30 PROGRAMS FOR THE SPECTRUM AND ZX-81

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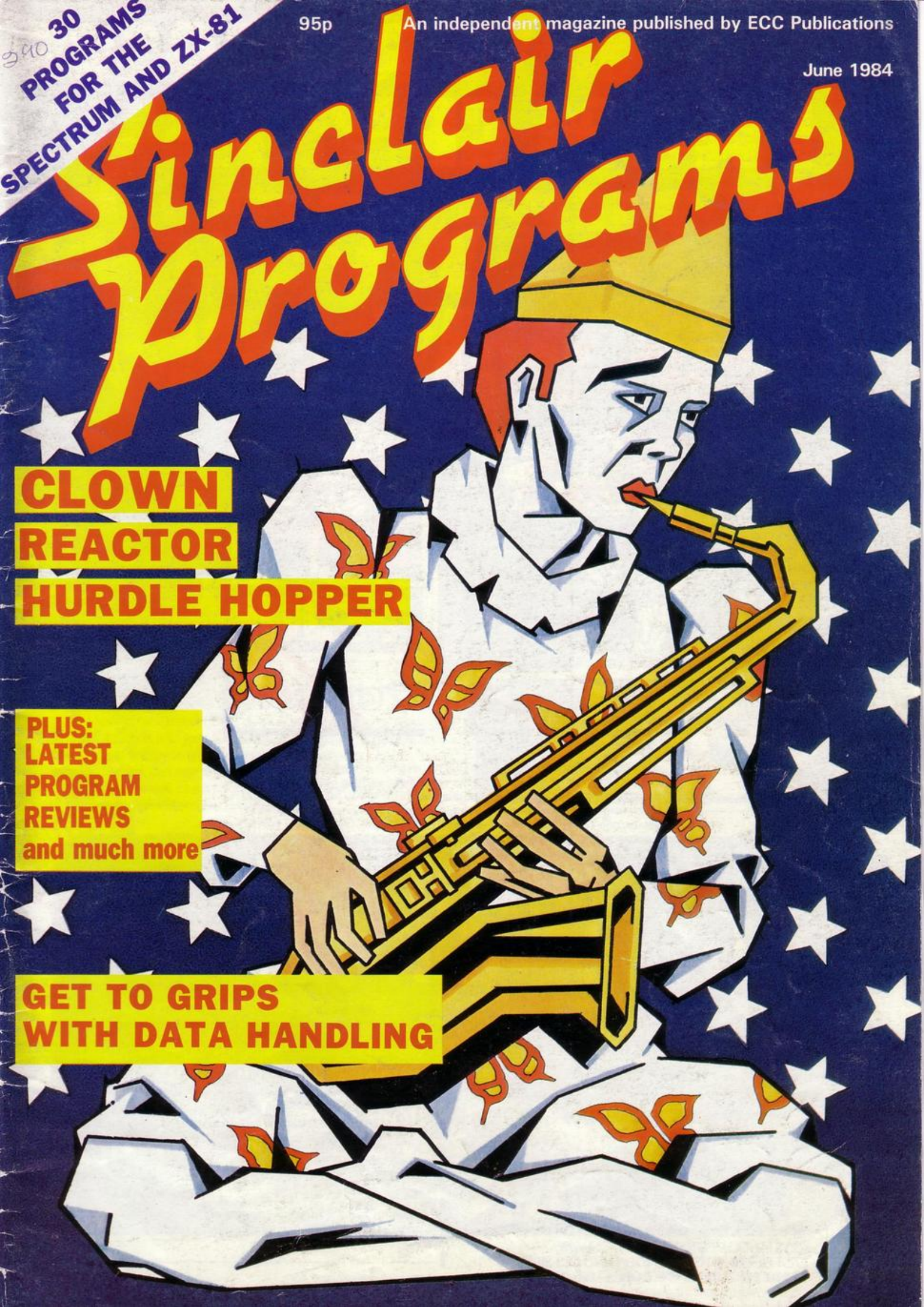
Sinclair Programs



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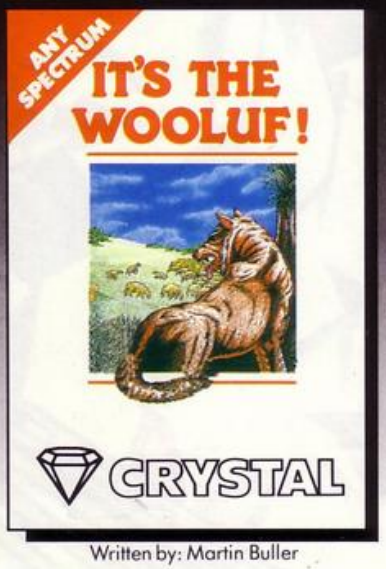

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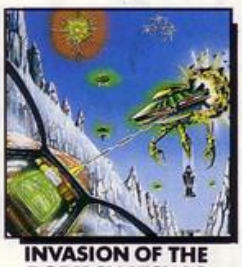

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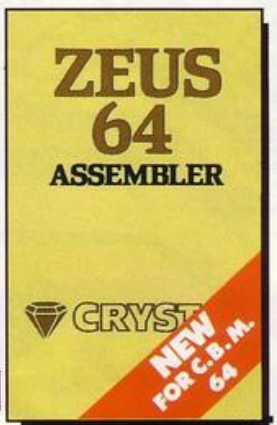

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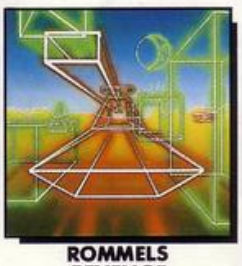

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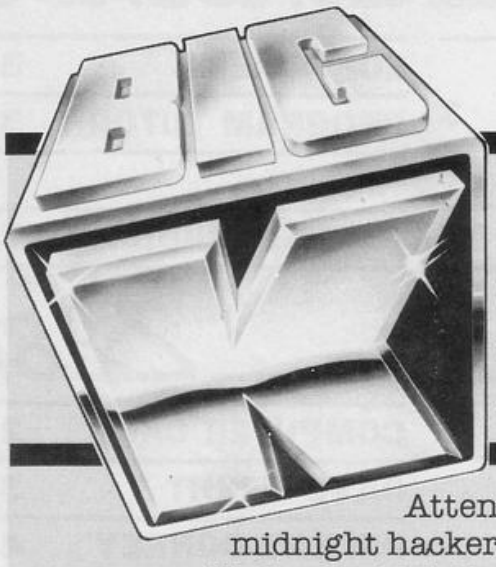
Instructions for graphics characters are printed in lower-case letters in our listings. They are enclosed by brackets and separated by colons to distinguish them and the brackets and colons should not be entered.

Inverse characters are represented by the letter "i" and graphics characters by "g". Thus an inverse W would be represented by "iw", a graphics W by "gw", and an inverse graphics W by "igw".

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

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

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



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THE CLOWN

THE OBJECT of **The Clown** is to answer 20 questions on either addition or subtraction correctly. If you choose to answer subtraction questions, a correct answer will result in a tick being drawn on the screen. Alternatively you can answer questions on addition, in which case a correct answer will result in a smiling clown, whereas an incorrect one will result in a gloomy clown.

The Clown was written for the 16K ZX-81 by David Read of Ashby-de-la Zouch, Leics.

```
  35 CLS
  40 FOR F=0 TO 21
  41 PRINT "
"
  42 NEXT F
  46 PRINT AT 1,2;"DO YOU WISH T
O ATTUD -";AT 3,3;"+ PRESS A";AT
 5,3;"- PRESS B"
  50 LET A$="
"
  52 PRINT AT 9,0;A$
  54 LET I$=INKEY$
  55 IF I$="A" THEN GOTO 70
  60 IF I$="B" THEN GOTO 322
  65 GOTO 54
  70 CLS
  80 PRINT AT 1,25;"KEY IN ";AT
2,25;"ANSWER";AT 3,25;"AFTER";AT
 4,25;"SUM";AT 5,25;"APPEARS"
  85 PRINT AT 9,20;"
";AT
 10,19;"
";AT 11,20;"
";AT 13,23;"
";AT 14,23;"
"
  88 PRINT AT 16,20;"
"
  90 LET C=0
  95 LET S=0
  97 LET C=C+1
 100 LET A=INT (RND*50)
 105 LET B=INT (RND*50)
 107 IF A+B=0 THEN GOTO 100
 110 PRINT AT C,1;A;"+";B;"="
 115 INPUT D
 117 IF D=0 THEN GOTO 35
 120 PRINT AT C,7;D
 130 IF D=A+B THEN GOTO 200
 135 IF D<>A+B THEN GOTO 300
 200 PRINT AT 16,20;"
"
 205 PRINT AT 16,20;"
";A
T 17,20;"
";AT 18,20;"
";AT 19,20;"
"
 210 LET S=S+1
 215 IF C=21 THEN GOTO 225
 220 GOTO 97
 225 CLS
 230 PRINT "YOU GOT ";S;" OUT OF
 20"
 235 IF S=0 THEN PRINT AT 2,0;"V
ERY WELL DONE"
 240 IF S=15 THEN PRINT AT 2,0;"
GOOD"
 245 IF S=10 THEN PRINT "HALF RI
GHT,NOT BAD"
 250 PAUSE 30
 255 GOTO 35
 300 PRINT AT 16,20;"
"
 305 PRINT AT 16,20;"
";A
T 17,20;"
";AT 18,20;"
";AT 19,20;"
"
 310 PRINT AT C,10;"ANSWER=";A+B
 315 IF C=21 THEN GOTO 225
 320 GOTO 97
 322 CLS
 323 LET C=0
 324 LET S=0
 325 LET A=INT (RND*50)
 330 LET B=INT (RND*50)
 335 IF A-B<=0 THEN GOTO 325
 345 PRINT AT C,0;A;"-";B;"="
 350 INPUT D
 352 IF D=0 THEN GOTO 35
 355 PRINT AT C,7;D
 357 LET C=C+1
 360 IF D=A-B THEN GOTO 400
 365 GOTO 500
 400 FOR F=12 TO 21
 405 PRINT AT F,21;"
"
 410 NEXT F
 415 PRINT AT 12,29;"
";AT 13,28
;"
";AT 14,27;"
";AT 15,26;"
";A
T 16,25;"
";AT 17,24;"
";AT 17,2
3;"
";AT 16,22;"
"
 420 LET S=S+1
 425 IF C=21 THEN GOTO 225
 430 GOTO 325
 500 FOR F=12 TO 21
 505 PRINT AT F,21;"
"
 510 NEXT F
 515 PRINT AT 12,21;"
";AT
13,21;"
";AT 14,21;"
";AT 15,21;"
";AT 16,21;"
";AT 17,21;"
"
 520 PRINT AT C-1,10;"ANSWER=";A
-B
 525 FOR F=0 TO 15
 530 NEXT F
 535 IF C=21 THEN GOTO 225
 540 GOTO 325
```

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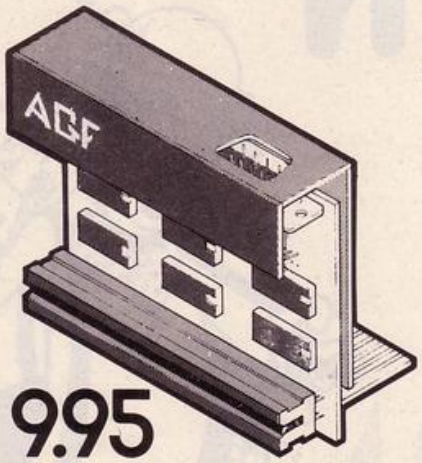

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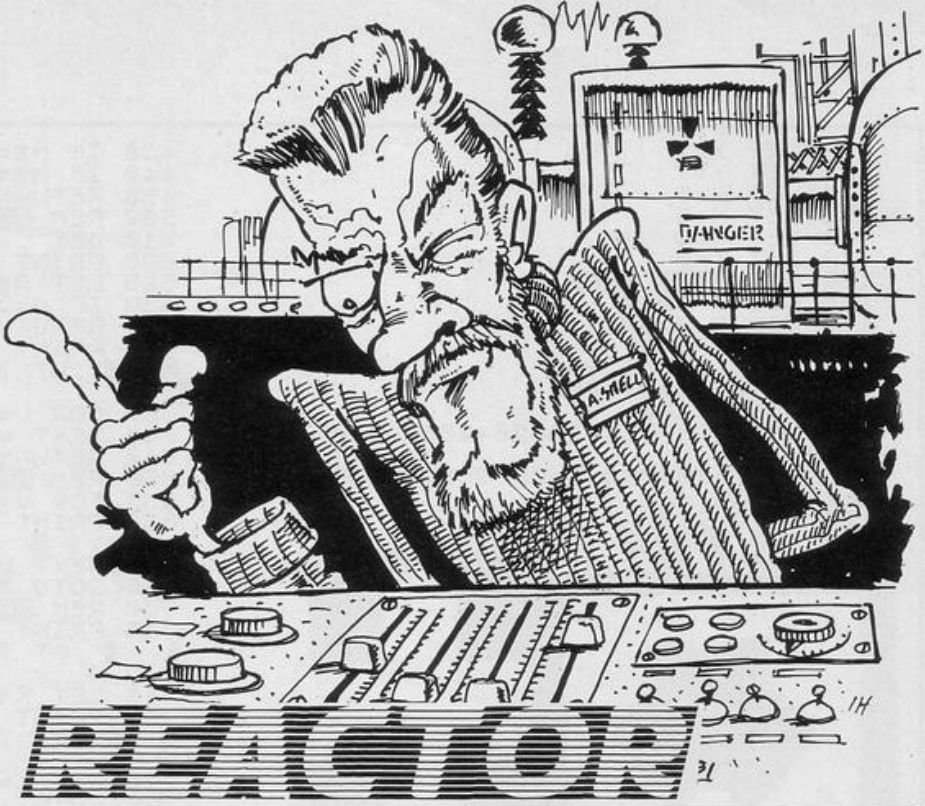


REACTOR centres on the player who is trapped in a nuclear power station. You have to move round the power station in an attempt to find three numbers which make up a code which allows entrance to the control room. Once in the control room you can choose one of two switches. One of those switches will close down the reactor, whereas the other will self-destruct. A reducing water level acts as a time limit, so if you run out of water the game ends.

The code you have to find is random, as are the two control room switches. To aid the search a map of the maze is displayed at the start of the game but the map, which can be recalled at any point during the game, will appear only for a second at any time.

Reactor was written for the 16K ZX-81 by Eliot Groves, aged 14, of Huyton, Merseyside. He has owned his ZX-81 for two years and the program took him approximately four hours to write.

It is good to see that people are still producing good-quality programs for the ZX-81. What is more, this one is written entirely in Basic and Spectrum owners could do worse than use the listing, since very little conversion is needed.

The game is centred on a nuclear reactor and you, the player, have pressed the self-destruct button accidentally. To prevent the disaster of a meltdown, you have to search the maze of corridors for three separate digits of code which will enable you to enter the control room.

Once you have entered the room, you have three attempts to re-arrange the code; if successful, you can enter the reactor where you have to flip a switch—but which way?

The program employs good use of the chunky ZX-81 graphics. When the program is loaded and run, you are confronted with 'windows' showing an enlarged section of the maze—with you in the centre—the reactor, code status and control room door.

You have four controls to move about the game, U — up, D — down, L — left and R right. If you need help you can enter 'HELP' and a map showing where you are as well as the codes will be displayed briefly.

When wandering round, keep an eye on the reactor which is melting; also watch for the radioactive wall.

Lines 9000-9130 display the introduction page and the controls. There is a small delay which is not produced by a pause statement but by the maze being set up in lines 9100-9122. Also the positions for the pieces of code and the control room have to be set up in lines 9130-9160.

Note that the general-purpose subroutine at lines 9200-9230 ensures that neither the code nor the control room will be positioned on any part of the maze wall or on the player.

The main display is printed at lines 200-220 and the expanded part of the maze is updated in the routine at lines 300-395. The time is checked at that point and a jump is made to lines 2000-2090.

Then T is incremented on every occasion the time is checked and, depending on its value, the reactor core is decremented. If T is greater than 7 a jump is made to line 2100, where you proceed to die.

On the other hand, you are then able to make a move and a small move processor at lines 400-450 checks your input. If you have entered HELP, a jump is made to 665, where the map is displayed. You can cheat by making the map display for as long as you like by entering line 665 IF INKEY$="" THEN GOTO 665.

That is the main part of the program loop but you still have to check to see if code has been found. That is done at line 500-540 and the code is jumbled in 800-940.

That shuffling is very useful in card games, so study it closely. Finally, 1000-1096 is the last task where you have to choose which switch to press; notice it is random.

The game can be made more interesting by defining your own mazes and because of the way the program is written the task is very simple.

SUBROUTINES AND MAIN CODE

9000-9130	Displays introduction
9200-9230	Sets positions of codes and control room
9135-9160	Inserts code into maze
9700-9780	Prints maze
200-220	Prints main display
300-395	Maintains and updates map
2000-2090	Checks time
2100-8999	Explosion
400-450	Prints man and checks user input
500-540	Deletes control room

ARRAYS USED

A$(13,13) Holds maze.

POKES USED

FRAMES	16436-16437	Used as timer
	16424	Jolts screen in explosion

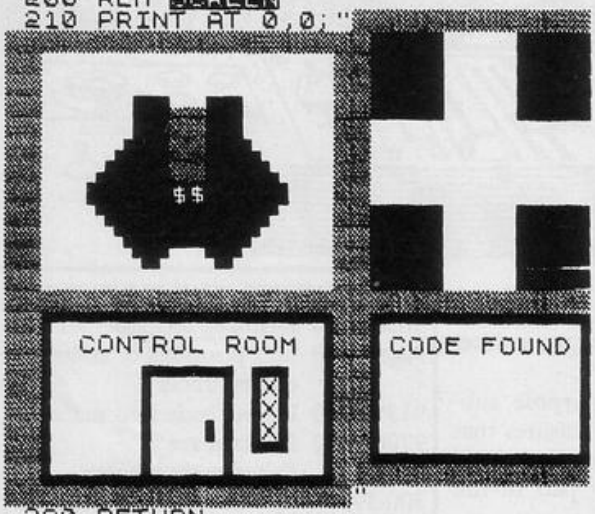
STRINGS USED

B$ Holds possible code digits 1-9
C$ Holds the three-digit code
M$ Stores user's input
F$ Stores jumbled code

VARIABLES USED

F,Q,V	FOR . . NEXT counters
X,Y	Hold horizontal and vertical co-ordinates of man
A,B	Hold horizontal and vertical co-ordinates for code and control room
R	Random number between 1 and 10, used to pick code
N,M	Used as indices to A$ — the maze
G,H	Used in plotting expanded part of maze
T1	Holds time
T	Used a counter to decrement the reactor core

```
  20 LET X=7
  30 LET Y=7
  40 LET N=5
  50 LET M=5
  60 LET C=0
  70 LET T=0
 150 REM MAIN GAME
 155 GOSUB 9000
 158 GOSUB 9700
 160 GOSUB 200
 162 POKE 16436,255
 163 POKE 16437,255
 170 GOSUB 300
 175 LET T1=PEEK 16436+256*PEEK
16437
 176 IF T1<64000 THEN GOSUB 2000
 180 GOSUB 400
 190 GOTO 170
 200 REM SCREEN
 210 PRINT AT 0,0;"
```




```
"
 220 RETURN
 300 REM MAP TO SCREEN
 310 FOR F=4 TO 12 STEP 4
 320 FOR Q=4 TO 12 STEP 4
 322 LET N=(X-2)+(F/4)
 324 LET M=(Y-2)+(Q/4)
 326 LET G=F-3
 328 LET H=Q-3
 330 IF A$(N,M)<>"■" THEN GOTO 3
40
 335 PRINT AT G,H;"▀▀▀";AT G+1,
H;"▀▀▀";AT G+2,H;"▀▀▀";AT G+3,
H;"▀▀▀"
 340 IF A$(N,M)<>" " THEN GOTO 3
50
 345 PRINT AT G,H;"   ";AT G+1,
H;"   ";AT G+2,H;"   ";AT G+3,
H;"   "
 350 IF A$(N,M)<>"X" THEN GOTO 3
60
 355 PRINT AT G,H;"▄▄▄";AT G+1,
H;"▀▄▀";AT G+2,H;"▄▄▄";AT G+3,
H;"▀▀▀"
 360 IF CODE A$(N,M)<156 THEN GO
TO 380
 365 PRINT AT G,H;"▄▄▄";AT G+1,
H;"CODE";AT G+2,H;"▄▄▄";AT G+3,
H;"▀▀▀"
 370 IF CODE A$(X,Y)>155 THEN PR
INT AT G+2,H+1;"■";A$(X,Y)
 375 IF CODE A$(X,Y)>155 THEN GO
SUB 500
 380 NEXT Q
 385 NEXT F
 390 IF A$(X,Y)="■" THEN GOTO 70
0
 391 IF A$(X,Y)="X" AND C=3 THEN
 GOTO 800
 395 RETURN
 400 REM MOVE
 405 PRINT AT 5,5;"  ▄  ";AT 6,5;
"  ▀  ";AT 7,5;" ▀▄▀ ";AT 8,5;" ▀ ▀
"

 410 INPUT M$
 420 LET X=X+(M$="D" AND X<12)-(
M$="U" AND X>2)
 425 LET Y=Y+(M$="R" AND Y<12)-(
M$="L" AND Y>2)
 430 IF M$="S" THEN STOP
 440 IF M$="HELP" THEN GOTO 650
 450 RETURN
 500 REM CODE FOUND
 510 LET C=C+1
 520 PRINT AT 16+C,2;A$(X,Y)
 525 LET A$(X,Y)=" "
 530 IF C=3 THEN GOSUB 600
 540 RETURN
 600 PRINT AT 5,5;"FIND";AT 6,5;
"CON-";AT 7,5;"TROL";AT 8,5;"ROO
M"
 604 FOR V=1 TO 100
 605 NEXT V
 610 RETURN
 650 REM HELP
 655 FOR V=1 TO 12
 656 PRINT AT V,1;A$(V, TO 12);A
T X,Y;("▒" AND V=X)
 660 NEXT V
 690 GOTO 300
 700 REM RADIO ACTIVE WALL
 710 PRINT AT 5,5;"▄▄▄▄▄";AT 6,5;
"▌   ▐";AT 7,5;"▌   ▐";AT 8,5;"▀▀▀
▀"
 711 LET K=X**Y
 715 PRINT AT 5,5;"▄▄▄▄▄";AT 6,5;
"▌ ▄ ▐";AT 7,5;"▌ ▀ ▐";AT 8,5;"▀▀▀
▀"
 716 LET K=X**Y
 720 PRINT AT 5,5;"     ";AT 6,5;
" ▄▄▄ ";AT 7,5;" ▀▄▀ ";AT 8,5;"
"
 721 LET K=X**Y
 725 PRINT AT 6,5;" ▄▄▄ ";AT 7,5;
" ▀▄▀ "
 726 LET K=X**Y
 730 PRINT AT 6,6;"   ";AT 7,6;"
"
 731 LET K=X**Y
 740 FOR V=1 TO 12
 745 PRINT AT V,1;"▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒"
 750 NEXT V
 760 STOP
 800 REM CONTROL ROOM CODE
 805 FOR V=1 TO 12
 810 PRINT AT V,1;"                "
 815 NEXT V
 820 PRINT AT 1,1;"CONTROL ROOM"
;AT 2,1;"▒▒▒▒▒▒▒▒▒▒▒▒";AT 4,1;"E
NTER THE";AT 5,1;" CODE.IF IT";A
T 6,1;"MATCHES THE";AT 7,1;" COM
BINATION";AT 8,1;"YOU CAN OPEN";
AT 9,1;" THE DOOR.";AT 10,1;"YOU
 HAVE 3";AT 11,1;" GOES."
 822 FOR V=1 TO 5
 825 LET F$="    "
 830 FOR F=1 TO 3
 835 LET R=INT (RND*3)+1
 840 IF F$(R)<>" " THEN GOTO 835
 860 LET F$(R)=C$(F)
 870 NEXT F
```

```
 880 LET C$=F$
 890 NEXT V
 895 FOR F=1 TO 3
 900 INPUT M$
 901 IF LEN M$<>3 THEN GOTO 900
 902 IF CODE M$(1)>155 THEN GOTO
 910
 905 FOR I=1 TO 3
 906 LET M$(I)=CHR$ (CODE M$(I)+
128)
 907 NEXT I
 910 PRINT AT 16,27;M$(1);AT 17,
27;M$(2);AT 18,27;M$(3)
 920 IF M$=C$ THEN GOTO 1000
 930 NEXT F
 940 GOTO 8000
1000 REM CONTROL ROOM OPEN
1010 PRINT AT 18,23;" "
1011 LET K=X**Y
1020 PRINT AT 18,23;" "
1021 LET K=X**Y
1030 PRINT AT 18,23;"  ";AT 16,2
1;"  ";AT 17,21;"  ";AT 18,2
1;"  ";AT 19,21;"  ";AT 20,2
1;"  "
1040 FOR V=1 TO 12
1045 PRINT AT V,1;"                "
1050 NEXT V
1060 PRINT AT 2,1;"YOU ARE NOW";
AT 3,1;" FACING TWO";AT 4,1;"SWI
TCHES,";AT 5,1;" ONE TURNS";AT 6
,1;"OFF THE NUKE";AT 7,1;" THE O
THER";AT 8,1;"DOES,NT.....";AT 1
0,3;"SWITCH";AT 11,3;"1 OR 2"
1070 LET R=INT (RND*2)+1
1075 INPUT SWITCH
1080 IF SWITCH>2 OR SWITCH<1 THE
N GOTO 1075
1090 IF SWITCH<>R THEN GOTO 2100
1091 FOR F=1 TO 12
1092 PRINT AT F,1;"                "
1093 NEXT F
1095 PRINT AT 6,5;"WELL";AT 7,5;
"DONE";AT 11,1;" NUKE  SAFE "
1096 STOP
2000 REM TIME CHECK
2010 LET T=T+1
2046 POKE 16436,255
2047 POKE 16437,255
2050 IF T>=1 THEN PRINT AT 3,22;
"  "
2055 IF T>=2 THEN PRINT AT 4,22;
"  "
2060 IF T>=3 THEN PRINT AT 4,22;
"  "
2065 IF T>=4 THEN PRINT AT 5,22;
"  "
2070 IF T>=5 THEN PRINT AT 5,22;
"  "
2075 IF T>=6 THEN PRINT AT 6,22;
"  "
2080 IF T>=7 THEN PRINT AT 6,22;
"  "
2085 IF T>=7 THEN GOTO 2100
2090 RETURN
2100 FOR F=0 TO 21
2110 PRINT AT F,0;"                
                              ";AT 21-F,0;"
                              "
2120 POKE 16424,255
2130 NEXT F
2140 STOP
8999 STOP
9000 REM MAP
9010 PRINT AT 0,0;"
```

```
                NUK
N LEFT IN CHARGE      YOU HAVE BEE
R POWER STATION.       OF A NUCLEA
Y YOU MISTAKENLY      UNFORTUNATEL
 SELF-DESTRUCT          PRESSED THE
ING IT WAS A          BUTTON THINK
H.....                 LIGHT SWITC

MOVE ROUND A          YOU HAVE TO
                       MAZE LOOKIN
```

```
G FOR 3 SEPERATE      PIECES OF SE
CRET CODE. WHEN        YOU HAVE FO
UND ALL THREE         YOU CAN ENTE
R THE CONTROL          ROOM (A CRO
SS) AND REARANGE      THE CODE TO
OPEN THE NUCLEAR       REACTER AND
 SWITCH IT OFF.                "
9020 IF INKEY$="" THEN GOTO 9020
9030 PRINT AT 0,0;
9040 FOR F=0 TO 21
9050 PRINT "                "
9060 NEXT F
9070 PRINT AT 5,10;"THE CONTROLS
";AT 6,10;"          ";AT 8,4;
""""U""=UP";AT 8,22;"""D""=DOWN";
AT 10,2;"""L""=LEFT";AT 10,22;""
"R""=RIGHT";AT 12,8;"""HELP""=PR
INT MAP"
9100 DIM A$(13,13)
9110 LET A$(1)="                "
9111 LET A$(2)="                "
9112 LET A$(3)="                "
9113 LET A$(4)="                "
9114 LET A$(5)="                "
9115 LET A$(6)="                "
9116 LET A$(7)="                "
9117 LET A$(8)="                "
9118 LET A$(9)="                "
9119 LET A$(10)="               "
9120 LET A$(11)="               "
9121 LET A$(12)="               "
9122 LET A$(13)="               "
9130 GOSUB 9200
9135 LET A$(A,B)="X"
9140 LET B$="1231567890"
9141 LET C$="XXX"
9145 FOR F=1 TO 3
9146 LET R=INT (RND*10)+1
9147 LET C$(F)=B$(R)
9148 GOSUB 9200
9149 LET A$(A,B)=C$(F)
9150 NEXT F
9160 RETURN
9200 LET A=INT (RND*13)+1
9210 LET B=INT (RND*13)+1
9215 IF A=X AND B=Y THEN GOTO 92
00
9220 IF A$(A,B)<>" " THEN GOTO 9
200
9230 RETURN
9700 PRINT AT 0,0;
9710 FOR F=0 TO 21
9720 PRINT "                
                "
9730 NEXT F
9750 FOR F=1 TO 13
9760 PRINT AT 4+F,9;A$(F)
9770 NEXT F
9780 RETURN
9900 CLEAR
9910 SAVE "NUK"
9920 RUN
```

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HURDLE HOPPER

FIVE HURDLES appear and you must jump over them using keys 5 and 8 to move back and forth and 7 to jump. When you have cleared the five hurdles on level one you go to level two, where you will be faced with five more hurdles and some thistles. The thistles multiply according to your level and an extra man is gained for each level completed.

