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Superb version of the old classic arcade game, including a few extras. 48 marching invaders drop bombs that erode your defences, and two types of spaceship fly over releasing large bombs that penetrate through your defences. Increasing difficulty, high score, superb graphics and sound.



**FRUIT MACHINE (32K) £7.95 Cassette**  
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## Making the most of your Acorn

**W**ELCOME to *Acorn Programs*, the magazine which aims to help you make the most of your machine by providing you with a comprehensive range of software. In the first issue, there are 25 new programs for the BBC micro Model B, ranging from games and educational quizzes to utilities, word processing and personal money management.

*Acorn Programs* will appear every two months and, in future issues, we hope to publish programs for the Electron as well as for the BBC micro.

We will also keep you abreast of the latest in Acorn and software developments in our news and reviews section.

If you would like to contribute to *Acorn Programs*, we would be pleased to hear from you. Send your programs, on disc or cassette, together with a brief description and, if possible, a printout, to *Acorn Programs*, ECC Publications, 196-200 Balls Pond Road, London N1 4AQ. We will pay a basic rate of £15 per published listing but will consider paying more for exceptionally good programs.

*The Editor*

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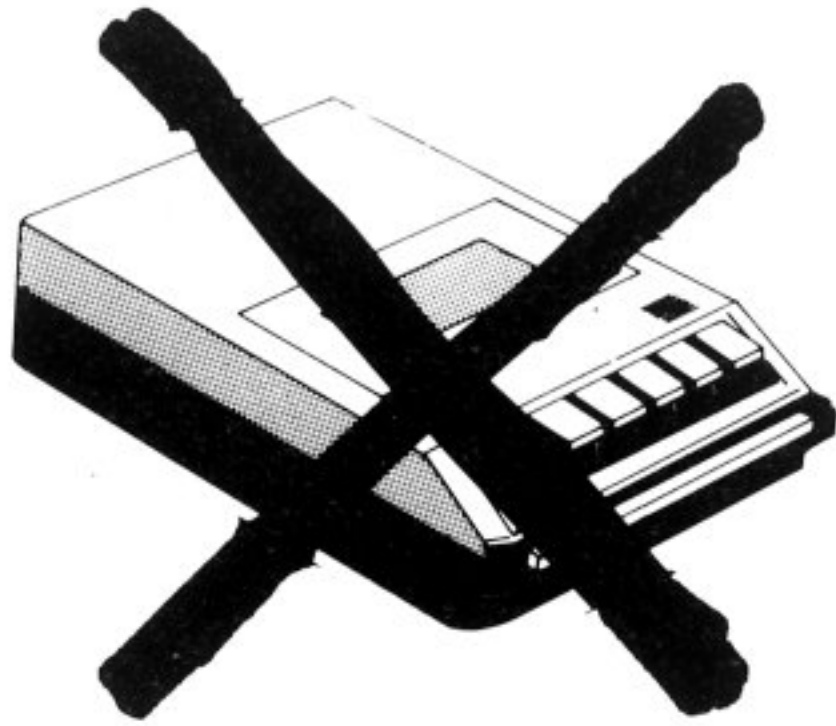
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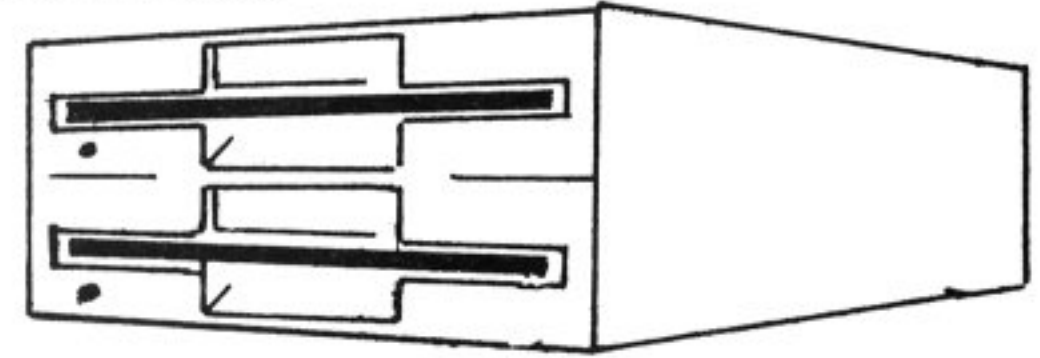
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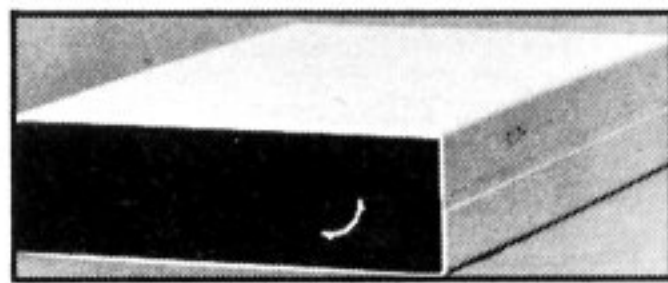
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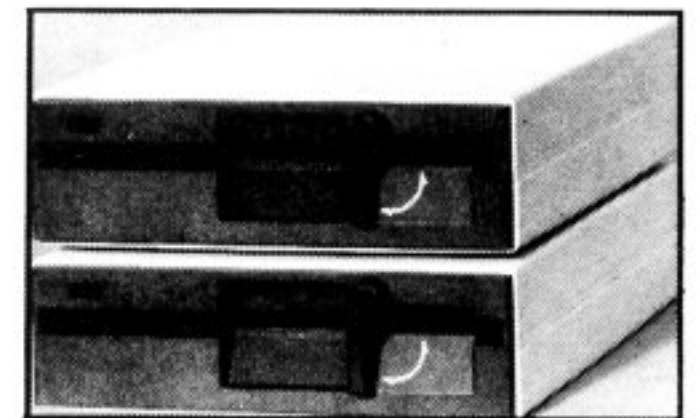
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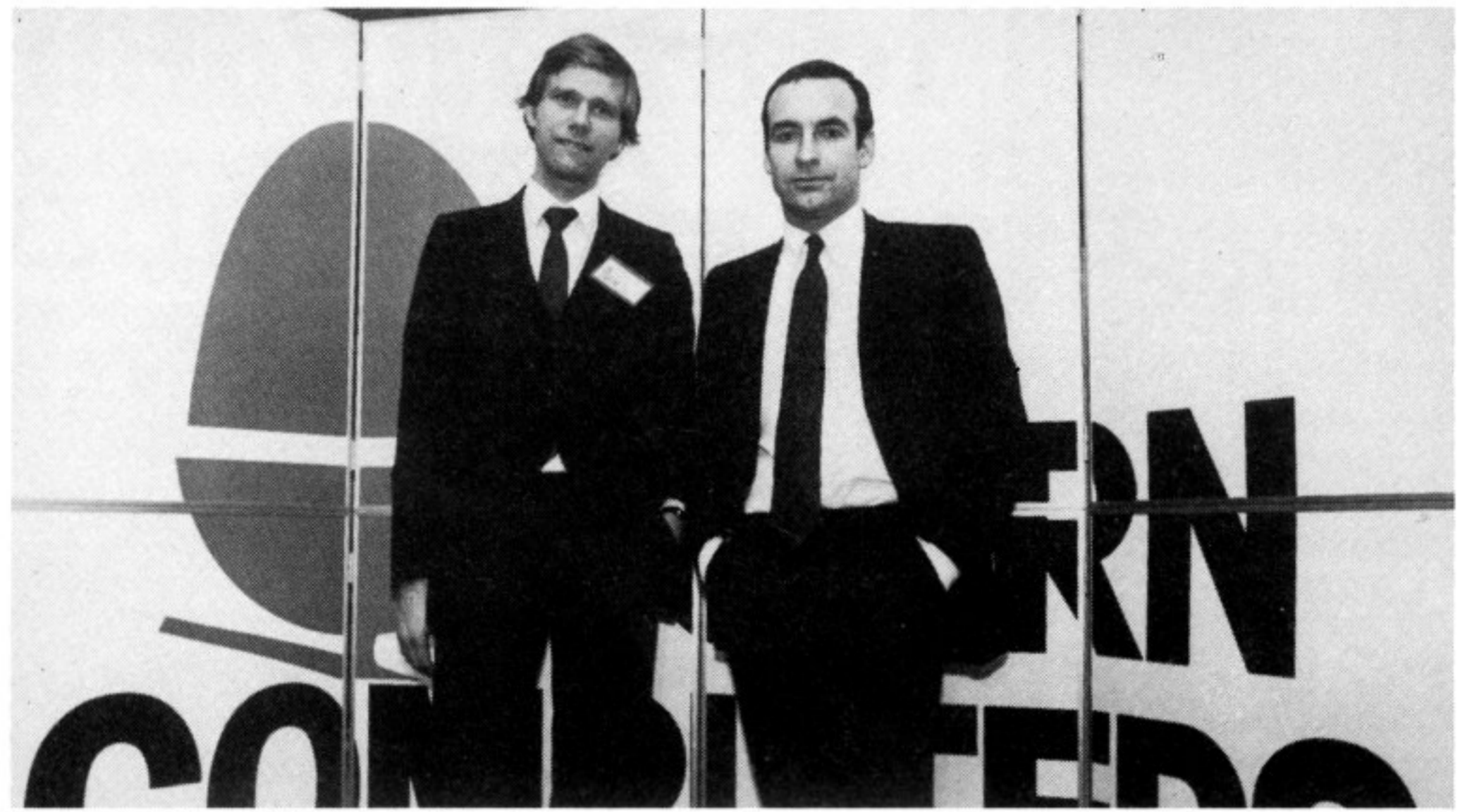
## Electron aims for sex equality

RESEARCH by Acorn Computers has confirmed that women are falling seriously behind in the race to computer literacy. The BBC micro accounts for most of the computers used in British schools and more than 80 percent of those ordered under the Department of Industry Microcomputers in Primary Schools scheme, so Acorn interviewed teachers and computer education specialists for its survey.

Many expressed concern that girls are falling behind boys in computer studies and that they use computers at home far less. As boys forge ahead, girls lose confidence, which leads to an ever-widening gap.

Acorn joint managing director Chris Curry believes the consequences are serious, because girls will find themselves less able to compete for jobs than boys. "Britain is in danger of losing half its talent if girls do not acquire vital computer skills," he says.

Acorn hopes that the Electron will help to remedy the problem by making computers in the home more readily available. The company intends to develop software which will appeal specifically to families. "By interesting the parents, we hope girls of school age will be encouraged not to fall behind in computer studies," Curry says.



Hermann Hauser (left) and Chris Curry

## Acorn Computers sailing ahead

ACORN COMPUTERS has raised £11 million through selling its shares on the Unlisted Securities Market. With a price tag of £132 million, Acorn is now one of the biggest companies quoted on the USM.

Started in 1978 by Chris Curry, who worked formerly with Sir Clive Sinclair in Cambridge, and Hermann Hauser, Acorn Computers has grown from a turnover of £31,000 in 1979 to £8.63 million last year. The 1983 figure is expected to be in the

region of £40 million. New sales offices in the U.S. and West Germany herald plans for Acorn expansion overseas. In the U.K. the company is investing in a new research and development building in Cambridge.

The company controls 80 percent of the British education market with the BBC micro and, in addition to its new Electron aimed at the home computer market, it plans to release a business version of the BBC micro next year.

Twelve packages from Acornsoft, the Acorn software publishing subsidiary, accompanied the launch of the Electron. The programs include six games — chess, draughts and Reversi, as well as arcade games — two programming languages, an educational deduction and logic game, and a personal money management program. The programs will also run on the BBC micro.

Acorn is already experiencing a big boost in sales of the Electron, with 160,000 already ordered. Acornsoft began to distribute software recently through ASK, which specialises in primary educational packages. Similar deals with other software houses are planned.

## Software shuttle

MICRODEAL, which specialises in programs for the Dragon 32, is moving into BBC Model B software with two new titles, Shuttle and

Air Traffic Controller. Great things are expected of Shuttle, which has already been a big success for the Dragon computer.

## BBC programs on the air

THE BBC is proving that it stands at the forefront of communications technology. Its Telesoftware Service, launched in September, is being billed proudly as the world's first regular broadcast service of computer programs.

Telesoftware uses the pages of the BBC Ceefax ser-

vice to transmit programs directly into computer memory — all you need is a BBC micro and an adaptor which, like the micro, is made by Acorn Computers.

Selling at £225 including VAT, the adaptor gives access to free programs and also to the news, finance, sports and other pages provided free

by Ceefax. The programs are downloaded straight into the computer, where they can be stored, run, or copied on to disc or cassette.

Batches of six to eight programs will replace each other every other week. "At present, the bias is educational," says Telesoftware organiser Lawson Brown,

"but utilities, program building-blocks and the occasional game will all have their place." The BBC will also be commissioning software to accompany its schools series.

With a backlog of more than 3,500 orders for adaptors, the BBC is pleased with the response to its latest brainchild.

← RICKSOFT ↓

# BBC SOFTWARE

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 An excellent introduction to adventure games. Can you survive the perils of the castle and the graveyard, to collect the 6 treasures AND rescue the princess?

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 You have been sent on a dangerous mission to find 10 treasures - but how are you going to get back? Beware of the Antiflavian MegaTiger and venomous lizard woman!

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EDUCATIONAL PROGRAMS

**ENJOY MATHS** 48K Spectrum £8.00  
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**TOWNTTEST** BBC/B £6.50  
 Identify the major towns and cities of England, Scotland and Wales, displayed on a high-resolution map. Suitable for all age groups and for school or home use (try it as a quiz for all the family!)

**BIOLOGY** BBC/B £12.50  
 A major collection of programs, written by a GCE examiner, designed to aid the understanding of Biology to CSE, 'O' and 'A' Level standards. These programs - comprising text, animated diagrams and questions - are available in one package and are suitable for individual study at school or in the home. Teachers will also find material suitable for class demonstration.

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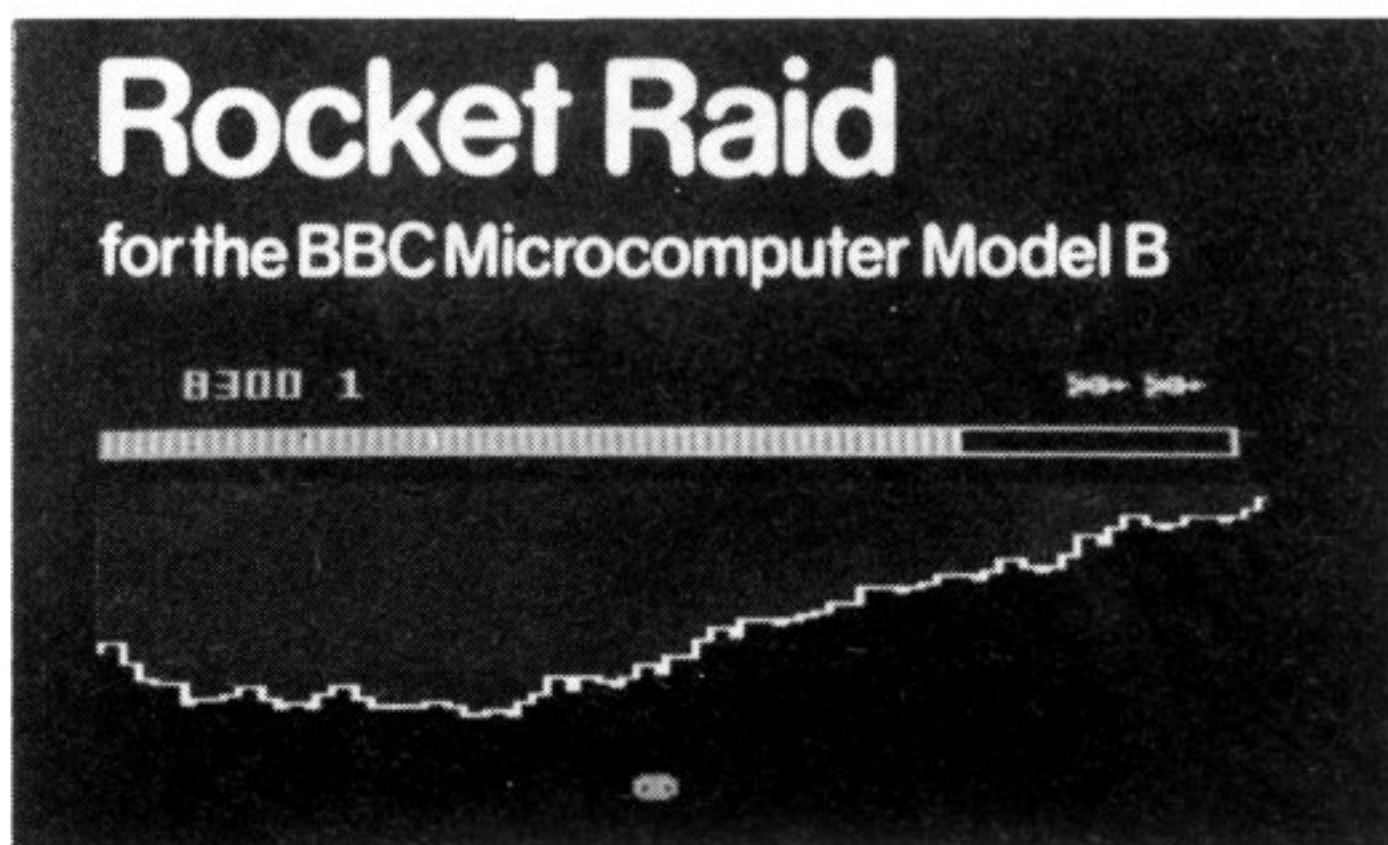
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*We require good programs to increase our catalogue and pay high royalty rates for published material.*

# Close encounters of the arcade kind

ROCKET RAID and Super Invaders show that Acornsoft is as adept at arcade games as at adventures. **Super Invaders** is, as you will have guessed, another version of that old friend Space Invaders. The graphics are of high quality and the action is as exciting as you want it to be. You can choose between a mild encounter, an uncomfortable situation, and no less than a terrifying experience—on that level, the bombs have a homing capability.

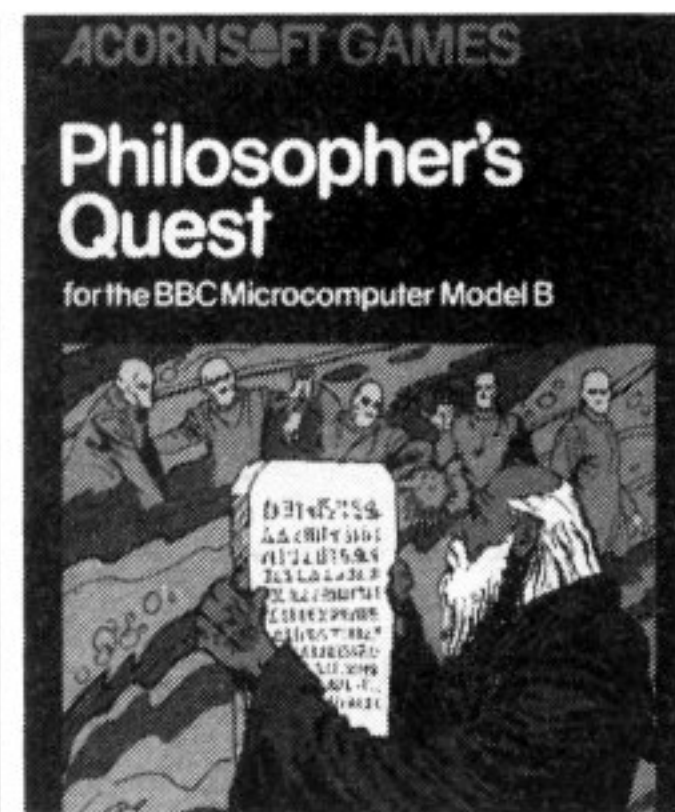
**Rocket Raid** will remind you of that old favourite, Scramble. You are at the helm of a rocket, firing at enemy vessels and dropping bombs on their servicing units. Life becomes more and more complicated as five



landscapes present their own hazards. After flying over the depot, there is a cavern to pass through, a horde of meteorites to dodge, skyscrapers point their missiles at you, and finally you have to negotiate a maze.

You have three ships in-

itially but if you reach 15,000 points you will have another one. Excellent graphics and increasingly lively action — watch for the whizzers on level 2 — should please the most jaded of arcade game players. Super Invaders and Rocket Raid cost £9.95 each.



## Philosophic adventure

ADVENTURE game addicts should find the Acornsoft **Philosopher's Quest** right up their street — or forest, or dark passageway, if you prefer. The situation at the start is that you are in a small shop from which you can take a choice of objects on your mission, which is to find various treasures and bring them back to where you began. Outside the shop it is dark and a giant spider lurks, waiting to pounce — the rest is up to the player to discover.

There is nothing startlingly original about the game but it is a well-produced and gripping variation on a familiar theme. The computer responses are convincingly human — it says “eh?” instead of “I don't understand” — it is occasionally witty, and it possesses a wide vocabulary. Discovering what responses are required has the proper degree of difficulty so that even beginners are not discouraged from pursuing the quest.

Philosopher's Quest from Acornsoft, 4a Market Hill, Cambridge, costs £9.95.

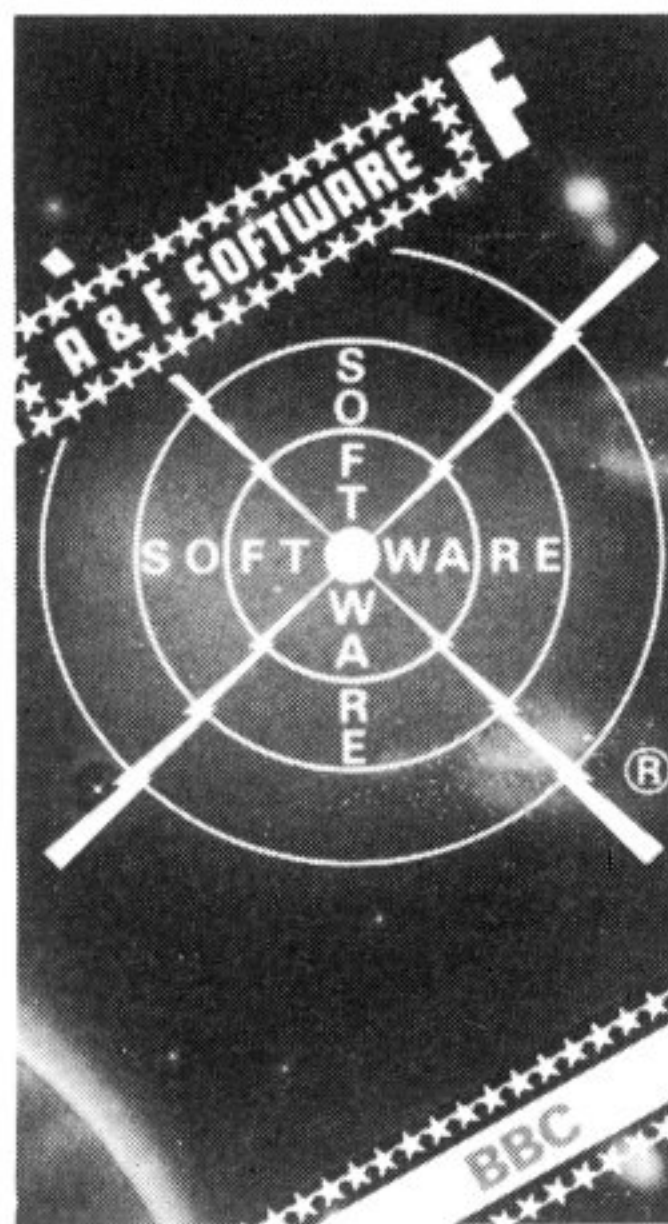
# Playing darts the armchair way

RELEASES from A & F Software include **One Hundred and Eighty**, an armchair version of darts. The graphics are excellent, with the darts board looking very realistic from the front and also in profile. You can choose between the various scoring methods known to real-life darts players and steering the darts towards the proper places requires a fair degree of dexterity and practice.

Another A & F offering is

**Horror Castle**. You may find that much of the horror is from not being able to get into the castle. It is a simple adventure, without graphics, and with the occasional spelling mistake, but it offers plenty of obscurity to exercise the most experienced mind games players.

Horror Castle and One Hundred and Eighty from A & F Software, 830 Hyde Road, Manchester M18 7JD £8 and £6.90 respectively.



# Painting by cursors

IF YOU FEEL that paint and canvas hold no further mysteries, you could try Quicksilva **Beeb-Art** for the BBC model B. You can use either a joystick or the cursor keys to draw lines of any colour on any background you choose.

