acorn programs

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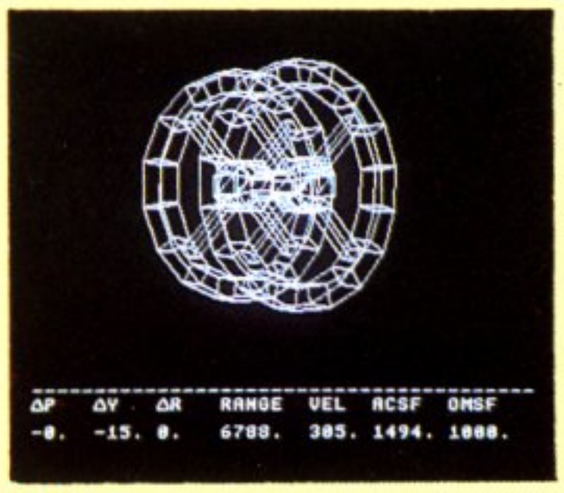

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An exciting target-shooting game! Bonuses are scored for spelling out the word FAIRGROUND by hitting the appropriate target letters, and for shooting all the targets. Extra bullets are obtained by shooting the numercial targets, but watch out for the "smileys" who are intent on stealing your bullets. Music, sound effects, hi-score, and rankings.
●●● *NEW RELEASE* ●●●

CENTIPEDE (32K) **£7.95**
Incredible arcade-style game featuring mushrooms, snails, flies, spiders, and the centipedes of course. Excellent graphics and sound. 6 skill levels, hi-score, rankings, bonuses, and increasing difficulty as the spiders become more lively and the number of mushrooms increases.
(For use with KEYBOARD or JOYSTICKS).
"Visually this game compares well with the arcade version, being colourful and clear."
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The only full feature machine-code version available for the BBC micro. Features include: scrolling screen, radar display, 3 pursuing cars, checkpoint flags, fuel gauge, smoke screens, 6 skill levels, rankings, increasing difficulty, and sound effects.
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"... very good indeed ... fast flicker-free graphics and a frog that really hops!"... BEEBUG MAGAZINE

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Cover of professional software expanded

WELCOME to the third issue of *Acorn Programs*. In this issue we expand our coverage of professional software for the BBC and Electron. One page remains devoted to reviews of games software, while a second is included containing reviews of educational software.

All programs published this month have been contributed by readers of *Acorn Programs*. Programs which are submitted to us for consideration are all tested on both BBC and Electron computers.

The best programs submitted are then listed from our working office copy for publication in the magazine. All listings published are produced in this way, so that it is certain that programs will work on the machine for which they are intended, without amendments.

Please remember, when submitting programs for consideration, that they must be recorded on cassette or disc. Please state clearly for which computer your programs are intended, and enclose a stamped, addressed envelope if you would like them returned.

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Telephone, all departments: 01-359 3525. If you would like to contribute to *Acorn Programs*, please send programs on disc or cassette to *Acorn Programs*, ECC Publications, 196-200 Balls Pond Road, London N1 4AQ. We cannot undertake to return them unless a stamped, addressed envelope is enclosed. We pay a basic rate of £15 for the copyright of each program published.

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THRUSTA HIGHLY ORIGINAL AND FASCINATING NEW ARCADE GAME from a new company! Very neat graphics as your beautiful spaceship (with 'real' gravity) pushes and drops rocks to crush the revolting wobbling monsters' eggs before they hatch. Watch out for the guards! Great big smooth graphics make you feel you are really there! Takes a long time to complete each screen. Well-chosen keys but also KEMPSTON STIX. **(Software Projects) £5.95**

PHEENIX *"This program has everything ... superb presentation, graphics and sound. Highly recommended." (HomeCompWeekly)* The full arcade-action 5 screens in the best-ever Spectrum 'Phoenix'. 5 skill levels. Choice of character sets: demo mode. Crams 48K quality into 16K. KEMPSTON/ AGF STIX **(Megadodo) £5.50**

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3D SEIDDAB ATTACK *"One of the most impressive 3D progams I've seen." (PopCompWeekly)* Great 3D view through the turret of your tank as you patrol the city at night - glowing, luminous skyscrapers. Radar plan shows where you are - and were They are. 1 or 2 players and amazing flying saucers! You can see the damage they do to your tank as it happens! KEMPSTON STIX. **(Hewson) £5.95**

48K SPECTRUM ONLY

WHEELIE *"Lovely graphics, very, very difficult and challenging. Excellent value." (Crash)* Take off on your SuperDream Bike, jump buses and cars, watch out for hedgehogs as you search for the ghost rider. Will you find him? Will you beat him? Keyboard or ANY STIX. Some of the most spectacular graphics and sound we've met. Totally involving. **(Microsphere) £5.95**

PI-BALLED THE PIMANIAC'S Q-BERT!! Forget the horrible reggae flipside (you will eventually) and concentrate on changing the colour of the PYRAMID OF PI. Watch for the Piman and Sid the Snake, the Bouncing Balls, Col and Jas. 66 screens: transporter discs: graphic jokes. Buy it, it's wonderful! KEMPSTON STIX **(Automata) £6.00**

HUNTER-KILLER *"AN EXCELLENT SIMULATION." (PersCompNews)* Captain your own S-Class submarine: hunt down and kill the enemy sub: 18 controls (PROTEK STICK helps): dive, surface; chart your course: watch through your periscope the 3D target. Full-screen control room: chart room: periscope view. Quick-kill practice mode. Good full-screen graphics. Watch the track as your torpedoes run towards the enemy..... **(Protek) £7.95**

DENIS AMUSING and highly original text adventure. As Denis Thatcher, you travel up to 95 locations, seeking peace in the pub. You need to find a drink every few moves, while dropping in on the Royals, the MPs and, eventually, the Pope wearing a truss and carrying a lawnmower. It is all quite mad and lots of fun. 100% m/c. NO STIX. Written with THE QUILL (only £14.95!) The Thatcher adventure is by **(Applications) £5.50**

PAINTBOX *"If you've been looking for a Spectrum graphics aid, this is one of the best." (PopCompWkly)* We've tried it and, as they say, even a child can use it to define up to 84 User-Definable Graphics, draw all of them on-screen, save them to your programs: then there's the 2-speed hi-res drawing program and the 28-page manual and .... it is the most useful utility we've ever used. KEMPSTON/ANY CURSOR STIX. **(Print&Plotter) £7.70**

ALCHEMIST *"Graphically, this is probably the best game Imagine have produced." (PopCompWeekly)* Beautifully graphic arcade/adventure - as pretty as ATIC ATAC (£5.50) but entirely different. Amazing full-screen apparently endlessly different graphics as you search for the 4 parts of the Spell, turning yourself into a Golden Eagle from a Wizard (and back). Cast spell, fight the monsters with lightning bolts - and don't forget to eat too! Astounding. MOST STIX. **(Imagine) £5.50**

THE FOREST *"The world's most realistic adventure game." (PersCompNews)* RAVE REVIEWS all over for this fully graphic computer simulation of orienteering: you really feel you are map-making as you search for the Control Points. Draw 3D diagrams of the terrain, contour maps and feature maps. And there's 37kms of unmapped country for you to discover ...32-page manual helps. NO STIX. **(Phipps) £9.95**

STONKERS *"Excellent .... the best war game I've seen ... very addictive." (Crash)* The best battle-game graphics yet (NOT an arcade game). Simple joystick (MOST STIX) control: but the brain is in your strategy and tactics as you deploy and supply your troops. Beautiful large and small-scale maps of the battle area: moving graphics: great sound: tickertape messages: 2 skill levels. You are on the brink of battle ...make your first decision, NOW! **(Imagine) £5.50**

GO TO JAIL *"Excellent graphics are used to make a very impressive display indeed ... highly recommended." (ZXComp)* The best computer version of the famous game. From 2 to 5 players, including the Spectrum if you wish. It's ruthless, but honest. Every original feature is faithfully reproduced and the screen display (which scrolls helpfully) is simply incredible. NO STIX. **(Automata) £6.00**

HALLS OF THE THINGS *"The most exciting and innovative game I have seen ... no other game runs with such speed, smoothness of action and graphical quality." (ZX Comp)* Explore an 8-storey maze: find treasures: avoid nasties - but this time it's all graphic and you can see yourself waving your sword! Brilliant use of 19 command keys. NO STIX. **(Crystal) £7.50**

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POSTAGE AND PACKING	U K Add 55p only per order	£0.55p
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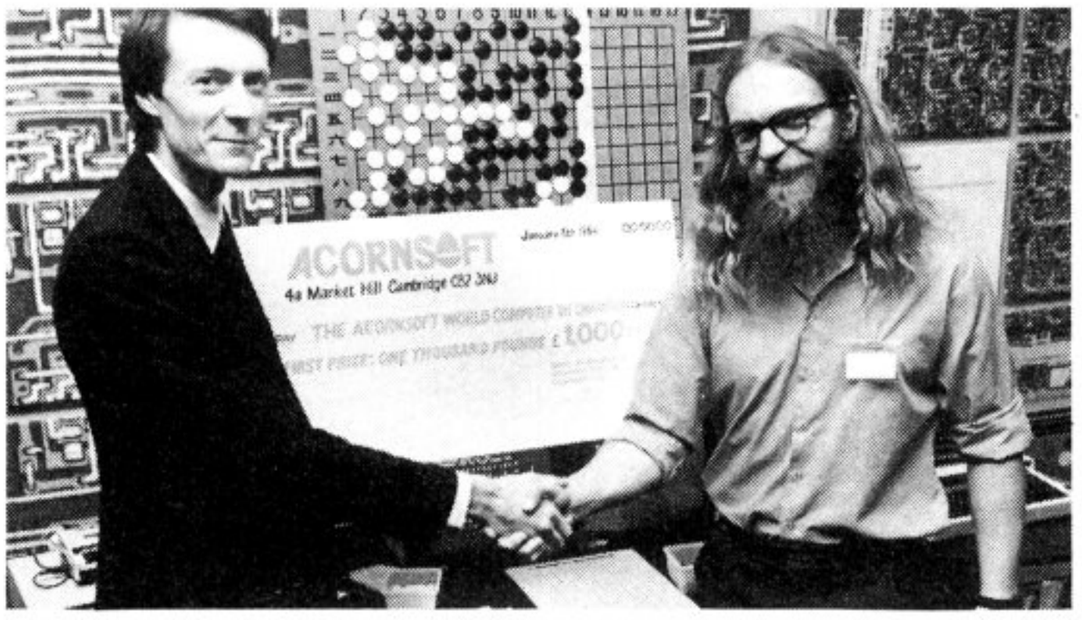
Contest champion gets development go-ahead

FOLLOWING its sponsorship of the World Chess semi-finals late last year, Acornsoft Ltd, in conjunction with the British Go Association and *A & B Computing,* sponsored a Go Tournament, in which eight BBC computers and their programmers competed for the title of Champion Computer Go player of the World.



Bronislaw Przybyla, right, is congratulated by David Johnson-Davies, managing director of Acornsoft.

The title was won by Bronislaw Przybyla, a freelance computer consultant from Wiltshire, who developed his Go program especially for the competition. Przybyla won £1,000 and is now working with Acornsoft to produce a commercial Go-playing game, based on his winning program, which is due for launch in the near future. Acornsoft managing director David Johnson-Davies comments:

"We hope the launch of a commercial program, which will be good enough to play a moderately strong game against a beginner will stimulate more people in the U.K. to take up Go themselves and help to popularise the game".

Nap hand eases BBC B input

ALTHOUGH the BBC micro has a conventional, typewriter-style keyboard which is easier to use than that of many other microcomputers, it can be used to its full advantage only by an experienced touch typist. Users without typing experience, or young users whose fingers cannot span the requisite number of keys, can find typing-in programs an arduous process.

Microwriter has produced the Quinkey keyboard, which uses only five keys and an extra shift key in various combinations to type any of the keys on the BBC B keyboard.

As the fingers of one hand cover the keys continually it is necessary to type without looking at the keyboard so that the user is free to look at a program listing.

The Quinkey keyboard and interface pack are available, for the right hand only, from Microwriter Ltd, 31 Southampton Row, London WC1B 5HJ for £48.

Exhibitions grow in popularity

COMPUTER SHOWS and exhibitions are becoming bigger and more popular. The WHICH COMPUTER? Show, held annually at the National Exhibition Centre, Birmingham, has demand for space at the 1985 show so great that the show, which attracted 40,000 visitors in January, will be expanding into a third hall in 1985.

Prior to that are The Electron and BBC Micro User Show, at the Westminster Exhibition Centre, London from March 29 to April 1; the fifth London Computer Fair, at Central Hall, Westminster, April 19, 21 and 23; The Electron and BBC Micro User Show, at Alexandra Palace, London from July 19-22 and at UMIST, Manchester from August 31-September 2, Alexandra Palace from October 25-28 and Westminster Exhibition Centre, London from December 6-9.

Cassette to disc service

ACORN computer owners who have upgraded from cassette recorder to disc drive often find that they are left with professional cassettes they cannot transfer to disc. Options open to such owners are to buy a new disc copy of the program, or to pirate that program.

Acornsoft, the software division of Acorn Computers, has introduced a new alternative. If you have an Acornsoft cassette which is also available on disc, return the cassette to Disc Replacement Service, Acornsoft Ltd, c/o Vector Marketing, Denington Industrial Estate, Wellingborough, Northamptonshire, enclosing half the price of a disc copy and your cassette will be replaced by a disc.

Thus the owner of Magic Garden on cassette, which costs £9.85, could return the cassette, pay an extra £5.75, and acquire the disc copy which retails normally at £11.50.

Acornsoft believes it to be the first cassette-to-disc exchange of its kind to be launched by a home software supplier. Computer owners, faced with a choice between paying £16.60 for one program or switching from disc to cassette to use their old software, may well expect it to be the last exchange offer of its kind as well.

Protector wins Electron

THE ELECTRON competition in the first issue of *Acorn Programs* was won by Graham Granger of Leatherhead, Surrey for his program **Protector,** a smooth-running, arcade-action game which will run on either the Electron or BBC B computer.

Granger has been programming for some years. He bought a ZX-81 when it was launched in 1981. At Christmas, 1982 he upgraded to a BBC computer but had to share time on it with other members of his family.

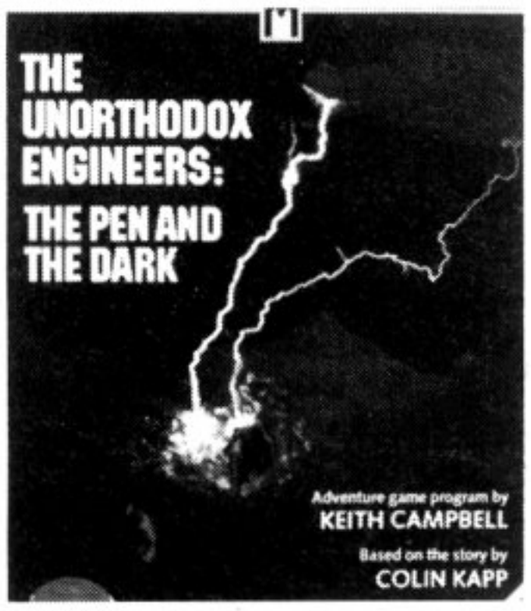
"Now I have an Electron", he says, "I will be able to spend more time programming and will be able to keep the computer in my bedroom."

He began writing Protector early last summer. At that time it was a simple game, with aliens flickering across the screen. It took six months to develop to its full form, in which four types of aliens menace a mothership and its protector in various ways.

Protector beat a variety of other programs entered for the competition to win. The majority of them were games programs, of which Protector was judged to be the most exciting and professional.

Game of the book is merely competent

THE PEN and The Dark is an adventure game, based on the story of the same title, which is provided in an accompanying book. Despite being hailed as a classic on the packaging, the story is not one of the better examples of science fiction on the market, but it is quick and easy to read and provides the player with vital clues and hints.



The game is a text adventure. A description of each location is printed at the top of the screen and so those who lose the top line of the BBC screen habitually because their television set is too small would be well-advised to take that into account before LOADing the program, as the programmer has not taken it into account and it is infuriating to attempt to play an adventure without a full description of locations.

The Pen and The Dark is a competent adventure game, with a wide variety of locations to visit, objects to collect and problems to solve.

More exciting screen use would add to the game, as would a more exciting use of the adventure format. Adventures do not have to become word games which must be solved to move from one area to the next; the pity is that an uninspiring adventure game can give people new to adventuring that impression.

The Pen and The Dark is produced by Mosaic Publishing Ltd, 187 Upper Street, Islington, London for the BBC Model B and costs £9.95.

Worst of all worlds

PHAROAH'S TOMB is a curious amalgamation of mental puzzle, graphical game and adventure. Unfortunately it has utilised the worst of all worlds. The adventure element, meant to summon the image of a convoluting **Pharoah's Tomb,** instead creates the impression of a series of identical rooms with different names, not all of which are spelt correctly. The graphical element, used as you fight enemies or collect coins, is explained insufficiently and on a par with the simplest amateur games.

Movement from one chamber to another is achieved only after finding a series of numbers in a Mastermind-type fashion, or by solving an anagram. The number puzzles are very easy, while the anagrams vary from easy to impossible.

Pharoah's Tomb is produced for the Electron by A&F Software, Unit 8, Canal Side Industrial Estate, Woodbine Street East, Rochdale, Lancashire OL16 5LB.

Adequate adventure

WRITING a successful adventure game is a complicated matter. The complexities of programming are not the only problem. The beginning of the game, at least, must be simple enough to encourage a beginner, while being complicated enough to persuade a player with experience to continue. A wide range of vocabulary should be available to the player, together with a variety of options linked by a coherent storyline.

Gideon's Gamble is an adequate adventure game; there is a vague story line, a limited vocabulary and a variety of problems to solve. It is, however, uninspiring. Once a variety of objects has been collected there is little incentive to sail away with them to continue the quest. There is also the uncomfortable feeling that the author is making fun of the player, as such disparate objects as a wheelbarrow and a pogo-stick appear.

The whole mood generated by the game is of monotony and frustration, rather than the enthralling excitement which a good adventure game can produce.

Gideon's Gamble is produced by Superior Software, 69 Leeds Road, Bramhope Leeds and costs £7.95.

New ideas on old and tried theme

MICROBE — £7.95, Virgin Games — **Attack on Alpha Centauri** — £7.95, Software Invasion — and **Transistor's Revenge** — £7.95 Softspot — are all games of the if-it-moves-shoot-it variety for the BBC Model B.

Attack on Alpha Centauri uses three-dimensional graphics. The landscape looks realistically-contoured and the attackers fly forward, increasing in size as they do so.

The aim is to kill all the deadly wasps before the player loses all three lives by being stung.

Microbe is a game in the same vein. The object is to attack an alien through its bloodstream, which means blasting the descending cells, spores, aminos and ribosome before they hit the player. Transistor's Revenge does not contain such good graphics as the other two games but what it loses in that area it compensates for in originality.

The components approach along the various data lines and can be shot only along those lines.

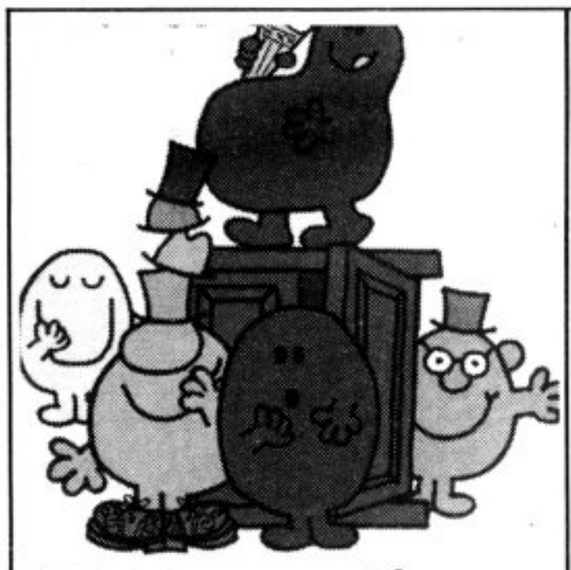
Another complication is the pulses of energy which occasionally move very quickly along a data line and prove deadly unless they are avoided.

Addicted to Chuckie Egg

MOVE ROUND the farmyard, collecting as many eggs and piles of grain as possible. That involves going up and down ladders, falling down holes and avoiding hungry geese, which will eat the corn if they reach it first — or you, if you fail to evade them. Once you have cleared one level you move to the next and movement becomes more complicated as you leap on to grain lifts and perform complicated bouncing movements to reach the last eggs.

Chuckie Egg is a development of the Krazy Kong style of game but with sufficient features of its own to make it entertaining. The speed is slow enough to make the game possible but not so slow that you can complete the game without several hours' practice. The main difficulty is in lining-up your figure with a ladder or floor to move. Movements must be very precise and there is nothing more frustrating than being eaten when you are within a pixel of safety.

A difficult but addictive game, Chuckie Egg is produced by A&F Software, Unit 8, Canal Side Industrial Estate, Woodbine Street East, Rochdale, Lancashire.



Attractive Mr Men

FIRST STEPS with the Mr Men contains four programs, aimed at four-to-eight-year-olds. They are intended to develop ideas of direction, shape matching and recognition skills, and letter recognition.

The games are very simple. Mr Forgetful's Wardrobe Game involves opening wardrobe doors, two at a time, to help Mr Forgetful locate pairs of clothing. It is the attention to detail which makes these programs into learning aids attractive to children rather than merely simple-to-write programs.

The packaging is colourful, containing pictures of the Mr Men. The keys to use are marked by a Mr Man card and the instructions are in a booklet complete with four appropriate Mr Man stories written by Roger Hargreaves. The games centre on Mr Greedy, Mr Silly and Mr Forgetful.

First Steps with the Mr Men is produced for the BBC B by Mirrorsoft, Holborn Circus, London EC1.

World Wise database lacks versatility

PRODUCERS of educational software for the BBC computer appear inordinately fond of creating a database, made up of a series of branches. Such a database lies at the heart of the Acornsoft Tree of Knowledge, the Bourne Educational Software Animal Vegetable Mineral — reviewed in the last issue — and in the Bourne Educational Software **World Wise** Program.

In World Wise there are two programs, one dealing with the U.K. and one with the world. Each program contains several headings, including rivers, lakes, flag and antiquity. Two or three items are already included on the database and it is intended that, with due use of reference books, students will be able to add new items to the database, distinguishing each item from those which have appeared previously by means of questions.

Databases are useful for classification purposes, for learning to distinguish quickly between similar things, for encouraging the use of books, and for learning long strings of facts. Only one database program, however, is needed to cover those points. World Wise is limited because it confines its subject to geography and does not contain a complete database.

World Wise is produced by Bourne Educational Software, Bedfield Lane, Headbourne Worthy, Winchester and costs £7.80 plus VAT on cassette and £9.55 plus VAT on disc.

Corrections needed

VECTORS maths tutor for the BBC B and Electron is aimed at students of O level additional mathematics or A level mathematics. In a series of 14 lessons the program deals with the skills and techniques involved with the main vector algebra requirements of those syllabi.

Once points have been explained in easy-to-understand text and diagrammatic form they are tested thoroughly in a series of multiple-choice questions. Lessons can, of course, be repeated several times until all the points in them have been fully understood.

Answering questions based on diagrams shown on-screen can be difficult for those used to working on paper but the difficulty can be overcome with practice.

When a question is answered incorrectly it would be helpful to have the correct answer and the reason for it displayed on screen, but that facility is not included in the program, meaning that either a teacher must be consulted or the lesson must be re-run to pick up a missed point.

Vectors costs £9.95 and is produced by Salamander Software, 17 Norfolk Road, Brighton, East Sussex.

Learning by sight

NOTHING but praise should go to Microtrust Software for **All Fingers Go,** which is a superb example of educational software for the BBC B. The two cassettes which arrive with the package take the user stage by stage from the level of complete novice to that of confident touch typist.

On-screen are displayed a typewriter keyboard, together with finger outlines which move to the correct positions as you type. The student is first taken through an exercise by the key to be typed flashing and a finger being shown pressing it. Once that key has been pressed the program moves to the next until a line of text is printed.

That should then be copied exactly and, when it has been copied, the number of errors made is displayed, followed by the student's speed in words per minute, if appropriate. The performance can also be analysed.

The program combines the typewriter-style keyboard of the BBC B, a clear on-screen display, a carefully-graded series of lessons and regular performance analysis to produce a clear, easy and enjoyable introduction to touch-typing. It is produced by Microtrust Software, National Extension College, 18 Brooklands Avenue, Cambridge and costs £14.95.

Taking the Tree route

TREE OF KNOWLEDGE allows its user to build, list and save a database on the BBC computer. Building the database is achieved by entering the names of two objects to be added and providing a question, the answer to which will distinguish between them. The procedure can be repeated until a substantial database has been created.

The database can then be used as a type of guessing game in which the computer chooses an item at random and provides clues from among the questions.

The most useful application of the program is demonstrated in the class database with the program. It is a classification of the animal kingdom, for use by biology students. Using it in that way for identification purposes could be very useful but experimentation shows that attempting to build a database without the help of a selection of reference books can be very difficult.

The program contains several spelling mistakes in its databases and it is to be hoped that they will be removed in future copies.

Tree of Knowledge is produced by Acornsoft Ltd, 4a Market Hill, Cambridge CB2 3NJ and costs £9.20.

```
   10 REM ** Monster  Hunt .. a
game to test your powers of obse
rvation **
   20 REM ** PART 1 ... this par
t must be used to load and run p
art two of this game **
   30 REM ** (C) 1984 S.W. Lucas
 **
   40 REM ** define characters f
or graphics **
   50VDU23,224,62,62,8,127,107,9
3,93,73
   60VDU23,225,65,8,8,8,127,93,9
3,93
   70VDU23,226,73,73,93,20,20,20
,54,99
   80 VDU23,227,60,36,61,107,11,
10,6,2
   90 VDU23,228,0,242,250,250,25
0,22,30,16
  100VDU23,229,0,1,3,15,31,63,11
5,255
  110VDU23,230,0,128,192,240,248
,252,206,255
  120VDU23,231,0,0,0,65,66,100,1
04,255
  130VDU23,232,0,0,0,130,66,38,2
2,255
  140VDU23,233,1,3,5,1,3,5,9,9
  150VDU23,234,128,192,160,128,1
92,160,144,144
  160VDU23,235,31,30,15,3,3,3,4,
8
  170VDU23,236,248,120,240,192,1
92,192,32,16
  180VDU23,237,104,100,66,65,64,
0,0,0
  190 VDU23,238,22,38,66,130,2,0
,0,0
  200VDU23,239,11,10,10,10,10,2,
2,14
  210VDU23,240,208,80,80,80,80,6
4,64,112
  220VDU23,241,255,192,191,144,1
52,148,146,145
  230VDU23,242,255,3,253,9,25,41
,73,137
  240VDU23,243,241,146,148,152,1
44,191,192,255
  250 REM ** now choose the colo
urs **
  260VDU23,244,143,73,41,25,9,25
3,3,255
  270REM ** erase character **
  280 VDU19,3,0,0,0,0
  290VDU23,245,255,255,255,255,2
55,255,255,255
  300 REM ** monster 1 = VDU229,
230,10,8,8,235,236
  310 REM ** monster 2 = VDU 231
,232,10,8,8,237,238
  320 REM ** monster 3 = VDU 233
,234,10,8,8,239,240
  330 REM ** monster 4 = VDU 241
,242,10,8,8,243,244
  340 REM ** monster 5 = VDU224,
10,8,225,10,8,226
  350 REM ** monster 6 = VDU227,
228
  351 REM ** define Envelopes fo
r the sound effects of the main
 program **
  352 ENVELOPE1,5,1,20,8,200,0,0
,126,0,0,-126,126,126
  353 ENVELOPE2,2,6,0,0,255,0,0,
126,0,0,-126,126,126
  354 ENVELOPE3,3,6,0,2,255,1,0,
126,0,0,-125,125,125
  355 ENVELOPE4,16,16,1,1,200,0,
0,126,0,0,-126,126,126
  360 MODE1
  370 VDU19,0,7,0,0,0
  380 VDU19,1,1,0,0,0
  390 VDU19,2,4,0,0,0
  400 VDU19,3,0,0,0,0
  410 COLOUR1
  420 PRINTTAB(12,1)"Monster Hun
t "
  430 PRINT''SPC(7)"(C) S.W. Luc
as    1984"''
  440 REM ** now flush the keybo
ard buffer
  450 *FX15,0
  455SOUND1,4,30,150
  460 COLOUR 2
  470 PRINT"This is a game which
 will test your     Powers of ob
servation."''"There are 36 monste
rs hiding from you.  You must tr
y  and seek them out by      fir
ing your PHASER gun at two locat
ions on the board."
  480 COLOUR3
  490 PRINT'"When you fire your
Phaser, the monster  will appear
 and you must try to          ide
ntify the locations of the match
ing  monsters. "
  500 COLOUR 1
  510FORX=1 TO37 STEP 36:PRINTTA
B(X,20);:VDU224,10,8,225,10,8,22
6,10,8:NEXT
  515 COLOUR3
  520PRINT''SPC(4)"Press <Space
bar> to continue "
  540 REPEAT UNTIL GET=32
  550CLS:PRINTTAB(12,1)"Monster
Hunt"
  560COLOUR1:PRINT''"The monster
s will only remain on the    scr
een when you have found a pair o
f    monsters which are of the s
ame type and colour."''
  570COLOUR2
  580PRINT"Try to hunt down and
destroy all the    monsters with
 the minimum number of      false
 moves."
  600 COLOUR3
  610PRINT''"You must tell the c
omputer where you    want to fir
e the PHASER by typing in    the
 co-ordinates of the square. eg.
 E4"
  611 COLOUR1
  615 FOR X= 1 TO 38 STEP 4
  620PRINT''TAB(X,25);:VDU231,23
2,10,8,8,237,238
  630 NEXTX
  635 REM FLUSH KEYBOARD BUFFER
  636 *FX15,0
  640COLOUR3
  650 PRINT''SPC(4)"Press <SPACE
 BAR> to load program"
  660 REPEAT UNTIL GET=32
  670 MODE2
  680 FOR X= 1 TO 18 STEP 3
  685 COLOUR1
  690 PRINTTAB(X,3);:VDU229,230,
10,8,8,235,236
  695 COLOUR2
  700 PRINTTAB(X,10);:VDU231,232
,10,8,8,237,238
  750 NEXTX
  760 COLOUR3
  770 PRINTTAB(4,6)"Monster Hunt
"
  780 COLOUR5
  790 PRINTTAB(3,8)"(C) S.W. Luc
as"
  800 COLOUR7
  805PRINTTAB(0,15)"Please wait
for "'"program to load"
  810 REM ** define text window
**
  820 VDU28,0,31,19,20
  830 COLOUR6
  840 REM ** DO NOT TYPE IN THE
NEXT TWO LINES UNTIL YOU HAVE FU
LLY DEBUGGED THE PROGRAM .. THEN
 SAVE A COPY BEFORE RUNNING AS T
HESE LINES DISABLE ESCAPE AND BR
```

Monster Hunt

A GRID is displayed on the screen and in each square of it a monster is hidden. You can display two of the monsters at a time by entering their co-ordinates. If the two you choose are identical you score a point; otherwise they will vanish. The object is to find all the pairs in as few attempts as possible.

The program is listed in two parts which should be saved on tape consecutively. The first can then be RUN with CHAIN"" and the second can then be LOADed from the first.

