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Electron User welcomes program listings and articles for publication. Material should be typed or computer-printed, and preferably double-spaced. Program listings should be accompanied by cassette tape or disc. Please enclose a stamped, self-addressed envelope, otherwise the return of material cannot be guaranteed. Contributions accepted for publication will be on an all-rights basis.

How to teach your Micro a thing or two

Thousands of home computer owners have yet to discover their microcomputer's potential to help with many of the problems and decisions that come up every day in the home or office.

Perhaps you have always promised yourself that you would teach yourself programming, but have been put off by manuals which seem to assume a lifetime spent studying computer science and mathematics. Maybe you have looked at other computer books, but have yet to find one which is free of unnecessary jargon or where the program examples bear some relevance to real life and not space invaders.

Relax, your search is over.

The 'Learn BASIC' tutorials from Logic 3 are the latest development of a teaching method pioneered by Professor Andrew Colin and perfected by testing on 3 generations of students at Strathclyde University. The 'Strathclyde Method' has been translated into 8 languages and used by over 300,000 microcomputer users.

'Learn BASIC' is a jargon free, step by step, course in computer programming, which explains everything clearly in English, not computer talk. In a matter of hours you will be writing your first programs.

'Learn BASIC' is designed for people who want to keep abreast of the computer age, for people who realise that understanding computers is a key to future success at work, at school, and as a parent.

Get 'Learn BASIC' and teach your micro how to be useful! (Available from major branches of W.H.Smiths, Boots, Laskys, Greens, John Menzies and better computer shops nationwide.)

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electron user NEWS

BBC's Pascal for the Electron

THE new BBC Micro version of the Pascal language from Acornsoft will shortly be available for the Electron.

The disc version has already earned the British Standards Institution Level One Class A validation.

This is the first such implementation on a micro and the first to achieve Level One Class A under the latest version of the test suite.

The ROM version, awarded a Level O Class B certificate, is the first of its type to even approach validation quality.

Awarding the certificates, John Souter of BSI said: "The Acornsoft ISO-Pascal is clearly the result of a first-class development job.

"As well as scoring many firsts in Pascal history the implementations are compact given the high level of conformance, and they include a text editor and comprehensive documentation.

"We are pleased to see Acornsoft bringing ISO-Pascal to so many new users".

Acornsoft ISO-Pascal is the full implementation of Pascal to the ISO standard, plus extra sound and graphics.

Electron heads for success in 1985

EXCELLENT Christmas sales of the Electron are being seen as an indication the machine could become the big computer success story of 1985.

High Street dealers were staggered by the demand for Electrons in the run up to Christmas.

Now they hope the vast increase in Electron owners will generate more software products and make the machine even more attractive to buyers than ever.

And although Acorn isn't yet releasing its projected sales figure for 1985, a spokesman told *Electron User* the company is extremely confident that sales will continue at a high level.

Targets being met

Acorn's optimism was boosted by its recent release of new add-ons and software which make the machine an even better buy than before.

When the final tally is made the company expects its seasonal sales projection of 150,000 to 200,000 Electrons sold will have been met.

In the High Street there was widespread joy over the machine's popularity.

Boots said: "Electron business is very strong even though sales generally are down on last year".

W.H. Smiths reported: "The sales rate for the Electron has almost tripled in a few weeks. Once the machine has established a decent base and the software starts to flow it might just be the surprise package of 1985".

Dixons said: "The Electron is selling four to five times as well as we had expected".

Lasky's said: "The Electron is the machine in demand right now. We've been putting together packages worth up to £500 in some cases, which means this is an extremely capable system with lots of potential".

PLUS 3 DISC DRIVE IS HERE

ACORN'S recently released range of hardware for the Electron is set to repeat the success of the Plus 1 expansion unit – the add-on that last summer took the Electron into the realms of more serious computing.

Big news for Electron users who feel they have outgrown their cassette recorders is the new Plus 3 add on. This is an L-shaped combination of interface and disc drive. It fits at the back of the Electron, between it and the Plus 1. The price: £229.

The 3½in single sided disc gives 300k of stored data and the new Acorn advanced disc filing system (ADFS) has "easy to use features at a basic level", says Acorn.

For users who also want to boost the power of their Electrons, there is an RS423 interface for connection to a second processor.

Armed with these extra goodies, plus Acorn's ROM-based word processing and spreadsheet programs, Electron users can now tackle business problems with aplomb.

In the words of an Acorn spokesman: "These developments put the Electron up there beside the BBC Micro as a serious machine".

For those who are not yet into discs, Acorn has brought out a matching data recorder. Finished in the Electron colours, it is designed to sit beside the micro and enhance the appearance of the workstation.

Lending a hand

PHOENIX Publishing has come to the aid of Electron users who don't possess the two pairs of hands required to operate a keyboard and control a manual simultaneously.

Rigid, free-standing crib cards provide easy access to the main facts you need while programming.

Topics covered include keywords, operating commands, graphic and sound commands, colour commands, data commands, input/output commands, disc commands, Basic statements and functions, logical operators and error messages.

The cards cost £1.99.

Logo on the way

LOGO, the educational computer language, is to become available for the Electron from Acornsoft early in the New Year.

Supplied in ROM, it simply plugs into the Plus 1.

Specially designed for use in the classroom, Logo allows children to communicate with the micro in a natural, straightforward manner.

At its simplest level, Logo is concerned with drawing lines on a graphics screen. The child simply moves a pointer – or turtle as it is known – which leaves a line trailing behind it.

Its advocates claim, though, that Logo is far more than just another drawing package: its easily-mastered command set allows children to build up libraries of procedures, such as square, triangle and so on.

In this way, children understand and learn to use the fundamental concepts of computing in an interactive, experimental manner.

LIFE AT THE TOP, CURRY STYLE

ACORN'S Chris Curry has only one 'A' level to his name, yet he enjoys a salary of £60,000 a year and lives in a 15 bedroom mansion.

His fame and fortune is attributable to his lingering in his morning bath which sometimes makes him late for work. For this is where he has his best ideas.

One of these, six years ago, was that computers could break out of the "electronics freak with a soldering iron" enclave and into the consumer and education market.

All this is according to a profile on Acorn's co-founder which is featured in issue number one of OM, a glossy giveaway with Options, the equally glossy women's journal.

It goes on to reveal that before he hit the jackpot with the BBC Micro, and subsequently the Electron, he had previously been employed as a student apprentice with Pye, Cambridge, then with the MoD as a scientific assistant and finally spending 13 years in association with Clive Sinclair working on calculators and hi-fi.

Chris Curry . . . "pretty hopeless" with computers.

Nor does Chris Curry apparently have any real affinity with computers today. In the article he admits to being "pretty hopeless" with computers – "I've got a computer at home. I play games on it, I'm afraid, and rather badly too".

OM estimates that Acorn is currently worth at least £100 million but that just means "100 times more responsibility", insists Curry.

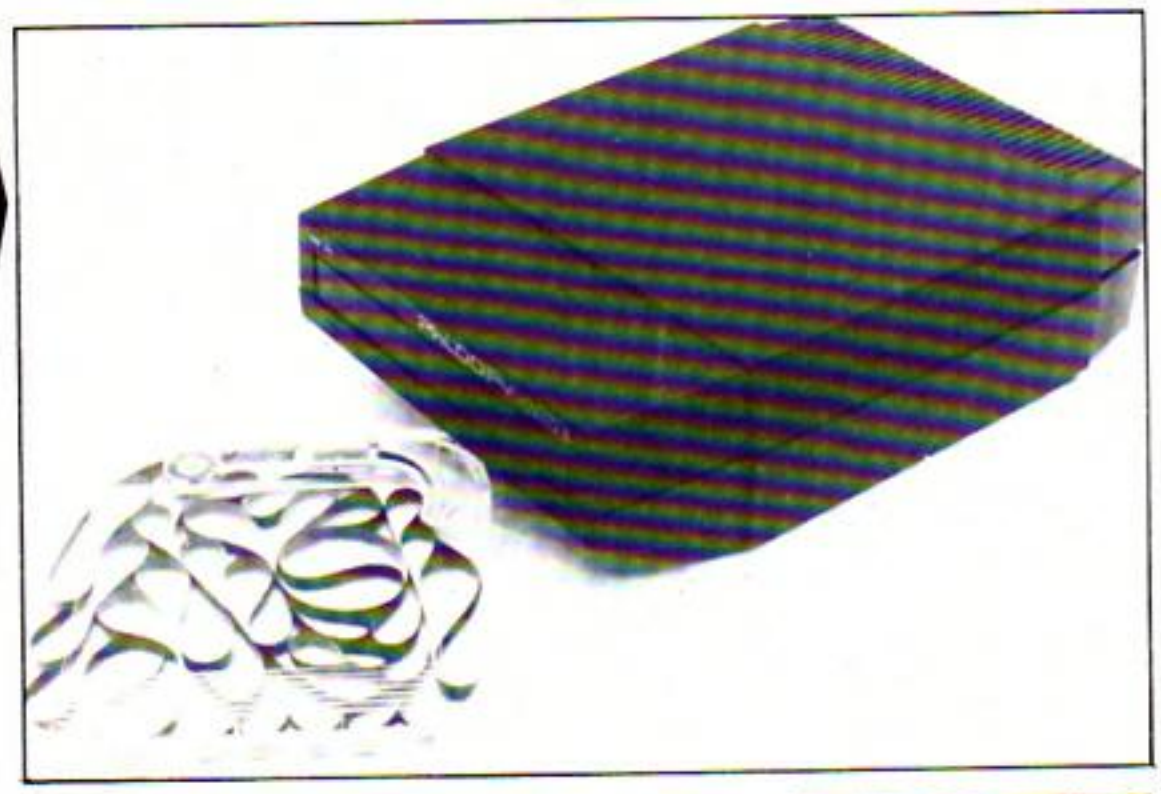
What has his newfound wealth meant?

