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A wider look at the Acorn scene

ACORN PROGRAMS is expanding. In this issue, we bring you news, more software reviews than ever before, a look at the fast-growing Electron software market, and the first of a regular advice series by our programming expert. We also meet the man behind Aviator, the leading game in the current Acornsoft range.

Listings still take pride of place and this month we publish the best 20 programs from the bumper crop you sent us. Keep sending your programs, on disc or cassette please, with your name and address and a brief description of what each one does and for which machine — BBC or Electron — it was written. Unfortunately, we cannot acknowledge every cassette we receive but we will return any program that we do not intend to publish provided that it is accompanied by a SAE.

The programs selected for this issue have been checked, listed from working copies and printed without amendments. All of them, including those written for the Electron, will also run on the BBC B. We hope you enjoy them.

The Editor

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– Soft, Sept 83

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– PC, Dec 83

"**Colossal Adventure** . . For once here's a program that lives up to its name . . a masterful feat. Thoroughly recommended"
– Computer Choice, Dec 83

"**Colossal Adventure** is one of the best in its class. I would recommend it to any adventurer."
– Acorn User, Feb 84

"**Adventure Quest** . . This has always been one of the best adventures for me as it seems to contain the lot. In all it took me about eight months to solve."
– PCW, 18th Jan 84

"To sum up, **Adventure Quest** is a wonderful program, fast, exciting and challenging. If you like adventures then this one is for you"
– NILUG issue 1.3

"Colossal Adventure is simply superb . . For those who want to move onto another adventure of similar high quality, **Dungeon Adventure** is recommended. With more than 200 locations, 700 messages and 100 objects it will tease and delight!"
– Educational Computing, Nov 83

ADVENTURE REVIEWS

"Colossal Adventure . . undoubtedly the best Adventure game around. Level 9 Computing have worked wonders to cram all this into 32K . . Finally **Dungeon Adventure**, last but by no means least. This is the best of the lot – a truly massive adventure – you'll have to play it yourselves to belive it."
– CBM 64 Users Club Newsletter

"The puzzles are logical and the program is enthralling. **Snowball** is well worth the money which, for a computer program, is a high recommendation."
– Micro Adventurer, Dec 83

"**Snowball** . . As in all Level 9's adventures, the real pleasure comes not from scoring points but in exploring the world in which the game is set and learning about its denziens . . this program goes to prove that the mental pictures conjured up by a good textual adventure can be far more vivid than the graphics available on home computers."
– Which Micro?, Feb 84

"**Lords of Time.** This program, writen by newcomer Sue Gazzard, joins my favourite series and is an extremely good addition to Level 9's consistently good catalogue . . As we have come to expect from Level 9, the program is executed with wonderful style – none of those boring "You can't do that" messages! Highly recommended."
– PCW, 1st Feb 84

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LEVEL 9 COMPUTING

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

Drawing on the power of a second processor

THE LONG-AWAITED 6502 second processor for the BBC micro, promised by Acorn Computers ever since the machine was launched two years ago, has made its appearance. Costing £199, the 6502 gives the BBC owner an additional 64K of memory and speeds the running of many programs by 50 percent.

Connected to the 'tube', the Acorn patented high-speed bus interface for the BBC, the 6502 takes over the running of the program, leaving the machine to handle input and output, screen display, memory and system filing. With the second processor plugged-in, the BBC has 60K of memory available to assembly language programs and 44K to Basic programs.

Acorn claims that the second processor will make possible many sophisticated applications not available to other home micros. To prove its point, the company launched the processor together with a powerful new graphics peripheral, the Bitstik.

Developed by Robocom, which produced it originally for the Apple, the Bitstik is intended as the Acorn entry into the growing computer-aided design market. The company regards it as the ideal tool for education and CAD training.

The joystick device makes a number of facilities possible, from drawing lines to painting, magnifying or copying sections of a drawing. The graphics software for the Bitstik is held on a special ROM chip which plugs into the micro and the master utilities are provided on an 80-track floppy disc. A complete Bitstik system will sell for £375.

A REAL JCB digger, a policewoman and two 'Meanies' helped to launch a new game from Acornsoft, *JCB Digger*. The game features a JCB excavator loader pitted in an island battle against marauding hordes of blob-like aliens. The idea of the game originated from the makers of the machine, JCB Excavators Ltd. "The company wanted a computer game to support its promotions," says Acornsoft managing director David Johnson-Davies, "but we believe it will appeal to all games enthusiasts." Author Jonathan Griffiths drove a JCB digger at the company's Staffordshire factory at the start of his five months' work on the program.

Growing Acorn

ACORN EXPANSION aims overseas include a plan to sell £5.5 million worth of BBC micros to Australia, where a total of £11 million is being spent in the next two years to put micros into state and private schools. The Australian government has chosen Acorn, Apple and Applied Technology of Australia as approved suppliers for the scheme.

Acorn sales in the U.S. may be helped by the BBC television series on computers to be shown on ABC.

At home, Acorn says it is hard-pressed to meet demand, which is running at about 25,000 machines a month. Nevertheless, the company is mounting a major promotion campaign this year.

Plans are going ahead for the launch of Acorn business machines costing less than £1,000 in the autumn.

Bad marks for maths programs

THE MATHEMATICAL Association has uncovered serious errors in the software pack supplied to primary schools by the Government-sponsored Microelectronics Education Programme. The software accompanies any machine which primary schools buy under an assisted purchase scheme. Schools can choose between the BBC, the 48K Spectrum, and the RML 480-Z.

So far the software, developed by the MEP at a cost of about £100,000, has gone to 27,000 primary schools. The package includes teacher training material, as well as language and mathematical programs.

Copies of the report prepared by a committee of the association are being sent to local education authority advisers and inspectors.

A spokesman for the MEP says if it proves necessary after discussions with the authors of the programs, new editions will be prepared.

A spokesman for the Inner London Education Authority educational computing centre comments: "The problems are those of any software package supplied free, although that is not to say teachers would do better with commercial software. Standards in educational software are uneven and teachers should look carefully at packages before they buy them."

A nod is as good as a win

A RECORD-BREAKING attempt to play computer games non-stop for 24 hours failed when 14-year-old Derek Creasey of Stockport fell asleep with 55 minutes to go.

The marathon was staged at the opening of the Electron and BBC Micro User show in London. "Creasey was still going strong after 20 hours," says organiser Mike Cowley, "but then started to develop a headache. When he fell asleep, we did not have the heart to wake him."

The attempt was intended to prove that playing computer games for long periods has no harmful medical effects. Creasey was monitored throughout his stint by a computer link with an electrocardiograph machine and checked regularly for disorientation and loss of concentration. "No obvious ill-effects were found," says Cowley, "apart from plain old-fashioned fatigue."

Although rugby-playing Creasey failed to reach his target, the 23 hour five minutes is still eligible for inclusion in the Guinness Book of Records, as no-one else has claimed the record for prolonged games playing.

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The great detective interrogation

CRIME and Detection Quiz is one of a recent series of quizzes from Acornsoft. Devised by crime writer Julian Symons, the quiz can be undertaken by one or two people or two competing teams, and a count-down facility enables you to play against the clock if you wish.

The program is loaded in two parts. The first gives you the main menu, with a choice of 15 sections; another 15 are offered on side two of the tape. The subjects about which you can choose to be interrogated range from general ones such as matching famous detectives to brief descriptions, to films of the books or specific authors like Agatha Christie or Raymond Chandler.

A good deal of information is packed into the single-screen summary of the subject which precedes the questions. Sensibly, the authors have avoided the necessity of building a database which would enable the computer to decide whether your answers are correct or not. You enter your solution and if it matches the correct answer supplied by the program, you award yourself one or two points, depending on how close you think your answer was.

The program will then keep track of how many points you have scored and tell you at the end how long you have taken to complete the quiz, a useful tie-breaker when more than one person is playing.

The questions are well judged to appeal to both the uninitiated, who are bound to find a few they can answer, and experts who have plenty to get their teeth into, and it is clear that much thought has gone into the program. The only disadvantage is the time it takes to load each quiz section. Any section close to the top of the list will load quickly but if you happen to be a Dashiell Hammett fan, you will have to wait for some time for your section, numbered 14 on the list. Working through the various sections chronologically, however, would eliminate excessive waiting.

Other quizzes in the series — history, theatre, music, royalty and science fiction — adopt the same format and have equally distinguished authors, such as Brian Aldis for the science fiction and John Julius Norwich for history. Judging by the high standard of **Crime and Detection Quiz,** the series should prove a success, even though at £12.95 the programs are expensive for the home buyer.

Crime and Detection Quiz is produced by Acornsoft, 4a Market Hill, Cambridge CB2 3NJ.

Invaders still to the fore

GALAXY WARS and City Defence are among several programs which Bug-Byte has released simultaneously in BBC B and Electron versions. Both will look distinctly familiar to anyone who has played Space Invaders.

Galaxy Wars has alien bombers attacking the player's base, with the player darting from side to side trying to avoid their missiles and shoot them from the sky. When one wave has been destroyed, a new wave arrives which weaves back and forth to add variety and make things a little more difficult.

The program is competently executed but the graphics look dated and the scoring is too laborious to provide real excitement.

City Defence is another variation on the same theme, with deadly missiles approaching your ground base. Your defence is conducted by means of rockets; you can have five in the air at a time, and some interest is added by the fact that the last to be released can be guided in pursuit of its target.

Galaxy Wars and City Defence are produced by Bug-Byte. Mulberry House, Canning Place, Liverpool L1 8JB. They cost £7.50 each.

Fast favourite

COMPUTER CONCEPTS does not score high marks either for the presentation of the cassette insert, a skimpy and easily-lost leaflet containing all the instructions, or the originality of **Android Attack.** Nevertheless, it is a fast and reasonably addictive version of an old favourite.

Closely modelled on Pacman, Android Attack features a maze where the object is to ward off attack by enemy androids while maintaining your energy level by eating dots or even more sustaining foods such as cherries.

Keeping ahead of the androds is not enough. To avoid being trapped, you may have to blast your way out of trouble by firing at the androids is not enough. To by turning to face them first. Another option is to lay mines and then explode them in the path of the enemy.

Quick wits and nimble fingers are needed to play the game, in which some fairly spectacular explosive effects add to the excitement. Android Attack is produced by Computer Concepts, 16 Wayside, Chipperfield, Herts WD4 9JJ. It costs £7.90.

Inter-galactic Eagle

INSTEAD of shooting at aliens or piloting a spacecraft through the skies, **Eagle** has you guiding an inter-galactic survey ship through the moons of the planet Thrug in a geological search for rare trace elements.

On each screen you start at the top and try to find your way through a passageway to a gap at the bottom, which leads to the next screen and a different landscape. You have only left and right controls, plus a thrust button, to avoid various hazards which will deplete your energy.

Fortunately each screen contains four iridium pods and picking them up will restore energy, although the risks of searching for them can sometimes outweigh the benefits. You score points for every screen you complete successfully and for every pod you pick up.

Although the graphics are not spectacular, they possess a touch of originality, and the floating movements, more like those of a parachute than any conventional computer spacecraft, provide an unusual challenge. Unless you are a very nimble-fingered player for whom the game seems easy, you will probably find Eagle an addictive if sometimes frustrating game.

Eagle is produced by Salamander Software, 17 Norfolk Road, Brighton, Sussex BN1 3AA and costs £7.95.

Lesson of helicopter crash

AN EDUCATIONAL program from the recently launched software house, Kerian (U.K.) Ltd is **Heli-Maths,** designed for children up to the age of 13.

The main menu gives five options — addition, subtraction, multiplication and division, plus a mixed section. For whichever section a child chooses, a sum appears at the top, while a series of answers is shown in a row of brick boxes at the bottom.

Using the cursor keys, the child guides a helicopter towards the chosen answer. The helicopter picks up the answer and deposits it beside the question. A correct answer is rewarded with a tick and a cheerful tune. An incorrect answer has the helicopter crashing to the ground, shaking the entire screen display.

Although the graphics are attractive and the idea of using a helicopter to winch numbers about the screen is appealing, the action is too slow to hold interest for long. One wonders, too, whether a child might not be tempted to choose incorrect answers rather than correct ones, since the helicopter crash is a more interesting response than the tick of approval.

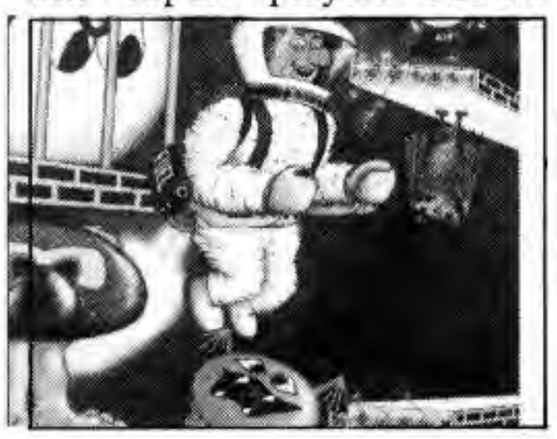
Kerian (U.K.) Ltd is at 29 Gisburn Road, Hessle, North Humberside HU13 9HZ. Heli-Maths costs £5.95.

Difficult balance in jet-powered journey

ABILITY to leap from ledge to ledge is a prime requirement for playing a new arcade game, **Jet Power Jack.**

The story is that Jack has been kidnapped and imprisoned in a large space garage. To escape he has to cross to the other side of the garage to collect some red fuel pods which will enable him to refuel his waiting starships. His task is complicated by the fact that his oxygen supply is limited to one minute for each trip, that various hostile space beasties are trying to prevent him succeeding, and that the fittings on the ceiling and also the edges of the platforms are live, causing Jack to plummet to his death at the slightest contact.

Jack is powered by a turbopack strapped to his back and piloting him across the garage entails achieving a difficult balance between the thrust of the turbopack and the left and right control keys. Mastering the movement takes a little practice but expert players should find the game addictive. The graphics are lively, with a variety of weird and wonderful creatures on the different screens. The way in which Jack's spectacular fall to the bottom of the garage is depicted, however, is definitely not for the squeamish.



Jet Power Jack is produced by Program Power, 8-8a Regent Street, Chapel Allerton, Leeds LS7 4PE. It costs £7.95.

Explosive battle

SUPERB GRAPHICS are the major asset of **3-D Bomb Alley** which is described as a simulation of an air-sea battle. Not everyone will like the inevitable associations with the Falklands war and the rendition of *Rule Britannia* can be irritating, especially when it is repeated at the start of every game. Other flaws are the lack of instructions on the cassette insert and the fact that it is impossible to return to the start of the game without re-loading the tape.

Further, 3-D Bomb Alley has little to offer in the way of a story-line; it is simply a case of lining-up your anti-aircraft gun sights and shooting at enemy aircraft in time to prevent them dropping their bombs on your ships. Your score will depend on how many ships you have remaining — the more you have the higher your score.

Simple though the game may be, and however unhealthy the impulses which make you want to indulge in such a warlike activity, it must be admitted that the screen display is extremely effective. The way the aircraft grow from tiny dots in the sky to recognisable aircraft and then zoom away overhead is particularly realistic, and the tension mounts as the number of aircraft increases, making the task of defending your ships even more difficult. There are some good explosive effects, too, even though the bombs do not land directly on the ships.

3-D Bomb Alley is produced by Software Invasion, 50 Elborough Street, Southfields, London SW18 5DN. It costs £7.95.

Mild action on ice

PERCY PENGUIN is one of a new range of games for the BBC B from Superior Software. A doubtful asset of the game is the skilful rendering of Bach's *Toccata and Fugue* in D minor which accompanies the action.

The story is that Percy the penguin is trapped in an ice maze populated by deadly Snobees. The only way he can survive is either to keep one step ahead of the creatures or to throw ice cubes at them to squash them. If Percy manages to eliminate the entire species, another breed of even deadlier creatures appears to threaten him.

Avoiding the Snobees is difficult at first but the speed and excitement of the game are not such as to lift the standard maze-type scenario out of the ordinary. The graphics are smooth and colourful, although the Snobees look more like fluffy chicks than deadly enemies.

Mastering the art of manoeuvring Percy while at the same time pecking through ice cubes or propelling them towards his pursuers can offer some satisfaction to arcade fans who like fairly mild action.

Percy Penguin is produced by Superior Software, Regent House, Skinner Lane, Leeds LS7 1AX. It costs £7.95.

BBC B TOP TEN

Position	Title	Company
1	Great Britain	Simon Hessel
2	Cylon Attack	A & F Software
3	Snowball	Level 9 Computing
4	Snooker	Acornsoft
5	Killer Gorilla	Program Power
6	Rocket Raid	Acornsoft
7	Planetoids	Acornsoft
8	Hunchback	Superior Software
9	747 Simulator	Dr Soft
10	Carousel	Acornsoft

Figures supplied by W H Smith

Time the key to adventure

ADVENTURE games are a speciality of Level 9 Computing and **Lords of Time** for the BBC B is an excellent example of what the company can achieve. The player's mission in the complex saga is to travel through time collecting nine objects which will prevent the evil time-lords bending the course of history to their will.

To succeed in your quest, you have to locate Father Time who will give you the necessary instrucions. As there are nine time zones, entered via the clock, the search can take a long time. The authors recommend tackling the time zones in chronological order, beginning with the prehistoric era when an encounter with a mammoth or allosaurus might prove educational.

Level 9 Computing has compressed a large amount of data into the program, which includes more than 200 realistically-described locations and about 80 objects. The computer understands elaborate commands of three or four words, as well as helpful ones like TAKE EVERYTHING or phrases using IT when referring to an object mentioned previously.

The company offers buyers of the game a free clue but you are unlikely to solve the adventure without contributing a good deal of patience and perseverance.

Level 9 Computing is at 229 Hughenden Road, High Wycombe, Bucks. Lords of Time costs £9.90.

Dangerous ramparts a popular formula

SUPERIOR SOFTWARE appears to have found the right formula for success with **Hunchback,** which is proving to be one of the most popular games available for the BBC.

The action takes place on the ramparts of a mediaeval castle and the object is to rescue Esmeralda who is being held captive in one of the towers. Each section of the walls presents its hazards and when one section has been negotiated safely it scrolls on to the next.

Our hero, who looks more like an amiable country bumpkin than any knight in shining armour, has to jump over cannonballs, duck arrows, swing on ropes and leap over the spears of guards to reach the grateful prisoner. One some screens, he faces combinations of all those dangers.

Except for the somewhat jerky scroll from one screen to another, the graphics and animation of Hunchback are extremely effective and appealing. While some sections of the game are easy enough for the most clumsy player, others demand advanced keyboard skills.

A great advantage is that you can choose not only at what skill level, or rather speed, you want to play, but at which section of the wall you want to start, so that if, like some of us, you have difficulty swinging across a chasm on a rope, you can miss that portion and go to the next. That eliminates the frustration encountered in so many computer games of having to start from the beginning every time you fail to clear any particular obstacle.

Hunchback is available from Superior Software, Regent House, Skinner Lane, Leeds LS1 2SP and costs £7.90.

Spooks are a challenge

GHOULS from Program Power is set in a deadly haunted mansion where the player is trying to rescue some power jewels, whatever they may be.

Ghosts, which bear down slowly on you and squash you flat are but one of the many dangers awaiting you. There are also cracks which appear suddenly in the floorboards, poisonous spikes, and an evil spider which bobs up and down. Consuming the yellow titbits scattered about the mansion earns extra points.

Some of the details of the scenario may be different but otherwise **Ghouls** is similar to a number of other BBC games in that it involves jumping over obstacles and leaping from one level or platform of the game to the next. The ultimate aim is to reach the top of the screen before your time expires and from there go on to new and even more spooky screens.

Inexperienced players may find difficulty in surviving — even with four lives initially — let alone reaching the top in time, but the nimble-fingered will probably enjoy the challenges presented by the game.

The graphics are competent and sound effects include a soothing spot of Bach during the loading.

Ghouls is produced by Program Power, 8-8a Regent Street, Chapel Allerton, Leeds and costs £7.95.

Heist grabs the player

SOFTSPOT is relying on an old and well-tried formula in **Heist** for the BBC B but that is unlikely to detract from the popularity of the game.

On a Donkey Kong-style construction of ladders and platforms, a bank manager is attempting to gather bags of money scattered about the bank and store them away safely in the vault.

Four burglars have broken into the bank and are pursuing the manager to take the bags from him. As if that alone did not cause sufficient problems, the burglars occasionally plant time bombs which the bank manager must hurry to defuse before they blow the bank sky-high.

The manager can defend himself against the burglars by means of two hammers but they cannot be carried up the ladders. There is some good news, however, in the form of cups of tea which appear at random on the screen to give the player extra points if they are reached within 10 seconds.

Although scarcely an original game, Heist is entertaining enough, with plenty of action to keep you scurrying up and down ladders and along the different levels. If you complete the first screen, there is another more difficult one to continue to test the reflexes. The graphics are appealing, with the bank manager's demise shown as a flight to heaven on angel's wings.

Heist is produced by Softspot, 29 South Crescent, Prittlewell, Southend, Essex SS2 6TB. It costs £7.95.

Newcomers the target in shooting games

Nicole Segre surveys software for the Electron

DELAYS in delivery of the Electron, or perhaps the lack of serious competition at such an early stage in the life of the machine, appear to have led software houses to minimise their investment in Electron games and abandon any attempt at originality. Many of the games available seem to be aimed at the complete newcomer to computers who has never had a chance to make comparisons with the software available for other machines.

No doubt that mistake will soon be rectified and in the meantime any new software, much of it competent if not inspired, will be welcomed gratefully by Electron owners.

Wave upon wave of unwanted visitors of one kind or another are a recurring theme of the games on the market. In **Kamakazi** — such is the unusual spelling on the cassette cover — from A & F Software, the threat is from successive squadrons of enemy aircraft which are attacking the player's base. The aim of this straightforward shoot-out game on Space Invader lines is to move up the ranks listed on the score table, from novice through to leader right up to superman, by displaying prowess at zapping the enemy from the sky.

The concept is by now all too familiar, giving the game a decidedly dated air, and the graphics lack the sophistication which might have dragged it into the present, if not the future. The action is fast, however, and anyone who enjoys testing reflexes against invading hordes will probably find Kamakazi a satisfactory way of doing so.

A more interesting game for the Electron from the same company is **Cylon Attack,** based on an earlier version released early last year for the BBC micro. Cylon Attack features a space battle in which the player is a pilot on board an earth supply ship travelling to a distant planet. The Cylons are trying to prevent the mission succeeding and the player must try to line them up in the spaceship sights and zap them before they have time to release their deadly missiles.

The screen display shows the pilot's cockpit and the view from his windscreen. At the top is a long-range radar screen revealing the whereabouts of Cylons which are out of the pilot's view. When Cylons are framed in the pilot's sights, the cross at the centre increases in size to indicate that there is a good chance of a direct hit.

Fast reactions are needed to shoot at precisely the right moment and forestall enemy fire. Each time the spaceship is hit the number of its shields decreases and regular trips to the mothership are needed to prevent it running out of fuel.

The 3-D graphics and the sound effects of this lively game achieve some striking results and most arcade games fans would probably need no encouragement to play it for long periods. To make sure, however, A & F Software has incorporated a high-score competition, with the facility to save the high score table on cassette and send it as a competition entry.

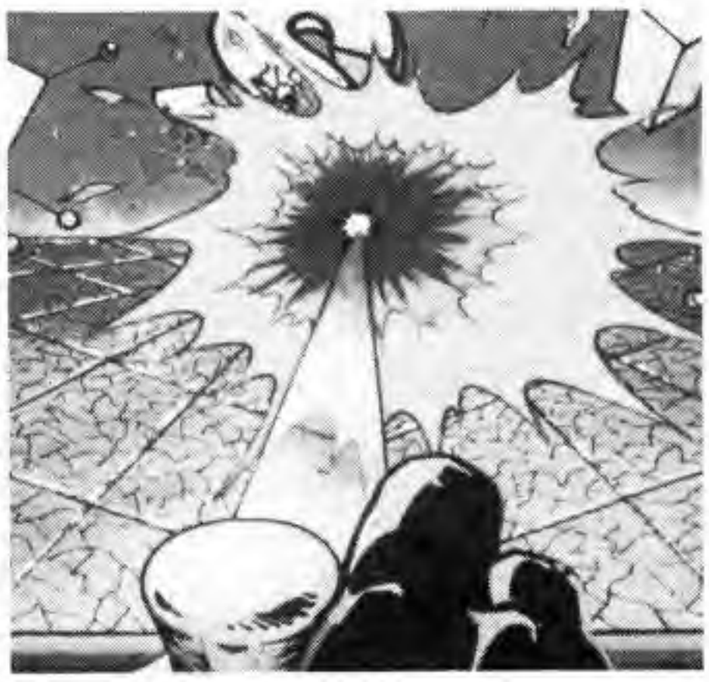
A & F Software is at Unit 8, Canal Side Industrial Estate, Woodbine Street East, Rochdale, Lancs OL16 5LB. Kamakazi and Cylon Attack cost £7.90 each.

The fact that the line of fire in **Jungle Jive,** produced for the BBC and Electron by Virgin Games, is directed against animals will probably not endear it to many people. The two-sided tape for the BBC B and the Electron has the player as explorer strolling through the jungle, with various beasts such as elephants and crocodiles closing in on either side.

The explorer moves on a central axis up and down the screen and pressing the left and right keys causes him to fire in the appropriate direction. The player's task is complicated by the fact that bullets which do not hit target are liable to ricochet from the sides of the screen and kill the explorer, as well as by a slithering snake which makes random appearances in the explorer's path. Clearing one screen leads to another where the action is faster and more dangerous.

Jungle Jive is well-presented and lively but in spite of an unusual setting, is simply a variation on a well-tried shoot-out theme.

The same goes for **Bugs,** another Virgin Games offering, this time for the Electron only. The targets are a variety of bugs which for some reason have invaded your garden and which you



must fight off with your fast-firing spray. A slow-moving snail adds to your difficulties by leaving a trail which prevents you killing your spider and scorpion enemies — this is obviously no English garden.

Jungle Jive and Bugs are produced by Virgin Games, 61-63 Portobello Road, London W11 3DD. They cost £7.95 each.

In **Alien Dropout,** from Superior Software, the pests to be eliminated are — you will never guess — killer moths bent on destroying the earth. The moths fall in sequence into a row of boxes overhead and as soon as one box is full a moth is released which will attempt to destroy your laser. Shooting from the ground, your aim is to destroy the moths before they fill their boxes and wreak havoc to your defences.

Although little more than yet another thinly disguised version of Space Invaders, Alien Dropout provides shoot-out fans with some fast, lively action and

'The concept is by now all too familiar, giving the game a dated air, and the graphics lack sophistication'

attractive graphics. Bonus laser bases at 10,000 and 20,000 points offer an additional incentive to continue playing.

Fruit Machine, again from Superior Software, is even less likely to win prizes for originality than Alien Dropout. Modelled faithfully on the pub game, it is introduced by a score table, followed by detailed instructions on how to play. As on real machines, you can spin, collect your winnings — if any — or gamble and you can also nudge or hold individual reels.

The game is reasonably realistic and certainly attractive to look at but any attempt to reproduce the thrills of gambling on a computer is bound to be a disappointment. This version of Fruit Machine is at a particular disadvantage as it is relatively slow and winning spins occur infrequently.

Superior Software has also produced two educational programs for the Electron which differ in appeal. **World Geography,** a straightforward quiz program intended to help students memorise capital cities and population figures for a wide range of countries, does an excellent job of what it sets out to do. A clearly-drawn map of the world occupies the top half of the screen and with each new question a flashing point indicates the location of the country being discussed.

At the start you can choose the category of countries on which you would like to be tested, from easy places such as Germany, the Netherlands, and Japan, to more obscure ones like Mauritius, Samoa and Kiribati — an island in

the Pacific, in case you didn't know. Eight categories give the quiz ample scope.

World Geography supplies the correct answer whenever an incorrect one is given and generally manages to combine entertainment with enlightenment. The only disadvantage is the somewhat slow transition from one question to another.

Constellation allows you to view the stars and planets from any vantage point and at any time you choose. All you need to do is enter the latitude and longitude of the location — several points around the world are given as examples — then the date, the time to the nearest minute, and the elevation of the telescope. The screen then displays a picture of the sky as it would appear according to the facts entered.

Without being an astronomer, it is difficult to judge how accurate the sky charts are. Assuming that they are, Constellation is no doubt a useful reference and teaching aid but it is a pity that no explanation is provided, either on screen or on the cassette insert, which would help the uninitiated to use and learn from the program. Stars and constellations are not named and there is no easy route back from one screen to the menu should you want to look at another screen.

Superior Software is at Regent House, Skinner Lane, Leeds. Alien Dropout, Fruit Machine, World Geography and Constellation each cost £7.95.

The humour in **Bed Bugs,** from Optima Software, may not be to everyone's liking but the game at least shows a promising touch of individuality. The less-than-enticing storyline has the player tucked in bed and falling prey to a swarm of fleas.

If the fleas are squashed successfully, they are followed by bed bugs, from which one bite is sufficient to end the game.

You have a choice of weapons with which to defend yourself — a set of dentures to bite back at the fleas; a jam sandwich which is most effective for swatting bed bugs but leaves undesirable stains on the covers; a sponge for wiping away jam stains; and a telephone to summon help.

'The action is fast even though the bugs prove difficult to swat'

The graphics and sound in Bed Bugs are lively without being highly sophisticated and the action is reasonably fast, even though the bugs, realistically enough, prove difficult to swat.

Optima Software is at 36 St Petersgate, Stockport SK1 1HL and the game costs £6.95.

Flying high on the wings of a Spitfire simulator

Nicole Segre talks to Geoffrey Crammond, author of Aviator

AVIATOR, launched with a great fanfare by Acornsoft in March, promises to be the high flier in the company's growing squadron of programs for the BBC. Billed as the world's first Spitfire flight simulator for a home computer, **Aviator** reproduces faithfully every aspect of the flight of the famous world war two aircraft, down to the screech of brakes on the tarmac and the slow response of the control column at low air speeds.

The author of Aviator, 30-year-old Geoffrey Crammond, knew nothing about Spitfires until he started writing the program and became involved with the BBC micro almost against his will.

A systems engineer with Marconi, Crammond counts electronics, especially allied to music and graphics, among his hobbies. "In 1981," he says, "I was toying with the idea of building a simulator in my spare time. Looking at the chips and hardware available at the time, I was thinking of buying a home computer to cannibalise it. Then I realised that most were as good off the shelf as anything I could build."

Crammond first set eyes on a BBC micro at a trade fair in August, 1981 and was so impressed with it that he sent an order next morning. It took six months for the machine to be delivered and during that time curiosity lured Crammond into an amusement arcade. He also began reading home computer magazines, whose small advertisements convinced him that there was a promising future in games software for home computers, all of which led to the idea for his first game, **Super Invaders.**

"I thought I would choose a well-known game for my first attempt," he says, "and Space Invaders seemed the obvious choice."

When the micro finally arrived in March, 1983, Crammond had to go back to basics, or rather assembler language. From his work with Marconi he was familiar with high-level Fortran but did not know Basic or machine code.

"It took me two months to learn to handle the machine and find how to move things round on the screen," Crammond recalls. It then took him another four months to write Super Invaders, which he sent to Acornsoft out of the blue in the hope that the company would like and publish it.

"Luckily, I had written the game in mode 1, a more laborious process than using mode 7, but much better in terms of resolution and smoothness. Acornsoft already had a space invaders game written in mode 7 but accepted mine instead, with only a few minor modifications."

Slightly more forward planning went into the creation of Aviator. Crammond discussed his idea for a flight simulator with Acornsoft and a decision was made to base the program on the Spitfire rather than a modern passenger aircraft. "We chose the Spitfire because it is one of the most interesting aircraft to fly," says David Johnson-Davies, managing director of Acornsoft. "You can also perform stunts and aerobatics on it, unlike a DC10."

Crammond knew there were other flight simulators on the market but decided not to look at them so that he would remain free from other people's influences. "Sometimes, just because someone has solved a problem in a certain way, you think that that is the only way to do it," he says. "I prefer to keep an open mind and try to find my own solutions."

> "Sometimes, just because someone has solved a problem in a certain way, you think that is the only way to do it"

Thus untrammelled by other people's concepts, Crammond researched and wrote the Aviator program single-handed, a mammoth task which took him nine months. Still employed at Marconi, he devoted every free evening, weekend and holiday to the program. "I was stuck occasionally," he recalls, "but I would just go to the library or talk to people to try to sort it out."

Much of the time Crammond spent on Aviator was devoted to research. Although during his first term at Bristol University he studied aeronautics, after that he switched to physics, the subject in which he eventually obtained his degree. For the program, he needed to know about the first principles of aerodynamics, as well as about aircraft instruments and the Spitfire.

Fortunately, he knew someone who had a wartime set of pilot's notes, the equivalent of a manual explaining to pilots the workings of the aircraft, an invaluable addition to the many other volumes he studied.

Crammond decided early to sacrifice colour to devote the full resources of the BBC micro to smooth, flicker-free graphics. "It was a compromise," he says, "one of the many you always have to make when writing a program."

For the same reason, the buildings and bridges over which the Spitfire flies in Aviator are drawn in simple line graphics. "Fitting in a database for the map of the terrain over which the Spitfire flies, the equations for its flight performance, as well as operational dashboard controls and 3-D graphics, stretched the machine to the full," says Crammond.

It is too early to tell whether Aviator will achieve the success Acornsoft is expecting for it but one man at least can vouch for the realism and authenticity of the program. He is Air Vice-marshal Sandy Johnstone who, standing beneath a Spitfire at the Royal Air Force Museum at Hendon, demonstrated what Aviator could do on the occasion of its press launch. Johnstone first flew a Spitfire in March, 1939 and went on to command a wing of Spitfires during the siege of Malta in 1942.

"The Spitfire was a most remarkable aircraft," Johnston says. "The first time

I flew one was an experience rather similar to falling in love. Aviator certainly brings back the memories, right down to the sweaty palms. It even reproduces the bumpy take-off — we used to call it a 'whoopsy' take-off — which was so typical of the aircraft."

Acornsoft released Aviator primarily as a game but maintains that it also has educational value. The program is accompanied by a booklet which explains the aircraft control surfaces, the aerodynamic forces it would encounter, the instrument panels, some principles of navigation and piloting, and more. "Aviator has serious applications," says Johnson-Davies, "either in the classroom or for the flying instructor demonstrating the basics of small aircraft aviation."

Besides the booklet there is a map showing the terrain over which the simulator pilot is flying. Landmarks such as a lake, a bridge, and the town of Acornsville can be seen through the windscreen and appear on an even keel so long as you keep the aircraft under control. Otherwise they rush towards you, or tip dramatically sideways in a terrifying way.

For most people, piloting the aircraft successfully from 'whoopsy' take-off to landing is sufficient challenge but those with a real taste for bravado can also try to notch a score by flying through the streets of Acornsville or diving under the bridge. Extra points are awarded for performing the same feats upside down — even though Johnstone declined to attempt them.