Monster Hunt was written for the BBC B(1.2) by Steven Lucas of Cheadle Hulme, Cheshire.

```
EAK KEYS! **
  850 *FX229,1
  860 *KEY 10 OLD|M RUN|M
  870 REM ** Next line changes t
he setting of Page for DISC or E
CONET users **
  880 PAGE=&E00
  890 *TAPE
  900 CHAIN"pro92"
  910 REM ** Make sure that you
save the second part with the fi
le name in the above line ! **
```

```
  10 REM ** Monster Hunt Part 2
 **
  20 REM ** this part must be l
oaded and run from PART1 **
  30 REM ** (C) S.W. Lucas Janu
ary 1984 **
  40 REM ** when you have typed
 this program in, you should sav
e it with the file name of "pro9
2"
  50 REM ** DO NOT TYPE IN NEXT
 LINE UNTIL YOU HAVE FULLY DEBUG
GED THE PROGRAM
  60 ON ERROR RUN
  70 *FX229,1
  80 *KEY 10 OLD|M RUN|M
  90 E%=0:S%=0
 100 MODE1
 110 VDU19,0,7,0,0,0
 120 VDU19,1,1,0,0,0
 130 VDU19,2,4,0,0,0
 140 VDU19,3,5,0,0,0
 150 DIMX%(6,6)
 160 VDU28,0,5,39,0
 170 GCOL0,1:FOR A%=0 TO 6
 180 MOVE0,A%*128:DRAW1280,A%*1
28
 190 NEXTA%
 200 MOVE 0,820:DRAW1280,820
 210 FOR A%=0 TO 6
 220 MOVEA%*190+60,0:DRAWA%*190
+60,820
 230 NEXT
 240 COLOUR2:PRINTTAB(12)"Monst
er Hunt"''TAB(9)"(C) S.W. Lucas
1984"
 250 SOUND1,4,7,50
 260 GCOL0,2:VDU5:FORA%=0TO5:MO
VE140+A%*190,810:PRINTCHR$(65+A%
):NEXT:VDU4
 270 VDU5:FORA%=5TO0STEP-1:MOVE
10,80+A%*128:PRINTCHR$(49+A%):MO
VE1230,80+A%*128:PRINTCHR$(49+A%
):NEXT:VDU4
 280 A$=CHR$229+CHR$230+CHR$10+
CHR$8+CHR$8+CHR$235+CHR$236
 290 B$=CHR$231+CHR$232+CHR$10+
CHR$8+CHR$8+CHR$237+CHR$238
 300 C$=CHR$233+CHR$234+CHR$10+
CHR$8+CHR$8+CHR$239+CHR$240
 310 D$=CHR$241+CHR$242+CHR$10+
CHR$8+CHR$8+CHR$243+CHR$244
 320 E$=CHR$224+CHR$10+CHR$8+CH
R$225+CHR$10+CHR$8+CHR$226
 330 F$=CHR$227+CHR$228
 340 G$=CHR$245+CHR$245+CHR$245
+CHR$10+CHR$8+CHR$8+CHR$8+CHR$24
5+CHR$245+CHR$245+CHR$10+CHR$8+C
HR$8+CHR$8+CHR$245+CHR$245+CHR$2
45
 350 FORA%=1TO18
 360 FORB%=1TO2
 370 REPEAT
 380 C%=RND(6):D%=RND(6)
 390 UNTIL X%(C%,D%)=0
 400 X%(C%,D%)=A%
 410 NEXT B%,A%
 420 REPEAT
 430 CLS:COLOUR1:PRINT"Number o
f guesses =";E%;SPC(5);"Score ="
;S%
 440 COLOUR2:PRINT'"Enter the f
irst coordinate ";
 450 REPEAT A%=GET:UNTIL(A%)64A
NDA%<71)
 460 PRINTCHR$(A%);
 470 REPEAT B%=GET:UNTIL(B%)48A
NDB%<55)
 480 PRINTCHR$(B%)
 490 A%=A%-64:B%=B%-48:T%=A%:U%
=B%
 500 PROCPrint
 510 IF X%(A%,B%)=0 THENPRINT"Y
ou have already guessed that loc
ation"'"Press <SPACE BAR> to con
tinue";:E%=E%+1:REPEAT UNTIL GET
=32:GOTO430
 520 PRINT'"Enter the second co
ordinate ";
 530 REPEAT C%=GET:UNTIL(C%)64A
NDC%<71)
 540 PRINTCHR$(C%);
 550 REPEAT D%=GET:UNTIL(D%)48A
NDD%<55)
 560 PRINTCHR$(D%)
 570C%=C%-64:D%=D%-48:T%=C%:U%=
D%
 580 IF (A%=C% AND B%=D%) THENP
RINT"Don't cheat!"'"Press <SPACE
 BAR> to continue";:E%=E%+1:REPE
AT UNTIL GET=32:PROCcls :GOTO430
 590 PROCPrint
 600 IF X%(C%,D%)=0 THENPRINT"Y
ou have already guessed that loc
ation"'"Press <SPACE BAR> to con
tinue";:E%=E%+1:REPEAT UNTIL GET
=32:VDU5:MOVEA%*190-60,B%*128-20
:GCOL0,0:PRINTG$:VDU4:GOTO430
 610 *FX21,0
 620 E%=E%+1
 630 PRINTSPC(5)"Press <SPACE B
AR> to continue":REPEAT UNTIL GE
T=32
 640 CLS:IF X%(A%,B%)<>X%(C%,D%
)THENPROCcls :SOUND1,2,4,50 ELSE
S%=S%+1:X%(A%,B%)=0:X%(C%,D%)=0:
SOUND1,4,30,36
 650 UNTILS%=18
 660 CLS:PRINT"Well done you ha
ve found all of the     monsters
 with only ";E%-S%
 670 PRINT"wrong moves. "'"Woul
d you like another game <Y/N>"
 680 REPEAT S$=GET$
 690 UNTIL S$="Y"ORS$="N"
 700IFS$="Y"THEN RUN ELSEMODE6:
PRINT"THANK YOU FOR PLAYING!":EN
D
 710 END
 720DEFPROCPrint
 730 SOUND0,3,7,20
 740 VDU5:MOVE T%*190-60,U%*128
-20
 750 V%=X%(T%,U%)
 760 IF V%<19 THEN GCOL0,1
 770 IF V%<13 THEN GCOL0,2
 780 IF V%<7 THEN GCOL0,3
 790 IF V%=10RV%=70RV%=13THENPR
INTA$
 800 IF V%=20RV%=80RV%=14THENPR
INTB$
 810 IF V%=30RV%=90RV%=15THENPR
INTC$
 820 IF V%=40RV%=100RV%=16THENP
RINTD$
 830 IF V%=50RV%=110RV%=17THENP
RINTE$
 840 IF V%=60RV%=120RV%=18THENP
RINTF$
 850 VDU4:ENDPROC
 860 DEFPROCcls
 870 VDU5:MOVE A%*190-60,B%*128
-20
 880 GCOL0,0:PRINTG$
 890 MOVE C%*190-60,D%*128-20
 900 PRINTG$
 910 VDU4
 920 ENDPROC
```

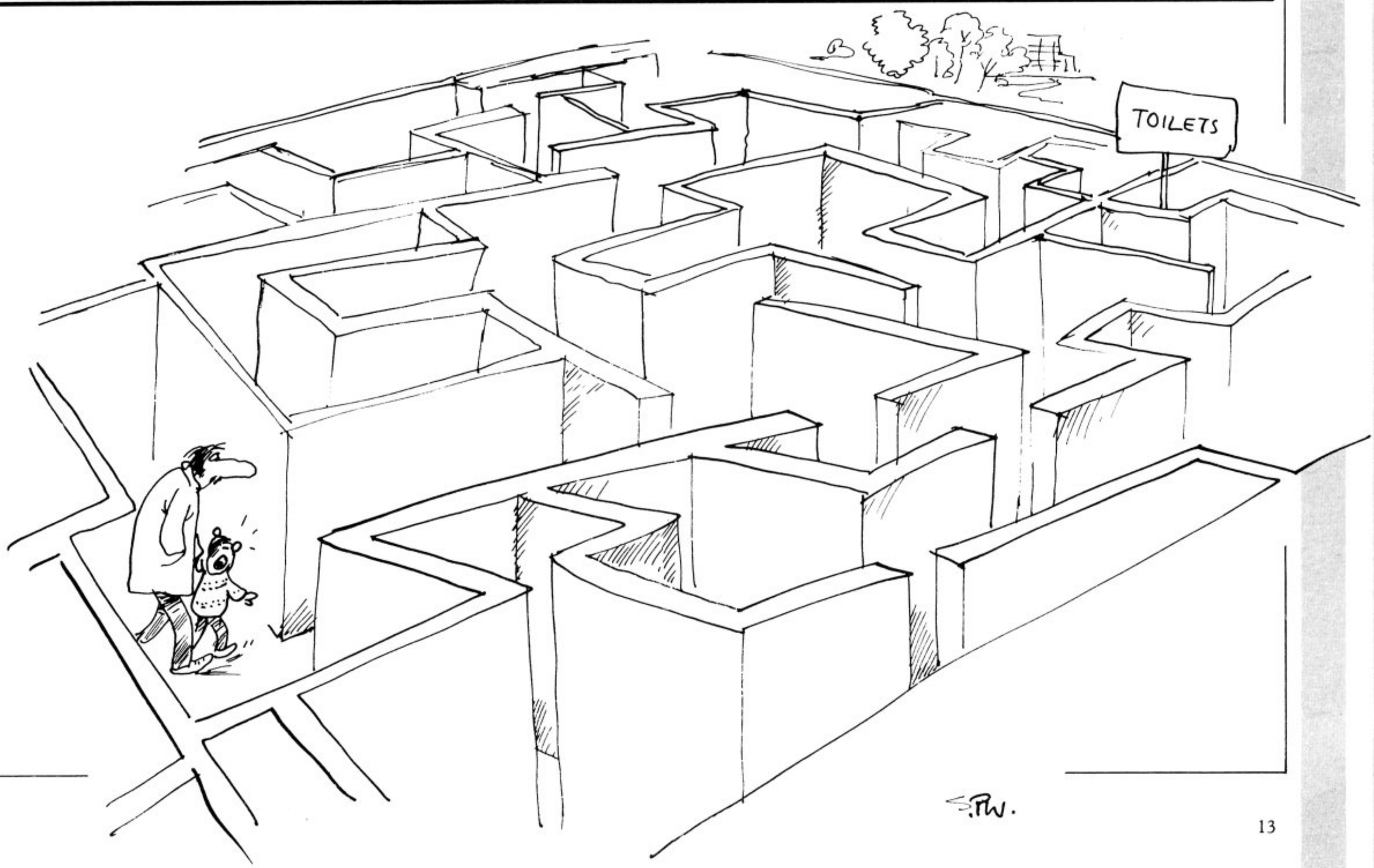
3-D maze

THIS PROGRAM produces a three-dimensional maze in MODE 2 graphics. Side walls are shown in green, facing walls in red. Any maze can be set up by changing the data in lines 20-140. In those lines 1 represents a wall, 0 represents a passage, and 8 the target. The depth and width of any new maze can be placed in the variable A% in line 170. Move through the maze using the cursor keys.

Three-dimensional Maze was written for the BBC and Electron by C J Locke of Winscombe, Avon.

```
10 ON ERROR GOTO 1350
20 DATA 1,1,1,1,1,1,1,1,1,1
,1
30 DATA 1,0,0,0,0,1,0,0,0,0,1
,1
40 DATA 1,0,1,0,1,1,0,1,1,0,0
,1
50 DATA 1,0,1,0,0,0,0,0,0,1,0
,1
60 DATA 1,0,1,0,1,1,1,1,0,1,0
,1
70 DATA 1,0,0,0,1,8,1,0,0,0,0
,1
80 DATA 1,0,1,1,1,0,1,0,1,1,0
,1
90 DATA 1,0,0,1,0,0,0,1,1,0,0
,1
100 DATA 1,0,1,1,0,1,0,1,0,1,0
,1
110 DATA 1,0,1,0,0,1,0,1,0,0,0
,1
120 DATA 1,0,1,1,1,0,0,0,0,1,0
,1
130 DATA 1,0,0,0,1,0,1,1,0,1,0
,1
140 DATA 1,1,1,1,1,1,1,1,1,1,1
,1
150 REM
160 *FX4,1
170 DIM A%(13,12)
180 FOR T=1 TO 13:FOR H=1 TO 1
2
190 READ A%(T,H)
200 NEXT H,T
210 X%=2:Y%=2:DIR=2
220 TIME=0
230 H%=4*(TAN(60)*600):H1%=0
240 MODE2
250 VDU 23;8202;0;0;0;
260 REM >>>> MAIN LOOP <<<<
270 W%=600:W1%=200
280 FOR T=0 TO 4
290 H2%=H1%+TAN(60)*(W1%*2)
300 ON DIR GOSUB 490,570,650,7
30
310 W%=W%-W1%:W1%=W1%-40
320 H1%=H2%
330 NEXT T
340 PRINTTAB(0,0);"TIME ";120-
(TIME DIV 100);" "
350 IF 120-(TIME DIV 100)<=0 T
HEN GOTO 1530
360 Z=INKEY(10):IF Z<136 THEN
GOTO 340
370 IF Z=136 THEN DIR=DIR-1
380 IF Z=137 THEN DIR=DIR+1
390 IF DIR<1 THEN DIR=4
400 IF DIR>4 THEN DIR=1
410 IF Z=139 THEN GOTO 430
420 GOTO 230
430 IF DIR=1 AND A%(Y%-1,X%)<>
1 THEN Y%=Y%-1
440 IF DIR=2 AND A%(Y%,X%+1)<>
1 THEN X%=X%+1
450 IF DIR=3 AND A%(Y%+1,X%)<>
1 THEN Y%=Y%+1
460 IF DIR=4 AND A%(Y%,X%-1)<>
1 THEN X%=X%-1
470 IF A%(Y%,X%)=8 THEN GOTO 1
390
480 GOTO 230
490 Y1%=Y%-T
500 IF A%(Y1%,X%)=8 THEN GOTO
1210
510 IF A%(Y1%,X%)=1 THEN GOTO
1130
520 IF A%(Y1%,X%-1)=1 THEN PRO
Clefcl
530 IF A%(Y1%,X%+1)=1 THEN PRO
Crigcl
540 IF A%(Y1%,X%-1)=0 THEN PRO
ClefoP
550 IF A%(Y1%,X%+1)=0 THEN PRO
CrigoP
560 RETURN
570 X1%=X%+T
580 IF A%(Y%,X1%)=8 THEN GOTO
1210
590 IF A%(Y%,X1%)=1 THEN GOTO
1130
600 IF A%(Y%-1,X1%)=1 THEN PRO
Clefcl
610 IF A%(Y%+1,X1%)=1 THEN PRO
Crigcl
620 IF A%(Y%-1,X1%)=0 THEN PRO
ClefoP
630 IF A%(Y%+1,X1%)=0 THEN PRO
CrigoP
640 RETURN
```

```
  650 Y1%=Y%+T
  660 IF A%(Y1%,X%)=8 THEN GOTO
1210
  670 IF A%(Y1%,X%)=1 THEN GOTO
1130
  680 IF A%(Y1%,X%+1)=1 THEN PRO
Clefcl
  690 IF A%(Y1%,X%-1)=1 THEN PRO
Crigcl
  700 IF A%(Y1%,X%+1)=0 THEN PRO
ClefoP
  710 IF A%(Y1%,X%-1)=0 THEN PRO
CrigoP
  720 RETURN
  730 X1%=X%-T
  740 IF A%(Y%,X1%)=8 THEN GOTO
1210
  750 IF A%(Y%,X1%)=1 THEN GOTO
1130
  760 IF A%(Y%+1,X1%)=1 THEN PRO
Clefcl
  770 IF A%(Y%-1,X1%)=1 THEN PRO
Crigcl
  780 IF A%(Y%+1,X1%)=0 THEN PRO
ClefoP
  790 IF A%(Y%-1,X1%)=0 THEN PRO
CrigoP
  800 RETURN
  810 DEF PROClefcl
  820 GCOL 0,2
  830 MOVE 600-W%,H1%
  840 DRAW (600-W%)+W1%,H2%
  850 DRAW (600-W%)+W1%,H%-H2%
  860 DRAW 600-W%,H%-H1%
  870 DRAW 600-W%,H1%
  880 ENDPROC
  890 DEF PROCrigcl
  900 GCOL 0,2
  910 MOVE 1200-(600-W%),H1%
  920 DRAW 1200-((600-W%)+W1%),H
2%
  930 DRAW 1200-((600-W%)+W1%),H
%-H2%
  940 DRAW 1200-(600-W%),H%-H1%
  950 DRAW 1200-(600-W%),H1%
  960 ENDPROC
  970 DEF PROClefoP
  980 GCOL 0,1
  990 MOVE (600-W%)+W1%,H2%
 1000 DRAW 600-W%,H2%
 1010 DRAW 600-W%,H%-H2%
 1020 DRAW (600-W%)+W1%,H%-H2%
 1030 DRAW (600-W%)+W1%,H2%
 1040 ENDPROC
 1050 DEF PROCrigoP
 1060 GCOL 0,1
 1070 MOVE 1200-((600-W%)+W1%),H
2%
 1080 DRAW 1200-(600-W%),H2%
 1090 DRAW 1200-(600-W%),H%-H2%
 1100 DRAW 1200-((600-W%)+W1%),H
%-H2%
 1110 DRAW 1200-((600-W%)+W1%),H
2%
 1120 ENDPROC
 1130 REM >>>> END <<<<
 1140 GCOL 0,1
 1150 MOVE 600-W%,H1%
 1160 DRAW 1200-(600-W%),H1%
 1170 DRAW 1200-(600-W%),H%-H1%
 1180 DRAW 600-W%,H%-H1%
 1190 DRAW 600-W%,H1%
 1200 T=4:RETURN
 1210 REMexit
 1220 TIM%=TIME
 1230 COL=2
 1240 FOR EX%=H1% TO 396 STEP 16
 1250 GCOL 0,COL
 1260 COL=COL+1:IF COL=7 THEN CO
L=2
 1270 MOVE (600-W%)+(EX%-H1%),EX
%
 1280 DRAW (600-W%)+(EX%-H1%),H%
-EX%
 1290 DRAW 1200-((600-W%)+(EX%-H
1%)),H%-EX%
 1300 DRAW 1200-((600-W%)+(EX%-H
1%)),EX%
 1310 DRAW (600-W%)+(EX%-H1%),EX
%
 1320 Z=INKEY(0):IF Z>100 THEN G
OTO1340
 1330 NEXT EX%
 1340 TIME=TIM%:T=4:GOTO 330
 1350 MODE7
 1360 *FX4,0
 1370 PRINT "ERROR ";ERR;" AT LI
NE ";ERL
 1380 END
 1390 REM >>> REACHED IT <<<
 1400 ENVELOPE 1,1,2,0,-2,20,4,2
0,0,0,0,-1,80,80
 1410 SOUND 1,1,100,60:SOUND 2,1
,100,60
 1420 FOR COL1=0 TO 20
 1430 FOR COL=1 TO 5
 1440 VDU 19,COL-1,COL-1,0;19,CO
L,0;0;
 1450 VDU 19,COL+1,0;0;
 1460 Z=INKEY(6)
 1470 NEXT COL
 1480 VDU 19,5,5;0;19,6,6;0;
 1490 NEXT COL1
 1500 TIME=0:REPEAT UNTIL TIME=3
00
 1510 CLG
 1520 GOTO 1520
 1530 REM >>> OUT OF TIME <<<
 1540 REM >>> DURGE <<<
 1550 ENVELOPE 1,1,0,0,0,0,0,0,2
0,-1,0,-1,80,40
 1560 READ X:IF X=999 THEN GOTO
1630
 1570 READ Y
 1580 SOUND 1,1,X,Y:SOUND 2,1,X,
Y
 1590 GOTO 1560
 1600 DATA 53,15,53,15,53,5,53,1
5
 1610 DATA 65,15,61,5,61,15,53,5
,53,8
 1620 DATA 45,15,53,20,999
 1630 MODE 1
 1640 MOVE 100,100:DRAW 100,700
 1650 DRAW 300,800:DRAW 800,800
 1660 DRAW 1000,700:DRAW 1000,10
0
 1670 DRAW 100,100
 1680 *FX9,20
 1690 *FX10,20
 1700 VDU 19,3,13;0;
 1710 PRINT TAB(14,10);"R.I.P"
 1720 PRINT TAB(7,12);"'DIED OF
SUFFOCATION'"
 1730 COLOUR 2
 1740 PRINT TAB(8,18);"ANOTHER A
TTEMPT ?"
 1750 A$=GET$
 1760 IF A$="N" THEN END
 1770 RUN
```

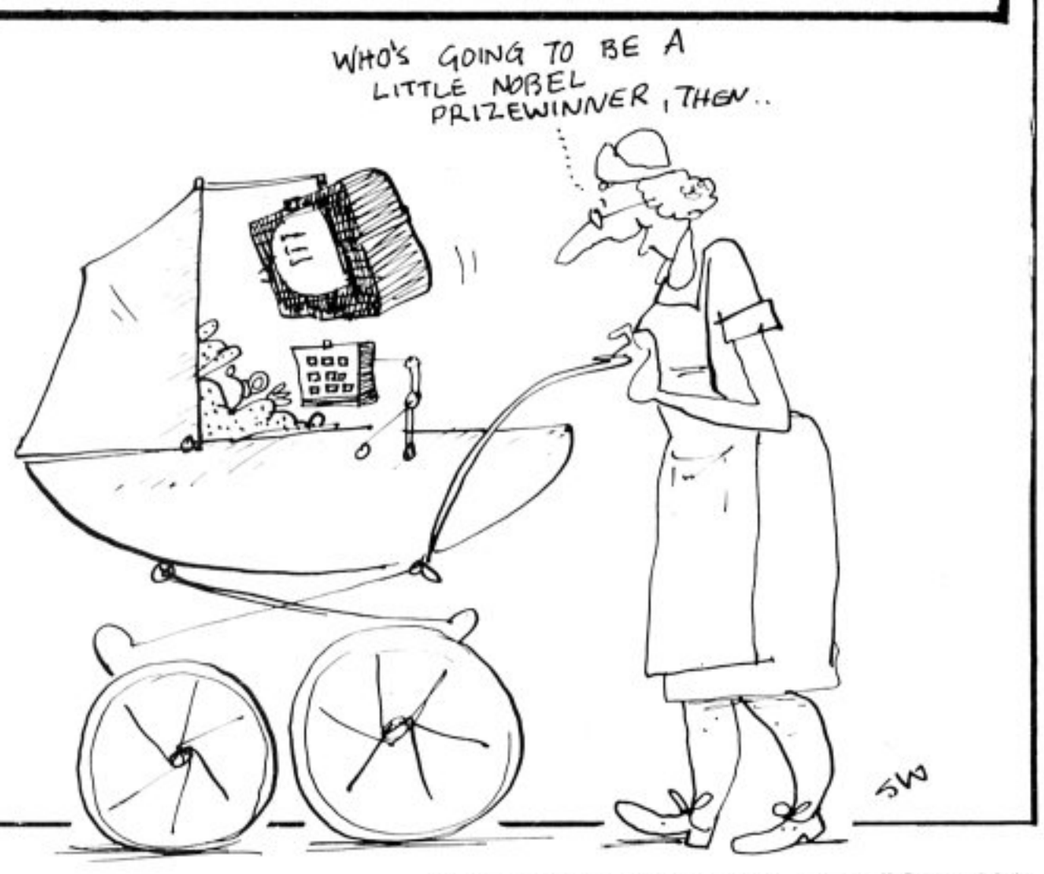


MATHS

THE COMPUTER throws a random number of dice. Add the numbers shown on their tops, which are displayed in the left-hand column, and their bases, which are shown in the right-hand column. The computer will then indicate the answer. An ideal program for learning and practising addition.

Maths was written for the BBC B and Electron by James Morle of Formby, Liverpool.

```
10MODE 1
20PROCdiceroll
30PROCquestions
32MODE 7
35PROCexplain
40GOTO 10
50DEF PROCdiceroll
60COLOUR 129:COLOUR 2
70B=RND(5)
80IF B=1 THEN 70
90PRINTTAB(8,0);"Bottom";TAB(
26,0);"ToP"
100Y=2
110COLOUR 135:COLOUR 0
120ANS=B*7
130FOR ROLL=1 TO B
140NO=RND(6)
150PRINTTAB(9,Y);
160PROCdice(NO)
170PRINTTAB(26,Y);:PROCdice(7-
NO)
180Y=Y+4
190NEXT
200ENDPROC
210DEF PROCdice(NUM)
220ON NUM GOTO 230,250,270,290
,310,330
230PRINT"    ";CHR$8;CHR$8;CHR$
8;CHR$10;
240PRINT" o  ";CHR$8;CHR$8;CHR$
8;CHR$10;"    ":GOTO 350
250PRINT"o   ";CHR$8;CHR$8;CHR$
8;CHR$10;
260PRINT"    ";CHR$8;CHR$8;CHR$
8;CHR$10;"  o":GOTO 350
270PRINT"o   ";CHR$8;CHR$8;CHR$
8;CHR$10;
280PRINT" o  ";CHR$8;CHR$8;CHR$
8;CHR$10;"  o":GOTO 350
290PRINT"o o";CHR$8;CHR$8;CHR$
8;CHR$10;
300PRINT"    ";CHR$8;CHR$8;CHR$
8;CHR$10;"o o":GOTO 350
310PRINT"o o";CHR$8;CHR$8;CHR$
8;CHR$10;
320PRINT" o  ";CHR$8;CHR$8;CHR$
8;CHR$10;"o o":GOTO 350
330PRINT"o o";CHR$8;CHR$8;CHR$
8;CHR$10;
340PRINT"o o";CHR$8;CHR$8;CHR$
8;CHR$10;"o o":GOTO 350
350ENDPROC
360DEF PROCquestions
370COLOUR 1:COLOUR 130
380PRINTTAB(0,24);"Add up numb
ers in TOP column."
390A=INKEY(2000)
400COLOUR 129:COLOUR 2
410PRINTTAB(0,25);"Add up numb
ers in the BOTTOM column."
420A=INKEY(2000)
430COLOUR 1:COLOUR 130
440PRINTTAB(0,26);"Add up your
 results."
450A=INKEY(1000)
460COLOUR 129:COLOUR 2
470PRINTTAB(0,27);"Your answer
 is ";ANS;"!!!"
480COLOUR 1:COLOUR 130
490PRINTTAB(0,28);"Correct (Y/
N)":IF GET$="N" THEN PRINTTAB(0,
29);"Liar!!!"
500COLOUR 129:COLOUR 2
510PRINT"Press a key to contin
ue.."
520A$=GET$
530ENDPROC
540DEF PROCexplain
550FOR B=0 TO 1
560PRINTTAB(0,B);CHR$141;CHR$1
31;"Explanation."
570NEXT
580PRINT''CHR$132;"The predict
ion is acheived by the fact "';C
HR$132;"that the top and bottom
 no.s of a dice  "';CHR$132;"alwa
ys add up to 7 !!!!"
590PRINT''CHR$133;"Press a key
 to continue..."
600A$=GET$
610ENDPROC
```



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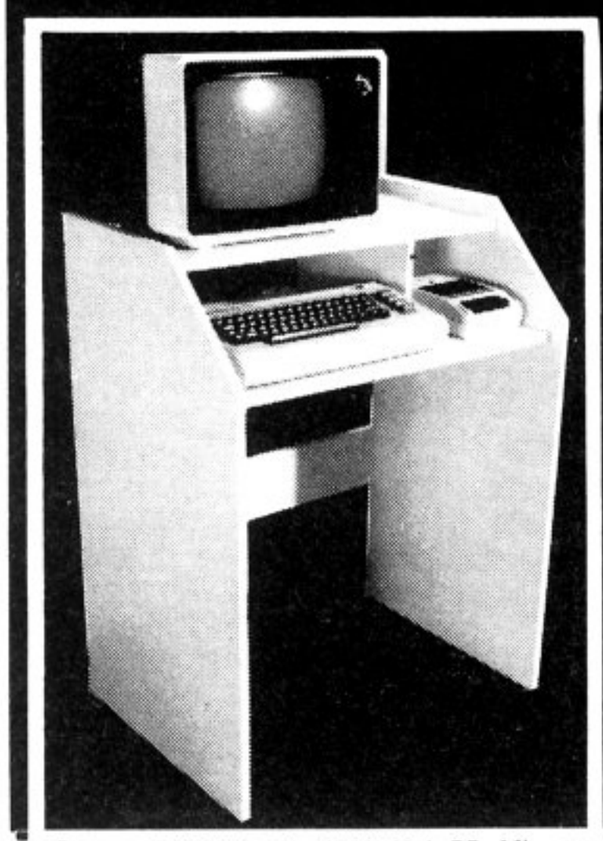

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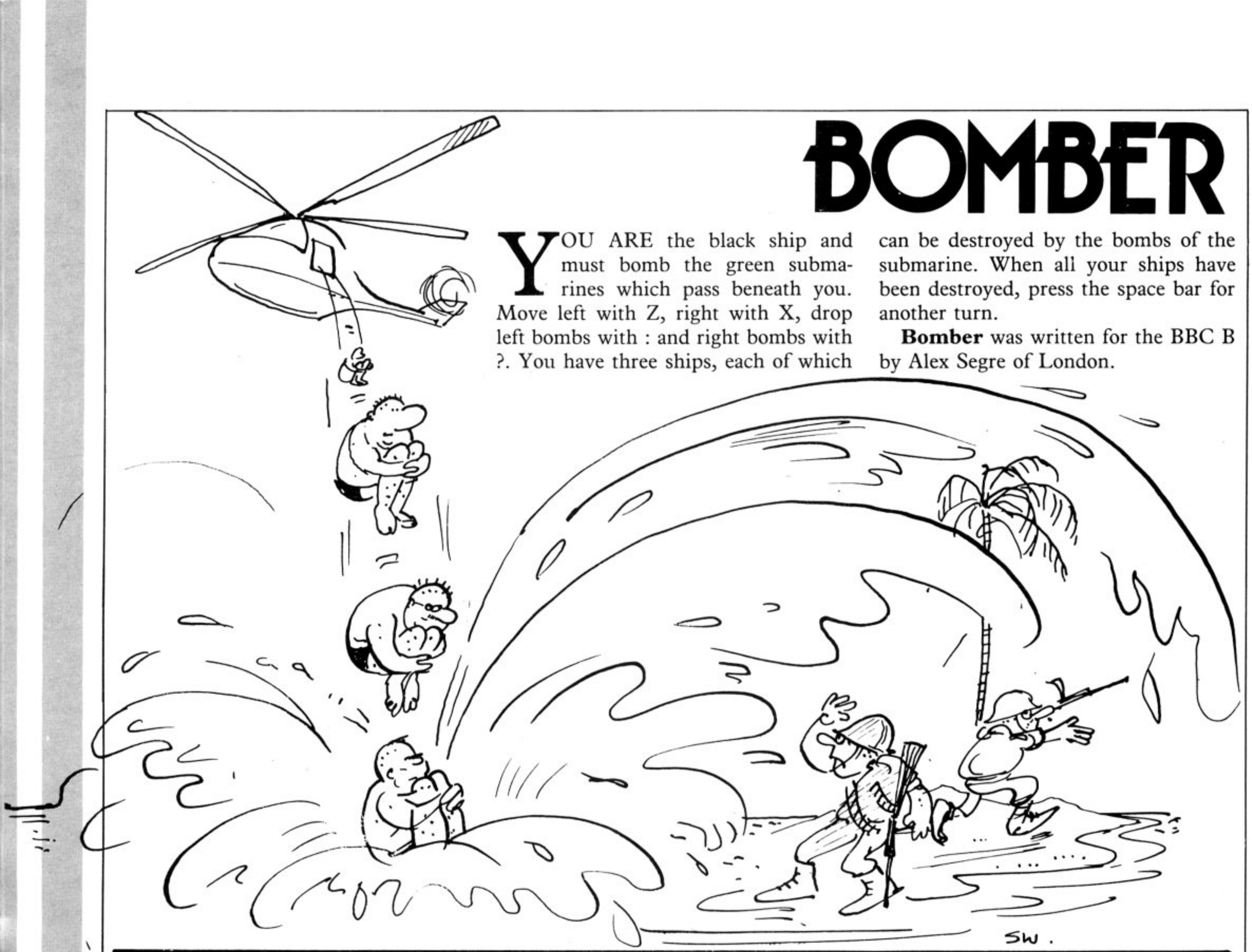
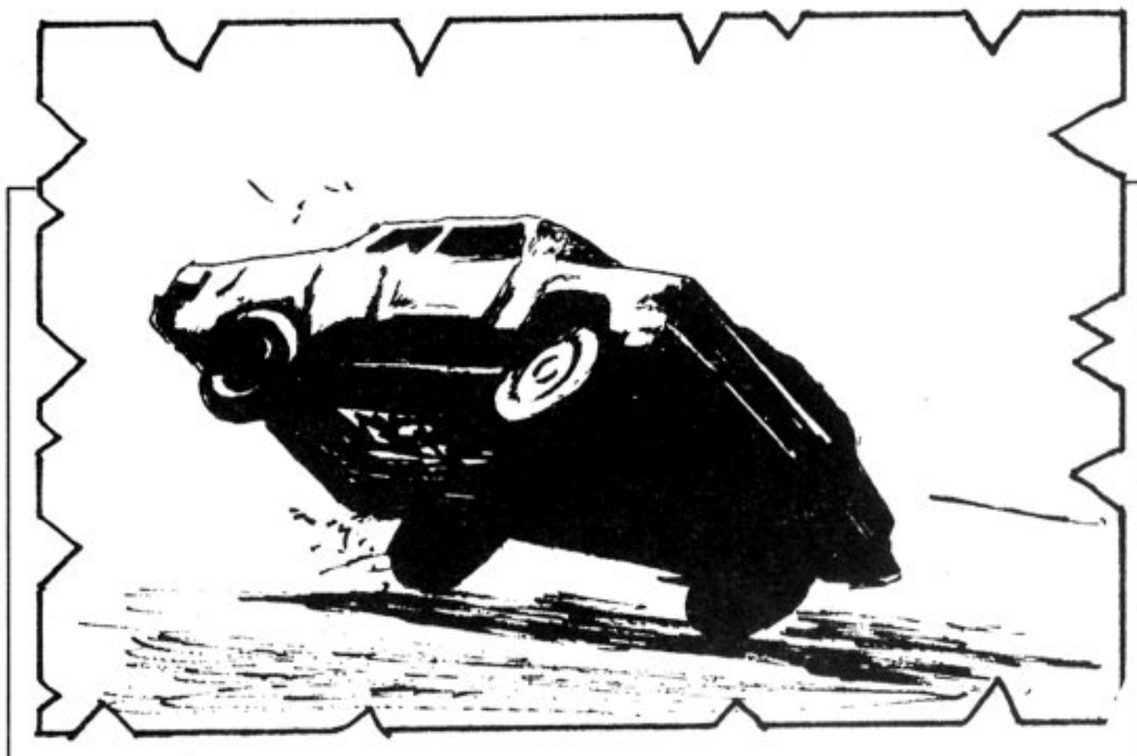
BOMBER



YOU ARE the black ship and must bomb the green submarines which pass beneath you. Move left with Z, right with X, drop left bombs with : and right bombs with ?. You have three ships, each of which can be destroyed by the bombs of the submarine. When all your ships have been destroyed, press the space bar for another turn.