According to the OM profile he appears to thoughly enjoy it and readily describes his country home as "a totally unnecessary extravagance".

However he doesn't treat himself to expensive holidays. "They bring on an attack of worrying", he says.

"I've always assumed that somehow I'd achieve a fairly high standard of living", he admits. "Someone told Clive Sinclair once that I was starting to make quite a lot of money, and he said, 'Chris Curry? Oh, he's always behaved like a rich man'. I think that's very true".

Phloopy speeds the load



AN exciting new product that should free Electron users from the tyranny of cassettes has just been announced by Phi Mag Systems.

Their Phloopy, a high speed tape based data storage system is now available for the Electron, at a price well below that of current disc interfaces.

Phloopy will interface with the Electron either through the Plus 1 cartridge slot or plug directly to the databus, but they will not be interchangeable.

On the databus version a Centronics printer port is also available as an optional extra.

The Phloopy drive costs £85. An interface for the Electron is £29 (via Plus 1) or £38 (via Databus).

Managing director Mike Lucas says: "Many customers really appreciate the benefits that Phloopy gives over both cassettes and discs.

"Automatic compacting and reorganisation of files and data every time a Phloopy is updated means that in practical terms it is as fast as many discs".

For fast program development and quick access Phi is offering Phloopy cartridges with 25k and 50k capacities as well as the usual 100k.

Colour plotter

WHAT is claimed to be the first four-colour A4 plotter under £200 for the Electron has arrived from Japan.

The Sakata SCP-800 – also compatible with the BBC Micro – can handle 210mm rolls of paper.

Talent collects £2,000 cheque

JOHN Garland, founder partner of educational software house Garland Computing, has been judged brightest young business talent in the South West.

Garland won the competition held by BBC Television and English Estates, the government commercial property developers who provide premises for small businesses.

Garland Computers was formed two years ago and specialises in educational programs for the Electron and BBC Micro, mainly for secondary schools and institutes of higher education.

It publishes more than 50 titles covering biology, chemistry, physics, maths, geography and music.

Recently it signed agreements for the distribution of its programs in Australia and New Zealand.

In our picture John Garland (right) receives his first prize cheque for £2,000 from Alan James, regional manager of English Estates.

Comment ca va?

'ALLO. 'Allo. You weesh to parlez Français très bon? In fact, bon enough to passez le 16 plus examination or l'O level?

The Electron can now provide the answer – and not in franglais.

Dean Associates of Sheffield is offering a French revision package made up of four units, each requiring at least four hours study time.

There's a keyboard introduction to explain special features like the ability to enter accents. Diagnostic testing, graded levels of difficulty and the display of student scores are also included in the package.

The development team for the project was made up of a senior O level French examiner, French teachers and a native French speaker.

Both cassette and disc versions are available and grade units can be bought singly, in pairs or as a complete set. Prices range from £9.95 for a single grade on cassette.

£99 printer

A low-cost thermal printer for the Electron and BBC Micro has just been launched by Phi Mag Systems, the people responsible for the Phloopy data storage tape.

Called the Phiprint, the 40 column machine has a nine-element dot head which gives true descenders and underlines and costs £99.

The character set gives 96 characters in three pitches, plus the ability to condense or extend the typeface.

Other features include graphics for graphs and pictures, and seven different typestyles.

MORE COMMANDS

ELECTRON users can now extend the number of Basic commands with the Addcomm ROM.

It adds 40 commands to the Electron's built-in Basic, and according to makers Vine Micros, gives a mixture of toolkit, Logo graphics and extra graphics statements. The ROM comes complete with a detailed user guide.

Night sky on your screen

RECENT interest in Halley's comet has prompted Century Communications to bring out a program – Starfinder – which, they say, does something no book can achieve.

You tell the program the date and where abouts in the world you are – and it shows you what the night sky view should be out of your window.

You can identify any star, planet or constellation by steering a "space probe" across the screen – and print out star maps for exactly the times and places you want.

The Electron program was written by Ronald Alpiar, previously a department head at the University of London Computer Centre.

It was checked by TV astronomer Heather Couper, who recently succeeded Patrick Moore as president of the British Astronomical Association. With the program comes a book written by Heather Couper.

Soccer database

SOCCER fans who own an Electron can now build up a complete database of facts and figures about their favourite team.

Your Team – a cassette-based program – covers results, scores, attendances, personalities and so on – all recorded for playback on screen in a choice of club colours.

The program was designed by Colin Whitelaw, whose textiles-by-post firm BEC Sports specialises in football souvenirs.

Part 12 of PETE BIBBY's introduction to programming

READ and DATA – a powerful duo so...

THIS month we're going to have a look at using READ and DATA to give values to program variables. Put like that it doesn't sound too exciting but, if you hang on until the end of the article, you'll find how useful this can be.

Take a look at Program I.

```
10 REM PROGRAM I
20 LET x=1
30 LET y=2
40 LET z=3
50 sum=x+y+z
60 PRINT sum
```

All this does is give values to the variables *x*, *y* and *z*, add them up and print the answer.

What I want you to notice is the rigidity of the program. If I now wanted to add 6, 7 and 8 using the same program structure, I'd have to rewrite lines 20 to 40.

As you can see, assigning values to variables using simple LET assignments can be fairly inflexible.

Of course, there are other ways of giving values to variables. We've already come across two of them. Take a look at Program II.

```
10 REM PROGRAM II
20 sum=0
30 DIM number(3)
40 FOR loop=1 TO 3
50 number(loop)=loop
60 NEXT loop
70 FOR loop=1 TO 3
80 sum=sum+number(loop)
90 NEXT loop
100 PRINT sum
```

Here we are using the (I hope) familiar FOR . . . NEXT loops and a DIM statement. The first loop cycles three times, giving the subscripted variables *number(1)*, *number(2)*, *number(3)* the values 1, 2 and 3 respectively.

The final loop adds the three numbers in turn, storing the result in *sum*. The last line prints out the result of the addition.

While this may seem a bit longwinded when just adding 1, 2 and 3, try adapting it to add up the numbers from 1 to 1000. You'll see that it beats the first program's way of doing things hands down.

The trouble is that while using a loop control variable to give values to an array is both very efficient and very adaptable, it is a bit limited. If you think about it, you'll see why.

Since the loop control variable increases by the same amount each time round the loop, the values it gives to the array are in a regular pattern. It's easy to add say, 1, 2 and 3 or 4, 8, 12 and 16, using this method.

You do it by varying the STEP parameter and the values of the control variables in the FOR . . . NEXT loop. The trouble is it doesn't lend itself easily to adding 1, 7 and 23.

It's better than the first method but still rigid. Program III shows a much more flexible way of getting information into a program. It has you actually typing it in at the keyboard at the Electron's request.

```
10 REM PROGRAM III
20 sum=0
30 DIM mark(3)
40 FOR loop=1 TO 3
50 PRINT "Enter mark:"
60 INPUT mark(loop)
70 NEXT loop
80 FOR loop=1 TO 3
90 sum=sum+mark(loop)
100 NEXT loop
110 PRINT sum
```

When you run this program you'll see it can handle adding

1, 7 and 23. In fact it's so flexible that it can add any three numbers you care to think of. It's only limited by the Electron's range.

It's the INPUT of line 60 that gives the program this marvellous adaptibility. However nothing in life is that good and this same adaptable use of INPUT does have its own drawbacks.

The major one is that it holds up the program until you respond to the keyboard. And imagine trying to add a thousand numbers using this method!

Also, you have to input the numbers every time you run the program. One error typing in your responses and you have to go right back to the beginning again.

So each of the methods used in these three programs seems to have a drawback. Wouldn't it be nice if there was a way to give values to variables that was flexible, would take any numbers, and wouldn't involve typing things in while the program is running?

Have a go at Program IV which meets these criteria.

```
10 REM PROGRAM IV
20 sum=0
30 DIM mark(5)
40 FOR loop=1 TO 5
50 READ mark(loop)
60 sum=sum+mark(loop)
70 NEXT loop
80 PRINT sum
90 DATA 10,11,12,13,10
```

As you can see, the program has added up the numbers in the last line (10, 11, 12, 13 and 10) and printed out the result. What's interesting is the way in which it's done.

Line 20 gives the numeric variable *sum* the value of 0. This will be used later to hold a running total. Line 30 dimensions an array of six variables, *mark(0)*, *mark(1)*, and so on up to *mark(5)*.

As the FOR . . . NEXT loop cycles, *loop* goes from 1 to 5 and the numbers the program finds in line 90 are entered into the array. This means that *mark(1)* is given the value 10, *mark(2)* the value 11 and so on.

The work is done by the READ command of line 50.

The first time round the loop, *loop* is 1, so the array element *mark(loop)* is *mark(1)*. The READ command tells the Electron to look at the line with DATA at the beginning and take the next available number.

Since this is the first time it has looked at the DATA statement, it takes the first number it finds after DATA and gives *mark(1)* the value 10.

The next time round the loop, *loop* is 2. Line 50 now tells the Electron to have another look at the DATA line and put the next unREAD number into *mark(2)*. Since 10 has already been READ, the micro goes on to the next free number and READs the value 11 into *mark(2)*.

