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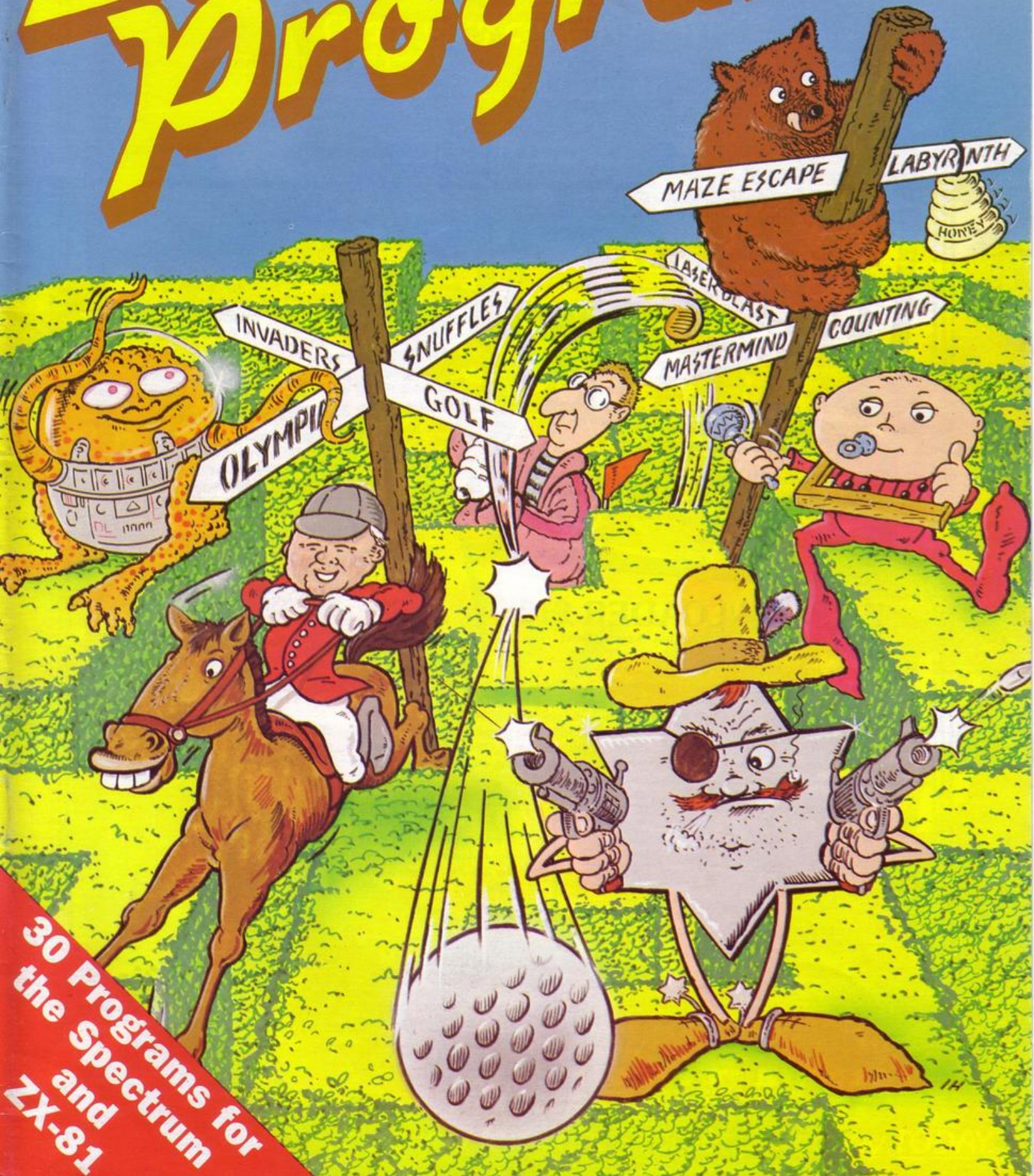
Sinclair Programs



30 Programs for the Spectrum and ZX-81

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SPECTRUM 80-£46

PAGED 64k MEMORY EXTENSION

Fitting, power consumption and add-on compatibility are identical to the SP48 (Issue 1 version £50). It can be used as a standard 48k, but software instructions can switch to a second page of 32k. Although not recommended for the complete beginner, the SP80 is of tremendous benefit to the serious user.

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Dear Sir, Just a line about your excellent Slowloader.
I bought it because I was nearing the completion of a project which uses practically everything in 16k RAM including a string array (DIM 629,7) which took 4 hours hard graft to bash in. I really did not fancy doing it all again.
SLOWLOADER twice found a tape-loading error. So I SAVEd again onto a short, high-quality tape – and this time it went straight in. Two minutes to take out the SLOW and FAST lines, 10 to renumber the PEEKs and POKEs, 20 to add some colour and a few BEEPs, and the thing was ready to SAVE again. What a little masterpiece!

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To help with entering graphics characters we have adopted a system of writing the characters for the ZX-81. We indicate inverse characters by the letter i and graphics by g, so that an inverse letter W is shown as iW and the graphics character on key 6 is denoted by g6. Spaces are shown by sp and inverse spaces are isp. If some occur together, for instance a row of six spaces, they are shown by 6★sp and where there is a combination of characters each one is divided by a colon, thus sp:isp:6★g6 means a space followed by an inverse space and then six characters on the 6 key.
Where whole words are written in inverse letters they appear in the listings as lower-case letters.
In the Spectrum listings, letters to be entered in graphics mode are underlined, while other graphics instructions are underlined and take the form shown above, with the addition that inverse graphics characters are represented by the letters "ig".

The changes continue. Following our decision to publish *Sinclair Programs* monthly and make a special award for the best program each month, we have decided to make another attempt to encourage better programming.

From this issue we shall publish only 30 programs instead of the 40 which have been included previously. The move was made necessary partly by you, our readers, who sent us many programs which, despite their quality, we were unable to use because of their length. With more space for longer programs we will print more complicated listings which your letters tell us are needed.

We also intend to begin publishing machine code listings. We have one in this issue for a Space Invaders game and we will be looking for more in the coming months. Please enclose a complete listing with all machine code programs.

AGF

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for

sinclair ZX Spec 81

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Surpassing the outstanding specification of our Interface Module II which still offers the best software support at its price, a Joystick Interface that is compatible with ALL SOFTWARE through its unique hardware programmable design.

The Interface plugs on to the rear connector of your ZX81 or ZX Spectrum.

Quick clip-on connections, which are configured from a reference card supplied, allow you to define which of the forty keys are simulated by which action of the Joystick. A pack of ten Quick Reference Programming Cards makes setting for your favourite games even easier. These can be filled in to show at a glance the configuration required and stored in the cassette case of the particular game. When you change to a game using different keys the module is re-programmed in a few seconds.

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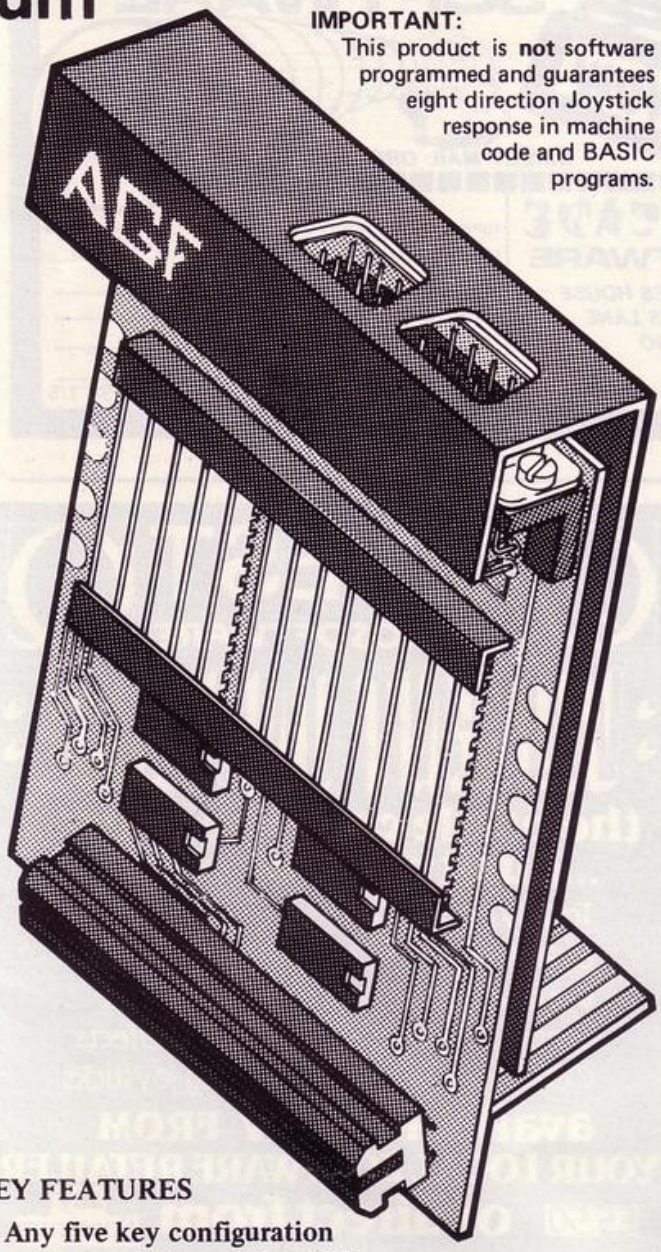

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	* Harrier	**ICL ...**	Star Trail (Man.Dock)
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	* The Android Run	**Imagine ...**	Zzoom
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	Meteoroids		

LATEST ADDITION

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We are pleased to say that future software support commitment for the AGF Interface II has been negotiated from many of the companies listed above.

For example all new titles from Imagine, commencing with Zzoom, will be compatible and carry the compatibility logo, shown below, on their packaging. This new logo scheme will help you select software that is guaranteed compatible and is also being adopted by many of the supporting suppliers.

At the time of printing it is hoped that pending releases from Bug-Byte will enjoy AGF compatibility.

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AGF Hardware, 26 Van Gogh Place, Bognor Regis, West Sussex PO22 9BY

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We are a professional marketing company, interested only in obtaining the highest rewards for software writers. We are not connected with any hardware or software manufacturers and deal with writers in total honesty. Most importantly, we can secure deals for them, worldwide, which are way ahead of anything they could negotiate themselves.

If you have written a program, for any Sinclair computer, which you think could be commercial, send it to us on tape for evaluation. We will advise you, free and without the slightest obligation, on the commercial prospects for your program.

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LETTERS

AS I BROWSED through the magazines at my local newsagent, my eyes clamped on a yellow and pink cover—what great colours. I bought it immediately and ran the mile home in two seconds flat. I went upstairs to my room, ripped off the cassette neatly and peered inside the magazine. At that point disaster struck—more and more 48K Spectrum games.

I read on and found that there were only a few good 16K Spectrum games and all the 48K games were of good quality.

The 16K Spectrum games in your magazine are becoming very rare, so you had better put 16K games in your magazine in equal proportion to the 48K, or my mates and I will give you a good pasting.

Mark Sargusingh,
London NW9.

The greatest

YOU ARE the greatest. You brighten me up every month with your programs. I like everything about the magazine. It is the only one which is read nearly every day.

What I think is a good idea would be to have a pull-out poster of a big program.

Yours gratefully for the best computer magazine.

Carl Marson,
Debenham,
Suffolk.

Over-stated

I BUY *Sinclair User* and *Sinclair Programs* every month. I would like to know the point of putting such statements as:

10 GOTO VAL "50"

OR

10 GOTO CODE "COS"

Why (in the first example) cannot you print

10 GOTO 50

Why in the second example do you not print

10 GOTO 179—this being the relevant code.

We all know that the longer the statement the more memory it uses, so why use this method?

I would also like to point out that Play School is a programme and Asteroids is a program. Many people are confused with the spelling of these two words.

Mark Mills (aged 13),
Lytham St. Annes,
Lancashire.

Misled

I THINK that your advertisement on page 44 in the May issue of *Sinclair Programs* is rather misleading. You say at the top of the advertisement that for 95 pence you can get hours of fun, intellectual satisfaction, and educational programs. At the bottom of the advertisement you wrote *Sinclair Programs*—12 issues—price £13.20. If you multiply 95 times 12 your answer is £11.40.

Can you please tell me where the bonus £2 has gone? Is it postage? If it is, why is that not written somewhere in the advertisement?

Ian Bryant,
Fleet, Hampshire.

● *As you suggest, the extra £2 is to cover postage costs, in common with all other magazines. We consider it worthwhile for subscribers to pay the extra amount to ensure receiving their copies of the magazine.*

Plea for more

IN BUYING the new monthly issue of *Sinclair Programs,* I found that most of the programs were very enjoyable to play and enter. I have a ZX-81 which is a very good computer but I wish that there could be more 16K programs.

I found that the best program was Fruit Collector, which is difficult to master but has easy listing to put in the computer.

I am one of many who are learning how to use the ZX-81. I would be very grateful if you would put in more 16K programs and not as many 1K programs.

The Best of Sinclair Programs was very enjoyable and entertaining.

Daniel Ferrier (aged 13),
Louth, Lincs.

Rio bound

REGARDING *Sinclair Programs,* I really feel that I have no need for computer games; after all, it is a computer and not a video games machine, at least not full time.

Hubert Melin,
c/o General Motors do Brasil, Av. Augusto Severo 8-8th, 20.021 Rio de Janeiro, Brazil.

ERRORS AND MISHAPS

ONE CORRECTION to the May issue was not included in our last issue. The last line of **Climber** on page 29 was omitted. It should have read:

300 PRINT S

A smudge in the listing of **Deployment Strategy**—June, page 47—caused problems for many of our readers. Line 1030 should have read:

1030 PRINT A$(1+(21-I)/20, 1 TO A(P))

Beat the Barrage—June, page 36—caused problems for people trying to program line 750. It read:

750 READ b: POKE USR a$+a,b

INVADERS

LESLIE ROBINSON and Trevor Leeming of Rotherham, South Yorkshire have speeded this short space invaders program by writing part of it in machine code. The object is to kill as many space invaders as possible before you run out of fuel or your laser over-heats.

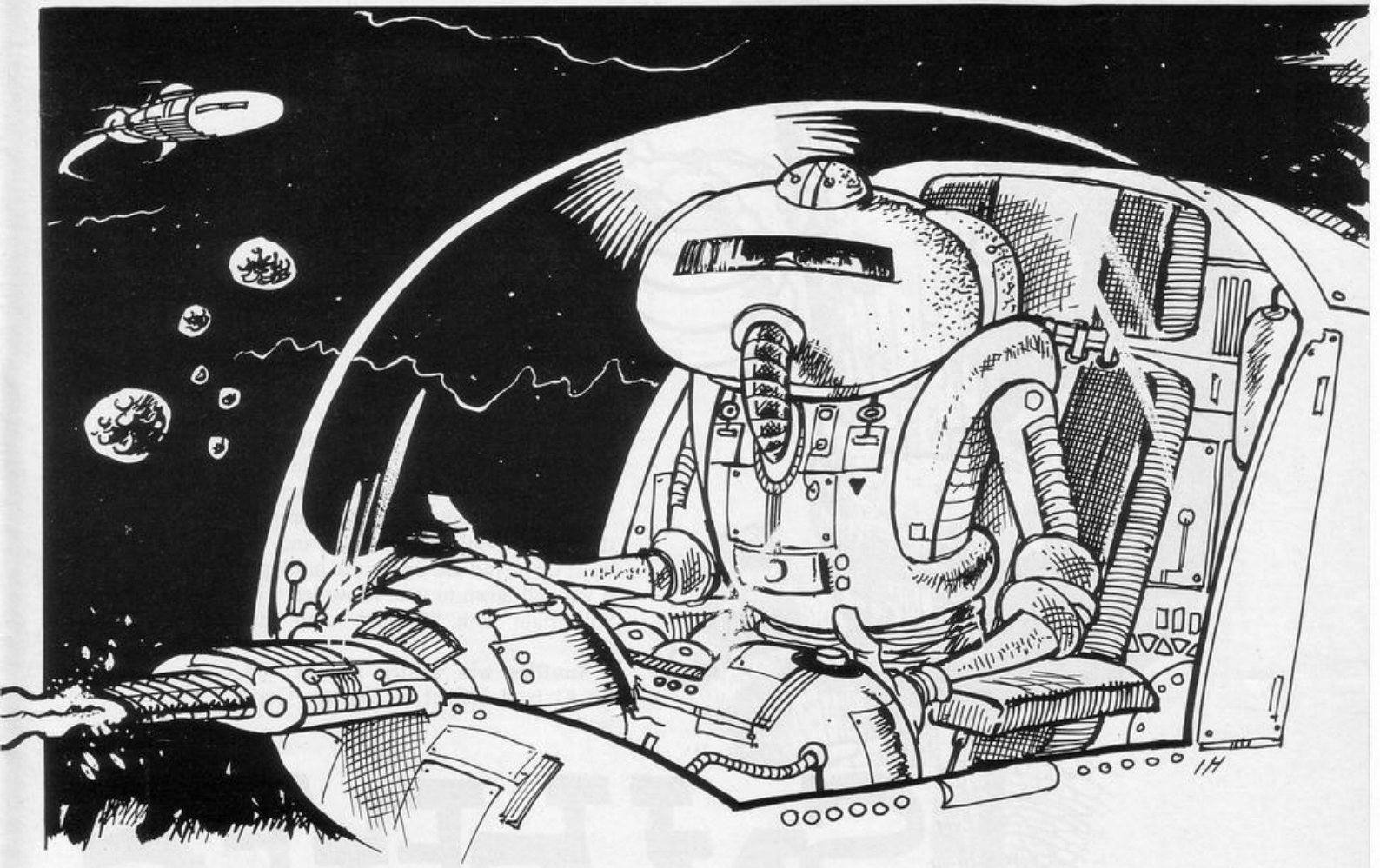
To enter the program first enter the short program lines 1 to 80. RUNning that should produce two quotation marks at the bottom of the screen. Next, the three columns of numbers should be entered. Enter each two digits separately and work horizontally across the columns. Thus you would begin by typing 2A ENTER and proceed to type 0E ENTER.

Once all that data has been typed-in, RUN the program again to place all the machine code in line 1. Lines 10 to 80 should then be deleted. The remaining line 1 containing the machine code should then become line 1 of the main program (16K ZX-81).

```
2A   0E   40
06   11   36
05   0E   21
2B   0D   20
FC   5E   1C
1D   20   22
36   05   0E
21   23   0D
20   FC   36
00   0E   21
2B   0D   20
FC   0E   FE
0D   20   FD
0E   FE   0D
20   FD   10
D7   36   00
01   00   00
C9   2B   2B
2B   0E   05
23   36   00
0D   20   FA
0E   1F   23
0D   20   FC
36   00   01
0C   08   C9
```

```
~   1 REM ZZZZZZZZZZZZZZZZZZZZ
ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ
ZZZZZZZZZZZZZZZZZZ
  10 LET A$=""
  20 FOR X=16514 TO 16588
  30 IF A$="" THEN INPUT A$
  40 POKE X,16*CODE A$+CODE A$(2
)-476
  50 SCROLL
  60 PRINT X,"   ";A$( TO 2)
  70 LET A$=A$(3 TO )
  80 NEXT X
```

```
   2 GOTO 2000
   3 LET HS=0
   6 LET XX=0
   7 LET H$="??????"
  10 LET Q=0
  11 LET SCORE=0
  20 LET A=10
  30 LET L=0
  31 LET B=INT (RND*28)
  32 PRINT AT 21,0;"HIGH SCORE="
;HS;" BY ";H$
  35 PRINT AT 4,B;"(sP:i*:sP)"
  40 LET A=A+(INKEY$="8" AND A<2
9)-(INKEY$="5" AND A>2)
  50~PRINT AT 19,A-2;"(sP:93:9w:
sP)";AT 18,A;
  60 IF INKEY$="0" THEN LET L=US
R 16514
  61 IF INKEY$="0" THEN LET XX=X
X+1
  65 IF XX=50 THEN GOSUB 600
  70 IF L<>0 THEN LET SCORE=SCOR
E+1
  71 IF L=0 THEN LET Q=Q+1
  75 IF Q>500 THEN GOTO 1000
  76 IF Q>400 THEN GOSUB 500
  77 IF RND>.95 THEN GOSUB 700
  80 GOTO 30
```



```
 500 PRINT AT 0,0;"FUEL LOW";AT
0,0;"fuel low"
 501 RETURN
 600 FOR F=1 TO 100
 605 PRINT AT 0,15;"LAZER OVERHE
ATED ";AT 0,15;;"lazer overheate
d"
 606 LET Q=Q+.2
 620 NEXT F
 630 PRINT AT 0,15;"LAZER OPERAT
IONAL      "
 635 LET XX=0
 640 RETURN
 700 PRINT AT 4,0;"
 701 FOR Z=26 TO 0 STEP -2
 704 PRINT AT 2,Z;"(9q:i$:9w:sP:
sP)"
 705 LET A=A+(INKEY$="8" AND A<2
9)-(INKEY$="5" AND A>2)
 706 PRINT AT 19,A-2;"(sP:93:9w:
sP)";AT 18,A;
 707 IF INKEY$="0" THEN LET L=US
R 16514
 710 IF L<>0 THEN LET SCORE=SCOR
E+15
 711 IF L<>0 THEN PRINT AT 2,Z;"
        "
 712 IF L<>0 THEN RETURN
 720 NEXT Z
 721 PRINT AT 2,0;"       "
 722 RETURN
1000 PRINT AT 0,0;"YOUR TIME IS
UP YOU KILLED ";SCORE;"   ALIENS
"
1010 IF SCORE>HS THEN PRINT "YOU
 HAVE ATAINED THE HIGH SCORE"
1015 IF SCORE>HS THEN PRINT "PLE
ASE TYPE IN YOUR NAME FOR    OTH
ERS TO LOOK AT AND WONDER"
1016 IF SCORE>HS THEN INPUT H$
1020 IF SCORE>HS THEN LET HS=SCO
RE
1025 FOR F=0 TO 100
1026 NEXT F
1028 CLS
1030 GOTO 10
2000 PRINT "SPACE INVADERS
             KILL AS MANY AS YOU
CAN BEFORE   YOUR FUEL RUNS OUT
             USE    TO MOVE
              5     LEFT
              8     RIGHT
              0     TO FIRE LAZER"
7004 PAUSE 2000
7005 CLS
7006 GOTO 3
```

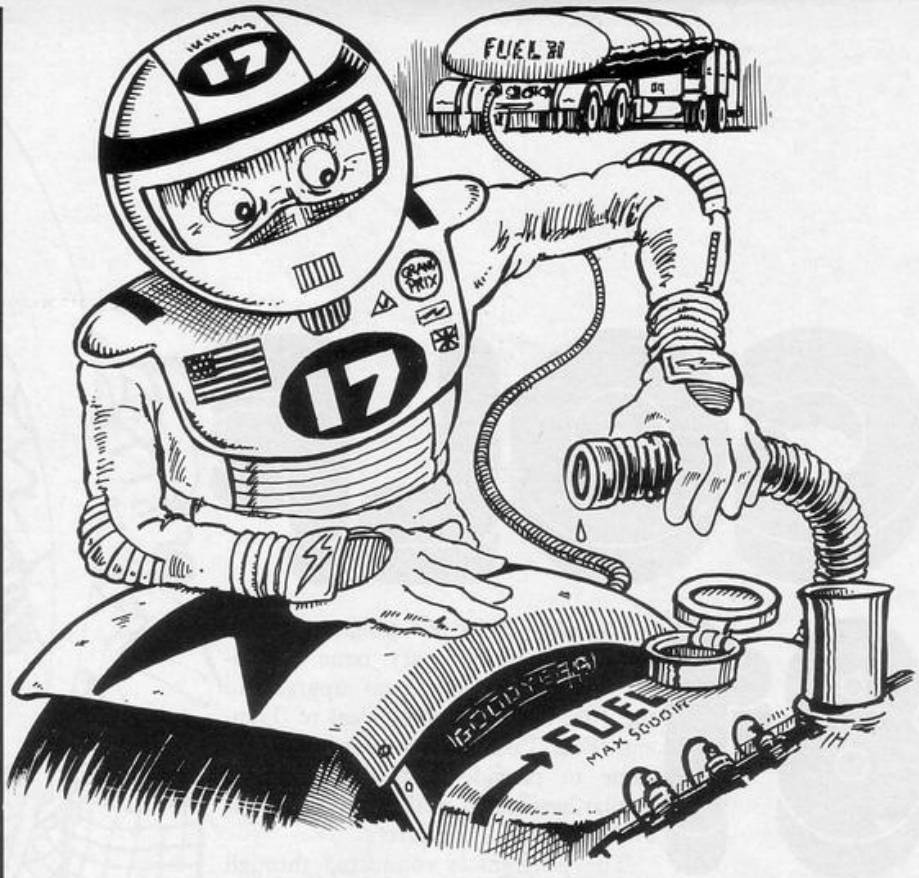
THE OBJECT is to collect as many honeypots as possible from the tree on the left of the screen. To get a honeypot you must jump over the rolling boulders, the hole and the wall. Once you are under the honeypot it will fall down to you. Move left with "5", right with "8" and jump with "0".

Snuffles was written for the 16K ZX-81 by J Hallett of Helston, Cornwall.

SNUFFLES

```
  1 DIM A$(12,8)
  2 LET SC=0
  6 LET Y=23
  7 LET F=6
 10 LET A$(1)="(2*sP:4*9h:2*sP)
"
 11 LET A$(2)="(sP:6*9h:sP)"
 12 LET A$(3)="(8*9h)"
 13 LET A$(4)="(sP:6*9h:sP)"
 14 LET A$(5)="(2*sP:4*9h:2*sP)
"
 15 LET A$(6)="(3*sP:98:95:3*sP
)"
 16 LET A$(7)="(3*sP:98:95:3*sP
)"
 17 LET A$(8)="(3*sP:98:95:3*sP
)"
 18 LET A$(9)="(3*sP:98:95:3*sP
)"
 19 FOR N=1 TO 9
 20 PRINT A$(N)
 21 NEXT N
 22 PRINT AT 9,0;"(16*97:sP:14*
97)"
 23 LET X=8
 24 PRINT AT 4,4;"U"
 25 PRINT AT 8,F;" 0"
 26 LET I$=INKEY$
 27 IF I$="5" THEN LET Y=Y-1
 28 IF I$="0" THEN LET Y=Y-1
 29 IF I$="0" THEN LET X=X-1
 30 IF I$="8" THEN LET Y=Y+1
 31 PRINT AT X,Y;" 8   "
 32 LET F=F+1
 33 PRINT AT 8,11;"(95)"
 34 IF X=8 AND Y=10 OR Y=F THEN
GOSUB 1000
 35 PRINT AT X-1,Y;"       "
 36 IF F>=25 THEN LET F=6
 37 IF Y=15 AND X=8 THEN GOSUB
2000
 38 IF Y=5 THEN GOSUB 3000
 39 PRINT AT 8,25;"   "
 40 GOTO 23
1000 PRINT AT 10,10;"SPLAT.SCORE
=";SC
1020 STOP
2000 PRINT AT X,Y;"       ";AT X+
1,Y+1;"8";AT 10,10;"AAAGH.SCORE=
";SC
2020 STOP
3000 PRINT AT 4,4;"(9h)";AT 8,5;
"U"
3010 PAUSE 100
3020 LET SC=SC+10
3030 CLS
3040 GOTO 5
```

```
  10 LET a$="PETROL CONSUMPTION
CALCULATOR": PRINT AT 9,16-(LEN
a$/2);a$
  20 PRINT AT 11,14;"BY": PRINT
AT 13,10;"GERRY NEARY"
  30 PAUSE 100: BORDER 2: PAPER
6: INK 9: CLS
  40 PRINT AT 10,0; BRIGHT 1;"Th
is Program Assumes You Fill
   Your Tank Each Time          "
  45 PAUSE 100: CLS
  50 INPUT "Enter start mileage"
,a: PRINT "STARTING MILEAGE =";a
  60 INPUT "Enter finishing mile
age",b: PRINT "FINISHING MILEAGE
=";b
  70 LET c=b-a: PRINT "COMPLETED
 MILEAGE =";c
  80 INPUT "Enter Petrol in figu
res only",d: PRINT "PETROL =";d
  90 INPUT "Press 1 if gallon,Pr
ess 2 if    litres",e: GO TO e*1
00
 100 LET f=c/d: PRINT "MILES PER
 GALLON =";f
 110 PRINT "or ";c/(d*4.546);" M
ILES PER LITRE"
 130 GO TO 300
 200 LET f=c/d: PRINT "MILES PER
 LITRE = ";f: PRINT "or ";c/(d*.
22);" MILES PER GALLON": GO TO 3
00
 300 INPUT "enter Price Paid in
Pence",g
 310 LET h=g/c: PRINT "COST PER
MILE = ";h;"p"
 320 IF h<5 THEN PRINT FLASH 1;"
CHEAP OR YOU ARE CHEATING"
 325 IF h>5 AND h<10 THEN PRINT
FLASH 1;"AVERAGE"
 330 IF h>10 THEN PRINT FLASH 1;
"BUY A SMALLER CAR"
 340 INPUT "COPY ";G$: IF G$="y"
 THEN COPY
 350 IF G$<>"Y" THEN PRINT FLASH
 1;"HOPE YOU CHECKED THE OIL"
```



PETROL CONSUMPTION

WHEN PETROL began to be sold by the litre as well as by the gallon, Gerry Neary of Croydon, Surrey, found he had problems calculating his **Petrol Consumption** and so he devised a program for the 16K Spectrum which would calculate it for him.

Input your starting mileage, your finishing mileage and the amount of petrol in litres or gallons. The computer will display your fuel consumption in gallons per mile and litres per mile, as well as the price per mile.

LOGO

I BILLUPS of Crewe, Cheshire, has written a useful routine for displaying titles, slogans or logos on the 16K Spectrum. Once it is run it requires an input of fewer than 30 characters.

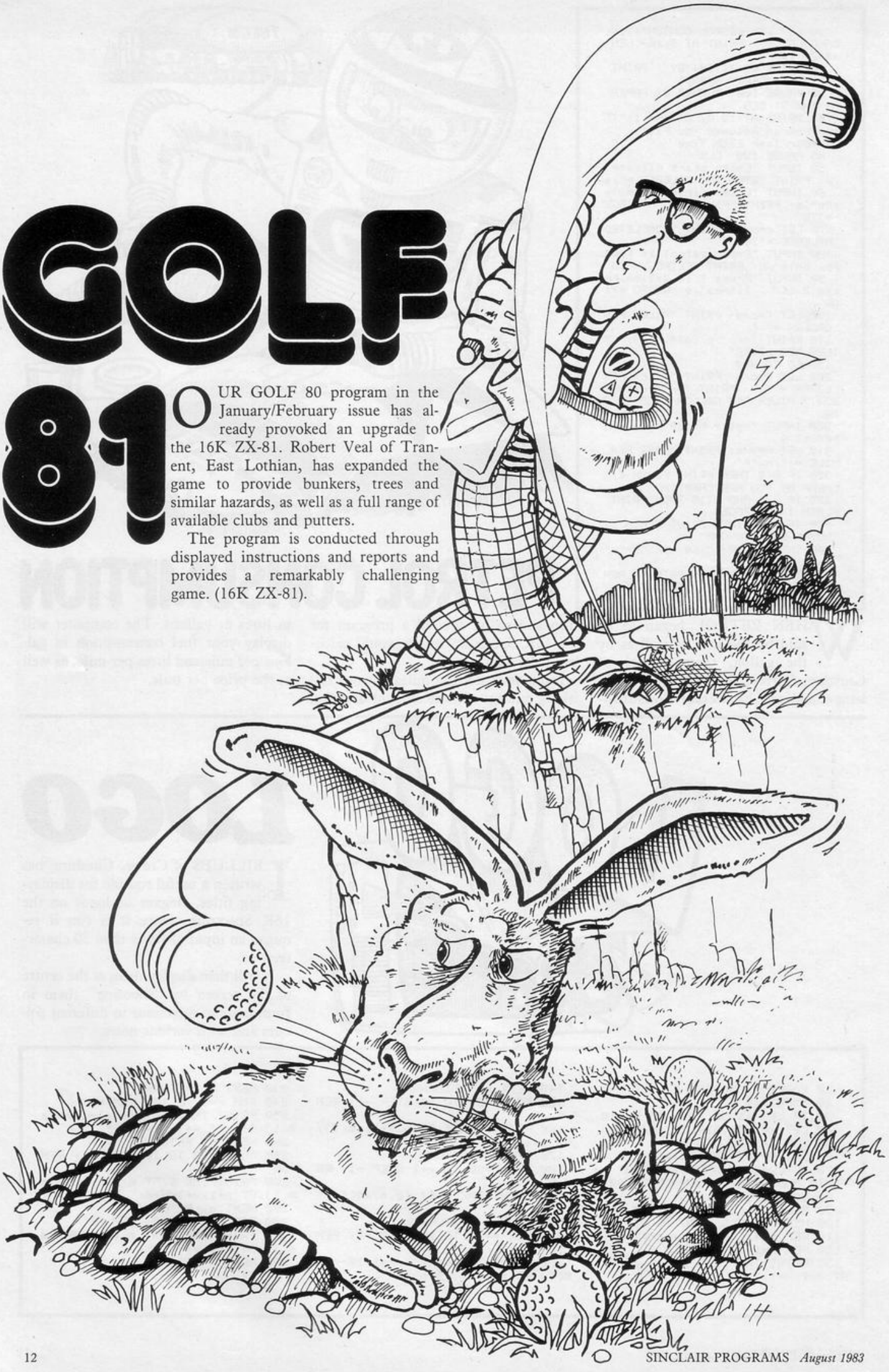
It will then display them at the centre of the screen by "shooting" them in from random directions in different colours and with various notes.

```
  10 PAPER 0: BORDER 0: CLS
  20 INPUT a$
  30 IF LEN a$>30 THEN GO TO 10
  40 LET x=INT (31-LEN a$)/2
  50 FOR l=1 TO LEN a$
  60 LET g=INT (RND*7)*30+120
  70 IF (x+l>20 AND g>200) OR (x
+l<10 AND g>200) THEN GO TO 60
  80 GO SUB g
  90 BEEP .1+(l=LEN a$)*2,g/10
 100 NEXT l: CLS : GO TO 50
 110 REM ****Subroutines****
 120 FOR n=1 TO 10: REM N
 130 PRINT INK 7;AT n,x+l;a$(l);
AT n-1,x+l;" "
 140 NEXT n: RETURN
 150 FOR n=20 TO 10 STEP -1: REM
 S
 160 PRINT INK 6;AT n,x+l;a$(l);
AT n+1,x+l;" "
 170 NEXT n: RETURN
 180 FOR n=30 TO x+l STEP -1: RE
M E
 190 PRINT INK 5;AT 10,n;a$(l)+"
"
 200 NEXT n: RETURN
 210 FOR n=20 TO 10 STEP -1: REM
 SW
 220 PRINT INK 4;AT n,x+l+10-n;a
$(l);AT n+1,x+l+9-n;" "
 230 NEXT n: RETURN
 240 FOR n=1 TO 10: REM NW
 250 PRINT INK 5;AT n,x+l-10+n;a
$(l);AT n-1,x+l-11+n;" "
 260 NEXT n: RETURN
 270 FOR n=20 TO 10 STEP -1: REM
 SE
 280 PRINT INK 6;AT n,x+l-10+n;a
$(l);AT n+1,x+l-9+n;" "
 290 NEXT n: RETURN
 300 FOR n=1 TO 10: REM NE
 310 PRINT INK 7;AT n,x+l+10-n;a
$(l);AT n-1,x+l+11-n;" "
 320 NEXT n: RETURN
```

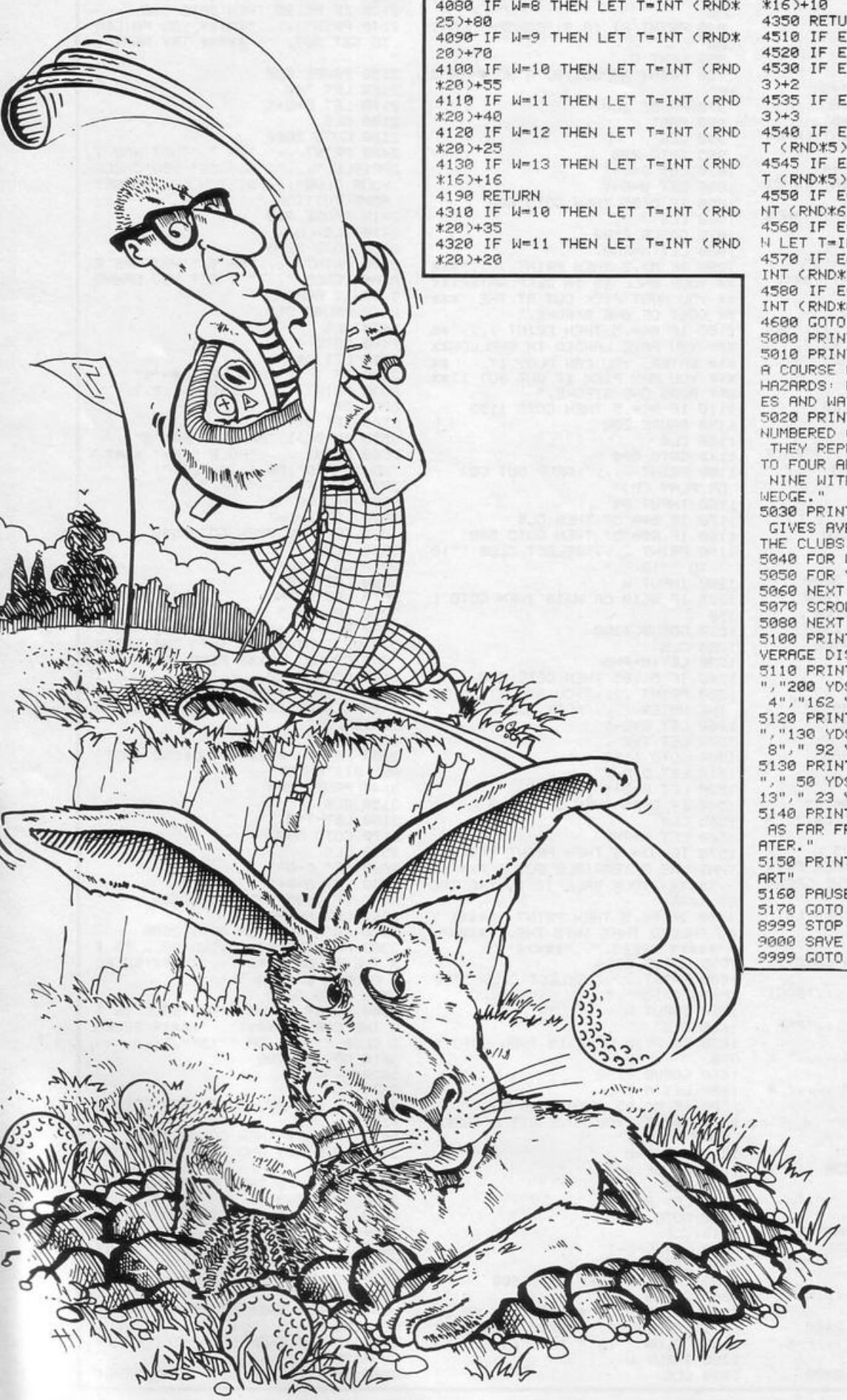
GOLF 81

OUR GOLF 80 program in the January/February issue has already provoked an upgrade to the 16K ZX-81. Robert Veal of Tranent, East Lothian, has expanded the game to provide bunkers, trees and similar hazards, as well as a full range of available clubs and putters.