Hurdle Hopper was written for the 16K ZX-81 by Michael McRoberts of New Brighton.

```
   2 LET MEN=3
   3 LET DIF=10
   4 LET LEVEL=1
   5 GOSUB 1000
   6 PRINT AT 0,0;"MEN=";MEN;"
  ";"LEVEL:";LEVEL
   7 PRINT AT 11,0;"
                    "
   8 PRINT "
                    "
   9 PRINT AT 14,5;"ZX81 HURDLE
HOPPER"
  10 FOR A=3 TO 25
  15 LET Z=INT (RND*10)+1
  20 IF Z>DIF THEN PRINT AT 10,A
;"*"
  30 NEXT A
  60 FOR A=3 TO 28 STEP 6
  70 PRINT AT 10,A;"■"
  80 NEXT A
  90 LET A=10
 100 LET B=0
 110 PRINT AT A,B;"■"
 115 IF B>27 THEN GOTO 500
 120 IF INKEY$="" THEN GOTO 120
 130 PRINT AT A,B;" "
 140 LET B=B+(INKEY$="8")-(INKEY
$="5")
 150 IF INKEY$="7" THEN GOSUB 30
0
 160 PRINT AT A,B;
 170 IF PEEK (PEEK 16398+256*PEE
K 16399)<>0 THEN GOTO 400
 180 GOTO 110
 300 LET A=A-1?■
 305 LET B=B+1
 310 PRINT AT A,B;"■"
 315 PRINT AT A,B;" "
 316 LET B=B+1
 317 PRINT AT A,B;"■";AT A,B;" "
 320 LET A=A+1
 330 LET B=B+1
 340 PRINT AT A,B;
 350 IF PEEK (PEEK 16398+256*PEE
K 16399)<>0 THEN GOTO 400
 360 RETURN
 400 FOR Z=0 TO 20
 410 PRINT AT A,B;"■";AT A,B;"""
"
 420 NEXT Z
 430 CLS
 440 PRINT AT 10,10;"BAD LUCK"
 450 PRINT AT 15,5;"YOU LOSE ONE
LIFE"
 460 LET MEN=MEN-1
 470 IF MEN=0 THEN GOTO 700
 480 PRINT AT 21,3;"PRESS ANY KE
Y TO CONTINUE"
 490 IF INKEY$="" THEN GOTO 490
 491 CLS
 495 GOTO 6
 500 CLS
 505 FOR Z=0 TO 2
 510 LET A$="WELL DONE "
 520 FOR A=1 TO 10
 530 PRINT AT 10,10;A$
 540 LET A$(A)=CHR$ (CODE A$(A)+
128)
 550 NEXT A
 560 NEXT Z
 570 LET LEVEL=LEVEL+1
 580 LET DIF=DIF-1
 590 LET MEN=MEN+1
 600 PRINT AT 15,5;"YOU ARE NOW
ON LEVEL ";LEVEL
 610 PRINT AT 21,3;"PRESS ANY KE
Y TO CONTINUE"
 620 IF INKEY$="" THEN GOTO 620
 625 CLS
 630 GOTO 6
 700 FOR T=0 TO 50
 710 NEXT T
 720 CLS
 725 FOR A=0 TO 2
 730 PRINT AT 5,10;"GAME OVER"
 740 FOR T=0 TO 10
 750 NEXT T
 760 PRINT AT 5,10;"GAME OVER"
 770 FOR T=0 TO 10
 780 NEXT T
 790 NEXT A
 800 PRINT AT 10,0;"BAD LUCK.YOU
 REACHED LEVEL:";LEVEL
 801 FOR A=0 TO 30
 802 PRINT AT 15,A;" ■";AT 15,31
;""
 803 NEXT A
 810 PRINT AT 21,3;"DO YOU WANT
ANOTHER GAME?"
 820 IF INKEY$="" THEN GOTO 820
 830 IF INKEY$="Y" THEN RUN
 840 STOP
1000 CLS
1010 PRINT TAB 5;"ZX81 HURDLE HO
PPER"
1020 PRINT ,,,," IN HURDLE HOPPE
R YOU (■) THE    HOPPER MUST JUM
P OVER THE       HURDLES (■) BY
PRESSING KEY 7.  BUT WATCH OUT F
OR THE DEADLY    THISTLES (*) ON
 THE OTHER SIDE  OF THE HURDLE."
1030 PRINT ,," WHEN YOU HAVE CLE
ARED ALL         FIVE HURDLES YOU
WILL GO ONTO     THE NEXT LEVEL WH
ICH WILL HAVE    MORE THISTLES AND
 YOU WILL GET    AN EXTRA H■PPER."
1040 PRINT ,," 5=LEFT              8
=RIGHT                    7=HOP"
1050 PRINT AT 21,3;"PRESS ANY KE
Y TO START."
1060 IF INKEY$="" THEN GOTO 1060
1070 CLS
1080 GOTO 6
9998 SAVE "HURDLE HOPPE■"
9999 RUN
```

ROLLING STONES

ALTHOUGH **Rolling Stones** is simple in operation, the program is small and compact. Many important programming features are included and it is worth looking at even if only to learn a few of them.

The program has no subroutines yet closer examination reveals that it is in three distinct parts. First, lines 1 to 18 which set variables. Next, the main part of the program is really a large loop from lines 20 to 36. The last section deals with printing the dead man and the score.

As the program allows you to control a man with cursor keys 5 and 8, and a stone is falling, much of the program deals with controlling screen co-ordinates. Here is a description of the important portions:

The stone begins its fall at a random position at each attempt and that is set in line 14. Line 20 prints the stone and erases the position directly above it. Line 22 checks to see if you have missed the catch and, if you have, a jump is made to the section where the dead man is printed. If all is well, the program proceeds to line 24, where the line number of the stone is incremented. Lines 28 and 30 check the key being pressed and alter variable A which holds the position of the man.

The man is printed in line 32 and line 34 checks to see if you have caught the stone. Line 35 loops back to line 20, where all the checks are repeated.

Eventually you will miss the stone and a jump will be made to line 38. From there the dead man is printed in line 40 and your score in 44. Lines 46 to 54 check to see if you have achieved the high score which is printed. Note that this program can be run on the Spectrum with very little difficulty.

VARIABLES USED

- A$ Holds user's input.
- H$ Holds high score.
- A Holds the horizontal position of man.
- C Holds the line number where the stone is.
- HS Holds high score.
- Z Holds score.

YOU ARE standing at the bottom of a hill and must try to catch the stones rolling down. Use keys 5 and 8 to move as you attempt to catch the stones in your pouch.

The graphics representation of the man is very good when the length of the program is taken into account. There is also a facility for the name of the highest scorer to be entered.

Rolling Stones was written for the 16K ZX-81 by Richard Turner of Gorleston, Great Yarmouth.

```
   1 REM "ROLLING"
   4 LET H$="??????"
   6 LET HS=0
   8 LET A=15
  10 LET Z=0
  12 CLS
  14 LET B=INT (RND*30)
  16 LET C=0
  18 PRINT AT 21,0;"------------
--------------------"
  20 PRINT AT C,B;"O";AT C-1,B;"
 "
  22 IF A+3<>B AND C=18 THEN GOT
O 38
  24 LET C=C+1
  26 IF C=20 THEN GOTO 14
  28 IF INKEY$="5" AND A>0 THEN
LET A=A-1
  30 IF INKEY$="8" AND A<28 THEN
 LET A=A+1
  32 PRINT AT 16,A;" ▒▒▒ ";AT 17,
A;" ▟▀▀ ";AT 18,A;" ▟▀▀▖ ";AT 19,A
;" ▀▀▀ ";AT 20,A;" ▛▚▜ "
  34 IF A+3=B AND C=18 THEN LET
Z=Z+5
  36 GOTO 20
  38 CLS
  40 PRINT AT 20,A;"▒ ▀▀▀▀"
  42 PRINT AT 2,2;"YOU RE DEAD..
."
  44 PRINT AT 4,2;"YOUR SCORE=";
Z
  46 IF Z>HS THEN INPUT A$
  48 IF Z>HS THEN LET H$=A$
  50 PRINT AT 6,2;"BY ";H$
  52 IF Z>HS THEN LET HS=Z
  54 PRINT AT 8,2;"HIGH SCORE=";
HS
  56 PRINT ,,"FOR ANOTHER GO PRE
SS ANY KEY"
  58 IF INKEY$="" THEN GOTO 58
  60 GOTO 8
```

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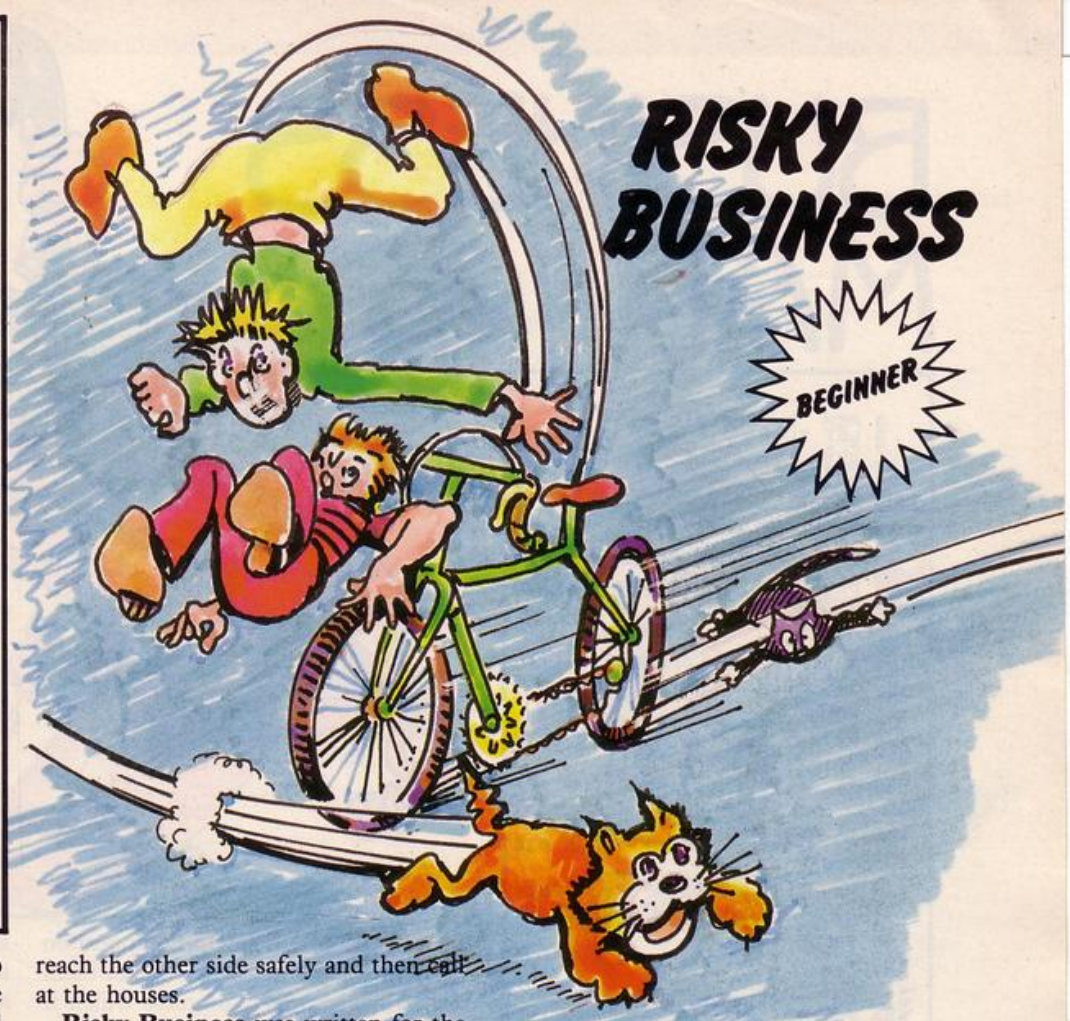
RISKY BUSINESS




```
   2 FOR N=1 TO 20
   3 PRINT "[illegible]"
   4 NEXT N
   5 PRINT AT 9,1;"PRESS ""R"" TO PLAY RISKY BUSINESS"
   6 PRINT AT 17,0;"USE KEYS (5) LEFT (8)RIGHT  0(UP)"
   8 INPUT A$
   9 IF A$="R" THEN GOTO 20
  10 IF A$<>"R" THEN GOTO 6
  20 LET S=0
  30 CLS
  35 PRINT "              RISKY BUSINESS"
  40 PRINT AT 1,0;"[illegible]"
  41 PRINT AT 2,0;"[illegible]"
  42 PRINT AT 3,0;"[illegible]"
  50 LET S=S+1
  55 PRINT AT 17,0;"[illegible]"
  60 LET A$="  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  "
  70 LET B$="[illegible]  [illegible]  [illegible]  [illegible]  [illegible]  "
  80 LET Y=13
  90 LET X=16
 100 IF S=5 THEN GOTO 20
 110 LET A$=A$(19)+A$( TO 29)
 120 LET B$=B$(2 TO )+B$(19)
 130 PRINT AT X,Y;" ";AT 4,0;A$;AT 6,0;B$;AT 8,0;A$;AT 10,0;B$;AT 12,0;A$;AT 14,0;B$
 140 LET Y=Y+(INKEY$="8")-(INKEY$="5")
 150 LET X=X-(INKEY$="0")
 160 PRINT AT X,Y;
 170 IF PEEK (PEEK 16398+256*PEEK 16399)>121 THEN GOTO 210
 180 PRINT "[illegible]"
 190 IF X=2 THEN GOTO 50
 200 GOTO 110
 210 PRINT AT 19,1;"GAME OVER-ANOTHER GAME PERHAPS"
 211 PRINT AT 20,13;"Y/N"
 215 INPUT A$
 220 IF A$="Y" THEN GOTO 20
 230 IF A$="N" THEN STOP
 240 IF A$<>"Y" THEN GOTO 215
 250 SAVE "SF"
```

CROSSING the road is not too easy, especially when you have to avoid the juggernauts and other vehicles which race along the road. Taking your life into your hands you have to attempt to cross the road to reach the other side safely and then call at the houses.

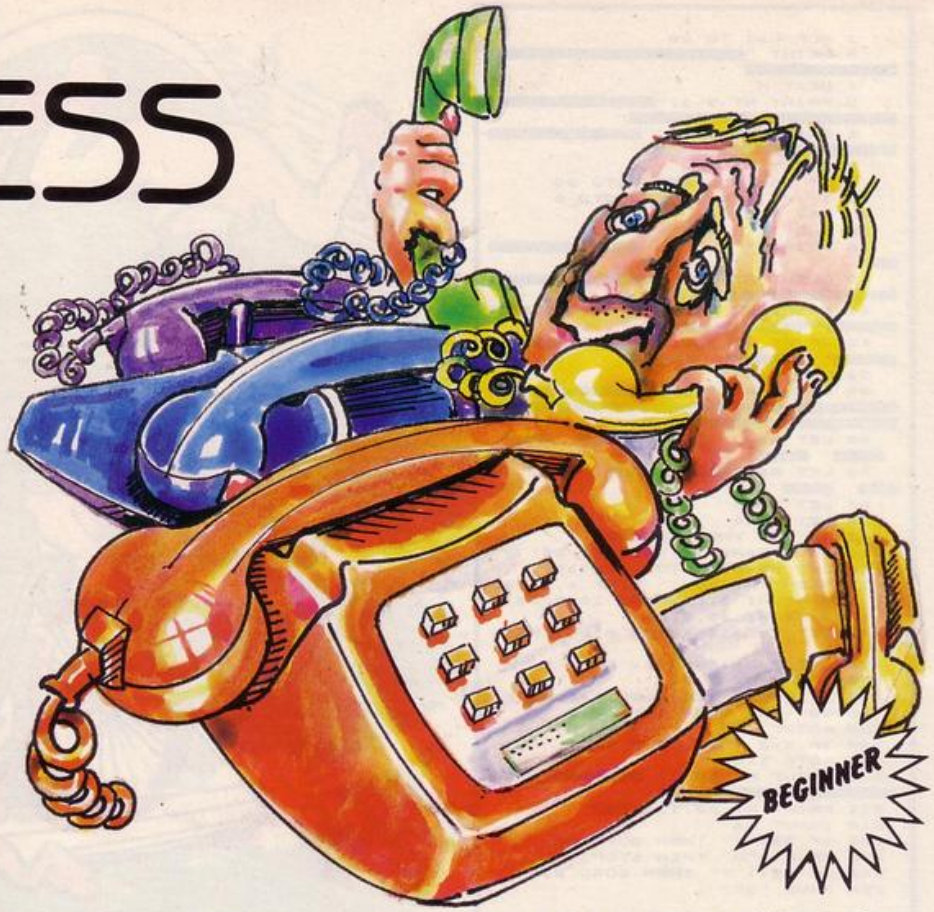
Risky Business was written for the 16K ZX-81 by Matthew Norman of Redhill, Surrey, who has managed to complete 10 screens.

SLOW BOAT

SHOOT the **Slowboat** as it chugs along the screen and prevent it invading your territory. If you allow the boat to pass you four times, the game ends. Use key K for up, M for down and Z for fire. Slowboat is a beginners' program written for the 1K ZX-81 by Matthew Norman of Redhill, Surrey.

```
   1 PRINT "[illegible]SLOW BOAT[illegible]"
  15 LET K=0
  16 LET C=0
  17 LET D=1
  18 LET P=4
  19 LET S=4
  20 FOR T=D TO 28
  30 PRINT AT S,T;"[illegible]"
  35 PRINT AT P,25;"[illegible]"
  45 LET V=0
  50 IF INKEY$="K" THEN LET V=-4
  60 IF INKEY$="M" THEN LET V=4
  65 IF INKEY$="Z" AND P=S THEN GOTO 200
  70 IF P+V<3 THEN LET V=0
  85 PRINT AT P,25;"   "
  90 LET P=P+V
 100 NEXT T
 105 LET C=C+1
 106 IF C=3 THEN GOTO 230
 110 LET S=INT (RND*4)*4+4
 120 IF S>16 THEN LET S=4
 130 GOTO 20
 200 PRINT AT S,T;"      "
 210 LET K=K+1
 215 IF K>10 THEN LET D=D+2
 220 GOTO 110
 230 PRINT AT 1,0;"SCORE=";K
```

BUSINESS MAN




```
  3 REM "BUSINESS MAN"
  5 LET SC=0
  7 CLS
 10 PRINT "BUSINESS MAN"
 20 PRINT "
 30 PRINT AT 5,0;"
 40 PRINT AT 6,0;"
 45 PRINT AT 7,0;"
 50 PRINT AT 8,0;"
 60 PRINT
 70 PRINT "          RRRING"
 80 PRINT
 90 PRINT "WHICH PHONE?"
100 LET A=INT (RND*4)+1
105 LET B=INT (RND*1000)+1
110 INPUT P
115 IF P<1 OR P>4 THEN GOTO 7
120 IF A=1 THEN PRINT "YOU HAVE
INHERITED £";B
130 IF A=1 THEN LET SC=SC+B
140 IF A=2 THEN PRINT "YOUR SHA
RES HAVE RISEN.                COLL
ECT £";B
150 IF A=2 THEN LET SC=SC+B
160 IF A=3 THEN PRINT "YOUR FIR
M HAS GONE BUST."
170 IF A=3 THEN GOTO 205
180 IF A=4 THEN PRINT "YOU HAVE
JUST BEEN DIDDLED OUT OF £";B
190 IF A=4 THEN LET SC=SC-B
195 PAUSE 150
200 GOTO 7
205 CLS
210 PRINT "BAD LUCK"
220 PRINT "YOU MANAGED £";SC
230 PRINT
240 PRINT "ANOTHER GO (Y/N)?"
250 INPUT A$
260 IF A$="Y" THEN RUN
270 STOP
```

FOUR TELEPHONES appear on the screen and when one of them rings you have to guess which it is and answer it. If you choose the wrong telephone your firm will become bankrupt or be swindled by a client. If you answer the correct telephone your shares will rise or you will learn of an inheritance. The object is to try to raise as much money as possible before being made bankrupt.

Business Man was written for the 1K ZX-81 by David Hindon and Martin Bowell, of Swindon, Wilts.

SUN KING

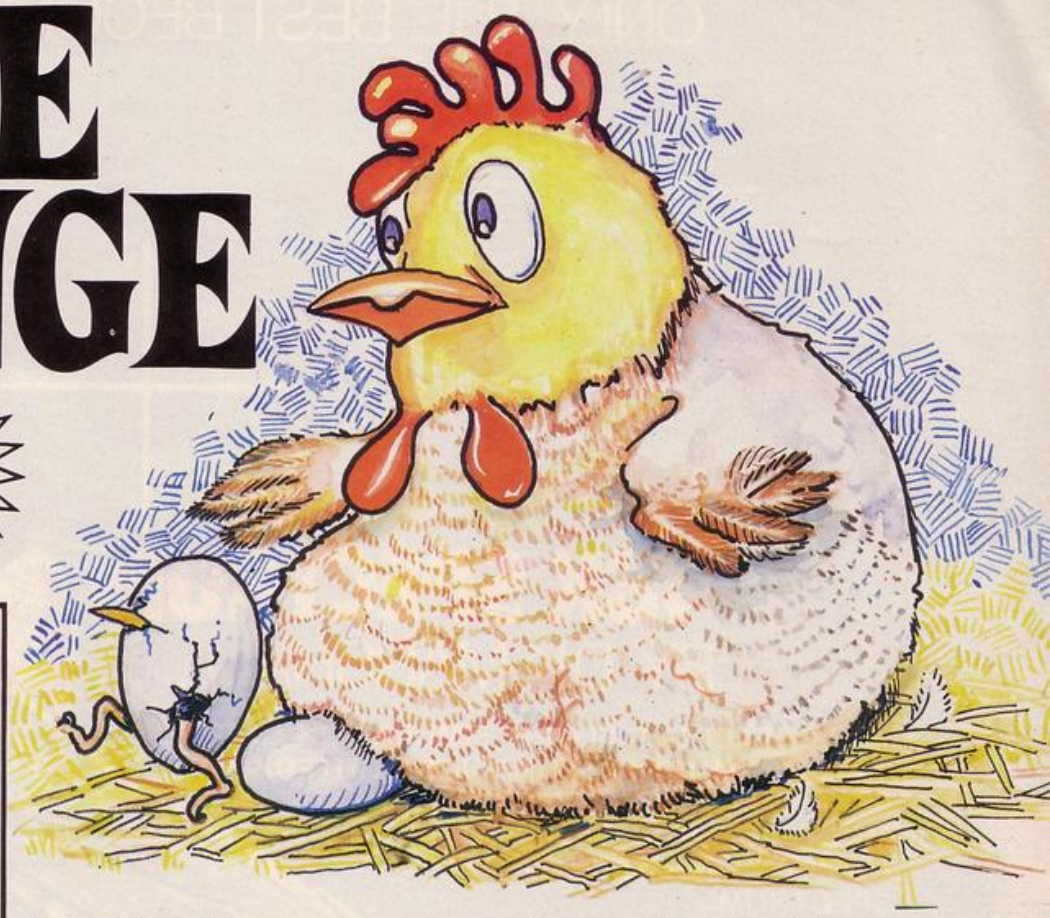
MOVE your laser base left and right with keys "6" and "7" and catapult missiles into space using "0". You must fire at the **Sun King** as it passes and attempt to reach as high a score as possible before you run out of laser power and the Sun King wins again.

Written for the 16K Spectrum by Christopher Powton of Shildon, Co. Durham.

```
  1 LET sc=0
 10 PAPER 2: INK 6: CLS
 15 FOR f= USR "a" TO  USR "f"+
7: READ a: POKE f,a: NEXT f
 20 DATA 8,20,36,72,68,69,196,1
98
 30 DATA 15,24,51,102,102,51,24
,15
 40 DATA 240,24,208,102,102,208
,24,240
 50 DATA 0,24,60,126,24,60,60,6
0
 60 DATA 126,24,24,24,24,60,102

 70 DATA 0,0,24,24,24,60,36,0,0

 75 FOR f=1 TO 30: PLOT  INK 6;
INT ( RND *200), INT ( RND *150
): NEXT f
 76 CIRCLE 175,125,10
 80 LET laser=20: LET pos=15: L
ET v=0
 90 PRINT  AT 20,pos; INK 0;" D
": PRINT  AT 21,pos; INK 0;" E
"
100 PRINT  AT 10,v; INK 6;" BC
"
101 IF v >= 29 THEN  PRINT  AT
10,v;"   ": LET v=0: LET laser=l
aser-1: GO TO 100
110 IF  INKEY$ ="6" THEN  LET p
os=pos-1: BEEP .005,pos
112 PRINT  AT 0,10;"SCORE = ";s
c
120 IF  INKEY$ ="7" THEN  LET p
os=pos+1: BEEP .005,pos
130 IF pos <= 1 THEN  LET pos=1

140 IF pos >= 27 THEN  LET pos=
27
150 IF  INKEY$ ="0" THEN  FOR f
=19 TO 10 STEP -1: PRINT  AT f,p
os+1;"F": BEEP .005,f: BEEP .005
,f*pos/v/laser: BEEP .005,laser:
 PRINT  AT f,pos+1;" ": NEXT f:
IF f=9 AND pos=v+1 OR f=9 AND po
s=v THEN  LET sc=sc+10: BEEP .1,
5: PRINT  AT 10,v;"   ": LET v=0
:| GO TO 100
160 IF laser <= 0 THEN  PRINT "
THE SUN KING WINS AGAIN !!!!!!":
 PAUSE 0: PAUSE 0: CLS : RUN
170 IF sc>1000 THEN  PRINT "YOU
 WIN CONTROLL OVER THE SUN": FOR
 f=1 TO 5: BEEP .1,f: NEXT f: PA
USE 0: PAUSE 0: CLS : RUN
200 LET v=v+1
2000 GO TO 90
```

FREE RANGE

BEGINNER



```
  3 LET S=0
  4 FOR F=1 TO 10
  5 LET B$="■"
  7 LET A=INT (RND*20)
  8 LET B=INT (RND*20)
  9 PRINT AT A,B;B$
 10 LET A$="■▟■"
 30 LET X=10
 40 LET Y=0
 50 PRINT AT X,Y;A$
 80 LET Y=Y+(INKEY$="8")-(INKEY
$="5")
 90 IF INKEY$="7" THEN LET X=X-
1
100 IF INKEY$="6" THEN LET X=X+
1
120 CLS
124 PRINT AT A,B;B$
130 IF X=A AND Y=B THEN NEXT F
135 IF VAL "F"=10 THEN GOTO 150
136 LET S=S+1
140 GOTO 50
150 PRINT AT 21,0;"YOU TOOK ";S
;" TIME UNITS"
151 STOP
152 SAVE "FREERANG■"
153 RUN
```

YOU ARE working on a free-range farm and have to collect the eggs round the yard. Only one egg can be seen at any time and you have to guide your barrow round the screen using the cursor keys. To collect each egg you have to push the barrow through the egg. The next egg will then appear on the screen.

Free Range was written for the 1K ZX-81 by C Heath of Kings Norton, Birmingham.