Each time the loop cycles the READ takes the next unREAD number from line 90 and gives it to *mark(loop)*.

Line 60 holds a running total of these values in *sum* and, when the loop is ended, line 80 displays the result.

To sum up, the READ command causes the Electron to take a value from a DATA statement and give it to a variable. The micro keeps track of whereabouts in the DATA list it's up to and always READs the next unused item on the list.

In a way, the READ command works exactly like the INPUT command except that instead of looking at the keyboard the Electron looks in the program itself for the value to be assigned to the variable.

In a way, it's a combination of the best features of all three of the above methods, but without sacrificing any flexibility.

This adaptability comes from the fact that if we want to give the program different values, all we have to do is change the DATA statement of line 90. So to add up 19, 12, 12, 13 and 3 we just change line 90 to:

```
90 DATA 19,12,12,13,3
```

while:

```
90 DATA 3,15,4,19,17
```

gives us the sum of 3, 15, 4, 19 and 17.

You'll notice from this that the commas in the DATA statements act as separators. They come between the numbers, telling the micro where one item of DATA ends and another one starts.

Obviously they're very important and Program V shows what happens if one is left out.

```
10 REM PROGRAM V
20 sum=0
30 DIM mark(5)
40 FOR loop=1 TO 5
50 READ mark(loop)
60 sum=sum+mark(loop)
70 NEXT loop
80 PRINT sum
90 DATA 10,1112,13,10
```

We get the horrible message:

```
Out of DATA at line 50
```

and the program stops. What's happened is that we've left out the comma between the 11 and 12 in the DATA statement. The first four times the loop cycles it READs in the values 10, 1112, 13 and 10.

The Electron doesn't know that 1112 was meant to be two numbers. It just READs the numbers between the commas.

When the loop cycles the fifth time the READ of line 50 tells the micro to take a value from the DATA line and put it in *mark(5)*.

The trouble is that there is no more data in the DATA statement. There are only four numbers there and the micro has read them all. It can't read the fifth and so the program crashes. All for the lack of a comma.

A point to bear in mind is that although the error message accuses line 50, the mistake really lies in line 90. So if you get an error message that points to a line with READ in it, remember that the actual mistake may lie in a DATA statement elsewhere in the program.

Program VI shows the opposite case, where an inadvertent comma between the 1 and the 3 that should make up 13 gives the DATA statement six numbers. RUN it and see what happens.

```
10 REM PROGRAM VI
20 sum=0
30 DIM mark(5)
40 FOR loop=1 TO 5
50 READ mark(loop)
60 sum=sum+mark(loop)
70 NEXT loop
80 PRINT sum
90 DATA 10,11,12,1,3,10
```

The result is 37 and not the 56 we should have got. Notice that the Electron doesn't know there is anything wrong. You get no error message. This mistake can lead to all sorts of problems in longer programs and it can be very hard to locate.

Until now the DATA statements have been tucked away at the end of the program – all the information being held on one line. This doesn't have to be the case as Program VII shows.

```
10 REM PROGRAM VII
20 DATA 10,11
30 sum=0
40 DIM mark(5)
50 FOR loop=1 TO 5
60 READ mark(loop)
70 sum=sum+mark(loop)
80 NEXT loop
90 PRINT sum
100 DATA 12
110 DATA 13,10
```

Despite the fact that there are now three DATA statements, the program still works. All that happens is that when the Electron comes across a READ for the first time it looks through the program for the first DATA statement and READs from that.

As more data is required, so

→

From Page 9

the micro hunts it down. When the data in one DATA statement has been used, it searches through the program for the next DATA statement and uses the data in that.

So, the DATA statements can be scattered all over the program and the Electron can keep track of them. The trouble is that in a long program, *you* might not!

Good programming practice demands that you put your DATA statements at the very end of the program. It won't affect the Electron but it will make life a lot easier for you.

If you must have your DATA statements all over the listing, beware the fate of Program VIII.

```
10 REM PROGRAM VIII
20 DATA 10,11,
30 sum=0
40 DIM mark(5)
50 FOR loop=1 TO 5
60 READ mark(loop)
70 sum=sum+mark(loop)
80 NEXT loop
90 PRINT sum
100 DATA 12
110 DATA 13,10
```

When you run it, it gives you a nasty:

No such variable at line 60

message and promptly stops. Of course, as we're getting to expect with READ and DATA, if you do get an error message when things go wrong, it points to the wrong line!

The error is actually in line 20 where we've put an unnecessary comma after the 11 at the end of the DATA statement. It's easy to do but the micro doesn't like it – so beware. Do not end DATA statements with a comma!

So far we've only read numbers from the DATA statements. Can we read strings? The answer is yes, and Program IX shows how it's done.

Notice that we don't have to put inverted commas round the strings in the DATA

```
10 REM PROGRAM IX
20 DIM name$(3)
30 FOR loop=1 TO 3
40 READ name$(loop)
50 NEXT loop
60 FOR loop=1 TO 3 STEP
2
70 PRINT name$(loop)
80 NEXT loop
90 DATA Eileen, Peter, B
odger
```

statement. You can if you want to but they're unnecessary unless the string contains spaces or commas. My advice is to do without the inverted commas – they're just one more thing that can go wrong!

Talking of things that can go wrong, run Program X and see what happens.

```
10 REM PROGRAM X
20 DIM name$(3)
30 FOR loop=1 TO 3
40 READ name(loop)
50 NEXT loop
60 FOR loop=1 TO 3 STEP
2
70 PRINT name$(loop)
80 NEXT loop
90 DATA Eileen, Peter, B
odger
```

If you've typed it in correctly (or do I mean incorrectly?) you should get the message:

Array at line 40

While it's annoying to have a program go wrong like this, there is a positive element in this case. The error message actually points to the right line!

What's happened is that line 40 tries to READ data into the numeric variable *name(loop)*. The trouble is that when the Electron searches out the DATA statement of line 90 and tries to READ it, all it finds are strings. And you can't put a string into a numeric variable. If you don't believe me try:

LET numeric="string"

and see what you get.

In a short program like the

above, it's an easy error to sort out, but in a long program it can be murder.

But what of the reverse, where you try to read numbers into string variables?

```
10 REM PROGRAM XI
20 DIM name$(3)
30 FOR loop=1 TO 3
40 READ name$(loop)
50 NEXT loop
60 FOR loop=1 TO 3 STEP
2
70 PRINT name$(loop)
80 NEXT loop
90 DATA 1,2,3
```

As you can see, the program works quite happily, the numbers in the DATA statement being taken as strings. The program isn't doing what you intended but you get no error message.

Program XII READs data into both numeric and string variables. The first loop reads the data of line 120, putting the names in the string variable *name$(loop)*. The second loop READs line 130, putting the numbers into the variable *mark(loop)*.

```
10 REM PROGRAM XII
20 DIM name$(3),mark(3)
30 FOR loop=1 TO 3
40 READ name$(loop)
50 NEXT loop
60 FOR loop=1 TO 3
70 READ mark(loop)
80 NEXT loop
90 FOR loop=1 TO 3 STEP
2
100 PRINT name$(loop),mar
k(loop)
110 NEXT loop
120 DATA Eileen, Peter, B
odger
130 DATA 1,2,3
```

This, however, is a little longwinded. Program XIII achieves the same effect but only uses one loop to READ in both *name$(loop)* and *mark(loop)*.

```
10 REM PROGRAM XIII
20 DIM name$(3),mark(3)
30 FOR loop=1 TO 3
40 READ name$(loop),mark
(loop)
50 NEXT loop
60 FOR loop=1 TO 3
70 PRINT name$(loop),mar
k(loop)
80 NEXT loop
90 DATA Eileen,1,Peter,2
,Bodger,3
```

The READ of line 40 is followed by two variables, *name$(loop)*, and *mark(loop)* separated by commas. Each time round the loop the READ forces the Electron to examine the DATA statements first for a string, then for a number.

As you can see, the DATA statement of line 90 is structured in this format, first a string, then a number, then a string and so on.

This method of organising the data to be READ has in its favour the fact that the data is organised in a logical fashion. It's easy to see that Eileen has 1 mark, Peter has 2 and Bodger has 3. The trouble is that it's also very easy to get the strings out of step or put a comma into the middle of a number and so cause an error.

And that's as far as we'll go with READ and DATA this month. As you've seen, they're a very powerful and versatile duo of commands. The trouble is that when they go wrong they can be hard to sort out. Definitely a case of handle with care.

Merlin, our intrepid wizard, returns to offer further advice on tackling adventures

Let your Electron amaze you

IT seems from the mail I've received that there are quite a lot of you adventurers out there. I'd like to thank you all for writing in. Keep up the good work!

The two things most of your letters concerned were on the lines of: "Help! I'm stuck in a maze" and "Until we get more adventures for the Electron, how can I convert some of the BBC Micro adventures?"

I can't really tell you how to convert programs without the permission of the software houses that publish them. They wouldn't appreciate it.

I would like, though, to take this opportunity to say that if any software houses would like to send me the details I would be extremely happy to include them in a future article.

However, I can help with the first problem. So now for a quick run-down on mazes and how to tackle them.

Most of the problems you have encountered seem to lie in not knowing how to approach them. Let's examine the most common types of mazes.

While I shan't be giving specific answers to your letters, you should be able to solve your problems – and be able to tackle more difficult mazes – by the time you have read this article.

Barring some rather epic adventures, whose names I shan't mention, all mazes have one thing in common – there's a way out.