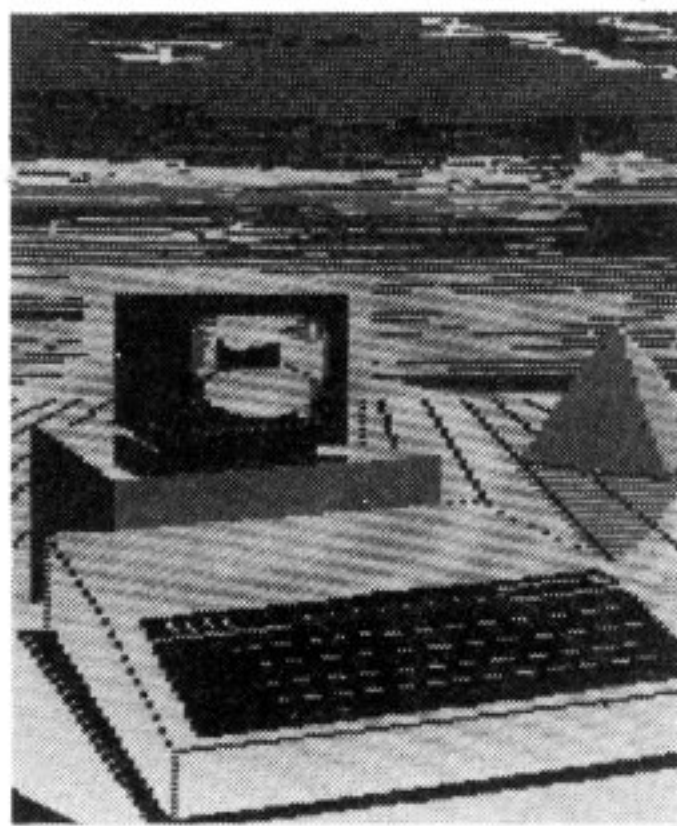
There is also an impressive array of additional facilities—

pre-defined shapes, a circle routine, a choice between filled-in and outlined shapes, a screen wraparound, and others. You can store your latest masterpiece, or erase it if you are not satisfied with your work. All the possibilities are set out very clearly in the accompanying booklet.

Beeb-Art provides an ab-

sorbing pastime but you will need plenty of practice before you achieve results as striking as the three pictures included as examples on the cassette.

Beeb-Art is from Quicksilva, Palmerston Park House, 13 Palmerston Road, Southampton SO1 1LL. It costs £14.95.



# Jungle

```
30HS=0:ST=0:K9=0
40U%=6:V%=10
50W%=U%*2+2
60Z%=V%*2+2
70K%=(U%+1)*(V%+1)-2
80DIM T%(W%,Z%),M%(U%,V%)
90VDU23,224,255,129,181,181,129,173,129,255
100VDU23,225,0,255,137,175,169,175,137,255
110VDU23,226,126,66,102,90,90,102,90,126
120VDU23,227,255,0,189,60,129,52,129,255
130VDU23,228,255,189,165,173,165,255,171,255
140VDU23,229,24,36,126,255,189,189,165,36
150VDU23,249,24,24,60,90,24,60,36,102
160VDU23,250,56,124,56,214,254,214,16,16
170VDU23,251,24,60,126,126,36,24,24,24
180VDU23,252,16,56,56,124,124,56,16,16
190VDU23,253,0,0,56,124,124,56,16,16
200VDU23,254,84,170,84,170,84,16,16,16
210VDU23,255,0,5,162,68,40,16,16,16
220MODE 7
230PRINT"" Use the cursor keys to move the man""
around the maze and collect as many"" items as you can before the
monkey""TAB(19)"catches you."
240PRINT""TAB(9)"PRESS KEY TO CONTINUE"
250A=GET
260S=0:LL=0
270REPEAT
280MODE 2
290VDU23,1,0,0,0,0
300COLOUR 132:COLOUR 2
310CLS
320PRINTTAB(2)"* MONKEY MAZE *"
330PRINTTAB(1,3)"SCORE HI-Score"
340FOR I%=0TOU%:FOR J%=0TOV%
350M%(I%,J%)=210
360NEXT:NEXT
370Q%=0
380I%=RND(U%+1)-1
390J%=RND(V%+1)-1
400IF M%(I%,J%)=210 AND Q%>1 THEN PROCC
410IF Q%>K% THEN GOTO620
420H%=0:G%=RND(4)
430H%=H%+1
440IF H%>4 THEN GOTO380
450L%=I%
460N%=J%
470IF G%>4 THEN G%=1
480IF G%=1 AND I%<U% THEN F%=2:L%=I%+1
490IF G%=2 AND J%>0 THEN F%=3:N%=J%-1
500IF G%=3 AND I%>0 THEN F%=5:L%=I%-1
510IF G%=4 AND J%<V% THEN F%=7:N%=J%+1
520IF M%(L%,N%)<>210 OR (N%=J% AND L%=I%) THEN G%=G%+1:GOTO430
530M%(I%,J%)=M%(I%,J%)/F%
540IF F%=2 THEN F%=5:GOTO580
550IF F%=3 THEN F%=7:GOTO580
560IF F%=5 THEN F%=2:GOTO580
570IF F%=7 THEN F%=3
580I%=L%:J%=N%
590M%(I%,J%)=M%(I%,J%)/F%
600Q%=Q%+1
610GOTO420
620I%=RND(U%-1)-1
630M%(I%,0)=M%(I%,0)/3
640FOR I%=0TOU%:FOR J%=0TOZ%
650T%(I%,J%)=32
660NEXT:NEXT
670FOR J%=0TOV%:FOR I%=0TOU%
680D%=M%(I%,J%)
690T%(I%*2,J%*2)=RND(6)+249
700IF D%/3=D%DIV3 THEN T%(I%*2+1,J%*2)=RND(6)+249
710IF D%/5=D%DIV5 THEN T%(I%*2,J%*2+1)=RND(6)+249
720IF D%/7=D%DIV7 AND J%=V% THEN T%(I%*2,J%*2+2)
=RND(6)+249:T%(I%*2+1,J%*2+2)=RND(6)+249
730IF D%/2=D%DIV2 AND I%=U% THEN T%(I%*2+2,J%*2)
=RND(6)+249:T%(I%*2+2,J%*2+1)=RND(6)+249
740NEXT:NEXT
750T%(W%,Z%)=RND(6)+249
760FOR I=0TOU%:FOR J=0TOZ%
```

USE YOUR cursor keys to find your way round a **Jungle Maze**, with gorillas in hot pursuit. You can eat the bananas but you cannot get through the trees. An excellent, fast-moving maze game, with fine graphics and plenty of action.





# Maze



```

770PRINTTAB(I+2,J+6)CHR#T%(I,J)
780NEXT NEXT
790FOR Z=1TO50
800K=RND(5)+223
810I=RND(W%-1)
820J=RND(Z%-1)
830COLOUR 3
840IF T%(I,J)=32 THEN T%(I,J)=K:
PRINTTAB(I+2,J+6)CHR#K ELSE GOTO800
850NEXT
860COLOUR 0
870XG=RND(W%-1)
880YG=RND(Z%-1)
890B=T%(XG,YG)
900X1=XG:Y1=YG
910GC=B:T%(XG,YG)=229
920PRINTTAB(XG+2,YG+6)CHR#229
930COLOUR 7
940FOR I=0TOW%
950IF T%(I,0)=32 THEN T%(I,0)=249:
L=I:N=0:PRINTTAB(I+2,6)CHR#249
960NEXT
970XX=1
980REPEAT
990IF S>HS THEN HS=S
1000PRINTTAB(3,4):S
1010PRINTTAB(13,4):HS
1020IF S/50=S DIV 50 AND S<>0 AND K9<>1 THEN FOR
I=0 TO 5:FOR J=5TO3STEP-1:SOUND2,-15,J*10,1:NEXT NEXT:K9=1
1030I=L:J=N
1040FORW=0TO100:NEXT
1050IF INKEY(-122) THEN I=I+1:SOUND1,-12,10,1:GOTO1090
1060IF INKEY(-58) THEN J=J-1:SOUND1,-12,10,1:GOTO1090
1070IF INKEY(-26) THEN I=I-1:SOUND1,-12,10,1:GOTO1090
1080IF INKEY(-42) THEN J=J+1:SOUND1,-12,10,1
1090IF J<0 OR J>Z% THEN J=N
1100IF I<0 OR I>W% THEN I=L
1110IF T%(I,J)>223 AND T%(I,J)<229 THEN
T%(I,J)=32:S=S+1:ST=ST+1:K9=0
1120IF T%(I,J)<229 THEN T%(L,N)=32:COLOUR
7:PRINTTAB(L+2,N+6)CHR#32TAB(I+2,J+6)CHR#249:L=I:N=J
1130IF RND(3)<>1 THEN GOTO1030
1140R=RND(2)
1150Z=0:XO=XG:YO=YG
1160IF R=1 THEN GOTO1230
1170IF N>YG THEN Z=1
1180IF N<YG THEN Z=-1
1190IF RND(3)=1 THEN Z=-Z:IF Z=0 THEN Z=RND(3)-2
1200YG=YG+Z
1210IF YG<0 THEN YG=0
1220IF YG>Z% THEN YG=Z%
1230IF L>XG THEN Z=1
1240IF L<XG THEN Z=-1
1250IF RND(3)=1 THEN Z=-Z:IF Z=0 THEN Z=RND(3)-2
1260XG=XG+Z
1270IF XG<0 THEN XG=0
1280IF XG>W% THEN XG=W%
1290IF GC<250 THEN COLOUR 3 ELSE COLOUR 2
1300IF XG<>XO OR YG<>YO THEN PRINTTAB(XO+2,
YO+6)CHR#(GC):T%(XO,YO)=GC:GC=T%(XG,YG):T%(XG,YG)=229
1310COLOUR 0
1320PRINTTAB(XG+2,YG+6)CHR#229
1330UNTIL ST=50 AND N=0 OR (XG=I AND YG=J)
1340IF XG=I AND YG=J THEN LL=LL+1 ELSE S=S+20
1350FOR I=0TO2:FOR J=3TO10
1360SOUND1,-15,J*20,1
1370NEXT NEXT
1380ST=0
1390FORW=0TO5000:NEXT
1400UNTIL LL=3
1410CLS:FX15,0
1420PRINTTAB(2,12)"Another game Y/N":A$=GET#
1430IFA$="Y" OR A$="y" THEN GOTO 260
1440END
1450DEFPROC
1460I%=I%+1
1470IF I%>U% THEN I%=0:J%=J%+1:IF J%>V% THEN J%=0
1480IF M%(I%,J%)=210 THEN GOTO1460
1490ENDPROC

```



# BINARY

**C**AN YOU convert decimal numbers into binary and vice versa? **Binary** will test your ability. It will tell you whether you are correct or not but will not give you the correct answer, which you will have to find yourself. A useful program for anyone learning about computers.

```

30MODE7
35DIM B(10)
40P$="01"
50PRINT'
60PRINTSTRING$(20,P$)
70PRINT
80PRINTTAB(15);CHR$(134);CHR$(141);"BINARY"
90PRINTTAB(15);CHR$(133);CHR$(141);"BINARY"
100PRINT
110PRINTSTRING$(20,P$)
120PRINT
130PRINT"BINARY TO DECIMAL = 1"
140PRINT"DECIMAL TO BINARY = 2"
150VDU20,0,24,39,15
160T0=20
170INPUT"ENTER YOUR CHOICE PLEASE";C%
180IF C%>2 OR C%<1 THEN CLS:GOTO170
185 IF C% = 2 THEN 340
190FOR I=1 TO 10
200PROCDIGIT
210PRINT"BINARY: ";
220FOR J=1 TO 5
230PRINTMID$(P$,B(J)+1,1);
240NEXT J
245PRINT"(HEX ";~D;") ";
250PRINT"DECIMAL: ";
260INPUTA
270IF A=0 THEN PROCRIGHT :GOTO300
280 PROCWRONG
290T0=T0-1
300PRINT
310NEXT I
320 GOTO 550
330PRINT
340FOR I=1 TO 10
350PROCDIGIT
360PRINT"DECIMAL: ";D;" (HEX = ";~D;")";
370PRINT"BINARY: ";
380I$="00000"
390INPUTI#
400IF LEN(I#)> 10 THEN 470
410I$="00000"+I#
420 I$=RIGHT$(I$,5)
430FOR J=1 TO 5
440IF MID$(P$,B(J)+1,1)<>MID$(I#,J,1)THEN 470
445PROCRIGHT
450 NEXT I
460 GOTO560
470 PRINT" ";
475 Z$=""
480 FOR R = 1 TO 5
490 Z$=Z$+MID$(P$,B(R)+1,1)
500NEXTR
505PRINTZ$
506PROCWRONG
510PRINT
520T0=T0-1
530PRINT
540NEXT I
550PRINT
560CLS
570PRINT"YOUR SCORE: ";INT(T0/.2+.5);"%
580GOTO160
590PRINT
600END
605DEFPROCDIGIT
6100=0
620FOR J=1 TO5
630B(J)=INT(RND(1)+.5)
6400=0*2+B(J)
650NEXT J
660ENDPROC
700 DEFPROCRIGHT
710 PRINT"CORRECT - VERY GOOD"
720 PROCWAIT
740 ENDPROC
750DEFPROCWAIT
760 FOR R= 1 TO 8000 :NEXT R
770CLS
780ENDPROC
790DEFPROCWRONG
800PRINT"WRONG - YEROCHH"
810PROCWAIT
820ENDPROC

```



```

10 REM MEMORY EXAMINER
15 CLS
20 PRINT "MEMORY EXAMINER"
30 PRINT "(SP)=Step to next location"
40 PRINT "- =Step back to Previous location"
50 PRINT "M =Change contents of location"
60 PRINT
70 INPUT "Start location: "A#:L=EVAL(A#)
80 PRINT "L,~?L)" " "
90 IF ?L<0 OR ?L>126 PRINT ". " ELSE PRINT CHR*(?L); " "
100 K=GET
110 IF K=&20 THEN L=L+1:PRINT:GOTO 80
120 IF K=&2D THEN L=L-1:PRINT:GOTO 80
130 IF K=&4D THEN PRINT "New byte:";GOTO 140
135 GOTO 100
140 INPUT B#
150 ?L=EVAL(B#)
160 IF ?L<>EVAL(B#) THEN PRINT "Location failed to Program";GOTO 170
ELSE L=L+1:GOTO 80
170 END

```

## MEMORY PROBE

A SIMPLE utility program, **Memory Probe**, allows you to examine a specified area of computer memory. Entering the start address and end address is all that is required to define the area.

## Alpha Sort

ENTER UP to 15 words and Alpha Sort will put them into alphabetical order.

You can arrange for it to handle a longer list by altering the variable con-

tained in line 80. Just the thing for school registers, indexing, memberships lists, or finally getting some order into that jumble of computer programs.

```

10 REM ALPHA SORT (BASIC)
40 MODE 7
50 CLEAR
60 PRINT " *** ALPHA - SORT ***"
70 INPUT " Enter number of words for sort "E%
80 IF E%<2 OR E%>15 THEN 40
90 DIM B%(E%)
100 PRINT TAB(4,5); "Your list"
110 FOR B%=1 TO E%
120 PRINT TAB(1,B%+6); INPUT "Enter word "C#
130 IF LEN(C#)>10 THEN PRINT TAB(12,B%+6); STRING$(LEN(C#)-10);
GOTO 120
140 B%(B%)=C#
150 NEXT
160 FOR J%=1 TO E%
170 FOR K%=1 TO E%
180 IF B%(J%)<B%(K%) THEN C#=B%(J%);B%(J%)=B%(K%);B%(K%)=C#
190 NEXT
200 PRINT TAB(26,5); "Sorted list"
210 FOR B%=1 TO E%
220 PRINT TAB(29,B%+6); B%(B%)
230 NEXT
240 PRINT TAB(9,B%+8); "Another sort (Y/N) "; INPUT "C#
250 IF C#="Y" OR C#="YES" OR C#="y" OR C#="yes" THEN 10
260 END

```



# CAR DEPRECIATION

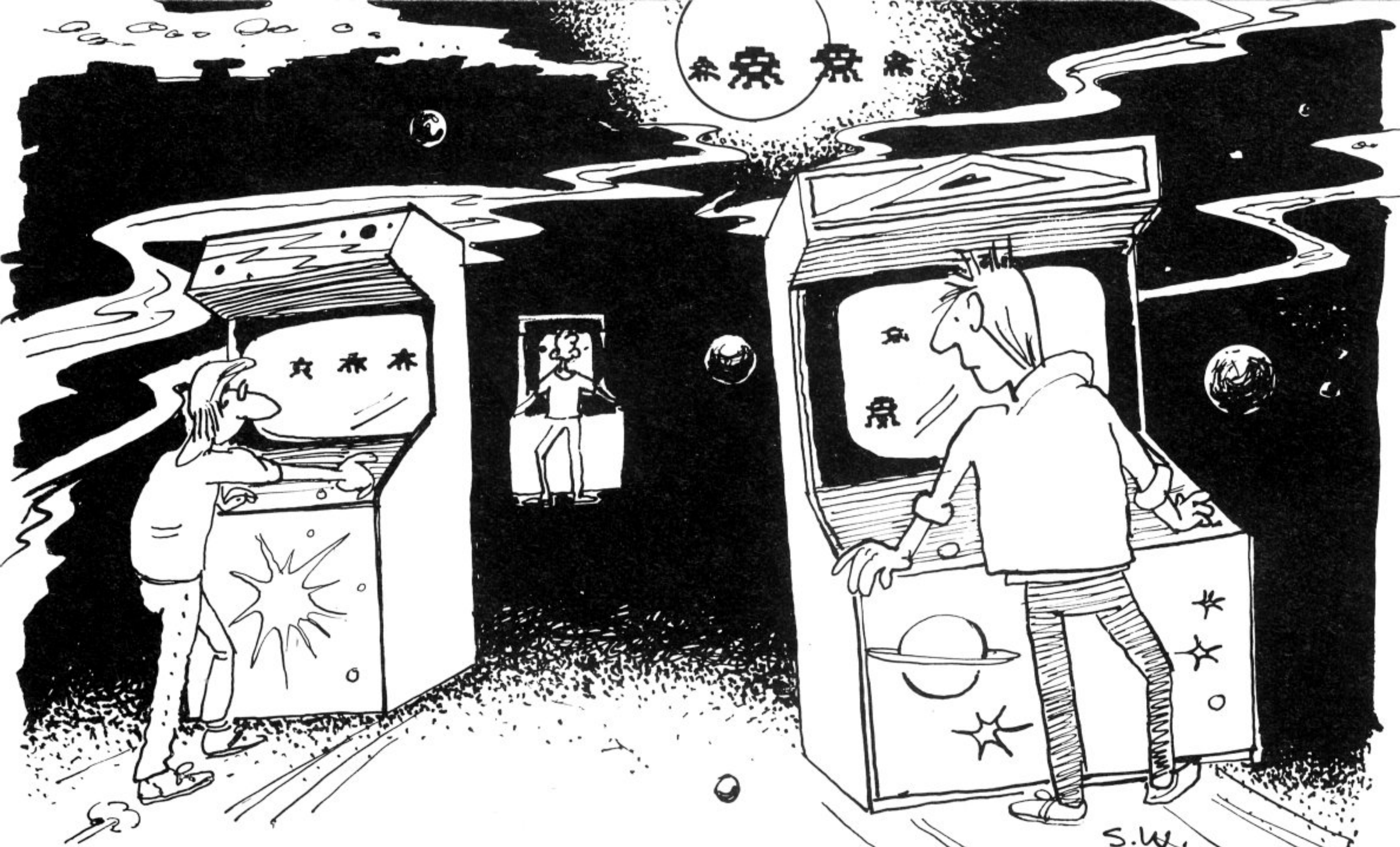
```

10MODE7
20VDU23;8202;0;0;0
50PRINT'
60PRINT TAB(10);CHR$(141);CHR$(132);"CAR DEPRECIATION"
70PRINT TAB(10);CHR$(141);CHR$(132);"CAR DEPRECIATION"
80PRINT TAB(11);"*****"
90PRINT';"AS MOST SELF EMPLOYED PEOPLE KNOW,"
100PRINT"A DEPRECIATION VALUE OF 25% PER ANNUM "
110PRINT"WRITE DOWN VALUE IS GIVEN FOR VEHICLES"
120PRINT"THE FOLLOWING PROGRAM DOES NOT TAKE"
130PRINT"INTO ACCOUNT THE MAXIMUM ALLOWANCE OF"
140PRINT"$2000."
150PRINT''''
160INPUT"PRESS RETURN TO CONTINUE"0
170MODE4
180REPEAT
190CLS
200PROCBOX
210%=&20209
220PRINT TAB(9,2);" THEN PRESS <RETURN>"
230INPUT TAB(1,0);"ENTER PURCHASE PRICE OF CAR = £"C
240FOR Y=0 TO 3
250FOR X=1 TO 12
260PRINT TAB((Y*9)+4,(X*2)+4);C
270C=C*0.9741861
280NEXT X
290NEXT Y
300PRINT TAB(0,30);"PRESS 'H' FOR HELP, ANY KEY TO CONTINUE"
310A$=GET$
320IF A$="H" THEN RUN
330UNTIL FALSE
340DEF PROCBOX
350%=-10
360MOVE 0,80:DRAW 0,916
370FORX=96 TO 1279 STEP 280
380MOVE X,80:DRAW X,916
390NEXT
400MOVE 0,80:DRAW1247,80
410MOVE 0,848:DRAW1247,848
420MOVE 0,916:DRAW1247,916
430FOR X=0 TO 3
440PRINT TAB(0,4);"M+h"
450FOR Y=1 TO 12
460PRINT TAB(1,(Y*2)+4);Y
470NEXT
480FOR X=0 TO 3
490PRINT TAB((X*9)+4,4);"YEAR ";X+1
500NEXT
510ENDPROC
520PRINT"ALLOWED (£8000). "
530PRINT''
540INPUT"PRESS RETURN TO CONTINUE"0
550GOTO180

```

**D**O YOU want to know how much your car will be worth this time next year? Or in February, 1985? Enter the price at which you bought it and **Car Depreciation** will set out clearly, month by month, the depreciation for the next four years. It uses a write-down value of 25 percent per annum and should be of interest as much to personal car owners as to heads of small businesses with several cars to run.