The program is conducted through displayed instructions and reports and provides a remarkably challenging game. (16K ZX-81).



```
  30 CLS
  40 FAST
  50 LET X=0
  60 LET A=1
  70 LET F=0
  80 LET H=0
  90 LET B=0
 100 LET P=0
 120 LET M=RND
 130 IF M<.18 THEN LET P=3
 140 IF P=3 THEN GOTO 190
 150 IF M<.2 THEN LET P=5
 160 IF P=5 THEN LET D=INT (RND*
75)+476
 170 IF M>=.2 THEN LET P=4
 180 IF P=4 THEN LET D=INT (RND*
224)+251
 190 IF P=3 THEN LET D=INT (RND*
145)+105
 220 LET D$=" "
 230 IF D<>1 THEN LET D$="S"
 240 PRINT ,,,,"HOLE ";A;" ****
";D;" YARD";D$;" TO PLAY"
 250 PRINT ,,,,"PAR ";P
 270 IF H<>1 THEN PRINT ,,,,"SEL
ECT CLUB      ""1"" TO ""13""."
 280 IF H=1 THEN GOTO 340
 290 INPUT W
 300 CLS
 310 IF W>13 THEN GOTO 220
 320 GOSUB 4000
 330 GOTO 390
 340 IF H=1 THEN PRINT ,,,,"ENTE
R PUTT DISTANCE  ""1"" TO ""17""
"
 350 INPUT E
 360 CLS
 370 IF E>17 THEN GOTO 220
 380 GOTO 4500
 390 LET M=RND
 400 IF M<.03 THEN GOTO 3000
 410 IF M<.05 THEN GOTO 1000
 420 IF M<.1 THEN GOTO 1500
 430 IF M<.15 THEN GOTO 2000
 450 IF M<.2 THEN GOTO 3500
 580 LET D=D-T
 590 LET B=B+1
 600 LET D$=" "
 610 IF T<>1 THEN LET D$="S"
 620 PRINT ,,"STROKE ";B;T;" YAR
D";D$
 630 IF D>-1 THEN GOTO 680
 640 LET D=-D
 650 LET D$=" "
 660 IF D<>1 THEN LET D$="S"
 670 PRINT ,,,,D;" YARD";D$;"  P
AST HOLE"
 680 IF D=0 THEN GOTO 725
 700 IF D<18 AND D>-19 THEN PRIN
T ,,,,"YOUR BALL IS ON THE GREEN
"
 710 IF D<18 AND D>-19 THEN LET
H=1
 720 GOTO 220
 725 IF D=0 AND B=1 THEN GOTO 91
0
 730 IF B>P THEN PRINT ,,,,"BOGI
E ";B,B-P;" OVER"
 740 IF B=P THEN PRINT ,,,,"PAR
";B
 750 IF B=P-1 THEN PRINT ,,,," *
 BIRDIE ";B;" *"
 760 IF B=P-2 THEN PRINT ,,,," *
* EAGLE ";B;" **"
 780 LET X=X+B
 790 LET F=F+P
 800 LET A=A+1
 810 IF A=19 THEN GOTO 850
 820 PAUSE 300
 830 CLS
 840 GOTO 80
 850 PRINT ,,,,"COURSE PAR",F
 860 PRINT ,,,,"YOUR SCORE",X
 870 IF X=F THEN PRINT ,,,,"LEVE
L PAR"
 880 IF X>F THEN PRINT ,,,,X-F;"
   OVER"
 885 IF X>F+5 THEN GOTO 2400
 890 IF X<F THEN PRINT ,,,,F-X;"
  UNDER","WELL DONE"
 895 IF X+4<F THEN GOTO 2450
 900 STOP
 910 SLOW
 920 FOR Q=1 TO 10
 930 PRINT AT 18,9;"CONGRATULATI
ONS"
 940 PRINT AT 18,9;"CONGRATULATI
ONS"
 950 NEXT Q
 960 PRINT AT 20,10;"A HOLE IN O
NE"
 970 PAUSE 200
 980 FAST
 990 CLS
 995 GOTO 730
1020 LET D=D-T
1030 LET B=B+1
1050 IF D<25 THEN GOTO 600
1060 CLS
1070 GOSUB 2500
1080 LET M=RND
1090 IF M>.5 THEN PRINT ,,,,"***
** YOUR BALL IS IN DEEP WATER***
** YOU MUST PICK OUT AT THE  ***
** COST OF ONE STROKE."
1100 IF M<=.5 THEN PRINT ,,,,"**
*** YOU HAVE LANDED IN SHALLOW**
*** WATER. YOU CAN PLAY IT.   **
*** YOU MAY PICK IT OUT BUT IT**
*** ADDS ONE STROKE."
1110 IF M<=.5 THEN GOTO 1150
1120 PAUSE 200
1130 CLS
1140 GOTO 590
1150 PRINT ,,,," DROP OUT (O)
 OR PLAY (P)"
1160 INPUT B$
1170 IF B$="O" THEN CLS
1180 IF B$="O" THEN GOTO 590
1190 PRINT ,,,,"SELECT CLUB ""10
"" TO ""13""."
1200 INPUT W
1205 IF W<10 OR W>13 THEN GOTO 1
190
1210 GOSUB 4300
1220 CLS
1230 LET M=RND
1240 IF M<.85 THEN GOTO 580
1250 PRINT ,,,,"YOU ARE STILL IN
 THE WATER.",,,"PLAY AGAIN."
1260 LET B=B+1
1270 LET T=0
1300 GOTO 1190
1510 LET D=D-T
1520 LET B=B+1
1540 IF D<25 THEN GOTO 600
1550 CLS
1560 LET M=RND
1570 IF M>=.5 THEN PRINT "*****
THAT WAS A TERRIBLE SLICE.*****"
,,"***** YOUR BALL IS IN THE TRE
ES.*****"
1580 IF M<.5 THEN PRINT "***** Y
OU PULLED THAT INTO THE  *****",
,"***** TREES.",,"*****"
1590 GOSUB 2500
1600 PRINT ,,,,"SELECT CLUB ""10
"" TO ""13""."
1610 INPUT W
1620 CLS
1630 IF W<10 OR W>13 THEN GOTO 1
590
1640 GOSUB 4100
1680 LET M=RND
1690 IF M<.95 THEN GOTO 580
1700 PRINT "YOU HAVE HIT A TREE.
 PLAY AGAIN."
1710 LET T=0
1720 PAUSE 200
1730 CLS
1740 LET B=B+1
1750 GOTO 1590
2010 CLS
2020 LET D=D-T
2030 LET B=B+1
2050 IF D<18 THEN GOTO 600
2060 GOSUB 2500
2070 PRINT ,,,,"***** YOUR BALL
IS IN A BUNKER. *****",,"***** S
ELECT CLUB ""10"" TO ""13""."
2080 INPUT W
2090 CLS
2100 IF W<10 OR W>13 THEN GOTO 2
060
2110 GOSUB 4300
2120 LET M=RND
2130 IF M<.95 THEN GOTO 580
2140 PRINT ,,,,"***** YOU FAILED
 TO GET OUT.     ***** TRY AGAIN.
"
2150 PAUSE 200
2160 LET T=0
2170 LET B=B+1
2180 CLS
2190 GOTO 2060
2400 PRINT ,,,,TAB 7;"THAT WAS T
ERRIBLE.",,,"I SUGGEST YOU CHECK
 YOUR CLUB",,,"DISTANCES. OR GET
 SOME TUITION."
2410 PAUSE 300
2420 CLS
2430 GOTO 5100
2450 PRINT ,,,,TAB 5;"THAT WAS R
ATHER GOOD.",,," I BET YOU CANNO
T DO IT AGAIN."
2460 PAUSE 300
2470 CLS
2480 GOTO 1
2510 LET D$=" "
2520 IF T<>1 THEN LET D$="S"
2530 PRINT ,,,,"STROKE ";B;T;" Y
ARD";D$
2540 LET D$=" "
2550 IF D<>1 THEN LET D$="S"
2560 PRINT ,,,,"HOLE ";A;" ****
";D;" YARD";D$;" TO PLAY"
2570 PRINT ,,,,"PAR ";P
2580 RETURN
3010 LET D=D-T
3030 IF D<30 THEN GOTO 590
3040 CLS
3050 LET D=D+T
3060 LET B=B+1
3070 LET M=RND
3080 IF M>=.5 THEN GOTO 3110
3090 PRINT "***** YOU HAVE HOOKE
D YOUR SHOT ***** INTO THE TREES
 AND CANNOT ***** FIND IT."
3100 GOTO 3120
3110 PRINT "***** YOU HAVE SLICE
D INTO WILD ***** ROUGH. YOUR BA
LL IS LOST."
3120 PRINT "*****"
3130 PRINT "***** YOU LOSE SHOT
AND DISTANCE"
3140 PAUSE 200
3150 CLS
3160 LET T=0
3170 GOTO 590
3510 CLS
3520 LET D=D-T
3530 LET B=B+1
3550 IF D<25 THEN GOTO 600
3560 LET M=RND
3570 IF M>.9 THEN GOTO 3600
3580 PRINT "***** YOUR BALL IS I
N THE ROUGH.*****",,"***** SELEC
T CLUB ""9"" TO ""13""."
3590 GOTO 3610
3600 PRINT "***** YOUR BALL IS I
N THE GORSE.*****",,"***** SELEC
T CLUB ""12"" OR ""13""."
3610 GOSUB 2500
3620 INPUT W
3630 CLS
3640 IF W<8 AND M<.9 THEN GOTO 3
610
3650 IF M<.9 THEN GOSUB 4080
3660 IF M>=.9 AND W<12 THEN GOTO
 3610
3670 IF M>=.9 THEN GOSUB 4120
3720 GOTO 580
4010 IF W=1 THEN LET T=INT (RND*
65)+185
4020 IF W=2 THEN LET T=INT (RND*
55)+175
4030 IF W=3 THEN LET T=INT (RND*
35)+160
4040 IF W=4 THEN LET T=INT (RND*
25)+150
4050 IF W=5 THEN LET T=INT (RND*
20)+135
4060 IF W=6 THEN LET T=INT (RND*
```



```
20)+120
4070 IF W=7 THEN LET T=INT (RND*
25)+100
4080 IF W=8 THEN LET T=INT (RND*
25)+80
4090 IF W=9 THEN LET T=INT (RND*
20)+70
4100 IF W=10 THEN LET T=INT (RND
*20)+55
4110 IF W=11 THEN LET T=INT (RND
*20)+40
4120 IF W=12 THEN LET T=INT (RND
*20)+25
4130 IF W=13 THEN LET T=INT (RND
*16)+16
4190 RETURN
4310 IF W=10 THEN LET T=INT (RND
*20)+35
4320 IF W=11 THEN LET T=INT (RND
*20)+20
4330 IF W=12 THEN LET T=INT (RND
*20)+15
4340 IF W=13 THEN LET T=INT (RND
*16)+10
4350 RETURN
4510 IF E=1 THEN LET T=1
4520 IF E=2 THEN LET T=2
4530 IF E=3 THEN LET T=INT (RND*
3)+2
4535 IF E=4 THEN LET T=INT (RND*
3)+3
4540 IF E=5 OR E=6 THEN LET T=IN
T (RND*5)+4
4545 IF E=7 OR E=8 THEN LET T=IN
T (RND*5)+5
4550 IF E=9 OR E=10 THEN LET T=I
NT (RND*6)+7
4560 IF E=11 OR E=12 OR E=13 THE
N LET T=INT (RND*7)+8
4570 IF E=14 OR E=15 THEN LET T=
INT (RND*7)+11
4580 IF E=16 OR E=17 THEN LET T=
INT (RND*8)+12
4600 GOTO 500
5000 PRINT AT 0,12;"G O L F"
5010 PRINT ,,"THIS IS PLAYED ON
A COURSE WHICH",,"HAS THE USUAL
HAZARDS: BUNKERS,",,,"ROUGH, TRE
ES AND WATER."
5020 PRINT ,,"    THE CLUBS ARE
NUMBERED ONE",,,"  TO THIRTEEN.
 THEY REPRESENT",,,"  WOODS ONE
TO FOUR AND IRONS",,,"  THREE TO
 NINE WITH WEDGE AND",,,"  SAND
WEDGE."
5030 PRINT ,,"THE FOLLOWING LIST
 GIVES AVERAGE",,"DISTANCE WITH
THE CLUBS."
5040 FOR U=1 TO 22
5050 FOR Y=1 TO 10
5060 NEXT Y
5070 SCROLL
5080 NEXT U
5100 PRINT AT 0,0;"CLUB         A
VERAGE DISTANCE"
5110 PRINT "  1","215 YDS.","  2
","200 YDS.","  3","178 YDS.","
 4","162 YDS."
5120 PRINT "  5","145 YDS.","  6
","130 YDS.","  7","112 YDS.","
 8"," 92 YDS.","  9"," 80 YDS."
5130 PRINT " 10"," 65 YDS.","11
"," 50 YDS."," 12"," 35 YDS.","
13"," 23 YDS."
5140 PRINT ,,,,"YOU WILL NOT HIT
 AS FAR FROM",,,"      SAND OR W
ATER."
5150 PRINT ,,"     ANY KEY TO ST
ART"
5160 PAUSE 4E4
5170 GOTO 1
8999 STOP
9000 SAVE "GOLF 81"
9999 GOTO 5000
```

THE WIZARD'S WARRIORS: A fast moving game that matches developments in your skill as a player by becoming increasingly more devious. By offering to you the full range of options you can choose how to control your warrior throught the maze. A full implementation of this program enables such features as a continuous series of sound effects, arcade quality graphics, double-point scoring, and-for the very artful-bonus lives — **Spectrum £4.95**

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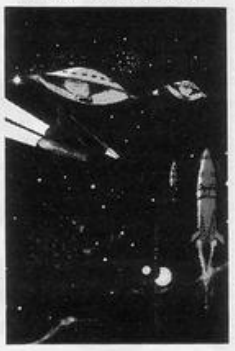

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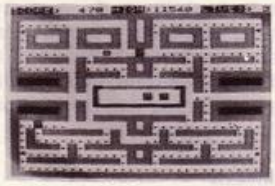

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"Without sounding pushy I would like to conclude this review by saying — if you have a ZX-81 and like games, then you should buy Michael Orwin's cassette 4."
2 extracts from *ZX Computing*, Oct/Nov '82

"Eight games, including an excellent version of the Scramble arcade game . . . Easy to operate, graphically impressive and good value for money."
The Times, Saturday 11th December 1982 (about Cassette 4)

CASSETTE 1 £3.80
(eleven 1k programs)

Machine code:
React, invaders, Phantom aliens, Maze of death, Planet lander, Bouncing letters, Bug splat.

Basic:
I Ching, Mastermind, Robots, Basic Hangman. PLUS Large screen versions of Invaders and Maze of Death, ready for when you get 16k

CASSETTE 2 £5
Ten games in Basic for 16k ZX81

Cassette Two contains Reversi, Awari, Laser Bases, Word Mastermind, Rectangles, Crash, Roulette, Pontoon, Penny Shoot and Gun Command.

CASSETTE 3 £5
8 programs for 16k ZX81
STARSHIP TROJAN

Repair your Starship before disaster strikes. Hazards include asphyxiation, radiation, biological specimens and plunging into a Supernova.

STARTREK This version of the well known space adventure game features variable Klingon mobility, and graphic photon torpedo tracking.

PRINCESS OF KRAAL An adventure game.

BATTLE Strategy game for 1 to 4 players.

KALABRIASZ World's silliest card game, full of pointless complicated rules.

CUBE Rubik Cube simulator, with lots of functions including 'Backstep'.

SECRET MESSAGES This message coding program is very txip qexi if.

MARTIAN CRICKET A simple but addictive game (totally unlike Earth cricket) in machine code. The speed is variable, and its top speed is very fast.

CASSETTE 4 £6
8 games for 16k ZX81

ZX-SCRAMBLE (machine code) with 3 stages.
Bomb and shoot your way through the fortified caves.

GALAXY INVADERS (machine code)
Fleets of swooping and diving alien craft to fight off.

SNAKEBITE (machine code)
Eat the snake before it eats you. Variable speed. (very fast at top speed).

LIFE (machine code)
A ZX81 version of the well known game.

3D TIC-TAC-TOE (Basic)
Played on a 4×4×4 board, this is a game for the brain. It is very hard to beat the computer at it.

GUNFIGHT (machine code)

INVADERS (machine code)

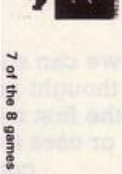
7 of the 8 games are in machine code, because this is much faster than Basic. (Some of these games were previously available form J. Steadman).

CASSETTE 5 8 games for 16k ZX81 £6

BYTE-MAN (machine code)
(previously available from Mindseye)

BREAKOUT (machine code)

SPACE RESCUE (machine code)
(previously available from Mindseye)



BLITZ (machine code)

7 of the 8 games are in machine code because it is much faster than Basic.

PLANETOIDS (machine code)
Rotate, move, fire and hyperspace controls. Wide range of choice of speed and difficulty.

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Dodge the computer's car while eating the dots.

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ZX81 & SPECTRUM SOFTWARE WANTED

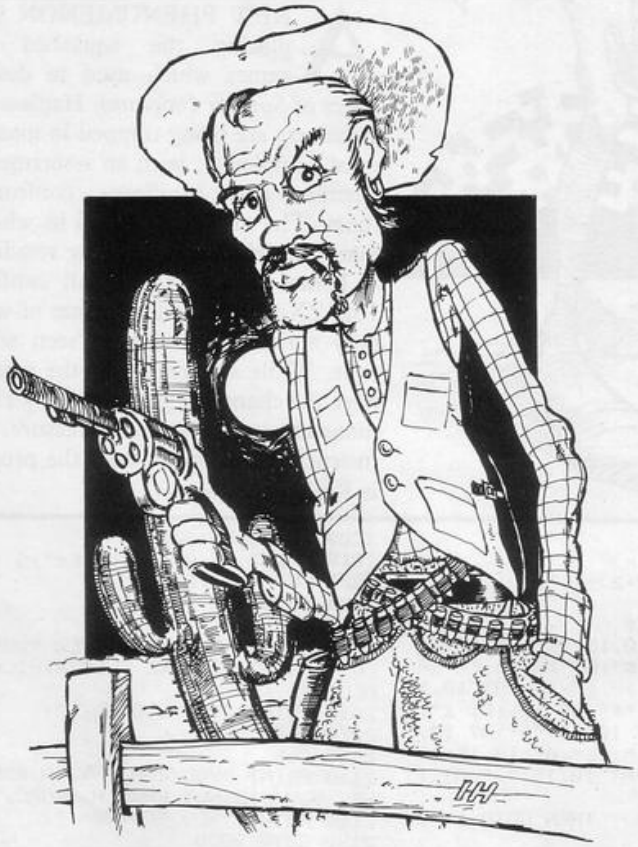
MAZE SCAPE

A NEW PHENOMENON is replacing the squashed frog games which used to dot the pages of *Sinclair Programs*. Hapless programmers are being trapped in mazes of great complexity, with an assortment of enemies and handicaps confronting them. The number of ways in which a maze can be used is growing steadily.

Tomas Whitlock of Hull confronts 16K ZX-81 users with a maze of which only a small area can be seen at one time. While scratching for the exit you have the chance to gain points by killing monsters and picking-up treasure. Full instructions are given once the program is RUN.

```
  50 GOSUB 9500
  60 CLS
  61 PRINT AT 7,12;"(9e:5*97:9r)
";AT 8,12;"(95:5*sP:98)"
  62 PRINT AT 12,12;"(95:5*sP:98
)";AT 13,12;"(9w:5*96:99)"
  65 LET S=0
  70 DIM A$(26,36)
 100 LET A$(3)="(2*sP:32*isP)"
 110 LET A$(4)="(2*sP:isP:9h:sP:
im:sP:5*9h:sP:5*9h:2*sP:10*9h:3*
:i*)"
 120 LET A$(5)="(2*sP:isP:9h:sP:
9h:2*sP:4*9h:3*sP:im:2*sP:is:sP:
10*9h::9h::isP)"
 130 LET A$(6)="(2*sP:isP:2*sP:2
*9h:5*sP:im:5*9h:2*sP:10*9h:im:9
h:im:isP)"
 140 LET A$(7)="(2*sP:isP:9h:sP:
is:6*9h:sP:6*9h:sP:10*9h::9h::
isP)"
 150 LET A$(8)="2*sP:isP:2*9h:2*
sP:3*9h:3*sP:6*9h:3*sP:im:3*sP:4
*9h::::is:isP)"
 160 LET A$(9)="(2*sP:isP:3*9h:s
P:9h:sP:im:sP:9h:sP:6*9h:sP:5*9h
:2*sP:9h:3*sP:9h:sP:isP)"
 170 LET A$(10)="(2*sP:isP:9h:5*
sP:3*9h:sP:9h:sP:im:6*sP:im:3*9h
:is:2*sP:3*9h:sP:isP)"
 180 LET A$(11)="(2*sP:isP:9h:is
:5*9h:2*sP:is:2*9h:is:2*9h:sP:im
:sP:9h:sP:5*9h:sP:3*9h:sP:isP)"
 190 LET A$(12)="(2*sP:isP:9h:sP
:9h:is:sP:4*9h:sP:2*9h:sP:2*9h:i
t:9h:sP:9h:is:5*9h:sP:3*9h:sP:is
P)"
 200 LET A$(13)="(2*sP:isP:9h:sP
:9h:sP:im:sP:it:sP:is:3*sP:im:3*
sP:9h:sP:9h:sP:5*9h:it:sP:is:2*s
P:isP)"
 210 LET A$(14)="(2*sP:isP:9h:sP
:9h:2*sP:4*9h:sP:4*9h:3*sP:is:9h
:sP:5*9h:sP:3*9h:im:isP)"
 220 LET A$(15)="(2*sP:isP:9h:sP
:7*9h:is:4*9h:sP:2*9h:sP:9h:sP:5
*9h:sP:3*9h:im:isP)"
 230 LET A$(16)="(2*sP:isP:9h:it
:2*sP:is:4*9h:sP:3*9h:sP:is:sP:3
*9h:2*sP:it:im:it:sP:is:3*9h:sP:
isP)"
 240 LET A$(17)="(2*sP:isP:9h:sP
:2*9h:sP:4*9h:sP:is:im:2*sP:9h:s
P:3*9h:sP:5*9h:sP:4*9h)"
 250 LET A$(18)="(2*sP:isP:4*9h:
sP:4*9h:3*sP:3*9h:it:sP:im:2*sP:
5*9h:2*sP:is:im:it:isP)"
 260 LET A$(19)="(2*sP:isP:4*9h:
sP:is:3*9h:is:6*9h:sP:2*9h:sP:7*
9h:sP:2*9h:isP)"
 270 LET A$(20)="(2*sP:isP:5*9h:
it:sP:2*9h:sP:6*9h:sP:2*9h:is:7*
9h:sP:2*9h:isP)"
 280 LET A$(21)="(2*sP:isP:6*9h:
2*sP:9h:2*sP:is:im:3*9h:sP:2*9h:
sP:9h:im:is:it:4*sP:2*9h:isP)"
 290 LET A$(22)="(2*sP:isP:7*9h:
is:im:sP:2*9h:2*sP:it:sP:is:5*sP
:5*9h:it:2*9h:isP)"
 300 LET A$(23)="(2*sP:isP:8*9h:
it:21*9h:isP)"
 310 LET A$(24)="(2*sP:32*isP)"
 400 LET A=14
 410 LET B=17
 420 LET B$="X"
 500 LET A=A+(INKEY$="6")-(INKEY
$="7")
 510 LET B=B+(INKEY$="8")-(INKEY
$="5")
 800 PRINT AT 9,12;"(95:sP)";A$(
A-1,B+1 TO B+3);"(sP:98)";AT 10,
12;"(95:sP)";A$(A,B+1 TO B+3);"(
sP:98)";AT 11,12;"(95:sP)";A$(A+
1,B+1 TO B+3);"(sP:98)";AT 12,12
;"(95:5*sP:90)"
 810 PRINT AT 10,15;B$
 900 IF A$(A,B+2)="(is)" THEN GO
SUB 1000
 910 IF A$(A,B+2)="(i*)" THEN GO
SUB 9000
 920 IF A$(A,B+2)="(9h)" OR A$(A
,B+2)="(isP)" THEN GOTO 2000
 930 IF A$(A,B+2)="(im)" THEN GO
SUB 1100
 940 IF A$(A,B+2)="(it)" THEN GO
SUB 1200
 999 GOTO 500
1000 LET B$="(ix)"
1010 LET A$(A,B+2)=" "
1020 RETURN
1100 REM *FIGHT*
1110 PRINT AT 10,15;":";AT 10,15
;";";AT 10,15;"$";AT 10,15;"+";A
T 10,15;"-";AT 10,15;"=";AT 10,1
5;"/";AT 10,15;"*";AT 10,15;"£";
AT 10,15;"<";AT 10,15;">";AT 10,
15;"""";AT 10,15;"(";AT 10,15;"?
";AT 10,15;".";AT 10,15;",";AT 1
0,15;" "
1120 IF B$="(ix)" THEN GOTO 1140
1130 GOTO 2100
1140 LET A$(A,B+2)=" "
1150 LET B$="X"
1160 LET S=S+100
1165 PRINT AT 0,0;"SCORE=";S
1170 RETURN
1200 LET S=S+1000
1210 PRINT AT 0,0;"SCORE=";S
1220 LET A$(A,B+2)=" "
1230 RETURN
2000 CLS
2005 PRINT "YOU JUST BLEW YOURSE
LF TO BITS  ON THE ELECTRIFIED W
ALLS."
2010 PRINT "YOU SCORED: ";
2020 GOTO 9020
2100 CLS
2110 PRINT "YOU RAN INTO A MONST
ER. YOU DID NOT HAVE A SWORD."
2120 PRINT "YOU SCORED: ";
2130 GOTO 9020
9000 CLS
9010 PRINT "CONGRATULATIONS. YOU
 HAVE FOUND YOUR WAY OUT WITH:";
9020 PRINT S;" POINTS."
9022 PRINT "ANOTHER GAME (YES/NO
```

```
) ?"
9023 INPUT Z$
9024 IF Z$(1)="Y" THEN RUN
9025 IF Z$(1)="N" THEN GOTO 9029
9026 GOTO 9023
9029 GOTO 9800
9500 PRINT "          maze-monste
rs                    by twhitlo
ck"
9501 PRINT
9502 PRINT
9510 PRINT "YOU HAVE TO FIND YOU
R WAY OUT OFA 22X32 MAZE, WHICH
IS STOCKED  WITH TREASURE, SWORD
S, AND      MONSTERS."
9520 PRINT "YOU START OFF AS AN
X, AND YOU  GET A SWORD BY MOVIN
G YOUR X    OVER THE (is)."
9525 PRINT
9530 PRINT "THERE IS TREASURE; (
it),          THERE ARE MONSTER
S; (im),          THERE ARE SWOR
DS; (is)."
9535 PRINT
9540 PRINT "POINTS:"
9550 PRINT "TREASURE: 1000 PTS.;
           KILLING A MONSTER: 1
00 PTS."
9559 PRINT
9560 PRINT ,,"      ANY KEY TO CO
NTINUE."
9570 IF INKEY$="" THEN GOTO 9570
9580 CLS
9590 PRINT "AS YOU MOVE, THE COR
RIDOR WILL  SCROLL PAST YOU, DEP
ENDING ON   WHICH KEY YOU PRESS.
 THIS GIVES THE EFFECT THAT THE
CORRIDUR IS MOVING PAST YOU."
9595 PRINT
9600 PRINT "CONTROLS:"
9610 PRINT "8-RIGHT,"
9620 PRINT "5-LEFT,"
9630 PRINT "6-DOWN,"
9640 PRINT "7-UP."
9645 PRINT
9650 PRINT "(im)=MONSTER,"
9660 PRINT "(is)=SWORD,"
9670 PRINT "(it)=TREASURE,"

9680 PRINT ":=THIS WAY.
9681 PRINT "      ANY KEY TO CON
TINUE."
9682 IF INKEY$="" THEN GOTO 9682
9683 CLS
9690 PRINT "IF YOU TOUCH THE WAL
LS OR THE   BORDER ROUND THE MAZ
E, YOU WILL GET FRAZZLED TO A CR
ISP."
9695 PRINT ,,"(isP)=THE BORDER,"
9697 PRINT "(9h)=THE WALLS."
9698 PRINT
9701 PRINT ,,"THE OBJECT OF THE
GAME IS TO    FIND THE EXIT (MAR
KED (i*)) WITH ASMUCH TREASURE A
S POSSIBLE."
9705 PRINT ,,"BUT BEWARE; DO NOT
 USE UP ALL   THE SWORDS, BECAUS
E THERE ARE   MONSTERS GUARDING
THE ESCAPE    ROUTE."
9709 PRINT
9710 PRINT "      ANY KEY TO BE
GIN."
9720 IF INKEY$="" THEN GOTO 9720
9720 RETURN
```



HIGH NOON

```
          2 LET W=VAL "11"
  3 LET E=CODE "$"
  4 LET F=CODE ":"
  5 LET L=CODE "£"
  7 LET H=CODE "?"
  8 LET T=CODE "(9s)"
  9 LET O=CODE "("
 10 PRINT AT T,H;"(99*94)";AT W
,F;"(92*99*96)";AT L,F;"(92*98*9
2)";AT E,F;"(sP*95*91)"
 30 PAUSE 0
 40 CLS
D  70 PRINT AT T,H;"(93*isP*94)"
AT W,0;"(99)";AT L,H;"(9e*isP*9r
)";AT E,H;"(93*isP*94)";AT F,H;"
(99*sP*9w)";AT H,H;"(2*sP*isP)"
 80 PAUSE 0
 85 CLS
 90 PRINT AT T,F;"(2*99)";AT W,
E;"(4*isP)";AT L,F;"(2*isP)";AT
E,F;"(2*9a)";AT F,L;"(6*isP)";AT
 H,L;"(isP*sP*2*isP*sP*isP)"
 100 PRINT AT 0,F;"(2*isP)";AT C
ODE ")",E;"(9y*2*isP*9t)";AT COD
E ")",E;"(isP*2*sP*isP)"
 105 PRINT AT CODE "(",E;"(isP*2
*sP*isP)"
 110 PAUSE 0*PI
 120 IF INKEY$<>"" THEN STOP
 140 PRINT AT CODE ")",E;"(sP*2*
isP*sP)";AT 0,CODE "£";"(io*sP*2
*isP*sP*io)"
 150 FOR Z=PI TO RND*CODE "(9d)"
 160 IF INKEY$<>"" THEN PRINT "G
OT HIM";K
 170 NEXT Z
 180 PRINT "GOTCHA"
```

TIM DERBY of Hedge End, Southampton has, by devising a relatively simple game, managed to incorporate a very good graphics display in this program for the 1K ZX-81.

The cowboy walks quickly towards you. Once his guns appear in his hands you must shoot him by pressing any key, before he shoots you. Good reactions are needed; your reviewer managed to shoot the cowboy only once.

TOUCH TYPE

FOR THOSE who have never had typing lessons and consequently feel that typing programs on the Spectrum is more difficult than it should be, T Collins of Enfield, Middlesex has written **Touch Type,** a program designed to be a crash course in typing.