My purpose in stating the obvious is to make sure you realise that whoever has programmed the maze has done it in such a way that it is neither too easy or too hard to get out of.

So if you get stuck instead of moving about randomly think about the nature of the maze and that will usually give you a clue as to how to beat it.

Remember the programmer will have written it logically, and it is up to you to solve it logically!

Let's look at some of the mazes that can be encountered in various commercial adventures which illustrate the various types you are likely to come across. By far the most common are those that present this kind of room description:

```
You are at a junction with
exits north, south, east,
west.
```

Generally to tackle these DROP an object, make a move and LOOK. If you can still see the object you have dropped then you obviously haven't moved!

So get a piece of paper, the larger the better, draw a circle and write inside it what object you have dropped.

If the move you just tried was NORTH, then put a cross at the top of the circle to show that you cannot move in that direction. Then try a different direction.

If the object is still there then put another cross. If it isn't there then draw another circle. DROP another object and then try another direction.

Keep on doing this and eventually, by trial and error, you will be able to map out the whole maze.

But if you are underground or in an unlit room then don't drop the lamp.

Incidentally, you don't have to make your map the way I've suggested. I make my maps this way because it is the way I feel happiest with. The best way to make a map is the way *you* feel happiest with.

The next most common types of maze are those where, for every location you move to, the room description *seems* to be the same.

Look closely at the following example and see if you can work out how many moves have been made. The location you are in is described thus:

```
You are in a
tangled,gloomy jungle with
exits in all directions.
NORTH
You are in a
tangled,gloomy,jungle with
exits in all directions.
WEST
You,are in a tangled gloomy
jungle with exits in all
directions.
WEST
You,are in a tangled gloomy
jungle with exits in all
directions.
```

Yes! You're right, two moves have actually been made! Look closely and you'll see that there are three different descriptions (check the commas).

You have the description for your original location, then there is a change when you move NORTH and another when you first move WEST.

The fourth description is the same as the third. You haven't moved.

Clever stuff isn't it! Quite often with this type of maze any attempt to map it by dropping objects will result in this type of message:

```
Your OBJECT
dissappears into the
undergrowth and is
irretrievably lost!
```

The secret of solving this type of maze is to make a map based on whether the room descriptions do, or do not, change.

So keep going in one direction until the description remains the same. Then try another direction until that remains the same. Then another direction ... and so on.

Eventually you will have found a way out, or mapped out the whole maze, or both.

Quite often you can come across a description that is totally unlike any of the others. Usually this means that there is an object of value or an exit nearby.

Here it often pays to stop mapping and try single moves in each direction just to see if there is anything nearby.

Another fairly common type of maze, that can literally have you at your witt's end, is the kind that for every move you try to make you end up in the place you have just started from. Typically you get this type of comment:

```
You have become completely
disorientated in the warren
of tunnels surrounding you
and are back where you
started from. There are
exits north, south, east
and west.
```

Mazes like these look very difficult, as indeed they are, but they can be solved with a little patience. The programmer knows that adventurers

E

From Page 11

like their problems to be hard, but not impossible.

So you should be able to get out reasonably easily and one of two methods should work for you.

Either a reasonable number of set moves is needed for you to get out, say six, or you only need make one move in the right direction.

Often in the latter type the move is subject to a random response.

Think of it as the Electron saying to itself: "Well, they've picked the right direction, now I'll toss a coin to see if I'll let them out".

If you are not aware that this kind of maze exists you can spend a lot of time wandering around trying to get out. I once spent weeks in one before I realised what was going on.

So try making about 10 moves in each direction. If this doesn't work then try likely combinations of moves such as NORTH, WEST, SOUTH, EAST, and so on.

Remember to use the save game facility. Make sure you have a game saved at the point at which you enter the maze, then you will know when you finally make any progress.

The bad news is that you have an awful lot of keying to do. The good news is that you will, eventually, get out. I promise.

Most other types of maze require you to think carefully about where you've been, what you've got and what you can see.

Two mazes in one particular adventure require you to do things with some of the objects you have found – or should have found. If you haven't got them you will not get very far.

In the first you need to have found a lamp and lit it before you can even enter the maze. If you try to enter without the lamp you don't live very long.

Once in, however, you have to turn the lamp off, LOOK and then turn the lamp back on.

Why? The directions you need to have to get to the next location successfully, and therefore get through the maze, are written on the wall of each room in phosphorescent paint.

So you have to turn the lamp off to see the direction you need to make next and then you have to turn it back on to avoid being

```
Eaten in the dark by a huge
spider!
```

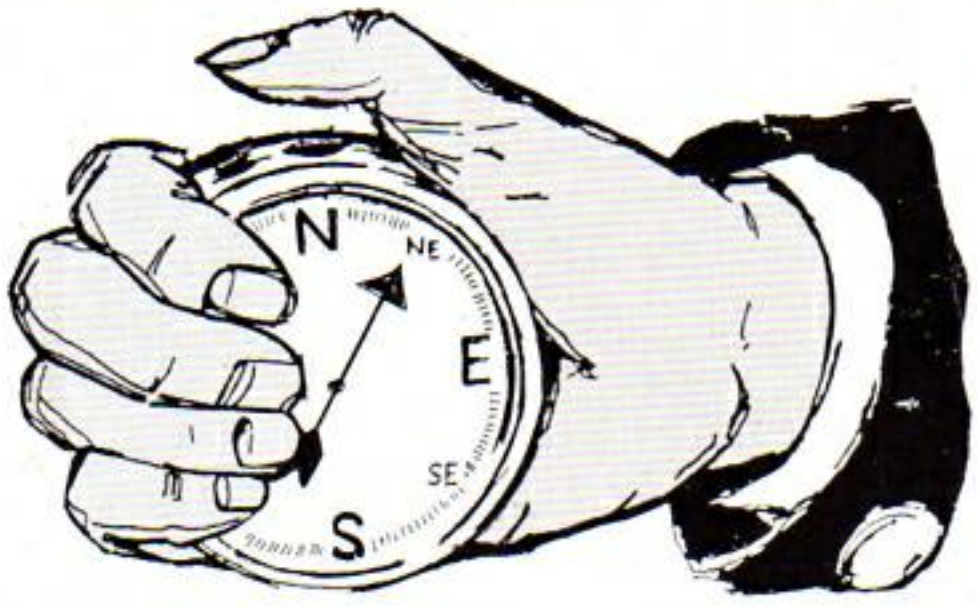
After getting through this maze you manage to collect several objects, one of which, when WAVEd, emits

```
A cloud of dense white
smoke.
```

You discover this because it is good practice in any fantasy adventure to RUB and WAVE everything. Later you find yourself in:

```
A featureless black room.
```

You find that you cannot return the way you came, so you set off bravely to explore



this new maze. After wandering around aimlessly for a while you remember the rod.

In desperation you WAVE it again. This time you get:

```
A cloud of dense green
smoke.
```

After wandering through various locations, waving the rod as you go, you discover that the rod emits seven different colours – blue, green, red, orange, violet, indigo and yellow.

That looks familiar you think, so you arrange it thus: red, orange, yellow, green, blue, indigo and violet.

And what have you got? You've guessed it! The colours of the, dare I say it, spectrum.

Now all you have to do is make a map based on these colours. So you return to your waving and make a map of each of the colours in each of the locations.

When you've finished you go back to the starting point and move in the order of the colours. That is red, then orange, then yellow, then green and so on.

When you get to the maze exit you find that it is a small cylindrical room whose only exit is back the way you came. In other words, back into the maze.

What's needed here is a password. Since there is always a clue to any password somewhere, you think of the spectrum and eventually arrive at the password – "Rainbow" – and you're out. Obviously, if you hadn't solved the maze you wouldn't have been able to get out.

The last type of maze I'll look at is the type that gives you clues – if you can find them. Often they have been given previously somewhere, perhaps as a reward for solving a puzzle. But they cna even be given in the maze itself.

The extract below is from a superb adventure that is due to be released shortly.

Here you have almost completed the adventure. You are in the final room which, wouldn't you know it, just happens to be a maze.

The way out is given. Look closely and see if you can find it.

```
You are in an octagonal
room with exits in each
wall. a plaque reads
 WARNING: Keep moving or
you'll regret it'
```

Another sign reads:

```
The guardian waits forever
here, eight ways to choose,
one way is right, no time
to lose, here ends your
light, so walk where one
can't see or hear.
```

The clues are all on the second plaque. There are "Eight ways to choose", that is eight directions you can take. BUT it also means that eight moves will get you out. Look at the last line:

```
So walk.......WHERE ONE
CAN'T SEE OR HEAR.
```

The last part of the line is the important part:

```
WhErEoNE caN't SE-E or
hEar.
```

Remember those eight moves?

```
W E E NE  N  SE E   E
```

Clever these programmers, aren't they?

Obviously, I can't cover every type of maze you are likely to come across. The ones I have mentioned should help those of you who have written in.

In case you're wondering where you can get these adventures, the answer is you can't, at least, not yet.

I decided not to use Electron adventures in case I spoilt it for anyone, though I understand that some of these adventures are to be released for the Electron.

Finally, you are more than welcome to write in with any problems – and tips as well. I need them too you know!

But please, if you want a quick answer then enclose a stamped addressed envelope. I will reply to it, even if my reply is that I don't know either!

Or if you want any information about adventures generally, write to me at Electron User and, who knows, perhaps we'll base an article on it. **Merlin**

Letters to: Merlin, ELECTRON USER, 68 Chester Road, Hazel Grove, Stockport SK7 5NY. Don't forget a stamped addressed envelope if you want a reply.