# INVASION

DO NOT be surprised if there is something vaguely familiar about **Invasion**. It is yet another version of space invaders and a reasonably exciting one. The screen will fill with more and more of those menacing aliens and you will need quick reflexes to sort them out. Use the N and M keys to move left and right and the space bar to fire.

```

50PRINTTAB(13)CHR$(141)CHR$(133)"INVADERS"
55*FX11,0
60 PRINT:PRINTCHR$(134)"The idea of the game is to shoot as"
70PRINTCHR$(134)"many INVADERS as possible. If enough"
80PRINTCHR$(134)"are destroyed they will retreat."
90PRINT:PRINTCHR$(136)"BUT THEY'LL BE BACK!"
100PRINT:PRINTCHR$(131)"TO MOVE LEFT PRESS 'N'"
110PRINT:PRINTCHR$(131)"TO MOVE RIGHT PRESS 'M'"
115PRINT:PRINTCHR$(131)"TO FIRE PRESS 'SPACE BAR'"
116PRINT:VDU134,157,136,133:PRINT"    PRESS ANY KEY TO CONTINUE"
120Z#=GET#:MODE5
140COLOUR4
150N=1:B=0:J=0:G=0:V=1000
170VDU23,230,36,153,66,0,219,24,90,153
180VDU23,224,60,24,126,90,255,102,255,129
190VDU23,225,24,60,126,255,255,255,255,255
200VDU23,226,15,31,63,127,255,255,255,255
210VDU23,227,255,255,255,255,255,255,255,255
220VDU23,228,240,248,252,254,255,255,255,255
230A#=CHR$(226)+CHR$(227)+CHR$(228)+"  "
240B#=CHR$(227)+CHR$(227)+CHR$(227)+"  "
250COLOUR1
260VDU23,8202,0,0,0)
270VDU31,0,24
280FORR=1TO4:PRINTA#:NEXT
290FORR=1TO4:PRINTB#:NEXT

```

```

300FORR=1TO4:PRINTB#:NEXT
310FORC=1TO24STEP0.05
320COLOUR2
330PRINTTAB((RND(18)-1),C);" ";CHR$(224);" "
340SOUND0,-12,-4,.1
350COLOUR3
360PRINTTAB(0,30)" "
370PRINTTAB(N,29);" ";CHR$(225);" "
380VDU30:PRINTTAB(4)"SCORE=";J
390N#=INKEY$(15)
400IFN#="M"ANDN<17THENN=N+1
410IFN#="N"ANDN>0THENN=N-1
420IFN#=" "THENGOSUB450
430NEXTC
440GOTO600
450VDU23,229,24,0,24,0,24,0,24,0
460F#=CHR$(229)
470T=28:U=175
480REPEAT
490PRINTTAB(N+1,T);F#
500PRINTTAB(N+1,T)" "
510T=T-1:U=U+1:SOUND1,-10,U,1
520Y=((N+1)*64)+32
530Z=(ABS((T-1)-31)*32)+16
540G=POINT(Y,Z)
550IFG=2THENJ=J+10
560IFG>0THENB=1:PROCEX(N,T)
570UNTILT=0ORB=1
580B=0
590RETURN
600IFJ<J THENA%=J
610IFV<J THENGOTO820
620MODE7
630 PRINTTAB(10,4)CHR$(141)CHR$(133)"GAME OVER"
640 PRINTTAB(10,4)CHR$(141)CHR$(133)"GAME OVER"
650PRINTTAB(6,10)CHR$(132)"INVADERS HAVE LANDED"
660 PRINTTAB(7,15)CHR$(141)CHR$(131)"HIGHEST SCORE=";A%
670 PRINTTAB(7,15)CHR$(141)CHR$(131)"HIGHEST SCORE=";A%
680PRINTTAB(11,20)CHR$(131)"YOUR SCORE=";J
690FORN=1TO1000
700SOUND3,-12,RND(149)+75,.1
710NEXTN
720 PRINTTAB(2,24)"DO YOU WANT ANOTHER GAME 'Y' OR 'N'"
730IFGET#="Y"THENGOTO20
740IFGET#="N"THENCLS:END
750DEFPROCEX(N,T)
760PRINTTAB(N+1,T-1);CHR$(230)
770SOUND0,-12,30,5
780FORG=1TO100:NEXTG
800PRINTTAB(N+1,T-1)" "
810ENDPROC
820 V=J:J=0
830 MODE7:PRINTTAB(1,5)CHR$(130)"You have forced the invaders to "
840PRINTTAB(1,6)CHR$(130)"retreat with your expert shooting."
850PRINTTAB(1,8)CHR$(131)"But this time you have to beat your"
860PRINTTAB(1,9)CHR$(131)"last"CHR$(133)" SCORE OF ";V
870FORI=1TO50000:NEXTI
880PRINTTAB(6,15)CHR$(141)CHR$(134)CHR$(136)"HERE THEY COME AGAIN"
890PRINTTAB(6,16)CHR$(141)CHR$(134)CHR$(136)"HERE THEY COME AGAIN"
900 FOR I=1 TO 10000:NEXTI
910 MODE5:GOTO250

```

# Write a Game and Win an Electron

There is a wonderful prize to be won in our competition to welcome you to *Acorn Programs*. An Electron computer, worth £199, will go to the best games program sent to us. Games can run on either the BBC Micro or the Electron and will be judged for originality, excitement, presentation, playability and entertainment value.

Fill in the entry form below and send a cassette, accompanied by a listing and a brief description. Your entry must reach us no later than January 2, 1984. We reserve the right to publish any entries.

The usual rules about the editor's decision being final and employees of ECC Publications being ineligible apply.



Name .....

Adress .....

.....

Send your entries, marked Electron Competition, to Acorn Programs, 196-200 Balls Pond Road, London N1 4QA to arrive no later than January 2, 1984.

# SKETCH

**T**HE PROGRAM for anyone who is tired of doodling with ordinary pen and paper. Use the cursor keys to draw slowly-revolving straight lines.

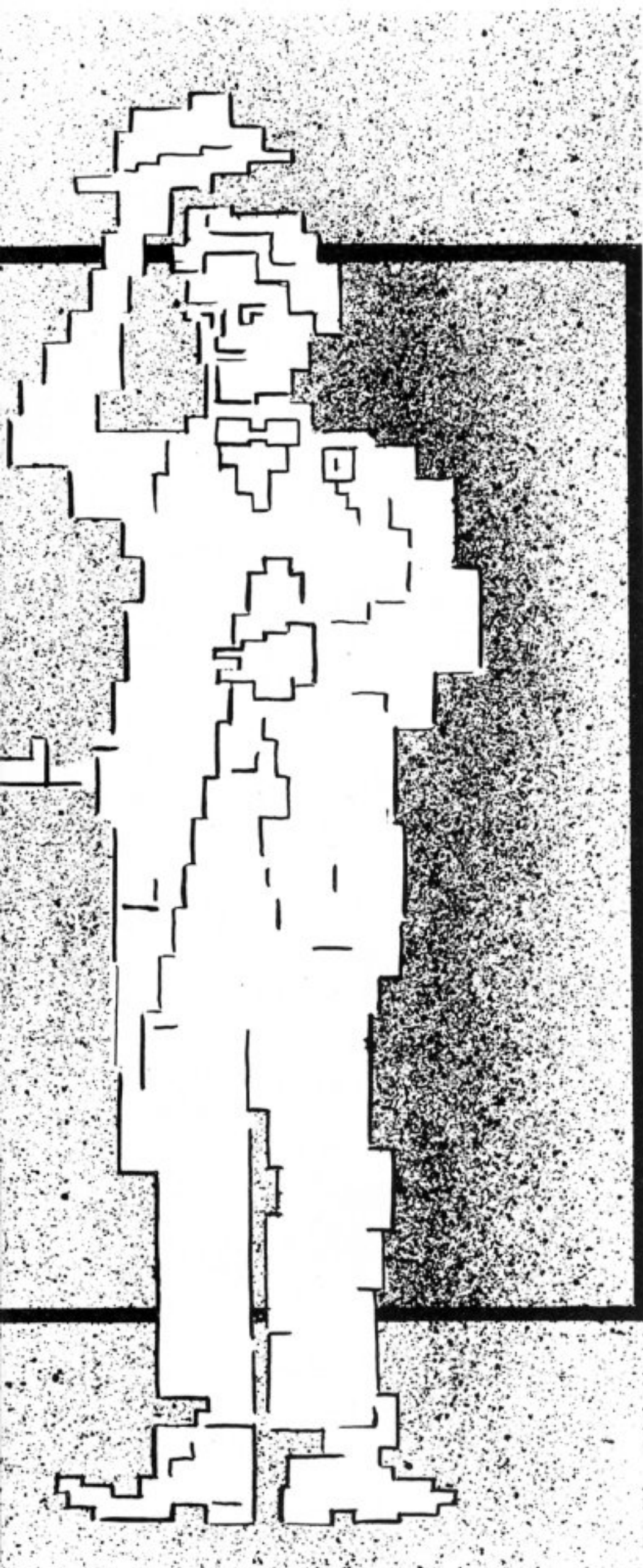
```
30MODE7:VDU23;11,0;0;0;0
40CZ=5
50Q=131:Z=134:Y#=CHR$(136)+CHR$(134)
60*TV 255
70scale=5
80ON ERROR GOTO1010
90IFR%=1 THEN190
100PROCTITLE
110PROCCL
120PRINT'CHR$(Z);" Use the cursor keys to move the line"
130PRINTTAB(0,6);Y#;"F";CHR$(137);"will fix the current line
and move";PRINTCHR$(Z);" the origin to the new end."
140PRINT'Y#;"L";CHR$(137);"will fix the current line but
keep";PRINTCHR$(Z);" the old origin."
150PRINT'Y#;"M";CHR$(137);"will move the origin without
drawing ";PRINTCHR$(Z);"in the current line."
160PRINT'CHR$(Z);" You may use the number keys to
change";PRINTCHR$(Z);" the speed at which the line moves."
170PRINTTAB(8,22)CHR$(Q);"Press SPACE to start"
180REPEAT UNTIL GET#=" "
190C#="Writing":PROCWHICHCOLOUR(C#)
200CW=A
210C#="Background":PROCWHICHCOLOUR(C#)
220CB=A
230MODE4:VDU23;11,0;0;0;0
240VDU19,1,CW,0,0,0
250VDU19,0,CB,0,0,0
260CLS:PRINTTAB(2,1)"S K E T C H E R"
270PROCSETUP
280F=0
290MOVEX,Y
300PLOT69,X,Y:REM PLOT THE START POINT
310PROCGETKEY
320IFF=1THEN XBAR = X:YBAR = Y:XLAST=X:YLAST=Y:F=0:GOTO300
330IFXP=1THENX=XLAST:Y=YLAST:XP=0:F=1:GOTO320
340PROCUNPLOT(X,Y):REMPLOT OLD POSITION IN BACKGROUND COLOUR
350PROCNEWXY(A#)
360MOVEXBAR,YBAR
370PROC PLOT(X,Y):REM IN FOREGROUND COLOUR
380GOTO310
390END
400DEFPROCGETKEY
410*FX 4 1
420A# = GET#
430IFA# = CHR$(136) THEN A# = "L":GOTO630
440IFA# = CHR$(139) THEN A# = "U":GOTO630
450IFA# = CHR$(137) THEN A# = "R":GOTO630
460IFA# = CHR$(138) THEN A# = "D":GOTO630
470IFA# = "L" THEN XP = 1
480IFA# = "F" THEN F = 1
490IFA# = "M" THEN CZ = 7:PROCUNPLOT(X,Y):CZ = 5:F = 1
500IFA# = CHR$(80) THEN R% = 1:RUN
510IFA# = "0" THEN scale = 1
520IFA# = "1" THEN scale = 3
530IFA# = "2" THEN scale = 6
540IFA# = "3" THEN scale = 9
550IFA# = "4" THEN scale = 12
560IFA# = "5" THEN scale = 15
570IFA# = "6" THEN scale = 18
```





# SKETCHER

The L key will fix the line in place, the F key will fix it and move the origin to the other end, and M will simply move the origin without drawing a line. Have fun.



```
500IFA#="7"THENscale=21
590IFA#="8"THENscale=24
600IFA#="9"THENscale=27
610IFA#=CHR#(127)THEN CLS:PRINTTAB(2,1)
"SKETCHER":PROCSETUP
620GOTO420
630ENDPROC
640DEFPROCNEWXY(A#)
650IFA#="D"THENY=Y-scale:GOTO720
660IFA#="L"THENX=X-scale:GOTO720
670IFA#="R"THENX=X+scale:GOTO720
680IFA#="U"THENY=Y+scale:GOTO720
690IFX>1279THENX=1279
700IFX<0THENX=0
710IFY>1023THENY=1023
720ENDPROC
730DEFPROCUNPLOT(X,Y)
740MOVEXBAR,YBAR
750PLOT(X,Y)
760ENDPROC
770DEFPROCPLLOT(X,Y)
780GCOL4,1
790PLOT(X,Y)
800ENDPROC
810DEFPROCWHICHCOLOUR(C#)
820PROCCL
830PRINT'CHR#(Q);C#;" Colour "'
840PRINT';CHR#(Z);" 1 Red"
850PRINT';CHR#(Z);" 2 Green"
860PRINT';CHR#(Z);" 3 Yellow"
870PRINT';CHR#(Z);" 4 Blue"
880PRINT';CHR#(Z);" 5 Magenta"
890PRINT';CHR#(Z);" 6 Cyan"
900PRINT';CHR#(Z);" 7 White"
910PRINT';CHR#(Z);" 8 Black"
920PRINT';CHR#(Q);"Enter your choice "
930A#=#GET#
940A=VAL(A#)
950IF A < 1 OR A > 8 THEN 930
960IF A=0 THEN A=0
970ENDPROC
980DEFPROCCL
990CLS:PRINTTAB(10,1);CHR#(Q);"SKETCHER"
1000ENDPROC
1010*FX 4 0
1020MODE7
1030PRINT''''CHR#(Z);"Goodbye":VDU7:VDU23;11,255;0;0;0:R%#0
1040END
1050DEFPROCTITLE
1060TITLE#="Sketcher"
1070CLS
1080PRINTTAB(12,10);CHR#134;CHR#141;TITLE#
1090PRINTTAB(12,11);CHR#134;CHR#141;TITLE#
1100A#=#INKEY#(1000)
1110ENDPROC
1120DEFPROCSETUP
1130XBAR=640:YBAR=512:XLAST=XBAR:YLAST=YBAR:XP=0:X=XBAR:Y=YBAR
1140ENDPROC
```

```

1 REM * TO SPEED THE GAME UP
2 REM * CHANGE 'S' AT LINE TEN
10 MODE 7:PRINT:Q=0:T=0:W=0:S=400:P=0
20 PRINTTAB(11);CHR#141;CHR#131;"*** DUEL ***"
25 PRINTTAB(11);CHR#141;CHR#131;"*** DUEL ***"
30 PRINT:IF P=1 THEN 140
40 PRINT"THIS GAME WILL TEST YOUR REFLEXES WHEN "
50 PRINT"YOU DUEL WITH ONE OF THE MOST FAMOUS "
60 PRINT"DUELISTS IN THE WORLD, YOUR COMPUTER !!"
70 PRINT
80 PRINT"KEEP YOUR FINGER ON THE (<'F'>) KEY WHEN "
90 PRINT"YOU ARE READY TO FIRE, JUST PRESS IT."
100 PRINT:PRINT"DON'T FIRE BEFORE THE COUNT OF TEN AND"
110 PRINT"YOU SEE A STAR (*) ON THE VIDEO - THAT"
115 PRINT"WOULD BE CHEATING."
120 PRINT:PRINT"A TOTAL OF TEN ROUNDS WILL BE RUN, THE"
125PRINT"THE ONE COMING UP WITH THE MOST HITS"
130 PRINT"WILL BE THE WINNER."
135 PRINT:PRINT"(NOTE: AS THE ROUNDS BECOME GREATER THE"
COMPUTER WILL FIRE FASTER)."
140 PRINT:PRINT"      PRESS RETURN TO BEGIN";
145 INPUT X
150 CLS:PRINT
160 PRINT"START YOUR PACES...."
170 REM COUNT PACES
180 FOR M=1 TO 10
190 PRINTTAB(19);M
200 FOR N=1 TO 500:NEXT N
210 Z#=INKEY#(0)
220 IF Z#="F" THEN PROCHEAT:GOTO 410
230 NEXT M
240 REM SET STAR
250 H=INT/PND(30)+1)
260 FOR J=1 TO 500:NEXT J
270 PRINT:PRINT:PRINT:PRINT
275 Z#=INKEY#(0):IF Z#="F" THEN PROCHEAT:GOTO 410
280 PRINTTAB(X);"*"
290 REM SET UP SPEED FOR COMPUTER SHOT
300 FOR I=1 TO S:NEXT I
310 Y#=INKEY#(0)
320 IF Y#("<'F'>") THEN 340
330 GOTO 380
340 CLS:PRINT
350 PRINTTAB(8,3);CHR#141;CHR#131;"TOO SLOW SUCKER !!!":PRINTTAB
(8,4);CHR#141;CHR#131;"TOO SLOW SUCKER !!!"
360 PRINTTAB(10,11)"I JUST SHOT YA !!!"
365 Q=Q+1
370 GOTO410
380 CLS:PRINT
390 PRINTTAB(2,3);CHR#141,CHR#134;"O U C H !!!":PRINTTAB(2,4);CHR
#141,CHR#134;"O U C H !!!"
400 PRINTTAB(0,11)"GOT ME. SCRATCH ONE INTEGRATED CIRCUIT !!!"
W=W+1
405 IF W>4 THEN PRINTTAB(10)"I'M GETTING WEAKER !"
410 PRINT:T=T+1:IF T=10 THEN 440
420 PRINTTAB(8,19)"THAT'S ROUND NUMBER ";T
430 IF T<10 PRINT:PRINTTAB(10)"ONLY ";10-T;" MORE TO GO."
S=S-10:GOTO 140
440 PRINTTAB(9)"THAT'S ";T;" ROUNDS !!!"
460 IF Q>W THEN 490
470 IF W>Q THEN 520
480 IF Q=W THEN 550
485 REM FINAL MESSAGES
490 PRINT:PRINT"  LOOKS LIKE I WON THE BETTER OF ";T
500 PRINT"  ROUNDS, WITH A TOTAL OF ";Q
510 GOTO 640
520 PRINT:PRINT" WELL YOU'RE FASTER THAN YOUR COMPUTER."
530 PRINT"YOU WON THE ";T;" ROUNDS, WITH A TOTAL OF ";W
540 GOTO 640
550 PRINT:PRINT" SO WE'RE ABOUT EVEN WITH THE REFLEXES,"
560 PRINT" YOU HAD ";W;" AND I HAD ";Q;" NOT BAD !!!"
570 GOTO 640
575 DEFPROCHEAT
580 FOR I=1 TO 300:NEXT I:CLS:PRINT:PRINT
590 PRINTTAB(9,3);CHR#141;CHR#129;"OKAY RESTLESS !!!":PRINTTAB
(9,4);CHR#141;CHR
#129;"OKAY RESTLESS !!!"
600 PRINTTAB(3,9)"NEITHER ONE OF US GOT THIS ROUND."
610 PRINT:PRINT"  YOU LOSE A ROUND-FOR SHOOTING ME"
620 PRINT:PRINT"  IN THE BACK, DID YOU SEE A STAR ?"
630 W=W-1:ENDPROC
640 PRINT:PRINT:PRINT" WOULD YOU LIKE TO TRY YOUR REFLEXES"
650 PRINT" AGAIN, BY GOING ";T;" MORE ROUNDS (<'Y/N'>):"
660 INPUTA#
670 IF A#="Y" THEN P=1:GOTO10
680 PRINT
690 PRINT" GETTING TIRED OF SHOOTING AT A STAR..."
700 END

```



**T**EST YOUR REFLEXES in a shoot-out with your computer. The aim in **Duel** is to fire the instant you see a star appear on the screen, but it is as well to know that in this game the computer is a crack shot and you are likely to be killed every time. A very simple game without graphics — it is just between you and that star.

# SQUARES

**F**IND THE SQUARE of any number you like. In **Squares** it is for you to specify in the program how high you would like the table to go. Press shift to keep the column moving. A simple concept which provides an interesting exercise in programming for beginners.

```
10MODE7
50PRINT'
60VDU129,141;:PRINT;:PRINTTAB(12);"SQUARES"
70VDU129,141;:PRINT;TAB(12);"SQUARES"
80PRINT'"  SHIFT = CONTINUE CALCULATIONS.'"
90VDU28,0,23,39,8
100PRINT'
110VDU14
120INPUT"INPUT LOWEST VALUE ",L
130PRINT
140INPUT"INPUT HIGHEST VALUE ",H
150PRINT
160 FOR I= L TO H
170 PRINT I;"SQUARED = ";I*I
180NEXT I
190GOTO120
```



```

9
100N ERROR GOTO 220
200DIM CPEG(5):DIM PLAYERSGO*(5):DIM PCHOICE(5):DIM
PCHOICE2(5):DIM CPEG2(5)
300DIM S*(7):DIM CPEG*(5)
40Y=4
50T1=TIME
60PROCcolset
70MODE2:VDU 23:8202:0:0:0
80PROCsetup
90CORRECT = 0
100GAME=0
110GOES = 0
120REPEAT
130GOES = GOES +1
140PROCplayersmove
150PROCcheckgame
160PROCstatus
170Y=Y+2
180UNTIL GOES =14 OR GAME =1
190PROCreveal
200IF GAME=1 THEN PROCwingame ELSE PROCendgame
210IF R*="Y" THEN GOTO 40
220 MODE 7
225 END
227
230REM *****COL SET*****
240DEF PROCcolset
250REM SET COMPUTERS SECRET COLOUR SEQUENCE
260FOR I = 0 TO 4
270CL=RND(7)
280CPEG(I)=CL
290NEXT I
300ENDPROC
310REM *****PLAYERS MOVE*****
320DEF PROCplayersmove
330ANSW*="!"
340REPEAT
350PRINTTAB(11,0)"      "
360PRINTTAB(11,1)"      "
370PRINTTAB(11,2)"      "
380IF ANSW*(1)" THEN PRINTTAB(11,0)"OK-DO THE
" PRINTTAB(11,1)"ROW ONCE " PRINT
TAB(11,2)" AGAIN " PROCclear_row
390X=1
400FOR I = 0 TO 4
410REPEAT
420PLAYERSGO*(I)=GET*
430PCHOICE(I)=0
440IF PLAYERSGO*(I) = "R" THEN PCHOICE(I)=1
450IF PLAYERSGO*(I) = "G" THEN PCHOICE(I)=2
460IF PLAYERSGO*(I) = "Y" THEN PCHOICE(I)=3
470IF PLAYERSGO*(I) = "B" THEN PCHOICE(I)=4
480IF PLAYERSGO*(I) = "M" THEN PCHOICE(I)=5
490IF PLAYERSGO*(I) = "C" THEN PCHOICE(I)=6
500IF PLAYERSGO*(I) = "W" THEN PCHOICE(I)=7
510UNTIL PCHOICE(I)<0
520COLOUR PCHOICE(I)
530PRINTTAB(X,Y)PLAYERSGO*(I)
540X=X+2
550NEXT I
560REPEAT
570PRINTTAB(11,0)"TO ALTER " PRINTTAB(11,1)
"ROW-PRESS" PRINTTAB(11,2)" RETURN"
ANSW*=GET*
580UNTIL ANSW* = CHR#13 OR ANSW* = "N"
590UNTIL ANSW*="N"
600ENDPROC
610REM *****REVEAL ANSWER*****
620DEF PROCreveal
630X=1
640FOR I = 0 TO 4
650IF CPEG(I) =1 THEN COLOUR 1:CPEG*(I)="R"
660IF CPEG(I) =2 THEN COLOUR 2:CPEG*(I)="G"
670IF CPEG(I) =3 THEN COLOUR 3:CPEG*(I)="Y"
680IF CPEG(I) =4 THEN COLOUR 4:CPEG*(I)="B"
690IF CPEG(I) =5 THEN COLOUR 5:CPEG*(I)="M"
700IF CPEG(I) =6 THEN COLOUR 6:CPEG*(I)="C"
710IF CPEG(I) =7 THEN COLOUR 7:CPEG*(I)="W"
720PRINT TAB(X,2)CPEG*(I)
730X=X+2
740NEXT I
750ENDPROC
760REM *****STATUS*****
770DEF PROCstatus
780PRINTTAB(14,Y);
790IF CORRECT (>0 THEN COLOUR 2:
FOR I = 1 TO CORRECT PRINT"*"; NEXT I
<>0 THEN COLOUR 7: FOR I = 1 TO RIGHT-CORRECT:
PRINT"*"; NEXT I
810ENDPROC
820REM *****END GAME*****
830DEF PROCendgame
833FOR I=1 TO 2
835SOUND 1,-15,10,5
836FOR I1=0 TO 1000 NEXT I1
837NEXT I
840PRINTTAB(11,0)" OH DEAR "
850PRINTTAB(11,1)" NO MORE "
860PRINTTAB(11,2)" GUESSES "
870FOR DELAY=0 TO 12000 NEXT
880PRINTTAB(11,0)" LIKE "
890PRINTTAB(11,1)" ANOTHER "

```

# COLOUR



**I**F YOU have ever played Mastermind, you will be familiar with the object of **Colour Logic**. The computer has in mind a sequence of five colours and you must try to guess what they are, in the correct order. Key-in a sequence of your own — Y for yellow, R for red, G for green, M for magenta, C for cyan, B for blue, W for white — and the computer will give you a white star for any colour which is correct but not

# R LOGIC



in the proper place, and a green star for the proper colour in the correct place. You have 14 rows to determine the answer by a process of elimination.

Press return to change a row you have just entered, and N to go on to the next row.