Bomber was written for the BBC B by Alex Segre of London.

```
   10 MODE 2
   20 PROCinitialise
   30 COLOUR 132:CLS
   40 COLOUR 3:PRINT TAB(0,0);"S
core=";score;TAB(13,0);"Lives=";
lives
   50 REPEAT
   60 COLOUR 3:PRINT TAB(13,0);"
Lives=";lives
   70 A$=INKEY$(0)
   80 IF A$="Z" AND X>0 THEN X=X
-1
   90 IF A$="X" AND X<13 THEN X=
X+1
  100 IF A$=":" AND F=0 THEN F=1
:S=Y:V=X+1
  110 IF A$="J" AND G=0 THEN G=1
:N=Y:M=X+4
  120 *FX 15,1
  130 COLOUR 0:PRINT TAB(X,Y);"
";SHIP$;" "
  140 IF F=1 THEN PROCfireF
  150 IF G=1 THEN PROCfireG
  160 R=RND(10):IF R=1 AND Z=0 T
HEN Z=1:REPEAT:W=RND(20):UNTIL W
>12:Q=0
  170 IF Z=1 THEN COLOUR 2:PRINT
 TAB(Q,W);" ";SUB$
  180 IF Z=1 AND RND(10)=5 THEN
PRINT TAB(E,L+1);" ":U=1:E=Q+3:L
=W
  190 SL=SL+1:IF SL MOD 3=1 OR S
L MOD 3=2 THEN Q=Q+1
  200 IF Q>15 THEN Z=0:PRINT TAB
(Q,W);"    "
  210 IF U=1 THEN PROCfightback
  220 UNTIL FALSE
  230 DEF PROCfireF
  240 PRINT TAB(V,S-1);" "
  250 PRINT TAB(V,S);BOMB$
  260 IF S<28 AND F=1 THEN S=S+1
 ELSE F=0:PRINT TAB(V,28);" "
  270 IF V>Q AND V<Q+4 AND S=W T
HEN PRINT TAB(V,S-1);" ":PROCexP
lode:F=0
  280 ENDPROC
  290 DEF PROCfireG
  300 PRINT TAB(M,N-1);" "
  310 PRINT TAB(M,N);BOMB$
  320 IF N<28 AND G=1 THEN N=N+1
 ELSE G=0:PRINT TAB(M,28);" "
  330 IF M>Q AND M<Q+4 AND N=W T
HEN PRINT TAB(V,S-1);" ":PROCexP
lode:F=0
  280 ENDPROC
  290 DEF PROCfireG
  300 PRINT TAB(M,N-1);" "
  310 PRINT TAB(M,N);BOMB$
  320 IF N<28 AND G=1 THEN N=N+1
 ELSE G=0:PRINT TAB(M,28);" "
  330 IF M>Q AND M<Q+4 AND N=W T
HEN PRINT TAB(M,N-1);" ":PROCexP
lode:G=0
  340 ENDPROC
  350 DEF PROCexPlode
  360 SOUND&0010,2,4,50
  370 Z=0
  380 COLOUR 1
  390 PRINT TAB(Q,W);EX$;EX$;EX$
;EX$:FOR A=0 TO 200:NEXT A:PRINT
 TAB(Q,W);"     "
  400 Q=0:W=0
  410 score=score+10
  420 COLOUR 3:PRINT TAB(0,0);"S
core=";score
  430 ENDPROC
  440 DEF PROCfightback
  450 COLOUR 5
  460 PRINT TAB(E,L+1);" "
  470 PRINT TAB(E,L);SBOMB$
  480 L=L-1
  490 IF L=9 THEN U=0:IF E>X AND
 E<X+5 THEN PROCdead
  500 IF L=9 THEN PRINT TAB(E,L+
1);" "
  510 ENDPROC
  520 DEF PROCdead
  530 lives=lives-1
  540 COLOUR 3:PRINT TAB(13,0);"
Lives=";lives
  550 SOUND &0014,-15,100,30
  560 COLOUR 1:PRINT TAB(X,Y);EX
$;EX$;EX$;EX$;EX$:FOR A=0 TO 270
0:NEXT:PRINT TAB(X,Y);"      "
  570 X=0
  580 IF lives=0 THEN PROCfinish
  590 ENDPROC
  600 DEF PROCfinish
  610 REPEAT:UNTIL GET=32
  620 RUN
  630 DEF PROCinitialise
  640 VDU 23;8202;0;0;0;
  650 *FX 11,8
  660 *FX 12,6
  670 X=0:Y=10:F=0:G=F:Z=F:Q=F:W
=F:U=F:E=F:L=F:SL=F:lives=3:scor
e=F
  680 ENVELOPE 2,10,0,0,0,10,10,
10,126,-5,-5,-5,110,0
  690 VDU 23,240,0,0,0,159,191,2
55,191,159,23,241,0,31,31,255,25
5,255,255,255,23,242,128,128,128
,252,246,254,252,248
  700 VDU 23,244,0,0,0,126,14,25
5,63,31,23,245,1,1,1,127,127,255
,255,255,23,246,4,4,4,254,254,25
5,255,255,23,247,2,4,8,112,112,2
55,252,248
  710 VDU 23,243,195,231,126,60,
60,60,60,24
  720 VDU 23,248,24,60,60,60,60,
126,231,195
  730 VDU 23,249,84,10,188,29,18
0,46,69,40
  740 SHIP$=CHR$(244)+CHR$(245)+
CHR$(246)+CHR$(247)
  750 SUB$=CHR$(240)+CHR$(241)+C
HR$(242)
  760 BOMB$=CHR$(243)
  770 SBOMB$=CHR$(248)
  780 EX$=CHR$(249)
  790 ENDPROC
```

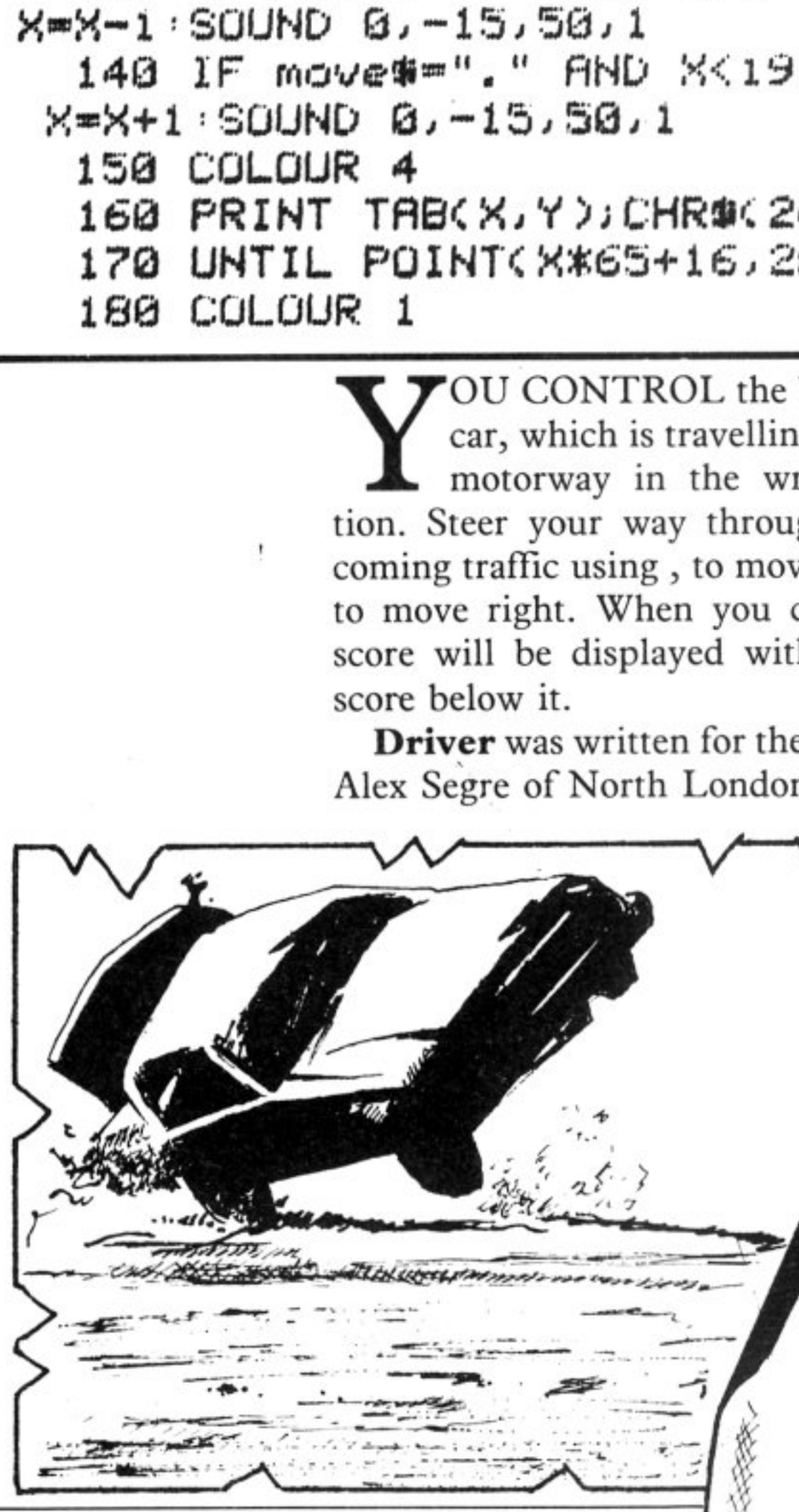


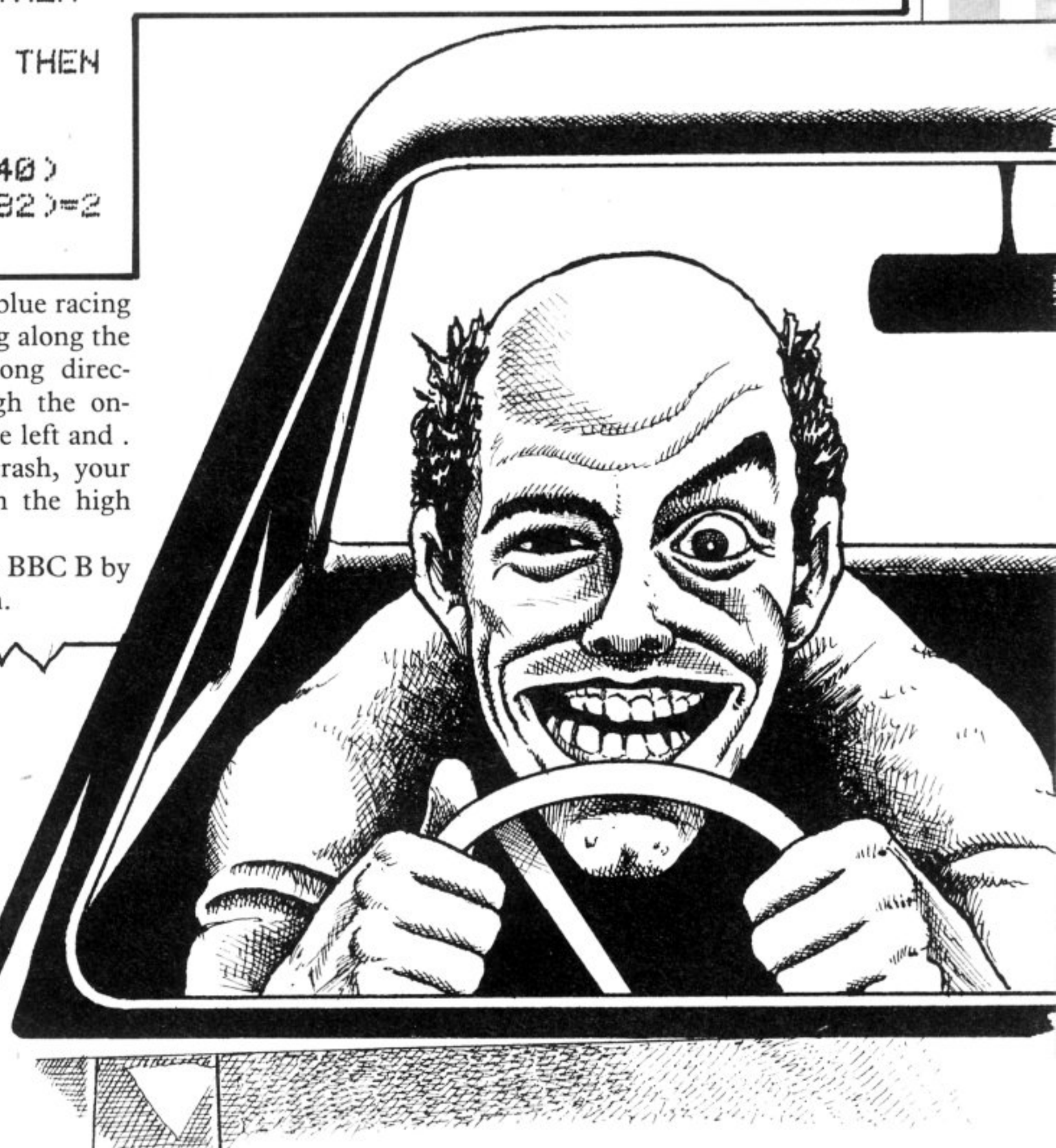
DRIVER

```
   10 REM By Alex Segre
   20 high=0
   30 MODE 2
   40 PROCinitialise
   50 REPEAT
   60 score=score+1
   70 PRINT TAB(X,Y);CHR$(240)
   80 move$=INKEY$(0)
   90 car=RND(19)
  100 R=RND(2):IF R=1 THEN COLOU
R 2:PRINT TAB(car,2);CHR$(241)
  110 PRINT TAB(X,Y);" "
  120 VDU 30,11
  130 IF move$="," AND X>1 THEN
X=X-1:SOUND 0,-15,50,1
  140 IF move$="." AND X<19 THEN
 X=X+1:SOUND 0,-15,50,1
  150 COLOUR 4
  160 PRINT TAB(X,Y);CHR$(240)
  170 UNTIL POINT(X*65+16,282)=2
  180 COLOUR 1
  190 PRINT TAB(X,Y);CHR$(242)
  200 SOUND 0,2,4,50
  210 IF score>high THEN high=sc
ore
  220 COLOUR 3
  230 PRINT TAB(7,13);"SCORE ";s
core
  240 PRINT TAB(7,15);"HIGH  ";h
igh
  250 FOR T=0 TO 3000:NEXT
  260 *FX 12,0
  270 *FX 15,0
  280 G=GET
  290 GOTO 30
  300 DEF PROCinitialise
  310 VDU 23;8202;0;0;0;
  320 ENVELOPE 2,10,0,0,0,10,10,
10,126,-5,-5,-5,110,0
  330 VDU 23,240,8,93,127,93,28,
93,127,85
  340 VDU 23,241,85,127,93,28,93
,127,93,8
  350 VDU 23,242,84,10,188,29,11
6,46,69,40
  360 *FX 11,8
  370 *FX 12,6
  380 X=12
  390 Y=24
  400 score=-21
  410 ENDPROC
```

YOU CONTROL the blue racing car, which is travelling along the motorway in the wrong direction. Steer your way through the oncoming traffic using , to move left and . to move right. When you crash, your score will be displayed with the high score below it.

Driver was written for the BBC B by Alex Segre of North London.





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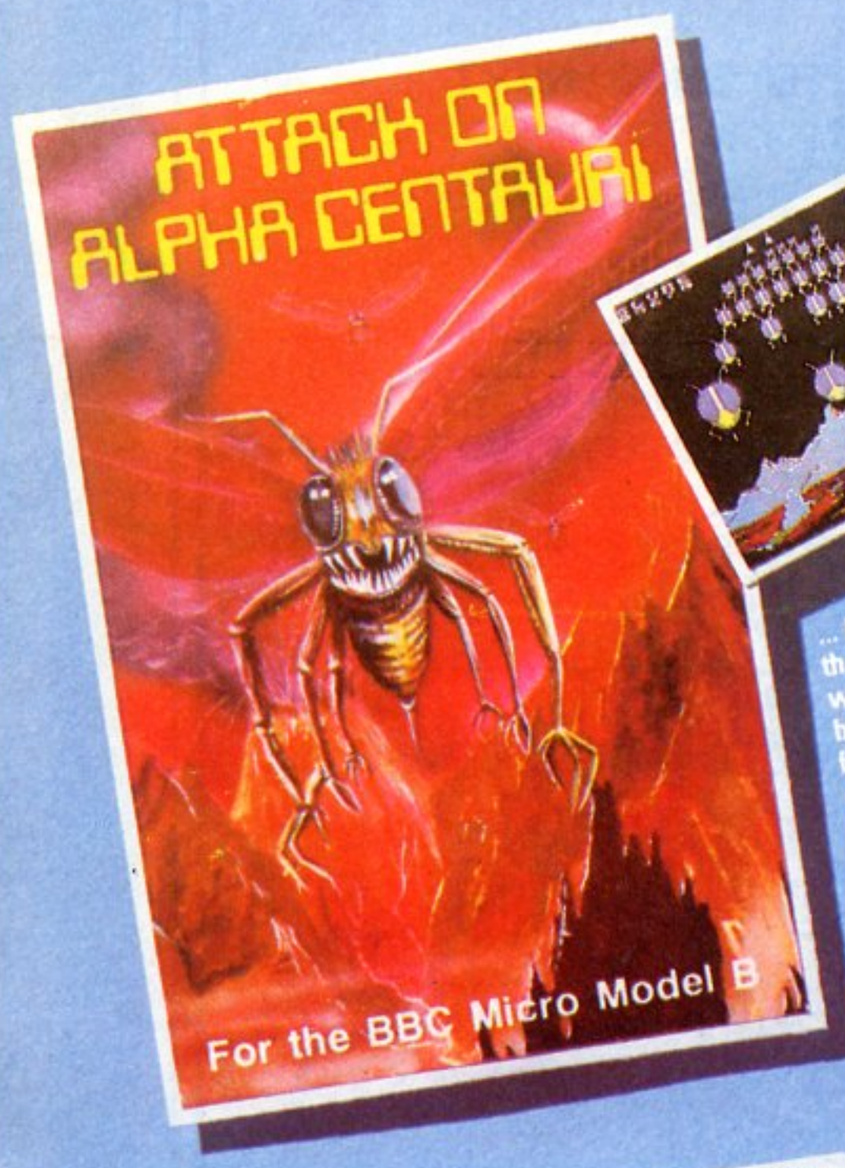

... he punched the key, and the control monitor filled with the picture of bug-eyed wasps attacking from their volcanic nest; decisively he dived to the left and his laser gun burst into action...
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... there was no escape, he had to enter the Vortex and bet on his skills! He grabbed the manual controls and with determination fired both upper deck guns...
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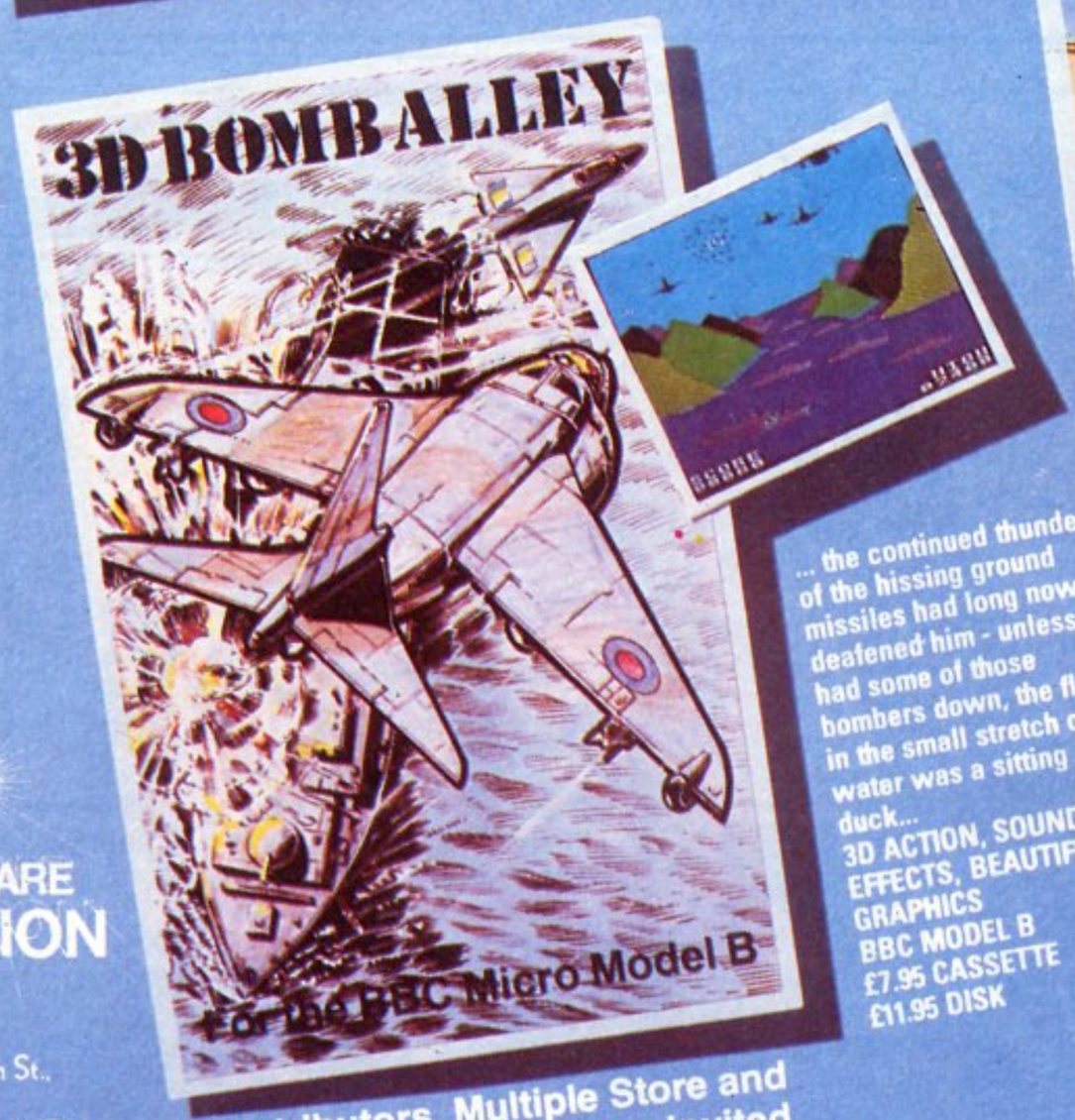

... the continued thunder of the hissing ground missiles had long now deafened him - unless he had some of those bombers down, the fleet, in the small stretch of water was a sitting duck...
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...the movement of the saloon-bar door was all the warning he needed! At the speed of light his hand moved toward his holster, while a sixth sense warned him of the upper floor window...
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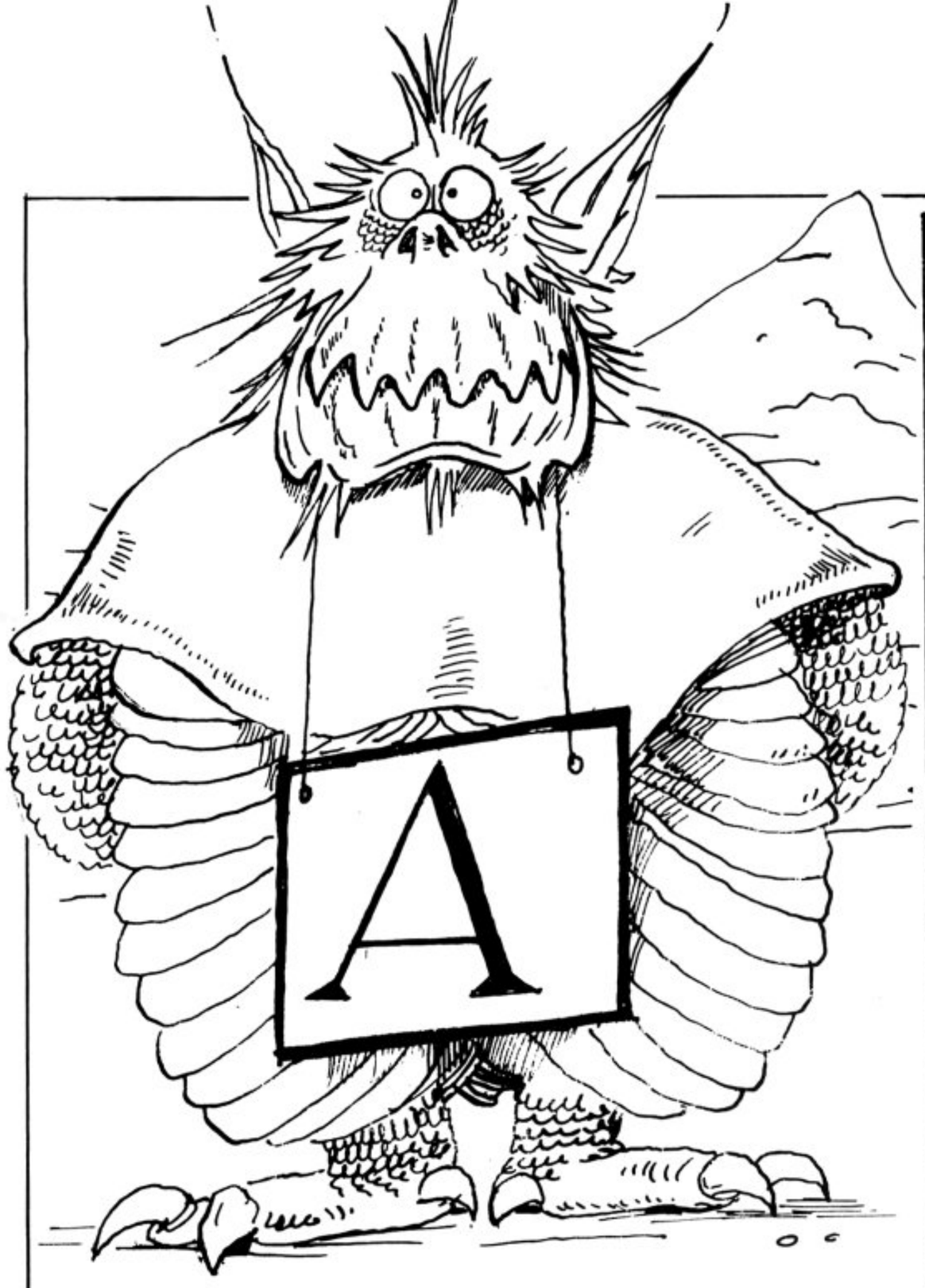


DEFINER

THIS ROUTINE can be used to work out user-defined characters. An eight by eight grid is displayed on the screen and a cursor can be moved round it using Q,W,U and 8. Squares can be filled by pressing Z and cleared by pressing X. Once the character is complete, press TAB to find the decimal values of each line. They can then be typed after VDU 23,224 and the character will then be displayed by pressing VDU 224.

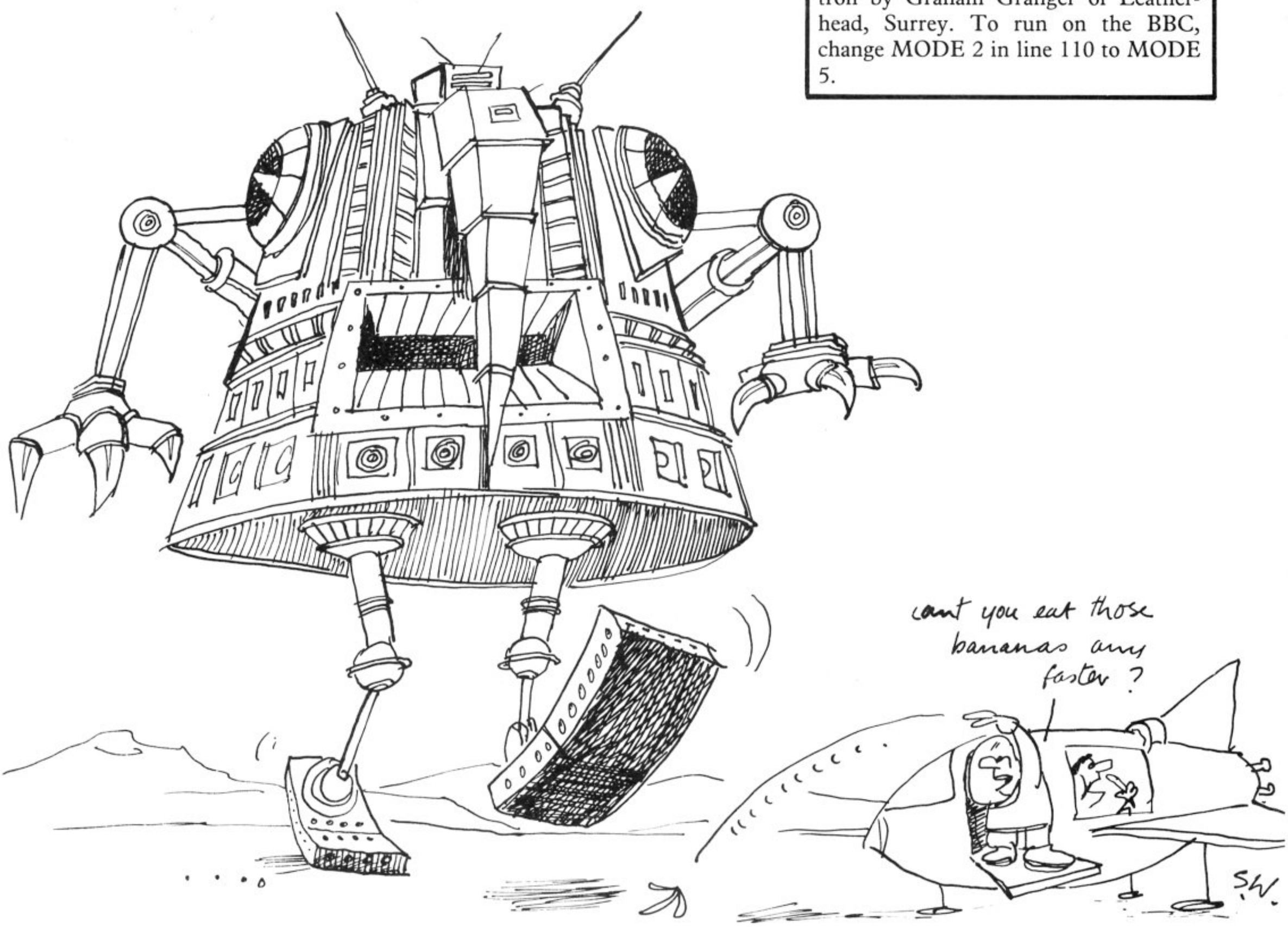
Definer was written for the BBC computer by Edmund Quek of Mitcham, Surrey.

```
10 REM CHARACTER DEFINER
20 *TV255
30 MODE1
40 *FX12,255
50 VDU23;8202;0;0;0;
60 VDU19,1,3,0;0;0;
70 VDU19,2,2,0;0;0;
80 VDU19,3,5,0;0;0;
90 GOTO210
100 DEFPROCGRID
110 GCOL0,2:MOVE0,1000
120 DRAW800,1000:DRAW800,200
130 DRAW0,200:DRAW0,1000
140 FORZ%=1TO7
150 MOVE(Z%*100),1000
160 DRAWZ%*100,200
170 MOVE0,(200+Z%*100)
180 DRAW800,(200+Z%*100)
190 NEXTZ%
200 ENDPROC
210 PROCGRID
220 COLOUR1
230 PRINTTAB(0,26)"Use Q,W,8 a
nd U to position cross over des
ired area. Press 'z' to fill in
and 'x' to clear square.Press T
AB to finish."
240 H=0:V=1000
250 A$=INKEY$(0)
260 IFA$="Q"ANDH>0THENH=H-100
270 IFA$="W"ANDH<700THENH=H+10
0
280 IFA$="8"ANDV<1000THENV=V+1
00
290 IFA$="U"ANDV>300THENV=V-10
0
300 IFA$="Z"THENPROCFILL
310 IFA$="X"THENPROCUNFILL
320 IFINKEY(-97)THENPROCADD
330 VDU5:GCOL4,3
340 MOVEH,V:DRAWH+100,V-100
350 MOVEH,V-100:DRAWH+100,V
360 MOVEH,V:DRAWH+100,V-100
370 MOVEH,V-100:DRAWH+100,V
380 GOTO250
390 DEFPROCFILL:GCOL0,1
400 MOVEH,V:MOVEH+100,V
410 PLOT85,H+100,V-100
420 MOVEH,V-100:PLOT85,H,V
430 PROCGRID
440 SOUND1,-10,100,1
450 ENDPROC
460 DEFPROCUNFILL:GCOL0,0
470 MOVEH,V:MOVEH+100,V
480 PLOT85,H+100,V-100
490 MOVEH,V-100:PLOT85,H,V
500 SOUND1,-10,200,1
510 PROCGRID
520 ENDPROC
530 DEFPROCADD
540 FORZ%=8TO1STEP-1
550 BIT=0:BIN=128
560 FORY%=1TO8
570 COL%=POINT(Y%*100-50,200+Z
%*100-50)
580 IFCOL%=1THENBIT=BIT+BIN
590 BIN=BIN/2
600 NEXTY%
610 MOVE600,200+Z%*100-50:PRIN
TBIT
620 NEXTZ%
630 VDU4
640 PRINTTAB(0,30)"Press a key
to define another character"
650 *FX21,0
660 N=GET:RUN
```

Prote

PROTECT the mothership from the dangerous Walkers, Bouncers and Droppers as well as the harmless Treader. Move left with Z, right with X, fire with RETURN and move upwards with SHIFT — gravity will pull you down again. Eight small mines are scattered round the screen. Seven of them are harmless but one is deadly and can disable your gunship if you shoot it in error.

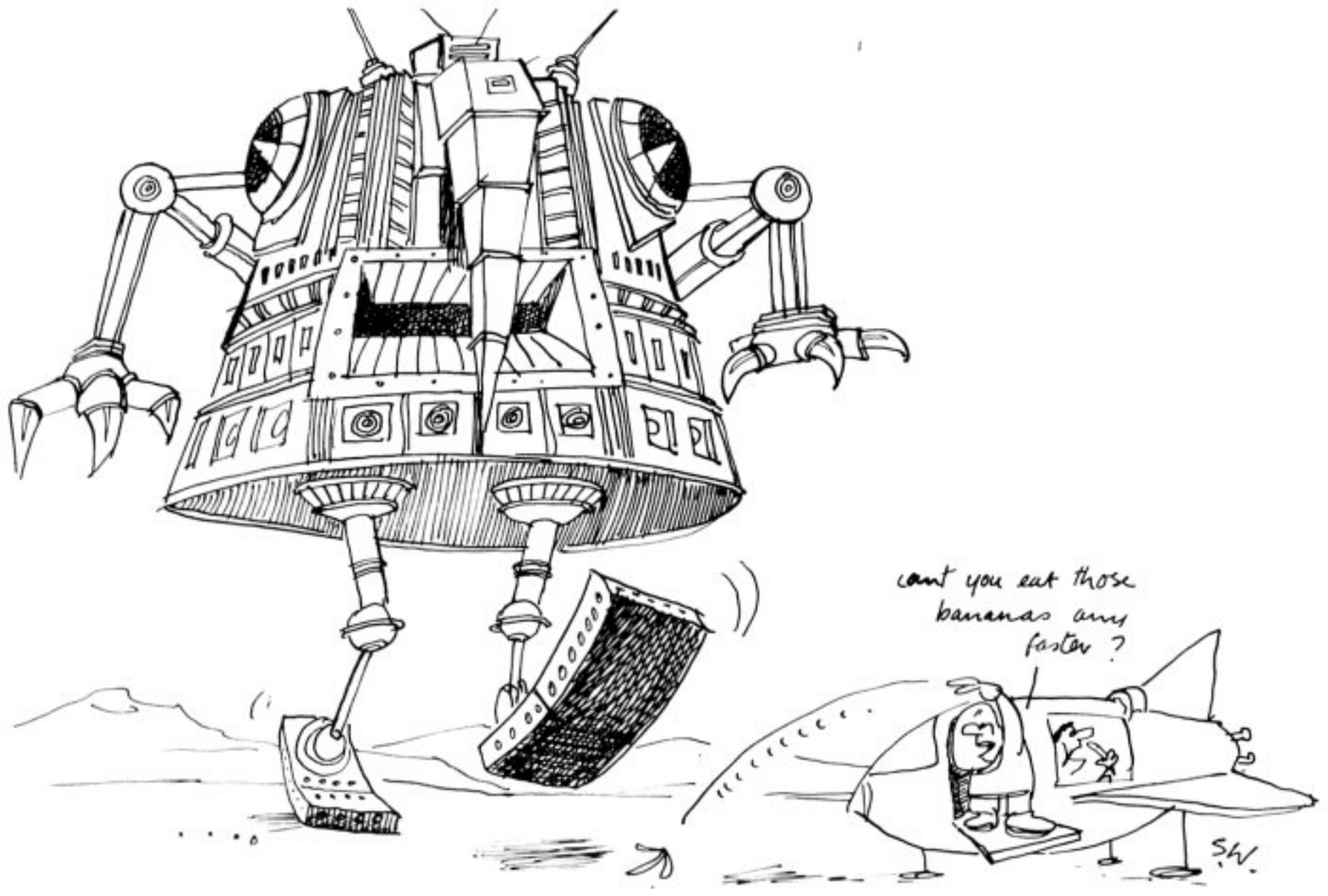
Protector was written for the Electron by Graham Granger of Leatherhead, Surrey. To run on the BBC, change MODE 2 in line 110 to MODE 5.