COLOURS

BEGINNER

COLOURS is a short routine written for the 16K Spectrum by Andrew Wallis, aged 16, of Marston Green, Birmingham. It produces three screens full of different colours by combining the user-defined graphics and paper and ink colours. The finished effect is similar to the pattern of a woven rug.

```
 10 REM### EXTRA COLOURS ###

 20 REM### BY ANDREW WALLIS ##

 30 CLS
 40 FOR a=0 TO 7
 50 READ b
 60 POKE  USR "A"+a,b
 70 NEXT a
 80 DATA 85,170,85,170,85,170,8
5,170
 90 FOR p=0 TO 7
100 FOR i=0 TO 7
110 PRINT  INK i; PAPER p;"AAAA
AAAAAAAAAAAAAAAAAAAAAAAAAAAA"
120 NEXT i
130 NEXT p
140 STOP
150 SAVE "colour" LINE 10
```

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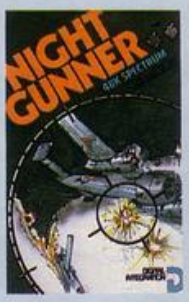

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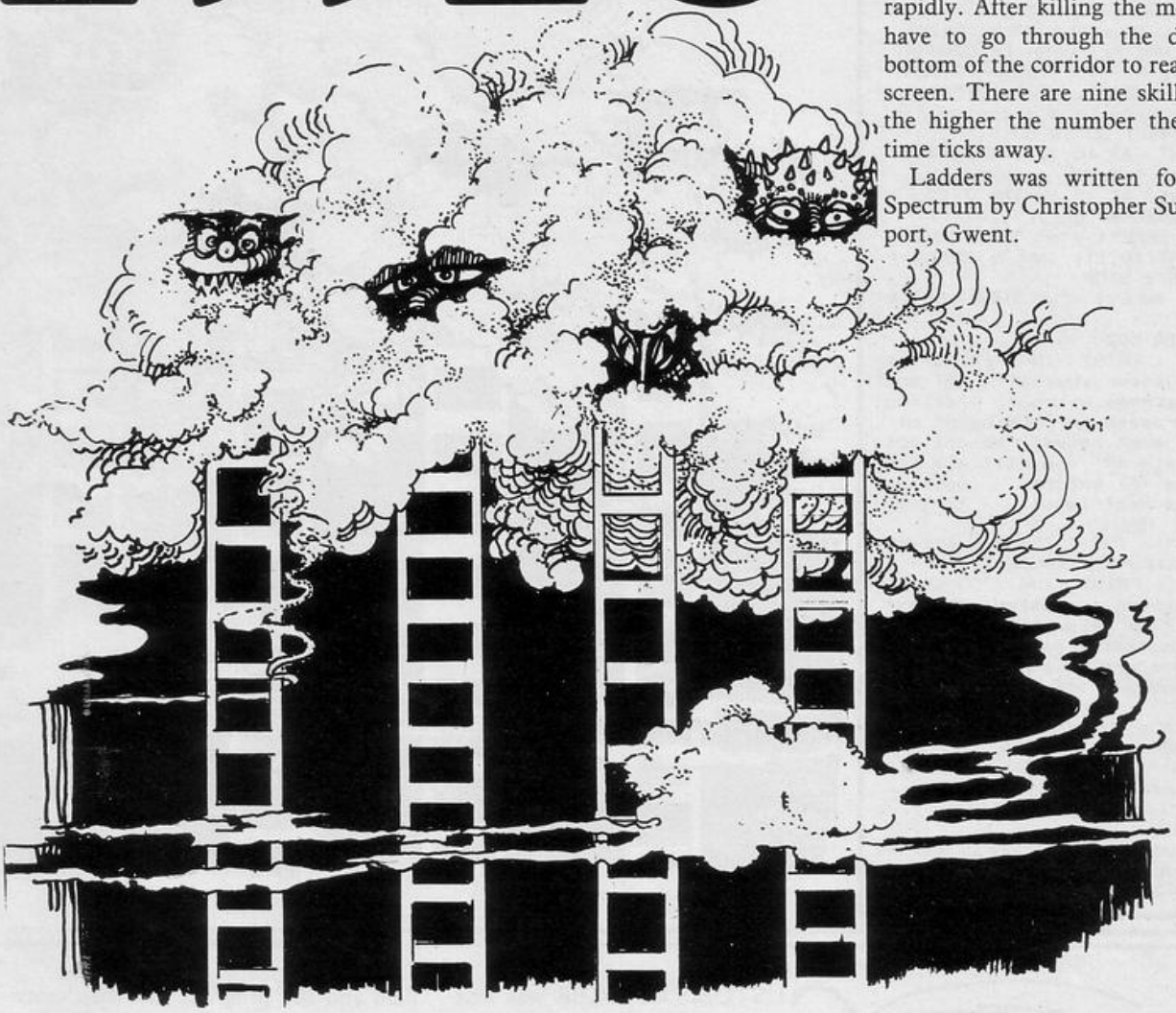
LADDERS

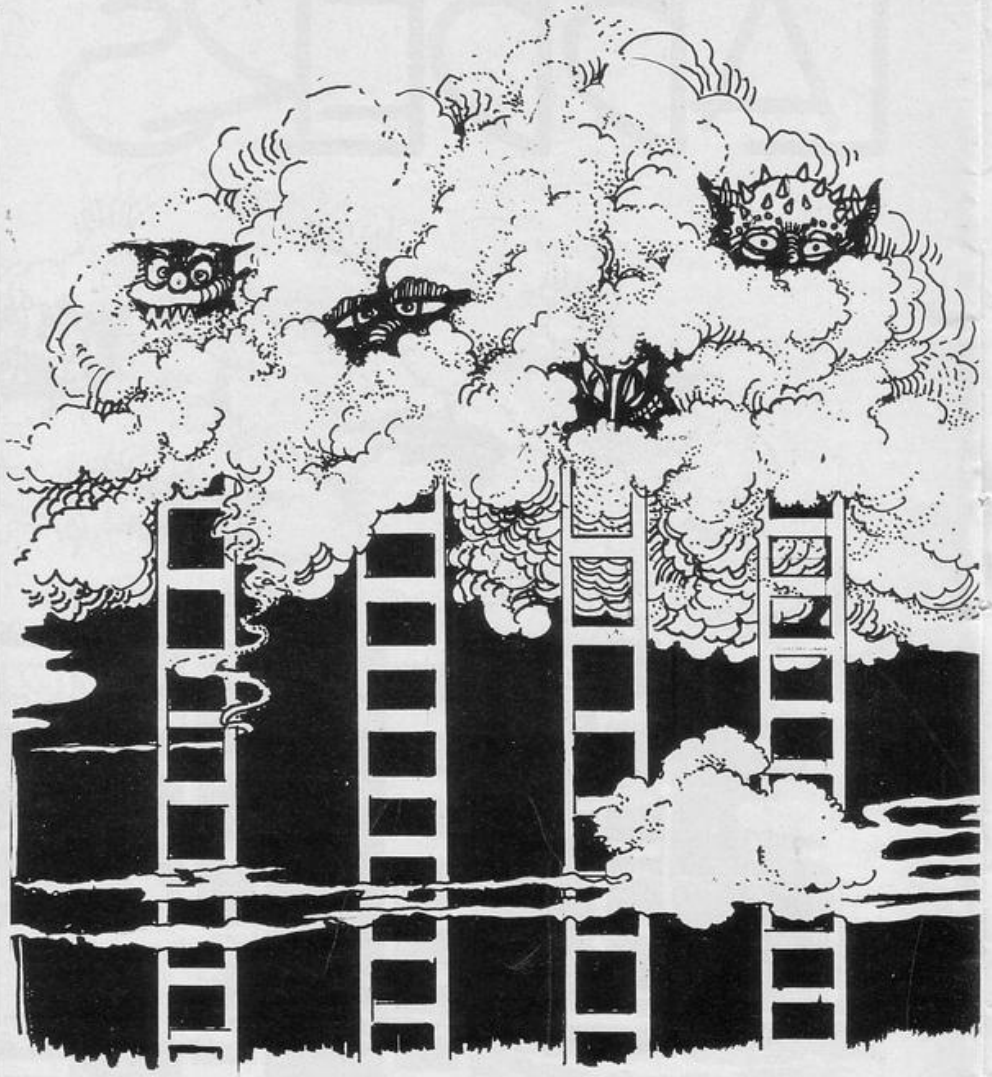
THE OBJECT of **Ladders** is to race along the corridors and climb the ladders to reach the monsters at the top of the house. As each monster is killed it releases an invisible gas which decreases your time rapidly. After killing the monsters you have to go through the door at the bottom of the corridor to reach the next screen. There are nine skill levels and the higher the number the faster the time ticks away.

Ladders was written for the 16K Spectrum by Christopher Sully of Newport, Gwent.



```
  1 LET hs=0
  2 INK 3: BORDER 0: PAPER 0: C
LS : GO SUB 2000
  3 CLS : PRINT  AT 10,0; INK 7
;"Do you need instructions ? (y/
n)"
  4 IF  INKEY$ ="n" THEN  GO TO
 7
  5 IF  INKEY$ ="y" THEN  GO SU
B 5500
  6 GO TO 4
  7 CLS : PRINT  INK 7;"START L
EVEL ? (1-9)": INPUT l: LET sc=0
: LET k=0: IF l<1 OR l>9 THEN  C
LS : PRINT  AT 10,13; FLASH 1; I
NK 7;"FOOL": PAUSE 100: GO TO 3

  8 LET b=21: LET t=1000
  9 CLS : PRINT  AT 0,0; INK 7;
"SCORE=";sc; AT 0,13;"TIME=";t;
AT 0,25;"LEVEL=";l
 10 FOR a=1 TO 30
 11 PRINT  AT b,a; INK 5;"E"
 20 NEXT a
 30 IF b>8 THEN  LET b=b-3: GO
TO 10
 40 FOR m=1 TO 2
 45 LET r= RND *29+1
 50 FOR s=1 TO 2: PRINT  AT b,r
; INK 6;"D": LET b=b+1: NEXT s

 70 IF b<19 THEN  LET b=b+1: GO
TO 45
 80 LET b=3: NEXT m
 90 LET z=5
 95 FOR b=1 TO 14: PRINT  AT 1,
b; INK 4;"F": LET b=b+1: NEXT b:
 PRINT  AT 1,15; INK 4;"FF": FOR
 b=18 TO 30: PRINT  AT 1,b; INK
4;"F": LET b=b+1: NEXT b
 100 FOR n=0 TO 5: PRINT  AT z,
RND *29+1; INK 7; BRIGHT 1;"C":
LET z=z+3: NEXT n
 110 PRINT  AT 20,29; INK 2;"GH"

 120 FOR m=-10 TO 20: BEEP .05,m
: NEXT m
 195 LET a=20: LET b=1
 200 PRINT  AT a,b;"A"
 201 BEEP .002,0: BEEP .002,10

 205 PRINT  AT 0,6; INK 7;sc
 250 IF  INKEY$ ="5" AND b>0 THE
N  LET b=b-1: PRINT  AT a,b+1; O
VER 1;"A"
 260 IF  INKEY$ ="8" AND b<31 TH
EN  LET b=b+1: PRINT  AT a,b-1;
OVER 1;"A"
 270 IF  SCREEN$ (a-1,b)=" " AND
  INKEY$ ="7" THEN  PRINT  AT a,
b;" ": LET a=a-1: PRINT  AT a,b;
"A": BEEP .1,2: LET a=a+1: PRINT
  AT a-1,b;" "
 275 IF  ATTR (a-1,b)=6 AND  INK
EY$ ="7" AND a>3 THEN  PRINT  AT
 a,b;" ": LET a=a-3: BEEP .01,10
: BEEP .01,5
 280 IF  ATTR (a-1,b)=4 AND  INK
EY$ ="7" AND a<3 THEN  PRINT  AT
 a,b;" ": PRINT  AT a-1,b;"A": B
EEP .1,-20: PRINT  AT a-1,b;" ":
 LET sc=sc+100: LET n=1: LET k=k
+1
 281 IF  ATTR (a+1,b)=6 AND  INK
EY$ ="6" AND k >= 16 THEN  LET a
=a+3: PRINT  AT a-3,b;" ": BEEP
.01,10: BEEP .01,0: LET n=0
 282 LET t=t-1
 285 IF  ATTR (a,b)=71 THEN  BEE
P .1,40: LET sc=sc+50
 287 IF n=1 THEN  LET t=t-(2*l)

 288 PRINT  AT 0,18;"    "; AT 0
,18; INK 7;t
 289 IF t<0 THEN  LET t=0: PRINT
  AT 0,18;"   "; AT 0,18; INK 7;
"0": IF t=0 THEN  GO SUB 5000
 290 IF b=0 OR b=31 THEN  GO SUB
 1000
 291 IF  ATTR (a,b)=2 THEN  LET
l=l+1: GO TO 8
 300 GO TO 200
1000 LET a=a+1: PRINT  AT a,b;"A
": BEEP .1,-a: PRINT  AT a,b;" "
: IF a <> 21 THEN  GO TO 1000
1010 PRINT  AT a,b; FLASH 1; INK
 2;"B": BEEP 2,-40: GO TO 5000

2000 FOR z=144 TO 151: FOR x=0 T
O 7: READ a: POKE  USR  CHR$ z+x
,a: NEXT x: NEXT z
2010 DATA 24,36,24,60,90,24,36,6
6
2020 DATA 60,92,191,251,190,255,
86,24
2030 DATA 0,16,56,84,254,84,56,1
6
2040 DATA 195,255,255,195,195,25
5,255,195
2050 DATA 255,255,129,66,36,24,2
55,255
```

```
2060 DATA 102,153,60,90,60,102,2
55,126
2070 DATA 63,33,33,33,33,33,33,6
3
2080 DATA 248,248,248,248,232,24
8,248,248
2090 RETURN
5000 CLS : IF sc>hs THEN  PRINT
 AT 5,8; INK 7; FLASH 1;"CONGRAT
ALATIONS"; AT 7,3;"YOU HAVE BEAT
EN THE HI-SCORE"; AT 9,10;"of ";
hs; AT 11,8;"with a score of ";s
c: LET hs=sc: GO TO 5010
5005 PRINT  AT 10,7; INK 7;"Your
 score was ";sc
5010 PRINT  AT 15,1; INK 7;"Do y
ou want another go ? (y/n)"
5020 IF  INKEY$ ="n" THEN  CLS :
 PRINT  AT 10,11; INK 7; FLASH 1
;"GOODBYE": STOP
5030 IF  INKEY$ ="y" THEN  GO TO
 3
5040 GO TO 5020
6000 CLS : PRINT  INK 7;"Your ta
sk is to steer yourself  (A) aro
und the screen without  falling
 to your death or runningout of
time.You must attempt to collect
 the jewels (C) and kill all the
 monsters (F) before  moving
on to the next level  through
the door (GH)."
6005 PRINT  INK 7''"Press any ke
y to continue.": PAUSE 0
6010 CLS : PRINT  INK 7''"Once yo
u have killed a monster  an invi
sible gas is released  and you
r time decreases more  rapidly
."''"You score 50 points for eac
h  jewel and 100 for each mons
ter."
6020 PRINT  AT 10,10; INK 7;"INS
TRUCTIONS"; AT 12,5;"5.........
.....left"; AT 14,5;"6.........
.....down"; AT 16,5;"7.........
.....up"; AT 18,5;"8...........
...right"
6025 PRINT  INK 7''"Press any ke
y to continue.": PAUSE 0
6030 GO TO 7
```



CUSTOMS OFFICER

CUSTOMS OFFICER was written for the 1K ZX-81 by Stephen Kecskemety of Cheshunt, Herts.

When asked if you have anything to declare you should enter a commodity of some kind, e.g., cigarettes or alcohol. The next step is to enter the cost of the item and the program will then calculate the import duty at a rate of 15 percent.

You will then be told how much you owe and be given the opportunity to pay it. If you refuse you will receive a random fine or be excused. The game ends when you run out of money.

```
  1 LET M=VAL "5E3"
  4 PRINT "ANYTHING TO DECLARE?
"
  5 INPUT L$
  6 PRINT "MONEY=£";M,,"WHATS T
HE COST OF YOUR ";L$
  9 INPUT C
 10 CLS
 11 PRINT "COST=£";C,,"AMOUNT L
EFT=£";M-C,"DUTY=15 PERCENT"
 12 LET M=M-C
 15 IF VAL "C*0.15>M" THEN GOTO
 VAL "50"
 20 PRINT "YOU SHOULD HAVE PAYE
D £";VAL "(C*0.15)+C","WILL YOU
PAY £";VAL "C*0.15";"?"
 25 INPUT A$
 26 CLS
 27 IF A$(VAL "1")="Y" THEN LET
 M=M-VAL "C*0.15"
 28 CLS
 29 IF A$(VAL "1")="Y" THEN GOT
O VAL "2"
 32 LET Q=VAL "INT (RND*2+1)"
 33 LET L=VAL "INT ((RND*2)+1)*
250"
 34 IF Q=VAL "1" THEN PRINT "YO
U ARE FINED £";L
 35 IF Q=VAL "1" THEN LET M=M-L
 36 IF Q=VAL "1" THEN GOTO VAL
"2"
 37 IF Q=VAL "2" THEN PRINT "I"
"LL LET YOU OFF THIS TIME"
 38 GOTO VAL "2"
 50 PRINT "YOU""VE NO MONEY LEF
T"
```

ACID RUN

WHILE WORKING in a laboratory experimenting with a new jar of acid, you have made the jar explode and the contents pour out. Using the laser which runs along the bottom of the screen you must fire at the acid, using "1" to prevent it seeping through the floor. When the acid hits the ground you will die. Each time you fire the laser you lose five points, 15 points are gained for hitting the acid, and if your score reaches "0" the laser runs out of energy.

Acid Run was written for the 16K Spectrum by Robert Courtney of Isleworth, Middlesex.

```
  1 GO TO 1000
  2 LET m=4
  3 LET n=4
  4 LET t=0
  5 FOR a=0 TO 4
  6 PRINT ; BRIGHT 1; INK 6; AT
a,10;"A"
  7 PRINT ; BRIGHT 1; INK 6; AT
a,20;"A"
  9 NEXT a
 10 FOR a=0 TO 30
 20 PRINT ; INK 0; AT 20,a;" C"

 25 BEEP .001,30
 30 IF  INKEY$ ="1" THEN  GO SU
B 100
 40 NEXT a
 41 PRINT ; BRIGHT 1; INK 6; AT
m,10;"A"
 42 PRINT ; BRIGHT 1; INK 6; AT
n,20;"A"
 43 LET m=m+1
 44 LET n=n+1
 47 IF m >= 19 THEN  GO TO 500

 48 IF n >= 19 THEN  GO TO 500

 49 LET t=t+2
 50 FOR a=30 TO 1 STEP -1
 60 PRINT ; INK 0; AT 20,a;"C "
 65 BEEP .001,30
 70 IF  INKEY$ ="1" THEN  GO SU
B 100
 80 NEXT a
 85 PRINT  AT 21,0;"Time=";t
 90 GO TO 10
100 BEEP .3,0
101 FOR b=19 TO 0 STEP -1
102 IF a=10 AND b=m THEN  LET m
=m-4
103 IF a=20 AND b=n THEN  LET n
=n-4
105 LET l=s
107 PRINT  AT b+1,a;" "
110 PRINT ; INK 2; AT b,a;"B"
121 IF a=10 AND b-4=m THEN  LET
s=s+15
122 IF a=20 AND b-4=n THEN  LET
s=s+15
123 IF a=10 AND b-4=m THEN  PRI
NT  AT m,10;" "; AT m+1,10;" ";
AT m+2,10;" "; AT m+3,10;" "; AT
m+4,10;" "
124 IF a=20 AND b-4=n THEN  PRI
NT  AT n,20;" "; AT n+1,20;" ";
AT n+2,20;" "; AT n+3,20;" "; AT
n+4,20;" "
128 IF s <> 1 THEN  GO TO 132

130 NEXT b
132 PRINT  AT b+1,a;" "
133 IF s <> 1 THEN  BEEP .1,30:
BEEP .1,20: BEEP .1,10: BEEP .1
,0
135 LET s=s-5
136 PRINT  AT 21,12;"Score=";s;
"  "
137 IF s<0 THEN  GO TO 500
140 RETURN
500 CLS
510 PRINT "YOU ARE KILLED"
520 PRINT  AT 10,10;"Score=";s

530 STOP
1000 LET s=20
1005 PAPER 5: BORDER 5: CLS
1010 DIM a(8)
1020 LET w=96
1100 FOR x=1 TO 3
1110 LET w=w+1
1150 LET y$= CHR$ w
1200 FOR z=1 TO 8
1300 READ a(z)
1400 POKE  USR y$+(z-1),a(z)
1500 NEXT z
1550 NEXT x
1900 GO TO 2
2000 DATA 60,60,124,124,255,255,
124,24,24,24,24,24,24,24,24,24,2
4,24,24,153,189,179,255,255
```

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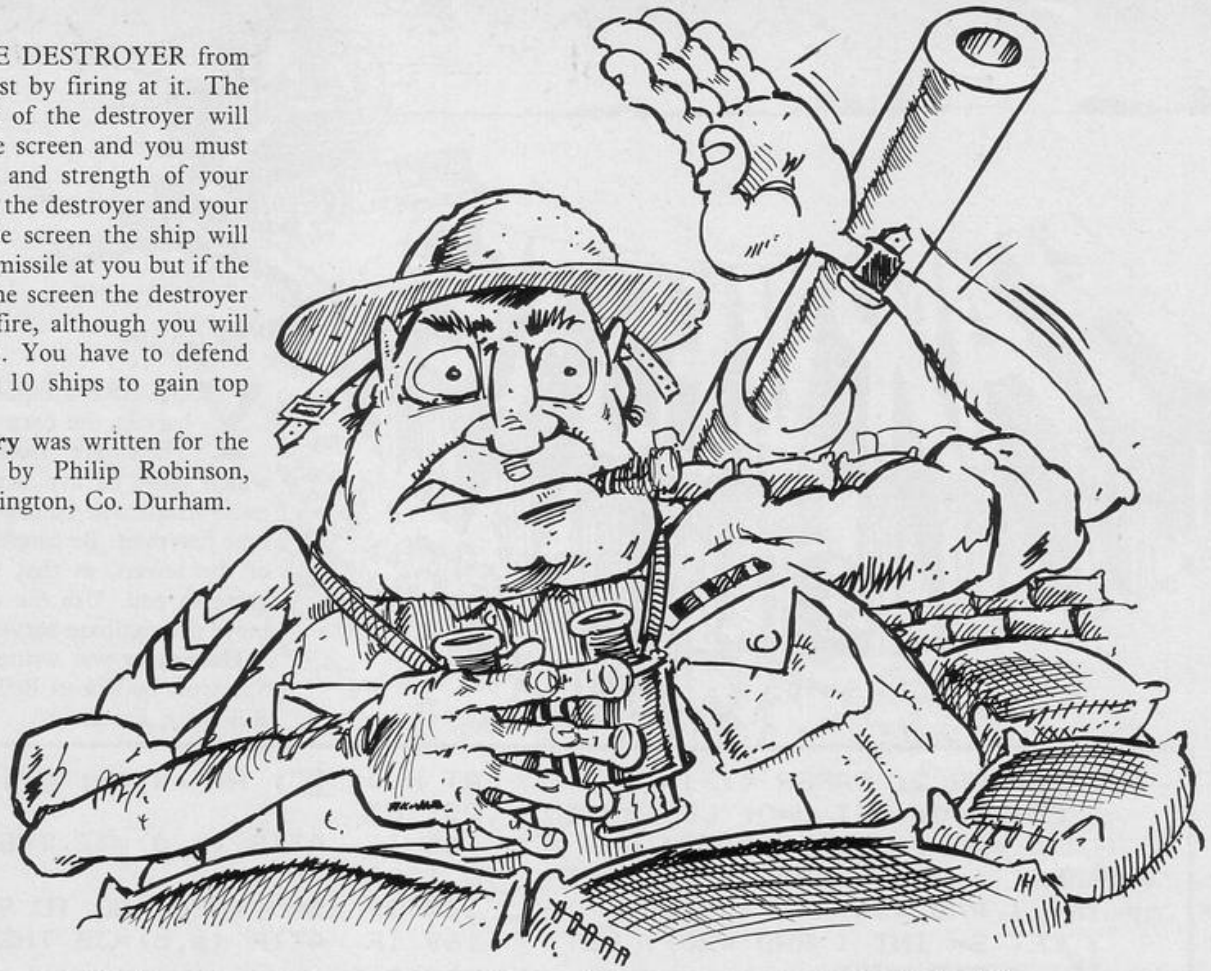
HIT THE DESTROYER from your post by firing at it. The position of the destroyer will be shown on the screen and you must input the angle and strength of your shot. If you miss the destroyer and your shot stays on the screen the ship will launch a deadly missile at you but if the shot strays off the screen the destroyer will not return fire, although you will not score points. You have to defend yourself against 10 ships to gain top marks.

Shore Battery was written for the 16K Spectrum by Philip Robinson, aged 13, of Darlington, Co. Durham.



SHORE BATTERY

```
    1 DIM a(36): RESTORE 1: FOR
x=1 TO 16: READ a(x): BEEP .5,a(
x): NEXT x: DATA 0,0,2,-.6,0,2,4
,4,5,4,2,0,2,0,-.6,0
   2 GO SUB 9000
   3 BRIGHT 1: CLS
   5 PRINT  AT 1,8; INK 1;"SHORE
 BATTERY!"; AT 2,8; INK 1;"-----
---------"
   7 PRINT  AT 4,4; INK 3;"The o
bject of the game is to hit the
 the menacing destroyersfrom your
 position (A). You fire by first
 entering the angle of your shot
 (Less than 66 and morethan 19),
 then the strength of the shot (U
sually between 300 and  500)"
   8 PRINT "If your shot stays o
n the screenand misses the ship
 will launch a deadly  missile at
 your post!": PRINT "If your sho
t leaves the screen  the ship wi
ll not fire but you  will not sc
ore anything!": PRINT "To surviv
e you must defend your self agai
nst 10 ships!": PRINT  AT 20,5;
INK 2; FLASH 1;"PRESS ANY KEY TO
 BEGIN!!"
  10 PAUSE 0: CLS
  15 PAPER 7: BORDER 7: POKE 236
09,50
  20 LET lives=3: LET h=0: LET s
c=0: LET ship=0: LET n$=""
  22 LET f= INT ( RND *17)+15
  23 LET b= INT ( RND *13)
  24 IF lives=0 THEN  GO TO 165
  25 FOR s=18 TO 21: FOR g=4 TO
31: PRINT  AT s,g; INK 1;"(ig8)"
: NEXT g: NEXT s: PRINT  AT 16,0
; INK 0;"A"
  26 FOR s=17 TO 21: FOR g=0 TO
3: PRINT  AT s,g; INK 4;"(ig8)":
 NEXT g: NEXT s
  27 IF ship=10 THEN  GO TO 160
  30 LET ship=ship+1: PRINT  AT
1,1;ship
  35 PRINT  AT 1,1; INK 1;ship;"
 SHIP"; AT 1,13;"SCORE= ";sc; AT
 1,25;"HI = ";h; AT 3,26;n$; AT
0,13;"A=";lives
  38 INK 2: PRINT  AT 17,f-1;"BC
"
  40 INPUT "Angle of shot =";ang
le
  42 IF angle>65 THEN  PRINT  AT
 10,0; FLASH 1; INK 2;"Angle bel
ow 66 Please!": PAUSE 150: CLS :
 GO TO 22
  43 IF angle<20 THEN  PRINT  AT
 10,0; FLASH 1; INK 2;"Angle abo
ve 19 please!": PAUSE 150: CLS :
 GO TO 22
  45 PRINT  AT 4,1;"Angle=";angl
e
  50 INPUT "Strength =";st
  55 PRINT  AT 5,1;"Strength=";s
t
  70 LET a=st* COS ( PI *angle/1
80)
  75 LET b=st* SIN ( PI *angle/1
80)
  80 FOR j=0 TO b/16 STEP .3
  85 LET c=.01*(b*j-16*j*j)
  90 IF a*j>6200 THEN  GO TO 130
  95 IF c>40 THEN  GO TO 120
 100 INK 0
 105 INK 0: OVER 1: PLOT .04*a*j
+.04,4*c+40: OVER 0: INK 0
 110 BEEP .005,c+13
 115 NEXT j
 120 IF  ABS (a*b/3200-f)<1 OR
ABS (a*b/3200-f+1)<1 THEN  GO TO
 135
 125 LET z=f: PRINT  AT 12,20; F
LASH 1; INK 2;"MISSED": PAUSE 40
: FOR x=0 TO f-1: LET z=z-1: BEE
P .003,-23: PRINT  AT 16,z;"D":
PRINT  AT 16,z+1;" ": NEXT x: PR
INT  AT 16,0;"""": BEEP .4,-20:
LET lives=lives-1: IF lives=0 AN
D sc>h THEN  GO TO 180
 130 PAUSE 150: CLS : GO TO 22

 135 PRINT  AT 17,f-1;"*": PRIN
T  AT 16,4; FLASH 1; INK 2;"Ship
 Destroyed!": FOR n=-10 TO 10: B
EEP .05,n+3: NEXT n: LET sc=sc+1
: PRINT  AT 1,11;sc
 150 PAUSE 50: CLS : GO TO 22
 160 CLS : INK 1
 162 IF sc>0 AND h<sc THEN  LET
h=sc: GO TO 180
 165 CLS : PRINT  AT 5,1;"You sa
nk ";sc;" Ships!"''"Would you li
ke another go?"; AT 10,14;"(Y/N)
": LET lives=3: LET sc=0
 170 INPUT y$
 175 IF y$="y" THEN  LET ho=0 AN
D sc=0: CLS : GO TO 22
 176 IF y$="n" THEN  STOP
 178 STOP
 180 INK 1
 185 LET h=sc: LET lives=3: LET
ship=0: CLS : PRINT  AT 5,1;"Con
gratulations you have scored"''"
 the most today"''"Please input
your initials."','"Max 5 Letters"
: INPUT n$
 190 LET sc=0: CLS : GO TO 22
9200 FOR a= USR "a" TO  USR "d"+
7
9210 READ user: POKE a,user: NEX
T a
9220 DATA 4,8,16,32,80,184,56,16

9230 DATA 0,0,0,3,255,127,63,0

9240 DATA 0,0,192,224,255,255,25
4,0
9245 DATA 0,0,1,127,255,127,1,0

9250 RETURN
```

YOU ARE a farmer and have to harvest the corn on your land. There are trees and rabbits which must be avoided, as they will cause irreparable damage to your combine harvester. Be careful not to go off of the screen, as that will cause the game to end. Use the cursor keys to move the combine harvester.

