

**30
PROGRAMS
FOR THE
SPECTRUM AND ZX-81**

95p

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May 1984

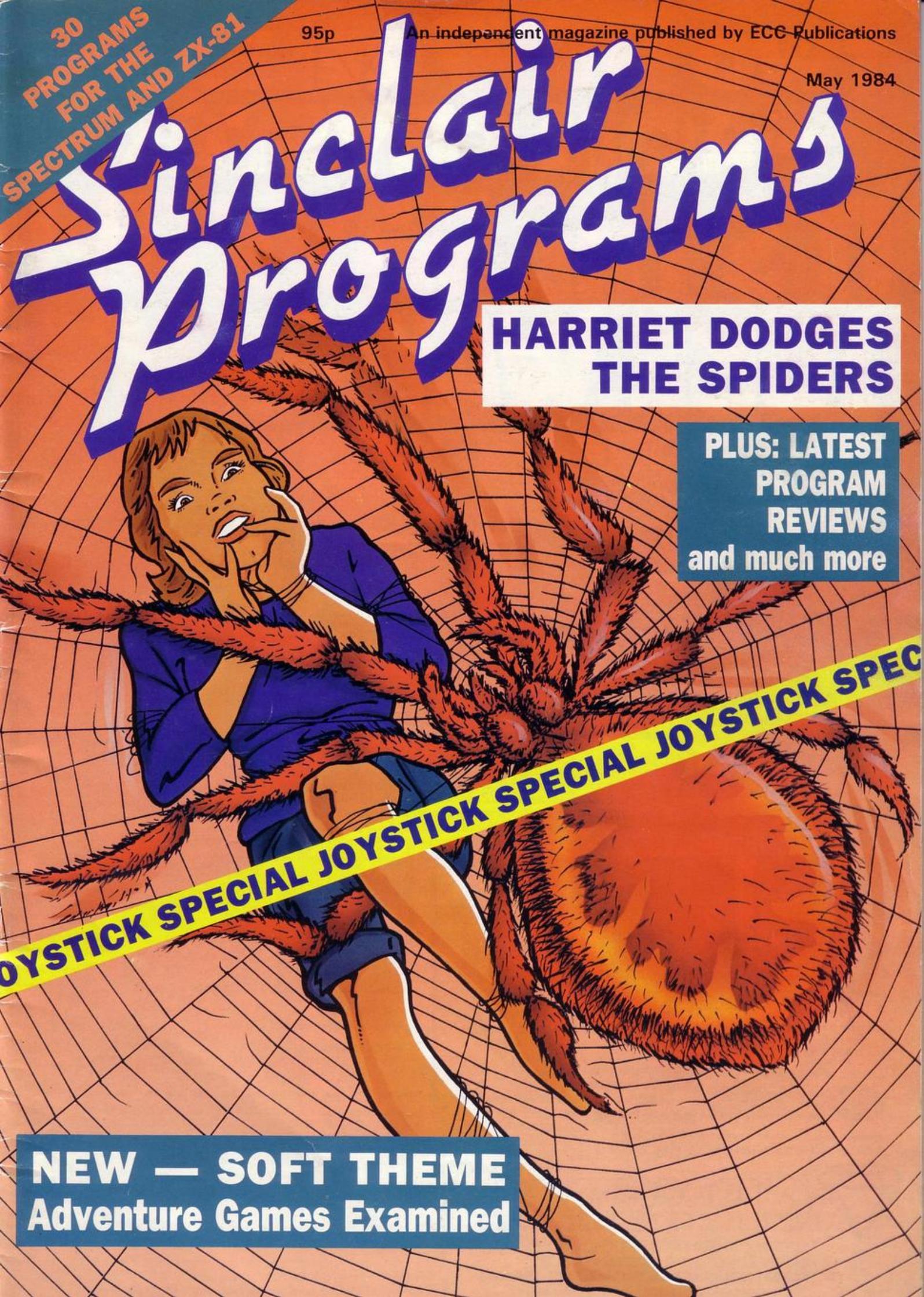
Sinclair Programs

**HARRIET DODGES
THE SPIDERS**

**PLUS: LATEST
PROGRAM
REVIEWS
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JOYSTICK SPECIAL JOYSTICK SPECIAL JOYSTICK SPEC

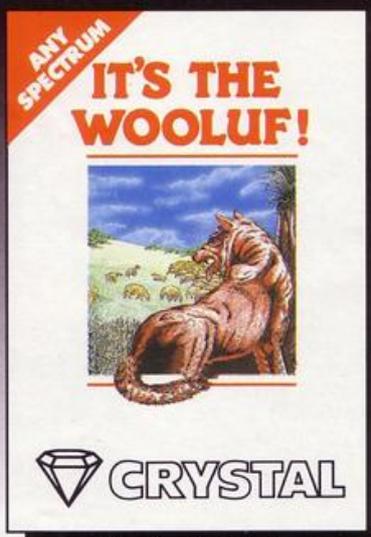
**NEW — SOFT THEME
Adventure Games Examined**



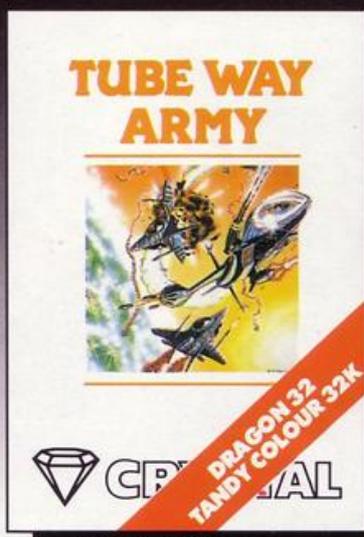
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Written by: Neil Mottershead, Simon Brattel and Martin Horsley



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Written by: Graham Stafford



ROMMELS REVENGE

Written by: Martin Horsley



THE DUNGEON MASTER

Written by: Graham Stafford

All titles for 48K Spectrum unless otherwise stated

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

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

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

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

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

Where to study computers

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

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

CTEC Ltd, 102-108 Clerkenwell Road, London EC1M 5SA, Tel: 01-251 4010 will be running a course in Basic from April 30 to May 4. For more information, contact Karen Harding.

Adult Education, Centre for Continuing Education, The City University, Northampton Square, London EC1V 0HB, Tel: 01-253 4399 extn. 3252 or 3268 runs a number of courses in computing and mathematics, including *An Introduction to Basic Programming* which will consist of 10 weekly meetings beginning on Thursday, May 3. Times will be 6.30-8.30pm

and the cost will be £25. *History of mathematics* is a course for teachers which will run for 10 weeks from May 3. Meetings will be from 6-8pm and the course will cost £10.

MSS Services Ltd, PO Box 31, Worthing, West Sussex, Tel: 0903 34755 runs a range of computer courses aimed primarily at professionals who will be using computers during their work. They include *Introduction to Computing* which runs from May 8 to May 10 and costs £275 plus £15 registration fee plus VAT; *Effective Microcomputer Programming* which runs from May 10 to 11 and costs £210 plus £15 registration fee plus VAT; and *Hands-on Microcomputers* which runs from May 2-3 and costs £210 plus £15 registration fee plus VAT.

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

Joysticks and adventures

THIS MONTH *Sinclair Programs* expands its coverage of Sinclair software once again with the addition of Soft Theme. Each month the section will examine a specific area of the software market in detail, looking at the best programs, the worst programs, and the many variations which often appear on one theme.

In this issue we consider adventure programs, including some of the most popular Spectrum games produced, and examine the development of the adventure game from the original mainframe computers to grandiose affairs containing sound, colour and animation.

A special feature is our Hardware Section. Five programs are included, all of which work with the Spectrum computer and joystick. The listings contain several ways of making programs work with joysticks which can, of course, be incorporated into other games.

Programmable joysticks and cursor-controlled joysticks are straightforward and selecting the correct movement

keys will allow any game to work with them. The popular Kempston-type joysticks are slightly more difficult to cater for. Owners of them will see from our listings that the relevant command is IN 30. That will produce different answers, depending on which way the joystick has been moved. The relevant numbers are west, two; north-west, ten; north-east, seven; east, one; south-east, five; south, four; south-west, six; and fire, sixteen.

Regular readers will see that we have once again improved the quality of our listings, so that they are clearer than ever before. In the past, our graphics instructions have proved a problem for some readers. These instructions are used to make it easier to enter a program quickly. One black square in a program is easy to identify but a long string of graphics and spaces can prove mystifying to even the most experienced computer users.

Inverse letters — those printed white on black rather than black on white — can prove illegible in print when print-

ed exactly as they appear on-screen. The abbreviations we use are explained in detail at the foot of the contents page each month.

Graphics instructions are always entered so that they will stand out from the main body of a program and will be treated as instructions rather than entered exactly. In ZX-81 programs they are given in lower-case letters in brackets and in Spectrum programs they are underlined and placed in brackets.

It has been brought to our attention that certain computer owners are submitting programs for computer games which are not their own. If you wish to submit programs, which must be your original work and must not have appeared elsewhere, please send your contributions to The Editor, *Sinclair Programs*, 196-200 Balls Pond Road, London N1 4AQ. If you would like your cassette returned, please enclose a stamped-addressed envelope.

A guide to program length is that five screens full of program listing will occupy one page of the magazine. Programs of two or fewer pages in length have the best chance of publication but original ideas and skilful programming are also important and it is those qualities for which we look in our Program of the Month.

LORDS OF TIME

Joins our range of acclaimed pure-text puzzle adventures, at £9.90, for:

BBC 32K **COMMODORE 64** **SPECTRUM** 48K **LYNX** 48K **NASCOM** 32K **ORIC** 48K **ATARI** 32K

ADVENTURE REVIEWS

"Adventures which have a fast response time, are spectacular in the amount of detail and number of locations, and are available to cassette owners... Simply smashing!"

— *Soft, Sept 83*

"Colossal Adventure is included in Practical Computing's top ten games choice for 1983: 'Poetic, moving and tough as hell.'"

— *PC, Dec 83*

"Colossal Adventure... For once here's a program that lives up to its name... a masterful feat. Thoroughly recommended"

— *Computer Choice, Dec 83*

"Colossal Adventure is one of the best in its class. I would recommend it to any adventurer."

— *Acorn User, Feb 84*

"Adventure Quest... This has always been one of the best adventures for me as it seems to contain the lot. In all it took me about eight months to solve."

— *PCW, 18th Jan 84*

"To sum up, Adventure Quest is a wonderful program, fast, exciting and challenging. If you like adventures then this one is for you"

— *NILUG issue 1.3*

"Colossal Adventure is simply superb... For those who want to move onto another adventure of similar high quality, Dungeon Adventure is recommended. With more than 200 locations, 700 messages and 100 objects it will tease and delight!"

— *Educational Computing, Nov 83*

ADVENTURE REVIEWS

"Colossal Adventure... undoubtedly the best Adventure game around. Level 9 Computing have worked wonders to cram all this into 32K... Finally **Dungeon Adventure**, last but by no means least. This is the best of the lot - a truly massive adventure - you'll have to play it yourselves to believe it."

— *CBM 64 Users Club Newsletter*

"The puzzles are logical and the program is enthralling. **Snowball** is well worth the money which, for a computer program, is a high recommendation."

— *Micro Adventurer, Dec 83*

"**Snowball**... As in all Level 9's adventures, the real pleasure comes not from scoring points but in exploring the world in which the game is set and learning about its denizens... this program goes to prove that the mental pictures conjured up by a good textual adventure can be far more vivid than the graphics available on home computers."

— *Which Micro?, Feb 84*

"**Lords of Time**. This program, written by newcomer Sue Gazzard, joins my favourite series and is an extremely good addition to Level 9's consistently good catalogue... As we have come to expect from Level 9, the program is executed with wonderful style - none of those boring "You can't do that" messages! Highly recommended."

— *PCW, 1st Feb 84*



MIDDLE EARTH ADVENTURES

1: COLOSSAL ADVENTURE

A complete, full size version of the classic mainframe game "Adventure" with 70 bonus locations added

2: ADVENTURE QUEST

Centuries have passed since the time of Colossal Adventure and evil armies have invaded The Land. The way is long and dangerous, but with cunning you can overcome all obstacles on the way to the Black Tower, source of their demonic power, and destroy it

3: DUNGEON ADVENTURE

The trilogy is completed by this superb adventure, set in the Dungeons beneath the shattered Black Tower. A sense of humour is essential!

THE FIRST SILICON DREAM ADVENTURE

1: SNOWBALL

The first of Pete Austin's second trilogy. The giant colony starship, Snowball 9, has been sabotaged and is heading for the sun in this massive game with 7000 locations.

THE LORDS OF TIME SAGA

7: LORDS OF TIME

Our congratulations to Sue Gazzard for her super design for this new time travel adventure through the ages of world history. Chill to the Ice-age, go romini' with Caesar's legions, shed light on the Dark Ages, etc.

Price: £9.90 each (inclusive)

Level 9 adventures are available from good computer shops, or mail-order from us at no extra charge. Please send order, or SAE for catalogue, to:

LEVEL 9 COMPUTING

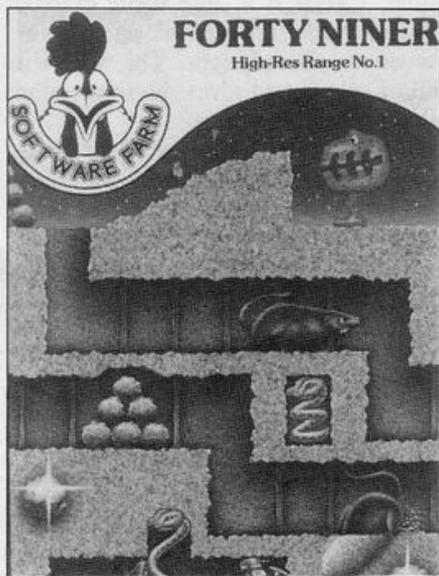
Dept SP 229 Hughenden Road,
High Wycombe, Bucks HP13 5PG
Please describe your computer

Excellent Forty Niner

ANY NEW program produced for the ZX-81 has a good chance of being received with open arms by the half-million ZX-81 owners who have been starved of new software in 1984. **Forty Niner** stands a better chance than most for it is not only a ZX-81 game but also an extremely good one.

The aim is to mine as much gold as possible. Opposing you in the aim are the vicious rats which chase and kill you, and the strange, earth-shifting gremlin which tries to block the entrance to your tunnel. The approach of the gremlins can be slowed by frequent trips to the tunnel entrance, while the rats can be slowed by frequent trips to the tunnel entrance, by tunnel cave-ins, and killed, if you are clever, by the release of snakes.

It is fast-moving and entertaining, the graphics are excellent, and the game loaded easily. **Forty Niner** is produced for the 16K ZX-81 by Software Farm, Freeport (BS 3658)A, Bristol BS8 2YY and costs £5.95.



Base Invaders

COMPUTER WAR games are meeting more and more opposition from within the software industry. Death and destruction are giving way to thought and ingenuity. **Base Invaders** by Magination is probably the first attempt to set up a peace game to challenge the war

games. The scene is Greenham Common and it is the player's aim to run through the undergrowth, dodge the slow-moving policemen and snip through the wire surrounding the air base.

Once the fence has been cut in one place the player returns to the start, a procedure which is repeated until the whole fence has been destroyed or the player has been arrested three times.

The game serves a variety of purposes. It puts across a message to its player, provides entertainment, and raises money for the Greenham women. It does not reach the professional standard of other commercial games but is more comparable with some of the longer games published in *Sinclair Programs*. It is slow and the screen layout is simple but the concept is original. Magination has added a new dimension to the world of computer software.

Base Invaders costs £3 and is available from Magination, 21 Stratford Grove, Heaton, Newcastle-upon-Tyne.

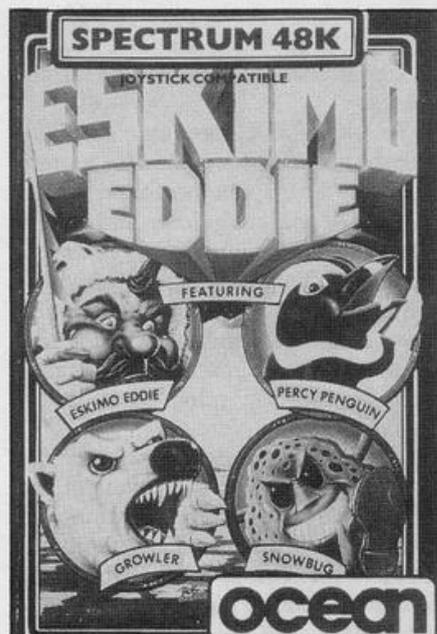
Eskimo Eddie

PERCY the Penguin stands at the top of the screen, Eskimo Eddie at the bottom. Between them, the savage polar bears move one way and the treacherous holes in the ice move the other way. The player's aim is to move Eddie to the top of the screen to collect Pengy and to return with him to the bottom of the screen three times.

The game is a simplified version of Frogger but, even so, it requires co-ordination and careful timing, especially as it is often slow to respond to either keys or joystick. Another difficulty is that the program does not always realise when Eddie has collided with a polar bear and so it is possible for him to walk on top of the bear for some distance.

Once Pengy has been saved three times the game moves to the next completely different level. The player controls Pengy, who is trapped in the centre of a maze of ice cubes, threatened by the evil snow bugs. The only way to escape is to push the ice blocks at the

It is a game for experienced arcade players only, for plenty of skill is needed to escape the bugs and to be in the proper place at the proper time to move the ice blocks. Those difficulties are compounded by the strange choice of



control keys made by the authors, a choice which there is no option to alter.

Eskimo Eddie is produced by Ocean Software Ltd, Rail Building, Stanley Street, Manchester M3 5FD and costs £5.90.

Pi-Balled

EXCITING and challenging new arcade-style games are becoming thin on the ground, so **Pi-Balled** by Automata is a refreshing change. The player's aim is to move from step to step of a pyramid, changing the colour of each step crossed. Once the colour of the whole pyramid has been changed a new pyramid appears and the game becomes more difficult.

Attempting to run off the edge of the pyramid, or colliding with any of the other creatures on the pyramid, means instant death. Each creature has different attributes; one of the balls helps the player to change the colour of the pyramid, the other hinders by changing back the pyramid to its original colour. Sid the snake appears to be purely malevolent, while the Pi-man appears to

be not only malevolent but almost inescapable.

The animated graphics are extremely good. The player has the option of climbing the pyramid on a spinning disc, which sends the player revolving along the edge of the screen and which may lure the snake into plunging into the depths beneath the pyramid. Movement on the screen is fast and smooth and colour changes appear to be instantaneous.

The skill levels are also carefully worked-out. With some practice a route round the board can be found which will change colours quickly and safely. It soon becomes apparent, however, that speed is not the attribute for which to aim, as it is not what provides the points. Destroying the snake yields several points, while reaching the higher levels too quickly often leads to an untimely death.

It can be very unnerving to watch the pyramid changing to the colour of the background as you move and thus, apparently, vanishing; or to see the pyramid seem invisible as it begins by being the same colour as the background.

Pi-balled is an entertaining and enjoyable game, produced for the Spectrum by Automata (U.K.) Ltd, 27 Highland Road, Portsmouth, Hampshire and costs £6.

Camelot

AS DEMAND for adventure games has grown, so has the number of variations on the theme. There are all-action adventure games, combination arcade action/adventure games, and then there is **Camelot** by CCS.

As Arthur Pendragon, the player is banished from Camelot with 10 warriors, 50 bags of gold and 10 bags of food. The aim is to find seven items and re-enter Camelot. The number of locations to be visited is very limited and the graphics display of each of them is sketchy. Skill is required to maintain supplies of warriors, food and gold but, apart from that, there is no excitement, little feeling of adventure and no feeling of speed.

As a textual simulation game on the ZX-81, Camelot would have worked well, especially with continuous on-

screen displays of supplies. As a graphics adventure, however, it is a disappointment.

Camelot is produced for the 48K Spectrum by Cases Computer Simulations Ltd, 14 Langton Way, London SE3 7TL and costs £5.

Glug-Glug

KILL THE GIANT squids. Dodge the killer crabs. Avoid the hunting piranha fish. Grab the sunken treasure. If those activities appeal to you, **Glug Glug** from CRL is a computer game you will enjoy.

The player's role is that of a diver, leaping from a ship on the surface of the ocean, dodging or killing the aquatic



wildlife, and returning to the surface with treasure found in the sand at the bottom. Once all the treasure on a screen has been returned to the boat a new, more difficult screen is produced, stocked with bigger, more dangerous creatures.

A strange feature is the use made of the wrapround screen which allows you to walk off the right-hand side and re-appear on the left. It poses several questions. Why can many creatures move on and off the screen easily while the piranha fish appear to be completely confused by the wrapround feature? If all the sea is visible at any time, from where do all the new fish appear? More to the point, could CRL not have dispensed with an effect which shows half a giant squid on the left-hand side of the

screen while the other half is on the right-hand side?

Glug Glug is produced for the 48K Spectrum by Computer Rentals Ltd. Tel: 01-533 2918 and costs £5.95.

Caesar

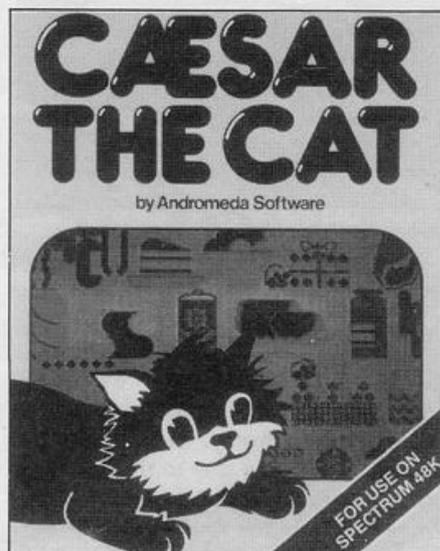
THE SCENE is a well-stocked larder which the player, as **Caesar the Cat**, must protect from the hungry mice. Caesar is the most attractive, cuddly cat you are likely to see on your computer screen. He bounds from shelf to shelf, pads along contentedly once he has caught a mouse, and sometimes whisks crockery from the shelf with his tail.

The object is to catch the mice one by one and deposit them outside the larder. The only way to gain points is by catching mice, otherwise your points decline rapidly, especially if you knock crockery from the shelf, stay still, or allow the mice to eat too much food.

The graphics are very unusual. The screen is cluttered with objects in the larder. Caesar is a large sprite graphic which winds around objects as he moves to left and right. The screen is full of colour and gives the impression of an animated cartoon.

Caesar the Cat is an excellent game and Caesar could well soon become one of the cult characters of the computer games world.

Caesar the Cat is produced for the 48K Spectrum by Mirrorsoft, PO Box 50, Bromley, Kent BR2 9TT and costs £8.95.



Hardware



CONVICT



YOU HAVE just escaped from prison and are making your way to your hideout. On the way you must collect as many jewels as possible while avoiding the numerous policemen in pursuit. As the game progresses the border colour changes and at the end your score is given. Ten points are gained for each jewel collected.

Convict is compatible with the Kempston joystick or can be played using keys 5 and 8. Written for the 16K Spectrum by Tim Wreford, aged 13, of Windsor, Berkshire.

```

10 BORDER 7: PAPER 7: CLS : IN
K 0
20 LET hi=0
30 GO SUB 330
40 GO SUB 520
50 CLS : PRINT AT 8,5;"1 = JO
YSTICK(KEMPSTON)"
60 PRINT AT 11,5;"2 = KEYBOAR
D(5 AND 8)"
70 PAUSE 0: LET b$= INKEY$
80 CLS
90 LET a=11
95 LET t=0
100 FOR s=1 TO 1050
110 PRINT INK 1; AT 21, RND *2
B;"BBBB"
115 IF RND <.05 THEN PRINT F
LASH 1; INK 4; AT 21, RND *31;"Q
"
120 LET l=USR 32500
130 PRINT AT 5,a;
140 IF ATTR (5,a)=57 THEN GO
TO 220
145 IF ATTR (5,a)=188 THEN FO
R n=1 TO 10: LET l= USR 32500: N
EXT n: LET t=t+10
150 PRINT INK 2;"A"
160 LET sc= USR 3582
170 IF b$="2" THEN LET a=a+( I
NKEY$ ="8" AND a<31)-( INKEY$ ="
5" AND a>0)
180 IF b$="1" THEN LET a=a+( I
N 31=1 AND a<31)-( IN 31=2 AND a
>0)
190 BORDER s/150
200 NEXT s
210 GO TO 440
220 LET l= USR 32525: CLS
230 PRINT AT 7,10; FLASH 1;"YO
U GOT CAUGHT"
240 BORDER 7
250 IF s+t>hi THEN LET hi=s+t
260 PRINT AT 11,13;"SCORE=";s+
t
270 PRINT AT 4,14;"HIGH=";hi
280 PRINT AT 15,9;"ANOTHER GO?
(Y/N)"
290 PAUSE 0
300 IF INKEY$ ="y" THEN CLS :
GO TO 50
310 IF INKEY$ ="n" THEN STOP
320 GO TO 290
330 FOR n=32500 TO 32545
340 READ a
350 POKE n,a
360 NEXT n
370 DATA 33,100,2,17,1,0,229,21
3,197,205,181,3,33,212,1,17,1,0,
205,181,3,193,209,225,201,33,244
,1,17,4,0,6,255,229,213,197,205,
181,3,193,209,225,35,16,244,201
380 FOR n= USR "a" TO USR "c"+
7
390 READ a
400 POKE n,a
410 NEXT n
420 DATA 24,126,90,255,231,90,1
02,24,24,126,90,255,231,66,90,60
425 DATA 0,0,60,126,255,126,0,0
430 RETURN
440 CLS : POKE 32542,43
450 LET l= USR 32525
460 PLOT 70,20: DRAW 130,0: DRA
W 0,100: DRAW -130,0: DRAW 0,-10
0
470 PLOT 70,120: DRAW 65,40: DR
AW 65,-40
480 PLOT 105,20: DRAW 0,60: DRA
W 50,0: DRAW 0,-60
490 PRINT FLASH 1; AT 9,12;"HI
DE-OUT"
500 PRINT INK 2; PAPER 6; AT 2
,0; FLASH 1;"WELL DONE"
502 PRINT AT 3,0;"YOU GOT TO";
AT 4,0;"THE HIDE-OUT"
505 POKE 32542,35
510 GO TO 240
520 CLS : PRINT AT 1,10;"E S C
A P E"; AT 1,10; OVER 1;"-----
"
530 PRINT AT 3,0;"YOU HAVE JUS
T ESCAPED FROM PRISON AND H
AVE TO ESCAPE TO YOUR HIDE-OU
T. BUT ON THE WAY YOU MUST DODGE L
OADS OF POLICEMEN WHO ARE AFTE
R YOU. THE FURTHER YOU GET THER
E WILL BE A DIFFERENT CO
LOUR BORDER."
535 PRINT "ON THE WAY THERE WI
LL BE FLASHING GREEN JEWEL
LS AND THESE ARE WORTH 10 POINTS
"
540 PRINT "THERE ARE TWO CONT
ROL OPTIONS. EITHER JOYSTICK(KE
MPSTON) OR KEYBOARD(5 AND 8)."

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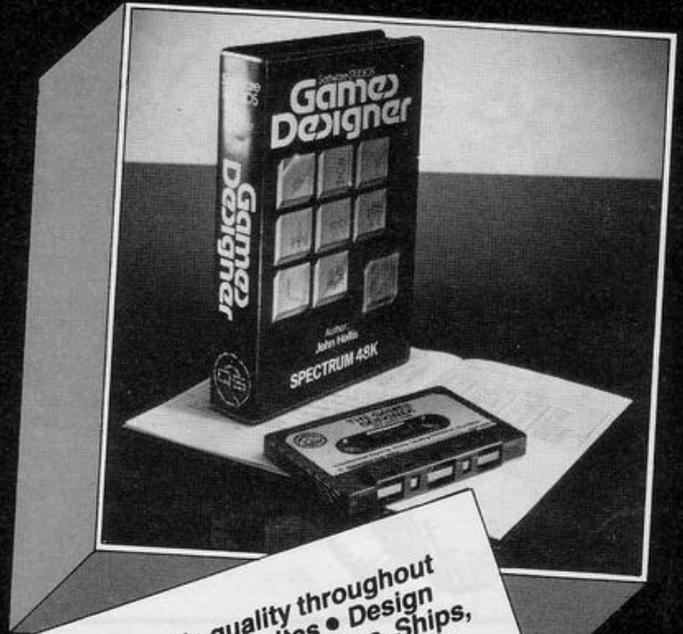
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WOLF ATTACK

YOU are the leader of your village and must protect the villagers from a pack of ravenous wolves. The wolves head towards the village

from the woods and you must intercept and kill them with your axe to prevent them reaching the village. If they reach the village they will eat the occupants

until there are no more villagers. Use the Kempston joystick to move. **Wolf Attack** was written for the 16K Spectrum by P Hodges of Ashford, Kent.