ector

```
  20VDU23,240,1,7,168,174,1,1,0
,0,23,242,244,20,2,1,182,146,146
,36,23,243,244,20,2,1,182,146,16
4,18,23,240,5,31,119,191,119,11,
112,0,23,241,5,31,123,191,119,11
,16,112
  30VDU23,244,0,96,0,0,0,0,0,0,
23,245,0,24,0,0,0,0,0,0,23,246,0
,6,0,0,0,0,0,0
  40VDU23,249,219,60,106,255,15
3,66,230,7,23,250,90,189,86,255,
153,66,103,224,23,237,0,0,20,0,0
,0,0,23,238,0,0,40,0,0,0,0,0

  50VDU23,251,126,159,255,60,24
,36,90,66,23,252,126,231,255,60,
24,36,66,153,23,253,126,249,255,
60,24,165,90,24
  60VDU 23,230,126,219,231,60,2
19,189,60,219,23,232,129,129,219
,126,60,24,36,36,23,231,0,0,24,6
0,126,219,165,165,23,234,0,0,12,
0,12,29,31,12,23,235,24,60,126,2
55,90,189,231,165,23,236,0,0,48,
0,48,184,248,48
  70VDU23,225,102,195,219,126,6
0,24,0,0
  80VDU23,228,90,102,189,102,0,
0,0,0,23,229,0,24,0,0,0,0,0,0
  90VDU23,224,146,84,40,85,87,4
0,84,146,23,226,24,36,90,189,189
,90,36,24,23,227,73,42,20,170,23
4,20,42,73
 100VDU23,233,0,24,36,66,66,36,
24,0,23,254,0,0,16,40,40,16,0,0,
23,255,0,0,8,20,20,8,0,0
 110MODE 2:VDU23;8202;0;0;0;
 120HIGH=0
 130HI$="GRG"
 140DIM LX(8):DIM LY(8)
 150PROC_BACKGROUND
 160LHI%=0
 170OLX=1:OLY=1
 180EPX=1:EPY=1
 190HHH=TRUE
 200SHIPY%=200:AAA=1
 210ODY%=1:ODX%=1
 220DROP=0:FIT=0
 230X%=0:Y%=3000:M$="R":Y$="U":
DX%=500:DY%=1100:SP%=100:K%=0:S%
=0:AX%=-300:AY%=RND(700)+200:P%=
0:Q%=0:F%=FALSE:E%=70:G%=1:D%=24
9:OD%=0:U%=251:OU%=0:W%=3:J%=1:A
%=25:SHIPX%=-128:TT%=FALSE:FF%=F
ALSE
 240BX%=RND(500)+300:CBX%=BX%:B
Y%=700:LBY%=BY%:CAT%=0
 250PROC_SETUP
 260ENVELOPE1,2,-2,-2,-1,10,10,
50,126,-4,-4,-4,126,0
 270ENVELOPE2,1,1,-125,109,40,2
35,77,124,17,-11,-33,-106,126
 280ENVELOPE3,2,-1,-1,-1,255,25
5,255,120,0,0,-120,120,120
 290ENVELOPE4,1,0,0,0,1,1,1,0,-
1,-2,-3,126,100
 300PIT%=RND(8)
 310FORN%=1TO8
 320LX%=RND(1080)+100:LY%=RND(
450-(LY%+180))+LY%+180
 330MOVEGX%,GY%:GCOL0,3:VDU22
8:GCOL0,1:MOVEGX%,LY%:VDU229
 340IFPIT%=N%MX%=GX%:MY%=LY%
 350NEXT
 360PROC_P_MOTHER:PROC_SHIP_SET
UP:PROC_BORD_HI:PROC_SCORE(0)
 370REM*************************
*****
 380REPEAT
 390PROC_M_SHIP
 400PROC_MINE
 410PROC_LAZ
 420PROC_BOUNCE
 430IFDROP=0PROC_ALIEN ELSE PRO
C_DROPA
 440PROC_SNAIL
 450IFINKEY(-74)PROC_CHECK
 460IFLY(1)<-500 E%=E%+2:W%=W%+
1:PROC_SETUP
 470IFRND(80)=1PROC_DEC
 480UNTIL0
 490REM*************************
*****
 500DEF PROC_CHECK
 510SOUND1,1,105,5
 520X%=SHIPX%+32:Y%=SHIPY%+5

 530GCOL3,5
 540MOVEX%,Y%:DRAWX%,Y%+300

 550J%=0
 560IFX%<DX%+64ANDX%>DX%ANDY%+3
00>DY%ANDY%<DY%VDU19,128,1,0,0,0
:SOUND0,4,RND(4)+3,10:SP%=SP%-5:
PROC_CLEAR:DX%=500:DY%=1100:PROC
_SCORE(200):VDU20:DROP=0
 570IFX%<AX%+192ANDX%>AX%ANDY%+
300>AY%ANDY%<AY%VDU19,128,1,0,0,
0:PROC_SCORE(100):PROC_WIPE(6,AX
%,AY%,CHR$(D%-9)+CHR$248+CHR$(D%
-7)):AY%=1280:VDU20
 580IFX%<BX%+64ANDX%>BX%ANDY%+3
00>BY%ANDY%<BY%VDU19,128,1,0,0,0
:PROC_SCORE(50):PROC_WIPE(7,BX%,
BY%,CHR$(U%)):GCOL3,1:MOVEBX%,BY%:
VDU U%-7:BX%=RND(600)+300:BY%=70
0:F%=FALSE:VDU20
 590FORN%=2TOW%
 600IFLY(N%)=0GOTO620
 610IFX%<LX(N%)+64ANDX%>LX(N%)A
NDY%+300>LY(N%)ANDY%<LY(N%)VDU19
,128,1,0,0,0:PROC_SCORE(20):PROC
_WIPE(4,LX(N%),LY(N%),CHR$OD%):M
OVELX(N%),LY(N%):GCOL3,7:VDU OD%
-12:LX(N%)=0:LY(N%)=0:VDU20
 620NEXT
 630GCOL3,5:MOVEX%,Y%:DRAWX%,Y%
+300
 640ENDPROC
 650REM*************************
*****
 660DEF PROC_ALIEN
 670IFRND(SP%)=1 DROP=1:FIT=1:G
COL3,5:MOVEDX%,DY%:PRINTCHR$(D%+
18)
 680IFDROP=1 PROC_DROPA:ENDPROC

 690ODX%=DX%:ODY%=DY%
 700GCOL3,5:MOVEDX%,DY%:VDU D%-
18
 710DX%=BX%
 720DY%=DY%-4
 730MOVEDX%,DY%:VDU OD%-18
 740IFDY%<-32 DY%=1364
 750ENDPROC
 760REM*************************
*****
 770DEF PROC_LAND
 780GCOL0,1:LY%=120
 790FORN%=0TO1280STEP8
 800LY%=LY%+RND(20)-10.5
 810IFLY%<30 LY%=LY%+11
 820IFLY%>300 LY%=LY%-11
 830IFN%=640 GY%=LY%
 840GCOL0,7
 850MOVEN%,0
 860DRAWN%,LY%
 870GCOL0,1
 880MOVEN%,0:DRAWN%,LY%-10
 890NEXT
 900ENDPROC
 910REM*************************
*****
 920DEF PROCEND
 930T=70
 940LX=544:LY=GY%+100:CY=GY%+10
0:RX=672
 950REPEAT
 960GCOL3,5:MOVELX,LY:VDU224:MO
VE608,CY:VDU226:MOVERX,LY:VDU227
 970GCOL3,3:MOVE608,CY:VDU233:M
OVELX,LY:VDU254:MOVERX,LY:VDU255
 980LX=LX-T:LY=LY+T:RX=RX+T:CY=
CY+90
 990GCOL3,5:MOVELX,LY:VDU224:MO
VE608,CY:VDU226:MOVERX,LY:VDU227
 1000GCOL3,3:MOVE608,CY:VDU233:M
OVELX,LY:VDU254:MOVERX,LY:VDU255
 1010FORN=0TO100:NEXT
 1020UNTIL CY>1050
 1030VDU19,128,15,0,0,0,
 1040FORM=-15TO-4STEP.5:SOUND0,M
,100+RND(3),10:NEXT:VDU20
 1050VDU4:PRINTTAB(0,0):FORN=0TO
32:VDU11:FORG=0TO50:NEXT:NEXT
 1060GOTO150
 1070REM*************************
*****
 1080DEF PROC_SNAIL
 1090IFAX%<-200 ENDPROC
 1100GCOL3,6:MOVEAX%,AY%:VDU OD%
-9,248,OD%-7
 1110AX%=AX%-110
 1120MOVEAX%,AY%:VDU D%-9,248,D%
-7
 1130ENDPROC
 1140REM*************************
*****
 1150DEF PROC_BOUNCE
 1160CBX%=BX%:CBY%=BY%
 1170OU%=U%
 1180U%=U%+1
 1190IFU%=254 U%=251
 1200GCOL3,7:MOVEBX%,BY%:VDU OU%
 1210BX%=BX%+32-P%
 1220BY%=BY%+64-Q%
 1230IFBX%<200 P%=0
 1240IFBY%<GY%+100 Q%=0
 1250IFBX%>1000 P%=64
 1260IFBY%>800 Q%=128
 1270MOVEBX%,BY%:VDU U%
 1280GCOL3,1:MOVECBX%,CBY%:VDU O
```

```
U%-7:MOVEBX%,BY%:VDU U%-7
 1290IFF%=FALSE GCOL3,7:MOVECBX%
,CBY%:VDU OU%:GCOL3,1:MOVECBX%,C
BY%:VDU OU%-7
 1300F%=TRUE
 1310IFBY%>GY%+68ANDBY%<GY%+132A
NDBX%>480ANDBX%<736 PROCEND
 1320ENDPROC
 1330REM*********************
*****
 1340DEF PROC_M_SHIP
 1350IFCAT%=1ENDPROC
 1360GCOL3,2:MOVESHIPX%-64,SHIPY
%:VDU234,235,236
 1370IFINKEY(-98)SHIPX%=SHIPX%-5
1
 1380IFINKEY(-67)SHIPX%=SHIPX%+5
1
 1390IFSHIPY%<GY%+182 AAA=0 ELSE
 AAA=-32
 1400IFINKEY(-1)HHH=FALSE
 1410IFHHH=FALSE AAA=0
 1420IFHHH=FALSE AND SHIPY%<500
AAA=32
 1430SHIPY%=SHIPY%+AAA
 1440MOVESHIPX%-64,SHIPY%:VDU234
,235,236
 1450IFHHH=FALSE SOUND0,1,105,1

 1460HHH=TRUE
 1470ENDPROC
 1480REM*********************
*****
 1490DEF PROC_DEC
 1500IFAX%<-200 AX%=1280:AY%=RND
(550)+300:SOUND2,2,105,120
 1510ENDPROC
 1520REM*********************
*****
 1530DEF PROC_LAZ
 1540OD%=D%
 1550D%=D%+1
 1560IFD%=251 D%=249
 1570FORN%=1TOW%
 1580IFN%=1 GOTO1630
 1590IFLY(N%)=0 GOTO1690
 1600GCOL3,4:MOVELX(N%),LY(N%):V
DU D%
 1610GCOL3,7:MOVELX(N%),LY(N%):V
DU D%-12
 1620OLX=LX(N%):OLY=LY(N%)
 1630LX(N%)=LX(N%)+RND(50)-26
 1640LY(N%)=LY(N%)-RND(E%)
 1650IFLX(N%)<640 LX(N%)=LX(N%)+
32ELSE LX(N%)=LX(N%)-32
 1660IFN%=1 GOTO1690
 1670IFLY(N%)>GY%+68ANDLY(N%)<GY
%+132ANDLX(N%)>480ANDLX(N%)<736
PROCEND
 1680GCOL3,4:MOVELX(N%),LY(N%):V
DU OD%:GCOL3,7:MOVELX(N%),LY(N%)
:VDU OD%-12
 1690NEXT:ENDPROC
 1700REM*********************
*****
 1710DEF PROC_SETUP
 1720IFW%=7 W%=3
 1730FORN%=1TOW%:LX(N%)=RND(1280
):LY(N%)=1100:NEXT
 1740ENDPROC
 1750REM*********************
*****
 1760DEF PROC_SCORE(NY%)
 1770GCOL0,0
 1780MOVE80,957:PRINT;S%
 1790MOVE73,950:PRINT;S%
 1800S%=S%+NY%
 1810GCOL0,7:MOVE80,957:PRINT;S%

 1820GCOL0,1:MOVE73,950:PRINT;S%

 1830ENDPROC
 1840REM*********************
*****
 1850DEF PROC_SHIP_SETUP
 1860REPEAT
 1870GCOL3,2:MOVESHIPX%-64,GY%+1
50:VDU234,235,236
 1880SHIPX%=SHIPX%+32
 1890MOVESHIPY%-64,GY%+150:VDU23
4,235,236
 1900FORN=0TO100:NEXT
 1910UNTIL SHIPX%>600
 1920SHIPY%=GY%+150
 1930ENDPROC
 1940REM*********************
*****
 1950DEF PROC_P_MOTHER
 1960GCOL3,3:MOVE544,GY%+100:VDU
254,233,255
 1970GCOL3,5:MOVE544,GY%+100:VDU
224,226,227:ENDPROC
 1980REM*********************
*****
 1990DEF PROC_BACKGROUND
 2000CLS
 2010VDU4
 2020IFS%>HIGH COLOUR15:PRINTTAB
(2,10)"-NEW HIGH SCORE-":COLOUR3
ELSE COLOUR7
 2030PRINTTAB(6,6)"SCORE-";S%
 2040COLOUR3
 2050COLOUR4:PRINTTAB(4,15)CHR$2
49
 2060COLOUR7:PRINTTAB(4,17)CHR$2
51
 2070COLOUR6:PRINTTAB(3,19)CHR$2
40+CHR$248+CHR$242
 2080COLOUR5:PRINTTAB(4,21)CHR$2
32
 2090COLOUR1:PRINTTAB(0,3)"MINES
- -ONE IS":COLOUR3:PRINTTAB(6,3)
CHR$228
 2100COLOUR10:PRINTTAB(14,3)"*LI
VE*"
 2110COLOUR3
 2120PRINTTAB(5,15)"........."
 2130PRINTTAB(5,17)"........."

 2140PRINTTAB(6,19)"........."
 2150PRINTTAB(5,21)"........."

 2160COLOUR2
 2170PRINTTAB(14,15)"20"
 2180PRINTTAB(14,17)"50"
 2190PRINTTAB(14,19)"100"
 2200PRINTTAB(14,21)"200"
 2210IFS%<HIGH OR S%=HIGH GOTO22
50ELSEHIGH=S%
 2220*FX15,0
 2230COLOUR3:PRINTTAB(14,26)"---
":COLOUR1:PRINTTAB(3,25):INPUT"
  YOUR NAME-?"HI$
 2240IFLEN(HI$)<>3 GOTO2230
 2250COLOUR13:PRINTTAB(1,26)"SPA
CE-BAR TO PLAY!"
 2260REPEAT:UNTIL INKEY(-99)
 2270PRINTTAB(0,30)" ":FORN=0TO3
0:FORG=0TO50:NEXT:PRINT" ":NEXT

 2280VDU5
 2290PROC_LAND
 2300ENDPROC
 2310REM*********************
*****
 2320DEF PROC_DROPA
 2330IFFIT=1FIT=0:SOUND3,3,255,6
0:GOTO2350
 2340GCOL3,5:MOVEDX%,DY%:VDU225
 2350DY%=DY%-110
 2360GCOL3,5:MOVEDX%,DY%:VDU225
 2370IFDY%-200<GY% GCOL0,9:MOVED
X%+32,DY%-32:DRAWG40,GY%+84:PROC
END
 2380ENDPROC
 2390REM*********************
*****
 2400DEF PROC_CLEAR
 2410MOVEDX%,DY%:GCOL3,5
 2420IFDROP=0 VDU OD%-18 ELSEVDU
225
 2430ENDPROC
 2440REM*********************
*****
 2450DEF PROC_WIPE(CG%,WX%,WY%,C
$)
 2460SOUND0,4,RND(4)+3,10
 2470GCOL3,CG%:MOVEWX%,WY%:PRINT
C$
 2480ENDPROC
 2490REM*********************
*****
 2500DEF PROC_MINE
 2510IFCAT%=1ENDPROC
 2520IFMIX%+64>SHIPX%-32ANDMIX%<
SHIPX%+96ANDMIY%-16<SHIPY%ANDMIY
%>SHIPY%-32 SOUND1,4,1,20:CAT%=1
:GCOL0,10:MOVESHIPX%-64,SHIPY%:V
DU234,235,236
 2530ENDPROC
 2540REM*********************
*****
 2550DEF PROC_BURD_HI
 2560GCOL0,4:MOVE60,974:DRAW1220
,974:DRAW1220,915:DRAW60,915:DRA
W60,974
 2570JO%=0:RET%=FALSE
 2580REPEAT
 2590JO%=JO%+1
 2600N%=10^JO%
 2610IFHIGH-N%<-1 RET%=TRUE
 2620UNTIL RET%=TRUE
 2630LHI%=64*JO%
 2640GCOL0,7:MOVE1205-LHI%,957:P
RINT;HIGH
 2650GCOL0,1:MOVE1212-LHI%,950:P
RINT;HIGH
 2660GCOL0,7:MOVE481,957:PRINT"(
"HI$")"
 2670GCOL0,1:MOVE481,950:PRINT"(
"HI$")"
 2680ENDPROC
```



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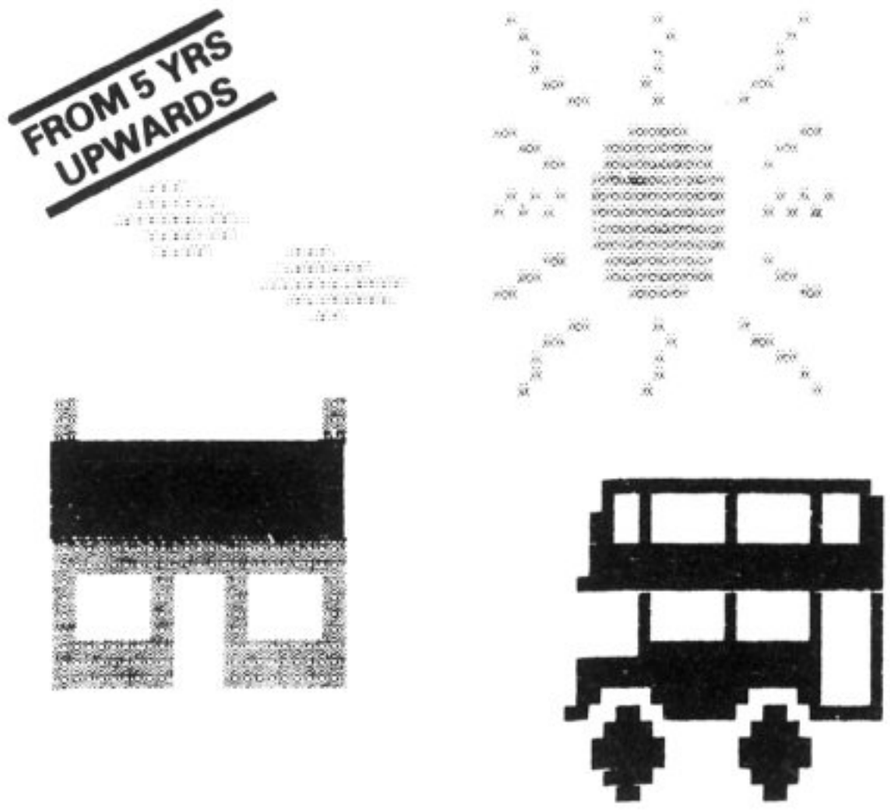

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KEY BOARD

```
   10 ON ERROR GOTO 20
   20 MODE2
   30 VDU23;8202;0;0;0;:CLS:COLO
UR7
   40 PRINTTAB(3,5);
   50 VDU23,224,248,248,248,248,
248,248,248,248
   60 VDU23,225,24,24,24,24,24,2
4,24,24
   70 VDU23,226,31,31,31,31,31,3
1,31,31
   80 VDU23,227,254,254,254,254,
254,254,254,254
   90 VDU23,228,126,126,126,126,
126,126,126,126
  100 VDU23,229,127,127,127,127,
127,127,127,127
  110 VDU23,230,24,60,126,255,24
,24,24,24
  120 VDU23,231,128,64,32,17,11,
7,15,31
  130 VDU23,232,16,48,112,255,25
5,112,48,16
  140 A$=CHR$224:B$=CHR$225:C$=C
HR$226
  150 FOR s%=0TO2
  160 PRINTTAB(3,7+s%);
  170 FOR c%=0TO1
  180 PRINTA$+B$+B$+C$+A$+B$+C$;
  190 NEXTc%
  200 PRINT" "
  210 NEXTs%
  220 PRINTTAB(3,10);
  230 PRINTCHR$227;
  240 FOR x%=0 TO 11
  250 PRINTCHR$228;
  260 NEXT x%
  270 PRINTCHR$229
  280 PRINTTAB(3,11);
  290 PRINTLHR$227;
  300 FOR x%=0 TO 11
  310 PRINTLHR$228;
  320 NEXT x%
  330 PRINTCHR$229
  340 PRINTTAB(3,12);
```

KEYBOARD permits its user to play tunes on the BBC B by pressing keys. The BBC can be used as a piano, an organ, as a synthesiser, or in "fantasy" mode. The program will RUN on an Electron, although the sound effects will not be so varied or realistic. It can also be RUN in Mode 5 on the BBC A.

Written by Philip and Stephen Gales of Hornchurch, Essex.

```
  350 PRINTCHR$227;
  360 FOR x%=0 TO 11
  370 PRINTCHR$228;
  380 NEXT x%
  390 PRINTCHR$229
  400 FOR x%=0 TO 12
  410 COLOUR10:PRINTTAB(3+x%);CH
R$230;
  420 NEXT x%
  430 FOR z%=0 TO 2
  440 COLOUR13:PRINTTAB(3+z%,5);
CHR$231;
  450 NEXT z%
  460 FOR z%=0 TO 1
  470 PRINTTAB(7+z%,5);CHR$231;:
NEXTz%
  480 FOR z%=0 TO 2
  490 PRINTTAB(10+z%,5);CHR$231;
:NEXTz%
  500 FOR z%=0 TO 1
  510 PRINTTAB(14+z%,5);CHR$231;
:NEXTz%
  520 COLOUR14:PRINTTAB(3,4);"12
3 56 890 ↑\"
  530 COLOUR9:PRINT TAB(3,15);"t0
WERTYUIOP@[ "
  540 COLOUR7
  550 PROCX
  560 *KEY0 e
  570 *KEY1 f
  580 *KEY2 g
  590 *KEY3 h
  600 *KEY4 i
  610 PROCENV1
  620 *FX11,30
  630 *FX12,20
  640 A$="1Q2W3ER5T6YU8I9OOP@^[\
_"
  650 B$=INKEY$(0)
  660 IF INKEY(-1)F=19:PROCSTOP:
GOTO 740
  670 IF B$="e" PROCENV1
  680 IF B$="f" PROCENV2
  690 IF B$="g" PROCENV3
  700 IF B$="h" PROCENV4
  710 IF B$="i" PROCENV5
  720 F=INSTR(A$,B$)+1
  730 IF B$=""THEN 650 ELSEPROCS
TOP
  740 SOUND1,1,(F*4)-4,5
  750 IF INKEY(-99)PROCE
  760 IF INKEY(-98)PROCU
  770 IF INKEY(-105)PROCD
  780 COLOUR7:PROCX
  790 GOTO650
  800 DEFPROCSTOP:*FX15,0
  810 ENDPROC
  820 DEFPROCENV2:COLOUR1:PRINTT
AB(2,20);"f1= XYLOPHONE MODE ":E
NVELOPE1,1,0,0,1,1,1,1,-4,-12,-4
,-4,126,100:FOR T=0 TU 1000:NEXT
:ENDPROC
  830 DEFPROCENV1:COLOUR4:PRINTT
AB(2,19);"f0= PIANO MODE     ":EN
VELOPE1,1,0,0,0,1,1,1,-1,-3,-1,-
1,126,100:FOR T=0 TU 1000:NEXT:E
NDPROC
  840 DEFPROCENV3:COLOUR2:PRINTT
AB(2,21);"f2= ORGAN MODE     ":EN
VELOPE1,5,1,-1,1,1,1,1,-4,-12,-4
,-4,126,100:FOR T=0 TU 1000:NEXT
:ENDPROC
  850 DEFPROCENV4:COLOUR5:PRINTT
AB(2,22);"f3= FANTASY MODE     ":
ENVELOPE1,1,100,10,100,1,10,1,-1
,-3,-1,-126,126,100:FOR T=0 TU 1
000:NEXT:ENDPROC
  860 DEFPROCENV5:COLOUR3:PRINTT
AB(2,23);"f4= SYNTH MODE     ":EN
VELOPE1,1,0,10,0,1,1,1,-1,-3,-1,
-126,126,100:FOR T=0 TU 1000:NEX
T:ENDPROC
  870 DEFPROCU
  880 FOR i%=0TO45
  890 SOUND1,-15,i%,1
  900 SOUND2,-15,i%,1
  910 SOUND3,-15,i%,1
  920 NEXTi%
  930 ENDPROC
  940 DEFPROCD
  950 FOR y%=45 TO 0 STEP-1
  960 SOUND1,-15,y%,1
  970 SOUND2,-15,y%,1
  980 SOUND3,-15,y%,1
  990 NEXTy%
 1000 ENDPROC
 1010 DEFPROCE
 1020 FOR a%=-15 TO 0
 1030 SOUND0,a%,4,4
 1040 NEXTa%
 1050 ENDPROC
 1060 DEFPROCX
 1070 PRINTTAB(2,19);"f0= PIANO
MODE"
 1080 PRINTTAB(2,20);"f1= XYLOPH
ONE MODE"
 1090 PRINTTAB(2,21);"f2= ORGAN
MODE"
 1100 PRINTTAB(2,22);"f3= FANTAS
Y MODE"
 1110 PRINTTAB(2,23);"f4= SYNTH
MODE"
 1120 PRINTTAB(2,24);"Z = UP SYN
TH"
 1130 PRINTTAB(2,25);"/ = Down S
YNTH"
 1140 PRINTTAB(2,26);"SP= EMPLOS
ION"
 1150 ENDPROC
```

BBC SPEECH

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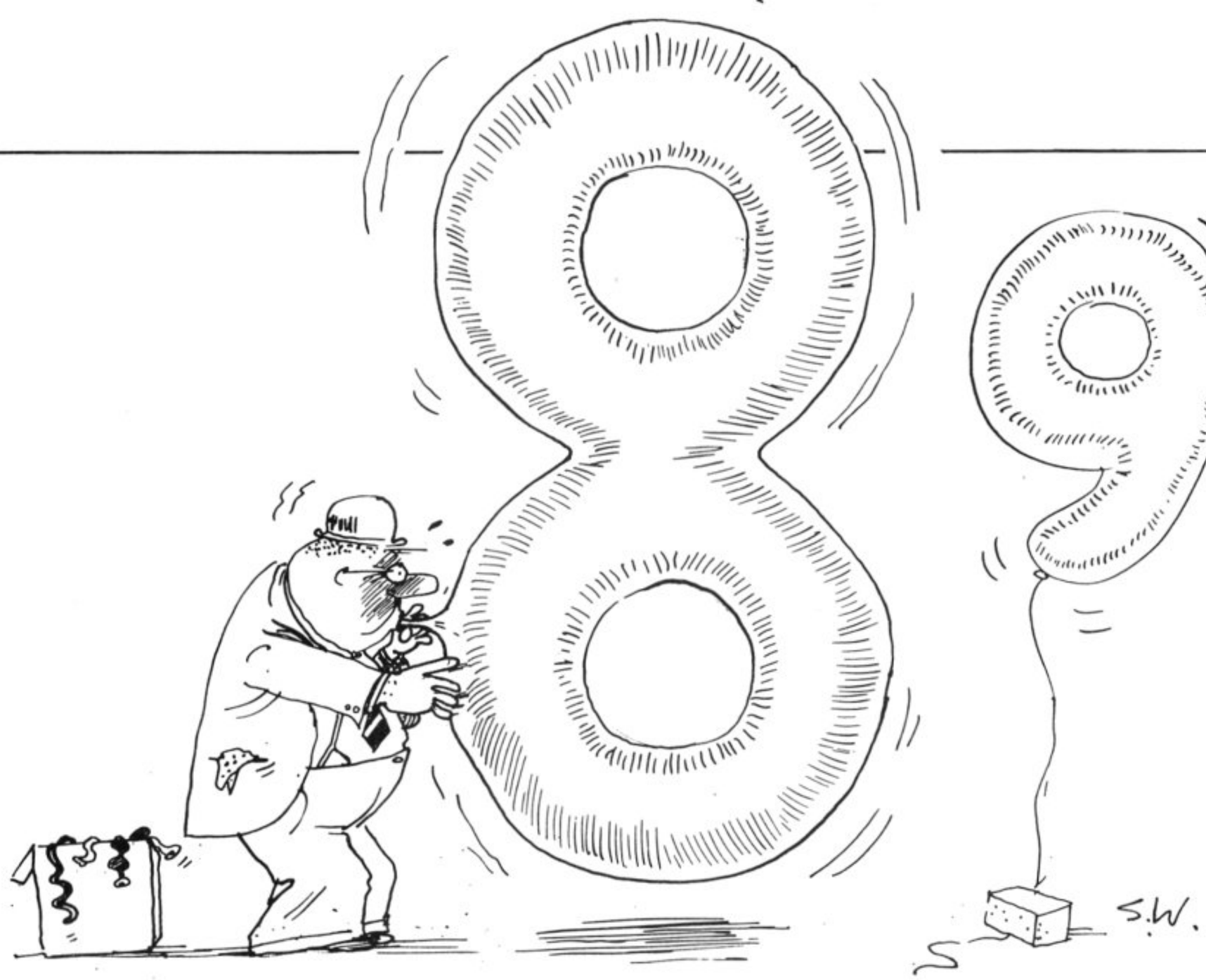


Octal Characters

OCTAL CHARACTERS incorporates a short assembly language routine which converts decimal to binary. When RUN the program will print any character typed-in eight times larger than normal size.

Written for the BBC B and Electron by C J Locke of Winscombe, Avon.


```
   10 REM >> DECIMAL TO BINARY R
OUTINE
   20 FOR I%=0 TO 2 STEP 2
   30 P%=&D00
   40 LOPT I%
   50 .START
   60 CLC
   70 ROL&70
   80 BCC SPACE
   90 LDA&255
  100 JSR&FFEE
  110 JMP CHECK
  120 .SPACE
  130 LDA&32
  140 JSR&FFEE
  150 .CHECK
  160 LDA&70
  170 BEQ FINISH
  180 JMP START
  190 .FINISH
  200 RTS:]
  210 NEXT I%
  220 REM >> MAIN PROGRAM
  230 MODE 0
  240 VDU 23,8202;0;0;0;
  250 VDU 23,255,0,&18,&7E,&7E,&
FF,&7E,&7E,&18
  260 VDU 19,0,4;0;19,1,3;0;
  270 REPEAT
  280 A=GET
  290 Z=&C000+(8*(A-32))
  300 FOR X=Z TO Z+7
  310 ?&70=?X
  320 CALL&D00
  330 PRINT
  340 NEXT X
  350 UNTIL FALSE
```

GOLD SEARCH

A LARGE GRID is displayed on the screen and in one of the squares on that grid gold is hidden. Move your man round the screen by entering the co-ordinates of the square to which he must move. After each turn the direction in which the gold can be found will be displayed and a section of the screen in which the gold is not present will be blocked-off.

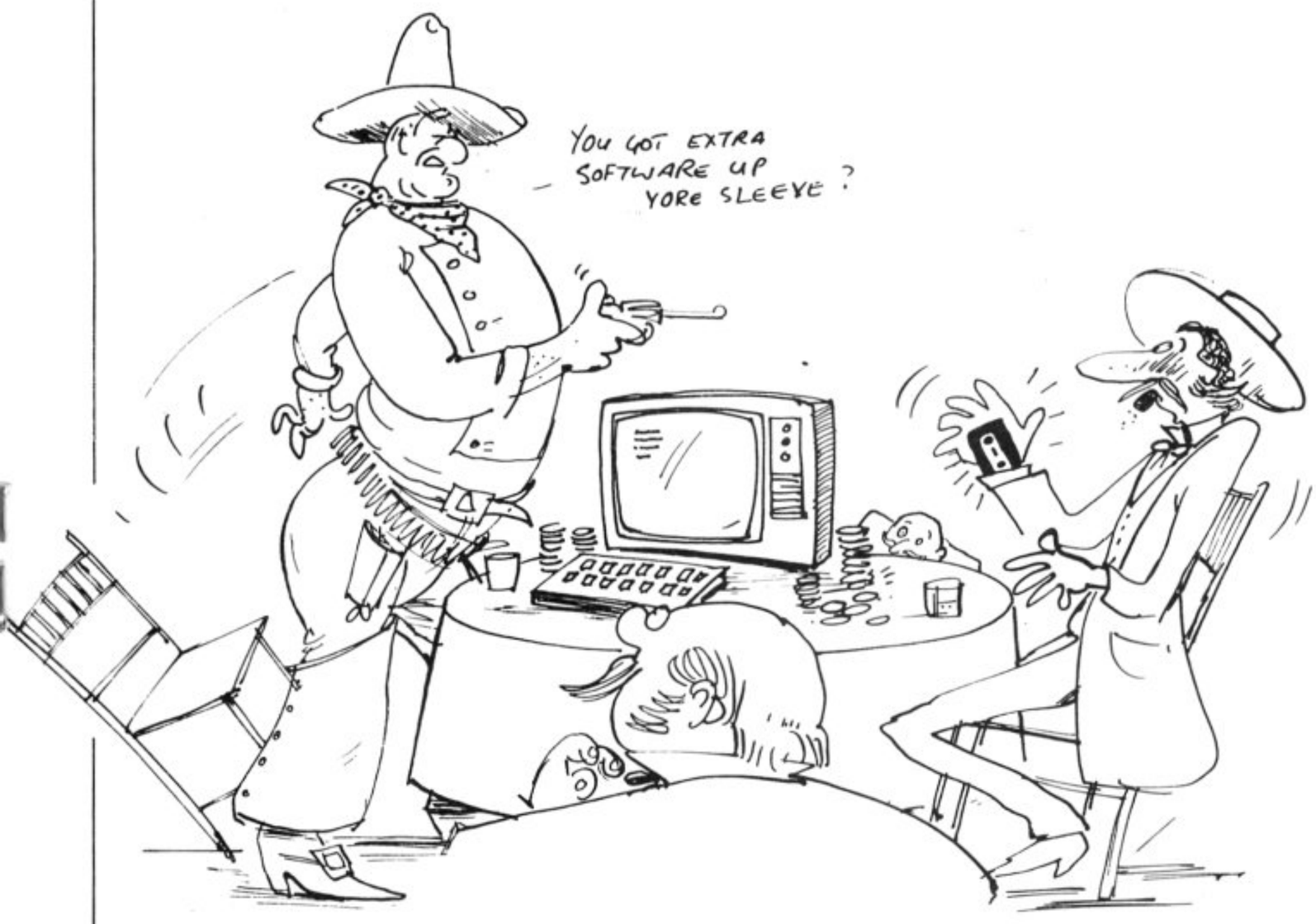
Gold Search was written for the BBC B and Electron by A Beesley of Abingdon, Oxon, who has used it at school for educational purposes.

```
   10REM ** A D BEELEY 1982 **
   20REM ** 53 WHITEHORNS WAY, D
RAYTON **
   30REM ** ABINGDON, OXON. OX14
 4LH **
   40REM ** (0235)31180 **
   50MODE1
   60*FX11,0
   70DIMN$(11),S(11)
   80FORJ=1TO10:N$(J)="BBC Compu.
ter":S(J)=0:NEXTJ
   90S(10)=0:T=20
  100CLS
  110PROCINSTRUCTION
  120GX=((RND(22)-1)*50)+110:GY=
((RND(16)-1)*50)+237:GOLD=0
  130B0=50
  140VDU24,0;110;1279;1023;
  150VDU28,0,30,39,29
  160COLOUR128
  170VDU23,240,28,28,8,127,8,20,
34,65
  180VDU5
  190PROCSCREEN
  200REPEAT
  210PROCGRID
  220PROCMOVE
  230PROCMOVEMAN
  240PROCCHECK
  250T=T-1:B0=B0-10:IFB0<0THENB0
=0
  260UNTILT<=0 OR GOLD=99
  270VDU4:CLS
  280VDU5:CLG
  290IF GOLD=99 THEN120
  300PROCEND
  310GOTO90
  320DEFPROCMOVEMAN
  330VDU5
  340GCOL4,1
  350NX=(X*50)+110:NY=(Y*50)+237
  360MOVENX,NY
  370VDU240
  380ENDPROC
  390DEFPROCINSTRUCTION
  400COLOUR2:PRINT''"S E A R C
H  F O R  G O L D"
  410PRINT"_____________________
```


```
_______"
  420*FX15,0
  430PRINT'"Hello, may I have yo
ur name Please?"
  440INPUTN$(10)
  450N$(10)=LEFT$(N$(10),16)
  460IFN$(10)=""THEN430
  470PRINT
  480PRINT'"In this game you hav
e to find as many  Pots of Gold
 as you can. You have Got  20 m
oves, and after each move you ar
e  given a clue as to the direc
tion the  Gold is in."
  490PRINT'"You are also given a
 visual clue, due  to the fact
that part of the area you  need
n't search is blotted out in whi
te."
  500PRINT'"Enter your choice by
 using co-ordinates,enter the nu
mbers with a comma between  them
: E.G. 12,4"
  510PRINT'"     SEARCH VERY CAR
EFULLY"
  520PRINT''"     Any key to sta
rt"
  530PROCSPACE
  540ENDPROC
  550DEFPROCSPACE
  560VDU23;8202;0;0;0;
  570A$=INKEY$(100000)
  580 ENDPROC
  590DEFPROCSCREEN
  600GCOL0,129:CLG
  610GCOL0,2
  620MOVE1200,200:DRAW100,200:DR
AW100,1000
  630FORY%=200TO1100STEP50:MOVE1
00,Y%:DRAW90,Y%:NEXTY%
  640FORX%=100TO1200STEP50:MOVEX
%,200:DRAWX%,190:NEXTX%
  650G=47
  660FORX%=110TO560STEP50:G=G+1:
MOVEX%,180:VDUG:NEXTX%
  670G=47
  680FORX%=610TO1060STEP50:G=G+1
:MOVEX%,180:VDU49:MOVEX%,150:VDU
G:NEXTX%
  690G=47
  700FORX%=1110TO1160STEP50:G=G+
1:MOVEX%,180:VDU50:MOVEX%,150:VD
UG:NEXTX%
  710G=47
  720FORY%=240TO690STEP50:G=G+1:
MOVE60,Y%:VDUG:NEXTY%
  730G=47
  740FORY%=740TO990STEP50:G=G+1:
MOVE60,Y%:VDUG:NEXTY%
  750FORY%=740TO990STEP50:MOVE30
```

```
,Y%:VDU49:NEXTY%
  760ENDPROC
  770DEFPROCGRID
  780GCOL0,0:FORX%=150TO1200STEP
50:MOVEX%,1000:DRAWX%,200:NEXTX%
  790FORY%=250TO1050STEP50:MOVE1
200,Y%:DRAW100,Y%:NEXTY%
  800ENDPROC
  810DEFPROCMOVE
  820VDU4
  830*FX15,0
  840PRINT"Score = ";S(10);"    W
here now";
  850INPUTX,Y
  860IFX>21ORX<0ORY<0ORY>15THENV
DU7:GOTO840
  870ENDPROC
  880DEFPROCCHECK
  890VDU4
  900IFNX=GX AND NY=GY THENPRINT
"You've done it - you found the
gold.":S(10)=S(10)+T+80:PROCSOUN
D:A$=INKEY$(1000):GOLD=99:PRINT
ENDPROC
  910PRINT"Left  ";T;"       Go "
;
  920IF NY>GY THENPRINT"south";
  930IF NY<GY THENPRINT"north";
  940IF NX<GX THENPRINT"east";
  950IF NX>GX THENPRINT"west";
  960PRINT" of ";X;",";Y
  970VDU5
  980GCOL1,3
  990IFNX>GX THEN A=NX-10:PROCE
 1000IFNX=GX THEN A=NX-10:B=NX+4
0:PROCWE
 1010IFNX<GX THEN A=NX+40:PROCW
 1020IFNY>GY THEN A=NY-37:PROCN
 1030IFNY<GY THEN A=NY+13:PROCS
 1040IFNY=GY THEN A=NY-37:B=NY+1
3:PROCNS
 1050PROCMOVEMAN
 1060ENDPROC
 1070DEFPROCN
 1080MOVE100,A:MOVE100,1000:PLOT
85,1200,1000:MOVE1200,A:PLOT85,1
00,A
 1090ENDPROC
 1100DEFPROCS
 1110MOVE100,A:MOVE100,200:PLOT8
5,1200,200:MOVE1200,A:PLOT85,100
,A
 1120ENDPROC
 1130DEFPROCE
 1140MOVEA,200:MOVE1200,200:PLOT
85,1200,1000:MOVEA,1000:PLOT85,A
,200
 1150ENDPROC
 1160DEFPROCW
 1170MOVEA,200:MOVE100,200:PLOT8
5,100,1000:MOVEA,1000:PLOT85,A,2
00
 1180ENDPROC
 1190DEFPROCNS
 1200MOVE100,B:MOVE100,1000:PLOT
85,1200,1000:MOVE1200,B:PLOT85,1
00,B:MOVE100,A:MOVE100,200:PLOT8
5,1200,200:MOVE1200,A:PLOT85,100
,A
 1210ENDPROC
 1220DEFPROCWE
 1230MOVEA,200:MOVE100,200:PLOT8
5,100,1000:MOVEA,1000:PLOT85,A,2
00:MOVEB,200:MOVE1200,200:PLOT85
,1200,1000:MOVEB,1000:PLOT85,B,2
00
 1240ENDPROC
 1250DEFPROCEND
 1260MOVE0,1000
 1270PRINT'''"   S E A R C H   S
C O R E B O A R D"
 1280PRINT"   ____________________
__________________"
 1290FORL=1TO10
 1300IFS(L)<S(L+1)THENF$=N$(L):N
$(L)=N$(L+1):F=S(L):S(L)=S(L+1):
N$(L+1)=F$:S(L+1)=F:L=0
 1310NEXTL
 1320PRINT
 1330PRINT" TOP TEN SCORES:"
 1340PRINT'
 1350FORJ=1TO10
 1360PRINTS(J);"  ";N$(J)
 1370NEXT
 1380PROCSOUND
 1390*FX15,0
 1400A$=INKEY$(10000)
 1410ENDPROC
 1420DEFPROCSOUND
 1430ENVELOPE3,7,2,1,1,1,1,1,121
,-10,-5,-2,120,120
 1440SOUND2,3,200,20
 1450ENDPROC
```