Harvester was written for the 16K Spectrum by Robert Beiley, aged 10, of Billericay, Essex.

```
   1 BORDER 2: PAPER 4: INK 6
   2 LET a=0: LET d=0: LET c= IN
T ( RND *20): LET b= INT ( RND *
30): LET f= INT ( RND *20): LET
g= INT ( RND *30)
   3 LET S= INT ( RND *20): LET
W= INT ( RND *30)
   4 LET H= INT ( RND *20): LET
J= INT ( RND *30): LET AB= INT (
 RND *20): LET BA= INT ( RND *30
)
   5 LET ct=688
   6 LET as= INT ( RND *20): LET
 sa= INT ( RND *30): LET SD= INT
 ( RND *20): LET DS= INT ( RND *
30)
  10 FOR x=0 TO 55: READ y: POKE
  USR "a"+x,y: NEXT x
  20 DATA 0,68,238,238,238,68,68
,0,0,0,159,28,30,30,96,96
  30 DATA 1,7,15,31,23,29,63,55,
224,184,244,172,254,95,239,252

  40 DATA 30,3,1,1,1,1,3,7,222,2
24,224,192,192,192,224,224
  50 DATA 36,36,60,60,102,126,60
,24
  70 GO SUB 7999
  90 LET A$="AAAAAAAAAAAAAAAAAA
AAAAAAAAAAAA"
  95 INK 6
 100 FOR P=0 TO 21: PRINT  AT P,
0;A$: NEXT P
 149 INK 0
 150 PRINT  AT c,b;"CD"
 155 PRINT  AT c+1,b;"EF"
 160 PRINT  AT f,g;"CD"
 161 PRINT  AT f+1,g;"EF"
 162 PRINT  AT S,W;"CD"
 163 PRINT  AT S+1,W;"EF"
 164 PRINT  AT AB,BA;"G": PRINT
 AT H,J;"G"; AT as,sa;"G"; AT SD
,DS;"G"
 165 IF  ATTR (a,d)=32 THEN  GO
TO 1000
 167 IF ct=0 THEN  GO TO 9000
 169 IF  ATTR (a,d)=38 THEN  LET
 ct=ct-1
 170 INK 2
 171 PRINT  AT a,d;"B"
 173 LET a1=a: LET d1=d
 180 LET a=a+( INKEY$ ="6")-( IN
KEY$ ="7")
 200 LET d=d+( INKEY$ ="5")-( IN
KEY$ ="8")
 201 FOR N=0 TO 5: NEXT N
 205 PRINT  AT a1,d1;" "
 210 GO TO 165
1000 BEEP .02,8: BEEP .5,3: PRIN
T ; BRIGHT 1; INVERSE 1; FLASH 1
; INK 2;"YOU CRASHED - AND YOUR
COMBINE  HARVESTER IS A"; INK 7;
" WRITE OFF"
1001 STOP
7999 INK 2
8000 PRINT  TAB 7;"AAAA HARVEST
AAAA"
8010 PRINT  AT 2,7;"BY ROBERT BE
ILEY"
8020 PRINT  AT 4,0;"You are a fa
rmer.Todays job is  to cut the c
orn.But remember to avoid the tr
ees and rabbits...."
8030 PRINT  AT 8,0;"Use the curs
or keys"
8040 PRINT  AT 10,4;"PRESS ANY K
EY TO START": PAUSE 0
8050 RETURN
9000 BEEP .09,9: BEEP .2,2: PRIN
T ; FLASH 1; BRIGHT 1; INVERSE 1
; INK 7;"YOU FINISHED YOUR DAYS
WORK -   IN TIME FOR TEA": STOP
```

LETTER BOX

THERE ARE five levels of play in **Letter Box,** level five being the fastest. As soon as a letter appears in the box in the centre of the screen you must press the corresponding letter on the keyboard. You do not lose a life for pressing an incorrect letter but you will lose a life if you do not press the letter shown in the time limit. The score, level and number of lives are displayed on the screen.

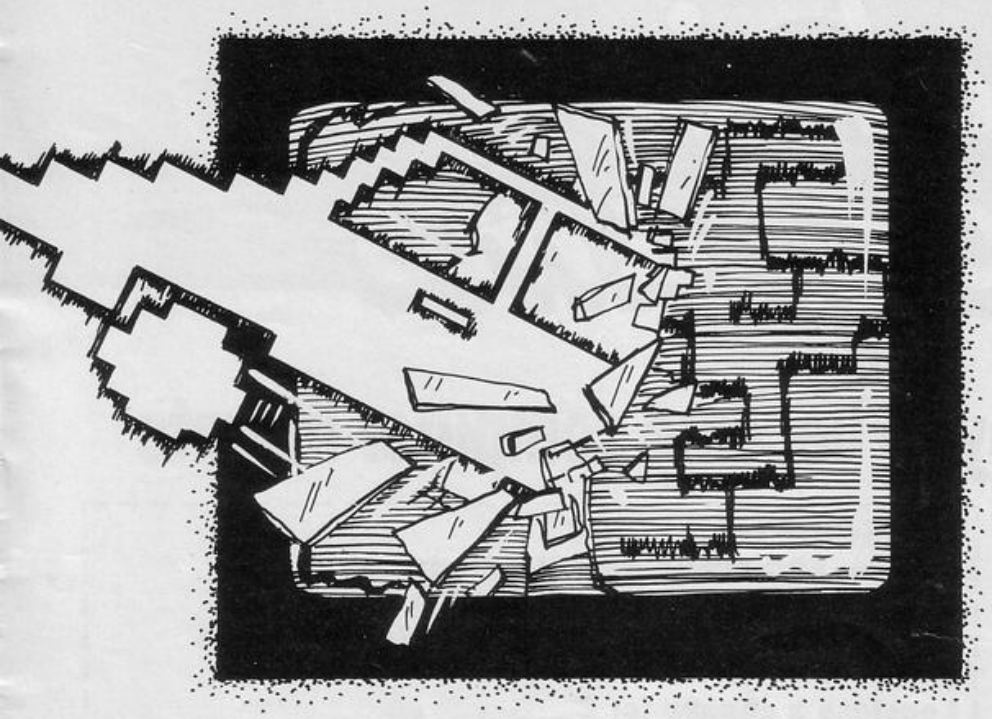
Written for the 16K Spectrum by Pushkar Dadarkar of Ickenham, Middlesex.

```
   1 PRINT  INK 0; AT 9,0;"A LET
TER WILL APPEAR IN THE BOX,PRESS
 THE CORRESPONDING KEY AS  QUICK
LY AS YOU CAN."
   3 POKE 23658,8
   4 PAPER 5: BORDER 4: BRIGHT 1

   5 INPUT "DIFFICULTY?(1 TO 5)
";DF
   6 CLS : PRINT  INK 0; AT 11,1
1;"GET READY": PAUSE 80
   7 LET D=100-(10*DF)
   8 LET S=0: LET LVS=3
   9 CLS
  10 LET A$="QWERTYUIOPASDFGHJKL
ZXCVBNM"
  13 BRIGHT 1: INK 4: PAPER 5
  15 PRINT  AT 10,15;"(ig4:g3:g7
)"
  17 PRINT  AT 11,15;"(ig5:sp:g5
)"
  19 PRINT  AT 12,15;"(ig1:ig3:i
g2)"
  25 PRINT  INK 0; AT 3,23;"SCOR
E=";S; AT 3,0; INK 0;"LIVES=";LV
S; AT 0,13; INK 1;"(iL:iE:iV:iE:
iL:i":i;:iD:iF)"
  30 LET Q= INT ( RND *26)+1
  40 PRINT  AT 11,16; INK 0;A$(Q
): BEEP .1,20
  50 FOR F=0 TO D
  60 IF  INKEY$ =A$(Q) THEN  GO
TO 100
  70 NEXT F
  80 FOR G=20 TO -10 STEP -1: BE
EP .03,G: NEXT G
  90 LET LVS=LVS-1
  92 IF LVS=0 THEN  BEEP .5,-10:
 CLS : PRINT  AT 11,0; INK 1;"YO
U SCORED "; FLASH 1;S; FLASH 0;"
 POINTS."'"PRESS A KEY TO PLAY A
GAIN": PAUSE 0: RUN

  94 PRINT  INK 0; AT 21,0;"  YO
U LOST A LIFE.PRESS A KEY ": IF
 INKEY$ ="" THEN  GO TO 94
  96 CLS : GO TO 13
 100 BEEP .4,30
 120 LET S=S+1
 130 GO TO 25
 200 SAVE "TOUCH-TYPE" LINE 1
```

COMPUTER CAR



WHEN the program is RUN, a random maze is generated and a car is placed at the bottom of the screen. You have to plot the movement of the car so that it will reach the top safely without crashing into the walls of the maze. Use the commands L, R, B and F to direct the car. If you are successful you score 10 points and progress to a more difficult maze.

Computer Car was written for the 16K ZX-81 by Michael McRoberts of New Brighton.

```
   1 LET SCORE=0
   2 LET DIF=150
   3 CLS
   5 FAST
   6 LET DIF=DIF+10
  10 FOR A=0 TO DIF
  20 PRINT AT RND*21,RND*31;"■"
  30 NEXT A
  35 SLOW
  40 LET A=21
  45 LET X=A
  50 LET B=15
  55 LET Y=B
  60 PRINT AT A,B;"O"
  70 INPUT A$
  80 FOR Z=1 TO LEN A$
  90 PRINT AT X,Y;" ";AT A,B;"■"
  91 LET X=A
  92 LET Y=B
 100 LET A=A+(A$(Z)="B")-(A$(Z)=
"F")
 110 LET B=B+(A$(Z)="R")-(A$(Z)=
"L")
 120 PRINT AT A,B;
 130 IF PEEK (PEEK 16398+256*PEE
K 16399)<>0 THEN GOTO 200
 135 IF A=0 THEN GOTO 300
 140 NEXT Z
 200 FOR Z=0 TO 10
 210 PRINT AT A,B;"O";AT A,B;"■"
 220 NEXT Z
 230 CLS
 240 PRINT "YOU CRASHED",,,,,,"D
O YOU WANT ANOTHER GO?"
 245 PRINT AT 15,0;"YOURE SCORE
WAS  ";SCORE;" POINTS"
 250 IF INKEY$="Y" THEN RUN
 260 IF INKEY$="N" THEN STOP
 270 GOTO 250
 300 CLS
 310 PRINT "WELL DONE YOU MADE I
T.","YOU GET 10 POINTS."
 320 FOR T=0 TO 50
 330 NEXT T
 335 LET SCORE=SCORE+10
 340 GOTO 3
 350 SAVE "COMPUTER CA■"
 360 RUN
```

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High-res revolution has been achieved on ZX-81 computers

I AM writing to say how pleased I was when, a few weeks ago, I received a game called Forty Niner for the 16K ZX-81. When I LOADed it I nearly died of shock when I came to face a cosmic cockerel in hi-res graphics. The game is exciting and highly addictive and makes great use of high resolution.

It has a hall of fame, five skill levels and lets users define their own keys for use. In case anyone thinks I am talking about a Spectrum game, I am not. This is definitely my favourite game for the ZX-81 and, to me, it is definitely my favourite game by miles — no, light years.

Software Farm is the culprit behind this revolution. You can also be expecting new games in its high-res range. This is only number one. So, before you rush to buy your Spectrum, think first.

It is difficult to explain this piece of excellence so, if you want to find how fantastic it is, buy it. If anyone can beat my brother's high score of 46,469, write to *Sinclair Programs*. My personal best is 39,896.

Daniel Popplewell,
aged 12,
Bradford.

The Snowman

WELL DONE, Raymond Briggs and Quicksilva. Their game, The Snowman, deserves terrific success for having no violence in it. It always amazes me that orgies of mindless zapping and destruction can be the product of brains which can create highly-original machine code games.

An example is the game City Lander, which instructs the player to bomb as many buildings as possible to clear a landing area. That printout was published in the Christmas issue of *Sinclair Programs* under the title Moscow Raid. Would it have been as readily printed under the title, say, Washington Raid?

Nick Thompson,
Langport, Somerset.

Worm record

WHILE READING the April edition of *Sinclair Programs* I read the letter titled Worm record from Peter Clarke. He said he had scored 176,400 and reached level seven a second time. I recently scored 403,335 which is a new record. I completed level seven five times and, at one point in the third round, I had five worms.

Jenny Matthews,
aged 13,
Hoddesdon, Herts.

● *Worm Game was published in the March/April 1983 edition of* Sinclair Programs.

ZX-81 hardware

THANK YOU for a great magazine. I have never had a better computer magazine. The one thing which disappoints me, and I am sure many readers will agree, is that most of the advertisements are for the Spectrum.

In the December issue on page 15 it read "Sinclair Special Inside. New Interface Two and ROM cartridges. New Software".

Cartridges for my ZX-81, I thought, but when I turned to page 17 and read "The ZX Interface 2 is the latest new peripheral for the Spectrum" I was full of disappointment. Because, as it was near to Christmas, I could have had one for my present as it was only £19.95. I am sure that it would not take much to make a game or interface for both a Spectrum and ZX-81. I think it would please many readers if Sinclair Research did that.

Freddy Powell,
aged 13,
Waltham Abbey, Herts.

● *A spokesman for Sinclair Research said recently that there were no plans to produce new hardware for the ZX-81.*

Worm again

IN *Sinclair Programs* in April, Peter Clarke said he had a new record on the Worm Game of 176,400. Recently I have achieved a new record of 439,870. I completed stage seven four times and reached stage four on my fifth lap.

Lee Gordon,
aged 14,
Plymouth, Devon.

Scrolling

I OFFER a POKE command which scrolls one line on the Spectrum screen over and over again:

```
10 FOR n=1 TO 255
20 POKE 23606,n
30 PRINT AT 10,0;
   "ABCDEFGHIJK
   lmnopqrstuvwxyz"
40 NEXT n
50 GOTO 10
```

David Pankhurst,
Stroud, Kent.

Zap record

I HAVE beaten the best time for the game Zap-Zap, which is 36 set by Andrea Woobery. The time I have set is 31 time units.

I have had my ZX-81 since October, 1982 and I have written a few adventure games for the 16K and two 1K games since then. I am hoping to upgrade to a Spectrum soon.

I think *Sinclair Programs* is ace and I buy it every month.

Denis Butler,
Fakenham,
Norfolk.

Slow loader

PLEASE inform F Jugg — *Sinclair Programs*, April — that the Slow Loader works. We have 16K ZX-81 programs operating perfectly on our 48K Spectrum, thanks to Slow Loader.

I think perhaps he has not tried a low volume setting. The volume control on my recorder runs from one to 12. The volume at which the Slow Loader works is just less than one — yes, one. He may at first get garbled versions. He should make minor adjustments to the volume systematically until the translation is perfect.

G L Budden,
Burnham-on-Sea,
Somerset.

ZX pen-friend

I AM Brazilian and a ZX-81 owner and I like *Sinclair Programs*. I have 300 programs, games and others, and I should like to exchange programs and information with British people.

I should like to know about the Sinclair User Group and if I could be a part of it.

Andre Koch Zielasko
Av. Emancipação
403 sala 2
Tramandaí — RS — 95590
— Brazil.

Binders

I FEEL your magazines are very good and think they are getting damaged on the shelf at home and am wondering if you could produce a strong binder to protect them — a binder which holds 12 copies like the ones for other magazines. The binders could have the volume number and the name on it.

J Bentley,
Plymouth, Devon.

Enjoyable version of an old racing favourite

KNIGHT DRIVER provides its players with a birds-eye view of the car to be controlled. The aim is to drive the car round a complicated circuit. Controls are accelerator, brake and steering to left and right.

The road is very narrow and attempting to remain on it at speed is no simple task. Learner option allows players not to lose a life when they steer off the road but limits time allowed to complete the circuit. That time is short and any player who can negotiate the course at sufficient speed to complete it in that time should choose the professional option.

Professional limits players to five lives, one of which is lost whenever the car is steered off the road. Beginners will find it difficult to move more than a few inches without losing all five.

Automatic option allows the computer to guide the car round the course. It gives some idea of what the course is like, how long it is, and where the most difficult bends and obstacles are.

Racing car games are not new but this is a difficult and enjoyable version. **Knight Driver** is produced for the 48K Spectrum by Hewson Consultants Ltd, 60a St Mary's Street, Wallingford, Oxfordshire and costs £5.95.

Study software

PENGUIN Study Software has released a range of study cassettes for people studying the Shakespearian plays *Macbeth, Twelfth Night, Romeo and Juliet, Julius Caesar, The Merchant of Venice* and *Henry IV part one*. One cassette is dedicated to each title and the cassettes reviewed by *Sinclair Programs* were *Romeo and Juliet* and *Julius Caesar*.

The programs make use of the computer as a database from which information can be called-up under subject headings or cross-referenced and compared. Searches for references can be made under character or theme headings and limited to specific acts or carried across the entire play.

Summoning-up references to two or more subjects together can suggest themes or images in the play which have not been noticed previously. When

This month we focus on a selection of games and on the new range of software for students of Shakespeare from Penguin Books

a reference is shown on-screen, the other headings under which it could be classified are given, so that a student can choose to change the direction of the search.

Students are referred to specific act, line and scene numbers in *The New Penguin Shakespeare* version of the play. Information on-screen acts as a gloss or comment on the lines mentioned and is designed to make the student think more carefully about those lines. Questions raised by the program are not answered in it, so the program would be most useful when used with guidance by an experienced teacher.

The cover specifies that the cassette can be used by O level and CSE students. Points raised by the program and its cross-referencing system would be useful to students for those examinations and also to A level students.

The cassettes are £5.95 each and are produced for the 48K Spectrum by Penguin Books Ltd, 536 Kings Road, London SW10.

Blue thunder

THE AIM of **Blue Thunder** is to steer a jet helicopter across the sea and islands, avoiding all attacks from enemy missiles and barrage balloons, to reach and destroy the nuclear reactor and thus rescue your comrades who are trapped there.

The graphics are very well done. As the helicopter moves, so the landscape scrolls smoothly across the screen. The helicopter movements and changes in direction are equally well-displayed.

The game, however, is unexciting. After a few runs the majority of attacks become predictable and it is possible to reach the nuclear reactor by moving upwards, waiting the appropriate length of time and then flying left. That is a useful facility for those who are trying to eat their lunch, or drink a cup of coffee, or do anything else while playing the game, but for those who require a game to be interesting throughout it is a major disadvantage.

Blue Thunder is produced by Foundry Business Systems Ltd, 2 Station Road, Walsall, West Midlands WS7 0JZ and costs £5.95.

Dr Franky

THE PLAYER takes the part of **Dr Franky** who is trying to bring his monstrous creation to life. To do it, flasks of life-giving chemicals must be collected from one side of the dungeons and carried to the monster on the other side. Of course, in a computer game things are never so simple. Dr Franky is being chased by the ghosts of his previous victims, the floors of the dungeons are riddled with holes, and crossing the dungeons involves jumping on and off a very unsafe lift.

The game is fast and furious, for the ghosts seem to be everywhere at once, so, for some time, it can be difficult to decide how to move more than a few inches without being killed. The screen layout, the ghosts, the difficulties of the game are not startlingly original.

Nevertheless, despite the air of *deja vu* which many buyers will feel, the

game provides a real challenge even for the most experienced arcade games player.

Dr Franky is produced for the 48K Spectrum by Virgin Games Ltd, 61-63 Portobello Road, London W11 and costs £5.95.

Jokers Wild

JOKERS WILD is divided into two sections — adventure and action game. To play the adventure, skill level four of the action game must be reached. At the end of each skill level, clues for the adventure are provided, all of which remain obscure until the adventure is reached.

Novel features of the action game are the compression of the maze format into a grid, making it much more difficult to become accustomed to the maze layout; the fast-moving — but predictable by the very alert — movement of the knaves and the provision of a separate adventure game, as a reward for the skilful player.

Jokers Wild is produced for the 16K or 48K Spectrum by Phoenix Software, Tel: 01-868 3353 and costs £9.99.

The Skull

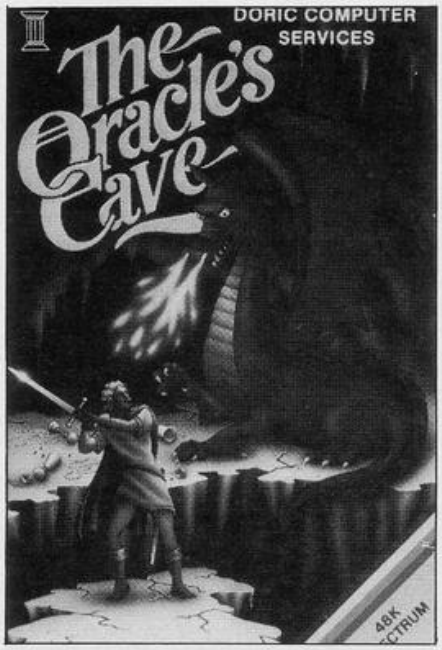
THE SKULL, by Games Machine, appears to be a three-dimensional version of Pac-man-type game. The aim is to move round a three-dimensional maze, amassing points by collecting as much treasure as possible.

Also wandering round the maze are a series of large skulls, which will kill the hapless player who meets them. They can be killed only if the player has recently picked up a cross.

The maze is on several levels. Movement from one to another is by accident through a broken trapdoor, or by design down a ladder.

The graphics and screen layout are good, the movement is smooth. Maze games, however, both two- and three-dimensional, have become commonplace on the Spectrum and **The Skull** has no features which make it stand out from the other games of its type.

The Skull is produced for the 48K Spectrum by Games Machine Ltd, 40, Fretherne Road, Welwyn Garden City, Herts AL8 6NU and costs £6.95.



Oracle's Cave

ORACLE'S CAVE is a superb animated adventure for the 48K Spectrum. The player's quest is to negotiate the **Oracle's Cave** complex, find the chosen quest item, collect four items of treasure, kill the oracle and escape.

Each movement through the caves is shown on-screen, in a display which scrolls smoothly from left to right and up and down. The screen display is divided into several areas — a map of the cave showing areas which have been explored and which do not contain monsters; a list of options open to the player; a response to the player's last choice; a chart showing the player's progress; and the display of the action.

The game has a time limit of five days, which means that the player must always clock-watch and avoid taking too many rests. The time limit means that the game never continues for too long and it can easily be played several times in one session.

Playing the game several times is important, since there are several strategies to be worked out. It is important to collect sufficient weapons to be able to escape to freedom, to know where the most valuable treasure can be found, and to know when to explore and when not. The key is important, so do not try to finish the game without it, or you will never see the blue sky and the mountainside outside but will perish in the caves.

Oracle's Cave is produced for the 48K Spectrum by Doric Computer Services, 3 The Oasis, Glenfield, Leicester and costs £7.95.

Colditz

FULL MARKS to Phipps Associates for providing reviewers with a map of locations in its latest adventure game, **Colditz.** The map shows that escape from the German prisoner-of-war camp is possible but that there are numerous problems to be faced en route.

The game combines graphics and text to provide a clear description of the player's situation at each point.

The text often includes the sound made at a location and it is best to pay close attention to those descriptions, as any loud noise can alert the guards to the fact that a prisoner is trying to escape.

There are many objects to be collected and used, which creates problems, because there are limitations as to how many objects a player can carry.

Never assume that because everything which has been found cannot be carried at once that it is not all useful.

The game contains plenty of action. There are guards to avoid and kill, tunnels to dig, wire to cut, a prisoner to rescue, and the final challenge of making sure that the guards cannot follow once the escape has been effected.

It is an excellent adventure, well worth the time required to complete it.

Colditz is produced for the 48K Spectrum by Phipps Associates, 172 Kingston Road, Ewell, Surrey KT19 0SD and costs £6.95.

Taking the easy route to better programs

Games Designer, Hurg and The Quill allow beginners to produce machine-code games. We look at these three programs in detail.

PROGRAMMING a Spectrum with an original game is not difficult. Simple games can be written within hours of first using a computer, with the knowledge gained from reading the first chapters of the manual.

When those games are compared, as they are bound to be, to professional software, they are found to be sadly lacking. The graphics are unsophisticated, the sound is unexciting, and the speed is slow. As original home-made creations they have their charm but many programmers find themselves wishing they knew an easy route to machine code and good programming.

It is for everyone who ever wished they knew such an easy route that three programs have been put on the market. **The Quill** by Gilsoft, **Games Designer** from Software Studios and **Hurg** from Melbourne House are all easy routes to professional-style games programming.

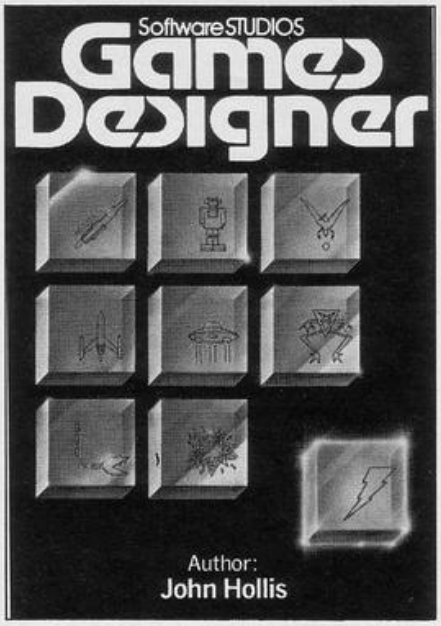
Games Designer is complete with eight pre-recorded games which have been written using the designer program.

While playing the games, common themes become apparent. Each consists of one creature/object, defending itself by destroying attacking waves of other objects/creatures. Each creature is a sprite graphic; that is a graphic which is much bigger than a user-defined graphic and which moves smoothly across the screen as a whole. The movement is smooth and fast and the sound is not a series of beeps, as in a Basic program, but a variety of rising and falling machine-coded noises.

Menu-driven

Games Designer is menu-driven and arrives with a short instruction booklet. The main menu allows the user to load, save or play a game, to change the game being played, to alter the sprites, their configuration, their movement and the attack waves. Once one of those options has been chosen, a secondary menu or some other list of options is displayed.

The configuration option on the main menu produces a variety of options. The background or foreground colour of the screen during the game can be changed, sounds can be defined, and the general format of the game can be changed. Game formats are based on existing types of game. The choices are



Invaders-type, Asteroids-type, Scramble-type and Berserk-type.

Two hours only

Games Designer is fairly simple to use and a first game can be completed in two hours. Once each section of the program and of the instruction manual has been understood the program can be used easily and machine-coded games can be designed quickly and efficiently. A major difficulty is that the games are all of the same type and that it does not take long for the format to become uninteresting.

The Hurg package is complete with three games designed with its help. They show far more variety than those in the Games Designer package. One is a version of Pac-man, while the other two are unlike other games on the market. The games feature animated sprite graphics, including a manic koala bear, complicated screen layouts and a variety of scoring procedures.

The catch is, of course, that no games design program, however good, can do all the work and there is a great deal for the player to do before a professional-looking game can be produced. Each sprite graphic must be designed, the screen layout must be produced, complete animation cycles in all directions must be devised—the list goes on and on.

Bewildering variety

With so much to do and so many options in it, Hurg necessarily contains a bewildering variety of menus, within which it is easy to become lost. The instruction manual is not nearly clear enough and leaves much to guesswork. Despite the comment at the beginning of the booklet that "any combination of options can make a valid game", a large variety of combinations can produce nothing like a valid game.

At the end of the instruction booklet, hidden in Appendix A, are the instructions which would best be given at the beginning of the manual, on how to find and use the correct menu at the correct time and thus write a simple Hurg game.

The first step is to re-set Hurg and thus clear any previous attempts at games. The next stage is to create the background which will appear on-screen. That should be designed separately and LOADed into the main program at that point. There is no help with design, although it is suggested that the program **Melbourne Draw** could be used.

It would have been more helpful to let users know before they LOADed the main program that the screen design should be completed previously. Users without Melbourne Draw will find that some knowledge of Basic programming is needed to create a satisfactory background.

Designing the player's character is done in a sub-menu. The character can be a variety of sizes although, at first, it is best to follow the instructions and create the simplest possible character of the size two columns by two rows. As in

Games Designer, a grid is supplied on which characters can be designed quickly and easily.

The design menu is slightly confusing. If you have chosen an animation

count of 2, as suggested in the booklet, the program will expect you to design two characters. The game will then use those characters alternately to produce an animated effect, so designing, for example, a lettuce followed by a cricket bat, will quickly prove a strain on the eyes. The easiest shapes are lines and crosses of varying lengths and sizes, for they give an effect of animation quickly and easily.

Once the player has been defined and modified, the first alien can be produced in the same way and the fire button action can be chosen. Any other necessary aliens can be defined. The game will probably, at that point, resemble a machine-coded version of a beginner's Basic game — very crude, undeveloped and probably not very exciting.

Effective aid

Users who reach that stage will already have spent some hours using the program, criticising the very sketchy instruction booklet and sorting-out one menu from another. Hurg is a very effective tool for producing games but it is not as simple to use as the publicity suggests. It seems likely that people who have the time and patience to learn to use it will also be those who have the time and patience to use machine code.

Nevertheless, even to people who can use machine code it would be useful for trying ideas. If Melbourne House were to produce a better instruction manual, preferably with a detailed breakdown of how one of the pre-recorded games was created, together with diagrams, Hurg would be unbeatable value.

Hurg allows users to produce any arcade game for the Spectrum. The Quill by Gilsoft enables users to produce any text-only adventure. Gilsoft also allows users to market games produced in that way and a number of games already on the market were written using it.

As with Hurg, The Quill very quickly makes it clear that the user cannot expect something for nothing. An adventure contains a large number of location descriptions. Each of those must be typed into the computer. An adventure has a large vocabulary and each word to be understood must be entered. Most important, everything which the adventurer asks the computer to do must provoke some response and each of those responses must be entered.

The manual explains in detail how to create a very simple adventure, which involves exploring a house, opening a safe, removing a jewel and taking it to the correct part of the house. That is a very short adventure, with very few locations and very limited vocabulary.

Ten options

To create your own adventure of that size, using The Quill would take some five hours' work. The sheer volume of information to be entered means that, even when the user knows exactly what

to enter, and has already debugged it, an adventure of that size would take around an hour-and-a-half to enter, longer for inexperienced typists.