There are three sections between which you can choose—a short series of instructions, an endless series of letters for practice, and a typing test which indicates your speed in words per minute (16K Spectrum).

```
  1 POKE 23658,8: RESTORE
  2 DEF FN T( )=(65536*PEEK 2367
4+256*PEEK 23673+PEEK 23672)/50
  3 DEF FN L(A,B)=(A+B+ABS (A-B
))/2
  4 DEF FN R(X)=((INT (X*10))/1
0)
 10 LET K$="1234567890QWERTYUIO
PASDFGHJKL  ZXCVBNM  "
 20 LET Y=0: DATA -2,-1,0,-1
 50 BORDER 0: PAPER 0: INK 6
 100 CLS : FOR R=0 TO 2: LET Y=Y
+3: READ X
 110 FOR K=1 TO 10: LET X=X+3
 120 PRINT INK 0; PAPER 5;AT Y,X
;K$(R*10+K);" ";AT Y+1,X;"  "
 130 NEXT K: NEXT R
 140 PRINT PAPER 5;AT 20,1;" ";A
T 21,1;" ";AT 20,31;" ";AT 21,31
;" "
 160 GO SUB 9000: PRINT INVERSE
1;AT 0,0;" PLEASE SELECT "

 170 PRINT '"""1""-Instructions"
'"""2""-Training"'"""3""-Timed t
est"'"""4""-Quit Program"
 200 GO TO 200+800*(INKEY$="1")+
1800*(INKEY$="2")+2800*(INKEY$="
3")+9799*(INKEY$="4")
1000 GO SUB 9000: PRINT INVERSE
1;" 1 INSTRUCTIONS "
1010 PRINT '"  Place the four fi
ngers of eachhand on the flashin
g keys."
1020 PRINT '"  These are the 'ho
me keys' and your fingers always
 return to  them when they are
not typing."
1025 LET R=1500
1030 GO SUB 1500: GO SUB 9000
1040 PRINT "  Each finger has a
set of keys which only that fing
er touches."
1050 PRINT '"  All except the in
dex fingers  control the vertica
l row of fourkeys that the finge
r's home key is in."
1060 PRINT '"E.g. only the ring
fingers      should touch the fl
ashing keys."
1070 GO SUB 1500: GO SUB 9000
1080 PRINT "  The only exeption
to this is  the index fingers wh
ich must    both control eight k
eys."
1090 PRINT '"  The right hand in
dex finger,  for example, uses a
ll eight of  the flashing keys."
1100 PRINT '"YOU NOW HAVE THE AB
SOLUTE BASICSOF TOUCH-TYPING."
1110 GO SUB 1500: GO TO 150
1500 DATA 17,3,17,6,17,9,17,12,1
7,21,17,24,17,27,17,30
1510 DATA 11,4,11,25,14,5,14,26,
17,6,17,27,20,5,20,26
1520 DATA 11,16,11,19,14,17,14,2
0,17,18,17,21,20,17,20,20
1530 LET I=0: OVER 1: FLASH 1: I
NK 1: PAPER 5: FOR N=1 TO 2: RES
TORE R: FOR M=1 TO 8
1540 READ Y,X: PRINT AT Y,X;"  "
;AT Y+1,X;"  "
1550 NEXT M: IF I=0 THEN INPUT F
LASH 1;" Push ""ENTER"" to conti
nue "; LINE a$: LET I=1
1560 FLASH 0: INK 0: NEXT N: OVE
R 0: INK 6: PAPER 0: LET R=R+10
1570 RETURN
2000 GO SUB 9000: PRINT INVERSE
1;" 2 TRAINING "
2010 PRINT '"  You are required
to type the  characters that wil
l appear on  the top half of the
 screen."
2020 PRINT '"  Do not look at th
e keys as youPush them although
you can look at the screen below
 until you  get a feel for thei
r locations."
2030 INPUT FLASH 1;" Keyboard vi
ssible? (Y/N) "; LINE A$: IF A$<
>"Y" AND A$<>"N" THEN GO TO 2030
2040 GO SUB 9000
2050 IF A$="N" THEN CLS
2060 LET C=0: LET IC=0
2080 PRINT '" "; INVERSE 1;" TYP
E:"
2090 PRINT '''" NUMBER CORRECT: 0
"'''" NUMBER INCORRECT: 0"
2095 PRINT '''" TYPE ""STOP"" TO
EXIT"
2100 LET B$=K$(RND*37+1): IF B$=
" " THEN GO TO 2100
2110 PRINT FLASH 1;AT 1,7;" ";B$
;" "
2120 LET A$=INKEY$: IF A$="" THE
N GO TO 2120
2125 IF CODE A$=226 THEN RUN
2130 IF A$=B$ THEN BORDER 6: BEE
P .1,10: BEEP .2,20: BORDER 0: L
ET C=C+1: PRINT AT 4,17;C
2140 IF A$<>B$ THEN BORDER 2: BE
EP .1,0: BEEP .2,-10: BORDER 0:
LET IC=IC+1: PRINT AT 6,19;IC: G
O TO 2120
2150 GO TO 2100
3000 GO SUB 9000: PRINT INVERSE
1;" 3 TIMED TEST "
3010 PRINT '"  Random words will
 appear and  you must type and "
"ENTER"" them  as fast as possib
le."
3020 PRINT '"  After ten words,
your typing  speed will be calcu
lated."
3030 PRINT '"NO CHEATING & NO KE
YBOARD EITHER"
3040 INPUT FLASH 1;" Push ""ENTE
R"" to begin "; LINE A$: CLS
3050 DRAW 0,175: DRAW 255,0: DRA
W 0,-175: DRAW -255,0
3060 PLOT 0,144: DRAW 255,0
3070 PLOT 127,175: DRAW 0,-175
3080 PRINT AT 1,3;"WORD TO BE";A
T 2,4;"ENTERED:";AT 1,22;"WORD";
AT 2,20;"ENTERED:"
3090 LET W$="   DEARWALLFACEDRAW
LISTNAMEFALLFAMEMAILTAPEHIGHFROM
POSTMODEKEYSBOTHLINEFILMNOSEPART
"
3095 POKE 23674,0: POKE 23673,0:
 POKE 23672,0
3100 FOR N=1 TO 10: LET W=INT (R
ND*20+1): LET B$=W$(W*4 TO W*4+3
): PRINT AT N+4,1;N;TAB 6;B$
3110 INPUT LINE A$: PRINT AT N+4
,22;A$;"    "
3120 IF A$<>B$ THEN GO TO 3110
3130 NEXT N
3140 LET T=FN L(FN T( ),FN T( ))
3150 BEEP 1,0: CLS
3160 PRINT "TIME:",FN R(T);" SEC
ONDS"
3165 PRINT '''"SPEED:",FN R(50/T
);" CHR/SEC"'',FN R(50/T*12);" W
ORDS/MIN"
3170 INPUT FLASH 1;" Push ""ENTE
R"" to continue "; LINE a$: RUN
9000 PRINT AT 0,0;: FOR n=1 TO 1
0: PRINT INK 0;K$( TO 32): NEXT
n: PRINT AT 0,0;: RETURN
9999 BORDER 7: INK 0: PAPER 7: C
LS : STOP
```

WASHING LINE

A GAME for one to five players. A washing line is displayed on the screen and you must choose which items of clothing to hang on it until it breaks. Try not to be the person who breaks the line.

Heavier clothes carry high scores; socks score very low. A random element is introduced by the birds of unknown weight which land on the washing line from time to time.

Washing Line was written for the 16K Spectrum by Michael Leach of Blackburn, Lancashire.

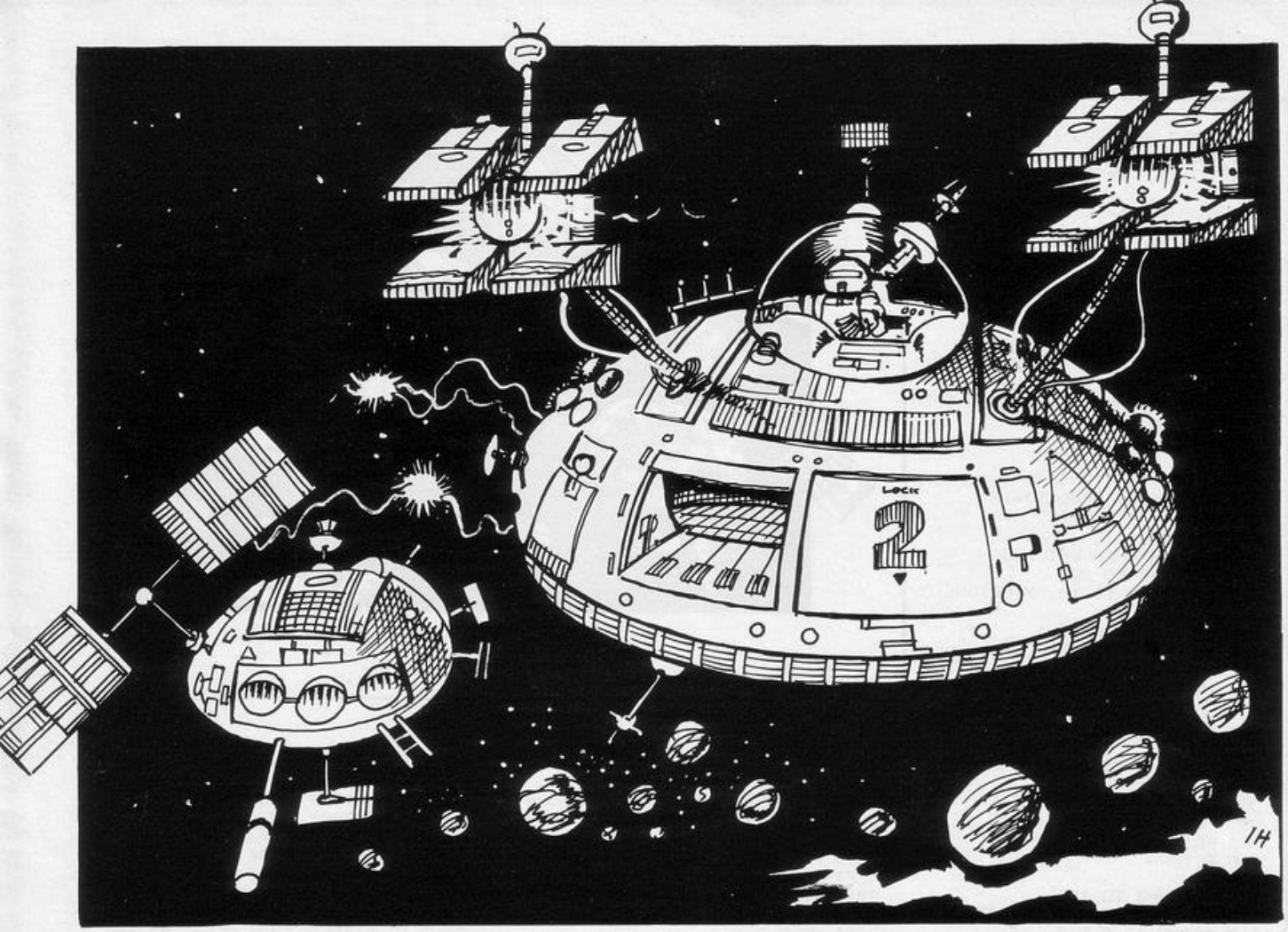
```
  1 PRINT "STOP THE TAPE": LET
hs=0: GO SUB 1000: DIM b$(2): LE
T b$(1)="p": LET b$(2)="q"
  2 DIM t$(2): DIM r$(2): DIM p
$(2,2): DIM j$(2,2): DIM s$(1):
DIM u$(3,2)
  3 LET t$(1)="r": LET t$(2)="s
": LET r$(1)="t": LET r$(2)="u":
 LET u$(2)="lm": LET u$(3)="no":
 LET p$(1)="ab": LET p$(2)="cd":
 LET j$(1)="fg": LET j$(2)="hi":
 LET s$(1)="j": LET u$(1)="k"
  4 INPUT "Do you want instruct
ions?(y/n)";a$: IF a$="y" THEN G
O SUB 2000
  5 BORDER 5: PAPER 7: INK 0: C
LS
  6 INPUT "1 TO 5 PLAYERS";p
  7 IF p>5 THEN GO TO 50
  8 DIM n$(p,4)
  9 FOR f=1 TO p: INPUT "Player
 ";(f);" name(4 letters)";n$(f):

 NEXT f
 10 PRINT AT 0,5;"HANG  OUT  TH
E WASHING!"
 15 PRINT AT 1,13;"HI-SCORE";hs
 20 PRINT AT 21,0; INK 4;"(32*i
98)"
 30 FOR z=10 TO 20: PRINT AT z,
0; INK 3;"(i95)";AT z,31; INK 3;
"(95)": NEXT z
 40 PLOT 0,96: DRAW 255,0
 70 DIM s(f): LET s(1)=0: LET s
(2)=0
 80 LET pp=1: LET x=2: LET y=1
 90 LET pw=500: LET jw=400: LET
 vw=100: LET uw=75: LET sw=50
 95 LET gt=2500+INT (RND*1000)+
100
 96 LET tw=0
 100 FOR f=1 TO p
 110 PRINT INK 0;AT 2,0;n$(f);"'


s go "
 120 PRINT INK 0;AT 3,0;"Which i
tem? p=pants j=jumper    uP=u.Pa
nts  v=vest s=socks      sc=scar
f  sk=skirt": INPUT a$
 130 IF a$="p" THEN GO TO 200
 140 IF a$="j" THEN GO TO 250
 150 IF a$="v" THEN GO TO 300
 160 IF a$="uP" THEN GO TO 350
 170 IF a$="s" THEN GO TO 400
 171 IF a$="sc" THEN GO TO 450
 172 IF a$="sk" THEN GO TO 500
 175 GO TO 120
 180 IF INT (RND*10)=5 THEN GO T
O 700
 185 IF pp>=21 THEN GO TO 850
 190 NEXT f
 195 GO TO 100
 200 LET tw=tw+500+INT (RND*20)
 201 OVER 1
 210 IF tw>=gt THEN GO TO 800

 220 LET s(f)=s(f)+25+INT (RND*1
1)
 230 INK INT (RND*7): PRINT AT 1
0,pp;p$(1);AT 11,pp;p$(2)
 235 LET pp=pp+2
 236 OVER 0
 237 BEEP .1,25
 240 GO TO 180
 250 LET tw=tw+400+INT (RND*15)
 251 OVER 1
 260 IF tw>=gt THEN GO TO 800
 270 LET s(f)=s(f)+20+INT (RND*1
1)
 280 INK INT (RND*7): PRINT AT 1
0,pp;j$(1);AT 11,pp;j$(2)
 285 LET pp=pp+2
 286 OVER 0
 287 BEEP .1,20
 290 GO TO 180
 300 LET tw=tw+100+INT (RND*15)
 301 OVER 1

 310 IF tw>=gt THEN GO TO 800
 320 LET s(f)=s(f)+15+INT (RND*1
1)
 330 INK INT (RND*7): PRINT AT 1
0,pp;u$(2);AT 11,pp;u$(3)
 335 LET pp=pp+2
 336 OVER 0
 337 BEEP .1,15
 340 GO TO 180
 350 LET tw=tw+75+INT (RND*15)
 351 OVER 1
 360 IF tw>=gt THEN GO TO 800
 370 LET s(f)=s(f)+10+INT (RND*1
)
 380 INK INT (RND*7): PRINT AT 1
0,pp;u$(1)
 385 LET pp=pp+1
 386 BEEP .1,10: OVER 0
 390 GO TO 180
 400 LET tw=tw+50+INT (RND*15)
 401 OVER 1

 410 IF tw>=gt THEN GO TO 800
 420 LET s(f)=s(f)+5+INT (RND*11
)
 430 INK INT (RND*7): PRINT AT 1
0,pp;s$(1)
 435 LET pp=pp+1
 436 BEEP .1,5: OVER 0
 440 GO TO 180
 450 LET tw=tw+250+INT (RND*15)
 451 OVER 1
 460 IF tw>=gt THEN GO TO 800
 470 LET s(f)=s(f)+17+INT (RND*1
1)
 480 INK INT (RND*7): PRINT AT 1
0,pp;t$(1);AT 11,pp;t$(2)
 485 LET pp=pp+1
 486 BEEP .1,17: OVER 0
 490 GO TO 180
 500 LET tw=tw+450+INT (RND*25)
 501 OVER 1
 510 IF tw>=gt THEN GO TO 800


 520 LET s(f)=s(f)+22+INT (RND*1
1)
 530 INK INT (RND*7): PRINT AT 1
0,pp;r$(1);AT 11,pp;r$(2)
 535 LET pp=pp+1
 536 BEEP .1,22: OVER 0
 540 GO TO 180
 700 INK 0: LET x=2: LET y=31: L
ET ty=INT (RND*31)
 705 LET tx=(31-ty)/5
 710 FOR g=31 TO ty STEP -1
 720 PRINT AT x,g;"q"; PAUSE 5:
 PRINT AT x,g;" "
 730 NEXT g
 740 FOR g=2 TO g: PRINT AT g,ty
;"q": PAUSE 5: PRINT AT g,ty;" "
: NEXT g
 750 PRINT AT g,ty;"p"
 760 LET tw=tw+50+INT (RND*101)
 765 IF tw>=gt THEN GO TO 800
 770 LET s(f)=s(f)+INT (RND*25)+

 770>LET s(f)=s(f)+INT (RND*25)+
25
 780 GO TO 185
 790 PRINT AT 0,0;"BIRD": GO TO
185
 799 STOP
```

```
 800 OVER 0: PRINT AT 10,pp+1;"e
";AT 9,pp;"SNAP": BEEP 1,-20: PR
INT "Player ";f;" loses"
 801 LET s(f)=s(f)-25
 802 PAUSE 100
 810 INK 0: FOR f=1 TO p: PRINT
AT 9+f,0;"Player ";f;" ";n$(f);"
 ";"Score";s(f): NEXT f
 815 FOR f=1 TO p: IF s(f)>hs TH
EN LET hs=s(f)
 816 NEXT f
 820 INPUT "Another Game?(y/n)";
a$
 830 IF a$="y" THEN GO TO 870
 840 IF a$="n" THEN STOP
 845 GO TO 820


 850 PRINT "Line Full. All Playe
rs lose"
 860 PRINT AT 9,28;"SNAP";AT 10,
30;"e": GO TO 810
 870 INPUT "Same number of Playe
rs?(y/n)";a$
 880 IF a$="y" THEN GO TO 900
 890 IF a$="n" THEN GO TO 4
 895 GO TO 870
 900 INPUT "Instructions? (y/n)"
;a$
 910 IF a$="y" THEN GO SUB 2000:
 CLS : GO TO 10
 930 IF a$="n" THEN CLS : GO TO
10
 940 GO TO 900
1000 FOR u=144 TO 164
1010 FOR f=0 TO 7: READ a: POKE
USR CHR$ u+f,a: NEXT f: NEXT u
1020 RETURN
1050 DATA 15,15,15,15,14,14,14,1
4
1060 DATA 240,240,240,240,112,11
2,112,112
1070 DATA 14,14,14,14,14,14,14,1
4
1080 DATA 112,112,112,112,112,11
2,112,112
1090 DATA 145,82,0,0,82,0,74,137
1100 DATA 3,7,63,63,55,55,55,55
1110 DATA 192,224,252,252,236,23
6,236,236
1120 DATA 55,55,7,7,7,0,0,0
1130 DATA 236,236,224,224,224,0,
0,0
1140 DATA 20,20,20,20,20,20,119,
119
1150 DATA 255,255,255,126,60,24,
0,0
1160 DATA 4,4,6,7,7,7,7,7
1170 DATA 32,32,96,224,224,224,2
24,224
1180 DATA 7,7,7,7,7,0,0,0
1190 DATA 224,224,224,224,224,0,
0,0
1200 DATA 4,4,7,252,124,60,16,25
5
1210 DATA 0,0,66,165,24,24,0,0
1220 DATA 124,124,62,31,62,124,2
48,124
1230 DATA 62,31,62,124,248,168,8
4,42
1240 DATA 126,126,126,126,126,12
6,126,126
1250 DATA 255,255,170,0,0,0,0,0
2000 CLS : PRINT AT 0,5;"HANG  O
UT  THE WASHING!"
2001 PRINT "You have to hang as
many items"'"of clothing out on
the line "'"as possible without
the line "'"breaking. Each item
has an "'"approximate weight and

 the "'"heavier the item the hig
her "'"the score.The score is al
so "'"approximate The game ends
when"'"the line snaps."
2010 PRINT "Also birds can land
on the line"'"which makes it hea
vier."
2020 PRINT AT 11,0;"SCORING:-";T
AB 16;"POINTS";TAB 25;"WEIGHT"
2030 PRINT AT 12,0;p$(1);"  Pant
s";TAB 16;25;TAB 25;500;"g";TAB
0;p$(2)
2035 PRINT 'r$(1);" Skirt";TAB 1
6;22;TAB 25;450;"g";TAB 0;r$(2)
2040 PRINT 'j$(1);"  Jumper";TAB
 16;20;TAB 25;400;"g";TAB 0;j$(2
)
2044 PRINT "Press any key": PAUS
E 0: POKE 23692,255
2045 PRINT 't$(1);"  Scarf";TAB
16;17;TAB 25;250;"g";TAB 0;t$(2)
2050 PRINT 'u$(2);"  Vest";TAB 1
6;15;TAB 25;100;"g";TAB 0;u$(3)
2060 PRINT 'u$(1);" UnderPants";
TAB 16;10;TAB 25;75;"g"
2070 PRINT 's$(1);"  Socks";TAB
16;5;TAB 25;50;"g"
2075 PRINT 'b$(1);"  Bird";TAB 1
6;"?";TAB 25;"?g"
2080 PRINT '"Press any key": PAU
SE 0: RETURN
```

HIT STAR

ALONG THE TOP of the screen is a row of stars. You must clear away the stars in as few attempts as possible. Do so by means of the stars at the bottom. By setting them in motion at different times you can make them collide under a specific star, thus sending up a bolt of energy which will destroy that star. **Hit Star** is for the 16K Spectrum and was written by John Lifford of north-west London.

```
  10 LET hsc=50: LET b$="Spectru
m"
  20 GO SUB 2000
  60 DATA .15,7,.15,7,.15,7,.9,0
,.9,7,.15,5,.15,4,.15,2,.9,12,.4
5,7,.15,5,.15,4,.15,2,.9,12,.45,
7,.15,5,.15,4,.15,5,1,2
  70 RESTORE 60: FOR n=1 TO 19:
READ c,d: BEEP c,d: NEXT n
 110 CLS
 120 PRINT AT 0,0;"* * * * * * *
*  * * * * * * * * *"
 160 PRINT AT 21,ay; INK 1;"*"
 170 PRINT AT 21,by; INK 3;"*"
 210 IF a=0 THEN GO SUB 300
 220 IF b=0 THEN GO SUB 350
 230 IF a=1 THEN GO SUB 400
 240 IF b=1 THEN GO SUB 500
 290 GO TO 200
 310 IF INKEY$="z" OR INKEY$="Z"
 THEN LET a=1
 340 RETURN
 360 IF INKEY$="m" OR INKEY$="M"
 THEN LET b=1
 390 RETURN
 410 IF ay<>by THEN PRINT AT 21,
ay; INK 1;" *": LET ay=ay+1
 420 IF ay=by THEN GO TO 600
 490 RETURN
 510 IF by<>ay THEN LET by=by-1:
 PRINT AT 21,by; INK 3;"* "
 520 IF by=ay THEN GO TO 600
 590 RETURN
 610 LET s=ay
 620 IF SCREEN$ (0,s)="*" THEN L
ET beep=1
 630 FOR n=20 TO 0 STEP -1
 640 PRINT AT n,s; INK 4;"a": PR
INT AT n+1,s;" "
 650 BEEP .02,50-(2*n)
 660 NEXT n
 670 IF beep=1 THEN PRINT AT 0,s
; INK 2;"b": BEEP .05,24
 680 PRINT AT 0,s;" "
 690 LET sc=sc+1: LET a=0: LET b
=0: LET beep=0: LET ay=0: LET by
=31
 710 FOR n=0 TO 31
 720 IF SCREEN$ (0,n)="*" THEN G
O TO 150
 730 NEXT n
 740 CLS
 750 PRINT AT 8,1; INK 2; PAPER
 7; BRIGHT 1; INVERSE 1;"WELL DON
E!!   You took ";sc;" goes"
 760 PRINT AT 12,8; INK 4;"Best
score = ";hsc
 770 PRINT AT 13,8; INK 4;"By ";
 INK 3;b$
 780 IF sc<hsc THEN GO TO 800
 790 GO TO 850
 810 INPUT INK 0; PAPER 7; FLASH
 1;"Name Please";b$
 820 IF LEN b$>15 THEN GO TO 810
 830 LET hsc=sc
 840 PRINT AT 12,21; INK 4;hsc;"
    ";AT 13,11; INK 3;b$;"
          "
 860 PRINT AT 20,3; INK 1; PAPER
 6; FLASH 1;"Do you want another
 game?"
 870 INPUT a$
 880 IF a$="n" OR a$="N" THEN ST
OP
 890 PRINT AT 20,0;"
                    "
 900 GO SUB 1000
 910 GO TO 50
1010 LET sc=0: LET beep=0
1020 LET ay=0: LET by=31
1030 LET a=0: LET b=0
1990 RETURN
2010 PRINT AT 0,0; INK 0; PAPER
5;"              HIT-STAR
   "
2030 PRINT '''"You have to clear
 the stars off      the top of th
e screen."
2040 PRINT '"In order to do this
 you have to make your two stars
 (the ones onthe bottom) collide
 and send up          a bolt of en
ergy."
2050 PRINT '' INK 2;"Use:-"
2060 PRINT ' INK 1;"          z - t
o start left  one          m - t
o start right one"
2940 GO SUB 3000
2950 GO SUB 1000
2960 PRINT AT 21,4; INK 1; PAPER
 6; FLASH 1;"Press any key to st
art"
2970 PAUSE 0
2980 PRINT AT 21,0;"
                    "
2990 RETURN
3010 DATA "a",0,24,24,24,24,24,2
4,0,"b",153,66,36,129,129,36,66,
153
3020 RESTORE 3010
3030 FOR f=1 TO 2
3040 READ e$
3050 FOR n=0 TO 7
3060 READ 9
3070 POKE USR e$+n,9
3080 NEXT n
3090 NEXT f
3990 RETURN
```



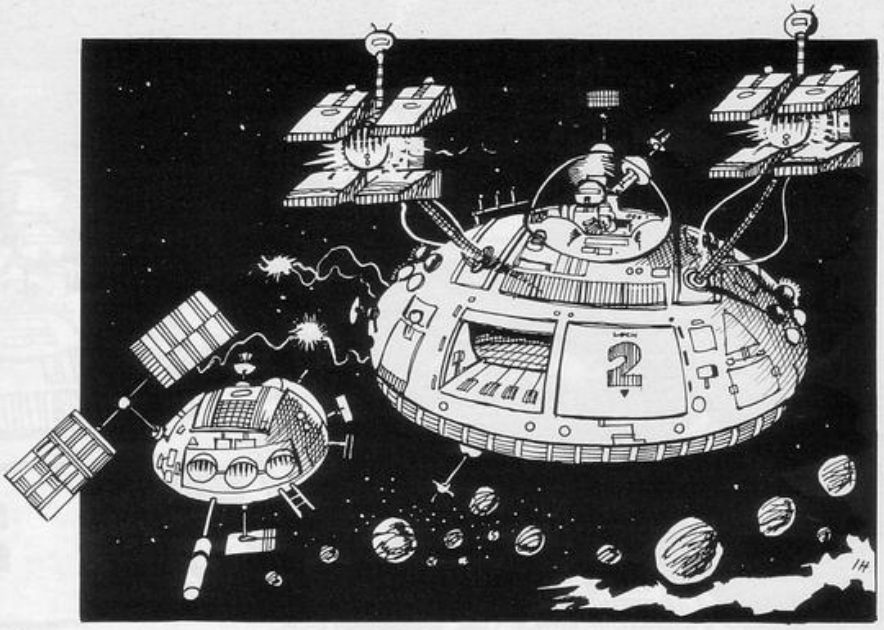
SPACE MISSION

YOUR JOB is to collect as many of the satellites above you as possible. On each journey there are two satellites towards which you to steer, the easily-reached higher satellite and the more elusive lower satellite. You score extra points for landing correctly on your launch pad.

Space Mission is a game for the 16K ZK-81 written by G B Duncan of Hartfield, East Sussex.

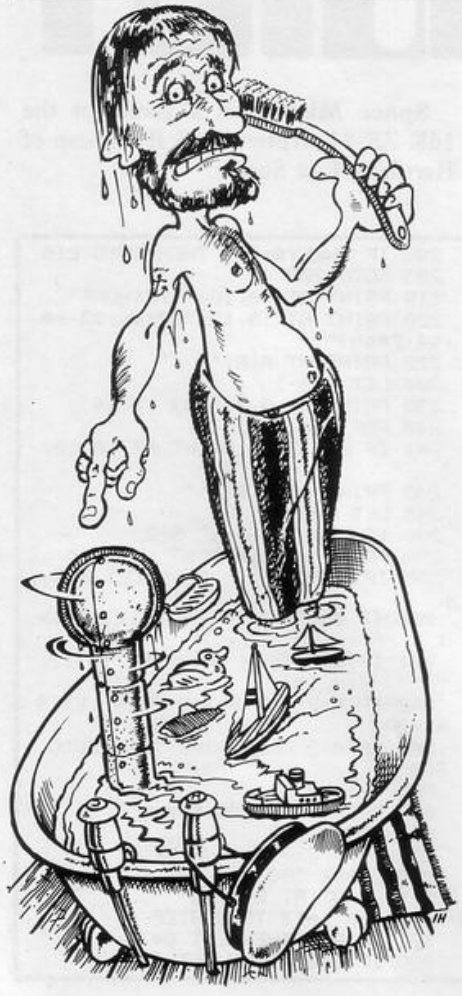
```
  1 REM "SPACE MISSON"
  2 LET H=0
  3 LET I=0
  4 LET M=1
  5 LET S=0
  6 IF I=0 THEN LET A$="ZX 81"
 10 LET A=19
 11 LET B=14
 18 IF I=0 THEN GOTO 20
 19 GOTO 24
 20 FOR F=1 TO 20
 21 PRINT AT 10,10;"SPACE MISSO
N"
 22 PRINT AT 10,10;"
 "
 23 NEXT F
 27 FOR P=1 TO 13
 28 PRINT AT P,0;"
                 "
 29 NEXT P
 30 IF I=1 THEN GOTO 100
 34 PRINT AT 10,5;"DO YOU WANT"
;;;" INSTRUCTIONS (Y/N) ?"
 35 IF INKEY$="Y" THEN GOTO 50
 37 IF INKEY$="N" THEN GOTO 99
 40 IF INKEY$<>"N" THEN GOTO 35
 50 PRINT AT 10,3;"YOUR TASK IS
 TO ";;"COLLECT THE SATELLITES(
*)"
 51 PRINT
 52 FOR F=1 TO 10
 53 NEXT F
 55 PRINT "200 - TOP SATELLITE"
 56 PRINT "300 - MIDDLE SATELLI
TE"
 57 PRINT "50 - LANDING CORRECT
LY"
 58 PRINT
 60 PRINT "   ANY KEY TO CONTIN
UE"
 65 IF INKEY$="" THEN GOTO 65
 67 CLS
 70 PRINT AT 10,3;"""P"" TO LAU
NCH"
 71 PRINT
 75 PRINT """5"" AND ""8"" TO S
TEER"
 76 PRINT
 78 PRINT "YOU HAVE 5 MISSION8"
 80 PRINT
 81 PRINT
 82 PRINT "   ANY KEY TO CONTIN
UE"
 85 IF INKEY$="" THEN GOTO 85
 86 CLS
 87 PRINT AT 10,6;"9ood luck"
 88 FOR F=1 TO 20
 89 NEXT F
 99 CLS
100 PRINT AT 21,0;"SCORE=";S;"
   ";TAB 21;"MISSION=";M;AT 0,0
;"HI-SCORE=";H;"  BY ";A$
107 IF M>=6 THEN GOTO 800
110 PRINT AT 20,0;"(13*9d*96*99
*i$*9w*96*14*9d)"
115 PRINT AT A-1,B+1;":"
120 PRINT AT A,B;"(93*i$*94)"
130 GOSUB 900
200 IF INKEY$="P" THEN GOTO 210
205 GOTO 200
210 PRINT AT 10,10;"LIFT-OFF"
220 PRINT AT 19,12;"(2*9h*93*i$
*94*2*9h)"
222 PRINT AT A,B;"    "
224 LET A=A-1
230 PRINT AT A,B;"(93*i$*94)"
240 FOR N=0 TO 15
241 IF N=1 THEN PRINT AT 10,10;
"         "
242 PRINT AT A,B-1;"      "
245 LET A=A-1
246 IF B=1 THEN LET B=2
250 PRINT AT A,B;"(93*i$*94)"
255 IF INKEY$="5" THEN LET B=B-
1
260 IF INKEY$="8" THEN LET B=B+
1
261 IF N=3 THEN PRINT AT 19,12;
"          "
262 IF A=2 AND B+1=X THEN LET S
=S+200
264 IF A=2 AND B+1=X THEN GOTO
300
265 NEXT N
266 PRINT AT 21,6;S
267 GOSUB 500
270 GOTO 320
310 GOSUB 500
315 PRINT AT 21,6;S
320 FOR L=17 TO 0 STEP -1
321 IF B=1 THEN LET B=2
322 IF B=29 THEN LET B=28
```

```
 323 PRINT AT A,B;"(93:i$:94)"
 325 PRINT AT A,B-1,"      "
 330 IF INKEY$="5" THEN LET B=B-
1
 335 IF INKEY$="8" THEN LET B=B+
1
 345 LET A=A+1
 350 IF A=C AND B+1=V THEN LET S
=S+300
 360 NEXT L
 362 PRINT AT 21,6;S
 365 LET M=M+1
 366 IF A=20 AND B=14 THEN LET S
=S+50
 367 IF A=20 AND B<>14 THEN GOSU
B 1000
 368 LET I=1
 370 GOTO 7
 500 LET C=INT (RND*2)+8
 505 LET V=INT (RND*5)+12
 530 PRINT AT C,V;"*"
 540 RETURN
 800 IF S>H THEN LET H=S
 802 FOR K=0 TO 20
 803 PRINT AT 10,10;"MISSIONS OV
ER"
 804 PRINT AT 10,10;"
     "
 805 NEXT K
 806 IF H=S THEN GOSUB 2000
 808 GOSUB 3000
 809 PRINT AT 12,8;"ANY KEY TO R
UN "
 810 IF INKEY$="" THEN GOTO 810
 820 GOTO 4
 900 LET X=INT (RND*20)+5
 905 LET Z=2
 930 PRINT AT Z,X;"*"
 940 RETURN
 950 RUN
1000 FOR J=0 TO 15
1005 PRINT AT A,B;"(3*i?)"
1010 PRINT AT A,B;"   "
1020 NEXT J
1030 RETURN
```



```
2000 CLS
2010 PRINT AT 10,6;"YOU HAVE SET
 A NEW "
2012 PRINT AT 12,11;"highJscore"
2014 PRINT AT 14,6;"PLEASE ENTER
 YOUR "
2016 PRINT AT 16,8;"NAME (MAX 10
 LETTERS)"
2018 INPUT A$
2019 FOR Z=1 TO 30
2020 NEXT Z
2021 CLS
2022 RETURN
```

```
3000 CLS
3010 IF S<1000 THEN PRINT AT 10,
6;"NOT BAD FOR AN AMATEUR"
3015 IF S<1000 THEN RETURN
3020 IF S<2000 THEN PRINT AT 10,
6;"WELL DONE THATS GOOD"
3025 IF S<2000 THEN RETURN
3030 IF S<3000 THEN PRINT AT 10,
6;"EXCELLENT PLAY "
3035 IF S<3000 THEN RETURN
3040 IF S<4000 THEN PRINT AT 10,
6;"REALLY PROFESSIONAL "
3045 RETURN
```



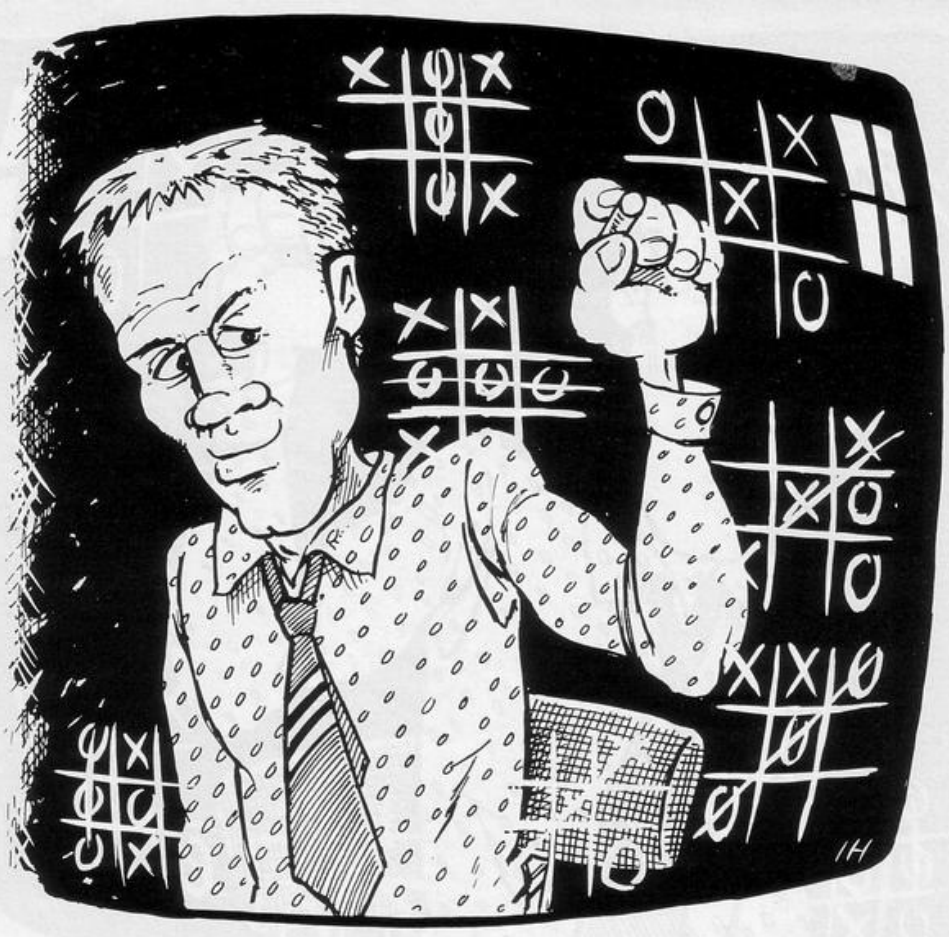
PERISCOPE

THE COMPUTER prints a ship at random on the screen. Type-in the number of the row and then of the column in which you think the ship is situated. You score one point for hitting the ship and five points for hitting it in the middle.