HIGH LOW

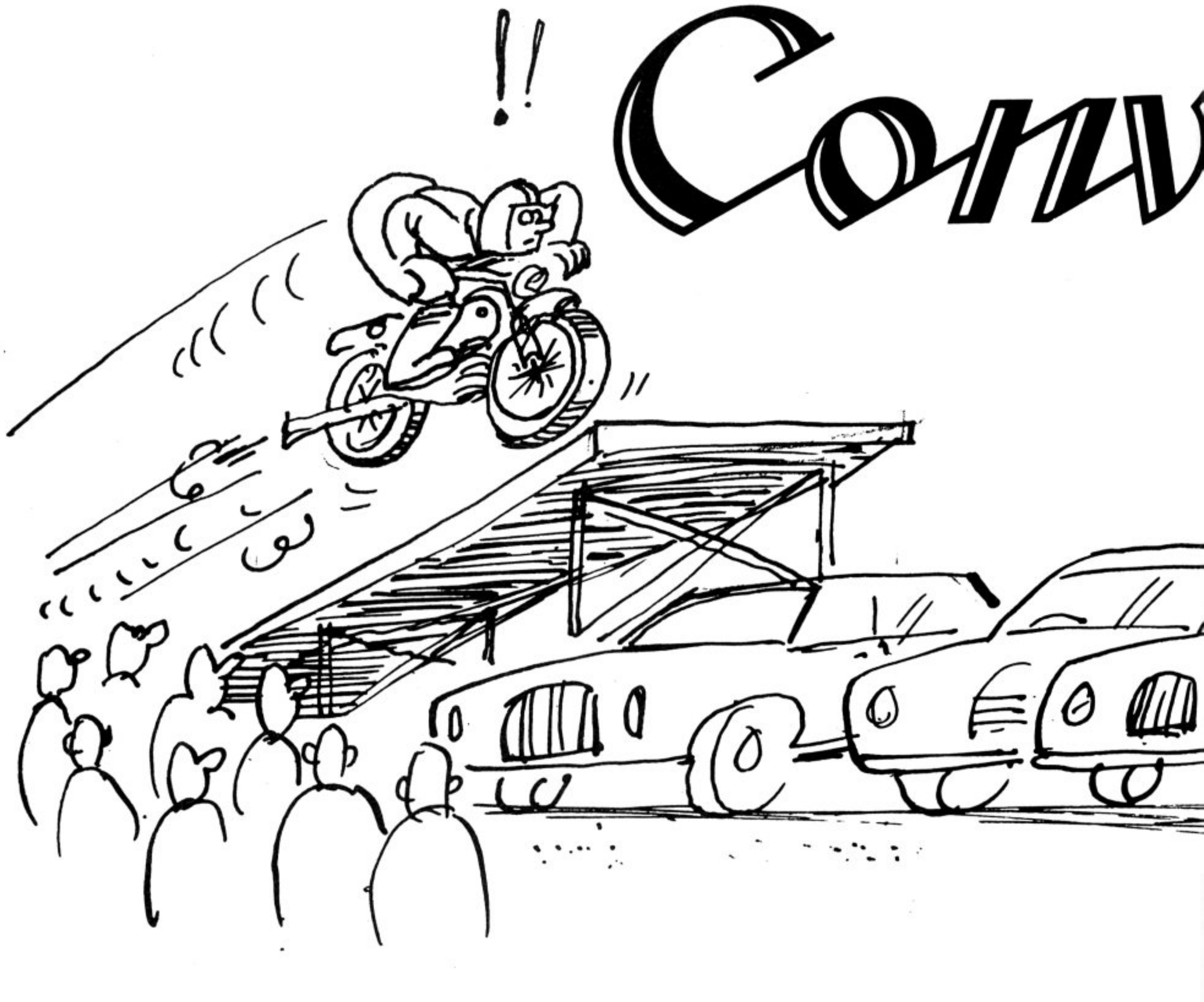


THE COMPUTER will pick a card and the player must guess whether the next card will be higher or lower in value and bet on that guess. The aim is to win £5,000 in 10 turns.

High-Low was written for the BBC B and Electron by Andrew Everitt of Wantage, Oxon.

```
   10 CLS
   20 A=200
   30 PRINT"YOU START WITH £200"
   40 PRINT"YOU HAVE 10 GOES TO
GET TO REACH £5000"
   50 PRINT:PRINT:PRINT" THE AIM
 IS TO SAY WHETHER THE NEXT CARD
WILL BE HIGHER OR LOWER THAN THE
 LAST   CARD."
   60 PRINT"  EACH TIME,YOU GET
A CHANCE TO BET SOMEMONEY ON YOU
R CHOICE"
   70 PRINT"        YOUR MINIMUM
BET IS £50"
   80 PRINT TAB(0,25);"PRESS ANY
 KEY TO START"
   90 E=GET
  100 C=RND(12)+1
  110 FOR B=1 TO 10
  120 CLS
  130 PRINT"GO NUMBER ";B
  140 PRINT:PRINT
  150 PRINTTAB(12,1);"YOU HAVE £
";A
  160 PRINT:PRINT
  170 PRINT"YOUR CARD IS A ";C
  180 D=RND(12)+1
  190 PRINT"DO YOU THINK THE NEX
T CARD IS HIGHER(H) OR LOWER(L)?
"
  200 A$=GET$
  210 IF A$<>"H" AND A$<>"L"THEN
 VDU7:GOTO200
  220 PRINT:INPUT"HOW MUCH DO WA
NT TO BET? £"F
  230 IF F<50 THEN PRINT"MINIMUM
IS £50":GOTO 220
  240 IF F>A THEN PRINT"YOU HAVE
ONLY GOT £";A:GOTO210
  250 PRINT:PRINT
  260 IF A$="H" AND D>C OR A$="L
" AND D<C THEN PRINTCHR$(136);"C
ORRECT":A=A+F ELSEPRINTCHR$(136)
;"WRONG":A=A-F
  270 PRINT"THE CARD WAS A ";D
  280 IF A<50 THEN 380
  290 IF A>=5000 THEN 360
  300 C=D
  310 PRINT"PRESS ANY KEY TO CON
TINUE"
  320 E=GET
  330 NEXT
  340 PRINT"  YOU DID NOT MAKE I
T TO THE TARGET BUT STILL WON £"
;A
  350 PRINT:PRINT:GOTO 400
  360 PRINT"WELL DONE...YOU HAVE
 WON THE CAR IN ";B;"         GOES
"
  370 PRINT:PRINT:GOTO 400
  380 PRINT"YOU HAVE RUN OUT OF
MONEY"
  390 PRINT"YOU LASTED ";B;" GOE
S"
  400 PRINT"DO YOU WANT ANOTHER
GO(Y/N)"
  410 E$=GET$
  420 IF E$="Y" OR E$="y" THEN R
UN ELSE END
```

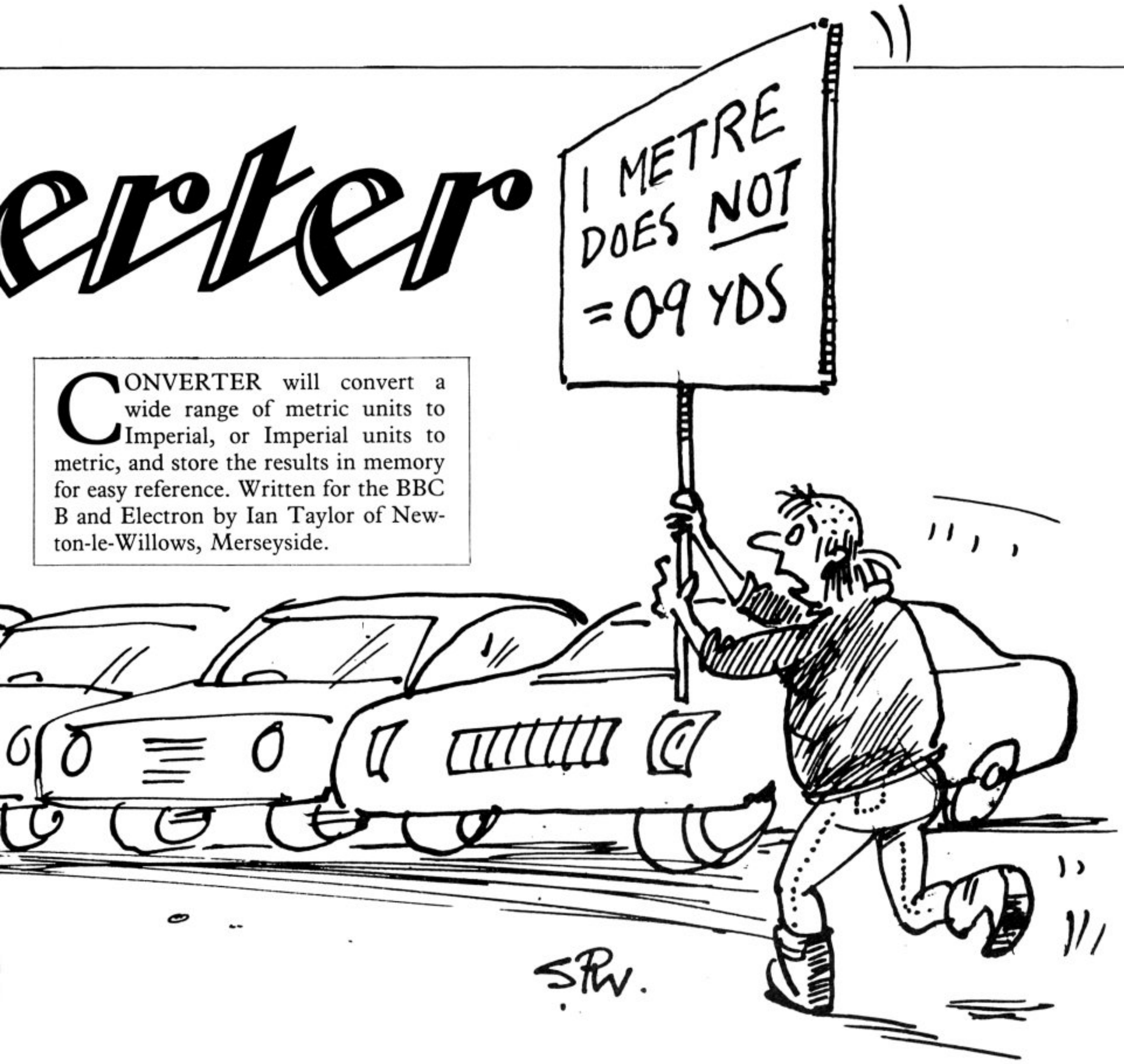
Conv



```
 10 REM*** PROGRAM FOR CONVERS
ION OF METRIC AND IMPERIAL UNITS
. ***
  20 REM*** BY  IAN TAYLOR ***
 100 MODE6
 110 DIM M$(20):N=0
 120 PROC_colour
 200 CLS:PRINTTAB(0,1)"THIS PRO
GRAM WILL CONVERT METRIC UNITS
TO IMPERIAL AND VISA VERSA."
 210 PRINTTAB(0,4)"THE ANSWERS
TO THE CONVERSIONS WILL BE  STOR
ED IN MEMORY UNTIL THE PROGRAM I
S   ENDED."
 220 PRINTTAB(0,8)"THE MEMORY C
AN BE REVIEWED AFTER EACH   CONV
ERSION."
 230 INPUTTAB(0,11)"PRESS 'RETU
RN' KEY TO CONTINUE..."A
 240 REPEAT UNTIL A=INKEY(-74)
 290 :
 300 CLS:PRINTTAB(1,3)"DO YOU W
ANT TO:-"
 310 PRINTTAB(3,5)"(1) CONVERT
METRIC UNITS TO IMPERIAL"
 320  PRINTTAB(1,7)"OR"
 330 PRINTTAB(3,9)"(2) CONVERT
IMPERIAL UNITS TO METRIC"
 340 PRINTTAB(1,12)"ENTER PROCE
DURE NUMBER...";:GOTO 400
 350 :
 360 PRINT:PRINT M$(N)
 370 PROCstore:PROCre_select
 390 :
 400 ON INSTR("1234",GET$)GOTO
410,430,450,5000 ELSE 400
 410 PROCmenu_met_imP
 420 Y%=Y%*100+1000:GOTO Y%
 430 PROCmenu_imP_met
 440 Z%=Z%*100+3000:GOTO Z%
 450 PROCmem:PROCre_select:GOTO
400
 990 :
1000 REM*** MET. TO IMP. CONVER
SIONS**
1100 CLS:PRINTTAB(1,2)"PROGRAM
(1)"
1110 PRINT:INPUT"ENTER TEMPERAT
URE IN DEGREES C...",c
1120 f=((c*9)/5)+32
1130 M$(N)=STR$(c)+" DEGREES C.
= "+STR$(f)+" DEGREES F.":GOTO 3
60
1200 CLS:PRINTTAB(1,2)"PROGRAM
(2)"
1210 PRINT:INPUT"ENTER DISTANCE
 IN CMS...",c
1220 i=c*0.3937
TR$(i)+" INS.":GOTO 360
1300 CLS:PRINTTAB(1,2)"PROGRAM
(3)"
1310 PRINT:INPUT"ENTER DISTANCE
 IN METRES...",m
1320 f=m/0.30481:t=INT f:i=(f-t
)*12
1330 IF i<0.1 THEN i=0
1340 M$(N)=STR$(m)+" METRES = "
+STR$(f)+" FEET"+"                O
R "+STR$(t)+" FEET "+STR$(i)+" I
NS.":GOTO 360
1400 CLS:PRINTTAB(1,2)"PROGRAM
(4)"
1410 PRINT:INPUT"ENTER DISTANCE
 IN KILOMETRES...",k
1420 m=k*0.621
1430 M$(N)=STR$(k)+" KM. = "+ST
R$(m)+" MILES":GOTO 360
1500 CLS:PRINTTAB(1,2)"PROGRAM
(5)"
1510 PRINT:INPUT"ENTER AREA IN
SQ. CMS...",c
1520 i=c*0.155
1530 M$(N)=STR$(c)+" SQ. CMS. =
 "+STR$(i)+" SQ. INS.":GOTO 360
1600 CLS:PRINTTAB(1,2)"PROGRAM
(6)"
1610 PRINT:INPUT"ENTER AREA IN
SQ. METRES...",m
1620 y=m*1.196:f=y*9
1630 M$(N)=STR$(m)+" SQ. M. = "
+STR$(f)+" SQ. FT.
     OR "+STR$(y)+" SQ. YDS.":GO
TO 360
1700 CLS:PRINTTAB(1,2)"PROGRAM
(7)"
1710 PRINT:INPUT"ENTER AREA IN
SQ. KILOMETRES...",k
1720 m=k*0.3861:a=k*247.1
1730 M$(N)=STR$(k)+" SQ. KM. =
"+STR$(m)+" SQ. MILES
       OR "+STR$(a)+" ACRES":GO
TO 360
1800 CLS:PRINTTAB(1,2)"PROGRAM
(8)"
1810 PRINT:INPUT"ENTER VOLUME I
N CU. CMS...",c
1820 i=c*0.061
1830 M$(N)=STR$(c)+" CU. CMS. =
 "+STR$(i)+" CU. INS.":GOTO 360
1900 CLS:PRINTTAB(1,2)"PROGRAM
(9)"
1910 PRINT:INPUT"ENTER VOLUME I
N CU. METRES...",m
1920 f=m*35.31:y=m*1.308
1930 M$(N)=STR$(m)+" CU. M. = "
+STR$(f)+" CU. FT.
     OR "+STR$(y)+" CU. YDS.":G
```

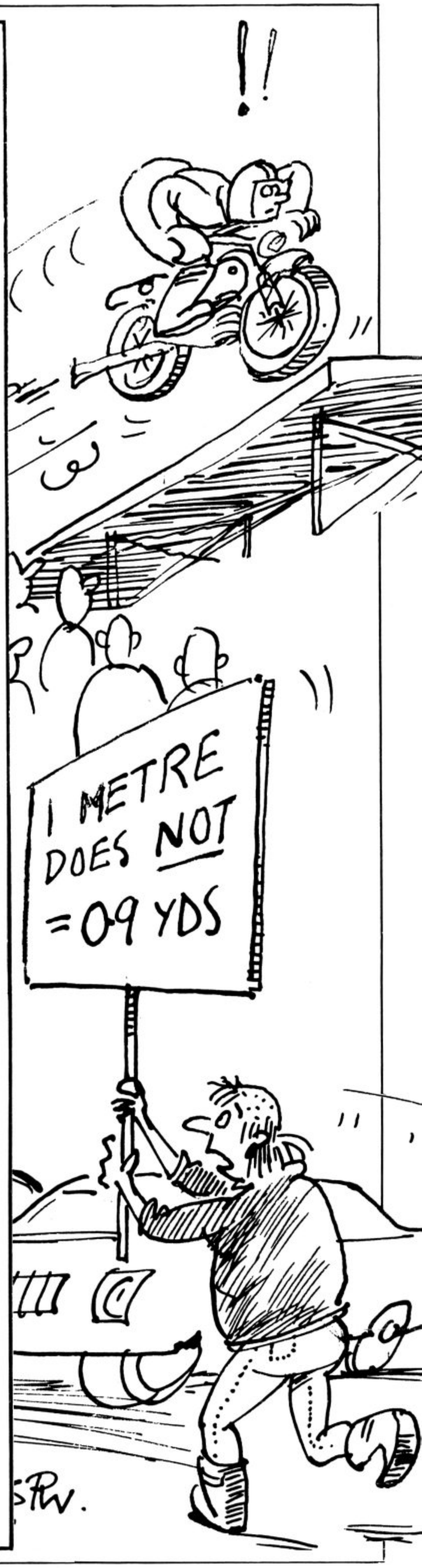
erter

CONVERTER will convert a wide range of metric units to Imperial, or Imperial units to metric, and store the results in memory for easy reference. Written for the BBC B and Electron by Ian Taylor of Newton-le-Willows, Merseyside.



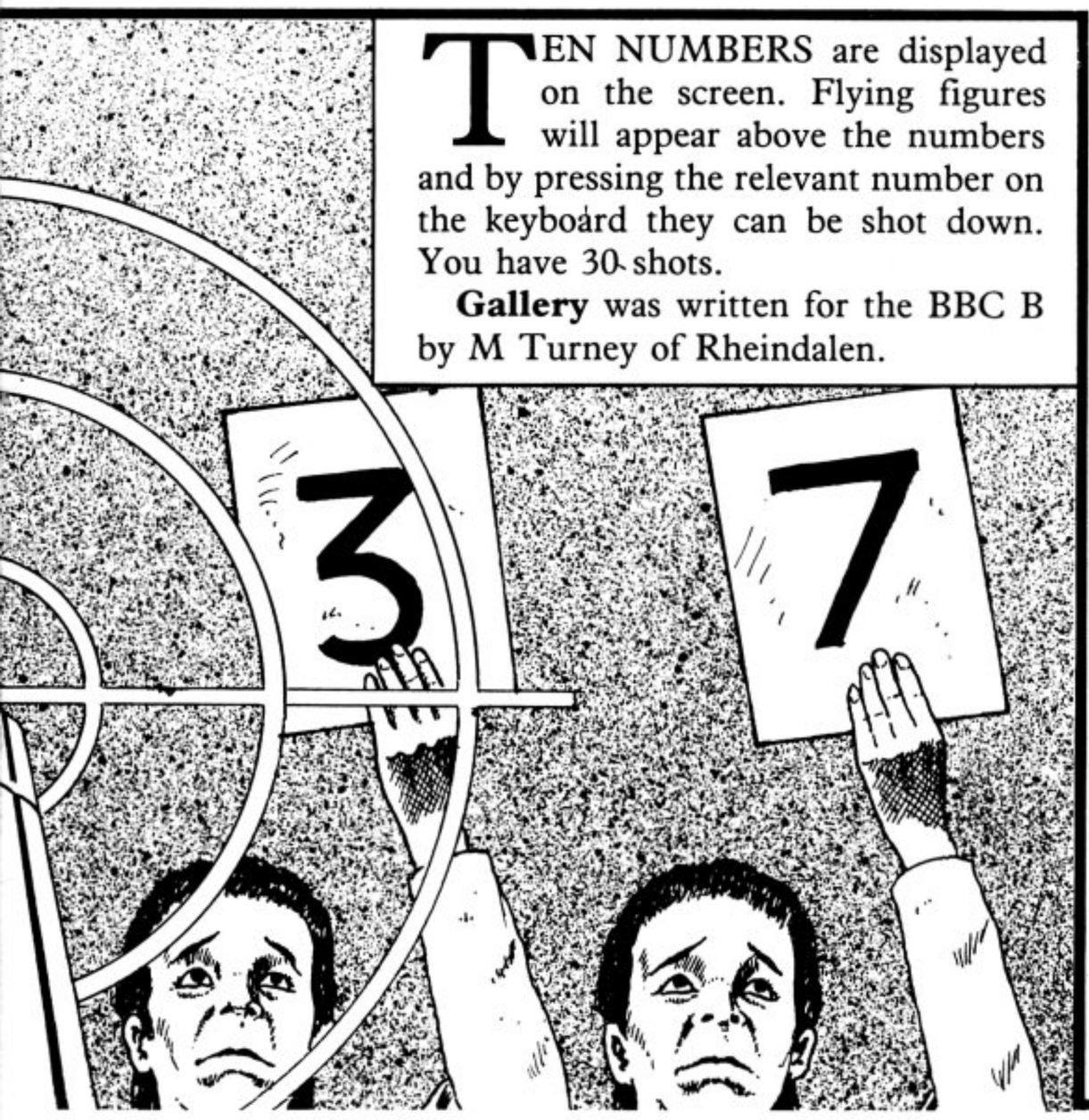

```
OTO 360
 2000 CLS:PRINTTAB(1,2)"PROGRAM
(10)"
 2010 PRINT:INPUT"ENTER WEIGHT I
N GRAMMES...",g
 2020 o=g*0.035
 2030 M$(N)=STR$(g)+" GMS. = "+S
TR$(o)+" OZS.":GOTO 360
 2100 CLS:PRINTTAB(1,2)"PROGRAM
(11)"
 2110 PRINT:INPUT"ENTER WEIGHT I
N KILOGRAMMES...",k
 2120 P=k*2.20465:l=INTP:o=(P-l)
*16
 2130 IF o<0.1 THEN o=0
 2140 M$(N)=STR$(k)+" KG. = "+ST
R$(P)+" LBS.
OR "+STR$(l)+" LBS. "+STR$(o)+"
OZS.":GOTO 360
 2200 CLS:PRINTTAB(1,2)"PROGRAM
(12)"
 2210 PRINT:INPUT"ENTER WEIGHT I
N KILOGRAMMES...",k
 2220 t=k/1016.05
 2230 M$(N)=STR$(k)+" KG. = "+ST
R$(t)+" TONS":GOTO 360
 2300 CLS:PRINTTAB(1,2)"PROGRAM
(13)"
 2310 PRINT:INPUT"ENTER VOLUME I
N LITRES...",l
 2320 P=l*1.7598:g=P/8
 2330 M$(N)=STR$(l)+" LITRES = "
+STR$(P)+" PINTS
    OR "+STR$(g)+" GALLONS":GOTO
 360
 2400 CLS:PRINTTAB(1,2)"PROGRAM
(14)"
 2410 PRINT:INPUT"ENTER VOLUME I
N LITRES...",l
 2420 o=l/0.0284
 2430 M$(N)=STR$(l)+" LITRES = "
+STR$(o)+" FL. OZS.":GOTO 360
 3000 REM*** IMP. TO MET. CONVER
SIONS**
 3100 CLS:PRINTTAB(1,2)"PROGRAM
(1)"
 3110 PRINT:INPUT"ENTER TEMPERAT
URE IN DEGREES F...",f
 3120 c=(f-32)*5/9
 3130 M$(N)=STR$(f)+" DEGREES F.
= "+STR$(c)+" DEGREES C.":GOTO 3
60
 3200 CLS:PRINTTAB(1,2)"PROGRAM
(2)"
 3210 PRINT:INPUT"ENTER DISTANCE
 IN INCHES...",i
 3220 c=i*2.54
 3230 M$(N)=STR$(i)+" INS. = "+S
TR$(c)+" CMS.":GOTO 360
 3300 CLS:PRINTTAB(1,2)"PROGRAM
(3)"
 3310 PRINT"ENTER DISTANCE IN FE
ET AND INCHES"
 3320 PRINT:INPUT"FEET.....",f
 3330 INPUT"INCHES...",i
 3340 m=(f+(i/12))*0.3048
 3350 M$(N)=STR$(f)+" FT. "+STR$
(i)+" INS. = "+STR$(m)+" METRES"
:GOTO 360
 3400 CLS:PRINTTAB(1,2)"PROGRAM
(4)"
 3410 PRINT:INPUT"ENTER DISTANCE
 IN MILES...",m
 3420 k=m*1.60934
 3430 M$(N)=STR$(m)+" MILES = "+
STR$(k)+" KM.":GOTO 360
 3500 CLS:PRINTTAB(1,2)"PROGRAM
(5)"
 3510 PRINT:INPUT"ENTER AREA IN
SQ. INS...",i
 3520 c=i*6.425
 3530 M$(N)=STR$(i)+" SQ. INS. =
 "+STR$(c)+" SQ. CMS.":GOTO 360
 3600 CLS:PRINTTAB(1,2)"PROGRAM
(6)"
 3610 PRINT:PRINT"ENTER AREA IN
SQ. FT. OR SQ. YDS."
 3620 PRINT:INPUT"SQ. YDS...",y
 3630 INPUT"SQ. FT....",f
 3640 m=(f*0.0929)+(y*0.8361)
 3650 M$(N)=STR$(y)+" SQ. YDS.
AND/OR    "+STR$(f)+" SQ. FT.
        = "+STR$(m)+" SQ. METRES
":GOTO 360
 3700 CLS:PRINTTAB(1,2)"PROGRAM
(7)"
 3710 PRINT:PRINT"ENTER AREA IN
SQ. MILES OR ACRES"
 3720 PRINT:INPUT"SQ. MILES...",
m
 3730 INPUT"ACRES.....",a
 3740 k=(m*2.59)+(a*0.00405)
 3750 M$(N)=STR$(m)+" SQ. MILES
 AND/OR    "+STR$(a)+" ACRES
       = "+STR$(k)+" SQ. KM.":GO
TO 360
 3800 CLS:PRINTTAB(1,2)"PROGRAM
(8)"
 3810 PRINT:INPUT"ENTER VOLUME I
N CUBIC INCHES...",i
 3820 c=i*16.387
 3830 M$(N)=STR$(i)+" CU. INS. =
 "+STR$(c)+" CU. CMS.":GOTO 360
 3900 CLS:PRINTTAB(1,2)"PROGRAM
(9)"
 3910 PRINT:PRINT"ENTER VOLUME I
N CU. YDS. OR CU. FT."
```

```
 3920 PRINT:INPUT"CU. YDS...",y
 3930 INPUT"CU. FT....",f
 3940 m=(y*0.765)+(f*0.0283)
 3950 M$(N)=STR$(y)+" CU. YDS.
AND/OR  "+STR$(f)+" CU. FT.
        = "+STR$(m)+" CU. METRE
S":GOTO 360
 4000 CLS:PRINTTAB(1,2)"PROGRAM
(10)"
 4010 PRINT:INPUT"ENTER WEIGHT I
N OUNCES...",o
 4020 g=o*28.35
 4030 M$(N)=STR$(o)+" OZS. = "+S
TR$(g)+" GRAMMES":GOTO 360
 4100 CLS:PRINTTAB(1,2)"PROGRAM
(11)"
 4110 PRINT:PRINT"ENTER WEIGHT I
N LBS.  AND/OR  OZS."
 4120 PRINT:INPUT"LBS...",l
 4130 INPUT"OZS...",o
 4140 k=(l*0.4536)+(o*0.02835)
 4150 M$(N)=STR$(l)+" LBS.  AND/
OR  "+STR$(o)+" OZS.
      = "+STR$(k)+" KG.":GOTO 36
0
 4200 CLS:PRINTTAB(1,2)"PROGRAM
(12)"
 4210 PRINT:INPUT"ENTER WEIGHT I
N TONS...",t
 4220 k=t*1016.05
 4230 M$(N)=STR$(t)+" TONS = "+S
TR$(k)+" KG.":GOTO 360
 4300 CLS:PRINTTAB(1,2)"PROGRAM
(13)"
 4310 PRINT:PRINT"ENTER VULUME I
N GALS.  AND/OR  PINTS"
 4320 PRINT:INPUT"GALS....",g
 4330 INPUT"PINTS...",p
 4340 l=(g*4.546)+(p*0.568)
 4350 M$(N)=STR$(g)+" GALS.  AND
/OR  "+STR$(p)+" PINTS
        = "+STR$(l)+" LITRES":G
OTO 360
 4400 CLS:PRINTTAB(1,2)"PROGRAM
(14)"
 4410 PRINT:INPUT"ENTER VOLUME I
N FLUID OZS...",o
 4420 l=o*0.0284
 4430 M$(N)=STR$(o)+" FL. OZS. =
 "+STR$(l)+" LITRES"
 4990 :
 5000 CLS:PRINTTAB(2,1)"OK.   PR
OGRAM ENDED."
 5010 END
 5020 :
 6000 DEF PROCmenu_met_imp
 6005 PROC_colour
 6010 CLS:PRINTTAB(1,1)"TO CONVE
RT"
 6020 PRINT
 6030 PRINT" (1) DEGREES C. TO D
EGREES F."
 6040 PRINT" (2) CMS. TO INS."
 6050 PRINT" (3) METRES TO FEET
& INS."
 6060 PRINT" (4) KILOMETRES TO M
ILES"
 6070 PRINT" (5) SQ. CMS. TO SQ.
 INS."
 6080 PRINT" (6) SQ. METRES TO S
Q. FT./YDS."
 6090 PRINT" (7) SQ. KM. TO SQ.
MILES/ACRES"
 6100 PRINT" (8) CU. CMS. TO CU.
 INS."
 6110 PRINT" (9) CU. METRES TO C
U. FT./YDS."
 6120 PRINT"(10) GRAMMES TO OUNC
ES"
 6130 PRINT"(11) KG. TO LBS.& OZ
."
 6140 PRINT"(12) KG. TO TONS"
 6150 PRINT"(13) LITRES TO PINTS
/GALLONS"
 6160 PRINT"(14) LITRES TO FLUID
 OZ."
 6165 PRINT:PRINT"ENTER REQUIRED
 PROGRAM NUMBER..."
 6166 PRINT"THEN PRESS 'RETURN'
KEY."
 6167 INPUTTAB(33,10)Y%
 6170 ENDPROC
 6175 :
 6180 DEF PROCmenu_imp_met
 6185 PROC_colour
 6190 CLS:PRINTTAB(1,1)"TO CONVE
RT"
 6200 PRINT
 6210 PRINT" (1) DEGREES F. TO D
EGREES C."
 6220 PRINT" (2) INS. TO CMS."
 6230 PRINT" (3) FEET & INS. TO
METRES"
 6240 PRINT" (4) MILES TO KILOME
TRES"
 6250 PRINT" (5) SQ. INS. TO SQ.
 CMS."
 6260 PRINT" (6) SQ. FT./YDS. TO
 SQ. METRES"
 6270 PRINT" (7) SQ. MILES/ACRES
 TO SQ. KM."
 6280 PRINT" (8) CU. INS. TO CU.
 INS."
 6290 PRINT" (9) CU. FT./YDS. TO
 CU. METRES"
 6300 PRINT"(10) OUNCES TO GRAMM
ES"
 6310 PRINT"(11) LBS.& OZ. TO KG
."
 6320 PRINT"(12) TONS TO KG."
 6330 PRINT"(13) PINTS/GALLONS T
O LITRES"
 6340 PRINT"(14) FLUID OZ. TO LI
TRES"
 6345 PRINT:PRINT"ENTER REQUIRED
 PROGRAM NUMBER..."
 6346 PRINT"THEN PRESS 'RETURN'
KEY."
 6347 INPUTTAB(33,18)Z%
 6350 ENDPROC
 6355 :
 6360 DEF PROCre_select
 6370 PROC_colour
 6380 CLS:PRINTTAB(1,3)"DO YOU W
ANT TO:-"
 6400 PRINTTAB(3,5)"(1) CONVERT
ANY MORE"
 6410 PRINTTAB(7,6)"METRIC UNITS
 TO IMPERIAL"
 6430 PRINTTAB(3,8)"(2) CONVERT
ANY MORE"
 6440 PRINTTAB(7,9)"IMPERIAL UNI
TS TO METRIC"
 6460 PRINTTAB(3,11)"(3) REVIEW
INFORMATION IN MEMORY"
 6480 PRINTTAB(3,14)"(4) END THE
 PROGRAM"
 6490 PRINTTAB(1,17)"ENTER PROCE
DURE NUMBER...";
 6530 ENDPROC
 6590 :
 6600 DEF PROCdelay_2
 6610 NOW=TIME
 6620 REPEAT UNTIL TIME-NOW=200
 6630 ENDPROC
 6690 :
 6700 DEF PROCstore
 6710 N=N+1
 6720 PROCdelay_2
 6730 PRINT:PRINT:PRINT:INPUT"CA
LCULATION STORED IN MEMORY...PRE
SS    RETURN KEY TO CONTINUE",A
 6740 REPEAT UNTIL A=INKEY-74
 6750 ENDPROC
 6790 :
 6800 DEF PROCmem
 6810 PROC_colour:CLS:VDU14
 6820 IF N=0 PRINTTAB(10,1)"MEMO
RY CLEAR."
 6830 FOR M=0 TO N
 6840 PRINT:PRINT M$(M)
 6850 NEXT
 6860 PRINT:INPUT"PRESS 'RETURN'
 KEY TO CONTINUE..."A
 6870 REPEAT UNTIL A=INKEY-74
 6880 ENDPROC
 6890 :
 6900 DEFPROC_colour
 6910 Q=RND(6)
 6920 VDU19,0,7;0;
 6930 VDU19,128,Q;0;
 6940 ENDPROC
```



```
 1REM ************************
 2REM * Shooting Gallery *
 3REM *   M. H. Turney   *
 4REM * St. Patricks Sch.*
 5REM *   Rheindahlen    *
 6REM *      BFPO 40     *
 7REM *    11.12.1983    *
 8REM ************************
 9
10ON ERROR RUN
15REM set screen down a space
20*TV255
30MODE7:PROCRULES
35REM main Program structure
40MODE5
50:
60PROCINIT
70:
80PROCTITLE
90:
100FOR Z=1 TO 30:REM adjust sh
ots here
110:
115REM random Pause before man
 appears
120FORW=1 TO RND(500)+1000:NEX
T
125REM clear hit/miss line
130PRINTTAB(0,8);SPC20
140:
150PROCFIGURE
160:
170PROCANALYSE
180:
190NEXT Z
200:
210PROCCREDIT
220:
230PROCMORELO
240:
250END
260:
265REM draw man at rnd Pos. an
d look for shot
270DEFPROCFIGURE
275REM choose Position of man
280A=RND(10)*2-1
285REM adjust for skill Previo
usly shown
290IF K=0 THEN B=B-1 ELSE B=B+
1
300IFB<0 THEN B=0
305REM compute number of jumPs
 man makes
310V=3+B:REM adjust sPeed here
315REM flush buffer to stoP ne
xt shot beinG sPoilt
320*FX15,1
325REM draw man
330FOR X=1 TO V
340PRINTTAB(A,10);CHR$(240)
350PROCPAUSE
360PRINTTAB(A,10);CHR$(242)
370PROCPAUSE
380PRINTTAB(A,10);CHR$(241)
390PROCPAUSE
400PRINTTAB(A,10);CHR$(242)
410PROCPAUSE
415REM look for shot fired
420R$=INKEY$(0):IF ASC(R$)<48
OR ASC(R$)>57 THEN R$=""
425REM stoP looP if shot fired
430IFR$<>"" THEN X=V
440NEXT X
445REM kill man
450PRINTTAB(A,10);" "
460ENDPROC
470
475REM analyse R$
480DEF PROCANALYSE
485REM make aPProPriate sound
490IF R$<>"" THEN ENVELOPE2,3,
0,0,0,0,0,0,121,-10,-5,-2,120,12
0:SOUND0,2,5,5 ELSE SOUND1,-15,2
0,5
495REM adjust for 0 beinG Pres
sed
500IFR$="0" THEN R$="10"
505REM increase score if shot
correct
510T=VAL(R$):IF T*2-1=A THEN S
CORE=SCORE+1
515REM adjust skill factor
520IFT*2-1=A THEN K=0 ELSE K=1
525REM Print result of shot
530IF T*2-1=A THEN PRINTTAB(0,
8);"* HIT *" ELSE PRINTTAB(10,8)
;"* MISS *"
```

```
  535REM Print score
  540PRINTTAB(6,15);"GO-";Z;TAB(
3,17);"SCORE-";SCORE
  550ENDPROC
  560:
  565REM standard Pause
  570DEFPROCPAUSE
  580FOR T=1 TO 100
  590NEXT T
  600ENDPROC
  610:
  615REM Print rules of game
  620DEF PROCRULES
  630CLS
  640FOR X=0 TO 1:PRINTTAB(0,0+X
)CHR$141CHR$131STRING$(34,"#")
  650PRINTTAB(0,2+X)CHR$141CHR$1
31"#S H O O T I N G  G A L L E
R Y#"
  660PRINTTAB(0,4+X)CHR$141CHR$1
31STRING$(34,"#"):NEXT
  670PRINT''"   When the game st
arts you will see"'"a little man
 PoP uP over a number."''"   If
 you Press the same number key,"'
"you will be able to shoot the m
an."''"   A running total of sho
ts taken and"
  680PRINT"hits scored will appe
ar under the"'"target."''"   You
 will have 30 shots."
  690PRINTTAB(5,23)CHR$131"Press
 any key to continue."
  700r=GET
  710ENDPROC
  720
  725REM Print suitable Phrase a
t end of game
  730DEF PROCCREDIT
  740SC=SCORE
  750IF SC<10 THEN PRINT'"Practi
ce makes"'"Perfect....."
  760IF SC>=10 AND SC<20 THEN PR
INT'"Not bad I suPPose!"
  770IF SC>=20 AND SC<30 THEN PR
INT'"Very good indeed!!!!"
  780IF SC=30 THEN PRINT'"* CRAC
K SHOT, EH! *"
  790ENDPROC
  800:
  805REM initialise variables etc.
  810DEF PROCINIT
  815REM switch off cursor OS 1,
2
  820VDU23,1,0;0;0;0;
  825REM create characters for d
rawing man
  830VDU23,240,28,28,8,28,42,85,
20,20
  840VDU23,241,28,93,42,28,8,20,
34,65
  850VDU23,242,28,28,8,127,8,20,
34,20
  855REM switch off auto repeat
  860*FX11,0
  865REM choose yellow for disPl
ay
  870COLOUR2
  875REM initialise score
  880SCORE=0
  885REM initialise skill factor
s
  890B=4:K=0
  900ENDPROC
  910:
  915REM draw screen titles
  920DEF PROCTITLE
  930PRINTTAB(0,2)STRING$(20,"£"
):PRINTTAB(0,4);"# SHOOTING GALL
ERY #":PRINTTAB(0,6)STRING$(20,"
#")
  940PRINTTAB(0,12);" 1 2 3 4 5
6 7 8 9 0"
  950PRINTTAB(0,13)STRING$(20,"_
")
  960ENDPROC
  970:
  975REM ask for another go
  980DEF PROCMOREGO
  990FOR W=1 TO 100:PROCPAUSE:NE
XT
 1000CLS
 1010PRINTTAB(0,10);"Would you l
ike"'"another go (Y/N)"
 1020R$=GET$
 1030IF R$="Y" THEN RUN
 1040ENDPROC
 1050:
```