Finally, if stunts should pall, there is a game called the **Theme** which involves saving the inhabitants of Acornsville from aliens who threaten to devour all the surrounding crops, sprout tentacles and take to the air to devastate the town.

Crammond attributes his fascination with aeroplanes to a time when during a school holiday he helped his father's building firm install partitions at a Rolls-Royce factory where Concorde parts were being built. "There it was in the next hangar," he says. "It was very exciting."

As for the art of writing such a complex program as Aviator, Crammond believes that the main requirements are confidence and determination. "You have to start with the idea that you will do it, not let us see if it can be done. You may not know how it will work out but you know that it will be done. That way, every hour you spend on a program, even if it is an hour where you are going back over something you have already done, will seem constructive and well-spent."

Born and raised in Somerset, Crammond now lives with his wife at Watford. Since completing Aviator, he has decided to leave his job with Marconi and devote himself full-time to programming. He has started work on one new game, about which he will say no more than it is "made-up" rather than based on any other game, or indeed aircraft. Yet another game is in the pipeline but he will reveal even less about that.

Leaving his job with Marconi will mean sacrificing security for the uncertainties of a freelance existence but Crammond has no real fears about the future. With the experience of Super Invaders and Aviator behind him, he is confident of his ability to write good software. "Besides," he says, "even if no-one knows how long the games market will last, something else is bound to replace it."

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Common complaints

Jeremy Richards starts a regular advice column by answering some of your most frequently asked questions

WE RECEIVE many queries on various aspects of the BBC and Electron machines and to help you fathom the depths of your Acorn machine there will be a regular letters page starting from the next issue. So do not hesitate to write and we will try to help.

To start you on the right track, I deal with some of the most common and most frequently asked questions. Surely the most common problem posed concerns programs which will not load or cannot be saved. It is an all-too-frequent comment that the computer is faulty. Ninety-nine percent of all difficulties in that area prove to be a cassette recorder problem rather than one with the computer. If you are experiencing problems with LOADing or SAVEing programs, use the following checklist to determine the likely fault before rushing to your dealer suggesting a machine is faulty. You could save yourself a good deal of time:

- Load both sides of the tape — a good manufacturer will supply a back-up copy.
- Try loading another piece of software, preferably from another manufacturer.
- If you get a loading error message at the same point every time, i.e., Block 05, there is almost certainly a corruption on tape.
- If one of the cassettes loads, you have two options — the cassette you have is corrupted or badly recorded or your tape recorder is at fault.

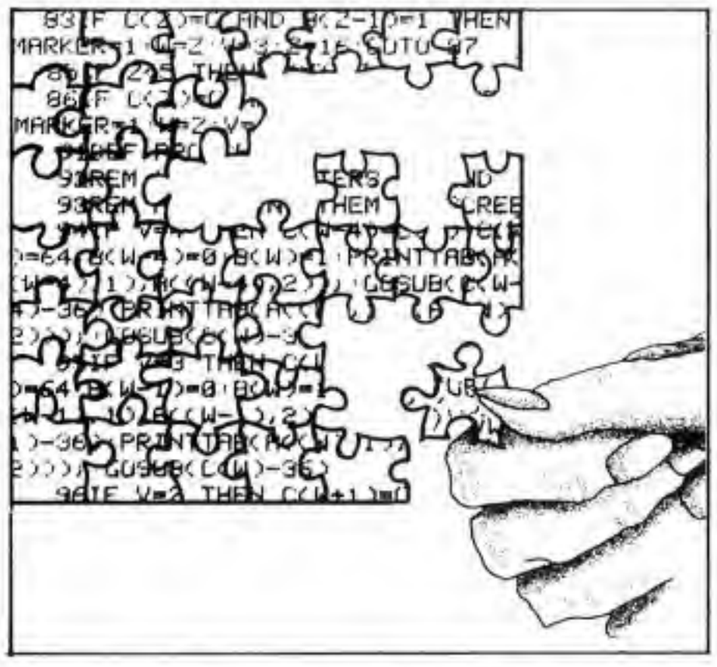
In most cases it is the tape recorder. Cassette recordings vary in quality and therefore a certain amount of variation occurs between software from different manufacturers. That is due to the equipment and quality of tape used. If your recorder has both volume and tone-pitch controls, try loading the tape at different levels until you are successful. Failing that, try to borrow a recorder from a friend to load the program. If it loads, your recorder is at fault.

- SAVE your program at different volume and tone levels and then try to LOAD.
- Don't be fooled by the fact that you can load commercial programs but are not able to save your own. That is not a fault with the computer but again a tape recorder problem. The comments about recording variations apply equally. In general, the most frequent difficulties occur with recorders which do not have both volume and tone controls but there are recorders which have pre-set levels and they work just as well.

Remember that tape recorders are delicate instruments and should be well-maintained. Clean the cassette recording heads regularly. Also check that your cassette lead is not broken.

Other points to look for include the addition of extra ROMs which might affect the running of some software. For BBC owners, check also that the tape is suitable for your machine — i.e., Model A, Model B, operating system.

The last point leads me to the next major source of confusion—which BBC have I? That is not as daft a question as it might seem. Since the BBC was introduced, there have been modifications to the system and the changes still perplex people. If you are now buying a BBC or have had one for a few months, the following probably will not apply, though it is useful to understand the differences.



If you buy a BBC computer today, it will be a Model B, Operating System 1.2 and Basic 2. What on earth does all that mean?

Originally the BBC was launched in two separate models, A and B. Model A was a cut-down version of the B and had only half the memory — 16K. Also lacking were the peripheral ports enabling one to link the BBC to printers, joysticks, modems and disc drives. Model A was designed so that it could be upgraded to a full Model B specification or in part to the specific needs of the user. That has meant there are BBCs which are neither A nor B.

Since last autumn, production of the Model A has ceased and only Model B has been manufactured. So far so good. The areas which have caused most confusion have been the operating systems and Basic 2. First, the OS. The original operating system of the BBC was OS 0.1 and its major disadvantage was a random fault preventing correct recording of the first block of saved information. OS 0.1 would not support paged ROMs; in other words the user could not use the sideways ROM sockets for extra utilities like word processors. Those bugs were cleared in the series 1 OS and it includes enhancement of the FX calls. There are very few machines around with the 0.1 OS and most original owners have upgraded their BBCs to the 1.2.

If you have bought a BBC second-hand and want to check what operating system it is, type 'FXO' RETURN and the machine will inform you of the OS number. Similarly you can determine the version of Basic by typing 'REPORT' and RETURN when the machine is first turned on. If the message is dated 1981 it is Basic 1 and if dated 1982, Basic 2.

To the majority of users the differences between the two versions will not be noticeable. Basic 2 is probably of major use to the programmer in assembler language, as four new operations have been added. Besides those changes minor corrections and improvements have been made to arithmetic functions for greater precision and to a few Basic keywords. The main changes for Basic programmers to note is the addition of two new commands, OPENUP and OSCLI.

OPENUP gives the same result as using OPENIN on Basic 1 but the meaning of OPENIN has changed in Basic 2. In Basic 1, it was not possible to open a file for read-only operations. That is now possible in Basic 2 using OPENIN. If that is not clear, refer to the user guide for explanation of file handling.

The other new keyword is OSCLI. It is a very useful command enabling the user to take a string expression and create an operating system command.

How close a relative to the BBC is the Electron? If you are one of the people

Continued on page 16

Continued from page 15

who own an Electron you have probably been asking yourself, and your dealer, what BBC programs will run on your machine. First, let us look at the difference between the two computers.

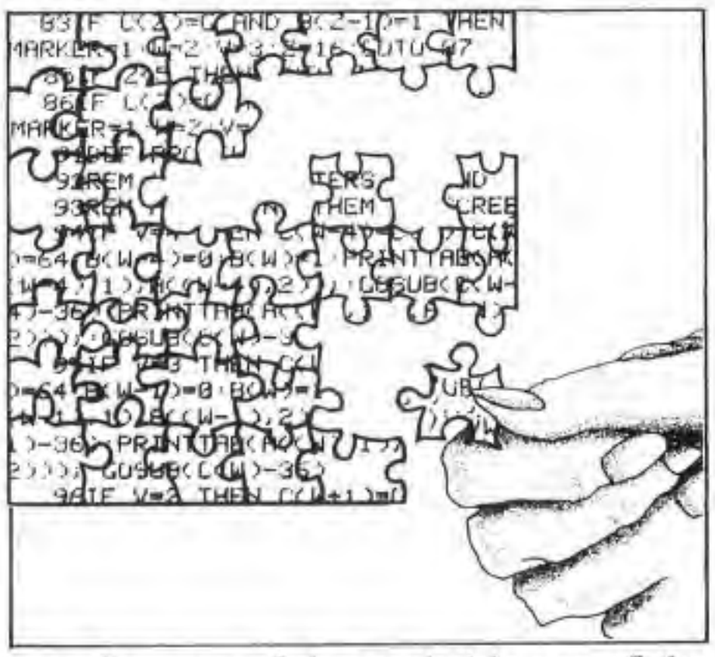
The Electron is a cut-down version of the BBC, not merely in size but in its overall power. It has the same memory as the BBC B but lacks the peripheral ports. That has been catered for by an edge connector board at the rear which will attach to an expansion unit soon to be released by Acorn.

The language is BBC Basic 2 and is virtually the same. The difference is noticeable in the ENVELOPE command for SOUND, where only eight out of the 14 parameters are present. The printed circuit board is not the same and there is the noticeable absence of the 6845 CRTC and the 6522 VIA which enable the sideways scrolling and hardware timing for games such as Planetoid.

The functions of those chips are contained in the ULA but the versatility of programming those functions is not fully present. The Electron is slower than its BBC counterpart and that is one reason for re-writing programs. The other is Mode 7 or, to be more exact, the lack of Mode 7.

The Electron has all the screen display modes of the BBC except Mode 7. The Electron will default automatically to Mode 6 if it encounters a Mode 7 statement but that can still cause some very funny-looking displays. The following are points to consider when using a BBC program on the Electron.

As a general rule of thumb, most arcade games will not run on the Elec-



tron because of the probable use of the 6522 and 6845 in programming and the speed difference between the two machines. As those games are usually protected, it is unlikely you will be able to list and change a program. It is best to contact your dealer or the manufacturer and ask if an Electron version is being written.

Converting programs written on a BBC, say by a friend or at school, is a relatively easy task. The thing to look for is the use of *FX calls and Mode 7. The Electron will accept *FX calls it cannot implement like *TV commands but will do nothing with the command. I mentioned that there is a difference in speed between the two machines. To increase the speed on the Electron, try taking out or reducing any time delay loops if present on the BBC version; there are sometimes 'FOR—NEXT' loops or 'X=INKEY(40)' statements in a BBC program to slow the running of the program.

Mode 7 is the other major headache. Often the Mode 7 screen is used for presenting instructions or text and advantage is taken of using double-height characters by implementing a 'CHR$141' statement. The best thing to do is either to remove the CHR$ statements from the PRINT line or to re-write the text section in Mode 6.

In the next few issues I will look at ways of making your Acorn machine work for you, methods of programming and utilities for use in your programs. Keep the letters rolling, whatever the software problem, or even if you just want to pass on your tips to other readers.

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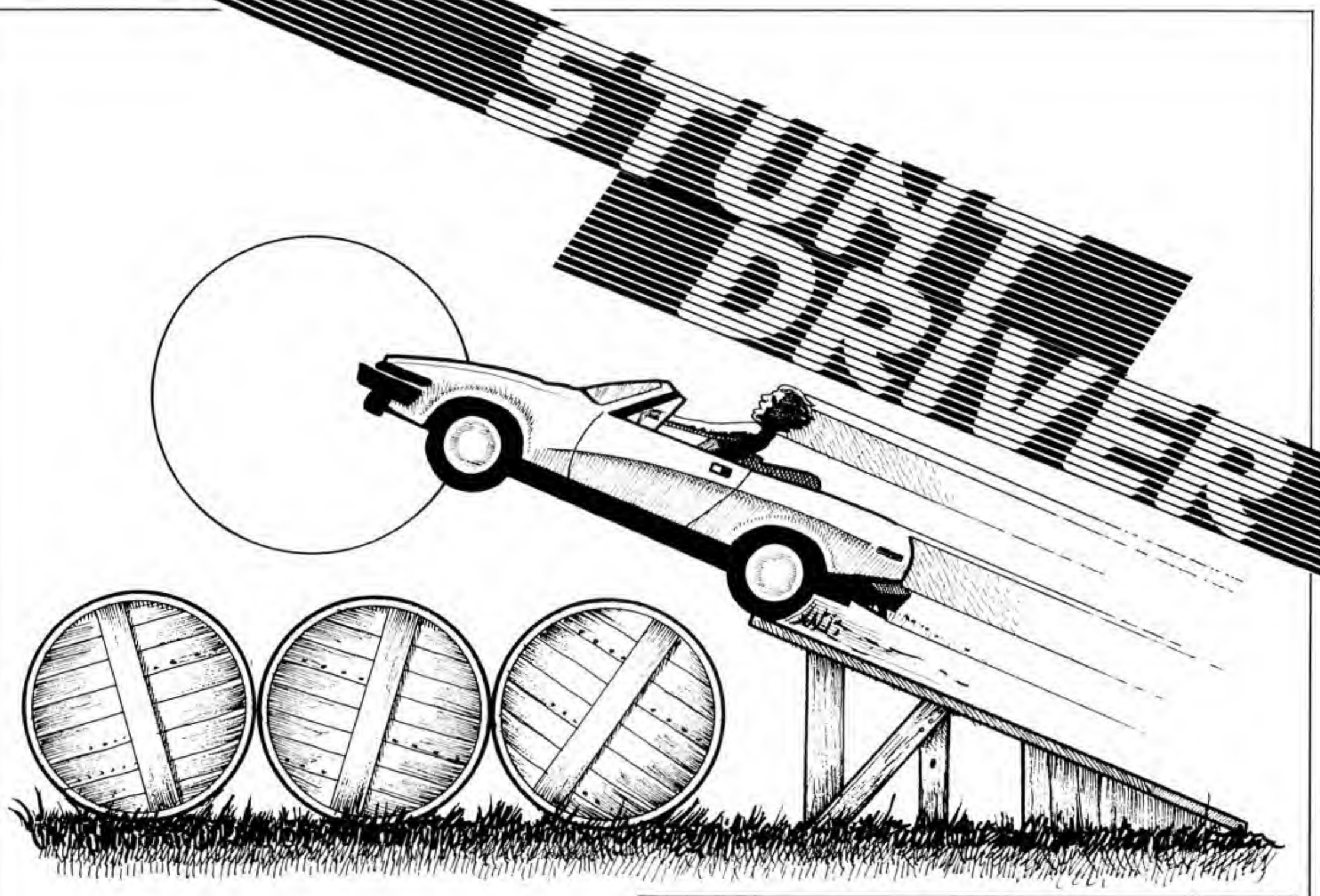


PICTURE YOURSELF as Evil Knievel in this program by Gary Woolridge, of Handsworth, Birmingham. Using SHIFT to accelerate and RETURN to jump, your aim is to race your stunt car along the ramps and over the barrels. After every successful jump another barrel is added to the row.

You have three lives and each barrel you clear without crashing is worth 10 points. **Stunt Driver** will run on the BBC B or the Electron.

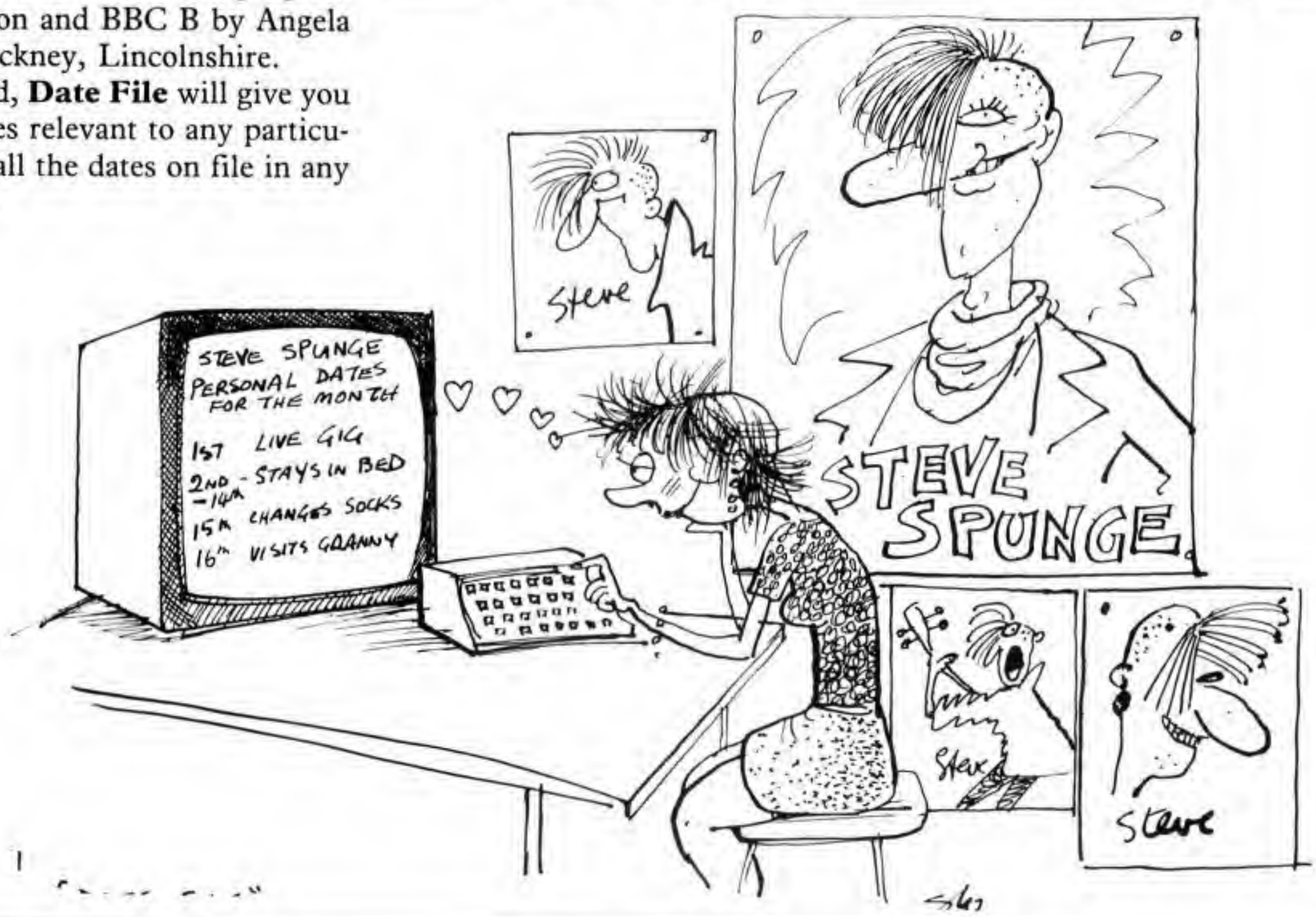
```
  232REM =-------------------------
-----=
 1010REM =        STUNT DRIVER
      =
 1020REM =       Gary Woolridge.
      =
 1030REM =-------------------------
-----=
 1040
 1050PROCinitialize
 1060
 1070REPEAT
 1080 REPEAT
 1090  MODE 2
 1100  PROCvars
 1110  PROCscreen
 1120  PROCscore
 1130  REPEAT
 1140   PROCkeys
 1150   IF S%<>0 OR J%  : PROCmo
vecar
 1160   IF P%>0 OR Q%>0 : dead=T
RUE
 1170  UNTIL end OR dead
 1180  IF dead: lives%=lives%-1
 1190  IF end : score%=score%+10
*nbars% : nbars%=nbars%+1 : SOUN
D 1,1,100,30
 1200  IF score%>99990 : score%=
0
 1210 UNTIL nbars%=13 OR lives%=
0
 1220 nbars%=1
 1230 uu%=uu%+200
 1240 IF uu%>700 : uu%=300
 1250UNTIL lives%=0
 1260PROCnewgame
 1270MODE 7
 1280END
 1290
 1300
 1310DEF PROCkeys
 1320K%=-1
 1330IF INKEY(-1)    : K%=1
 1340S%=S%+K%
 1350IF S%>48 : S%=48
 1360IF S%<0  : S%=0
 1370IF J%    : ENDPROC
 1380IF INKEY(-74)   : J%=TRUE
 1390IF J% AND Z%=0 : H%=4
 1400ENDPROC
```

```
 1410
 1420
 1430DEF PROCmovecar
 1440end=FALSE : dead=FALSE
 1450GCOL 3,7
 1460*FX 19
 1470MOVE X%,Y%+Z% : VDU 128,129
 1480X%=X%+S%       : Z%=Z%+H%
 1490P%=POINT(X%+128,Y%-16+Z%)
 1500Q%=POINT(X%,Y%+Z%-24)
 1510IF P%>0 OR Q%>0:PROCcrash:E
NDPROC
 1520IF Z%>64    : H%=-4
 1530IF Z%=0     : H%=0 : J%=0
 1540IF X%>1152 : Y%=Y%-200 : X%
=0
 1550IF Y%<300  : end=TRUE
 1560MOVE X%,Y%+Z% :VDU 128,129
 1570ENDPROC
 1580
 1590
 1600DEF PROCcrash
 1610SOUND 0,2,100,50
 1620MOVE X%+32,Y%
 1630GCOL 1,9 : VDU 135,8
 1640GCOL 1,12: VDU 136
 1650TIME=0
 1660REPEAT UNTIL TIME>200
 1670ENDPROC
 1680
 1690
 1700DEF PROCscore
 1710LOCAL X
 1720X=5-LEN(STR$(score%))
 1730VDU 4,23,1,0;0;0;0; : COLOU
R 6
 1740PRINT TAB(X,28);score%
 1750PRINT TAB(8,28);nbars%
 1760PRINT TAB(15,28);lives%
 1770VDU 5
 1780ENDPROC
 1790
 1800
 1810DEF PROCscreen
 1820GCOL 0,2
 1830FOR O%=868 TO 268 STEP -200
 1840 FOR I%=0 TO 16 STEP 4
 1850  PLOT 77,0,O%-I%
 1860 NEXT
 1870NEXT
 1880GCOL 0,4 : MOVE 128,uu%
 1890VDU 5,131,132 : GCOL 0,3
 1900FOR B%=1 TO nbars%
 1910 VDU 130
 1920NEXT
 1930GCOL 0,4 : VDU 133,134 : GC
OL 0,7
 1940MOVE X%,Y% : VDU 128,129,4
 1950PRINT TAB(0,26) "SCORE" TAB
(6) "BARRELS" TAB(14) "CARS"
 1960COLOUR 6: PRINT TAB(0,28);"
00000"
 1970ENDPROC
 1980
 1990
 2000DEF PROCnewgame
 2010VDU 4,23,1,0;0;0;0;
 2020CLS : COLOUR 3
 2030PRINT'''"SCORE :";score%
 2040PRINT'''"New Game (Y/N) :";
 2050*FX 15,0
 2060REPEAT
 2070A$=CHR$(GET AND 223)
 2080UNTIL A$="Y" OR A$="N"
 2090IF A$="Y" THEN RUN
 2100ENDPROC
 2110
 2120
 2130DEF PROCvars
 2140V%=0 : S%=0  : Z%=0 : J%=0
: H%=0
 2150X%=0 : Y%=900: P%=0 : Q%=0
: K%=0
 2160end=FALSE    : dead=FALSE
 2170ENDPROC
 2180
 2190
 2200DEF PROCinitialize
 2210@%=1
 2220score%=0 : lives%=3 : nbars
%=1
 2230uu%=300
 2240*FX 4,1
 2250*FX 16,0
 2260*FX 229,1
 2270VDU 23,128,0,31,60,60,127,5
6,40,56
 2280VDU 23,129,0,192,112,60,254
,28,20,28
 2290VDU 23,130,126,129,153,165,
165,153,129,126
 2300VDU 23,131,0,0,0,0,3,15,63,
255
 2310VDU 23,132,0,12,60,252,252,
252,252,252
 2320VDU 23,133,0,48,60,63,63,63
,63,63
 2330VDU 23,134,0,0,0,0,192,240,
252,255
 2340VDU 23,135,24,40,68,171,165
,90,60,255
 2350VDU 23,136,0,18,36,0,74,36,
0,0
 2360ENVELOPE 1,5,0,0,0,0,0,0,12
6,-10,-5,-1,126,126
 2370ENVELOPE 2,3,2,4,2,2,-2,2,1
26,-10,-5,-1,126,126
 2380ENDPROC
```

DATE FILE

YOU CAN keep important dates such as birthdays and anniversaries on this useful file program for the Electron and BBC B by Angela Grebby of Stickney, Lincolnshire.

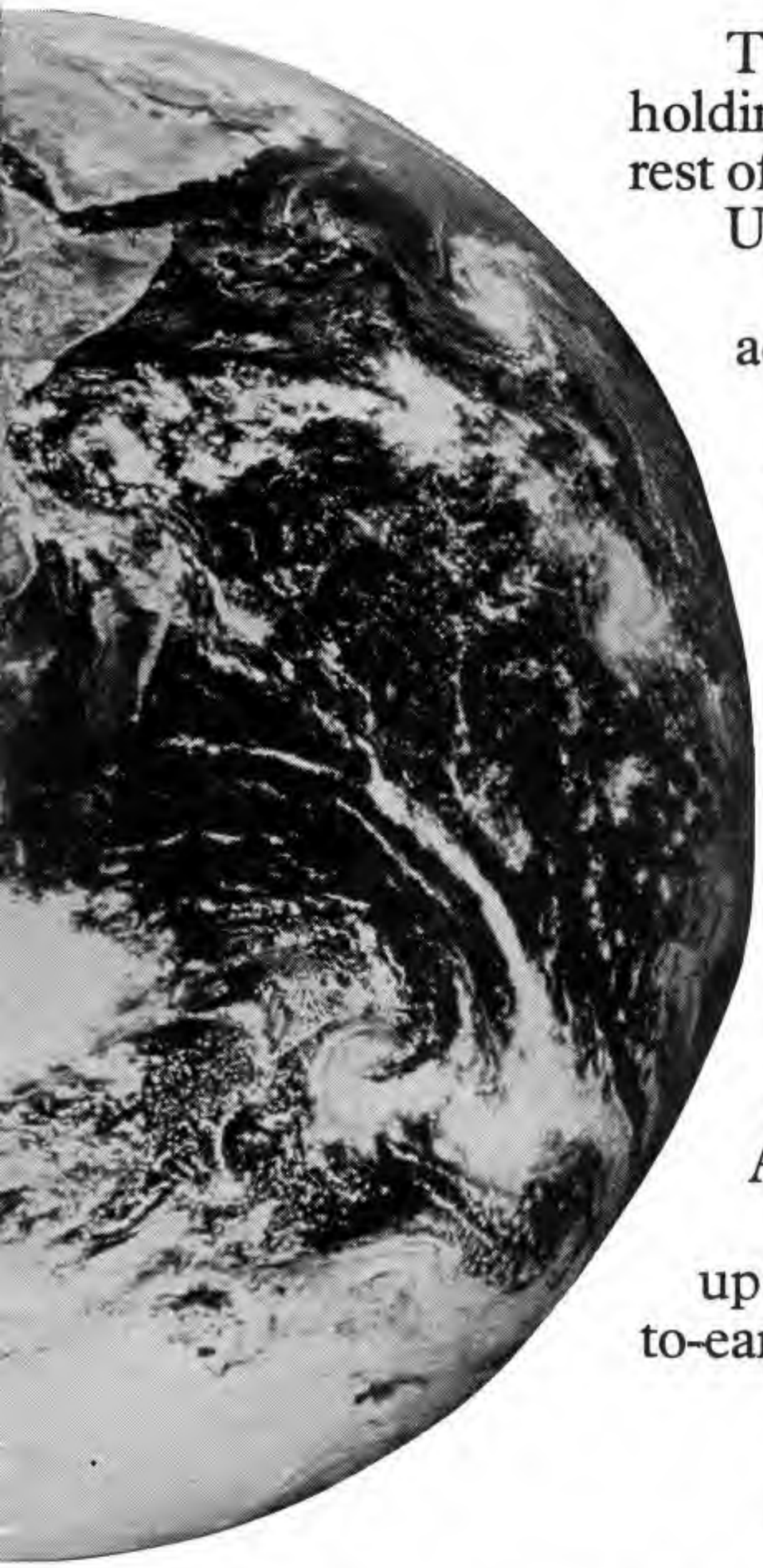
Once loaded, **Date File** will give you either the dates relevant to any particular person or all the dates on file in any given month.




```
   10REM BIRTHDAYS
   20CLS
   30PRINTTAB(4,5);CHR$(141);"B
IRTHDAYS AND IMPORTANT DATES"
   40PRINTTAB(4,6);CHR$(141);"B
IRTHDAYS AND IMPORTANT DATES"
   50PRINTTAB(9,10);"CHOOSE A N
UMBER"
   60PRINTTAB(6,12);"1. CHECK SO
MEONES DATE"
   70PRINTTAB(6,13);"2. CHECK A
MONTH"
   80PRINTTAB(6,14);"3. QUIT"
   90X=GET-48
  100IF X<1 OR X>3 GOTO 90
  110CLS:ON X GOTO 130,260,120
  120END
  130PRINTTAB(9,5);"CHECK SOMEO
NES DATE"
  140PRINTTAB(1,7);"PLEASE TYPE
IN THE NAME OF THE PERSON/S"
  150INPUT A$
  160PRINT
  170REPEAT READ N$,E$,D$,M$,Y$
  180UNTIL A$=N$ OR N$="XXX"
  190IF N$="XXX" THEN PRINT"NO P
ERSON/S OF THAT NAME":GOTO210
  200PRINTN$;" ";E$;" ";D$;"/";M
$;"/";Y$
  210RESTORE
  220PRINTTAB(0,22);"DO YOU WISH
 TO CHECK ANOTHER DATE (Y/N)"
  230Z$=GET$
  240IF Z$="Y" THEN CLS:GOTO 130
  250CLS:GOTO 30
  260PRINTTAB(9,1);"CHECK A MON
TH"
  270PRINTTAB(3,3);"PLEASE TYPE
IN THE MONTH NUMBER"
  280PRINTTAB(5,4);"eg:November
would be 11"
  290INPUT B$
  300PRINT
  310REPEAT READ N$,E$,D$,M$,Y$
  320IF B$=M$ THEN PRINT N$;" ";
E$;" ";D$;"/";M$;"/";Y$
  330UNTIL N$="XXX"
  340IF N$="XXX" THEN GOTO 360
  350GOTO 310
  360RESTORE
  370PRINTTAB(0,22);"DO YOU WISH
 TO CHECK ANOTHER MONTH (Y/N)"
  380C$=GET$
  390IF C$="Y" THEN CLS:GOTO 260
  400CLS:GOTO 30
  410DATA FRED BLOGGS,BIRTHDAY,1
,1,45
  420DATA JOHN SMITH,BIRTHDAY,4,
8,NA
  430DATA JOHN+MARY,ANNIVERSARY,
17,4,66
  440DATA XXX,X,X,X,X
```

Available at selected Spectrum (UK) and other leading computer outlets.

MAKE THE BBC AN EXPERT AT COMMUNICATIONS.



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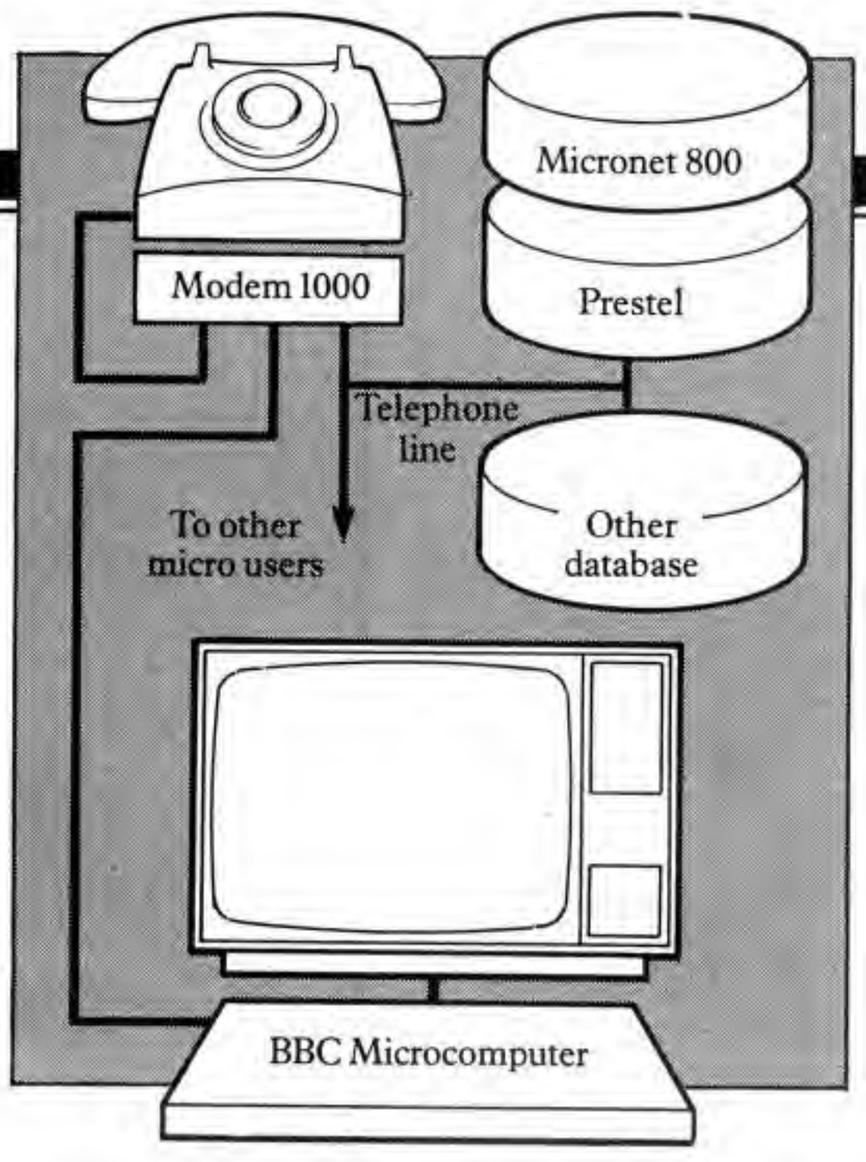

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the curse of BORGAN castle

YOU ARE about to embark on a dangerous mission. The Princess of Hloria is imprisoned inside forbidding Borgan Castle. Pursued by monsters, spiders and ghosts, you must make your way to the heart of the castle and free her from the clutches of the wicked Jolonians.

The computer will understand two-word commands such as RUB LAMP or GET BOAT in this absorbing adventure.