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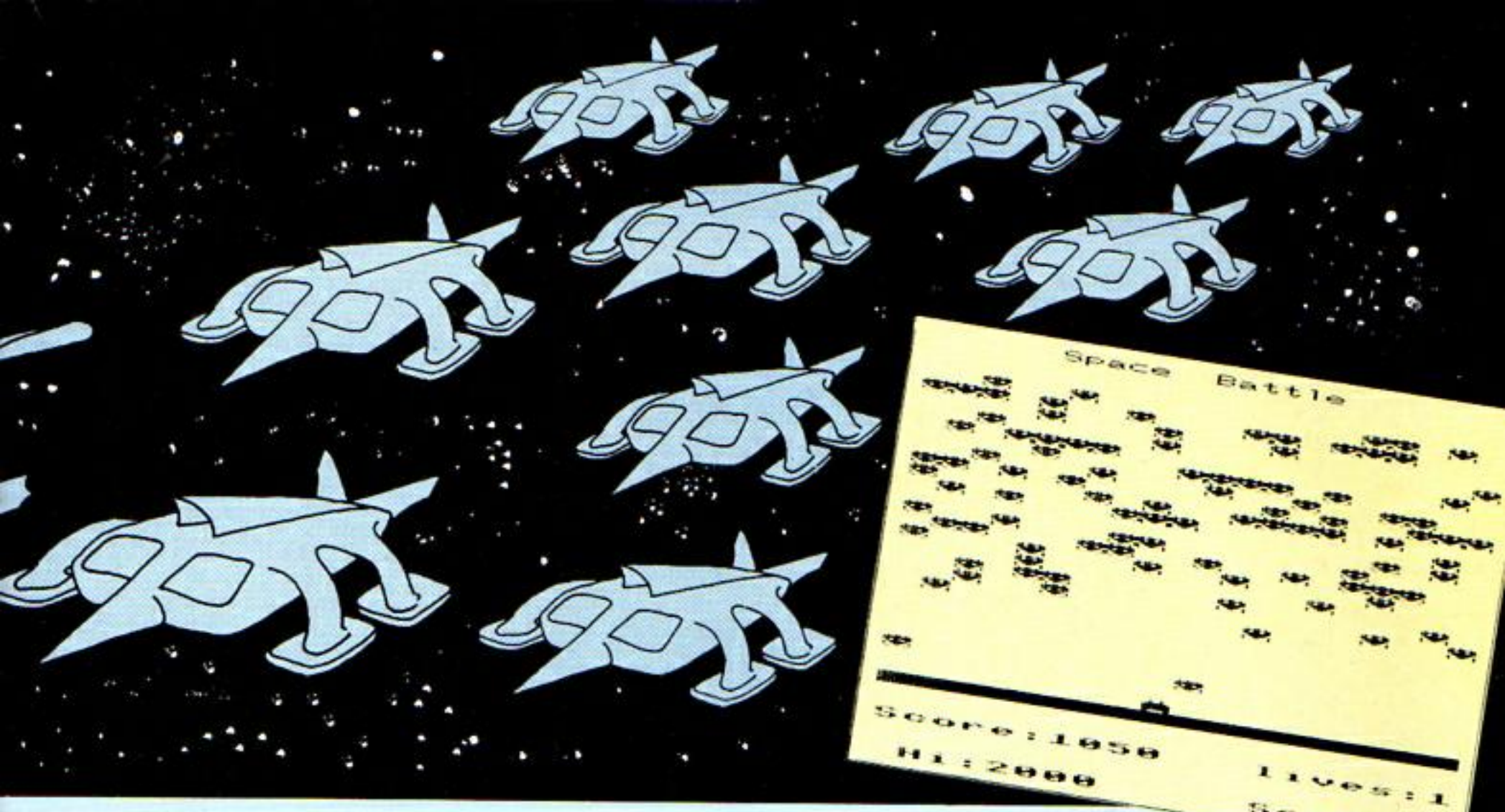
You take control of one of the missile batteries. Your task is to repel the aliens who hover, dive and, if you're not quick enough, land with disastrous results. Far from easy, but it is great fun.

```
   10REM ** SPACE BATTLE **
*
   20REM *By  R.A.Waddilove
*
   30REM *For Electron User
*
   40ON ERROR MODE 6:REPORT
:PRINT" at line ";ERL:END
   50MODE 4
   60PROCinstructions
   70HIMEM=&5400
   80PROCasseable:CLEAR
   90PROCinitialise
  100VDU 22,5,23,1,0;0;0;0;
  110REPEAT
  120PROCset_up
  130PROCgame
  140PROCanother
  150UNTIL INSTR("Nn",key$)
  160MODE 6:*FX12,0
  170*FX21,0
  180*FX4,0
  190END
  200
  210DEF PROCinstructions
  220*KEY10 "OLD|MRUN|M"
  230*FX229,1
  240*FX4,1
  250VDU 23,1,0;0;0;0;19,1,
4;0;19,0,5;0;
  260VDU 28,4,4,35,1:COLOUR
 129:CLS
  270COLOUR 0:PRINT'SPC(4);
  280PROCbig("S P A C E
B A T T L E")
  290VDU 26,28,1,28,38,6:CL
S
  300PRINT''"   The alien ba
ttle cruisers, high"''" abo
ve the earth, have managed
to"''" punch a hole in the
earth's outer"''" defence s
hield with their intense"''
" plasma energy bolts."
  310PRINT''"   Formations
of alien landing craft"''"
appear out of hyper-space,
pause for"''" a second, the
n break off to begin"''" th
eir descent."
  320COLOUR 128:COLOUR 1:PR
INT TAB(7,21);" Press the s
pace bar... ";
  330COLOUR 129:COLOUR 0:VD
U 26
  340*FX21,0
  350PROCscroll
  360VDU 28,1,30,38,6:CLS
  370PRINT''"   You are the
commander of one of"''" the
 many missile batteries sca
ttered"''" over the earth,
and your task is to"''" pre
vent any aliens from landin
g."
  380PRINT''" Controls :
press a letter"''" K...keyb
oard"''" J...joystick"''" S
...sound"''" Q...quiet"
  390COLOUR 128:COLOUR 1:PR
INT TAB(7,23);" Press space
 to start... ";:*FX21,0
  400joy=FALSE:*FX16,0
  410REPEAT K%=INKEY0 AND &
DF
  420PROCtune(1)
  430COLOUR 128:COLOUR 1
  440IF K%=ASC"J" joy=TRUE:
PRINT TAB(1,14);"J":COLOUR
129:COLOUR 0:PRINT TAB(1,12
);"K":TAB(2,21):SPC(36):*FX
16,1
  450IF K%=ASC"K" joy=FALSE
:PRINT TAB(1,12);"K":COLOUR
 129:COLOUR 0:PRINT TAB(1,1
4);"J";TAB(3,21);"A=left
 S=right    RETURN=fire":*F
X16,0
  460IF K%=ASC"S" PRINT TAB
(1,16);"S":COLOUR 129:COLOU
R 0:PRINT TAB(1,18);"Q":*FX
210,0
  470IF K%=ASC"Q" THEN *FX2
1,5
  480IF K%=ASC"Q" PRINT TAB
(1,18);"Q":COLOUR 129:COLOU
R 0:PRINT TAB(1,16);"S":*FX
210,1
  490UNTIL K%=0
  500VDU 19,0,0;0;19,1,0;0;
26,12
  510ENDPROC
  520
  530DEF PROCscroll
  540a$=STRING$(6," ")+"Ele
ctron User"+STRING$(6," ")+
"Micro  User":b$=a$
  550REPEAT b$=b$+a$
  560REPEAT K%=INKEY0
  570PROCtune(1)
  580PRINT TAB(3,30);LEFT$(
b$,34);
  590b$=MID$(b$,2)
  600UNTIL LEN b$=34 OR K%=
32
  610UNTIL K%=32
  620ENDPROC
  630
  640DEF PROCbig(string$)
  650FOR I%=1 TO LEN string
$
  660?&70=ASC(MID$(string$,
I%,1))
  670A%=10:X%=&70:Y%=0:CALL
&FFF1
  680FOR J%=0 TO 1
  690VDU 23,225
  700FOR K%=2 TO 9
  710VDU ?(&70+4*J%+K%DIV2)
  720NEXT
  730VDU 225,10,8
  740NEXT
  750VDU 11,11,9
  760NEXT
  770ENDPROC
  780
  790DEF PROCanother
  800RESTORE 1670
  810S%=1000*((?score AND &
F0)DIV &10)+100*(?score AND
 &F)+10*((score?1 AND &F0)D
IV &10)+(score?1 AND &F)
  820IF S%>scores%(10) PROC
hi_score
  830CLS:VDU 28,19,3,6;0;
  840PRINT'TAB(3)::PROCbig(
"High  Scores")
  850COLOUR 2:PRINT'''
  860FOR I%=1 TO 10
  870COLOUR 3:PRINT
  880PRINT;I%;".";:COLOUR 2
:PRINT TAB(3);name$(I%);TAB
(15);scores%(I%)
  890NEXT
  900COLOUR 1:PRINT'''"   A
nother game ?"''SPC(6);"(Y
or N)"
  910REPEAT key$=INKEY$0
  920IF ADVAL(-6)>3 PROCtun
e(0)
```




```
  930UNTIL INSTR(" YyNn",ke
y$)>1
  940CLS:*FX21,5
  950ENDPROC
  960
  970DEF PROChi_score
  980COLOUR 3:PRINT TAB(0,2
);
  990PROCbig("* CONGRATULAT
IONS *")
 1000COLOUR 2:PRINT''''"You
 are in the"''"high score t
 able."''"What is your name
 ?"''''"?";
 1010COLOUR 1:string$="":VD
U 23,1,1;0;0;0;
 1020REPEAT K%=INKEY0
 1030IF ADVAL(-6)>3 PROCtun
e(0)
 1040IF K%>31 AND K%<127 AN
D POS<11 string$=string$+CH
R$K%:VDU K%
 1050IF K%=127 AND LEN stri
ng$ string$=LEFT$(string$,(
LEN string$)-1):IF POS>1 VD
U K%
 1060UNTIL K%=13
 1070VDU 23,1,0;0;0;0;
 1080scores%(10)=S%:name$(1
0)=string$
 1090FOR I%=10 TO 2 STEP -1
 1100IF scores%(I%)>scores%
(I%-1) S%=scores%(I%):score
s%(I%)=scores%(I%-1):scores
%(I%-1)=S%:string$=name$(I%
):name$(I%)=name$(I%-1):nam
e$(I%-1)=string$
 1110NEXT
 1120ENDPROC
 1130
 1140DEF PROCinitialise
 1150*FX11,0
 1160VDU 23,224,170,85,170,
85,170,85,170,85
 1170ENVELOPE1,129,-5,-10,-
20,8,4,2,126,0,0,-126,126,1
26
 1180ENVELOPE 2,2,1,-1,1,2,
4,2,126,0,0,-126,126,126
 1190speed=&7D:score=&7E:de
ad=&79
 1200DIM scores%(10),name$(
10)
 1210FOR I%=1 TO 10
 1220scores%(I%)=2100-I%*10
0
 1230NEXT
 1240name$(1)="Electron":na
me$(2)="User"
 1250name$(3)="Micro":name$
(4)="User"
 1260FOR I%=5 TO 10
 1270name$(I%)=name$(I%-4)
 1280NEXT
 1290ENDPROC
 1300
 1310DEF PROCset_up
 1320RESTORE 1820:READ A%,B
%,C%
 1330VDU 19,1,A%;0;19,2,B%;
0;19,3,C%;0;
 1340COLOUR 129:COLOUR 3
 1350PRINT TAB(0,25);STRING
$(20,CHR$224)
 1360COLOUR128:COLOUR 2
 1370PRINT TAB(0,28)"Score:
0000";TAB(13);"lives:5"
 1380COLOUR 1:PRINT'" Hi:";
scores%(1);TAB(13);"Scr0:1"
;
 1390scr=1:!score=0:?speed=
20:lives=5
 1400ENDPROC
 1410
 1420DEF PROCgame
 1430REPEAT
 1440FOR I%=0 TO 99
 1450!(2*I%+&950)=&5E40+I%*
16
 1460NEXT
 1470COLOUR 2:CALL HIMEM:*F
X21,0
 1480IF scr=9 scr=0:RESTORE
 1820
 1490IF ?dead=FALSE AND ?sp
eed>5 ?speed=?speed-1
 1500IF ?dead lives=lives-1
:PRINT TAB(19,28);lives;:PR
OCpause(200) ELSE scr=scr+1
:COLOUR 1:PRINT TAB(18,31);
scr;:READ A%,B%,C%:VDU 19,1
,A%;0;19,2,B%;0;19,3,C%;0;
 1510COL 0,0:FOR I%=0 TO 1
280 STEP 8:MOVE I%,224:DRAW
 I%,1024:NEXT
 1520UNTIL lives=0
 1530ENDPROC
 1540
 1550DEF PROCpause(T%)
 1560TIME=0:REPEAT UNTIL TI
ME>T%
 1570ENDPROC
 1580
 1590DEF PROCtune(T%)
 1600READ pitch
 1610IF pitch<0 RESTORE 167
0:READ pitch
 1620IF T% SOUND 1,-10,pitc
h,3 ELSE SOUND 1,2,pitch,10
 1630ENDPROC
 1640
 1650
 1660REM ***** tune *****
 1670DATA 60,100,76,100, 52
,100,68,100, 44,92,60,92, 4
0,88,56,88
 1680DATA 60,100,76,100, 52
,100,68,100, 44,92,60,92, 4
0,88,88,88
 1690DATA 60,76,60,76,100,9
2,76,60, 52,68,52,68,100,80
,68,52, 44,60,44,60,92,72,6
0,44, 40,56,40,56,88,68,56,
40
 1700DATA 60,76,60,76,100,9
2,76,60, 52,68,52,68,100,80
,68,52, 44,60,44,60,92,72,6
0,44, 40,56,40,56,88,68,56,
40,-1
 1710REM ***** alien 1 ****
*
 1720DATA 85,255,249,217,11
9,171,153,68,170,255,249,18
5,238,93,153,34
 1730REM ***** alien 2 ****
*
 1740DATA 85,255,217,249,11
9,171,153,136,170,255,185,2
49,238,93,153,17
 1750REM **** explosion ***
*
 1760DATA 254,218,173,210,2
10,173,218,254,247,181,91,1
80,180,91,181,247
 1770REM ***** base *****
 1780DATA 2,2,39,107,105,75
,15,12,4,4,78,109,105,45,15
```