TEN NUMBERS are displayed on the screen. Flying figures will appear above the numbers and by pressing the relevant number on the keyboard they can be shot down. You have 30 shots.

Gallery was written for the BBC B by M Turney of Rheindalen.

Take flight this winter...

...with the most diverse simulators available

I'M FREDDIE—FLY ME!

...a 747 flight simulator...but I was disappointed with it...basic program unbearable. But, I would like to recommend another flight simulator —F for Freddie—a machine language program from Kansas City Systems.
—Popular Computing Weekly

F FOR FREDDIE IS THE HARDEST GAME THAT YOU WILL EVER PLAY!

Requires absolute concentration to prepare, take-off, fly and land a tri-star jet at varying destinations using a staggering 36 control keys!

If you only play the arcade type of game, needing just a couple of keys and the space bar to play, then this is most certainly not for you

If however, you are prepared to sit at your computer for literally hours on end getting to grips, and then give a considerable amount of effort and time into actually trying to solve it, then this is definitely for you.

Though F for Freddie is a flight simulator type of game, it is not one with simple operation and the ground appearing at the front of you, but is as accurate a simulation of not only flight, but preparation, take-off and the many more occurances associated with flying a tri-star jet as a 32K micro will allow.

Controls? A mind boggling 36 of them! And it is here where the logic and skill comes in, as everything must be done not only in the correct order but at the right time. Yes, it's in real time, with the clock ticking relentlessly away.

But the great asset of this 'game' is that every little piece of information you require is shown on the screen, nearly fifty in all, continuously being updated, with the colours being cleverly used to depict different, changing, situations.

Eventually you will master the take-off, then even manage to fly and at long last manage to land. But unlike all other games, at this stage you don t put it away for ever, for you have seven different destinations, all on different courses and distances...

There are plenty of instructions on the 36 controls and even a little advice, but as the whole thing is a colossal challenge, you are not told how to fly Freddie, this you have to discover entirely for yourself...

At times you will wish, as most certainly will your family, that you never bought the blasted thing!

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FIGHTER PILOT

With a true 3D cockpit view and accurate eight direction joystick control, this just has to be the most realistic computer flying experience you can get.

As a fighter pilot you have to destroy the enemy planes before they get to your cities. Control of movement is by joystick: climb, bank and climb starboard, bank starboard, bank and dive starboard, dive, bank and dive port, bank port, bank and climb port, all giving infinite control. Throttle, firing and all other controls are on the keyboard.

At the start of the game you have a view of the runway and it is up to you to take your fighter off without mishap. As you climb away, you switch on the radar, which will show you the position of the enemy. As you get closer the plane will appear on the screen and then it is up to you to get it in your sights and blast away with your air-to-air missile. Certain enemy planes have kamakazi instincts and will dive at your cities, then you are in trouble!

The graphics include a combined Turn and Bank indicator and Artificial Horizon, across the whole screen showing the actual state of your flying at all times. The Radar shows the enemy position in relationship to yourself. The enemy plane is lifelike as is the firing and explosions. Colour is used and of course sound.

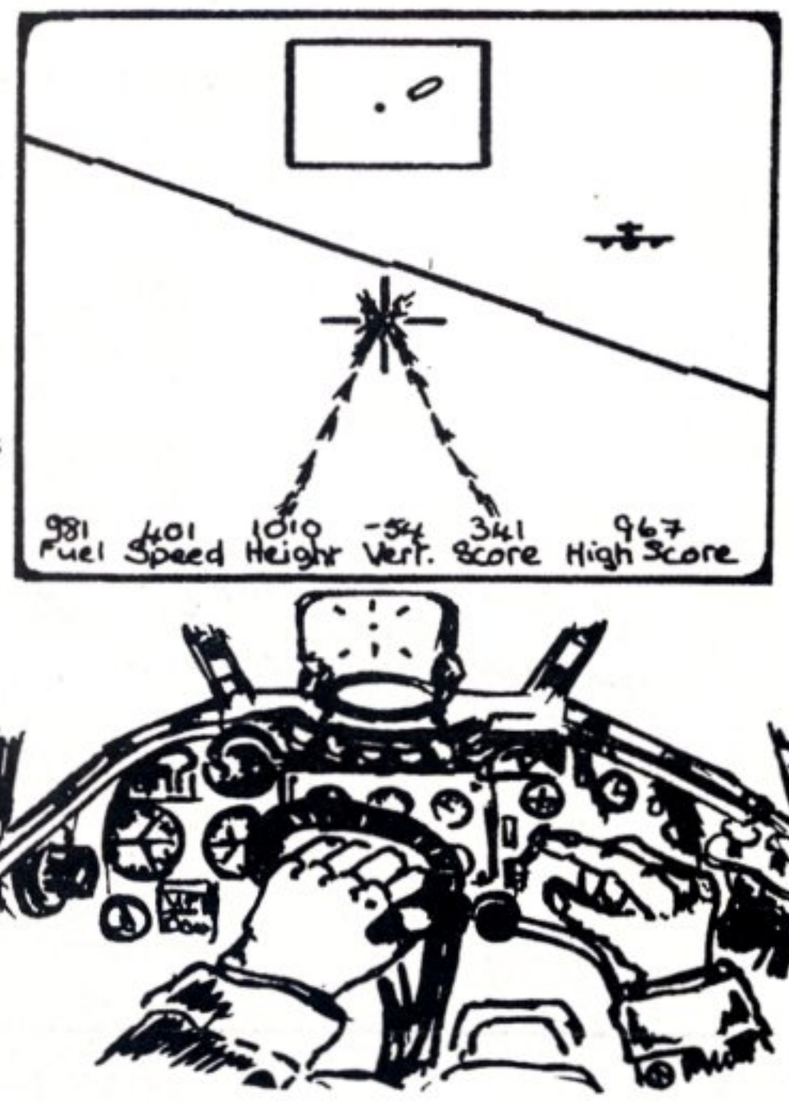
Further information includes fuel, speed, altitude, rate of climb/decent and score, with a complete score table as well.

As your fuel diminishes, you can actually land your fighter, lowering the undercarriage and getting an accurate view of the runway, with the operation needing good joystick control. You can then refuel, take-off and go into the attack again without any loss of your score.

JOYSTICK ONLY
This program will not operate without a joystick fitted

£8.50 Vat and post paid

The screen below is what you actually see—a true 3D cockpit view with the artificial horizon moving as you make joystick movements, with the enemy moving into your sights to destruct



Kansas

Recognised Brand Leader in microcomputer software

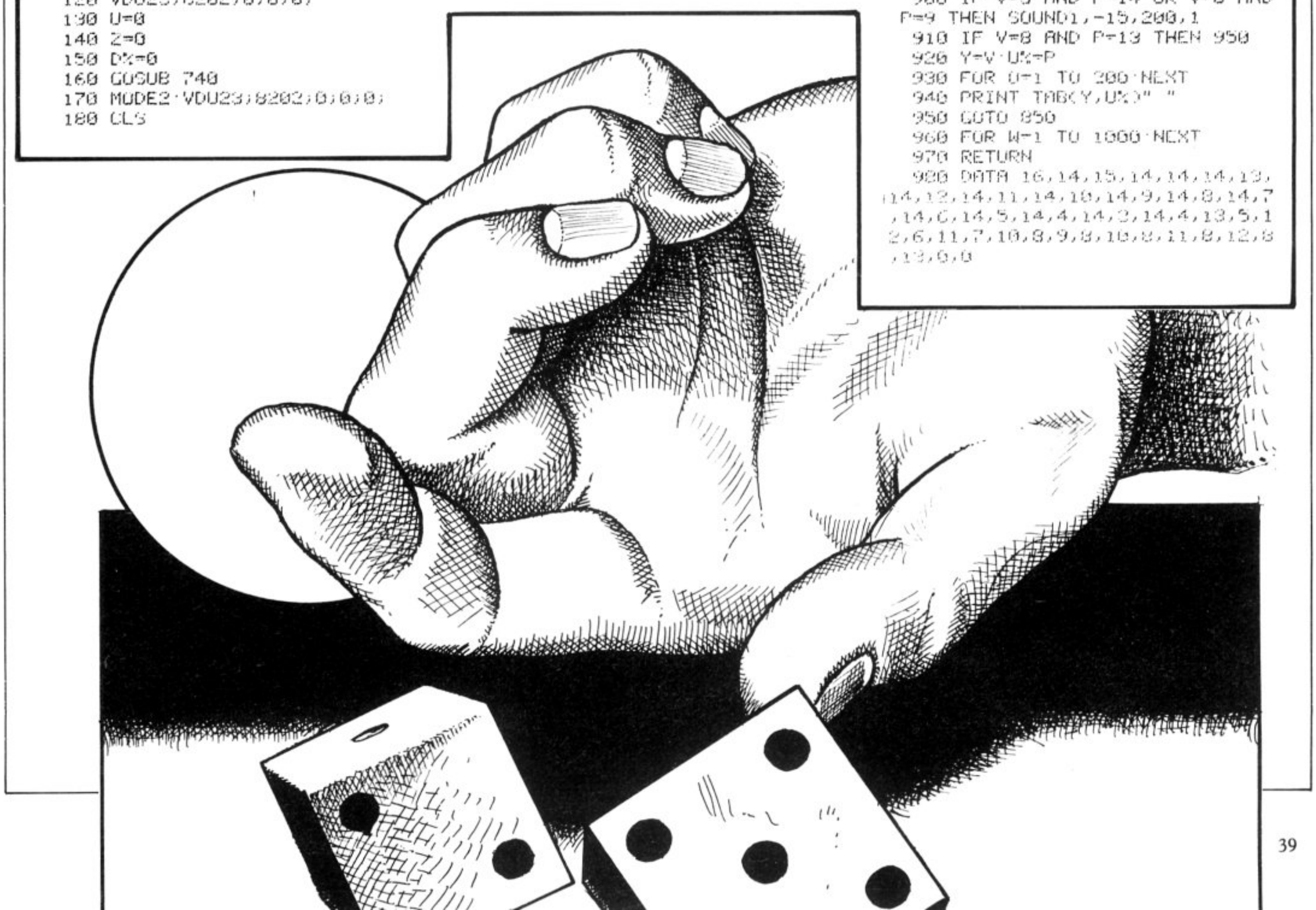
Kansas City Systems, Unit 3, Sutton Springs Wood, Chesterfield, S44 5XF. Tel. 0246 850357

NUMBER GAME

THE FIRST THROW of the dice will determine what you need to throw in subsequent turns. If you throw a 7 or an 11 on your first attempt you win immediately and if you throw a 3 or a 12 you lose automatically. If you throw any other number, you must throw that number again before throwing a seven to win.

Number Game was written for the BBC B by Brian Taylor of Chilwell, Nottingham.

```
  10 REM DICE
  20 MODE7
  30 VDU23;8202;0;0;0;
  40 CLS
  50 PRINT TAB(15,2);CHR$141;CH
R$130;"DICE"
  60 PRINT TAB(15,3);CHR$141;CH
R$131;"DICE"
  70 PRINT TAB(2,6);CHR$130;"Th
e first throw on the dice will"'
CHR$130;"determine what you need
 to throw the"'CHR$130;"second t
ime.But if you throw a 3 or 12"'
CHR$130;"on the first throw you
lose or if you"'CHR$130"throw a
7 or 11 you "
  80 PRINT TAB(20,10);CHR$130;"
win.After the first"CHR$130;"thr
ow if you didn't throw any of th
ose"'CHR$130;"numbers you have t
o throw the number you"'CHR$130;
"got first before you threw anot
her 7."'CHR$130;"Simple really"
  90 PRINT TAB(6,20);CHR$131;"P
RESS ANY KEY TO CONTINUE"
 100 G=GET
 110 MODE2
 120 VDU23;8202;0;0;0;
 130 U=0
 140 Z=0
 150 D%=0
 160 GOSUB 740
 170 MODE2:VDU23;8202;0;0;0;
 180 CLS
 190 A=350:B=153:C=511:D=306:F=
664:G=1023:K=350:L=153:M=306:N=5
11
 200
 210 GOSUB 600
 220 A=A+665:B=B+665:C=C+665:D=
D+665
 230 GOSUB 600
 240 COLOUR 2
 250 A%=RND(6)
 260 B%=RND(6)
 270 PRINT TAB(5,15);A%
 280 IF A%>1 THEN Q=A%-1 ELSE Q
=A%+1
 290 IF A%>4 THEN P=A%-3 ELSE P
=A%+2
 300 PRINT TAB(4,21);Q
 310 PRINT TAB(6,21);P
 320 PRINT TAB(15,15);B%
 330 IF B%>1 THEN Q%=B%-1 ELSE
Q%=B%+1
 340 IF B%>4 THEN P%=B%-3 ELSE
P%=B%+2
 350 PRINT TAB(14,21);Q%
 360 PRINT TAB(17,21);P%
 370 IF Z=0 THEN I%=A%+B%
 380 IF A%+B%=7 AND Z=0 THEN 47
0
 390 IF A%+B%=11 AND Z=0 THEN 4
70
 400 IF A%+B%=12 AND Z=0 THEN 5
50
 410 IF A%+B%=3 AND Z=0 THEN 55
0
 420 PRINT TAB(5,3)"YOU NEED ";
I%
 430 IF A%+D%=U THEN GOTO 470
 440 IF Z=1 AND A%+B%=7 THEN GO
TO 550
 450 IF Z=0 THEN U=A%+B%
 460 Z=1:GOTO 530
 470 FOR T=1 TO 25
 480 SOUND1,-15,T*10,1
 490 NEXT
 500 PRINT TAB(7,20)"YOU WIN"
 510 G=GET
 520 GOTO 130
 530 G=GET
 540 GOTO 160
 550 FOR T=1 TO 2000:NEXT T
 560 SOUND 1,-15,1,20
 570 PRINT TAB(7,20)"YOU LOSE"
 580 G=GET
 590 GOTO130
 600 MOVE A,L
 610 SOUND1,-11,C,2
 620 GCOL0,1
 630 DRAW C,M
 640 DRAW C,N
 650 DRAWD,F
 660 DRAWB,N
 670 DRAWB,M
 680 DRAWA,L
 690 DRAWA,K
 700 DRAWB,N
 710 MOVE A,K
 720 DRAWC,N
 730 RETURN
 740  MODE2:VDU23;8202;0;0;0;
 750 RESTORE
 760 VDU24,150;250;1130;770;
 770 GCOL0,129
 780 CLG
 790 D%=D%+1
 800 VDU24,195;290;1000;735;
 810 GCOL0,130
 820 CLG
 830 PRINT TAB(7,3)"THROW";D%
 840 VDU 23,240,56,56,56,0,0,56
56,56
 850 READ V,P
 860 SOUND3,-5,V+50,2
 870 IF V=0 THEN 960
 880 COLOUR 1:COLOUR 130
 890 PRINT TAB(V,P);CHR$240
 900 IF V=3 AND P=14 OR V=8 AND
P=9 THEN SOUND1,-15,200,1
 910 IF V=8 AND P=13 THEN 950
 920 Y=V:U%=P
 930 FOR U=1 TO 200:NEXT
 940 PRINT TAB(Y,U%)" "
 950 GOTO 850
 960 FOR W=1 TO 1000:NEXT
 970 RETURN
 980 DATA 16,14,15,14,14,14,13,
14,12,14,11,14,10,14,9,14,8,14,7
,14,6,14,5,14,4,14,3,14,4,13,5,1
2,6,11,7,10,8,9,8,10,8,11,8,12,8
,13,0,0
```

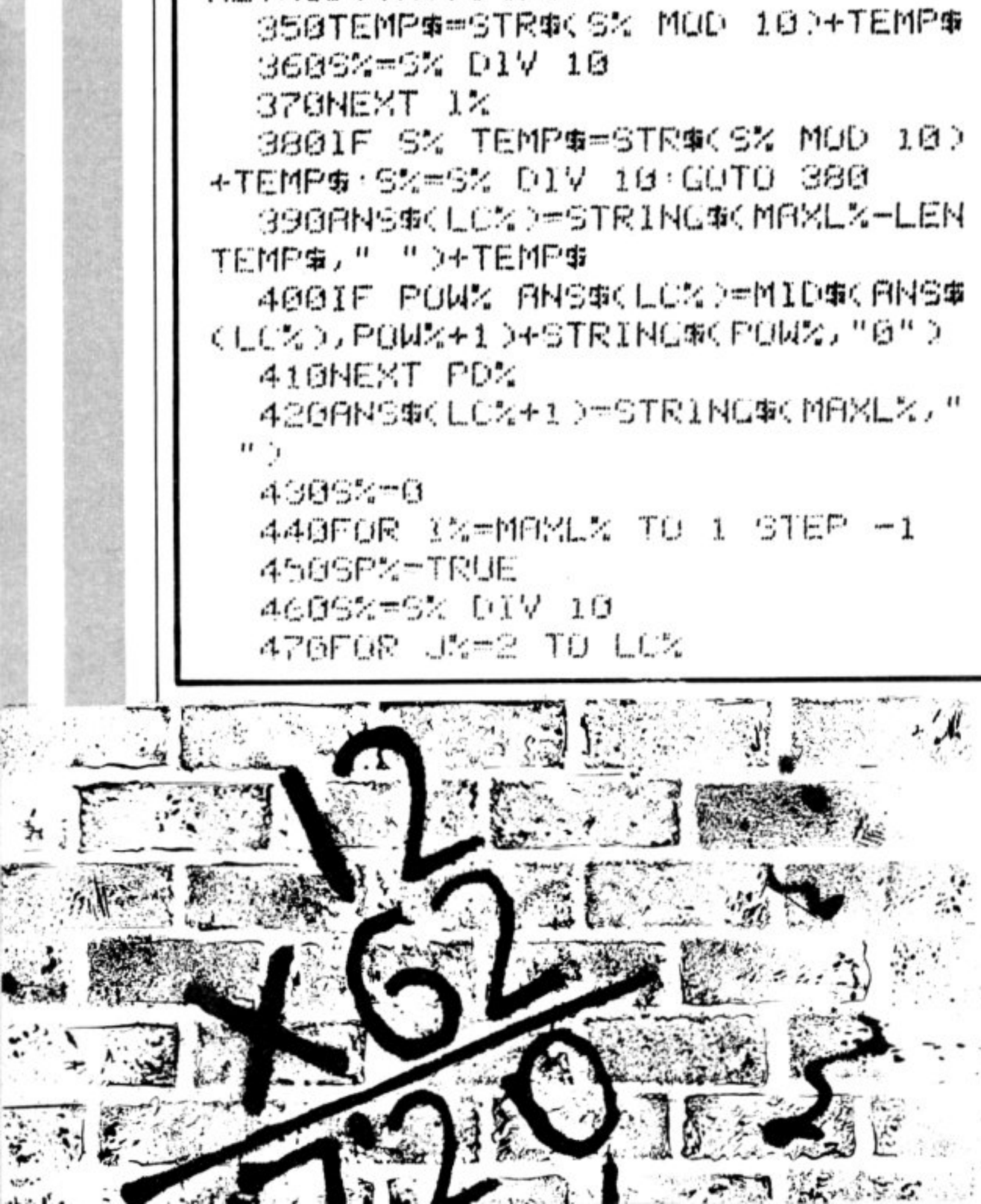


Long Multiplication

LONG MULTIPLICATION takes the hard work out of lengthy arithmetic exercises when you need to show your working. The program asks for two numbers and then multiplies them, setting-out the answer neatly in the manner commonly taught in schools.

Long Multiplication was written for the BBC B or Electron by Derek Chown of Wimborne, Dorset.

```
  90INPUT "Multiplicand:  "N$
 100IF VALN$=0 GOTO 90
 110INPUT "Multiplier:    "D$
 120IF VALD$=0 GOTO 110
 130MAXL%=39
 140DIM ANS$(MAXL%),UNDER%(MAXL
%)
 150ANS$(0)=STRING$(MAXL%-LENN$
," ")+N$
 160ANS$(1)=STRING$(MAXL%-LEND$
," ")+D$
 170T%=INSTR(N$,".") IF T% N$=L
EFT$(N$,T%-1)+MID$(N$,T%+1) T%=L
ENN$-T%+1
 180B%=INSTR(D$,".") IF B% D$=L
EFT$(D$,B%-1)+MID$(D$,B%+1) B%=L
END$-B%+1
 190D%=B%+T%
 200D%=MAXL%-D%
 210PROCMULT
 220PROCPRINT
 230END
 240DEFPROCMULT
 250LC%=1
 260POW%=LEND$
 270FOR PD%=1 TO LEND$
 280LC%=LC%+1
 290POW%=POW%-1
 300IF MID$(D$,PD%,1)="." GOTO
410
 310TEMP$=""
 320S%=0
 330FOR I%=LENN$ TO 1 STEP -1
 340S%=S%+VAL(MID$(D$,PD%,1))*V
AL(MID$(N$,I%,1))
 350TEMP$=STR$(S% MOD 10)+TEMP$
 360S%=S% DIV 10
 370NEXT I%
 380IF S% TEMP$=STR$(S% MOD 10)
+TEMP$ S%=S% DIV 10 GOTO 380
 390ANS$(LC%)=STRING$(MAXL%-LEN
TEMP$," ")+TEMP$
 400IF POW% ANS$(LC%)=MID$(ANS$
(LC%),POW%+1)+STRING$(POW%,"0")
 410NEXT PD%
 420ANS$(LC%+1)=STRING$(MAXL%,"
")
 430S%=0
 440FOR I%=MAXL% TO 1 STEP -1
 450SP%=TRUE
 460S%=S% DIV 10
 470FOR J%=2 TO LC%
 480IF MID$(ANS$(J%),I%,1)<>" "
 SP%=FALSE S%=S%+VAL(MID$(ANS$(J
%),I%,1))
 490NEXT J%
 500IF SP% IF S%=0 S%=I%-1 I%=1
 GOTO 520
 510ANS$(LC%+1)=LEFT$(ANS$(LC%+
1),I%-1)+STR$(S% MOD 10)+MID$(AN
S$(LC%+1),I%+1)
 520NEXT I%
 530IF T%=0 IF B%=0 GOTO 570
 540FOR I%=2 TO LC%+1
 550IF MID$(ANS$(I%),D%,1)<>" "
 ANS$(I%)=MID$(ANS$(I%),2,D%-1)+
"."+MID$(ANS$(I%),D%+1)
 560NEXT I%
 570ANS$(1)=LEFT$(ANS$(1),S%)+M
ID$(ANS$(1),S%+1) UNDER%(1)=S%+1
 580ANS$(LC%)=LEFT$(ANS$(LC%),S
%)+MID$(ANS$(LC%),S%+1) UNDER%(L
C%)=S%+1
 590ANS$(LC%+1)=LEFT$(ANS$(LC%+
1),S%)+MID$(ANS$(LC%+1),S%+1) UN
DER%(LC%+1)=S%+1
 600ENDPROC
 610DEFPROCPRINT
 620PRINT
 630FOR L%=0 TO MAXL%
 640IF ANS$(L%)="" M%=L% L%=MAX
L%
 650NEXT L%
 660FOR N%=0 TO M%-1 L%=N%
 670REM Leave out the next line
 if you normally start multiplyi
ng from the left
 680IF N%>1 AND N%<M%-1 L%=M%-N
%
 690PRINT ANS$(L%)
 700IF UNDER%(N%)=0 GOTO 730
 710UNDER%(N%)=UNDER%(N%)+(D%<>
MAXL%)
 720PRINT SPC(UNDER%(N%))STRING
$(MAXL%-UNDER%(N%),"-")
 730NEXT N%
 750ENDPROC
```

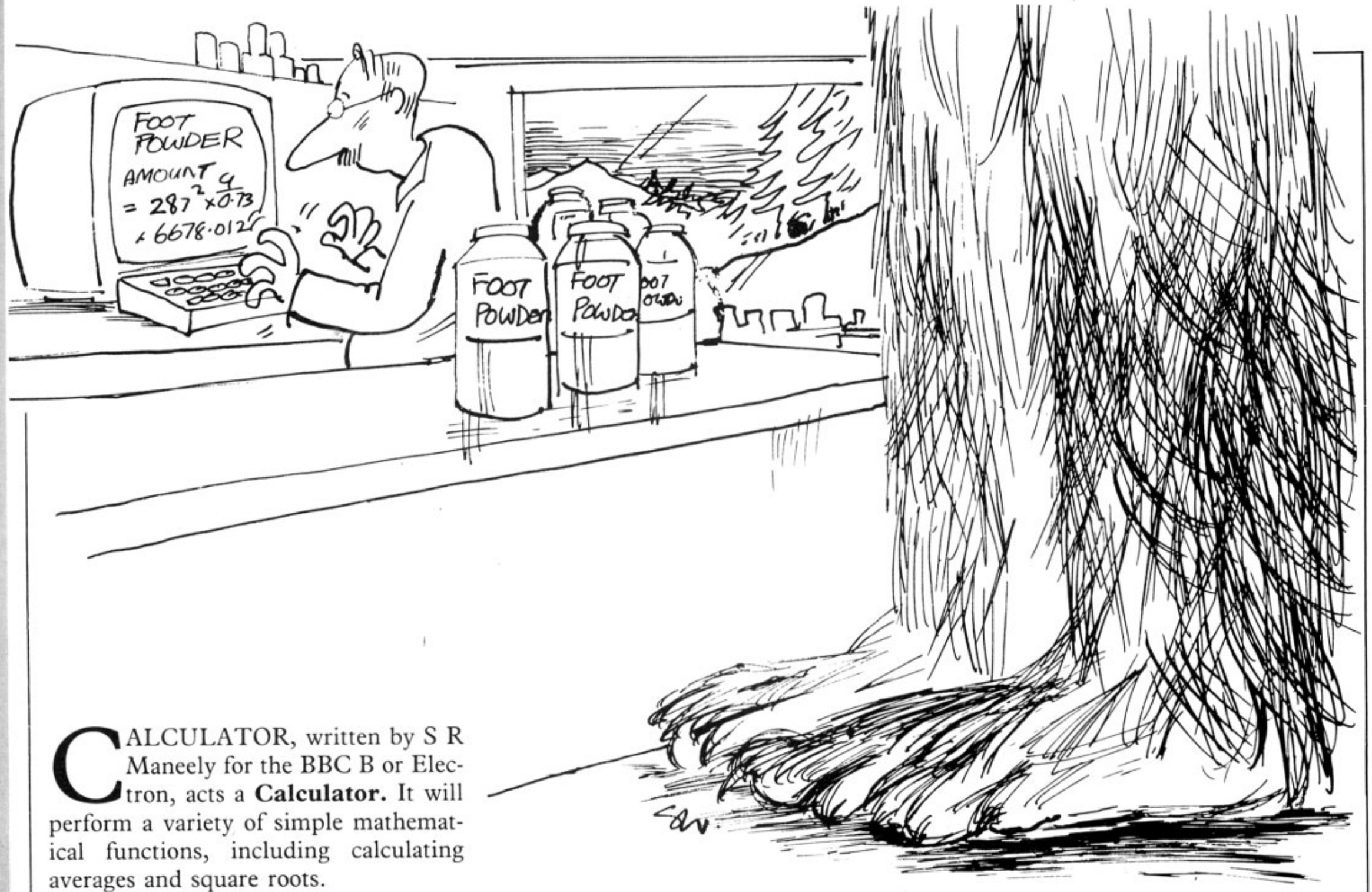


Long Division

THIS PROGRAM asks you for two numbers and then divides the first by the second: It prints both the answer and the working. If there is a remainder, it will be shown at the end of the working. If the program is given numbers after the decimal point, it will answer to the same number of decimal points.