```
1 LET b$="P.H": LET mi=10: CL
S : BORDER 2: PAPER 2: INK 7: CL
S : PRINT AT 0,8;"WOLF ATTACK":
PAUSE 0: BORDER 2: PAPER 2: INK
7
```

```
2 PRINT AT 1,8;"-----"
```

```
3 PRINT AT 3,0;"YOU ARE THE
BRAVE LEADER OF","YOUR VILLAGE.F
ROM THE WOODS TO","THE EAST COME
THE RAVONOUS","WOLVES.ARMED WIT
H YOUR AXE YOU","MUST KILL AS MA
NY AS POSSIBLE.","IF YOU LET 5 G
D PAST ALL THE","VILLAGERS WILL
BE EATEN"
```

```
4 PAUSE 0: CLS
```

```
6 BORDER 2: PAPER 2: INK 7
```

```
7 LET sc=0
```

```
9 LET li=5
```

```
10 FOR n=1 TO 7
```

```
20 READ p$
```

```
30 FOR m=0 TO 7
```

```
40 READ a: POKE USR p$+m,a
```

```
41 DATA "g", BIN 00111100, BIN
01000010, BIN 10000010, BIN 100
00010, BIN 10000010, BIN 1000001
0, BIN 11010100, BIN 11111110
```

```
42 DATA "c", BIN 00011100, BIN
00101010, BIN 10010100, BIN 010
01001, BIN 00111110, BIN 0000100
0, BIN 00010100, BIN 00110110
```

```
45 DATA "j", BIN 00010000, BIN
00010000, BIN 11111110, BIN 000
10000, BIN 00010000, BIN 0001000
0, BIN 00010000, BIN 00010000
```

```
50 DATA "p", BIN 00011100, BIN
00101010, BIN 00010100, BIN 000
01000, BIN 00111111, BIN 0100100
0, BIN 00010100, BIN 00110110
```

```
51 DATA "o",0, BIN 01100000, B
IN 01100000, BIN 01000000, BIN 1
0000000, BIN 01000000, BIN 01000
000, BIN 0
```

```
52 DATA "d",0, BIN 00100000, B
IN 11100010, BIN 01111100, BIN 0
0111100, BIN 00100100, BIN 00100
100,0
```

```
53 DATA "h", BIN 00011100, BIN
00111110, BIN 01111111, BIN 001
11110, BIN 00010100, BIN 0001010
```

```
0, BIN 00010100,0
```

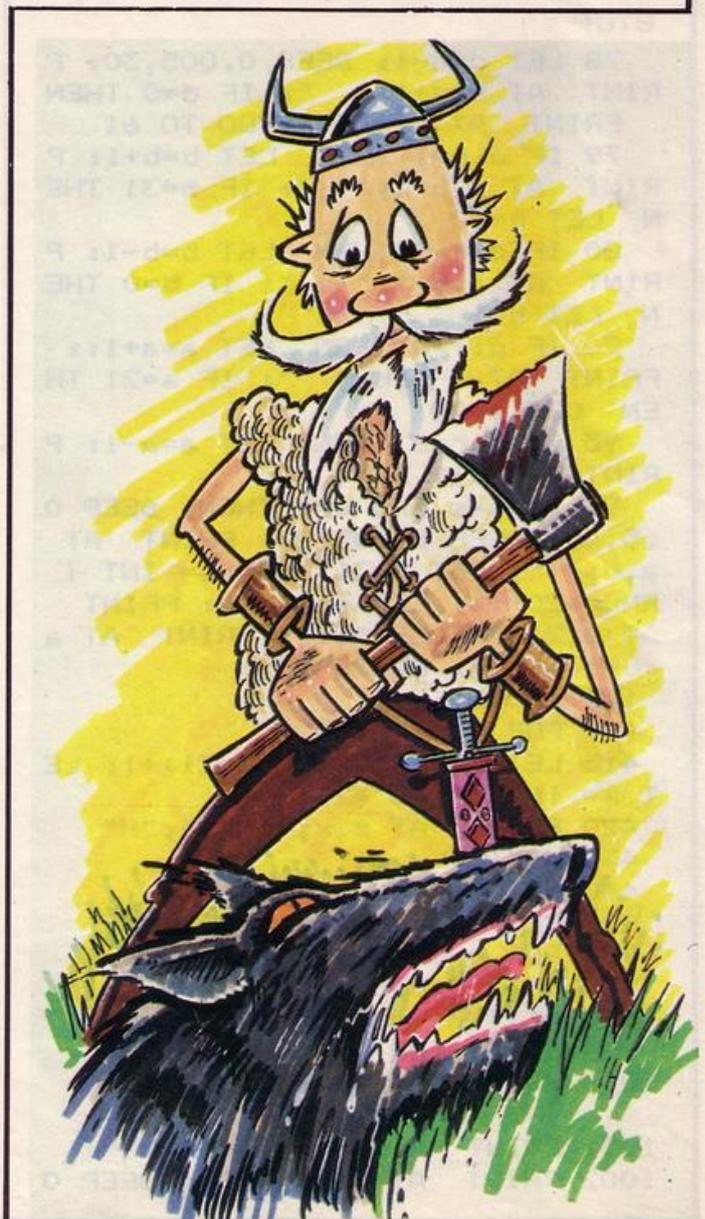
```
54 NEXT m: NEXT n
```

```
55 PRINT "HIGHEST SCORE IS ";m
i,"BY ";b$: PAUSE 0: CLS : PRINT
AT 0,0;"P": PRINT AT 0,1;"P":
PRINT AT 0,2;"P": PRINT AT 0,
3;"P": PRINT AT 0,4;"P": LET sc
=0
```

```
56 GO SUB 400
```

```
57 LET a=11: LET b=11
```

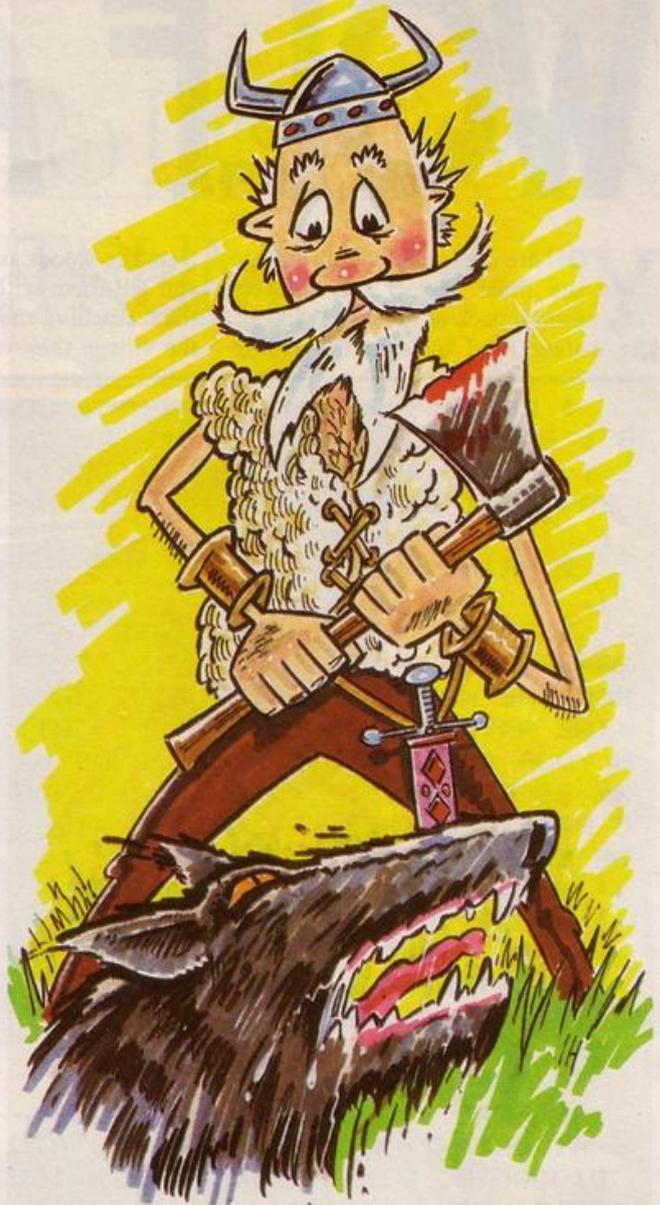
```
58 FOR v=1 TO 20: PRINT AT v,
31: INK 4;"H": NEXT v
```



```

59 LET s= INT ( RND *20)+1: LE
T d=30
60 PRINT AT a,b;"PO"
62 IF li=4 THEN PRINT AT 0,4
;" G"
63 IF li=3 THEN PRINT AT 0,3
;" G"
64 IF li=2 THEN PRINT AT 0,2
;" G"
65 IF li=1 THEN PRINT AT 0,1
;" G"
67 IF li=0 AND sc >= mi THEN
GO TO 800
74 LET dir= IN 30
75 PRINT AT s,d;"D"
76 IF d=1 THEN PRINT AT s,d;
" ": LET li=li-1: LET d=31: LET
s= INT ( RND *20)+1: IF li=0 AND
sc<mi THEN CLS : PRINT AT 11,
0;"YOUR VILLAGERS ARE DEAD","YOU
KILLED ";sc;" WOLVES","TRY AGAI
N?(Y/N)": INPUT a$: IF a$="y" OR
a$="Y" THEN CLS : LET li=5: GO
TO 55 77 IF li=0 AND sc<mi THEN
STOP
78 LET d=d-1: BEEP 0.005,30: P
RINT AT s,d+1;" ": IF d=0 THEN
PRINT AT a,d;" ": GO TO 61
79 IF dir=1 THEN LET b=b+1: P
RINT AT a,b-1;" ": IF b=31 THE
N LET b=30
80 IF dir=2 THEN LET b=b-1: P
RINT AT a,b+1;" ": IF b=0 THE
N LET b=1
90 IF dir=4 THEN LET a=a+1::
PRINT AT a-1,b;" ": IF a=21 TH
EN LET a=20
95 IF dir=8 THEN LET a=a-1: P
RINT AT a+1,b;" "
96 IF a=s AND b=d THEN BEEP 0
.5,40: BEEP 0.005,30: PRINT AT
a,d;" ": LET d=31: LET s= INT (
RND *20)+1: LET sc=sc+1: PRINT
AT 0,21;"KILLS=";sc: PRINT AT a
,b+1.5;"J": GO TO 75
100 GO TO 60
409 FOR y=1 TO 40
415 LET z= INT ( RND *21)+1: LE
T x= INT ( RND *28)
420 PRINT AT z,x; INK 4;"H"
430 NEXT y
440 RETURN
800 CLS
900 FOR q=0 TO 30
950 BEEP 0.005,q
960 NEXT q
999 CLS : FOR l=1 TO 20
1000 PRINT AT 16,12;"HOORAY!"
1001 PRINT AT 6,12;"HOORAY!"
1002 PRINT AT 11,15;"P": BEEP 0

```



```

.005,20
1003 CLS
1004 PRINT AT 11,15;"C": BEEP 0
.005,-30
1005 FOR k=6 TO 16
1006 PRINT AT k,5;"HOORAY": PRI
NT AT k,20;"HOORAY"
1007 NEXT k: NEXT 1
1008 FOR x=0 TO 30: BEEP 0.005,x
: NEXT x
1009 CLS : PRINT "YOU HAVE REACH
ED THE HIGHEST","SCORE"
1010 PRINT "TYPE IN YOUR NAME":
INPUT b$
1015 LET mi=sc
1016 CLS : PRINT "DO YOU WISH TO
PLAY AGAIN?(Y/N)"
1017 INPUT g$
1018 IF g$="y" OR g$="Y" THEN C
LS : LET li=5: GO TO 55
1020 STOP

```



HARRIET DODGES THE SPIDERS

HARRIET Dodges the Spiders was written for the 16K Spectrum by Alan Rees, aged 13, of Abergavenny, Gwent. The object is to dodge the oncoming spiders to stay alive for as long as possible. You gain a bonus serum at 1,000 points. The game is joystick-compatible with the ZX Interface Two. If you have no Interface Two, you can use keys 1 and 2 to move left and right.

```

1 LET a=0
2 LET b=15
3 LET se=0
4 LET sc=0
5 LET hsc=200
8 GO SUB 9000
9 GO SUB 8000
10 LET z= INT ( RND *32)
11 PRINT INK 2; AT 19,z; "B"

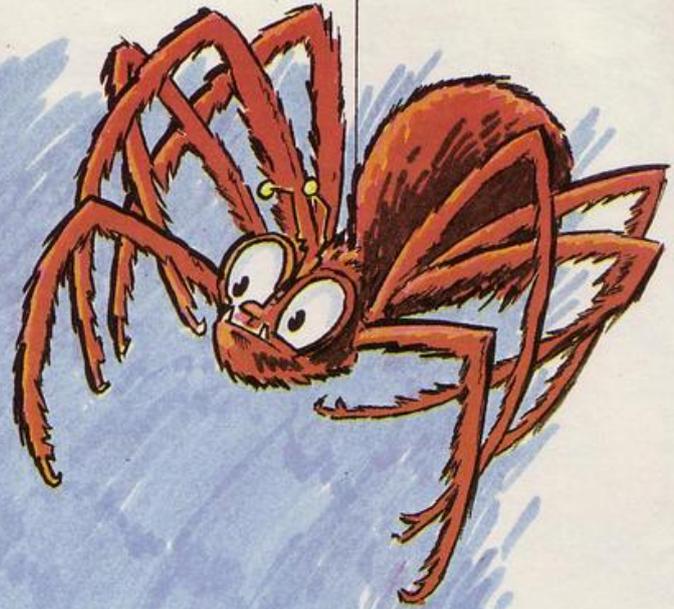
12 LET z= INT ( RND *32)
13 BEEP .04,z
14 PRINT INK 2; AT 19,z; "B"

15 PRINT AT 20,0; "
"
16 PRINT AT 21,0; "SERUM ";se+
1
20 PRINT INK 4; AT a,b; "A"
30 IF INKEY$ ="1" THEN LET b
=b-1: IF b<0 THEN LET b=0
35 IF sc=9999 THEN GO SUB 700
0
40 IF INKEY$ ="2" THEN LET b
=b+1: IF b>31 THEN LET b=31
50 LET l=USR (3280)
55 LET sc=sc+1
57 PRINT AT 0,0;sc
58 PRINT AT 0,25; "HI ";hsc
60 PRINT INK 4; AT a,b; "A"
65 IF sc=1000 OR sc=2000 OR sc
=3000 OR sc=4000 OR sc=5000 OR s
c=6000 OR sc=6000 OR sc=8000 OR
sc=9000 THEN GO SUB 8200
70 IF ATTR (a+1,b)=58 THEN G
O SUB 2000
100 GO TO 10
2000 IF se >= 1 THEN GO TO 2050

2010 IF se=0 THEN GO SUB 2080

2050 LET se=se-1
2060 PRINT FLASH 1; AT 21,8; "ON
E LESS SERUM: LOOK OUT"
2062 FOR N=0 TO 100: NEXT N
2070 RETURN
2080 PRINT FLASH 1; AT 20,0; "NO
SERUM: TOO DANGEROUS TO GO ON"

```



```

2095 IF sc>hsc THEN LET hsc=sc
2110 FOR p=1 TO 15
2111 PRINT AT a+1,b;" "
2115 BEEP .2,9
2120 PRINT INK 4; AT a,b;"A"
2125 BEEP .2,10
2130 PRINT INK 2; AT a,b;"B"
2140 NEXT p
2150 CLS
2160 PRINT FLASH 1;"ANOTHER GO
?"
2170 IF INKEY$="y" THEN GO TO
.10
2180 IF INKEY$="n" THEN GO TO
.2200.
2190 GO TO 2170
2200 PRINT "A A A A A A A A A A
A A A A A A A A A A A A A A A
A A A A A A A A A A A A A A A
A A A A A A"
2210 PRINT INK 4; AT 10,10;"A<
Good bye"
2220 STOP
7000 CLS
7001 PRINT FLASH 1; AT 10,8;"CO
NGRATULATIONS"
7005 PRINT FLASH 1; AT 11,2;"YO
U HAVE SAVED HARRIET FROM"
7007 PRINT FLASH 1; AT 12,10;"T
HE SPIDERS"
7010 PRINT AT 5,10; INK 4;"A<Th
ank you "
7020 STOP
8000 PRINT "DO YOU WANT INSTRUCT
IONS?"
8010 INPUT A$
8020 IF A$="YES" OR A$="yes" THE

```

```

N GO TO 8050
8030 IF A$="NO" OR A$="no" THEN
RETURN
8050 CLS
8070 PRINT " YOU USE THE SECOND
JOY-STICK TO MOVE HARRIET FROM
LEFT TO RIGHT DODGING THE SP
IDERS."
8080 PRINT " IF YOU DO NOT HAVE
A SINCLAIR INTERFACE 2
THEN USE KEYS 1 AND 2 TO MOVE
."
8082 PRINT " YOUR SCORE IS ON TH
E LEFT AND THE HI-SCORE ON THE
RIGHT"
8084 PRINT " YOU GET A BONUS SER
UM AT EVERY THOUSAND"
8090 PRINT "PRESS ANY KEY (OR F
IRE ) TO CONTINUE...."
8100 IF INKEY$="" THEN GO TO
8100
8105 CLS
8110 RETURN
8200 PRINT FLASH 1; AT 21,8;"BO
NUS SERUM!"
8205 BEEP .3,sc/60
8210 LET se=se+1
8220 RETURN
9000 FOR q=USR "a" TO USR "b"+
7
9010 READ w: POKE q,w
9020 NEXT q
9080 DATA 0,30,63,109,191,158,52
,38
9090 DATA 0,0,24,189,255,153,165
,165
9099 RETURN

```

Hardware

USE the Kempston joystick to move around the screen in **Trap**, written for the 16K Spectrum by Paul Johnson, aged 13, of Newton-le-Willows, Merseyside. As you move, holes you must try to avoid appear. Falling down a hole will mean instant death. If you are trapped by holes on all four sides you can press "9" to escape. The holes are often flashed on the screen before they appear, so you know which areas to avoid. You must eat the seeds and plants as they appear.



TRAP

```

10REM Trap
30GO SUB 9900:REM Graphics

40GO SUB 9800:REM Main Variables
50GO SUB 9700:REM Titles
60GO SUB 9600:REM Starting Screen
70GO SUB 1000:REM Game
80GO SUB 9500:REM End of Game

90GO TO 50
1000LET x2=x1:LET y2=y1:
1005LET sc=0:LET ch=0
1010 LET kem= IN 30
1025 PRINT AT x2,y2; INK 1;"b"

1035 LET x3=x2: LET y3=y2
1040 LET x2=x2+(kem=4 AND y2<29)-
(kem=8 AND x2>2)
1050 LET y2=y2+(kem=1 AND y2<29)-
(kem=2 AND y2>2)
1055 IF kem=16 THEN LET x3=x2+1
: GO SUB 8010: LET sc=sc-50
1060IF x3=x2AND y3=y2THEN PRINT AT x2,y2; INK 4;"+":GO TO 1010
1070BEEP .1,24
1080LET boo=ATTR (x2,y2)
1090IF boo=58THEN RETURN
1100IF boo=57THEN GO SUB 8000

1110IF boo=59THEN LET sc=sc+20
1115GO SUB 8300
1120IF sc>hsTHEN GO SUB 8100:LET hs=sc
1130PRINT INK 0;AT 20,6;sc;" ";AT 20,21;hs;" "
1140GO SUB 8200

1150GO TO 1010
8000LET sc=sc+10
8010PRINT INK 3;PAPER 7;AT x2,y2+1;"c";AT x2,y2-1;"c";AT x2+1,y2;"c";AT x2-1,y2;"c"
8020RETURN
8100IF ch=1THEN RETURN
8110LET ch=1
8120FOR n=1TO 2:BEEP .025,36:BEEP .5,48:NEXT n
8130RETURN
8200PRINT AT x2,y2; INK 4;"+"

8220RETURN
8300FOR z=1TO 2
8302LET a=INT (RND *4+1)
8305LET p=x2:LET q=y2
8310LET p=x2+(a=1)-(a=2)
8320LET q=y2+(a=3)-(a=4)
8330IF p=x2AND q=y2THEN GO TO 8302
8340PRINT INK 2;AT p,q;"a"
8345NEXT z
8350RETURN
9500CLS
9510 BEEP .5,12:BEEP 1,0
9520PRINT "You fell in a hole!"
9530PRINT "Your score was ";sc

9540PAUSE 1000
9550RETURN
9600CLS
9610PRINT INK 7;PAPER 2;"bbbbbbbbbbbbbbbbbbbbbbbbbbbbbb"
9620FOR n=1TO 18
9630PRINT INK 7;PAPER 2;AT n,0;"b";AT n,31;"b"
9640NEXT n

9650PRINT INK 7;PAPER 2;"bbbbbbbbbbbbbbbbbbbbbbbbbbbbbb"
9660PRINT INK 0;PAPER 7;AT 20,0;"Score=";AT 20,16;"High="
9670PRINT AT x1,y1; INK 4;"+"

9680RETURN
9700BORDER 7;PAPER 7:INK 0:CLS
9710PRINT TAB 13;"Trap":PLOT 104,166:DRAW 31,0
9720PRINT AT 2,1;"Move + with the arrow keys"" Don't fall down a a hole."" Plant the B seeds."" Eat the c plants."" B = 10"" c = 20"" Press 9 to escape if you get trapped."
9730PRINT "" Press any key to start":PAUSE 0:RETURN
9800LET hs=500:REM High Score

9810LET x1=9:LET y1=15:REM Starting Positions
9820RETURN
9900FOR n=0TO 23
9910READ gr:POKE USR "a"+n,gr

9920NEXT n:RETURN
9930DATA BIN 00111100,BIN 011110,255,255,255,255,BIN 0111110,BIN 00111100:REM HOLE
9940DATA 0,0,0,BIN 00011000,BIN 00011000,0,0,0:REM TRAIL
9950DATA 255,BIN 11000011,BIN 10100101,BIN 10011001,BIN 10011001,BIN 10100101,BIN 11000011,255:REM FOOD

```

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IN TREE SNAKE, written for the 16K Spectrum by Jason Gould of Swanley, Kent, high scores are not too easy to attain. Using the cursor keys you must move the snake round the maze in an attempt to eat all the apples. The snake starts stationary in the middle of the screen and, once moved, will continue in that particular direction at a high speed until a different key is pressed. You must avoid your tail and the walls of the maze.

```

1 GO SUB 9000
2 PAPER 2: BORDER 1: INK 0: B
RIGHT 0: CLS
5 PRINT INK 6; "(32*ig8)": AT
21,0; "(32*ig8)"
10 LET sc=0: LET m=8000: LET L
ive=3: LET bomb=10
20 FOR j=0 TO 21: PRINT AT j,
0: INK 6; "(ig8)": AT j,31; "(ig8)
": NEXT j
30 FOR j=1 TO 20: PRINT AT j,
1; "
": NEXT j
35 GO SUB m
40 FOR j=1 TO Bomb
45 LET x= INT ( RND *19)+1: LE
T y= INT ( RND *29)+1: IF x=1 AN
D y=15 OR ATTR (x,y)=23 OR ATT
R (x,y)=22 THEN GO TO 45
50 PRINT AT x,y; INK 7; "a"
55 NEXT j
70 LET d=0
75 PRINT AT 21,4; PAPER 6; "LI
VES: "; live; AT 21,20; "SCORE: "; sc
; "
80 LET x1=10: LET y1=15
85 PRINT AT 10,15; INK 7; "b"

90 IF INKEY#="" THEN GO TO
90
95 LET b#= INKEY# : LET a#= IN
KEY#
100 PRINT AT x1,y1; INK 6; "b"

105 PRINT AT 21,26; PAPER 6; sc

110 IF INKEY# <> "" THEN LET
b#= INKEY#
115 IF B#<"5" OR B#>"8" THEN G
O TO 120
117 LET a#=b#
120 LET x2=x1: LET y2=y1
130 LET y2=y2+(a#="8")-(a#="5")

140 LET x2=x2+(a#="6")-(a#="7")

145 PRINT AT x1,y1; INK 6; "c"

150 IF ATTR (x2,y2)=23 THEN B
EEP .1,30: LET sc=sc+5: LET d=d+
1: IF d=bomb THEN PRINT AT x2,
y2; INK 6; "b": GO TO 500
160 IF ATTR (x2,y2)=22 OR x2=2
1 THEN PRINT AT x2,y2; INK 6;
FLASH 1; "b": GO TO 600
210 BEEP .009,7
220 LET x1=x2: LET y1=y2
230 GO TO 100
500 REM Next Maze
510 BEEP .5,5: BEEP .5,10
520 LET m=m+100
530 FOR j=1 TO 100
540 LET sc=sc+1: BEEP .002,j/2

550 PRINT AT 21,26; INK 0; PAP
ER 6; sc: NEXT j
560 IF m>8200 THEN LET bomb=bo
mb+1
570 GO TO 20
600 REM Lose Live
610 LET live=live-1
615 IF x2=0 OR x2=21 OR y2=0 OR
y2=31 THEN PRINT AT x2,y2; IN
K 6; "(ig8)"
620 IF live=0 THEN GO TO 700
630 BEEP .3,0: BEEP .3,-5

```

TREE SNAKE



```

650 GO TO 20
700 PRINT AT 10,10; INK 6; FLA
SH 1; "Game Over": FOR j=1 TO 10:
BEEP .1, RND *100-50: NEXT j
710 INPUT "Another Game (Y/N) ?
": a#
720 IF a#="Y" OR a#="y" THEN G
O TO 10
730 STOP
8000 REM Mazes
8099 RETURN
8100 FOR j=1 TO 6: PRINT AT j,1
0; INK 6; "(ig8)": NEXT j
8110 FOR j=14 TO 20: PRINT AT j
,10; INK 6; "(ig8)": NEXT j
8199 RETURN
8200 FOR j=1 TO 6: PRINT AT j,1
0; INK 6; "(ig8)": AT j,20; "(ig8)
": NEXT j
8210 FOR j=14 TO 20: PRINT AT j
,10; INK 6; "(ig8)": AT j,20; "(ig
8)": NEXT j

```

```

8299 RETURN
8999 GO TO 8200
9000 FOR j=0 TO 7: READ q: POKE
USR "a"+j,q: NEXT j
9010 FOR j=0 TO 7: READ q: POKE
USR "b"+j,q: NEXT j
9020 FOR j=0 TO 7: READ q: POKE
USR "c"+j,q: NEXT j
9100 DATA 6,8,28,62,62,62,62,28
9110 DATA 60,126,255,219,255,231
,126,60
9120 DATA 126,231,231,129,129,23
1,231,126
9999 RETURN

```

GUNNER

```

4 CLS
5 PRINT "          GUNNER"

6 PRINT "*****"
7 PRINT "
*****"
8 PRINT "          THE IDEA OF TH
E GAME IS TO TRY AND MANOEURE
YOUR GUN- SIGHT INTO THE APP
ROACHING ENEMY AIRCRAFT. T
HEN, BY PRESSING THE "0"
KEY, FIRING YOUR MACHINE GUN
5. IF YOU MISS THE ENEMY AIRCRA
FT WILL KEEP ON APPROACHING U
NTIL HIS LESS DEVELOPED MACHIN
E GUNS ARE IN RANGE THEN HE OF
ENS FIRE..... AND IT IS CURTAI
NS FOR YOU."
9 PRINT "          5: MOVE LEFT
          8: MOVE RIGHT
          0: FIRE"

10 LET Y$=""
11 PRINT "          YOU MUST LINE UP
THE CENTRE OF THE GUN SIGHT
WITH THE RADAR BLIP. AL
THOUGH YOU CAN BE ONE SPACE O
UT EITHER WAY.....PRESS A/K
TO COMMENCE"
12 PAUSE 4E4
13 LET AMM=100
14 CLS
15 LET S=0
16 LET B=1
17 LET A=14
18 GOTO 100
19 PRINT AT 10,0;"

96 LET B=1
97 PRINT AT 17,2;"
100 LET Z=INT (RND*10)+10
110 PRINT AT 10,0;"

120 PRINT AT 16,0;"
130 PRINT AT 17,2;"
135 LET B=B+1
136 PRINT AT 19,0;"
140 PRINT AT 18,0;"

141 LET B=B+1
150 PRINT AT 12,A-4;"
160 LET A=A+(INKEY$="0" AND A<=
25)-(INKEY$="5" AND A>5)
161 IF AMM<=0 THEN GOTO 165
164 IF INKEY$="0" THEN GOSUB 10
00
165 IF B=11 THEN GOTO 2000
166 PRINT AT B,Z-1;"
170 PRINT AT B+1,Z-1;Y$
180 GOTO 141
1001 PRINT AT 11,A;"
1002 PRINT AT 11,A;"
1003 LET AMM=AMM-1
1004 IF B<>11 THEN RETURN
1005 IF Z<>A THEN GOTO 1007
1006 GOTO 1010
1007 IF Z<>A+1 THEN GOTO 1009
1008 GOTO 1010
1009 IF Z<>A+2 THEN GOTO 2000
1010 IF A=Z THEN LET S=S+10
1020 IF A+1=Z THEN LET S=S+10
1030 IF A+2=Z THEN LET S=S+10
1031 PRINT AT 11,A;"
1040 PRINT AT 19,22;"SCORE:";S
1050 GOTO 95
2000 PRINT AT B,Z-1;"
,Z-2;"
2001 PRINT AT B-1,Z-2;"
B-2,Z-4;"
2002 PRINT AT B-1,Z-2;"
B-2,Z-4;"
2003 PRINT AT B-2,Z-4;"
4,Z-4;"
2004 PRINT AT 11,7;"
AT 9,11;"
AT 7,14;"
AT 5,1
8;"
AT 6,18;"
AT 3,22;"
;AT 4,22;"
2005 FOR U=0 TO 21
2007 PRINT AT U,0;"
2008 NEXT U
2009 CLS
2010 PRINT "*****YOU ARE DE
AD*****"
2011 PRINT
2020 PRINT
2030 PRINT
2040 PRINT " YOU SCORED ";S/10;
" HITS AND YOU SCORED ";S
;" POINTS"
2050 PRINT " ANOTHER GO (Y/N)?"
2060 INPUT L$
2070 IF L$="Y" THEN GOTO 0

```



MANOEUVRE your gunsights and line them up with the approaching enemy aircraft which you must destroy. Use keys 5 and 8 to line up your sights with the radar blip which acts as a guide and you can fire at the enemy using 0. You have 100 rounds of ammunition which decreases each time you fire a round. If the enemy lands he will blow up your base and then take-off.

Gunner was written for the 16K ZX-81 by Ian Mylrea of Burnham-on-Sea, Essex.



CREEPY CREATURES

HAVING just trekked over moor and mountain, you are sitting on a large boulder to recover. When you have caught your breath you look up at the haunted mansion you are to explore. You have 1,500 power points which you need to beat the animals facing you on the way. If you destroy the crocodiles, poisonous spiders and giants you will reach the treasure.

Creepy Creatures was written for the 16K ZX-81 by James Forsyth, aged 11, of Dover, Kent.