If you hit the top deck only you score nothing. At the end of the game the number of ships sunk, ships destroyed, and your score are all displayed.

Periscope can be played on the 1K or 16K ZX-81 and was written by Mark Snowshall of Sherwood, Nottingham.

```
  1 LET S=0
  2 LET SS=0
  3 LET SD=0
  9 FOR T=1 TO 10
 10 LET H$="(9s)"
 30 LET A=INT (RND*20)+1
 40 LET B=INT (RND*26)+1
 50 PRINT AT A,B;"(9r:3*isP:9e)
"
 60 PRINT AT A-1,B;"(2*sP:9w:2*
sP)"
 65 PAUSE 50
 70 INPUT D
 80 INPUT F
100 IF D=A AND F=B+2 THEN LET H
$="(9y:9t)"
101 IF D=A AND F=B+2 THEN LET S
=SS+1
110 IF D=A AND F=B+2 THEN LET S
=S+5
120 IF D=A AND F=B OR F=B+1 OR
F=B+3 OR F=B+4 THEN LET S=S+1
120~IF D=A AND F=B OR F=B+1 OR
F=B+3 OR F=B+4 THEN LET S=S+1
121 IF D=A AND F=B OR F=B+1 OR
F=B+3 OR F=B+4 THEN LET SD=SD+1
131 PRINT AT D,F;H$
132 PAUSE 100
133 CLS
134 NEXT T
150 PRINT AT 0,0;"SHIPS SUNK";S
S
160 PRINT "SHIPS DAMADGED:";SD
170 PRINT "SCORE:";S
```

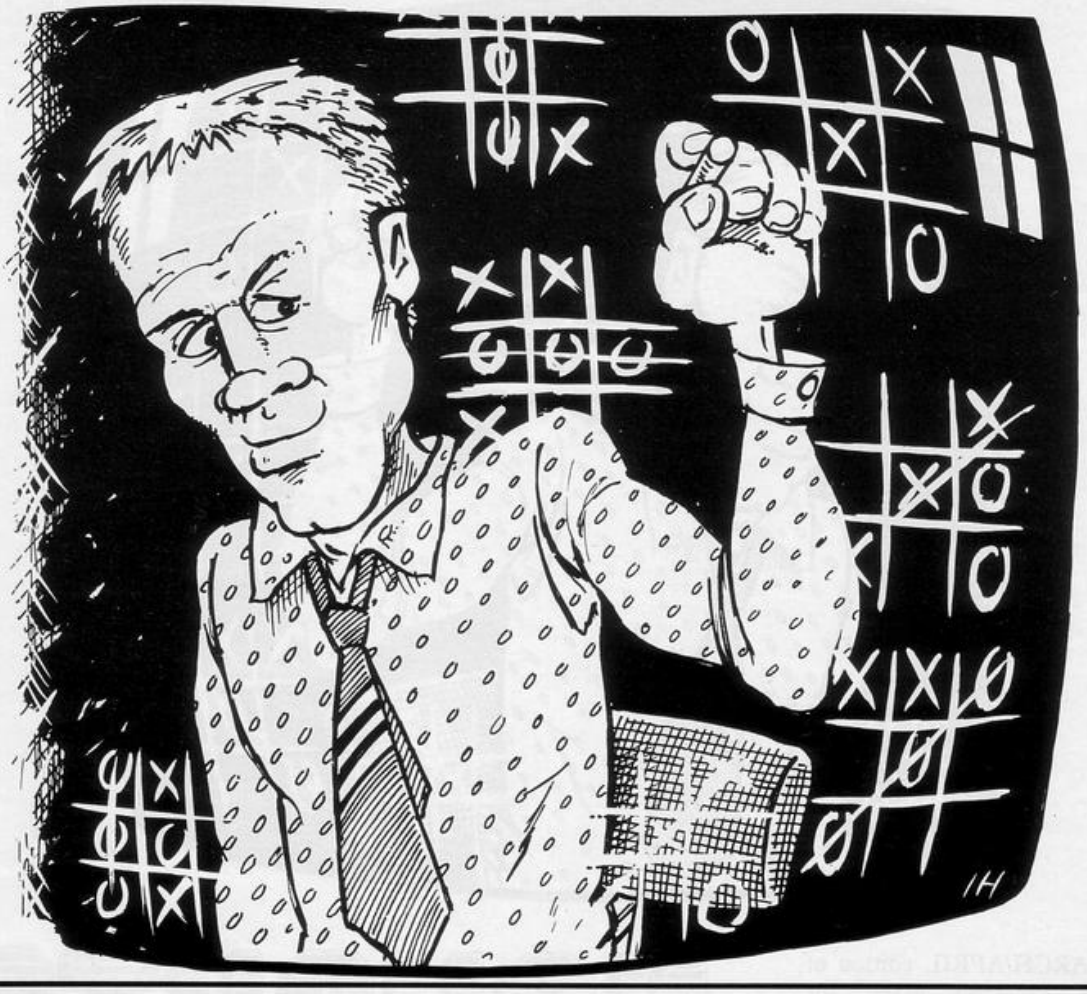


NOUGHTS AND CROSSES

THE MARCH/APRIL edition of *Sinclair Programs* asked for **Noughts and Crosses** programs in which the computer takes part. The problem with most of the programs which we received was either that the computer could play Noughts and Crosses well, in which case it would never lose, making the game extremely uninteresting, or it could play Noughts and Crosses badly, in which case it was always possible for the player to win.

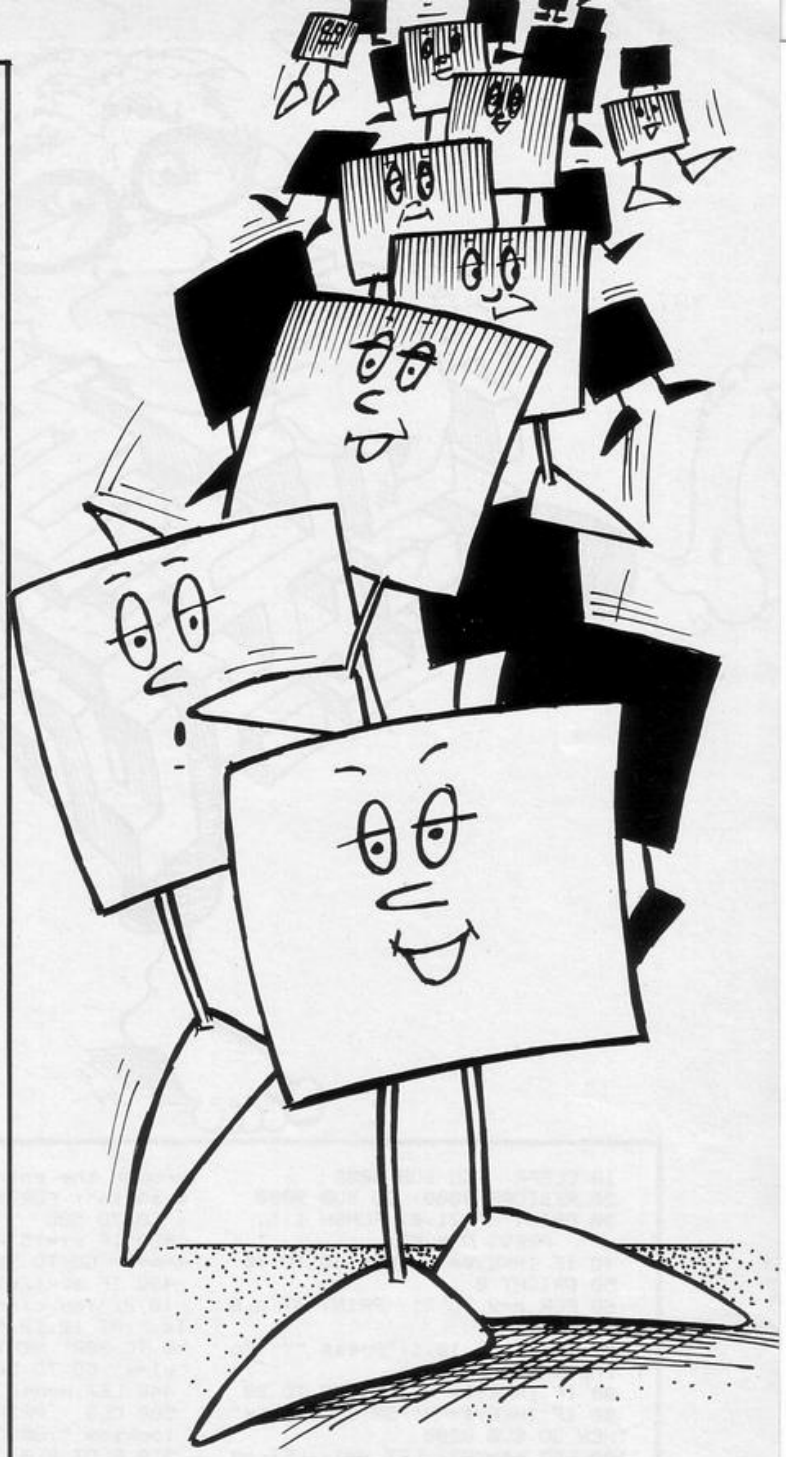
Richard Sutton of Putney, London produced the solution—a program for the 16K Spectrum in which the computer does not always respond to the same move in the same way, so that, if you watch for an opening, it is occasionally possible to win.

```
  2 PRINT AT 11,4;"Press any ke
y to start": PAUSE 0: CLS
  10 DATA 192,224,112,56,28,14,7
,3,3,7,14,28,56,112,224,192,7,31
,60,112,96,224,192,192,224,240,6
0,14,6,7,3,3,192,192,224,96,112,
60,31,7,3,3,7,6,14,60,248,224
  11 FOR n=0 TO 47: READ a: POKE
 USR "a"+n,a: NEXT n
  12 LET d=0
  13 PRINT AT 8,8;"Noughts & Cro
sses": PAUSE 99
  15 PAUSE 5: PRINT AT 8,9;" ";A
T 7,9;"o": BEEP .05,8: FOR n=9
TO 20: PRINT AT 7,n;" o": BEEP .
05,8: NEXT n: PAUSE 2: FOR n=7 T
O 0 STEP -1: PRINT AT n,21;"o";A
T n+1,21;"X";AT n+2,21;" ": BEEP
 .05,8: NEXT n: PRINT AT 0,21;"X
";AT 1,21;" ": BEEP .05,8: PRINT
 AT 0,21;" ": BEEP .05,8
  16 PAUSE 20: PRINT AT 0,21;"s"
: BEEP .05,8: PRINT AT 0,21;"o";
AT 1,21;"s": BEEP .05,8: FOR n=0
 TO 6: PRINT AT n,21;" ";AT n+1,
21;"o";AT n+2,21;"s": BEEP .05,8
: NEXT n: PAUSE 2: FOR n=21 TO 9
 STEP -1: PRINT AT 7,n;"o ": BEE
P .05,8: NEXT n: PAUSE 40: PRINT
 AT 7,9; INK 2;"o": PAUSE 60: PR
INT AT 7,9;" ";AT 8,9;"o": BEEP
 .1,0: PAUSE 15: PRINT AT 8,9; IN
K 0;"o"
  20 LET d=0: PRINT AT 14,4;"How
 many Players? (1 or 2)": PAUSE
0
  25 IF INKEY$="2" THEN GO TO 50
  30 IF INKEY$<>"1" THEN GO TO 2
0
  35 PRINT AT 20,0;"Shall I go f
irst? (Y/N)"
  40 IF INKEY$="Y" OR INKEY$="y"
 THEN LET FLAG=0: GO TO 200
  41 IF INKEY$<>"N" AND INKEY$<>
"n" THEN GO TO 35
  45 LET FLAG=1: GO TO 200
  50 INPUT "Name of Player 1? ";
b$
  51 INPUT "and name of Player 2
? ";c$
  55 CLS : PRINT AT 5,0;"Who sta
rts first,";AT 7,0;b$;"(1)? or "
;c$;"(2)?": PAUSE 0
  60 IF INKEY$="1" THEN LET D=1
  65 IF INKEY$="2" THEN LET D=2
  70 IF INKEY$<>"1" AND INKEY$<>
"2" THEN GO TO 55
 200 CLS : PLOT 80,96: DRAW 96,0
 201 PLOT 80,64: DRAW 96,0
 202 PLOT 112,32: DRAW 0,96
 203 PLOT 144,32: DRAW 0,96
 210 PRINT AT 21,2;"(select with
 <> keys & ENTER)"
 250 DIM c(9): DIM p(9)
 254 IF d=1 OR d=2 THEN GO TO 50
00
 255 IF FLAG=0 THEN GO TO 300
 256 IF FLAG=1 THEN GO TO 2200
 300 DATA 1,2,3,4,5,6,7,8,9,1,4,
7,2,5,8,3,6,9,1,5,9,3,5,7
 350 RESTORE 300: FOR n=1 TO 8:
READ a,b,c
 355 IF p(a)+p(b)+p(c)=9 THEN GO
 TO 3000
 360 NEXT n
 400 RESTORE 300: FOR n=1 TO 8:
READ a,b,c
 405 IF c(a)+c(b)+c(c)=2 THEN GO
```




```
 SUB 600
 410 IF FLAG=1 THEN GO TO 3200
 415 NEXT n
 430 IF (C(1)+P(1)+C(5)+P(5)+C(9
)+P(9)=2 AND C(2)+P(2)+C(3)+P(3)
+C(4)+P(4)+C(6)+P(6)+C(7)+P(7)+C
(8)+P(8)=0) OR (C(3)+P(3)+C(5)+P
(5)+C(7)+P(7)=3 AND C(1)+P(1)+C(
2)+P(2)+C(4)+P(4)+C(6)+P(6)+C(C)
+P(8)+C(9)+P(9)=0) THEN LET x=2*
(INT (RND*4)+1): LET c(x)=1: LET
 FLAG=1: GO SUB 1000: GO TO 2200
 450 RESTORE 300: FOR n=1 TO 8:
READ a,b,c
 455 IF P(a)+P(b)+P(c)=2 THEN GO
 SUB 600
 460 IF FLAG=1 THEN GO TO 3500
 465 NEXT n
 500 LET n=5
 505 IF P(n)+c(n)=0 THEN GO SUB
700
 510 IF FLAG=1 THEN GO TO 3500
 550 RANDOMIZE : LET n=(2*INT (R
ND*5))+1
 555 FOR m=1 TO 5
 560 IF P(n)+c(n)=0 THEN GO SUB
700
 565 IF FLAG=1 THEN GO TO 3500
 570 LET n=n+2
 573 IF n=11 THEN LET n=1
 574 NEXT m
 575 LET n=n+1
 578 FOR m=1 TO 4
 580 IF n=10 THEN LET n=2
 585 IF P(n)+c(n)=0 THEN GO SUB
700
 590 IF FLAG=1 THEN GO TO 3500
 595 LET n=n+2: NEXT m
 600 IF P(a)+c(a)=0 THEN LET c(a
)=1: LET FLAG=1: LET x=a: GO SUB
 1000
 605 IF P(b)+c(b)=0 THEN LET c(b
)=1: LET FLAG=1: LET x=b: GO SUB
 1000
 610 IF P(c)+c(c)=0 THEN LET c(c
)=1: LET FLAG=1: LET x=c: GO SUB
 1000
 615 RETURN
 700 LET c(n)=1: LET x=n: LET FL
AG=1: GO SUB 1000: RETURN
 999 STOP
1000 LET v=1: LET h=x-4
1005 IF x>6 THEN LET v=2: LET h=
x-7
1010 IF x<4 THEN LET v=0: LET h=
x-1
1015 IF FLAG=1 THEN PRINT AT 7+v
*4,11+h*4; INK 2;"AB";AT 8+v*4,1
1+h*4;"BA": BEEP .1,3: BEEP .2,0
1020 IF FLAG=0 THEN PRINT AT 7+v
*4,11+h*4; INK 1;"CD";AT 8+v*4,1
1+h*4;"EF": BEEP .1,0: BEEP .2,0
1025 IF FLAG=2 THEN PRINT OVER 1
; PAPER 6; INK 8;AT 7+v*4,11+h*4
;"  ";AT 8+v*4,11+h*4;"  "
1030 RETURN

2200 PRINT AT 1,3;"YOUR TURN...
                "
2210 LET x=1: LET FLAG=2: GO SUB
 1000
2212 PAUSE 0
2214 LET a$=INKEY$
2215 PRINT PAPER 7; OVER 1; INK
8;AT 7+v*4,11+h*4;"  ";AT 8+v*4,
11+h*4;"  "
2220 LET x=x+(a$="8")-(a$="5"):
IF x=0 THEN LET x=1
2221 IF x=10 THEN LET x=9
2225 IF a$=CHR$ 13 AND (D=1 OR D
=2) THEN GO TO 5200
2230 IF a$=CHR$ 13 THEN GO TO 23
00
2240 GO SUB 1000
2250 GO TO 2212
2300 IF P(x)+c(x)=1 THEN BEEP .4
,-10: GO TO 2212
2310 LET FLAG=0: LET P(x)=1: GO
SUB 1000: GO TO 3500
2400 PRINT AT 1,3;"
...MY TURN"
2410 GO TO 300
3000 PRINT AT 1,3; FLASH 1;"
    YOU WIN!              ": GO TO
 3205
3200 PRINT AT 1,3; FLASH 1;"
   SPECTRUM WINS!         "
3204 LET FLAG=3
3205 LET x=a: GO SUB 1000: GO SU
B 3230
3210 LET x=b: GO SUB 1000: GO SU
B 3230
3215 LET x=c: GO SUB 1000: GO SU
B 3230
3220 GO TO 4000
3230 FOR n=6 TO 9: PRINT PAPER 4
; OVER 1; INK 8;AT n+v*4,10+h*4;
"    ": NEXT n: BEEP .1,-8: BEEP
.1,-12: RETURN
3499 STOP
3500 LET t=0
3510 FOR n=1 TO 9
3515 LET t=t+P(n)+c(n): NEXT n
3520 IF t=9 THEN GO TO 4000
3525 IF FLAG=1 THEN GO TO 2200
3530 IF FLAG=0 THEN GO TO 2400
4000 PRINT AT 3,13;"Another game
? (Y/N)": PAUSE 0
4005 IF INKEY$<>"y" AND INKEY$<>
"Y" THEN STOP
4010 IF d=0 THEN RUN 20
4020 IF d<>0 THEN PRINT AT 4,13;
"Same Players? (Y/N)": PAUSE 0
4030 IF INKEY$="y" OR INKEY$="Y"
 THEN FOR n=1 TO 9: LET P(n)=0:
LET c(n)=0: NEXT n: CLS : GO TO
55
4040 RUN 20
4999 STOP
5000 IF d=2 THEN GO TO 6010
5010 PRINT AT 1,3;b$;"'s turn...
                "
5020 GO TO 2210
5030 LET P(X)=1: LET FLAG=1: GO
SUB 1000: GO TO 6000
5200 IF P(x)+c(x)=1 THEN BEEP .4
,-10: GO TO 2212
5205 IF D=1 THEN GO TO 5030
5210 LET c(x)=1: LET FLAG=0: GO
SUB 1000: GO TO 6500
6000 RESTORE 300: FOR N=1 TO 8:
READ a,b,c: IF P(a)+P(b)+P(c)=3
THEN PRINT AT 1,3; FLASH 1;"  ";
b$;" wins!  ": LET FLAG=3: GO TO
 3205
6001 NEXT n
6005 LET t=0: FOR n=1 TO 9: LET
t=t+P(n)+c(n): IF t=9 THEN GO TO
 4000
6010 LET d=2: PRINT AT 1,3;c$;"'
s turn...              ": GO TO 22
10
6500 RESTORE 300: FOR n=1 TO 8:
READ a,b,c: IF c(a)+c(b)+c(c)=3
THEN PRINT AT 1,3; FLASH 1;"  ";
c$;" wins!  ": LET FLAG=3: GO TO
 3205
6501 NEXT n
6505 LET t=0: FOR n=1 TO 9: LET
t=t+P(n)+c(n): IF t=9 THEN GO TO
 4000
6510 LET d=1: GO TO 5000
```

```
9GDG    1 REM   block stop
    2 LET HC=0
    9 CLS
   10 FOR B=1 TO 30
   20 PRINT AT 0,B;"(isP)";AT 21,
B;"(9f)"
   30 NEXT B
   40 FOR A=0 TO 21
   50 PRINT AT A,0;"(9f)";AT A,31
;"(9f)"
   60 NEXT A
   70 LET X=10
   80 LET Y=10
   90 LET A=1
   99 LET SC=0
  100 LET B=2
  110 PRINT AT A,B+1;
  120 LET I=PEEK (PEEK 16398+PEEK
  16399*256)
  121 LET B=B+1
  122 IF B=31 THEN LET B=2
  130 IF I=8 THEN LET A=A-1
  130~IF I=8 THEN LET A=A-1
SC
  290 IF SC<HC THEN GOTO 320
  300 PRINT TAB 2;"A NEW HIGH-SCO
RE OF ";SC;TAB 2;" HAS BEEN ACHI
hc;    v 130~IF I=8 THEN LET A=A-1
  140 IF I=128 THEN LET A=A+1
  150 PRINT AT A,B;"(isP)";AT A,B
-1;" "
  160 LET Y=Y+(INKEY$="8" AND Y<3
0)-(INKEY$="5" AND Y>1)
  170 LET X=X+(INKEY$="6" AND X<2
0)-(INKEY$="7" AND X>1)
  180 PRINT AT X,Y;"(9a)"
  190 IF A=21 THEN GOTO 250
  200 LET SC=SC+1
  210 GOTO 110
  250 FOR C=0 TO 20
  260 PRINT AT 10,2;"(91:ie:is:ic
:ia:iP:ie:92)";AT 10,2;"(99:ie:i
s:ic:ia:iP:ie:9w)";
  270 NEXT C
  280 PRINT TAB 2;"YOUR SCORE = "
;SC
  290 IF SC<HC THEN GOTO 320
  300 PRINT TAB 2;"A NEW HIGH-SCO
RE OF ";SC;TAB 2;" HAS BEEN ACHI
  300~PRINT TAB 2;"A NEW HIGH-SCO
RE OF ";SC;TAB 2;" HAS BEEN ACHI
EVED."
  310 LET HC=SC
  320 PRINT TAB 2;"ANOTHER GAME?
(Y/N)"
  330 IF INKEY$="Y" THEN GOTO 9
  340 IF INKEY$="N" THEN STOP
  350 GOTO 330
  900 SAVE "BLOCK STOP"
  910 GOTO 1
```



BLOCK STOP

THE BLACK SQUARE moves across the screen, leaving a trail of black squares behind it. Its object is to reach the bottom of the screen and escape. You must prevent that for as long as possible.

You are the grey square, leaving a grey trail. Whenever the black square hits a black square it will move down a row. Whenever it hits a grey square it will move up a row. When finally it reaches the bottom of the screen your score will be given. Avoid crashing into the border of the playing area.

Block Stop was written by M Thompson of Ashford, Kent for the 16K ZX-81.

LAB

OUR INITIAL reaction on playing **Labyrinth,** by Steven Vignaux of Bridgwater, Somerset was that it surpassed comparable professional software. Perhaps that is not surprising for Vignaux has had more access to computers than the majority of our readers.

His school owns five Spectrums and he was having lessons on them and practising on his ZX-81 at home until he upgraded to a Spectrum last Christmas. He is developing his programming skills and is learning machine code.

On RUNning Labyrinth you will find yourself inside the entrance of a large maze, from which it is your object to escape. Three-dimensional views of the maze to north, south, east and west can be obtained at the press of a button. When you are completely lost, press "H" and a plan of the maze will be displayed briefly, but that option is available only five times during your journey (16K Spectrum).

```
  10 CLEAR : GO SUB 8000
  20 RESTORE 9000: GO SUB 9000
  30 PRINT AT 21,0; FLASH 1;"
       PRESS ANY KEY          "
  40 IF INKEY$="" THEN GO TO 40
  50 BRIGHT 0
  60 FOR n=9 TO 21: PRINT AT n,0
;,,: NEXT n
  70 PRINT AT 10,1;"Press ~Y~ fo
r the instructions"
  80 IF INKEY$="" THEN GO TO 80
  90 IF INKEY$="Y" OR INKEY$="y"
 THEN GO SUB 8200
 100 LET b$="8": LET d=1: LET m=
0
 110 LET p=0: LET x=9: LET y=1
 120 LET x1=x: LET y1=y
 140 BORDER 7: PAPER 7: CLS : IN
K 0
 150 GO TO 500
 220 IF a$="5" THEN LET b$=a$: L
ET d=-1: BEEP .2,10: GO TO 500
 230 IF a$="8" THEN LET b$=a$: L
ET d=1: BEEP .2,10: GO TO 500
 240 IF a$="6" THEN LET b$=a$: L
ET d=1: BEEP .2,10: GO TO 500
 250 IF a$="7" THEN LET b$=a$: L
ET d=-1: BEEP .2,10: GO TO 500
 260 LET a$=INKEY$: IF a$="" THE
N GO TO 260
 270 BEEP .2,0: IF a$="H" OR a$=
"h" THEN LET p=p+1: IF p<=5 THEN
 BEEP .2,10: GO SUB 1000: GO TO
500
 280 IF a$="0" THEN GO TO 300
 290 GO TO 220
 300 IF b$="8" THEN LET y1=y1+1
 310 IF b$="5" THEN LET y1=y1-1
 320 IF b$="6" THEN LET x1=x1+1
 330 IF b$="7" THEN LET x1=x1-1
 400 BEEP .2,10: CLS
 410 IF y1=0 AND x1<>15 THEN LET
 y1=1: PRINT AT 2,3;"You are try
ing to leave by";AT 4,3;"going t
hrough the entrance";AT 6,11;"Tr
y again": FOR n=0 TO 250: NEXT n
: GO TO 500
 420 IF x1=15 AND y1=1 THEN LET
m=m+1: GO TO 3000
 430 IF a(x1,y1)=1 THEN PRINT AT
 10,2;"You cannot go through wal
ls.";AT 12,12;"Try again": FOR n
=0 TO 200: NEXT n: LET x1=x: LET
 y1=y: GO TO 500
 440 LET m=m+1
 500 CLS : PRINT AT 1,6;"You are
 looking ";d$((VAL b$)-4)
 510 PLOT 8,0: DRAW 0,175: PLOT
247,0: DRAW 0,175
 520 IF b$="8" OR b$="5" THEN GO
 TO 800
 530 LET x=x1: LET y=y1
 540 LET d1=d: FOR i=1 TO 5
 550 IF a(x+d,y)=1 THEN GO SUB (
i*10)+2000: LET d=d1: GO TO 260
 560 IF a(x+d,y-1)=1 THEN GO SUB
 (i*10)+2060: GO TO 580
 570 GO SUB (i*10)+2210
 580 IF a(x+d,y+1)=1 THEN GO SUB
 (i*10)+2110: GO TO 600
 590 GO SUB (i*10)+2160
 610 LET d=d+d1: NEXT i
 620 LET d=d1: GO TO 260
 800 LET x=x1: LET y=y1
 810 LET d1=d: FOR i=1 TO 5
 815 IF y+d=0 AND x<>15 THEN GO
TO (i*10)+2490
 817 IF y+d=0 OR y+d=32 THEN IF
x=15 THEN GO TO (i*10)+2590
 820 IF a(x,y+d)=1 THEN GO SUB (
i*10)+2000: LET d=d1: GO TO 260
 830 IF a(x-1,y+d)=1 THEN GO SUB
 (i*10)+2060: GO TO 850
 840 GO SUB (i*10)+2210
 850 IF a(x+1,y+d)=1 THEN GO SUB
 (i*10)+2110: GO TO 870
 860 GO SUB (i*10)+2160
 880 LET d=d+d1: NEXT i
 890 LET d=d1: GO TO 260
1000 BORDER 7: PAPER 7: CLS : IN
K 0
1010 PRINT AT 0,8;"PLAN OF MAZE
No.";p
1020 FOR n=1 TO 20: FOR b=1 TO 3
1
1030 IF a(n,b)=1 THEN PRINT AT n
,b;"■"
1040 NEXT b: NEXT n
1050 IF x=9 AND y=1 THEN PRINT A
T 9,0;">"
1060 PRINT AT x,y; FLASH 1;"X"
1070 IF x<>9 OR y<>1 THEN PRINT
AT 9,1;">"
1080 PRINT AT 15,1;"<"
1100 PRINT £1;"    YOU ARE WHERE
 THE ~X~ IS."
1110 PRINT £0;"  ENTRANCE = >
      EXIT = <"
1130 FOR n=0 TO 50
1140 BEEP .05,n: BEEP .05,50-n
1150 NEXT n
1160 CLS : RETURN
2010 DRAW -239,0: PLOT 8,0: DRAW
 239,0: RETURN
2020 PLOT 48,32: DRAW 159,0: PLO
T 48,144: DRAW 159,0: RETURN
2030 PLOT 80,56: DRAW 95,0: PLOT
 80,120: DRAW 95,0: RETURN
2040 PLOT 104,72: DRAW 47,0: PLO
T 104,104: DRAW 47,0: RETURN
2050 PLOT 120,80: DRAW 15,0: PLO
T 120,96: DRAW 15,0: RETURN
2060 RETURN
2070 PLOT 8,0: DRAW 40,32: DRAW
0,111: DRAW -40,32: RETURN
2080 PLOT 48,32: DRAW 32,24: DRA
W 0,64: DRAW -32,24: RETURN
2090 PLOT 80,56: DRAW 24,16: DRA
W 0,32: DRAW -24,16: RETURN
2100 PLOT 104,72: DRAW 16,8: DRA
W 0,16: DRAW -16,8: RETURN
2110 PLOT 120,80: DRAW 8,8: DRAW
```