Ten options in the main menu are those used to create the main body of the adventure. The vocabulary table must contain every word which the program will be expected to understand. Adventurers who have been puzzled when a location description in an adventure contains words which the computer does not understand will see that the reason is that the location table is different from the vocabulary table. Each word in the vocabulary is given a number. Synonyms, such as UP, U and ASCEND, are all given the same number, so that they will all be treated in the same way by the computer.

Provoke responses

The words with the lowest numeric values in the vocabulary table are treated by the program as directions, so that they provoke the response "I can't go in that direction" if they cannot be used in a location. Words with higher numeric values provoke the response "I can't" when used at the wrong time.

The object table is separate from the vocabulary table. It must include every object to be used, e.g., sword, food, light. Object zero will always be treated by the program as a source of light, a torch for example, which will illuminate dark places. Some objects which seem the same must be listed separately. The open safe and the closed safe are treated by the computer as two different things, as are the torch and the lighted torch.

Once objects have been entered, the text for each location should be entered. Locations, like objects and vocabulary, are all given numbers. Objects can then be given a start location, which tells the computer in which room to place them. Some objects, such as the lighted torch, do not have a start location and must be defined as not created.

Draw a map

When creating an adventure it is best to begin with a map, which will serve as a reminder of where everything is. It is also useful to write on paper exactly what has been typed into the database. In that way, if the spanner is to begin life in the living room it is not necessary to refer to different tables to find that the spanner is object one and the living room location 20.

The Quill is an excellent program which enables patient users to produce thought-provoking, professional adventures. It also provides valuable insights into how adventure games are put together. By using the program for a few hours it is possible to learn a good deal about how adventures are created and how they can be solved.

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If it takes decisions then it is programming

This month David Janda explains how your computer can compare information and make a decision based on its findings.

WHAT IS a programming language? Or to put it a better way, what qualifies as a programming language? The answer is the ability to program tests and act on them. That is the fundamental power behind all programming languages and it enables us to program computers to take different courses of action.

For a better idea, you should look at a Basic program in two ways — first its physical layout and then its logical one. Program one asks the user to enter two numbers which are then added, subtracted and multiplied by each other and the results are printed.

Note that there are no decisions in the program and the logical flow of control is from the top to the bottom. That means that type of program is not very flexible. You can perform only set operations on data such as our two numbers.

Control constructs

Program two, on the other hand, is different. We have introduced the IF condition(s) THEN action construct, so we can start to test the data entered and then perform operations exceptional to the test. Two important things should be noted. First, the program logic is still sequential, from top to bottom. Second, the action part of the IF is limited so it is best to make good use of it.

The third example shows how best the IF. .THEN. . construct can be used. Instead of using it to make a decision on some set of data and then perform one action, using GOSUB and GOTO after the THEN means that you can jump conditionally to another part of the program where a group of actions can be executed. That group of actions could even include more conditional jumps.

The Sinclair machines do not offer many control constructs; we have the bare essentials. It should be noted that although other Basics, such as BBC Basic, offer more structured and flexible control constructs, it is possible to emulate many of them in Sinclair Basic.

For the ZX-81, the IF statement takes the form of IF condition(s) THEN action. So far as branching is concerned, GOTO and GOSUB are provided as a means of passing control to other parts of a program. A third method of passing control is provided in the form of USR. That is very similar in operation to GOSUB, insofar as it passes control to a machine code program and, after the program is finished, control is then passed to the next line of Basic.

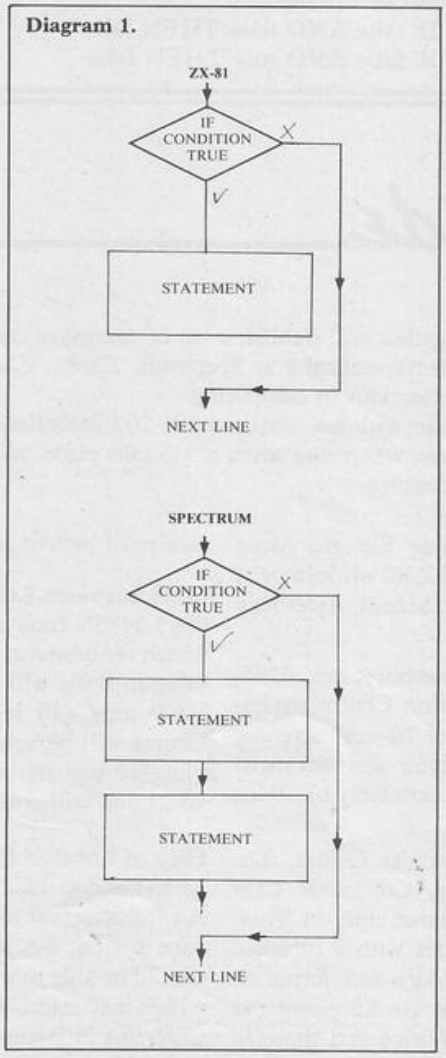
USR can be used to return a value to the Basic program. That is achieved by calling a machine code program with:

LET A=USR n

where A is a numeric variable and n is the address of the machine code program. After the machine code is finished and control is returned to Basic, the variable will contain the value of the register pair BC on return from the machine code program.

That may not seem to be of much use at first but if you have a super-fast random number routine in machine code you can load BC with the number and, on return to Basic, your selected variable will hold the number.

Diagram 1.



Machine code

That applies to the Spectrum with these differences. First, because multiple statement lines are allowed for on the Spectrum, it is possible to have more than one action after the THEN statement. That is useful if you wish to do two things and it can save some space. Second, do not be confused with the USR function on the Spectrum; it has two purposes—first to call a machine code program and second in defining user-definable graphics.

So what exactly is a condition and what has it to do with decisions? First, it is best to look at the whole structure of the IF. .THEN. .ELSE construct. When the program reaches a line such as IF A=B THEN. . . it performs tests to see if A equals B. If A does not equal B, the rest of the line is ignored completely and the program drops to the next line. That applies to Spectrum owners who have a number of statements after IFs. This example explains things a little:

```
10  LET A=1
20  IF A=2 THEN PRINT A :
    PRINT "OK"
30  PRINT "THE NEXT LINE"
```

When run the test will not be true so that A will not be printed, neither will 'OK'. Program control will pass to the next line in the program. Diagram one shows a flowchart for the ZX-81 and Spectrum IF; notice that the only difference is that the flowchart indicates that the Spectrum can have more than one statement after the IF.

The conditions in an IF statement are a little more complex. In a condition the computer is not looking to see if A*10 = 1 or if "BILL"<>"John"; what it is doing is performing a comparison test

Program Tutor

Program 1.

```
10 REM SEQUIENTAL PROGRAM
20 PRINT "ENTER A NUMBER"
30 INPUT A
40 PRINT "ENTER A SECOND NUMBER"
50 INPUT B
60 PRINT A;"+";B;"=";A+B
70 PRINT A;"-";B;"=";A-B
80 PRINT A;"X";B;"=";A*B
90 STOP
```

which can yield one of two results, true or false. Or, to put it more accurately, '1' or '0'.

That applies not only for simple tests such as A=B but also for more complex ones such as IF A=B AND C=D THEN... Again, even though there are two tests, there is only one result.

For those who have never suffered Boolean algebra and truth tables I must tell you that a little understanding of the subject is necessary.

Computers are very logical, so when a comparison is made, there is only one result, true or false. In other words it is either equal to something or it is not; it is either less than something or it is not, and so on. There are no halfway houses.

If we take that point and say that true=1 and false=0 we can draw a truth table:

Condition		Condition
1	OR	0
0	OR	1

Once you have digested the foregoing consider what happens when you have a condition with a logical operator—AND, OR, NOT—in it. Let us assume we have four variables A, B, C, D. A=1, B=1, C=2 and D=3, so look at the test; IF A=B AND C=D THEN. First the test on A and B is performed and they are equal so the result is true, or 1.

Next the test on C and D is performed and the results are not equal so

Program 2.

```
10 REM SEQUIENTAL PROGRAM WITH DECISIONS
20 PRINT "ENTER FIRST NUMBER"
30 INPUT A
40 PRINT "ENTER SECOND NUMBER"
50 INPUT B
60 IF A=B THEN PRINT "THE NUMBERS ARE EQUAL"
70 IF A<B THEN PRINT A;" IS SMALLER THAN ";B
80 IF A>B THEN PRINT A;" IS LARGER THAN ";B
90 STOP
```

the result is 0. Looking at both tests, we have 1 AND 0; the condition is then false because AND requires both tests to be true. If everything is true, THEN can be executed, so:
IF false AND false THEN false
IF false AND true THEN false
IF true AND false THEN false
IF true AND true THEN true.

Program 3.

```
 10 REM DECISIONS AND BRANCHING
 20 LET R=INT(RND*100)
 30 LET T=0
 40 PRINT "I HAVE THOUGHT OF A NUMBER"
 50 PRINT "UNDER 100"
 60 PRINT "TRY TO GUESS MY NUMBER"
 70 PRINT
 80 GOSUB 200
 90 IF G=R THEN GOTO 300
100 IF G<R THEN GOSUB 400
110 IF G>R THEN GOSUB 500
120 GOTO 80

199 REM FROM LINE 80
200 REM ZX-81 INCLIDE SCROLL HERE
210 LET T=T+1
220 PRINT "ENTER YOUR GUESS"
230 INPUT G
240 RETURN

299 REM FROM LINE 90
300 PRINT "WELL DONE,"
305 PRINT "GUESS ";T;" IS RIGHT"
310 PRINT "MY NUMBER WAS ";G
320 STOP
399 REM FROM LINE 100
400 PRINT "MY NUMBER IS BIGGER THAN ";G
410 RETURN

499 REM FROM LINE 110
500 PRINT "MY NUMBER IS SMALLER THAN ";G
510 RETURN
```

You should be able to see that the third test is the same as the example.

Finally, remember that tests can be made on any data using the operators available on the Sinclair machines. Multiple tests are possible using AND, OR and NOT as well as the operators, so it is possible to test for many conditions in only one line, after some practice.

Course Guide

EACH MONTH from now, *Sinclair Programs* will publish a list of computer courses of interest to readers. Courses with priority in this section will be those aimed specifically at Spectrum, ZX-81, ZX-80 or QL users, courses in Basic, Z-80 machine code or Forth, and general introductions to computing.

If you run such a course please write to us with full details at 196-200 Balls Pond Road, London N1 4AQ. Details should include the name and duration of the course, where and when it will take place, price, any qualifications needed to begin the course, and the extent of access for the disabled.

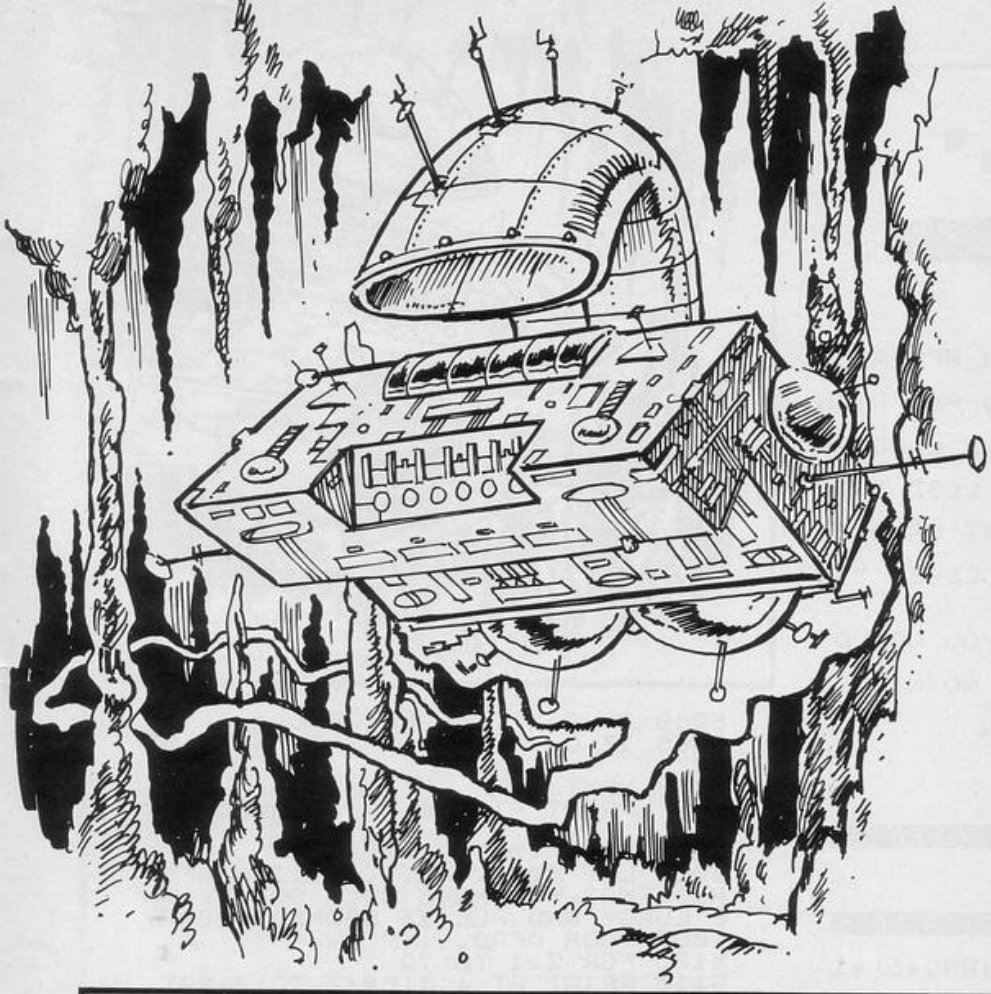
Aylesbury Computer Club, c/o 12 Long Plough, Aston Clinton, Aylesbury, Bucks holds Basic and Z-80 workshops at many of its weekly meetings at Quarrendon School, Aylesbury on Friday evenings, beginning at 7.30pm.

Grange Adult Education Centre, Aylesbury, tel: 0296-27342 and the Quarrendon Adult Education Centre, Aylesbury, tel: 0296-28551, both run five- and 10-week evening courses on introductory Basic programming and advanced Basic programming. The courses cost approximately £7.50 for five weeks and £15 for 10 weeks.

The Prettygate Centre, Office and Activity Centre, The Philip Morant School, Rembrandt Way, Colchester CO3 4QS, tel: Colchester 77458, runs a computer club on Tuesdays from 7.30 to 9.30pm which alternates with a tutor-led course. The standard course is of 12 hours and forms an introduction to Basic programming. Fees are 85 pence per hour; pensioners and under 18s pay half-price and those in receipt of benefit pay 21 pence per hour.

MSS Services Ltd, PO Box 31, Worthing, West Sussex, tel: 0903-34755 runs a number of computer courses, many of which are aimed at members of specific professions. Programming in Basic will run from June 4-6 and will cost £275 plus VAT plus £15 registration fee. Microcomputers — Crash Course will be held on June 11 and will cost £130 plus VAT plus £15 registration fee. Programming in Basic is from June 18-21 and will cost £320 plus VAT plus £15 registration fee.

City of London Polytechnic, Short Course Unit, 84 Moorgate, London EC2M 6SQ, tel: 01-283 1030 will be running An Introduction to 6502 assembly language programming on June 6 from 6-8.30pm. At the end of the evening, students should be able to write machine language programs, programs which may stand on their own or perform utilities called from programs in Basic. The cost is £35.



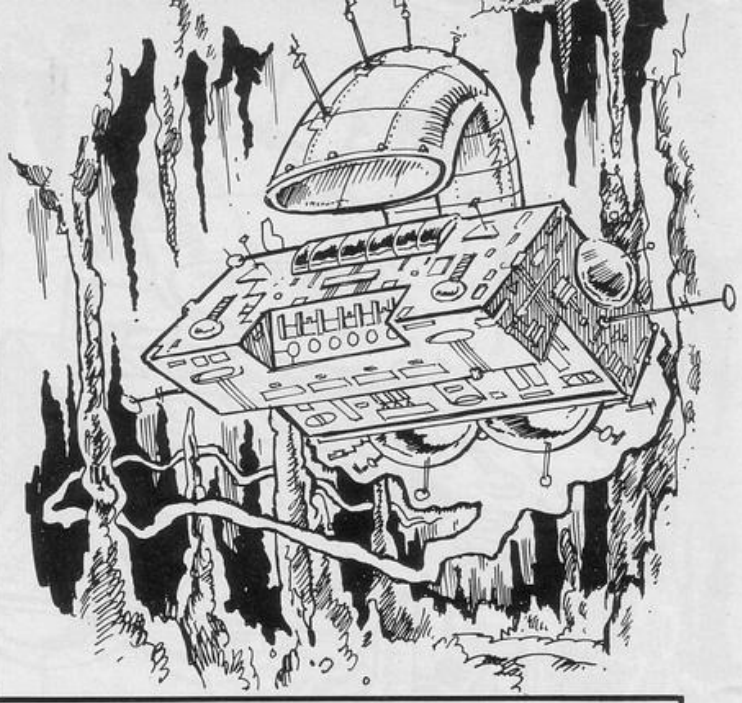
CAVE FLIGHT

TRAVEL through the cave avoiding the stalactites and stalagmites and docking for fuel when necessary. You have to reach the exit sign to get to the next level. Occasionally you will be subject to an attack but if you survive you can continue your journey. Your fuel, which will be high, medium, low or almost empty, is displayed on-screen at all times. If you choose to play a faster game your score will not be shown although it will be given at the end of the game. Use "Q" to move up and "S" to move down.

Cave Flight was written for the 16K ZX-81 by Paul Metcalfe of Hindhead, Surrey.

```
   1 CLS
   2 LET SC=0
   3 PRINT " FAST(F) OR SLOW(S)
GAME ?"
   4 INPUT X$
   5 DIM D$(4,8)
   6 LET D$(1)="H M L E"
   7 LET D$(2)="H M L E"
   8 LET D$(3)="H M L E"
   9 LET D$(4)="H M L E"
  10 LET LEV=0
  11 LET JJ=20
  12 LET F=1
  20 LET LEV=LEV+1
  22 FAST
  23 LET Y=11
  24 CLS
 100 FOR I=7 TO 21
 110 PRINT AT I,0;"
                    "
 120 NEXT I
 130 PRINT AT 0,9;"*CAVE FLIGHT*
"
 131 PRINT AT 2,7;"LEVEL =";LEV
 140 PRINT AT 7,0;"
                    "
 150 PRINT AT 21,0;"
                    "
 160 FOR H=5 TO 25
 170 FOR J=21 TO INT (RND*5)+15
STEP -1
 180 PRINT AT J,H;""
 190 NEXT J
 200 NEXT H
 205 FOR H=5 TO 25
 210 FOR J=7 TO INT (RND*6)+5 ST
EP 1
 220 PRINT AT J,H;""
 230 NEXT J
 240 NEXT H
 250 LET K=INT (RND*2)+1
 260 IF K=1 THEN LET N=10
 270 IF K=2 THEN LET N=16
 280 PRINT AT N,31;""
 290 LET X=1
 310 FOR A=1 TO 10+LEV+LEV
 320 PRINT AT INT (RND*13+7),INT
 (RND*18)+7;""
 330 NEXT A
 340 PRINT AT 11,14;"O"
 390 SLOW
 400 PRINT AT Y,X;"X"
 405 PRINT AT Y,X+3;
 406 IF PEEK (PEEK 16398+256*PEE
K 16399)=CODE "" THEN GOTO 1000
 407 IF INKEY$="Q" OR INKEY$="S"
 THEN PRINT AT Y,X;"   "
 410 IF INKEY$="Q" THEN LET Y=Y-
1
 415 IF INKEY$="Q" OR INKEY$="S"
 THEN PRINT AT Y,X;"   "
 420 IF INKEY$="S" THEN LET Y=Y+
1
 425 IF INKEY$="Q" OR INKEY$="S"
 THEN PRINT AT Y,X;"   "
 430 LET X=X+1
 440 IF X>28 THEN GOTO JJ
 450 IF X$="S" THEN PRINT AT 0,0
;"SCORE=";SC
 460 LET SC=SC+1
 470 PRINT AT 3,20;"FUEL ";D$(F)
 477 IF F>4.27 THEN PRINT AT 6,8
;"OUT OF FUEL"
 478 IF F>4.27 THEN GOTO 1040
 480 LET F=F+.04
 510 IF F>2.8 THEN PRINT AT 5,0;
"WARNING:FUEL LOW"
 540 IF Y=11 AND X=12 THEN GOTO
2000
 545 LET N=INT (RND*20)
 550 IF N=9 THEN GOTO 5000
 600 GOTO 400
1000 PRINT AT Y,X;"   "
1009 FOR I=128 TO 138
1010 PRINT AT Y,X;""
1020 PRINT AT Y,X;CHR$ I
1025 PRINT AT Y,X+1;CHR$ I
1030 NEXT I
1040 FOR U=Y TO 19
1050 PRINT AT U,X;""
1055 PRINT AT U-1,X;" "
1060 PRINT AT U+1,X;"V"
1070 NEXT U
1080 FOR T=0 TO 5
1090 PRINT AT 21-T,X-T;""
1100 PRINT AT 21-T,X;""
```

```
1110 NEXT T
1120 FOR T=0 TO 5
1130 PRINT AT 21-T,X-T;"■"
1140 PRINT AT 21-T,X;"■"
1150 NEXT T
1160 FOR G=1 TO 10
1170 PRINT AT 15,2+G;" CRASH"
1177 PRINT AT 15,2+G;" CRASH"
1178 NEXT G
1180 FOR L=1 TO 20
1190 NEXT L
1200 CLS
1210 PRINT ,,,,,,,,"IAM AFFRAID
THAT YOU HAVE JUST"
1220 PRINT "BEEN MEATED AND RIGH
T NOW BEING"
1230 PRINT "EATEN BY THE LURGY K
ING."
1240 PRINT "ALL IS NOT LOST THOU
GH BECAUSE"
1250 PRINT "YOU DID JUST MANAGE
TO SCORE ";SC
1255 PRINT "AND GET TO LEVEL ";L
EV
1260 PRINT
1270 PRINT "I SUPPOSE YOU WOULD
LIKE ANOTHER"
1280 PRINT "GO. YES(Y) NO(N)"
1290 INPUT A$
1300 IF A$="Y" THEN RUN
1310 STOP
2000 LET F=1
2010 PRINT AT 5,0;"
"
2020 PRINT AT 5,0;"** DOCKED **"
2030 GOTO 400
5001 LET C=19
5002 LET D=2
5003 PRINT AT 5,0;"LURGI ATTACK
                "
5005 FOR T=1 TO 5+INT (RND*5)+1
5010 PRINT AT C,D;""""
5020 PRINT AT C,D;"■"
5030 IF C>Y THEN LET C=C-1
5040 IF C<Y THEN LET C=C+1
5050 IF D<X THEN LET D=D-1
```

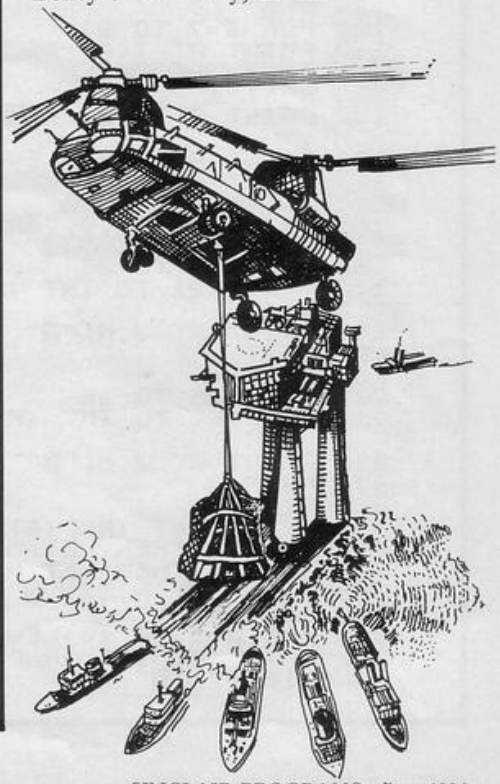


```
5060 IF D>X THEN LET D=D-1
5066 IF C=Y AND D=X THEN GOTO 50
90
5070 NEXT T
5077 PRINT AT 5,0;"    SAVED....
"
5080 GOTO 400
5090 LET B$="............IAM AFFR
AID THAT YOU HAVE BEEN GOT BY TH
E LURGY AND ALL IS DOOMED .SORRY
 BUT YOUR DEAD...."
5100 FOR Z=1 TO 72
5110 PRINT AT 4,1;B$(Z TO Z+29)
5120 NEXT Z
5130 FOR Z=1 TO 30
5140 NEXT Z
5150 GOTO 1000
```

OIL POST

USING the "d" key you have to drop mail sacks on to North Sea oil rigs from a helicopter. There are 20 sacks to be dropped and each must land in the centre of the rig to count as a delivery. **Oil Post** was written for the 16K Spectrum by Robert Beiley of Billericay, Essex.

```
  1 BORDER 2: PAPER 5: BRIGHT 1
: CLS
  2 PRINT  AT 4,4; INK 2; FLASH
 1; BRIGHT 1;"O I L  P O S T"
  3 PRINT  AT 6,5; INK 2; FLASH
 1; BRIGHT 1;"BY ROBERT BEILEY"
  4 PRINT  AT 8,4; INK 2; BRIGH
T 1;"YOU ARE A HELICOPTER PILOT
    FLYING OVER THE NORTH SEA
    YOUR JOB IS TO DROP MAILBAG
S    ON THE OIL RIGS"
  5 PRINT  AT 14,4; INK 6;"USE
'd' TO DROP THE BAGS"
  6 PRINT  AT 16,5; INK 4;"PRES
S ANY KEY TO START": PAUSE 0
  7 CLS
 10 FOR A=0 TO 39: READ B: POKE
 USR "A"+A,B: NEXT A
 20 DATA 0,0,0,126,24,63,63,63,
0,0,248,96,120,252,255,249
 25 DATA 63,63,1,1,1,15,15,0,24
9,254,192,192,192,248,248,0
 30 DATA 0,60,24,60,122,122,60,
0
 40 LET L=20: LET SC=0
 50 PRINT  AT 16,2;"(sp:3*ig8:7
*sp:3*ig8:7*sp:3*ig8:9*sp:g5:ig8
:ig5:sp:ig2:ig1:4*sp:g5:ig8:ig5:
ig2:ig1:5*sp:g5:ig8:ig5:sp:ig2:i
g1:5*sp:g3:g7:4*g3:ig4:g3:2*sp:g
3:g7:4*g3:ig4:g3:2*sp:g3:g7:4*g3
:ig4:g3:5*sp:g5:4*sp:ig5:4*sp:g5
2*ig8:2*sp:2*ig8:4*sp:2*ig8:2*sp
:4*sp:ig5:4*sp:g5:4*sp:ig5:6*sp:
2*ig8:4*sp:2*ig8:2*sp:2*ig8)" \
 70 LET h=0: LET a=0
 80 IF L=0 THEN  GO TO 500
 85 PRINT  AT 0,0;"
                  "
 90 PRINT  AT h,a; INK 1;"AB"
110 PRINT  AT h+1,a; INK 1;"CD"
120 BEEP 0.05,15
130 LET a=a+1
150 IF a=30 THEN  LET a=0
160 FOR z=0 TO 10: NEXT z
170 IF  INKEY$ <> "d" THEN  GO
TO 85
190 LET L=L-1: FOR f=2 TO 14: B
EEP 0.02,0: PRINT  AT f,a; INK 6
;"E"
195 FOR x=0 TO 5: NEXT x
210 PRINT  AT f,a;" ": NEXT f
220 IF a=4 THEN  LET SC=SC+1
223 IF a=14 THEN  LET SC=SC+1
227 IF a=24 THEN  LET SC=SC+1
230 PRINT  AT f,a;" ": GO TO 80
500 BEEP 1,-9: BEEP .1,9
510 PRINT "YOU HAVE SUCCESSFULL
Y DROPPED ";SC;" SACKS"
520 STOP
```



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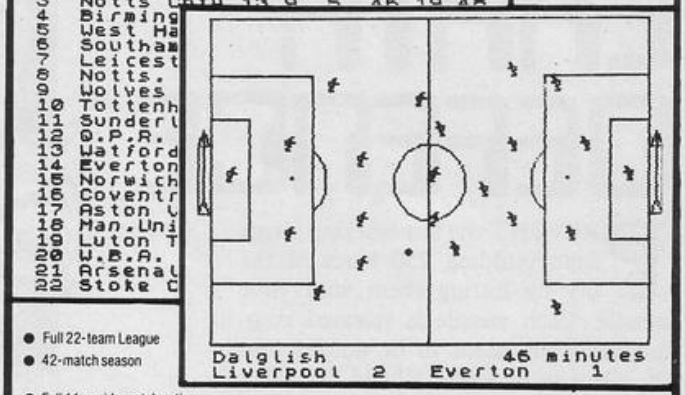

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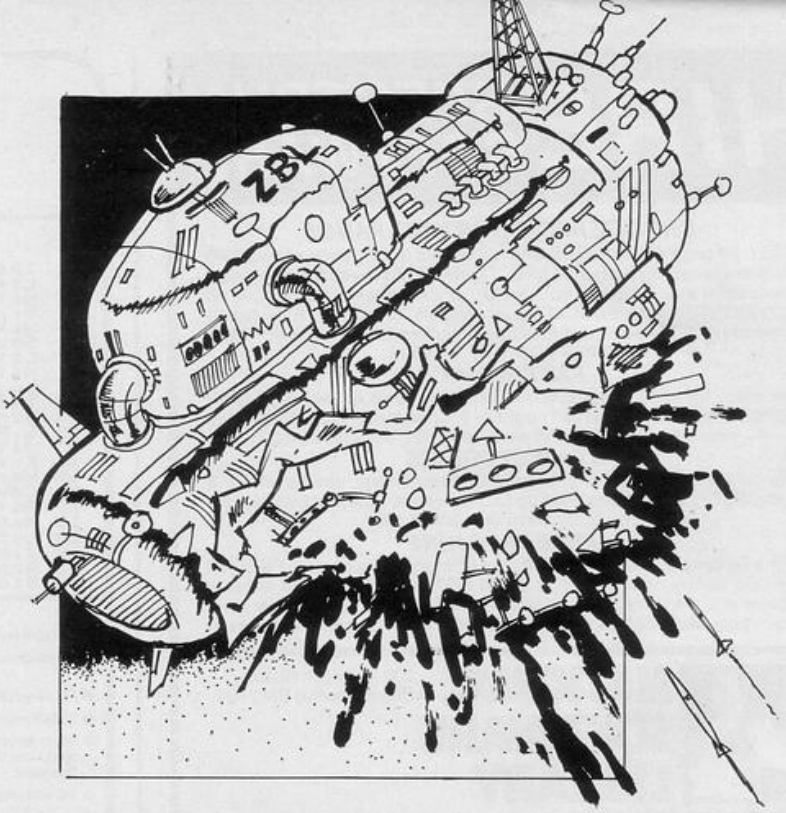

PREVENT the fast-working aliens from building 250 bases in the sky by hitting them with your missile. Each missile is released automatically but needs to be guided into the aliens using keys "5" and "8". Ten bases are destroyed for each alien hit.