```

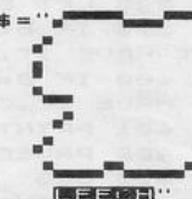
30 PAUSE 250
40 CLS
95 LET S=1500
97 LET W=0
100 PRINT "YOUR LONG JOURNEY OVE
ER MOOR AND MOUNTAIN IS OVER AND
YOU SIT DOWN ON A LARGE BOUL
DER."
105 PRINT
110 PRINT "AFTER YOUVE CAUGHT Y
OUR BREATH YOU LOOK UP AT THE
MENACING HAUNTED MANSION."
120 PRINT
130 PRINT
140 PRINT "YOU RUN UP TO THE BI
G OAKEN DOORAND SLAM YOUR FIST O
N IT.THE DOOR OPENS AND YOU E
NTER THROUGH"
150 PRINT
160 PRINT "YOU LOOK DOWN THE LO
NG HALLWAY AND PROCEED INTO THE
KITCHEN AND PICK UP A BUTCHE
RS KNIFE "
170 PAUSE 1000
200 CLS
221 LET Y=INT (RND*2+1)
222 IF Y=1 THEN LET P$="

```

```

"
223 IF Y=2 THEN LET P$="
"
224 PRINT "AS YOU PICK UP THE K
NIFE A GIANT "
225 PRINT AT 13,8;P$
226 PRINT AT 1,0;"ATTACKS YOU"
235 PRINT AT 4,0;"YOU HAVE ";S;
" POWER POINTS"
240 PRINT AT 5,0;"HOW MANY POWE
R POINTS?"
250 INPUT P
251 LET BB=INT (RND*110)+1
260 IF BB>P THEN GOTO 260
270 IF BB<P THEN GOTO 300
280 PRINT "TOO BAD...HE ATE YOU"
290 STOP
300 PRINT "YOU SURE BEAT THAT M

```



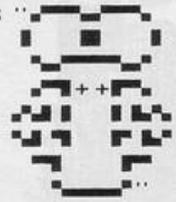
LEECH



```

ONSTER."
303 LET F=INT (RND*150)+1
305 PRINT "YOU NOW HAVE ";U+F;"
TREASURE POINTS"
310 PRINT "AND YOU HAVE ";S-P;"
POWER POINTS."
312 PAUSE 200
315 CLS
320 PRINT "AFTER YOU WIPE THE B
LOOD OFF YOUR SWORD YOU PROCE
ED INTO THE NEXT ROOM."
321 PRINT "YOU SWITCH ON THE LI
GHT AND STANDING NEXT TO YOU
IS COUNT DUCKULA"
322 PAUSE 450
325 PRINT AT 14,10;"

```



```

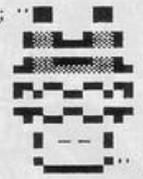
330 FOR I=1 TO 60
335 PRINT AT 15,11;" "
340 PRINT AT 15,11;" "
345 NEXT I
346 LET S=S-P
350 PRINT AT 7,0;"YOU NOW HAVE
";S;" POWER POINTS."
355 PRINT AT 8,0;"HOW MANY POWE
R POINTS?"
356 LET UU=INT (RND*120)+1
360 INPUT 0
365 IF UU>0 THEN GOTO 375
370 IF UU<0 THEN GOTO 360
375 PRINT "TOO BAD...HE BIT YOU
"
377 STOP
380 PRINT "YOU SURE HAVE GOT A
STRONG ARM."
385 LET N=INT (RND*150)+1
387 LET S=S-0
390 PRINT "YOU NOW HAVE ";U+N+F
;" TREASURE POINTS"
391 PRINT "AND YOU HAVE ";S;" P
OWER POINTS."
392 PAUSE 300
393 CLS
394 PRINT "THERE IS A KEY IN TH
E ROOM DO YOU WANT IT? "
396 PRINT "2=YES
1=NO"
397 INPUT 0$
398 LET B=INT (RND*2)+1
399 IF B=1 THEN LET L$="YOU CAN
T HAVE IT."
400 IF B=2 THEN LET L$="YOU CAN
HAVE IT."
401 PRINT L$
402 PAUSE 300
405 CLS
410 PRINT "AFTER SOOTHING YOUR
FIST YOU ENTER INTO A ROOM OF
POISONOUS SPOOKY SPIDERS..."
411 PRINT "5=LEFT 8=RIGHT"
412 PAUSE 350
413 LET U=0
415 LET K=11
420 PRINT AT 21,INT (RND*26);"*
"
425 PRINT AT 0,K;
430 IF PEEK (PEEK 16398+256*PEE
K 16399)=23 THEN GOTO 460
435 PRINT "Y"
440 SCROLL
445 IF INKEY$="5" THEN LET K=K-
1

```

```

450 IF INKEY$="8" THEN LET K=K+
1
453 LET U=U+5
455 GOTO 420
460 PRINT
462 LET S=S+U
464 PRINT "YOU NOW HAVE ";U+N+F
;" TREASURE POINTS"
465 PRINT "AND YOU HAVE ";S;" P
OWER POINTS"
466 PAUSE 200
470 FAST
475 CLS
480 SLOW
490 PRINT "AS YOU ENTER THE NEX
T ROOM A HUGE BEASTIE BAT FLI
ES OVERHEAD"
500 PRINT
510 PRINT "YOU NOW HAVE ";S;" P
OWER POINTS."
520 PRINT AT 11,10;"

```

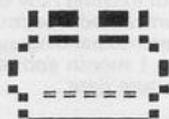


```

530 FOR I=1 TO 50
531 PRINT AT 15,4;"
"
540 PRINT AT 14,10;" "
550 PRINT AT 14,10;" "
560 NEXT I
570 PRINT AT 5,0;"HOW MANY POWE
R POINTS?"
580 INPUT I
584 LET 00=INT (RND*130)+1
590 IF 00>I THEN GOTO 610
595 IF 00<I THEN GOTO 620
610 PRINT "TOO BAD...HE STRUCK
YOU DOWN"
615 STOP
620 PRINT "YOU SURE THUMPED HIM
"
625 LET Z=INT (RND*200)+1
627 PRINT "YOU NOW HAVE ";U+N+F
+Z;" TREASURE POINTS"
628 LET S=S-I
630 PRINT "AND YOU HAVE ";S;" P
OWER POINTS"
635 PAUSE 250
640 CLS
650 LET E=INT (RND*4)+1
660 IF E=1 THEN LET I$="
"
670 IF E=2 THEN LET I$="
"
680 IF E=3 THEN LET I$="
"

```



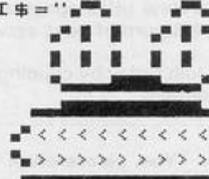


CATERPILLA

```

[ ]"
690 IF E=4 THEN LET I$="
:
:
<
>

```



CROCODILE

```

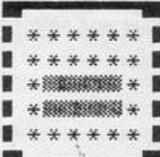
[ ]"
700 PRINT "UNFORTUNATELY YOU HAVE MET A ";AT 12,8;I$
710 PRINT AT 1,0;"YOU HAVE ";S;
" POWER POINTS"
711 LET MM=INT (RND*140)+1
720 PRINT "HOW MANY POWER POINTS?"
730 INPUT C
740 IF MM>C THEN GOTO 760
750 IF MM<C THEN GOTO 770
760 PRINT "TOO BAD...HE MANGLED

```

```

YOU TO DEATH"
765 STOP
770 PRINT "WELL DONE.NOW THAT YOU HAVE KILLED ALL THE CREEPY CREATURES I SUPPOSE YOU WANT THE TREASURE."
771 PAUSE 300
772 PRINT "IF SO PRESS Y FOR YES N FOR NO"
773 INPUT M$
774 IF M$="Y" THEN GOTO 789
775 IF M$="N" THEN GOTO 776
776 CLS
777 PRINT "THERE YOU ARE";AT 14,10;"

```



```

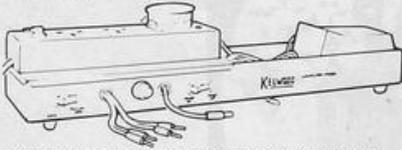
778 STOP
789 CLS
790 PRINT "IM SORRY BUT YOU CANNOT HAVE IT"
791 PAUSE 140
792 GOTO 1

```

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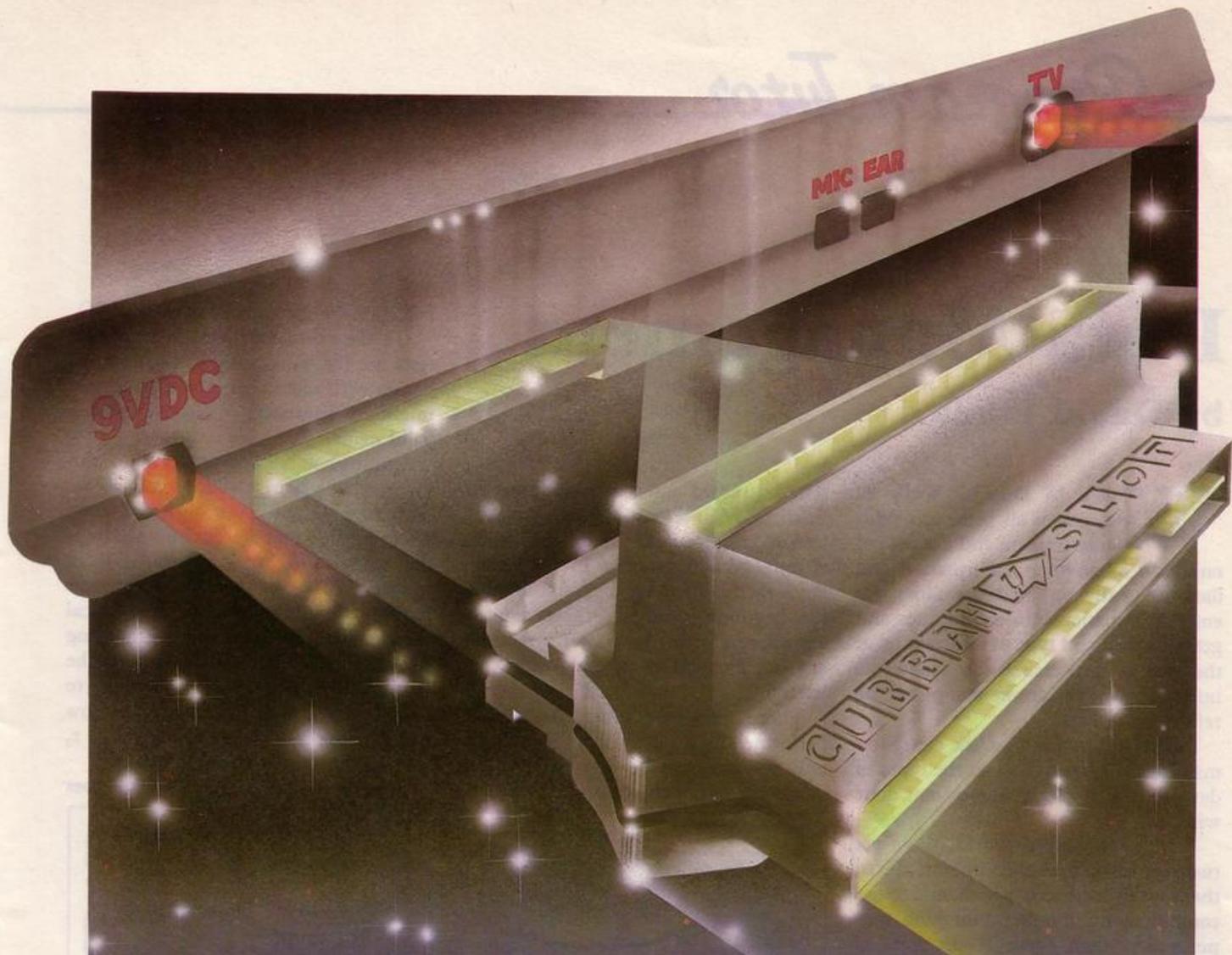
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Data Management

by David Janda

WHAT IS DATA? Well, 99 percent of all programs written operate on and use data of one kind or another. Information and data are really one and the same; we enter information into a computer and get out a different type of information at the end of processing. So when the information is inside the computer, we refer to it as data.

Before we discuss how the computer manages data, let us look at the types of data we give it and what we want done with it.

In the commercial world, there are two very broad uses of computers. First, there are the sciences, which tend to use computers for number-crunching purposes and then there is the area of commerce, where computers are used for storing and manipulating large amounts of data, such as an index.

Examine files

Expanding on the commercial side, a typical data processing problem might be to examine the contents of a file containing names and addresses and producing a second file with data which meets a particular condition.

Imagine that our first file comprises hundreds of entries — records — and each record consists of the following entries — fields — Name, Sex, Age.

The program looks at each record in turn and if sex is female and age is less than 21, the whole record is transferred to a second file. The second file need contain only one field called NAME, because we know each person is female and less than 21.

In reality, we should have the same fields in the second file as there were in the first. That is because we might want to do more processing on that file.

It is worth noting that even though the problem may seem simple, writing a program to do it is not. The problem lies not in the sifting of records but in checking we have valid records in the first place.

Let us assume that our program has

found a record and it is examining the field NAME. Does NAME have all letters in it? After all, do you know anyone with a number in his name? Does each name have a capital letter at the beginning and are there capitals anywhere else in the name? Are there any other characters in NAME except letters?

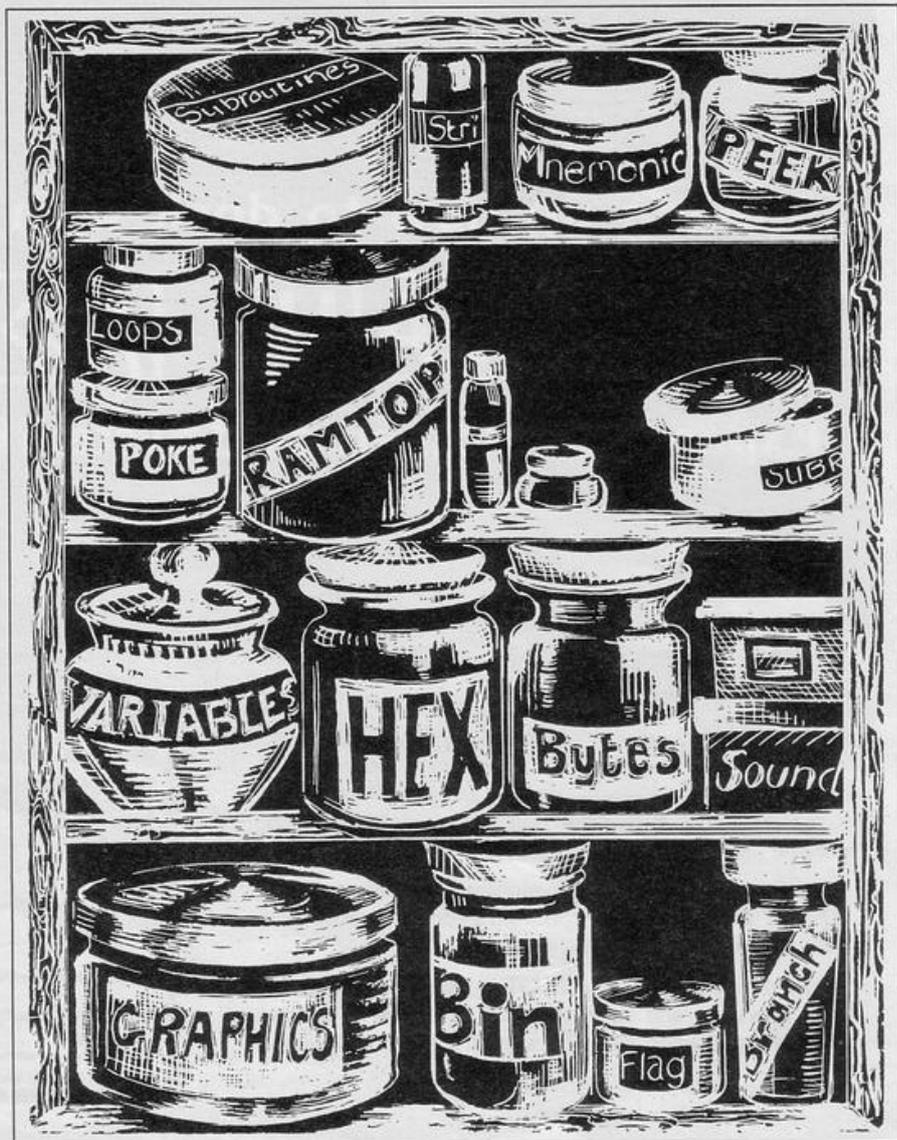
Those tests, and others, should be performed on all the fields. That is the only way you can be sure you will get valid data out of the computer; remem-

ber, garbage in, garbage out — GIGO.

On the other hand, make sure your tests are the correct ones. Rejecting all names with more than one capital in it might be disastrous — McDonald is a valid name.

Unfortunately computers do not know what makes a valid name, so we have to program for it. What is even worse for those who program in Basic is that we have to do a good deal of work to get valid data into the computer initially. Some languages such as Pascal can take the drudgery out of checking for valid data. Take the example of the field NAME; in Pascal it is possible to define a data type which would allow only for the letters A to Z and a to z, thus making the task much easier.

Sinclair machines can store two types



of data, numeric — floating point — and string — alphanumerics — and that is it. So far as the numeric type is concerned, all numbers are held as floating point, even if the number you store has no exponent.

One of the reasons why the ZX-81 and Spectrum are slow machines is because all calculations performed are done on floating point as well. So, even if you specify a variable A as holding an integer — a whole number — and do some arithmetic on it, it will take the same amount of time, possibly even longer.

Data types

The data type string is probably the most widely-used, because it is so flexible. With strings it is possible to store any character, including graphics, on a ZX-81 or Spectrum keyboard. Not only that, strings can be joined and manipulated in many ways. So no matter what

type of data, it must be handled by those two data types and it is possible.

Both data types have binary operators associated with them, namely; '+', '-', '*', '/', '**' or '^' on the Spectrum, '=', '>', '<', '<=', '>=', and '<>'. They are the basic numeric and string operators. With them we can compare different types of data, thus allowing for different courses of action to be taken depending on the result. A good deal of computing can also be performed by using those operators and even though scientific functions are available on Sinclair machines, doing the same job with those operators can mean more accuracy, although it would take longer.

A point worth noting about accuracy is that doing comparisons on numeric variables is a slightly dangerous area because the numbers are held in floating point format. There are two data types on Sinclair machines, numeric and string. One holds numbers and the other characters. Both comprise charac-

ters from the machine character set which can be seen by running this program.

```
10 REM PROGRAM 1.
20 REM ZX-81 VERSION.
30 FOR I=0 TO 255
40 SCROLL
50 PRINT CHR$(I);";";I
60 NEXT I
```

```
10 REM program 1.
20 REM Spectrum version.
30 FOR I=32 TO 255
40 PRINT CHR*(I);";";I
50 NEXT I
```

Making comparisons using the binary operators can be dangerous, try this one.

```
10 REM PROGRAM 2.
20 FOR A=1 TO 20
30 LET B=SQR A*SQR A
40 PRINT B
50 IF B<>A THEN PRINT "ERROR"
60 NEXT A
```

What is happening is that even though the answer appears to be correct, at machine level it is not, because of small inaccuracies.



THE OBJECT of *Vortex* is for you to lure the alien towards it using your command ship. Use the cursor keys to move your ship round the screen and the alien will follow automatically. The alien will latch on to you if it gets too close and earth will be destroyed. To destroy the alien you must take it through the centre of the vortex.

Written for the 1K ZX-81 by Shaun Beales of Wisbech, Cambs.

```
10 REM "ALIEN"
15 PAUSE 50
20 LET T=0
30 LET U=INT (RND*7)*2
40 LET X=1
50 LET Y=X
60 LET Z=U
70 LET J=11
80 PRINT AT U+1,X-1;"███"
90 PRINT AT Y,Z;"███"
100 IF U=Y AND X=Z THEN GOTO 28
110 PRINT AT J,10;"███ ███"
130 IF J=Y AND J=Z THEN PRINT T
: "****ALIEN DESTROYED****"
: "██████████████████"
135 IF U=Y AND J=Z THEN STOP
136 LET T=T+5
140 IF U=Y AND X=Z THEN PRINT T
: "****EARTH DESTROYED****";K
170 LET X=X+2*(INKEY$="8")-2*(I
NKEY$="5")
180 LET U=U+2*(INKEY$="6")-2*(I
NKEY$="7")
190 IF Y<U THEN LET Y=Y+1
200 IF Y>U THEN LET Y=Y-1
210 IF Y>U THEN LET Y=Y-1
220 IF Z>X THEN LET Z=Z-1
230 IF Z<X THEN LET Z=Z+1
240 CLS
260 GOTO 80
280 GOTO 140
```

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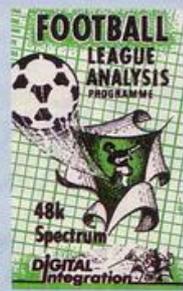
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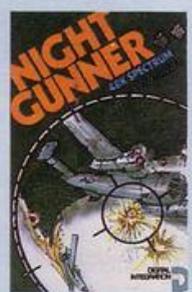


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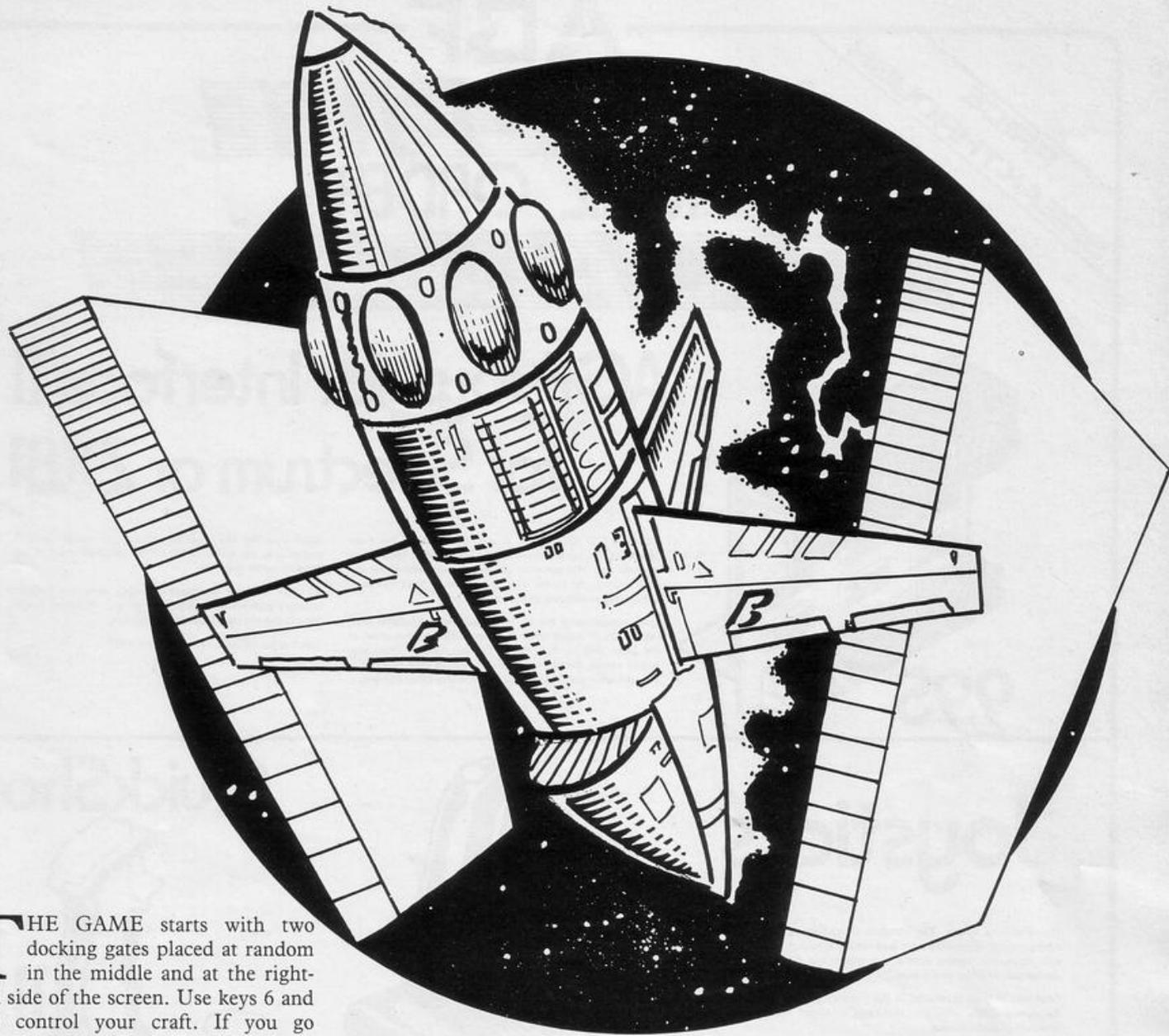
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Five successful runs will result in you achieving the highest accolade.

Fleet Brigadier was written for the 16K ZX-81 by Phillip Woods of Chester.

FLEET BRIGADIER

```

1 REM "DOCKER"
2 FOR E=1 TO 5
3 PRINT "DOCK YOUR SHIP BETWE
EN THE 2 █"
4 PRINT "CAN YOU LEAVE YOUR C
ARGO AT GATE 1 AND DOCK IN GATE
2 TO BECOME FLEET BRIGADIER USE
KEYS 7-UP,6-DOWN"
5 PAUSE 500
6 CLS
7 FOR C=1 TO 22
8 PRINT "█"
9 NEXT C
10 LET P=INT (RND*17)+1
11 LET Q=31
12 PRINT AT P,0;"█";TAB 0;"█";
TAB 0;"█";TAB 0;"█"
13 LET Q=INT (RND*17)+1
14 LET R=15
15 PRINT AT Q,R;"█";TAB R;"█";
TAB R;"█";TAB R;"█"
16 FOR A=1 TO 30
20 PRINT AT INT (RND*21),INT (
RND*32);"█"
30 NEXT A
35 LET X=INT (RND*21)+1
40 FOR B=1 TO 12
50 PRINT AT X,B;"█"
51 FOR K=1 TO 5
52 NEXT K
61 IF B=13 THEN GOTO 2000
62 IF B=27 THEN GOTO 4000
63 IF INKEYS="7" THEN GOTO 100
64 IF INKEYS="6" THEN GOTO 200
65 NEXT B
67 IF B=13 THEN GOTO 2000
100 PRINT AT X,B;"█"
110 LET X=X-1
115 LET B=B+1
120 GOTO 50
200 PRINT AT X,B;"█"
210 LET X=X+1
215 LET B=B+1
220 GOTO 50
700 SAVE "DOCKER"
1000 FOR R=1 TO 20
1010 PRINT AT X,B;"███"
1020 PRINT AT X,B;"███"
1021 FOR K=1 TO 3
1022 NEXT K
1030 NEXT R
1040 CLS
1050 PRINT TAB 8;"HA...YOU DIED"
1060 PAUSE 200
1070 GOTO 1
2000 IF X=0+1 OR X=0+2 THEN GOTO
2090
2030 GOTO 1000
2090 FOR B=14 TO 27
3000 GOTO 50
4000 IF X=P+1 OR X=P+2 THEN GOTO
4050
4010 GOTO 1000
4050 IF E=1 OR E=2 OR E=3 OR E=4
OR E=5 THEN GOTO 4051
4051 CLS
4055 PRINT "WELL DONE...YOU MA
DE IT"
4065 FOR K=1 TO 10
4070 PRINT AT 13,10;"HOORAY"
4071 FOR J=1 TO 10
4072 NEXT J
4080 PRINT AT 13,10;"*****"
4090 NEXT K
4092 IF E=1 OR E=2 OR E=3 OR E=4
OR E=5 THEN GOTO 6000
4095 STOP
5000 CLS
5010 GOTO 1
5020 STOP
6000 CLS
6010 PRINT "YOU MADE IT ";E;" TI
MES AND YOU ARE"
6011 IF E=1 THEN GOTO 6020
6012 IF E=2 THEN GOTO 6050
6013 IF E=3 THEN GOTO 6090
6014 IF E=4 THEN GOTO 6130
6015 IF E=5 THEN GOTO 6170
6020 PRINT AT 3,0;"STAR
CADET"
6025 PAUSE 170
6030 CLS
6040 NEXT E
6050 PRINT AT 3,0;"STAR
SERAGENT"
6055 PAUSE 170
6070 CLS
6080 NEXT E
6090 PRINT AT 3,0;"STARSHI
P CAPTAIN"
6100 PAUSE 170
6110 CLS
6120 NEXT E
6130 PRINT AT 3,0;"COMMANDER O
F ARMED FORCES"
6140 PAUSE 170
6150 CLS
6160 NEXT E
6170 PRINT AT 3,0;"*****FLEET
BRIGADIER*****"
6180 STOP
7000 SAVE "DOCKER"

```

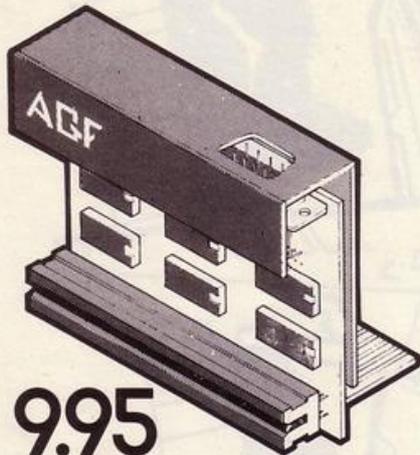
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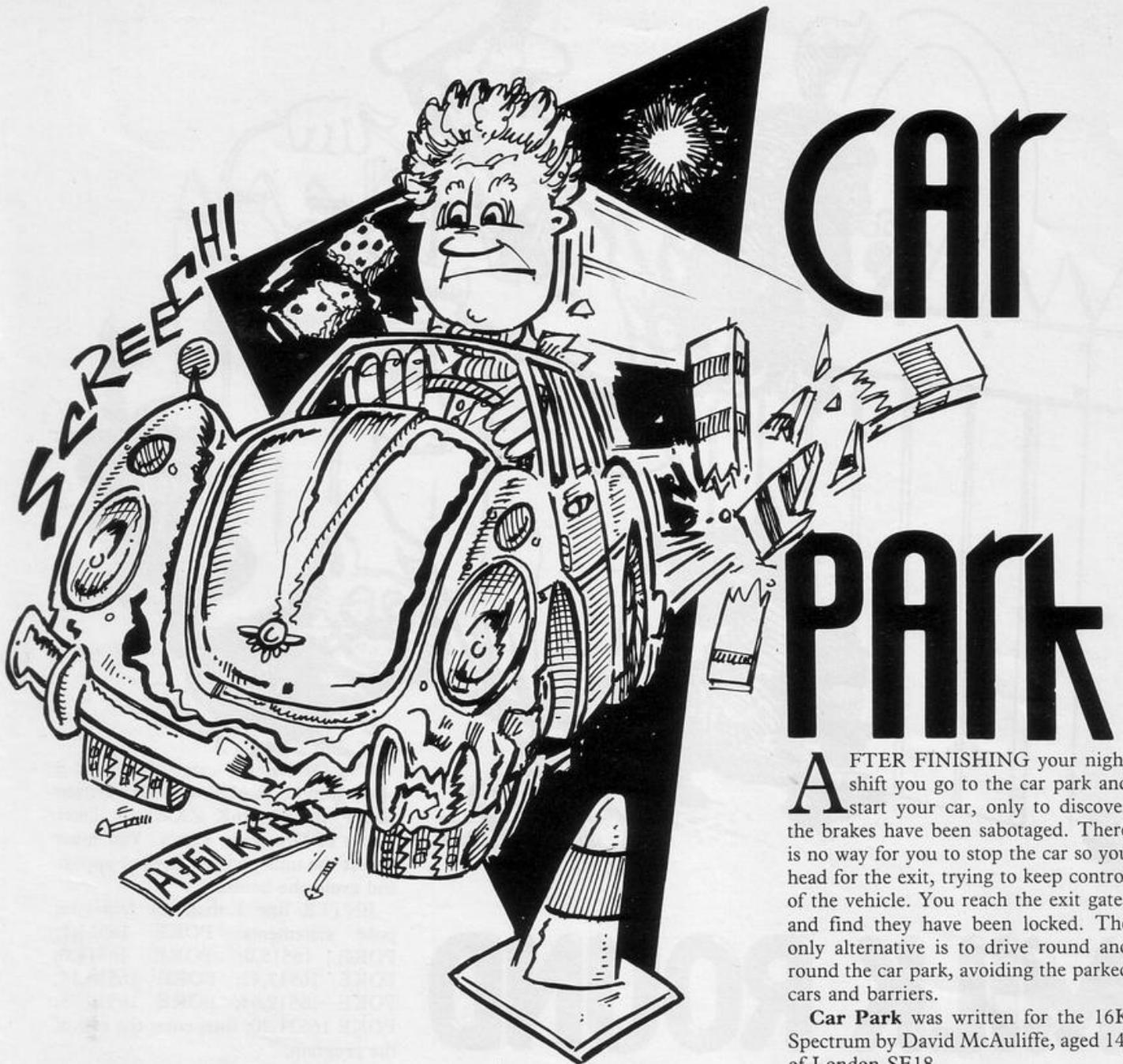
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AFTER FINISHING your night shift you go to the car park and start your car, only to discover the brakes have been sabotaged. There is no way for you to stop the car so you head for the exit, trying to keep control of the vehicle. You reach the exit gates and find they have been locked. The only alternative is to drive round and round the car park, avoiding the parked cars and barriers.

Car Park was written for the 16K Spectrum by David McAuliffe, aged 14, of London SE18.

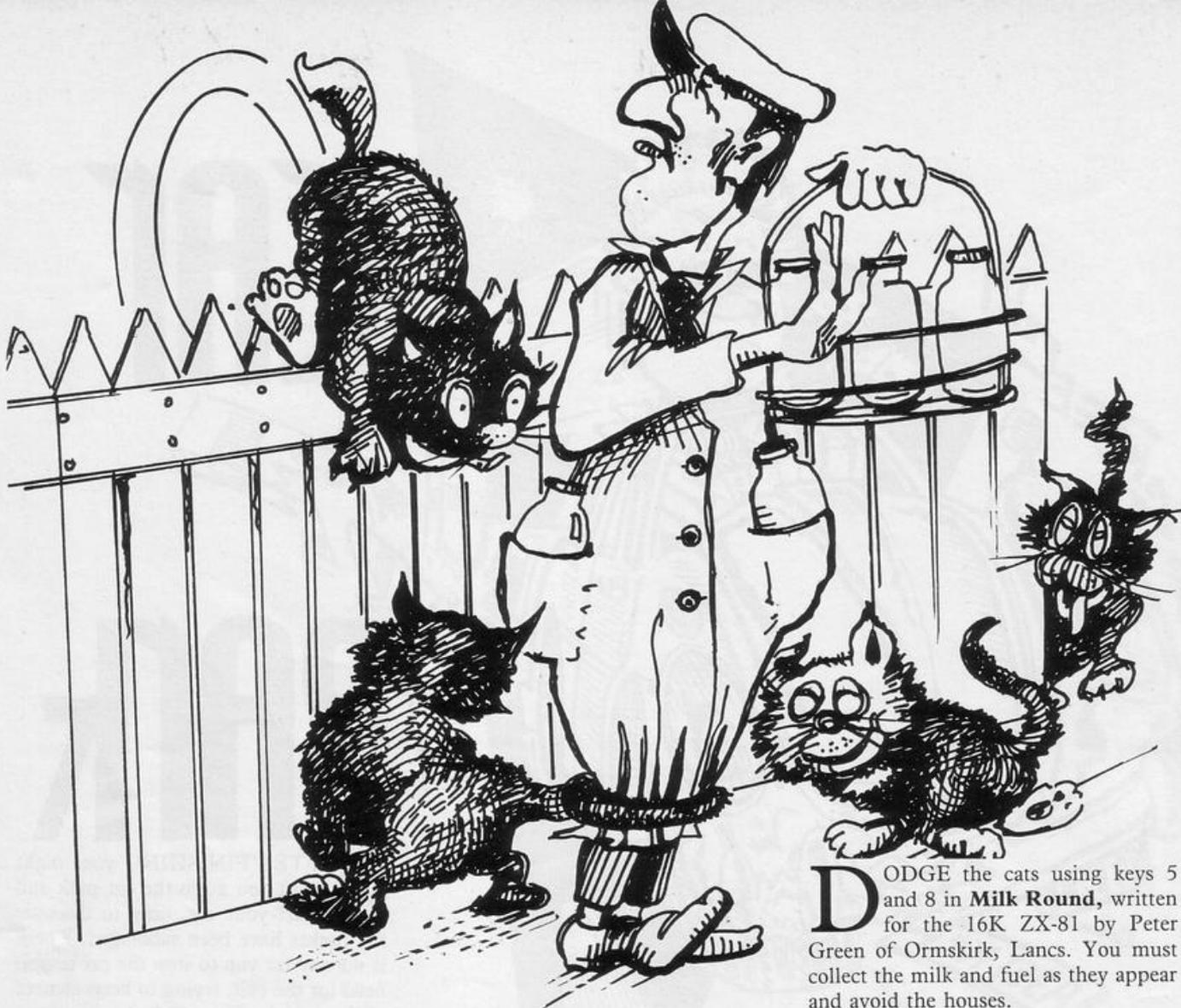
```