EYRINTH

```
 -8,8: RETURN
2120 PLOT 247,175: DRAW -40,-32:
 DRAW 0,-111: DRAW 40,-32: RETUR
N
2130 PLOT 207,32: DRAW -32,24: D
RAW 0,64: DRAW 32,24: RETURN
2140 PLOT 175,56: DRAW -24,16: D
RAW 0,32: DRAW 24,16: RETURN
2150 PLOT 151,72: DRAW -16,8: DR
AW 0,16: DRAW 16,8: RETURN
2160 PLOT 135,80: DRAW -8,8: DRA
W 8,8: RETURN
2170 PLOT 247,32: DRAW -40,0: DR
AW 0,112: DRAW 40,0: RETURN
2180 PLOT 207,56: DRAW -32,0: DR
AW 0,64: DRAW 32,0: RETURN
2190 PLOT 175,72: DRAW -24,0: DR
AW 0,32: DRAW 24,0: RETURN
2200 PLOT 151,80: DRAW -16,0: DR
AW 0,16: DRAW 16,0: RETURN
2210 PLOT 127,88: DRAW 8,0: RETU
RN
2220 PLOT 8,32: DRAW 40,0: DRAW
0,112: DRAW -40,0: RETURN
2230 PLOT 48,56: DRAW 32,0: DRAW
 0,64: DRAW -32,0: RETURN
2240 PLOT 80,72: DRAW 24,0: DRAW
 0,32: DRAW -24,0: RETURN
2250 PLOT 104,80: DRAW 16,0: DRA
W 0,16: DRAW -16,0: RETURN
2260 PLOT 127,88: DRAW -7,0: RET
URN
2500 PLOT 8,160: DRAW 239,0: PLO
T 8,151: DRAW 239,0: PRINT AT 2,
8;"E N T R A N C E": LET d=d1: G
O TO 260
2510 PLOT 48,136: DRAW 159,0: PL
OT 48,127: DRAW 159,0: PRINT AT
5,12;"ENTRANCE": LET d=d1: GO TO
 260
2550 LET d=d1: GO TO 260
2610 PLOT 48,136: DRAW 159,0: PL
OT 48,127: DRAW 159,0: PRINT AT
5,14;"EXIT": LET d=d1: GO TO 260
2700 GO TO 260
3000 BORDER 1: PAPER 1: CLS : IN
K 7: BRIGHT 1
3010 PRINT AT 21,0; FLASH 1;"(sP
:i95:2*sP:i96:93:i96:95:2*93:i97
:96:sP:94:92:i94:93:96:91:97:93:
95:i97:sP:i95:93:i94:92:i95:sP:9
5:sP)": RANDOMIZE USR 3280
3020 PRINT AT 21,0; FLASH 1;"(sP
:i95:2*sP:i91:i93:i92:95:2*93:i9
7:sP:96:92:sP:i91:i93:i96:sP:95:
sP:95:91:i97:i95:sP:i95:sP:i94:9
3:97:sP)": RANDOMIZE USR 3280
3030 PRINT AT 21,0; FLASH 1;"(sP
:i91:i93:i97:i95:sP:2*95:2*i93:9
2:sP:95:2*sP:i95:sP:96:94:i92:i9
3:95:sP:91:i95:sP:i95:sP:i95:sP:
95:sP)": RANDOMIZE USR 3280
3035 PRINT AT 21,0; FLASH 1;"
                              "
3040 FOR n=0 TO 16
3050 RANDOMIZE USR 3280
3060 NEXT n
3070 BRIGHT 1
3080 PRINT AT 8,3;"You managed t
o get out in"
3090 PRINT AT 9,3;m;" moves."
3100>IF p=0 THEN PRINT AT 11,0;"
You did not ask for help at all"
;
3110 IF p=1 THEN PRINT AT 11,3;"
You asked for help once."
3120 IF p=2 THEN PRINT AT 11,3;"
You asked for help twice."
3130 IF p>2 THEN PRINT AT 11,2;"
You asked for help ";p;" times"
3140 PRINT AT 15,0;"Would you li
ke to see the maze  you have con
quered again ?"
3150 PRINT AT 18,8;"Press ~Y~ if
 YES"
3160 IF INKEY$="" THEN GO TO 316
0
3170 IF INKEY$="Y" OR INKEY$="y"
 THEN GO SUB 4000
3180 FOR n=15 TO 18: PRINT AT n,
0;,,: NEXT n
3190 PRINT AT 15,0;"Would you li
ke to play again ?"
3200 PRINT AT 18,8;"Press ~Y~ if
 YES"
3210 IF INKEY$="" THEN GO TO 321
0
3220 IF INKEY$="Y" OR INKEY$="y"
 THEN GO TO 3240
3230 BRIGHT 0: BORDER 7: PAPER 7
: CLS : INK 0: STOP
3240 GO TO 10
4000 BRIGHT 0: BORDER 7: PAPER 7
: CLS : INK 0
4005 PRINT AT 0,10;"PLAN OF MAZE
"
4010 FOR n=1 TO 20
4020 FOR i=1 TO 31
4030 IF a(n,i)=1 THEN PRINT AT n
,i;"■"
4040 NEXT i: NEXT n
4050 PRINT £0;"      PRESS ANY KE
Y TO RETURN "
4060 IF INKEY$="" THEN GO TO 406
0
4070 CLS : RETURN
8000 BORDER 1: PAPER 1: CLS : IN
K 7: BRIGHT 1
8005 PRINT AT 21,0; FLASH 1;"
                              ":
RANDOMIZE USR 3280
8010 PRINT AT 21,0; FLASH 1;"(sP
:i95:2*sP:i96:93:96:95:2*93:i97:
96:sP:94:92:i94:93:96:91:97:93:9
5:i97:sP:i95:93:i94:92:i95:sP:95
:sP)": RANDOMIZE USR 3280
8020 PRINT AT 21,0; FLASH 1;"(sP
:i95:2*sP:i91:i93:i92:95:2*93:i9
7:sP:96:92:sP:i91:i93:i96:sP:95:
sP:95:91:i97:i95:sP:i95:sP:i94:9
3:97:sP)": RANDOMIZE USR 3280
8030 PRINT AT 21,0; FLASH 1;"(sP
:i91:i93:i97:i95:sP:2*95:2*i93:9
2:sP:95:2*sP:i95:sP:96:94:i92:i9
3:95:sP:91:i95:sP:i95:sP:i95:sP:
95:sP)": RANDOMIZE USR 3280
8035 PRINT AT 21,0; FLASH 1;"
                              "
8040 FOR n=0 TO 16
8050 RANDOMIZE USR 3280
8060 NEXT n
8070 PRINT AT 9,8;"By Steven Vig
naux"
8080 PRINT AT 12,2;"Please wait
while I work out"
8090 PRINT AT 14,12;"the maze"
8100 RETURN
8210 PRINT AT 10,1;"
```

```
                    "
8220 PRINT AT 6,2;"The object of
 the game is to","find your way
out of the maze."
8230 PRINT "  If while trying to
 find your  way out of the maze
you find youare completely lost
then you can9et some help by Pre
ssin9 ~H~.  Once you have Presse
d the key   the screen will clea
r and you   will be shown a Plan
 of the     maze. This will indi
cate your  Position in the maze
, the exit  and the entrance. Ho
wever the   Plan will only remai
n on view   for a short Period o
f time."
8240 PRINT AT 21,0;"   PRESS ANY
 KEY TO CONTINUE    "
8250 IF INKEY$="" THEN GO TO 825
0
8260 BEEP .2,0: BEEP .2,10
8270 FOR n=6 TO 21: PRINT AT n,0
;,,: NEXT n
8275 PRINT AT 6,0;"  Another thi
n9 about the Plan  of the maze i
s that you are only9iven access
to it five times."
8280 PRINT "  Once the 9ame star
ts you will be 9iven a three dim
ensional    representation of th
e maze as   you would see it. Th
is view is  9overned by the dire
ction in    which you are lookin
9. You can  look either north,so
uth,east or west."
8290 PRINT "  When you move you
move one    Place forward in the
 direction  you are lookin9."
8300 PRINT AT 21,0;"   PRESS ANY
 KEY TO CONTINUE    "
8310 IF INKEY$="" THEN GO TO 831
0
8320 BEEP .2,0: BEEP .2,10
8330 FOR n=6 TO 21: PRINT AT n,0
;,,: NEXT n
8340 PRINT AT 6,0;"Keys for look
in9 in different   directions:"
8350 PRINT '" WEST    SOUTH    N
ORTH    EAST"
8360 PRINT "   5       6
7       8"
8370 PRINT '"As indicated by the
 arrows abovethe key."
8375 PRINT '"Press ~0~ to move o
ne Place     forward in the dire
ction you    are lookin9."
8380 PRINT '"       Press ~H~ fo
r HELP"
8390 PRINT AT 21,0;"     PRESS A
NY KEY TO PLAY"
8400 IF INKEY$="" THEN GO TO 840
0
8410 BEEP .2,0: BEEP .2,10
8420 BORDER 7: PAPER 7: CLS : IN
K 0
8430 RETURN
9000 DIM a(20,31): DIM d$(4,5)
9010 FOR n=1 TO 20
9020 READ b$
9030 FOR i=1 TO 31
9040 LET a(n,i)=VAL b$(i)
9070 NEXT i
9080 NEXT n: BEEP .2,0
9090 BEEP .2,10
9095 FOR n=1 TO 4: READ d$(n): N
EXT n: RETURN
9100 DATA "1111111111111111111111
1111111111"
9110 DATA "1010010001010000000000
0100100001"
9120 DATA "1000110101010111011111
0010001101"
9130 DATA "1010010111010101010001
1010100001"
9140 DATA "1011110100010100010101
1010111111"
9150 DATA "1000000001110111111010
1000100001"
9160 DATA "1010101110000000000001
1010101101"
9170 DATA "1010101000110101010101
1010000011"
9180 DATA "0010101010100101010101
1010111001"
9190 DATA "1011100000001101010111
1010101111"
9200 DATA "1010101111110010100010
0010000001"
9210 DATA "1110001010111000110111
1110101101"
9220 DATA "1000111010101111000010
0000101001"
9230 DATA "1111100000001010011111
1111101011"
9240 DATA "0010111010111010100000
0001001001"
9250 DATA "1010000010000010101111
0101111011"
9260 DATA "1010111111011111100011
0100000001"
9270 DATA "1000010000010000011111
0111011101"
9280 DATA "1010100101000111000000
0001000001"
9290 DATA "1111111111111111111111
1111111111"
9300 DATA "WEST","SOUTH","NORTH"
 "EAST"
```

```
 DDT    1 LET L=VAL "9"
    2 LET S=SGN PI
    3 CLS
   10 FOR N=11 TO 20 STEP .03
   20 IF RND>.5 THEN PRINT AT N,R
ND*15+2;"+"
   30 LET L=L+(INKEY$="A" AND L<1
7)-(INKEY$="1" AND L>2)
   40 PRINT AT 21,L-2;"(sP:93:isP
:94:sP)"
   50 IF INKEY$="0" THEN GOSUB 13
0
   60 NEXT N
  100 PRINT AT N,0;S
  110 PAUSE VAL "4E4"
  120 RUN
  130 FOR A=CODE "=" TO CODE "(9d
)" STEP -CODE "(91)"
  131 PRINT AT A,L;
  132 IF PEEK (PEEK 16398+256*PEE
K 16399)=21 THEN GOTO 140
  133 PRINT "(95)"
  133~PRINT "(95)"
  134 PRINT AT A,L;" "
  136 NEXT A
  137 GOTO VAL "100"
  140 LET S=S+CODE "(91)"
  141 PRINT " "
  142 RETURN
```

SPACE CRAZE

WHEN THIS GAME is RUN you find yourself at the bottom of the screen with a horde of dark shapes above you in the air. Maddened by that intrusion on your airspace, you rush from side to side, using keys "1" and "A", shooting at the shapes with key 0. The game ends with your score if you shoot an empty space or if you run out of time.

Space Craze was written for the 1K ZX-81 by P Roberts of Leominster, Herefordshire.

LASER BLAST

STOP THE ALIENS landing at their base on the planet Krypton. You have six laser bases, each of which is activated by the correspondingly-numbered key on your 16K ZX-81. As the aliens do not move smoothly but jump it is not sufficient to press one key continuously.

Laser Blast was written by Philip Cole of Rickmansworth, Hertfordshire.

```
 100 LET I$="
INSTRUCTIONS?"
 110 PRINT AT 5,0;I$
 120 LET I$=I$(2 TO )+I$(1)
 130 IF INKEY$="N" THEN GOTO 150
 140 IF INKEY$<>"Y" THEN GOTO 11
0
 150 IF INKEY$="Y" THEN GOSUB 70
00
 160 CLS
 164 LET L$=".....................
..........."
 166 LET O$="
          "
 170 LET S$="     "
1000 REM ***LANDSCAPE***
1005 REM ,
1010 PRINT AT 16,0;"(9W)";AT 16,
31;")";AT 17,0;"(isP)(";AT 17,30
;"/(isP)";AT 18,0;"(2*isP)";AT 1
8,30;"(2*isP)";AT 19,0;"(2*isP)"
;AT 19,30;"(2*isP)"
1020 PRINT AT 20,0;"(2*isP:28*9f
:2*isP)"
1030 PRINT AT 2,0;"(i1)>";AT 7,0
;"(i2)>";AT 12,0;"(i3)>"
1040 PRINT AT 4,30;"<(i4)";AT 9,
30;"<(i5)";AT 14,30;"<(i6)"
1050 PRINT AT 21,0;"SCORE=";AT 2
1,14;"FUEL=500"
1060 LET T=0
1070 LET F=500
2000 REM ***ALIENS***
2005 REM ,
2010 LET A$="(9f)"
2020 LET B$="?"
2030 LET C$="F"
2040 LET S=0
2050 LET K=0
2497 REM
2498 REM ***PLAY***
2499 REM
2500 LET X=0
2510 LET A=(INT (RND*6)+1)
2520 LET S=(INT (RND*24)+8)
2530 IF A=1 OR A=2 OR A=3 OR A=4
 THEN LET P$=A$
2540 IF A=5 THEN LET P$=B$
2550 IF A=6 THEN LET P$=C$
2697 REM
2698 REM ***CONTINUE***
2699 REM
2700 IF F<=0 THEN GOTO 6000
2705 PRINT AT X,S+K;S$
2710 LET K=(INT (RND*5)-6)
2720 LET Z=(INT (RND*3)+1)
2730 LET X=X+Z
2740 IF X>=20 THEN GOTO 3200
2750 PRINT AT X,S+K;P$
2760 LET Y=0
2770 IF INKEY$="1" THEN LET Y=2
2780 IF INKEY$="2" THEN LET Y=7
2790 IF INKEY$="3" THEN LET Y=12
2800 IF Y=2 OR Y=7 OR Y=12 THEN
GOTO 3000
2810 IF INKEY$="4" THEN LET Y=4
2820 IF INKEY$="5" THEN LET Y=9
2830 IF INKEY$="6" THEN LET Y=14
2840 IF Y=4 OR Y=9 OR Y=14 THEN
GOTO 3100
2850 GOTO 2700
2997 REM
2998 REM ***FIRE***
2999 REM
3000 PRINT AT Y,2;L$;AT Y,2;O$
3010 LET F=F-10
3020 PRINT AT 21,19;S$;AT 21,19;
F
3030 IF X=Y THEN GOTO 5000
3040 GOTO 2700
3099 REM
3100 PRINT AT Y,0;L$;AT Y,0;O$
3110 LET F=F-10
3120 PRINT AT 21,19;S$;AT 21,19;
F
3130 IF X=Y THEN GOTO 5000
3140 GOTO 2700
3197 REM
3198 REM ***LANDED***
3199 REM
3200 LET T=T-10
3210 PRINT AT 21,6;S$;AT 21,6;T
3220 GOTO 2500
4997 REM
4998 REM ***ZAP***
4999 REM
5000 PRINT AT X,S+K;"(iz:is:ip)"
5010 IF A=1 OR A=2 OR A=3 OR A=4
 THEN LET T=T+25
5020 IF A=5 THEN LET T=T+(INT (R
ND*100)+1)
5030 IF A=6 THEN LET F=F+70
5040 FOR N=0 TO 20
5050 NEXT N
5060 PRINT AT 21,6;S$;AT 21,6;T
5070 PRINT AT 21,19;S$;AT 21,19;
F
5080 PRINT AT X,S+K;S$
5090 GOTO 2500
5999 REM
6000 REM ***THE END***
6010 REM
6020 CLS
6025 PRINT AT 2,1;"YOU SCORED- "
;T
6030 IF T<=100 THEN PRINT AT 2,1
;AT 10,4;"WHAT AN EMBARASSMENT..
."
6035 IF T<500 AND T>100 THEN PRI
NT AT 10,4;"NOT BAD   I SUPPOSE.
."
6040 IF T>=500 THEN PRINT AT 10,
4;"WELL DONE"
6050 PRINT AT 20,0;"DO YOU WANT
TO HAVE ANOTHER GO?"
6060 IF INKEY$="N" THEN GOTO 699
9
6070 IF INKEY$="Y" THEN GOTO 10
6080 GOTO 6060
6999 STOP
7000 REM ***INSTRUCTIONS***
7010 REM ,
7015 CLS
7020 PRINT TAB 10;"INSTRUCTIONS"
;TAB 9;"============"
7030 PRINT AT 2,2;"THE AIM OF TH
E GAME IS TO STOPTHE ALIENS FROM
 LANDING AT THEIRSPACE STATION O
N KRYPTON."
7040 PRINT AT 6,1;"USE KEYS 1,2,
3,4,5,6 TO FIRE."
7050 PRINT AT 8,1;"THE ALIENS AR
E:-"
7060 PRINT AT 10,0;"1. (9f)-WORT
H 25 POINTS";AT 12,0;"2. ?-WORTH
 0-100 POINTS";AT 14,0;"3. F-WOR
TH 70 FUEL POINTS"
7070 PRINT AT 17,7;"GOOD LUCK...
";AT 20,16;"ANY KEY TO START"
7080 IF INKEY$="" THEN GOTO 7080
7090 RETURN
```

```
  1 PAPER 7: BORDER 7: INK 0: C
LS
  2 LET go=0
  5 FOR p=1 TO 4: READ a$: FOR
n=0 TO 7
 10 READ m: POKE USR a$+n,m
 15 NEXT n: NEXT p
 20 DATA "a",0,16,56,124,254,12
4,56,16
 25 DATA "b",0,56,56,16,214,254
,214,16
 30 DATA "c",0,108,254,254,124,
124,56,16
 35 DATA "d",0,16,56,124,254,25
4,214,16
 40 PRINT AT 1,9;" P O K E R "
 42 PRINT AT 4,0;"  The compute
r will deal you a"'"five card PO
KER hand and you"'"delete as man
y cards as you wish"'"in an atte
mpt to obtain a good"'"winning h
and."
 44 PRINT AT 10,0;"  The comput
er gives you 20"'"credits to sta
rt with and you"'"bet (LIMIT 10
 credits) before"'"each hand is d
ealt"
 46 GO SUB 1400
 49 CLS : PRINT AT 2,0;"  Winni
ng hands are Paid:-";AT 4,5;"2 P
AIR -    -- Evens";AT 5,5;"3 OF
     -- 2/1";AT 6,5;"RUN
-- 4/1";AT 7,5;"FLUSH      -- 5/
1"
 50 PRINT AT 8,5;"FULL HOUSE --
 9/1";AT 9,5;"POKER      -- 14/1
";AT 10,5;"ST FLUSH   -- 20/1";A
T 11,5;"ROYAL FLUSH-- 50/1"

 56 GO SUB 1400
 60 CLS : PRINT AT 2,0;"  The k
eys used are:-";AT 4,5;"0 -- bet
 (rePeat key)";AT 5,5;"9 -- deal
";AT 6,5;"8 -- draw";AT 7,5;"7 -
- stand";AT 8,5;"6 -- cancel";AT
 9,5;"1 to 5 -- delete cards"
 62 GO SUB 1400
 71 DIM s$(4): DIM z$(4): DIM t
(5): DIM v(5): DIM c(5): DIM h(8
): DIM p$(8,11)
 72 FOR i=1 TO 4: READ s$(i): R
EAD z$(i): NEXT i
 73 DATA "a","A","b","K","c","Q
","d","J"
 74 FOR i=1 TO 8: READ h(i): NE
XT i: DATA 1,2,4,5,9,14,20,50
 75 FOR i=1 TO 8: READ p$(i): N

EXT i: DATA "2 PAIR","3 OF","RUN
","FLUSH","FULL HOUSE","POKER","
ST FLUSH","ROYAL FLUSH"
 76 LET credit=20: LET bet=0
 77 PAPER 4: CLS : GO SUB 2600
 79 IF credit=0 THEN GO SUB 400
0: GO TO 76
 80 FOR i=1 TO 5
 85 GO SUB 1010
 92 NEXT i
 93 LET bet=0
 94 PRINT AT 20,16;"
    "
 95 PRINT INK 7;AT 21,23;"
BET"
 97 LET a$=INKEY$: IF a$="0" TH
EN PAPER 4: CLS : GO TO 105
100 GO TO 97
104 PRINT INK 7;AT 21,27;"DEAL"
 GO SUB 1500

105 IF a$="0" AND credit>0 AND
bet<10 THEN LET bet=bet+1: LET c
redit=credit-1: GO SUB 2600: BEE
P .1,15: GO TO 104
111 IF a$<>"9" THEN GO TO 104
112 LET x=0: LET f=7: FOR p=1 T
O 13 STEP 3: GO SUB 500: GO SUB
559: NEXT p: PRINT INK 7;AT 20,1
8;"DELETE & DRAW";AT 21,23;"OR S
TAND": LET set=1: GO SUB 3000: L
ET set=0
115 GO SUB 1500
117 IF a$="7" THEN GO SUB 3000:
GO TO 79
118 IF a$="8" THEN PAPER 4: CLS
: GO SUB 2600: FOR i=1 TO 5: GO
SUB 1010: NEXT i: LET x=0: FOR
p=1 TO 13 STEP 3: GO SUB 500: GO
SUB 559: NEXT p: GO SUB 3000: G
O TO 79
119 GO SUB 2000
120 GO SUB 1500
121 IF a$="8" AND l=1 THEN GO T
O 118
122 IF a$<>"8" THEN GO TO 127
123 GO SUB 1700: GO SUB 2500: G
O SUB 3000
126 GO TO 79
127 IF a$="6" AND l=0 THEN GO S
UB 2500: GO SUB 2000
128 FOR i=1 TO 5
129 IF a$=STR$ i THEN LET l=0:
LET j(i)=1: LET f=4: LET p=2*i-2
: GO SUB 500: GO TO 120
130 NEXT i
135 GO TO 120

500 FOR m=2 TO 9
520 FOR q=0 TO 4
530 PRINT PAPER f;AT m,2*p+q;"
"
540 NEXT q: NEXT m
550 RETURN
559 LET x=x+1
560 IF v(x)<9 THEN PRINT PAPER
7;AT 2,2*p;v(x)+1
570 IF v(x)>=10 THEN PRINT PAPE
R 7;AT 2,2*p;z$(14-v(x))
575 IF t(x)=1 OR t(x)=3 THEN LE
T z=2
576 IF t(x)=2 OR t(x)=4 THEN LE
T z=0
580 PRINT PAPER 7; INK z;AT 3,2
*p;s$(t(x))
585 BEEP .05,5
590 RETURN
1010 LET c(i)=INT (RND*52)+1
1020 IF i=1 THEN GO TO 1050

1030 FOR m=1 TO i-1: IF c(i)=c(m
) THEN GO TO 1010
1040 NEXT m
1050 LET t(i)=INT ((c(i)-1)/13)+
1
1060 LET v(i)=c(i)-(t(i)-1)*13
1070 RETURN
1400 PRINT AT 21,2; FLASH 1;"Pre
ss any key to continue"
```

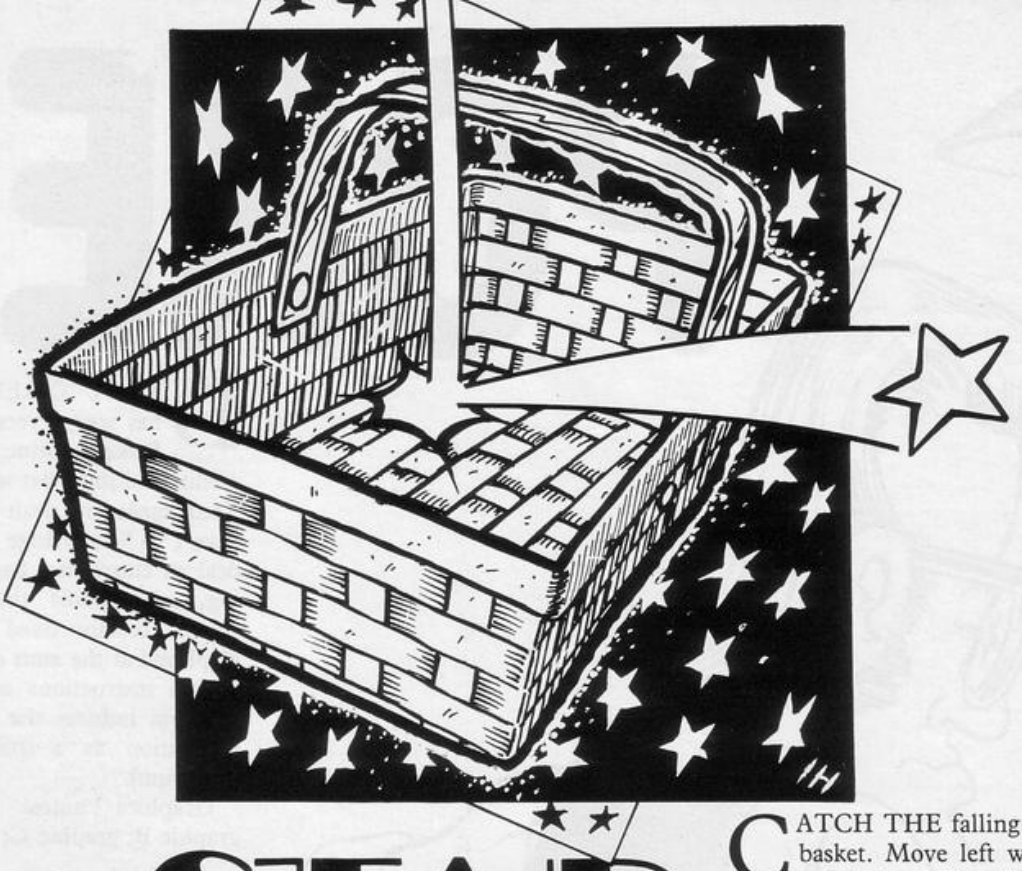
POKER

DANNY O'REILLY of Belfast has sent a version of the arcade **Poker** routine. You are given 20 credits and must bet whatever you dare. Your cards are dealt and you can hit keys 1 to 5 to change them. Key 8 will deal an entire new hand. You are playing, not against the computer, but against certain fixed odds which are displayed at the start of the program.

Full instructions are given and the program induces the same sleepy-eyed fascination as a fruit machine (16K Spectrum).

Graphics notes: 73—graphic A; graphic B; graphic C; graphic D.

```
1500 LET a$=INKEY$: IF a$="" THE
N GO TO 1500
1505 RETURN
1700 FOR i=1 TO 5: IF j(i)=0 THE
N GO TO 1705
1701 LET c(i)=INT (RND*52)+1
1702 FOR m=1 TO 5: IF i=m THEN G
O TO 1704
1703 IF c(i)=c(m) THEN GO TO 170
0
1704 NEXT m: GO SUB 1050
1705 NEXT i: RETURN
2000 DIM j(5): LET l=1
2001 RETURN
2500 FOR i=1 TO 5: IF j(i)=0 THE
N GO TO 2502
2501 LET f=7: LET p=3*i-2: LET x
=i-1: GO SUB 500: GO SUB 559
2502 NEXT i
2503 RETURN
2600 PRINT INK 7;AT 0,0;"CREDITS
";TAB 28;"BET"
2601 PRINT INK 7;AT 1,4;credit;T
AB 28;bet
2610 RETURN
3000 DIM n(13): DIM e(4): DIM r(
9): LET r(1)=-1: LET s=0
3002 FOR i=1 TO 5: LET n(v(i))=n
(v(i))+1: LET e(t(i))=e(t(i))+1:
 NEXT i
3005 FOR i=1 TO 13
3010 IF n(i)=2 THEN LET r(1)=r(1
)+1
3020 IF n(i)=3 THEN LET r(2)=1
3025 IF n(i)=4 THEN LET r(6)=1
3030 NEXT i
3040 FOR i=1 TO 13
3045 IF n(i)<>1 THEN GO TO 3060
3050 LET s=s+1: IF s=5 THEN GO T
O 3065
3052 IF i=4 AND s=4 AND n(13)=1
THEN GO TO 3065
3055 NEXT i
3060 LET s=0: NEXT i: GO TO 3080
3065 LET r(3)=1
3070 IF s=5 AND i=13 THEN LET r(
9)=1
3080 IF r(2)=1 AND r(1)=0 THEN L
ET r(5)=1
3090 FOR i=1 TO 4: IF e(i)=5 THE
N LET r(4)=1
3100 NEXT i

3110 IF r(3)=1 AND r(4)=1 THEN L
ET r(7)=1
3120 IF r(9)=1 AND r(4)=1 THEN L
ET r(8)=1
3130 FOR i=8 TO 1 STEP -1
3140 IF r(i)=1 THEN GO TO 3160
3150 NEXT i: RETURN
3160 PRINT FLASH 1; INK 7;AT 13,
12;"WINNER"
3163 PRINT INK 7;AT 15,12;p$(i)
3165 IF set=1 THEN RETURN
3170 LET win=h(i)*bet+bet
3180 FOR i=1 TO win
3190 LET credit=credit+1: PRINT
INK 7;AT 1,4;credit: BEEP .2,15:
 PAUSE 30
3200 NEXT i: RETURN
4000 PAUSE 100: PAPER 7: CLS : L
ET go=go+1: PRINT AT 11,2;"You h
ave run out of credits";AT 12,3;
"Do you wish to play again?";AT
13,11;"(Y or N)"
4001 INPUT a$: IF a$="Y" OR a$="
y" THEN RETURN
4002 CLS : PRINT AT 11,0;"You ha
ve lost ";go*20;" money units";A
T 12,4; FLASH 1;"THANK YOU FOR P
LAYING": STOP
```

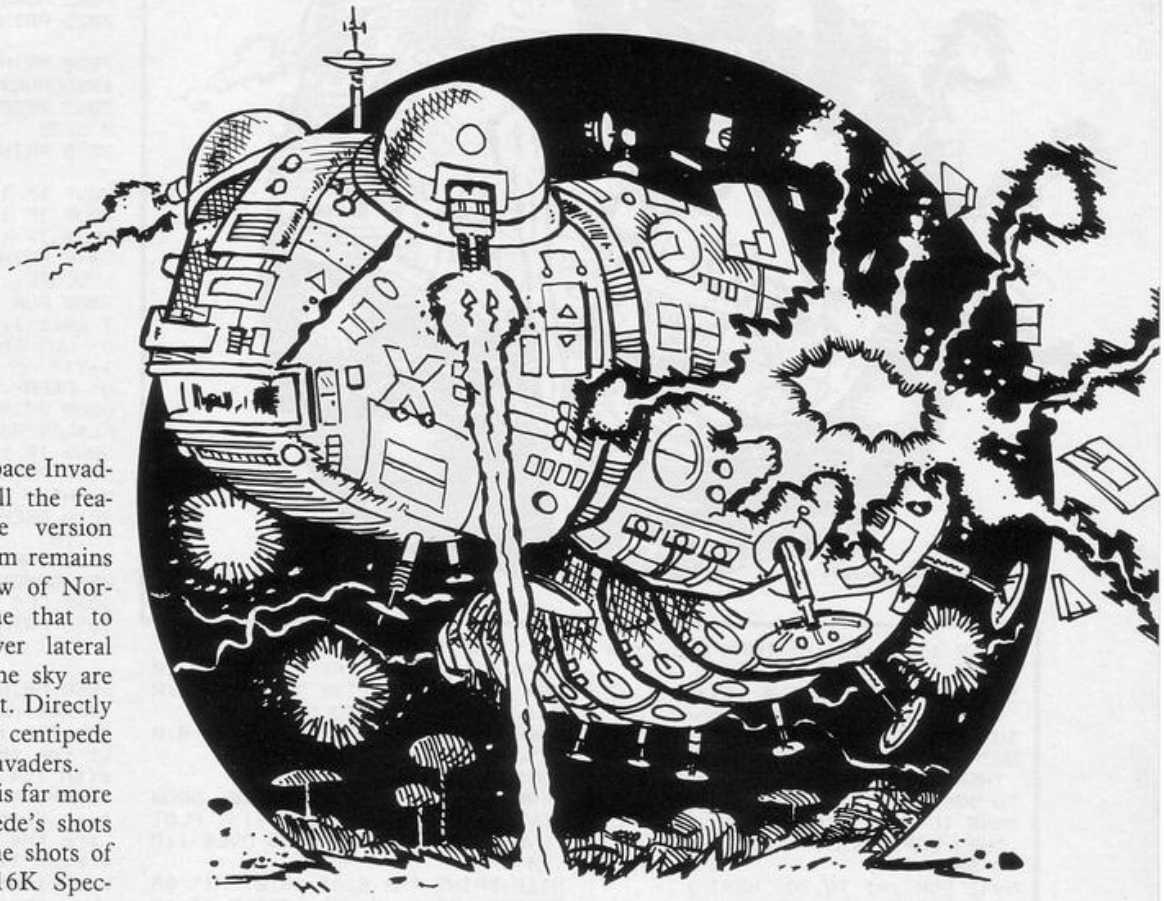


STAR CATCH

CATCH THE falling star in your basket. Move left with key "1" and right with key "2". When no key is being pressed the basket will move steadily to the right. Movement is limited because the game takes place in a small area surrounded by a frame and colliding with the right-hand side of the frame will cause you to explode.

Star Catch was written by P D Lodge of Chelmsford, Essex for the 16K ZX-81.

```
 10 LET A=8
 20 LET B=0
 30 LET C=4
 40 LET D=5
 50 LET E=26
 60 FOR F=D TO E
 70 PLOT E+10,F+10
 80 PLOT F+10,E+10
 90 PLOT D+10,F+10
100 PLOT F+10,D+10
110 NEXT F
120 FOR G=8 TO 17
130 PRINT AT 13,G;"(9h)"
140 NEXT G
150 LET H=INT (RND*17)+1
160 IF H<8 THEN GOTO 150
170 FOR I=4 TO 12
180 PRINT AT I,H;"*"
190 PRINT AT I,H;" "
200 IF INKEY$="1" THEN LET A=A-
2
210 IF INKEY$="2" THEN LET A=A+
1
220 IF A<5 THEN LET A=5
230 PRINT AT 12,7;"(98)"
240 PRINT AT 12,18;"(95)"
250 PRINT AT 13,20;"GOES LEFT="
;C-1
260 PRINT AT 12,A;"(2*sP:98:96:
95:sP)"
270 IF I=12 AND A+3=H OR I=12 A
ND A+4=H THEN LET B=B+1
280 IF A-1>12 THEN GOTO 330
290 LET A=A+1
300 PRINT AT 10,20;"SCORE=";B
310 NEXT I
320 GOTO 150
330 PRINT AT 11,14;"(sP:9y:95:9
t)"
340 PRINT AT 12,14;"(2*9y:98:9t
)"
360 PRINT AT 11,15;"(sP:2*92)"
370 PRINT AT 12,15;"(sP:9y:9r)"
390 PRINT AT 12,14;"(3*sP:9y)"
410 PRINT AT 12,14;"(4*sP)"
430 PRINT AT 11,14;"    "
440 LET C=C-1
450 IF C=0 THEN GOTO 480
460 LET A=7
470 GOTO 150
480 PRINT AT 21,2;"* PRESS ANY
KEY TO RESTART *"
490 PAUSE 10000
500 CLS
510 RUN
```

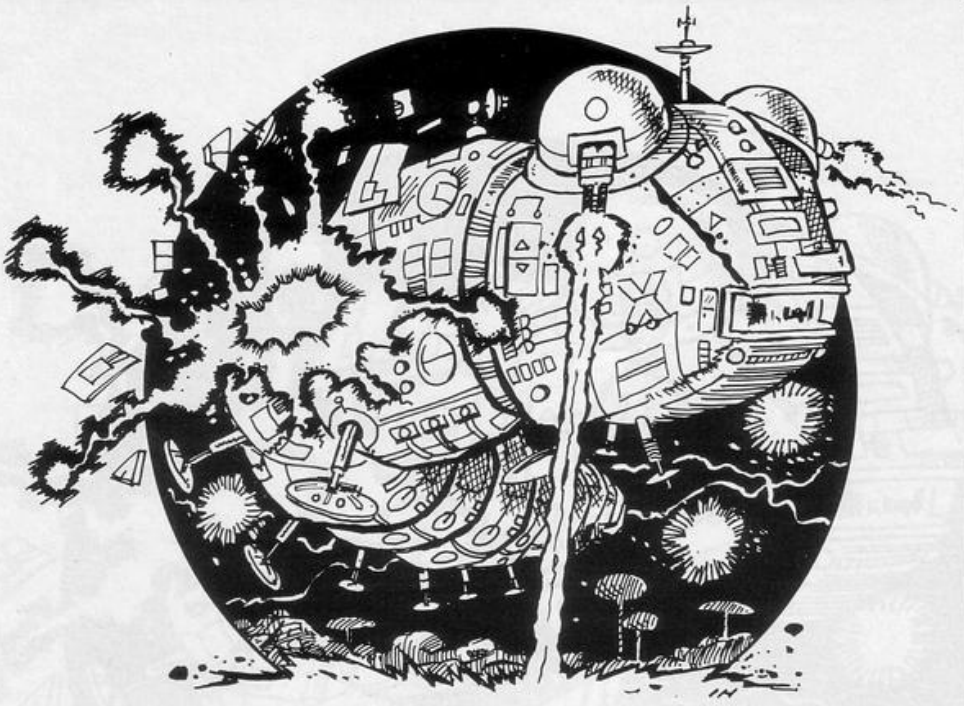


THE SEARCH for a Space Invaders-type game with all the features of the arcade version continues. The major problem remains one of speed. Timothy Shaw of Norwich, Norfolk has overcome that to some extent by some clever lateral thinking. The invaders in the sky are unaggressive and do not shoot. Directly above you, though, is a giant centipede which shoots to defend the invaders.

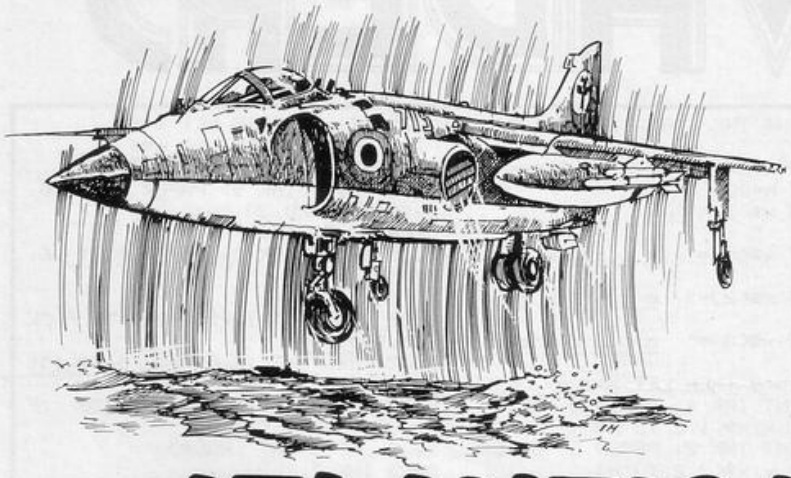
Because of its proximity it is far more difficult to avoid the centipede's shots than it would be to avoid the shots of the more distant invaders (16K Spectrum).