Attractive, clear graphics add to the appeal of this absorbing, if scarcely original, game.

```

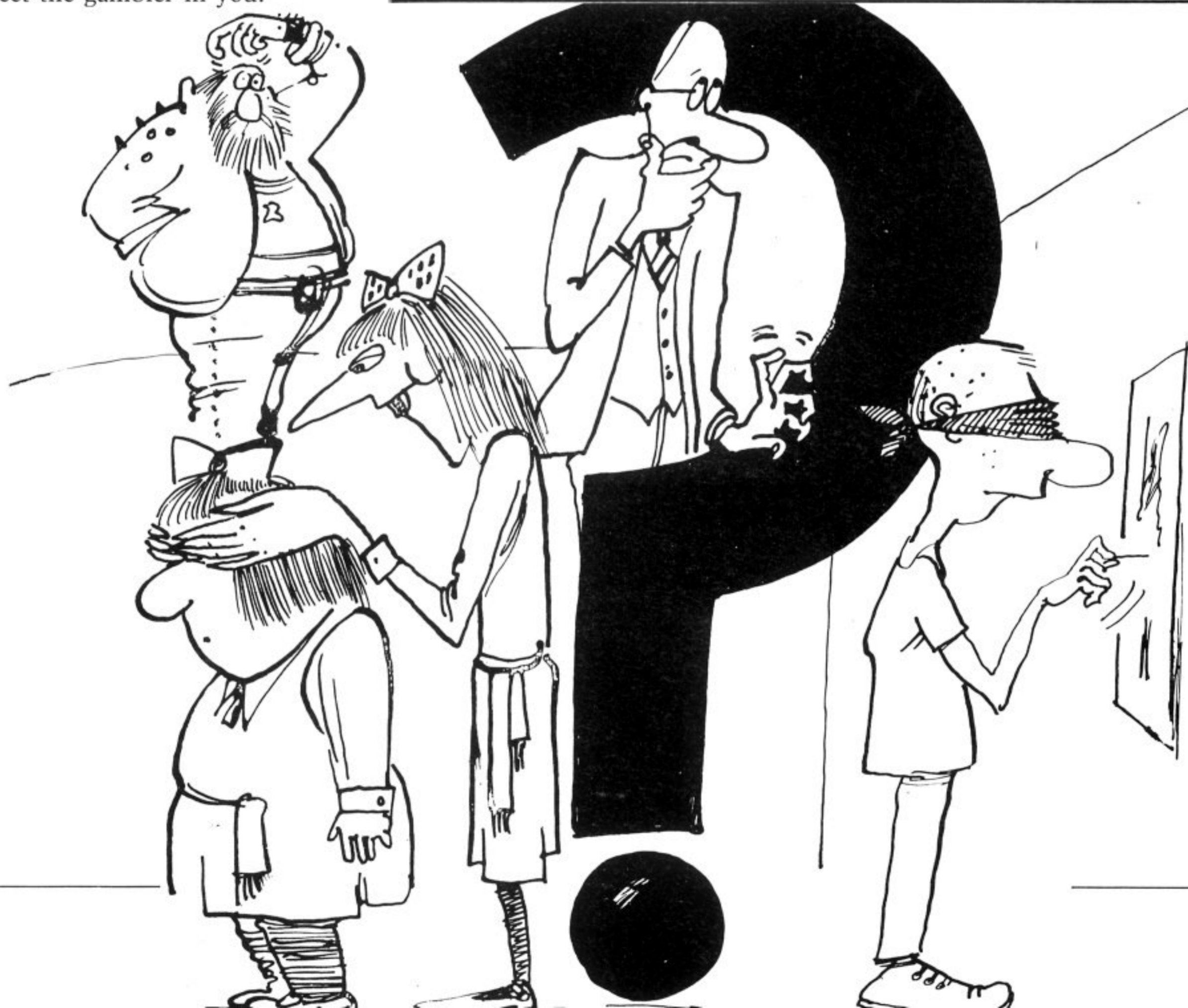
900PRINT TAB(11,2)" GAME ?"
910R#="!"
920REPEAT
930R#="GET"
940UNTIL R#="Y" OR R#="N"
950ENDPROC
960REM *****CHECK GAME*****
970DEF PROCcheckgame
980FOR I=0 TO 4
990CPEG2(I)=CPEG(I):PCHOICE2(I)=PCHOICE(I)
1000NEXT I
1010CORRECT=0:RIGHT=0
1020FOR L=0 TO4
1030IF PCHOICE(L)=CPEG(L) THEN CORRECT=CORRECT+1
1040NEXT L
1050IF CORRECT=5 THEN GAME =1 ELSE GAME =0
1060FOR I = 0 TO 4
1070FOR M= 0 TO 4
1080IF PCHOICE2(M)=CPEG2(L) THEN RIGHT=RIGHT +
1:PCHOICE2(M)=0:CPEG2(L)=0 ELSE
NEXT M
1090NEXT L
1100ENDPROC
1110REM *****SETUP*****
1120DEF PROCsetup
1130RO=1
1140COLOUR 12
1150PRINTTAB(1,2)"? ? ? ? ?"
1160COLOUR 3
1170FOR I = 4 TO 30 STEP 2
1180PRINTTAB(1,I)"X X X X X";" ";RO
1190RO=RO+1
1200NEXT I
1210PRINTTAB(2,0);
1220FOR I= 1 TO 7
1230READ S#:COLOUR I:PRINTS#;
1240NEXT I
1250DATA R,G,Y,B,M,C,W
1260RESTORE
1270PROCtable_outline
1280ENDPROC
1290REM*****TABLE OUTLINE*****
1300DEF PROCtable_outline
1310GCOL 0,2
1320MOVE 30,18
1330HORIZ = 30
1340DRAW 30,980:DRAW 680,980:DRAW
680,18:DRAW 30,18
1350MOVE 860,18:DRAW 860,915:DRAW
1250,915:DRAW 1250,18:DRAW 860,18
1360FOR Z= 0 TO 3
1370HORIZ = HORIZ + 130
1380MOVE HORIZ,18:DRAW HORIZ,980
1390NEXT Z
1400MOVE 30,82:DRAW 680,82
1410H = 64:H1 = H
1420FOR Z= 0 TO 12
1430MOVE 30,82+H1:DRAW 680,82+H1
1440H1 = H1 + H
1450NEXT Z
1460GCOL0,7:MOVE 30,980:DRAW 680,980:
DRAW 680,915:DRAW 30,915:DRAW 30,980
1470ENDPROC
1480ENDPROC
1490REM*****WIN GAME*****
1500DEF PROCwin game
1502 FOR I=0 TO 10
1504 SOUND 1,-15,200,1
1505 FOR I1=0 TO 100:NEXT I1
1506 NEXT I
1510T2 = TIME
1520T=INT((T2-T1)/100)
1530COLOUR 130
1540COLOUR 4
1550FOR I=0 TO 5000:NEXT I
1560CLS
1570PRINTTAB(2,3)"CONGRATULATIONS!"
1580PRINT
1590PRINT
1600PRINT"WITH ";GOES;" GOES IT TOOK"
1620PRINT"YOU ";COLOUR 12:PRINT T:COLOUR 4
1630PRINT
1635PRINT"SECONDS TO BEAT THE"
1650COLOUR 4
1660PRINT"COMPUTER'S COLOUR"
1667PRINT"CODE !"
1670PRINT:COLOUR 1
1680PRINT"LIKE ANOTHER GO ?"
1690REPEAT
1700R#="GET"
1710UNTIL R#="Y" OR R#="N"
1720ENDPROC
1730REM*****RE DO*****
1745DEF PROCclear row
1747X=1
1750FOR I=0 TO 4
1760PRINTTAB(X,Y)"_"
1770X=X+2
1780NEXT I
1790ENDPROC

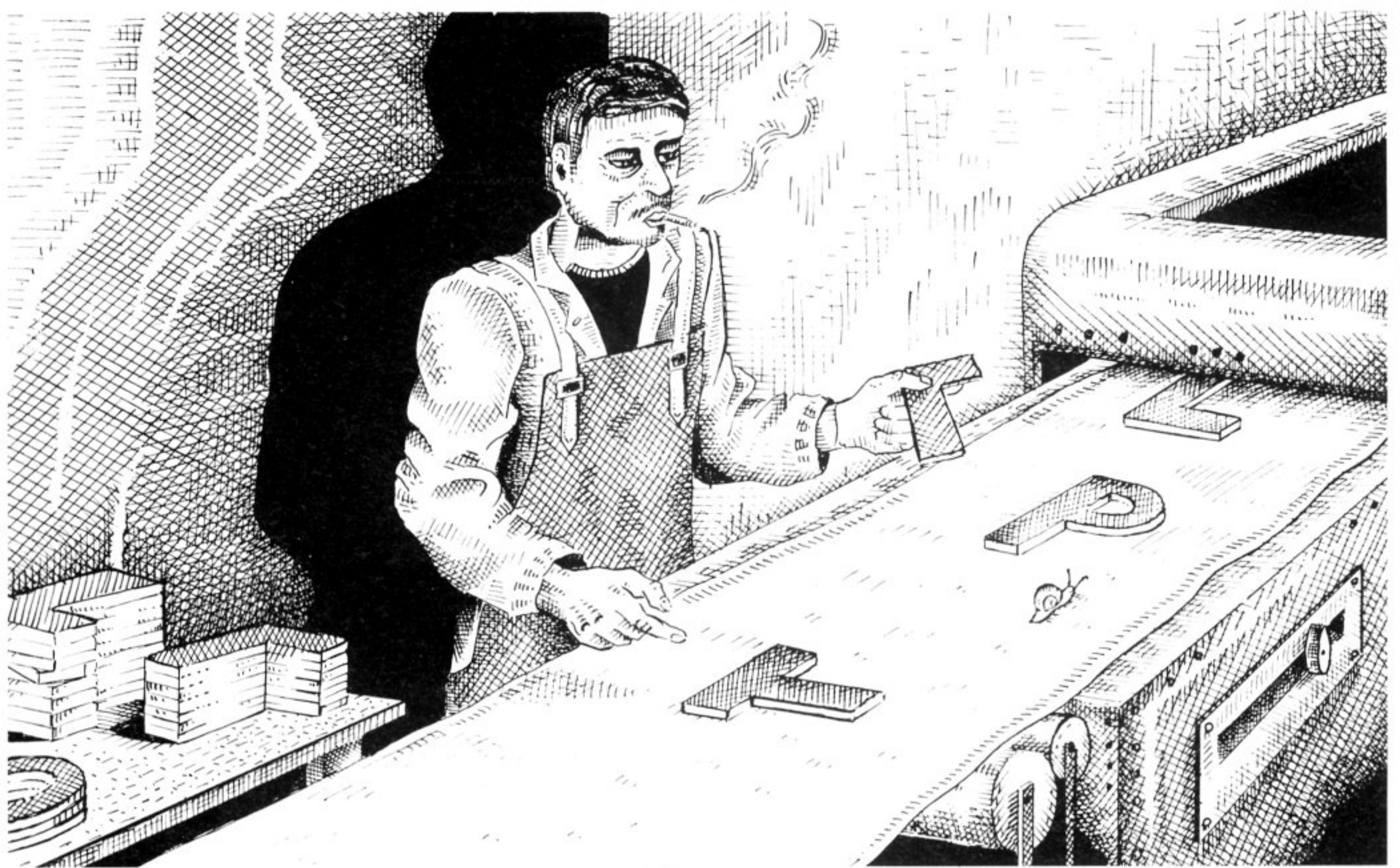
```

# GUESS

**T**HE COMPUTER generates a number between 1 and 100 and you have six attempts to try to pinpoint it. After each try, the computer will tell you if the number is lower or higher than the one you just entered. A very simple game, designed to detect the gambler in you.

```
40 MODE 7
50 PROChead
60 PROCinit
65PRINT' "PRESS A KEY WHEN READY"
70 AB=GET#
75 CLS
80 PROChead
90 CX=RND(-TIME)
100 CX=RND(100)
110 PRINT'SPC3"O.K. I Have Thought of a number"
120 GO=0
130 PRINT
140 REPEAT
150 PRINTSPC9"Enter your guess"; INPUT"D%
160 IF D%<0 OR D%>100 THEN 150
170 IF D%=CX THEN GO=10
180 IF D%<CX THEN PRINTSPC6"My number is more than";D%
190 IF D%>CX THEN PRINTSPC6"My number is less than";D%
200 GO=GO+1
210 UNTIL GO>6
220 IF GO=11 THEN PRINTSPC12"WELL DONE !!" ELSE PRINTSPC10
"BAD LUCK TRY AGAIN" PRINTSPC12"MY NUMBER WAS";CX
230 PRINTSPC10"Another go (Y/N)"; AB=GET#
240 IF AB="Y" OR AB="y" THEN 75
250 END
260 DEFPROCinit
270 PRINT
280 PRINTSPC7"I will guess a number"
290 PRINTSPC7"between1and100all"
300 PRINTSPC7"you have to do is get"
310 PRINTSPC7"the correct number in"
320 PRINTSPC7"less thanSIXtry's."
330 PRINT'SPC7"I will give you clues"
340 PRINTSPC7"on how far wrong you,"
350 PRINTSPC7"you are guessingO.K."
360 ENDPROC
370 DEFPROChead
380 FOR BX=1 TO 2
390 PRINTTAB(6,BX);CHR#141;"*** NUMBER GUESS ***"
400 NEXT
410 ENDPROC
```





# WORD PROCESSOR

**H**ERE is the software you need to write, edit and print your letters, or any other body of text, on a BBC model B. The same program can be used on a model A to write and save text.

```

140 MODE7
160 CLEAR: DIM T$(64), S(7)
170 PRINT CHR$(130); "WHAT IS THE STARTING PAGE NO"; INPUT, CH
180 PAN=1: S(6)=CH
190 PRINT CHR$(131); "MAX60, HOW MANY LINES PER PAGE"; INPUT, A
200 IF A>60 THEN 190
210 S(1)=A
220 IF A/2<>INT(A/2) THEN A=A+1
230 PRINT
240 PRINT CHR$(132); "MAX 74,
HOW MANY CHARACTERS PER LINE"; INPUT, S(2)
250 IF S(2)>74 THEN 240
260 INPUT "WHAT IS YOUR PRINTER BAUD RATE?
(DEFAULT PARALLEL)", S(3)
270 CLS: PRINT
290 PRINT TAB(6); CHR$(129); "TEXT (LINE) PROCESSING"
300 PRINT
310 PRINT "F0="; PRINT " PRINTER ";
320 PRINT "F1="; PRINT " TAPE ";
330 PRINT "F2="; PRINT " LAST LINE"
340 PRINT "F3="; PRINT " READ ";
350 PRINT "F4="; PRINT " ALTER ";
360 PRINT "F5="; PRINT " CENTRE"
370 PRINT "F6="; PRINT " NEW PAGE ";
380 PRINT "F7="; PRINT " INSTRUCT ";
400 PRINT
405 PRINT
410 FOR HH=1 TO 20: PRINT CHR$(133); CHR$(255); NEXT
420 PRINT TAB(3, 22); "0"
430 D=S(2): IF D<35 THEN E=1: GOTO 460
440 D=35: E=S(2): IF E>D THEN E=E-D: GOTO 460
450 E=1
460 G=10: PRINT CHR$(131); FOR F=0 TO D: PRINT "-"; NEXT F
470 PRINT TAB(0, 23); CHR$(131); "-"; FOR F=0 TO E: PRINT "-"; NEXT F
480 PRINT TAB(3, 22); CHR$(129); "1"
490 F=12
500 FOR R=1 TO INT(D/10): PRINT TAB(F, 22);
CHR$(129); G: G=G+10: F=F+10: NEXT

```

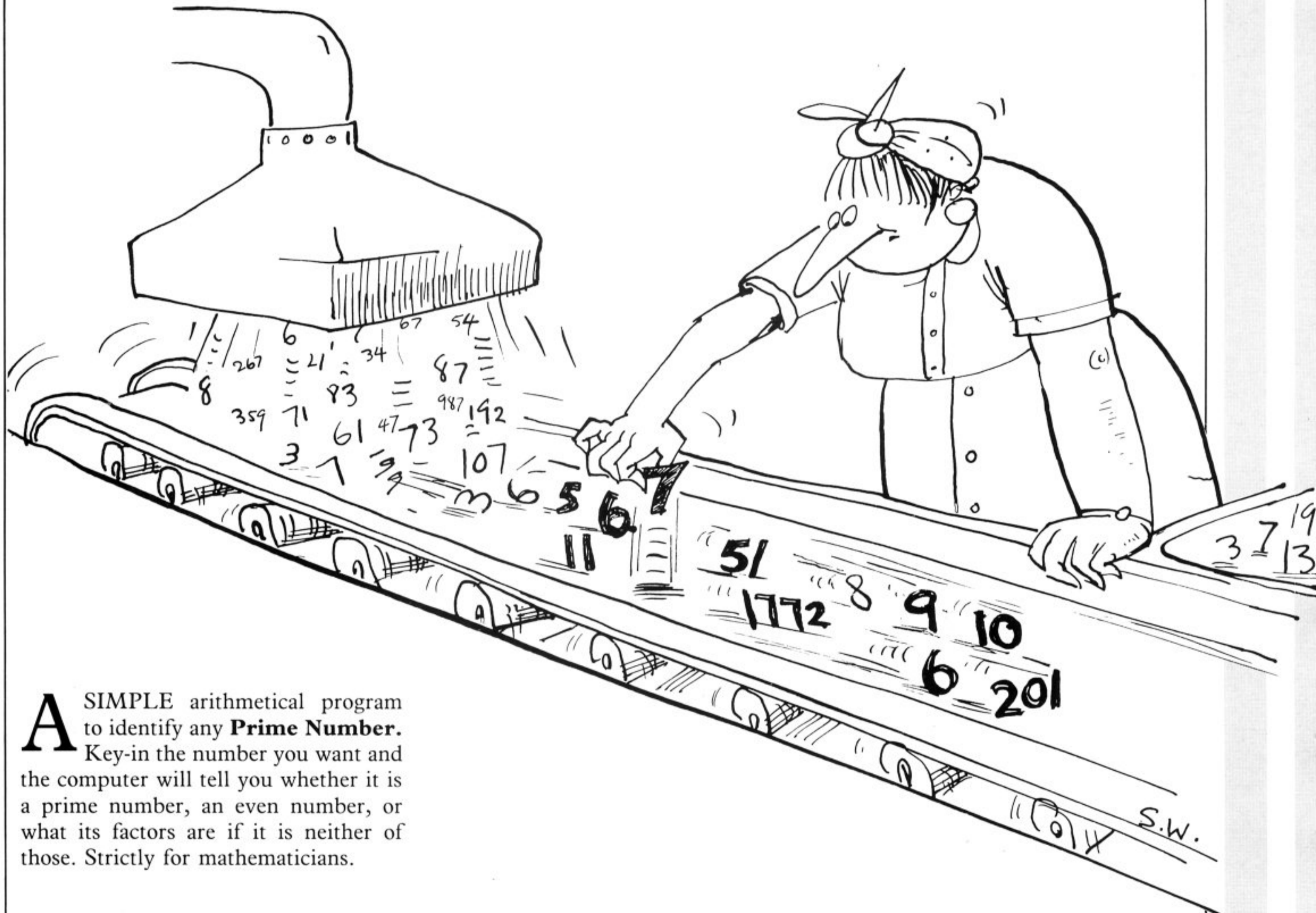
```

510VDU10,13
520IF E=1THEN540
530F=2:FORR=0TOINT(E/10):PRINTTAB(F,23):
CHR$(129);G:=G+10:F=F+10:NEXT
540VDU20,0,21,39,9
550REM DEFINE KEYS
560*KEY 0"PRINTER IM"
570*KEY 1"TAPE IM"
580*KEY 2"LAST IM"
590*KEY 3"LOOK IM"
600*KEY 4"ALTER IM"
610*KEY 5"CENTRE IM"
620*KEY 6"FRESH IM"
630*KEY 7"TELL IM"
640XZ=0
650L=L+1
660S(5)=L
670FOR R=1TO13:PRINT"":NEXT
680VDU15
690PRINT
700PRINT"PAGE "JCH" LINE "JL"
(PAGE=")S(1):" X "S(2):" LINES/CHAR.)"
710PRINT
720D=L-0:IFL<0THEN D=0
730 FOR R=D TO L-1
740PROCNO:PROCLINE:NEXTR
750REM ALTER ENTRY
760IF CH=PAN THEN 790
770PRINTTAB(7):" ** NEW PAGE NO"JCH"
STARTING **":PAN=CH :S(6)=CH
780PRINT
790R=L:VDU13:
800PROCNO:US=""
805 PRINTCHR$(130):
810I=INKEY(0):IFI=34THEN810
820IFI=-1THEN810
830IFI=13THEN800
840IF I=127 THEN PROCLESS:GOTO0670
850IF LEN(U$)=S(2)-4 THEN VDU7
860U$=U$+CHR$(I)
870PRINTCHR$(I):GOTO810
880IFU$="PRINTER "THEN1020
890IFU$="TAPE "THEN1340
900IFU$="LAST "THEN1300
910IFU$="LOOK "THEN1410
920IFU$="ALTER "THEN1520
930IFU$="CENTRE "THEN1630
940IFU$="FRESH "THEN1740
950IFU$="TELL "THEN1810
960T(L)=U$
970IFXZ=1THENXZ=0:L=S(5)+1:GOTO0670
980IF L=A THEN PROCFULL
990IFL>S(5)ORL=S(5)THENS(5)=L:L=L+1
1000PRINT
1010GOTO0790
1020REMPRINTER
1030PR=0
1040IFS(3)<19200THENPR=7
1050IFS(3)<9600THENPR=6
1060IFS(3)<4800THENPR=5
1070IFS(3)<2400THENPR=4
1080IFS(3)<1200THENPR=3
1090IFS(3)<300THENPR=2
1100IFS(3)<150THENPR=1
1110IFS(3)=0THEN1120EL9E1140
1120*FX5,1
1130GOTO1160
1140*FX5,2
1150*FX0,PR
1160PQ=0
1170PRINT
1180INPUT"HOW MANY COPIES WOULD YOU LIKE",QU
1190PRINT
1200INPUT"POSITION PAPER,ENTER WHEN READY PLEASE",QME
1210VDU2
1220FOR R=1 TO S(5)
1230 IF T(R)=" " THEN PRINT " "
1240PRINT T(R):NEXT
1250 GAP=65-S(5)
1260IF GAP>30THEN1200
1270 FOR SP=0 TO GAP:PRINT" ":NEXT
1280PQ=PQ+1
1290VDU3
1300PRINT:PRINT"PAGE "JCH" COPIES="J)PQ
1310IF NOT (QU=PQ)AND(GAP>30)THEN1200
1320 IF NOT (QU=PQ)AND(GAP<31)THEN1210
1330GOTO0670
1340REM TAPE
1350INPUTTAB(7):"DO YOU WISH TO LOAD",QU#
1360IF LEFT$(QU#,1)="Y"THENPROCFETCH:GOTO0670
1370PROCDITCH:GOTO0670
1380REM LAST LINE
1390IFT(S(5))=" "THENS(5)=S(5)-1:GOTO1390
1400 L=S(5)+1:GOTO0670
1410REM READ
1420R=0:PRINT
1430 N=INT((S(5)+4)/5)
1440FOR C=1 TO N
1450FOR K=1 TO 4
1460 R=R+1
1470PROCNO:PROCLINE
1480 NEXT K
1490PRINT"KEY=CONTINUE":GOS=GET#
1500NEXTC
1510GOTO0670
1520REM ALTER
1530INPUT"WHICH LINE",QU
1540ZY=0
1550IFQU>8THENZY=QU-8
1560FOR R=ZY TO QU
1570PROCNO
1580PROCLINE
1590NEXTR
1600I=0
1610XZ=1:GOTO0750
1620GOTO0670
1630REM CENTRE
1640INPUT"WHICH LINE",QU
1650AA=LEN(T$(QU))
1660AA=INT(AA/2)
1670VA=INT((S(2)/2)-AA)
1680U$=T$(QU)
1690FOR R=1 TO VA
1700U$=" "+U$
1710NEXTR
1720T$(QU)=U$
1730GOTO0670
1740REM NEW
1750FOR R=1 TO S(5)
1760T(R)=" "
1770NEXTR:YX=1
1780L=0
1790PAN=1:CH=S(6)+1
1800CLS:GOTO0520
1810REM INSTRUCT
1820PRINT:PRINT
1830PRINT"THIS PROGRAMME WILL ALLOW YOU TO"
1840PRINT"WRITE AND FILE, PAGES OF TEXT"
1850PRINT"EDITING CAN BE PERFORMED AS"
1860PRINT"IN THE USER GUIDE FOR THE BBC COMPUTER."
1870PRINT"'NEW' CLEARS ALL EXISTING TEXT"
1880PRINT"READY FOR A NEW PAGE."
1890PRINT"THE 'PAPER' IS AS WIDE AS THE GRID BELOW"
1900PRINT"AND IS ENDLESS."
1910PRINT"PRESS KEY TO CONTINUE"
1920GOS=GET#
1930YX=0
1940IFS(5)<2THENPAN=1:YX=1
1950GOTO0670
1960DEFPROCFETCH
1970PRINT"INSERT DATA TAPE,PRESS PLAY"
1980PRINT:INPUT"DO YOU WANT A SPECIAL FILE",DU#
1990IF DU#="YES"ORDU#="Y"THENPROCCHANGE:GOTO02020
2000INPUT"WHICH PAGE NUMBER DO WE WANT",QU
2010A$="PAGE"+STR$(QU)
2020ONERRORGOTO02130
2030B=OPENIN(A$)
2040FOR Y=1 TO 7
2050INPUTEB,S(Y)
2060NEXTY
2070FOR Y=1 TO S(5)
2080INPUTEB,T(Y)
2090NEXTY
2100L=S(5)+1
2110CLOSEEB
2120ENDPROC
2130REPORT
2140PRINT"SORRY ABOUT THAT TRY AGAIN?"
2150IF ERR=17THENEND
2160GOTO1970
2170DEFPROCDITCH
2180A$="PAGE"+STR$(S(6))
2190PRINT"I HAVE CALLED THIS FILE"
2200PRINT
2210PRINTTAB(6),A$
2220PRINT
2230INPUT"DO YOU WISH TO CHANGE THIS",QU#
2240A$="PAGE"+STR$(S(6))
2250IF LEFT$(QU#,1)="Y"THENPROCCHANGE
2260PRINT"INSERT DATA TAPE,SET FOR RECORDING."
2270INPUT"ENTER WHEN READY",ZZ
2280ONERROR GOTO 2300
2290B=OPENOUT(A$)
2300FOR Y=1 TO 7
2310 PRINTEB,S(Y)
2320NEXTY
2330FOR Y=1 TO S(5)
2340PRINTEB,T(Y)
2350NEXTY
2360CLOSEEB
2370ENDPROC
2380REPORT
2390PRINT"SOMETHING IS WRONG,RESET RECORDER"
2400IFERR=17THENEND
2410GOTO2270
2420DEFPROCCHANGE
2430INPUT"WHAT NAME WOULD YOU LIKE",D#
2440INPUT"WHAT REFERENCE NUMBER",X
2450S(6)=X
2460A$=D#+STR$(X)
2470ENDPROC
2480DEFPROCFULL
2490PRINT"MY MEMORY IS FULL, WE NEED TO SAVE"
2500PRINT"THIS PAGE, THEN START 'NEW'."
2510ENDPROC
2520DEFPROCNO
2530VDU15:@%=800000902
2540PRINT CHR$(129);R:" ":@%=2570
2550ENDPROC
2560DEFPROCLINE
2570PRINT:TAB(3):CHR$(130)T(R)
2580ENDPROC
2590DEFPROCLESS
2600XZ=LEN(U$)
2610U$=MID$(U$,1,(XZ-1))
2620ENDPROC