Earth Defence was written for the 16K Spectrum by Marc Fanciullacci of Ickenham, Middlesex.

```
  1 CLS : PRINT  AT 0,7;"EARTH
DEFENCE"; AT 5,0;"YOU MUST STOP
THE ALIANS FROM MAKING 250 BASES
.WHEN YOU HIT AN ALIAN YOU WILL
DESTROY 10 BASES."; AT 10,0;"TO
CONTROLL MISSILE 5-LEFT 8-RIGHT.
"; AT 20,12;"GOOD LUCK PRESS ANY
 KEY TO PLAY"
  2 PAUSE 0: CLS :
  3 FOR f=0 TO 7: READ a: POKE
 USR "a"+f, VAL (" BIN "+ STR$ a
): NEXT f: FOR f=0 TO 7: READ a:
 POKE  USR "b"+f, VAL (" BIN "+
STR$ a): NEXT f
  4 FOR f=0 TO 7: READ a: POKE
 USR "c"+f, VAL (" BIN "+ STR$ a
): NEXT f: FOR f=0 TO 7: READ a:
 POKE  USR "d"+f, VAL (" BIN "+
STR$ a): NEXT f: FOR f=0 TO 7: R
EAD a: POKE  USR "e"+f, VAL (" B
IN "+ STR$ a): NEXT f
  5 BORDER 0: PAPER 0: INK 6: P
RINT  AT 0,9;"EARTH DEFENCE"
  10 LET sc=0
  11 LET p=0
  12 LET x=20: LET y=14
  14 LET a=19: LET b=15
  20 LET q= INT ( RND *32)-1: LE
T w=2
  23 PRINT  AT 0,23;"BASES ";p

  25 PRINT  AT w,q; INK 2;"A"
  28 PRINT  AT 0,0;"SCORE ";sc

  30 PRINT  AT 1,0; INK 0;"(32*i
g8)"
  32 IF b=0 THEN  LET p=p-3
  34 LET p=p+1
  35 PRINT  AT x,y; INK 4;"BCD"
  36 PRINT  AT a+1,b-1;"   ": PR
INT  AT a,b; INK 5;"E"
  38 IF b=1 THEN  LET b=2
  40 LET a=a-1
  42 BEEP 0.002,a
  45 IF a=0 THEN  GO TO 220
  48 IF b=30 THEN  LET b=29
  50 IF  INKEY$ ="5" THEN  LET b
=b-1
  52 IF  INKEY$ ="8" THEN  LET b
=b+1
  60 IF p=250 THEN  GO TO 250
 200 GO TO 20
 220 LET a=20: LET b=15: LET sc=
sc+10
 225 BEEP 0.005,10: BEEP 0.005,1
1: LET p=p-15
 230 GO TO 20
 250 PRINT  AT 10,0;"YOU COULD N
OT SAVE EARTH"
 254 BEEP 0.5,1: BEEP 0.5,6: BEE
P 0.5,4: BEEP 0.5,2: BEEP 0.5,0:

 260 GO TO 1
 300 DATA 10000001,11000011,0110
0110,00111100,00111100,00011000,
00011000,00011000
 310 DATA 00000001,00000011,0000
0111,00001111,00011111,00111111,
01111111,11111111
 320 DATA 11100111,11100111,1111
1111,11000011,11000011,11000011,
11111111,11111111
 330 DATA 10000000,11000000,1110
0000,11110000,11111000,11111100,
11111110,11111111
 340 DATA 00011000,00011000,0011
1100,01100110,11100111,00100100,
00111100,00011000
```

GEOGRAPHY TEST

THERE ARE two tests from which to choose in **Geography Test** written for the 16K Spectrum by A Laurillard of Pillaston, Cornwall. If you choose the first test a country will be named and you have to give the capital city of that country. In the second test a city is named and you have to state its country. At the end of the test you will be told how many questions were answered correctly and the number of questions answered incorrectly.

```
  4 LET GO=0
  5 LET A$=""
  6 LET S=0
  7 LET R=0
  8 LET C=0
  9 INPUT "Please ENTER 'Caps L
ock' Mode ! ";z$
 10 CLS : PRINT "WOULD YOU LIKE
          "'''"     (1)THE FI
RST TEST     OR        (2)THE SE
COND TEST  ": INPUT A
 15 IF A=1 THEN  GO TO 100
 20 IF A=2 THEN  GO TO 5000
 30 BEEP .1,1: INPUT A: GO TO 1
5
 100 CLS : PRINT "A COUNTRY WILL
 BE NAMED AND THENYOU WILL HAVE
 TO GIVE ITS        CAPITAL CITY !
": PAUSE 300
 102 PRINT ''"HOW TO ENTER YOUR
 ANSWERS        (25*g3)       "''"T
YPE IN YOUR ANSWER LETTER BY   L
ETTER AND WHEN THE WORD IS     C
OMPLETE PRESS '1' .            "
: PAUSE 200: PRINT "IF YOU MAKE
 A MISTAKE PRESS '0'  TO DELETE .
": PAUSE 300
 110 PRINT '''"YOUR SCORE WILL B
E GIVEN WHEN   THE TEST IS COMPL
ETED .": PAUSE 200: PRINT '' FLA
SH 1;"GOOD LUCK"
 120 PAUSE 0: PAUSE 0
 130 CLS
 200 REM TYPE ROUTINE
 201 LET L$="COUNTRY": LET P$="C
APITAL"
 205 FOR Z=0 TO 36
 210 READ Q$,C$
 219 PRINT  AT 2,0;"THE ";L$;" I
S ";Q$;"."
 220 PRINT  AT 4,0;"THE ";P$;" I
S "; INVERSE 1;A$; FLASH 1; INK
6; PAPER 1;">"; INK 7; PAPER 7;
FLASH 0;"                      "
 221 IF  INKEY$  <> "" THEN  GO
TO 221
 222 IF  INKEY$ ="" THEN  GO TO
222
 227 IF  INKEY$ ="1" THEN  GO TO
500
 228 IF  INKEY$ ="0" THEN  LET A
$="": LET I$="": GO TO 230
 229 LET A$=A$+ INKEY$
 230 BEEP .01,30: GO TO 220
 500 REM CHECK
 510 IF A$=C$ THEN  CLS : LET S=
S+1: PRINT "GOOD,NEXT ONE.": LET
 A$="": PAUSE 100: CLS : NEXT Z
 515 IF Z=100 THEN  GO TO 530
 520 PRINT "NO,THAT WAS WRONG .
          IT WAS ";C$;".": LET
 R=R+1: FOR F=0 TO 200: NEXT F:
LET A$="": PAUSE 200: CLS : NEXT
 Z
 530 CLS : PRINT "YOU HAVE OBTAI
NED THE AMAZING   TOTAL OF ";S;"
 QUESTIONS RIGHT !": PAUSE 100:
PRINT '''"BUT ";R;" WRONG."''''''
'''"ANY KEY TO PLAY AGAIN !": PA
USE 0: PAUSE 0: RUN
5000 CLS : PRINT "A CITY WILL BE
 NAMED AND THEN   YOU WILL HAVE
 TO GIVE ITS        COUNTRY !": PA
USE 300
5002 LET L$="CITY": LET P$="COUN
TRY"
5010 PRINT ''"HOW TO ENTER YOUR
ANSWERS
          "''"TYPE IN YOUR AN
SWER LETTER BY   LETTER AND WHEN
 THE WORD IS      COMPLETE PRESS
'1' .            ": PAUSE 200: P
RINT "IF YOU MAKE A MISTAKE PRES
S '0'  TO DELETE .": PAUSE 300
5020 PRINT '''"YOUR SCORE WILL B
E GIVEN WHEN   THE TEST IS COMPL
ETED .": PAUSE 200: PRINT '' FLA
SH 1;"GOOD LUCK"
5030 PAUSE 0: PAUSE 0: CLS
5040 FOR Z=0 TO 36: READ C$,Q$

5050 GO TO 219
8999 STOP
9000 DATA "ENGLAND","LONDON","FR
ANCE","PARIS","SPAIN","MADRID","
ITALY","ROME","CHINA","PEKING","
AMERICA","WASHINGTON DC","ARGENT
INA","BUENOS AIRES","USSR","MOSC
OW","BRAZIL","BRAZILIA","MOROCCO
","CASABLANCA","TURKEY","ISTANBU
L","LEBANON","BEIRUT","GREECE","
"ATHENS","BELGUIM","BRUSSELS"
9001 DATA "TUNISIA","TUNIS","FIN
LAND","HELSINKI","NORWAY","OSLO"
,"RUMANIA","BUCHAREST","HUNGARY"
,"BUDAPEST","SWITZERLAND","BERN"
,"SOUTHERN IRELAND","DUBLIN","IC
ELAND","REYKJAVIK","DENMARK","CO
PENHAGEN","CZECHOSLOVAKIA","PRAG
UE","EYGPT","CAIRO","PORTUGAL",
"LISBON","YUGOSLAVIA","BELGRADE"
9002 DATA "INDIA","DELHI","THAIL
AND","BANGKOK","JAPAN","TOKYO","
AUSTRALIA","CANBERRA","KENYA","N
AIROBI","CHAD","BARDEI","SPANISH
 SAHARA","VILLA CISNEROS","SIERR
A LEONE","FREETOWN","IVORY COAST
","ABIDJAN","MEXICO","MEXICO CIT
Y"
```

MANOR GROUNDS

YOU ARE in the grounds of a manor house and must search for the gate to go on to a more difficult screen. That is not so easy as it may seem as you have to avoid the electric dustbins littered around the grounds and also the electrified fence. If you run out of energy you will lose one of three lives. Use "Z" to move left, "X" to move right and "H" to go up. Due to a lack of energy you cannot move backwards. **Manor Grounds** was written for the 16K Spectrum by Martin and Chris Mann, aged 13 and 12 respectively, of Sea Mills, Bristol.

```
   1 LET hi=0: BORDER 4: PAPER 4
: CLS : GO SUB 6000
   2 PRINT  INVERSE 1; AT 0,7;"M
ANOR***GROUNDS"
   3 PRINT  AT 5,0;"Welcome to '
MANOR GROUNDS'"
   8 BEEP .5,16: BEEP .3,21: BEE
P .3,23: BEEP .4,24: BEEP .4,24:
 PAUSE 3: BEEP .5,16: BEEP .3,21
: BEEP .3,23: BEEP .7,24: PAUSE
3: BEEP .5,16: BEEP .3,21: BEEP
.3,23: BEEP .4,24: BEEP .4,24: B
EEP .3,23: BEEP .3,21: BEEP .4,1
9: BEEP 1,14: BEEP 2,16
   9 PRINT  FLASH 1; AT 3,8;"PRE
SS ANY KEY": PAUSE 0: CLS
  10 BEEP .1,12: BEEP .1,14: BEE
P .1,17: BEEP .3,20: BEEP .1,17:
 BEEP .9,20
  20 LET li=3: LET le=1
  25 LET how=100
  30 LET en=50: LET x=18: LET y=
14
  40 FOR p=0 TO 31: PRINT  INK 1
; INVERSE 1; AT 0,p;"X": BEEP .0
05,p
  50 PRINT  INK 1; INVERSE 1; AT
 21,p;"X": BEEP .005,p
  60 PRINT  INK 1; INVERSE 1; AT
 19,p;"X": BEEP .005,p
  70 NEXT p
  80 FOR o=0 TO 21: PRINT  INK 1
; INVERSE 1; AT o,0;"X": BEEP .0
05,o
  90 PRINT  INK 1; INVERSE 1; AT
 o,31;"X": BEEP .005,o
 100 NEXT o
 110 LET z=0
 120 LET a= INT ( RND *17)+1
 130 LET b= INT ( RND *30)+1
 140 PRINT  INK 0; AT a,b;"A": B
EEP .009,0
 150 LET z=z+1
 160 IF z=how THEN  GO TO 200
 170 GO TO 120
 200 LET q= INT ( RND *30)+1
 210 PRINT  INK 7; FLASH 1; AT 1
,q;"£"
 211 PRINT  AT 20,1;"Lives=";li
 212 PRINT  AT 20,11;"Level=";le

 213 PRINT  AT 20,28;"   "
 220 PRINT  AT 20,21;"Energy=";e
n
 230 PRINT  INK 1; AT x,y;"B"
 240 IF  INKEY$ ="z" THEN  GO TO
 1000
 250 IF  INKEY$ ="x" THEN  GO TO
 2000
 260 IF  INKEY$ ="h" THEN  GO TO
 3000
```

```
 300 LET en=en-1
 305 IF en=0 THEN  GO TO 9000
 310 GO TO 211
1000 LET y=y-1: PRINT  AT x,y+1;
" ": IF y<0 THEN  LET y=0: IF y>
31 THEN  LET y=31
1001 IF  SCREEN$ (x,y) <> " " TH
EN  GO TO 7000
1100 GO TO 310
2000 LET y=y+1: PRINT  AT x,y-1;
" ": IF y<0 THEN  LET y=0: IF y>
31 THEN  LET y=31
2001 IF  SCREEN$ (x,y) <> " " TH
EN  GO TO 7000
2100 GO TO 310
3000 LET x=x-1: PRINT  AT x+1,y;
" ": IF y<0 THEN  LET y=0: IF y>
31 THEN  LET y=31
3001 IF  SCREEN$ (x,y) <> " " TH
EN  GO TO 7000
3100 GO TO 310
6005 FOR n=0 TO 7: READ p: POKE
 USR "a"+n,p: NEXT n
6010 FOR n=0 TO 7: READ p: POKE
 USR "b"+n,p: NEXT n
6020 DATA 16,254,254,170,170,170
,170,254
6040 DATA 56,56,146,254,16,40,40
,108
6070 RETURN
7000 IF  SCREEN$ (x,y)="#" THEN
 GO TO 9999
7010 IF  SCREEN$ (x,y) <> "#" TH
EN  GO TO 9000
7020 GO TO 310
9000 PRINT  AT 0,0;"OH DEAR!!!":
 PAUSE 100: BEEP .9,-10: BEEP .9
,-10: BEEP .1,-10: BEEP 2,-10: P
RINT ; INVERSE 1; INK 1; AT 0,0;
"XXXXXXXXXX": LET li=li-1: PRINT
  AT x,y;" ": LET en=50: LET x=1
8: LET y=14
9005 IF li=0 THEN  GO TO 9500
9006 GO TO 211
9500 CLS : BEEP .1,5: BEEP .1,5:
 BEEP .1,5: BEEP 1,0: BEEP .1,5:
 BEEP .1,5: BEEP .1,5: BEEP 2,-2
: PRINT  INVERSE 1;"YOU GOT TO L
EVEL ";le
9501 IF le>hi THEN  LET hi=le
9502 PRINT  INVERSE 1; AT 5,0;"H
IGHEST LEVEL=";hi
9503 INPUT  AT 10,0;"DO YOU WANT
 ANOTHER GO (Y/N)?";z$
9504 IF z$="n" THEN  STOP
9600 CLS : GO TO 2
9999 CLS : PRINT  FLASH 1; AT 0,
5;"W E L L  D O N E ! ! !": BEEP
 .4,25: BEEP .1,20: BEEP .4,25:
BEEP .1,20: BEEP .2,25: BEEP .9,
28: PAUSE 50: LET le=le+1: LET h
ow=how+20: GO TO 30
```

PIN THE DONKEY

THE DONKEY will appear at a random position on the screen and you have to work out the co-ordinates where you think the tail should be. First input the vertical position and then the horizontal position. The game continues until you succeed in pinning the tail on the donkey. You will be told how many attempts it needed for you to find the co-ordinates.

Pin the Donkey was written for the 1K ZX-81 by Jason Williams of Camborne, Cornwall.

```
  5 RAND
 10 LET A=0
 20 LET B=A
 30 LET N=A
 40 LET Y=INT  (RND*25)+1
 50 LET X=INT  (RND*18)+1
 60 CLS
 70 LET A$="  "
 80 LET B$="  "
 90 PRINT AT X,Y;A$;AT X+1,Y;B$
;AT A,B;"/"
100 IF A=X AND B=Y+4 THEN GOTO
300
105 IF N=4 THEN GOTO 250
110 FOR T=1 TO 20
120 NEXT T
130 CLS
140 PRINT "TAIL POSITION"
150 PRINT "VERTICAL POSITION 5-
30"
155 INPUT A
160 PRINT "HORIZONTAL 5-30"
165 INPUT B
170 LET N=N+1
180 GOTO 60
250 PRINT AT X-2,2;"YOU LOSE"
260 PRINT ,,X;"  ";Y+4
270 SLOW
300 PRINT AT X-2,2;"CORRECT, YO
U TOOK ";N;" GOES";AT X-2,2;"COR
RECT"
310 IF INKEY$="" THEN GOTO 300
320 RUN
```

MINEFIELD

WHEN the program is RUN, you have to enter the number of mines you want to dodge. A higher number will make your task more difficult. You then have to move round the screen avoiding the mines and heeding the warning signs. Use the cursor keys to move.

Minefield was written for the 16K ZX-81 by Jason Williams of Camborne, Cornwall.

```
  5 LET SC=0
 10 LET A$="  O
           ┌┼┐
           ┘ └"
 20 RAND
 30 CLS
 35 POKE 16418,2
 40 PRINT "   INPUT NO. OF MINES
";
 50 INPUT MNS
 60 DIM M(MNS,2)
 70 FOR N=1 TO MNS
 80 LET M(N,1)=INT (RND*20)+1
 90 LET M(N,2)=INT (RND*32)
100 NEXT N
105 CLS
106 POKE 16418,0
110 PRINT "TIMER=        ┌EXIT┐
┐  SCORE=";SC
120 LET T=0
130 LET X=23
140 LET Y=INT (RND*28)
150 PRINT AT X-2,Y-1;A$
160 LET T=T+1
170 PRINT AT 0,6;T
180 IF T=100 THEN GOTO 1000
190 GOSUB 300
191 LET A=X
192 LET B=Y
195 LET B$=INKEY$
196 IF B$="" THEN GOTO 150
200 LET X=X+(B$="6" AND X<23)-(
B$="7" AND X>3)
210 LET Y=Y+(B$="8" AND Y<30)-(
B$="5" AND Y>0)
220 PRINT AT A-2,B-1;"
                      "
230 GOTO 150
300 PRINT AT 0,11;"┌EXIT┐"
310 IF X=3 AND Y>11 AND Y<20 TH
EN GOTO 2000
320 LET N=1
330 LET XC=M(N,1)-X
340 LET YC=M(N,2)-Y
350 IF ABS XC<3 AND ABS YC<3 TH
EN PRINT AT 0,11;"┌WARNING┐"
360 IF XC=0 AND YC=0 THEN GOTO
1000
365 LET N=N+1
370 IF N=MNS THEN RETURN
380 GOTO 330
1000 PRINT AT X-2,Y-1;"▪▪▪
                      ▪▪▪
                      ▪▪▪"
1010 FOR N=1 TO MNS
1020 PRINT AT M(N,1),M(N,2);"*"
1030 NEXT N
1040 FOR N=0 TO 100
1050 NEXT N
1060 RUN
2000 LET SC=SC+100
2010 PRINT AT 10,5;"MISSION SUCS
ESSFUL"
2020 PRINT AT 12,5;"STAND BY FOR
 NEXT BATTLE FIELD"
2030 FOR N=0 TO 80
2040 NEXT N
2050 GOTO 105
```

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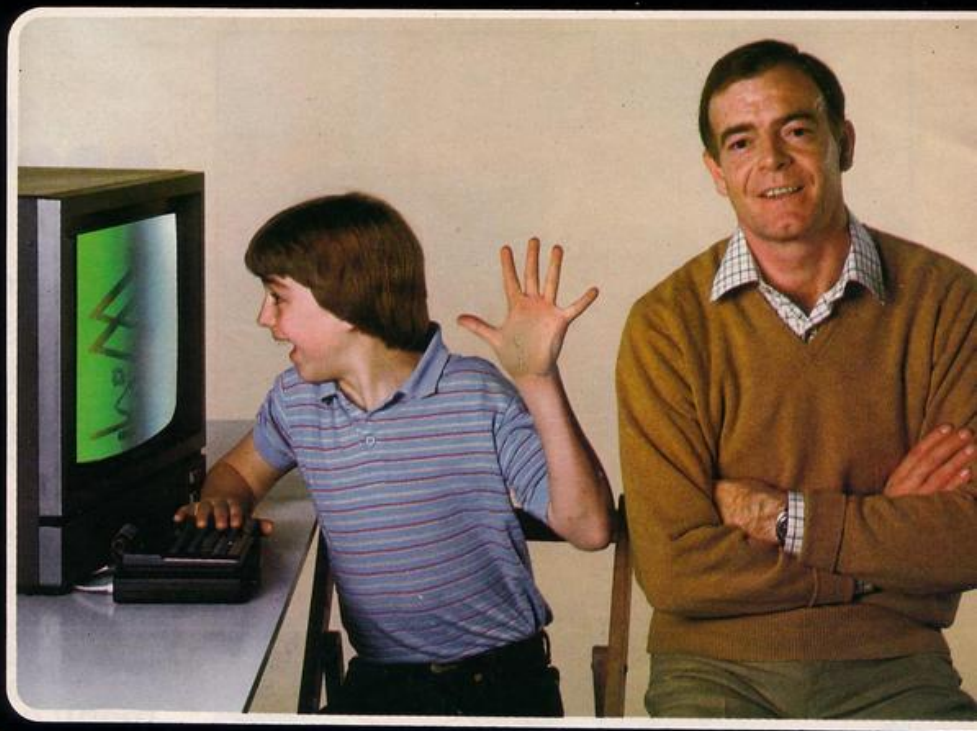

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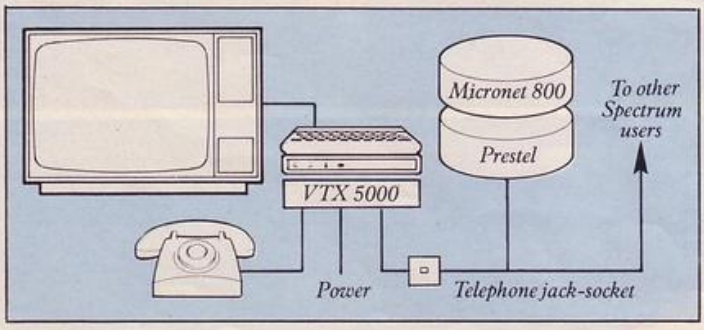

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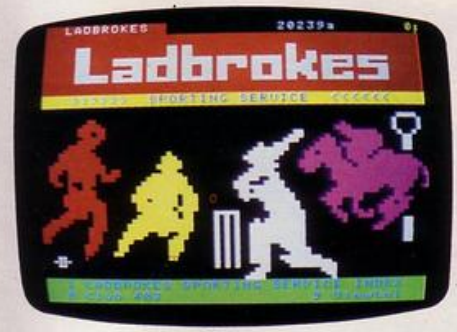

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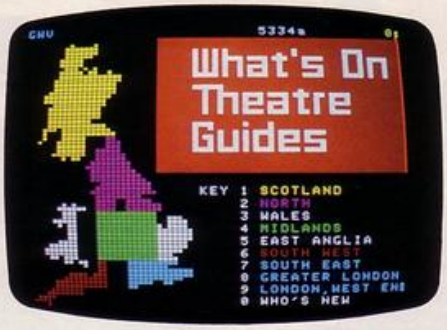

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...Pole Position gives a very strong sense of speed as you hurtle round the track. The super-realism of the three-dimensional effect adds a lot to the game. It is a great graphics demo.

PRACTICAL COMPUTING.

Brilliant!

WHICH MICRO? AND SOFTWARE REVIEW.

...a terrific version of the arcade motor racing game...graphics are superb...sound, too is very good as brakes screech and engines rev-up.

PERSONAL COMPUTER GAMES.

Exciting, exhilarating, excellent, Pole Position takes the lead as the best Atari race game around.

PERSONAL COMPUTER NEWS.

What can we say?

We're overwhelmed. Though we should just add that with Atarisoft, you can now play Pole Position* on the Commodore 64, BBC and Spectrum computers, as well as on all Atari® systems. Oh, and we're giving away free a Grand Prix kit and full colour wall chart with every game.

POLE POSITION
***from* ATARISOFT™**

LOOK OUT FOR OTHER LEADING COMPUTER GAMES ON ATARISOFT. PRICES START FROM £14.99. *TRADEMARK OF NAMCO. ®TM ARE TRADEMARKS OF ATARI INC.

CIGARETTE DOWSER is an original program, written for the 16K Spectrum by John McCrory, aged 14, of Belfast, N. Ireland. You have to save Fred, a heavy chain smoker, from the effects of smoking. Another 10 cigarettes could prove fatal for him. Shoot at the tip of the cigarette using the "0" and use "5" and "8" to move left and right.