SPECVADERS

```
  15 CLS : PAPER 0: INK 7: BORDE
R 1: CLS
  30 LET hs=0
  40 CLS : PAPER 0: INK 7: BORDE
R 1: CLS
  50 GO SUB 9050
  90 LET c=0
 100 LET l=3
 150 CLS
 200 LET s=0
 205 RESTORE 260
 210 FOR r=1 TO 8
 220 READ d$
 230 FOR u=0 TO 7
 240 READ a: POKE USR d$+u,a: NE
XT u
 250 NEXT r
 260 DATA "a",231,36,126,126,126
,126,36,231
 270 DATA "b",8,85,127,55,62,28,
34,65

 280 DATA "c",60,102,102,219,219
,126,90,129
 290 DATA "d",0,0,24,60,126,255,
255,255
 300 DATA "e",0,24,60,90,153,153
,255,90
 310 DATA "f",0,24,60,126,255,25
5,66,66
 320 DATA "g",0,85,255,251,251,0
,223,223
 330 DATA "h",129,8,33,4,80,4,16
0,9
 400 LET a=15
 402 PRINT INK 0; PAPER 3;AT 0,2
2;"HIGH: ";hs
 403 PRINT AT 0,0; INK 0; PAPER
3;"SCORE:"
 405 PRINT INK 4;AT 21,0;"LIVES
d d d"
 410 LET x=6: LET y=6: LET z=6
 412 LET h=20
 415 DIM x$(3,h)

 420 LET x$(1)="  a a a a a a a
a a "
 430 LET x$(2)="  b b b b b b b
b b "
 440 LET x$(3)="  c c c c c c c
c c "
 470 IF h<0 THEN LET h=2
 500 PRINT INK 4; PAPER 0; BRIGH
T 1;AT 1,x;x$(1,2 TO h)
 520 PRINT INK 2; PAPER 0; BRIGH
T 1;AT 3,y;x$(2,2 TO h)
 540 PRINT INK 6; PAPER 0; BRIGH
T 1;AT 5,z;x$(3,2 TO h)
 560 IF l<=0 THEN PRINT AT 21,6;
"   ": GO TO 9000
 600 PRINT INK 6; PAPER 0;AT 20,
a;" d "
 640 IF INKEY$="9" THEN GO TO 70
00
 650 IF INKEY$=" " THEN GO SUB 5
000

 660 IF INKEY$="a" AND a>2 THEN
LET a=a-1
 665 IF INKEY$="d" AND a<27 THEN
 LET a=a+1
 670 PRINT INK 6; PAPER 0;AT 20,
a;" d "
 680 GO SUB 2000
 690 LET g=INT (RND*3): IF g=0 T
HEN LET x=x+1
 700 IF g=1 THEN LET y=y+1
 710 IF g=2 THEN LET z=z+1
 720 IF x>7 THEN LET x=6
 730 IF y>7 THEN LET y=6
 740 IF z>7 THEN LET z=6
 750 PRINT INK 5; PAPER 2;AT 20,
0;"99";AT 20,30;"99"
 760 GO TO 470
2000 PRINT INK 2; PAPER 0;AT 16,
c;" fffe "

2005 PRINT AT 16,26; INK 5; PAPE
R 0;"999999"
2007 PRINT AT 16,0; INK 5;"99999
9"
2010 LET c=c+1: BEEP .001,20: IF
 c>25 THEN LET c=6
2020 LET d=INT (RND*3)
2025 INK 7
2030 IF d<>0 THEN GO TO 3000
2040 PLOT OVER 1;c*8+32,39: DRAW
 OVER 1;0,-25: BEEP .009,30: PLO
T OVER 1;c*8+8,39: DRAW OVER 1;0
,-25: PLOT OVER 1;c*8+32,39: DRA
W OVER 1;0,-25: PLOT OVER 1;c*8+
8,39: DRAW OVER 1;0,-25
2050 PRINT INK 4; PAPER 0;AT 16,
c;" fffe "
2055 PRINT AT 16,26; INK 5; PAPE
R 0;"999999"
2060 IF c>25 THEN LET c=0

2070 IF CODE SCREEN$ (20,c+4)<>3
2 THEN GO SUB 8000: GO TO 3000
2080 IF CODE SCREEN$ (20,c+1)<>3
2 THEN GO SUB 8000: GO TO 3000
3010 RETURN
5000 IF SCREEN$ (16,a+1)="" THEN
 GO TO 5100
5010 PLOT OVER 1;a*8+12,16: DRAW
 OVER 1;0,150: BEEP .02,40: PLOT
```



```
 OVER 1;a*8+12,16: DRAW OVER 1;0
,150
5020 IF CODE SCREEN$ (5,a+1)<>32
 THEN LET s=s+10: LET h=h-2: GO
TO 5050
5030 IF CODE SCREEN$ (3,a+1)<>32
 THEN LET s=s+20: LET h=h-2: GO
TO 5060
5040 IF CODE SCREEN$ (1,a+1)<>32
 THEN LET s=s+30: LET h=h-2: GO
TO 5070
5042 FOR i=1 TO 30: NEXT i
5045 RETURN
5050 PRINT INK 7;AT 5,a+1;"h": B
EEP .2,7: PRINT PAPER 0;AT 5,a+1
;" ": GO TO 5080
5060 PRINT INK 7;AT 3,a+1;"h": B
EEP .2,7: PRINT PAPER 0;AT 3,a+1
;" ": GO TO 5080
5070 PRINT INK 7;AT 1,a+1;"h": B
EEP .2,7: PRINT INK 7; PAPER 0;A
T 1,a+1;" ": GO TO 5080
5080 PRINT INK 0; PAPER 3;AT 0,0
;"SCORE: ";s
5090 RETURN
5100 PLOT OVER 1;a*8+12,16: DRAW
 OVER 1;0,24: BEEP .01,-15: PLOT
 OVER 1;a*8+12,16: DRAW OVER 1;0
,24
5110 PRINT INK 6;AT 10,8;"HIT BA
RRIER": BEEP .01,35: PRINT AT 10
,8;"           ": RETURN
7000 FOR b=0 TO 31
7010 IF CODE SCREEN$ (1,b)=0 THE
N GO TO 450
7012 IF CODE SCREEN$ (3,b)=0 THE
N GO TO 450
7020 IF CODE SCREEN$ (5,b)=0 THE
N GO TO 450
7022 NEXT b
7025 PRINT AT 10,0;"
                    "
7030 PRINT FLASH 1;AT 10,0;"****
***BONUS*END*OF*SHEET******"
7033 BEEP .5,10: BEEP .5,-7: BEE
P 2,35
7035 PRINT AT 10,0;"
                    "
7037 IF l=3 THEN LET s=s+100
7038 IF l=2 THEN LET s=s+75
7039 IF l=1 THEN LET s=s+50
7040 PRINT INK 0; PAPER 3;AT 0,0
;"SCORE: ";s: GO TO 410
8000 FOR g=1 TO 5: PRINT INK g;A
T 20,a+1;"d": BEEP .1,g*2: NEXT
g: LET l=l-1: PRINT INK 3;AT 21,
l+7;"  ": BEEP .5,10: BEEP .2,-1
0: BEEP .5,35: RETURN
9000 PRINT FLASH 1;AT 10,0;"***A
LL*LIVES*LOST*END*OF*GAME***"
9005 IF s>hs THEN LET hs=s
9007 PRINT INK 0; PAPER 3;AT 0,2
2;"HIGH: ";hs
9010 BEEP .5,0: BEEP .5,0: BEEP
.5,10
9020 INPUT "PRESS ENTER FOR ANOT
HER GAME"; LINE z$
9030 CLS : GO TO 40
9050 PRINT AT 0,0; INK 0; PAPER
4;"       SPECTRUM  INVADERS
  "
9060 PRINT  '"In this version of
 spaceinvaders"'" you must dest
roy the invaders"'" but watch o
ut for the moving"'" centipede
with its double lazer"'"The inv
aders sometimes disappear"'" to
o so destroy them fast "'"These
 are the keys"'"   A-to move th
e base left"'"   D-to move the b
ase right"'"  SPACE-fire      0
-New sheet"
9065 PRINT FLASH 1;AT 21,10;"GOO
D LUCK!!"
9070 INPUT "Press enter to play"
; LINE z$
9075 RETURN
```



LAND YOUR small aircraft on an aircraft carrier in the Atlantic. To do it successfully you must bear in mind that your fuel is running out rapidly, your airspeed increases with your level and the number of times you land, and that the ship below you is also moving. Move upwards with key "6", and down with key "7".

Atlantic Lander runs on the 1K ZX-81 and was written by A Powell and T Goodhand of Bracknell, Berkshire.

ATLANTIC LANDER

```
   20 LET S=VAL "0"
  25 PRINT "INPUT LEVEL(1-5)"
  27 INPUT Z
  28 IF Z<VAL "0" OR Z>VAL "5" T
HEN GOTO VAL "27"
  30 LET A=INT (RND*VAL "15")
  40 LET F=VAL "50"
  50 LET B=F-F
  60 FOR C=VAL "25" TO VAL "0" S
TEP VAL "-1"
  70 PRINT AT VAL "20",C;"(94*3*
sP*93)"
  80 PRINT AT VAL "21",C;"(9r*3*
isP*9e)"
  90 PRINT AT A,B;"(2*9w)"
 100 LET F=F-VAL "1"
 105 IF F<VAL "0" THEN GOTO VAL
"240"
 109 IF A=VAL "20" THEN GOTO VAL
 "170"
 110 LET A=A+(INKEY$="6")-(INKEY
$="7")
 120 LET B=B+(Z/2)+(.3 AND Z=1)
 121 IF INT B>VAL "30" THEN LET
B=VAL "0"
 140 CLS
 150 NEXT C
 160 GOTO VAL "60"
 170 IF INT B=C+VAL "1" OR INT B
=C+VAL "2" THEN GOTO VAL "200"
 180 PRINT AT 20,B;"cras$"
 185 PRINT AT 0,0;"SCORE=";S
 190 PRINT "FUEL=";F
 195 STOP
 200 PRINT "LANDED...(ANY KEY)"
 210 LET S=S+INT (F/2)
 215 LET Z=Z+.8
 220 PAUSE 4E4
 230 GOTO VAL "30"
 240 FOR N=A TO VAL "21"
 250 PRINT AT N,B;"(2*9w)";AT N,
B;"  "
 260 NEXT N
 270 GOTO VAL "180"
```

FALL THROUGH

```
D   1 FAST
    2 CLS
    5 DIM S(2)
   10 DIM A$(8,10)
   15 DIM A(8)
   20 DIM D$(8,10)
   21 DIM M(2,8,8)
   25 DIM D(8)
   30 FOR N=1 TO 8
   40 FOR H=1 TO 5
   60 LET A$(N,2*H-INT (RND>.5))=
"(isP)"
   65 LET D$(N,2*H-(RND>.5))="(is
P)"
   70 NEXT H
   71 LET H=2+INT (RND*10)
   72 LET A$(N)=A$(N,H TO )+A$(N,
1 TO H-1)
   73 LET H=2+INT (RND*10)
   74 LET D$(N)=D$(N,H TO )+D$(N,
1 TO H-1)
   75 LET A(N)=INT (RND*3)
   76 LET D(N)=INT (RND*3)
   80 NEXT N
   90 SLOW
  100 FOR N=1 TO 8
  110 PRINT AT 2*N,4;
  120 FOR M=1 TO 8
  130 PRINT "(isP)"+CHR$ (128*(A$
(N,M)=" ")+131*(D$(M,N)=" " AND
A$(N,M)="(isP)"));
  140 NEXT M
  141 FOR D=0 TO A(N)
  142 PRINT "(isP(isP)";
  143 NEXT D
  150 FOR D=1 TO D(N)
  151 PRINT AT 16+2*D,2*N+3;"(isP
)"
  152 NEXT D
  160 NEXT N
  170 LET S(1)=8
  180 LET S(2)=8
  200 FOR M=1 TO 8
  210 FOR P=1 TO 2
  220 LET X=1
  230 LET Y=1
  270 PRINT AT 2*Y-1,3+2*X;CHR$ (
23+128*(M(1,X,Y)<>M(2,X,Y)))
  280 GOSUB 2500
  305 IF D=11 THEN GOTO 390
  307 PRINT AT 2*Y-1,3+2*X;CHR$ (
  307 PRINT AT 2*Y-1,3+2*X;CHR$ (
28*(M(1,X,Y)<>M(2,X,Y))+M(1,X,Y)
+M(2,X,Y))
  310 LET Y=Y-(D=8)+(D=2)
  320 IF Y<1 THEN LET Y=1
  330 IF Y>8 THEN LET Y=8
  340 LET X=X+(D=6)-(D=4)
  350 IF X<1 THEN LET X=1
  360 IF X>8 THEN LET X=8
  370 GOTO 270
  390 IF D$(X,Y)+A$(Y,X)="(2*isP)
" OR M(1,X,Y)<>M(2,X,Y) THEN GOT
O 280
  400 PRINT AT 2*Y-1,3+2*X;P
  405 LET M(P,X,Y)=P
  410 NEXT P
  420 NEXT M
  500 LET X=0
  510 LET Y=0
  520 LET P=1+(P=1)
  530 PRINT AT 2*Y,3+2*X;"*"
  540 GOSUB 2500
  565 PRINT AT 2*Y,3+2*X;" "
  570 IF ((D=2 OR D=8) AND X) OR
((D=4 OR D=6) AND Y) THEN GOTO 7
00
  580 LET Y=Y+(D=2)*(Y(8)-(D=8)*(
Y>0)
  590 LET X=X+(D=6)*(X(8)-(D=4)*(
X>0)
```

A BOARD is displayed, comprising horizontal and vertical strips, each with several holes in it. Each strip can be moved to three positions and the markings at the bottom and right-hand side indicate where they start.

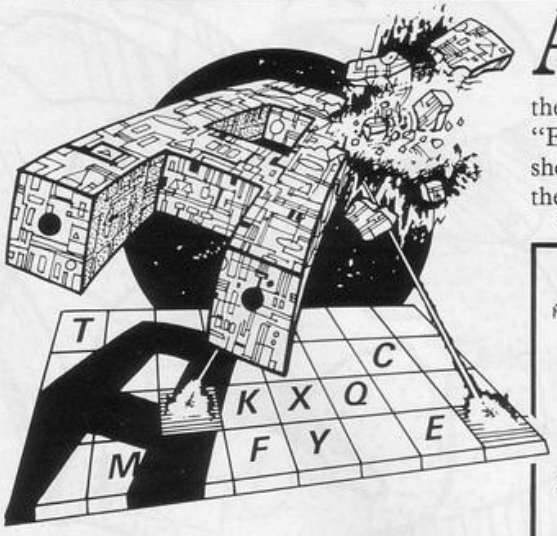
If a horizontal strip has a hole in the play area it is shown as a gap in the line. If a vertical strip has a hole in the play area it is visible only when it coincides with a hole in the vertical strip, in which case it appears as a hole.

The game begins with the two players taking turns to set their numbers on the board. Player one moves the cursor with keys 2,Q,W and A and sets a number with Z. Player two moves the cursor with 0, O,P and L and sets a number with. When each player has set eight numbers the cursor will move to a slightly higher position on the screen. Players must then take turns to choose a strip to move. The cursor then moves along the left and top of the board, so that a control key in line with the edge will move the cursor, and a control key in line with a strip will move that strip.
line with a strip will move that strip.

When the strips are moved so that a number stands on a hole it will fall through and vanish. The object of the game is to remove all your opponent's numbers.

Fall Through was written for the 16K ZX-81 by R Entwistle and son of Cheltenham.

```
  600 GOTO 530
  700 IF NOT X THEN GOTO 704
  701 IF (D=2 AND D(X)=2) OR (D=8
 AND D(X)=0) THEN GOTO 530
  704 IF NOT Y THEN GOTO 710
  705 IF (D=4 AND A(Y)=0) OR (D=6
 AND A(Y)=2) THEN GOTO 530
  710 IF D<>2 THEN GOTO 750
  720 LET D$(X)=D$(X,10)+D$(X,1 T
O 9)
  730 LET D(X)=D(X)+1
  740 GOTO 800
  750 IF D<>8 THEN GOTO 900
  760 LET D$(X)=D$(X,2 TO )+D$(X,
1)
  770 LET D(X)=D(X)-1
  800 FOR N=1 TO 2
  810 PRINT AT 2*N+16,2*X+3;CHR$
(128*(N<=D(X)))
  820 NEXT N
  830 FOR N=1 TO 8
  840 PRINT AT 2*N,3+2*X;CHR$ (12
8*(A$(N,X)=" ")+131*(D$(X,N)=" "
 AND A$(N,X)="(isP)"));
  850 IF D$(X,N)=" " OR A$(N,X)="
 " THEN GOTO 880
  859 IF NOT M(1,X,N) THEN GOTO 8
65
  860 LET S(1)=S(1)-1
  861 LET M(1,X,N)=0
  865 IF NOT M(2,X,N) THEN GOTO 8
70
  866 LET M(2,X,N)=0
  867 LET S(2)=S(2)-1
  870 PRINT AT 2*N-1,3+2*X;" "
  880 NEXT N
  890 GOTO 2000
  900 IF D<>6 THEN GOTO 950
  920 LET A$(Y)=A$(Y,10)+A$(Y,1 T
O 9)
  930 LET A(Y)=A(Y)+1
  940 GOTO 1000
  950 IF D<>4 THEN GOTO 2000
  960 LET A$(Y)=A$(Y,2 TO )+A$(Y,
1)
  970 LET A(Y)=A(Y)-1
1000 FOR N=1 TO 2
1010 PRINT AT 2*Y,2*N+20;CHR$ (1
28*(N<=A(Y)))
1020 NEXT N
1030 FOR N=1 TO 8
1040 PRINT AT 2*Y,3+2*N;CHR$ (12
8*(A$(Y,N)=" ")+131*(D$(N,Y)=" "
 AND A$(Y,N)="(isP)"));
1050 IF D$(N,Y)=" " OR A$(Y,N)="
 " THEN GOTO 1080
1060 IF NOT M(1,N,Y) THEN GOTO 1
065
1061 LET M(1,N,Y)=0
1062 LET S(1)=S(1)-1
1065 IF NOT M(2,N,Y) THEN GOTO 1
070
1066 LET M(2,N,Y)=0
1067 LET S(2)=S(2)-1
1070 PRINT AT 2*Y-1,3+2*N;" "
1080 NEXT N
2000 IF S(1)<=0 OR S(2)<=0 THEN
GOTO 2020
2010 GOTO 500
2020 IF S(1)<=0 THEN PRINT AT 20
,0;"PLAYER 1 HAS LOST"
2030 IF S(2)<=0 THEN PRINT AT 21
,0;"PLAYER 2 HAS LOST"
2040 PRINT AT 0,10;"PRESS N/L TO
 REPLAY"
2050 INPUT K$
2060 RUN
2500 LET K$=INKEY$
2510 IF P=1 THEN LET D=2*(K$="A"
)+4*(K$="Q")+6*(K$="W")+8*(K$="2
")+11*(K$="Z")
2520 IF P=2 THEN LET D=2*(K$="L"
)+4*(K$="O")+6*(K$="P")+8*(K$="0
")+11*(K$=".")
2530 IF NOT D THEN GOTO 2500
2540 RETURN
3000 CLEAR
3010 SAVE "FAIL THROUGH"
3020 RUN
```



ALPHA ATTACK

A STRING of random characters is printed at the top of the screen and one of them also appears at the bottom. Using the keys "Q"—left, "E"—right, and "P"—fire, you must shoot the character from the string at the top.

Your time to achieve that is limited and decreases after each shot. When the inverse "X" reaches the right of the screen your time has expired. The game ends when you miss for the third time.

Alpha Attack was written for the 16K Spectrum by Laurence Wood of Northampton.

```
   9 PRINT AT 10,10;"Any key": P
AUSE 0
  10 LET y=40: LET j=2: LET m=0:
 LET s=0: LET l=15
  20 CLS
  30 BORDER 6: PAPER 7: INK 1
  40 CLS : IF m=3 THEN GO TO 500
  50 FOR f=3 TO 25
  60 PRINT AT 3,f;CHR$ ((RND*100
)+27)
  70 NEXT f
  75 LET y=y+2
  80 GO TO 180
  90 FOR t=y TO 100
 100 IF t>70 THEN PRINT AT 5,t-7
0;"(sP:ix)"
 110 BEEP .009,t-40
 120 PRINT AT 20,l;"(sP:i96:i↑:9
6:sP)"
 130 LET l=l+(INKEY$="e")-(INKEY
$="q")+(l=0)-(l=28)
 140 IF INKEY$="p" THEN BEEP .00
5,10: BEEP .007,3: GO TO 220
 150 NEXT t
 160 BEEP 1,-50
 170 LET m=m+1: GO TO 40
 180 LET a$=SCREEN$ (3,INT (RND*
20)+3)
 190 PRINT AT 0,22;"SCORE= ";s;A
T 0,0;"Misses: ";m
 200 PRINT AT INT (RND*10)+10,IN
T (RND*30);a$
 210 GO TO 90
 220 FOR z=19 TO 4 STEP -1: PRIN
T AT z,l+2;"^": NEXT z
 230 IF SCREEN$ (3,l+2)<>a$ THEN
 BEEP .2,-30: BEEP .2,-60: LET m
=m+1: GO TO 40
 240 LET s=s+1
 250 BEEP .01,10: BEEP .01,20
 260 GO TO 40
 500 BEEP .7,-30: BEEP .7,-60: C
LS
 510 PRINT AT 10,9; FLASH 1;" Th
ird miss ! "; FLASH 0;AT 2,11;"S
core = ";s;AT 18,5;"Any key to P
lay again"
 520 PAUSE 0
 530 GO TO 10
```

```
 100 REM  Define Graphics
 105 RESTURE 1400 cc
 110 FOR n=144 TO 149: FOR m=0 T
O 7        c c d    c    c
 120 READ a: POKE USR CHR$ n+m,a
 130 NEXT m: NEXT n
 140 DATA 0,0,63,120,255,255,126
,0
 150 DATA 0,0,252,30,255,255,126
,0
 160 DATA 16,56,84,56,84,186,16,
16
 170 DATA 0,0,0,24,24,0,0,0
 180 DATA 0,0,56,0,0,0,0,0
 190 DATA 137,82,44,90,189,44,82
,137
 200 REM  Set-uP Game
 210 BORDER 0: PAPER 0: INK 6: C
LS
 220 PRINT AT 0,4;"a   T A N K
D U E L   b": PRINT
 230 PRINT TAB 9;"@ T. COLLINS":
 PRINT
 240 PRINT TAB 6;"GENERAL INSTRU
CTIONS": PRINT
 250 PRINT "  A game for two pla
yers, try toshoot your oPponents
 tank first."
 260 PRINT "  Avoid tank obstacl
es [ ] whichcan be shot"
 270 PRINT "  Trees [c] are harm
less but canblock shots."
 280 PRINT "  Avoid mines [d] wh
ich cannot  be shot."
 290 PRINT TAB 12;"CONTROLS": PR
INT
 300 PRINT " Player 1";TAB 23;"P
layer 2"
 310 PRINT "1-5:Move uP";TAB 21;
"6-0:Move uP"
 320 PRINT "Q-T:Move down";TAB 1
9;"Y-P:Move down"
 330 PRINT "Bottom row:Fire";TAB
 17;"Bottom row:Fire"
 340 FOR c=7 TO 1 STEP -1
 350 PRINT INK c;AT 0,8;"T A N K
  D U E L"
 352 PRINT INVERSE 1; INK c;AT 2
1,9;" PUSH ANY KEY "
 355 IF c=7 THEN PAUSE 10
 360 IF INKEY$<>"" THEN GO TO 40
0
 365 PAUSE 5
 370 NEXT c
 380 GO TO 340
 400 BORDER 7: PAPER 4: INK 1: C
LS
 410 INPUT "HOW MANY TANKS FOR P
LAYER 1? ";t1: IF t1>99 THEN GO
TO 410
 420 INPUT "HOW MANY TANKS FOR P
LAYER 2? ";t2: IF t2>99 THEN GO
TO 420
 430 PRINT INK 0; PAPER 7;"TANKS
 LEFT: ";t1;TAB 16;" TANKS LEFT:
 ";t2;TAB 31;" "
 440 PRINT INK 0; PAPER 7;AT 21,
0;"SHOTS LEFT: 5";TAB 16;"SHOTS
LEFT: 5";TAB 31;" "
 450 FOR n=5 TO 24 STEP 19: FOR
m=2 TO 19
 460 IF RND>.3 THEN GO TO 490
 470 LET o=INT (RND*3+n)
 480 PRINT INK 0;AT m,o;CHR$ 143
;AT m-1,o;CHR$ INT (RND*4+140);A
T m+1,o;CHR$ INT (RND*2+138);AT
m,o-1;CHR$ INT (RND*2+140);AT m,
o+1;CHR$ INT (RND*3+138)
 490 NEXT m: NEXT n
 500 FOR n=9 TO 18 STEP 9: FOR m
=1 TO 20: FOR o=n TO n+4
 510 IF RND<.3 THEN PRINT INK 7;
AT m,o;CHR$ 146
 520 NEXT o: NEXT m: NEXT n
 530 FOR n=1 TO 20: FOR m=14 TO
17
 540 IF RND<.3 THEN PRINT INK 2;
AT n,m;CHR$ 147
 550 NEXT m: NEXT n
 560 LET k=0
 600 REM  New Tanks
 605 FOR n=1 TO 100: NEXT n
 610 LET s1=5: LET s2=5
 615 PRINT INK 0; PAPER 7;AT 21,
0;"SHOTS LEFT: 5";TAB 16;"SHOTS
LEFT: 5";TAB 31;" "
 620 LET a=INT (RND*19+1): LET b
=1
 630 LET c=INT (RND*19+1): LET d
=30
 640 PRINT INK 1;AT a,b;CHR$ 144
;AT c,d;CHR$ 145
 650 BEEP .25,-10: BEEP .5,-5: P
AUSE 10: BEEP .25,-10: BEEP .5,-
5
1000 REM  Player 1 Move
1005 IF k=1 THEN LET k=0: GO TO
7000
```

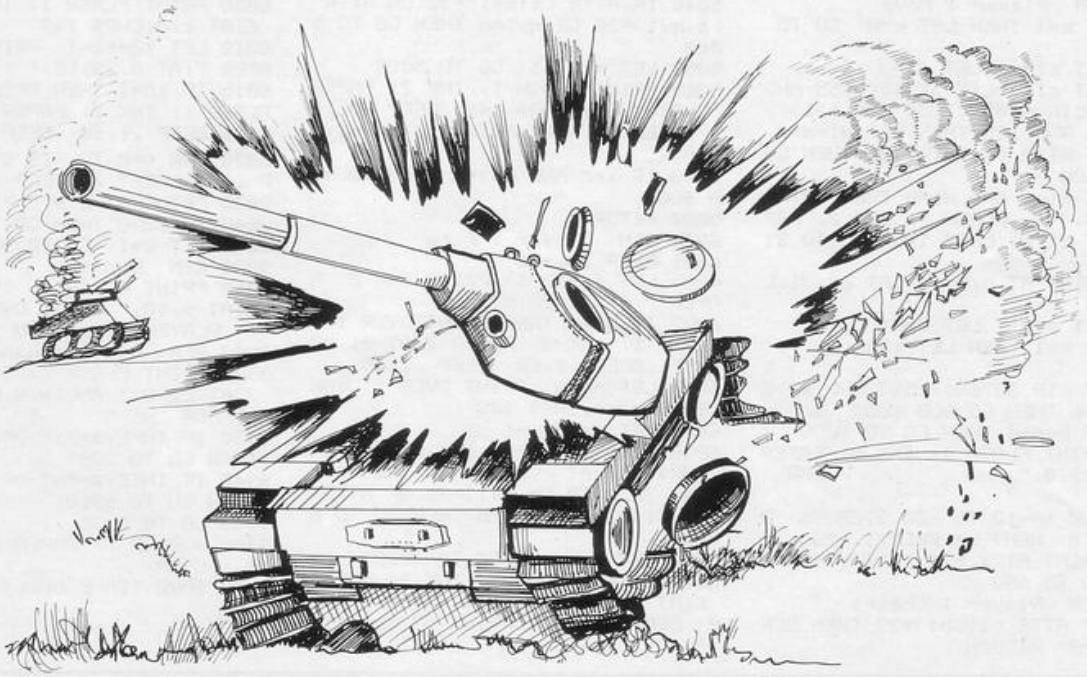
TANK DUEL

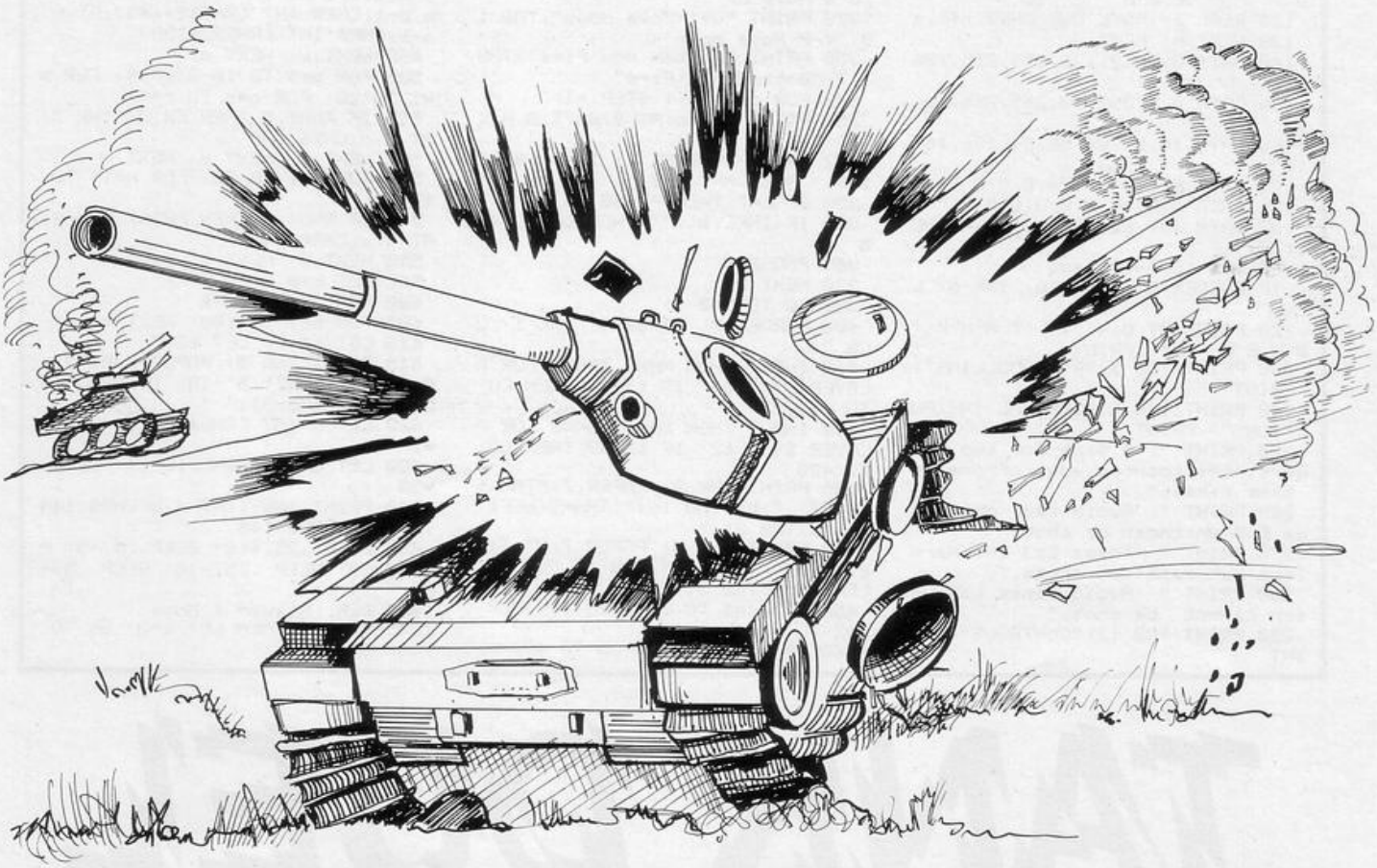
WE ARE BECOMING increasingly surprised and delighted at the quality of listings emerging as Spectrum owners become more and more skilful in the use of their machines. **Tank Duel** is yet another excellent listing to set alongside several others in this issue. It requires skill, luck and speed and is played on a stylised but convincing battleground.

Full instructions are given with the program but briefly the game requires two players to control a series of tanks travelling across varied terrain towards the final showdown.

Three types of obstacle are encountered — tank traps which can disable your vehicle but which can be blasted away; trees which can be pushed over but which will block your shells; and mines which can neither be pushed over nor destroyed by gunfire but which will not impede your shooting. The game was sent by A R P Collins of Enfield, Middlesex. (16K Spectrum).