Long Division was written for the BBC B or Electron by Derek Chown of Wimborne, Dorset.

```
  90INPUT "Dividend  (or Numerator)·"N$
 100IF VALN$=0 GOTO 90
 110INPUT "Divisor (or Denominator)·"D$
 120IF VALD$=0 GOTO 110
 130IF RIGHT$(N$,1)="." N$=N$+"0"
 140IF VALD$=INT(VALD$) GOTO 190
 150D$=STR$(10*VALD$)
 160L%=INSTR(N$,".")
 170IF L% N$=LEFT$(N$,L%-1)+MID$(N$,L%+1,1)+"."+MID$(N$,L%+2) ELSE N$=N$+"0"
 180GOTO 130
 190MAXL%=20
 200DIM ANS$(MAXL%),UNDER%(MAXL%)
 210LGD%=LEND$
 220LGN%=LENN$
 230SIG%=FALSE
 240DP%=INSTR(N$,".")
 250DPOS%=DP%+LGD%
 260ANS$(0)=STRING$(LGD%+1," ")·UNDER%(0)=LGD%+1
 270ANS$(1)=D$+")"+N$
 280PROCDIVIDE
 290PROCPRINT
 300END
 310DEFPROCDIVIDE
 320POINT%=0
 330CALC%=1
 340TRY$=""
 350REPEAT
 360REPEAT
 370POINT%=POINT%+1
 380IF CALC%>=MAXL%-2 POINT%=-1·GOTO 440
 390IF POINT%<=LGN% ELSE IF (POINT%-LENSTR$VAL(ANS$(CALC%))<DP%)AND(VALANS$(CALC%)>0) N$=N$+"0"·ANS$(1)=ANS$(1)+"0" ELSE POINT%=-1·GOTO 440
 400IF POINT%<>DP% ELSE IF SIG% ANS$(0)=ANS$(0)+"." ·POINT%=POINT%+1 ELSE SIG%=TRUE·ANS$(0)=LEFT$(ANS$(0),LENANS$(0)-1)+"0." ·POINT%=POINT%+1
 410TRY$=TRY$+MID$(N$,POINT%,1)
 420IF CALC%>2 ANS$(CALC%)=ANS$(CALC%)+MID$(N$,POINT%,1)
 430IF VALTRY$>=VALD$ ELSEIF SIG% ANS$(0)=ANS$(0)+"0" ELSE ANS$(0)=ANS$(0)+" "
 440UNTIL VALTRY$>=VALD$ OR POINT%=-1
 450SIG%=TRUE
 460IFPOINT%=-1 GOTO 550
 470IF DP% PNT%=POINT%+(PUINT%>=DP%)ELSE PNT%=PUINT%
 480ANS$(0)=ANS$(0)+STR$((VALTRY$)DIV(VALD$))
 490CALC%=CALC%+1
 500TEMP$=STR$((VALTRY$)-(VALTRY$)MOD(VALD$))
 510ANS$(CALC%)=STRING$(LGD%+1+PNT%-LENTEMP$," ")+TEMP$·UNDER%(CALC%)=LGD%+1+PNT%-LENTEMP$
 520CALC%=CALC%+1
 530TRY$=STR$((VALTRY$)MOD(VALD$))
 540ANS$(CALC%)=STRING$(LGD%+1+PNT%-LENTRY$," ")+TRY$
 550UNTIL POINT%=-1
 560ENDPROC
 570DEFPROCPRINT
 580PRINT
 590FOR L%=0 TO MAXL%
 600IF ANS$(L%)="" L%=MAXL%·GOTO 710
 610IF DP% ELSE GOTO 690
 620IF L%<2 GOTO 690
 630I%=0
 640IF LENANS$(L%)>0 I%=UNDER%(L%)-(UNDER%(L%)>0)
 650IF I% ELSE GOTO 680
 660IF I%>DPOS% UNDER%(L%)=UNDER%(L%)+1·ANS$(L%)=" "+ANS$(L%) ELSE IF LENANS$(L%)>=DPOS% ANS$(L%)=LEFT$(ANS$(L%),DPOS%)+"."+MID$(ANS$(L%),DPOS%+1)
 670GOTO 690
 680IF LENANS$(L%)<DPOS% ELSE IF MID$(ANS$(L%),DPOS%,1)=" " ANS$(L%)=LEFT$(ANS$(L%),DPOS%)+" "+MID$(ANS$(L%),DPOS%+1) ELSEANS$(L%)=LEFT$(ANS$(L%),DPOS%)+"."+MID$(ANS$(L%),DPOS%+1)
 690PRINT ANS$(L%)
 700IF UNDER%(L%) PRINT STRING$(UNDER%(L%)," ")STRING$(LEN(ANS$(L%))-UNDER%(L%),"-")
 710NEXT L%
 720ENDPROC
```



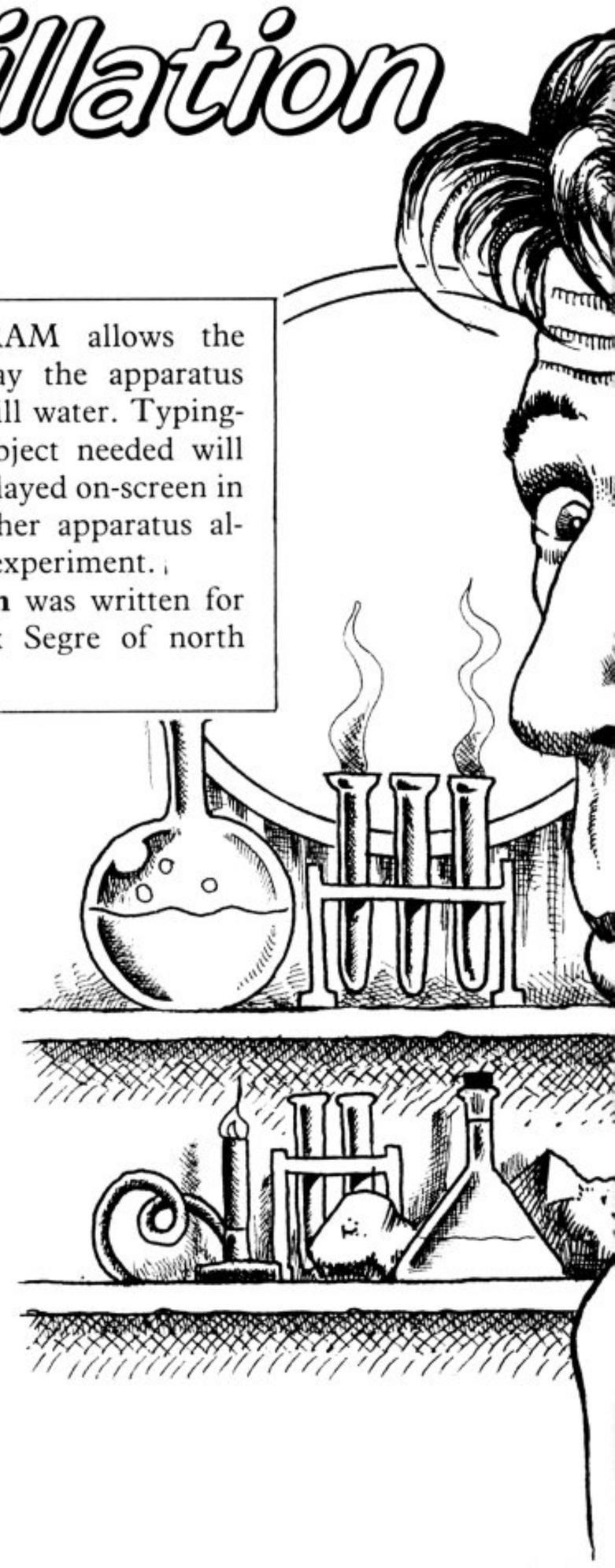
CALCULATOR, written by S R Maneely for the BBC B or Electron, acts a **Calculator.** It will perform a variety of simple mathematical functions, including calculating averages and square roots.

CALCULATOR

```
   10MODE 6
   20 COLOUR 5
   30 REM (c) Copyright of G.R.
Maneely
   40PRINT:PRINT:PRINT:PRINT
   50 PRINT TAB(10)"PRESS S TO S
TART"
   60 INPUT Z$
   70 IFZ$="S" THEN GOTO 80 ELSE
 GOTO 20
   80MODE 2
   90 FOR X=1 TO 17
  100 FOR U = 1 TO 10
  110 LET W=U*U*U
  120 NEXT U
  130 COLOUR X
  140PRINT TAB(4)"CALCULATOR"
  150 NEXT X
  160PRINT:PRINT
  170MODE 6
  180 PRINT:PRINT:PRINT:PRINT
  190PRINT TAB(5)" THIS PROGRAM
TAKES THE FORM OF A  POCKET CALC
ULATOR.  "
  200PRINT TAB(5)" TYPE IN THE N
UMBER OF THE FUNCTION YOU REQUIR
E. "
  210PRINT:PRINT:PRINT
  220 PRINT TAB(10)"PRESS B TO B
EGIN"
  230 INPUT A$
  240IF A$="B" THEN GOTO 250 ELS
E GOTO 190
  250CLS
  260 *TV 255
  270 PRINT:PRINT:PRINT:PRINT:PR
INT
  280 PRINT TAB(5)"WHICH NUMBER
DO YOU WISH?"
  290 PRINT:PRINT:PRINT
  300 PRINT TAB(5) "1 ADD
2 SUBTRACT"
  310 PRINT TAB(5) "3 MULTIPLY
4 DIVIDE "
  320 PRINT TAB(5) "5 SQUARE
6 SQUARE ROOT "
  330 PRINT TAB(5) "7 AVERAGES
8 END PROGRAM"
  340 INPUT B
  350 *TV255
  360IF B=1 THEN GOTO 440
  370IF B=2 THEN GOTO 480
  380IF B=3 THEN GOTO 520
  390IF B=4 THEN GOTO 560
  400IF B=5 THEN GOTO 600
  410IF B=6 THEN GOTO 640
  420IF B=7 THEN GOTO 680
  430IF B=8 THEN GOTO 760
  440INPUT "ENTER TWO NUMBERS TO
BE ADDED ",C,D
  450LET E=C+D
  460PRINT C;" PLUS ";D;" IS ";E
  470GOTO 740
  480INPUT "ENTER TWO NUMBERS TO
BE SUBTRACTED ",F,G
  490LET H=F-G
  500 PRINT F;" MINUS ";G;" IS "
;H
  510GOTO 740
  520INPUT "ENTER TWO NUMBERS TO
BE MULTIPLIED ",I,J
  530LET K=I*J
  540PRINT I;" MULTIPLIED BY ";J
;" IS ";K
  550GOTO 740
  560INPUT "ENTER TWO NUMBERS TO
BE DIVIDED ",L,M
  570LET N=L/M
  580PRINT L;" DIVIDED BY ";M;"
IS ";N
  590GOTO740
  600INPUT "ENTER NUMBER TO BE S
QUARED ",O
  610LET P=O*O
  620PRINT O;" SQUARED IS ";P
  630 GOTO 740
  640INPUT "ENTER NUMBER OF WHIC
H THE SQUARE ROOT MUST BE FOUND
",Q
  650LET R=SQR(Q)
  660PRINT "THE SQUARE ROOT OF "
;Q;" IS ";R
  670GOTO 740
  680S=0:T=0
  690INPUT " ENTER NUMBERS, LAST
 ONE MUST BE 999 ",U
  700IF U=999 THEN GOTO 730
  710LET S=S+U:LET T=T+1
  720GOTO 690
  730PRINT " THE AVERAGE IS ";S/
T
  740INPUT " DO YOU WISH TO DO A
NOTHER CALCULATION  Y/N ",V$
  750IF V$="Y" THEN GOTO 250 ELS
E GOTO 760
  760 END
```

```
    5 A=0:B=0:C=0:D=0:E=0:F=0
   10 MODE 7
   11 VDU 23;8202;0;0;0;
   12 PROCtitle
   13 MODE 1
   15 RESTORE 500
   16 IF A+B+C+D+E+F<>6 THEN CLS
:GOTO 10
   17 FOR T=0 TO 2000:NEXT
   18 MODE 7:PROCcongratulations
   19 RUN
   20 INPUT"Enter a piece of app
aratus"
   30 INPUT APP$
   32 PRINTTAB(0,0);"
                                  "
   35 FOR N=1000 TO 1500 STEP 10
0
   40 READ D$
   50 IF APP$=D$ THEN SOUND 1,-1
5,150,2:GOTO N
   60 NEXT N
   63 SOUND 0,-15,50,2
   65 GOTO 15
  500 DATA BUNSEN BURNER,CORK,FL
ASK,CONDENSER,TRIPOD,BEAKER
  600 END
 1000 REM bunsen burner
 1010 MOVE 200,350
 1020 DRAW 200,230
 1030 DRAW 140,220
 1035 DRAW 140,200
 1040 DRAW 280,200
 1050 MOVE 220,350
 1060 DRAW 220,260
 1062 DRAW 240,260
 1064 MOVE 240,245
 1065 DRAW 220,245
 1066 DRAW 220,230
 1070 DRAW 280,220
 1080 DRAW 280,200
 1085 A=1
 1090 GOTO 15
 1100 REM cork
 1110 FOR Y=565 TO 580
 1120 MOVE 195,Y
 1130 DRAW 225,Y
 1140 NEXT
 1145 B=1
 1150 GOTO 15
 1200 REM flask
 1210 MOVE 195,500
 1220 DRAW 195,500
 1230 DRAW 130,410
 1240 MOVE 225,580
 1250 DRAW 225,550
 1252 DRAW 250,543
 1254 MOVE 250,520
 1256 DRAW 225,530
 1258 DRAW 225,500
```

Water Distillation



THIS PROGRAM allows the user to display the apparatus needed to distill water. Typing-in the name of an object needed will result in its being displayed on-screen in correct relation to other apparatus already chosen for the experiment.

Water Distillation was written for the BBC B by Alex Segre of north London.

```
 1260 DRAW 290,410
 1270 DRAW 130,410
 1280 C=1
 1295 GOTO 15
 1300 REM condenser
 1310 MOVE 250,543
 1320 DRAW 280,550
 1340 DRAW 650,400
 1350 DRAW 675,375
 1355 DRAW 730,350
 1360 MOVE 250,520
 1365 DRAW 260,495
 1370 DRAW 625,345
 1375 DRAW 655,357
 1380 DRAW 726,327
 1390 D=1
 1395 GOTO 15
```

```
 1400 REM tri pod
 1410 MOVE 100,200
 1420 DRAW 140,380
 1430 DRAW 280,380
 1440 DRAW 320,200
 1450 DRAW 340,200
 1455 DRAW 300,380
 1460 DRAW 320,380
 1465 DRAW 320,400
 1470 DRAW 100,400
 1475 DRAW 100,380
 1480 DRAW 120,380
 1485 DRAW 80,200
 1490 DRAW 100,200
 1493 E=1
 1495 GOTO 15
 1500 REM beaker
 1510 MOVE 800,320
 1520 DRAW 800,200
 1530 DRAW 700,200
 1540 DRAW 700,320
 1545 F=1
 1550 GOTO 15
 2000 DEF PROCtitle
 2010 PRINT TAB(8,5);CHR$(141);C
HR$(134);"WATER DISTILLATION":PR
INT TAB(8,6);CHR$(141);CHR$(134)
;"WATER DISTILLATION"
 2020 PRINT TAB(3,10);CHR$(131);
"In this program you must type i
n a"
 2030 PRINT TAB(0,11);CHR$(131);
"piece of apparatus used in the"
 2040 PRINT TAB(0,12);CHR$(131);
"distillation of water. If you g
et one"
 2050 PRINT TAB(0,13);CHR$(131);
"right then a short beep will oc
cur"
 2060 PRINT TAB(0,14);CHR$(131);
"and the apparatus will be displ
ayed."
 2080 PRINT TAB(3,20);CHR$(129);
CHR$(136);"HIT THE SPACE_BAR TO
START"
 2090 G=GET
 2100 IF G=32 THEN ENDPROC ELSE
GOTO 2090
 3000 DEF PROCcongratulations
 3010 RESTORE 3240
 3020 VDU 23;8202;0;0;0;
 3030 PRINT TAB(7,5);CHR$(141);C
HR$(130);CHR$(136);"CONGRATULATI
ONS":PRINT TAB(7,6);CHR$(141);CH
R$(136);CHR$(136);"CONGRATULATIO
NS"
 3040 PRINT TAB(3,9);"YOU HAVE S
UCCEEDED IN OBTAINING"
 3050 PRINT TAB(10,10);"PURE WAT
ER!!"
 3060 FOR X=1 TO 11
 3070 READ P,D
 3080 IF P=999 THEN L=0 ELSE L=-
15
 3090 SOUND 1,L,P,D
 3100 SOUND 1,0,0,3
 3110 NEXT
 3200 PRINT TAB(0,20);CHR$(129);
CHR$(136);"HIT THE SPACE_BAR FOR
 ANOTHER GO"
 3210 G=GET
 3220 IF G<>32 THEN GOTO 3210
 3230 ENDPROC
 3240 DATA 97,15,97,5,101,5,999,
5,101,5,97,5,101,10,97,2,89,5,81
,5,77,10
```

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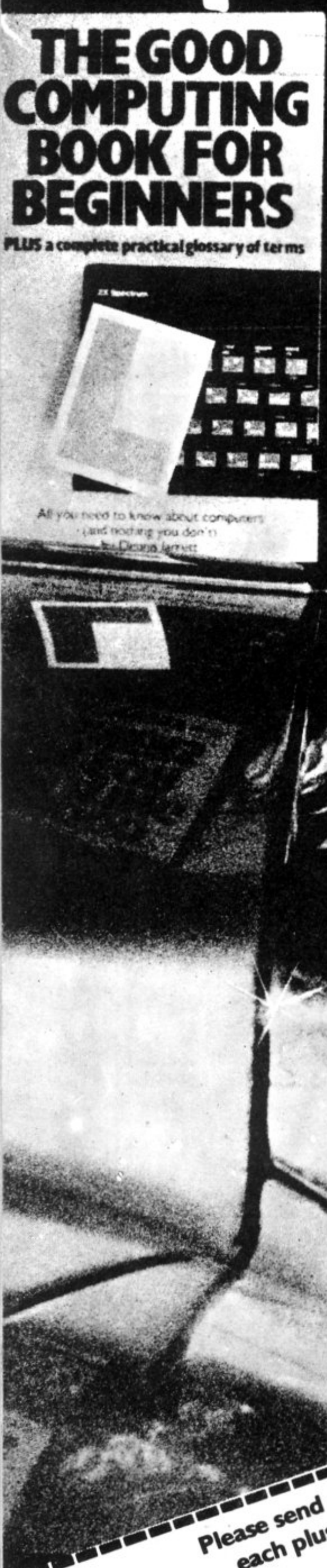

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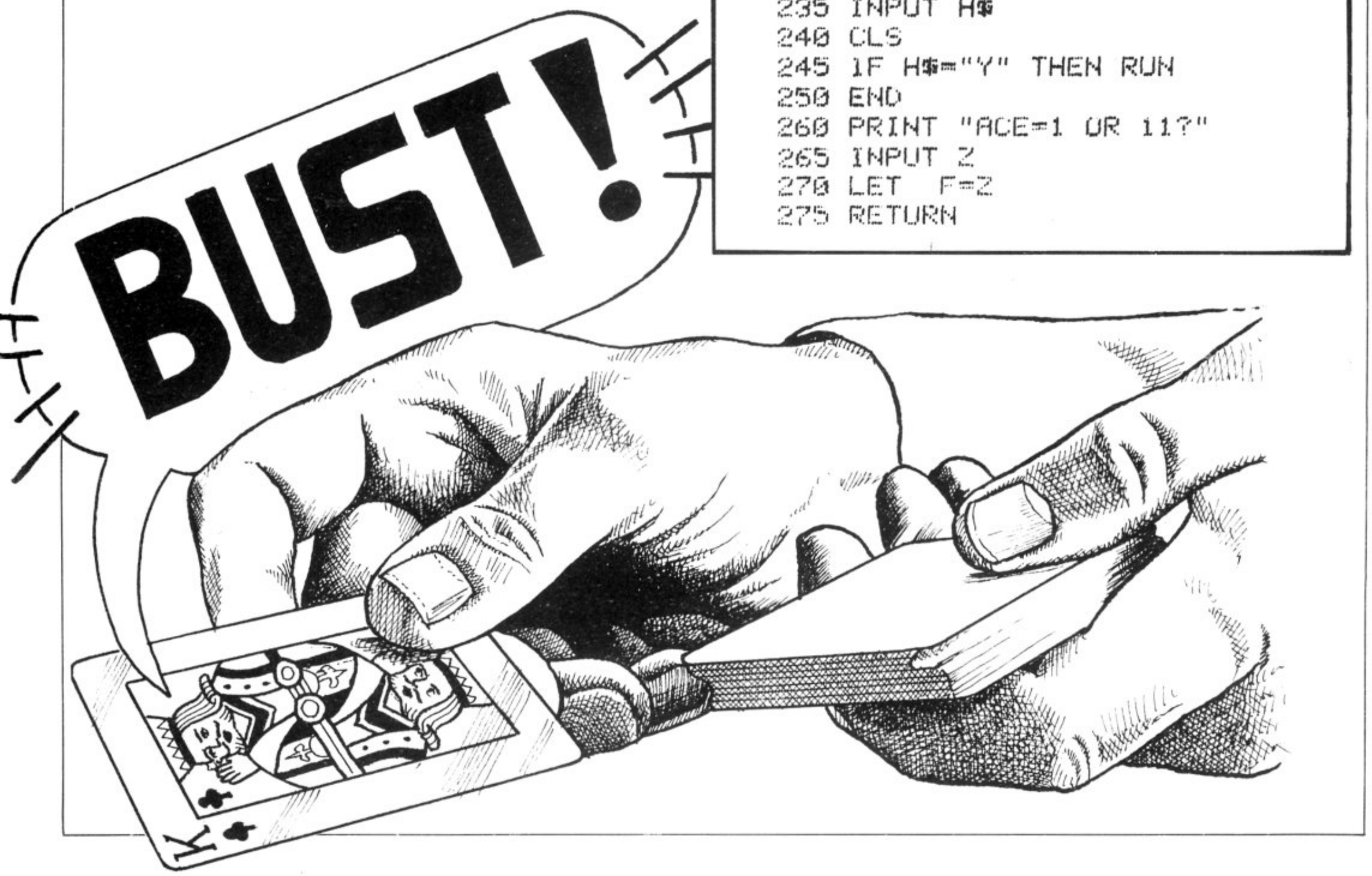
Pontoon

PLAY a traditional game of **Pontoon** on your BBC B against friends or the computer. The object is to hold cards totalling 21 or the nearest possible lowest figure. A total exceeding 21 will lose automatically or "bust". Take as many cards as is necessary or safe and the computer will make its selection.

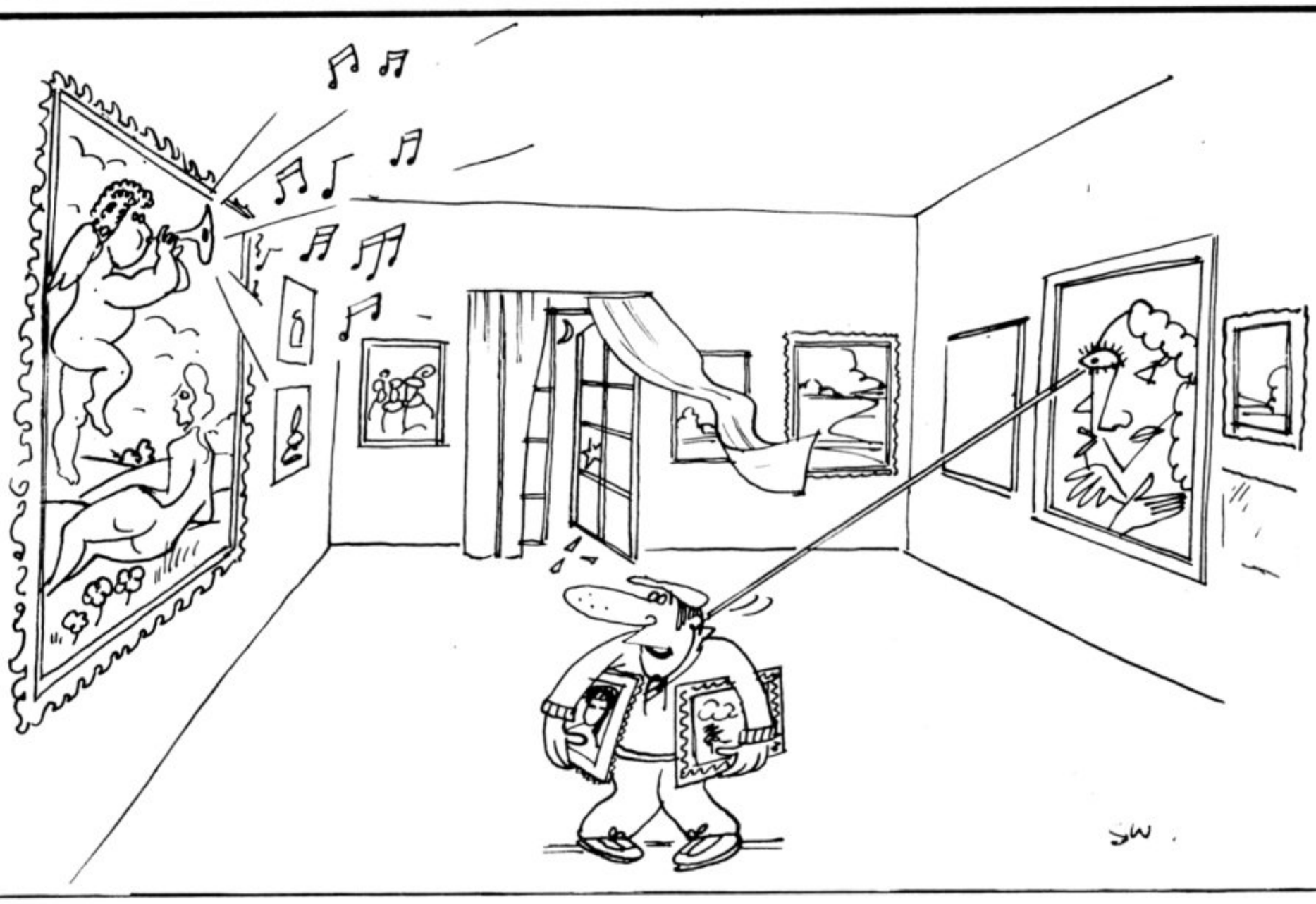
```
  1 CLS
 10 PRINT"HOW MANY PLAYERS?"
 20 INPUT B
 21 LET A=0
 30 DIM C(B)
 40 LET D=RND(11)
 50 LET A=A+D
 60 IF A>21 THEN GOTO 80
 70 GOTO 40
 80 LET A=A-D
 90 FOR E=1 TO B
 95 CLS
100 PRINT"YOUR TURN PLAYER";E

105 PRINT
110 IF C(E-1)>21 THEN PRINT "P
LAYER";E-1;" HAS GONE BUST"
115 LET F=RND(10)
120 IF F=1 THEN GOSUB 260
125 LET C(E)=C(E)+F
130 PRINT
135 PRINTTAB(8)"==="
140 PRINT
145 PRINT C(E)
150 PRINTTAB(8)"==="
155 PRINT
160 IF C(E)>21 THEN GOTO 185
165PRINT "ANOTHER CARD?(Y OR N
)"
170 INPUT G$
175 CLS
180 IF G$="Y" THEN GOTO 115
185 NEXT E
190 CLS
200 FOR E=1 TO B
201 IF C(E)>21 THEN PRINT"PLAY
ER ";E;"BUST"
205 IF C(E)<22 THEN PRINT "PLA
YER ";E;"SCORED ";C(E)
210PRINT
215 NEXT E
220 PRINT"THE COMPUTER HAS ";A

225 PRINT
230PRINT "ANOTHER GAME? Y/N"
235 INPUT H$
240 CLS
245 IF H$="Y" THEN RUN
250 END
260 PRINT "ACE=1 OR 11?"
265 INPUT Z
270 LET  F=Z
275 RETURN
```



Bank Robber

BREAK into your local bank and steal as much money as possible. Vicious guard dogs and brutal guards will reduce your strength and shoot at you, but bags of money can be found in the vaults. The aim is to leave alive with as much money as possible. For the BBC B and Electron.

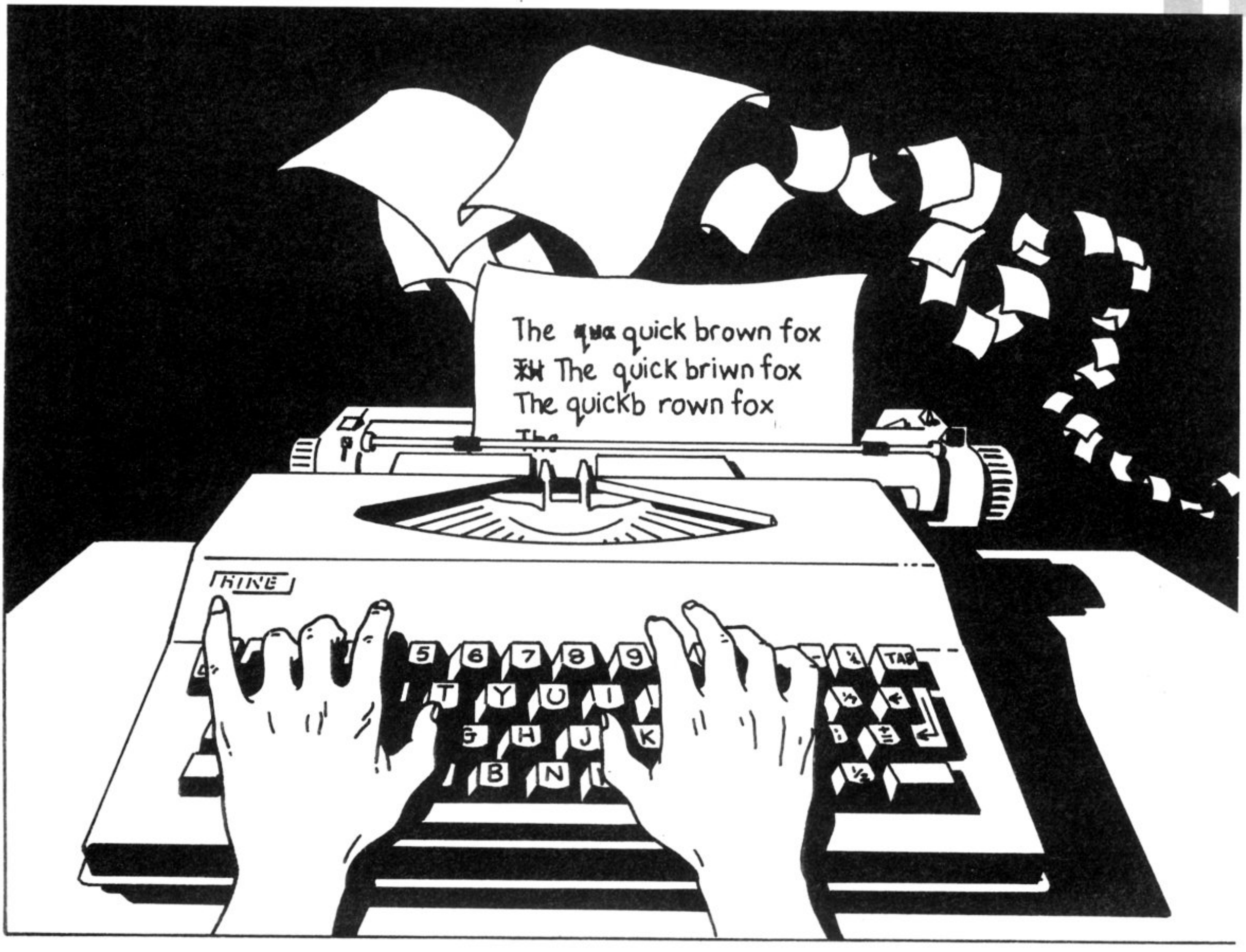
```
   10 CLS
   20LET P=RND(14)
   30 LET V=0
   40 LET A=RND(20)
   50 LET B=RND(15)
   55 PRINTTAB(6)"BANK RUBBER"

   60 PRINT "POWER=";P;" STRENGT
H OF  BULLET PROOF VEST";A;" BOD
Y HITS";B;" LOOT=";V
   70 PRINTTAB(6)"BANK RUBBER"
   80 PRINT"THE BANK IS VERY DAR
K.                    YOU CAN  HAR
DLY SEE"
   90 PRINT
  100 PRINT "WILL YOU ENTER THE
SAFE?"
  110 INPUT A$
  120 IF A$="N" THEN GOTO 70
  140 LET P=RND(3)
  145 LET X=RND(60)
  150 IF P=0 THEN GOTO 150
  160 IF P=1 THEN GOTO 220
  170 IF P=2 THEN GOTO 240
  180 LET E=RND(12)
  190 IF P>E THEN PRINT"YOU KILL
ED TWO VICIOUS GUARD DOGS"
  200 IFP<E THEN LET P=P-4:PRINT
"BITTEN BY GUARD DOGS.  LOSE 4 P
OINTS"
  210 GOTO 300
  220 PRINT" NO GUARDS HERE..YOU
R POWER INCREASES":LET P=P+1
  225 LET P=P+1
  230 GOTO 290
  240 PRINT"SHOT AT BY GUARDS.
LOSE 7 HITS"
  250 IF A=0 THEN LET B=B-7
  260 IF A>0 THEN LET A=A-7
  270 IF A<0 THEN LET A=0
  280 GOTO 300
  290 PRINT"YOU FIND A BAG OF BA
NKNOTES":LET V=V+100
  300 IF B<=0 THEN PRINT "YOU AR
E DEAD":END
  310 PRINT"WILL YOU GO FURTHER?
"
  320 INPUT S$
  330 CLS
  335 PRINT "POWER=";P;" STRENGT
H OF  BULLET PROOF VEST";A;" BOD
Y HITS";B;" LOOT=";V
  338 IF X=32 THEN GOTO 360
  340 IF S$="Y" THEN GOTO 140
  350  PRINT "YOU ARE AT THE ENT
RANCE"
  360 END
```



Typing Practice

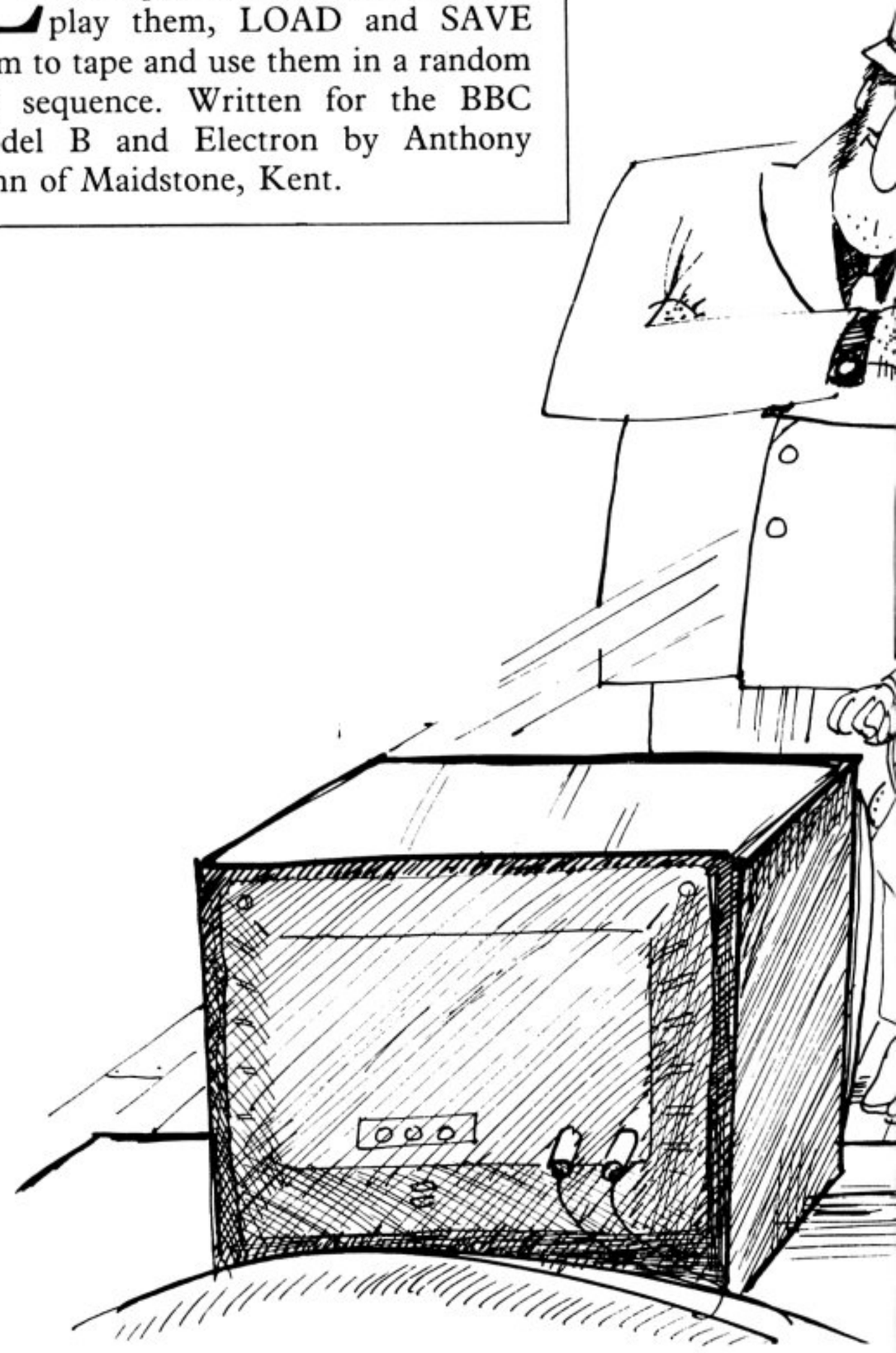
```
    5 CLS
   10 PRINT"PRESS THE LETTER SHO
WN TO SCORE A POINT."
   15 FOR V=1TO10000
   16 NEXT V
   20 LET S=0
   30REM LOOP WHICH RUNS THE ROU
TINE 20 TIMES
   40 FORA=1 TO 20
   50LET M=RND(26)
   60 LET M=M+64
   70 LETM$=CHR$(M)
   80PRINT M$
   90 LET N$=INKEY$(160)
  100 IF N$=M$ THEN LET S=S+1
  110 CLS
  120 NEXT A
  130 PRINT "YOU HAVE NOW HAD 20
 TURNS.                  YOUR SCORE
IS NOW ";S
  140 FOR V=1 TO 10000
  150 NEXT V
  160 RUN
```

TEST your touch typing with **Typing Practice** for the BBC or Electron. Letters will be displayed briefly on-screen. Type the same letter before it disappears to gain a point. After 20 letters have been displayed, your score will be given.



```
   10 ON ERROR CLS:GOTO 60
   20 REM ***QUESTION MASTER***
   30 REM *******1982**********
   40 REM ***BY ANTHONY CHAN***
   50 CLS
   60 PRINT TAB(10);STRING$(15,"
*")
   70 PRINT TAB(10);"QUESTION MA
STER"
   80 PRINT TAB(10);STRING$(15,"
*")
   90 PRINT"Select an option:-"
  100 PRINT'TAB(5)"1. Display qu
estions"
  110 PRINT'TAB(5)"2. Random tes
t"
  120 PRINT'TAB(5)"3. Enter test
 questions"
  130 PRINT'TAB(5)"4. Change a t
est question"
  140 PRINT'TAB(5)"5. Load data
from a cassette"
  150 PRINT'TAB(5)"6. Save data
onto a cassette"
  155 PRINT'TAB(5)"7. Catalogue"
  160 A$=GET$:IF VAL(A$)<1 OR VA
L(A$)>7 THEN 160
  170 CLS
  180 ON VAL(A$) GOTO 190,300,44
0,580,630,780,892
  190 PRINT TAB(9);STRING$(9,"*"
)
  200 PRINT TAB(10);"DISPLAY"
  210 PRINT TAB(9);STRING$(9,"*"
)
  220 VDU 14
  230 FOR A=1 TO X
  240 PRINT'TAB(5);A;")";TAB(8);
Q$(A)
  250 PRINTTAB(8);A$(A)
  260 NEXT A
  270 VDU 15
  280 PROCEND
  290 GOTO 60
  300 PRINT TAB(9);STRING$(6,"*"
)
  310 PRINT TAB(10);"TEST"
  320 PRINT TAB(9);STRING$(6,"*"
)
  330 FOR A=1 TO X:A(A)=0:NEXT
  340 SC=0
  350 FOR B=1 TO X
  360 A=INT(RND(X)):IF A(A)=1 TH
EN 360 ELSE A(A)=1
  370 PRINT Q$(A)
  380 INPUT A$
  390 IF A$=A$(A) THEN PRINT"Cor
rect,well done.":SC=SC+1 ELSE PR
INT"Bad luck,it was ";A$(A)
  400 NEXT
  410 PRINT"You scored ";SC;" ou
t of ";X
  420 PROCEND
  430 GOTO 60
  440 PRINT'TAB(9)STRING$(17,"*"
)
  450 PRINTTAB(10)"ENTER QUESTIO
NS"
  460 PRINTTAB(9)STRING$(17,"*")
  470 CLEAR
  480 INPUT'"How many questions"
,X
  490 DIM Q$(X),A$(X),A(X)
  500 PRINT"Right then,inPut que
stions and answers alternately"
  510 PRINT"Pressing return inbe
tween"
  520 FOR A=1 TO X
  530 PRINTTAB(1);A;")";TAB(5);
INPUT Q$(A)
  540 PRINTTAB(5);:INPUTA$(A)
  550 NEXT
```

EXAMINER allows its user to enter questions and answers, display them, LOAD and SAVE them to tape and use them in a random test sequence. Written for the BBC Model B and Electron by Anthony Cahn of Maidstone, Kent.