The Curse of Borgan Castle, was written for the BBC and the Electron by Steve Lucas of Cheadle Hulme, Cheshire.

```
   10REM ** The curse of Borgan
Castle **
   20 REM ** An adventure game f
or the BBC and Electron Computer
s **
   30 REM ** <C> 1984 S.W. LUCAS
   40 REM ** DON'T ADD THE NEXT
THREE LINES UNTIL THE PROGRAM IS
 FULLY DEBUGGED AND SAVE A COPY
BEFORE RUNNING IT **
   50 *FX229,1
   60 ON ERROR X$="A ghost attac
ks me":PROClose
   70 *KEY 10 OLD|M RUN|M
   80 MODE6:VDU19,0,3,0,0,0,19,1
,4,0,0,0
   90VDU23,1,0;0;0;0;
  100PRINTTAB(7,1)"The Curse of
Borgan Castle"''TAB(12)"An adven
ture game"''TAB(14)"by S.W. Luca
s"
  110S%=0:RESTORE140:FORX=1TO20:
READ D:SOUND1,-15,D,3:NEXT
  120DIMS%(24,4),Q$(23),G$(30),V
$(4),B%(30,1),N$(30),N%(30)
  130AA%=0:AB%=0:AD%=0:AE%=0:AF%
=0:AG%=0:AH%=0:AI%=0:AJ%=0:AK%=0
:AL%=0:AM%=0:AN%=0:AO%=0:AP%=0:A
Q%=0:AR%=0:AS%=0:AT%=0:AU%=0:AV%
=0:AW%=0:AX%=0:AY%=0:AZ%=0:P%=1
  140 DATA61,53,69,53,61,53,69,5
3,97,89,81,73,61,53,69,53,61,53,
69,53
  150PRINT''" I am standing at t
he gates of Borgan    Castle and
 am about to embark on a      da
ngerous mission ."
  160PRINT''" Please help me to
rid the Castle of the evil force
s which threaten anyone who   en
ters the castle gates."
  170PRINT''" You must give me i
nstructions in the    form of tw
o word sentences such as      GE
T FOOD etc."
  180FORX=1TO21:READQ$(X):FORY=1
TO4:READS%(X,Y):NEXTY,X
  190FORX=1TO13:READG$(X),B%(X,1
),N$(X):N%(X)=X:NEXT
  200PRINTTAB(2,22)"Press <SPACE
 BAR> when ready to start.";
  210 REPEAT UNTIL GET=32: CLS
  220 REPEAT
  230IFP%>10ANDAB%<2THENX$="I tr
ip over something in the dark!":
PROClose
  240IFP%=14THENAH%=AH%+1:IFAH%>
2THENX$="The spider comes over a
nd bites me!":PROClose
  250IFP%=8THENAI%=AI%+1:IFAI%>2
THENX$="The ghost attacks me!":P
ROClose
  260IFP%=17THENAJ%=AJ%+1:IFAJ%>
2THENX$="The monster attacks !":
PROClose
  270PRINT'"I am :-"'Q$(P%)
  280A$="":IFS%(P%,1)>0THENA$="N
orth"
  290IFS%(P%,2)>0ANDLEN(A$)>0THE
NA$=A$+",South" ELSEIFS%(P%,2)>0
THENA$="South"
  300IFS%(P%,3)>0ANDLEN(A$)>0THE
NA$=A$+",East" ELSEIFS%(P%,3)>0T
HENA$="East"
  310IFS%(P%,4)>0ANDLEN(A$)>0THE
NA$=A$+",West" ELSEIFS%(P%,4)>0T
HENA$="West"
  320PRINT''"I can go :-"'A$'
  330E=0:FORT%=1TO13:PP%=0:IFB%(
T%,1)=P%THENPP%=1
  340IFPP%=1THEN360
  350NEXT:GOTO380
  360IFE=0THENPRINT"I can see :-
"
  370PRINT'G$(T%):E=E+1:GOTO350
  380PRINT'"What should I do now
 ";:INPUTZ$
  390B$=LEFT$(Z$,2):C$=LEFT$(Z$,
3):D$=LEFT$(Z$,4):CLS:VDU7:K=0
  400IFC$="LOO"THENK=1 ELSEIFC$=
"EAT"THENPRINT"I can't see any f
ood!":K=1 ELSEIFC$="DRI"THENPRIN
T"I can't see anything to drink!
":K=1 ELSEIFC$="SCO"THENK=1:PRIN
T"What do you think this is a ga
me ?"
```

```
 410IFC$="RUB"THENPRINT"Don't b
e ridiculous!":K=1 ELSEIF(B$="N"
ORLEFT$(Z$,4)="GO N")ANDS%(P%,1)
>0THENP%=S%(P%,1):K=1
 420IF(B$="S"ORLEFT$(Z$,4)="GO
S")ANDS%(P%,2)>0THENP%=S%(P%,2):
K=1 ELSEIF(B$="E"ORLEFT$(Z$,4)="
GO E")ANDS%(P%,3)>0THENP%=S%(P%,
3):K=1 ELSEIF(B$="W"ORLEFT$(Z$,4
)="GO W")ANDS%(P%,4)>0THENP%=S%(
P%,4):K=1
 430IFC$="RIN"THENK=1:PROCring
ELSEIFC$="SWI"THENK=1:PROCswim E
LSEIFC$="LIG"THENPROClight ELSEI
FC$="THR"ORC$="CHU"THENPROCthrow
 440IFC$="USE"ORC$="SHO"ORC$="H
OL"THENPROCshow ELSEIFC$="I"ORD$
="GO I"THENPROCin ELSEIFC$="OUT"
ORC$="O"ORD$="GO O"THENPROCout
 450IFC$="ROW"ORC$="SAI"THENPRO
Crow ELSEIFC$="UNL"THENPROCunloc
k
 460IFC$="UP"ORD$="GO U"THENPRO
Cup ELSEIFC$="DOW"ORD$="GO D"THE
NPROCdown
 470IFC$="DRO"ORC$="LEA"ORC$="P
UT"THENPROCdrop ELSEIFC$="INV"TH
ENPROCinventory
 480IFC$="PRI"ORC$="INS"THENPRO
Cinsert ELSEIFC$="KIL"ORC$="ATT"
ORC$="STA"ORC$="HIT"THENX$="A gh
ost sneaks up behind me and says
    'I won't have that here!'":P
ROClose
 490IFC$="EXA"THENK=1:PRINT"I c
an't see anything special!":ELSE
IFC$="SEA"THENPRINT"I didn't fin
d anything!":K=1
 500IFK=0AND(B$="N"ORB$="S"ORB$
="E"ORB$="W")THENPRINT"I can't g
o that way here!":K=1
 510IFC$="GET"ORC$="TAK"ORC$="G
RA"THENPROCget ELSEIFC$="HEL"THE
NK=1:PRINT"Sorry I can't think o
f anything!" ELSEIFC$="PRA"THENP
RINT"That did me good!":K=1 ELSE
IFB$="FU"ORB$="PI"THENPRINT"How
dare you speak to me like that?"
:K=1
 520UNTILS%=10
 530CLS:PRINT''"That's done the
trick!.. The Princess   is free
!"
 540 PRINT''"Well done!"'''"You
have solved the game!"
 550RESTORE140:FORX=1TO20:READ
D:SOUND1,-15,D,3:NEXT
 560 END
 570DATAstanding by the open ga
teway of the     castle. A vicio
us dog prevents my escape,0,0,0,
2,by a large metal gate. It is s
hut.,0,0,1,0,on a dirt track. Th
ere is a metal door  to the Nort
h but it is locked,0,0,4,0
 580DATAby a moat. There is a d
rawbridge on the far side but it
 is up at the moment.,0,0,0,3,by
 a moat. The drawbridge is up. A
 wide passage leads into the cas
tle.,0,6,0,0
 590DATAin a large cobbled cour
tyard. There is alake to the eas
t.,5,0,7,10,at the side of a wid
e lake.,0,0,0,6,by a deep lake.
A path leads west from  here.,0,
0,0,9
 600DATAby the South Turret.,0,
0,8,0,by the West Turret,0,0,6,0
,in a dirty room. Steps lead up
from here,0,0,16,0,at the top of
 some steps,0,15,13,0,in a dirty
 room. Spiders are crawling  al
l over the furniture,0,14,0,12
 610DATAby a window overlooking
 a courtyard.,13,0,0,15,in an em
pty room.,12,0,14,0,at the top o
f a spiral staircase,0,0,0,11
 620DATAat the bottom of a spir
al staircase,19,18,0,0,by a lock
```

```
ed door,17,0,0,0,in an armoury,0
,17,0,0,in the dungeons.,18,21,0
,0,outside a locked cell.,20,0,0
,0
  630DATAa large bell,2,BELL,a b
ox of matches,1,MATCHES,an oil l
amp,10,LAMP,a small rowing boat
with oars,6,BOAT,an evil looking
 ghost,8,GHOST,a gleaming sword,
15,SWORD,a giant spider,14,SPIDE
R,a key,12,KEY
  640DATAAn old prisoner locked
behind bars,20,PRISONER
  650DATAa beautiful princess,21
,PRINCESS,a three headed monster
,17,MONSTER,a crucifix,4,CRUCIFI
X,a menacing vampire bat,10,VAMP
IRE
  660DEFPROCget
  670K=1:PROCcheck
  6801FL%<>1THENENDPROC
  690E%=0
  700FORH%=1TO13:IFB%(H%,1)=P%AN
DB%(N%(R),1)=P%THENE%=1
  710NEXT
  7201FE%=0THENPRINT"I can't see
 it here!":ENDPROC
  7301FR=1THENPRINT"Don't be an
idiot!":ENDPROC ELSEIFR=2ANDAA%<
0THENAA%=1ELSEIFR=4THENAC%=1
  7401FR=3ANDAF%<>2THENX$="The V
ampire sinks his teeth into my n
eck":PROClose ELSEIFR=3THENAB%=1
  7501FR=5THENPRINT"What an idio
t!":ENDPROC ELSEIFR=7THENPRINT"T
hat's a stupid idea!":ENDPROC EL
SEIFR=9THENPRINT"He's locked in
dummy!":ENDPROC
  7601FR=11THENPRINT"Don't be ab
surd!":ENDPROC ELSEIFR=13THENPRI
NT"That's a ridiculous idea!":EN
DPROC
  7701FR=8THENAD%=1 ELSEIFR=6THE
NAE%=1 ELSEIFR=12THENAF%=1
  780E%=0:FORD%=1TO3:IFV$(D%)=""
THENV$(D%)=G$(N%(R)):E%=1:D%=5
  790NEXT
  8001FE%=0THENPRINT"Sorry my ha
nds are full!":K=1:ENDPROC
  810B%(N%(R),1)=0:ENDPROC
  820DEFPROCcheck
  830L$="":FORH%=1TOLEN(Z$)
  8401FMID$(Z$,H%,1)=" "THENL$=R
IGHT$(Z$,(LEN(Z$)-H%)):H%=H%+40
  850NEXT
  860R=0:L%=0:IFLEN(L$)<2THENEND
PROC
  870FORH%=1TO13:IFLEFT$(N$(H%),
LEN(L$))=L$ THENL%=1:R=H%
  880NEXT
  890ENDPROC
  900DEFPROCdrop
  910PROCcheck
  920K=1:IFL%<>1THENPRINT"I can'
t see a ";L$:ENDPROC
  930E%=0
  940FORD%=1TO3:IFV$(D%)=G$(N%(R
))THENV$(D%)="":E%=1
  950NEXT:IFE%<>1THENPRINT"I hav
en't got it!":ENDPROC
  960B%(N%(R),1)=P%
  970IFR=2ANDAA%=1THENAA%=0 ELSE
IFR=2THENAA%=3
  980IFR=4THENAC%=0 ELSEIFR=6THE
NAE%=0 ELSEIFR=8THENAD%=0 ELSEIF
R=13THENAF%=0
  990IFR=3THENIFAB%=2THENPRINT"T
he lamp blows out!"
 1000IFR=3THENAB%=0
 1010ENDPROC
 1020DEFPROCinventory
 1030K=1:PRINT"I have :-":F%=0
 1040FORH%=1TO3:IFV$(H%)<>""THEN
PRINTV$(H%):F%=1
 1050NEXT:IFF%=0THENPRINT"Not a
sausage!"
 1060PRINT:ENDPROC
 1070DEFPROCring
 1080IFP%<>2THENPRINT"I can't do
 that here dummy!":ENDPROC ELSEP
RINT"The door opens, a hand come
s out and    drags me through. T
he door slams shut!":P%=3:ENDPRO
C
 1090DEFPROCswim
 1100IFP%=4THENPRINT"O.K.":IFAA%
=1THENAA%=2:PRINT"The matches ar
e wet!"
 1110IFP%=4THENP%=5:ENDPROC
 1120IFP%=5THENP%=4:PRINT"O.K.":
IFAA%=1THENAA%=2:PRINT"The match
es are wet!":ENDPROC
 1130IFP%=7ORP%=8THENX$="I swim
into a whirlpool and drown":PROC
lose
 1140PRINT"Don't be silly":ENDPR
OC
 1150DEFPROClose
 1160 CLS:PRINT''X$''"I AM DEAD!
!!!!!!!!!"
 1170 PRINT'''"WOULD YOU LIKE AN
OTHER GAME ?   <Y/N>"
 1180RESTORE140:FORX=1TO20:READ
D:SOUND1,-15,D,3:NEXT
 1190 REPEAT A$=GET$
 1200UNTIL A$="Y" OR A$="N"
 1210IFA$="Y"THENRUN ELSEPRINT''
"Goodbye thank you for playing"
 1220END
 1230ENDPROC
 1240DEFPROClight
 1250K=1:IFAB%=0THENPRINT"I have
n't got the lamp!":ENDPROC ELSEI
FAB%=2 THENPRINT"It's already li
t!":ENDPROC
 1260IFAA%=2THENPRINT"The matche
s are wet!":ENDPROC ELSEIFAA%<>1
THENPRINT"I have no matches!":EN
DPROC
 1270PRINT"I light the lamp":AB%
=2:FORV%=1TO3:IFV$(V%)=G$(3)THEN
V$(V%)="an oil lamp (LIT)"
 1280NEXT:ENDPROC
 1290DEFPROCthrow
 1300K=1:PROCcheck
 1310IFR<>2THENPRINT"I can't see
 much point in throwing that!":E
NDPROC
 1320IFAA%=0THENPRINT"I haven't
got them":ENDPROC ELSEIFAA%<>1TH
ENPRINT"I don't see much point i
n doing that!":ENDPROC
 1330IFP%=5THENB%(N%(R),1)=0:FOR
V%=1TO3:IFV$(V%)=G$(2)THENV$(V%)
="":AA%=0
 1340IFP%=5THENNEXT:PRINT"They h
ave fallen in the water!":ENDPRO
C
 1350IFP%=4THENB%(N%(R),1)=5:FOR
V%=1TO3:IFV$(V%)=G$(2)THENV$(V%)
="":AA%=0
 1360IFP%=4THENNEXT
 1370ENDPROC
 1380DEFPROCshow
 1390K=1:IFAF%<1THENPRINT"I have
n't got the crucifix!":ENDPROC
 1400IFP%<>10THENPRINT"I can't s
ee any point in doing that here"
:ENDPROC
 1410IFAF%>1THENPRINT"The Vampir
e's gone!":ENDPROC
 1420PRINT"The Vampire disappear
s in fright!":AF%=2:G$(13)="":EN
DPROC
 1430DEFPROCin
 1440K=1:IFP%=10THENPRINT"The do
or is locked!":ENDPROC ELSEIFP%=
9THENPRINT"O.K.":P%=11:ENDPROC
 1450PRINT"I can't do that here!
":ENDPROC
 1460DEFPROCout
 1470K=1:IFP%=11THENP%=9:PRINT"O
.K.":ENDPROC
 1480PRINT"I can't do that!":END.
PROC
 1490DEFPROCrow
 1500K=1:IFAC%<>1THENPRINT"Just
how am I supposed to do that ?":
ENDPROC
 1510IFP%=7THENP%=8:PRINT"O.K.":
ENDPROC ELSEIFP%=8THENP%=7:PRINT
"O.K.":ENDPROC
 1520PRINT"I can't do that here!
!!":ENDPROC
 1530DEFPROCup
 1540K=1:IFP%=11THENP%=12:PRINT"
O.K.":ENDPROC ELSEIFP%=17THENP%=
16:PRINT"O.K.":ENDPROC
 1550PRINT"Not here!":ENDPROC
 1560DEFPROCdown
 1570K=1:IFP%=12THENP%=11:PRINT"
O.K.":ENDPROC ELSEIFP%=16THENP%=
17:PRINT"O.K.":ENDPROC
 1580PRINT"Not here!":ENDPROC
 1590DEFPROCunlock

 1600K=1:IFP%=21THENPRINT"The ke
y doesn't work!":ENDPROC ELSEIFP
%<>18THENPRINT"Just how am I sup
posed to do that here?":ENDPROC
 1610IFAD%<>1THENPRINT"I don't h
ave the key":ENDPROC
 1620PRINT"I unlock the door":Q$
(18)="By an unlocked door":S%(18
,2)=20:ENDPROC
 1630 DEFPROCinsert
 1640K=1:IFAE%<>1THENPRINT"I don
't have anything to do that with
!":ENDPROC
 1650IFP%<>21THENPRINT"I can't d
o that here!":ENDPROC
 1660S%=10:ENDPROC
```

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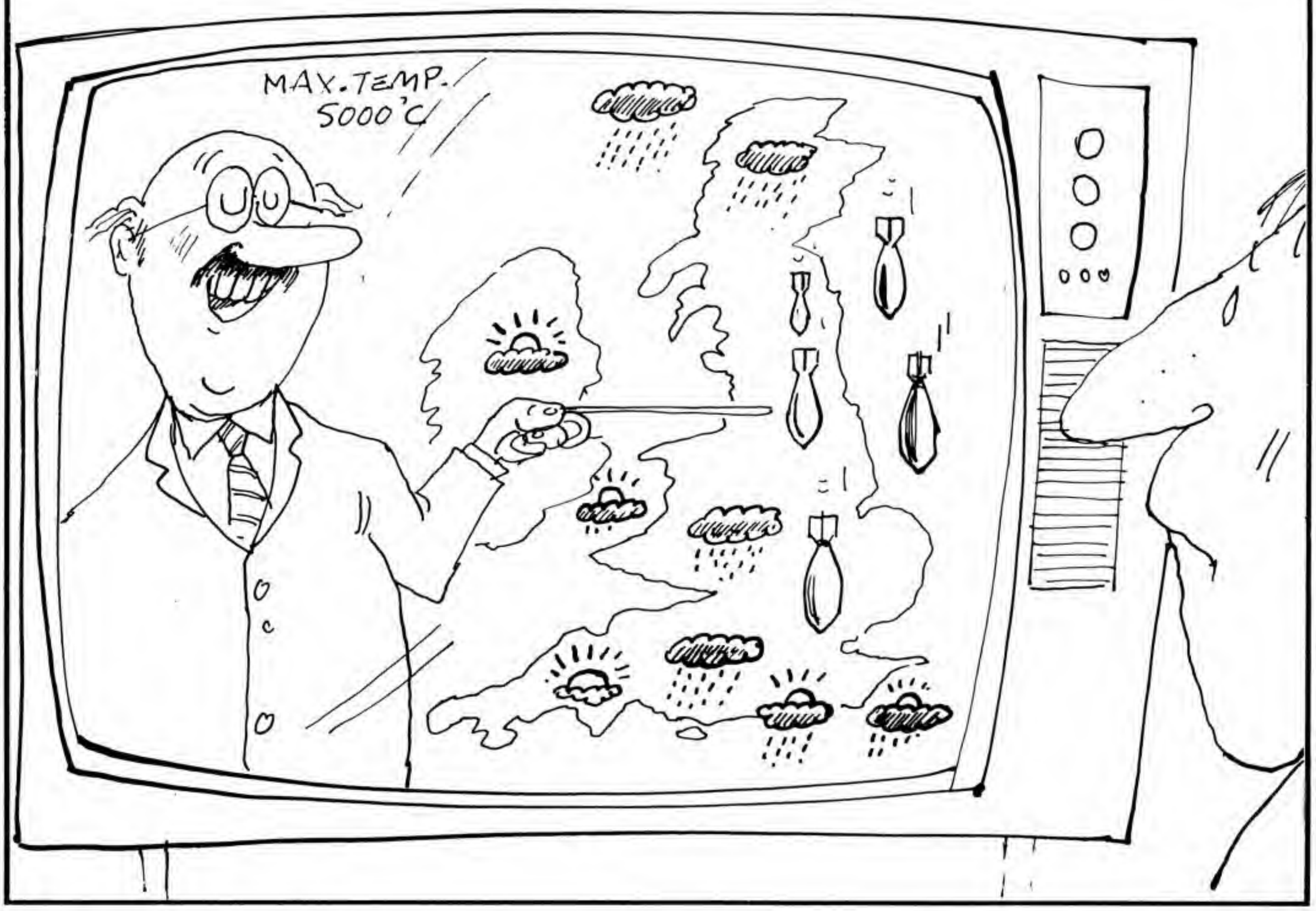
Use the space bar to drop your bombs and wait for one bomb to land before releasing another.

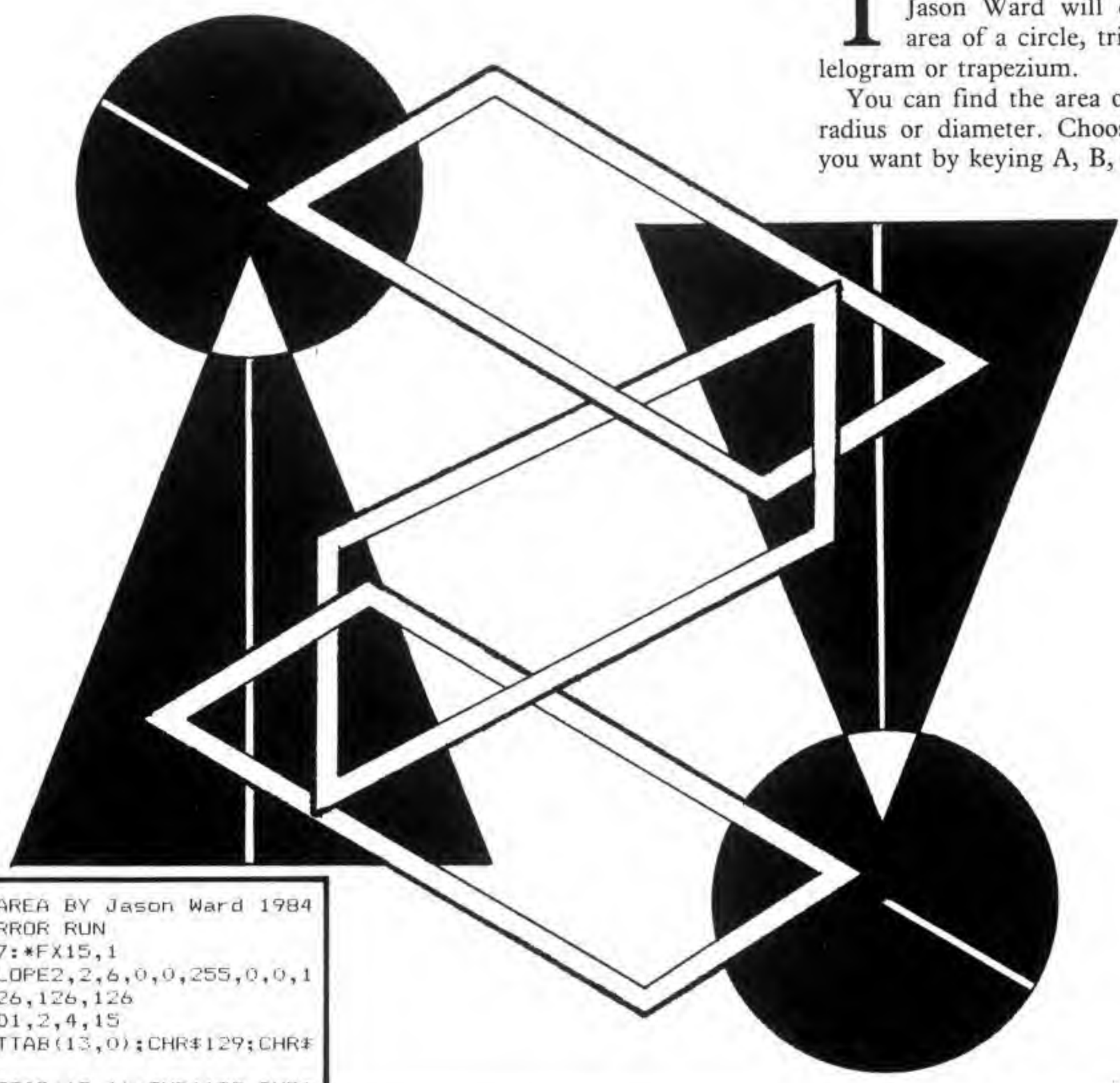
```
   10 ONERRORRUN
   20 MODE7
   30 PROCTITLE
   40 YCO=960
   50 SC=0
   60 VDU23,240,146,254,146,254,
146,254,146,254
   70 VDU23,241,16,16,16,56,56,1
24,254,254
   80 VDU23,242,60,126,247,251,2
51,247,126,60
   90 VDU23,243,0,0,192,224,240,
255,255,255
  100 VDU23,244,0,0,0,0,0,240,25
2,255
  110 VDU23,245,28,93,42,28,8,26
,34,65
  120 VDU23,246,28,28,8,28,42,85
,20,20
  130 *TV255
  140 MODE2
  150 VDU23;8202;0;0;0;
  160 COLOUR130
  170 Y=29
  180 FORX=0TO19
  190 PRINTTAB(X,Y)" "
  200 NEXT
  210 COLOUR128:COLOUR1
  220 X=2
  230 Y=29
  240 C=RND(L)
  250 FORT=1TOC
  260 PRINTTAB(X,Y-T);CHR$(240)
  270 NEXT
  280 PRINTTAB(X,Y-T);CHR$(241)
  290 X=X+1:IFX>17THEN310
  300 GOTO230
  310 VDU5
  320 GCOL0,5
  330 X=0:Y=YCO
  340 MOVEX,Y
  350 PRINTCHR$(243)
  360 VDU4:COLOUR4
  370 PRINTTAB(0,0);"SCORE ";SC
  380 VDU5
  390 MOVEX+64,Y
  400 PRINTCHR$(244)
  410 K$=INKEY$(20)
  420 IFK$=" "ANDY>=160THENPROCF
IRE
  430 SOUND1,VOL,40,1
  440 FORT=1TO100:NEXT
  450 SOUND1,0,40,1
  460 MOVEX+128,Y
  470 VDU127,127
  480 X=X+64:IFX>1152THENX=0:Y=Y
-32
  490 IFPOINT(X+146,Y-16)=1THENP
ROCCRASH
  500 IFY<160ANDX+128>1216THENPR
OCLAND:GOTO60
  510 GOTO340
  520 DEFPROCFIRE
  530 I=1
  540 X1=X
  550 Y1=Y
  560 MOVEX+128,Y
  570 GCOL0,5
  580 VDU127,127
  590 X=X+64:IFX>1152THENX=0:Y=Y
-32
  600IFPOINT(X+146,Y-16)=1THENPR
OCCRASH
  610 VDU4:COLOUR4
  620 PRINTTAB(0,0)"SCORE ";SC
  630 VDU5
  640 IFY<160ANDX+128>1216THENPR
OCLAND:GOTO60
  650 MOVEX,Y:PRINTCHR$(243)
  660 MOVEX+64,Y:PRINTCHR$(244)
  670 COLOUR2
  680 MOVEX1,Y1
  690 GCOL0,3
  700 PRINTCHR$(242)
  710 SOUND0,VOL,50,1
  720 FORT=1TO300:NEXT
  730 SOUND0,0,50,1
```

```
  740 MOVEX1+64,Y1
  750 VDU127
  760 Y1=Y1-32
  770 IFPOINT(X1,Y1)=1THENMOVEX1
+64,Y1:VDU127:I=I+1:SC=SC+1:SOUN
D1,0,0,1:SOUND0,0,0,1:SOUND0,VOL
,60,1
  780 IF I>4 OR POINT(X1,Y1-64)=
2 THEN GCOL0,5:ENDPROC
  790 GOTO560
  800DEFPROCLAND
  810MOVEX,Y
  820 PRINTCHR$(243)
  830MOVEX+64,Y
  840PRINTCHR$(244)
  850 FORT=1TO5
  860 MOVEX-128,Y
  870 PRINTCHR$(245)
  880 FORV=1TO1000:NEXTV
  890 MOVEX-64,Y:VDU127
  900 MOVEX-128,Y
  910 PRINTCHR$(246)
  920 FORV=1TO1000:NEXTV
  930 MOVEX-64,Y:VDU127
  940 NEXTT
  950 FORT=1TO22
  960 READA,B
  970 SOUND1,VOL,A,B/4
  980 SOUND1,0,0,B/7
  990 NEXTT
 1000 DATA101,10,109,10,117,10,1
21,20,101,20,121,10,117,10,121,1
0,129,20,109,20
 1010 DATA109,10,117,10,121,10,1
37,10,129,10,129,10,121,10,121,1
0,117,10,109,10,117,10,101,40
 1020 RESTORE
 1030 MOVEX+128,Y:VDU127,127,127
,127
 1040 VDU4
 1050 COLOUR5
 1060 X=0:Y=28
 1070 PRINTTAB(X,Y);CHR$(243)
 1080 PRINTTAB(X+1,Y);CHR$(244)
 1090 SOUND0,VOL,60,5
 1100 FORT=1TO500:NEXT
 1110 SOUND0,0,0,1
 1120 PRINTTAB(X,Y);CHR$(32)
 1130 PRINTTAB(X+1,Y);CHR$(32)
 1140 X=X+1:Y=Y-1
 1150 IFX>18ORY<0THEN1170
 1160 GOTO1070
 1170 CLS
 1180 COLOUR11
 1190 PRINTTAB(0,13)"WELL DONE Y
OU LANDED"
 1200 COLOUR14
 1210 PRINTTAB(0,15)"YOUR SCORE
IS ";SC
 1220 COLOUR2
 1230 PRINTTAB(5,17)"PRESS SPACE
"
 1240 K$=GET$
 1250 IFK$<>" "THEN1240
 1260 YCO=YCO-32
 1270 ENDPROC
 1280 DEFPROCCRASH
 1290 VDU4
 1300 COLOUR12
 1310 PRINTTAB(7,14)"SPLAT!"
 1320 FORT=1TO10
 1330 SOUND0,VOL,53,2
 1340 NEXT
 1350 FORT=1TO5
 1360 SOUND0,VOL,53,2
 1370 NEXT
 1380 FORT=1TO5
 1390 SOUND0,VOL,60,2
 1400 NEXT
 1410 FORT=1TO1000:NEXT
 1420 CLS
 1430 COLOUR11
 1440 PRINTTAB(0,14)"BAD LUCK YO
U CRASHED"
 1450 COLOUR13
 1460 PRINTTAB(0,16)"BUT SCORED
";SC
 1470 COLOUR1
 1480 PRINTTAB(5,18)"PRESS SPACE
"
 1490 K$=GET$
 1500 IFK$<>" "THEN1490
 1510 RUN
 1520 DEFPROCTITLE
 1530 VDU23;8202;0;0;0;
 1540 PRINTTAB(11,1);CHR$141"CI
TY BOMBER"
 1550 PRINTTAB(11,2);CHR$141"CI
TY BOMBER"
 1560 PRINTTAB(1,4)"TRY TO LAND
 YOUR RAPIDLY DESCENDING"
 1570 PRINTTAB(1,6)"AIRCRAFTBY
 CLEARING A RUNWAY"
 1580 PRINTTAB(1,8)"FROM THE SK
YSCRAPERS BELOW"
 1590 PRINTTAB(1,10)"AFTER LAND
ING ONE PLANE YOU MUST"
 1600 PRINTTAB(1,12)"GO ON TO T
HE NEXT SCREEN"
 1610 PRINTTAB(1,14)"REMEMBER T
HOUGH YOU ONLY GET ONE LIFE"
 1620 PRINTTAB(1,16)"SO BE CARE
FUL"
 1630 PRINTTAB(1,18)"USESPACE
TO DROP BOMBS"
 1640 PRINTTAB(1,20)"NOTE DO NO
T HOLD THE SPACE BAR FOR TOO"
 1650 PRINTTAB(1,22)"LONG OR EL
SE THE BOMBS WILL BECOME"
 1660 PRINTTAB(1,24)"OUT OF CON
TROL"
 1670 K$=GET$
 1680 IFK$=""THEN1670
 1690 CLS
 1700 PRINTTAB(5,3)"DO YOU REQUI
RE SOUND (Y/N)"
 1710 K$=GET$
 1720 IFK$="N"THENVOL=0
 1730 IFK$="Y"THENVOL=-15
 1740 IFK$<>"N"ANDK$<>"Y"THEN171
0
 1750 PRINTTAB(5,5)"LEVEL (1-5)"
 1760 K$=GET$
 1770 IFK$="1"THENL=5
 1780 IFK$="2"THENL=10
 1790 IFK$="3"THENL=15
 1800 IFK$="4"THENL=20
 1810 IFK$="5"THENL=25
 1820 IFK$<>"1"ANDK$<>"2"ANDK$<>
"3"ANDK$<>"4"ANDK$<>"5"THEN1760
 1830 PRINTTAB(13,7)"GOOD LUCK!"

 1840 FORT=1TO2500:NEXT
 1850 ENDPROC
```



AREA



THIS USEFUL program by Jason Ward will calculate the area of a circle, triangle, parallelogram or trapezium.