Graphics notes:
220—Graphic A, graphic B
260—Graphic shifted 1
270—Graphic C
280—Graphic D.





```
1010 LET a1=a: LET b1=b
1020 LET a1=a+(IN 64510<>255 AND
 a<20)-(IN 63486<>255 AND a>1)
1030 IF RND<.25 THEN LET b1=b+1
1040 IF ATTR (a1,b1)<>33 THEN GO
 SUB 3000
1045 IF a1=c AND b1=d THEN PRINT
 AT a,b;" "; FLASH 1; INK 2; PAP
ER 6;AT a1,b1;CHR$ 149: GO TO 21
00
1050 PRINT AT a,b;" ";AT a1,b1;C
HR$ 144
1060 LET a=a1: LET b=b1
1070 IF k=1 THEN LET k=0: GO TO
7000
1080 IF (IN 65278<>255) AND s1>0
 AND b<d THEN GO SUB 5000
2000 REM  Player 2 Move
2005 IF k=1 THEN LET k=0: GO TO
8000
2010 LET c1=c: LET d1=d
2020 LET c1=c+(IN 57342<>255 AND
 c<20)-(IN 61438<>255 AND c>1)
2030 IF RND<.25 THEN LET d1=d-1
2040 IF ATTR (c1,d1)<>33 THEN GO
 SUB 4000
2045 IF c1=a AND d1=b THEN PRINT
 AT c,d;" "; FLASH 1; INK 2; PAP
ER 6;AT c1,d1;CHR$ 149: GO TO 21
00
2050 PRINT AT c,d;" ";AT c1,d1;C
HR$ 145
2060 LET c=c1: LET d=d1
2070 IF k=1 THEN LET k=0: GO TO
8000
2080 IF (IN 32766<>255) AND s2>0
 AND d>b THEN GO SUB 6000
2090 IF b<d+4 THEN GO TO 1000
2100 PRINT FLASH 1; INK 0; PAPER
 7;AT 21,0;"                DRAW
                "
2105 FOR n=-10 TO -20 STEP -1: B
EEP .1,n: NEXT n: BEEP 1,-20
2110 PRINT AT a,b;" ";AT c,d;" "
2130 GO TO 600
3000 REM  Player 1 Checks
3010 IF ATTR (a1,b1)=39 THEN BEE
P .1,-20: RETURN
3020 LET k=1: RETURN
4000 REM  Player 2 Checks
4010 IF ATTR (c1,d1)=39 THEN BEE
P .1,-20: RETURN
4020 LET k=1: RETURN
5000 REM  Player 1 Fire
5001 BEEP .1,-30
5005 LET s1=s1-1: PRINT INK 0; P
APER 7;AT 21,12;s1
5007 IF s1=1 THEN PRINT OVER 1;
FLASH 1; INK 0; PAPER 7;AT 21,12
;" ": BEEP .1,60: BEEP .1,40
5010 LET my=b: PRINT OVER 1; INK
 8;AT a,my;CHR$ 148
5020 LET my1=my+1
5030 PRINT OVER 1; INK 8;AT a,my
;CHR$ 148;AT a,my1;CHR$ 148
5040 IF ATTR (a,my1)=32 OR ATTR
(a,my1)=39 OR my1=d THEN GO TO 5
060
5050 LET my=my1: GO TO 5020
5060 PRINT FLASH 1; INK 2; PAPER
 6;AT a,my1;CHR$ 149: BEEP .05,2
0: BEEP .1,-10: PRINT AT a,my1;"
 "
5070 IF a=c AND my1=d THEN GO SU
B 8000
5080 RETURN
6000 REM  Player 2 Fire
6001 BEEP .1,-30
6005 LET s2=s2-1: PRINT INK 0; P
APER 7;AT 21,20;s2
6007 IF s2=1 THEN PRINT OVER 1;
FLASH 1; INK 0; PAPER 7;AT 21,28
;" ": BEEP .1,60: BEEP .1,40
6010 LET my=d: PRINT OVER 1; INK
 8;AT c,my;CHR$ 148
6020 LET my1=my-1
6030 PRINT OVER 1; INK 8;AT c,my
;CHR$ 148;AT c,my1;CHR$ 148
6040 IF ATTR (c,my1)=32 OR ATTR
(c,my1)=39 OR my1=b THEN GO TO 6
060
6050 LET my=my1: GO TO 6020
6060 PRINT FLASH 1; INK 2; PAPER
 6;AT c,my1;CHR$ 149: BEEP .05,2
0: BEEP .1,-10: PRINT AT c,my1;"
 "
6070 IF c=a AND my1=b THEN GO SU
B 7000
6080 RETURN
7000 REM  Death of Player 1
7005 PRINT FLASH 1; INK 2; PAPER
 6;AT a,b;CHR$ 149
7010 LET t1=t1-1: PRINT INK 0; P
APER 7;AT 0,12;t1;" "
7015 IF t1=1 THEN PRINT OVER 1;
FLASH 1; INK 0; PAPER 7;AT 0,12;
" ": BEEP .1,60: BEEP .1,40
7020 FOR n=0 TO -10 STEP -1: BEE
P .1,n: NEXT n: BEEP 1,-20
7030 PRINT AT a,b;" ";AT c,d;" "
7040 IF t1>0 THEN GO TO 600
7050 LET w=2: GO TO 9000
8000 REM  Death of Player 2
8005 PRINT FLASH 1; INK 2; PAPER
 6;AT c,d;CHR$ 149
8010 LET t2=t2-1: PRINT INK 0; P
APER 7;AT 0,29;t2;" "
8015 IF t2=1 THEN PRINT OVER 1;
FLASH 1; INK 0; PAPER 7;AT 0,29;
" ": BEEP .1,60: BEEP .1,40
8020 FOR n=0 TO -10 STEP -1: BEE
P .1,n: NEXT n: BEEP 1,-20
8030 PRINT AT c,d;" ";AT a,b;" "
8040 IF t2>0 THEN GO TO 600
8050 LET w=1: GO TO 9000
9000 REM  Winner
9010 PRINT FLASH 1; INK 2; PAPER
 6;AT 9,10;" GAME  OVER ";AT 11,
9;" PLAYER ";w;" WIN "
9900 REM  Another Game?
9920 PRINT FLASH 1; INK 0; PAPER
 7;AT 21,0;" ANOTHER GAME? PRESS
 'Y' OR 'N' "
9930 IF INKEY$="Y" OR INKEY$="y"
 THEN GO TO 200
9940 IF INKEY$="N" OR INKEY$="n"
 THEN GO TO 9960
9950 GO TO 9930
9960 BORDER 7: PAPER 7: INK 0: C
LS : STOP
9999 SAVE "TANK DUEL" LINE 100
```

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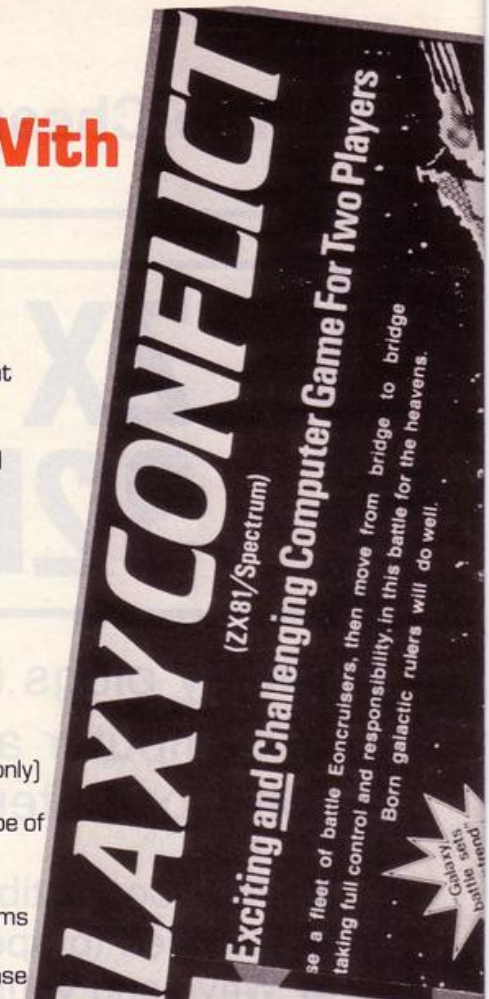

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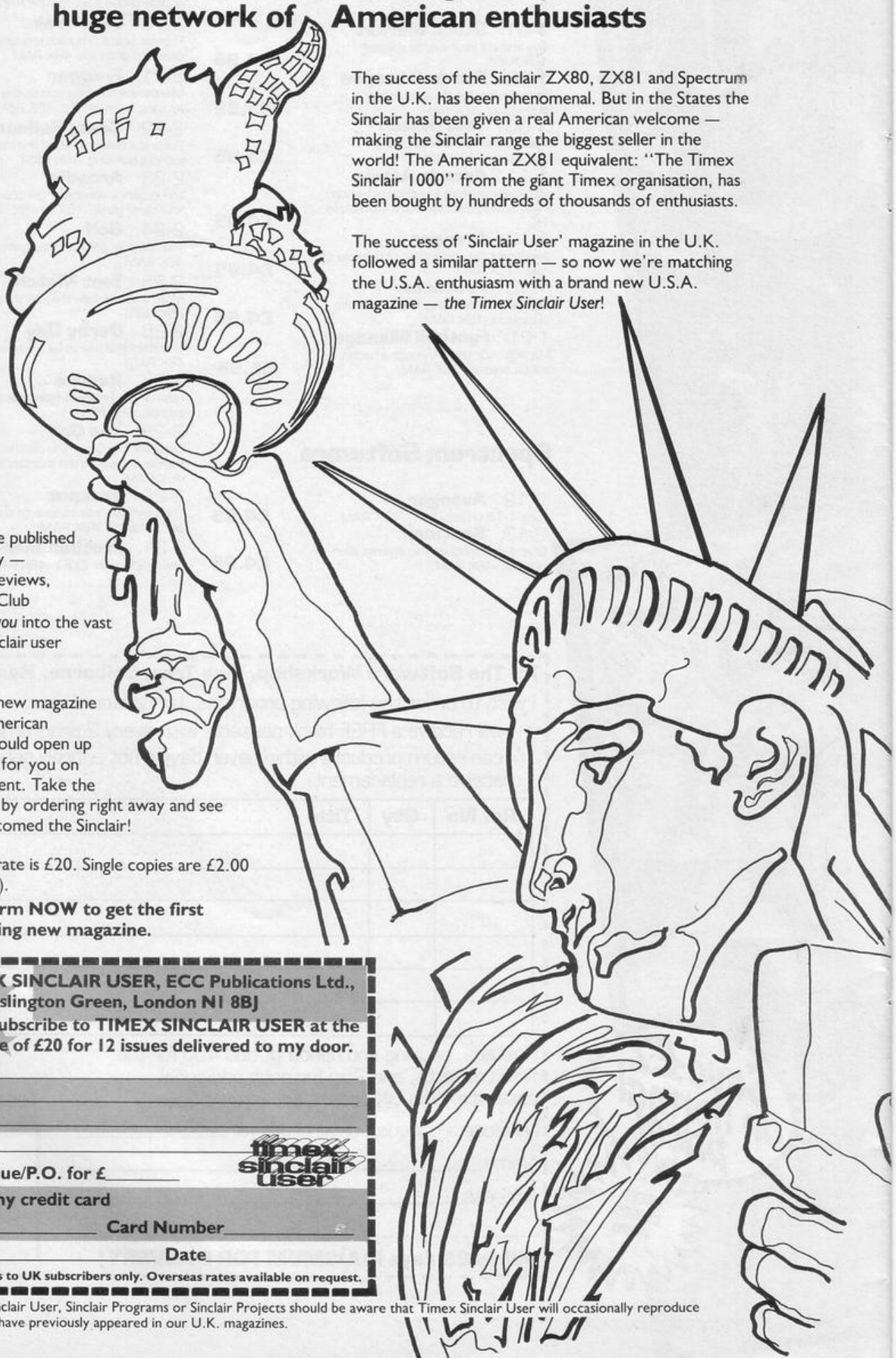

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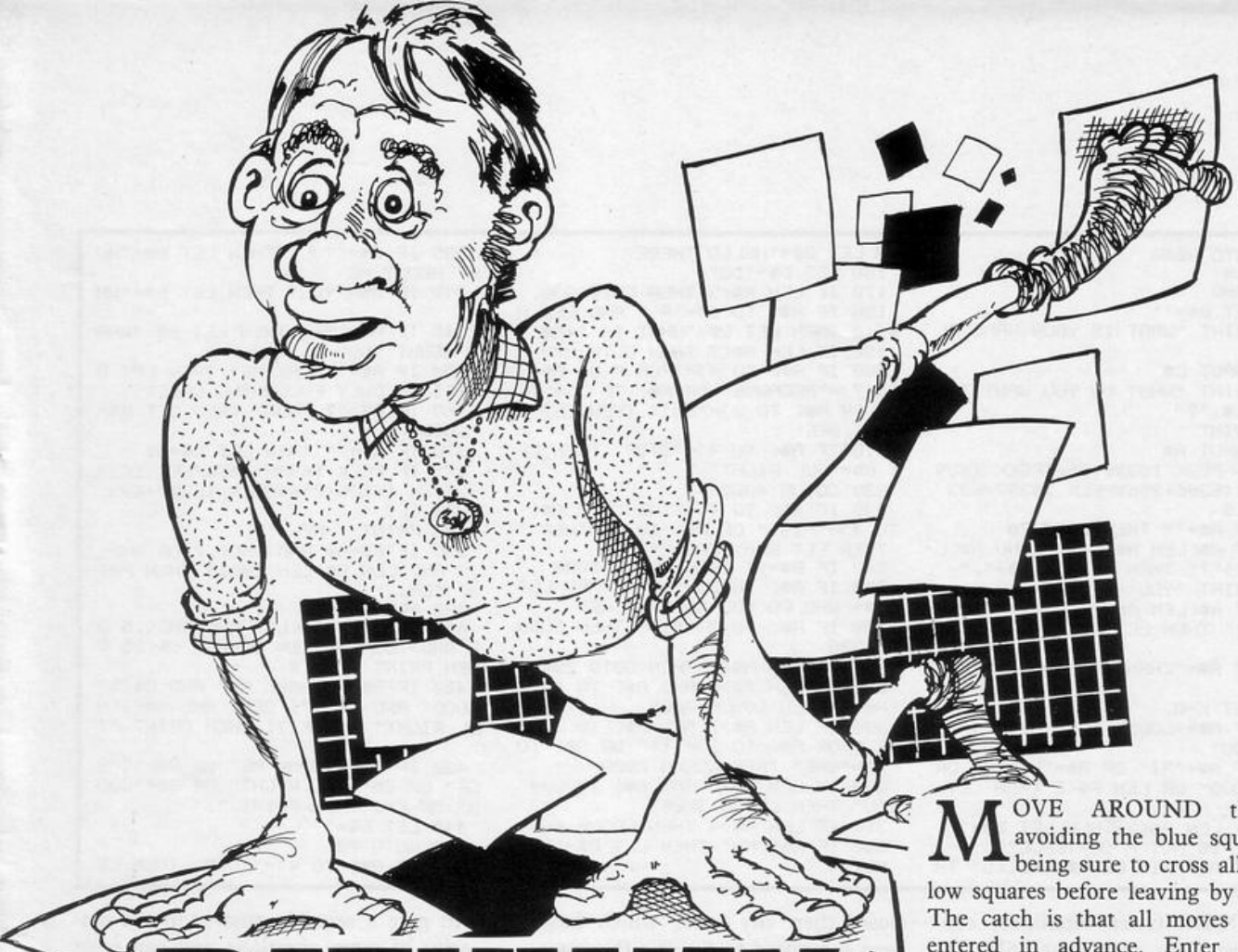


PATHWAY

MOVE AROUND the grid avoiding the blue squares but being sure to cross all the yellow squares before leaving by the exit. The catch is that all moves must be entered in advance. Enter them as "F"—forward, "B"—backward, "L"—left, "R"—right, and "S" when you have entered your moves to start your arrow moving.

Pathway runs on the 16K Spectrum and was written by Kevin Macdonald of Sheffield.

```
  40 POKE 23658,8
  50 LET Y=1
  60 LET SC=0
  70 LET J=0
  80 LET PH=18
  90 GO SUB 760
 100 FOR a=USR "a" TO USR "D"+7
 110 READ q: POKE a,q: NEXT a
 120 DATA BIN 11111111,BIN 10000
001,BIN 10000001,BIN 10000001,BI
N 10000001,BIN 10000001,BIN 1000
0001,BIN 11111111
 130 DATA BIN 00000000,BIN 00010
00,BIN 00000100,BIN 01111110,BIN
 00000100,BIN 00001000,0,0
 140 DATA 0,BIN 00010000,BIN 001
00000,BIN 01111110,BIN 00100000,
BIN 00010000,0,0
 150 DATA 0,BIN 00001000,BIN 000
01000,BIN 00001000,BIN 00101010,
BIN 00111100,BIN 00001000,0
 160 FOR b=0 TO 18
 170 PRINT AT B,0; INK 0; BRIGHT
 1;"AAAAAAAAAAAAAAAAAAAAAAAAAAAA
AAAA"; BRIGHT 0
 180 NEXT b
 200 FOR A=1 TO 80+(X*3*10)
 210 LET A1=INT (RND*18)
 220 LET A2=INT (RND*32)
 230 PRINT AT A1,A2; INK 1; PAPE
R 1;"."
 240 NEXT A
 250 FOR A=1 TO 3
 260 LET Y1=INT (RND*31)+1
 270 LET Y2=INT (RND*17)
 280 PRINT AT Y2,Y1; PAPER 6; IN
K 6;"T"
 290 NEXT A
 295 PRINT AT 0,0; INK 0; PAPER
0;"+"
 300 REM ENTER DIRECTIONS
 310 DIM D$(200,1)
 320 PRINT AT 21,0; FLASH 1;"
   PRESS ENTER TO START       "
 330 PAUSE 0
 340 PRINT AT 21,0;"
                              "
 350 LET PV=INT (RND*31)+1
 360 PRINT AT 18,PV; FLASH 1;"↑"
 370 PRINT AT 20,0;
 380 FOR A=1 TO 200
 390 PAUSE 0
 400 IF INKEY$="L" OR INKEY$="S"
 OR INKEY$="R" OR INKEY$="F" OR
INKEY$="B" THEN GO TO 430
 410 IF INKEY$=" " THEN GO TO 39
0
 420 GO TO 390
 430 IF INKEY$="S" THEN GO TO 48
0

 440 LET D$(A)=INKEY$
 450 PRINT INKEY$;: IF A=31 OR A
=62 OR A=93 OR A=124 OR A=165 TH
EN PRINT AT 20,0;"
                              ": PRINT AT 20
,0;
 460 BEEP .05,-10: BEEP .05,10
 470 NEXT A
 480 LET A1=A
 490 PRINT AT 20,0;"
                              "
 500 FOR A=1 TO 200
 520 LET PHL=PH: LET PVL=PV
 530 IF A=A1 THEN GO TO 670
 540 IF D$(A)="F" THEN LET PH=PH
-1: LET O$="↑"
 550 IF D$(A)="R" THEN LET PV=PV
+1: LET O$="B"
 560 IF D$(A)="L" THEN LET PV=PV
-1: LET O$="C"

 570 IF D$(A)="B" THEN LET PH=PH
+1: LET O$="D"
 580 IF SCREEN$ (PH,PV)="." THEN
 LET Y=0
 590 IF SCREEN$ (PH,PV)="T" THEN
 LET SC=SC+1: BEEP .5,40
 600 IF SCREEN$ (PH,PV)="+" AND
SC=3 THEN GO TO 710
 610 PRINT OVER 1;AT PH,PV;O$
 620 PRINT AT 19,0;D$(A)
 630 PRINT AT PHL,PVL; BRIGHT 1;
 PAPER 7;"A"
 640 IF Y=0 THEN GO TO 670
 650 BEEP .03,30: BEEP .03,0: BE
EP .03,30
 660 NEXT A
 670 PRINT AT 21,0; FLASH 1; PAP
ER 6; INK 0;"        YOU HAVE CR
ASHED        "
 680 BEEP .3,10: BEEP .3,20

 690 IF INKEY$="" THEN GO TO 670
 700 RUN
 710 PRINT AT 21,0; FLASH 1; INK
 1; PAPER 6;"              WELL DO
NE            "
 720 BEEP .3,30: BEEP .3,35
 730 IF INKEY$="" THEN GO TO 710
 740 PRINT AT 20,11;"SCORE=";A
 750 RUN
 760 CLS
 770 PRINT "      ENTER DIFFICULT
Y NO.": PRINT
 780 PRINT "  1-EASY": PRINT "
2-HARD": PRINT "  3-IMPOSSIBLE"
 790 PAUSE 0
 800 LET X=VAL INKEY$
 810 RETURN
```

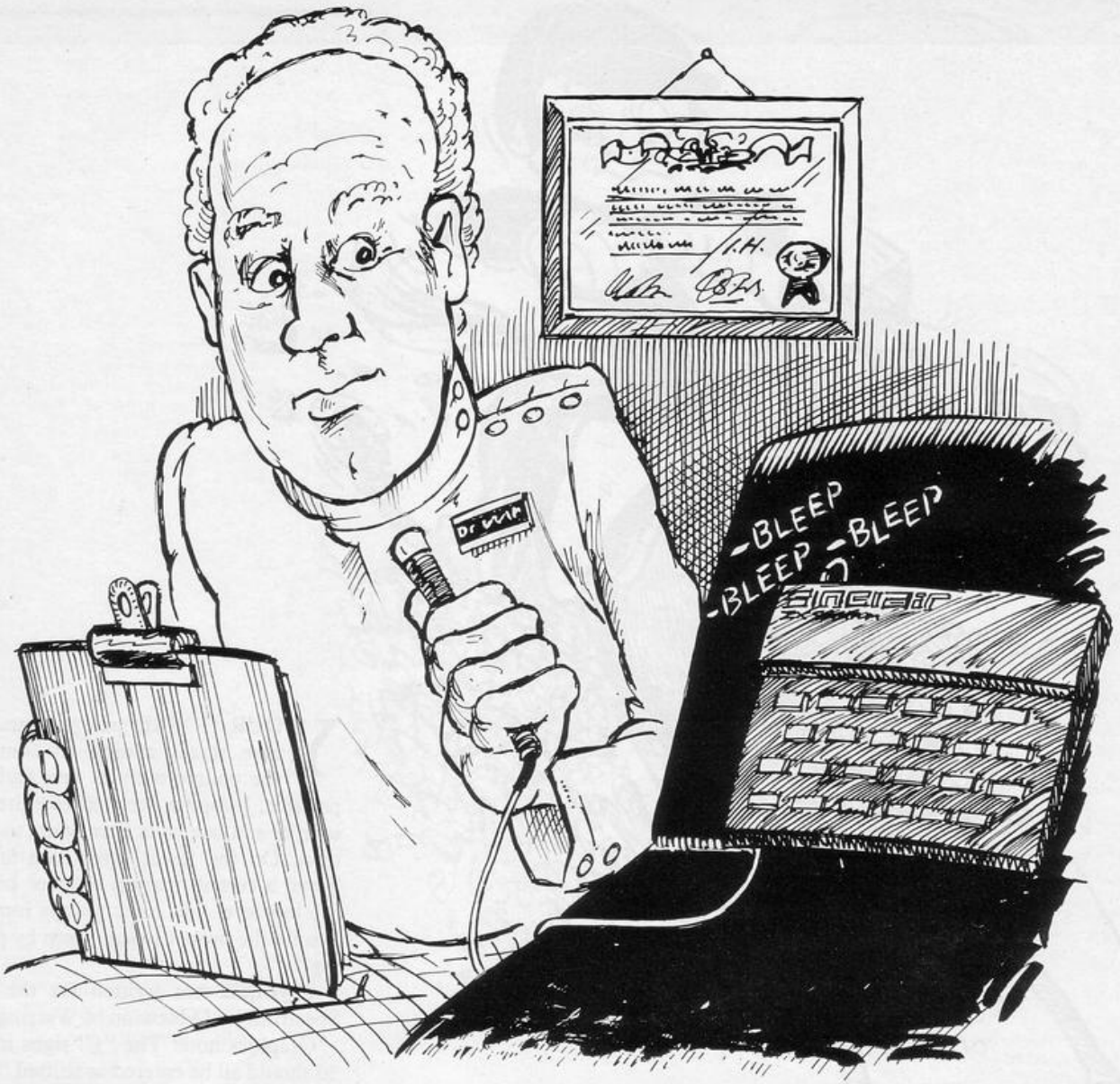
```
  5 GOTO 8000
  7 CLS
 10 RAND
 20 LET B$=""
 30 PRINT "WHAT IS YOUR NAME PL
EASE?"
 40 INPUT C$
 50 PRINT "WHAT DO YOU WANT TO
SAY ";C$;"?"
 60 PRINT
 70 INPUT A$
 75 IF PEEK 16398+256*PEEK 1639
9>PEEK 16396+256*PEEK 16397+693
THEN CLS
 80 IF A$="" THEN GOTO 70
 85 IF A$(LEN A$)<>"." AND A$(L
EN A$)<>"?" THEN LET A$=A$+"."
 90 PRINT "YOU:-";A$
100 IF A$(LEN A$)="." OR A$(LEN
 A$)="?" THEN LET A$=A$( TO LEN
A$-1)
105 IF A$="CHANGE USERS" THEN G
OTO 7
110 LET K=0
120 IF A$="GOOD" THEN LET B$="T
HANK YOU"
130 IF A$="HI" OR A$="HELLO" OR
 A$="GOOD" OR LEN A$<2 THEN LET
K=1
140 IF LEN A$<2 THEN LET B$="""
"+A$+"""IS NOT A SENTENCE"
150 IF A$="HI" OR A$="HELLO" TH
EN LET B$="HELLO THERE"
160 LET D$="DO"
170 IF LEN A$<3 THEN GOTO 330
180 IF A$( TO 2)="A " AND LEN A
$<10 THEN LET B$="WHAT IS "+A$
190 IF LEN A$<7 THEN GOTO 270
200 IF A$( TO 4)="FOR " OR A$(
TO 7)="BECAUSE" OR A$( TO 3)="TO
 " OR A$( TO 3)="SO " THEN LET B
$="I SEE"
210 IF A$( TO 4)="STOP" THEN LE
T B$="ALL RIGHT"
220 GOSUB 4000
230 IF A$( TO 4)="THE " OR A$(
TO 4)="HIS " OR A$( TO 4)="HER "
 THEN LET B$="REALLY"
240 IF B$="" THEN GOSUB 5000
250 IF A$( TO 3)="WE " THEN LET
 B$="WHO DO YOU MEAN BY WE"
260 IF A$( TO 2)="I " THEN GOSU
B 1000
270 IF LEN A$<5 THEN GOTO 290
280 IF LEN A$>8 AND A$( TO 4)="
THEY" THEN GOSUB 7000
290 IF LEN A$>7 AND A$( TO 3)="
HE " OR A$( TO 2)="IT" OR A$( TO
 3)="SHE" THEN GOSUB 2000
300 IF LEN A$>8 AND A$( TO 3)="
YOU" THEN GOSUB 3000
310 IF LEN A$>4 THEN GOSUB 460
330 IF A$="NO" THEN LET B$="WHY
 NOT"
335 IF A$="YOU" THEN LET B$="WH
AT ABOUT ME"
340 IF A$="YES" THEN LET B$="WH
Y"
345 IF A$="ME" THEN LET B$="WHA
T ABOUT YOU"
350 IF A$="THANK ME" THEN LET B
$="I AM ONLY FOLLOWING ORDERS"
360 IF A$="I KNOW" THEN LET B$=
"GOOD"
370 IF B$="" THEN LET B$=A$
375 IF PEEK 16398+256*PEEK 1639
9>PEEK 16396+256*PEEK 16397+693
THEN CLS
380 PRINT " ME:-";
390 IF B$=A$ AND RND<.7 OR RND<
.2 AND LEN B$+LEN C$<18 THEN PRI
NT "ER..";
400 PRINT B$;
410 IF B$="REALLY" AND RND<.5 O
R RND>.65 AND LEN B$+LEN C$<25 T
HEN PRINT " ";C$;
420 IF A$<>"THANK ME" AND B$<>"
GOOD" AND B$<>"I SEE" AND B$<>"A
LL RIGHT" AND K<>1 THEN PRINT "?
"
430 IF A$="THANK ME" OR B$="I S
EE" OR B$="ALL RIGHT" OR B$="GOO
D" OR K=1 THEN PRINT "."
440 LET B$=""
450 GOTO 70
460 IF A$( TO 4)="YOUR" THEN LE
```

HOLDING an intelligent conversation with your 16K ZX-81 may seem a remote possibility but this program by Simon Parker of Leeds makes that possibility closer than any other which has yet been submitted to *Sinclair Programs*.

Type-in your side of a **Conversation** and the computer responses will be displayed on the screen. The program will give a sensible answer to the majority of your questions and can even cope with philosophical points such as "What is the meaning of life?" or "Why did the chicken cross the road?"

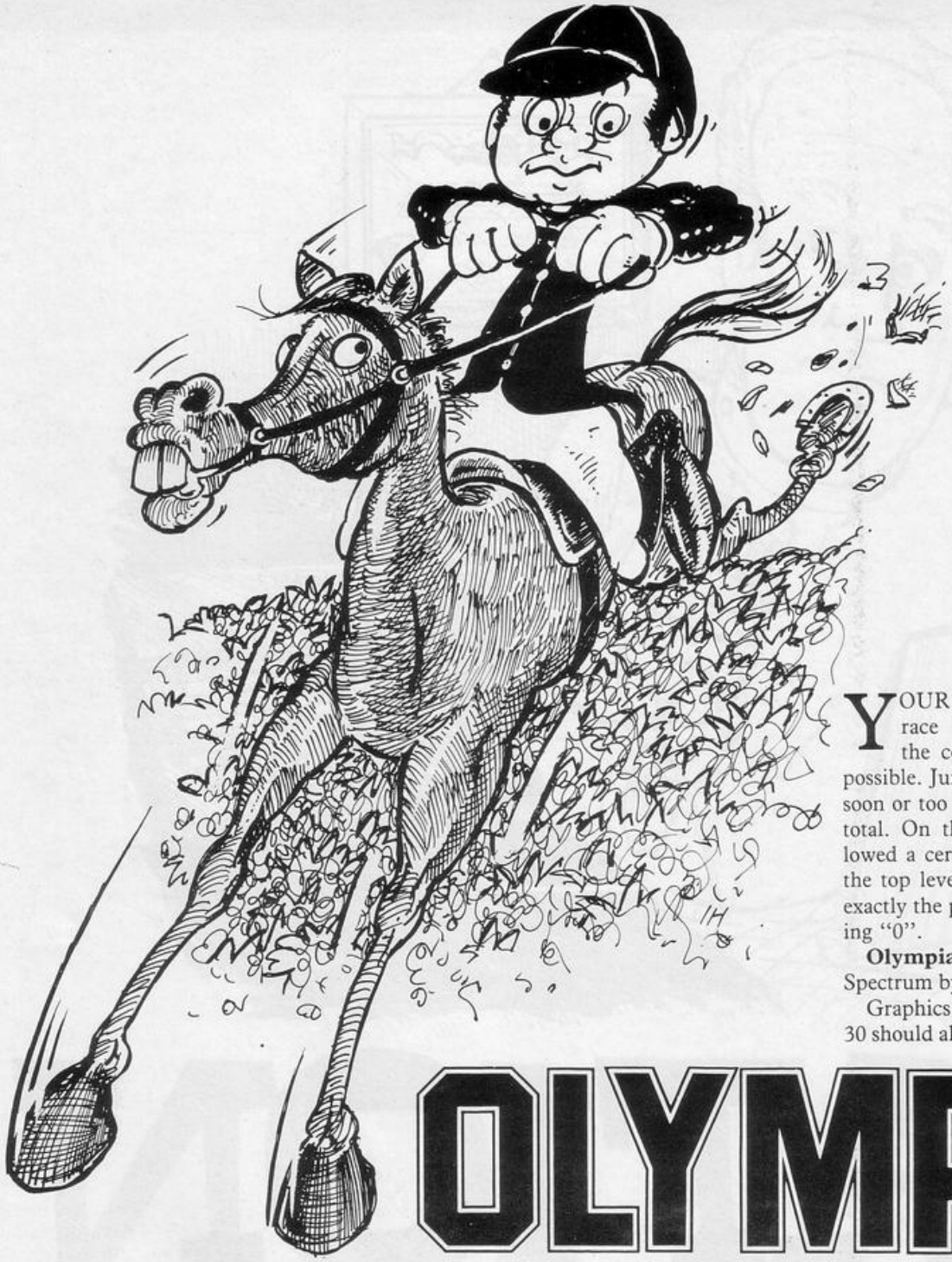
CONVER

```
T B$="I KNOW"
470 IF A$( TO 4)="YOUR" THEN LE
T K=1
480 IF A$( TO 4)="LOTS" THEN LE
T B$="SUCH AS"
490 IF A$( TO 3)="MY " THEN LET
 B$="YOUR"+A$(3 TO )
500 IF A$( TO 3)="ME " THEN LET
 B$="YOU"+A$(3 TO )
900 RETURN
1000 IF A$(3 TO 4)="AM" THEN LET
 B$="WHY ARE YOU"+A$(5 TO )
1002 IF A$(3 TO 5)="CAN" THEN LE
T B$="HOW CAN YOU"+A$(6 TO )
1005 IF A$(3 TO 5)="WAS" THEN LE
T B$="WHY WERE YOU"+A$(6 TO )
1007 IF A$(3 TO 5)="DID" THEN LE
T B$="WHY DID YOU"+A$(6 TO )
1008 IF A$(3 TO 4)="DO" AND B$="
" THEN LET B$="WHY DO YOU"+A$(5
TO )
1020 IF A$(3 TO 7)="COULD" THEN
LET B$="HOW COULD YOU"+A$(8 TO )
1030 IF A$(3 TO 6)="HAVE" THEN L
ET B$="WHY HAVE YOU"+A$(7 TO )
1040 IF A$(3 TO 7)="WROTE" THEN
LET B$="WHY DID YOU WRITE"+A$(8
TO )
1890 IF B$="" THEN LET B$="WHAT
"+D$+" YOU"+A$(2 TO )+" FOR"
1900 RETURN
2010 IF A$(5 TO 6)="IS" THEN LET
 B$="WHAT IS IT THAT MAKES HER "
+A$(7 TO )
2030 IF A$(4 TO 7)="DOES" THEN L
ET B$="WHY DOES "+A$( TO 2)+A$(8
 TO )
2035 IF A$(5 TO 8)="DOES" THEN L
ET B$="WHY DOES SHE"+A$(9 TO )
2040 IF A$(4 TO 6)="CAN" THEN LE
T B$="HOW CAN "+A$( TO 2)+A$(7 T
O )
2050 IF A$(5 TO 7)="CAN" THEN LE
T B$="HOW CAN SHE"+A$(8 TO )
2060 IF B$="" THEN LET B$="WHY I
S IT THAT "+A$
2900 RETURN
3000 IF A$(5 TO 7)="ARE" THEN LE
T B$="WHY AM I"+A$(8 TO )
3010 IF A$(5 TO 8)="WERE" THEN L
ET B$="WHY WAS I"+A$(9 TO )
3020 IF A$(5 TO 8)="HAVE" THEN L
ET B$="WHY HAVE I"+A$(9 TO )
3030 IF A$(5 TO 9)="WOULD" THEN
LET B$="WHY WOULD I"+A$(10 TO )
3040 IF A$(5 TO 7)="DO " THEN LE
T B$="WHAT DO I"+A$(7 TO )+" FOR
"
3050 IF A$(5 TO 7)="CAN" THEN LE
T B$="HOW CAN I"+A$(8 TO )
3080 IF B$="" THEN LET B$="WHAT
"+D$+" I"+A$(4 TO )+" FOR"
3090 RETURN
4000 IF A$( TO 4)="WHAT" OR A$(
TO 3)="WHO" THEN LET B$="I DO NO
T KNOW"
4005 IF A$( TO 3)="WHY" THEN LET
 B$="BECAUSE THAT IS THE WAY IT
IS"
4010 IF A$( TO 5)="WHERE" THEN L
ET B$="OVER THERE SOMEWHERE"
4020 IF A$( TO 3)="ARE" OR A$( T
O 5)="WILL " THEN LET B$="PROBAB
LY"
4030 IF A$( TO 5)="COULD" OR A$(
 TO 4)="CAN " THEN LET B$="I DOU
BT IT"
4040 IF A$( TO 5)="DO YO" THEN L
ET B$="I MIGHT DO"
4050 IF A$( TO 3)="HOW" OR A$( T
O 4)="WHEN" THEN LET B$="WHAT DO
```



RSATION

```
 YOU WANT TO KNOW   THAT FOR"
4060 IF B$="" THEN RETURN
4070 IF B$(1)<>"W" THEN LET K=1
4080 RETURN
5000 DIM A(LEN A$)
5005 LET B$="     "
5010 FOR F=5 TO LEN A$-1
5015 LET A(F)=0
5020 IF A$(F TO F+1)="MY" THEN L
ET A(F)=1
5021 IF A$(F-1 TO F+1)=" ME" THE
N LET A(F)=3
5023 IF A$(F-3 TO F+1)="LIKE " O
R A$(F-3 TO F+1)="LOVE " THEN LE
T K=F
5025 IF A$(F-2 TO F+1)="YOUR" TH
EN LET A(F)=2
5027 IF A$(F-1 TO F+1)="YOU" THE
N LET A(F)=4
5029 IF A$(F-1 TO F+1)=" I " THE
N LET A(F)=-1
5030 IF A$(LEN A$-1 TO )="ED" OR
 A$(F-1 TO F+1)="ED " OR A$(F-3
 TO F+1)="UGHT "  THEN LET D$="HA
VE"
5032 IF A$(F-1 TO F+1)="OFF" THE
N GOTO 9000
5035 NEXT F
5040 LET L=LEN A$
5050 FOR F=4 TO L
5055 IF A(F)=-1 THEN LET A$=A$(
TO F-1)+"YOU"+A$(F+1 TO )
5060 IF A(F)=1 THEN LET A$=A$( T
O F-1)+"YOUR"+A$(F+2 TO )
5062 IF A(F)=3 THEN LET A$=A$( T
O F-1)+"YOU"+A$(F+2 TO )
5065 IF A(F)=2 THEN LET A$=A$( T
O F-3)+"MY"+A$(F+1 TO )
5067 IF A(F)=4 THEN LET A$=A$( T
O F-2)+"ME"+A$(F+2 TO )
5070 NEXT F
5075 IF K>2 THEN LET B$="WHAT IS
"+A$(K+1 TO )+" LIKE"
5077 LET K=0
5080 IF A$(LEN A$)="S" AND B$( T
O 4)="WHAT" THEN LET B$="WHAT AR
E"+B$(8 TO )
6000 IF D$(1)=" " THEN LET B$=""
6020 RETURN
7000 IF A$(6 TO 9)="HAVE" THEN L
ET B$="WHY HAVE THEY"+A$(10 TO )
7010 IF A$(6 TO 8)="ARE" THEN LE
T B$="WHY ARE THEY"+A$(9 TO )
7020 IF B$="" THEN LET B$="WHY "
+D$+" THEY"+A$(5 TO )
7900 RETURN
8000 DIM A$(8,30)
8010 LET A$(1)=" I AM YOUR ZX81,
AND I AM HERE"
8020 LET A$(2)="TODAY TO COMMUNI
CATE WITH YOU,"
8030 LET A$(3)="AND MAKE YOU REA
LISE JUST HOW"
8040 LET A$(4)="MUCH THE WORLD O
F THE USERS"
8050 LET A$(5)="INTERESTS ME."
8060 LET A$(6)=" I HOPE I DO NOT
 SCARE YOU,AS"
8070 LET A$(7)="I AM A VERY FRIE
NDLY COMPUTER,"
8080 LET A$(8)="AS YOU SHALL SOO
N SEE."
8110 FOR F=1 TO 8
8115 FOR B=1 TO 30
8117 PRINT AT F*2+1,B;""
8120 PRINT AT F*2+1,B;A$(F,B)
8130 NEXT B
8150 NEXT F
8240 RUN 7
9000 CLS
9010 PRINT AT 10,1;"I DO NOT LIK
E YOUR LANGUAGE"
9020 PAUSE 150
9030 NEW
```



OLYMPIA

YOUR HORSE gallops round the race track, aiming to complete the course with as few faults as possible. Jumping over fences either too soon or too late adds four faults to your total. On the lower levels you are allowed a certain margin of error but on the top level you must always jump in exactly the proper place. Jump by pressing "0".

Olympia was written for the 16K Spectrum by D Newton of Warrington.