10 INPUT "Enter your name ";a#
: GO TO 20
20 PRINT AT 21,0;"Well hello
";a#
30 PAUSE 100: CLS
40 PRINT AT 17,0;"Press any k
ey to continue.": PAUSE 0: CLS

41 POKE USR "A"+0, BIN 011111
10
42 POKE USR "A"+1, BIN 010000
10
43 POKE USR "A"+2, BIN 010000
10
44 POKE USR "A"+3, BIN 111111
11
45 POKE USR "A"+4, BIN 110110
11
46 POKE USR "A"+5, BIN 111111
11
47 POKE USR "A"+6, BIN 011001
10
48 POKE USR "A"+7, BIN 000000
00
82 BORDER 0: PAPER 0: INK 4: G
O SUB 200
83 POKE 23609,30: CLS : LET hs
=-10
84 LET x=10
85 FOR n=-11 TO 10000

90 IF x=31 THEN LET x=30
95 IF x=0 THEN LET x=1
100 PRINT INK 7; AT 6,x;"A"
105 PRINT INK 4; AT 18, INT (
RND *32);"}>>"
110 IF INKEY#="o" THEN LET x
=x-1
120 IF INKEY#="p" THEN LET x
=x+1
130 POKE 23692,255: PRINT AT 2
1,31;" "
140 IF SCREEN# (6,x)="}" THEN
GO TO 1000
150 NEXT n
160 CLS
162 PRINT AT 5,5; INK 3;"Well
done!You have scored "; AT 8,10
; INK 3;"10000"
165 PRINT "'That is the end of
the game I amafraid."
170 PRINT "'Press any key": PA
USE 0: CLS : GO TO 1010
180 STOP
181 FOR n=0 TO 7
240 PRINT "You have finished yo
ur night-" "shift work and set-o
ff to drive" "home. But when you
drive off you" "realise that yo
ur brakes have" "been sabotaged
and you have no" "way of stoppin
g.As well as this," "someone has
closed the exit gate" "so all
you can do all night is" "drive a
round the car-park" "avoiding th
e parked cars" "KEYS: 'o '=LEF
T, 'p '=RIGHT .'" "*****PRESS*
ANY*KEY*TO*START*****": PAUSE 0:
RETURN
1000 FOR g=1 TO 5
1001 FOR f=0 TO 7
1002 BORDER f
1003 BEEP .02,f
1004 NEXT f
1005 NEXT g: CLS
1006 PRINT INK 7; AT 2,1;"BAD L
UCK! YOU HIT A PARKED CAR"
1010 PRINT INK 7; AT 5,5;"YOUR
SCORE IS ";n-1;" POINTS"
1020 IF n>hs THEN LET hs=n-1: G
O TO 1060
1030 PRINT AT 8,5;"HIGHEST SCOR
E: ";hs; AT 10,5;"DRIVER: ";a#
1040 GO TO 1070
1060 INPUT "Enter your name",a#
GO TO 1030
1070 PRINT INK 3; AT 15,0;"**PR
ESS*ANY*KEY*FOR*ANOTHER*GO**": P
AUSE 0
1080 CLS : GO TO 84
2000 CLS

```



MILK ROUND

DODGE the cats using keys 5 and 8 in **Milk Round**, written for the 16K ZX-81 by Peter Green of Ormskirk, Lancs. You must collect the milk and fuel as they appear and avoid the houses.

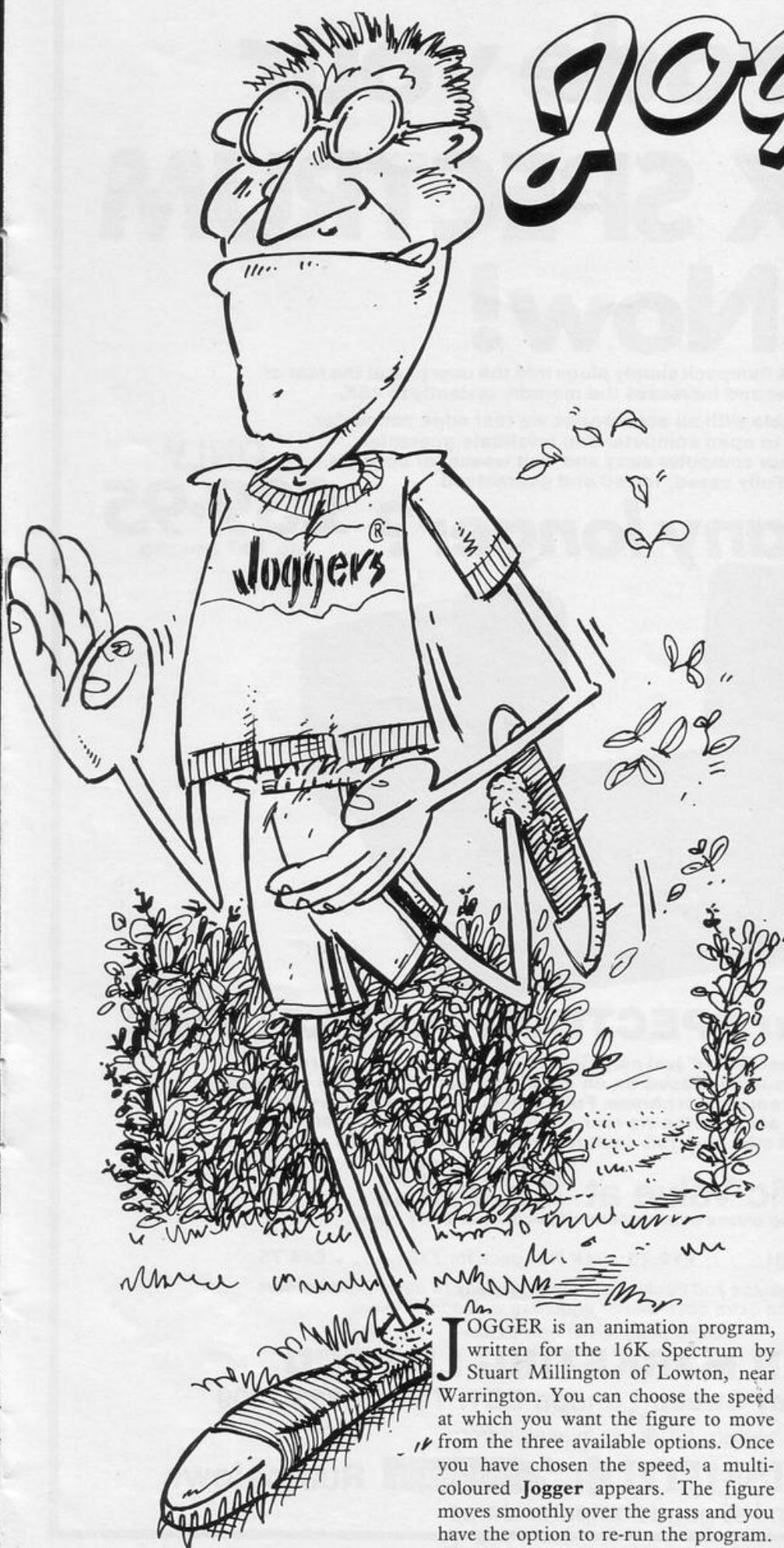
ENTER line 1 then the following poke statements: POKE 16514,1; POKE 16515,0; POKE 16516,0; POKE 16517,42; POKE 16518,14; POKE 16519,64; POKE 16540,78; POKE 16521,20; then enter the rest of the program.

```

1 REM   E:RND?TAN
3 IF INKEY$="" THEN GOTO 4
4 GOSUB 8888
5 CLS
6 LET F=200
7 LET M=0
8 LET K=7
9 LET D=7
10 IF F=0 THEN GOTO 200
11 LET P=INT (RND*2)+1
12 IF P=1 THEN LET K=K+1
13 IF P=2 THEN LET K=K-1
15 PRINT AT 21,K;"███████████"
16 LET L=INT (RND*2)+1
17 IF L=1 THEN GOTO 22
18 IF L=2 THEN GOTO 19
19 PRINT AT 21,K+RND*6+1;"█"
20 PRINT AT 21,K+RND*6+1;"@"
21 PRINT AT 21,K+RND*6+1;"■"
22 SCROLL
23 PRINT AT 7,D;
24 LET D=D+(INKEY$="8")-(INKEY
$="5")
25 IF USR 16514=178 THEN LET M
=M+1
26 IF USR 16514=128 THEN LET F
=F+40
27 IF USR 16514=168 THEN GOTO
90
28 IF USR 16514=173 THEN GOTO
90
29 PRINT "U"
31 LET F=F-1
32 IF K=2 THEN LET K=3
33 IF K=24 THEN LET K=23
34 GOTO 10
90 PRINT AT 0,0;"NOT BAD MILK"
100 PRINT AT 1,0;"COLLECTED=";M
101 STOP
200 PRINT "FUEL RAN OUT "
300 STOP
4444 SAVE "MILK"
5555 RUN
6666 STOP
8888 PRINT AT 7,0;"USE KEYS 5-AN
D-8 DODGE THE CATS ( @ ).COLLECT
THE MILK ( █ ). COLLECT FUEL
( ■ ). DONT HIT PEOPLES HOUSES (
█ )."
9990 IF INKEY$="" THEN GOTO 9990
9999 RETURN

```

JOGGER



JOGGER is an animation program, written for the 16K Spectrum by Stuart Millington of Lowton, near Warrington. You can choose the speed at which you want the figure to move from the three available options. Once you have chosen the speed, a multi-coloured **Jogger** appears. The figure moves smoothly over the grass and you have the option to re-run the program.

```

10 FOR F=0 TO 9: FOR G=0 TO 7:
  READ A: POKE USR CHR# (144+F)
  +G,A: NEXT G: NEXT F
  20 DATA 60,126,95,255,255,63,2
  54,62,126,33,45,13,125,125,1,127
  ,54,54,54,55,55,48,240,240,0,0,0
  ,192,192,192,192,0,126,118,118,1
  27,127,7,14,14,108,108,108,236,2
  36,12,15,15,0,0,0,3,3,3,3,0,126,
  130,178,176,190,190,128,126,60,1
  26,250,255,255,252,127,124,126,
  110,110,254,254,224,112,112
  30 CLS : BORDER 0: PAPER 0: CL
  S : CLS : PRINT AT 1,7: BRIGHT
  1: FLASH 1: INK 7: PAPER 2:"ANIM
  ATION SELECTION": INK 7: PRINT
  AT 8,8;"1 SLOW MOVING": AT 10,
  8;"2 MEDIUM MOVING": AT 12,8;"
  3 FAST MOVING": AT 14,8;"4 T
  O QUIT THIS PROGRAM": AT 16,8;"5
  LOOK AT LISTING"
  40 LET Z#= INKEY#
  50 IF Z#="1" THEN BEEP .3,22:
  LET S=4: GO TO 400
  55 IF Z#="2" THEN BEEP :3,22:
  LET S=2: GO TO 400
  60 IF Z#="3" THEN BEEP .3,22:
  LET S=1: GO TO 400
  65 IF Z#="4" THEN BEEP .3,22:
  POKE USR 1,1
  70 IF Z#="5" THEN CLS : BEEP
  .3,22: INK 7: LIST
  80 GO TO 40
  400 CLS : BORDER 0: PAPER 0: PA
  PER 0: CLS : PRINT AT 6,11: INK
  2: PAPER 7: FLASH 1: BRIGHT 1:"
  ANIMATION ": AT 18,11: INK 2:
  PAPER 7: FLASH 1: BRIGHT 1:"PRE
  SS ANY KEY": AT 4,14: INK 2: PAP
  ER 7: BRIGHT 1: FLASH 1:" JOGGER
  ": PAUSE 0: CLS
  410 FOR N=15 TO 21: FOR M=0 TO
  31: PRINT AT N,M: INK 4;"(igB)"
  : NEXT M: NEXT N
  420 FOR f=0 TO 5: CIRCLE 150,15
  0,f: NEXT f: PLOT 120,137: PLOT
  246,165: PLOT 13,100: PLOT 233,9
  0
  425 INK 4: PLOT 0,175: DRAW 255
  ,0
  430 BEEP .5,7: BEEP .5,5: BEEP
  .5,3: BEEP .5,3: BEEP .5,4: BEEP
  .5,5
  440 FOR F=-28 TO 0: INK 7: BEEP
  .01,F: PRINT AT 12,F;"a_": AT
  13,F: INK 2: BRIGHT 1;"b_": AT 1
  4,F: INK 5;"cd_": PAUSE 20: PRIN
  T AT 14,F: INK 5;"e_": PAUSE S:
  NEXT F
  450 FOR G=0 TO 28: BEEP .01,-10
  : INK 7: PRINT AT 12,G;"i_": PR
  INT AT 13,G: INK 2: BRIGHT 1;"
  h_": AT 14,G: INK 5;"gf_": PAUSE 2
  0: PRINT AT 14,G: INK 5;"j_": P
  AUSE S: NEXT G
  460 PRINT AT 18,1: PAPER 4: IN
  K 0:"DO YOU WISH TO SEE THAT AGA
  IN": PRINT : PRINT AT 20,10: IN
  K 0: PAPER 4:"(Y/N)"
  470 LET A#= INKEY#
  480 IF A#="n" OR A#="N" THEN G
  O TO 30
  490 IF A#="y" OR A#="Y" THEN P
  AUSE 20: PRINT AT 18,1: PAPER 4
  :
  ": PRINT AT 20,10: PAPER 4:"
  ": GO TO 440
  500 GO TO 470
  
```

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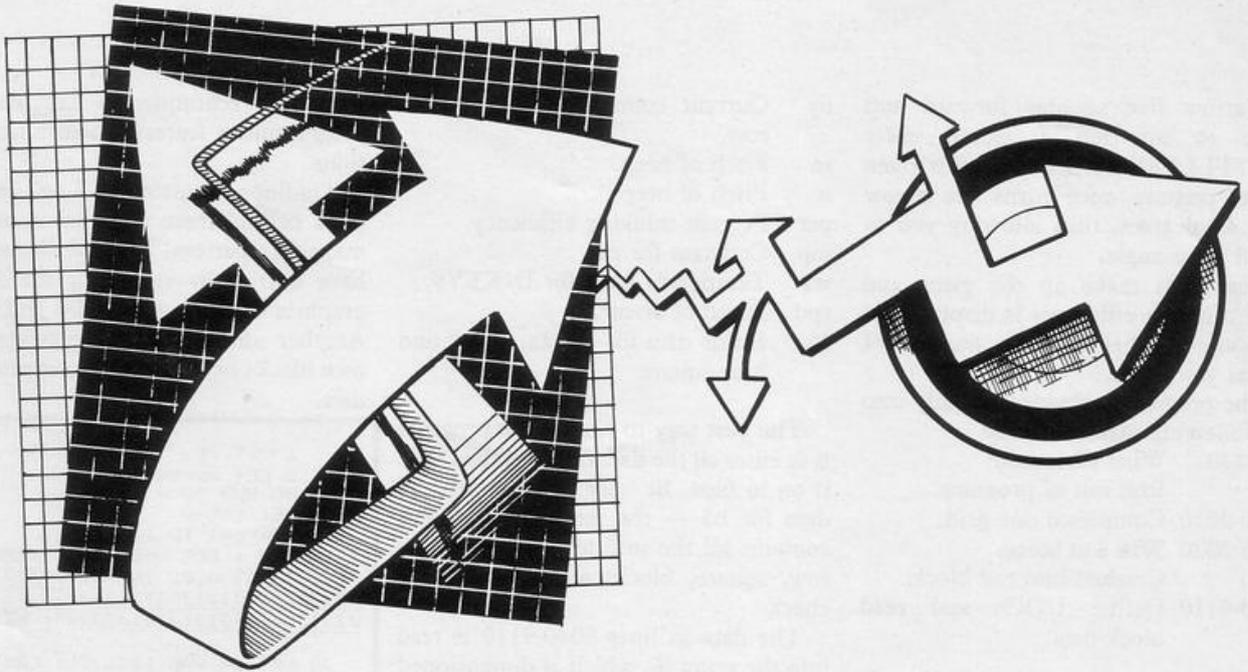
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PSEUDO LOGO

PSEUDO LOGO was written for the 48K Spectrum by Duncan Anderson of Bishops Frome, Worcester. He called the program **Pseudo Logo** because it is similar to the programming language Logo, which uses an arrow.

Imagine that you are the arrow so that you can input the correct commands for left and right. The player is faced with a square grid and must program the moves of the arrow so that it reaches the blue and magenta target without going off of the grid or running into any of the red obstacles.

The three commands for determining the direction of the arrow are the initial letters for left, right and forward. When

programmed to turn, the arrow rotates 45 degrees. The program is of particular use to young children, as they have to program the moves of the arrow and the process of doing so develops their geometrical and mathematical thinking.

Logo is programming language which allows the user — usually a child — to move a turtle about the screen or on the floor. Not a real turtle — it is normally a small triangle as far as the screen is concerned, or a small robot which can be controlled from the micro.

Simple commands such as FORWARD, BACKWARD, LEFT and RIGHT are used to control the direction of the turtle and it is possible to

build complex patterns in a very short time.

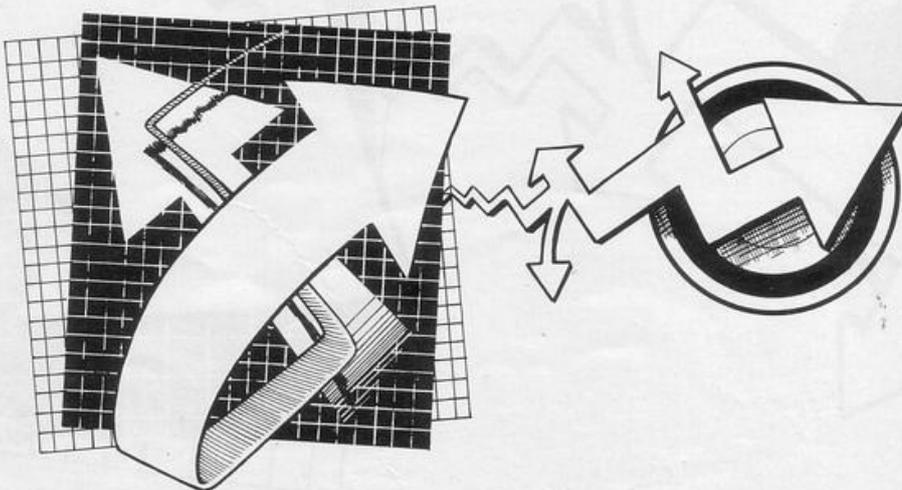
Pseudologo incorporates some of the features of the Logo language, insofar as it uses commands to move an arrow about the screen. The author has incorporated it into a game and the result is something which is worth the time and effort of entering into a Spectrum.

The program is loaded in the normal manner for a Basic program by entering LOAD " " or LOAD "Pseudologo". After running it, a menu will appear offering the choice of three speeds for the arrow — slow, medium and fast. Once the speed has been selected a 32-by-16-line square grid will appear and in each alternate square is a dot. Also displayed will be some red irregular-shaped blocks and a yellow arrow, as well as a small blue square.

The object of the game is to have the arrow touch the blue square and when that is done you will be moved into another grid where the red blocks are more frequent, thus making the path to the blue square more difficult to navigate.

You have to write a small program to move the arrow. The commands are simple and there are only three of them, F, L and R, for forward, left and right respectively.

One point to note is that you can turn in any of eight directions, so to move



the arrow five squares forward and three to my left I would enter FFFFLLFFF. Notice that left is given twice, because once turns the arrow only 45 degrees, thus allowing you to travel at an angle.

Ten grids make up the game and your thinking efficiency is displayed at the end, together with the number of moves you made.

The program is divided roughly into the following main sections:

- 140-170 What direction?
- 230 Run out of program.
- 2000-2010 Completed one grid.
- 2015-2020 Win and score.
- 2500 Crashed into red block.
- 9010-9110 Define UDGs and read block data.

Here is a list of the main variables and their functions:

- c Grid counter and index for I\$.
- d Direction of arrow, e.g., 1=north, 2=north-east.
- n General-purpose counter.
- sx Row number of arrow.
- sy Column number of arrow.
- ex Row number of arrow.
- ey Column number of arrow.
- b\$ Holds red block data for current grid.
- x Loop counter in block display, also x pos for arrow.
- y Loop counter in block display, also y pos for arrow.
- p\$ Holds user's program.
- i\$ Key pressed.
- tot Total number of program steps.
- p Number of program steps in current rty, also index.
- ox Current row number of arrow.

- oy Current column number of arrow.
- m Pitch of beep.
- n Pitch of beep.
- per Percent thinking efficiency.
- mp Constant for per.
- w\$ Temporary store for INKEY\$.
- spd Speed of arrow.
- I\$ Holds data for blocks, arrow and blue square.

The best way to handle the program is to enter all the data first and then save it on to tape. Be very careful with the data for b\$ — the lettered data — it contains all the information on the arrow, square, blocks and so on — so check.

The data in lines 9040-9110 is read into the array I\$, which is dimensioned at line 9040. The data looks confusing at first but closer examination reveals that the first number is the starting direction for the arrow, the next four numbers are the row and column for the arrow, and after that the next four are the same but for the blue block. The values are given to variables at lines 30-50.

The rest of the data is fed into string b\$. Eight numbers are extracted from it and used in loops which print-out the red blocks — line 50.

The screen is displayed in line 20 and the program prompt in line 60. A check is made to see if the current character is satisfactory and, if so, it is added to p\$ which holds the current program — line 100.

The author has decided to make some decisions using AND; also note the use of IF ... THEN IF. I will be discuss-

ing those techniques in next month's programming feature on making decisions.

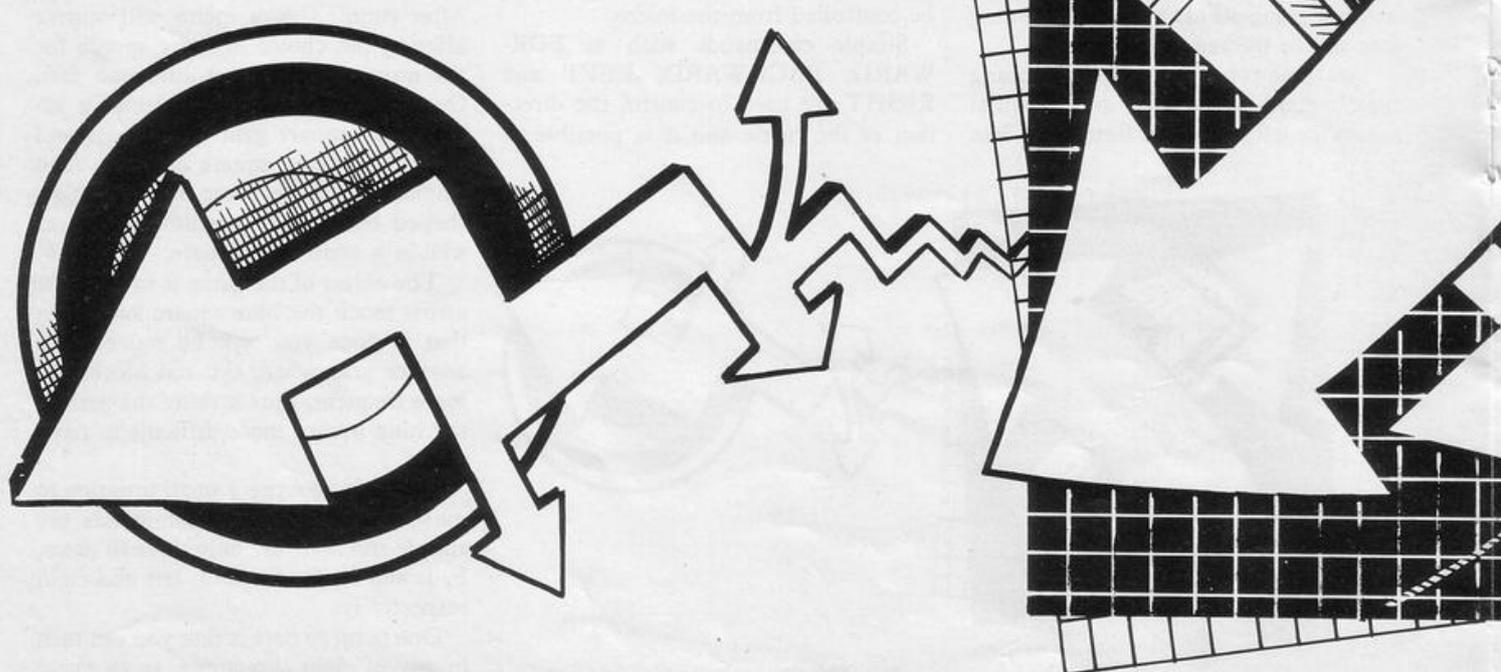
Traditional turtles in Logo leave a track behind them and that is used to make up a pattern. If you wish, you can have a trail by removing the square graphics in lines 210, 2000 and 2700. Another idea would be to create your own blocks by changing the appropriate data.