You can find the area of a circle by radius or diameter. Choose the shape you want by keying A, B, C or D.

```
   10REM AREA BY Jason Ward 1984
   20ON ERROR RUN
   30MODE7:*FX15,1
   34ENVELOPE2,2,6,0,0,255,0,0,1
26,0,0,-126,126,126
   35SOUND1,2,4,15
   40PRINTTAB(13,0);CHR$129;CHR$
141"AREA"
   50PRINTTAB(13,1);CHR$129;CHR$
141"AREA"
   60PRINT'CHR$130;"FOR AREA OF
A CIRCLE TYPE 'A'"
   70PRINT'CHR$131;"FOR AREA OF
A TRIANGLE TYPE 'B'"
   80PRINT'CHR$132;"FOR AREA OF
A PARALLELOGRAM TYPE 'C'"
   90PRINT'CHR$133;"FOR AREA OF
A TRAPEZIUM TYPE 'D'"
  100PRINT''" Enter A,B,C or D"
  110VDU23,1,0;0;0;0;
  120Z$=GET$
  130MODE6
  140VDU23,1,1;0;0;0;
  150IFZ$="A"THEN PROCa
  160IFZ$="B"THEN PROCb
  170IFZ$="C"THEN PROCc
  180IFZ$="D"THEN PROCd
  190RUN
  200DEF PROCa
  210VDU19,1,2,0,0,0
  220CLS
  230INPUT'"DO YOU WISH TO FIND
THE AREA BY THE      (R)ADIUS OR
(D)IAMETER "A$
  240IFA$="D"ORA$="d"THEN 290
  250CLS:INPUT'"ENTER RADIUS OF
CIRCLE "R
  260A=PI*R*R
  270PRINT''"AREA OF CIRCLE IS "
;A
  280PROCend
  290CLS:INPUT''"ENTER DIAMETER
OF CIRCLE "D
  300A=PI*D
  310PRINT''"AREA OF CIRCLE IS "
A
  320PROCend
  330DEF PROCb
  340VDU19,7,3,0,0,0
  350CLS
  360INPUT''"ENTER BASE OF TRIAN
GLE "B
  370INPUT''"ENTER PERPENDICULAR
 HEIGHT OF TRIANGLE "H
  380A=0.5*B*H
  390PRINT''"AREA OF TRIANGLE IS
";A
  400PROCend
  410DEF PROCc
  420VDU19,1,4,0,0,0
  430CLS
  440INPUT''"ENTER PERPENDICULAR
 HEIGHT OF          PARALELLOGR
AM "H
  450INPUT''"ENTER BASE OF PARALE
LLOGRAM "B
  460A=H*B
  470PRINT''"AREA OF FARALELLOGR
AM IS ";A
  480PROCend
  490DEF PROCd
  500VDU19,1,5,0,0,0
  510CLS
  520INPUT''"ENTER LENGTH OF TOP
PARALLEL SIDE "X
  530INPUT''"ENTER LENGTH OF BOT
TOM PARALLEL SIDE "Y
  540INPUT''"ENTER PERPENDICULAR
HEIGHT "Z
  550A=0.5*(X+Y)*Z
  560PRINT''"AREA OF TRAPEZIUM IS
";A
  570PROCend
  580DEF PROCend
  590*FX15,1
  600PRINT''"PRESS ANY KEY"
  610Z$=GET$
  620RUN
```

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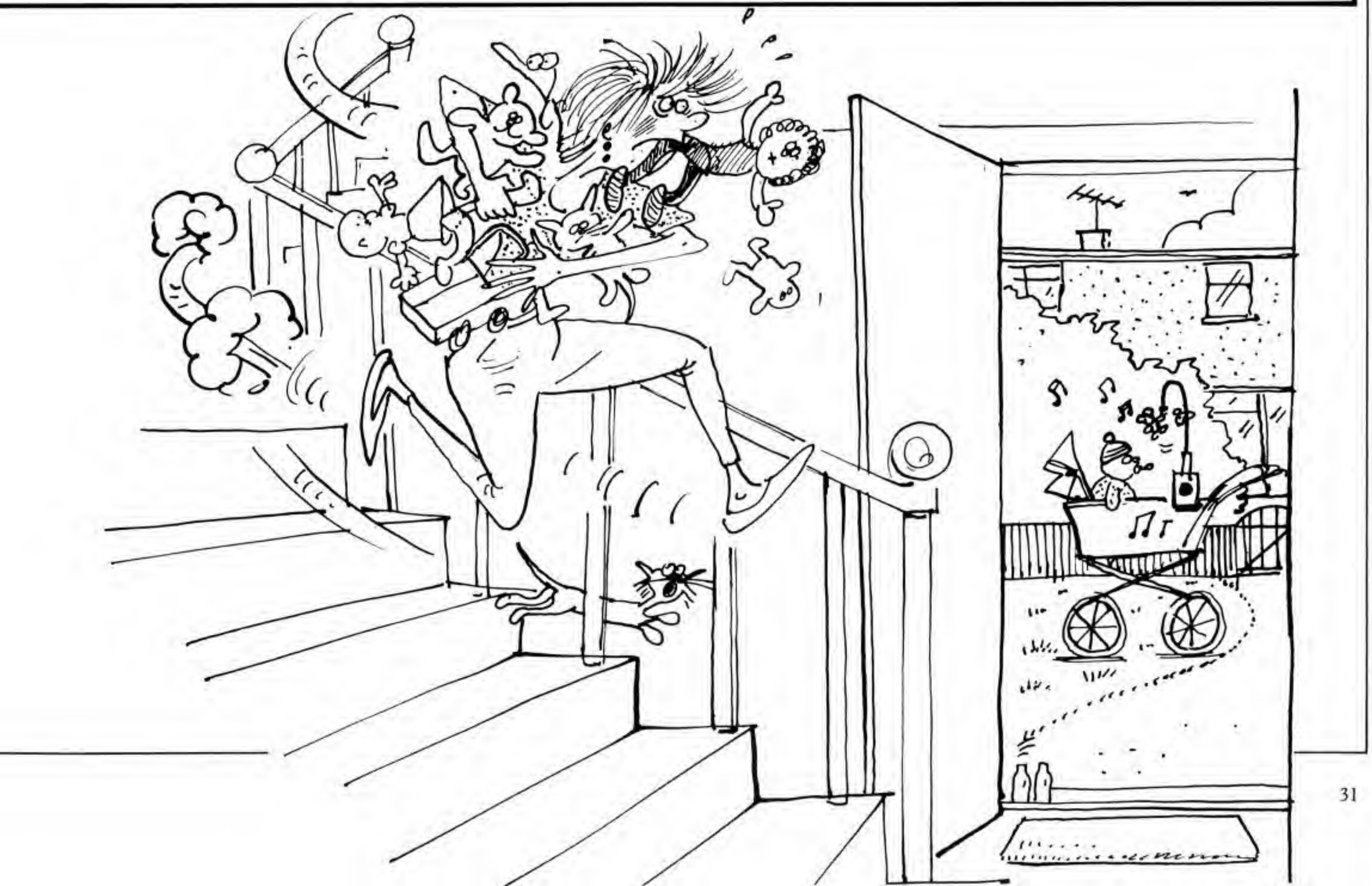
Babysitter

HERE IS the winning entry in the music competition announced in our February/March issue. **Babysitter** was written for the BBC B by P A Baranek, of Matlock Bath, Derbyshire. In this lively maze game, your job is to look after the baby. You have left it in the front garden to sleep in its pram while you go inside to pick up all the toys.

The baby will sleep only so long as its music box is playing, so before the tune ends you must dash back and start the box again. Otherwise the baby will wake and you will be fired. If you manage to collect all the toys in the house, you win 1,000 points. Then the game becomes more complicated as a new set of toys appears and the baby-snatcher tries to sneak up and grab the baby.

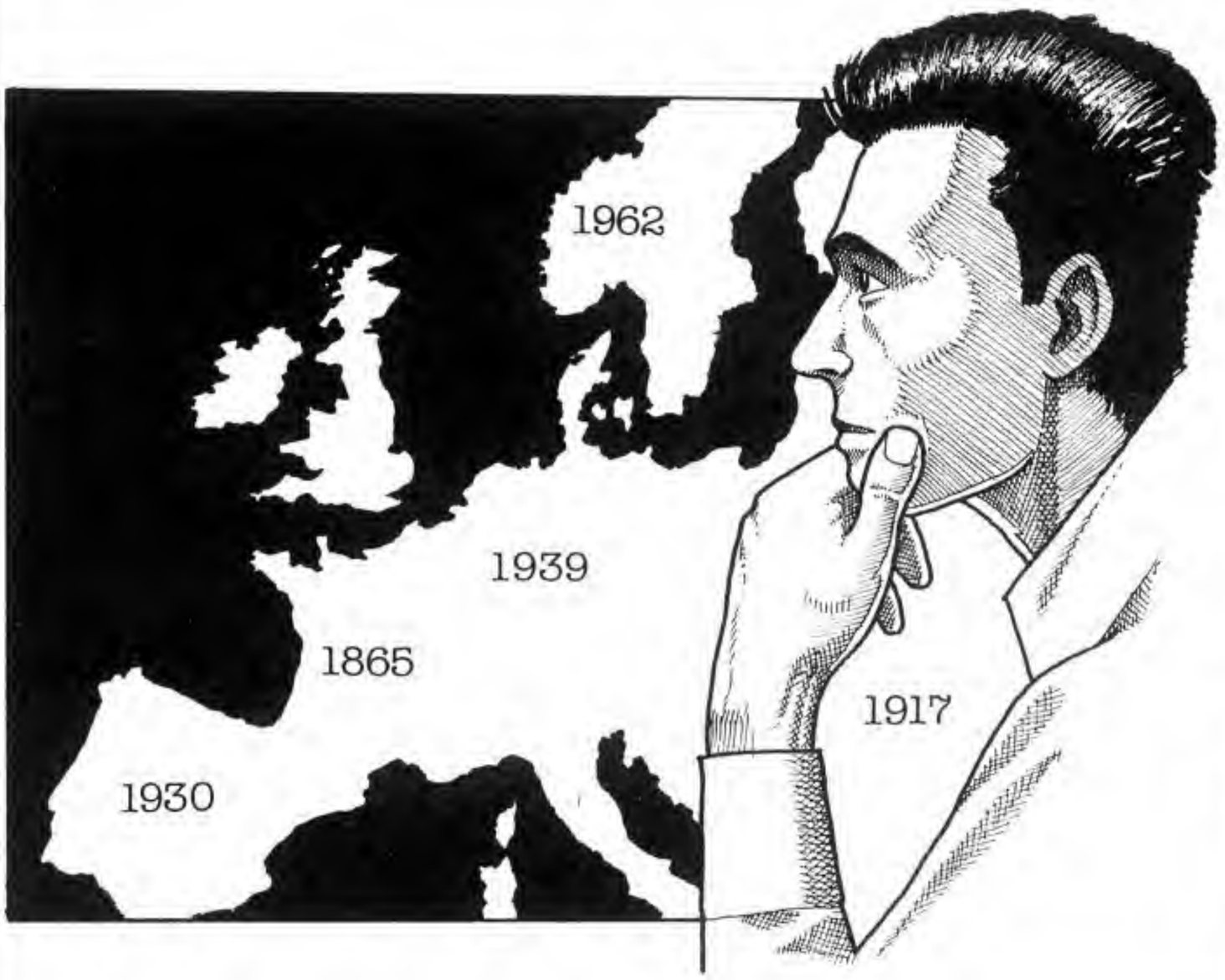
```
   10REM*****BABYSITTER*******
   20REM*****A GAME FOR ALL AGES
********
   30REM*****BY P.A.BARANEK*****
*****
   40REM*****(C) MARCH 1984*****
*
   50HS=0:S=0:CL=1
   60U%=6:V%=10
   70W%=U%*2+2
   80Z%=V%*2+2
   90K%=(U%+1)*(V%+1)-2
  100DIM T%(W%,Z%):DIMM%(U%,V%):
DIMX(80):DIMY(80)
  110 MODE7:VDU23,1,0;0;0;0;:GOS
UB1180
  120VDU23 224,0,34,20,8,20,42,8
,8,23,225,0,0,0,0,124,127,127,34
,23,226,0,0,8,28,8,62,20,34
  130VDU23,227,0,0,0,3,6,252,68,
68,23,228,0,64,32,20,14,31,14,4
  140 VDU23,241,24,24,126,189,18
9,189,36,36,102,23,242,24,24,225
,60,60,36,36,102,23,243,153,153,
126,60,60,36,66,129
  150VDU23,249,24,24,60,90,24,60
,60,102,23,248,0,0,4,31,31,4,0,0
  160VDU23,250,170,85,170,85,170
,85,170,85,23,240,24,36,36,36,18
9,126,60,60
  170 VDU23,240,24,36,36,36,189,
126,60,60,23,244,8,4,127,143,143
,127,4,8
  180 GOSUB1890
  190 MODE5
  200VDU23,1,0;0;0;0;
  210 VDU19,0,4;0;19,3,2;0;
  220 CLS:COLOUR3:COLOUR129
  230PRINTTAB(3,2)"SCORE"
  240PRINTTAB(11,2);S
  250FOR I%=0TOU%:FOR J%=0TOV%
  260M%(I%,J%)=210
  270NEXT:NEXT
  280Q%=0
  290I%=RND(U%+1)-1
  300J%=RND(V%+1)-1
  310IF M%(I%,J%)=210 AND Q%>1 T
HEN GOSUB1590
  320IF Q%>K% THEN GOTO530
  330H%=0:G%=RND(4)
  340H%=H%+1
  350IF H%>4 THEN GOTO290
  360L%=I%
  370N%=J%
  380IF G%>4 THEN G%=1
  390IF G%=1 AND I%<U% THEN F%=2
:L%=I%+1
  400IF G%=2 AND J%>0 THEN F%=3:
N%=J%-1
  410IF G%=3 AND I%>0 THEN F%=5:
L%=I%-1
  420IF G%=4 AND J%<V% THEN F%=7
:N%=J%+1
  430IF M%(L%,N%)<>210 OR (N%=J%
 AND L%=I%) THEN G%=G%+1:GOTO340
  440M%(I%,J%)=M%(I%,J%)/F%
  450IF F%=2 THEN F%=5:GOTO490
  460IF F%=3 THEN F%=7:GOTO490
  470IF F%=5 THEN F%=2:GOTO490
  480IF F%=7 THEN F%=3
  490I%=L%:J%=N%
  500M%(I%,J%)=M%(I%,J%)/F%
  510Q%=Q%+1
  520GOTO330
  530I%=RND(U%-1)-1
  540M%(I%,0)=M%(I%,0)/3
  550FOR I%=0TOW%:FOR J%=0TOZ%
  560T%(I%,J%)=32
  570NEXT:NEXT
  580FOR J%=0TOV%:FOR I%=0TOU%
  590D%=M%(I%,J%)
  600T%(I%*2,J%*2)=250
  610IF D%/3=D%DIV3 THEN T%(I%*2
+1,J%*2)=250
  620IF D%/5=D%DIV5 THEN T%(I%*2
,J%*2+1)=250
  630IF D%/7=D%DIV7 AND J%=V% TH
EN T%(I%*2,J%*2+2)=250:T%(I%*2+1
,J%*2+2)=250
  640IF D%/2=D%DIV2 AND I%=U% TH
```

```
EN T%(I%*2+2,J%*2)=250:T%(I%*2+2
,J%*2+1)=250
  650NEXT:NEXT
  660 CLS:COLOUR 128:COLOUR 3
  670T%(W%,Z%)=250
  680FOR I=0TOW%:FOR J=0TOZ%
  690PRINTTAB(I+2,J+6)CHR$T%(I,J
)
  700NEXT:NEXT
  710 FOR I=0TOW%
  720IF T%(I,0)=32 THEN T%(I,0)=
250:PRINTTAB(I+2,6)CHR$250
  730 NEXT
  740FOR Z=1TO30
  750K=RND(5)+223
  760I=RND(W%-1)
  770J=RND(Z%-1)
  780COLOUR 2:COLOUR128
  790IF T%(I,J)=32 THEN T%(I,J)=
K:PRINTTAB(I+2,J+6)CHR$K:ELSE GO
TO750
  800NEXT
  810 COLOUR3:COLOUR128
  820 PRINTTAB(2,5)CHR$240
  830COLOUR 1
  840 T%(1,0)=32:T%(1,0)=249:L=1
:N=0:PRINTTAB(3,6)CHR$249
  850 H=1:A%=1
  860ST=0
  870REPEAT
  880COLOUR 0:COLOUR 129:PRINTTA
B(3,2)"SCORE":PRINTTAB(11,2);S
  890 COLOUR129:PRINTTAB(17-A%,5
)" "
  900 COLOURO:COLOUR129:PRINTTAB
(16-A%,5)CHR$241
  910 IF RND(29+CL*2)>29THEN A%=
A%+1
  920I=L:J=N
  930 FORW=1TO80:NEXT
  940IF INKEY(-100) THEN I=I+1
  950IF INKEY(-70) THEN J=J-1
  960IF INKEY(-83) THEN I=I-1
  970IF INKEY(-86) THEN J=J+1
  980IF J<0 OR J>Z% THEN J=N
  990IF I<0 OR I>W% THEN I=L
 1000IF T%(I,J)>223 AND T%(I,J)<
229 THEN T%(I,J)=32:S=S+100:ST=S
T+100:K9=0
 1010IF T%(I,J)<229 THEN T%(L,N)
=32:COLOUR 1:COLOUR128:PRINTTAB(
L+2,N+6)CHR$32TAB(I+2,J+6) CHR$2
49:L=I:N=J
 1020 IF X(H)=255 THEN loud=0 EL
SE loud=-10
 1030 IF ADVAL(-6)>2 ANDH<76 THE
N SOUND1,loud,X(H),Y(H):H=H+1
 1040IF RND(4)>1 THEN GOTO920
 1050 IF N=0 SOUND&1011,-10,121,
1:H=1:IF ST=3000 GOTO1120
 1060IF N=0 THEN COLOUR129:PRINT
TAB(4,5)"                ":A%=1:COLO
UR128:COLOUR2:PRINTTAB(2,5)CHR$(
240)
 1070 IF N=0 THEN PRINTTAB(3,5)C
HR$249:PRINTTAB(3,6)" ":REPEAT:U
NTILINKEY(-86):PRINTTAB(3,5)" ":
PRINTTAB(3,6)CHR$249
 1080 IF N=0 SOUND&1011,-10,121,
1:H=1
```



```
 1090 IF A%>14 GOTO1690
 1100UNTIL ST=3000 AND N=0 OR H=
76
 1110IF H=76 GOSUB1630
 1120IF ST=3000 AND N=0THEN ST=0
:S=S+(1000*CL):CL=CL+1:CLS:MODE7
:VDU23,1,0;0;0;0;:PRINTTAB(0,6)C
HR$(130)"WELL DONE! YOU HAVE CLE
ANED THE HOUSE"
 1130PRINTTAB(1,10)CHR$(133)"BUT
 WAIT, EVEN BEFORE YOU HAVE HAD"
:PRINTTAB(1,12)CHR$(131)"TIME TO
 PUT YOUR FEET UP   OH NO!!"
 1140PRINTTAB(7,17)CHR$(134)"THE
RE ARE TOYS LYING":PRINTTAB(7,18
)CHR$(134);"ALL AROUND THE HOUSE
"
 1150 FOR W=1TO20000:NEXT
 1160 GOTO190
 1170 IF H=76 GOSUB1630
 1180RESTORE:FORI=20TO24:VDU31,0
,I:VDU135:FORJ=1TO40:READX:VDU-3
2*(X=0)-255*(X=1):NEXT:NEXT
 1190DATA0,1,1,0,0,0,1,0,0,1,1,0
,0,1,0,1,0,1,1,1,0,1,0,1,1,1,0,1
,1,1,0,1,1,1,0,1,1,1,0,0,0,1,0,1
,0,1,0,1,0,1,0,1,0,1,0,1,0,1,0,0
,0,1,0,0,1,0,0,0,1,0,0,1,0,0,0,1
,0,1,0,0
 1200 DATA0,1,1,0,0,1,1,1,0,1,1,
0,0,0,1,0,0,1,1,1,0,1,0,0,1,0,0,
0,1,0,0,1,1,0,0,1,1,1,0,0,0,1,0,
1,0,1,0,1,0,1,0,1,0,0,1,0,0,0,0,
1,0,1,0,0,1,0,0,0,1,0,0,1,0,0,0,
1,1,0,0,0
 1210 DATA0,1,1,0,0,1,0,1,0,1,1,
0,0,0,1,0,0,1,1,1,0,1,0,0,1,0,0,
0,1,0,0,1,1,1,0,1,0,1,0,0
 1220RESTORE:FORI=19TO23:VDU31,0
,I:VDU110+I:FORJ=1TO40:READX:VDU
-32*(X=0)-255*(X=1)
 1230SOUND1,-10,(I-15)*(8+J),1:N
EXT:NEXT
 1240VDU31,1,30:FOR F=1TO16:PRIN
T" ":FOR G=20TO30:SOUND1,-10,25+
12*G,1:NEXT:NEXT
 1250PRINTTAB(0,16)CHR$(141);CHR
$(131);CHR$(157);CHR$(132)"
    by P.A.BARANEK      "
 1260PRINTTAB(0,17)CHR$(141);CHR
$(131);CHR$(157);CHR$(132)"
    by P.A.BARANEK      "
 1270TIME=0:REPEAT UNTIL TIME>60
0
 1280 TIME=0: PRINTTAB(3,20)"If
you do not reqire instructions
                  press N "
 1290 REPEAT UNTIL INKEY(-86)OR
TIME>300
 1300 IF INKEY(-86) THEN RETURN
 1310 IF TIME>300 GOTO 1320
 1320CLS:GOSUB1990
 1330PRINTTAB(0,12)"Your job is
to look after the baby"
 1340PRINTTAB(0,14)"You put the
baby outside the front door in i
ts pram to sleep, while you go i
nto the house to collect all the
 toys the  baby has left on the
 floor."
 1350PRINTTAB(3,24)"Press any ke
y to continue...":G=GET:CLS:GOSU
B1990
 1360PRINTTAB(0,11)"But wait....
the baby will only sleep if it h
ears a lullaby so before you lea
ve  wind up the music box"
 1370PRINTTAB(0,15)"If the music
 stops the baby will wake upand
fall out of the pram."
 1380PRINTTAB(7,19)CHR$(129);"TH
AT MEANS  YOU'RE FIRED"
 1390PRINTTAB(0,21)"You must get
 back to the baby to wind upthe
music box before it stops."
 1400PRINTTAB(4,24)"Press any ke
y to continue...":G=GET:CLS:GOSU
B1990
 1410PRINTTAB(0,11)"If you manag
e to collect all the toys  and
get back to the baby you are giv
en":PRINTTAB(12,14)CHR$(136);CHR
$(133);"1000 points"
 1420PRINTTAB(0,16)"But like all
 houses with children,as  soon
 as they are tidy, someone comes
 anddrops more toys.....so off
you go again"
 1430PRINTTAB(0,20)"A bonus of":
PRINTTAB(12,20)CHR$(136);CHR$(13
3);"2000 points":PRINTTAB(27,20)
CHR$(137);CHR$(135);"this time"
 1440PRINTTAB(3,24)"Press any ke
y to continue...":G=GET:CLS:GOSU
B1990
 1450PRINTTAB(12,10)CHR$(136);CH
R$(129); "BUT WAIT!!":PRINTTAB(0
,12)"There is a baby snatcher ab
out.He sneeksup on the baby and
tries to steal it.  If he sees
you outside with the baby he wil
l run away and hide."
 1460PRINTTAB(0,17)"If he steals
 the baby you loose your jobThe
longer the game goes on, the fas
ter he sneeks up on your baby"
 1470PRINTTAB(0,21)CHR$(136);CHR
$(129); "IF YOU LOOSE YOUR JOB T
HE GAME IS OVER "
 1480PRINTTAB(3,24)"Press any ke
y to continue...":G=GET:CLS:GOSU
B1990
```

```
 1490PRINTTAB(0,11)"  Score as m
any points as you can but
          PLEASE
 "
 1500PRINTTAB(7,15)CHR$(136);CHR
$(129); "LOOK AFTER THE BABY"
 1510PRINTTAB(3,24)"Press any ke
y to continue...":G=GET:CLS:GOSU
B1990
 1520PRINTTAB(0,11)CHR$(131);CHR
$(157);CHR$(132)"                CONT
ROLS"
 1530PRINTTAB(10,13)"J moves lad
y up"
 1540PRINTTAB(10,15)"N moves lad
y down"
 1550PRINTTAB(10,17)"C moves lad
y left"
 1560PRINTTAB(10,19)"V moves lad
y right"
 1570PRINTTAB(3,24)"Press any ke
y to start the game":G=GET
 1580CLS:RETURN
 1590I%=I%+1
 1600IF I%>U% THEN I%=0:J%=J%+1:
IF J%>V% THEN J%=0
 1610IF M%(I%,J%)=210 THEN GOTO1
590
 1620RETURN
 1630 COLOUR2:COLOUR129:FOR W=1T
04000:NEXT:FOR B=5TO26:PRINTTAB(
1,B-1)" ":PRINTTAB(1,B)CHR$226:S
OUND1,-10,200-(B*10),4:NEXT
 1640 FOR W=1TO4000:NEXT
 1650 CLS:MODE7:VDU23,1,0;0;0;0;
:PRINTTAB(6,6)CHR$(132);"YOU LET
 THE BABY WAKE UP"
 1660PRINTTAB(5,10)CHR$(136);CHR
$(133)"THIS MEANS YOU ARE FIRED"
 1670 PRINTTAB(10,13)CHR$(129);"
YOUR SCORE  ";S
 1680 IFS>HS GOTO1760 ELSE GOTO1
830
 1690 SOUND&1011,-10,129,1
 1700 COLOUR15:FOR P=1TO16:PRINT
TAB(0+P,5)CHR$241:SOUND0,-10,P,3
:PRINTTAB(0+P,5)CHR$242:SOUND0,-
10,P,3:PRINTTAB(0+P,5)" ":PRINTT
AB(0+P,4)CHR$243:SOUND0,-10,P,3:
PRINTTAB(0+P,4)" ":NEXT
 1710FOR W=1TO5000:NEXT:CLS
 1720 MODE7:VDU23,1,0;0;0;0;:PRI
NTTAB(4,4)CHR$(132)"THE BABY SNA
TCHER GOT YOUR BABY"
 1730PRINTTAB(0,7)CHR$(136);CHR$
(133)"YOU ARE FIRED FOR BEING IN
COMPETANT"
 1740 PRINTTAB(10,13)CHR$(129);"
YOUR SCORE  ";S
 1750 IFS>HS GOTO1760 ELSE GOTO1
830
 1760PRINTTAB(5,16)CHR$(136);CHR
$(129)"THIS IS A NEW HIGH SCORE"
:HS=S
 1770PRINTTAB(1,19)"      "
 1780*FX 15,1
 1790 INPUT "   TYPE IN YOUR NAM
E  " NAME$
 1800PRINTTAB(3,24)CHR$(130);"Pr
ess space bar for another go"
 1810 REPEAT UNTIL INKEY(-99)
 1820 IF INKEY(-99) S=0:CL=1:GOT
O190
 1830 PRINTTAB(4,16)CHR$(132);"T
his is not a new high score"
 1840 PRINTTAB(6,18)CHR$(133);"T
HE HIGH SCORE STANDS TO"
 1850 PRINTTAB(2,20)CHR$(136);CH
R$(134);NAME$:PRINTTAB(20,20)"at
 ";HS;" points",
 1860PRINTTAB(3,22)CHR$(130);"Pr
ess space bar for another go"
 1870 REPEAT UNTIL INKEY(-99)
 1880 IF INKEY(-99) S=0:CL=1:A%=
1:GOTO190
 1890 FOR H=1TO75
 1900READX(H)
 1910READY(H)
 1920DATA 109,10,129,10,255,.5,1
29,10,137,10,145,5,157,5,255,.5,
157,15,149,5,145,10,255,.5,145,1
0,137,10,129,20
 1930DATA 109,10,129,10,255,.5,1
29,10,137,10,145,5,157,5,255,.5,
157,15,149,5,145,10,255,.5,145,1
0,137,10,129,20
 1940 DATA157,10,255,.5,157,10,1
45,10,157,10,255,.5,157,5,149,5,
137,15,255,.5,137,5
 1950DATA 145,10,129,10,145,10,1
37,20,109,10,129,10,255,.5,129,1
0,137,10,145,5,157,5,255,.5,157,
15,149,5,145,10,255,.5,145,10,13
7,10,129,20
 1960 DATA 149,5,125,5,129,20,13
7,5,109,5,129,20,255,.5,129,5,14
5,5,157,10,145,5,129,5,137,5,109
,5,129,20,129,20,129,20
 1970 NEXT
 1980RETURN
 1990RESTORE:FORI=3TO7:VDU31,0,I
:VDU126+I:FORJ=1TO40:READX:VDU-3
2*(X=0)-255*(X=1): NEXT:NEXT:RET
URN
```



HISTORY QUIZ

ANSWER 20 questions to find how good you are at remembering historic dates. If you want to add your own questions, insert the date and the fact, separated by a comma, at any line after 320.

History Quiz was written by Mark Hammond of Milton Keynes, Buckinghamshire.

```
   10 CLS
   20 COR%=0:WRO%=0
   30 DIM D%(21),H$(21)
   40 PRINTTAB(11,11);CHR$134;CH
R$141;"HISTORY QUIZ"
   50 PRINTTAB(11,12);CHR$134;CH
R$141;"HISTORY QUIZ"
   60 X$=INKEY$(500)
   70 RESTORE 290
   80 FOR N=1 TO 20
   90 READ D%(N),H$(N)
  100 NEXT N
  105 TIME=0
  110 FOR QN%=1 TO 20
  120 CLS
  122 PRINTTAB(0,2);"  This is"
  125 PRINTTAB(0,3);"Question no
. ";QN%;"  Number right ";COR%
  127 PRINT''''''
  130 PRINT:PRINTCHR$129;CHR$141
;"  NAME THE DATE WHEN"
  140 PRINTCHR$129;CHR$141;"  NA
ME THE DATE WHEN"
  150 PRINT:PRINT"]]] ";H$(QN%)
  160 INPUT ANS%
  170 IF ANS%=D%(QN%) THEN COR%=
COR%+1:PRINT:PRINT"CORRECT":X$=I
NKEY$(100)
  180 IF ANS%<>D%(QN%) THEN PRIN
T:PRINT"THE DATE WAS ";D%(QN%):X
$=INKEY$(300)
  190 NEXT QN%
  200 CLS:PRINT''''''
  210 PRINTCHR$130;CHR$141;"
        RESULTS"
  220 PRINTCHR$130;CHR$141;"
        RESULTS"
  230 PRINTCHR$131;"
          "
  240 PRINT:PRINT"AFTER 20 QUEST
IONS :"
  250 PRINT
  260 PRINTSPC(9);"YOU HAVE SCOR
ED ";COR%;" POINT";
  270 IF COR%<>1 THEN PRINT"S."
  275 PRINT:PRINTSPC(9);"TIME TA
KEN ";TIME/100;" SECONDS."
  280 PRINT:END
  290 DATA 122,HADRIANS WALL WAS
 BUILT,1066,THE BATTLE OF HASTIN
GS WAS,1215,THE MAGNA CARTA WAS
SIGNED,1348,THE BLACK DEATH WAS,
1492,COLUMBUS DESCOVERED THE WES
T INDIES,1587,MARY QUEEN OF SCOT
S WAS EXECUTED
  300 DATA 1588,THE SPANISH ARMA
DA WAS DESTROYED,1605,THE GUNPOW
DER PLOT WAS,1665,THE GREAT PLAG
UE OF LONDON WAS,1666,THE GREAT
FIRE OF LONDON WAS,1804,NAPOLEON
 BECAME EMPEROR OF FRANCE
  310 DATA 1805,THE BATTLE OF TR
AFALGAR WAS,1815,THE BATTLE OF W
ATERLOO WAS,1878,THE ELECTRIC LI
GHT WAS INVENTED,1903,THE FIRST
FLIGHT WAS,1914,THE FIRST WORLD
WAR STARTED
  320 DATA 1939,THE SECOND WORLD
 WAR STARTED,1961,THE FIRST MAN
WENT IN SPACE,1971,BRITAIN CHANG
ED TO DECIMAL CURRENCY,1982,THE
FALKLAND ISLANDS WERE INVADED
```

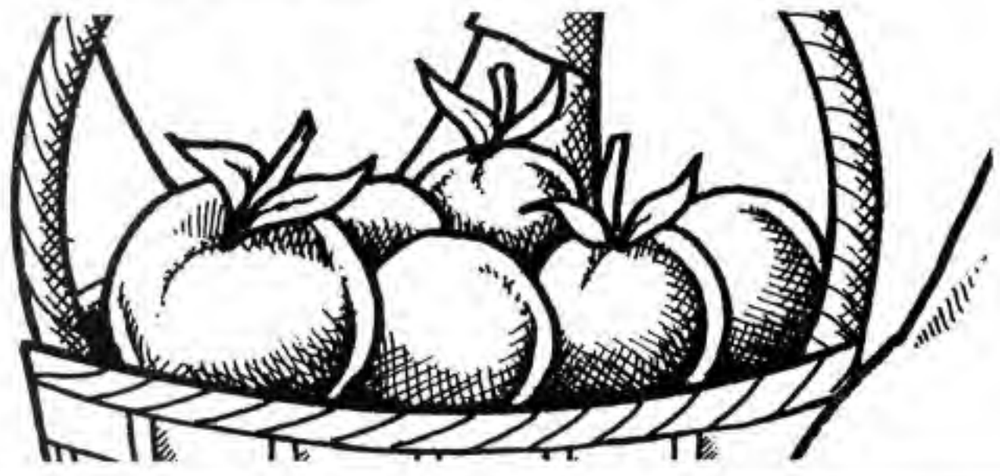
ORCHARD WALL

```
   10CLS
   20GOTO630
   30VDU23,224,255,255,255,126,6
6,90,90,60
   40VDU23,225,24,24,24,60,36,66
,66,66
   50VDU23,226,0,127,127,127,127
,127,127,0
   60VDU23,227,0,24,60,126,126,6
0,24,0,0
   70MODE5
   80COLOUR1:PRINT"     ORCHARD W
ALL"
   90VDU23,1,0;0;0;0;
  110VDU19,7,4,0,0,0:COLOUR7
  120 FORW=1TO300:PRINTCHR$226;:
NEXT
  130SC%=0:L%=1:LI%=5:Z=27:X=10
  140FORB=1TO15
  150W=0
  160U=0
  170G=0
  180COLOUR1:PRINTTAB(0,28)"SCOR
E ";SC%:PRINTTAB(12,28)"LEVEL ";
L%
  190COLOUR2:PRINTTAB(6,29)"LIVE
S ";LI%
  200H=RND(17)+1
  210FORS=1TOZ-1
  220U=0
  230IFX<0THENX=0
  240IF  INKEY(-98)THENPRINTTAB(X
,Z)" ";TAB(X,Z-1)"  ":X=X-1:SOUND
1,-15,20,1:SOUND2,-15,60,1
  250IFX<0THENX=0
  260IFX>19THENX=19
  270IF  INKEY(-67)THENPRINTTAB(X
,Z)" ";TAB(X,Z-1)"  ":X=X+1:SOUND
1,-15,20,1:SOUND2,-15,60,1
  280IFX>19THENX=19
  290COLOUR1
  300PRINTTAB(X,Z)CHR$225;TAB(X,
Z-1)CHR$224
  310COLOUR2
  320PRINTTAB(H,S)CHR$227:REPEAT
:U=U+1:UNTILU=2
  330COLOUR7
  340IF S<16 THENPRINTTAB(H,S)CH
R$226 ELSEIFS>=16THENPRINTTAB(H,
S)"  "
  350IFS=Z-2 AND H=X THENSOUND1,
-15,150,1:SOUND1,-15,200,1:SC%=S
C%+L%*5:GOTO390
  360IFS=Z-1 THENSOUND1,-15,1,3:
SOUND2,-15,30,5:LI%=LI%-1
  370IFLI%=0THENLI%=LI%-1:GOTO58
0
  380NEXTS
  390REPEAT:G=G+1:UNTILG=100
  400NEXTB
  410LI%=LI%+1
  420L%=L%+1
  430IFL%>11THENL%=11
  440COLOUR1
  450PRINTTAB(0,28)"SCORE ";SC%
  460ENVELOPE 1,1,-10,-10,-45,10
0,100,100,50,0,-10,-127,126,0
```

STAND BENEATH the orchard wall and catch as many apples as you can in your basket. You have five lives and lose one every time you fail to catch an apple; you have an extra life for each new level of the game.