```



# PRIME NUMBERS



**A** SIMPLE arithmetical program to identify any **Prime Number**. Key-in the number you want and the computer will tell you whether it is a prime number, an even number, or what its factors are if it is neither of those. Strictly for mathematicians.

```

50 CLS
60 ON ERROR GOTO 80
70 PROCtitle
80 PROCcalculate
90 END
100
110
120
130
140
150 DEF PROCtitle
160 X$=CHR#132+CHR#157+CHR#135
170 PRINT'
180 PRINTX$+CHR#141"***** PRIME NUMBERS *****"
190 PRINTX$+CHR#141"***** PRIME NUMBERS *****"
200 PRINT
210 PRINT"This program enables you to find out if"
220 PRINT"a number is a prime number. When you"
230 PRINT"enter a WHOLE POSITIVE number there"
240 PRINT"will be one of three responses: even"
250 PRINT"number, non-prime odd number (shown by"
260 PRINT"its factors), and PRIME NUMBER. Because"
270 PRINT"you may wish to enter several similar"
280 PRINT"numbers in turn the screen will not"
290 PRINT"clear after each number and will scroll"
300 PRINT"if necessary. The largest number you"
310 PRINT"can enter is 2147483647."
320 ENDPROC
330

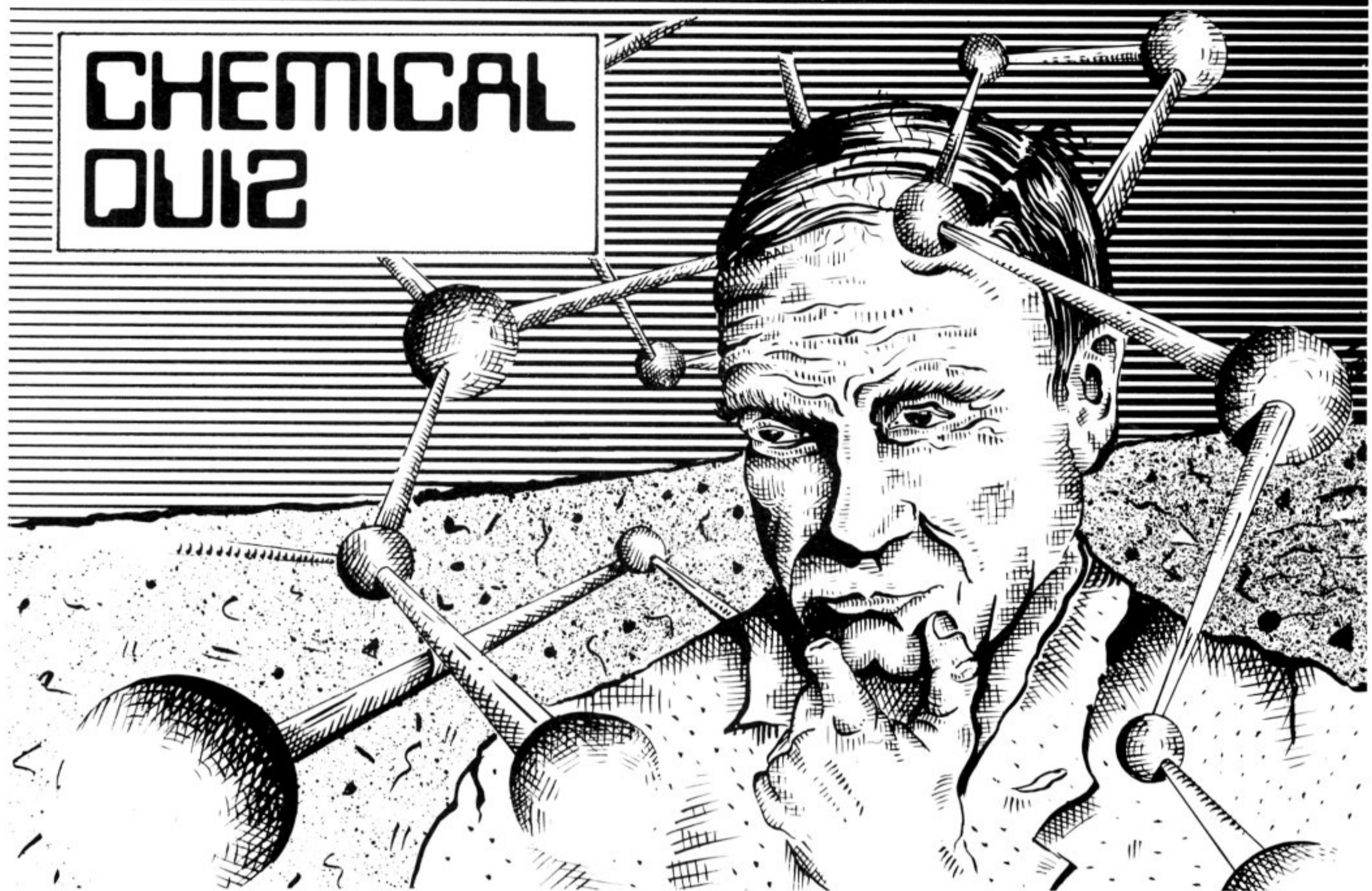
```

```

340
350
360
370
380 DEF PROCcalculate
390 REPEAT
400 PRINTX$:INPUT "Enter number : " N%
410 IF N%<1 THEN 400
420 IF N%=2 OR N%=3 THEN 510
430 IFN%/2=INT(N%/2) THEN PRINT" Even number"
440 IFN%/2=INT(N%/2) THEN 400
450 IFN%/2<>INT(N%/2) THEN 460
460 FORJ=3TOSQRN%+1 STEP 2
470 IFN%/J<>INT(N%/J) THEN 500
480 IFN%/J=INT(N%/J) THEN PRINTTAB(8)J;" x "N%/J;GOTO560
490 N%=N%/J
500 NEXTJ
510 PRINT CHR#136" PRIME NUMBER"
520 GOTO400
530 FORJ=3TOSQRN%+1 STEP 2
540 IFN%/J<>INT(N%/J) THEN 500
550 IFN%/J=INT(N%/J) THEN PRINTTAB(2)"The factors of the"
last multiplicand: PRINTTAB(8)J;" x "N%/J
560 N%=N%/J
570 GOTO530
580 NEXTJ
590 UNTIL FALSE
600 ENDPROC

```

# CHEMICAL QUIZ



**A**BSOLUTELY essential for chemistry students, **Chemical Quiz** tests your knowledge of elements. The computer will give you an element, such as hydrogen or tung-

sten, and you must type-in the symbol for it. You get two points for being correct first time, one for being correct at your second attempt.

If you still have not found it the

computer will give you the correct answer. Your score is given as a percentage at the end. A well-presented program which is fun to play as well as educational.

```

300N ERROR GOTO 60
40MODE 7
50PROCinitialise
60PROCtext
70REPEAT
80X=RND(84)
90IF element(X,0)=1 GOTO 80
100element(X,0)=1
110Questions=Questions+1
120Points=2
130REPEAT
140CLS
150PRINT'''TAB(11);CHR$(141);"CHEMICAL QUIZ"
160PRINT TAB(11);CHR$(141);"CHEMICAL QUIZ"
170PRINT TAB(12)"*****"
180PRINT'TAB(5);"DON'T FORGET TO ENTER FIRST"
190PRINT'TAB(7);"CHARACTER IN UPPER CASE"
200PRINT TAB(6,12);"QUESTIONS=";Questions-(Points-1)
210PRINT TAB(24,12);"SCORE=";Percent$e%;"%"
220PRINT TAB((17-LEN(element$(X,0)))/2,15);" ENTER SYMBOL FOR ";element$(X,0);
230INPUT " = " A$
240IF A$=element$(X,1) THEN PROCcorrect ELSE PROCwrong
250UNTIL Points=0
260A$=GET$
270UNTIL Questions=84
280PRINT' "
290PRINT'TAB(6);"WELL DONE YOU JUST COMPLETED"
300PRINT'TAB(11);"ALL THE ELEMENTS "
310PRINT'TAB(4);"WOULD YOU LIKE ANOTHER GO (Y/N)"
320PRINT' "
330A$=GET$
340IF A$="Y" OR A$="y" THEN RUN ELSE GOTO 330
350END

```

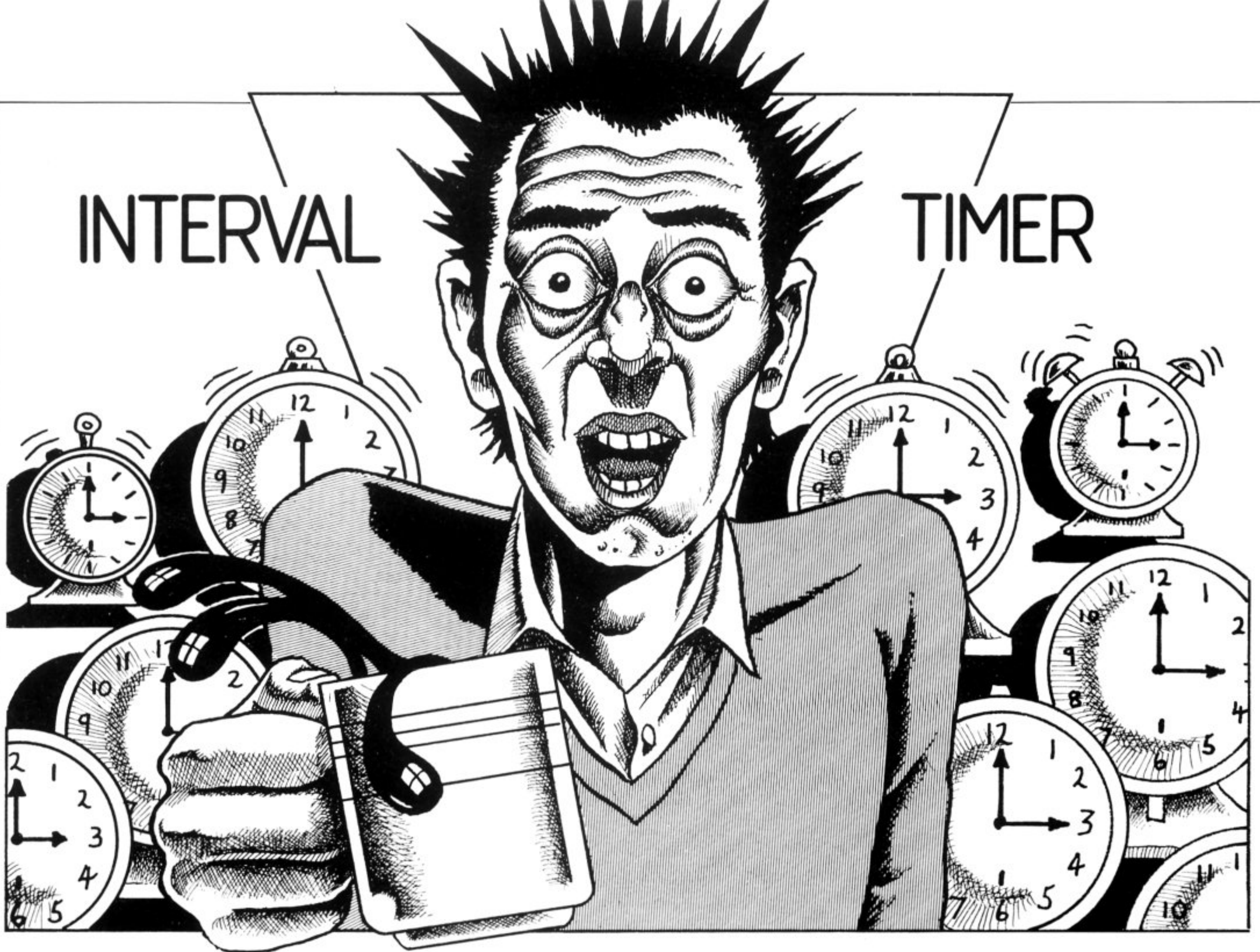
```

360DEF PROCinitialise
370VDU 23;8202;0;0;0
380IF 7&FFFE=164 THEN 7&D8=&30 ELSE 7&25A=&30
390Score%=0
400Questions=0
410Percentage%=0
420DIMelement$(90,2)
430DIMelement(90,0)
440FOR X=0 TO 84
450READ element$(X,0)
460READ element$(X,1)
470element(X,0)=0
480NEXT
490ENDPROC
500DEF PROCcorrect
510PRINT TAB(16);"CORRECT"
520PRINT TAB(4);"PRESS ANY KEY FOR NEXT QUESTION"
530PROCscore
540Points=0
550ENDPROC
560DEF PROCwrong
570Points=Points-1
580PRINT TAB(17);"WRONG"
590IF Points=0 THEN PROCanswer:PROCscore:ENDPROC
600PRINT TAB(9);"ONE MORE GUESS(Y/N)"
610A$=GET$
620IF A$="Y" OR A$="y" THEN ENDPROC ELSE IF A$="N" OR A$="n" Points=0:PROCanswer:PROCscore ELSE GOTO 610
630ENDPROC
640DEF PROCanswer
650PRINT TAB(14);"ANSWER= ";element$(X,1)
660PRINT TAB(4);"PRESS ANY KEY FOR NEXT QUESTION"
670ENDPROC
680DEF PROCscore
690Score%=Score%+Points
700Percentage%=(Score%/(Questions*2))*100
710PRINT TAB(6,12);"QUESTIONS=";Questions
720PRINT TAB(24,12);"SCORE=";Percentage%;"%
730ENDPROC
740DEF PROCtext
750CLS
760PRINT "" TAB(11);CHR$(141);"CHEMICAL QUIZ"
770PRINT TAB(11);CHR$(141);"CHEMICAL QUIZ"
780PRINT TAB(12)"*****"
790PRINT " The idea of the quiz is to go through all the elements."
800PRINT " You have two chances to answer."
810PRINT " The first scores 2, the second scores 1"
820PRINT " Be sure to enter the first character in upper case and the second i
n lower case"
830PRINT TAB(11);"e.g. Copper=Cu."
840PRINT TAB(7);"PRESS ANY KEY TO START"
850A$=GET$
860ENDPROC
870DATA Aluminium,Al,Antimony,Sb,Argon,A,Arsenic,As,Barium,Ba,Bismuth,Bi,Boron
,B,Bromine,Br
880DATA Cadmium,Cd,Caesium,Cs,Calcium,Ca,Carbon,C,Cerium,Ce,Chlorine,Cl,Chromi
um,Cr,Cobalt,Co,Columbium,Cb,Copper,Cu
890DATA Dysprosium,Dy,Erbium,Er,Europium,Eu,Flourine,F,Gadolinium,Gd,Gallium,
Ga,Germanium,Ge,Glucinum,Gl,Gold,Au
900DATA Hafnium,Hf,Helium,He,Holmium,Ho,Hydrogen,H,Indium,In,Iodine,I,Iridium,
Ir,Iron,Fe,Krypton,Kr
910DATA Lanthanum,La,Lead,Pb,Lithium,Li,Lutecium,Lu,Magnesium,Mg,Manganese,Mn,
Mercury,Hg,Molybdenum,Mo
920DATA Neodymium,Nd,Neon,Ne,Nickel,Ni,Niton (emanation),Nt,Nitrogen,N,Osmium,
Os,Oxygen,O
930DATA Palladium,Pd,Phosphorus,P,Platinum,Pt,Potassium,K,Praseodymium,Pr
940DATA Radium,Ra,Rhenium,Re,Rhodium,Rh,Rubidium,Rb,Ruthenium,Ru
950DATA Samarium,Sa,Scandium,Sc,Selenium,Se,Silicon,Si,Silver,Ag,Sodium,Na,Str
ontium,Sr,Sulphur,S
960DATA Tantalum,Ta,Tellurium,Te,Terbium,Tb,Thallium,Tl,Thorium,Th,Thulium,Tm,
Tin,Sn,Titanium,Ti,Tungsten,W
970DATA Uranium,U, Vanadium,V,Xenon,Xe,Ytterbium,Yb,Yttrium,Yt,Zinc,Zn,Zirconiu
m,Zr

```

# INTERVAL

# TIMER



**D**ESIGNED chiefly to help photographers with colour processing, **Interval Timer** is a useful program for anyone needing a precise timing mechanism. Besides the alarm, which you can set for the time you want, it provides a countdown facility — and a five-second delay period before the timer goes into action.

```

10 ONERROR start=0:GOTO220
20 REM *****
30 REM *      Title 'INTTIM'      *
40 REM *      Interval Timer     *
50 REM * With Count-down Warning *
60 REM * Sound varies in Pitch  *
70 REM *      each five seconds  *
80 REM *      during warning Period *
90 REM * Useful for Photographic *
100 REM *      Colour Processing  *
130 REM *
140 REM * BBC Micro Model A or B *
150 REM *****
160 CLS
170 start=0
180 PROCtitle
190 PRINTTAB(5,7);"Press";CHR(130);"SPACE";CHR(135);" - ";CHR(130);" for DETAILS"
200 PRINTTAB(5,9);"Press";CHR(130);"RETURN";CHR(135);"- ";CHR(130);" to continue"
210 A$=GET$:IFA$="" THENPROCdetail
220 CLS:N=0:W=0:TT=0:N1=0
230 PRINTTAB(0,20);"To";CHR(133);"REPEAT";CHR(135);"last sequence Press";CHR
(133);"RETURN";PRINTTAB(30,21);"-----"
240 PRINTTAB(5,22);"To";CHR(134);"CLEAR";CHR(135);"Press";CHR(134);"ESCAPE"
PRINTTAB(20,23);"-----"
250 PROCtitle
260 PRINTTAB(6,6);"LAST TIMING (Total)      "N1+W;"      "
270 PRINTTAB(6,7);"LAST COUNT-DOWN      "W;"      "
280 PRINTTAB(30,9);CHR(129);"CLOCK"
290 PRINTTAB(24,12);"      "PRINTTAB(22,13);"      "
300 PRINTTAB(0,12);
310 INPUT" TOTAL TIME SECONDS - "TT
320 REM * Disables REPEAT before first run *
330 IFTT=0ANDstart=0 THEN220

```

```

340 start=1
350 IFTT<1THENPRINTTAB(23,12);"REPEAT":TT=N1+W:GOTO390
360 INPUT" COUNT-DOWN SECONDS - "W
370 IFW>TT THEN290
380 N=TT-W
390 PRINTTAB(2,15);"TOTAL TIME = ";TT;" SECONDS ";TAB(12)" ( FROM '8 IGNAL' )"
400 N1=N:W1=W
410 REM * Delay after 'RETURN' *
420 TIME=0:REPEATUNTILTIME>500
430 SOUND1,-15,53,20
440 TIME=0:REPEATUNTILTIME>100
450 SOUND1,-15,101,2:SOUND2,-15,99,2
460 REM * Warns end of time *
470 SEC%=0:F=100:G=0
480 REM * Turn off cursor *
490 VDU23,1,0,0,0,0;REM (On OS 0.1 use VDU23,8202,0,0,0)
500 TIME=0
510 REPEAT
520 S%=SEC%
530 SEC%=TIME/100:MIN%=SEC%/60
540 IFSEC%>TT-W THEN IFSEC%=S%+1 PROCsnd
550 S%=SEC%-(MIN%*60)
560 PRINTTAB(31,11);MIN%;" " ;S%;" "
570 UNTILSEC%>TT-1
580 PROCwarn
590 GOTO250
600 DEFPROCwarn REM end of Process
610 TIME=0
620 ENVELOPE1,1,-26,-36,-45,255,255,255,127,0,0,-127,126,0
630 SOUND1,1,50,50
640 REPEATUNTILTIME>15
650 ENDPROC
660 DEFPROCdetail
670 CLS
680 PROCtitle
690 PRINT" This is a Program to assist in Photo"
700 PRINT" colour Processing or similar Processes"
710 PRINT" calling for very accurate timing to the"
720 PRINT" second."
730 PRINT" The timing required is entered in two"
740 PRINT" sections."
750 PRINT" (a) the TOTAL time required."
760 PRINT" (b) the COUNT-DOWN time (included in"
770 PRINT" the TOTAL) to the end of the Process."
780 PRINT" Section (b) produces timing 'beeps' at"
790 PRINT" one second intervals, the tone rising"
800 PRINT" every five seconds, as a COUNT-DOWN"
810 PRINT" indicator, terminated by a final warning"
820 PRINT" sound. (END of Process)"
830 PRINT" Press SHIFT for more details"
840 DL=INKEY(-1):FORPP=1TO100:NEXTPP
850 IFDL<>-1THEN840
860 CLS:PROCtitle
870 PRINT" After setting up the timings required"
880 PRINT" Pressing RETURN activates a five second"
890 PRINT" delay ending in a one second warning."
900 PRINT" The end of this warning marks the start"
910 PRINT" of the timing proper, leaving the"
920 PRINT" operator free to handle the Process."
930 PRINT" To repeat a timing sequence Press 'RETURN'"
940 PRINT" Press SHIFT to continue"
950 DL=INKEY(-1):FORPP=1TO100:NEXTPP
960 IFDL<>-1THEN950
970 ENDPROC
980 DEFPROCtitle
990 PRINTTAB(10,2);CHR$(131);CHR$(141);"INTERVAL TIMER"
1000 PRINTTAB(10,3);CHR$(132);CHR$(141);"INTERVAL TIMER"
1010 ENDPROC
1020 REM *** Countdown warning ***
1030 DEFPROCsnd
1040 SOUND1,-15,F,4
1050 G=G+1:IFG MOD5=0 THENF=F+12
1060 ENDPROC

```

# ALPHABET Jumble



```

10 DIM A$(31),X$(50)
20 MODE 7:M=0
30 PRINTTAB(13,1);CHR$(141);"ALPHABET"
40 PRINTTAB(13,2);CHR$(141);"ALPHABET"
50 PRINT"THIS IS THE GAME OF ALPHABET."
60 PRINT"THE OBJECT OF THE GAME IS TO REARRANGE THE LETTERS INTO ALPHABETICAL
L ORDER IN AS FEW MOVES AS POSSIBLE. YOU CAN MOVE ANY LETTER INTO ANY SPACE."
70 PRINT"PRINT" HIT ANY KEY TO CONTINUE"
80 W$=GET$:MODE 1:VDU 19,0,4,0,0,0:VDU 19,1,0,0,0,0
90 FOR I=1 TO 31:READA$(I):NEXT
100 DATA J,E,F,D,B, ,C,G,A,L,K, ,I,M,H,P,O, ,N,R,S,T,Q
110 DATA Z,V,U, ,Y,X,W
120 FOR I=1 TO 5:X$(I)=A$(I):NEXT
130 FOR I=7 TO 11:X$(I)=A$(I):NEXT
140 FOR I=13 TO 17:X$(I)=A$(I):NEXT
150 FOR I=19 TO 23:X$(I)=A$(I):NEXT
160 FOR I=25 TO 27:X$(I)=A$(I):NEXT
170 FOR I=29 TO 31:X$(I)=A$(I):NEXT
180 FOR I=6 TO 24 STEP 6:X$(I)=" ":NEXT
183 X$(28)=" "
185 FOR Q=1 TO 184:S=RND(30)+1:SA=RND(30)+1:X$(32)=X$(S):X$(S)=X$(SA):X$(SA)=X
$(32):NEXT
200 PRINTTAB(10,7)"THIS IS THE ALPHABET:"
210 PRINTTAB(5,12)"1234567890123456789012345678901"
220 PRINTTAB(5,11)" 1111111111222222222233"
225 COLOUR134:COLOUR1
230 FOR I=1 TO 31:PRINTTAB(I+4,15)X$(I):NEXT
240 PRINT"PRINT"
245 COLOUR132:COLOUR7
250 PRINTTAB(8,20)"ENTER YOUR MOVE (FROM/TO)"
260 PRINTTAB(8,21)"ENTER 50/50 TO RESTART"
270 INPUT F:PRINTTAB(8,25)" "
" ":PRINTTAB(8,23)"
":INPUT T
280 IF F=50 AND T=50 THEN RESTORE:M=0:CLS:GOTO 90
290 IF X$(T)<>" " THEN PRINTTAB(8,25)"TRY LANDING ON A SPACE THIS TIME":GOTO 24
0
300 X$(T)=X$(F)
310 X$(F)=" "
320 Q$=""
330 FOR I=1 TO 31
340 Q$=Q$+X$(I)
350 NEXT
360 PRINTTAB(10,7)"YOUR ALPHABET SO FAR:"
365 COLOUR134:COLOUR1
370 PRINTTAB(4,15);Q$
375 COLOUR132:COLOUR7
376 PRINTTAB(4,15);" "
380 M=M+1
390 M$=" ABCDEFGHIJKLMNOPQRSTUVWXYZ "
400 IF Q$=M$ THEN 420
410 GOTO 240
420 CLS:PRINT:PRINT"FANTASTIC!!"
430 PRINT"YOU'VE LEARNED THE ALPHABET !!"
440 IF M<50 THEN PRINT"AND IT ONLY TOOK ";M;"MOVES":GOTO 460
450 IF M>50 THEN PRINT"AND IT DID TAKE YOU A TOTAL OF ";M;"MOVES"
460 PRINT" "
" ";PRINT"ARE YOU READY TO BE
AT YOUR LAST RECORD NOW ?
470 R$=GET$
480 IF R$="Y" THEN RESTORE:M=0:CLS:GOTO 90
490 PRINT
500 PRINT"YOU WANT TO POLISH UP ON THE ALPHABET WITH A PENCIL AND PAPER, RIG
HT?"
510 END

```

THE LETTERS of the alphabet are jumbled. The object of **Alphabet Jumble** is to re-assemble them in the correct order. Letters are numbered and can be moved one at a time or in blocks into the empty spaces. The cursor gives you two lines; the top one is for the letter or letters you wish to move, the bottom line for the position to which you want to move them.