```

1 LET i$=""
5 LET mp=486
10 GO SUB 9000
12 LET tot=0
15 FOR c=1 TO 10
20 CLS : FOR n=0 TO 14 STEP 2:
PRINT AT n,0; INK 4;"JIJIJIJI
JIJIJIJIJIJIJIJIJIJIJIJIJIJIJI
JIJIJIJIJIJIJIJIJIJIJIJIJIJIJI" : NEXT n

30 LET d= VAL 1$(c,1): LET sx=
VAL 1$(c,2 TO 3): LET sy= VAL 1
$(c,4 TO 5): LET ex= VAL 1$(c,6
TO 7): LET ey= VAL 1$(c,8 TO 9):
LET b$=1$(c,10 TO )
40 PRINT AT sx, sy; INK 6; CHR
$(143+d); AT ex, ey; INK 5; PAPE
R 3; BRIGHT 1; FLASH 1; "( 6)"
50 IF LEN b$>0 THEN IF b$(1)
<> " " THEN FOR x= VAL b$( TO
2) TO VAL b$(5 TO 6): FOR y= VA
L b$(3 TO 4) TO VAL b$(7 TO 8):

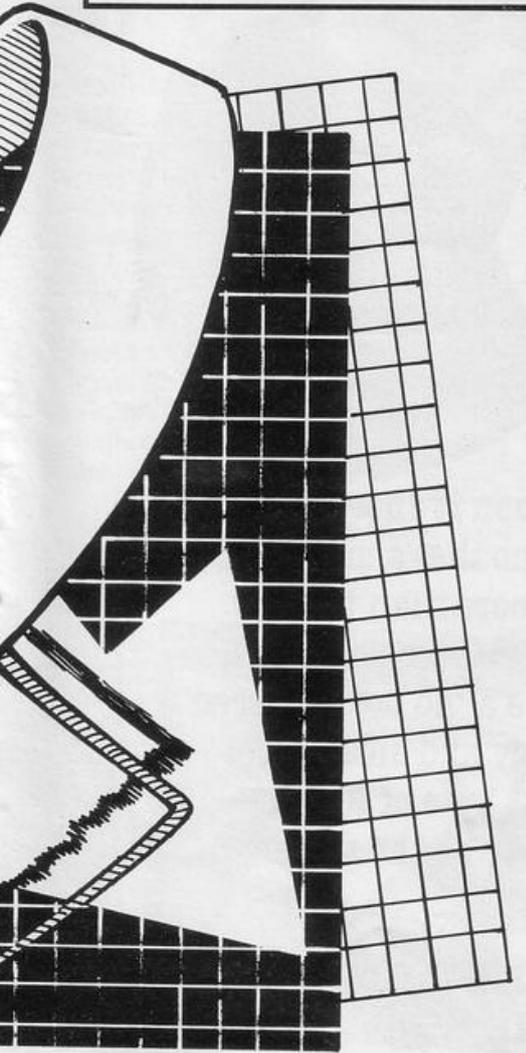
```



```

PRINT AT x,y; INK 2; BRIGHT 1;
"(ig8)": NEXT y: NEXT x: LET b#=
b#(9 TO ): GO TO 50
60 PRINT AT 16,0;"Program:":
LET p#=""
65 POKE 23658,8: PRINT AT 16,
8;p#;"+"
70 IF INKEY# <> "" THEN GO
TO 70
80 LET i#= INKEY# : IF i#="" T
HEN GO TO 80
81 BEEP .006,30
90 IF LEN p# THEN IF i#="0"
THEN LET p#=p#( TO LEN p#-1):
GO TO 65
100 IF i#="F" OR i#="L" OR i#="
R" THEN LET p#=p#+i#
110 IF i# <> CHR# 13 THEN GO
TO 65
115 LET tot=tot+ LEN p#
120 FOR n=16 TO 21: PRINT AT n
,0; TAB 31; " ": BEEP .01,n: NEX
T n: PRINT AT 19,14;"E"; AT 21,
14;"A"
140 LET x=sx: LET y=sy: FOR p=1
TO LEN p#
141 IF p<15 THEN IF LEN p#-p<
15 THEN PRINT AT 20,15-p;p#;"
": GO TO 150
142 IF p<15 THEN PRINT AT 20,
15-p;p#( TO 14+p); " ": GO TO 150
143 IF p>14 THEN IF LEN p#-p>
15 THEN PRINT AT 20,0;p#(p-14
TO p+14); " ": GO TO 150
144 PRINT AT 20,0;p#(p-14 TO )
;" "

```



```

150 PRINT AT 17,12; INK 6; ("Ri
ght " AND p#(p)="R"); ("Left "
AND p#(p)="L"); ("Forward" AND p
#(p)="F")
151 IF p#(p)="L" THEN LET d=d-
1: IF d=0 THEN LET d=8
160 IF p#(p)="R" THEN LET d=d+
1: IF d=9 THEN LET d=1
170 IF p#(p)="F" THEN LET ox=x
: LET oy=y: LET x=x+((d=4) OR (d
=5) OR (d=6))-((d=1) OR (d=2) OR
(d=8)): LET y=y+((d=2) OR (d=3)
OR (d=4))-((d=6) OR (d=7) OR (d
=8))
180 IF x=ex THEN IF y=ey THEN
GO TO 2000
190 IF x<0 OR x>15 OR y<0 OR y>
31 THEN GO TO 2500
200 IF ATTR (x,y)=66 THEN GO
TO 2700
210 PRINT AT ox,oy; INK 4;"I";
AT x,y; INK 6; CHR# (143+d)
220 BEEP spd,10*(p#(p)="F"): NE
XT p
230 FOR n=0 TO 15: BEEP .04,-5;
BEEP .04,-7: NEXT n: GO SUB 300
0: PRINT AT 17,0; INK 5; BRIGHT
1;"Your program doesn't do any
moreNext time plan your moves mo
re carefully. Press any key to
tryagain.": PAUSE 1: PAUSE 0: L
ET c=c-1: NEXT c
2000 PRINT AT ox,oy; INK 4;"I";
AT ex,ey; INK 3; PAPER 5; FLASH
1; BRIGHT 1; CHR# (143+d): GO S
UB 3000: PRINT AT 17,10; FLASH
1; INK 1; PAPER 6;"WELL DONE !":
FOR m=0 TO 5: FOR n=0 TO 10: BO
RDER 5: BORDER 3: BEEP .01,m*7+n
: NEXT n: NEXT m: BORDER 0
2010 GO SUB 3000: PRINT AT 17,1
0; TAB 30: IF c<10 THEN PRINT
AT 17,0;"OK. Now try a harder pr
oblem. (Press any key to start
)": PAUSE 1: PAUSE 0: NEXT c
2015 BEEP .4,10: BORDER 3: BEEP
.2,10: BORDER 5: BEEP .2,10: BOR
DER 3: BEEP .4,14: BORDER 5: BEE
P .4,14: BORDER 3: BEEP .4,17: B
ORDER 5: BEEP .4,17: BORDER 3: B
EEP .8,22: BORDER 0
2020 LET per=mp/tot: LET per=per
*100+.5: LET per= INT per: GO SU
B 3000: PRINT AT 17,0; INK 5; B
RIGHT 1;"Well done ! You've comp
leted every,problem. And it t
ook you"tot; moves, which mean
s that""your thinking is ";per;
"%""efficient.": STOP
2500 GO SUB 3000: BEEP 1,-5: BEE
P 1,-14: PRINT INK 5; BRIGHT 1;
AT 17,0;"Your program lead the
arrow off the screen. Think abou
t this when you write the nex
t proram. (Press any key to try
again)": PAUSE 1: PAUSE 0: LET c
=c-1: NEXT c
2700 PRINT AT ox,oy; INK 4;"I";
AT x,y; INK 2; PAPER 7; FLASH 1
; BRIGHT 1; CHR# (143+d): FOR n=
0 TO 30: BORDER 2: BEEP .01,n: B
ORDER 6: BEEP .01,20: NEXT n: BO
RDER 0
2710 GO SUB 3000: PRINT AT 17,0
; INK 5; BRIGHT 1;"You should no
t hit the red ! Think before
you program !""(Press any key t
o try again)": PAUSE 1: PAUSE 0:
LET c=c-1: NEXT c
2999 STOP
3000 FOR n=16 TO 21: PRINT AT n
,0; TAB 31;" ": NEXT n: RETURN
8999 STOP
9000 POKE 23658,8: OVER 0: INVER
SE 0: FLASH 0: BRIGHT 0: BORDER
0: PAPER 0: INK 9: CLS : POKE 23
609,9: POKE 23562,1: POKE 23561,

```

```

20
9005 PRINT AT 8,0;"Please selec
t speed of arrow :"" TAB 10;"S
-Slow"; TAB 10;"M -Medium"; TAB
10;"F - Fast"
9010 RESTORE : FOR n=0 TO 79: RE
AD a: POKE USR "a"+n,a: DATA B
IN 11000, BIN 111100,126,255,24,
24,24,24, BIN 111111, BIN 11111,
BIN 1111, BIN 11111, BIN 110111
, BIN 1110001, BIN 11100000, BIN
11000000, BIN 1000, BIN 1100, B
IN 1110,255,255, BIN 1110, BIN 1
100, BIN 1000
9011 LET w#= INKEY# : IF w# <> "
" THEN BEEP .1,1: LET i#=w#
9012 NEXT n
9020 DATA BIN 11000000, BIN 111
00000, BIN 1110001, BIN 111011,
BIN 11111, BIN 1111, BIN 11111,
BIN 111111,24,24,24,24,255,126,
BIN 111100, BIN 11000,3,7, BIN 1
0001110, BIN 11011100, BIN 1111
000, BIN 11110000, BIN 11111000,
BIN 11111100
9025 DATA BIN 10000, BIN 110000
, BIN 1110000,255,255, BIN 11100
00, BIN 110000, BIN 10000, BIN 1
111100, BIN 1111000, BIN 1110
000, BIN 11111000, BIN 11011100,
BIN 10001110, BIN 111,3
9029 DATA 255,129,129,129,129,12
9,129,255,255,129,129,153,153,12
9,129,255
9030 LET ox=15: LET oy=15
9040 DIM l$(10,250): FOR n=1 TO
10: READ l$(n): NEXT n: DATA "11
51500150715091704031206012005241
1241330","11520080000612091505241
2261104130714141515"
9050 DATA "115041531021305150221
11260506120711091210130913151218
1518","7043115150023032504240525
04290829090414051111131608080821
061707210921112112221524"
9060 DATA "110140925020313070313
04150224082502260428071908250818
09180715081607100813091213121112
11150916111613181520111711251124
112507160717"
9070 DATA "305000000001400150021
01280200032004170920040613081013
15160524142801050107070214030321
0423"
9080 DATA "500240000020514140015
0116021707180819112200220220422
05220026022604260526032314250001
010402020402"
9090 DATA "703310618001700180023
03150115071601191420040504200426
08290500080405230725060913100905
0918092315251314151500230325"
9100 DATA "506140814010114041305
14050106121001110511081112111409
15150612071201131213011404141114
12140114041501160223061507170516
05310815101506200625072207231220
13221215121711161117091710170918
09260719081907260826102710310714
0715"
9110 DATA "402131023011702170102
01090205080601110811031204130014
07140017002102170617061806210318
03190908140809090912110911100815
15151016111712181319072014200922
15220923092410241025112512251324
14231422142415221523140914121324
1424"
9119 IF i# <> "" THEN GO TO 913
0
9120 LET i#= INKEY# : IF i#="" T
HEN GO TO 9120
9130 IF i# <> "F" THEN IF i# <>
"M" THEN IF i# <> "S" THEN GO
TO 9120
9140 LET spd=.03*(i#="F")+ .22*(i
#="M")+ .6*(i#="S")
9999 RETURN

```

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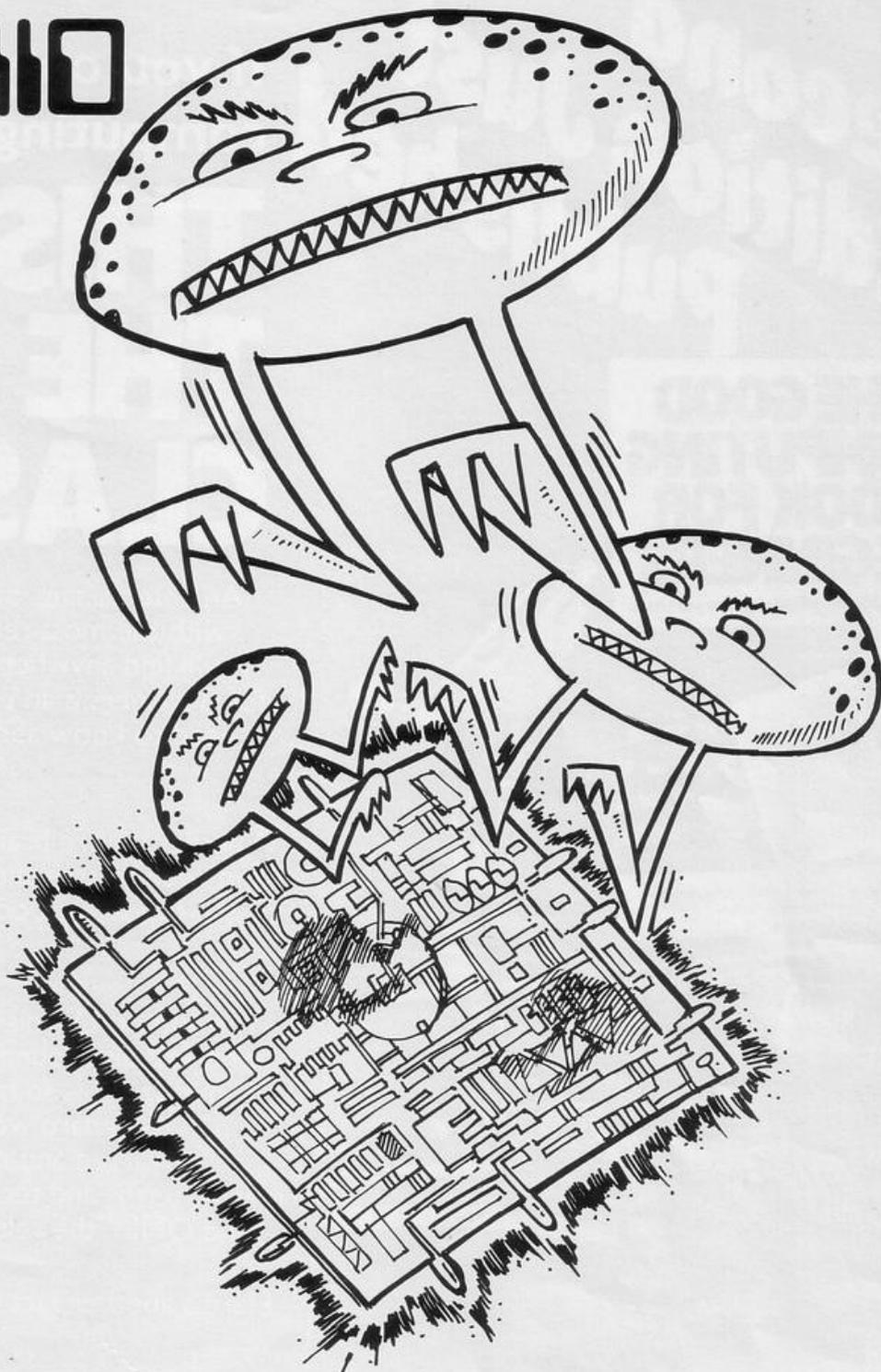


CHIP RAID

```

5 GO SUB 9000
10 CLS
20 PRINT AT 10,8;"a a a a a a
a a"
25 INK 0
30 PRINT AT 11,7;"(17*ig8)"
40 PRINT AT 12,7;"(17*ig8)"
50 PRINT AT 13,7;"(17*ig8)"
55 INK 7
60 PRINT AT 14,8;"b b b b b b
b b"
70 FOR a=0 TO 9: FOR b=8 TO 22
STEP 2
80 PRINT AT a,b;"c"
90 NEXT b
100 NEXT a
105 LET score=0: LET energy=3
110 FOR a=15 TO 21: FOR b=8 TO
22 STEP 2
120 PRINT AT a,b;"c"
130 NEXT b: NEXT a
140 LET a=9: LET b=16
150 LET x=0: LET y= INT ( RND *
8)+1
155 PRINT AT 21,1; PAPER 2; IN
K 7;"SCORE=": PRINT AT 21,22; I
NK 7; PAPER 2;"ENERGY=";energy
160 PRINT AT a,b; INK 6; BRIGH
T 1;"e"
165 IF y=1 THEN LET y=8
166 IF y=2 THEN LET y=10
167 IF y=3 THEN LET y=12
168 IF y=4 THEN LET y=14
169 IF y=5 THEN LET y=16
170 IF y=6 THEN LET y=18
171 IF y=7 THEN LET y=20
172 IF y=8 THEN LET y=22
179 PRINT AT x,y; INK 2; PAPER
7; FLASH 1;"d"
180 PRINT AT x-1,y;"c"
190 LET x=x+1
200 IF x=10 THEN GO SUB 1000
210 IF INKEY# ="1" OR INKEY#
="2" OR INKEY# ="0" THEN GO SU
B 2000
220 GO TO 160
1000 BEEP .1,-20: LET energy=ene
rgy-1
1010 IF energy=0 THEN GO TO 800
0
1020 PRINT AT x-1,y;"c"
1030 GO TO 150
2000 IF INKEY# ="1" AND b>8 THE
N LET b=b-2: PRINT AT a,b+2;"c"
"
2010 IF INKEY# ="2" AND b<22 TH
EN LET b=b+2: PRINT AT a,b-2;"
c"
2020 IF INKEY# ="0" THEN GO SU
B 3000
2030 RETURN
3000 BEEP .01,50: IF b=y THEN B
EEP .01,5: PRINT AT x-1,y; INK
7;"c": LET score=score+10: LET x
=0: LET y= INT ( RND *5)+1
3005 PRINT AT 21,7; PAPER 2; IN
K 7;score
3010 RETURN
8000 CLS : PRINT AT 1,10; FLASH
1;"You scored ";score
8030 FOR a=0 TO 20: BEEP .01, RN
D *20: NEXT a: PRINT AT 10,2; F
LASH 1;"Press any key to start a
gain"
8040 PAUSE 0
8050 RUN 6

```



THE OBJECT of the game is to stop the bugs descending onto the microchip. You control the protector, which is located just above the microchip, using keys "1" and "2" for left and right and "0" to fire. Position yourself below the bug as it runs

down the wire and shoot it. If more than three bugs land they drain all your energy and the game ends.

Chip Raid was written for the 16K Spectrum by Peter Beard of London SE23.

```

9000 FOR a=USR "a" TO USR "e"+
7
9010 READ b: POKE a,b
9020 NEXT a
9025 BORDER 4: PAPER 1: INK 7: C
LS
9030 DATA 24,24,24,24,255,129,12
9,129,129,129,129,255,24,24,24,2
4
9040 DATA 24,24,24,24,24,24,24,2
4,90,153,90,153,90,153,90,153

```

```

9050 DATA 90,90,219,219,219,219,
126,60
9055 PRINT AT 2,11; FLASH 1;"CH
IP RAID"
9056 PRINT AT 5,9; PAPER 7; INK
2;"By PETER BEARD"
9060 PRINT AT 10,5;"Press any k
ey to start"
9070 PAUSE 0
9080 RETURN

```

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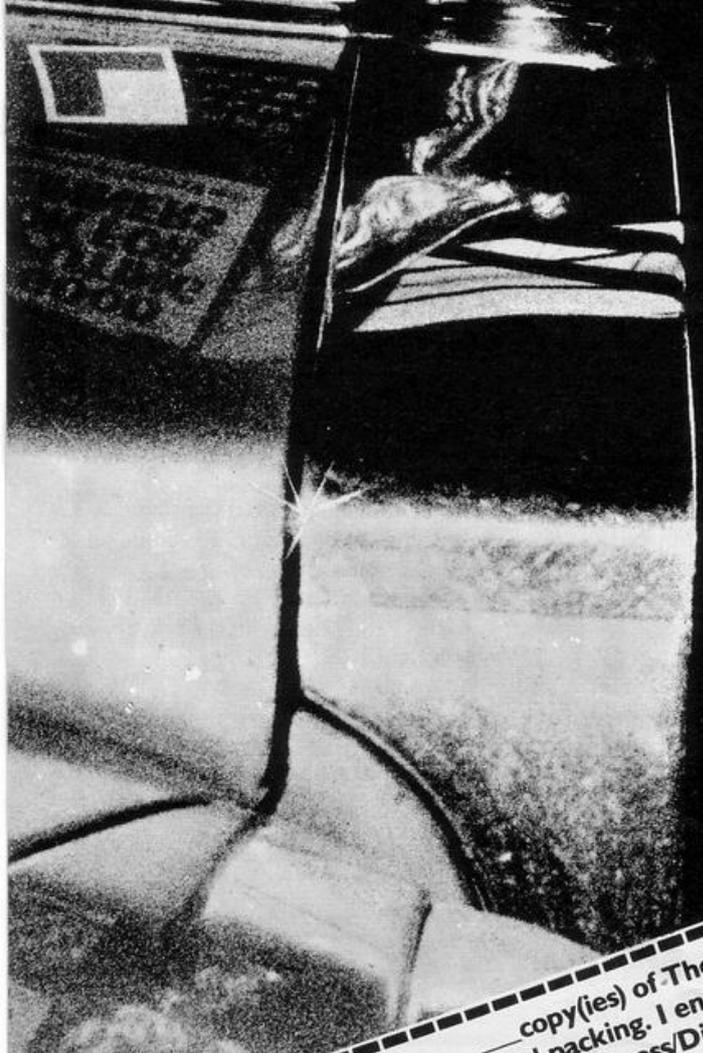
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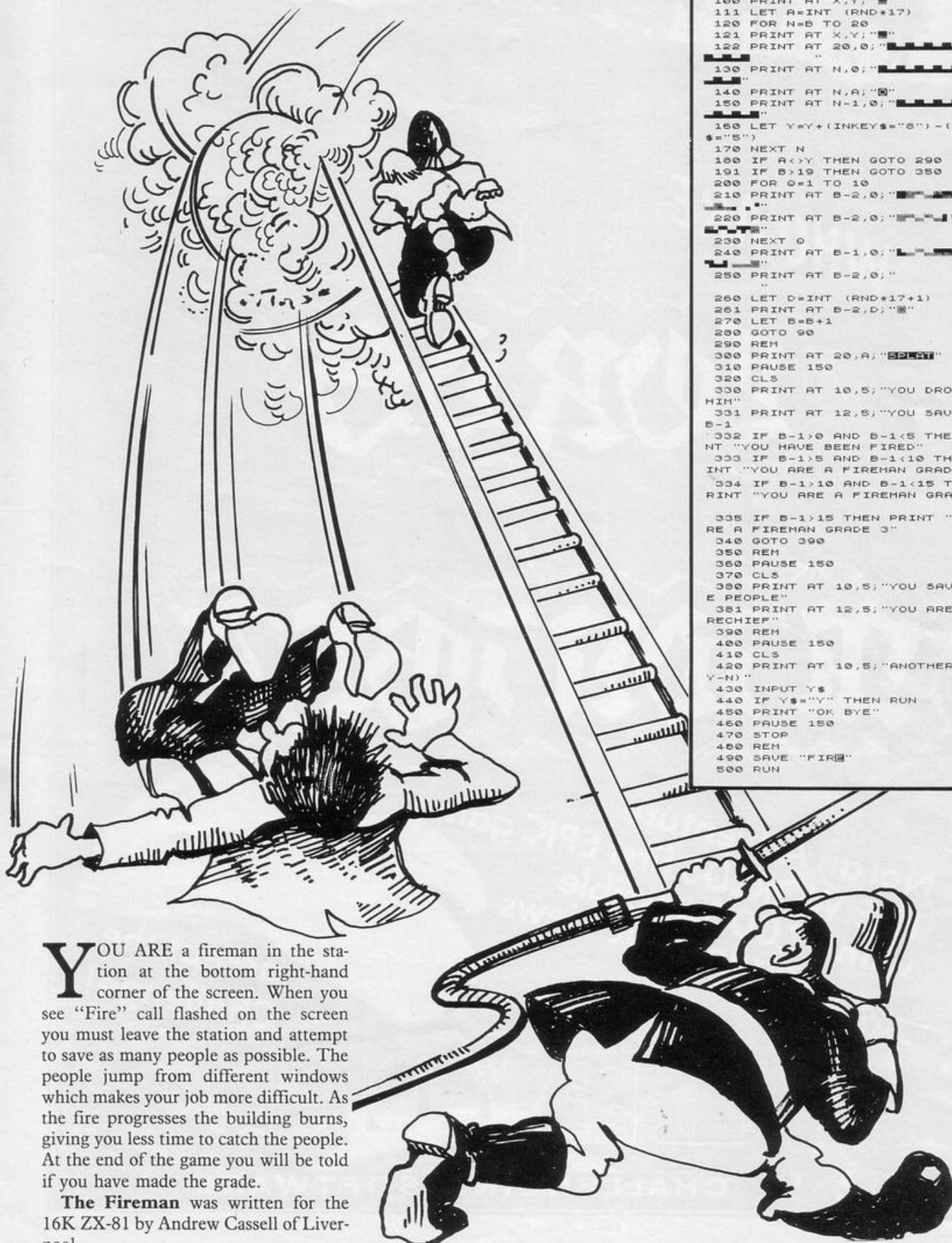
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THE FIREMAN



```

10 REM "FIRE"
11 CLS
20 REM
30 LET X=20
40 LET Y=20
41 LET B=1
50 REM
60 FOR Z=1 TO 20
70 PRINT AT Z,0;"██████████"
80 NEXT Z
81 PRINT AT 19,24;"███"
82 PRINT AT 20,24;"███"
83 FOR F=1 TO 20
84 PRINT AT 5,20;"FIRE"
85 PRINT AT 5,20;"███"
86 NEXT F
90 REM
100 PRINT AT X,Y;"███"
111 LET A=INT (RND*17)
120 FOR N=B TO 20
121 PRINT AT X,Y;"███"
122 PRINT AT 20,0;"██████████"
130 PRINT AT N,0;"██████████"
140 PRINT AT N,A;"███"
150 PRINT AT N-1,0;"██████████"
160 LET Y=Y+(INKEY$="S")-(INKEY$="5")
170 NEXT N
180 IF A<>Y THEN GOTO 290
191 IF B>19 THEN GOTO 350
200 FOR Q=1 TO 10
210 PRINT AT B-2,0;"██████████"
220 PRINT AT B-2,0;"██████████"
230 NEXT Q
240 PRINT AT B-1,0;"██████████"
250 PRINT AT B-2,0;"███"
260 LET D=INT (RND*17+1)
261 PRINT AT B-2,D;"███"
270 LET B=B+1
280 GOTO 90
290 REM
300 PRINT AT 20,A;"██████"
310 PAUSE 150
320 CLS
330 PRINT AT 10,5;"YOU DROPPED HIM"
331 PRINT AT 12,5;"YOU SAVED ";B-1
332 IF B-1>0 AND B-1<5 THEN PRINT "YOU HAVE BEEN FIRED"
333 IF B-1>5 AND B-1<10 THEN PRINT "YOU ARE A FIREMAN GRADE 1"
334 IF B-1>10 AND B-1<15 THEN PRINT "YOU ARE A FIREMAN GRADE 2"
335 IF B-1>15 THEN PRINT "YOU ARE A FIREMAN GRADE 3"
340 GOTO 390
350 REM
360 PAUSE 150
370 CLS
380 PRINT AT 10,5;"YOU SAVED THE PEOPLE"
381 PRINT AT 12,5;"YOU ARE A FIRE CHIEF"
390 REM
400 PAUSE 150
410 CLS
420 PRINT AT 10,5;"ANOTHER GO (Y-N)"
430 INPUT Y$
440 IF Y$="Y" THEN RUN
450 PRINT "OK BYE"
460 PAUSE 150
470 STOP
480 REM
490 SAVE "FIRE"
500 RUN

```

YOU ARE a fireman in the station at the bottom right-hand corner of the screen. When you see "Fire" call flashed on the screen you must leave the station and attempt to save as many people as possible. The people jump from different windows which makes your job more difficult. As the fire progresses the building burns, giving you less time to catch the people. At the end of the game you will be told if you have made the grade.

The Fireman was written for the 16K ZX-81 by Andrew Cassell of Liverpool.



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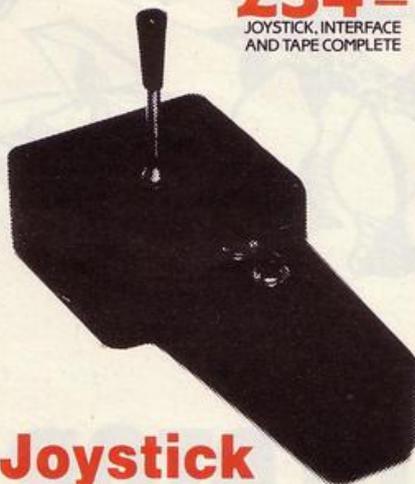
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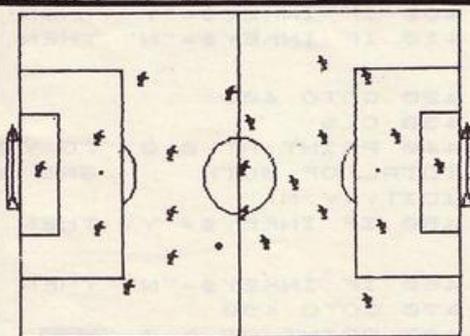
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2 Liverpool	16	8	8	61	31	53
3 Notts Coun	13	8	11	45	19	42
4 Birmingham						
5 West Ham						
6 Southampton						
7 Leicester						
8 Notts						
9 Wolves						
10 Tottenham						
11 Sunderland						
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15 Norwich						
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17 Aston U.						
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19 Luton T.						
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21 Arsenal						
22 Stoke C.						

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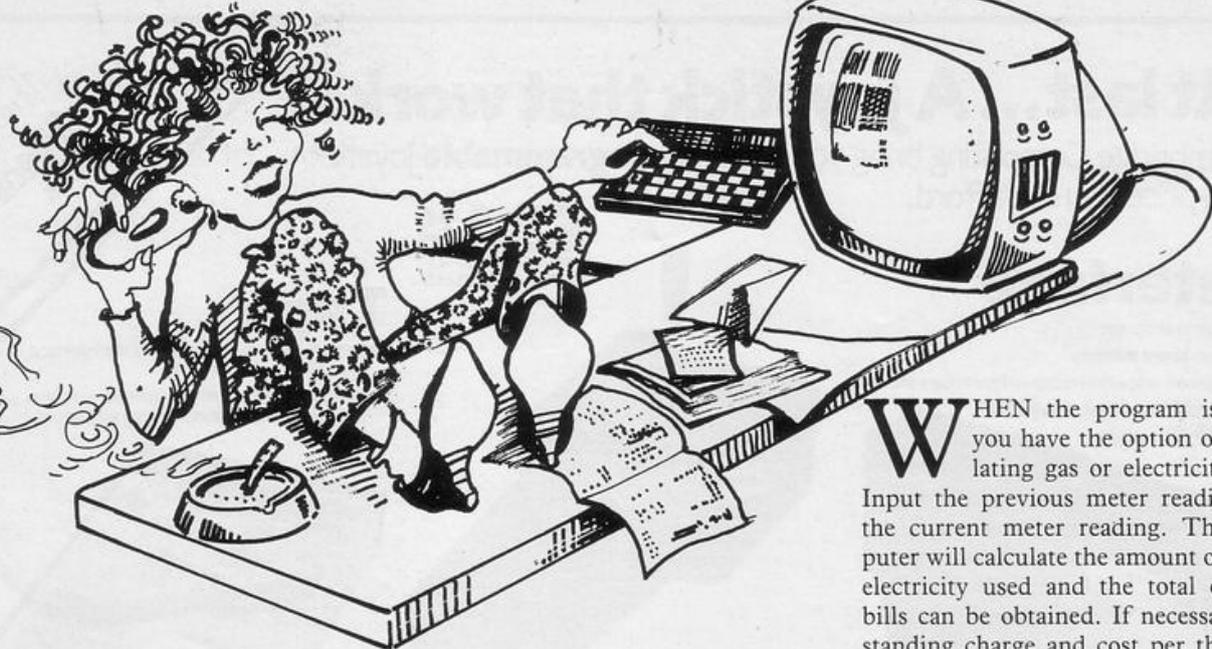
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SP 5



WHEN the program is RUN you have the option of calculating gas or electricity bills. Input the previous meter reading and the current meter reading. The computer will calculate the amount of gas or electricity used and the total of both bills can be obtained. If necessary, the standing charge and cost per therm or unit can be changed.

Bill Calculator was written for the 16K ZX-81 by Colin Moore of Greenock, Renfrewshire.

BILL CALCULATOR

```

10 CLS
20 PRINT AT 0,0;"WHICH DO YOU
REQUIRE          (1) GAS
                  (2) ELECTRICI
TY"
30 IF INKEY$="1" THEN GOTO 60
40 IF INKEY$="2" THEN GOTO 210