EXAMINER

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EXAMINER

```
 560 PROCEND
 570 GOTO 60
 580 INPUT"Which question to be
changed",A
 590 PRINT"Right then,input new
question and then answer,return
separating."
 600 INPUT Q$(A),A$(A)
 610 PROCEND
 620 GOTO 60
 630 CLEAR
 640 INPUT"What is the name of
your file",F$
 650 PRINT"Play tape and Press
any key"
 660 Q=GET
 670 PRINT"Please wait"
 680 E%=OPENIN F$
 690 INPUT#E%,X
 700 DIM Q$(X),A$(X)
 710 FOR A=1 TO X
 720 INPUT#E%,Q$(A),A$(A)
 730 NEXT
 740 CLOSE#E%
 750 DIMA(X)
 760 PROCEND
 770 GOTO 60
 780 PRINT"What is the name of
your file?"
 790 INPUT F$
 800 PRINT"Please Press ";
 810 E%=OPENOUT F$
 820 PRINT'"Please wait"
 830 PRINT#E%,X
 840 FOR A=1 TO X
 850 PRINT#E%,Q$(A),A$(A)
 860 NEXT
 870 CLOSE#E%
 880 PROCEND
 890 GOTO 60
 892 *CAT
 900 DEF PROCEND
 910 PRINT'TAB(7)"PRESS THE SPA
CE BAR"
 920 A$=GET$:IF A$=" " THEN CLS
:ENDPROC ELSE 920
```

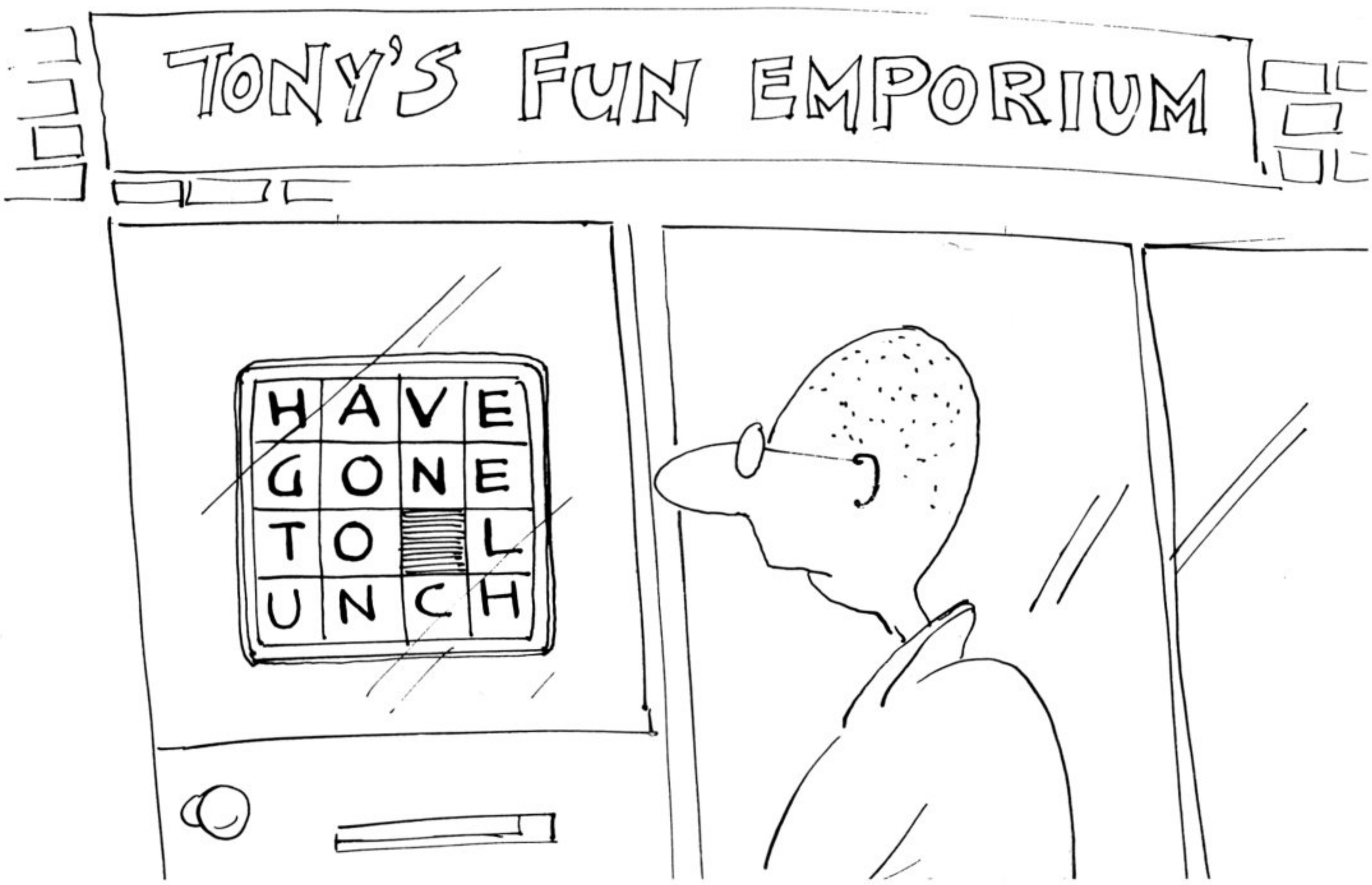
IN ORDER

THE COMPUTER will display a square comprising 16 smaller squares. Fifteen of them contain a letter while the other contains a space. The aim is to arrange all the letters in alphabetical order by moving letters adjacent to the space repeatedly into the space.

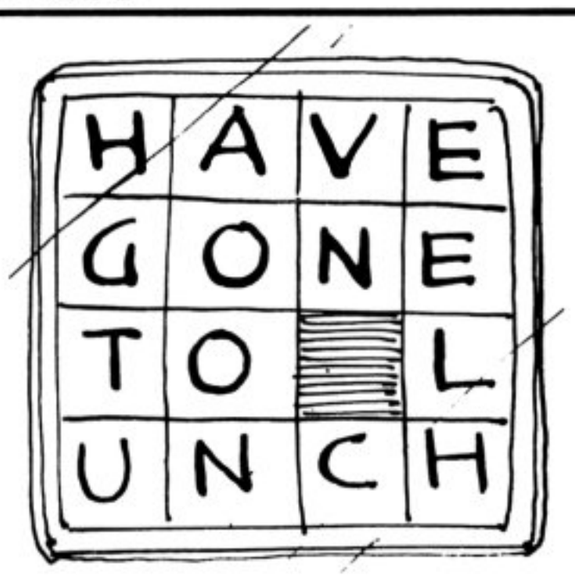
In Order was written for the BBC B by Neil Devlin of Dundee, Tayside.

```
    1REM              IN-ORDER
    2REM           BY NEIL DEVLIN
    3REM         6TH DECEMBER 1983

    4REM
    5IF J%=0 THEN H%=10000
    6DIM A(16,2)
    7MODE 7
    8PROCINTRO
    9DIM B(16):DIM C(16):REM LET
TERS
    10VDU 23;8202;0;0;0;:REM CURS
OR OFF
    11:
    12REM      MAIN PART OF PROGRA
M
    13:
    14PROCSCREEN:REM POSITIONS ON
 SCREEN
    15PROCMIX:REM MIX UP LETTERS
    16REPEAT
    17REPEAT:G=GET:UNTIL G>64 AND
 G<80
    18PROCINPUT:REM PICK LETTER T
O MOVE
    19IF MARKER=0 THEN PROCFALSE:
GOTO17
    20PROCCHANGE:REM CHANGE LETTE
RS
    21SCORE=SCORE+1
    22PROCSCORE
    23PROCCHECK:REM CHECK IF END
OF GAME
    24UNTIL FALSE
    25:
    26:
    27REM  PRINT LETTERS ON SCREE
N
    28PRINTCHR$(134);" ":RETURN

    29PRINTCHR$(129);"A":RETURN
    30PRINTCHR$(129);"B":RETURN
    31PRINTCHR$(129);"C":RETURN
    32PRINTCHR$(129);"D":RETURN
    33PRINTCHR$(131);"E":RETURN

    34PRINTCHR$(131);"F":RETURN

    35PRINTCHR$(131);"G":RETURN
    36PRINTCHR$(131);"H":RETURN
    37PRINTCHR$(130);"I":RETURN
    38PRINTCHR$(130);"J":RETURN
    39PRINTCHR$(130);"K":RETURN
    40PRINTCHR$(130);"L":RETURN
    41PRINTCHR$(132);"M":RETURN
    42PRINTCHR$(132);"N":RETURN
    43PRINTCHR$(132);"O":RETURN

    44:
    45:
    46DEF PROCMIX
    47PRINTTAB(1,4);CHR$(136);CHR
$(129);"                    IN-ORDER
                "
    48SCORE=0:FORZ%=1TO16
    49Y=RND(16):IF B(Y)=0 THEN GO
TO49
    50C(Z%)=B(Y):B(Y)=0:NEXT
    51FORZ=1TO16:IF C(Z)=64 THEN
B(Z)=1 ELSE NEXT
    52FORZ=1TO16:PRINTTAB((A(Z,1)
),(A(Z,2)));:GOSUB(C(Z)-36):NEXT
    53PRINTTAB(6,3);"SCORE";TAB(8
,5);"0"
    54PRINTTAB(28,3);"BEST SCORE"
;:IF H%>10 THEN PRINTTAB(31,5);H
% ELSE PRINTTAB(30,6);H%
    55ENDPROC
    56:
    57:
    58DEF PROCSCREEN
    59PRINTTAB(1,4);CHR$(130);"TH
IS IS HOW IT SHOULD BE FINISHED"
:X=12
```

```
   60FORZ=1TO4:A%(Z,1)=X:X=X+4:A%(
Z,2)=10:NEXT:X=12
   61FORZ=5TO8:A%(Z,1)=X:X=X+4:A%(
Z,2)=13:NEXT:X=12
   62FORZ=9TO12:A%(Z,1)=X:X=X+4:A
%(Z,2)=16:NEXT:X=12
   63FORZ=13TO16:A%(Z,1)=X:X=X+4:
A%(Z,2)=19:NEXT
   64X=65:FORY=1TO15:B%(Y)=X:X=X+
1:NEXT
   65B%(16)=64
   66FORZ=1TO15:PRINTTAB(A%(Z,1)
),(A%(Z,2)));:GOSUB(B%(Z)-36):NEXT
   67PRINTTAB(4,22);CHR$(136);CH
R$(129);"PRESS SPACE BAR TO STAR
T":REPEAT:UNTIL GET=32:PRINTTAB(
6,22);"
                "
   68ENDPROC
   69:
   70:
   71DEF PROCINPUT
   72REM MAKE SURE INPUT IS VALI
D
   73MARKER=0:Z=0
   74REPEAT:Z=Z+1
   75REM      DOWN
   76IF Z>12 THEN GOTO78
   771F C%(Z)=G AND B%(Z+4)=1 THEN
 MARKER=1:W=Z:V=1:Z=16:GOTO 87
   78REM      RIGHT
   79IF Z=4 OR Z=8 OR Z=12 OR Z=
16 THEN GOTO81
   80IF C%(Z)=G AND B%(Z+1)=1 THEN
 MARKER=1:W=Z:V=2:Z=16:GOTO 87
   81REM      LEFT
   82IF Z=1 OR Z=5 OR Z=9 OR Z=1
3 THEN GOTO 84
   83IF C%(Z)=G AND B%(Z-1)=1 THEN
 MARKER=1:W=Z:V=3:Z=16:GOTO 87

   84REM      UP
   85IF Z<5 THEN GOTO87
   86IF C%(Z)=G AND B%(Z-4)=1 THEN
 MARKER=1:W=Z:V=4:Z=16
   87UNTIL Z=16
   88ENDPROC
   89:
   90:
   91DEF PROCCHANGE
   92REM CHANGE LETTERS AROUND
   93REM AND PRINT THEM ON SCREE
N
   94IF V=4 THEN C%(W-4)=C%(W):C%(W
)=64:B%(W-4)=0:B%(W)=1:PRINTTAB(A%
(W-4),1),A%(W-4),2)));:GOSUB(C%(W-
4)-36):PRINTTAB(A%(W),1),(A%(W),
2)));:GOSUB(C%(W)-36)
   95IF V=3 THEN C%(W-1)=C%(W):C%(W
)=64:B%(W-1)=0:B%(W)=1:PRINTTAB(A%
(W-1),1),A%(W-1),2)));:GOSUB(C%(W-
1)-36):PRINTTAB(A%(W),1),(A%(W),
2)));:GOSUB(C%(W)-36)
   96IF V=2 THEN C%(W+1)=C%(W):C%(W
```



```
)=64:B(W+1)=0:B(W)=1:PRINTTAB(A(
(W+1),1),A((W+1),2)):GOSUB(C(W+
1)-36):PRINTTAB(A((W),1),(A((W),
2))):GOSUB(C(W)-36)
   97IF V=1 THEN C(W+4)=C(W):C(W
)=64:B(W+4)=0:B(W)=1:PRINTTAB(A(
(W+4),1),A((W+4),2)):GOSUB(C(W+
4)-36):PRINTTAB(A((W),1),(A((W),
2))):GOSUB(C(W)-36)
   98ENDPROC
   99:
  100:
  101DEF PROCFALSE
  102REM WRONG INPUT
  103SOUND 1,-15,100,10
  104PRINTTAB(3,23);"THAT WAS AN
 INVALID GUESS,TRY AGAIN"
  105FORZ1=1TO5000:NEXT
  106FORZ=37 TO 3 STEP-1
  107PRINTTAB(Z,23);" ":NEXT
  108SOUND 1,-15,100,3
  109ENDPROC
  110:
  111:
  112DEF PROCSCORE
  113REM PRINT SCORE
  114IF SCORE<10 PRINTTAB(8,5);S
CORE ELSE PRINTTAB(7,5);SCORE
  115ENDPROC
  116:
  117:
  118DEF PROCCHECK
  119K=65
  120FORA%=1TO15
  121IF C(A%)=K THEN K=K+1
  122NEXT
  123IF K<>80THEN ENDPROC
  124ENVELOPE 1,1,-26,-36,-45,25
5,255,255,127,0,0,-127,126,0
  125SOUND 1,1,255,155
  126C=INKEY(800):J%=1
  127IF SCORE=H% THEN SCORE=1:GO
TO129
  128IF SCORE<H% THEN H%=SCORE:S
CORE=0
  129CLS
  130VDU 23;8202;0;0;0;:REM CURS
OR OFF
  131PRINTTAB(14,10);CHR$(129);"
WELL DONE!"
  132IF SCORE=0 THEN PRINT'''';CH
R$(130);TAB(3);"YOU MANAGED TO G
ET THE BEST SCORE":GOTO134
  133IF SCORE=1 THEN PRINT'''';CH
R$(130);TAB(7);"YOU EQUAL THE BE
ST SCORE" ELSE PRINT';CHR$(130);
TAB(18);"BUT";'';CHR$(130);"YOU
WERE ";SCORE-H%;" POINTS OFF THE
 BEST SCORE"
  134PRINT'';TAB(4);CHR$(131);"D
O YOU WANT ANOTHER GAME(Y/N)"
  135REPEAT:G=GET:UNTIL G=89 OR
G=78
  136IF G=89 THEN CLS:GOTO10
  137CLS:PRINTTAB(14,12);
  138PRINTCHR$(136);CHR$(141);CH
R$(131);"BYE!";TAB(14,13);
  139PRINTCHR$(136);CHR$(141);CH
R$(131);"BYE!"
  140GOTO140
  141:
  142:
  143DEF PROCINTRO
  144REM   INTRODUCTION & INSTRU
CTIONS
  145CLS
  146VDU 23;8202;0;0;0;:REM CURS
OR OFF
  147PRINTTAB(14,10);CHR$(131);"
IN-ORDER"
  148PRINTTAB(18,12);"BY"
  149PRINT'TAB(13,14);CHR$(129);
"NEIL DEVLIN"
  150FORZ=1TO5000:NEXT
  151CLS
  152PRINT';CHR$(129);CHR$(157);
CHR$(135);"                IN-ORDER
                "
  153PRINT'''TAB(11);CHR$(131);"
* INSTRUCTIONS *"
  154PRINT''CHR$(134);"RE-ARRAN
GE THE LETTERS IN ALPHABETICAL"

  155PRINTCHR$(134);"ORDER,BY PR
ESSING THE LETTER YOU WANT"
  156PRINTCHR$(134);"TO MOVE INT
O THE SPACE.THE LOWEST SCORE"
  157PRINTCHR$(11);CHR$(134);"IS
 KEPT ON THE SCREEN.LESS THAN 10
000"
  158PRINTCHR$(134);"IS YOU'RE T
ARGET,TO BEGIN WITH."
  159PRINT''CHR$(132);TAB(12);"Y
OU CAN ONLY MOVE"
  160PRINT'CHR$(132);"       UP-
DOWN    OR    LEFT-RIGHT"
  161PRINT'';CHR$(136);CHR$(129
);"     PRESS SPACE BAR TO CONTI
NUE"
  162REPEAT:UNTIL GET=32:CLS
  163ENDPROC
```



GOLF

PLAY a simple game of **Golf** on your BBC B or Electron. You will be told how many yards you have to play and par for the hole. You can then select a club or a putter to hole out as quickly as possible. There are nine holes to play and, when you finish, you will be told whether your game was above or below par.

```
 10 LET X=0
 20 A=1
 30 F=0
 40 H=0
 50 B=0
 60 CLS
 70 LET D=RND(245)+175
 80 LET P=6
 90 P=4
100 IF D<276 THEN LET P=3
110 IF D>350 THEN LET P=5
120 PRINT
 130 PRINT"HOLE,";A;"  ";D;" YA
RD(S) TO PLAY"
 140PRINT
 150PRINT "PAR ";P
 160 PRINT
 170 IF  D<>0THEN PRINT B;"STRO
KES PLAYED"
 180 IF H<>1 THEN PRINT"CLUB? 5
TO9"
 190IF H=1THENPRINT "PUTTER? 1
TO 4"
 200 INPUT W
 210 CLS
 220 T=1
 230 IF W=2 THEN LET T=W
 240 IF W=3 THEN LET T=RND(2)+4
 250 IF W=4 THEN LET T=RND(4)+8
 260 IF W=5 THEN LET T=RND(6)+2
0
 270 IF W=6 THEN LET T=RND(9)+4
5
 280 IF W=7 THEN LET T=RND(8)+9
6
 290 IF W=8 THEN LET T=RND(9)+1
35
 300 IF W=9 THEN LET T=RND(15)+
195
 310 D=D-T
 320 PRINT"STROKE,";T;" YARD(S)
"
 330 LET B=B+1
 340 IF D>-1 THEN GOTO 370
 350 LET D=-D
 360 PRINT D;"PAST HOLE"
 370 IF D=0 THEN GOTO 410
 380 IF D<18 AND D>-19 THEN PRI
NT "ON GREEN"
 390 IF D<18 AND D>-19 THEN LET
 H=1
 400 GOTO 90
 410 IF B>P THEN PRINT"BOGIE ";
B;,B-P;" OVER"
 420 IF B=P THEN PRINT "PAR ";B
 430 IF P-1=B THEN PRINT"BIRDIE
";B
 440 IF P-2=B THEN PRINT "EAGLE
";B
 450 LET X=X+B
 460 LET F=F+P
 470 LET A=A+1
 480 IF A=10 THEN GOTO 500
 490 GOTO 40
 500 PRINT "C/PAR ";F
 510PRINT "YOUR SCORE";X
```

Errors & MISHAPS

PART of a line was omitted from **Colour Logic** in the December/January issue. Line 790 should end with NEXT I, as printed. Line 800 should begin:
800 IF RIGHT > CORRECT AND RIGHT
and should continue <> 0 THEN as printed.

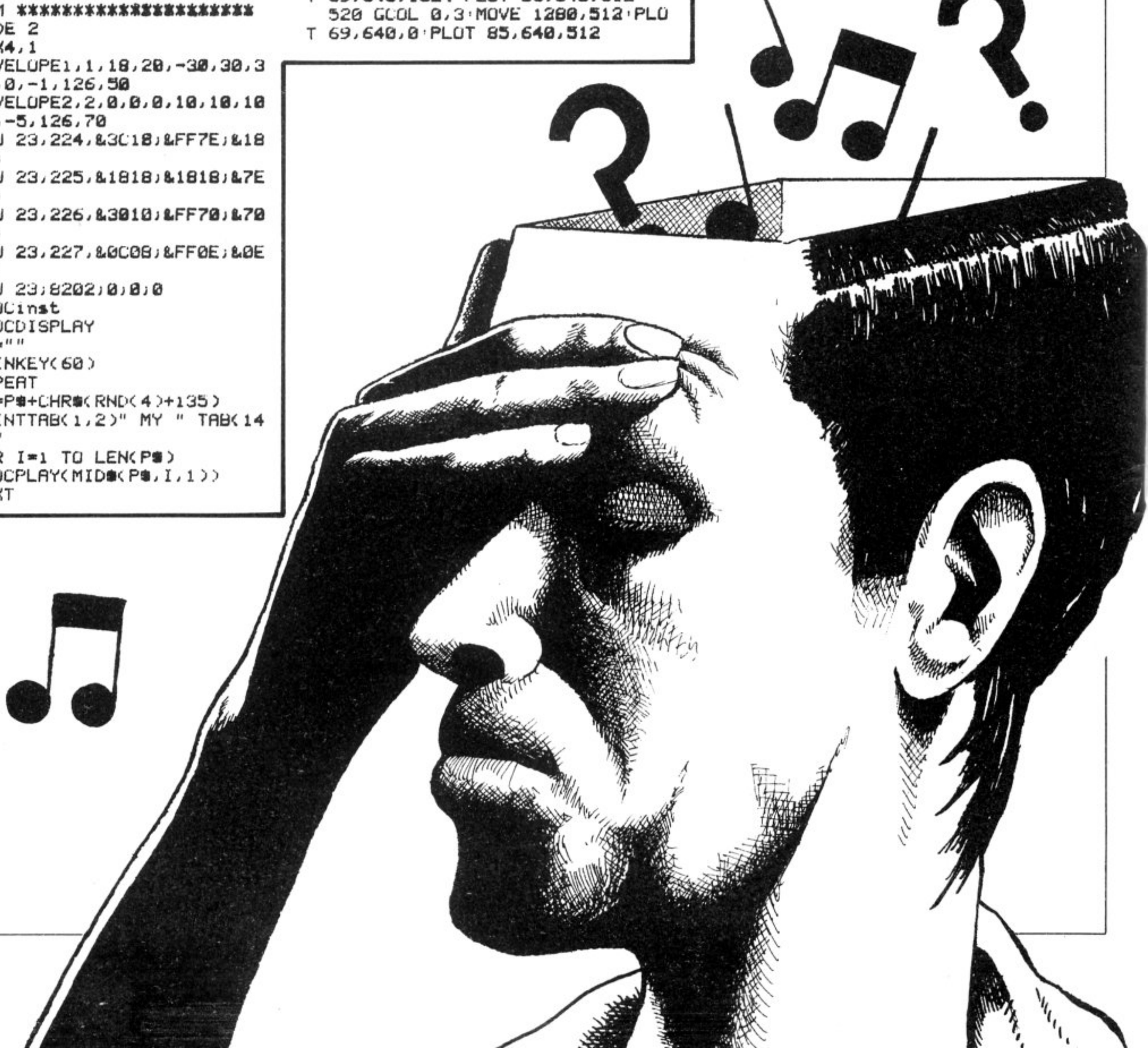
Line 730 of INVASION in the same issue should end THEN GOTO 50.

Simon's Game

ON THE SCREEN are displayed four coloured sections, each with its own sound and a corresponding cursor key. The computer will flash one of those sections and play the appropriate note. The player must then press the corresponding cursor key. The computer will then play two notes and the two corresponding keys must be pressed in sequence. The number of notes played will increase by one each turn until an error is made by the player, when the score will be displayed.

Simon's Game was written for the BBC B by N Mirza of Edgware, Middlesex.

```
  0 ON ERROR GOTO 700
 10 REM **********************
 20 REM **                    **
 30 REM **       SIMON        **
 40 REM **                    **
 50 REM **        (C)         **
 60 REM **                    **
 70 REM **   N. A. MIRZA      **
 80 REM **                    **
 90 REM **********************
100 MODE 2
110 *FX4,1
120 ENVELOPE1,1,18,20,-30,30,3
0,30,0,0,0,-1,126,50
130 ENVELOPE2,2,0,0,0,10,10,10
,0,-1,-3,-5,126,70
140 VDU 23,224,&3C18,&FF7E,&18
18,&1818,
150 VDU 23,225,&1818,&1818,&7E
FF,&183C,
160 VDU 23,226,&3010,&FF70,&70
FF,&1030,
170 VDU 23,227,&0C08,&FF0E,&0E
FF,&080C,
180 VDU 23,8202,0,0,0
190 PROCinst
200 PROCDISPLAY
210 P$=""
220 W=INKEY(60)
230 REPEAT
240 P$=P$+CHR$(RND(4)+135)
250 PRINTTAB(1,2)" MY " TAB(14
,2)"TURN"
260 FOR I=1 TO LEN(P$)
270 PROCPLAY(MID$(P$,I,1))
280 NEXT
290 PRINTTAB(1,2)"YOUR"
300 FOR I=1 TO LEN(P$)
310 G$=GET$:IF ASC(G$)<136 OR
ASC(G$)>139 GOTO 310
320 PROCPLAY(G$)
330 IF G$<> MID$(P$,I,1) GOTO
340 ELSE GOTO 430
340 *FX 15,0
350 IF G$=MID$(P$,I,1) THEN GO
TO430
360 SOUND 1,1,100,10
370 W=INKEY(10):CLS
380 COLOUR 5
390 PRINT TAB(4,4)"You scored
";LEN(P$)-1
400 COLOUR 15
410 PRINTTAB(5,9)"Any key to"
TAB(5,12)"play again"
420 X=GET:RUN
430 NEXT
440 PRINT TAB(9,16);LEN(P$);:F
OR J=1 TO 1000:NEXT
450 UNTIL LEN(P$)=254
460 *FX 15,0
470 PRINT TAB(5,4)"O.K you win
":PRINT TAB(5,7)"Any key to pla
y again":X=GET:RUN
480 DEFPROCDISPLAY
490 CLS
500 GCOL 0,1:MOVE 0,512:PLOT 6
9,640,1024:PLOT 85,640,512
510 GCOL 0,2:MOVE 1280,512:PLO
T 69,640,1024:PLOT 85,640,512
520 GCOL 0,3:MOVE 1280,512:PLO
T 69,640,0:PLOT 85,640,512
530 GCOL 0,4:MOVE 0,512:PLOT 6
9,640,0:PLOT 85,640,512
540 GCOL 0,0:MOVE 480,512:PLOT
69,800,512:PLOT 85,640,640
550 MOVE 480,512:PLOT 69,800,5
12:PLOT 85,640,384
560 PRINT TAB(6,10)CHR$226;TAB
(12,10)CHR$227;TAB(6,19)CHR$224;
TAB(12,19)CHR$225
570 ENDPROC
580 DEFPROCPLAY(B$)
590 B=ASC(B$)-135:VDU 19,B,7;0
;
600 SOUND 1,2,B*52+4,5
610 FOR J=1 TO 800:NEXT
620 VDU 19,B,B;0;
630 ENDPROC
640 DEF PROCinst
650 CLS:COLOUR 3:PRINT TAB(7,3
)"SIMON"
660 COLOUR 2:PRINT'''"Use the
cursor keys"''"to follow the tun
es"''"played by simon the"''"
computer"
670 COLOUR 6:PRINT''''    TO ST
ART PRESS"''"       ANY KEY"
680 COLOUR7
690 G=GET:ENDPROC
700 MODE 7
710 *FX 4,0
720 END
```



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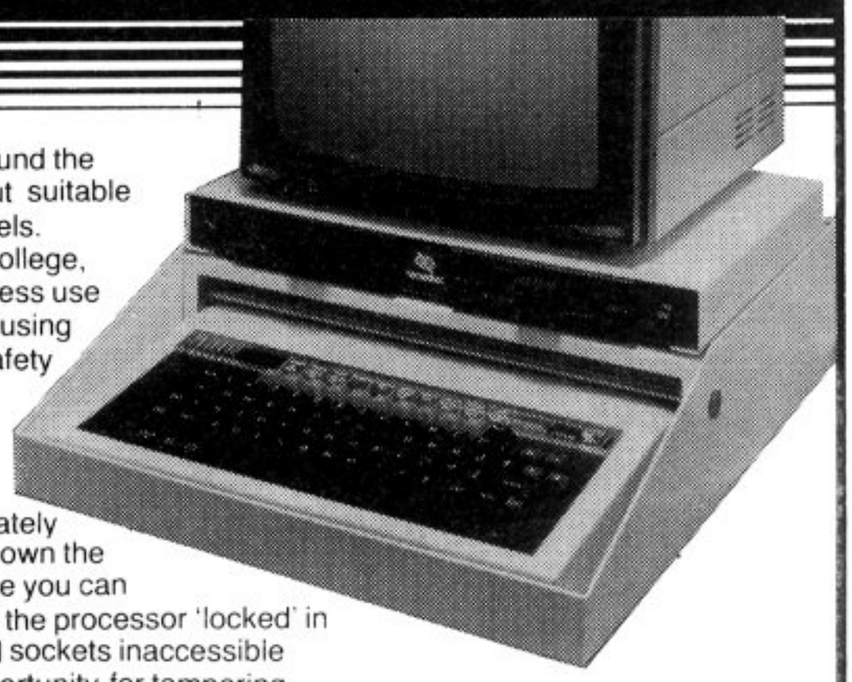

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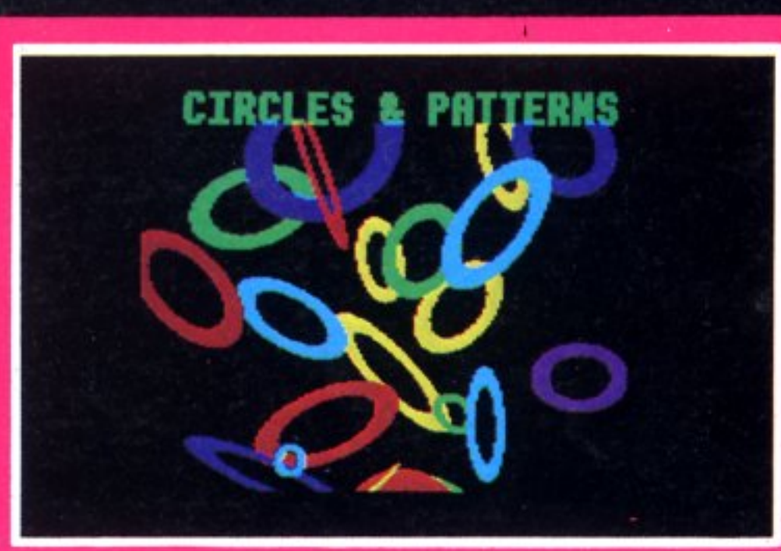

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