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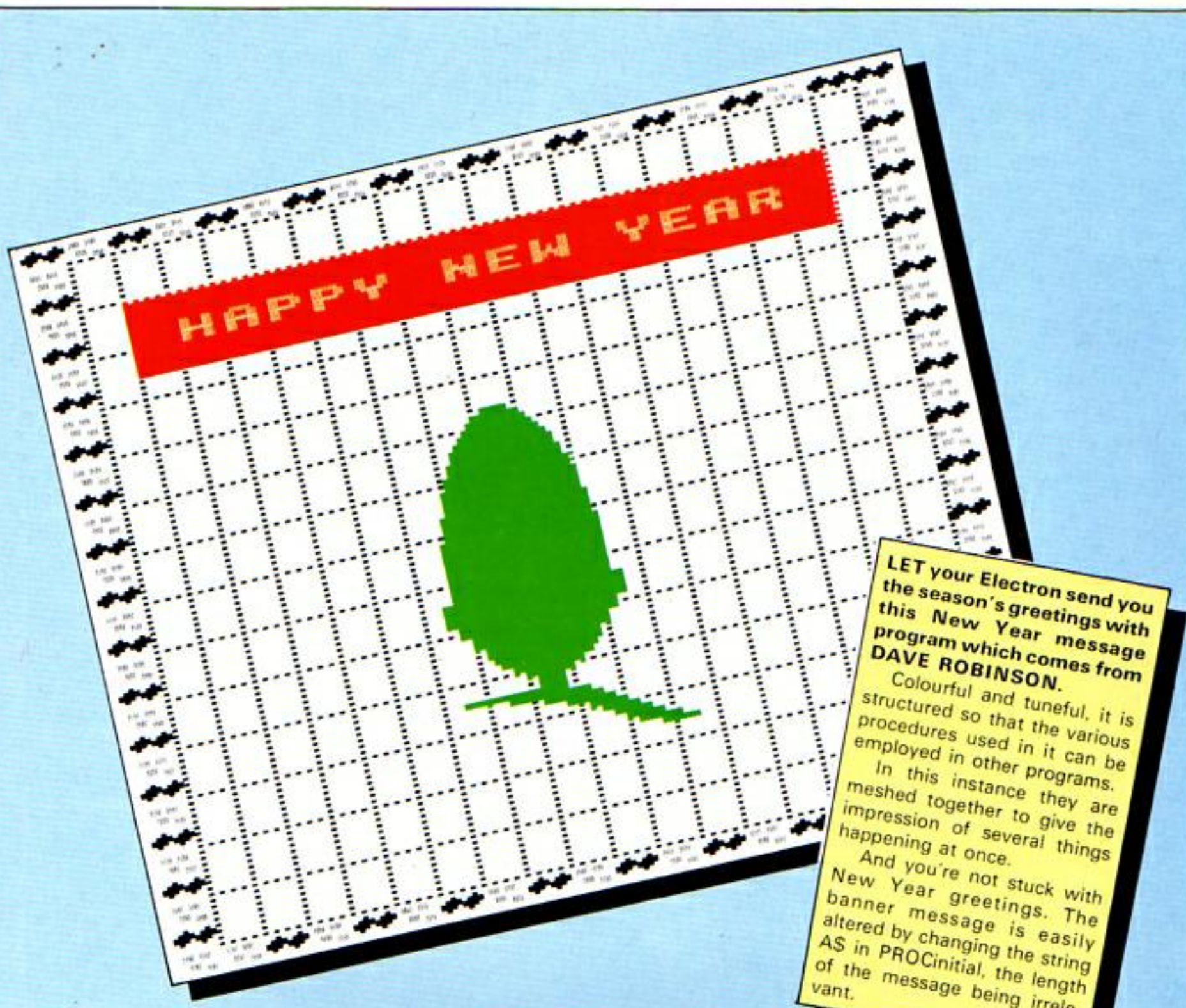

LET your Electron send you the season's greetings with this New Year message program which comes from DAVE ROBINSON.

Colourful and tuneful, it is structured so that the various procedures used in it can be employed in other programs.

In this instance they are meshed together to give the impression of several things happening at once.