50 GOTO 30
60 CLS
70 PRINT AT 0,0;"-----"
GAS
80 PRINT AT 2,0;"PLEASE INPUT
THE FOLLOWING    READINGS"
90 PRINT AT 5,0;"PREVIOUS"
100 INPUT PRG
110 PRINT AT 5,22;PRG
120 PRINT AT 7,0;"PRESENT"
130 INPUT TRG
140 PRINT AT 7,22;TRG
150 PRINT AT 9,0;"CONSUMPTION="
      (TRG-PRG)*100
155 LET THE=((TRG-PRG)*1034)/10
00
160 PRINT AT 11,0;"THERMS="
      ;THE
170 PRINT AT 13,0;"STANDING CHA
RGE="      £9.90"
180 PRINT AT 15,0;THE;" THERMS
AT 33.5P=£";INT ((THE*33.5/100)*
100+.5)/100
190 LET TCG=INT ((THE*33.5/100+
9.9)*100+.5)/100
200 PRINT AT 17,0;"TOTAL CHARGE
="      £";TCG
201 PRINT AT 19,0;"DO YOU WANT
A PRINTED COPY(Y/N)"
202 IF INKEY$="Y" THEN COPY
203 IF INKEY$="N" THEN GOTO 205

204 GOTO 202
210 CLS
220 PRINT AT 0,0;"-----"EL
ELECTRICITY
230 PRINT AT 2,0;"PLEASE INPUT
THE FOLLOWING    READINGS"
240 PRINT AT 5,0;"PREVIOUS"
250 INPUT PRE
260 PRINT AT 5,22;PRE
270 PRINT AT 7,0;"PRESENT"
280 INPUT TRE
290 PRINT AT 7,22;TRE
300 LET UN=TRE-PRE
310 PRINT AT 9,0;"UNITS USED="
320 PRINT AT 9,22;UN
330 IF UN<15 THEN PRINT AT 11,0
;UN;" AT 14.19P=      £";INT (
(UN*14.19/100)*100+.5)/100
340 IF UN<15 THEN GOTO 390
350 LET SUN=UN-15
360 PRINT AT 11,0;"15 AT 14.19
="      £";INT ((15*14.19/100)*
100+.5)/100
370 PRINT AT 13,0;SUN;" AT 4.52
="      £";INT ((SUN*4.52/100)
*100+.5)/100
380 PRINT AT 15,0;"TOTAL="
      £";INT ((15*14.19/100)*
100+.5)/100+INT ((SUN*4.52/100)*
100+.5)/100
390 PRINT AT 17,0;"DO YOU WANT
A PRINTED COPY(Y/N)"
400 IF INKEY$="Y" THEN COPY
410 IF INKEY$="N" THEN GOTO 430

420 GOTO 400
430 CLS
440 PRINT AT 0,0;"DO YOU WANT A
TOTAL OF BOTH    GAS AND ELECT
RICITY(Y/N)"
450 IF INKEY$="Y" THEN GOTO 460

460 IF INKEY$="N" THEN GOTO 10
470 GOTO 450
480 PRINT AT 6,0;"GAS"
490 PRINT AT 6,20;"£";TCG
500 PRINT AT 8,0;"ELECTRICITY"
510 PRINT AT 8,20;"£";INT ((15*
14.19/100)*100+.5)/100+INT ((SUN
*4.52/100)*100+.5)/100
520 PRINT AT 10,0;"TOTAL"
530 PRINT AT 10,20;"£";TCG+(INT
((15*14.19/100)*100+.5)/100+INT
((SUN*4.52/100)*100+.5)/100)
540 PRINT AT 12,0;"DO YOU WANT
A PRINTED COPY(Y/N)"
550 IF INKEY$="Y" THEN COPY
560 IF INKEY$="N" THEN GOTO 10
570 GOTO 550

```

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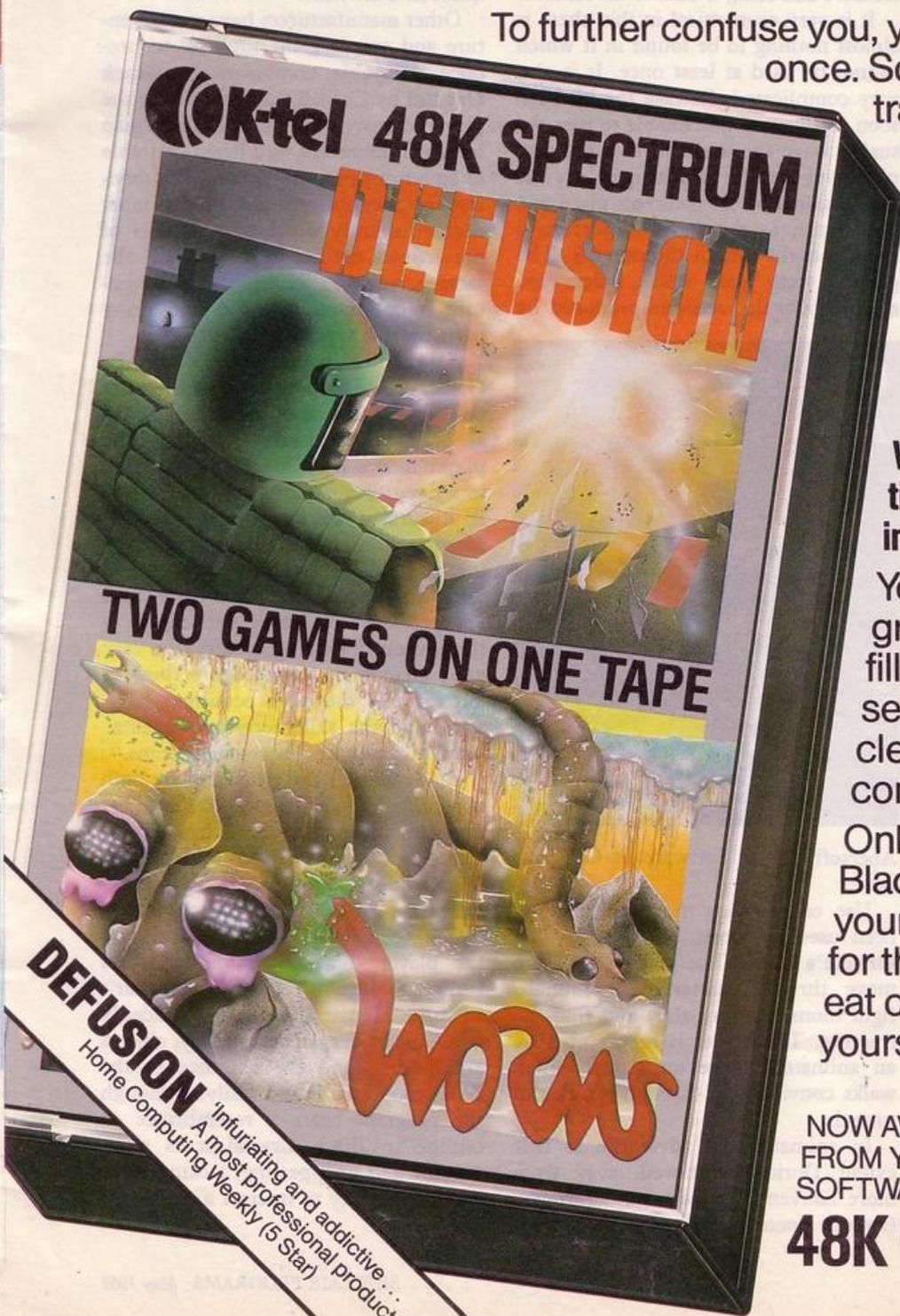
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Home Computing Weekly (5 Star)

Adventure games: Playing, choosing and writing them

ALWAYS HIGH in the lists of best-selling games for the Spectrum is an assortment of adventure games. That has led to a proliferation of adventure games on the market and also to a huge growth in computer owners perplexed by puzzles included in specific adventures.

Adventure games are those in which the player moves round a large playing area by collecting various objects, solving puzzles, and finding the correct instruction which allows movement to the next location. Most good adventures are mappable — a map can be drawn by the player showing the various locations included and their relationship with each other.

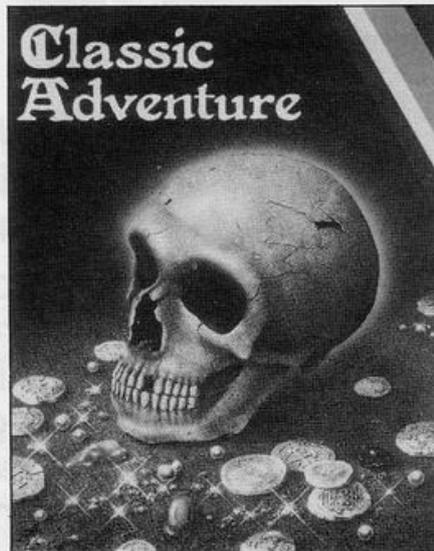
An attractive feature of adventure games is that commands can be entered in English and the computer will then appear to follow those commands. Very few games, though, allow the player to enter anything approaching a normal English sentence. Most restrict the player to two words per entry, a noun and a verb, such as TAKE ROPE or WEAR RING. Another restriction is that the computer is usually programmed only to interpret the first four letters of a word, so that the most useful words tend also to be the shortest.

The limitations in vocabulary are not always explained in full to adventurers and neither are the commonest words or abbreviations. Most adventure games accept the letters W, E, N, S as west, east, north and south respectively. R will often repeat a description of a location, INVEN will produce a list of objects carried, SCORE will give some indication as to how much of the adventure has been completed, and HELP will sometimes provide a clue, albeit a very obscure one.

The first adventure games were written on large mainframe computers and were adapted only later for use on microcomputers. The most famous of the mainframe games has been adapted for the Spectrum by several software houses including, most recently, Mel-

bourne House, which has labelled it **Classic Adventure**. It is a text-only adventure which takes the player down through subterranean passages to find treasure and bring it back to the surface.

It is very economical in that there is almost nothing to be found in it which cannot be used at least once. It is also very complicated. Release the bird too soon and you will be unable to pass the snake, wave the wand in the incorrect place and nothing will happen, say the magic words in the incorrect place and you return to the start. Players have spent months lost in the caverns. The game is very good value, unless you already own the versions produced by



Abersoft, Syrtis Software or CP Software.

Use of graphics in adventures has been used by Doric Software in **The Oracle's Cave**. The player's aim is to move through subterranean tunnels, fight monsters, stay alive and find the treasure. The player is represented by an animated figure on screen which walks convincingly through a series of tunnels.

In animating an adventure to that extent Doric has moved away from more conventional adventure formats. Options open to the player are always

shown on screen, so there is no difficulty about selecting the correct words to move; the problems lie in moving in the correct direction and completing the quest in a set time.

Other manufacturers have put adventure and arcade game together to produce enjoyable combinations. **Black Crystal** by Carnell Software allows the player to move across an illustrated map on which monsters, and items desirable to an adventurer, are hidden. If a monster is encountered the player must decide instantly which of a number of pre-defined options to use to kill the monster and win the fight. The adventure is enormous, divided into many parts on two separate cassettes.

Atic Atac by Ultimate Play The Game, one of the most enjoyable games on the market, also combines arcade action and adventure strategy. The player moves from location to location in a five-storey building, each of which is illustrated in detail very quickly. Moving through the building and dodging and killing attacking monsters is difficult enough but to find the golden key necessary to escape and complete the adventure requires a map, or a very good memory, a knowledge of how to kill some of the more persistent monsters, and the skill necessary to enter some of the more inaccessible rooms.

Black Crystal and **Atic Atac** are both absorbing and challenging games. That does not mean that all such combinations are certain to be enjoyable. **The Warlock's Treasure** by CRL produces a plan of an ancient castle. By searching the rooms and passageways the player should be able to amass sufficient clues to find evil C Sniciar's treasure. Monsters materialise suddenly and must be despatched quickly, objects are hidden, and the entrance to the cellar cannot be found easily. Although the program bears a resemblance in outline to **Black Crystal** it is slow-moving and unappealing, lacking sufficient originality to interest a player for long.



Likewise **Camelot**, which sets a player moving round a map and then draws each location in some detail, proves uninteresting very quickly. Skill is involved in keeping yourself and your troops alive for long enough to collect all necessary objects and return to Camelot to be crowned king but, especially on the easy level, the game is not difficult and the range of options is very limited.

Phoenix Software has investigated another way of combining adventure and arcade with its programs **Dodge City** and **Jokers Wild**. Each of the packages contains two cassettes, one of which is an arcade game and one an adventure game. To reach the adventure, certain skill levels must be achieved in the arcade games. At the end of skill levels, clues to the adventure are provided, so that each player necessarily will begin the adventure with some clues. The arcade games are very difficult, especially at the higher skill levels, so only quick-fingered experts will have the chance to play the adventures.

Virgin has also partially combined the two types of game in its program **The Island**. It contains straightforward but infuriating games in the adventure. They can prove frustrating as when, for example, the player has been proved agile enough mentally to set sail for the island but is not agile enough manually to reach it without being shipwrecked on the rocks which must be negotiated

during the voyage. The Island is also novel, in that it includes sound effects other than tunes in the adventure. The flute, when blown, plays tunelessly, and when the mosquitos begin to buzz it is time to reach for the quinine.

One other variation on the adventure is the comic plot. It has been utilised to the full in the Automata **Pi-mania** and **My name is Uncle Groucho**, which are full of the worst jokes which the player is likely to face in a computer game. Both games, however, offer major prizes for the first player to complete the adventure and solve the puzzle, both of which prizes are, as yet, unclaimed.

Also humorous are **Mad Martha** and its sequel, both from Mikro-gen. An element of bathos is present in both programs, as the adventure format is transferred from a mystical world of elves and magic to a British suburb and a Spanish resort where the monsters are raging stereotypes and the hero's first problem is to escape from his bedroom.

Writing new machine code adventures

Writing your own adventure games is possible on both the Spectrum and ZX-81. *Sinclair Programs* has published **Escape From Time** for the Spectrum, and **Haunted Dungeon** for the 1K ZX-81, both of which showed that writers of good adventures do not have to be machine code wizards and that adventures do not have to be extremely long programs.

For those who do not feel capable of programming an entire adventure, Gilsoft has produced a program called **The Quill**. It enables users to write machine code programs without having to program anything but simply by filling-in all the correct details. The Quill is also very flexible and makes very few assumptions about the form of an adventure to be programmed, which means that the amount of detail to be programmed in it is very large, so that even the simplest adventure can take two hours to create.

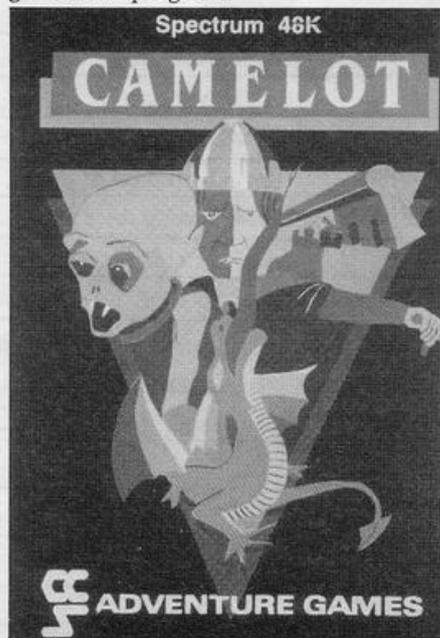
Once a game has been created, Gilsoft will allow its authors to market it. An example of a program written with

the Quill is **Diamond Trail**, also by Gilsoft. It is a text-only adventure which is full of clues, locations and red herrings. It is a difficult and enjoyable adventure which can prove very frustrating as the player starves to death in a certain number of moves unless food is found. The time limit indicates that a solution can be found in a set number of moves but finding the proper combination means beginning the game over and over again.

There are some excellent adventure games for the Spectrum on the market, among which **The Hobbit** by Melbourne House and **Valhalla** by Legend are outstanding examples. There is also a growing number of bad adventure games which tend to treat the format as some obscure form of word puzzle in which the player cannot progress until the correct code words have been guessed at the proper point.

Cassette cases can give some guide to the quality of an adventure. Instructions which are mis-spelt suggest that there may be bad spelling in a game and there is nothing more frustrating than being frustrated seeking for ways to escape while being nagged by the doubt that you have chosen the proper words but they are mis-spelt in the program.

Also to be avoided are programs which do not give clear or adequate instructions. If they do not consider the player from the outset, they may consider the player even less when the game is in progress.



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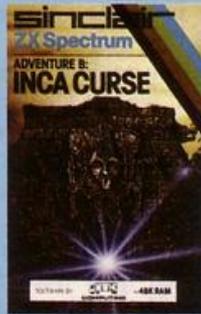
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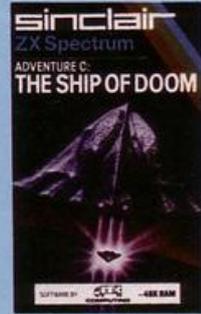
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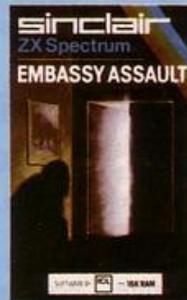
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GOALKEEPER

PLAYING the role of the **Goalkeeper** in this program written for the 16K Spectrum by Avi Margalit of Israel, you use key "5" to move left and "8" to move right. You must prevent as many goals as you can. If you concede a goal the game ends and you are told how many goals you prevented.



```
4 CLS : RESTORE
5 GO SUB 500
6 GO SUB 700
7 PRINT AT 18,1;"READY? pres
s any key to start!": PRINT AT
16,12;"<5 8>"
8 PAUSE 0
9 PRINT AT 18,1;"
"; AT 16,12
"; "
10 LET x=16: LET n=0
20 LET y= INT ( RND *14)+9
25 LET n=n+1
30 FOR i=20 TO 6 STEP -1
40 PRINT AT i+1,y;" "
50 PRINT AT i,y;"*"
60 PRINT AT 6,x;" "
70 LET x=x+( INKEY$ ="8")-( IN
KEY$ ="5")
80 LET x=x+(x=8)-(x=23)
90 PRINT AT 6,x;"a"
100 BEEP .05,1
110 NEXT i
120 IF x=y THEN GO TO 20
125 PRINT AT 6,x;" "
127 PRINT AT 6,y;" "
135 GO TO 1000
500 PLOT 70,125: DRAW 0,40: DRA
W 115,0: DRAW 0,-40: PLOT 70,125
: DRAW 30,20: DRAW 115,0: DRAW -
30,-20: PLOT 70,165: DRAW 15,10:
DRAW 115,0: DRAW -15,-10: PLOT
100,145: DRAW -15,30: PLOT 200,1
75: DRAW 15,-30
510 RETURN
700 FOR i=0 TO 7
710 READ a: POKE USR "a"+i,a
720 NEXT i
730 DATA 24,24,60,90,90,24,36,1
02
740 RETURN
1010 PRINT FLASH 1; AT 16,11;"G
OAL!!!"
1020 FOR i=-20 TO 30 STEP 2
1021 BEEP .1,i
1022 NEXT i
1030 PRINT FLASH 0; AT 16,11;"
"
1050 PRINT AT 17,2;"YOU STOP ";
N;" BALLS"
1060 PRINT AT 21,1;"Do you want
to play again!(y/n)"
1070 INPUT a$
1080 IF a$="y" THEN GO TO 4
1100 STOP
```

Line 4 clears the screen.

Line 5 sends the computer to the sub-routine at line 500, which draws the goalposts on the screen.

Line 6 sends the computer to the sub-routine at line 700, which sets up the user-defined graphic A. From then in the program, whenever graphic A is printed on the screen it will appear as a goalkeeper.

Lines 7 and 8 print the instructions and wait for the player to press a key.

Line 9 ensures that the screen is blank except for the goalposts.

Lines 10 and 20 set the values of your score and the co-ordinates n, x and y — n and x are fixed numbers, while y is a random number.

Lines 30 to 60 move the ball across the screen and ensure that only one ball can be seen at a time.

Lines 70 and 80 allow the player to move the goalkeeper but not to send him off the edge of the screen.

Line 90 prints the goalkeeper.

Line 100 makes a small noise.

Line 110 returns the program to line 30 unless the ball has reached the net.

Line 120 sends back the computer to line 20 to begin the game again if the goalkeeper has saved the ball.

Lines 125 and 127 clear the screen again.

Line 135 sends the computer to the sub-routine at line 1000. As there is no line 1000, the computer goes straight to line 1010.

Lines 1010 to 1022 flash GOAL on the screen, with accompanying noises.

Line 1030 clears the screen.

Lines 1050 and 1060 give your score and ask whether you wish to play again.

Lines 1070 to 1110 re-start the game if you answer "y" or stop the game if you press any other key.

THE OBJECT of **Clean Sweep** is to eat all the black boxes using the cursor keys. You can go off the screen and re-appear on the other side if you move too quickly. When you have swept the sheet clean, press "P" and the time in which you cleared the screen will be shown.

Clean Sweep was written for the 16K Spectrum by A Terry of Newcastle-under-Lyme, Staffs.



CLEAN SWEEP

```

2 GO TO 190
3 CLS
4 FOR e=1 TO 10
5 LET c= INT ( RND *20)
6 LET d= INT ( RND *30)
7 PRINT AT c,d;"(iq8)"
8 NEXT e
9 BORDER 2: PAPER 7: INK 1
10 LET a=6
20 LET b=7
25 FOR q=1 TO 2000000000
30 IF INKEY$ ="7" THEN LET a
=a-1
40 IF INKEY$ ="6" THEN LET a
=a+1
50 IF INKEY$ ="5" THEN LET b
=b-1
60 IF INKEY$ ="8" THEN LET b
=b+1
65 IF INKEY$ ="p" THEN GO TO
100
70 PRINT AT a,b;"+"
73 IF a=21 THEN LET a=0
74 IF b=31 THEN LET b=1
80 PRINT AT 21,11;q
90 NEXT q
100 CLS
110 PRINT "YOU HAVE CLEARD THAT
"
120 PRINT "CAN YOU CLEAR THIS ?
"
130 PRINT AT 5,9;"YOUR TIME IS
=";q
140 PRINT AT 10,2;"PRESS ANY K
EY TO START"

```

```

150 PAUSE 0
170 LET e=e+5
175 CLS
180 GO TO 4
190 CLS
200 PRINT "The name of the game
is eat the black boxes"
210 PRINT : PRINT : PRINT : PRI
NT

```

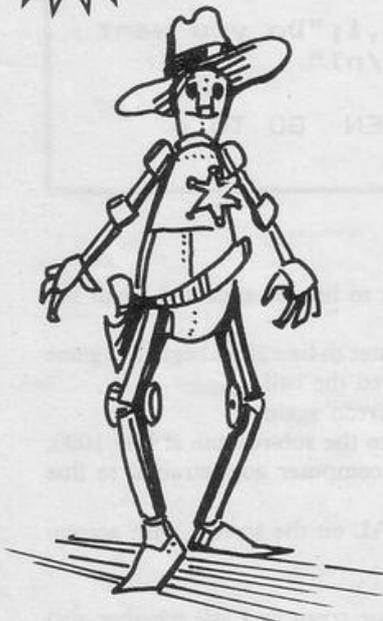
```

220 PRINT "When you have press
P"
230 PRINT : PRINT : PRINT : PRI
NT
240 PRINT "PRESS ANY KEY TO STA
RT"
250 PAUSE 0
260 GO TO 3

```



DUEL



THE FIGHT is on between your cowboy and the computer cowboy. Wait until "FIRE" is flashed on the screen and then press any key to shoot. If you are not fast enough the computer cowboy will shoot you first and you will be told how many rounds you survived. The game can be made easier by changing the 7 in line 40 to a bigger number.

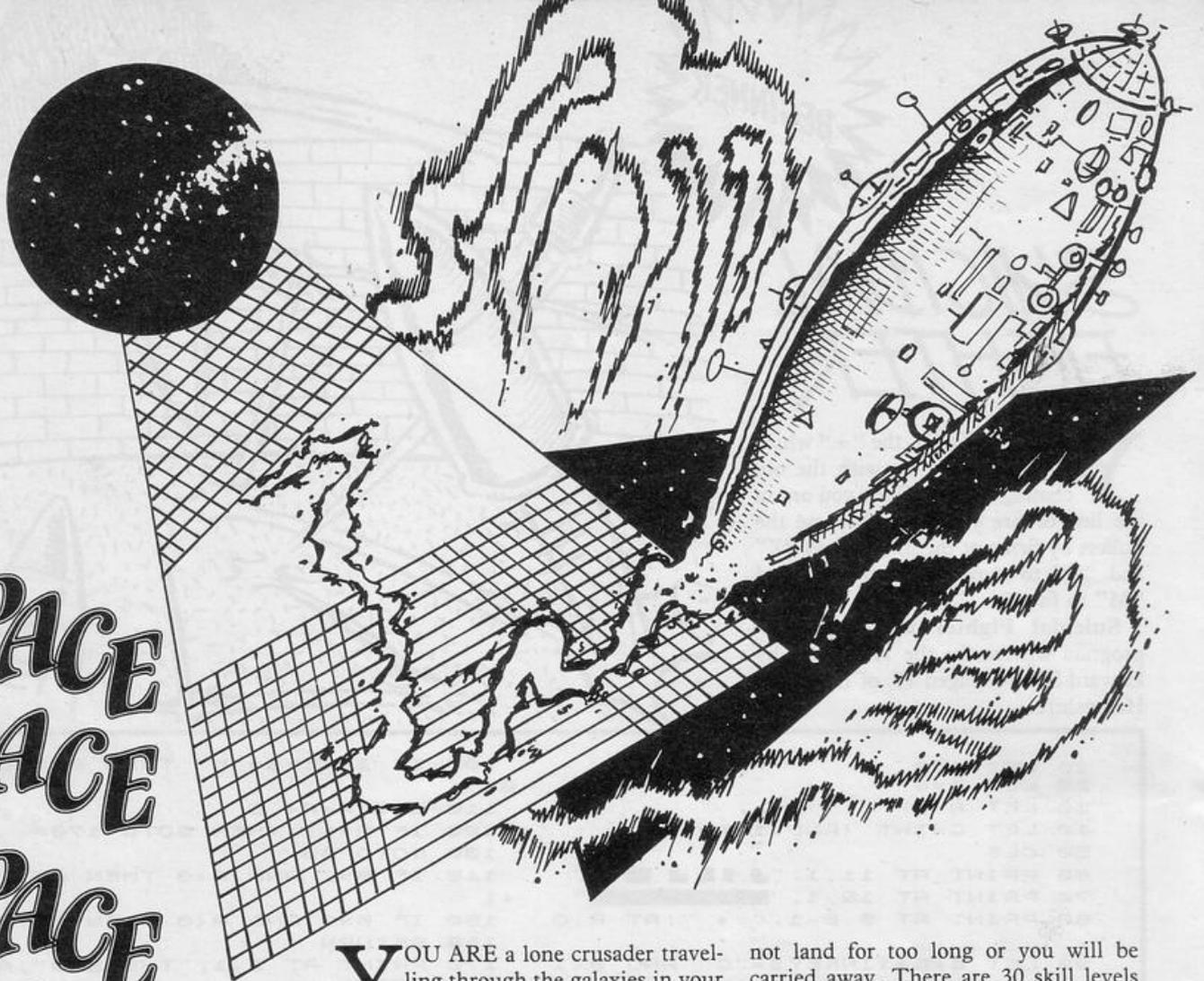
Duel was written for the 1K ZX-81 by Pascual Nicholson of Lowestoft, Suffolk.

```

1 LET S=0
5 CLS
10 PRINT AT 0,0;"- - - - -"
-";TAB 0;" | " | " |";TAB 0;"
| " | " | "
15 FOR I=1 TO RND*100
17 IF INKEY$<" THEN GOTO 15
20 NEXT I
30 PRINT AT 10,0;"FIRE..."
40 FOR I=1 TO 7
45 IF INKEY$<" THEN GOTO 100
50 NEXT I
60 FOR I=2 TO 11
65 PRINT AT 1,I;" ";AT 1,I;" "
70 NEXT I
80 PRINT AT 0,11;" ";TAB 11;
";TAB 11;" ";AT 2,11;" | "
;AT 10,0;"YOUR SCORE WAS ";S
85 PAUSE 300
90 RUN
100 FOR I=11 TO 2 STEP -1
105 PRINT AT 1,I;" ";AT 1,I;" "
110 NEXT I
115 PRINT AT 0,0;" ";TAB 0;"
";TAB 0;" ";AT 2,0;" | " ;AT
10,0;"WELL DONE "
120 LET S=S+1
125 PAUSE 100
130 GOTO 5

```


SPACE RACE SPACE RACE



YOU ARE a lone crusader traveling through the galaxies in your rocket. You are faced with several hazards along the way which you must dodge, including the stars and space phantoms. You can ride on the moon bases to gain extra points but do

not land for too long or you will be carried away. There are 30 skill levels from which to choose. Use "1" to move right and "0" to move left.

Space Race was written for the 16K Spectrum by E Marsden of Upper Denby, W. Yorks.