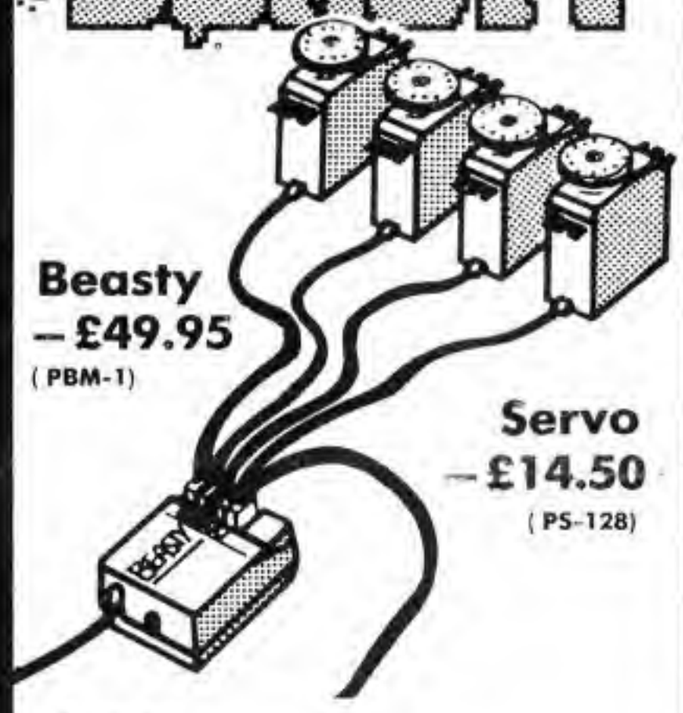
Orchard Wall was written for the Electron by Kevin Jackson of Wednesbury, West Midlands.

```
  470SOUND1,1,150,39
  480PRINTTAB(X,Z)" ":PRINTTAB(X
,Z-1)" "
  490Z=Z-1:IFZ<17THENZ=17
  500BON%=L%*LI%+30
  510COLOUR7
  520PRINTTAB(6,27)"BONUS ";BON%

  530REPEAT:W=W+1:UNTILW=900
  540PRINTTAB(6,27)"              "

  550SC%=SC%+BON%
  560GOTO140
  570VDU23,1,0;0;0;0;
  580COLOUR2:LI%=0:PRINTTAB(6,29
)"LIVES ";LI%
  590ENVELOPE1,2,8,-4,4,10,5,20,
126,0,0,-126,126,126
  600SOUND1,1,10,140
  610REPEAT:U=U+1:UNTILU=2000
  620CLEAR
  630MODE2:COLOUR11
  640PRINTTAB(4,2)"ORCHARD WALL"

  650COLOUR2:PRINTTAB(0,5)"The o
bject of this":PRINT"game is to
catch as":PRINT"many falling app
les":PRINT"as you can."
  660PRINT:COLOUR6
  670PRINT"To do this you must":
PRINT"position your man ":PRINT"
underneath an apple":PRINT"so th
at it falls in":PRINT"to his bas
ket on ":PRINT"top of his head."

  680PRINT:COLOUR3
  690PRINT"You have 5 lifes ":PR
INT"and gain 1 life ":PRINT"ever
y level,but ":PRINT"loose 1 life
 every ":PRINT"time you fail to"
:PRINT"catch an apple."
  700COLOUR4:PRINTTAB(5,24)"CONT
ROLS"
  710COLOUR7:PRINTTAB(0,26)"Z...
...LEFT":PRINT"X......RIGHT"
  720COLOUR1:PRINTTAB(1,30)"PRES
S S TO BEGIN"
  730IFINKEY(-82)THENGOTO30
  740GOTO730
```



SLAVES FROM AROUND £49!

THE BEASTY



Beasty
– £49.95
(PBM-1)

Servo
– £14.50
(PS-128)

Servos:
FROM – 1-4 servos, 3.5kg/cms
60 degrees in 0.25 secs, 100 degrees range.

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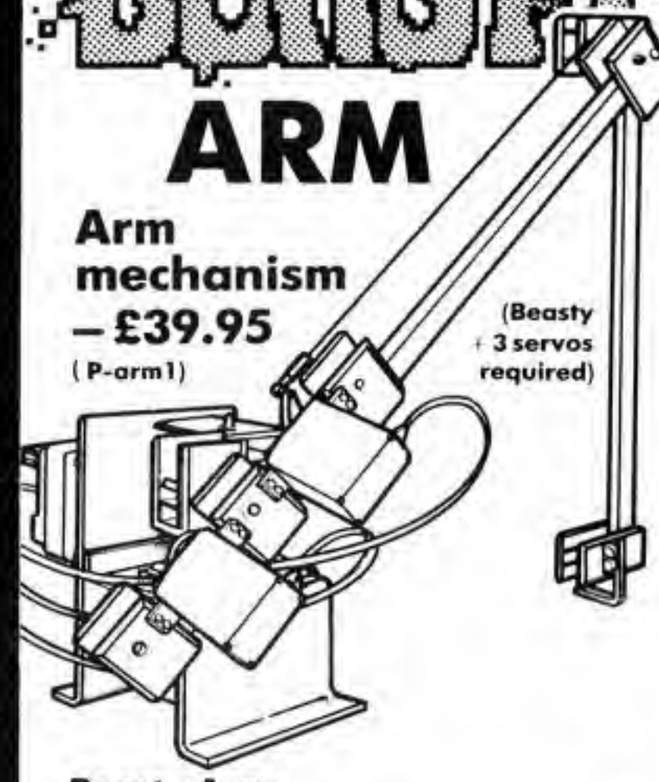
(P-arm1)

(Beasty + 3 servos required)



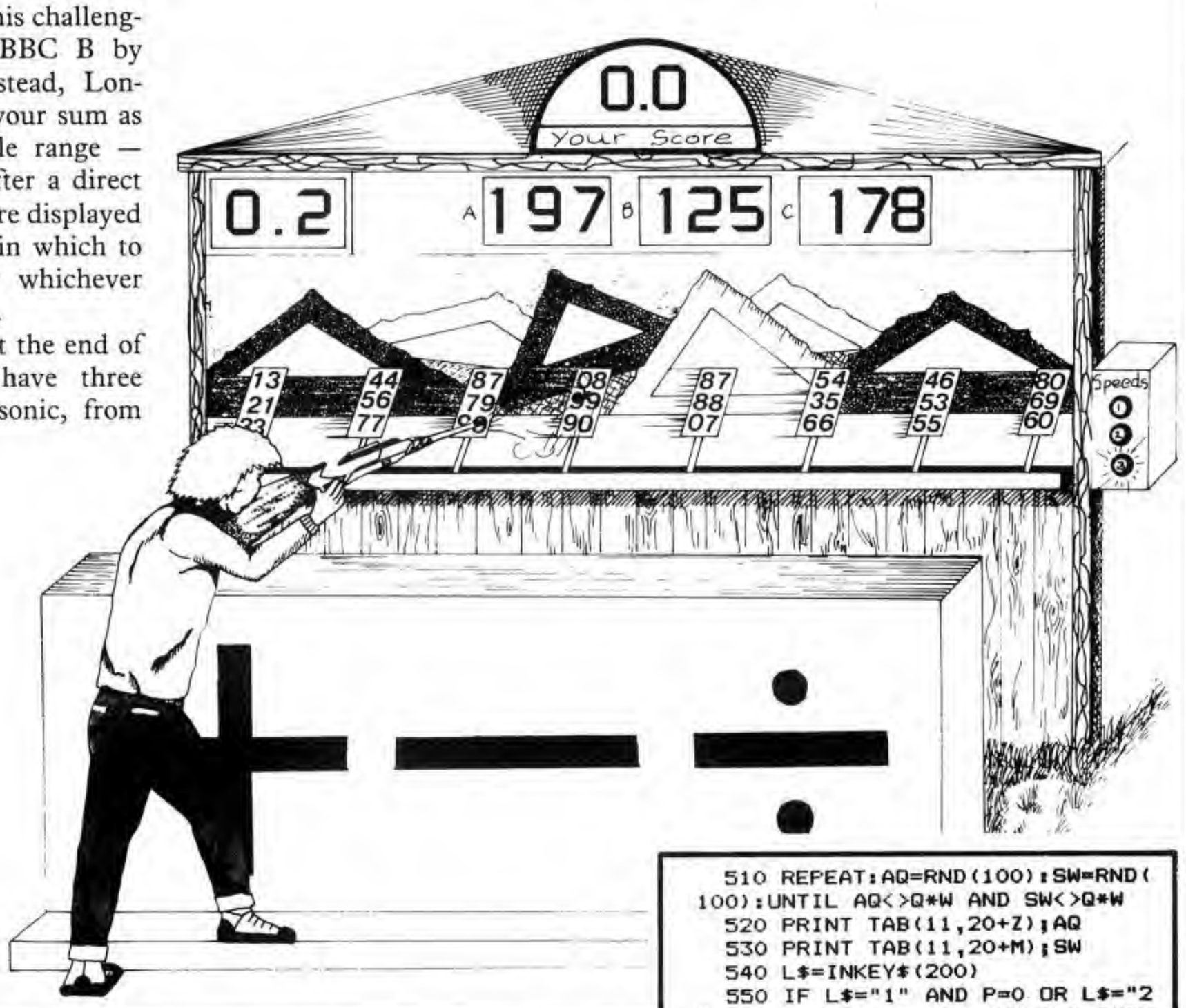
Beasty Arm:
Maximum reach: 340mm, maximum lift: 400mm, maximum load: 75gms, point to point time: less than 0.5 secs.

SNAP:
Resolution up to 256×128, up to 20 frames/second, up to 8 grey levels. **SNAP – £99.95**
(P-Snap1)

MATHSGROUND

TEST YOUR reflexes as well as your arithmetic in this challenging game for the BBC B by Nicholas Green of Hampstead, London. First you must shoot your sum as it whizzes past on the rifle range — press RETURN to fire. After a direct hit, three possible answers are displayed and you have two seconds in which to key either 1, 2 or 3 for whichever answer you think is correct.

Your score is displayed at the end of **Mathsground** and you have three speeds, from fast to supersonic, from which to choose.

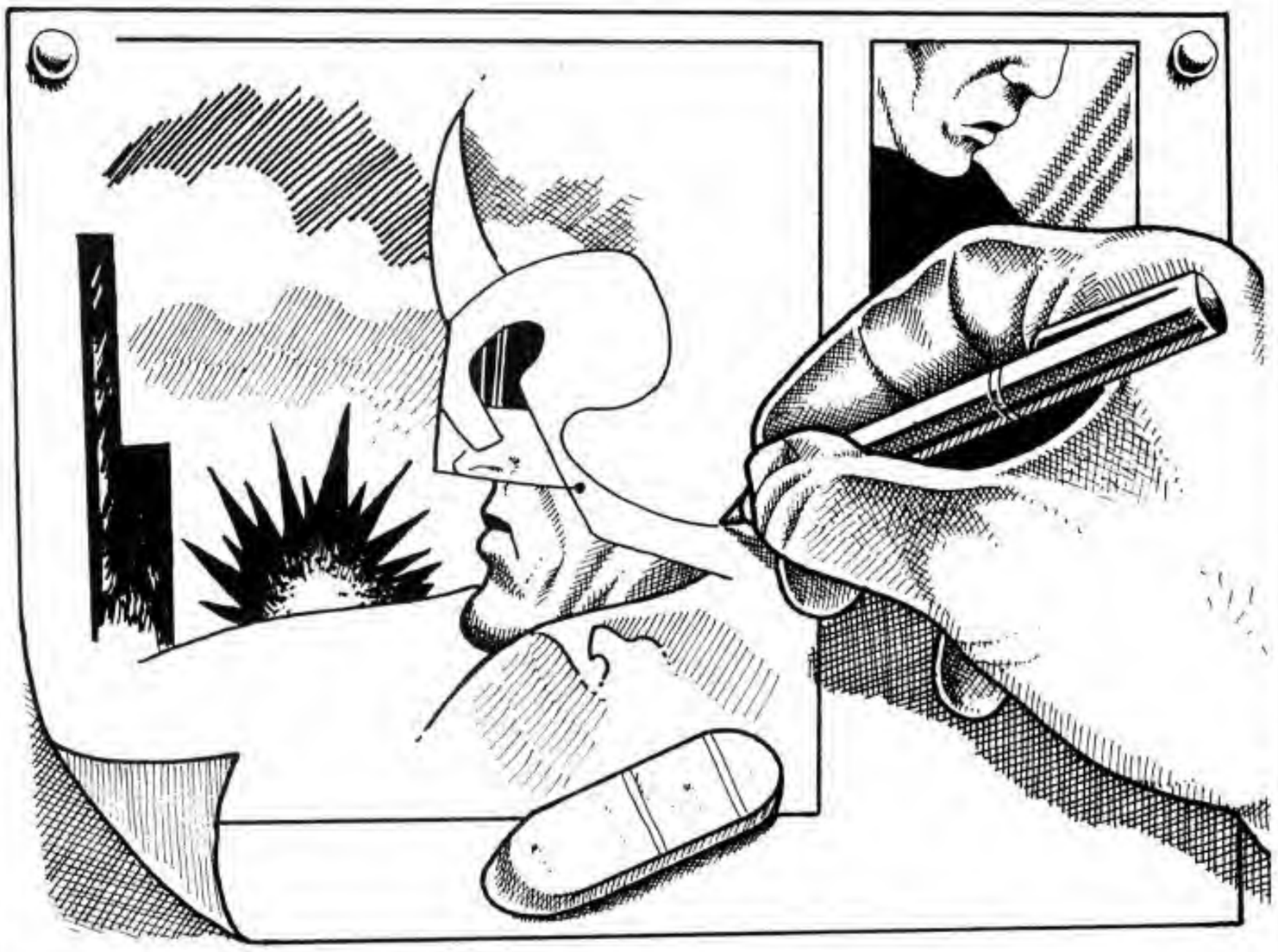



```
  10 HIGH%=0
  20 MODE 7
  30 VDU 23;8202;0;0;0;
  40 PROCspeed
  50 MODE 2
  60 ENVELOPE 2,1,0,0,0,0,0,0,1
26,-4,0,-1,126,0
  70 VDU 23;8202;0;0;0;
  80 VDU 23,240,8,8,16,8,4,8,16
,8,23,241,8,127,127,0,0,0,0,0
  90 F=0:SC=0:SHOTS=20:end=0
 100 Q=RND(9):W=RND(9)
 110 PROCtitle
 120 PROCline
 130 PRINT TAB(1,30);"Shots=";S
HOTS
 140 PRINT TAB(1,29);"Score=";S
C
 150 FOR T=0 TO 15
 160 PRINT TAB(T,10);" ";Q;"*";
W
 170 move=INKEY(0)
 180 IF move=13 AND F=0 THEN SO
UND 0,2,4,7:F=1:Y=28:SHOTS=SHOTS
-1
 190 IF F=1 THEN PROCfire:IF en
d=1 THEN GOTO 20
 200 IF F<>1 THEN FOR R=0 TO 20
:NEXT
 210 FOR STALL=0 TO SPEED*20:NE
XT STALL
 220 NEXT T
 230 PRINT TAB(16,10);"    "
 240 GOTO 150
 250 DEF PROCline
 260 PRINT TAB(10,30);CHR$(241)
 270 GCOL 0,3
 280 MOVE 0,670
 290 DRAW 1250,670
 300 ENDPROC
 310 DEF PROCtitle
 320 COLOUR 6
 330 PRINT TAB(5,2);"WELCOME TO
"
 340 PRINT TAB(4,4);"MATHS GROU
ND"
 350 COLOUR 1
 360 ENDPROC
 370 DEF PROCfire
 380 PRINT TAB(10,Y);CHR$(240)
 390 IF Y<9 THEN F=0:PRINT TAB(
10,Y);" ":PROCline:PRINT TAB(1,3
0);"Shots=";SHOTS:IF SHOTS<10 TH
EN PRINT TAB(8,30);" ":IF SHOTS=
0 THEN PROCagain:end=1:ENDPROC
 400 IF T>=7 AND T<=9 AND Y=10
THEN PROChit:PROCline:PROCtitle
 410 Y=Y-1
 420 PRINT TAB(10,Y+2);" "
 430 ENDPROC
 440 DEF PROChit
 450 SOUND 1,-15,150,1
 460 PRINT TAB(8,10);"      "
 470 PRINT TAB(8,20);"1)";TAB(8
,21);"2)";TAB(8,22);"3)"
 480 P=(RND(3))-1
 490 T=0:PRINT TAB(11,20+P);Q*W
 500 REPEAT:Z=(RND(3))-1:M=(RND
(3))-1:UNTIL Z<>M AND M<>P AND Z
<>P
 510 REPEAT:AQ=RND(100):SW=RND(
100):UNTIL AQ<>Q*W AND SW<>Q*W
 520 PRINT TAB(11,20+Z);AQ
 530 PRINT TAB(11,20+M);SW
 540 L$=INKEY$(200)
 550 IF L$="1" AND P=0 OR L$="2
" AND P=1 OR L$="3" AND P=2 THEN
 SOUND 1,-15,150,1:SC=SC+1:ELSE
SOUND 0,-15,50,4
 560 CLS
 570 PRINT TAB(1,29);"Score=";S
C
 580 Q=RND(9):W=RND(9)
 590 ENDPROC
 600 DEF PROCagain
 610 SOUND 1,-15,30,5:SOUND 1,-
15,50,5:SOUND 1,-15,20,10:SOUND
1,-15,50,5
 620 IF SC=20 THEN COLOUR 10:PR
INT TAB(2,2);"CONGRATULATIONS":P
RINT TAB(3,4);"20 OUT OF 20!"
 630 COLOUR 3
 640 PRINT TAB(0,14);"PRESS THE
 SPACE BAR"
 650 PRINT TAB(2,16);"TO HAVE A
NOTHER"
 660 PRINT TAB(3,18);"CRACK AT
'EM!"
 670 IF SC>HIGH% THEN HIGH%=SC:
COLOUR 10
 680 PRINT TAB(3,21);"High scor
e=";HIGH%
 690 REPEAT UNTIL GET=32
 700 CLS
 710 ENDPROC
 720 DEF PROCspeed
 730 PRINT TAB(5,10);"Enter spe
ed (1-FAST to 3-SLOW)"
 740 REPEAT:G=GET:UNTIL G<52 AN
D G>48
 750 LET SPEED=G-49
 760 ENDPROC
```

DOODLER

THE SCREEN becomes a sketching pad in **Doodler,** a drawing program for the BBC B written by Stephen Flood of Thornton Cleveleys, Lancashire.

You can use the up and down cursor keys to choose the width of your nib and pressing RETURN allows you to toggle through the colours. Move your nib by keying Z, X, * and ?.



```
   10 REM ************************
*
   20 REM ** DOODLER (artwork) *
*
   30 REM **   by S.T.Flood    *
*
   40 REM ************************
*
   50 MODE7
   60 PROCsetup:PROCinstruct
   70 MODE2
   80 REPEAT
   90 PROCscreen:PROCdraw
  100 UNTIL end=TRUE
  110 MODE7:END
  120
  130 DEFPROCsetup
  140 VDU23;8202;0;0;0;
  150 VDU23,224,136,216,112,32,3
2,112,216,136
  160 VDU23,225,136,136,216,112,
32,32,32,32
  170 VDU23,226,238,170,138,138,
138,138,170,238
  180 VDU23,227,14,10,10,234,10,
10,10,14
  190 VDU23,228,246,149,149,245,
165,181,149,150
  200 VDU23,229,142,138,138,138,
138,138,138,238
  210 VDU23,230,175,169,169,175,
170,171,169,233
  220 VDU23,231,146,146,210,242,
242,178,146,146
  230 VDU23,232,224,144,144,224,
144,144,144,224
  240 VDU23,233,242,130,130,242,
18,18,18,242
  250 VDU23,234,247,20,36,38,68,
68,132,247
  260 VDU23,255,255,255,255,255,
255,255,255,255
  270 ENDPROC
  280
  290 DEFPROCscreen
  300 X%=0:Y%=0:N%=20:C%=1
  310 VDU12,23;8202;0;0;0;
  320 GCOL0,1:MOVE 340,1004
  330 DRAW 340,96:DRAW 1260,96
  340 DRAW 1260,1004:DRAW 340,10
04
  350 VDU24,350;100;1250;1000;29
,800;550;
  360 VDU31,0,2,17,7,224,226,227
,228,31,0,4:PRINT;X%
  370 VDU31,0,6,225,226,227,228,
31,0,8:PRINT;Y%
  380 VDU31,0,11,226,229,230,17,
1,31,0,13,255,31,2,13:PRINT;C%
  390 VDU31,0,16,17,7,231,232,23
3,234,31,0,18:PRINT;N%
  400 ENDPROC
  410
  420 DEFPROCdraw
  430 end=FALSE
  440 REPEAT
  450 COLOUR7
  460 IF INKEY(-98) X%=X%-4:IF X
%>-450 PRINTTAB(0,4);X%;" "
  470 IF INKEY(-67) X%=X%+4:IF X
%<450 PRINTTAB(0,4);X%;" "
  480 IF INKEY(-73) Y%=Y%+4:IF Y
%<450 PRINTTAB(0,8);Y%;" "
  490 IF INKEY(-105) Y%=Y%-4:IF
Y%>-450 PRINTTAB(0,8);Y%;" "
  500 IFINKEY(-58) N%=N%+1:PRINT
TAB(0,18);N%;" ";:IF N%>100 N%=1
00
  510 IFINKEY(-42) N%=N%-1:COLOU
R7:PRINTTAB(0,18);N%;" ";:IF N%<
0 N%=0
  520 IFINKEY(-74) PROCcol
  530 IFINKEY(-87) end=TRUE
  540 IF X%<-450 X%=-450
  550 IF X%>450 X%=450
  560 IF Y%<-450 Y%=-450
  570 IF Y%>450 Y%=450
  580 IF N%>0 PROCline
  590 *FX15,1
  600 UNTIL INKEY(-97) OR end=TR
UE
  610 VDU26
  620 ENDPROC
  630
  640 DEFPROCcol
  650 C%=C%+1
  660 IF C%>15 C%=0
  670 VDU31,0,13,17,C%,255,31,2,
13:PRINT;C%
  680 IF C%=0 VDU31,2,13,17,7:PR
INT;C%;" "
  690 GCOL0,C%
  700 FOR DE=1 TO 400:NEXT
  710 ENDPROC
  720
  730 DEFPROCline
  740 MOVE X%-N%,Y%:DRAW X%+N%,Y
%
  750 MOVE X%,Y%+N%:DRAW X%,Y%-N
%
  760 ENDPROC
  770
  780 DEFPROCinstruct
  790 FOR A=1 TO 2
  800 PRINTTAB(12,A);CHR$141;CHR
$130;"DOODLER";:NEXT
  810 PRINT''CHR$132;" DOODLER";
CHR$135;"is a drawing program wr
itten  for the BBC Model B"
  820 PRINT'"The program uses Mo
de 2 when drawing    allowing al
l 16 colours to be used. To"
  830 PRINT"move the nib use the
 'Z','X','*' and    '?' keys.To
toggle the ink colour press"
  840 PRINT"<RETURN>. To increas
e or decrease the   size of the
nib use the up and down"
  850 PRINT"cursor keys. If you
wish to start again press the <T
AB> key."
  860 PRINT'" Finally,when you w
ant to leave the     program pre
ss 'L'."
  870 PRINTTAB(8,23);CHR$129;CHR
$136;"PRESS <SPACE BAR>..."
  880 REPEAT:K=GET:UNTILK=32
  890 ENDPROC
```

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BLAGGER Brand-new 20 SCREEN fully animated graphic game. (It's quite a lot like M*N*C M*N*R, actually.) Beautiful graphics, the screen is alive with movement as you try to collect keys to the safes. Each of the 20 screens is a different puzzle, with a different solution. Will your burglar make it? You'll certainly make him try for weeks! NO STIX. **(Alligata) £7.95**

PETTIGREW'S DIARY Intriguing new 3-part graphic + text adventure. Each chapter loads separately and you must finish each to reach the next! Can you unravel the secrets of the diary in the **Burning Farmhouse** (what must you rescue? How?) in **London Frolics** (realtime text adventure; collect information, not objects) and in **European Trek** (8 separate challenges!). The most challenging adventure we've met recently - and varied enough to keep you interested. NO STIX. **(Shards) £7.95**

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FORTRESS Too new for reviews, this **'ZAXXON'** -type game works beautifully on your Beeb. As Pace say ... the Fortress awaits you. It is a classic computer game, in a smashing 3D graphic form. All the features you would expect, plus a Hall of Fame. Fast and furious. STIX OK. **(Pace) £8.95**

POOL A very realistic simulation in this game for two players. (With very good Scott Joplin music, too!) You can play solo to perfect your technique. Excellent and smooth hi-res colour graphics make the full-screen table a pleasure to play on. You control the cue angle and strength of shot and can get it down to a fine art. Choose the frames to play, too. Great display: very satisfying program. NO STIX. **(Dynabyte) £7.95**

LORDS OF TIME *"Some of the most intriguing puzzles I've come across ... not to be missed". (Home CompWkly) "Executed with wonderful style ... highly recommended". (PopCompWkly)* In this text-puzzle adventure you must collect 9 objects, each marked with an hourglass, from different timezones - from the Ice Age to the Space Age. 200+ locations, 750 messages, 80 objects, vocabulary over 200 words. Beautifully written and more sophisticated than ever. NO STIX **(Level 9) £9.90**

PINBALL ARCADE *"As professional a piece of software as you are likely to find ... the graphics are exceptionally good" (C&V Games)* **DESIGN YOUR OWN PINBALL TABLES!** One example is included, but the fun is designing, playing and saving your own. You can add or take away or move 38 different features - springs, wires, flashing lights, bumpers. Alter their scores, their bounce. Alter the flippers, even tilt the table. Change just about everything, quickly and easily. Then play with the results. Be your own Pinball Wizard. NO STIX. **(Kansas) £9.90**

BIRDIE BARRAGE *"Very little to fault ... well-presented, and as accurate as you're going to get". (PersCompNews)* The best golf game we've seen for the Beeb. Acorn Park Golf Course has 18 holes, 72 par. You have a full bag of clubs and full screen graphics to play with. Set direction and power of each shot very accurately - and watch your ball in flight. Special detailed display when you reach the green. Wind strength, direction, changes between holes. NO STIX. **(Computasolve) £7.95**

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CYLON ATTACK *"Stands head and shoulders above the rest" (Acorn User) "Excellent ... the standard by which other games will be judged" (Micro User). "A superb program with excellent graphics" (CompChoice)* You will really believe you are launching from and docking with a mother ship: you will see and feel you are refuelling: you will know exactly when you can kill the enemy. UNIQUE 50-PLACE HI-SCORE TABLE CAN BE SAVED. Great. And 3D, of course. STIX OK. **(A & F) £7.90**

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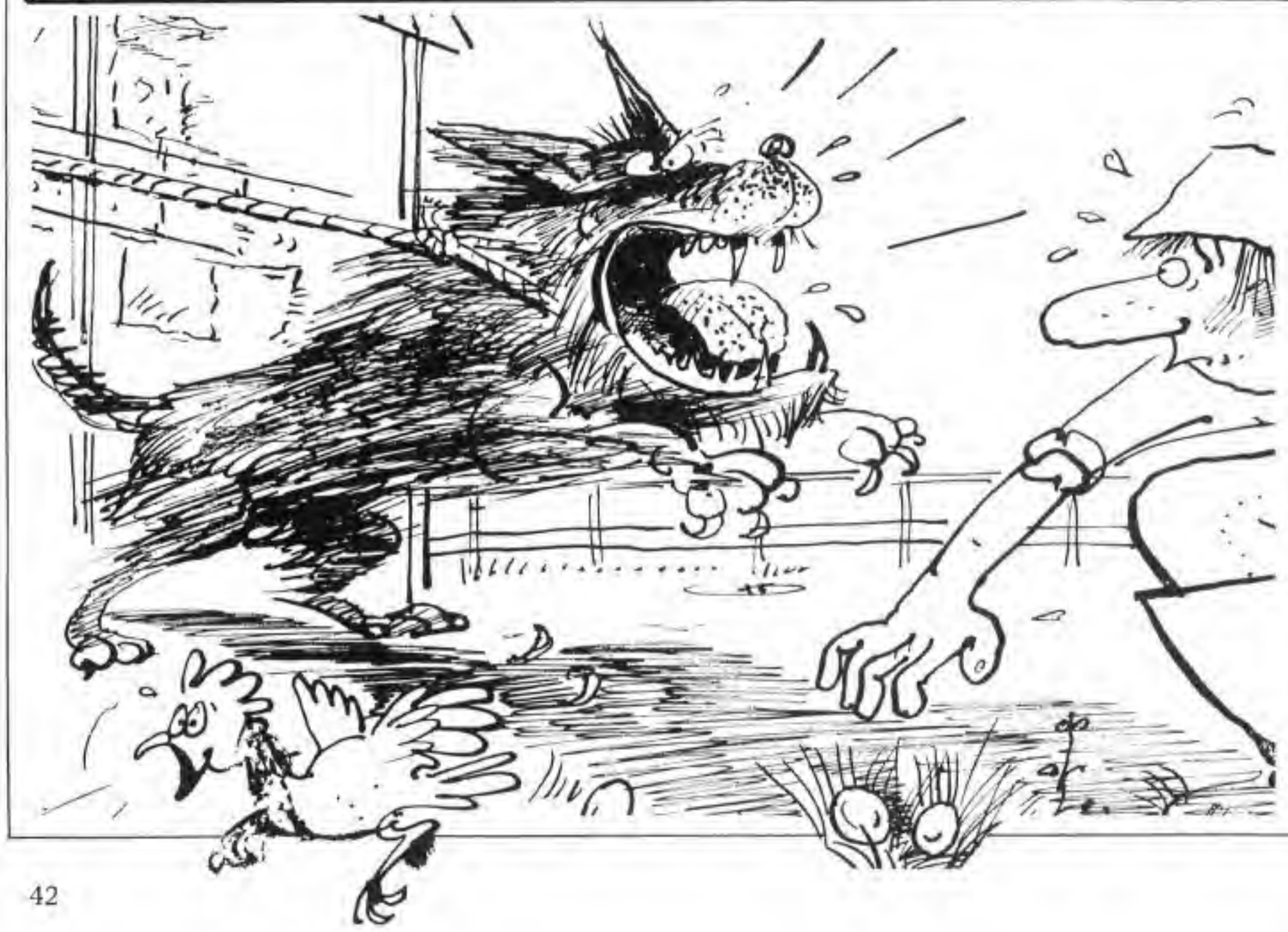
on the FARM

OUR HERO Dennis is trying to gather the eggs which are scattered about the farmyard. If he does not collect enough in the required time, he will lose his job and, to make matters worse, he leaves behind him a deadly trail of weedkiller which he cannot cross.

Move Dennis by using Z to go left, X to go right, * to go up and ? to go down. The SPACE bar allows you to jump out of the weedkiller trap, but you can do that only once a day. Beware of the guard dogs which can make you lose a life — you have three lives initially.