And you're not stuck with New Year greetings. The banner message is easily altered by changing the string A$ in PROCinitial, the length of the message being irrelevant.

```
 10 REM NEW YEAR MESSAGE
 20 REM BY DAVE ROBINSON
 30 REM (C)ELECTRON USER
 40 REM ----------------
 50 ON ERROR PROCerror:EN
D
 60 MODE5
 70 PROCinitial
 80 PROCborder
 90 PROCgrid
100 PROCtune
110 REPEAT
120 REPEAT
130 PROCmessage(A$,200)
140 UNTIL ADVAL(-6)>0
150 PROCtune
160 UNTIL end
170 PROCprint
180 REPEAT
190 PROCmessage(A$,400)
200 UNTIL FALSE
210 END
220 :
230 DEFPROCinitial
240 VDU23,1,0;0;0;0;
250 VDU19,3,2,0,0,0
260 VDU23,224,0,34,119,25
5,238,68,0,0
270 VDU23,225,0,100,100,0
,48,54,6,0
280 lineX=664
290 loopX=12
300 end=FALSE
310 A$="  * A HAPPY NEW Y
EAR FROM THE ELECTRON USER"
320 AX=&A:XX=0:YX=&A
330 DX=&A00
340 ENDPROC
350 :
360 DEFPROCprint
370 FOR KX=7 TO 11
380 PROCmessage(A$,200)
390 B$=MID$("acorn",KX-6,
1)
400 PROCdouble(B$,KX,8)
410 NEXT
420 FOR KX=6 TO 13
430 PROCmessage(A$,200)
440 B$=MID$("electron",KX
-5,1)
450 PROCdouble(B$,KX,26)
460 NEXT
470 ENDPROC
480 :
490 DEFPROCmessage(mess$,
delayX)
500 COLOUR1:COLOUR130
510 PRINTTAB(2,4)STRING$(
16," ")
520 PRINTTAB(2,5)LEFT$(me
ss$,16)
530 PRINTTAB(2,6)STRING$(
16," ")
540 mess$=RIGHT$(mess$,(L
EN mess$-1))+LEFT$(mess$,1)
550 FOR waitX=0 TO delayX
:NEXT
560 A$=mess$
570 ENDPROC
580 :
590 DEFPROCtune
600 READ noteX,durationX
610 IF noteX=0 THEN end=T
RUE:ENDPROC
620 SOUND 1,-15,noteX,dur
ationX
630 SOUND 1,0,0,0
640 PROCdraw
650 ENDPROC
660 :
670 DEFPROCdraw
680 READ startX,finishX
690 IF startX=0 THEN ENDP
ROC
700 FOR IX=1 TO 2
710 MOVE startX,lineX
720 DRAW finishX,lineX
730 lineX=lineX-4
740 NEXT
750 ENDPROC
```

Turn to Page 58

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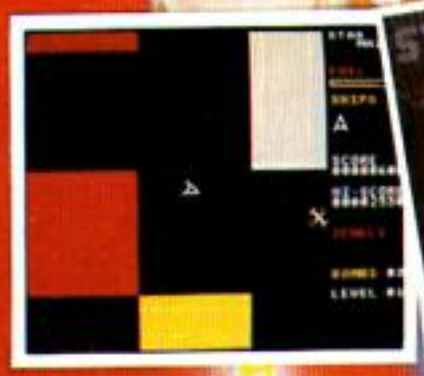
Author: Simon Vout



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Strategy on the final frontier

Warp 1
Icon Software

THE cassette insert describes Warp 1 as "a strategical space adventure", which is handy as I can't think of any other way of describing it.

It's like no other game I've played, a cross between battleships, Space Invaders, an adventure and a Lunar Lander.

You're commander of a Federation Starship, your mission to seek out a fellow captain who is lost in space. As you work your way through the six quadrants and 48 sectors of deep space the Klingons attack.

When you engage your phasers the Klingons appear on the starship's viewing screen. As you fight them off inevitably you incur damage and use precious energy, necessitating a risky docking manoeuvre with the nearest starbase.

If it sounds complicated that's because it is. Despite three full pages of excellent instructions in the cassette inlay, it took three games before I understood Warp 1 fully.

Having said that, the controls are easy to use and the screen layout is excellent – once you get used to the amount of information coming at you.

It's very easy to forget that you're running low on energy, and docking can be tricky. So if

you are tired of arcade action but don't want a game that's too hard on your brain then you have to look at Warp 1. It's different.

Norman Keynes

Merlin stopper

Blue Dragon
MP Software

EITHER these adventures from MP Software are getting harder or I'm losing my touch.

Your task is to find the location of the Sun God's treasure and defeat the ferocious blue dragon which guards it.

At the start you find yourself on a beach. To your left is a bird perched upon a high rock. It's not impressed with your efforts to catch it.

To your right is an evil-smelling rubbish dump that, surprisingly, is not to be avoided.

Behind you is an empty gulley. Is this how I got here, you think? Wrong! Ahead of you is a narrow track up the cliffs to a forbidding-looking castle high above.

You should be able to solve most of the mysteries surrounding you and, provided you have found that elusive knight (hint), you should be able to collect all the goodies and wipe the sneer off that bird's face.

On doing so you find that the bird is in reality a beautiful princess who has been transformed by an evil wizard. (Surely after all these adventures there can't be that many evil wizards left?)

Anyway, noble soul that you are, you volunteer to follow the bird to a land far

away and then your quest begins in earnest. After a couple of hours you reach the same point as me. (I'm the one in the corner with the beard and pointed hat.)

Can you uncover the secret of the "triangular slot in the wall by an almost invisible door"? If so, please write to me c/o Electron User and let me know, because I couldn't!

To be fair (excuses, excuses), I had just received MP's two latest adventures and was eager to try them out.

Anyway, back to Blue Dragon. I'm always impressed by any game that I don't manage to finish. This is no exception.

I daresay there is an object somewhere that will open that door and one day I am determined to go back and find it.

Overall, definitely superior to earlier MP adventures and of about average difficulty.

Merlin

YOU'LL ENJOY BEING STRANDED

Stranded
Superior Software

THIS is the smallest adventure that I have ever seen and, despite the fact that it has graphics, one that I truly didn't expect to like.

However I was wrong. Although I don't think it would pose any problems to the experienced adventurer it is nevertheless an enjoyable romp.

You have been stranded on an alien planet and your task is to find a means of leaving it and returning home.

It won't take you long to find a spaceship but unfortunately it's guarded by an unfriendly robot.

A careful search of the planet, along with a spot of hang-gliding, should provide you with the means of getting past the robot and, hopefully, into the spaceship.

After activating the engines you should search your craft. The articles you find, along with judicious use of Dr. Who's Tardis (!), should be enough for you to find your way home.

The graphics are quickly drawn and are the clearest I have seen in an adventure.

As with all graphical adventures the trade-off between the program size and quality of graphics is something you need to judge for yourself.

Do you choose a complex adventure with limited graphics or an easy adventure with well drawn graphics? This program falls into the latter category. I liked it.

Merlin

Bumble turn-on

Bumble Bee
Micro Power

MICRO Power have gained an enviable reputation for producing quality software for the Electron, Bumble Bee is

→

From Page 19

yet another addition to the range.

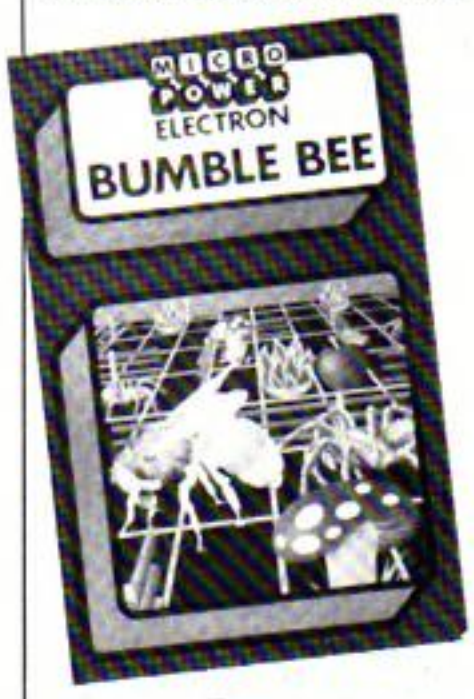
The game has its origins in Pac Man and will appeal to arcadians who love being chased round a maze by assorted bugs and beasts.

However it requires a lot more thought than the original when playing.

You are the bumble bee in the title, scurrying round a maze of swinging turnstiles collecting pollen grains. Spiders emerge and chase you making the task more difficult.

When you have collected all the pollen you buzz over to the Out sign and move on to the next screen. At 4,000 points you gain an extra life to add to the three provided at the start.

The interesting part of the game is the turnstiles. You can swing them but the spiders can't. So you can block off the



spiders in a different section, or swing a turnstile into their path if they are about to pounce on you.

Entering your name into the high score table is almost as hard as the game. The letters of the alphabet are printed in a grid, you have to fly over the correct letters to spell your name – and it's not easy as you buzz about the screen at top speed.

After an hour the high score table was full of names like RLANDI, RON AND and ROFLANG!

The only grumbles are the length of the loader – 7k is just too long, I didn't bother with it and just * ran the main program. And if you want to use joysticks you need a switch type joystick interface – it ignores the Plus 1.

Bumble Bee is a well written addictive arcade game with colourful, smooth graphics and good sound. It's well worth buying, so start saving your pennies now.

Roland Waddilove

Ghouls are good for you...