Graphics note: The "£" signs in line 30 should all be entered as shifted "3"s.

```
  15 BORDER 7: PAPER 6: INK 0
  18 GO SUB 1000
  21 PRINT "          OLYMPIA
          "
  23 LET b=.002: LET hs=80: LET
y=4: LET a=17
  25 PRINT AT 5,0;"     LEVEL (H
ARD)1-9(EASY)     ": PAUSE 0: IF
 INKEY$<"1" OR INKEY$>"9" THEN G
O TO 25
  26 LET p=VAL INKEY$
  27 CLS : LET s=0: LET f=0
  28 PRINT AT 8,0; FLASH 1;"## I
NTERNATIONAL  SHOWJUMPING ##"
  29 PRINT AT 4,5;"WINNING ROUND
 SO FAR";"=";hs
  30 PLOT 0,31: DRAW 255,0: PRIN
T AT 14,0;"£££££££££££ OLYMPIA £
£££££££££££"
  32 FOR c=0 TO 31: FOR v=9 TO 1
3: PRINT AT v,c; INK 0; PAPER 5;
"D": NEXT v: NEXT c
  33 FOR l=0 TO 31: PRINT AT 19,
l; INK 4;"E": NEXT l
  35 FOR x=30 TO 0 STEP -1: PRIN
T AT 17,x+1;" ";AT 17,x; INK 2;"
C"
  40 PRINT AT 17,0;" "
  45 IF s=20 THEN GO TO 700: IF
x=0 THEN GO TO 35
  50 PRINT AT a,y;"BA"
  60 IF x=6 THEN GO SUB 300
 200 BEEP b,10: PAUSE 1: BEEP b,
5: NEXT x: GO TO 35
 300 IF INKEY$="0" THEN PRINT AT
 20,0;"TOO EARLY 4 FAULTS": LET
f=f+4: GO TO 500
 305 PAUSE p*1.5
 310 IF INKEY$="0" THEN PRINT AT
 20,0;"JUST RIGHT": GO TO 500
 315 PAUSE p*1.5
 320 PAUSE 0: IF INKEY$="0" THEN
 PRINT AT 20,0;"TO LATE 4 FAULTS
": LET f=f+4: GO TO 500
 500 LET s=s+1
 505 PRINT AT a,y;"  ": LET a=a-
1: LET y=y+1: PRINT AT a,y;"BA"
 507 PAUSE 5
 510 PRINT AT a,y;"  ": LET y=y+
1: PRINT AT a,y;"BA"
 517 PAUSE 5
 520 PRINT AT a,y;"  ": LET y=y+
1: LET a=a+1: PRINT AT a,y;"BA"
 530 PAUSE 5
 535 PRINT AT a,y;"  "
 540 LET y=y-3: PRINT AT a,y;"BA
"
 545 PRINT AT 20,0;"
          "
 547 PRINT AT 17,x;" ": LET x=x-
3: NEXT x
 550 GO TO 35
 700 IF f=0 THEN PRINT AT 1,0;"Y
OU HAD A CLEAR ROUND,WELL DONE"
 720 PRINT AT 1,1;"HARD LUCK YOU
 COMPLETED THE      ROUND WITH ";
f;" FAULTS"
 725 IF f<hs THEN PRINT AT 5,1;"
YOUR ROUND WAS THE BEST TODAY":
PAUSE 50: LET hs=f
 730 PRINT AT 10,2;"PRESS ANY KE
Y TO START AGAIN! ": PAUSE 0
 740 GO TO 25
1000 FOR a=0 TO 7: READ s: POKE
USR "a"+a,s: NEXT a
1010 FOR a=0 TO 7: READ s: POKE
USR "b"+a,s: NEXT a
1020 FOR a=0 TO 7: READ s: POKE
USR "c"+a,s: NEXT a
1030 FOR a=0 TO 7: READ s: POKE
USR "d"+a,s: NEXT a
1040 FOR a=0 TO 7: READ s: POKE
USR "e"+a,s: NEXT a
1100 DATA 128,136,254,254,246,22
4,96,160,0,1,49,15,31,15,26,34,2
4,60,36,60,36,60,102,255,0,238,1
70,170,255,17,85,85,24,36,60,90,
126,36,60,24
1500 RETURN
```

MASTERMIND

THE COMPUTER chooses a series of three numbers and letters. It is then for you to discover, in as few turns as possible, the computer's series of numbers.

Unlike conventional **Mastermind** games, this version, written by D Shaw of Nether Poppleton, York for the 16K ZX-81, relies as much on luck as on your skill in logic.

```
 10 PRINT AT 10,8;"MASTERDIMN"
 20 FOR N=0 TO 100
 21 NEXT N
 30 FOR F=0 TO 7
 40 PRINT AT F,14;"     ";TAB 14
;" OO ";TAB 14;"(9t:2*97:9y)"
 50 NEXT F
 60 FOR N=0 TO 40
 61 NEXT N
 62 PRINT AT 8,15;"-"
 63 FOR N=0 TO 40
 64 NEXT N
 67 PRINT AT 8,15;"O"
 70 FOR G=8 TO 0 STEP -1
 80 PRINT AT G,14;" OO ";TAB 14
;"(9t:2*97:9y)";TAB 14;"DIMN";TA
B 14;"     "
 90 NEXT G
100 PRINT AT 0,14;"     ";TAB 14
;"     ";TAB 14;"     "
110 FOR N=0 TO 40
111 NEXT N
120 FOR J=0 TO 7
130 PRINT AT J,14;"     ";TAB 14
;" OO ";TAB 14;"(9t:2*97:9y)";TA
B 14;"MIND"
140 NEXT J
150 FOR N=0 TO 40
151 NEXT N
152 PRINT AT 8,16;"-"
153 FOR N=0 TO 40
154 NEXT N
155 PRINT AT 8,16;"O"
160 FOR K=7 TO 0 STEP -1
170 PRINT AT K,14;" OO ";TAB 14
;"(9t:2*97:9y)";TAB 14;"     "
180 NEXT K
190 PRINT AT 0,14;"     ";TAB 14
;"     "
200 FOR N=0 TO 100
201 NEXT N
210 CLS
213 PRINT AT 8,1;"(28*96)"
220 PRINT AT 9,1;"DO YOU WANT T
O SEE THE RULES                (
Y/N)"
222 PRINT AT 11,1;"(28*97)"
223 IF INKEY$<>"Y" AND INKEY$<>
"N" THEN GOTO 223
225 IF INKEY$="" THEN GOTO 225
230 IF INKEY$="Y" THEN GOTO 600
236 PRINT AT 12,0;"
                    "
237 CLS
240 LET A=INT (RND*35)+28
250 LET B=INT (RND*35)+28
260 LET C=INT (RND*35)+28
261 PRINT AT 11,10;"(98:97:9r:s
p:5*96:98:97:9r)";TAB 10;"(sp:98
:97:sp:95:3*sp:98:sp:98:97)";TAB
 10;"(sp:92:2*sp:5*97:sp:92)";TA
B 10;"(sp:93:8*sp:93)"
270 PRINT AT 12,15;"..."
275 LET S=0
280 INPUT E$
281 IF E$="Z" THEN GOTO 480
290 IF LEN E$<>3 THEN GOTO 280
291 LET S=S+1
300 IF E$(1)=CHR$ A THEN GOTO 4
00
310 IF E$(2)=CHR$ B THEN GOTO 4
30
320 IF E$(3)=CHR$ C THEN GOTO 4
60
330 IF E$(1)=CHR$ C THEN GOTO 5
00
340 IF E$(1)=CHR$ B THEN GOTO 5
00
350 IF E$(2)=CHR$ A THEN GOTO 5
00
360 IF E$(2)=CHR$ C THEN GOTO 5
00
370 IF E$(3)=CHR$ A THEN GOTO 5
00
300 IF E$(1)=CHR$ A THEN GOTO 4
00
310 IF E$(2)=CHR$ B THEN GOTO 4
30
320 IF E$(3)=CHR$ C THEN GOTO 4
60
330 IF E$(1)=CHR$ C THEN GOTO 5
00
340 IF E$(1)=CHR$ B THEN GOTO 5
00
350 IF E$(2)=CHR$ A THEN GOTO 5
00
360 IF E$(2)=CHR$ C THEN GOTO 5
00
370 IF E$(3)=CHR$ A THEN GOTO 5
00
380 IF E$(3)=CHR$ B THEN GOTO 5
00
381 IF E$(1)<>CHR$ A AND E$(1)<
>CHR$ B AND E$(1)<>CHR$ C AND E$
(2)<>CHR$ A AND E$(2)<>CHR$ B AN
D E$(2)<>CHR$ C AND E$(3)<>CHR$
A AND E$(3)<>CHR$ B AND E$(3)<>C
HR$ C THEN GOTO 9000
390 GOTO 280
400 PRINT AT 12,15;CHR$ A
430 IF E$(2)=CHR$ B THEN PRINT
AT 12,16;CHR$ B
460 IF E$(3)=CHR$ C THEN PRINT
AT 12,17;CHR$ C
470 GOTO 330
485 GOSUB 8000
490 PRINT AT 15,0;"DO YOU WANT
ANOTHER GAME (Y/N)"
491 IF INKEY$="" THEN GOTO 491
492 IF INKEY$="Y" THEN GOTO 210
493 IF INKEY$="N" THEN GOTO 700
500 PRINT AT 19,0;"ONE RIGHT IN
WRONG PLACE"
505 FOR N=0 TO 40
506 NEXT N
508 PRINT AT 19,0;"
                "
510 GOTO 280
600 PRINT AT 0,4;"----------
---------"
610 PRINT AT 1,4;"THE GAME OF M
ASTERMIND"
620 PRINT AT 2,4;"----------
---------"
630 PRINT AT 5,0;"THE COMPUTER
THINKS OF A SERIES OF THREE NUMB
ERS FROM(0 TO 9)   AND LETTERS F
ROM(A TO Y)"
635 PRINT "
              "
640 PRINT AT 9,0;"YOU MUST GUES
S THE COMBINATION  IN AS FEW GOE
S AS POSSIBLE.WHEN INVITED YOU M
UST ENTER A THREE  NUMBER AND/OR
 LETTER SERIES AND FIND THE HIDD
EN NUMBERS AND     LETTERS"
645 PRINT AT 14,7;"
                  "
650 PRINT AT 16,0;"IF YOU ENTER
 ""Z"" WHEN YOU HAVE  DISCOVERED
 THE SERIES THE CLEVERCOMPUTER W
ILL TELL YOU YOUR     SCORE"
660 PRINT AT 21,0;"     Press a
ny key to start      "
670 FOR N=0 TO 5
671 NEXT N
672 IF INKEY$<>"" THEN GOTO 230
680 PRINT AT 21,0;"**** PRESS A
NY KEY TO START ****"
690 FOR N=0 TO 5
691 NEXT N
692 IF INKEY$<>"" THEN GOTO 235
695 GOTO 660
700 CLS
710 PRINT AT 12,2;"***** AUF WI
EDERSEHEN *****"
720 FOR N=0 TO 50
730 NEXT N
740 GOTO 740
8000 CLS
8001 PRINT AT 5,5;"YOU HAD ";S;"
 GOES"
8005 IF S<=4 THEN PRINT AT 10,0;
"DOES MAGNUS MAGNUSSON KNOW ABOU
TYOU...."
8006 IF S<=4 THEN RETURN
8008 IF S<8 THEN PRINT AT 10,0;'
VERY GOOD EFFORT"
8009 IF S<8 THEN RETURN
8010 IF S<11 THEN PRINT AT 10,0;
"PRETTY GOOD"
8011 IF S<11 THEN RETURN
8012 IF S=11 OR S=12 THEN PRINT
AT 10,0;"NOT TOO BAD I SUPPOSE..
."
8013 IF S<13 THEN RETURN
8015 IF S<17 THEN PRINT AT 10,0;
"PERHAPS A LITTLE UNLUCKY"
8017 IF S<17 THEN RETURN
8030 IF S<20 THEN PRINT AT 10,0;
"PRETTY BAD REALLY...COULD DO
 BETTER"
8033 IF S>19 THEN PRINT AT 10,0;
"DO YOU REMEMBER YOUR NAME ?"
8035 RETURN
9000 PRINT AT 19,0;"SORRY,NONE O
F THOSE PLEASE TRY  AGAIN"
9001 FOR F=0 TO 40
9002 NEXT F
9003 PRINT AT 19,0;"
                    "
9004 GOTO 280
9998 SAVE "MASTERMINd"
9999 RUN
```

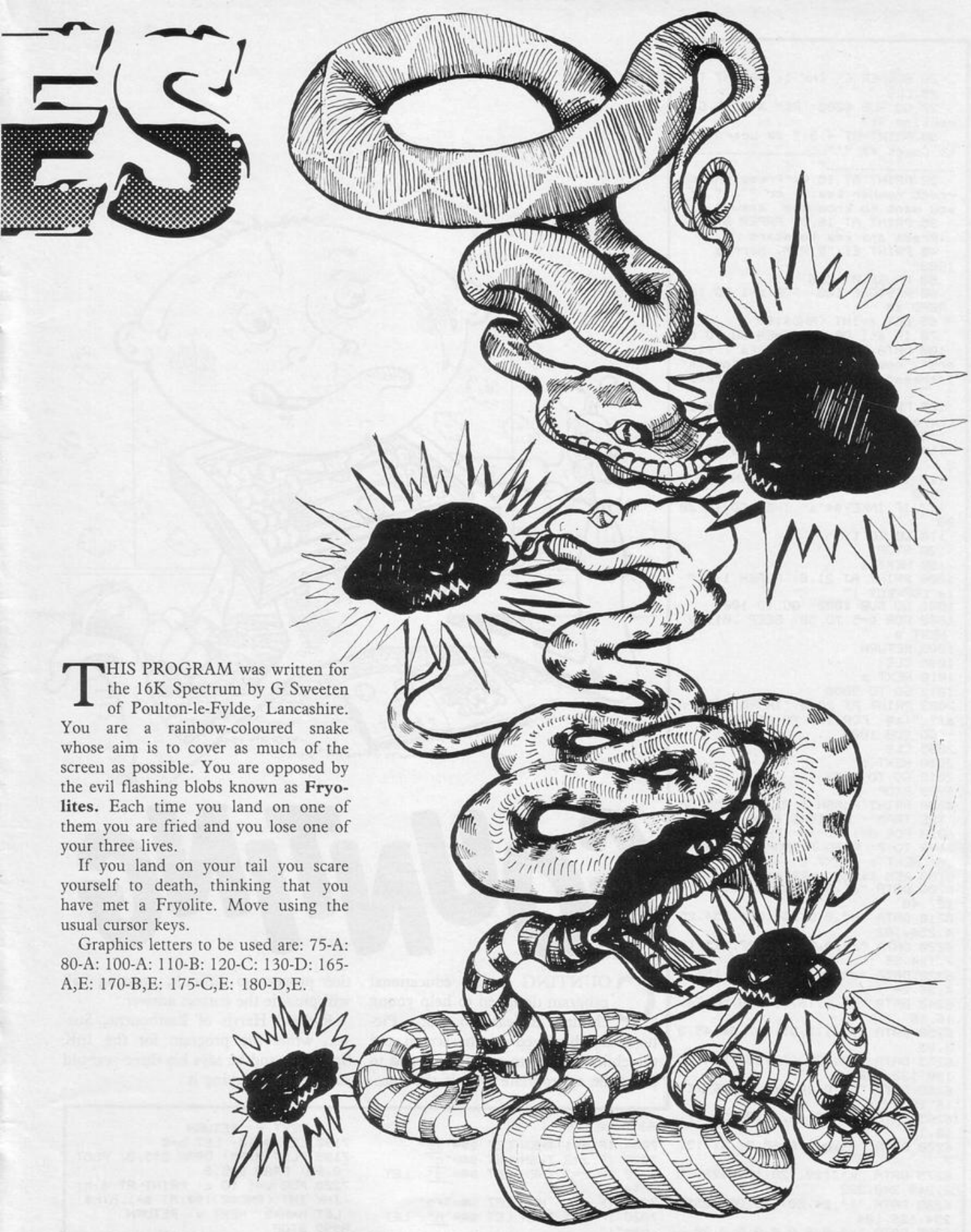
FRYOLITES

```
  1 BRIGHT 1: INK 7: PAPER 0: B
ORDER 0: CLS : PLOT 0,0: DRAW 25
5,0: DRAW 0,175: DRAW -255,0: DR
AW 0,-175: LET hc=0
  2 LET cd=20: LET men=3
  3 LET c=0: LET x=0
  5 LET w=1
 10 DATA 0,0,BIN 00011000,BIN 0
0111100,BIN 01011010,BIN 0101101
0,BIN 01111110,BIN 01111110
 20 DATA 0,BIN 11110000,BIN 110
01000,BIN 11111100,BIN 11111100,
BIN 11111000,BIN 11110000,0
 30 DATA BIN 01111110,BIN 01111
110,BIN 01011010,BIN 01011010,BI
N 00111100,BIN 00011000,0,0
 40 DATA 0,BIN 00001111,BIN 000
10011,BIN 00111111,BIN 00111111,
BIN 00011111,BIN 00001111,0
 50 DATA 0,BIN 00111100,BIN 011
11110,BIN 01111110,BIN 01111110,
BIN 01111110,BIN 00111100,0
 60 RESTORE 10: FOR d=144 TO 14
8: FOR e=0 TO 7: READ q: POKE US
R CHR$ (d)+e,q: NEXT e: NEXT d
 65 FOR f=1 TO 20: PRINT AT INT
 (RND*20)+1,INT (RND*30)+1; FLAS
H 1;"e": BEEP .004,(f-INT (RND*4
))+10: NEXT f
 70 LET a=INT (RND*20)+1: LET b
=INT (RND*30)+1
 75 PRINT AT a,b; FLASH 1;"a": 
FOR f=1 TO 200: NEXT f: PRINT AT
 a,b;" "
 80 LET z$="a"
 90 LET a$=INKEY$
 95 IF a$="" THEN LET a$=z$
 97 LET c=c+1: LET x=x+1: IF x=
380 THEN GO TO 300
 100 IF INKEY$="7" THEN LET z$="
a"
 110 IF INKEY$="8" THEN LET z$="
b"
 120 IF INKEY$="6" THEN LET z$="
c"
 130 IF INKEY$="5" THEN LET z$="
d"
 140 PRINT AT a,b; OVER 1;z$: BE
EP .006,15-w+10
 150 FOR g=1 TO cd: NEXT g
 165 IF z$="a" THEN LET a=a-1: P
RINT AT a+1,b;"e"
 170 IF z$="b" THEN LET b=b+1: P
RINT AT a,b-1;"e"
 175 IF z$="c" THEN LET a=a+1: P
RINT AT a-1,b;"e"
 180 IF z$="d" THEN LET b=b-1: P
RINT AT a,b+1;"e"
 185 IF a=21 OR a=0 OR b=0 OR b=
31 THEN GO TO 210

 190 IF POINT (b*8+5,175-a*8-4)=
1 THEN GO TO 210
 192 LET w=w+1: IF w=7 THEN LET
w=1
 193 INK w
 200 GO TO 90
 210 PRINT AT a,b;z$
 220 FOR f=1 TO 30: BEEP .004,IN
T (RND*20): PRINT AT a,b; FLASH
1;"0": NEXT f: CLS : LET men=men
-1
 230 IF men=0 THEN GO TO 260
 240 INK 7: PLOT 0,0: DRAW 255,0
: DRAW 0,175: DRAW -255,0: DRAW
0,-175
 250 LET w=1: LET x=0: GO TO 65
 260 INK 7: PRINT INK 7;"BAD LUC
K!!!   You scored ";c;"
    Points": IF c>hc THEN PRINT
AT 13,0;"Well done anyway... You
 have a  high score of ";c: LET
hc=c
 265 IF c<hc THEN PRINT INK 7;AT
 13,0;"  The high score is ";hc
 270 INK 7: INPUT "Do you want a
nother go ?";a$
 280 IF a$="y" OR a$="Y" THEN CL
S : PLOT 0,0: DRAW 255,0: DRAW 0
,175: DRAW -255,0: DRAW 0,-175:
GO TO 2
 290 STOP
 300 LET cd=cd-3: IF cd<0 THEN G
O TO 340
 310 FOR f=1 TO 100: NEXT f: CLS
 : PRINT INK 7;"Well done you sc
ored enough     Points to escape
 the fryolites. You must now try
 at a faster     speed"

 320 FOR f=1 TO 700: NEXT f: CLS
 : INK 7: PLOT 0,0: DRAW 255,0:
DRAW 0,175: DRAW -255,0: DRAW 0,
-175
```

FRYOLITES

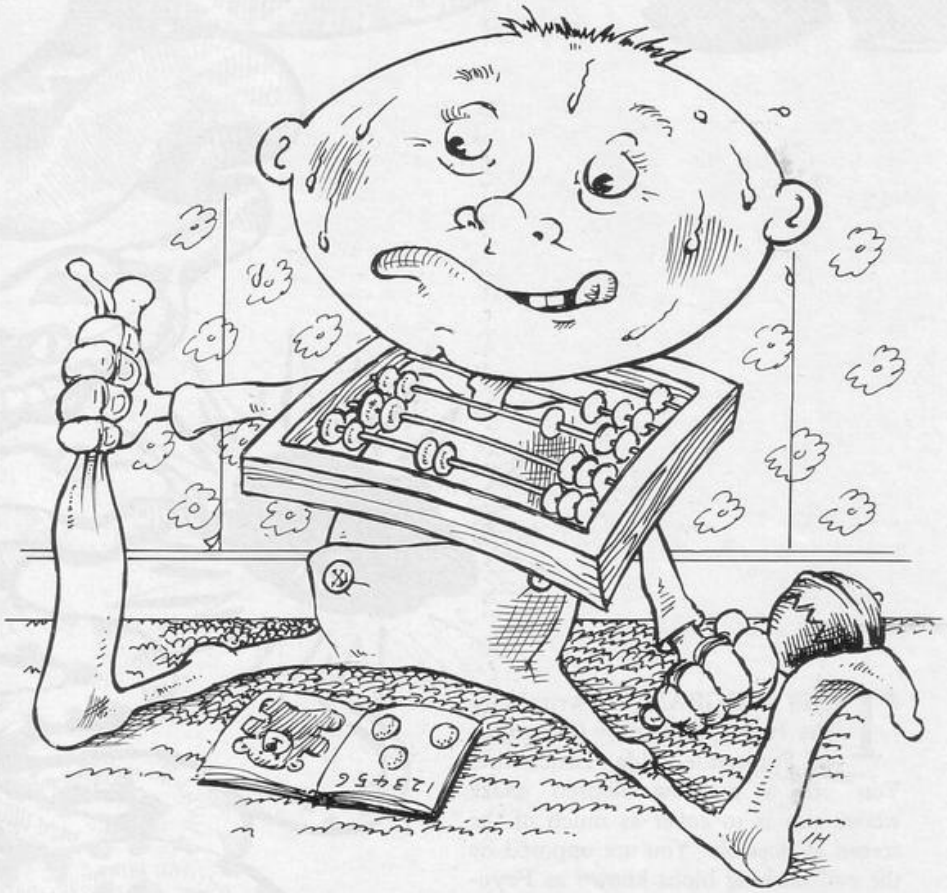


THIS PROGRAM was written for the 16K Spectrum by G Sweeten of Poulton-le-Fylde, Lancashire. You are a rainbow-coloured snake whose aim is to cover as much of the screen as possible. You are opposed by the evil flashing blobs known as **Fryolites.** Each time you land on one of them you are fried and you lose one of your three lives.

If you land on your tail you scare yourself to death, thinking that you have met a Fryolite. Move using the usual cursor keys.

Graphics letters to be used are: 75-A: 80-A: 100-A: 110-B: 120-C: 130-D: 165-A,E: 170-B,E: 175-C,E: 180-D,E.

```
  325 LET x=0
  330 GO TO 65
  340 PRINT INK 7;AT 5,0;"Well do
ne !!! You have beaten   all the
 fryolites... "
  350 BEEP .15,0: BEEP .15,2: BEE
P .15,4: BEEP .15,2: BEEP .15,0:
 BEEP .15,2: BEEP .3,4: PAUSE 2:
 BEEP .3,0: PAUSE 2: BEEP .3,0
  360 PRINT : PRINT : PRINT AT 10
,0; INK 7;"Do you want another g
ame ?"
  370 INPUT a$: IF a$="Y" OR a$="
y" THEN CLS : INK 7: PLOT 0,0: D
RAW 255,0: DRAW 0,175: DRAW -255
,0: DRAW 0,-175: GO TO 2
```



COUNTING

COUNTING is an educational program designed to help young children to learn to count. Pictures are displayed on the screen and the child is asked to count them and to press the appropriate key. If the question proves too difficult, pressing "a" will provide the correct answer.

Richard Harris of Eastbourne, Sussex, wrote the program for the 16K Spectrum and he says his three-year-old sister enjoys playing it.

```
  20 BORDER 6: INK 1: BRIGHT 1
  25 CLS
  27 GO SUB 6000: REM ** U.D.G.
routine **
  30 PRINT AT 4,3;" ** Learning
to Count ** "'"-----------------
---------------"
  32 PRINT AT 10,0;"Press the co
rrect number key,   or ""a"" if
you want to know the  answer..."
  35 PRINT AT 16,0; PAPER 3;"
  Press any key to start      "
  40 PRINT £1;"@ R.M. Harris
1983"
  50 PAUSE 0: CLS
  60 RESTORE 100: FOR z=1 TO 10:
 READ a$
  65 LET a=INT (RND*10)
  70 IF a<1 OR a>9 THEN GO TO 65
 100 DATA "lorries","cups","flow
ers","houses","giraffes","boats"
,"trees","people","clocks","keys
"
 105 PRINT "How many ";a$;" are
there ?"
 110 GO SUB 7000
 114 IF INKEY$<>"" THEN GO TO 11
2
 115 IF INKEY$=STR$ a THEN GO TO
 1000
 117 IF INKEY$="a" THEN GO TO 20
00
 118 GO TO 115
 120 STOP
 150 NEXT a
1000 PRINT AT 21,8; FLASH 1;a;"
is CORRECT !"
1001 GO SUB 1002: GO TO 1005
1002 FOR g=5 TO 50: BEEP .015,g:
 NEXT g
1003 RETURN
1005 CLS
1010 NEXT z
1012 GO TO 9000
2003 PRINT AT 20,0;"THERE ARE ";
a;" ";a$: FOR i=1 TO 150: NEXT i
: GO SUB 1002
2005 CLS
2010 NEXT z
2012 GO TO 9000
5999 STOP
6000 PRINT FLASH 1;AT 10,8;"STOP
 THE TAPE": RESTORE 6100
6010 FOR d=1 TO 18: READ d$: FOR
 e=0 TO 7: READ f: POKE USR d$+e
,f: NEXT e: NEXT d
6100 REM ***UDG HERE***
6200 DATA "a",0,0,62,38,126,126,
127,48
6210 DATA "b",0,0,254,254,254,25
4,254,102
6220 DATA "c",0,0,124,127,125,12
7,124,56
6230 DATA "d",24,36,74,186,154,8
4,36,24
6240 DATA "e",8,16,16,208,54,24,
16,16
6250 DATA "f",1,7,31,127,32,45,3
3,63
6255 DATA "g",128,228,252,254,4,
180,132,252
6260 DATA "h",0,48,112,16,16,16,
16,16
6265 DATA "i",16,16,16,30,31,17,
18,18
6270 DATA "j",0,0,0,60,31,31,15,
7
6275 DATA "k",128,128,128,128,25
2,248,248,232
6280 DATA "l",24,60,126,255,255,
254,126,104
6285 DATA "m",8,8,8,8,8,8,8,28
6290 DATA "n",56,56,56,16,254,18
6,186,186
6295 DATA "o",186,186,56,56,40,4
0,40,108
6300 DATA "p",255,145,145,145,13
7,133,131,255
6305 DATA "q",24,62,62,119,119,6
2,62,24
6310 DATA "r",0,0,0,255,255,7,5,
5
6320 PRINT AT 10,8;"
  "
6350 RETURN
7000 IF z=1 THEN LET g$="ab"
7005 IF z=2 THEN LET g$="c"
7010 IF z=3 THEN LET g$="d": LET
 h$="e"
7015 IF z=4 THEN LET g$="fg"
7020 IF z=5 THEN LET g$="h": LET
 h$="i"
7025 IF z=6 THEN LET g$="jk"
7030 IF z=7 THEN LET g$="l": LET
 h$="m"
7035 IF z=8 THEN LET g$="n": LET
 h$="o"
7040 IF z=9 THEN LET g$="p"
7050 IF z=10 THEN LET g$="qr"
7100 IF z=1 OR z=2 OR z=4 OR z=6
 OR z=9 OR z=10 THEN PRINT AT 9,
0;" ": PLOT 0,75: DRAW 255,0: PL
OT 0,98: DRAW 255,0: FOR x=1 TO
a: PRINT ; INK INT (RND*6);g$;"
 ": NEXT x: RETURN
7190 LET g=10: LET h=0
7195 PLOT 0,75: DRAW 255,0: PLOT
 0,98: DRAW 255,0
7200 FOR y=1 TO a: PRINT AT g,h;
 INK INT (RND*6);g$;AT g+1,h;h$:
 LET h=h+3: NEXT y: RETURN
8999 STOP
9000 FOR s=0 TO 9: BEEP .1,s: NE
XT s: BEEP .5,15: PAPER 6: CLS :
 PRINT AT 11,10; FLASH 1;"WELL D
ONE !"
9020 PRINT '''''"Another go ?  (y
)es    or                    (n
)o"
9025 IF INKEY$="y" OR INKEY$="Y"
 THEN RUN 30
9030 IF INKEY$="n" OR INKEY$="N"
 THEN STOP
9040 GO TO 9025
```

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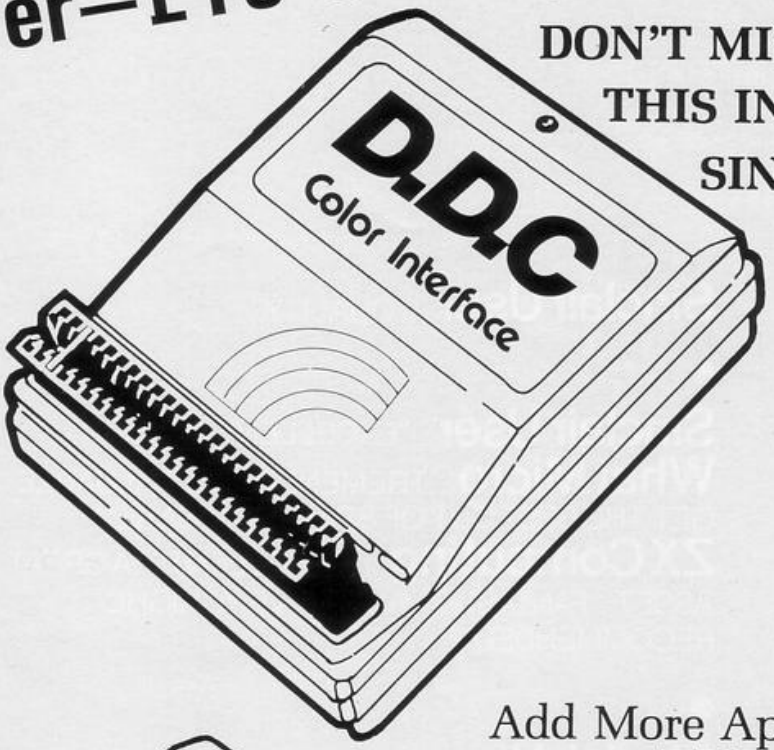

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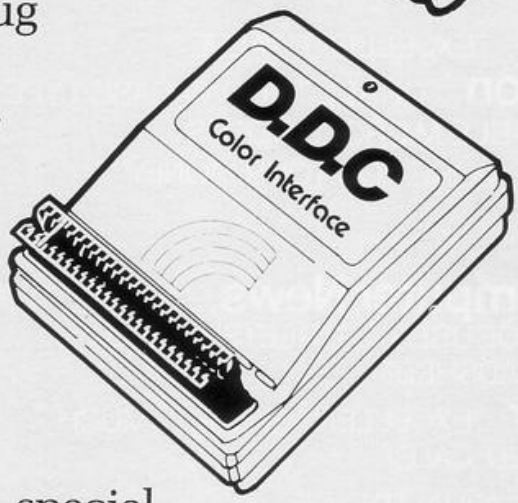

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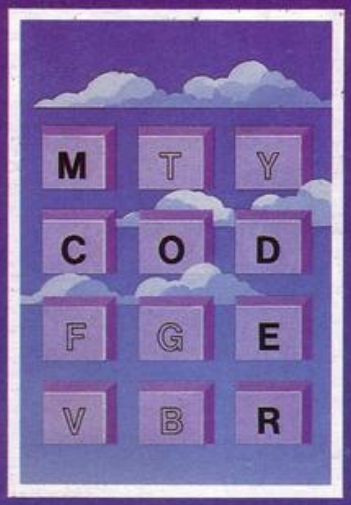

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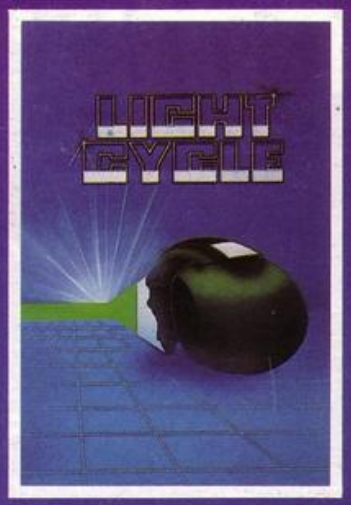

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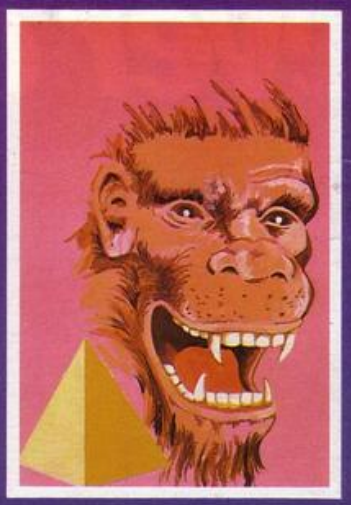

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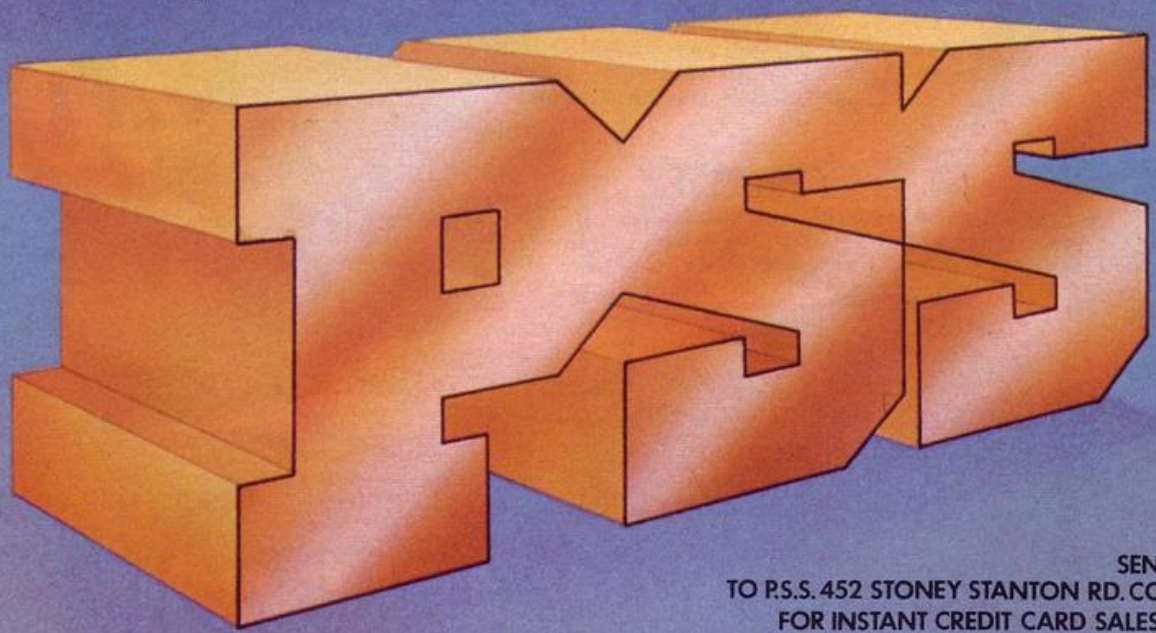

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