On the Farm was written for the BBC B by Stephen Flood of Thornton Cleveleys, Lancashire.

```
   10 REM ************************
**
   20 REM ** DENNIS ON THE FARM
**
   30 REM **     by S.T.Flood
**
   40 REM ************************
**
   50 ONERROR IF ERR=17 RUN ELSE
 PRINT''':REPORT:PRINT" at line
";ERL:END
   60 MODE7
   70 PROCinit:PROCinstruct
   80 REPEAT: PROCvar:MODE2
   90 PROCsetup:PROCplay
  100 MODE7:PROCendgame
  110 UNTIL FALSE
  120
  130
  140 DEFPROCinit
  150 HI%=0:E%=0
  160 VDU23,224,60,126,66,126,90
,102,126,60
  170 VDU23,225,0,0,0,0,36,24,0,
0
  180 VDU23,227,0,0,40,0,0,0,0,0
  190 VDU23,228,0,0,20,0,0,0,0,0
  200 VDU23,229,60,86,255,181,23
7,191,106,60
  210 VDU23,230,0,40,0,74,18,64,
20,0
  220 VDU23,233,1,97,187,242,30,
51,33,0
  230 VDU23,234,34,0,68,13,33,0,
0,33
  240 VDU23,255,255,255,255,255,
255,255,255,255
  250 ENVELOPE 1,2,3,-6,3,1,1,1,
127,0,0,-127,126,126
  260 ENVELOPE 2,4,-8,4,-12,1,1,
1,127,0,0,-127,126,126
  270 ENDPROC
  280
  290
  300 DEFPROCsetup
  310 VDU12,23;8202;0;0;0;4,19,1
,0;0;19,2,0;0;19,3,0;0;19,7,0;0;
  320 COLOUR1:COLOUR135
  330 PRINTTAB(0,0);" DENNIS ON
THE FARM ";
  340 COLOUR7:COLOUR128
  350 PRINTTAB(0,2);"DAY   ";D%;T
AB(9,2);"LIVES ";M%;TAB(0,3);"EG
GS ";EG%-E%;
  360 PRINTTAB(9,3);"HI     '";HI
%;TAB(0,4);"TIME ";T%;TAB(9,4);"
MONEY '";S%;
  370 GCOL0,2:MOVE0,0:MOVE0,832:
PLOT85,1279,0:PLOT85,1279,832
  380 VDU20,5:X%=640:Y%=832:
  390 PROCdennis(X%,Y%)
  400 FOR C=1 TO DOG%:PROCdog(RN
D(18)*64,832-(RND(24)*32)):NEXT
  410 ENDPROC
  420
  430
  440 DEFPROCplay
  450 REPEAT:E%=0:J=FALSE
  460 REPEAT:IF L=TRUE PROCsetup
  470 REPEAT:EX%=RND(18)*64:EY%=
832-(RND(24)*32):UNTIL POINT(EX%
,EY%)<>3
  480 PROCegg(EX%,EY%):TIME=0
  490 REPEAT:L=FALSE:B=FALSE
  500 IFINKEY(-98) PROCleft
  510 IFINKEY(-67) PROCright
  520 IFINKEY(-73) PROCup
  530 IFINKEY(-105) PROCdown
  540 IF INKEY(-99) PROCjump
  550 IFINKEY(-56) PROCpause
  560 PROCupdate
  570 UNTIL (X%=EX% AND Y%=EY%)
OR L=TRUE OR B=TRUE
  580 IF B=TRUE VDU4,31,15,2:PRI
NT;M%-1;:VDU5:PROCloseman(3,"BIT
TEN BY A DOG")
  590 UNTIL M%=0 OR E%=EG%
  600 IF E%=EG% SOUND 1,2,150,10
  610 EG%=EG%+1:T%=T%-1:D%=D%+1:
DOG%=DOG%+2:S%=S%+(20*D%):L=TRUE
  620 UNTIL M%=0:ENDPROC
  630
  640
  650 DEFPROCleft
  660 IF POINT(X%-32,Y%)=3 ENDPR
OC
  670 IF POINT(X%-32,Y%-16)=1:B=
TRUE
  680 SOUND 1,-15,180,1
  690 VDU25,4,X%;Y%;18,0,3,255
  700 X%=X%-64:IF X%<0 X%=1216
  710 PROCdennis(X%,Y%):S%=S%+1:
ENDPROC
  720
  730
  740 DEFPROCright
  750 IF POINT(X%+96,Y%)=3 ENDPR
OC
  760 IF POINT(X%+96,Y%-16)=1:B=
TRUE
  770 SOUND 1,-15,180,1
  780 VDU25,4,X%;Y%;18,0,3,255
  790 X%=X%+64:IF X%>1216 X%=0
  800 PROCdennis(X%,Y%):S%=S%+1:
ENDPROC
  810
  820
  830 DEFPROCup
  840 IF POINT(X%+32,Y%+16)=3 EN
DPROC
  850 IF POINT(X%+32,Y%+16)=1:B=
```



```
TRUE
  860 SOUND 1,-15,180,1
  870 VDU25,4,X%;Y%;18,0,3,255
  880 Y%=Y%+32:IF Y%>832 Y%=32
  890 PROCdennis(X%,Y%):S%=S%+1:
ENDPROC
  900
  910
  920 DEFPROCdown
  930 IF POINT(X%+32,Y%-48)=3 EN
DPROC
  940 IF POINT(X%+32,Y%-48)=1:B=
TRUE
  950 SOUND 1,-15,180,1
  960 IF POINT(X%+32,Y%-48)=1:bi
t=TRUE
  970 VDU25,4,X%;Y%;18,0,3,255
  980 Y%=Y%-32:IF Y%<32 Y%=832
  990 PROCdennis(X%,Y%):S%=S%+1:
ENDPROC
 1000
 1010
 1020 DEFPROCvar
 1030 VDU23;8202;0;0;0;:L=FALSE:
M%=3
 1040 S%=0:D%=1:T%=15:EG%=5:DOG%
=10
 1050 ENDPROC
 1060
 1070
 1080 DEFPROCjump
 1090 IF J=TRUE ENDPROC
 1100 VDU25,4,X%;Y%;18,0,3,255
 1110 REPEAT:X%=(RND(18)*64):Y%=
832-(RND(24)*32):UNTIL POINT(X%,
Y%)<>3
 1120 PROCdennis(X%,Y%):J=TRUE:E
NDPROC
 1130
 1140 DEFPROCendgame
 1150 *FX15,1
 1160 FOR C=1 TO 2
 1170 PRINTTAB(5,C);CHR$141;CHR$
129;"DENNIS ON THE FARM":NEXT
 1180 PRINTTAB(3,4);CHR$133;"YOU
 HAVE BEEN FIRED AFTER ";D%;" DA
YS,"';CHR$133;"HAVING EARNED `";
S%
 1190 IF S%>HI% THEN PRINT'TAB(2
);CHR$131;"A NEW HISCORE!!! CONG
RATULATIONS!!":HI%=S%
 1200 PRINT''TAB(8);"PRESS SPACE
 TO PLAY"
 1210 REPEATUNTILGET=32:ENDPROC
 1220
 1230
 1240 DEFPROCpause
 1250 *FX15,1
 1260 W=TIME:REPEAT:K$=GET$:UNTI
L K$="R":TIME=W
 1270 ENDPROC
 1280
 1290
 1300 DEFPROCupdate
 1310 TL=INT(T%-(TIME/100))
 1320 VDU4,31,16,4:PRINT;S%;:VDU
31,5,4:PRINT;TL;" ";
 1330 IF TL=0:VDU31,15,2:PRINT;M
%-1;:PROCloseman(4,"NO TIME LEFT
")
 1340 IF X%=EX% AND Y%=EY% E%=E%
+1:S%=S%+10:SOUND 1,1,100,10:VDU
31,5,3:PRINT;EG%-E%;" ";
 1350 VDU5:ENDPROC
 1360
 1370
 1380 DEFPROCloseman(P,M$)
 1390 SOUND0,-15,20,10:L=TRUE:M%
=M%-1
 1400 VDU4,31,P,20:PRINT;M$;
 1410 PROCdelay(5000):ENDPROC
 1420
 1430
 1440 DEFPROCinstruct
 1450 FOR C=1 TO 2
 1460 PRINTTAB(2,C);CHR$141;CHR$
129;"DENNIS ON THE FARM":NEXT
 1470 PRINT'"  Dennis has manage
d to find a job on a farm where
he must collect a required  num
ber of eggs each day. He also ha
s to collect each egg in a requi
red time or  else he will loose
a life. On loosing"
 1480 PRINT"three lives he will
be fired. Dennis  also looses
a life if he stops to strokethe
guard dogs protecting the eggs.
To  make matters even more diffi
cult Dennis leaves a trail of we
ed killer as he"
 1490 PRINT"moves, which he can
not pass over. If  Dennis is tr
apped he has enough energy  to j
ump to any place on the farm, bu
t  this can only be done once a
 day."
 1500 PRINT'"Keys..."
 1510 PRINT"  Z _ LEFT        X _
 RIGHT"
 1520 PRINT"  * _ UP          ? _
 DOWN"
 1530 PRINT"  <SPACE> _ JUMP"
 1540 PRINTTAB(8,23);CHR$133;CHR
$136;"PRESS <SPACE BAR>"
 1550 REPEATUNTILGET=32:ENDPROC
 1560
 1570
 1580 DEFPROCdelay(P)
 1590 FOR Z=1 TO P:NEXT
 1600 ENDPROC
 1610
 1620
 1630 DEFPROCdennis(A%,B%)
 1640 VDU 25,4,A%;B%;18,0,7,224,
8,18,0,1,225,8,18,0,8,227,8,18,0
,15,228
 1650 ENDPROC
 1660
 1670
 1680 DEFPROCegg(A%,B%)
 1690 VDU 25,4,A%;B%;18,0,4,229,
8,18,0,6,230
 1700 ENDPROC
 1710
 1720
 1730 DEFPROCdog(A%,B%)
 1740 VDU 25,4,A%;B%;18,0,1,233,
8,18,0,7,234
 1750 ENDPROC
```

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QUADRATICS

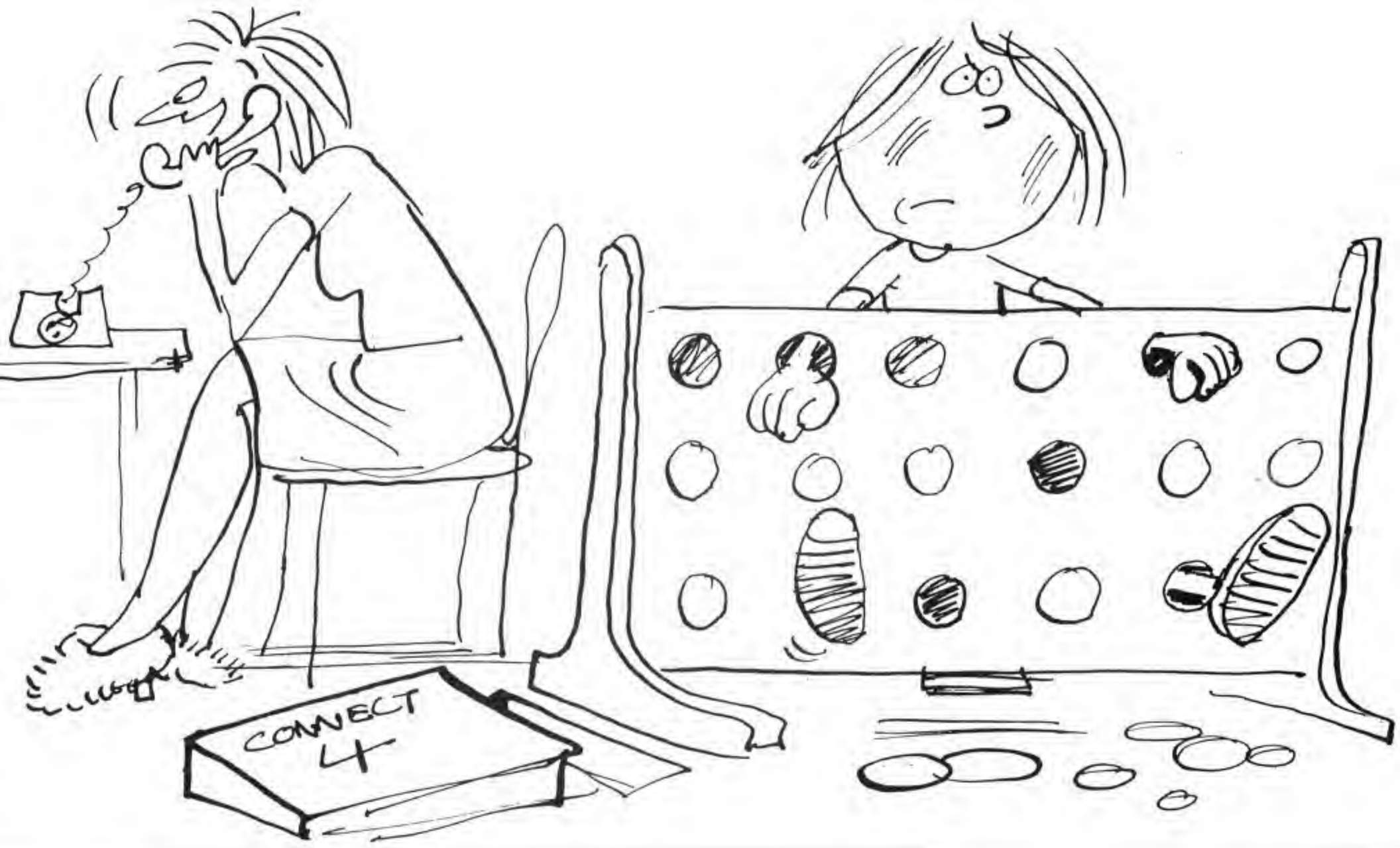
WRITTEN with O level students in mind, **Quadratics** for the Electron solves quadratic equations and is particularly useful for checking homework. The program was written by Philip Robinson of Macclesfield, Cheshire.

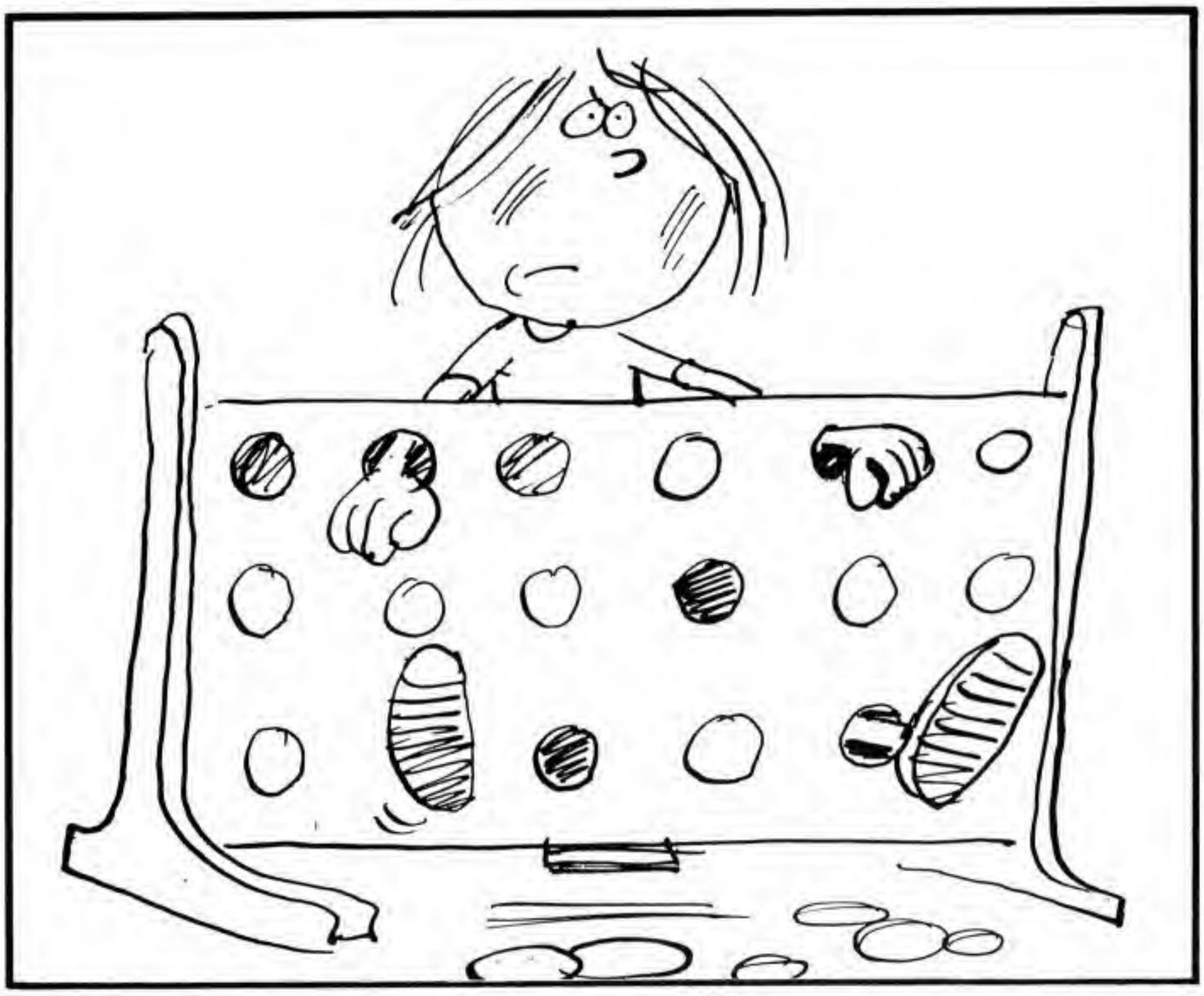
```
  10 REM QUADRATICS
  20 CLS
  30 @% = 12
  40PRINTTAB(0,3)"TO SOLVE"
  50PRINT"QUADRATIC"
  60PRINT"EQUATIONS"
  70PRINT   "OF THE TYPE:"
  80PRINT'"ax^2 + bx + c = 0
(a must not = zero)"
  90PRINT"ENTER VALUE FOR a"

 100 INPUTTAB(18,10)A
 110PRINT' "ENTER VALUE FOR b"

 120INPUT TAB(18,12)B
 130PRINT' "ENTER VALUE FOR c"

 140INPUT TAB(18,14)C
 150S = B^2 - (4*A*C)
 160 IF S<0 PROCnegsquare
 170T = SQR(S)
 180X = (-B-T)/(2*A)
 190Y = (-B+T)/(2*A)
 200PRINT'"The solutions to 4 d
ecimal"
 210PRINT"places are:-"
 220 @% = &2040A
 230PRINT' X
 240 PRINT "and"
 250PRINT Y
 260  PRINTTAB(25,20)"AGAIN? Y/
N"
 270 INPUTTAB(37,20)Q$
 280 IF Q$ = "Y":GOTO 20

 290 CLS
 300 PRINTTAB(18,12)"END"
 310 VDU 26
 320 END
 330 DEF PROCnegsquare
 340 PRINT' "Your equation has
imaginary roots."
 350 PRINT "To try again hit sp
ace bar."
 360 H$=GET$
 370 IF H$=" "GOTO 20
 380 ENDPROC
```

Join 'Em Up

FANS of Connect Four, the rack and counters game, will welcome **Join 'em Up** for the BBC B by Ian Thomas of Didsbury, Manchester. The game is designed for two players, each of whom tries to be the first to position markers either vertically, horizontally or diagonally to produce an uninterrupted row of four. Use keys 1-7 to drop your markers into the labelled slots.

```
   10 REM *** JOIN'EM'UP ***
   20 REM *** BY IAN THOMAS ***
   30 REM *** 06/03/84 ***
   40 *FX11,0
   50 MODE7
   60 PRINTTAB(5,5)CHR$(141)CHR$
(133)"J O I N  E M '  U P !!"
   70 PRINTTAB(5,6)CHR$(141)CHR$
(131)"J O I N  E M '  U P !!"
   80PRINT TAB(3,8)CHR$(134)"DO
YOU KNOW HOW TO PLAY Y/N"
   90 Q$=GET$
  100 IF Q$="N" THEN PROCINSTRUC
T
  110 CLEAR
  120 MODE4
  130 VDU 19,0,4,0,0,0
  140 VDU 19,3,3,0,0,0
  150 PROCSCREEN
  160 M=2:D=42:DIM Z(6,7),M$(2)
  170 M$(1)="CROSSES":M$(2)="NOU
GHTS"
```





```
  180 TIME=0:REPEAT UNTIL TIME>5
0
  190 M=M+1:IF M=3 THEN M=1
  200 PRINTTAB(2,28)M$(M)" TO MO
VE  "
  210 *FX15,0
  220 G$=GET$
  230 IF G$="1"THEN G=1
  240IF G$="2"THEN G=2
  250IF G$="3"THEN G=3
  260IF G$="4"THEN G=4
  270 IFG$="5"THEN G=5
  280IF G$="6"THEN G=6
  290IF G$="7"THEN G=7
  300 IF G$="E" THEN PROCFIN
  310 IF G$="9" THEN 110
  320 IF G$="1" OR G$="2" OR G$=
"3" OR G$="4" OR G$="5" OR G$="6
" OR G$="7" THEN 360
  330 PRINTTAB(0,29)"
                              "
  340 SOUND 1,-15,100,3
  350 PRINTTAB(0,29)"  PLEASE RE
-ENTER":GOTO 220
  360 PRINTTAB(0,29)"
                              "
  370 PRINTTAB(0,30)"
                              "
  380 X=1
  390 IF X>6 THEN GOTO 630
  400 IF Z(X,G)=0 THEN Z(X,G)=M:
PROCENTER:PROCCHECK:GOTO 190
  410 X=X+1:GOTO 390
  420 DEF PROCSCREEN
  430 VDU 23,240,255,255,255,255
,255,255,255,255
  440 FOR Y=5 TO 25 STEP 4
  450 FOR X=5 TO 33
  460 PRINT TAB(X,Y)CHR$(240):NE
XT:NEXT
  470 FOR X=5 TO 34 STEP4
  480 FOR Y=2 TO 25
  490 PRINT TAB(X,Y)CHR$(240):NE
XT:NEXT
  500 FOR X=2 TO 27 STEP 4
  510READ A$
  520 PRINTTAB(X+5,26)A$
  530 NEXT
  540 DATA 1,2,3,4,5,6,7
  550 ENDPROC
  560 DEF PROCENTER
  570 SOUND 1,-10,30,2
  580 VDU 23,240,195,231,126,60,
60,126,231,195
  590 VDU 23,241,60,126,255,255,
255,255,126,60
  600 PRINTTAB(4*G+3,27-4*X)CHR$
(239+M)
  610 IF Z(6,1)<>0 AND Z(6,2)<>0
 AND Z(6,3)<>0 AND Z(6,4)<>0 AND
 Z(6,5)<>0 AND Z(6,6)<>0 AND Z(6
,7)<>0 THEN PROCDRAW
  620 ENDPROC
  630 SOUND 1,-15,-1,10:PRINT TA
B(2,29)"SORY THIS LINE IS FULL ,
 TRY ANOTHER "
  640 TIME=0:REPEAT UNTIL TIME>4
0:GOTO 210
  650 DEF PROCINSTRUCT
  660 CLS
  670 PRINTTAB(5,5)CHR$(141)CHR$
(131)"J O I N  E M  '  U P !!"
  680 PRINTTAB(5,6)CHR$(141)CHR$
(133)"J O I N  E M  '  U P !!"
  690 PRINTTAB(9,8)CHR$(131)"USE
 KEYS 1 TO 7"
  700 PRINTTAB(10,9)CHR$(131)"TO
 INSERT MARKS"
  710 PRINTTAB(8,10)CHR$(131)"IN
TO LABLED SLOTS"
  720 PRINTTAB(1,12)CHR$(129)"TH
IS IS DESIGNED FOR TWO PLAYERS &
"
  730 PRINTTAB(1,13)CHR$(129)"TH
E IDEA OF THE GAME IS TO POSITIO
N"
  740 PRINTTAB(1,14)CHR$(129)"YO
UR MARKERS DIAGONALLY , HORIZONT
ALLY"
  750 PRINTTAB(1,15)CHR$(129)"OR
 VERTICALLY , SO AS TO PRODUCE A
N"
  760 PRINTTAB(1,16)CHR$(129)"UN
INTERUPTED LINE CONTAINING FOUR
OF"
  770 PRINTTAB(8,17)CHR$(129)"TH
E SAME MARKERS"
  780 PRINTTAB(7,19)CHR$(134)"9
WILL RE-START THE GAME"
  790 PRINTTAB(7,20)CHR$(134)"E
WILL END IT"
  800 PRINTTAB(5,21)CHR$(137)"PR
ESS SPACE BAR TO START NOW"
  810 G$=GET$
  820 IFG$=" "THEN 110ELSE 810
  830 ENDPROC
  840 DEF PROCCHECK
  850 X=1:Y=1
  860 IF Z(X,Y)=M THEN W=W+1 ELS
E W=0
  870 IF W=4 THEN PROCWIN
  880 Y=Y+1
  890 IF Y>7 THEN Y=1:X=X+1:W=0
  900 IF X<=6 THEN 860
  910 X=1:Y=1:W=0
  920 IF Z(X,Y)=M THEN W=W+1 ELS
E W=0
  930 IF W=4 THEN PROCWIN
  940 X=X+1
  950 IF X>6 THEN X=1:Y=Y+1:W=0
  960 IF Y<=7 THEN 920
  970 X=3:Y=1:X2=3
  980 IF Z(X,Y)=M THEN W=W+1 ELS
E W=0
  990 IF W=4 THEN PROCWIN
 1000 X=X+1:Y=Y+1
 1010 IF X<=6 THEN 980
 1020 X=X2-1:X2=X2-1:Y=1
 1030 IF X2>2 THEN W=0:GOTO980
 1040 X=1:Y=1:Y2=1:W=0
 1050 IF Z(X,Y)=M THEN W=W+1 ELS
E W=0
 1060 IF W=4 THEN PROCWIN
 1070 X=X+1:Y=Y+1
 1080 IF Y<=6 THEN 1050
 1090 X=1:Y=Y2+1:Y2=Y2+1
 1100 IF Y2<=4 THEN W=0:GOTO1050
 1110 X=1:Y=2:Y2=2:W=0
 1120 IF Z(X,Y)=M THEN W=W+1 ELS
E W=0
 1130 IF W=4 THEN PROCWIN
 1140 X=X+1:Y=Y+1
 1150 IF Y<=7 THEN 1120 ELSE W=0
 1160 Y=Y2+1:Y2=Y2+1:X=1
 1170 IF Y2<=5 THEN 1120
 1180 X=4:Y=1:X2=4:W=0
 1190 IF Z(X,Y)=M THEN W=W+1 ELS
E W=0
 1200 IF W=4 THEN PROCWIN
 1210 X=X-1:Y=Y+1
 1220 IF X>=0 THEN 1190
 1230 X=X2+1:X2=X2+1:Y=1
 1240 IF X2<=6 THEN 1190
 1250 X=6:Y=2:Y2=2:W=0
 1260IF Z(X,Y)=M THEN W=W+1 ELSE
 W=0
 1270 IF W=4 THEN PROCWIN
 1280 X=X-1:Y=Y+1
 1290 IF Y<8 THEN 1260
 1300 X=6:Y=Y2+1:Y2=Y2+1:W=0
 1310 IF Y2<=5 THEN 1260
 1320 ENDPROC
 1330 DEF PROCWIN
 1340 FOR Q=0 TO 255 STEP 4
 1350 SOUND 1,-10,Q,1:NEXT
 1360 CLS
 1370 PRINTTAB(10,5)"CONGRATULAT
IONS"
 1380 PRINTTAB(14,7)M$(M)
 1390 PRINTTAB(14,9)"YOU WIN"
 1400 PRINT "AGAIN Y/N ?"
 1410 *FX 15,0
 1420 G$=GET$
 1430 IF G$="Y" THEN 110
 1440 *FX12,0
 1450 END
 1460 DEF PROCDRAW
 1470 FOR X=0 TO -100 STEP -2
 1480 SOUND 1,-15,X,1:NEXT
 1490 TIME=0:REPEAT UNTIL TIME>5
0
 1500 CLS
 1510 PRINTTAB(5,10)"INCREDIBLE"
 1520 PRINTTAB(7,13)"A DRAW !"
 1530 GOTO 1400
 1540 DEF PROCFIN
 1550 *FX 12,0
 1560 PRINT"FINISHED !!"
 1570 END
```

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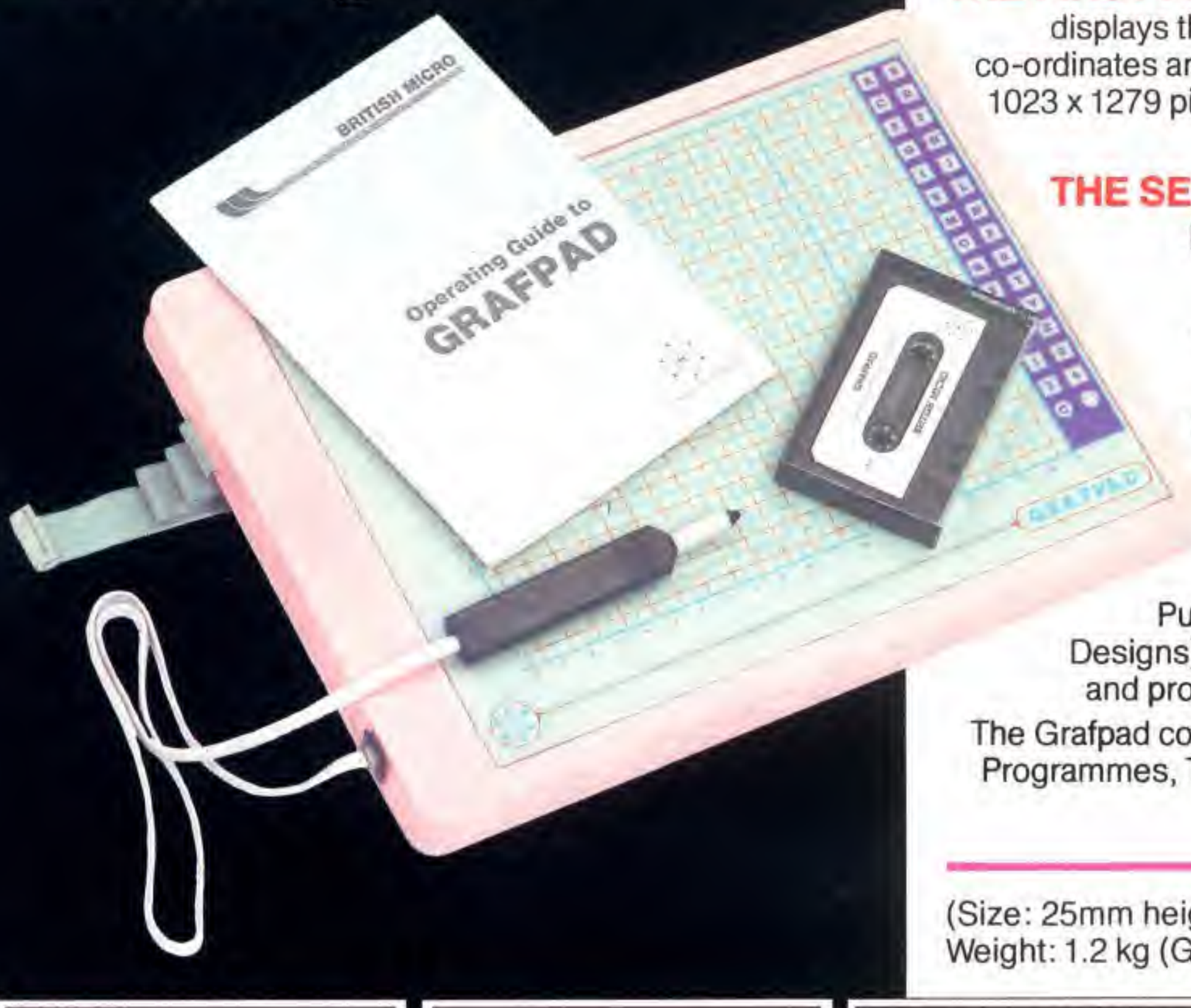

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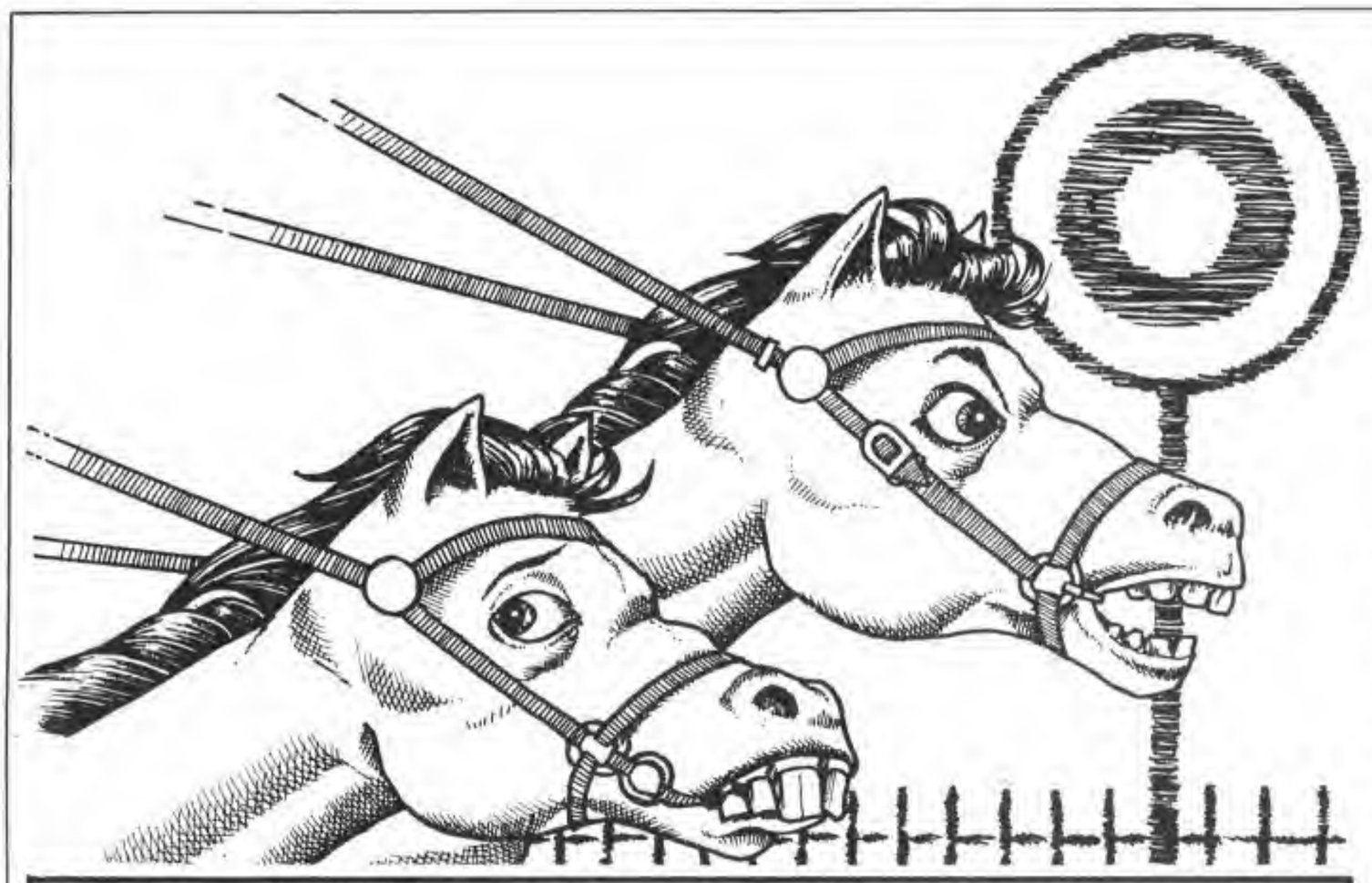


HORSE RACE

STARTING WITH £1,000, you are aiming to break the bookmakers in this betting game written for the Electron by Philip Yau of Aberdeen. Five horses are entered in the race and you choose your fancy; then sit back and see which is first past the post.