# TABLES

IF YOU do not know your multiplication tables, **Tables** will put them at your fingertips. You can choose any table from one to 12, or even multiply by 17.125 if you wish. A useful program not only for those who were not paying attention in class but for computer novices wanting to learn about simple programming structures.



```

10MODE7
20REM"MULTIPLICATION TABLES"
50PRINT'
60REM"PRINT HEADING"
70VDU129;141;:PRINT;:PRINTTAB(6);"MULTIPLICATION TABLES"
80VDU129;141;:PRINT;TAB(6);"MULTIPLICATION TABLES"
90PRINTSTRING$(19,"*")
100REM"GET THE USERS CHOICE"
110VDU20,0,23,39,8
120PRINT'
130PRINTTAB(4);:INPUT"WHICH TABLE WOULD YOU LIKE",V
140PRINT''
150REM"DO THE CALCULATION"
160 FOR I= 1 TO 12
170 PRINT"",I,"X ";V;"= ";I*V
180NEXT I
190GOTO130
    
```

# REACT



IF YOU do not know your typewriter keyboard, you will after you have played **React** a few times. A letter appears on the screen and you must hit the same key as quickly as possible — remember to use shift. The computer gives your score and also your time at the end of 20 attempts.

It is not so easy as it sounds, even for experienced typists, because of the fluster element involved.

```

40MODE 7
50PRINT'
60PRINT"THIS IS A REACTION TEST, WHICH WILL"
70PRINT"IMPROVE YOUR TYPING SKILLS."
80PRINT"A LARGE LETTER WILL APPEAR AT THE"
90PRINT"CENTRE OF THE SCREEN AND WHEN YOU"
100PRINT"SEE IT, PRESS THAT KEY."
110PRINT
120PRINT"YOUR SCORE AFTER 20 TRIES WILL BE"
130PRINT"DISPLAYED AT THE BOTTOM OF THE SCREEN."
140PRINT
150INPUT"ARE YOU READY",A#
160 TIME = 0
170 C=0
180D=0
190REPEAT
200 T%=TIME
210 L=RND(26)+64
220PRINT TAB(14,16);CHR$(141);CHR$(129);CHR$(L)
230PRINT TAB(14,17);CHR$(141);CHR$(129);CHR$(L)
240 IF INKEY$(1)<>CHR$(L) THEN 240
250 D=D+TIME-T%
260 C=C+1
270 UNTIL C=20
280PRINT
290PRINT"YOUR REACTION TIME IS "
300PRINTD/2000;"SECONDS PER WORD"
310PRINT
320 INPUT"ANOTHER GO",ans#
330 IF LEFT$(ans#,1)="Y"THEN 40 ELSE END
    
```

```

10REM /// MAP GAME PROG 1 ///
20MODE1
30VDU23,1,0;0;0;0;
40VDU19,1,2,0,0,0
50VDU19,2,6,0,0,0
60VDU19,3,3,0,0,0
70COLOUR130
80CLS
90GCOLOR,1
100FOR I%=0TO190
110READ X%,X1%,Y%
120MOVE X%,Y%
130DRAW X1%,Y%
140MOVE X%,Y%+4
150DRAW X1%,Y%+4
160NEXT
170COLOUR128
180VDU21
190CHAIN"MPROG2"
200DATA4,4,1016,608,620,1016,608,628,1008
210DATA608,628,1000,624,628,992,472,484,976
220DATA528,596,976,472,596,968,472,588,960
230DATA408,420,952,472,588,952,392,420,944
240DATA448,580,944,392,420,936,456,580,936
250DATA384,420,928,456,556,928,384,404,920
260DATA456,548,920,384,396,912,472,540,912
270DATA424,516,904,368,380,896,432,540,896
280DATA368,380,888,432,540,888,560,572,888
290DATA600,652,888,368,372,880,392,412,880
300DATA424,660,880,392,412,872,424,660,872
310DATA400,412,864,424,652,864,408,420,856
320DATA440,652,856,440,652,848,440,644,840
330DATA416,644,832,416,636,824,424,636,816
340DATA432,636,808,424,620,800,416,612,792
350DATA408,428,784,440,612,784,440,604,776
360DATA440,604,768,432,604,760,432,556,752
370DATA432,604,744,432,628,736,432,436,728
380DATA480,628,728,472,636,720,472,644,712
390DATA480,652,704,472,652,696,472,660,688
400DATA320,348,680,464,668,680,272,348,672
410DATA376,388,672,464,668,672,272,396,664
420DATA464,668,664,264,404,656,456,676,656
430DATA272,364,648,384,404,648,456,676,648
440DATA248,412,640,456,676,640,248,420,632
450DATA464,524,632,544,684,632,272,428,624
460DATA456,460,624,480,500,624,512,524,624
470DATA544,700,624,264,428,616,456,468,616
480DATA496,500,616,536,708,616,256,428,608
490DATA536,732,608,216,220,600,232,428,600
500DATA496,508,600,536,732,600,176,420,592
510DATA480,508,592,544,740,592,176,404,584
520DATA552,748,584,176,404,576,560,756,576
530DATA184,380,568,584,772,568,176,380,560
540DATA576,780,560,168,380,552,568,764,552
550DATA168,380,544,568,772,544,160,388,536
560DATA568,772,536,160,396,528,568,780,528
570DATA176,396,520,472,484,520,568,780,520
580DATA176,396,512,464,492,512,520,564,512
590DATA576,780,512,216,388,504,480,764,504
600DATA208,396,496,480,748,496,784,820,496
610DATA192,396,488,472,764,488,784,836,488
620DATA192,396,480,464,844,480,192,396,472
630DATA456,484,472,496,852,472,200,396,464
640DATA456,460,464,504,852,464,224,388,456
650DATA496,860,456,184,380,448,496,860,448
660DATA168,372,440,488,860,440,152,364,432
670DATA488,860,432,136,372,424,480,852,424
680DATA160,372,416,472,844,416,144,308,408
690DATA456,844,408,144,292,400,432,836,400
700DATA144,284,392,416,836,392,168,268,384
710DATA408,828,384,168,252,376,424,804,376
720DATA152,244,368,424,428,368,472,804,368
730DATA176,212,360,472,484,360,496,756,360
740DATA520,524,352,536,556,352,568,852,352
750DATA560,852,344,552,844,336,488,492,328
760DATA512,844,328,480,836,320,448,468,312
770DATA480,828,312,440,820,304,440,796,296
780DATA432,780,288,424,652,280,416,540,272
790DATA592,636,272,656,692,272,408,532,264

```

SO YOU think you know your map of Britain? This educational and entertaining quiz will tell you how good your geography is. The computer will give you a place name and you must try to move the cursor to its correct location on the map. When you have done that, the computer will give you a new place to identify. Only very accurate answers will be accepted.

The program is in two parts. Load part one, then when the map appears, load part two. Be sure to save both programs before you run them.



```

800DATA600,612,264,672,684,264,392,532,256
810DATA384,444,248,488,532,248,368,436,240
820DATA504,524,240,368,436,232,360,388,224
830DATA400,420,224,400,420,216

```

```

10REM /// MAP GAME PROG 2 ///
20ON ERROR GOTO 580
30DIM W%(99)
40VDU19,3,3,0,0,0
50VDU6

```



# MAP GAME

```
60PRINT TAB(24,2) " * MAP GAME * "
70REPEAT
80I%=-1
90REPEAT
100F=0
110G0=0
120X1=640
130Y1=512
140I%=I%+1
150IF I%>99 THEN GOTO 420
160READ A$,H%,V%
170IF W%(I%)<>0 THEN GOTO 140
180VDU4
190VDU28,0,31,39,26
200VDU12
210PRINT TAB(7,0)"Using the cursor keys, find"
220PRINT TAB(0,2)"[ ";I%+1;" ]"
230PRINT TAB(8,2)SPC(27);
240PRINT TAB(18-(LEN(A$)/2),2)"* ";A$;" *"
250PRINT TAB(0,4)"Press 'F' when you think you've found it";
260VDU5
270GCOL4,0
280REPEAT
290MOVEX1,Y1:PRINT"X"
300FOR W=0TO100
310NEXT
320MOVEX1,Y1:PRINT"X"
330*FX21,0
340IF INKEY(-58) AND Y1<1024 THEN Y1=Y1+10
350IF INKEY(-42) AND Y1>210 THEN Y1=Y1-10
360IF INKEY(-26) AND X1>0 THEN X1=X1-10
370IF INKEY(-122) AND X1<1260 THEN X1=X1+10
380IF INKEY(-68) AND F=0 THEN SOUND&11,-12,1,2:FOR W=0 TO 200:NEXT:G0=G0+1
390IF INKEY(-68) AND X1>H%*10-20 AND X1<H%*10 AND Y1>V%*10 AND Y1<V%*10+24 THE
N SOUND&11,-15,180,15:F=1:W%(I%)=85
400UNTIL F=1 OR G0>3
410IF G0<4 AND F=1 THEN GCOL0,4:MOVEH%*10-5,V%*10+18:PRINT"X"
420UNTIL I%>98
430RESTORE
440S%=0
450FOR I=0TO99
460IF W%(I)=0 THEN S%=S%+1
470NEXT
480VDU4
490VDU23,1,0;0;0;0;
500CLS
510IF S%=0 THEN PRINT TAB(4,3)" ALL CORRECT - WELL DONE!!":END
520PRINT TAB(4,1)" You will now be tested on"
530PRINT TAB(6,3)" the ";S%;" you got wrong!"
540T=TIME
550REPEAT UNTIL TIME>T+1000
560RESTORE
570UNTIL FALSE
580ON ERROR OFF
590MODE 7
600REPORT
610PRINT" @ line ";ERL
620END
630DATA Plymouth,47,25,Torquay,52,26,Bournemouth,63,27,Portsmouth,69,28,Southam
pton,67,30,Brighton,74,29,Bristol,58,34,Reading,70,35,London,74,36,Southend-on-S
ea,80,37
640DATA Ipswich,82,41,Norwich,82,47,Birmingham,62,44,Coventry,63,43,Cardiff,54,
35,Oxford,68,37,Cambridge,75,42,Swansea,49,36,Liverpool,58,52,Dover,84,33,Landse
nd,36,23
650DATA Truro,42,24,Ramsgate,84,35,Baltimore,18,37,Galway,22,51,Wexford,36,43,P
embroke,43,38,Whitehaven,53,61,Weymouth,60,27,Bridlington,74,59,Lancaster,59,57,
Isle of Skye,40,87,Eastbourne,78,29,Boston,74,48,Kings Lynn,77,48
660DATA Nottingham,68,49,Aberystwyth,49,43,Stoke-on-Trent,63,49,Manchester,61,5
2,Leeds,66,55,Teeside,70,61,Newcastle-upon-Tyne,66,65,Carlisle,55,63,Peterhead,6
5,88
670DATA Edinburgh,57,74,Glasgow,50,73,Dundee,59,77,Aberdeen,64,84,Inverness,54,
87,Wick,58,95,Dumfries,52,64,Ayr,47,68,Blackpool,57,54,Wrexham,57,49,Hereford,58
,40,Bridgwater,54,32,Exeter,53,27
680DATA Cheltenham,61,39,Luton,74,37,Holyhead,47,51,Isle of Man,49,59,Orkney Is
lands,61,100,Isle of Lewis,40,93,Isle of White,67,27,Kingston upon Hull,75,56
690DATA Clacton,81,39,Barrow-in-Furness,57,58,Kilmarnock,48,70,Oban,44,78,Durnes
s,48,97,Thurso,56,98,John o'Groats,59,98,Stirling,53,75,Ben Nevis,46,82,Berwick-
upon-Tweed,64,71
700DATA Blyth,66,66,Darlington,67,61,Skegness,78,52,Mansfield,68,51,Lincoln,72,
52,Northampton,69,45,Salisbury,63,32,Tunbridge Wells,76,32,Athlone,28,52,Tippera
ry,28,44,Donegal,27,63,Dundalk,38,57,Merthyr Tydfil,53,38
710DATA Lizard point,41,21,Start point,52,24,Newquay,40,26,Bude,44,29,Barnstapl
e,49,32,Cardigan,45,40,Pwllheli,47,47,Belfast,39,64,Dublin,38,50,Cork,22,38,Lime
rick,24,45,Waterford,33,41
```

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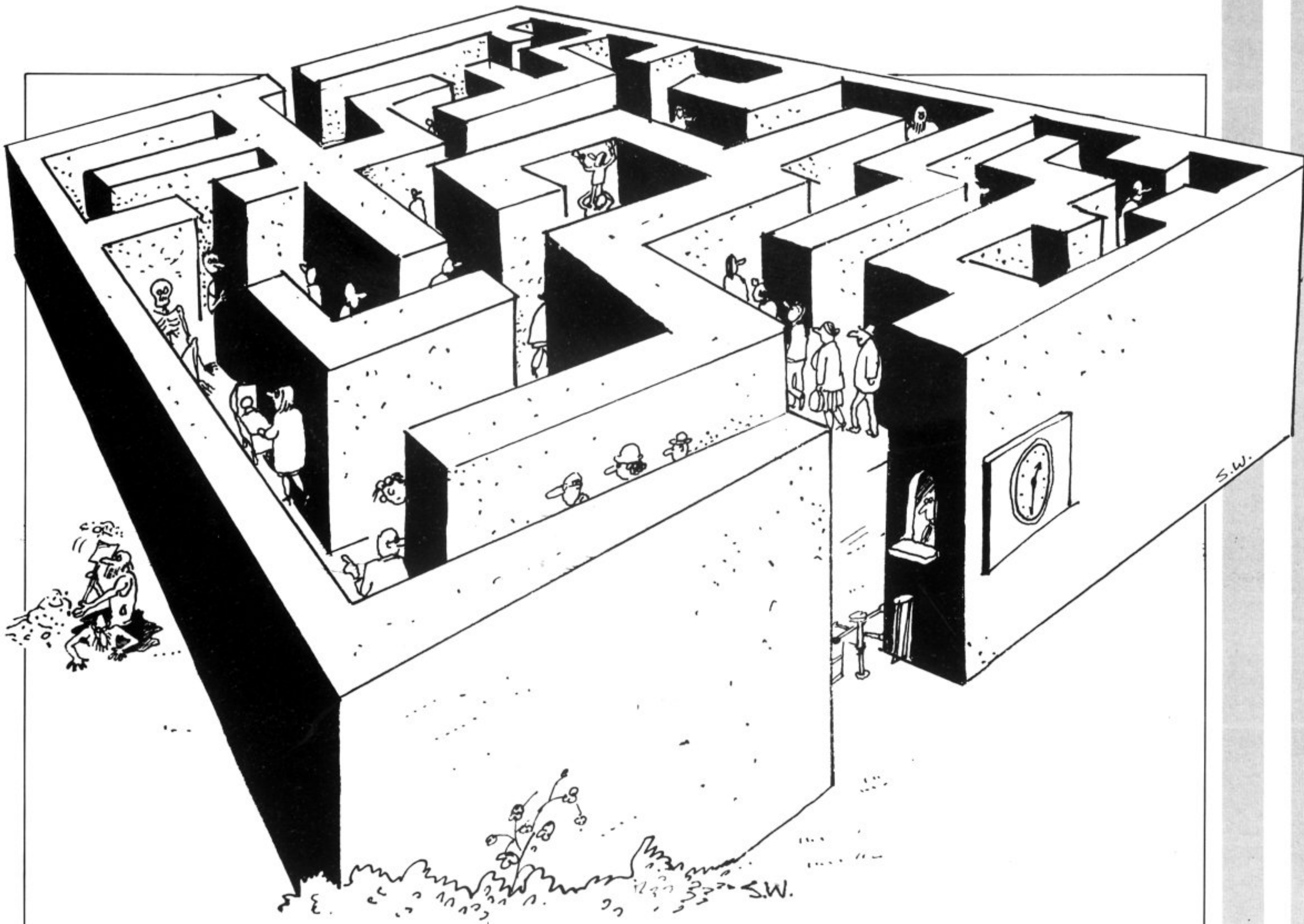
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# MAZE

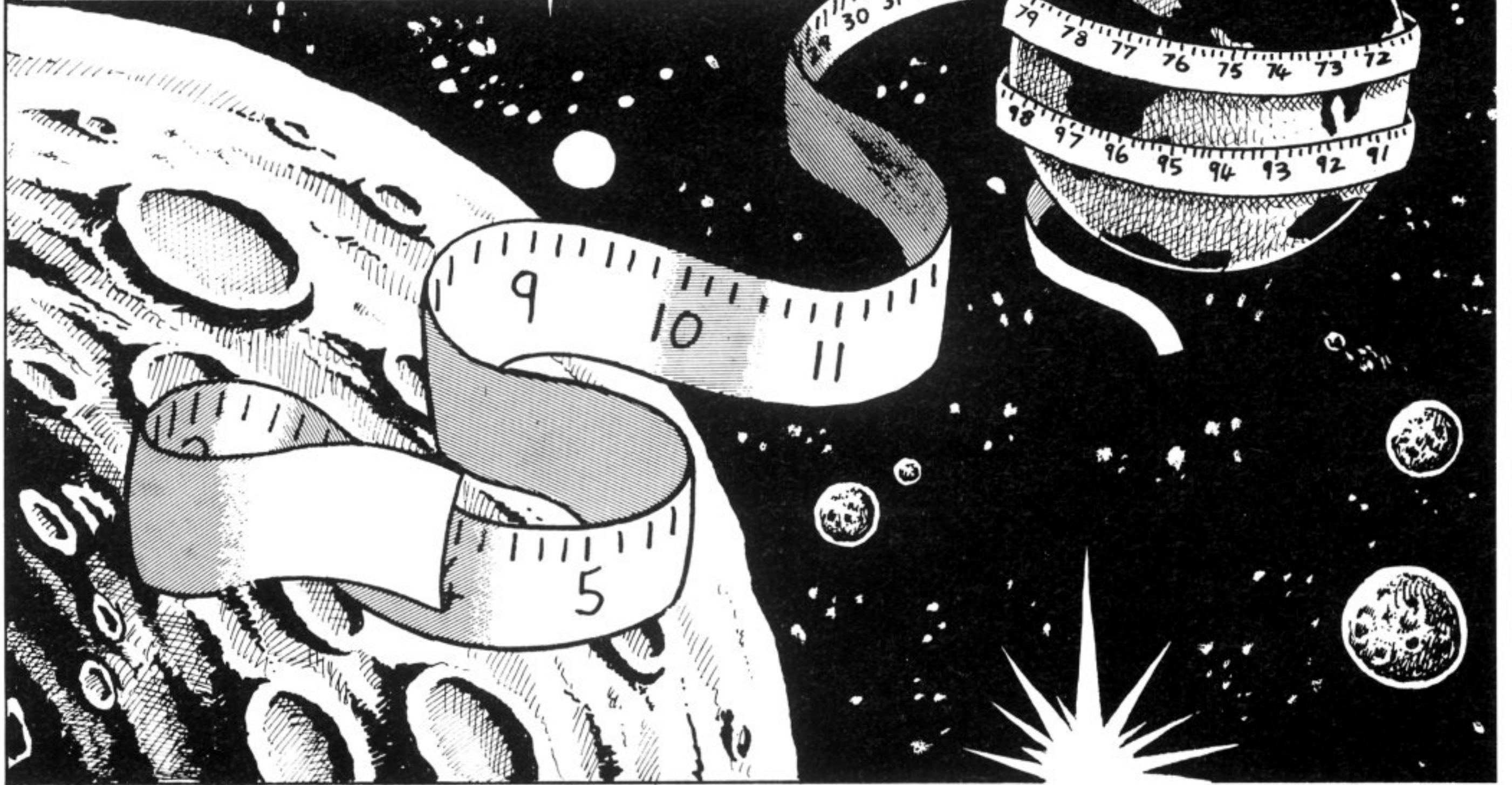
HERE IS another variation on the familiar **Maze** theme. This time the maze consists of gaps in a series of vertical stripes and your aim is to move a star through the gaps from the left-hand side of the screen to the right. That sounds simple enough but the catch is that the gaps move about and you will need to be alert to keep up with them. You will be working against the clock, too, and trying to improve your time will add to the excitement of this well-thought-out and addictive game.

```

30 DIM SP(40)
40 MODE 1: A=0: BL=4
50 VDU23,225,255,255,255,255,255,255
60 MODE 7: PRINTTAB(9,2):CHR#141:CHR#130:"*** BAR MAZE ***"
70 PRINTTAB(9,3):CHR#141:CHR#130:"*** BAR MAZE ***"
80 PRINT:PRINT"YOU MUST GET THE '*' FROM THE LEFT, TO"
90 PRINT"TO THE RIGHT OF THE SCREEN THROUGH THE"
100 PRINT"GAPS IN THE BARS (WHICH MOVE)"
110 PRINT:PRINT:PRINTCHR#134:"KEYS"
120PRINTCHR#133"-----"
130 PRINT:PRINT:PRINT"      - MOVES UP"
140 PRINT:PRINT"      / - MOVES DOWN"
150 PRINT:PRINT"      \ - MOVES LEFT"
160 PRINT:PRINT:PRINTCHR#129:" PRESS ANY KEY TO CONTINUE"
170 E$=GET$:MODE1:VDU23:8202:0:0:0:
180 VDU19,1,6,0,0,0
190 FOR Q=4 TO 38 STEP 2
200 FOR R=5 TO 38
210 COLOUR 1
220 PRINTTAB(Q,R):CHR#225
230 NEXT R
240 S=RND(23)+6
250 SP(Q)=S
260 PRINTTAB(Q,S):CHR#32
270 NEXT Q
280 H=3:V=RND(23)+6:HA=2:VA=12
290 TIME=0:COLOUR 3:PRINTTAB(15,2):"TIME = "
300 COLOUR 1
310 M$=INKEY(0)
320 TM=TIME:PRINTTAB(22,2):TM/100
330 IF H=39 THEN 560
340 PROCHECK(H,V,M$)
350 IF M$="X" AND A=1 THEN H=H+2:PRINTTAB(HA,VA)" "
360 IF M$="." AND A=1 THEN V=V-1:PRINTTAB(HA,VA)" "
370 IF M$="/" AND A=1 THEN V=V+1:PRINTTAB(HA,VA)" "
380 COLOUR 2
390 PRINTTAB(H,V):"*"
400 COLOUR 1
410 HA=H:VA=V
420 RA=(RND(19)*2)+2
430 PRINTTAB(RA,SP(RA)):CHR#225
440 SP(RA)=RND(23)+6
450 PRINTTAB(RA,SP(RA)):CHR#32
460 A=0
470 GOTO 310
480 DEFPROCHECK(H,V,M$)
490 X=((H*32)+48)
500 Y=ABS((32-V)*32)-16
510 COL=POINT(X,Y)
520 IF COL=0 AND M$="V" THEN A=1
530 IF V<30 AND M$="/" THEN A=1
540 IF V>5 AND M$="." THEN A=1
550 ENDPROC
560 MODE 7
570 TB=TM/100
580 PRINTTAB(5,12):CHR#141:CHR#134:"MADE IT IN ":TB:" SECONDS"
590 PRINTTAB(5,13):CHR#141:CHR#134:"MADE IT IN ":TB:" SECONDS"
600 PRINTTAB(4,15):"WOULD YOU LIKE ANOTHER GO (Y/N)?"
610 D$=GET$:IF D$="Y" THEN GOTO 40
620 CLS:END