CIGARETTE DOWSER

```
  5 LET hisc=0
 10 BORDER 0: PAPER 0: INK 7: B
RIGHT 1: CLS
 20 GO SUB 9000
 25 GO SUB 8500
 30 LET yp=15
 40 LET can=0
 50 LET a$="FFF"
 60 LET cig=27
 70 LET z=0
 80 LET f=17
 90 LET pu=0
100 LET b$="HK": LET c$="JL"
110 LET sc=0
200 PRINT  AT 4,0; BRIGHT 0; IN
K 6;"(ig8)D"; AT 5,0; INK 2; PAP
ER 1;"M"; AT 5,1; INK 2; PAPER 0
;"A"; AT 6,0;"(ig8)B"; AT 7,0;"(
ig8)C"
210 FOR n=0 TO 29: PRINT  AT 20
,n; INK 1;"(ig3)": NEXT n: FOR n
=0 TO 29: PRINT #1; AT 0,n; INK
1;"(ig3)": NEXT n: PRINT  AT 21,
30; INK 1;"(ig5)"; AT 20,30;"(ig
7)": PRINT #1; AT 0,30; INK 1;"(
g2)": PRINT  AT 20,10; INK 4; PA
PER 1; FLASH 1; BRIGHT 1;"CANCER
LEVEL"  220 FOR n=0 TO 30: PRINT
AT 0, n; INK 1;"(ig3)": NEXT n
1000 LET yp=yp+( INKEY$ ="8" AND
 yp<28)-( INKEY$ ="5" AND yp>2)

1005 PRINT  AT 18,yp-1;"    "; A
T 19,yp-1;"    "
1010 IF  INKEY$ ="0" THEN  LET p
u=1
1020 PRINT  AT 0,12; INK 0; PAPE
R 5;"SCORE ";sc
1030 PRINT  AT 18,yp; BRIGHT 0;
INK 3;b$; AT 19,yp;c$
1040 IF pu=1 THEN  PRINT  AT f,y
p+1; INK 5; BRIGHT 0;"I": BEEP .
001,f+20
1050 IF f=1 THEN  PRINT  AT f,yp
+1;" ": LET f=17: LET pu=0
1060 PRINT  AT 6,cig;a$; AT 6,ci
g+3; INK 2;"G"; AT 6,cig+4; INK
0;" "
1070 LET cig=cig-1
1080 IF cig=1 THEN  FOR n=0 TO -
10 STEP -1: BEEP .03,n: NEXT n:
PRINT  AT 6,cig+1;"     ": LET c
ig=27: PRINT  AT 21,z; INK 4;"(3
*ig8)": BEEP .05,-20: LET z=z+3:
 IF z=30 THEN  GO SUB 8000
1085 IF  ATTR (f,yp+1)=66 THEN
BEEP .1,-10: BEEP .1,0: PRINT  A
T 6,cig; INK 7; PAPER 0;"     ":
 LET cig=27: LET f=17: LET pu=0:
 LET sc=sc+10
1090 IF pu=1 THEN  PRINT  AT f,y
p+1;"  ": LET f=f-1
3000 GO TO 1000
8000 CLS : PRINT  AT 10,10; INK
3;"HARD LUCK !"; AT 14,4;"FRED J
UST DIED OF CANCER !": BEEP .4,1
: BEEP .4,8: BEEP .4,5: BEEP .4,
8: BEEP .4,13: FOR n=-5 TO -20 S
TEP -1: BEEP .1,n: NEXT n
8003 PRINT  AT 0,0; INK 6;"YOU S
CORED "; INK 4;sc; AT 2,0; INK 6
;"THE HI SCORE IS "; INK 4;hisc:
 IF sc>hisc THEN  LET hisc=sc: F
OR n=10 TO 20: BEEP .1,n: NEXT n
: PRINT  AT 4,0; INK 4;"YOU GOT
THE HI-SCORE"; AT 6,10; INK 5; P
APER 0; FLASH 1;"WELL DONE !"
8005 PRINT  AT 21,0; INK 2; PAPE
R 7; FLASH 1;"PRESS ANY KEY"
8010 PAUSE 0: PAUSE 0: CLS : GO
TO 25
8500 INK 3: CLS : PRINT  AT 0,0;
"CIGARETTES CAN SERIOUSLY DAMAGE
"; AT 2,10;"YOUR HEALTH"
8510 FOR n=0 TO -10 STEP -1: BEE
P .5,n: NEXT n: BEEP 1,-11
8520 PRINT  AT 4,2;"THOUSANDS OF
 PEOPLE DIE EACH": BEEP .5,20: P
RINT  AT 6,6;"YEAR FROM DISEASES
": BEEP .5,20: PRINT  AT 8,11;"D
UE TO": BEEP .5,20: PRINT  AT 10
,10;"SMOKING.": BEEP .5,20
8530 PRINT  AT 12,3;"YOU MUST LE
ARN TO FEAR THE": BEEP .5,20: PR
INT  AT 14,10;"CIGARETTE": BEEP
.5,20
8540 PRINT  AT 16,12; INK 7;"FFF
F"; AT 16,16; INK 2;"G"
8550 PRINT  AT 21,0; INK 2; PAPE
R 7; FLASH 1;"PRESS ANY KEY": PA
USE 0: BEEP .1,40
8560 INK 4: CLS
```

```
8570 PRINT  AT 0,11;"MEET FRED!"
: BEEP .5,30: PRINT  AT 2,15; IN
K 6;"(ig8)D"; AT 3,15; INK 2; PA
PER 1;"M"; AT 3,16; INK 2; PAPER
 0;"A"; AT 4,15;"(ig8)B"; AT 5,1
5;"(ig8)C"
8580 PRINT  AT 7,4; INK 4;"(OR P
ART OF HIM ANYWAY!)"
8590 PRINT  AT 9,0;"FRED STARTED
 SMOKING VERY YOUNG (3 MONTHS TO
 BE EXACT).HE IS A  CHAIN SMOKER
 AND SMOKES ABOUT...30,000 A DAY
."
8600 PRINT "YOU MUST HELP HIM FO
R IF HE GETSANOTHER 10 CIGARETTE
S HE WILL   DIE OF CANCER."
8610 PRINT  AT 17,0; INK 5;"USE
KEYS 5 AND 8 TO GO LEFT AND RIGH
T AND KEY 0 TO FIRE.REMEMBERTO H
IT THE FLAME!"
8620 PRINT  AT 21,0; INK 3; PAPE
R 7; FLASH 1;"PRESS ANY KEY TO S
TART": PAUSE 0: BEEP .3,-5: BEEP
 .4,0: BEEP .12,0: BEEP .1,0: BE
EP .4,7
8630 CLS : INK 7: GO TO 30
9000 FOR f=0 TO 12: FOR n=0 TO 7
: READ a: POKE  USR  CHR$ (144+f
)+n,a: NEXT n: NEXT f: RETURN

9005 DATA 128,128,224,240,248,25
2,254,252
9010 DATA 128,192,240,0,0,0,0,0

9015 DATA 248,248,248,192,128,12
8,0,0
9020 DATA 128,192,192,192,192,19
2,192,128
9025 DATA 127,255,255,255,255,25
5,255,255
9030 DATA 0,0,0,255,255,255,255,
255
9035 DATA 0,0,0,224,248,252,248,
224
9040 DATA 1,1,1,1,31,31,31,31
9045 DATA 16,120,126,252,120,124
,56,16
9050 DATA 31,31,31,31,31,31,31,3
1
9055 DATA 240,240,128,128,248,24
8,248,248
9060 DATA 248,248,248,248,248,24
8,248,248
9065 DATA 255,255,241,225,241,25
5,255,255
```

NAME TAG

WHEN USED in conjunction with the ZX printer, **Name Tag** can be used to produce tags or labels. The program draws the perimeter of a label complete with a car logo. All users have to do is input the name, middle name and surname and the program will centre them on the label. The finished tag can then be copied on to a printer.

Written for the 16K Spectrum by A A Paine of Brunham-on-Crouch, Essex.

```
 10 CLS
 20 PRINT  AT 4,4;"*"
 30 PRINT  AT 4,26;"*"
 40 PRINT  AT 17,4;"*"
 50 PRINT  AT 17,26;"*"
 60 FOR n=5 TO 25
 70 PRINT  AT 3,n;"*"
 80 PRINT  AT 18,n;"*"
 90 FOR m=5 TO 16
100 PRINT  AT m,3;"*"
110 PRINT  AT m,27;"*"
120 NEXT n: NEXT m
130 INPUT "Type in your first c
hristian    name(19 letters max)
:",a$
140 INPUT "Type in your second
christian   name(19 letters max)
:",b$
150 INPUT "Type in your surname
 (19 letters max):",c$
160 LET x=(19- LEN a$)/2: LET y
=(19- LEN b$)/2: LET z=(19- LEN
c$)/2
170 PRINT  AT 12,6+x;a$
180 PRINT  AT 14,6+y;b$
190 PRINT  AT 16,6+z;c$
200 PLOT 89,111: DRAW 66,0
210 PLOT 67,103: DRAW 24,0,- PI

220 PLOT 91,103: DRAW 2,-2: DRA
W 58,0: DRAW 2,2
230 PLOT 153,103: DRAW 24,0,- P
I
240 CIRCLE 79,103,6
250 CIRCLE 79,103,9
260 CIRCLE 165,103,6
270 CIRCLE 165,103,9
280 PLOT 177,103: DRAW 12,6: DR
AW -14,0
290 PLOT 173,113: DRAW 18,0: DR
AW -2,-4
300 PLOT 187,113: DRAW 4,6: DRA
W -4,4: DRAW -10,2: DRAW -18,10:
 DRAW -20,1: DRAW -20,-1: DRAW -
17,-10: DRAW -21,-2
310 PLOT 78,122: DRAW -15,-3: D
RAW -10,-4: DRAW 2,-4
320 PLOT 53,111: DRAW 18,0
330 PLOT 53,111: DRAW 0,-4: DRA
W 16,0
340 PLOT 53,107: DRAW 2,0: DRAW
 0,-2: DRAW 6,-2: DRAW 6,0
350 PLOT 119,135: DRAW 3,-2: DR
AW -19,-10: DRAW -2,2
360 PLOT 124,132: DRAW 6,2: DRA
W 10,0: DRAW -4,-15: DRAW -12,0:
 DRAW -20,2: DRAW 20,11
370 PLOT 142,134: DRAW 16,-4
380 PLOT 158,130: DRAW 0,-8,- P
I
390 PLOT 158,122: DRAW -20,-3:
DRAW 4,14
400 STOP
```

Little Brothers should be seen but not heard.

REGULAR, CONDENSED, OR EXTENDED FACES.

CUT SHEET A4 OR ROLLER PAPER.

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A maxim which eloquently describes the Brother HR-5.

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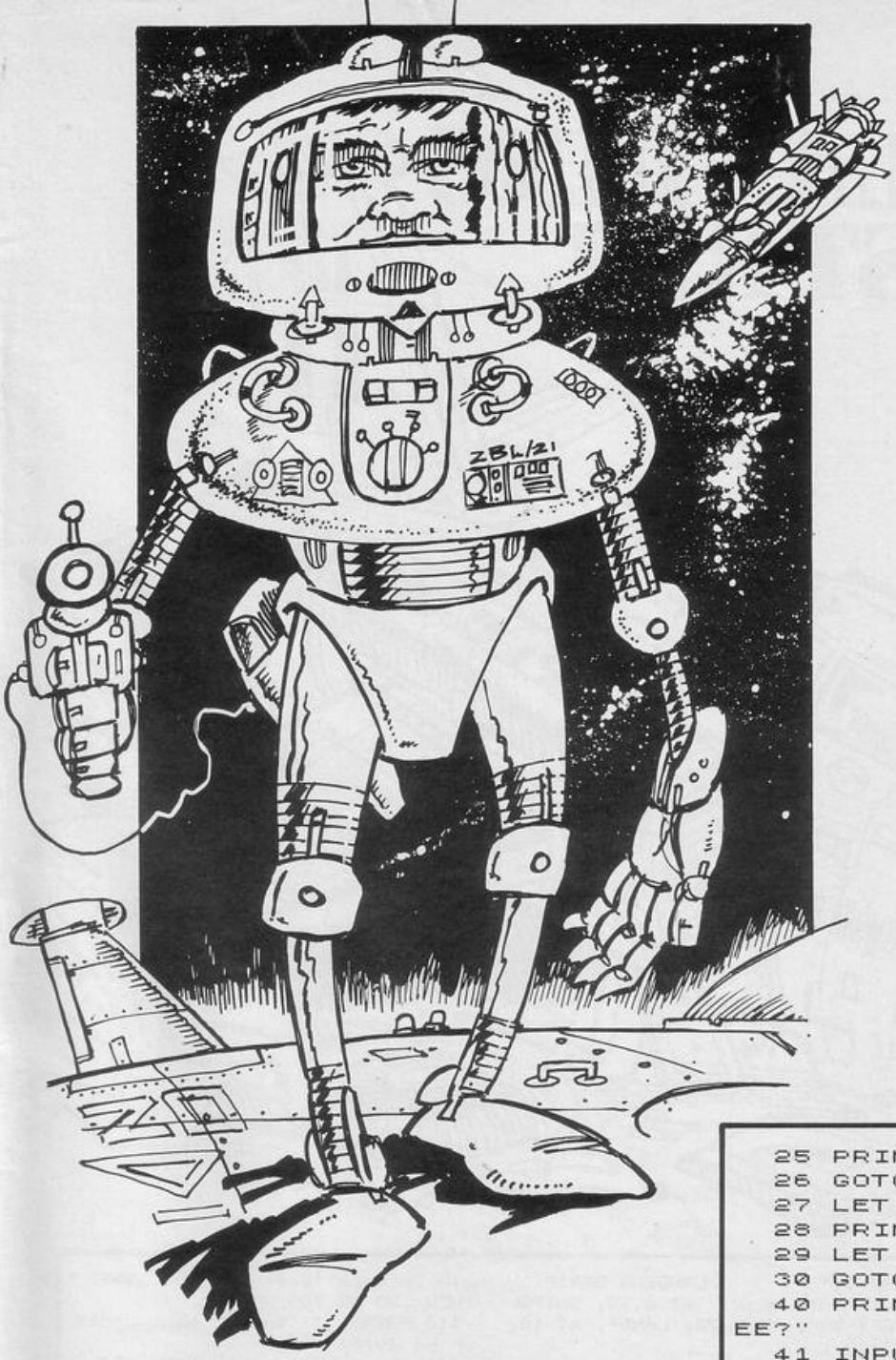


mini ADVENTURE 2

DRIFTING through space, you see an apparently deserted space station and decide to investigate. The only way to escape from the space station is to find your ship in the shuttle bay. Features of the program are fighting, jumping gaps and collecting money. Make decisions by pressing 1 for first choice, or yes, and by pressing 2 for second choice, or no.

After entering the program listing, enter the following as direct commands:

```
DIM A$ (3,6)
LET A$(1)="ROBOT"
LET A$(2)="ALIEN"
LET A$(3)="DALEK"
LET J=20
LET S=20
LET T=0
```

The game is then started by entering GOTO 1. To re-start the game, enter the last three commands again and start with GOTO 1. Some readers may find this information similar to that which accompanied the Mini Adventure game in the March issue. That was due to an error as a result of which the wrong listing was included.

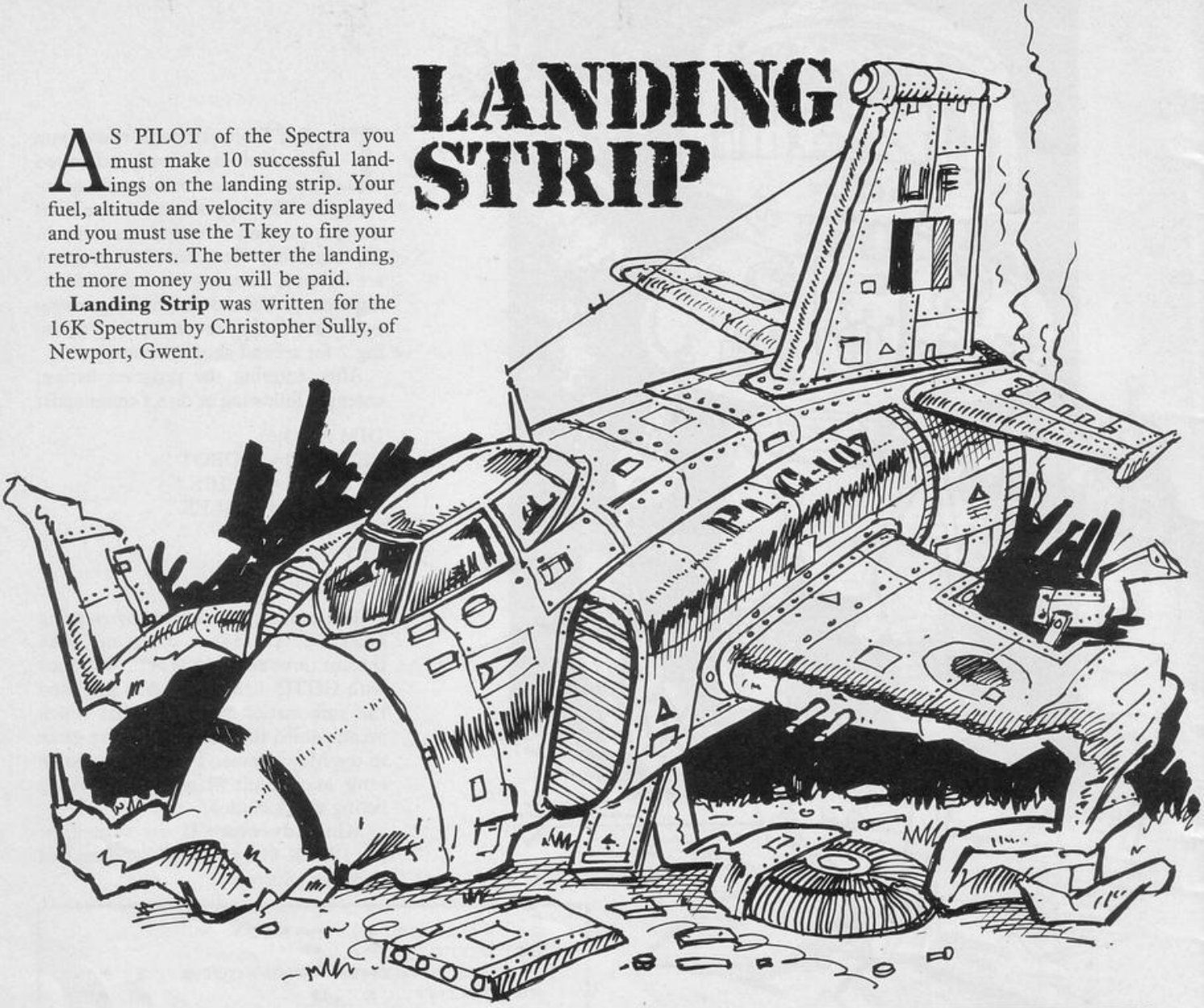
Mini Adventure II was written for the 1K ZX-81 by Russell Wooberry of Farnham, Surrey.

```
   1 IF S<CODE "■" THEN GOTO J*C
ODE "▗"
   2 PRINT "S=";S;" £";T;" L,R?"
   3 INPUT A
   4 CLS
   5 LET C=INT (RND*CODE "▀"+COD
E "■")
   6 LET M=INT (RND*CODE "▒"+COD
E "■")
   7 IF M>CODE "▌" THEN GOTO COD
E "■"
   8 GOTO M*J
  20 PRINT "DOOR.I,O?"
  21 INPUT A
  22 IF A=CODE "■" THEN GOTO COD
E "■"
  23 PRINT "YOU SEE"
  24 IF (RND)>.5 THEN GOTO CODE
"."
  25 PRINT "A ";A$(C)
  26 GOTO CODE "F"
  27 LET M=INT (RND*CODE "▌")
  28 PRINT "£";M
  29 LET T=T+M
  30 GOTO CODE "■"
  40 PRINT "A ";A$(C);".FIGHT,FL
EE?"
  41 INPUT A
  42 IF A=CODE "■" THEN GOTO COD
E "■"
  43 LET S=S-INT (RND*CODE "▛")
  44 PRINT A$(C);" DEAD"
  45 GOTO CODE "."
  60 PRINT "GAP.J,C?"
  61 INPUT A
  62 IF A=CODE "■" THEN GOTO COD
E "■"
  63 IF (RND)>.5 THEN GOTO J*COD
E "▗"
  64 LET T=T+CODE "▒"
  65 GOTO CODE "■"
  80 PRINT "SHUTTLE BAY.£20?"
  81 INPUT A
  82 IF A=CODE "■" THEN GOTO COD
E "■"
  83 CLS
  84 PRINT "YOU HAVE ESCAPED."
  85 STOP
 100 PRINT "OW..FORCE FIELD"
 101 LET S=S-INT (RND*CODE "▀"+C
ODE "■")
 102 GOTO CODE "■"
 120 CLS
 121 PRINT "R.I.P"
```

LANDING STRIP

AS PILOT of the Spectra you must make 10 successful landings on the landing strip. Your fuel, altitude and velocity are displayed and you must use the T key to fire your retro-thrusters. The better the landing, the more money you will be paid.

Landing Strip was written for the 16K Spectrum by Christopher Sully, of Newport, Gwent.



```
    1 LET h=0: PAPER 0: BORDER
1: INK 5: LET a$="??????????": C
LS : GO SUB 1000
   2 LET i=0: LET s=0
   3 CLS : LET m= PI / PI
   4 LET n=1
   6 LET f=130
   8 LET a=20
  10 LET b=a
  15 LET c=30
  20 LET v=a
  25 PRINT  AT 13,19; INK 6;"SCO
RE=";s; AT 16,17;"HI-SCORE=";h;
AT 18,17;" BY ";a$
  30 GO TO f
  40 LET z=a
  50 LET t=m-m
  60 LET a= INT (a-v/c)*(a >= v/
c)
  70 PRINT  AT b-z,n;"   "; AT b
-z+m,n+m;" "
  80 LET n=n+ RND
  90 PRINT  AT b-a,n; INK 3;"ABC
"
 100 IF  INKEY$ ="t" AND f >= 10
 THEN  LET t=10
 105 IF t=10 THEN  PRINT  AT b-a
+m,n+m; INK 6;"D": BEEP .02,-10:
 BEEP .02,-20: BEEP .02,-30: BEE
P .02,-15
 110 LET f=f-t
 120 LET v=v+5-t
 130 PRINT  AT m,b;"FUEL ";f;" "
; TAB b;"ALT ";a*c;" "; TAB b;"V
EL ";v;" "; AT 21,0; INK 4; INVE
RSE 1;"          LANDING STRIP
      ": PRINT  AT 6,18;"SHIPS
LEFT TO"; AT 8,22;"LAND"; AT 10,
23;10-i
 140 IF a>m-m THEN  GO TO 40
 150 IF v>b THEN  GO TO 200
 160 FLASH 1
 161 IF v=20 THEN  PRINT  AT m,m
;"LANDED": LET s=s+100
 162 IF v=15 THEN  PRINT  AT m,m
;"GOOD LANDING": LET s=s+200
 163 IF v=10 THEN  PRINT  AT m,m
;"VERY GOOD LANDING": LET s=s+50
0
 164 IF v<10 THEN  PRINT  AT m,m
;"EXCELLENT LANDING": LET s=s+10
00: IF v<5 THEN  LET s=s+1000
 165 FLASH 0
 170 LET i=i+1: FOR m=0 TO 500:
NEXT m: IF i=10 THEN  PRINT  AT
10,23;"0": GO TO 300
 171 GO TO 3
 200 PRINT  AT m,m; FLASH 1;"CRA
SHED": FOR x=7 TO 0 STEP -1: BEE
P .005,-40: BEEP .005,-x: BEEP .
005,-35: BEEP .08,-45: PRINT  AT
 b-a,n; INK 2; FLASH 1; INVERSE
1;"ABC": BORDER x: NEXT x: BORDE
R 1
 210 GO TO 170
 300 CLS : IF s>h THEN  LET h=s:
 PRINT  FLASH 1;"YOU BEAT THE HI
GHEST SCORE !";''"WITH A SCORE O
F ";s: INPUT ''"ENTER your name(
<10 letters)";a$: IF  LEN a$>10
THEN  GO TO 300
 310 PRINT '''"Do you want anoth
er go (y/n)"
 320 IF  INKEY$ ="y" THEN  LET i
=0: LET h=s: GO TO 2
 325 IF  INKEY$ ="n" THEN  STOP

 330 GO TO 320
1000 FOR a=144 TO 147: FOR u=0 T
O 7: READ i: POKE  USR ( CHR$ a)
+u,i: NEXT u: NEXT a
1010 DATA 0,31,127,225,240,127,1
23,48,126,219,195,189,102,126,25
5,90,0,248,254,135,15,254,222,12

1020 DATA 36,126,126,60,24,0,0,0

1025 INPUT "Instructions?";x$: I
F x$="" THEN  GO TO 1025
1026 IF x$(1)="y" OR x$(1)="Y" T
HEN  GO TO 2000
1030 RETURN
2000 PRINT  AT 1,2;"  Your task
as pilot for the     SPECTRA land
ing service is to    land 10 spac
e-craft (ABC).       Your boss wi
ll pay more for      better landi
ngs!"
2010 PRINT  AT 10,7;"Use T to fi
re your                  RETRO-THU
STERS.": PRINT  AT 15,5; INK 2;
FLASH 1;"Press any key to begin"
: PAUSE 0
2020 RETURN
```