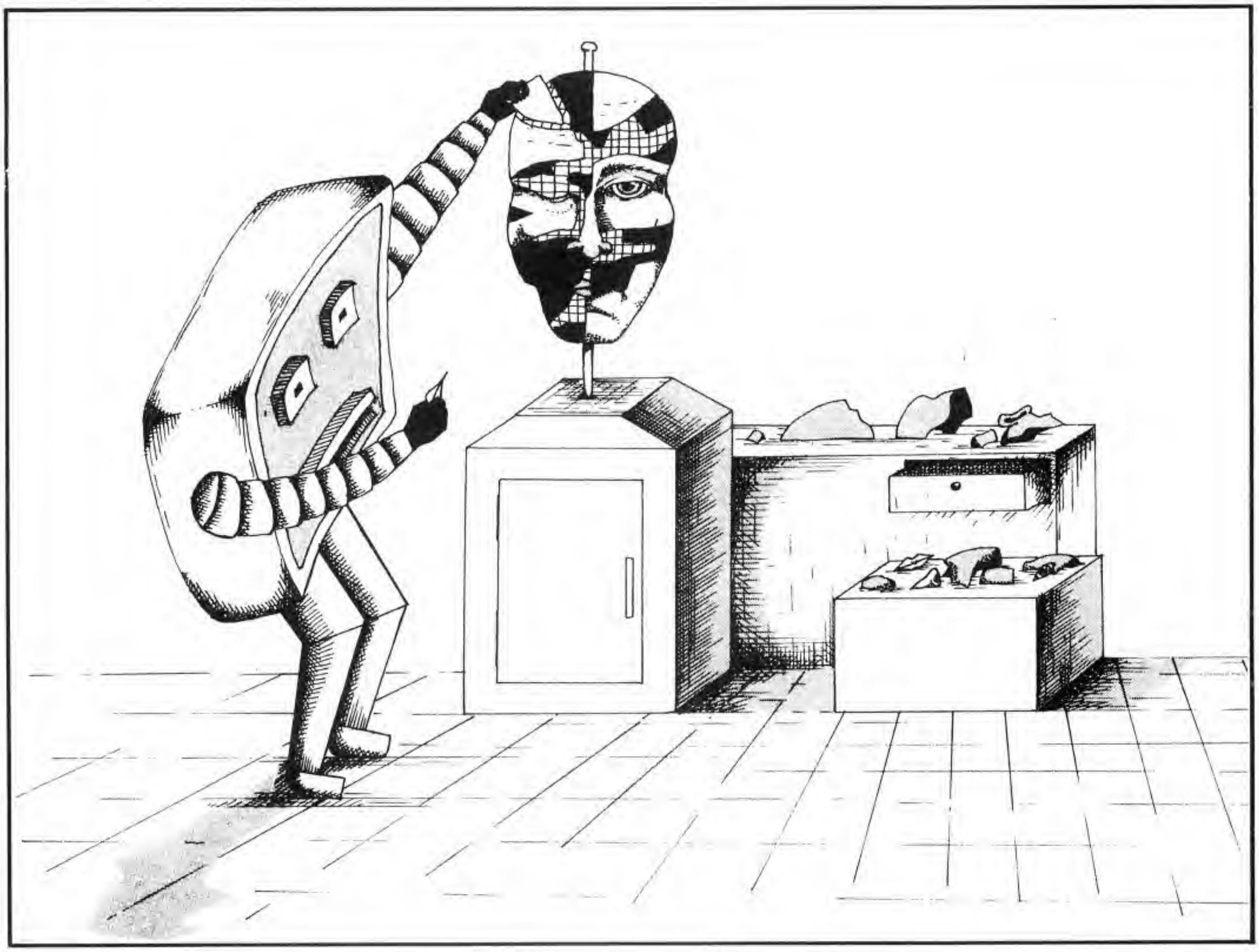
```
   10 REM ***** HORSES  ******
   11 REM *  By Philip Yau   *
   12 REM * For the Electron *
   13 REM **********************
   14:
   20 PROCdefine
   30 MONEY%=1000:X=-RND(TIME)
   40 MODE6:PRINT:PRINT;SPC15" H
ORSES"
   50 PRINT:PRINT" YOU HAVE £100
0 TO BET ON A CHOICE OF    5 HOR
SES"
   60 PRINT:PRINT" YOUR MISSION
IS TO BREAK THE BOOKIES     WHIC
H HAS ONLY £30,000"
   70 FOR Y%=1TO100:SOUND1,-10,R
ND(5)+80,1:NEXT
   80:
   90 A%=1:B%=1:C%=1:D%=1:E%=1:M
ODE6
   95 CLS
  100 IF MONEY%<=0 THEN PROCend
  110 IF MONEY%>=30000 THEN PROC
win
  120 PROCbet
  130 MODE5
  140 PROCMOVE
  145:
  150 AA%=RND(900):BB%=RND(1000)
:CC%=RND(1050):DD%=RND(1000):EE%
=RND(1100)
  160 IF A%=14 OR B%=14 OR C%=14
 OR D%=14 OR E%=14 THEN 90
  170 IF AA%<50 THEN PROCPY
  180 IF BB%<50 THEN PROCPX
  190 IF CC%<50 THEN PROCPZ
  200 IF DD%<50 THEN PROCPT
  210 IF EE%<50 THEN PROCPJ
  220 GOTO150
  230:
  240 DEFPROCdefine
  250 VDU23,225,0,0,0,15,31,47,1
94,12
  260 VDU23,226,0,8,4,234,254,24
2,16,96
  270 VDU23,230,24,60,90,255,219
,60,24,24
  280 ENDPROC
  290:
  300 DEFPROCPY:A%=A%+1:PROCMOVE
:ENDPROC
  310 DEFPROCPX:B%=B%+1:PROCMOVE
:ENDPROC
  320 DEFPROCPZ:C%=C%+1:PROCMOVE
:ENDPROC
  330 DEFPROCPT:D%=D%+1:PROCMOVE
:ENDPROC
  340 DEFPROCPJ:E%=E%+1:PROCMOVE
:ENDPROC
  350 END
  360:
  370 DEFPROCMOVE
  380 VDU23;8202;0;0;0;
  390 FOR I%=1TO20STEP10:SOUND1,-
12,106+I%,1:NEXT
  400 PRINTTAB(0,10);1;TAB(0,13)
;2;TAB(0,16);3;TAB(0,19);4;TAB(0
,22);5
  410 COLOUR2:COLOUR128:PRINTTAB
(A%,10);"  ";CHR$225+CHR$226:PRI
NTTAB(B%,13);"  ";CHR$225+CHR$22
6:PRINTTAB(C%,16);"  ";CHR$225+C
HR$226;:PRINTTAB(D%,19);"  ";CHR
$225+CHR$226:PRINTTAB(E%,22);"
";CHR$225+CHR$226
  420 FOR T%=9TO22:PRINTTAB(17,T
%)".":NEXT
  430 COLOUR1:COLOUR128:FOR T%=1
TO18 STEP 3:PRINTTAB(T%,26)CHR$2
30:NEXT
  440 IF A%=1 AND B%=1 AND C%=1
AND D%=1 AND E%=1 PROCdelay
  450 IF A%=14 OR B%=14 OR C%=14
 OR D%=14 OR E%=14 THEN PROCwinn
er
  460 ENDPROC
  470:
  490 DEFPROCwinner
  500 PRINTTAB(4,28)"THE WINNER!
!"
  510 FOR G%=100TO130:SOUND1,-15
,G%,1:NEXT
  520 IF A%=14 THEN PRINTTAB(4,3
0)"IS DEFENDER"
  530 IF B%=14 THEN PRINTTAB(4,3
0)"IS RED RUM"
  540 IF C%=14 THEN PRINTTAB(4,3
0)"IS SPEEDY"
  550 IF D%=14 THEN PRINTTAB(4,3
0)"IS FERNANDO"
  560 IF E%=14 THEN PRINTTAB(4,3
0)"IS CHAMP"
  570 NOW=TIME:REPEAT UNTIL TIME
>NOW+300
  580 PROCresult
  590 ENDPROC
  600:
  610 DEFPROCbet
  620 PRINT:PRINT:
  630 PRINT"    1          2
   3 "
  640 PRINT"DEFENDER   RED RUM
SPEEDY"
  650 PRINT"   5-1        5-2
    4-1"
  660 PRINT
  670 PRINT"    4          5"
  680 PRINT"FERNANDO   CHAMP"
  690 PRINT"   3-1        7-2"
  700 PRINT:PRINT
  710 PRINT" YOU HAVE £";MONEY%
  720 PRINTTAB(1,14)"HOW MUCH DO
YOU BET?";:INPUT BET
  730 IF BET>MONEY% THEN720
  740 SOUND 1,-15,150,1
  750 REPEAT
  760 PRINTTAB(1,16)"WHICH HORSE
 DO YOU BET ON?"
  770 PRINTTAB(1,19)"D-DEFENDER
R-RED RUM S-SPEEDY"
  780 PRINTTAB(1,21)"F-FERNANDO
C-CHAMP"
  790 A$=GET$
  800 UNTIL A$="D" OR A$="S" OR
A$="R" OR A$="F" OR A$="C"
  810 SOUND 1,-15,150,1
  820 ENDPROC
  830:
  840 DEFPROCresult
  850 IF A%=14 AND A$="D" THEN M
ONEY%=BET*5+BET+MONEY%
  860 IF B%=14 AND A$="R" THEN M
ONEY%=BET*2.5+BET+MONEY%
  870 IF C%=14 AND A$="S" THEN M
ONEY%=BET*4+BET+MONEY%
  880 IF D%=14 AND A$="F" THEN M
ONEY%=BET*3+BET+MONEY%
  890 IF E%=14 AND A$="C" THEN M
ONEY%=BET*3.5+BET+MONEY%
  900 MONEY%=MONEY%-BET
  910 PROCdelay
  920 ENDPROC
  930:
  940 DEFPROCend
  950 CLG:PRINTTAB(7,12)"GAME OV
ER"
  960 REPEAT
  970 PRINTTAB(7,15)"Do you want
 another game";
  980 A$=GET$
  990 UNTIL A$="Y" OR A$="N"
 1000 IF A$="Y" THEN RUN
 1010 IF A$="N" THEN END
 1020 ENDPROC
 1030:
 1040 DEFPROCwin
 1050 CLG:PRINTTAB(7,8)"You have
 broken the bookies!!"
 1060 FOR SS=20TO130STEP5:SOUND1
,-15,SS,1:NEXT:FOR M=1TO100STEP3
:SOUND1,-14,M+20,1:NEXT
 1070 PROCend
 1080 ENDPROC
 1090:
 1100 DEFPROCdelay
 1105 COLOUR1:COLOUR128
 1110 PRINTTAB(0,4)"THE GRAND NA
TIONAL"
 1120 NOW=TIME:REPEAT UNTIL TIME
=NOW+200
 1130 ENDPROC
 1140:
```

FACEMAKER

USE THIS amusing program written for the BBC B by Nicholas Green of Hampstead, London, to caricature your friends — or enemies. The computer will ask you the shape, colour, type and other characteristics of the features you would like it to draw and will build up a likeness gradually of the face you had in mind.

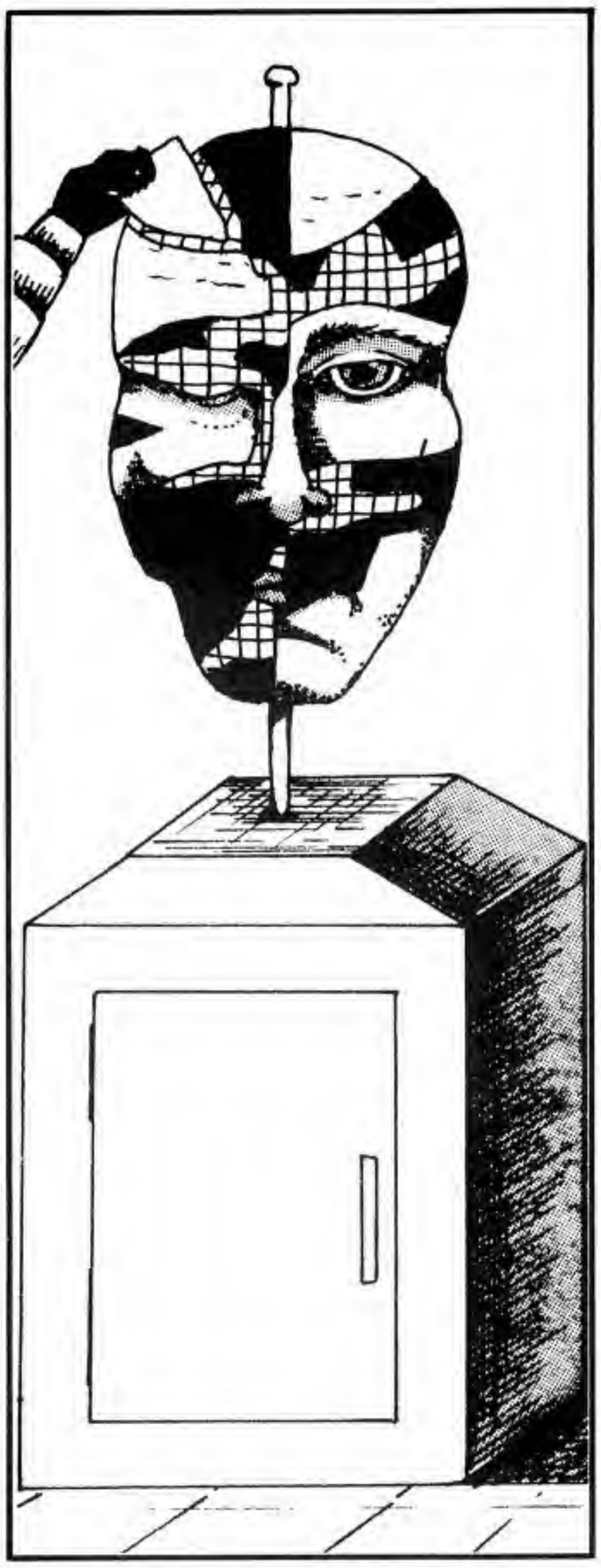
In **Facemaker** you answer the computer's questions by keying the initials of the colours and shapes you choose.

```
10 MODE 2
20 VDU 28,0,5,19,0
30 VDU 23;8202;0;0;0;
40 PRINT"Face colour?"
50 PROCcolour
60 PRINT"Is the face round or
square?"
70 H=GET
80 IF H<82 OR H>83 THEN GOTO
70
90 CLS
100 GCOL 0,D
110 IF H=82 THEN PROCround
120 IF H=83 THEN PROCsquare
130 PRINT"Mouth colour?"
140 PROCcolour
150 GCOL 0,D
160 PRINT"Is he Happy, normal
or sad?"
170 G=GET
180 IF G<>72 AND G<>78 AND G<>
83 THEN GOTO 170
190 CLS
200 MOVE 520,400
210 DRAW 880,400
220 IF G=72 THEN PROChappy
230 IF G=83 THEN PROCsad
240 PRINT"Eye colour?"
250 PROCcolour
260 GCOL 0,D
270 PROCeyes
280 PRINT"Nose colour?"
290 PROCcolour
300 GCOL 0,D
310 PRINT"Is it snobby, Normal
or round?"
320 REPEAT:G=GET:UNTIL G=83 OR
G=78 OR G=82
330 CLS
340 IF G=83 OR G=78 THEN PROCn
ose
350 IF G=82 THEN PROCroundnose
360 PRINT"Does he wear
spectacles?"
370 REPEAT:G=GET:UNTIL G=89 OR
G=78
```



```
  380 CLS
  390 IF G=89 THEN PRINT"Spectac
le colour?":PROCcolour:GCOL 0,D:
PROCgoggles
  400 PRINT"Is he bald?"
  410 REPEAT:G=GET:UNTIL G=89 OR
 G=78
  420 CLS
  430 IF G=89 THEN PRINT"Has he
got wrinkles on his forhead?" EL
SE GOTO 450
  440 REPEAT:W=GET:UNTIL W=89 OR
 W=78:IF W=89 THEN PROCwrinkles:
GOTO 530 ELSE GOTO 530
  450 PRINT"Does he have multi-
coloured hair?"
  460 REPEAT:P=GET:UNTIL P=89 OR
 P=78
  470 CLS
  480 IF P=78 THEN PRINT"Hair co
lour?":PROCcolour:GCOL 0,D
  490 PRINT"Does he have neat or
 messy hair"
  500 REPEAT:G=GET:UNTIL G=77 OR
 G=78
  510 CLS
  520 PROChair
  530 CLS
  540 PRINT"Ear colour?"
  550 PROCcolour
  560 GCOL 0,D
  570 PRINT"Do his ears stick
out?"
  580 REPEAT:G=GET:UNTIL G=78 OR
 G=89
  590 CLS
  600 PROCears
  610 INPUT"What is his/her name
?"NAME$
  620 CLS
  630 PRINT TAB(10-LEN(NAME$)/2,
0);NAME$
  640 END
  650 DEF PROCround
  660 MOVE 600,300
  670 FOR N=0 TO 6.5 STEP .1
  680 X=SIN N*300+700
  690 Y=COS N*300+500
  700 MOVE 500,500
  710 PLOT 85,X,Y
  720 NEXT
  730 ENDPROC
  740 DEF PROCsquare
  750 MOVE 400,200
  760 MOVE 400,800
  770 PLOT 85,1000,800
  780 MOVE 1000,200
  790 PLOT 85,400,200
  800 ENDPROC
  810 DEF PROChappy
  820 DRAW 930,450
  830 MOVE 520,400
  840 DRAW 470,450
  850 ENDPROC
  860 DEF PROCsad
  870 DRAW 930,350
  880 MOVE 520,400
  890 DRAW 470,350
  900 ENDPROC
  910 DEF PROCeyes
  920 FOR E=600 TO 800 STEP 200
  930 MOVE E,600
  940 FOR N=0 TO 6.5 STEP .1
  950 X=SIN N*10+E
  960 Y=COS N*10+600
  970 MOVE E,600
  980 PLOT 85,X,Y
  990 NEXT N
 1000 NEXT E
 1010 ENDPROC
 1020 DATA B,R,G,Y,B,P,B,W,!
 1030 DEF PROCcolour
 1040 RESTORE 1020
 1050 G=GET
 1060 FOR D=0 TO 8
 1070 READ T$
 1080 IF T$=CHR$(G) THEN GOTO 11
00
 1090 NEXT D
 1100 IF T$="!" THEN GOTO 1040
```

```
 1110 IF T$="B" THEN CLS:PRINT"I
s that Black, dark Blue or light
 Blue?" ELSE CLS:ENDPROC
 1120 REPEAT:G=GET:UNTIL G=66 OR
 G=68 OR G=76
 1130 IF G=66 THEN D=0
 1140 IF G=68 THEN D=4
 1150 IF G=76 THEN D=6
 1160 CLS
 1170 ENDPROC
 1180 DEF PROCnose
 1190 IF G=83 THEN VDU 23,240,28
,34,65,85,65,65,65,0 ELSE VDU 23
,240,24,36,66,129,102,24,0,0
 1200 VDU 5
 1210 MOVE 670,550
```



```
 1220 PRINT CHR$(240)
 1230 VDU 4
 1240 ENDPROC
 1250 DEF PROCnormal
 1260 VDU 23,240,24,36,66,129,10
2,24,0,0
 1270 VDU 5
 1280 MOVE 670,550
 1290 PRINT CHR$(240)
 1300 VDU 4
 1310 ENDPROC
 1320 DEF PROCroundnose
 1330 MOVE 700,540
 1340 FOR N=0 TO 6.5 STEP .1
 1350 X=SIN N*20+700
 1360 Y=COS N*20+540
```

```
 1370 MOVE 700,540
 1380 PLOT 85,X,Y
 1390 NEXT
 1400 ENDPROC
 1410 DEF PROChair
 1420 IF H=82 THEN GOTO 1510
 1430 FOR J=400 TO 1000 STEP 2
 1440 IF G=78 THEN C=J ELSE REPE
AT:C=RND(1100):UNTIL C>300
 1450 IF G=78 THEN B=700 ELSE RE
PEAT:B=RND(750):UNTIL B>600
 1460 IF P=89 THEN GCOL 0,RND(7)
 1470 MOVE J,800
 1480 DRAW C,B
 1490 NEXT
 1500 ENDPROC
 1510 FOR J=480 TO 920 STEP 2
 1520 IF G=78 THEN C=J ELSE REPE
AT:C=RND(1100):UNTIL C>300
 1530 IF G=78 THEN B=700 ELSE RE
PEAT:B=RND(750):UNTIL B>600
 1540 IF P=89 THEN GCOL 0,RND(7)
 1550 MOVE J,800
 1560 DRAW C,B
 1570 NEXT
 1580 IF G=77 THEN ENDPROC
 1590 GCOL 0,0
 1600 MOVE 480,730
 1610 MOVE 480,800
 1620 PLOT 85,950,800
 1630 MOVE 480,800
 1640 PLOT 85,950,720
 1650 ENDPROC
 1660 DEF PROCwrinkles
 1670 CLS
 1680 PRINT"Wrinkle colour?"
 1690 PROCcolour:GCOL 0,D
 1700 CLS
 1710 PRINT"Are they straight or
wonky?"
 1720 REPEAT:G=GET:UNTIL G=83 OR
 G=87
 1730 IF G=87 THEN GOTO 1790
 1740 FOR J=650 TO 700 STEP 25
 1750 MOVE 600,J
 1760 DRAW 800,J
 1770 NEXT J
 1780 ENDPROC
 1790 FOR J=650 TO 700 STEP 25
 1800 MOVE 600,J
 1810 DRAW 650,J+10
 1820 DRAW 750,J-10
 1830 DRAW 800,J
 1840 NEXT J
 1850 ENDPROC
 1860 DEF PROCears
 1870 IF G=89 THEN P=90 ELSE P=5
0
 1880 FOR F=400 TO 1000 STEP 600
 1890 IF F=400 THEN Q=3.2 ELSE Q
=PI
 1900 P=-P
 1910 MOVE F,540
 1920 FOR N=0 TO Q STEP .1
 1930 X=SIN N*P+F
 1940 Y=COS N*40+540
 1950 MOVE F,540
 1960 PLOT 85,X,Y
 1970 NEXT
 1980 NEXT
 1990 ENDPROC
 2000 DEF PROCgoggles
 2010 MOVE 550,630
 2020 DRAW 650,630
 2030 MOVE 750,630
 2040 DRAW 850,630
 2050 DRAW 850,560
 2060 DRAW 750,560
 2070 DRAW 750,630
 2080 MOVE 550,630
 2090 DRAW 550,560
 2100 DRAW 650,560
 2110 DRAW 650,630
 2120 MOVE 650,595
 2130 DRAW 750,595
 2140 MOVE 850,595
 2150 DRAW 1000,595
 2160 MOVE 400,595
 2170 DRAW 550,595
 2180 ENDPROC
```

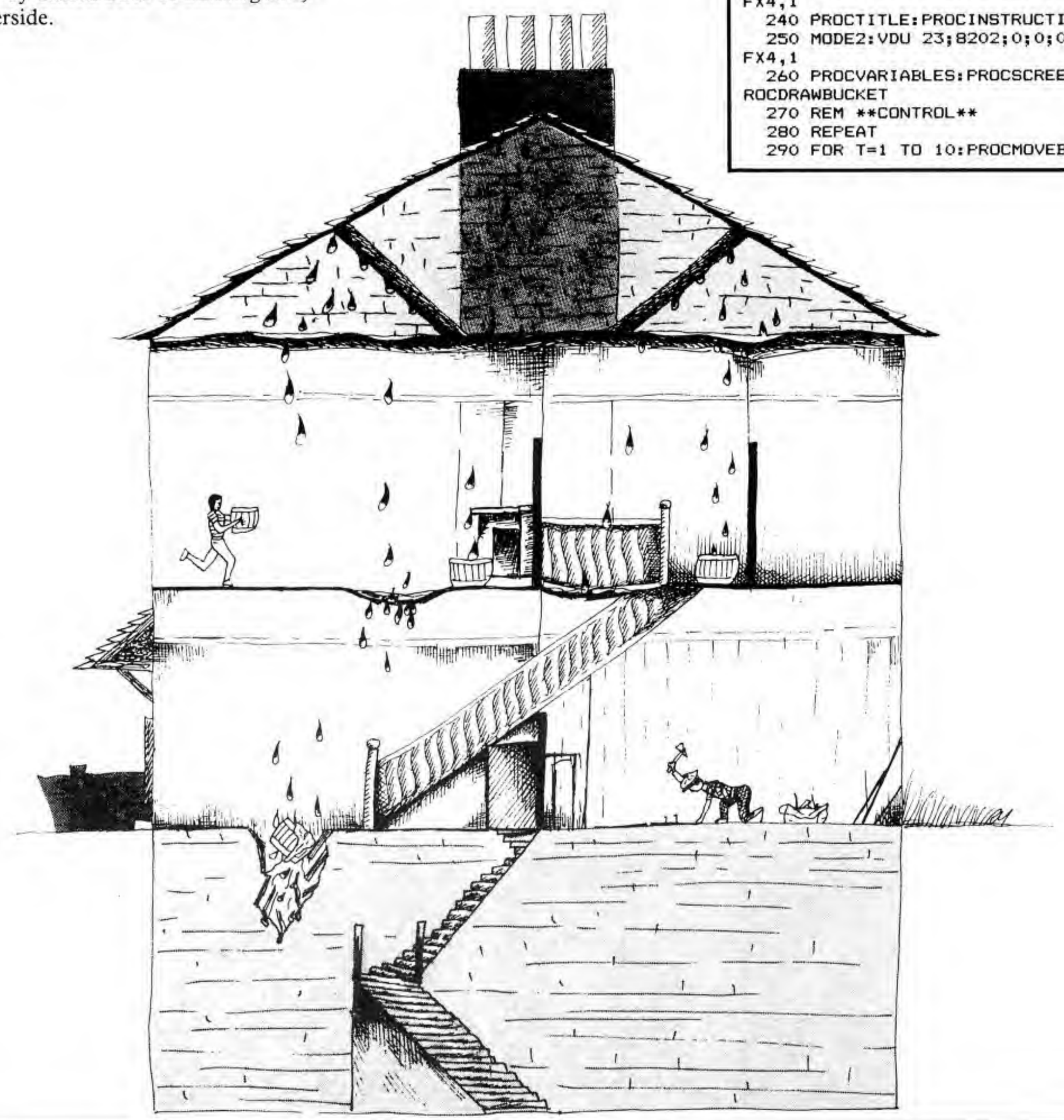
RISING DAMP

THE ROOF of your house is leaking but if you move your bucket quickly you can catch the raindrops before they rot the floor, causing your bucket to fall through to the basement.

Use the cursor key to control your bucket. For each drop of water you catch you score one point; for each one you miss your floor becomes five units weaker. If the floor has not rotted at the end of one minute, a carpenter will arrive to strengthen it for you but the game becomes more difficult after that.

Rising Damp was written for the BBC B by Simon Rear of Immingham, Humberside.

```
   10 REM ***RISING*DAMP***
   20 REM *    By S.Rear    *
   30 REM * 13th FEB.1984 *
   40 REM ***RISING*DAMP***
   50 REM ***DEFINE*CHARACTERS**
*
   60 VDU 23,224,7,8,16,32,76,14
0,128,129
   70 VDU 23,225,224,16,8,4,50,4
9,1,129
   80 VDU 23,226,15,16,32,64,128
,128,192,160
   90 VDU 23,227,240,8,4,2,1,1,3
,5
  100 VDU 23,228,144,143,96,80,7
2,71,32,32
  110 VDU 23,229,9,241,6,10,18,2
26,4,4
  120 VDU 23,230,32,32,16,16,16,
24,4,3
  130 VDU 23,231,4,4,8,8,8,24,32
,192
  140 VDU 23,232,8,8,28,62,28,8,
0,0
  150 VDU 23,233,0,24,0,129,66,0
,24,24
  160 VDU 23,234,255,126,60,24,2
4,60,126,255
  170 VDU 23,235,131,128,136,68,
35,16,8,7
  180 VDU 23,236,193,1,17,34,196
,8,24,224
  190 REM **ENVELOPES**
  200 ENVELOPE 1,1,0,0,0,0,0,0,1
27,-4,-3,-2,126,0
  210 REM **PROTECT*PROGRAM**
  220 *KEY 10 OLD!M RUN !M
  230 MODE1:VDU 23;8202;0;0;0;:*
FX4,1
  240 PROCTITLE:PROCINSTRUCTIONS
  250 MODE2:VDU 23;8202;0;0;0;:*
FX4,1
  260 PROCVARIABLES:PROCSCREEN:P
ROCDRAWBUCKET
  270 REM **CONTROL**
  280 REPEAT
  290 FOR T=1 TO 10:PROCMOVEBUCK
```