```

# ORBITS



SEE THE ORBITS of the earth and the moon in a clear visual demonstration. If you enter different data and coordination, you can create solar destruction, no less. The program uses high-resolution graphics.

```

100N ERROR GOTO 910
20MODE4:FX4,1
40PRINT"INPUT SPACE SHIPS INITIAL CONDITIONS"
50PRINT"DISTANCES: X Earth-Ship and Y Earth-Ship"SPC(11)"in Mm (10^6 meter)"
60PRINT"VELOCITIES: V in X direction of Ship and"SPC(12)"V in Y direction of
Ship in"SPC(12)"km/s (kilometer per second)"
70PRINT"e.g. for a lunar orbit, the space ships'"initial conditions could be:"
80PRINT"XES=0 Mm, YES=320 Mm"VXS=-1 km/s, VYS=0 km/s"
90PRINT"LATER, try changing the mass of the Moon to that of the Earth and sim-
ulate a binary star system"
100PRINT"INITIAL CONDITIONS FOR THRUST"
110PRINTTAB(2,29)"SPACE BAR to clear screen and turn off thrust"
120PRINTTAB(2,20)"XES= Mm"SPC(11)"Use arrowed"
130PRINTTAB(2,22)"YES= Mm"SPC(11)"EDIT keys"
140PRINTTAB(2,24)"VXS= Km/s"SPC(9)"once ON"
150PRINTTAB(2,26)"VYS= Km/s"SPC(9)"twice OFF"
160INPUTTAB(7,20)XES
170INPUTTAB(7,22)YES
180INPUTTAB(7,24)VXS:VXS=VXS*10^-3
190INPUTTAB(7,26)VYS:VYS=VYS*10^-3
200RES=(XES^2+YES^2)^.5
210VDU 5,29,640,512,10,3,1
220 REM Mass of Moon and Earth
230MM=73.4:ME=5980
240 REM in kg*10^21
250 DT=2000:REM step time in seconds
260 REM Moons initial conditions
270XM=0:YM=384:VXM=0:VYM=-1.02*10^-3
280RM=384:RMS=((XES-XM)^2+(YES-YM)^2)^.5
290PROCSCREEN
300REPEAT
310PROCTHRUST
320XD=XM:YD=YM
330PROCCALC
340PROCMOON(XD,YD)
350PROCMOON(XM,YM)
360PLOT70,XES,YES
370UNTIL RES>800
380GOTO 910
390 DEFPROCSCREEN
400FX=0:FY=0
410CLG
420MOVE -16,16
430VDU 8,4F
440PROCMOON(XM,YM)
450PLOT70,XES,YES
460ENDPROC
470 DEFPROCMOON(XM,YM)
480MOVE XM-16,YM+16
490VDU 8,4F
500ENDPROC
510 DEFPROCCALC
520FOR NX=1 TO 10
530ST=6.67*10^-8*ME/RM^3
540AXM=ST*XM
550AYM=ST*YM
560VXM=VXM-AXM*DT
570VYM=VYM-AYM*DT
580XM=XM+VXM*DT
590YM=YM+VYM*DT
600RM=(XM^2+YM^2)^.5
610STE=ST*RM^3/RES^3
620STM=6.67*10^-8*MM/RMS^3
630XMS=XES-XM:YMS=YES-YM
640AXS=STE*XMS+STM*XMS+FX*10^-9
650AYS=STE*YMS+STM*YMS+FY*10^-9
660VXS=VXS-AXS*DT
670VYS=VYS-AYS*DT
680XES=XES+VXS*DT
690YES=YES+VYS*DT
700RMS=(XMS^2+YMS^2)^.5
710RES=(XES^2+YES^2)^.5
720NEXT
730ENDPROC
740 DEFPROCTHRUST
750Z=INKEY(0):FX15,1
770IF Z=-1 ENDPROC
780IF Z=32 PROCSCREEN:ENDPROC
790IF Z<&88 OR Z>&88 ENDPROC
800VDU 4
810Z=Z-&87
820N Z GOTO 830,850,870,890
830IF FX<2 FX=2:VDU 31,1,1,&3C ELSE FX=0:VDU 31,1,1,32
840GOTO 900
850IF FX>-2 FX=-2:VDU 31,1,1,&3E ELSEFX=0:VDU 31,1,1,32
860GOTO 900
870 IF FY<2 FY=2:VDU 31,1,2,&76 ELSE FY=0:VDU 31,1,2,32
880GOTO 900
890IF FY>-2 FY=-2:VDU 31,1,2,&5E ELSE FY=0:VDU 31,1,2,32
900VDU 5:ENDPROC
910*FX4,0
920VDU4:STOP

```

# MORTGAGE



```

100N ERROR GOTO 540
20MODE 7
30@%=&20209
40REPEAT
50PROCmenu
60A@=GET#
70IF A@="1" PROCmonthlyPayment
80IF A@="2" PROCterm
90UNTIL FALSE
100END
110DEF PROCinPut
120PRINT TAB(10);CHR*(141);"ENTER DETAILS"
130PRINT TAB(10);CHR*(141);"ENTER DETAILS"
140PRINT TAB(10);"*****"
150PRINT TAB(8);"<THEN PRESS RETURN>"
160ENDPROC
170DEF PROCmenu
180CLS
190PRINT TAB(10);CHR*(141);"MORTGAGE & FINANCE"
200PRINT TAB(10);CHR*(141);"MORTGAGE & FINANCE"
210PRINT TAB(10);"*****"
220PRINT "KNOWN          FIND          KEY"
230PRINT "-----          ----          ---"
240PRINT "Principal," "Interest," "Monthly" "Term" "Paym
ent" "1"
250PRINT "Principal," "Interest," "Monthly Payment" "Term" "2"
260PRINT "" TAB(7);"PRESS KEY NUMBER REQUIRED"
270ENDPROC
280DEF PROCmonthlyPayment
290CLS
300PROCinPut
310INPUT "" TERM IN YEARS="term
320INPUT "" INTEREST RATE="interest
330INPUT "" PRINCIPAL BORROWED=#"Principal
340interest=interest/100
350monthlyPayment=(1/((1-((1/EXP((LN(interest+1))*term))-1)/interest)/Principal
^12
360PRINT "" MONTHLY PAYMENT=#";monthlyPayment
370interest=interest*0.7
380PRINT "" MONTHLY PAYMENT UNDER MIRAS=#";(1/((1-((1/EXP((LN(interest+1))*term)
)-1)/interest)/Principal))/12
390PRINT "" PRESS ANY KEY TO RETURN TO MENU"
400@=GET#
410ENDPROC
420DEF PROCterm
430CLS
440PROCinPut
450INPUT "" INTEREST RATE="interest
460INPUT "" PRINCIPAL BORROWED=#"Principal
470INPUT "" GROSS MONTHLY PAYMENT=#"monthlyPayment
480interest=interest/100
490 term=(LN(1/(((((interest*Principal)/monthlyPayment)/12)-1))))/LN(interest
+1)
500PRINT "" TERM=";term
510PRINT "" PRESS ANY KEY TO RETURN TO MENU"
520@=GET#
530ENDPROC
540IF ERR=22 PRINT "" PAYMENT TO LOW" PRINT "" PRESS ANY KEY TO RETURN TO MENU
" ;A@=GET#;GOTO 20
550GOTO 20

```

A SIMPLE program to work out your monthly payments on a **Mortgage** or, alternatively, the term, principal or interest rate. Key-in any of those three factors and you will be given the fourth. The program will also calculate payments under the Government MIRAS scheme.



# BEEBUG FOR THE BBC MICRO

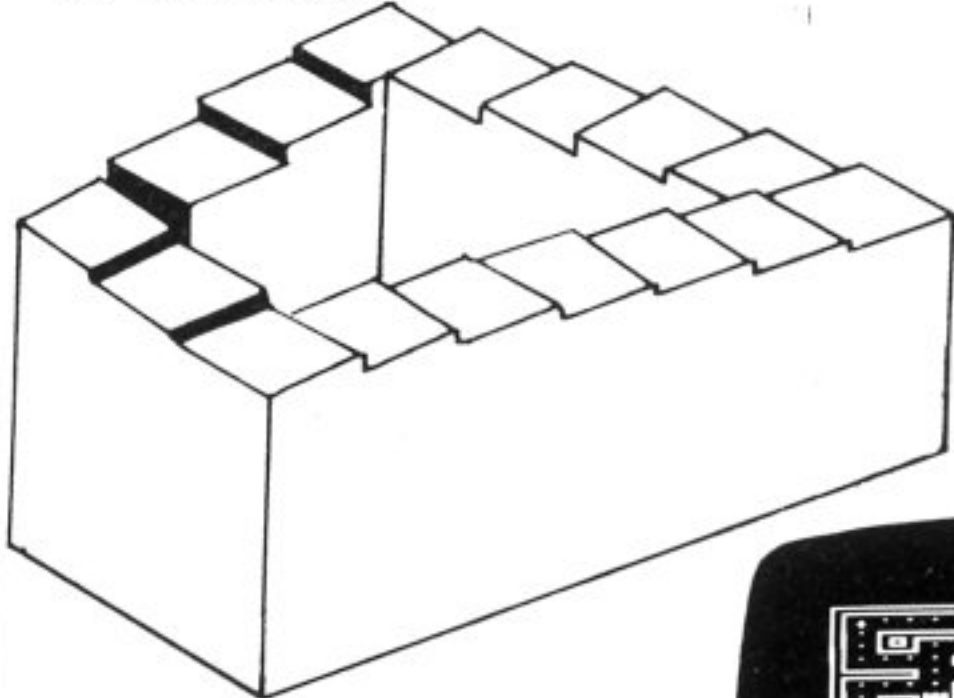
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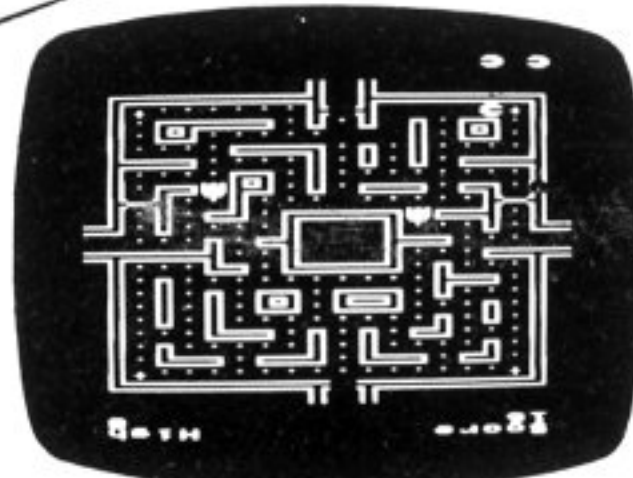
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July issue: Games: Robot Attack (32k) and Anagrams, a 16k word game. Watching the Beeb at work—a sample program to show your micro at work. An introduction to discs—what are they and are they worth getting. Balloons—a coloured animation. Make your micro speak like Kenneth Kendal. Bad Program Lister—lists programs even when the computer pronounces them 'bad'. Reviews of Epson and Seikosha's new printers. Five books of programs reviewed, plus more software reviews. Using Files Part 4. A full disc sector editor program—to read and retrieve lost disc files, and how to modify Acornsoft's Planetoid. Plus hosts of useful hints.

Aug/Sep Issue: Games: Space Lords (32k) a two-player space battle, and Mars Lander (16k). Build yourself a light pen—a simple explanation for the beginner, together with a sample program. Use our "Contact Points for the Beeb" to discover who to contact when in need. We show how to put those 'awkward' cassette programs onto disc. Final instalment of our popular 5-part series on "Using Files" **REVIEWS of—MICRONET, Watfords Electronic's Disc Filing System, two EPROM programmers, and the tax advisory package "Microtax"**. This month's visual programs include Spider's Web, Super Large Screen Characters, Bounce and Swing. We also show how to hold two complete screen pictures at once, and switch rapidly between them in "Dual Screens on the Beeb". A Crossword, Brain Teaser and our 4th Software Competition provide a competitive edge to this month's magazine. We also have our very popular scattering of Hints and Tips.

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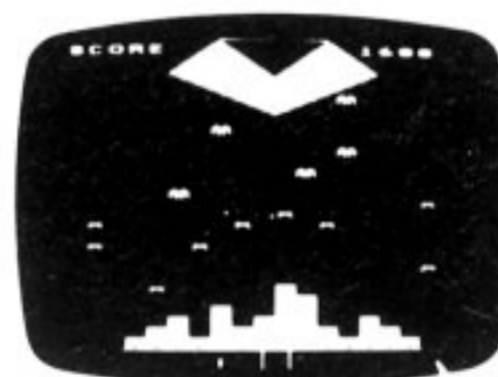
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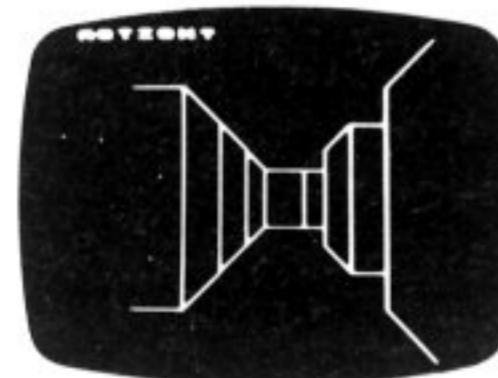
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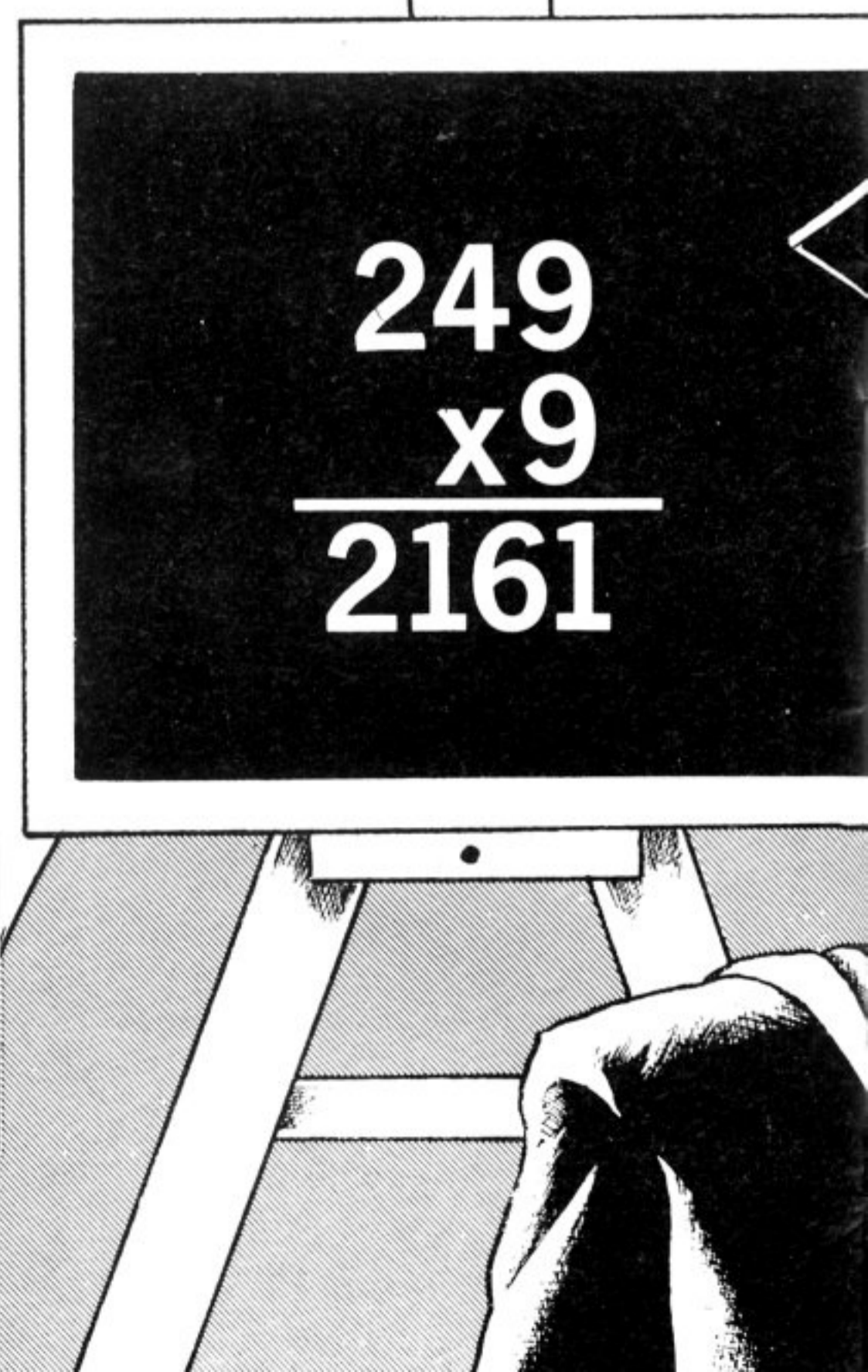
# MATHS

TEST YOUR arithmetic against the clock. **Maths Game** lets you choose between adding, subtracting, multiplying and dividing, and gives

```

20MODE7
30*FX220,0
40*KEY100LDIMname@=" "IMCLSIMG,99IM
50VDU23;8202;0;0;0;
60FORZ=10T011:PRINTTAB(7,2)CHR#141;"MATHS GAME"NEXT
70FORZ=12T013:PRINTTAB(6,2)CHR#141;"-----"NEXT:PROCWAIT:PROC
WAIT:CLS
80PRINTTAB(10,10)"Please tell me."
90INPUTTAB(8,12)"What is your name ? "name@
99*FX220,0
100CLS:PRINTTAB(11,10)"(1)ADD"
110PRINTTAB(11,11)"(2)SUBTRACT"
120PRINTTAB(11,12)"(3)MULTIPLY"
130PRINTTAB(11,13)"(4)DIVIDE":GOTO150
140CLS:*FX220,0
150INPUTTAB(9,16)"Enter Choice(1-4) "choice:CLS
160IF choice<10Rchoice>4CLS:GOTO100
170INPUTTAB(11,12)"LEVEL (1-4) ? "L:CLS
180IF L<10RL>4CLS:GOTO170
190INPUTTAB(10,12)"How many Questions ? "qu
200QUESTIONS=0:Correct=0
210CLS
220IF L=1 THEN F=12:G=12
230IF L=2 THEN F=50:G=20
240IF L=3 THEN F=100:G=30
250IF L=4 THEN F=1000:G=50
260PRINTTAB(12,9)"O.K "name@;'TAB(6)" Let's try this question":PROCWAIT:CLS:TIME=0
270IF choice=1PROCADD:GOTO980
280IF choice=2PROCminus:GOTO980
290IF choice=3PROCTimes:GOTO980
300IF choice=4PROCshare:GOTO980
310REM"*****"
320DEFPROCADD
330FORZ=0T01:PRINTTAB(13,2)CHR#141;"ADDITION"NEXT
340count=0
350A=RND(F)
360B=RND(F)
370QUESTIONS=QUESTIONS+1
380FORZ=5T06:PRINTTAB(10,2)CHR#141;"Question No. "QUESTIONS:NEXT
390PROCHECK
400IF QUESTIONS=qu+1ENDPROC
410PRINTTAB(9,13)CHR#131;A;" + ";B;" = "
420INPUTTAB(22,13)answer
430IF answer=A+B VDU7:PRINTTAB(6,16)"CORRECT! Well done ";name@:IF count=0 Correct=Correct+1
440PROCWAIT
450IF answer<>A+B GOTO500
460PRINTTAB(0,13)"
470PRINTTAB(0,16)"
480GOTO340
490PROCWAIT
500IF answer<>A+B THEN count=count+1:IF count=4 THEN PRINTTAB(6,18)"SORRY.The answer is ";A+B:PROCWAIT:CLS:GOTO340
510PRINTTAB(0,18)"WRONG.You've had ";count;" tries. Try again":PROCWAIT:CLS:GOTO410
520ENDPROC
530REM"*****"
540DEFPROCminus
550FORZ=0T01:PRINTTAB(11,2)CHR#141;"SUBTRACTION"NEXT
560count=0
570A=RND(F)
580B=RND(F)
590QUESTIONS=QUESTIONS+1
600FORZ=5T06:PRINTTAB(9,2)CHR#141;"Question No. "QUESTIONS:NEXT
610PROCHECK
620IF QUESTIONS=qu+1ENDPROC
630IFA<B THEN C=B ELSE C=A
640IFA<B THEN D=A ELSE D=B
650PRINTTAB(9,13)CHR#131;C;" - ";D;" = "
660INPUTTAB(22,13)answer
670IF answer=C-D VDU7:PRINTTAB(6,16)"CORRECT! Well done ";name@:IF count=0 Correct=Correct+1
680PROCWAIT
690IF answer<>C-D GOTO730
700PRINTTAB(0,13)"