```

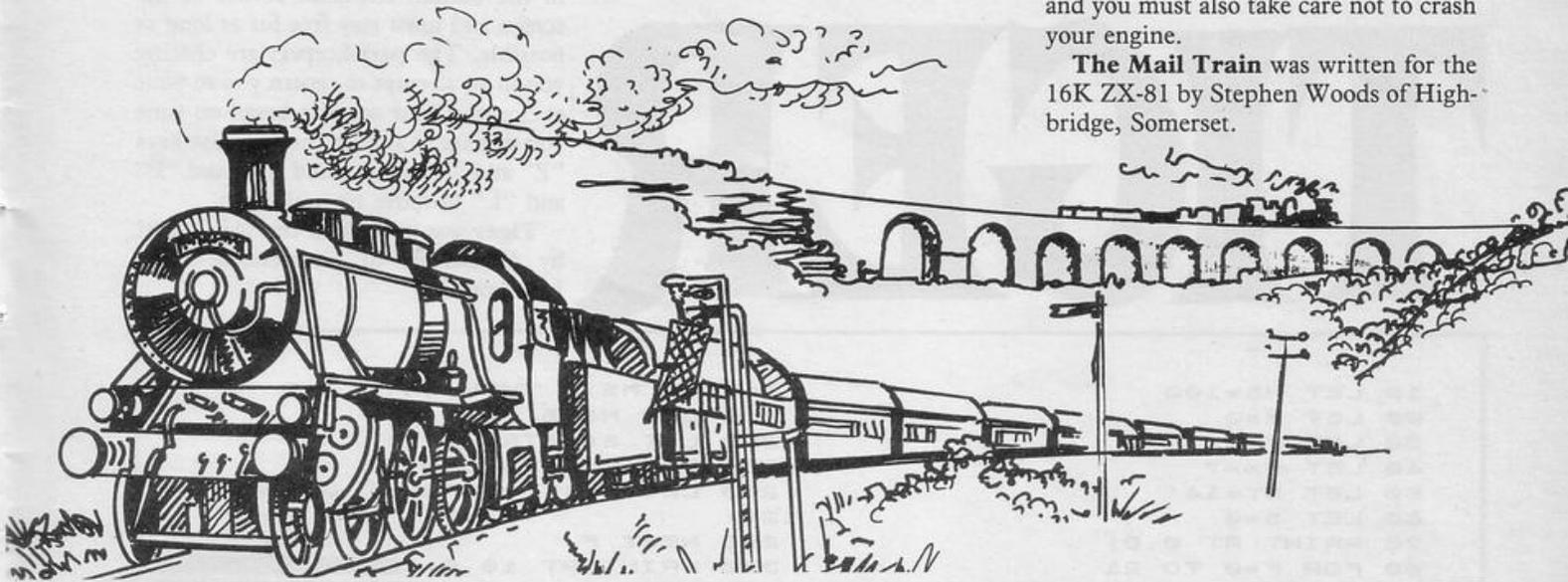
10 GO SUB 1000
20 LET s=0: LET q=20
30 LET x=15
40 LET y=8
50 IF q=20 THEN LET a= RND *2
9+1
60 LET b= RND *v
70 LET c= RND *v
80 LET d= RND *150
90 INK 7: PRINT AT y,x;"f"
91 LET w= RND *3-1
93 IF a+w<2 OR a+w>29 THEN LE
T w=-w
94 LET q=q-2
95 LET a=a+w
96 IF q<1 THEN LET q=20
97 IF v>600 THEN PRINT AT q+
1,a-w; INK 2;" "
99 IF x>a THEN LET a=a+1
100 PRINT AT q,a; INK 2;"a"
110 IF b<30 THEN PRINT AT 20,
b; INK 3;"b"
120 IF c<30 THEN PRINT AT 20,
c; INK 5;"c"
130 INK 6: IF d<28 THEN PRINT
AT 20,d;"d(g3)e"
140 IF SCREEN$(y+1,x) <> " "
THEN GO TO 500
150 LET x=x+(INKEY$="0")-(IN
KEY$="1")
160 LET s=s+1
170 INK 7: PRINT AT 20,31;".";
AT 20,0;"."
180 INK 7: PLOT RND *240+10,10
190 PLOT RND *240+10,10
200 IF y<7 THEN GO SUB 600
210 PRINT
220 POKE 23692,-1: PRINT
230 IF y<1 THEN GO TO 700

240 GO TO 50
500 IF ATTR (y+1,x)=6 THEN LE
T s=s+2: LET y=y-1: GO TO 150
520 IF ATTR (y+1,x)=7 THEN GO
TO 750
530 FLASH 1: INK 2: PRINT AT y
,x-1;"##"; AT y+1,x-1;"##"
540 INK 7: PRINT AT 15,2;"!!!Y
OU RAN INTO AN ALIAN!!!"
550 INK 2: PRINT AT 17,10;"SCD
RE ";s;" !"
560 BEEP 1,-15
570 FLASH 0: PRINT ; INK 7;"any
key to play"
580 IF INKEY$="" THEN GO TO
580
585 INPUT ;"select level (1 to
30)";v
587 LET v=(31-v)*30
590 CLS : GO TO 20
600 IF SCREEN$(y,x)=" " THEN
LET y=y+1
610 RETURN
700 INK 7: PRINT AT 10,5;" YOU
HAVE BEEN CARED OFF
BY A STRAY MOON!!!"
710 PRINT AT 15,11; INK 2;"HAR
D LUCK"
720 GO TO 550
750 INK 7: PRINT AT y,x;"*"
760 PRINT AT 10,0; INK 2;"YOU
RAN INTO A STAR - YOU FOOL!!!"
770 GO TO 550
1000 INK 7: PAPER 0: CLS : BORDE
R 0
1010 FOR m=1 TO 6: READ a$: FOR
n=0 TO 7: READ s: POKE USR a$+n
,s: NEXT n: NEXT m
1020 DATA "a",56,245,250,45,123,
156,167,34,"b",86,231,23,148,12,
12,145,88
1030 DATA "c",76,34,251,32,34,65
,87,121
1040 DATA "d",255,255, BIN 01111
111, BIN 00111111, BIN 00011111,
BIN 00000111, BIN 00000001,0,"e
",255,255,254,252,248,224, BIN 1
0000000,0
1050 DATA "f", BIN 00011100, BIN
01001001, BIN 01011101, BIN 001
01010, BIN 00010100, BIN 0001010
0, BIN 00001000, BIN 00001000,"g
",0
1055 FOR n=0 TO 255 STEP 3: BEEP
.02,5; INK 3: PLOT 127,87: DRAW
n-127,87: NEXT n
1057 FOR n=175 TO 0 STEP -3: BEE
P .02,0: INK 3: PLOT 127,87: DRA
W -127,n-87: NEXT n
1060 FOR n=255 TO 0 STEP -3: BEE
P .02,-10: INK 3: PLOT 127,87: D
RAW n-127,-87: NEXT n
1065 FOR n=0 TO 175 STEP 3: BEEP
.02,10: INK 3: PLOT 127,87: DRA
W 127,n-87: NEXT n
1067 INK 7: PRINT AT 5,10; FLAS
H 1;"MOON f BASE": INK 2: FOR n=
5 TO 25 STEP 2: BEEP 0.002,-20:
PRINT AT 10,2;"abcabdcbaeababdf
afabbababaa": PRINT AT 14,0;"":
PRINT AT 16,0;" ": INK 5: PRINT
AT 15,0;"1<0 DODG-a ,RIDE-d(g
3)e ,GOOD LUCK"
1070 PAUSE 500
1080 CLS
1090 GO TO 560

```

COLLECT the mail sacks dotted about the screen using the cursor keys to move. Each time you collect a sack you gain an extra carriage. You must avoid back-tracking as you will run into your own carriages and you must also take care not to crash your engine.

The Mail Train was written for the 16K ZX-81 by Stephen Woods of High-bridge, Somerset.



THE MAIL TRAIN

```

2 LET HS=0
3 GOTO 8000
5 CLS
10 LET A=30
30 LET SC=0
40 LET SH=0
90 POKE 16418,0
95 LET A=A+INT (RND*16)+7
96 CLS
97 DIM S(1200)
98 LET N=0
100 LET A$=""
110 LET B$=""
120 PRINT A$
130 FOR B=1 TO 22
140 PRINT B$
150 NEXT B
160 PRINT A$
161 LET H$=STR$ HS
162 FOR B=1 TO LEN H$
163 LET H$(B)=CHR$(CODE (H$(B)
)+128)
164 NEXT B
170 PRINT AT 23,10;"HIGH SCORE
";H$
180 FOR B=1 TO A
181 LET W=INT (22*RND+1)
182 LET Z=INT (30*RND+1)
183 PRINT AT W,Z;
184 IF PEEK (PEEK 16396+256*PEE
K 16399)<>0 THEN GOTO 181
185 IF W=9 AND Z<4 THEN GOTO 18
1
190 PRINT AT W,Z;"*"
200 NEXT B
210 LET X=(PEEK 16396+256*PEEK
16397)+300
220 LET M=1
230 LET Y=X
280 FOR T=1 TO 1200
285 LET S(T)=X
300 IF INKEY$<>" " THEN LET N=(I
NKEY$="6")+ (INKEY$="5")*33-(INKE
Y$="5")-(INKEY$="7")*33
305 IF N<>0 THEN LET M=N
310 IF PEEK (X+M)>40 THEN GOTO
570
320 IF PEEK (X+M)<>0 THEN LET S
C=SC+1
323 POKE X,52
324 POKE (X+M),40
330 POKE (S(T-SC+SH)),0
370 IF A=SC-SH THEN GOTO 500
380 IF T=1200 THEN GOTO 550
395 LET X=X+M
400 NEXT T
500 LET SH=SC
510 PRINT AT 0,0;"YOUR SCORE IS
: ";SC
520 FOR B=1 TO 60
530 NEXT B
540 GOTO 95
550 PRINT AT 0,0;"SORRY YOU RAN
OUT OF TIME : "
570 IF PEEK (X+M)=52 THEN PRINT
AT 0,0;"YOU SHOULD NOT RUN IN
TO YOUR OWN CARRIAGES "
580 IF PEEK (X+M)=128 THEN PRIN
T AT 0,0;"YOU CRASHED YOUR EN
GINE "
600 PRINT AT 5,0;"YOU SCORED: "
;SC
605 IF SC>HS THEN LET HS=SC
610 POKE 16418,2
620 PRINT "PRESS ANY KEY TO PLA
Y AGAIN"
625 PAUSE 4E4
640 GOTO 5
8000 CLS
8003 PRINT AT 5,0;"THE MAIL TRAI
N,THE OBJECT OF THEGAME IS TO GU
IDE THE ENGINE (000)AROUND THE S
CREEN COLLECTING THE MAIL BAGS.
YOU MUST NOT HIT YOUR OWN CARRIA
GES OR CRASH YOUR ENGINE."
8004 PRINT AT 19,0;"PRESS ANY KE
Y TO PLAY"
8005 PAUSE 4E4
8006 GOTO 4
9999 SAVE "TRAIN"

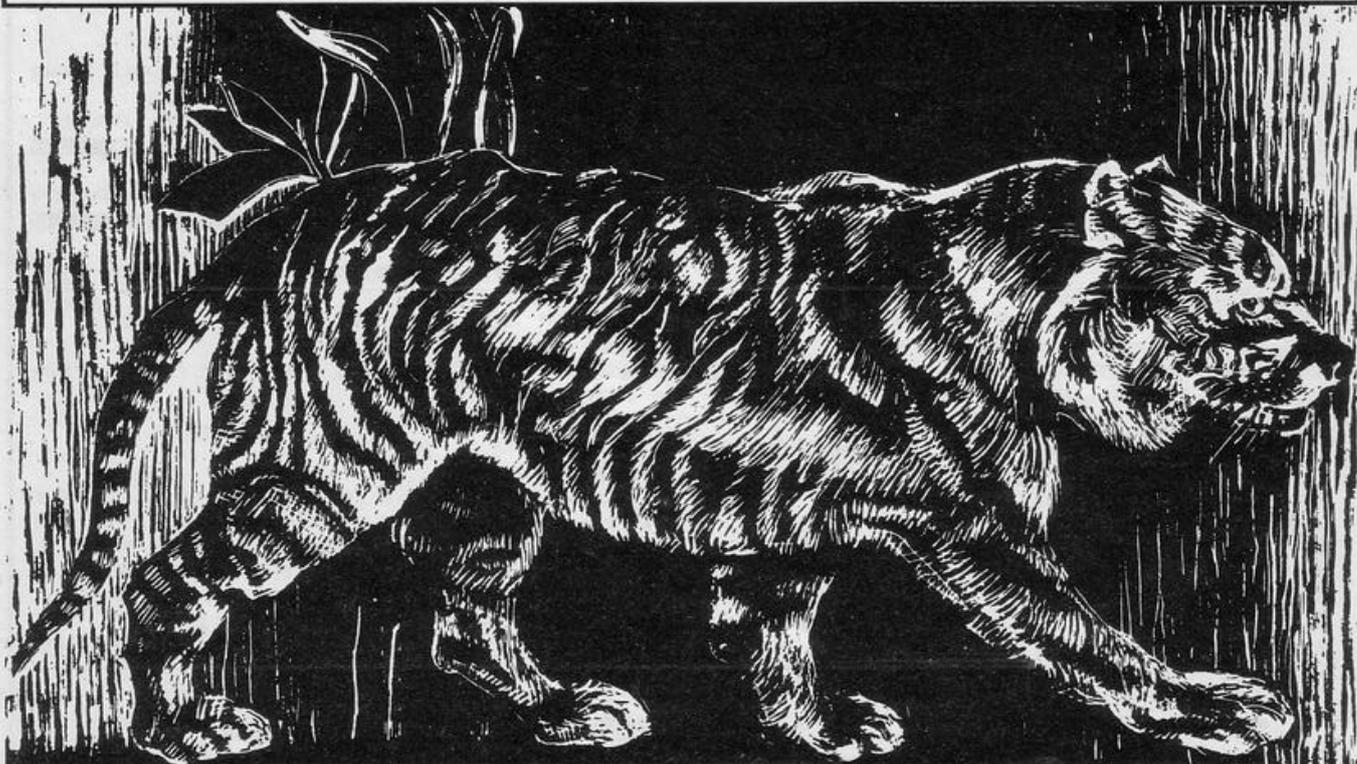
```

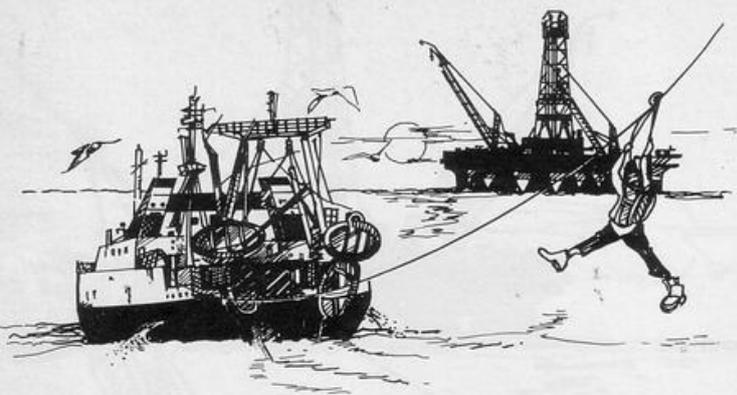
TIGER

PLAYING the part of a tiger which has escaped from an enclosure in a wildlife park, you start in the bottom left-hand corner of the screen and must stay free for as long as possible. The park-keepers are chasing you in an attempt to return you to your enclosure. Your score is based on time you manage to stay on the run. Use keys "Z" and "X" for left and right and "P" and "L" to move up and down.

Tiger was written for the 16K ZX-81 by D Barlow of Grassendale Park, Liverpool.

```
10 LET HS=100
20 LET X=0
30 LET Y=21
40 LET BX=7
50 LET BY=14
60 LET S=0
70 PRINT AT 0,0;
80 FOR F=0 TO 21
90 PRINT "#####"
100 NEXT F
110 PRINT AT BY,BX;"# "
120 FOR F=1 TO 2
130 LET A$=INKEY#
140 LET X=X+(A$="X" AND X<31)-(
A$="Z" AND X>0)
150 LET Y=Y+(A$="L" AND Y<21)-(
A$="P" AND Y>0)
160 PRINT AT Y,X;
170 IF PEEK (PEEK 16398+256*PEEK
K 16399)=149 THEN GOTO 240
180 PRINT "*"
190 NEXT F
200 LET BX=BX+(X>BX)-(X<BX)
210 LET BY=BY+(Y>BY)-(Y<BY)
220 LET S=S+1
230 GOTO 110
240 IF HS>5 THEN GOTO 320
250 LET HS=5
260 LET S$=STR$ S
270 FOR F=1 TO LEN S$
280 LET S$(F)=CHR$ (CODE S$(F)+
128)
290 NEXT F
300 PRINT AT 10,5;"YOU BEAT THE
HI-SCORE";TAB 7;"WITH A SCORE "
F";S$
310 GOTO 330
320 PRINT AT 10,8;"YOUR SCORE I
S ";S;AT 12,7;"THE HI-SCORE IS "
;HS
330 FOR F=1 TO 100
340 NEXT F
350 PRINT "DO YOU WANT TO PLAY
AGAIN? (Y/N)"
360 IF INKEY#="Y" THEN GOTO 20
370 IF INKEY#<>"N" THEN GOTO 36
0
380 CLS
390 PRINT AT 10,4;"#####
YE #####"
400 STOP
410 SAVE "CHAS#"
420 RUN
```





```

940 PRINT AT 3,5; "J L I I I I I"
950 PRINT AT 4,5; "
"
960 PRINT AT 8,3; "USE CURSOR KE
YS TO MOVE"
970 PRINT AT 10,10; "-----"
980 PRINT AT 11,10; " < "
990 PRINT AT 13,2; "PRESS 1 TO L
AND ON OIL RIG"
1000 PRINT AT 15,3; "PRESS 2 TO L
AND ON SHIP"
1010 PRINT AT 21,7; "ANY KEY TO S
TART"
1020 IF INKEY$="" THEN GOTO 1020

```

```

750 IF T<>18 THEN GOTO 250
760 IF U<>2 THEN GOTO 250
770 IF S>=23 AND S<=28 THEN GOT
O 790
780 GOTO 250
790 LET U=1
800 FOR J=1 TO 20
810 PRINT AT T+1,S+2; " "
820 PRINT AT T+1,S+2; " "
830 NEXT J
840 PRINT AT T+1,S+2; " "
850 IF U<>1 THEN PRINT AT T+1,S
+2; " "
860 IF U<>1 THEN RETURN
870 PRINT AT 1,1; "MEN DISEMBARK
ED,NOW TAKE OFF"
880 GOTO 250
890 FOR J=1 TO 50
900 NEXT J
910 GOTO 1040
920 PRINT AT 1,5; "-----"
930 PRINT AT 2,5; "L L L L L"

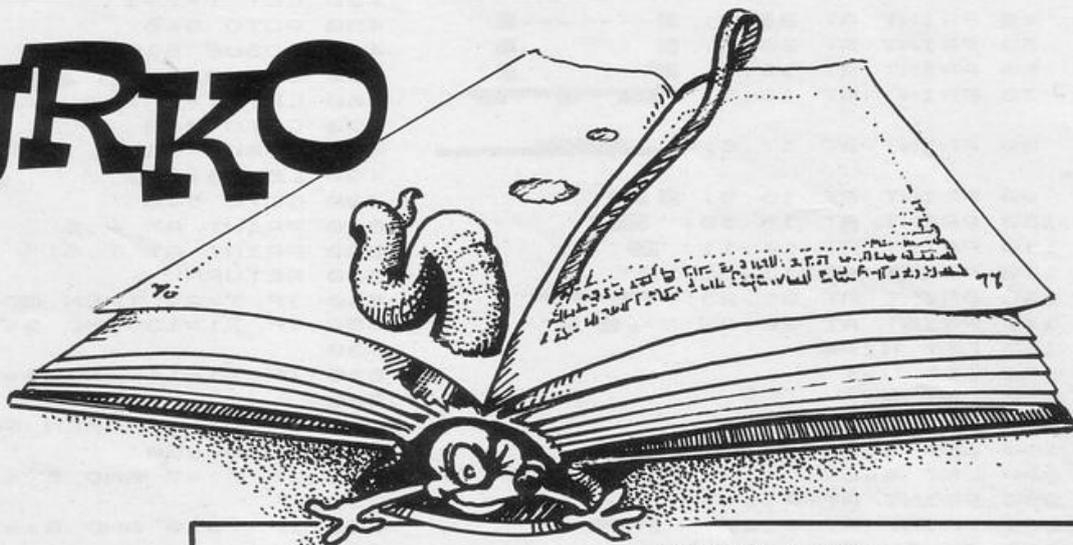
```

```

1030 GOTO 20
1040 CLS
1045 IF Z>HI THEN LET HI=Z
1050 PRINT AT 1,0; "
"
1060 PRINT AT 2,0; "
"
1070 PRINT AT 3,10; "HIGH SCORE"
1080 PRINT AT 4,0; "
"
1090 PRINT AT 5,0; "
"
1100 PRINT AT 8,3; "YOU RESCUED "
;Z; " PEOPLE"
1110 PRINT AT 10,3; "HIGHEST NO.
RESCUED=";HI; " PEOPLE"
1120 PRINT AT 14,0; "
"
1130 PRINT AT 15,0; "
"
1140 FOR J=1 TO 80
1150 NEXT J
1160 CLS
1170 GOTO 920

```

GURKO



PLAYING the part of Gurko the bookworm, you have to avoid the rip in the page. The rip descends from the top of the screen and you must use keys 5 and 8 to move left and right. Ten points are awarded for each page you survive. At the end of the game you have the option to RUN the program again, to NEW the game, to LOAD another program or to SAVE.

Written for the 16K ZX-81 by Robert Street of Belper, Derbyshire.

```

5 CLS
10 LET S=00
20 LET A=10
30 LET E=15
40 FOR F=0 TO 21
50 IF F=21 AND A=E THEN GOTO 2
60 LET A=A+(INKEY$="8")-(INKEY
$="5")
70 IF A>26 THEN LET A=26
80 IF A<2 THEN LET A=2
90 PRINT AT 21,A-2; " (" " "
100 PRINT AT F,E-1; " "
101 IF RND>.75 THEN GOTO 110
102 IF E<A THEN LET E=E+1
105 IF E>A THEN LET E=E-1
110 NEXT F
120 LET S=S+10
130 CLS
140 GOTO 20
200 PRINT AT 21,E-1; " "
205 PRINT AT 0,0; "SCORE=";S
210 FOR F=1 TO 90
220 NEXT F
230 CLS
240 PRINT " <1>RUN
<2>NEW
<3>AUTO-LOAD
<4>SAVE"
260 PRINT AT 4,0; " "
270 LET US=INKEY$
280 IF US="" THEN GOTO 270
283 IF US="1" THEN PRINT AT 4,1
;"RUN"
285 IF US="2" THEN PRINT AT 4,1
;"NEW"
290 IF US="3" THEN PRINT AT 4,1
;"LOAD"
295 IF US="4" THEN PRINT AT 4,1
;"SAVE"
297 FOR F=1 TO 60
299 NEXT F
300 IF US="1" THEN RUN
310 IF US="2" THEN NEW
320 IF US="3" THEN LOAD
330 IF US="4" THEN GOTO 350
335 IF US="" STOP " THEN STOP
340 GOTO 260
350 SAVE "GURKO"
360 RUN

```

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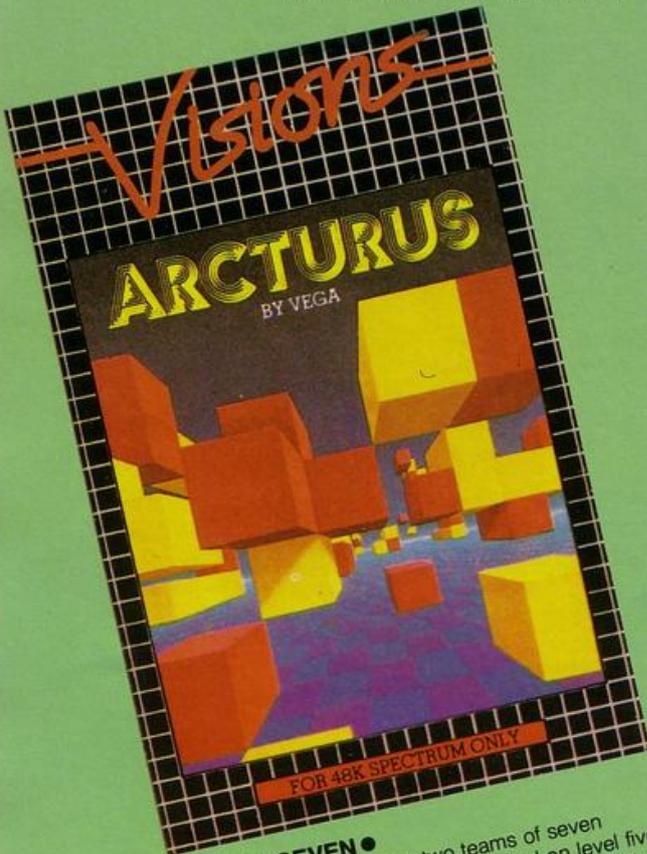
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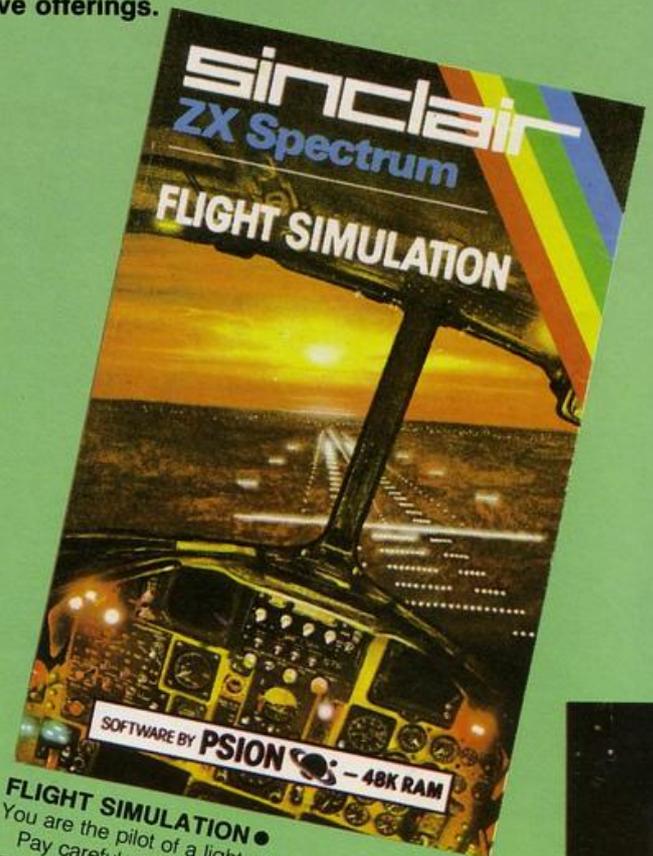


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Your mission is to rescue two teams of seven desperate men, trapped underground on level five. You must bring each man to the surface, surviving the dangers you meet en route.

ZX Spectrum 48K.
Cassette price: £6.95

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Cassette price: £7.95.

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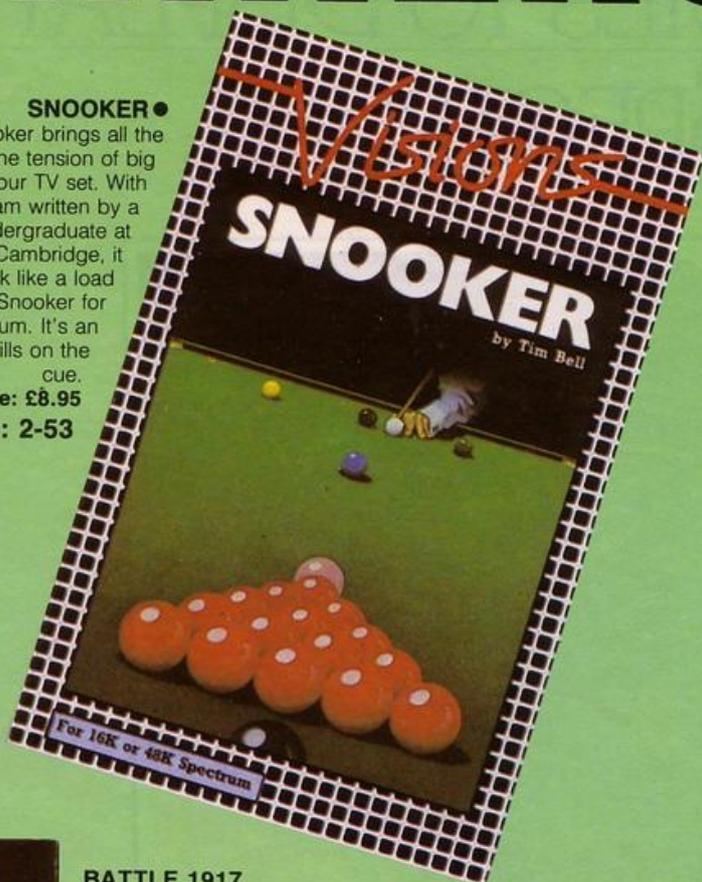
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Cassette price: £8.95

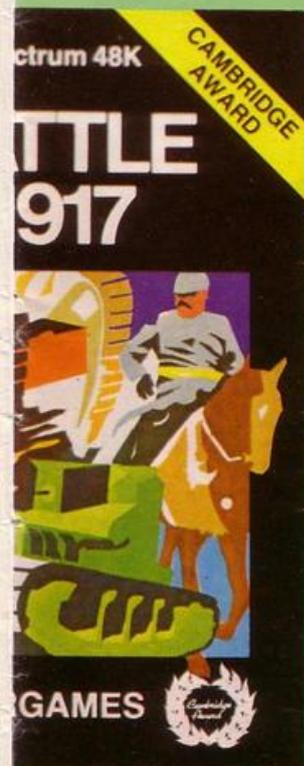
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BATTLE 1917

Winner of the 1983 Cambridge Awards sponsored by Sinclair User. The game is played by two players on a board 21 x 32 showing a map which changes with every game. Each player has 29 pieces including infantry, cavalry, tanks, artillery and a King. The object of the game, like chess, is to kill the enemy King. The game will appeal equally to all ages and all skills. This is the computer age's answer to Chess.

Cassette price: £6.00

Ref. No: 2-57

To: The Software Workshop, Yew Tree, Selborne, Hants GU34 3JP

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- * I will receive a FREE blank cassette with every 2 programs ordered
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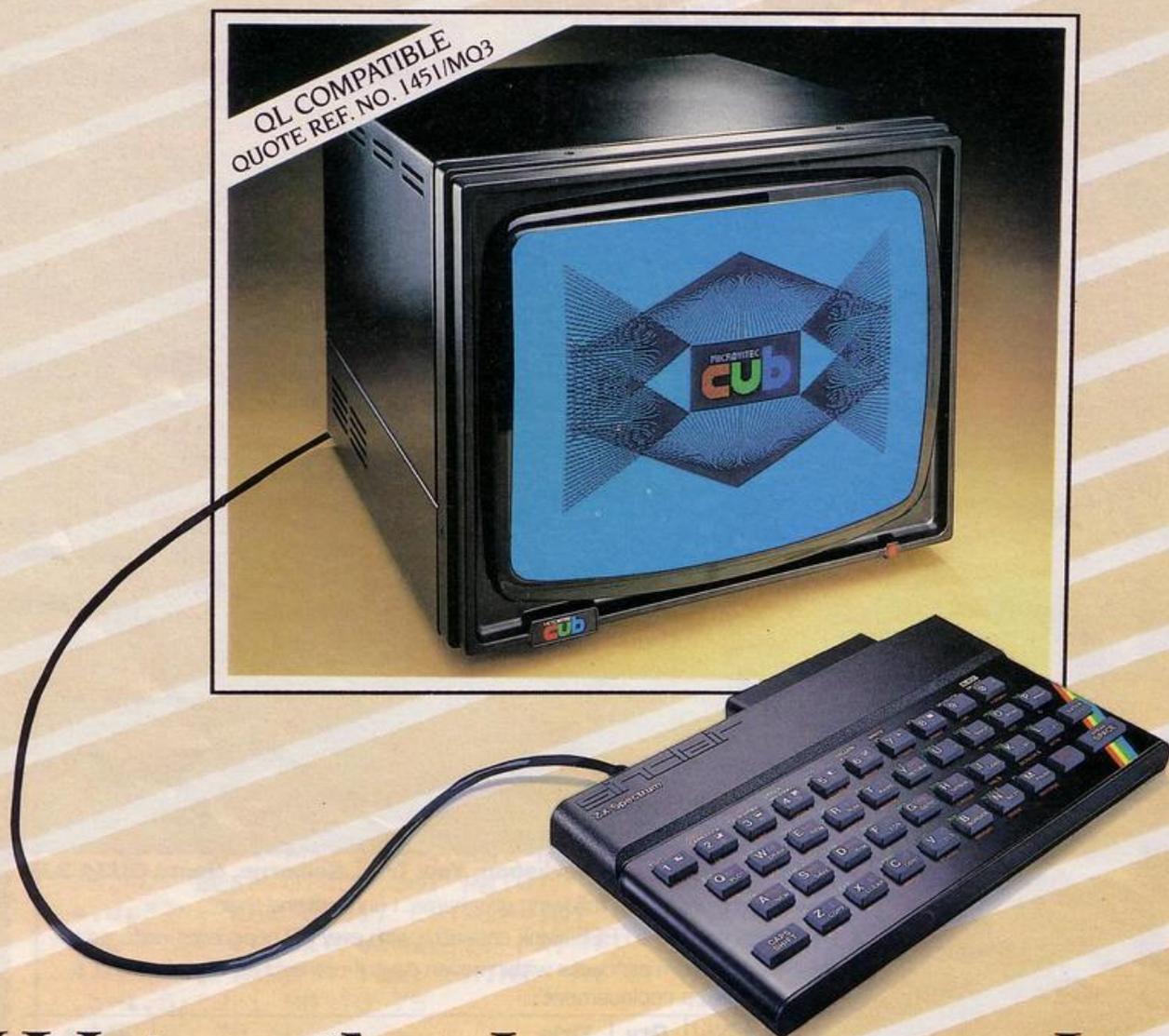
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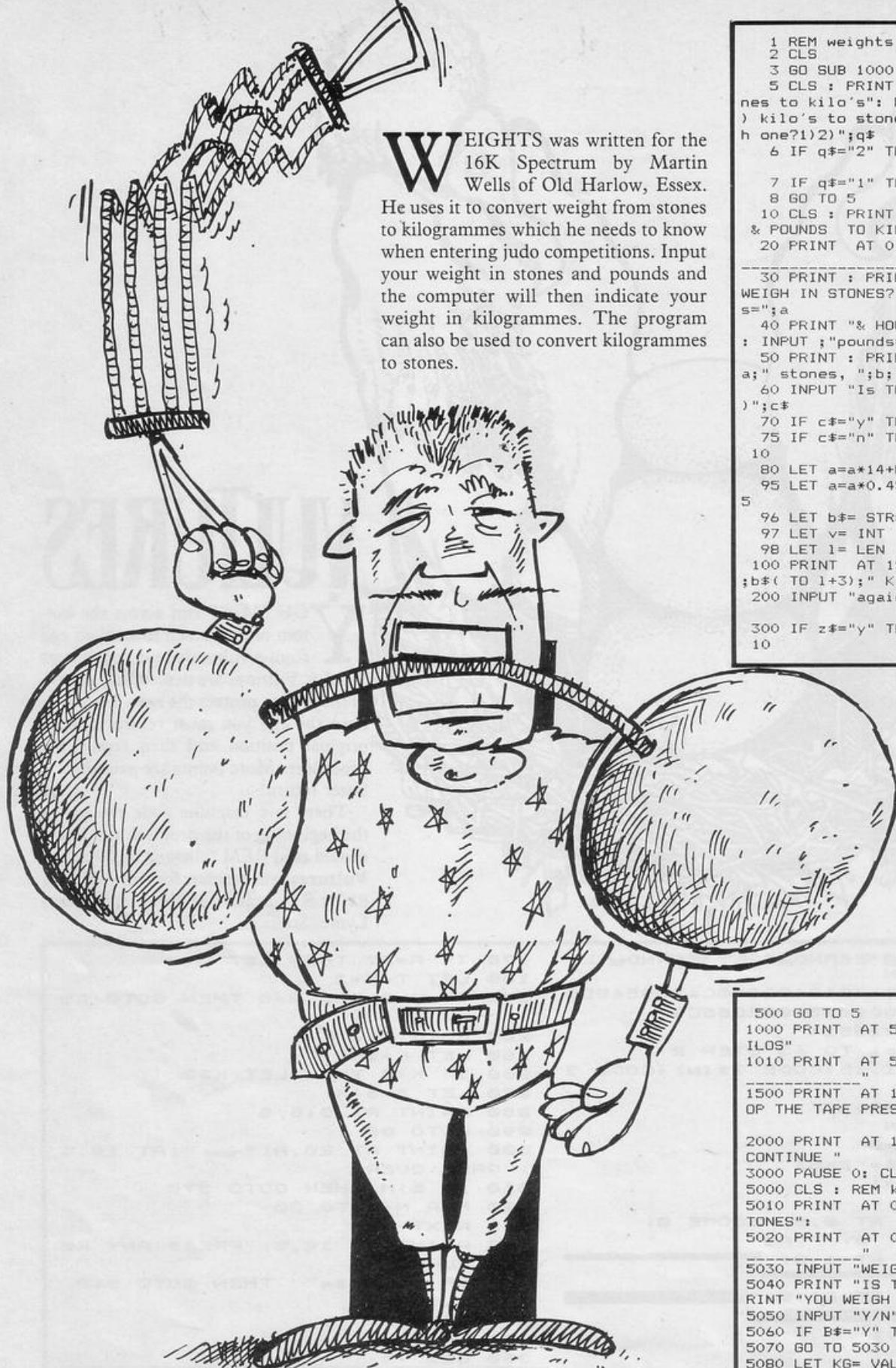
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COLOUR DISPLAYS

WEIGHTS was written for the 16K Spectrum by Martin Wells of Old Harlow, Essex.

He uses it to convert weight from stones to kilogrammes which he needs to know when entering judo competitions. Input your weight in stones and pounds and the computer will then indicate your weight in kilogrammes. The program can also be used to convert kilogrammes to stones.