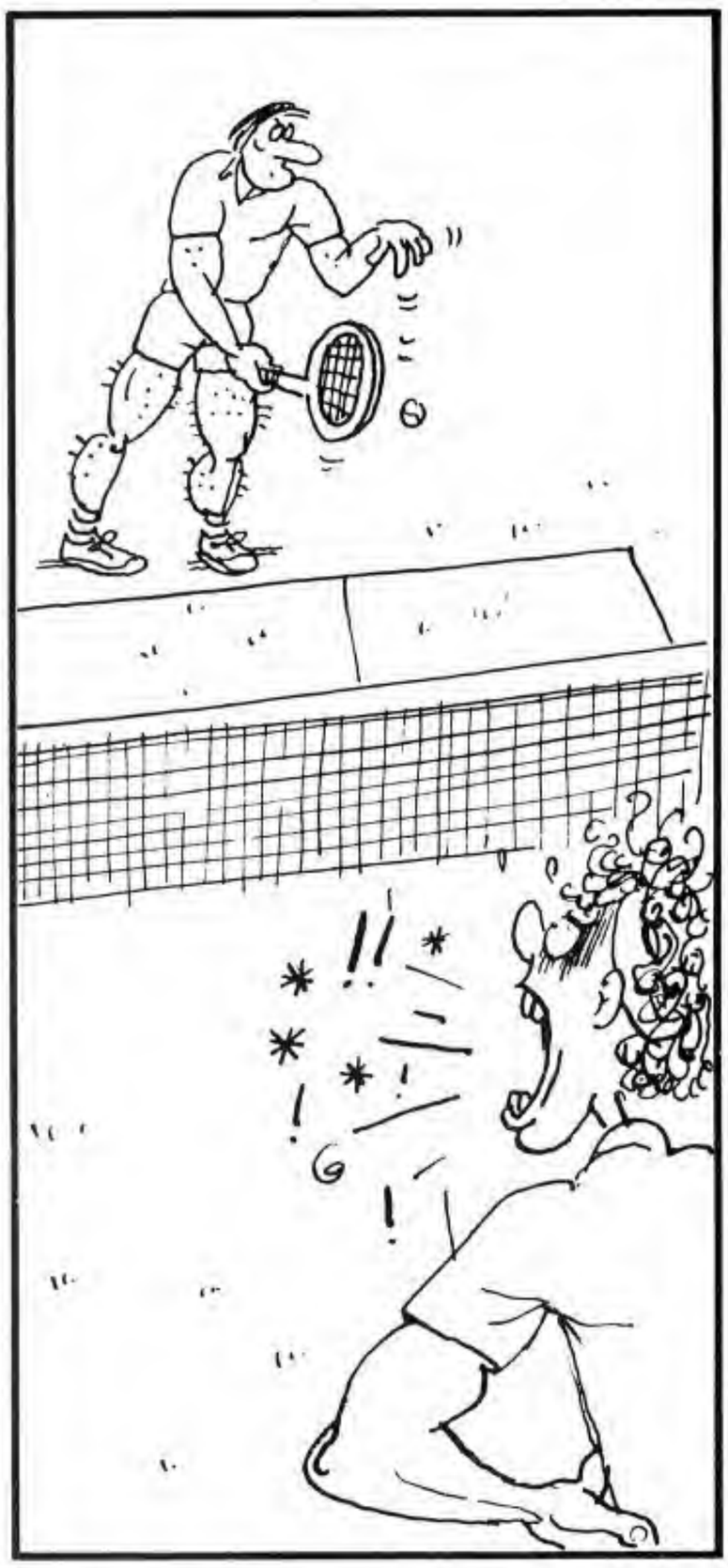


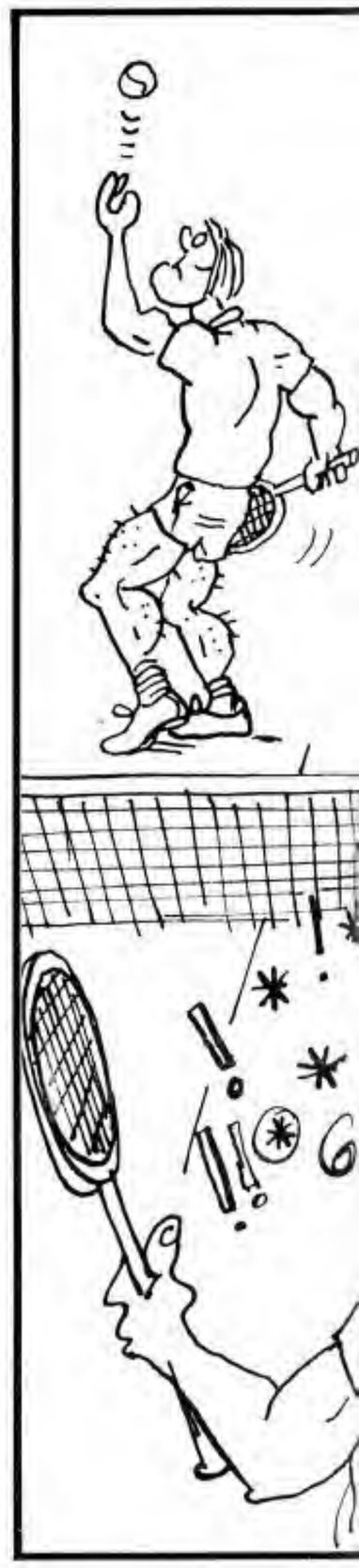
```
ET:NEXT T:PROCDROP
  300 PROCTIME
  310 UNTIL RE%=1 OR RE%=2
  320 IF RE%=1 THEN GOTO 260
  330 *FX4,0
  340 MODE7:END
  350 DEFPROCVARIABLES
  360 SC%=0:TI%=60:FS%=100:BUX%=
580:BUY%=140:RE%=0
  370 CT%=0:RX%=0:RY%=590:SK%=20
:RE$=""
  380 ENDPROC
  390 DEFPROCSCREEN
  400 VDU5:MOVE 0,600:GCOL 0,1
  410 RESTORE 420:FOR T=1 TO 5:R
EAD FX%,FY%,SX%,SY%,TX%,TY%:DRAW
 FX%,FY%:DRAW SX%,SY%:PLOT 85,TX
%,TY%:NEXT T
  420 DATA 0,600,50,600,50,0,50,
0,0,0,0,600,0,600,1279,600,650,9
00,1279,600,1229,600,1229,0,1229
,0,1279,0,1279,600
  430 GCOL 0,7
  440 FOR T=64 TO 1152 STEP 64:M
OVE T,30:VDU 234:NEXT T
  450 GCOL 0,7
  460 FOR T=600 TO 0 STEP-30:MOV
E 0,T:DRAW 50,T:MOVE 1229,T:DRAW
 1279,T:NEXT T
  470 GCOL 0,3:MOVE280,700:PRINT
 "rising damp";:VDU 4
  480 COLOUR 6:PRINT TAB(1,1);"s
core>";SC%
  490 COLOUR 2:PRINT TAB(11,1);"
time>";TI%
  500 COLOUR 5:PRINT TAB(1,2);"f
loor strength>";FS%
  510 COLOUR 7:PRINT TAB(1,0);ST
RING$(17,"*");TAB(1,3);STRING$(1
7,"*");
  520 ENDPROC
  530 DEFPROCMOVEBUCKET
  540  IF INKEY(-26) AND BUX%>85
 PROCDELBUCKET:BUX%=BUX%-65:PROC
DRAWBUCKET
  550 IF INKEY(-122) AND BUX%<10
75 PROCDELBUCKET:BUX%=BUX%+65:PR
OCDRAWBUCKET
  560 ENDPROC
  570 DEFPROCDRAWBUCKET
  580 GCOL0,3:VDU5:MOVE BUX%,BUY
%
  590 VDU 226,227,8,8,10,228,229
,8,8,10,230,231,4
  600 FB%=1:PROCDROP
  610 ENDPROC
  620 DEFPROCDELBUCKET
  630 PROCTIME
  640 GCOL0,0:VDU5:MOVE BUX%,BUY
%
  650 VDU 226,227,8,8,10,228,229
,8,8,10,230,231,4
  660 ENDPROC
  670 DEFPROCDROP
  680 IF FB%=1 THEN FB%=0:KS%=SK
%+SK%/2:ELSE KS%=SK%
  690 IF RX%>0 THEN 700 ELSE RX%
=RND(1066)+60:RY%=590
  700 GCOL0,0:VDU5:MOVE RX%,RY%:
VDU 232
  710 IF RY%<=130+SK% AND BUX%+2
0>=RX%-60 AND BUX%+20<=RX%+60 TH
EN PROCCAUGHT:ENDPROC
  720 RY%=RY%-KS%:IF RY%<=120 TH
EN PROCSPLASH:ENDPROC
  730  GCOL0,6:VDU5:MOVE RX%,RY%
:VDU 232
  740 VDU4:R=0
  750 ENDPROC
  760 DEFPROCSPLASH
  770 GCOL0,6:MOVE RX%,80:VDU233
:SOUND 3,-15,100+RND(100),1
  780 FOR T=0 TO 20:NEXT T:GCOL0
,0:MOVE RX%,80:VDU 233
  790 VDU4:RX%=0:PROCSTRENGTH
  800 ENDPROC
  810 DEFPROCCAUGHT
  820 RX%=0:SC%=SC%+1:SOUND 0,1,
5,1
  830 PROCSCORE
  840 ENDPROC
  850 DEFPROCSCORE
  860 VDU4:COLOUR6:PRINT TAB(7,1
);SC%;
  870 VDU 5:PROCDRAWBUCKET
  880 ENDPROC
  890 DEFPROCTIME
  900 CT%=CT%+1
  910 IF CT%=7 THEN CT%=0 ELSE E
NDPROC
  920 COLOUR 2:TI%=TI%-1
  930 PRINT TAB(16,1);TI%;"  "
  940 IF TI%=0 THEN PROCCARPENTE
R
  950 ENDPROC
  960 DEFPROCSTRENGTH
  970 FS%=FS%-5
  980 COLOUR 5:PRINT TAB(16,2);F
S%;"  ";
  990 IF FS%=0 THEN PROCBREAKFLO
OR
 1000 ENDPROC
 1010 DEFPROCBREAKFLOOR
 1020 FOR T=100 TO 30 STEP -1
 1030 SOUND 3,-15,T,1:NEXT T
 1040 FOR T=1 TO 200:NEXT T
 1050 PROCDELBUCKET:VDU5
 1060 MOVE BUX%,30:VDU 9,9,127,1
27
 1070 GCOL0,3:VDU 226,227,8,8,22
8,229,8,8,230,231
 1080 SOUND 3,1,12,2
 1090 PROCRESTART:ENDPROC
 1100 DEFPROCCARPENTER
 1110 PROCDELBUCKET:VDU5:RESTORE
 1310
 1120 FOR T=64 TO 960 STEP 64:MO
VE T,100
 1130 GCOL 0,5:VDU 224,225,8,8,1
0,235,236,8,8,11
 1140 READ A:IF A=999 THEN RESTO
RE 1310:GOTO 1140:ELSE READB,C,D
:SOUND 1,-15,A,B:SOUND2,-15,C,D
 1150 GCOL0,0:VDU 224,225,8,8,10
,235,236,8,8,11
 1160 NEXT T
 1170 SK%=SK%+8:TI%=60:FS%=105:V
DU4:PROCTIME:PROCSCORE:PROCSTREN
GTH
 1180 VDU4:PRINT TAB(2,20);"The
";CHR$(224);CHR$(225);TAB(6,21);
CHR$(235);CHR$(236);TAB(9,20);"h
as mended";TAB(3,22);"the   floo
r.";
 1190 FOR Q=1 TO 5000:NEXT Q
 1200 PRINT TAB(2,20);STRING$(17
," ");
 1210 PRINT TAB(2,21);STRING$(16
," ");
 1220 PRINT TAB(2,22);STRING$(16
," ");
 1230 PROCDRAWBUCKET:VDU4:ENDPRO
C
 1240 DEFPROCTUNE
 1250 RESTORE 1310
 1260 FOR TU%=1 TO 6
 1270 READ A,B,C,D
 1280 SOUND 1,-15,A,B:SOUND 2,-1
5,C,D
 1290 NEXT TU%
 1300 FOR Q=1 TO 100:NEXT Q:ENDP
ROC
 1310 DATA 129,10,33,10,149,5,53
,5,145,5,49,5,129,10,33,10,149,1
0,53,10,129,20,33,20,129,10,33,1
0,149,5,53,5,145,5,49,5,129,10,3
3,10,149,10,53,10,129,20,33,20,9
99
 1320 DEFPROCTITLE
 1330 COLOUR3:PTX%=13:PTY%=32
 1340 REPEAT
 1350 PTY%=PTY%-1
 1360 PRINT TAB(PTX%,PTY%);"RISI
NG DAMP";
 1370 SO%=SO%+1:SOUND 3,-15,SO%,
1:SOUND 2,-15,SO%,1:SOUND 1,-15,
SO%,1:FOR T=0 TO 50:NEXT T
 1380 PRINT TAB(PTX%,PTY%);"
        ";
 1390 UNTIL PTY%=3:PROCTUNE:SO%=
0
 1400 PRINT TAB(13,3);"RISING DA
MP"
 1410 ENDPROC
 1420 DEFPROCINSTRUCTIONS
 1430 COLOUR1:PRINT TAB(2,5);"Us
ing the arrow keys left and righ
t";TAB(2,6);"move your bucket an
d try to catch";TAB(2,7);"the fa
lling drops of water before";
 1440 PRINT TAB(2,8);"they rot t
he floor causing your bucket";TA
B(2,9);"to drop through to the b
asement.";
 1450 PRINT TAB(2,10);"For each
drop caught you score";TAB(2,11)
;"1 point.";TAB(2,12);"For each
drop you miss the floor";TAB(2,1
3);"becomes 5 units weaker.";
 1460 PRINT TAB(2,14);"If after
1 minute your bucket hasn't";TAB
(2,15);"fell through the floor t
he";

 1470 COLOUR 3:PRINT TAB(29,15);
CHR$(224);CHR$(225);TAB(29,16);C
HR$(235);CHR$(236);:COLOUR 1
 1480 PRINT TAB(2,17);"(carpente
r) will strengthen the";TAB(2,18
);"floor.After this the game wil
l";TAB(2,19)"become increasingly
 difficult.";

 1490 COLOUR2:PRINT TAB(2,22);"D
isplayed on the screen is;";TAB(
2,23);"SCORE- youre score.";TAB(
2,24);"TIME- time (in secs.) bef
ore the";TAB(9,25);"carpenter ar
rives.";TAB(2,26);"STRENGTH OF F
LOOR- units of strength"
 1500 PRINT TAB(21,27);"the floo
r has";TAB(21,28);"before it col
lapses"
 1510 COLOUR1:PRINT TAB(4,30);"P
RESS A KEY TO BEGIN";
 1520 A$=GET$
 1530 ENDPROC
 1540 DEFPROCRESTART
 1550 VDU4

 1560 PRINT TAB(3,20);">ANOTHER
GAME<";
 1570 PRINT TAB(3,21);"     (Y/N)
";
 1580 RE$=GET$
 1590 IF RE$="Y" OR RE$="y" THEN
 CLS:RE%=1:ENDPROC
 1600 IF RE$="N" OR RE$="n" THEN
 CLS:RE%=2:ENDPROC
 1610 GOTO 1580
 1620 ENDPROC
```

TENN

```
   10ONERRORRUN
   20MODE7
   30PROCINTRO
   40MODE5
   50PROCINIT
   60PROCSCREEN
   70FORI=1TO1000:NEXT
   80PROCBALL
   90IFD%<0 THEN PROC_PLAYER1:GO
TO110
  100IF P%=1 THEN PROC_COMP ELSE
 PROC_PLAYER2
  110GOTO80
  120
  130DEFPROCMISS
  140MOVEA%,B%:GCOL0,0:VDU240:A%
=A%+C%:B%=B%+D%:MOVEA%,B%:GCOL0,
3:VDU240
  150SOUND1,1,0,30
  160FORI=1TO3000:NEXT
  170IFB%<70 C=C+1 ELSE Y=Y+1
  180GOTO60
  190DEFPROCBALL:GCOL0,0:MOVEA%,
B%:PRINTCHR$240
  200A%=A%+C%:B%=B%+D%
  210IFB%<70 B%=70
  220IFB%>1010 B%=1010
  230IFA%<47 A%=47:SOUND1,1,1,1:
C%=-C%
  240IFA%>897 A%=897:SOUND1,1,1,
1:C%=-C%
  250GCOL0,2:MOVEA%,B%:PRINTCHR$
240
  260IFB%=70 PROCHIT(X%)
  270IFB%=1010 PROCHIT(Z%)
  280ENDPROC
  290DEFPROC_PLAYER1:MOVEX%,50:P
LOT3,100,0:IF INKEY(-98) X%=X%-R
% ELSE IF INKEY(-67) X%=X%+R%
  300GCOL0,1:MOVEX%,50:PLOT1,100
,0
  310*FX15,1
  320ENDPROC
  330DEFPROCHIT(H%):IFA%+10<H% O
R A%>(H%+110) THENPROCMISS
  340V%=A%-H%-50:D%=-D%:C%=V%/2
  350SOUND1,1,50,2
  360ENDPROC
  370DEFPROC_COMP:IF A%-Z%>20 AN
D A%-Z%<80 THEN FORI=1TO10:NEXT:
GOTO390 ELSE MOVEZ%,1000:PLOT3,1
00,0:IF(Z%+50)>A% THEN Z%=Z%-(12
+(R%/4)) ELSE Z%=Z%+(12+(R%/4))
  380GCOL0,2:MOVEZ%,1000:PLOT1,1
00,0
  390ENDPROC
  400DEFPROCNEW:MOVE50,600:PRINT
```

TENNIS for the BBC B will bring back memories to anyone who has played the classic video game. Here you can compete either against the computer or against another player, the winner being the first to reach 10 points. You cannot move your bat until the other person has hit the



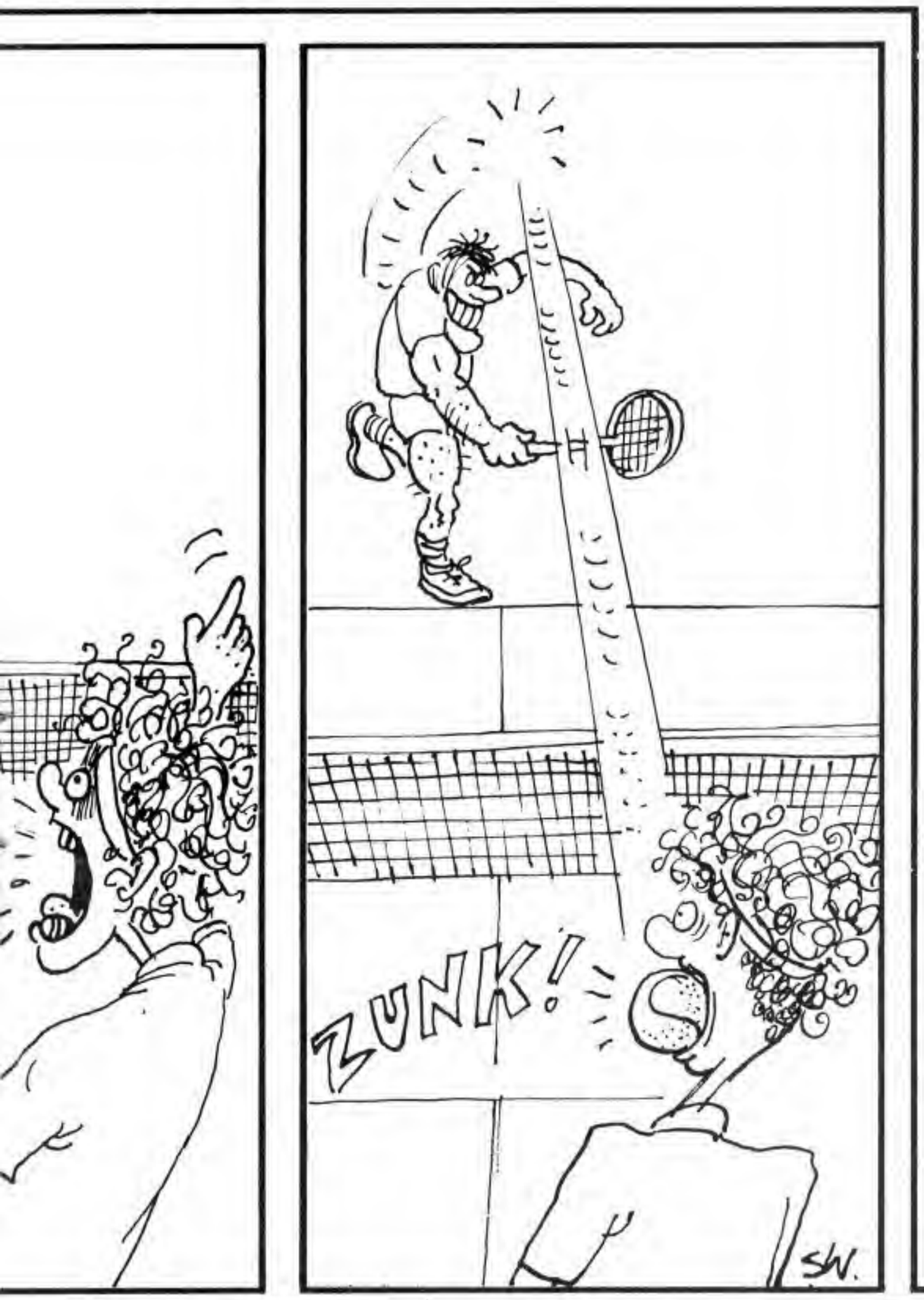


IIS

ball back to you and you can send the ball at an angle by using the side of your bat.

There are five speeds from which to choose in **Tennis** and according to J Bradshaw of Peebles, Tweeddale, who wrote the program, it is possible, but not easy, to win at all levels.

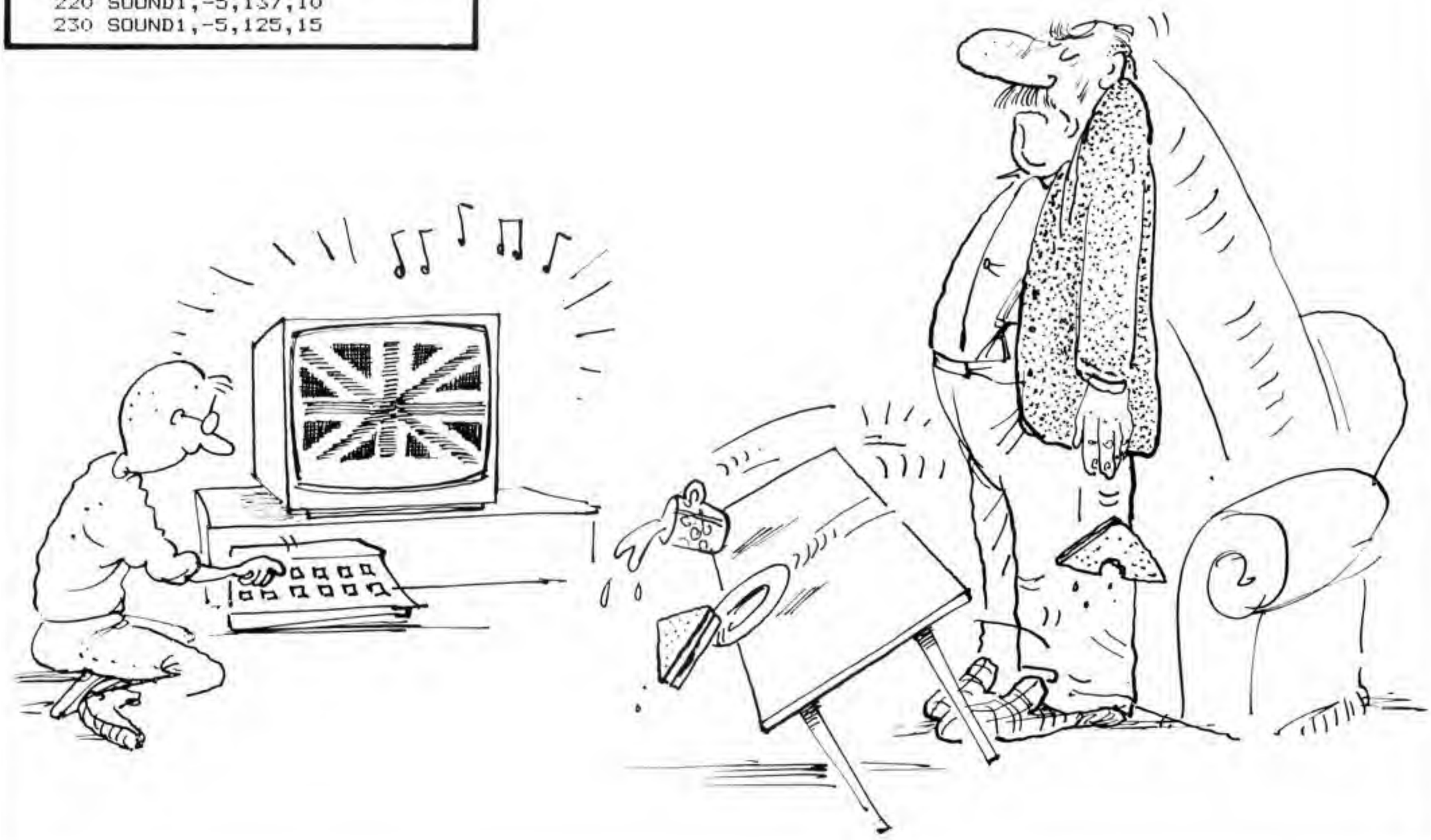
```
"ANOTHER GAME?":*FX15,1
  410*FX12,0
  420A$=GET$:IFA$="Y" RUN ELSE C
LS:VDU4:PRINTTAB(6,10);"GAME OVE
R"''':END
  430ENDPROC
  440DEFPROCINIT
  450VDU5
  460C=0:Y=0:VDU23,240,0,0,0,192
,192,0,0,0
  470ENVELOPE1,3,10,10,10,1,1,1,
127,0,0,-127,126,126
  480*FX12,1
  490*FX11,7
  500ENDPROC
  510DEFPROCSCREEN
  520VDU4:CLS:VDU5
  530GCOL0,3:MOVE32,50:DRAW32,10
00:MOVE915,50:DRAW915,1000:GCOLO
,2:MOVE1050,950:PRINT;C:MOVE400,
1000:DRAW500,1000:GCOL0,1:MOVE10
50,150:PRINT;Y:MOVE400,50:DRAW50
0,50
  540IFP%=2 THEN570
  550IFC=10 THEN MOVE300,800:PRI
NT"I WIN":PROCNEW
  560IFY=10 THEN MOVE200,800:PRI
NT"YOU WIN":PROCNEW
  570IF C=10 OR Y=10 PROCNEW
  580X%=400:Z%=400:A%=450:C%=RND
(20)-10:IFRND(1)<0.5 B%=820:D%=-
R% ELSE B%=200:D%=R%
  590ENDPROC
  600DEFPROC_PLAYER2:MOVEZ%,1000
:PLOT3,100,0:IF INKEY(-103) Z%=Z
%-R% ELSE IFINKEY(-104) Z%=Z%+R%
  610GCOL0,2:MOVEZ%,1000:PLOT1,1
00,0
  620IFB%<1010 AND B%>1009-R% PR
OCHIT(Z%)
  630*FX15,1
  640ENDPROC
  650DEFPROCINTRO
  660*FX12,0
  670PRINT:VDU131,141:PRINTTAB(9
);"T E N N I S":VDU133,141:PRINT
TAB(9);"T E N N I S":VDU134:PRIN
TTAB(10);"==========="
  680PRINTTAB(8,6);CHR$131;"1 OR
 2 PLAYERS ?";:P%=GET:IFP%<>49 A
ND P%<>50 GOTO680 ELSE P%=P%-48
  690IFP%=1 PRINTTAB(5,11);CHR$1
31;"You control the";CHR$129;"RE
D";CHR$131;"bat":PRINT:PRINTCHR$
133;TAB(12);"'Z' [   ] 'X'":GOTO
720
  700PRINTTAB(1,11);CHR$131;"Pla
yer 1 controls the";CHR$129;"RED
";CHR$131;"bat":PRINT:PRINTCHR$1
33;TAB(12);"'Z' [   ] 'X'"
  710PRINT'';CHR$134;"Player 2 c
ontrols the";CHR$131;"YELLOW";CH
R$134;"bat":PRINT:PRINTCHR$130;T
AB(12);"'<' [   ] '>'"
  720 PRINTTAB(6,8);CHR$129;CHR$
136;"Enter Speed (1-5)";:R%=GET:
IFR%<49 OR R%>53 GOTO720 ELSE R%
=(R%-48)*5+5
  730ENDPROC
```



UNION JACK

JUST THE THING for any patriotic occasion, **Union Jack** for the BBC B displays the British flag and a few seconds later plays the National Anthem. It was written by Michael Bowles of Sutton-cum-Lound, Nottinghamshire.

```
   10 REM UNION JACK & NATIONAL
ANTHEM
   20 REM   Michael Bowles Feb 1
984
   30 MODE2
   40 MOVE50,0:MOVE50,1000:PLOT8
5,1150,0:PLOT85,1150,1000
   50 GCOL0,4
   60 MOVE50,600:MOVE400,600:PLO
T85,50,950
   70 MOVE400,400:MOVE50,400:PLO
T85,50,50
   80 MOVE500,0:MOVE500,300:PLOT
85,200,0
   90 MOVE700,0:MOVE700,300:PLOT
85,1000,0
  100 MOVE1150,50:MOVE1150,400:P
LOT85,800,400
  110 MOVE1150,600:MOVE800,600:P
LOT85,1150,950
  120 MOVE700,700:MOVE700,1000:P
LOT85,1000,1000
  130 MOVE500,700:MOVE500,1000:P
LOT85,200,1000
  140 GCOL0,1
  150 MOVE50,550:MOVE50,450:PLOT
85,1150,550:PLOT85,1150,450
  160 MOVE550,1000:MOVE650,1000:
PLOT85,550,0:PLOT85,650,0
  170 MOVE150,1000:MOVE50,1000:P
LOT85,1150,0:PLOT85,1050,0
  180 MOVE1050,1000:MOVE1150,100
0:PLOT85,50,0:PLOT85,150,0
  190 TIME=0:REPEATUNTILTIME=200
  200 SOUND1,-5,129,10
  210 SOUND1,-5,129,10
  220 SOUND1,-5,137,10
  230 SOUND1,-5,125,15
  240 SOUND1,-5,129,5
  250 SOUND1,-5,137,10
  260 SOUND1,-5,145,10
  270 SOUND1,-5,145,10
  280 SOUND1,-5,149,10
  290 SOUND1,-5,145,10
  300 SOUND1,-5,145,5
  310 SOUND1,-5,137,5
  320 SOUND1,-5,129,10
  330SOUND1,-5,137,10
  340 SOUND1,-5,129,10
  350 SOUND1,-5,125,10
  360 SOUND1,-5,129,10
  370 SOUND1,-5,157,10
  380 SOUND1,-5,157,10
  390 SOUND1,-5,157,10
  400 SOUND1,-5,157,15
  410 SOUND1,-5,149,5
  420 SOUND1,-5,145,10
  430 SOUND1,-5,149,10
  440 SOUND1,-5,149,10
  450 SOUND1,-5,149,10
  460 SOUND1,-5,149,15
  470 SOUND1,-5,145,5
  480 SOUND1,-5,137,10
  490 SOUND1,-5,145,10
  500 SOUND1,-5,149,5
  510 SOUND1,-5,145,5
  520 SOUND1,-5,137,5
  530 SOUND1,-5,129,5
  540 SOUND1,-5,145,15
  550 SOUND1,-5,149,5
  560 SOUND1,-5,157,10
  570 SOUND1,-5,165,5
  580 SOUND1,-5,149,5
  590 SOUND1,-5,145,10
  600 SOUND1,-5,137,10
  610 SOUND1,-5,129,30
```

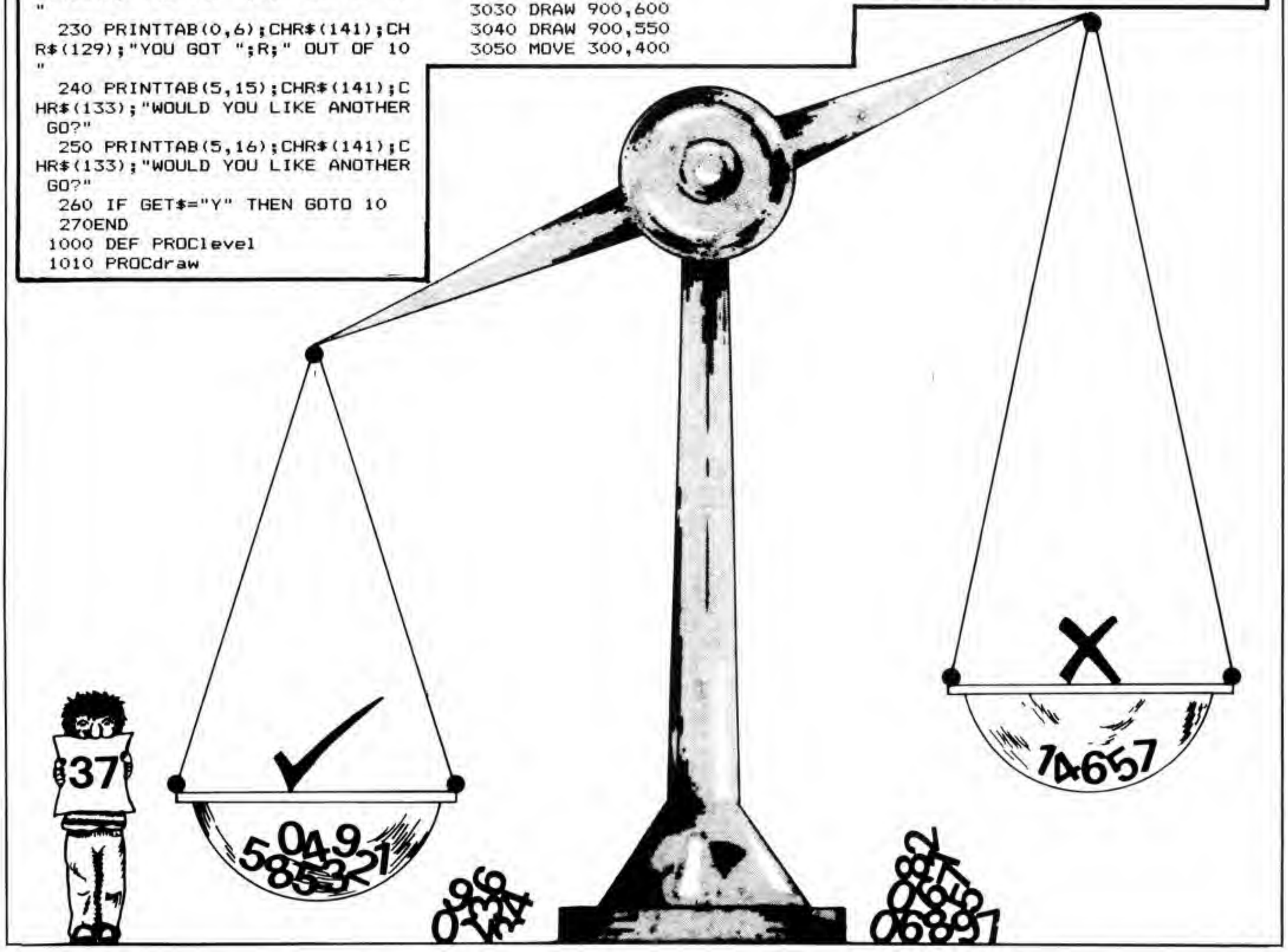


BALANCE

GAVIN HENDERSON of Stockton-on-Tees, Cleveland, wrote **Balance** for the BBC B to improve your skill at addition.

Every time you answer a sum correctly you will tip the scales and be rewarded with a large tick; for an incorrect answer the balance stays as it is and a cross appears.

```
10 REM BALANCE By G.Henderson
20 REM 19th November 1983
30
35 R=0
40 FOR Q=1 TO 10
45 MODE 1
50 REM MAIN PROGRAM
60 PROCdraw
70 GCOL0,3
80 MOVE 300,400:DRAW 900,600
90 MOVE 300,400
100 DRAW 300,350
105 MOVE 900,600:DRAW 900,550
110 A=RND(10):B=RND(8)
120 PRINT TAB(28,15);"?"
130 PRINT TAB(8,21);A;"+";B
140 PRINT TAB(0,0)"WHAT DO YOU
 THINK ? WILL EQUAL"
150 INPUT E
160 IF E=A+B THEN CLS:R=R+1:PR
OCdraw:PROClevel
170 IF E>A+B THEN CLS:PROCdraw
:PROCrdown
180 IF E<A+B THEN CLS:PROCdraw
:PROCldown
190 FOR C=0 TO 2000:NEXT
200 NEXT Q
210 MODE 7
220 PRINTTAB(0,5);CHR$(141);CH
R$(129);"YOU GOT ";R;" OUT OF 10
"
230 PRINTTAB(0,6);CHR$(141);CH
R$(129);"YOU GOT ";R;" OUT OF 10
"
240 PRINTTAB(5,15);CHR$(141);C
HR$(133);"WOULD YOU LIKE ANOTHER
 GO?"
250 PRINTTAB(5,16);CHR$(141);C
HR$(133);"WOULD YOU LIKE ANOTHER
 GO?"
260 IF GET$="Y" THEN GOTO 10
270END
1000 DEF PROClevel
1010 PROCdraw
1020 GCOL 0,0
1030 MOVE300,400
1040 DRAW900,600
1050 MOVE300,400
1060 DRAW300,350
1070 MOVE900,600
1080 DRAW900,550
1090 PRINT TAB(8,18);A;"+";B
1100 PRINT TAB(28,18);E
1110 GCOL0,3
1120 MOVE 300,500
1130 DRAW 900,500
1140 DRAW 900,450
1150 MOVE 300,500:DRAW 300,450
1160 PROCright
1170 ENDPROC
2000 DEF PROCdraw
2005 VDU19,0,4,0,0,0
2010 GCOL0,1
2020 MOVE900,100
2030 MOVE300,100
2040 PLOT85,900,200
2050 PLOT85,300,200
2060 MOVE 500,200
2070 MOVE 700,200
2080 PLOT85,600,500
2090 ENDPROC
3000 DEF PROCldown
3010 GCOL0,3
3020 MOVE 300,400
3030 DRAW 900,600
3040 DRAW 900,550
3050 MOVE 300,400
3060 DRAW300,350
3070 PRINT TAB(8,21);A;"X";B
3080 PRINT TAB(28,15);E
3090 PROCwrong
3100 ENDPROC
4000 DEFPROCrdown
4010 GCOL0,3
4020 MOVE 300,600
4030 DRAW 900,400
4040 DRAW 900,350
4050 MOVE 300,600
4060 DRAW 300,550
4070 PRINT TAB(8,14);A;"+";B
4080 PRINT TAB(28,21);E
4090 PROCwrong
4100 ENDPROC
5000 DEF PROCwrong
5010 SOUND0,-15,0,5:SOUND0,-15,
1,5:SOUND0,-15,2,5
5020 MOVE 900,700
5030 DRAW 1100,900
5040 MOVE 1100,700
5050 DRAW 900,900
5060 ENDPROC
6000 DEF PROCright
6010 SOUND1,-15,200,10
6020 MOVE 1100,900
6030 DRAW 900,700
6040 DRAW 900,800
6050 ENDPROC
```



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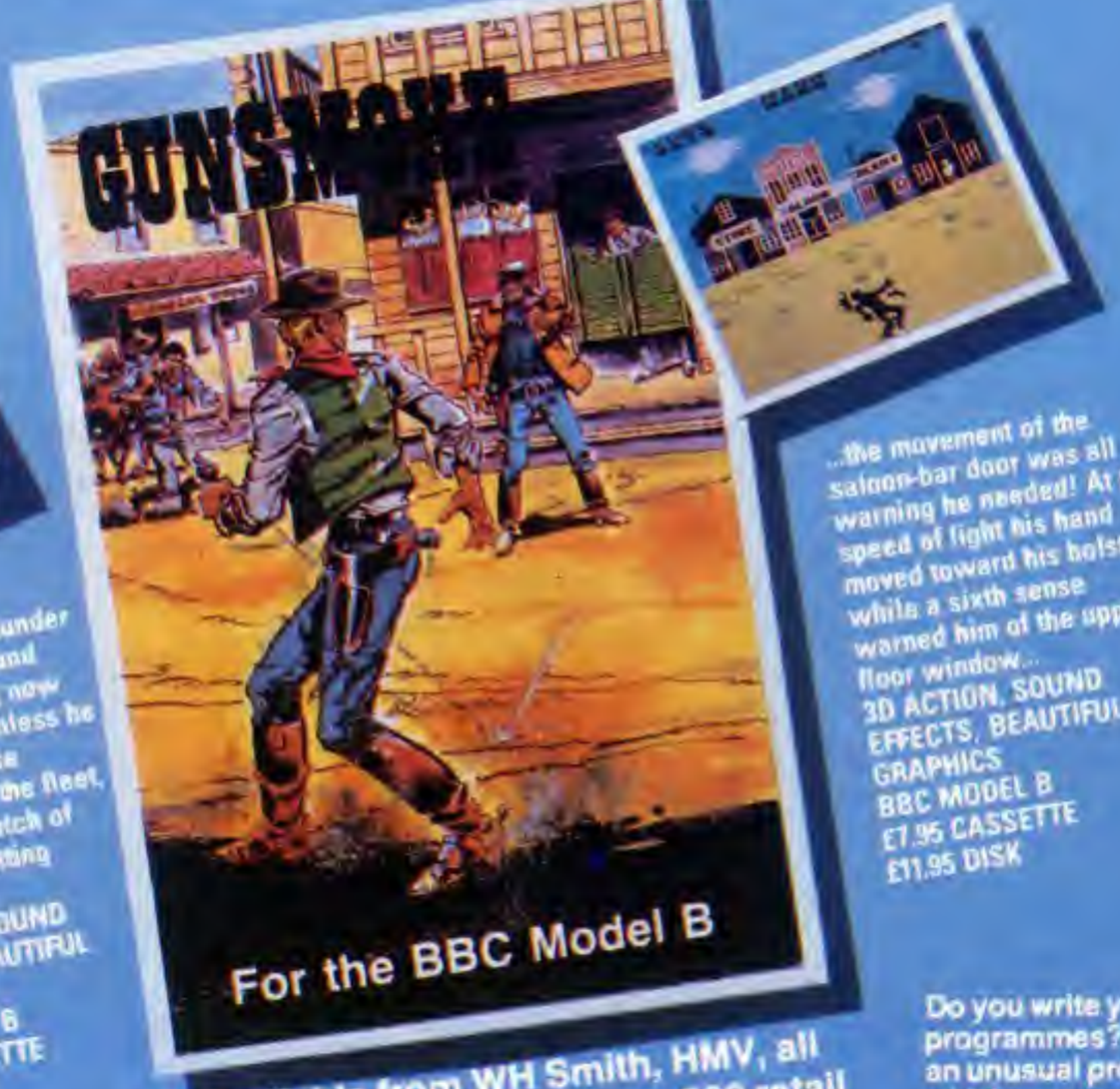

...the movement of the saloon-bar door was all the warning he needed! At the speed of light his hand moved toward his holster, while a sixth sense warned him of the upper floor window...
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