SUFFERIN' SOCCERCASH

IN CHARGE of the finances of your football club, you are responsible for buying and selling players, paying bills, and settling all debts before the end of the season. **Sufferin' Soccercash** was written for the 16K Spectrum by Stephen Robertson of Tremorfa, Cardiff.

```
  5 PAPER 7: BORDER 7: CLS
 10 REM ** THE VALUES **
 20 LET D=0
 25 LET WO=0
 30 LET E=0
 35 LET LO=0
 40 LET C=INT (RND*20000+1000)
 45 LET DR=0
 50 LET W=INT (RND*5000+1000)
 55 LET L=0
 60 LET T=INT (RND*5000+1000)
 70 LET M=INT (RND*50000+10000)
 80 LET O=INT (RND*300000+50000
)
 90 REM ** THE RULES **
 95 INK 4
100 BEEP .1,3: BEEP .1,3: PRINT
 "      SUFFERIN' SOCCERCASH
  "
110 PRINT "                by
          "
125 INK 0
130 BEEP .1,20: PRINT
140 PRINT "1. YOU PLAY 21 GAMES
PER SEASON"
150 BEEP .1,20: PRINT
160 PRINT "2. EVERY WIN - A BIG
GER CROWD"
170 BEEP .1,20: PRINT
180 PRINT "3. IF YOU LOSE - SMA
LLER CROWD"
190 BEEP .1,20: PRINT
200 PRINT "4. COMPUTER RESULTS"
210 BEEP .1,20: PRINT
220 PRINT "5. YOU CONTROL PURSE
 STRINGS"
230 BEEP .1,20: PRINT
240 PRINT "6. YOU MUST CLEAR OV
ERDRAFT"
250 BEEP .1,20: PRINT
260 PRINT "7. YOU MUST REPAY TH
E BOARD"
270 BEEP .1,20: PRINT
280 PRINT "8. OWE NOTHING AT EN
D OF SEASON"
290 BEEP .1,20: PRINT
300 PRINT "9. TYPE AND ENTER YO
UR TEAM NAME"
310 INPUT "up to 10 cap letters
";a$
322 LET A=INT (RND*6+0)
324 LET H=INT (RND*6+0)
325 FOR Y=1 TO 21
360 IF A>H THEN  LET LO=LO+1
370 IF H>A THEN  LET WO=WO+1
380 IF A=H THEN  LET DR=DR+1
390 CLS : GO SUB 1000
400 LET L=L+W+T
410 GO SUB 2000
420 LET F=INT (RND*3000+1000)
430 IF H>A THEN  LET C=C+F
440 IF A>H THEN  LET C=C-F
450 LET A=INT (RND*6+0)
460 LET H=INT (RND*6+0)
465 IF D=0 THEN  GO TO 485
470 IF Q$="n" THEN  GO TO 485
480 IF Q$="y" THEN  LET H=H-2
485 IF E=0 THEN  GO TO 510
490 IF Z$="n" THEN  GO TO 510
500 IF Z$="y" THEN  LET H=H+2
510 IF A<0 THEN  LET A=0
520 IF H<0 THEN  LET H=0
530 NEXT Y
540 PAUSE 500: PAPER 0: BORDER
0: INK 7: CLS
550 BEEP .1,3: BEEP .1,3: BEEP
.1,3: PRINT "     ASSESSMENT OF
SEASON!      "
560 PRINT
570 PRINT "REPORT: ";A$
580 PRINT
590 PRINT "WON ";WO;"  LOST ";L
O;"  DREW ";DR
600 PRINT
610 PRINT "SOLD ";D;" PLAYERS"
615 PRINT
620 PRINT "BOUGHT ";E;" PLAYERS
"
630 PRINT
640 PRINT "OVERDRAFT £";O
650 PRINT
660 PRINT "BOARD LOANS £";L
670 PRINT
680 PRINT "CLUB MONEY £";M
690 PRINT
700 PRINT " MANAGERIAL CONCLUSI
ONS:£        "
705 PRINT
708 IF O=0 AND L=0 AND WO=21 TH
EN  PRINT "OUT OF THIS WORLD! AL
L DEBTS     PAID AND WON EVERY GA
ME. CLUB    OFFERS YOU NEW CONTRA
CT AT       DOUBLE WAGES!": STOP
710 IF O>M THEN  PRINT "BANK LI
QUIDATED CLUB! MANAGER   HELD RE
SPOSIBLE": BEEP 2,33: STOP
```

```
 720 IF L>M THEN  PRINT "MANAGER
 FAILED TO REPAY THE     BOARD -
 MANAGER GETS SACK!": BEEP 2,33:
 STOP
 730 IF WO>LO THEN  PRINT "NOT A
 BAD SEASON - MANAGER HAS  OFFER
 OF NEW CONTRACT!": STOP
 740 IF LO>WO THEN  PRINT "MANAG
ER HANDLED FINANCES OK      BUT A
S A FOOTBALL COACH HE       ISN'T
 UP TO MUCH - SACKED!": BEEP 2,3
3: STOP
 750 IF DR>WO AND DR>LO THEN  PR
INT "TEAM RATHER GOOD AT DRAWING
     MATCHES. THOUGH NOT MUCH GO
OD ATANY THING ELSE! MANAGER RET
AINED": STOP
 999 REM ** THE MATCH **
1000 BEEP .1,3: BEEP .1,3: PAPER
 5: PRINT AT 0,0,,,,
1010 PAPER 0: PRINT AT 2,0,,,,
1020 PAPER 4: PRINT AT 9,0,,,,
1025 LET R=C+C
1030 FOR x=0 TO 3
1035 IF C<0 THEN  LET C=0
1036 IF R<0 THEN  LET R=0
1037 IF M<0 THEN  LET M=0
1040 PAPER 7: INK 0: PRINT AT x+
4,0;"******** ************** ***
*****"
1050 NEXT x
1060 PRINT AT 11,0;"
                    "
1065 PRINT AT 13,0;"
                    "
1070 INK 2: PRINT AT 8,0;"ON ":
INK 0: PRINT AT 8,3;" TEXACO ":
INK 1: PRINT AT 8,11;" SINCLAIR
USER ": INK 3: PRINT AT 8,26;" C
OCA "
1120 INK 0: PRINT AT 15,1;"CROWD
> ";C;AT 15,15;"MONEY> £";R;AT 1
7,7;" MATCH NUMBER> ";AT 17,23;Y
;AT 12,3;A$;AT 12,28;A: PRINT AT
 12,18;"UNITED": PAUSE 100: BEEP
 .1,.1: PRINT AT 12,15;H
1125 PRINT AT 19,1;" WON>  ";WO;
AT 19,11;" LOST>  ";LO;AT 19,22;
" DRAW>  ";DR
1130 PAPER 7: PAUSE 400: CLS
1150 RETURN
2000 REM ** THE MONEY **
2010 PAPER 6: PRINT ,,,,,,,,,,,,
,,,,,,,,,,
2020 PRINT AT 1,1;"       FINANC
IAL REPORT       "
2025 IF Y=21 THEN  FLASH 1: PRIN
T AT 1,1;"  FINAL FINANCIAL ADJU
STMENT  ": FLASH 0
2030 PRINT
2040 PRINT "  BANK OVERDRAFT> £
";O
2050 PRINT
2060 PRINT "  WAGES> £";W
2070 PRINT
2080 PRINT AT 5,16;" RATES> £";
T
2090 PRINT
2100 PRINT "  LOAN FROM BOARD>
£";L
2110 PRINT
2115 LET M=M+R
2120 PRINT "  CLUB'S MONEY> £";
M
2130 PAUSE 400: IF O>200000 THEN
  GO SUB 3000
2135 IF O<200000 THEN  LET Q$="n
"
2140 IF C<5000 THEN  GO SUB 4000
2145 IF C>5000 THEN  LET Z$="n"
2150 LET F=INT (RND*20+0)
2160 IF F=13 THEN  GO SUB 5000
2170 IF F=2 THEN  GO SUB 6000
2175 IF F=16 THEN  GO SUB 7500
2180 IF F=19 THEN  GO SUB 7000
2185 IF F=7 THEN  GO SUB 6500
2190 IF F=12 THEN  GO SUB 8000
2195 IF Y=11 AND WO=0 THEN  GO S
UB 9000
2200 BEEP .1,20: INPUT "D'DRAFT
REDUCTION? HOW MUCH?";V
2203 IF v>0 THEN  GO TO 2200
2205 IF V>M THEN  GO TO 2200
2206 LET D=D-V
2207 LET M=M-V
2208 IF M<0 THEN  LET M=0
2209 IF D<0 THEN  LET D=0
2210 PAPER 6: PRINT AT 9,18;M;"
     ": PRINT AT 3,20;D;"
"
2220 BEEP .1,20: INPUT "LOAN RED
UCTION? AMMOUNT?";S
2225 IF S>L THEN  GO TO 2220
2230 IF S>M THEN  GO TO 2220
2235 LET L=L-S
2240 LET M=M-S
2245 IF M<0 THEN  LET M=0
2250 IF L<0 THEN  LET L=0
2260 PAPER 6: PRINT AT 9,18;M;"
     ": PRINT AT 7,21;L;"
 "
2270 PAPER 7: PAUSE 300: CLS
2280 RETURN
3000 IF O=0 THEN  LET Q$="n": RE
TURN
3003 IF Y>20 THEN  RETURN
3005 PAPER 4: PRINT AT 15,0,,,,,
,,,,
3010 PAUSE 50
3020 BEEP .1,1.2: BEEP .1,1.2: B
EEP .1,1.2: PRINT AT 16,1;"BANK
ARE CONCERNED BY HIGH      LEVEL
 OF OVERDRAFT THEY URGE     YOU T
O SELL A PLAYER"
3030 LET F=INT (RND*20000+100)
3040 PAUSE 200
3050 PRINT AT 16,1;"UNITED HAVE
MADE AN OFFER OF    £";F;" MONEY
 GOES TO BANK
                    "
3052 INPUT "(y OR n)";Q$
3053 IF Q$="y" THEN  LET D=D+1
3055 IF Q$="n" THEN  PAPER 7: PR
INT AT 15,0,,,,,,,,,,,: RETURN
3060 IF Q$="y" THEN  LET O=O-F:
PAPER 6: PRINT AT 3,20;O
3070 PAPER 7: PRINT AT 15,0,,,,,
,,,,,,: RETURN
4000 IF E=8 THEN  LET Z$="n": RE
TURN
4003 IF Y>20 THEN  RETURN
4005 PAPER 5: PRINT AT 15,0,,,,,
,,,,,,
4010 BEEP .1,1.2: BEEP .1,1.2: B
EEP .1,1.2: PRINT AT 16,1;"BOARD
 ARE WORRIED BY LACK OF    SUPPO
RT ON THE TERRACES, THEY    WANT
ACTION - SIGN NEW PLAYER!"
4020 PAUSE 200
4025 LET F=INT (RND*20000+100)
4030 PRINT AT 16,1;"A PLAYER COM
ES ON THE MARKET     FOR £";F;" -
THE BOARD WILL PAY",,,,
4040 INPUT "(y OR n)";Z$
4045 IF Z$="y" THEN  LET E=E+1
4050 IF Z$="n" THEN  PAPER 7: PR
INT AT 15,0,,,,,,,,,,,: RETURN
4060 IF Z$="y" THEN  LET L=L+F:
PAPER 6: PRINT AT 7,21;L
4070 PAPER 7: PRINT AT 15,0,,,,,
,,,,,: RETURN
5000 BEEP .1,2: PRINT AT 17,0;"
 WEATHER DAMAGE-BILLS TO BOARD "
5010 LET F=INT (RND*5000+1000)
5020 PRINT
5030 PAPER 7: PRINT "
  £";F
5040 LET L=L+F: PAPER 6: PRINT A
T 7,21;L
5050 PAUSE 300: PAPER 7: PRINT A
T 17,0,,,,,,,,: RETURN
6000 BEEP .1,2: PRINT AT 17,0;"
  FA FINE CLUB FOR MISCONDUCT   "
6010 LET F=INT (RND*2000+100)
6020 PRINT "        PAID BY THE
BOARD       "
6030 PAPER 7: PRINT "
  £";F
6040 LET L=L+F: PAPER 6: PRINT A
T 7,21;L
6050 PAUSE 300: PAPER 7: PRINT A
T 17,0,,,,,,,,: RETURN
6500 BEEP .1,2: PRINT AT 17,0;"
RICH FINANCIER JOINS THE BOARD
PAYS OFF ANY DEBTS TO THE BANK "
6510 LET O=0: PAPER 6: PRINT AT
3,20;O;"       "
6520 PAUSE 300: PAPER 7: PRINT A
T 17,0,,,,,,,,,,: RETURN
7000 BEEP .1,2: PRINT AT 17,0;"
    SAFETY OF GROUNDS ACT       "
7010 PRINT " WORK MUST BE DONE -
 BANK PAYS! "
7020 LET F=INT (RND*50000+2000)
7030 PAPER 7: PRINT "
  £";F
7040 LET O=O+F: PAPER 6: PRINT A
T 3,20;O
7050 PAUSE 300: PAPER 7: PRINT A
T 17,0,,,,,,,,: RETURN
7500 BEEP 1,2: PRINT AT 17,0;" L
ARGE TAX BILL ARRIVES - TO BE
    PAID FROM CLUB FUNDS       "
7501 PAUSE 400
7505 LET U=M
7510 LET F=INT (RND*U+0)
7515 PAPER 7: PRINT "
  £";F
7520 LET M=M-F: PAPER 6: PRINT A
T 9,18;M;"       "
7530 PAUSE 300: PAPER 7: PRINT A
T 17,0,,,,,,,,: RETURN
8000 BEEP .1,2: PRINT AT 17,0;"
DIRECTOR PULLS OUT OF CLUB.... "
8010 PRINT "    BOARD HAS TO PAY
 HIM OFF    "
8020 LET F=INT (RND*10000+100)
8030 PAPER 7: PRINT "
  £";F
8040 LET L=L+F: PAPER 6: PRINT A
T 7,21;L
8050 PAUSE 300: PAPER 7: PRINT A
T 17,0,,,,,,,,: RETURN
9000 BORDER 0: PAPER 0: INK 7: C
LS : PRINT AT 10,0;" Stand by fo
r important message ": PAUSE 400
9005 BORDER 0: PAPER 0: INK 7: C
LS : PRINT AT 9,0;" WHAT A MANAG
ER YOU ARE-HALF WAY THROUGH THE
SEASON AND HAVE NOT  WON A GAME!
 SORRY THAT'S YOUR       LOT! YO
U'RE OUT MATE": FOR x=0 TO 50: B
EEP .1,13: NEXT x
9010 INK 6: PRINT AT 17,1;"   Si
gned: STEPHEN ROBERTSON     "
9020 INPUT "Another go? ( y or n
 )";t$
9030 IF t$="y" THEN  GO TO 5
9040 STOP
```

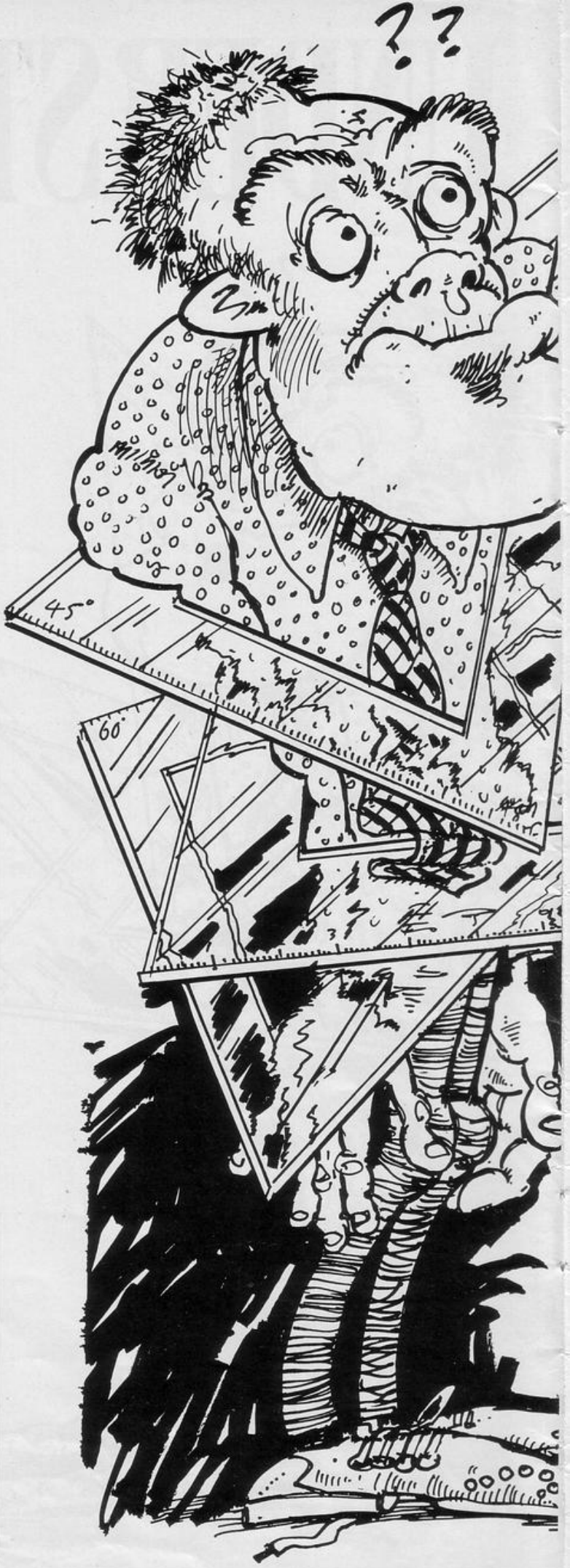
UNDERSTANDING ANGLES

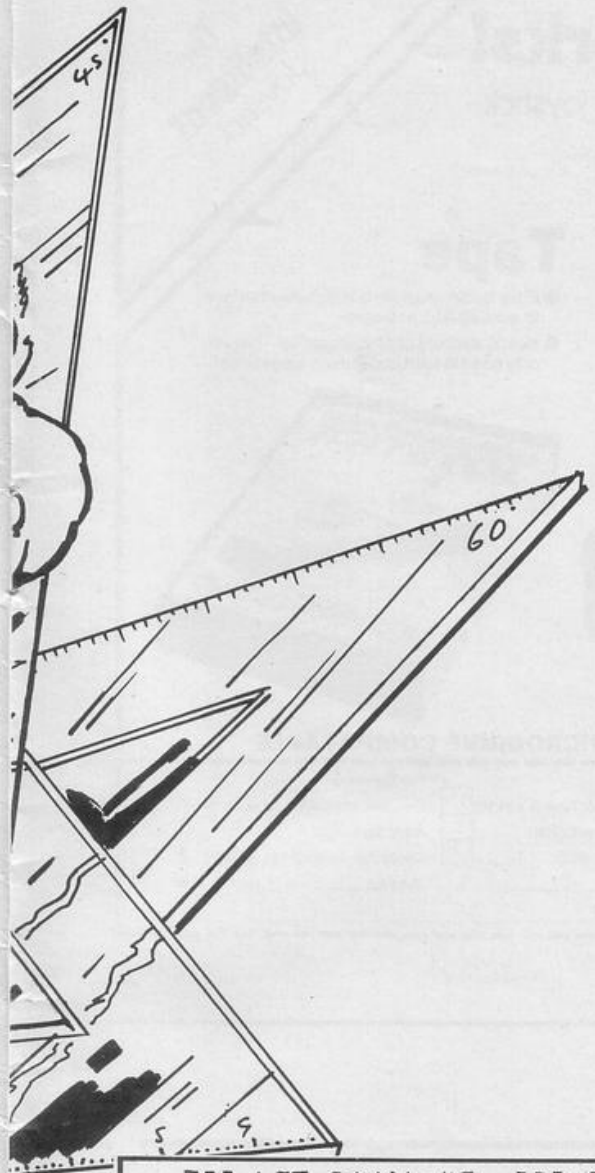
UNDERSTANDING ANGLES is an educational program for children of junior school age. The program is split into four categories and they include drawing angles, guessing the size of an angle and guessing compass points. If incorrect or inaccurate answers are given, the computer will tell you what the compass point is or draw a diagram if you give an incorrect answer in the angles section.

Rolling Stones was written for the 16K ZX-81 by Ian Thom of Allestree, Derby.

```
    2 REM "ANGLES"
    5 RAND
   10 CLS
   15 PRINT "THIS IS A PROGRAM TO
  HELP YOU"
   20 PRINT "UNDERSTAND ANGLES"
   30 PRINT AT 16,5;"PLEASE CHOOS
E THE GAME ;"
   40 PRINT "GAME 1 IS DRAWING AN
GLES"
   50 PRINT "GAME 2 IS GUESSING A
NGLES"
   60 PRINT "GAME 3 IS COMPASS PO
INTS"
   70 PRINT "GAME 4 IS HARDER COM
PASS POINTS"
   75 PRINT "     5 WILL STOP THE
  PROGRAM"
   80 IF INKEY$="1" THEN GOTO 200
   90 IF INKEY$="2" THEN GOTO 400
  100 IF INKEY$="3" THEN GOTO 700
  110 IF INKEY$="4" THEN GOTO 120
0
  115 IF INKEY$="5" THEN GOTO 400
0
  120 GOTO 80
  200 REM GAME 1
  205 LET SC=0
  210 CLS
  220 PRINT AT 2,21;"GAME 1"
  230 IF SC>0 THEN GOSUB 2100
  235 PRINT AT 5,17;"THERE ARE 36
0";TAB 17;"DEGREES IN A";TAB 17;
"COMPLETE CIRCLE";TAB 17;"INPUT
AN ANGLE";TAB 17;"AND I WILL DRA
W";TAB 17;"IT FOR YOU"
  240 FOR M=18 TO 20
  245 PRINT AT M,1;"
                   "
  246 NEXT M
  250 INPUT A$
  251 GOSUB 3100
  252 IF NO=1 THEN GOTO 250
  253 LET AD=VAL A$
  255 FOR M=5 TO 10
  256 PRINT AT M,17;"
     "
```

```
 257 NEXT M
 260 PRINT AT 18,3;AD;" DEGREES
     "
 270 GOSUB 2000
 280 IF AD>0 AND AD<90 THEN PRIN
T AT 19,1;"THIS IS AN ACUTE ANGL
E     "
 290 IF AD=90 THEN PRINT AT 19,1
;"THIS IS A RIGHT ANGLE
 300 IF AD>90 AND AD<180 THEN PR
INT AT 19,1;"THIS IS AN OBTUSE A
NGLE     "
 310 IF AD=180 THEN PRINT AT 19,
1;"THIS IS A STRAIGHT LINE     "
 320 IF AD>180 AND AD<360 THEN P
RINT AT 19,1;"THIS IS A REFLEX A
NGLE     "
 330 PRINT AT 20,2;"DO YOU WANT
ANOTHER GO ? Y/N"
 335 LET SC=SC+1
 340 IF INKEY$="Y" THEN GOTO 230
 350 IF INKEY$="N" THEN GOTO 10
 360 GOTO 340
 400 REM GAME 2
 405 CLS
 410 PRINT AT 2,21;"GAME 2"
 420 PRINT AT 5,17;"I AM GOING T
O";TAB 17;"DRAW AN ANGLE";TAB 17
;"AND I WANT YOU";TAB 17;"TO GUE
SS HOW";TAB 17;"MANY DEGREES IT"
;TAB 17;"IS."
 430 LET AD=INT (RND*360)
 440 GOSUB 2000
 442 FOR M=5 TO 10
 445 PRINT AT M,17;"
     "
 447 NEXT M
 450 PRINT AT 5,19;"YOUR GUESS I
S"
 460 INPUT A$
 462 GOSUB 3100
 464 IF NO=1 THEN GOTO 460
 466 LET AG=VAL A$
 470 PRINT AT 7,19;AG;" DEGREES"
 480 LET AC=ABS (AG-AD)
 490 PRINT AT 10,19;"THE CORRECT
";TAB 19;"ANSWER IS";TAB 23;AD
 500 IF AC<=10 THEN PRINT AT 15,
12;"WELL DONE-VERY CLOSE"
 510 IF AC>10 AND AC<=20 THEN PR
INT AT 15,17;"NOT A BAD GUESS"
 520 IF AC<=20 THEN GOTO 630
 530 PRINT AT 17,0;"YOUR GUESS I
S NOT CLOSE ENOUGH"
 540 PRINT "WATCH THE DIAGRAM AN
D SEE WHERE"
 550 PRINT "YOU WENT WRONG"
 560 FOR I=0 TO 16
 570 PLOT I,26
 580 NEXT I
 590 FOR I=11 TO 41
 600 PLOT 16,I
 610 NEXT I
 620 PRINT AT 0,8;"90";AT 8,0;"1
80";AT 7,16;"0";AT 9,15;"360";AT
 16,7;"270"
 630 PRINT AT 20,2;"DO YOU WANT
ANOTHER GO ? Y/N"
 640 IF INKEY$="Y" THEN GOTO 405
 650 IF INKEY$="N" THEN GOTO 10
 660 GOTO 640
 700 REM GAME 3-COMPASS POINTS
 705 RAND
 710 CLS
 720 PRINT AT 2,21;"GAME 3"
 730 PRINT AT 4,17;"HERE ARE THE
";TAB 17;"MAIN POINTS OF";TAB 17
;"THE COMPASS.";TAB 17;"I WILL P
OINT TO"
 735 PRINT AT 9,17;"A DIRECTION
AND";TAB 17;"I WANT YOU TO";TAB
17;"SAY WHAT";TAB 17;"BEARING IT
 IS"
 740 PRINT AT 0,8;"N";AT 8,0;"W"
;AT 8,16;"E";AT 16,8;"S"
 743 LET J=0
 746 GOSUB 750
 749 GOTO 710
 750 DIM D$(16,8)
```





```
  760 LET D$(1)="E   000.0"
  770 LET D$(2)="ENE022.5"
  780 LET D$(3)="NE  045.0"
  790 LET D$(4)="NNE067.5"
  800 LET D$(5)="N   090.0"
  810 LET D$(6)="NNW112.5"
  820 LET D$(7)="NW  135.0"
  830 LET D$(8)="WNW157.5"
  840 LET D$(9)="W   180.0"
  850 LET D$(10)="WSW202.5"
  860 LET D$(11)="SW  225.0"
  870 LET D$(12)="SSW247.5"
  880 LET D$(13)="S   270.0"
  890 LET D$(14)="SSE292.5"
  900 LET D$(15)="SE  315.0"
  910 LET D$(16)="ESE337.5"
  920 LET N=INT (RND*16+1)
  925 IF N+J>16 THEN LET J=J-16
  930 LET A=VAL D$(N,4 TO )*2*PI/
360
  940 FOR R=1 TO 14
  950 PLOT R*COS A+16,R*SIN A+26
  960 NEXT R
  965 DIM A$(3)
  970 INPUT A$
  972 IF A$(1)="H" THEN PRINT AT
18,5;"THE CORRECT BEARING IS
                ";D$(N+J,1 TO 3)
;"                "
  974 IF A$(1)="H" THEN GOTO 1020
  980 IF A$=D$(N+J,1 TO 3) THEN G
OTO 1010
  990 PRINT AT 18,12;"NO-THAT'S N
OT RIGHT TRY AGAIN OR PRESS ""H"
" FOR HELP"
1000 GOTO 970
1010 PRINT AT 18,7;"WELL DONE-TH
E BEARING IS                "
;A$;"                "
1020 PRINT AT 20,2;"DO YOU WANT
ANOTHER GO ? Y/N"
1030 IF INKEY$="Y" THEN RETURN
1040 IF INKEY$="N" THEN GOTO 10
1050 GOTO 1030
1200 REM GAME 4-HARDER BEARINGS
1205 RAND
1210 CLS
1220 PRINT AT 2,21;"GAME 4"
1230 PRINT AT 4,17;"I WANT YOU T
O";TAB 17;"SAY WHAT THE";TAB 17;
"BEARING IS";TAB 17;"BUT THIS TI
ME";TAB 17;"  ";TAB 17;"BE CAREF
UL";TAB 17;"WHERE NORTH IS."
1240 LET I=INT (RND*4+1)
1250 IF I=1 THEN LET J=0
1260 IF I=2 THEN LET J=4
1270 IF I=3 THEN LET J=8
1280 IF I=4 THEN LET J=12
1290 IF I=1 THEN PRINT AT 0,8;"N
"
1300 IF I=2 THEN PRINT AT 8,16;"
N"
1310 IF I=3 THEN PRINT AT 16,8;"
N"
1320 IF I=4 THEN PRINT AT 8,0;"N
"
1330 GOSUB 750
1340 GOTO 1210
2000 LET A=AD*2*PI/360
2010 FOR B=16 TO 31
2020 PLOT B,26
2030 NEXT B
2040 FOR R=1 TO 15
2050 PLOT R*COS A+16,R*SIN A+26
2060 NEXT R
2070 RETURN
2100 FOR R=1 TO 15
2110 UNPLOT R*COS A+16,R*SIN A+2
6
2120 NEXT R
2130 RETURN
3000 CLS
3005 PRINT AT 6,5;"
"
3010 PRINT TAB 5;"
"
3020 PRINT TAB 5;"
"
3030 PRINT TAB 5;"
"
3040 PRINT AT 15,6;"COMPILED BY
- I. THOM";TAB 14;"  ";TAB 14;"19
83"
3050 FOR I=1 TO 100
3060 NEXT I
3070 GOTO 2
3100 PRINT AT 18,0;"
                "
3105 FOR N=1 TO 3
3110 IF CODE A$(N)<>0 AND CODE A
$(N)<28 OR CODE A$(N)>37 THEN GO
TO 3140
3120 NEXT N
3125 LET NO=0
3130 RETURN
3140 PRINT AT 18,4;"PLEASE TYPE
NUMBERS ONLY           BETWEEN 1
AND 999"
3145 LET NO=1
3150 RETURN
4000 CLS
4005 PRINT AT 15,5;"TO RESTART P
RESS ""RUN"""
4010 PRINT AT 10,11;"END OF GAME
"
4020 STOP
5000 SAVE "ANGLES"
5010 GOTO 3000
```

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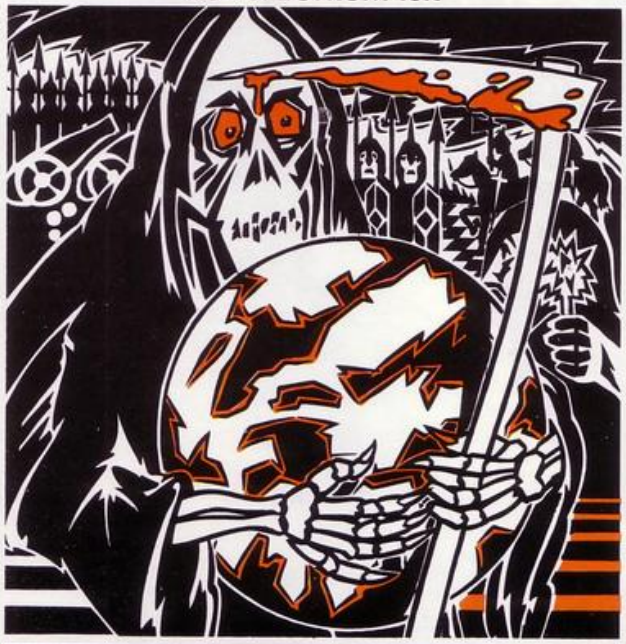
FOR SPECTRUM 48K



CONQUEST

CONQUEST A tactical game which even veteran players will find both challenging and rewarding.

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CheetahSoft

Soft we're not

FOR SPECTRUM 48K

3D BAT ATTACK

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fantasy
SOFTWARE

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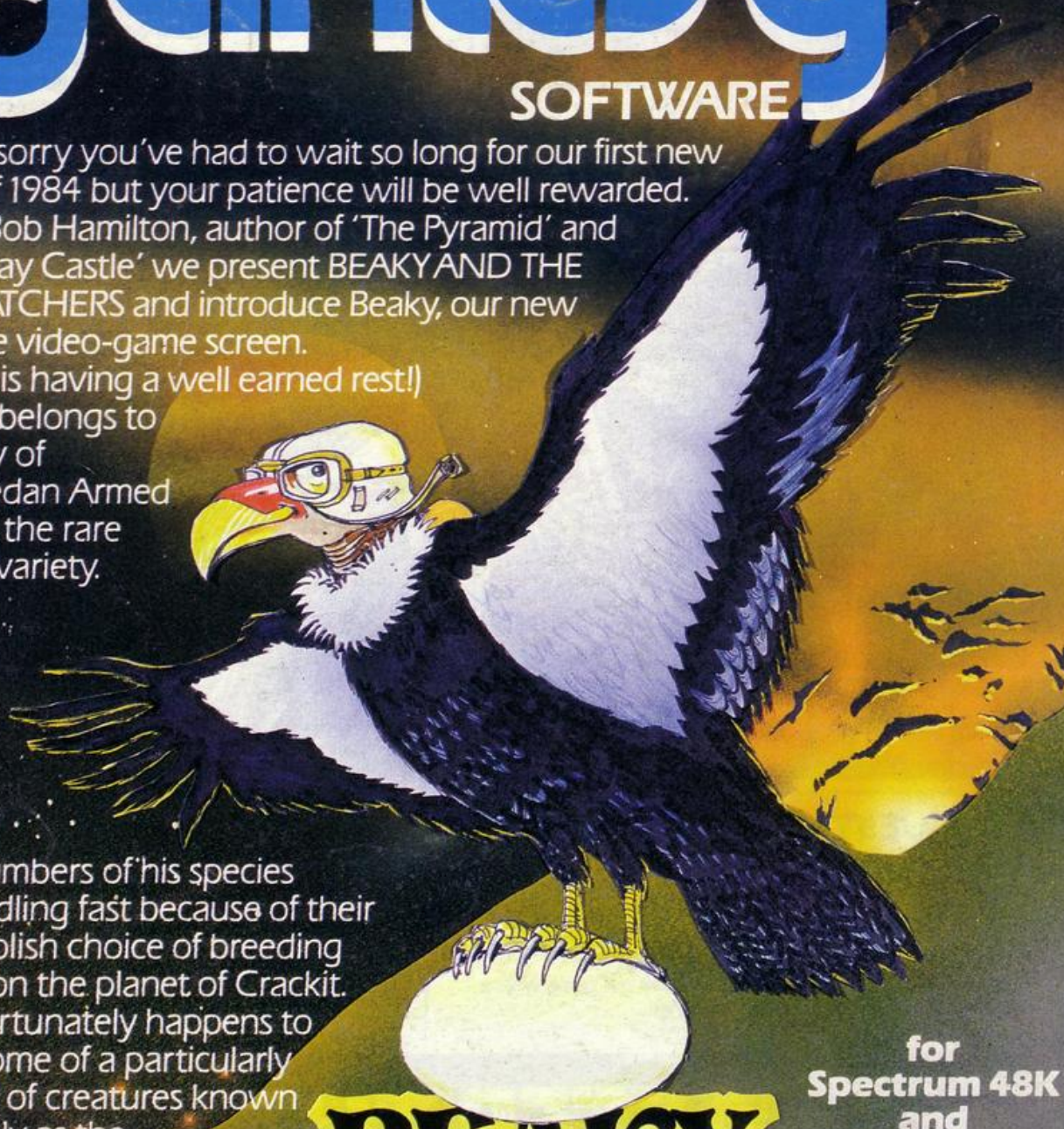
From Bob Hamilton, author of 'The Pyramid' and 'Doomsday Castle' we present BEAKY AND THE EGGSNATCHERS and introduce Beaky, our new star of the video-game screen.

(Ziggy is having a well earned rest!)

Beaky belongs to the family of Andromedan Armed Condors, the rare goggled variety.



The numbers of his species are dwindling fast because of their rather foolish choice of breeding ground, on the planet of Crackit. This unfortunately happens to be the home of a particularly evil band of creatures known collectively as the Eggsnatchers. Their sole malicious intent in life is to extinctify Beaky's species by stealing or destroying the eggs by any foul means available.

for Spectrum 48K and Commodore 64

BEAKY and the Egg Snatchers

Your objective is to try and brood, hatch out and rear as many little Beakys as possible through 12 different screens of formidable but delightful arcade action.

FANTASY SOFTWARE is available from W.H.SMITHS, JOHN MENZIES, BOOTS, WOOLWORTHS, LASKYS, GREENS, RUMBELLOWS, SPECTRUM GROUP and all other good software retailers.

Beaky and the Eggsnatchers is available for 48K Spectrum and Commodore 64 at £6.50 on cassette or on disk for the Commodore 64 at £9.50 from

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