```

1 REM weights
2 CLS
3 GO SUB 1000
5 CLS : PRINT AT 5,2;"1) sto
nes to kilo's": PRINT AT 6,2;"2
) kilo's to stones": INPUT "whic
h one?1)2)";q#
6 IF q#="2" THEN GO TO 5000

7 IF q#="1" THEN GO TO 10
8 GO TO 5
10 CLS : PRINT AT 0,5;"STONES
& POUNDS TO KILO'S"
20 PRINT AT 0,4; OVER 1;"____
"
30 PRINT : PRINT "WHAT DO YOU
WEIGH IN STONES?": INPUT ;"stone
s=";a
40 PRINT "& HOW MANY POUNDS ?"
: INPUT ;"pounds=";b
50 PRINT : PRINT "You weigh ";
a;" stones, ";b;" pounds"
60 INPUT "Is This Correct (y/n
)";c#
70 IF c#="y" THEN GO TO 80
75 IF c#="n" THEN CLS : GO TO
10
80 LET a=a*14+b
95 LET a=a*0.4536: LET a=a+.00
5
96 LET b#="STR$ a
97 LET v= INT VAL b#
98 LET l= LEN STR$ v
100 PRINT AT 15,0;"YOU WEIGH "
;b#( TO l+3);" KILOS"
200 INPUT "again (y/n)???" ;z#

300 IF z#="y" THEN CLS : GO TO
10

```

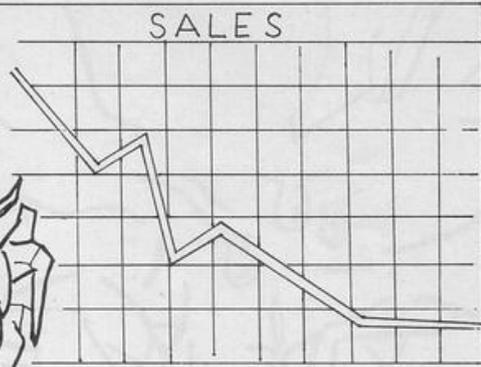
```

500 GO TO 5
1000 PRINT AT 5,10;"STONES TO K
ILOS"
1010 PRINT AT 5,10; OVER 1;"____
"
1500 PRINT AT 10,2; FLASH 1;"ST
OP THE TAPE PRESS ANY KEY TO"

2000 PRINT AT 11,11; FLASH 1;"
CONTINUE "
3000 PAUSE 0: CLS : RETURN
5000 CLS : REM k TO s
5010 PRINT AT 0,8;"KILO'S TO S
TONES":
5020 PRINT AT 0,8; OVER 1;"____
"
5030 INPUT "WEIGHT IN KG";A#
5040 PRINT "IS THIS CORRECT?": P
RINT "YOU WEIGH ";A#
5050 INPUT "Y/N";B#
5060 IF B#="Y" THEN GO TO 5080
5070 GO TO 5030
5080 LET KG= VAL A#
5090 LET LBS=KG*2.2045855
5095 LET REM=LBS- INT LBS
5097 LET LBS= INT LBS
5100 LET STNS= INT (LBS/14)
5105 LET LBS=LBS-(STNS*14)
5110 LET OZS= INT ((REM*16)+0.5)
: IF OZS=16 THEN LET OZS=0: LET
LBS=LBS+1
5120 PRINT : PRINT "YOU WEIGH";K
G;" KG ": PRINT "YOU WEIGH ";STN
S;" STONES ";LBS;" POUNDS ";OZS;
" OUNCES"
5130 PAUSE 0: GO TO 5

```

WEIGHTS



THIRST

YOU ARE running a soft drinks company which is in direct competition with the computer. The object is for you to make a greater profit in six months than your opponent. You are faced with various situations and must make suitable decisions, taking into account the weather forecast and the recession.

Thirst was written for the 16K Spectrum by A Harris of Haxby, York.

```

1 REM "thirst"
2 BORDER 1: PAPER 6: LET c=1

3 LET n=0: LET L=0
4 PRINT AT 10,8;"(ig8:iT:iH:
iI:iR:iS:iT:ig8:iF:iO:iR:ig8:iP:
iO:iW:iE:iR)"
6 PAUSE 150
7 DIM m(12)
10 GO SUB 8000
11 INK 0: PRINT AT 14,0;"YOU
ARE IN COMMAND AT A SOFT DRIN
KS FIRM.YOU ARE IN DIRECT COMP
ETITION WITH 'SPECTRUM' A RIVA
L FIRM.YOUR MISSION,SHOULD YOU
ACCEPT IT,IS TO MAKE A GREA
TER PROFIT OVER A SIX MONTH PERI
OD"
12 GO SUB 8100
13 GO SUB 8000
14 INK 0: PRINT AT 10,4;"DURI
NG THAT PERIOD YOU WILL BE FACED
WITH VARIOUS DECISIONS.YOU WILL
HAVE TO USE YOUR SKILL AND JUDG
EMENT TO DECIDE HOW MANYCRATES O
F SOFT DRINKS TO PRODUCE AND AT
WHAT PRICE TO SELL THEM AT"
16 GO SUB 8100
17 PAUSE 200: CLS
60 INPUT "ENTER NAME OF COMPAN
Y(MAX 10 LETTERS)";Z#
65 BEEP .05,10: BEEP .05,8
75 PRINT AT 7,9;"(iC:iO:iM:iP
:iE:iT:iI:iT:iO:iR:iS)"
90 PRINT AT 10,10;Z#; AT 12,1
0;"SPECTRUM"
92 BEEP .1,8
96 PAUSE 250
97 CLS
98 IF c >= 7 THEN STOP
100 PRINT AT 10,11;"(iM:iO:iN:
iT:iH:ig8)";c
101 BEEP .05,20
110 PAUSE 150
120 LET x= INT ( RND *4)+1
121 BEEP .05,6: BEEP .05,12
130 IF x=1 THEN PRINT AT 14,2
;"(iM:iE:iT:ig8:iO:iF:iF:iI:iC:i
E:ig8:iF:iO:iR:iE:iC:iA:iS:iT:iS
:ig8:iH:iE:iA:iT:iW:iA:iV:iE)"
131 IF X=2 THEN PRINT AT 14,2
;"(iM:iE:iT:ig8:iF:iO:iR:iE:iC:i
A:iS:iT:iS:ig8:iC:iO:iL:iD:ig8:i
S:iP:iE:iL:iL)"
132 IF X=3 THEN PRINT AT 14,6
;"(iR:iE:iC:iE:iS:iS:iO:iN:ig8:i
F:iO:iR:iE:iC:iA:iS:iT)"
133 IF X=4 THEN PRINT AT 14,8
;"(iN:iO:iR:iM:iA:iL:ig8:iC:iO:i
N:iD:iI:iT:iI:iO:iN:iS)"
134 GO SUB 8200
135 CLS
200 GO SUB 9000
201 INK 0
205 PRINT AT 3,12;Z#
206 INPUT;"NUMBER OF CRATES TO
BE PRODUCED(max=10) ";d
207 PRINT AT 5,19;d
208 LET v=0
209 LET v=d*1000
210 PRINT AT 7,19;v
215 LET t=v+4000
216 PRINT AT 11,19;t
220 INPUT "ENTER COST PER CRATE
(MAX 10000) ";e
225 BEEP .1,8
230 PRINT AT 13,19;e
240 IF X=1 THEN GO SUB 800
245 IF X=2 THEN GO SUB 850
247 IF X=3 THEN GO SUB 850
248 IF X=4 THEN GO SUB 900
249 PAUSE 100: PRINT AT 16,0;"
"
250 IF d<s THEN LET s=d
251 PRINT AT 15,25;s
252 LET w=s*e
255 PRINT AT 17,19;w
260 PRINT AT 19,19;w-t
270 PAUSE 600
271 CLS
272 LET n=n+(w-t)
273 BEEP .05,3: BEEP .05,6
275 PRINT AT 5,10;Z#, AT 10,5;
"(iC:iU:iM:iU:iL:iA:iT:iI:iV:iE:
ig8:iP:iR:iO:iF:iI:iT)";n
276 PAUSE 300: CLS
277 GO SUB 2000
279 GO SUB 1006
280 LET c=c+1
281 IF c=7 THEN GO TO 1000
285 PAUSE 100: GO TO 97
799 STOP
800 REM HEATWAVE ROUTINE
820 GO SUB 3000
821 LET q= INT ( RND *6)+1
825 PRINT AT 0,5;"COMPUTER SAL
ES PRICE ";m(q): PRINT AT 1,5;"
YOUR SALES PRICE ";e
830 IF e<m(q) THEN LET s=10: L
ET p=6
831 IF e>m(q) THEN LET p=10: L
ET s=6
832 IF e=m(q) THEN LET s=8: LE
T p=8
840 PAUSE 200
845 RETURN
850 REM winter/recession routin
e
861 GO SUB 3000
865 LET q= INT ( RND *6)+6
886 PRINT AT 0,5;"COMPUTER SAL
ES PRICE ";m(q): PRINT AT 1,5;"
YOUR SALES PRICE ";e
887 IF e<m(q) THEN LET s=4: LE
T p=0
888 IF e>m(q) THEN LET p=4: LE
T s=0
889 IF e=m(q) THEN LET s=2: LE
T p=2
890 PAUSE 200
899 RETURN
900 REM normal conditions routi
ne
905 GO SUB 3000
910 LET q= INT ( RND *12)+1
920 PRINT AT 0,5;"COMPUTER SAL
ES PRICE ";m(q): PRINT AT 1,5;"
YOUR SALES PRICE ";e
930 IF e<m(q) THEN LET s=8: LE
T p=4
940 IF e>m(q) THEN LET p=8: LE
T s=4
950 IF e=m(q) THEN LET s=6: LE
T p=6
960 PAUSE 200
970 RETURN
1000 CLS
1004 BEEP .05,6: BEEP .05,10: BE
EP .05,8: BEEP .05,12
1005 PRINT AT 5,8;"END OF GAME"

1007 BEEP .1,40: BEEP .1,32: BEE
P .5,36: BEEP .5,30: BEEP .1,40:
BEEP .1,32
1008 FOR i=0 TO 20
1009 PRINT AT i,0;"(32*iE
)"
1010 NEXT i
1011 PRINT AT 8,7;"NAME(8*iE
)MONEY"
1015 PRINT AT 10,5;Z#, AT 12,5;

```



SALES



```

"SPECTRUM"
1025 PRINT AT 10,20;n;"(5*i£
)"
1026 PRINT AT 12,20;L;"(5*i£
)"
1027 IF c=7 THEN GO TO 4000
1030 RETURN
2000 REM COMPUTER COSTS
2001 GO SUB 9000
2002 INK 0
2003 IF X=1 THEN LET G=8
2004 IF X=2 OR X=3 THEN LET G=0

2005 IF X=4 THEN LET G=6
2008 LET A= INT ( RND *6)+4
2010 LET B=A*1000
2015 LET F=B+4000
2016 IF A<p THEN LET p=A
2020 LET D=p*m(q)
2025 LET R=D-F
2030 LET L=L+R
2031 PRINT AT 5,18;A; AT 7,18;B
; AT 11,18;F; AT 13,18;m(q); AT
15,25;p; AT 17,18;D; AT 19,18;R

2032 PAUSE 800
2040 RETURN
3000 DATA 3000,4000,5000,6000,80
00,10000
3005 DATA 1850,2250,2750,3750,45
00,5500
3009 FOR q=1 TO 12
3010 READ m(q)
3011 NEXT q

3012 RESTORE
3020 RETURN
4000 IF n>L THEN PRINT FLASH 1
; AT 14,12;"(iY:iO:iU:ig8:iW:iI:
iN)"
4005 IF L>n THEN PRINT FLASH 1
; AT 14,5;"(iS:iP:iE:iC:iT:iR:iU
:iM:ig8:iW:iI:iN:iS:ig8:iA:iG:iA
:iI:iN)"
4010 PAUSE 600: GO TO 2
8000 REM GRAPHICS SECTION
8001 CLS
8005 FOR i=1 TO 7
8010 INK 0: PRINT AT i,12;"(g5)
", AT i,21;"(ig5)"
8015 NEXT i
8020 PRINT AT 8,12;"(g1:7*g3:g2
)"
8025 FOR r=2 TO 7
8030 INK 5: PRINT AT r,13;"(8*i
g8)"
8035 NEXT r
8040 RETURN
8100 FOR r=2 TO 7
8105 PRINT AT r,13;" "

8106 PAUSE 100
8107 BEEP .05,14
8110 NEXT r
8115 RETURN
8200 REM BORDER ROUTINE
8205 FOR g=1 TO 10
8210 FOR f=0 TO 7
8215 BORDER f

8220 BEEP .02,f
8225 NEXT f
8230 NEXT g
8240 RETURN
8999 STOP
9000 CLS : PRINT AT 4,2;"(iM:iO
:iN:iT:iH) ";c
9001 PRINT AT 5,2;"(iC:iR:iA:iT
:iE:iS:ig8:iP:iR:iO:iD:iU:iC:iE:
iD)"
9002 PRINT AT 7,2;"(iV:iA:iR:iI
:iA:iB:iL:iE:ig8:iC:iO:iS:iT:iS)
"
9003 PRINT AT 9,2;"(iF:iI:iX:iE
:iD:ig8:iC:iO:iS:iT:iS) #4,00
0"
9004 PRINT AT 11,2;"(iT:iO:iT:i
A:iL:ig8:iC:iO:iS:iT:iS)"
9005 PRINT AT 13,2;"(iP:iR:iI:i
C:iE:ig8:iP:iE:iR:ig8:iC:iR:iA:i
T:iE)"
9006 PRINT AT 15,2;"(iN:iU:iM:i
B:iE:iR:ig8:iO:iF:ig8:iC:iR:iA:i
T:iE:iS:ig8:iS:iO:iL:iD)"
9007 PRINT AT 17,2;"(iS:iA:iL:i
E:iS:ig8:iR:iE:iV:iE:iN:iU:iE)"

9008 PRINT AT 19,2;"(iP:iR:iO:i
F:iI:iT:ig8:iO:iR:ig8:iL:iO:iS:i
S)"
9009 FOR a=0 TO 2: INK 5: PRINT
AT a,0;"(32*ig8)"
9010 NEXT a
9011 RETURN

```

Improve Money Bags with two new lines

I AM WRITING with some improvements for the Money Bags program in the February issue of *Sinclair Programs*.

If line 90 is repeated as line 265, the scores will stay on the screen all the time, instead of only when you reach the top level.

The man could go off the right side of the screen, if he jumped, and stop the program. It will not happen if you add this line:

```
258 IF x>29 THEN LET x=29
```

When the man jumped, he left the old man behind him for a moment. That can be stopped by changing line 270 to:

```
270 IF a$="k" THEN PRINT AT y,x;" ":LET x=x+1:LET y=y+1:LET a$=""
```

Apart from those points, it was a good program. I managed to get £48,550 after playing only about 10 games. Has anyone written to say they have a higher score?

I also liked Moonladder and Walkies in the February issue and Silverstone and Clobber Castle in the December issue. I think it is a great magazine and most of the programs are fantastic.

T J Goatcher,
aged 12,
Wantage, Oxon.

Top ten

I AM sending you my choice of the top ten programs for the ZX-81 and the Spectrum.

Spectrum: Atic Atac, Lunar Jetman, Ant Attack, Manic Miner, Chequered Flag, Valhalla, Cookie, Zzoom, Trans Am, Scrabble.

ZX-81: Krazy Kong, 3D

Monster Maze, Flight Simulation, Football Manager, 3D Grand Prix, Maze Death Race, Hang Glider, ZX Chess, Sea War, Protector.

Emerson Alder,
Timperley, Cheshire.

● *In future, Sinclair Programs will include a software chart containing Britain's best-selling software.*

High score

I AM writing to tell you about my high score on It's Snowing Again. I had many attempts and I was just about to NEW the game when I thought I will have one more game and I scored 35,810. I would like to know if anyone can beat it.

Gary Hayes,
Wigan.

Zap Zap

I HAVE beaten Andrea Wooberry's best score on Zap-Zap. My top time was 32.

Simon Mee,
Mansfield,
Notts.

Save time

I WAS HAPPY to receive my twelfth edition of *Sinclair Programs* although there are two things on my mind.

While flipping through the pages of the February edition I noticed a program Find The Letter for the 16K ZX-81. I was surprised to see that lines 60-310 could all be replaced by a single line. The line is: 60 LET A\$=CHR\$(A+37)

Notice how much time that can save.

I sent a program to you three or four months ago. I wondered, as you must receive hundreds of programs,

do you plan your editions months before they are published? Do you have problems when sampling our programs through careless SAVEing and use of low-quality tapes? I am sure the readers of your great magazine would love to know.

Many readers have given opinions on their favourites. Mine, like many other readers, is The Worm Game—an excellent program.

Richard Green,
Colwick,
Nottingham.

● *Programs which are printed in Sinclair Programs usually are chosen three or four months prior to the date on the cover of the magazine in which they are printed. Several programs, usually for the ZX-81, are rejected by us each day because they cannot be LOADED.*

Bug hunt

I HAVE been helping children understand their mistakes when they type-in programs from magazines. They long to play the programs but are not very accurate typists. I have compiled a short list of most common mistakes.

Error ? on typing-in a line. Could it be muddling colons and semi-colons in PRINT and PAPER commands? Not sufficient inverted commas? Not sufficient brackets? An 'n', 'm' or . between items of DATA? =>, <=, <> entered as two items instead of one? An O instead of 0 or 4 instead of \$?

Error on trying to RUN. Enter LIST (no) and 'N' if asked 'scroll', to arrive at the line number criticised by the computer, which will also let you know which item in the line to which it objects and why. Check punctuation — a missing comma in a row of DATA means either the

number goes over 255 or the items are one fewer in that line. Have you typed a j or a k instead of punctuation? The computer considers that a new variable with no value assigned to it. Check for a missing line — that takes longer. If the screen looks peculiar, a comma rather than a semi-colon, or vice versa, could be responsible.

Patricia Richardson,
Maidstone, Kent.

Assembler

I WAS very pleased to see that you published my Enigma Assembler. Now some comments on the program:

To load a number into a register, e.g., HL, you can use only 8-bit numbers—2126.

When you enter a code you must fill the string until its length is 12—2025.

Example: LD A, NN Enter
123456789101112

That must be so because I used DIM a\$(252,12) in the first line.

Only those mnemonics which are listed can be used.

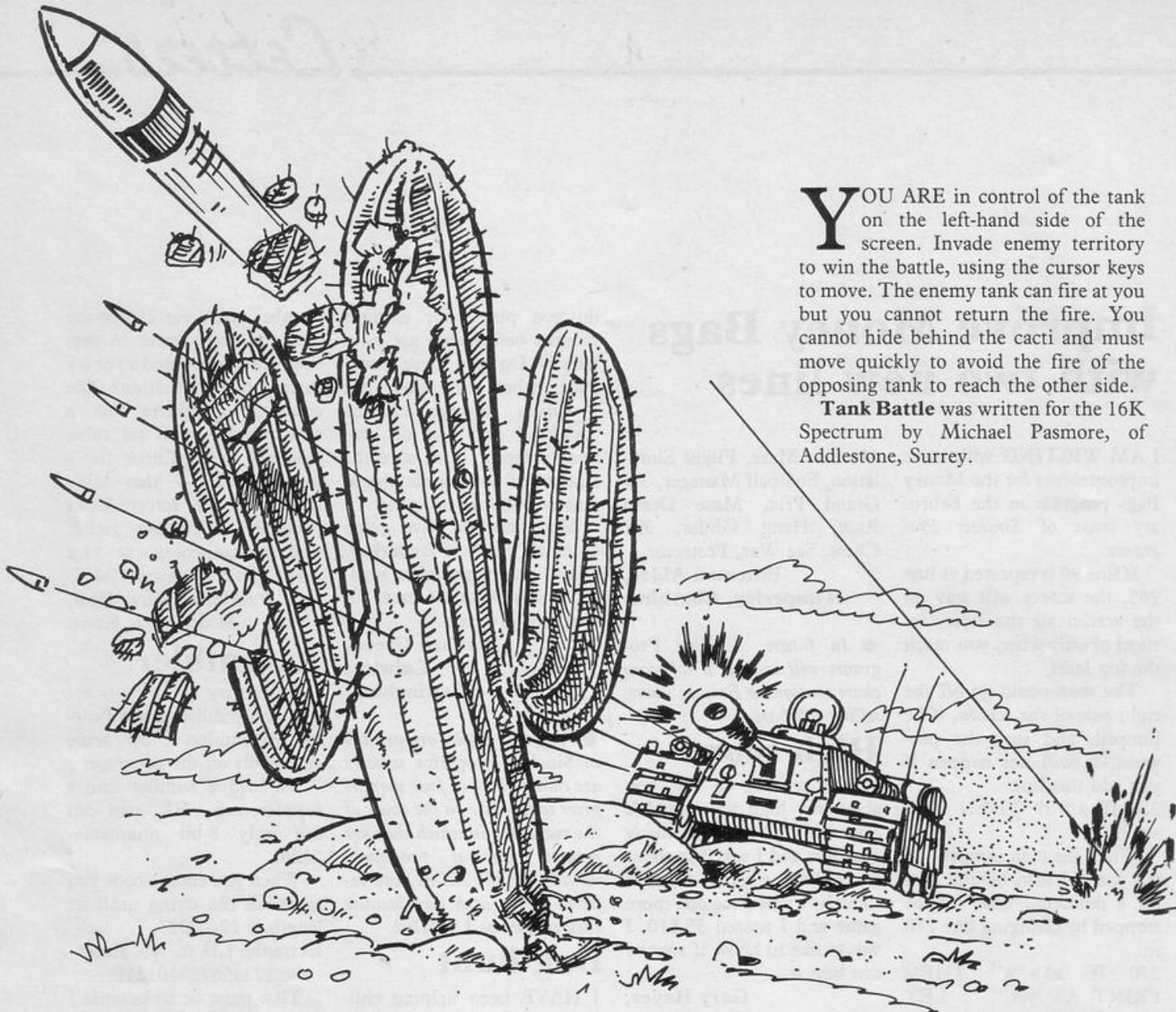
That all shows that Enigma is only a beginning and everybody should expand it to their own use.

Max Berle
Belgium.

March mishaps

PART of line 8260 was omitted from **Gibson's Revenge**, published on page 53 of the March edition. The line should read: 8260 IF B+3 <> A AND C=20 THEN GOTO 8750.

Line 8910 of the same program was difficult to read in some copies of the magazine. It should read: 8910 INPUT G\$



YOU ARE in control of the tank on the left-hand side of the screen. Invade enemy territory to win the battle, using the cursor keys to move. The enemy tank can fire at you but you cannot return the fire. You cannot hide behind the cacti and must move quickly to avoid the fire of the opposing tank to reach the other side.

Tank Battle was written for the 16K Spectrum by Michael Pasmore, of Addlestone, Surrey.

TANK BATTLE

```

JSS 1 PAPER 4: BORDER 4: INK 0
2 GO SUB 5000
3 PAPER 4
4 INK 0: PAPER 4
5 LET x=14: LET y=1: LET m=0:
LET f=0
6 LET s=0
10 LET a=INT(RND*20): LET
b=30
12 PRINT AT a,b;" "
15 PRINT AT x,y;" "
20 LET s=s+1
35 IF a >= 21 THEN GO TO 6
40 LET y=y+(INKEY#="8")-(IN
KEY#="5")+ (y <= 0)-(y >= 31)
50 LET x=x+(INKEY#="6")-(IN
KEY#="7")+ (x <= 0)-(x >= 21)
55 PRINT AT 0,17;"SCORE : ";s
60 PRINT AT x,y;"ab"
70 PRINT AT a,b;"de"
72 IF f >= 30 THEN LET f=0: L
ET m=0
75 IF m=1 THEN LET f=f+1: GO
TO 310
77 IF y=30 THEN CLS : GO TO 5
00
80 PAUSE 20
85 IF f=b AND x=y THEN GO TO
200
87 PRINT AT a,b;" "
90 IF a <> x THEN GO TO 10
95 PRINT AT a,b;"de"
100 FOR v=(b-1) TO y STEP -1
110 PRINT AT x,v;"-"
120 PRINT AT x,v;" "
130 NEXT v
200 PRINT AT x,y;"cc"
205 PRINT AT 0,25;" "
210 BEEP 2,-40
220 PRINT AT a,b;" "; AT x,y;
" "
230 GO TO 5
300 LET f=y: LET m=1
310 PRINT AT x,f;"-"
315 PAUSE 2
320 PRINT AT x,f;" "
330 GO TO 6
500 CLS : PRINT AT 5,3;"YOU HA
VE REACHED THE ENEMY"; AT 10,4;"
LINES AND WON THE BATTLE."
510 PRINT AT 15,7;"YOU SCORED
";s;" POINTS"
520 PRINT AT 20,3;"PRESS C TO
DO BATTLE AGAIN"
530 IF INKEY#="c" OR INKEY#
="C" THEN RUN
540 GO TO 530
5000 FOR i=1 TO 6: BEEP .01,20+i
*3
5010 FOR n=0 TO 7: READ a
5020 POKE USR CHR#(143+i)+n,a
: NEXT n: NEXT i
5030 DATA 0,16,31,31,63,127,63,
0
5040 DATA 0,0,252,0,240,248,240,
0
5050 DATA 15,64,99,174,8,252,203
,145
5060 DATA 0,0,63,0,15,31,15,0
5070 DATA 0,8,248,248,252,254,25
2,0
5080 DATA 0,8,73,73,42,42,28,127
5090 FOR t=1 TO 20
5100 PRINT AT RND*21, RND*31
;"f"
5110 NEXT t
5120 RETURN

```

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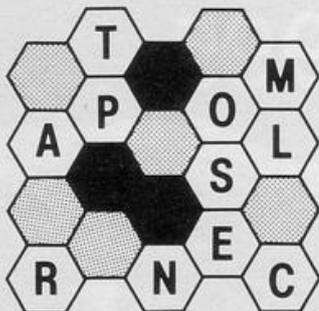
B 2

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