```





# GAME

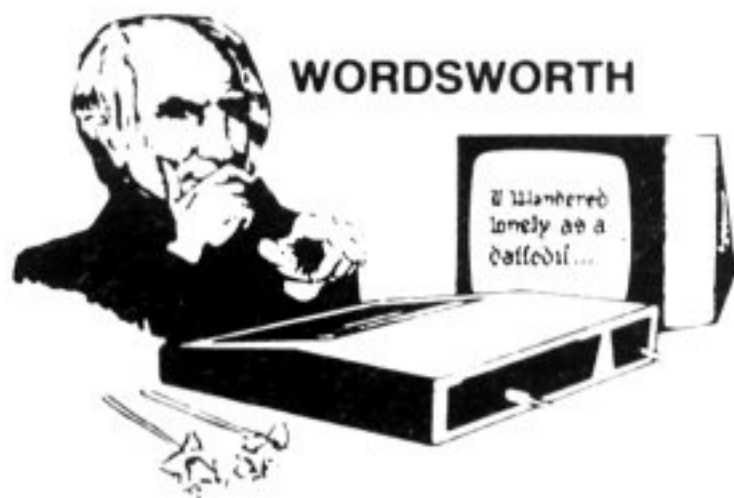
you four levels of difficulty for each. You will be given the correct answers and trying to improve your time will make learning seem fun.



```

710PRINTTAB(0,16)"
720GOTO560
730IFanswer<>C-D THEN count=count+1:IFcount=4 THEN PRINTTAB(6,18)"SORRY. The a
nswer is ";C-D:PROCWAIT:CLS:GOTO560
740PRINTTAB(0,18)"WRONG.You've had ";count;" tries. Try again":PROCWAIT:CLS:GO
T0650
750ENDPROC
760REM"*****"
770DEFPROCtimes
780FORZ=0TO1:PRINTTAB(18,2)CHR(141);"MULTIPLICATION":NEXT
790count=0
800A=RND(G)
810B=RND(G)
820QUESTIONS=QUESTIONS+1
830FORZ=5TO6:PRINTTAB(18,2)CHR(141);"Question No. ";QUESTIONS:NEXT
840PROCHECK
850IF QUESTIONS=9u+1ENDPROC
860PRINTTAB(9,13)CHR(131);A;" X ";B;" = "
870INPUTTAB(22,13)answer
880IFanswer=A*B VDU7:PRINTTAB(6,16)"CORRECT! Well done ";name@:IF count=0 Corre
ct=Correct+1
890PROCWAIT
900IFanswer<>A*B GOTO950
910PRINTTAB(0,13)"
920PRINTTAB(0,16)"
930GOTO790
940PROCWAIT
950IFanswer<>A*B THEN count=count+1:IFcount=4 THEN PRINTTAB(6,18)"SORRY.The an
swer is ";A*B:PROCWAIT:CLS:GOTO790
960PRINTTAB(0,18)"WRONG.You've had ";count;" tries. Try again":PROCWAIT:CLS:GO
T0860
970ENDPROC
980PROCTIME:INPUTTAB(0,16)"          Another game (Y/N) ";QU@
990IF LEFT$(QU@,1)="Y"OR LEFT$(QU@,1)="y"THEN CLS:GOTO100ELSE*FX220,27
1000*KEY10
1010CHAIN"*.MENU"
1020REM"*****"
1030DEFPROCshare
1040FORZ=0TO1:PRINTTAB(12,2)CHR(141);"DIVISION":NEXT
1050A=RND(G)
1060B=RND(G)
1070count=0
1080QUESTIONS=QUESTIONS+1
1090FORZ=5TO6:PRINTTAB(9,2)CHR(141);"Question No. ";QUESTIONS:NEXT
1100Z=A/B
1110PROCHECK
1120IF QUESTIONS=9u+1ENDPROC
1130PRINTTAB(9,13)CHR(133);Z;" = ";A;" / ";B;" = "
1140INPUTTAB(22,13)answer
1150IFanswer=Z/A VDU7:PRINTTAB(6,16)"CORRECT! Well done ";name@:IF count=0 Corr
ect=Correct+1
1160PROCWAIT
1170IFanswer<>Z/A GOTO1220
1180PRINTTAB(0,13)"
1190PRINTTAB(0,16)"
1200GOTO1050
1210PROCWAIT
1220IFanswer<>Z/A THEN count=count+1:IFcount=4 THEN PRINTTAB(6,18)"SORRY.The an
swer is ";Z/A:PROCWAIT:CLS:GOTO1050
1230PRINTTAB(0,18)"WRONG.You've had ";count;" tries. Try again":PROCWAIT:CLS:GO
T01130
1240ENDPROC
1250REM"*****"
1260DEFPROCWAIT
1270FORX=1TO3000:NEXT:ENDPROC
1280DEFPROCTIME
1290PROCTi:T%=TIME/6000MOD60:S%=TIME/100MOD60
1300FORZ=5TO6:PRINTTAB(4,2)CHR(132);CHR(141);"TIME TAKEN = ";:NEXT
1310FORZ=5TO6:PRINTTAB(18,2)CHR(141);T%;" mins ";S%;" secs":NEXT
1320ENDPROC
1330DEFPROCTi VDU23;10,32,0;0;0:ENDPROC
1340DEFPROCHECK
1350IF QUESTIONS=9u+1THEN CLS:FORZ=11TO12:PRINTTAB(7,2)CHR(141);CHR(129);CHR(136);
orrect;:RIGHT ";CHR(130);CHR(137)u-Count;:WRONG":NEXT:ENDPROC
1360ENDPROC

```



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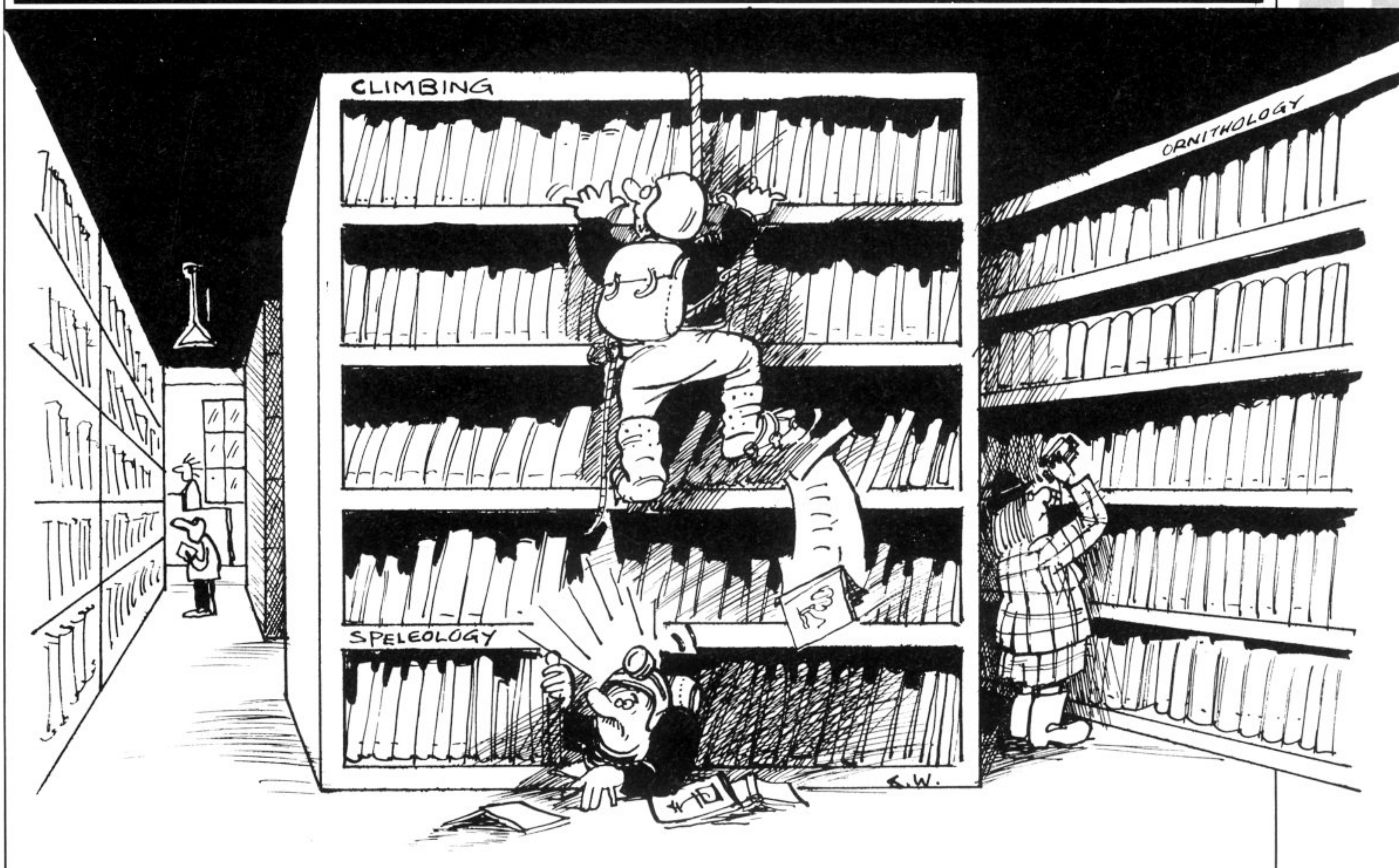
# BOOK SEARCH

**Y**OU KNOW the author and title of a book but you do not know which shelf it is on. Or you know the location and the title but you cannot remember the name of the author. **Book Search** will search for and supply the missing factor. It can keep track of 170 books, for which you enter the relevant details according to your needs. You can also use it for cassettes, video tapes or any other filed material.

```

40PRINT'
50VDU131,141:PRINTTAB(12):"BOOK LIST"
60VDU131,141:PRINTTAB(12):"BOOK LIST"
70 PRINT"TITLE";TAB(15);"AUTHOR";TAB(30);"LOCATION"
80PRINTCHR$(134);STRING$(19,"*+")
90PRINT
100INPUT"DO YOU WANT INSTRUCTIONS",Q#
110IF LEFT$(Q#,1)="Y" THEN PROCPLP
120VDU20,0,24,39,7
130VDU14
140 REPEAT
150 READ T#
160 READ A#,L#
170 PRINTT#,TAB(14);A#;TAB(30);L#
180UNTIL T#="END"
190 RESTORE
200 PRINT'"WHAT SHALL I SEARCH FOR:
AUTHOR(A), TITLE(T), OR LOCATION(L)?"
210 INPUT A#
220 IF A#="L" THEN 410
230 IF A#="A" THEN 330
240 PRINT"ENTER THE TITLE TO SEARCH FOR "
250 INPUT X#
260CLS
270 PRINT
280REPEAT
290READ T#,A#,L#
300 IF T#=#X# THEN PRINTT#;TAB(14);A#;TAB(30);L#
310UNTIL T#="END"
320GOTO190
330 PRINT"ENTER THE AUTHOR TO SEARCH FOR"
340 INPUT X#
350CLS
360REPEAT
370READ T#,A#,L#
380IF A#=#X# THEN PRINTT#;TAB(14);A#;TAB(30);L#
390UNTIL T#="END"
400 GOTO190
410PRINT"ENTER THE LOCATION TO SEARCH FOR"
420 INPUT X#
430CLS
440REPEAT
450READ T#,A#,L#
460IF L#=#X# THEN PRINTT#;TAB(14);A#;TAB(30);L#
470UNTIL T#="END"
480GOTO190
490 REM "**** DATA ENTRIES ****"
500 DATA 30HOUR BASIC,PRIGMORE,SHELF 3
510 DATA USER GUIDE,J.COLL,SHELF 2
520 DATA DICTIONARY,COLLINS,SHELF 2
530 DATA MURDER,HUGH DUNNIT,SHELF 1
540DATA BAD SPELLING,TERRY BULL,SHELF 1
550 DATA FOOT COMPLAINTS,IVOR BUNYON,SHELF 1
560DATA FALLEN,LUCY LASTIC,SHELF 2
570 DATA SEWING,FRED NEEDLES,SHELF 4
580DATA END,END,END
590DEFPROCPLP
600PRINT"DATA IS ENTERED AS PROGRAM"
610PRINT"LINE IN THE FORM OF TITLE, AUTHOR,"
620PRINT"SHELF."
630PRINT"USE LINES 820 TO 990."
640INPUT"ARE YOU READY",Q#
650ENDPROC

```



```

>LIST
  9MODE7
 10 CLR=0:TI=0:C9=0:Q=0
 11BA=134:FO=129:PROCCOLSCREEN
 20 REM
 22VDUBA,157,FO,141:PRINTTAB(9,9)""
 23VDUBA,157,FO,141:PRINTTAB(9,10)"MASTER MIND"
 24VDUBA,157,FO,141:PRINTTAB(9,11)"MASTER MIND"
 25VDUBA,157,FO:PRINTTAB(9,12)"-----"
 35FORI=1TO5000:NEXT
 40BA=134:FO=132:PROCCOLSCREEN
 70VDUBA,157,FO:PRINTTAB(15,1)"SET UP BOARD"
 75VDUBA,157,FO:PRINTTAB(15,2)"-----"
 80VDUBA,157,FO:PRINTTAB(3,5):INPUT"HOW MANY COLOURS <8 ? "C9#:C9=VAL(C9#):IF
C9=0THENPRINT" ";GOTO80
 90 IFC9>8THENVDUBA,157,FO:PRINTTAB(3,7)"NO MORE THAN 8 PLEASE!"GOTO80
 95 IFC9<2THENVDUBA,157,FO:PRINTTAB(3,7)"STUPID!"GOTO80
100 VDUBA,157,FO:PRINTTAB(3,7):INPUT"HOW MANY POSITIONS ? "P9#:P9=VAL(P9#)
101 IFP9=0THENPRINT" ";GOTO100
102 IFP9<2THENPRINT"STUPID!"GOTO100
110VDUBA,157,FO:PRINTTAB(3,9):INPUT"HOW MANY ROUNDS ? "R9#:R9=VAL(R9#)
112 IFR9=0THENPRINT" ";GOTO110
120 P=C9^P9
125VDUBA,157,FO:PRINTTAB(5,11)"NO. OF POSSIBILITIES "P
130VDUBA,157,FO:PRINTTAB(16,13)"HOW TO PLAY":VDUBA,157,FO:PRINTTAB(3,15)"YOU G
ET A 'BULL' WHEN CORRECT COLOUR"
131VDUBA,157,FO:PRINTTAB(3,15)"YOU GET A 'BULL' WHEN CORRECT COLOUR"
132VDUBA,157,FO:PRINTTAB(3,16)"IS IN CORRECT POSITION"
133VDUBA,157,FO:PRINTTAB(3,17)"YOU GET A 'COW' WHEN CORRECT COLOUR"
134VDUBA,157,FO:PRINTTAB(3,18)"IS IN THE WRONG POSITION"
136VDUBA,157,FO:PRINTTAB(5,23)"PRESS SPACE BAR WHEN READY"
138X#="GET# IF X#>"GOTO138
140 H=0:C=0
150 DIMQ(8),S(10,2),A(8),G(8),I(P),H(8),S(10)
151 FORI=0TOP9:Q(I)=0:NEXTI
160 L#="BWRGOYPT"
165BA=135:FO=129:PROCCOLSCREEN
170VDUBA,157,FO:PRINTTAB(5,1):
190 PRINT" COLOUR LETTER TRIES B C"
200VDUBA,157,FO:PRINTTAB(5,2):"-----"
210 FORX=1TOC9:READX#:VDUBA,157,FO:PRINTTAB(5,3+X)" ;X#:TAB(15);MID(L#,X,1)
NEXT
260FORR=1TOR9:VDUBA,157,FO:PRINTTAB(5,5+C9)"ROUND £"R
300VDUBA,157,FO:PRINTTAB(5,7+C9)"GUESS MY COMBINATION!"
310VDUBA,157,FO:PRINTTAB(5,8+C9)"OPTIONS: - ' ', 'QUIT'"
320 A9=P*AND(1)+1:A=INT(A9)
325VDUBA,157,FO:PRINTTAB(5,10+C9)"PLEASE WAIT - SETTING UP GAME":FORI=1TO2000:
NEXT
330 GOSUB3000
340 FORX=1TOR9:GOSUB3500:NEXT
370 FORM=1TO10
380 VDUBA,157,FO:PRINTTAB(5,10+C9)"MOVE £"M:" GUESS ? " ;INPUTTA
B(21,10+C9)" X#
382 IFX#=""THENPRINT" ";GOTO380
390 IFX#="BOARD"GOTO2000
400 IFX#="QUIT"GOTO2500
410 IF LEN(X#)=P9 GOTO 420
415VDUBA,157,FO:PRINTTAB(5)"THERE ARE ";P9;" POSITION(S) "GOTO380
420REM
430 FORX=1TOP9
440 FORY=1TOC9
450 IFMID(X#,X,1)=MID(L#,Y,1)GOTO480
460 NEXTY
470VDUBA,157,FO:PRINTTAB(5)" ;MID(X#,X,1):" IS UNRECOGNIZED"GOTO380
480 G(X)=MID(X#,X,1)
490 NEXTX
500 REM:**CONVERT Q(1-P9)TO A(1-P9)
510 GOSUB4000
520 REM:**GET £ OF B&W'S
530 GOSUB4500
540 IF B=P9 GOTO 630
550 REM:**RESULTS
555VDUBA,157,FO:PRINTTAB(27,2+M)X#;" "B;" "W:PRINTTAB(5,11+C9)
560 VDUBA,157,FO:PRINTTAB(2)"YOU HAVE ";B;" BULLS & ";W;" COWS"
570 REM:**SAVE FOR BOARD LAYOUT
580 S(M)=X#
590 S(M,1)=B
600 S(M,2)=W
610 NEXTM
620VDUBA,157,FO:PRINTTAB(5)"DUMMY YOU'VE RUN OUT OF MOVES!"GOTO640
622 GOSUB4000
623VDUBA,157,FO:PRINTTAB(5)"THE COMBINATION WAS:-- ";
624 FORX=1TOP9:VDUBA,157,FO:PRINTTAB(X):NEXT:PRINT
630VDUBA,157,FO:PRINTTAB(5)"YOU GUESSED IT IN ";M;" MOVES!! "
640 H=H+M
650 GOSUB5000
660 REM
670 REM:**COMPS GO
680 REM
690 FORX=1TOP:I(X)=1:NEXT

```



# BULL AND COW

**Y**ET ANOTHER imitation of that old favourite, Mastermind, **Bull and Cow** is a fairly simple version, with scarcely any graphics, but you can choose the number of colours and positions in the combination you



```

720 VDUBA,157,FO:PRINT"NOW I GUESS----THINK OF A COMBINATION"
730 VDUBA,157,FO:PRINTTAB(5,23)"PRESS SPACE BAR WHEN READY"
732 X#=GET#:IF X#<>"GOTO732
735
740 FORM=1TO10
750 GOSUB3000
760 REM**FIND A GUESS
770 AB=P*NRND(1)+1:G=INT(AB)
780 IF I(G)=1GOTO890
790 FOR X=G TO P
800 IF I(X)=1GOTO880
810 NEXT
820 FORX=1TOG
830 IF I(X)=1GOTO880
840 NEXT
850 VDUBA,157,FO:PRINT"YOU DUMMY, YOU'VE GIVEN ME"
851 VDUBA,157,FO:PRINT"INCONSISTENT INFORMATION"
860VDUBA,157,FO:PRINT"LET'S TRY AGAIN"
862VDUBA,157,FO:PRINT"& THIS TIME BE MORE CAREFUL!"
870 GOTO660
880 G=X
890 REM**CONVERT GUESS&G TO G#
900 FORX=1TOG:GOSUB3500:NEXT
930 GOSUB6000
935BA=129:FO=135:PROCCOLSCREEN
936VDUBA,157,FO:PRINTTAB(14,3)"COMPUTER'S TURN"
938VDUBA,157,FO:PRINTTAB(14,4)"=====
940VDUBA,157,FO:PRINTTAB(5,7)"MY GUESS IS:-- ";
950 FORX=1TOP9:PRINTH(X);NEXT:PRINT
980VDUBA,157,FO:PRINTTAB(5,9):INPUT"BULLS ? "B1#
981 IFB1#="0"THENB1=VAL(B1#):GOTO985
982 B1=VAL(B1#):IFB1=0THEN980
983IF B1=P9 THEN 990
985VDUBA,157,FO:PRINTTAB(5,11):INPUT"COWS ? "W1#
986 IFW1#<=P9#THENW1=VAL(W1#):VDUBA,157,FO:PRINTTAB(5,13)"PLEASE WAIT - I'M TH
INKING":GOTO990
987 W1=VAL(W1#):IFW1=0THEN985
990 IF B1=P9 GOTO1120
1000 GOSUB3000
1010 FORX=1TOP:GOSUB3500:IF I(X)=0GOTO1070
1035 GOSUB6500:GOSUB4000:GOSUB4500:IF B1<>B OR W1<>W THEN I(X)=0
1070 NEXT
1080 NEXTM
1090VDUBA,157,FO:PRINTTAB(5)"I'VE USED UP ALL MY MOVES!!"
1100VDUBA,157,FO:PRINTTAB(5)"I GUESS MY CPU IS HAVING AN OFF DAY"
1110 GOTO1130
1120VDUBA,157,FO:PRINTTAB(5)"I GOT IT IN ",M," MOVES"
1130 C=C+M
1140 GOSUB5000
1145VDUBA,157,FO:PRINTTAB(5,23)"PRESS SPACE BAR WHEN READY"
1146Z#=GET#:IFZ#<>"THEN1146
1147BA=135:FO=129:PROCCOLSCREEN
1150 NEXTR
1155BA=134:FO=129:PROCCOLSCREEN
1160VDUBA,157,FO:PRINTTAB(10,8)"GAME OVER"
1170VDUBA,157,FO:PRINTTAB(7,10)"FINAL SCORE:--"
1180 GOSUB5040:IFC<H THEN VDUBA,157,FO:PRINTTAB(4,14)"I BEAT YOU, BETTER LUCK N
EXT TIME":GOTO1190
1183IFC=H THEN VDUBA,157,FO:PRINTTAB(4,14)"ITS A DRAW":GOTO1190
1185VDUBA,157,FO:PRINTTAB(4,14)"CONGRATULATIONS. YOU WON !!"
1190 VDUBA,157,FO:PRINTTAB(4,23)"DO YOU WANT TO PLAY AGAIN Y/N ?"
1191Z#=GET#:IFZ#<>"N"ANDZ#<>"Y"THEN1191
1192IF Z#="Y" THEN CLEAR:GOTO40
1193 VDUBA,157,FO:PRINTTAB(2,23):CLS:END
2000 REM
2010 REM**BOARD PRINTOUT
2015PROCCLRBOT
2020 REM
2030 VDUBA,157,FO:PRINTTAB(3,18)"MOVE GUESS BULLS COWS"
2050 FORZ=1TOM-1:VDUBA,157,FO:PRINT" ",Z," "S(Z);" "9(Z,1);"
",S(Z,2)
2075 NEXT:PRINT
2080 GOTO380
2500 REM
2510 REM**QUIT ROUTINE
2520 REM
2525PROCCLRBOT
2530 VDUBA,157,FO:PRINTTAB(5,18)"QUITTER! MY COMBINATION WAS :-":GOSUB4000
2540VDUBA,157,FO:PRINTTAB(5,20)"":FORX=1TOP9:PRINTH(X);NEXT:PRINT
2570VDUBA,157,FO:PRINTTAB(2)"BETTER LUCK NEXT TIME!":FORI=1TO5000:NEXT:GOTO1190

3000 REM
3010 REM***INITIALIZE Q(1-P9) TO 0'S
3020 REM
3030 FORS=1TOP9:Q(S)=0:NEXT
3060 RETURN
3500 REM
3510 REM**INCREMENT Q(1-P9)
3520 REM
3522 IFQ(1)>0GOTO3530

```

have to guess and how many rounds you want to play.

The computer gives you a bull for the correct colour in the proper place, a cow for the proper colour in the incorrect place.



# BULL AND COW

```

3524 REM**IF 0 THIS IS FIRST INCR MAKE ALL 1'S
3526 FORS=1TOP9:Q(S)=1:NEXT
3529 RETURN
3530 Q=1
3540 Q(Q)=Q(Q)+1
3550 IFQ(Q)<C9+1 THEN RETURN
3560 Q(Q)=1
3570 Q=Q+1
3580 GOTO3540
4000 REM
4010 REM**CONVERT Q(1-P9) TO A(1-P9)
4020 REM
4030 FORS=1TOP9:A(S)=MID$(L$,Q(S),1):NEXTS
4060 RETURN
4500 REM
4510 REM**GETE OF B&W'S
4520 REM**MASHES G# & A# IN THE PROCESS
4530 REM
4540 B=0:W=0:F=0
4550 FORS=1TOP9:IFG(S)<>A(S)GOTO4620
4570 B=B+1:G(S)=CHR$(F):A(S)=CHR$(F+1):F=F+2
4610 GOTO4660
4620 FORT=1TOP9:IFG(S)<>A(T)GOTO4650
4640 IFG(T)=A(T)GOTO4650
4645 W=W+1:A(T)=CHR$(F):G(S)=CHR$(F+1):F=F+2:GOTO4660
4650 NEXTT
4660 NEXTS
4670 RETURN
5000 REM
5010 REM** PRINT SCORE
5020 REM
5030 VDUBA,157,FO:PRINTTAB(5)"SCORE:-
5040 VDUBA,157,FO:PRINTTAB(5)"COMPUTER " )C
5050 VDUBA,157,FO:PRINTTAB(5)"HUMAN " )H)" "
5070 RETURN
5500 REM
5510 REM**CONVERT Q(1-P9) TO G(1-P9)
5520 REM
5530 FORS=1TOP9:G(S)=MID$(L$,Q(S),1):NEXT
5560 RETURN
6000 REM
6010 REM**CONVERT Q(1-P9) TO H(1-P9)
6020 REM
6030 FORS=1TOP9:H(S)=MID$(L$,Q(S),1):NEXT
6060 RETURN
6500 REM
6510 REM**COPY H# TO G#
6520 REM
6530 FORS=1TOP9:G(S)=H(S):NEXT
6560 RETURN
8010 DATABLACK,WHITE,RED,GREEN,ORANGE,YELLOW,PURPLE,TAN
9999 END
10000DEFPROCCLSSCREEN
10010CLS:FORI=1TO25
10020VDUBA,157,FO:PRINT""
10030NEXT:PRINTTAB(0,0)
10040ENDPROC
11000DEFPROCCLRBOT:PRINTTAB(0,10):FORI=1TO5:VDUBA,157,FO:PRINT"" :NEXT
11010ENDPROC
11020 REM THE END

```

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