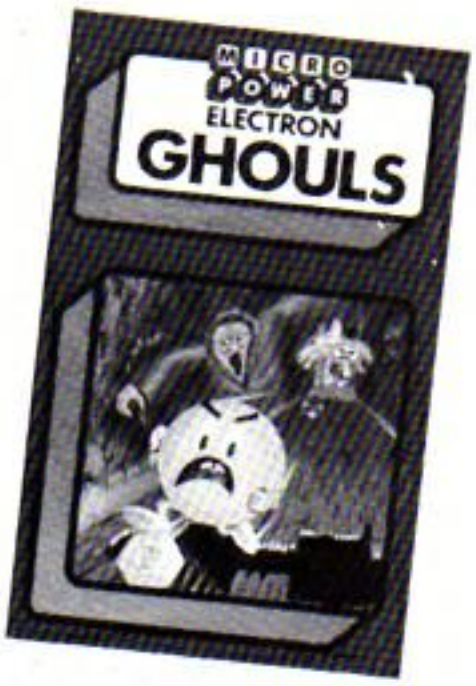
Ghouls
Micro Power

HIDDEN away in the creepy mansion at the top of the hill are a number of power jewels. Many have been to search for them but no one has lived to tell the tale.

Have you the courage to succeed where others have failed? This is the challenge issued by Ghouls.

You control the star of the show, a little man with the appearance of a pac-man on two legs. His ever munching mouth continuously snaps up titbits for bonus points as you attempt to reach the various levels in your search for treasure.

You start off in the first of



four screens – Spectre's Lair. Here to hinder you in your quest you will find the mansion's frowning ghost who's out to get you.

Let him catch you and you'll die and that frown will change to an enormous cheeky grin. This chap follows you through every screen, and at times his presence is positively painful.

You have a time limit in which to get to the box of jewels at the top of the screen in order to access the next landing. Titbits and the occasional stray jewel munched en route count for bonus points.

The jewel has the additional perk in that it makes the ghost disappear for a short while. However there are other hazards to make life unpleasant.

In order to make progress you must balance on a moving platform and leap to and from it to higher levels.

There is also a set of poison-smeared spikes in your way and contact with any one will prove fatal.

Should you succeed on the first screen you will progress to the more difficult Horrid Hall.

As well as all the other nasties you also have to avoid contracting floorboards.

Succeed on screen 2 and Spider's Parlour awaits you. The spider is something to behold but not touch. The fortunate thing is that he stays in one spot bouncing up and down waiting patiently for a tasty morsel – usually me!

The infuriating aspect of the game, as with most multi-levels ones, is that as soon as you "die" you start back at the beginning of the screen no matter how far you have progressed.

I must confess it is because of this beast that I haven't seen screen 4, the Death Tower.

Even so I've seen enough to consider it excellent value. It is

Have a blasted good time

One Last Game
Clemoes Software

THIS is probably best described as a cross between Scramble and Galaxians. The ground below you scrolls smoothly from right to left, while the aliens line up on the right hand side.

They peel off, in ones at first, then in groups later on, and blast your ship on the left.

You can move your ship up and down, dodging aliens and missiles as they swarm in from the right, and blast them with your laser, more points being scored if they are on the move rather than in the main formation.

There are 20 different screens with increasing difficulty – on the later ones the aliens can only be destroyed when they leave the main formation for their attack.

There is the option to start on any screen.

There are a couple of unusual features. The game can be speeded up or slowed down with the joystick (plugged into the Plus 1), so you can whizz through the first few easy screens then slow down when it gets tough.

The second extra is the way it plays a tune to the accompaniment of a drum.

The tune is played in the normal way, but as the Electron can only use one channel at once, how can it also play the drums?

Have you noticed the click of the cassette relay when loading or saving programs? The author has very cleverly utilised this as a makeshift drum. By rapidly switching it off and on a drum solo is played. Ingenious. I hate to think what it's doing to the relay though.

I loved this game right from the start and have played it for hours.

If you, like me, like the sort of games where you just blast everything in sight, then you will love this one.

Roland Waddilove

extremely addictive as there is always that incentive to "crack it this time".

The graphics are well presented and the eerie sounds make the game come to life. We've come to expect high standard games from Micro Power and Ghouls is one of their best.

Alan Sergeant

Learning is fun

Mystery of the Java Star
Shards Software

THIS is an educational adventure in four parts. Purpose of the game is to find the wreck of a ship which sank in 1767. You then have to search the wreck and recover its cargo of gold.

You are also seeking a ruby called the Java Star which is reputed to have strange properties.

You take the part of an adventurer in Bristol who buys an old chest and finds the torn pieces of an ancient map and a page from a ship's log.

Your first task is to rearrange the pieces into something recognisable. When you have done this you find that you have a map of the island where the ship sank.

There is also information on the approximate position of the ship in relation to the island at the time is sank.

You then load in the next program and find yourself in London seeking more information, such as ship's destination, weather conditions at the time and cargo manifest.

On completing this stage you jet off to the Caribbean to continue your search.

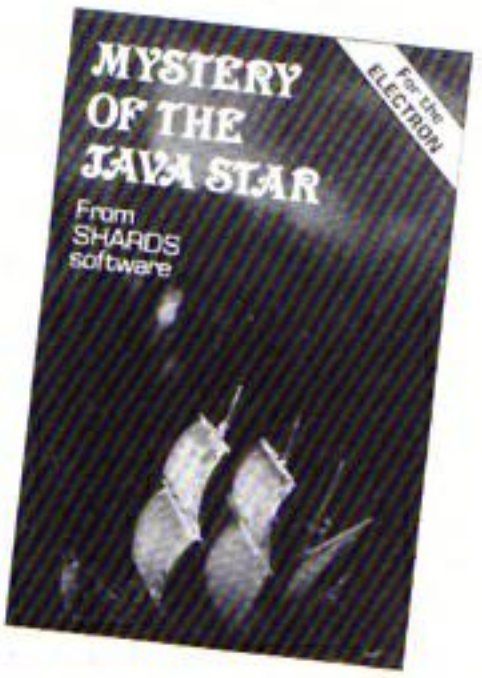
There you check various islands until you find one nearest the map outline.

Now comes the final part of the game, where you have to use the page from the ship's log to locate the wreck. I failed dismally.

Whatever I did I couldn't find that wreck. I suppose that adage about teaching old dogs new tricks applies to sea dogs as well!

As I said, this is an educational program but, above all, it's fun!

There are three skill levels



and despite the fact that I stayed on the easiest one that map was different every time.

An excellent educational program with something of interest to kids off all ages, including big ones.

Merlin

Gory, but great

SAS Commander
Comsoft

I MUST admit that when I first saw the title of Comsoft's latest offering all my finely-honed, Guardian-reading hackles rose.

Another arcade anthem to macho man? More bodies littered across the screen? I was dead against it.

That is I was until I started playing it, and then I was hooked.

The idea is quite simple. A group of urban terrorists has infiltrated three streets. There are 10 to each street and your job is to root them out.

However it's not that easy. As you tote your gun along the terrorised terraces the terrorists appear in the windows blasting away at you.

Of course you can dodge their fire and shoot back (each terrorist killed increases your points score) but beware. Some of the terrorists have taken hostages and are hiding behind them, sniping at you. Hit a hostage and you're drummed out of the game.

It's gory but great fun. Well worth looking at.

Trevor Roberts

Walking on thin ice

Polar Perils
Squirrel Software

WHAT'S your attitude to polar bears? Do you think that they're sweet, cuddly things, wrapped up snugly in white fur jackets looking like something off a Christmas card? That used to be my opinion until I played Polar Perils.

The action is set in the Arctic and your job is to guide your eskimo through the icy wastes, safely. Easier said than done!

The first screen has the eskimo at the top of the screen facing the cold Arctic waters. He has to get to the other side by leaping onto a passing ice floe.

The trouble is that these floes move randomly and there's no guarantee that the one chosen will take the eskimo within leaping distance of the other shore.

Happily you do have three eskimos, but it's amazing how fast you use them up.

To make things worse a polar bear is also leaping from floe to floe looking for its dinner (the eskimo).

You have to guide your little man to one of the two islands, grab the spear you will find there, and kill the bear.

Next comes a trip across the ice, which is so thin that in places it can't bear the eskimo's weight.

The bears can't wait either and try to devour him while he's attempting to collect rocks which can be used to map out a path through the thin ice and so to the other side.

Once there the eskimo faces a journey in a fragile kayak through iceberg-infested waters. Apparently he has to collect six blocks of ice to build an igloo but I've never got that far (thanks to the bears).

It's a smashing game, addictive, irritating, amusing and frustrating in turns, the sort that has your family giving you queer looks as you scream at the Electron.

I can't remember when reviewing a game gave me so much pleasure. Thoroughly recommended.

Nigel Peters

The DIY pinball machine

Pinball Arcade
Kansas City Systems

A COMPUTER version of a pinball machine might sound a little boring, but Pinball Arcade from Kansas is quite enjoyable, and makes a welcome change from blasting nasties out in space or being chased round a maze.

The interesting part is designing your own pinball machine from the five pages of bumpers, wires, slings and targets provided.

When you are satisfied with the board it can be saved on tape, to be loaded and used again.

Quite a number of options are available – you can even alter the tilt of the table and the bounce of the ball.

When playing the only keys needed are Z and / for the left and right flippers and the space bar to compress the spring.

There are a couple of annoying faults however. Firstly it will not run with the Plus 1 attached, and I am not going through all the bother of unplugging everything and unscrewing the Plus 1 every time I want to use the program.

The reason is simple – part of the code placed in page &D is being overwritten by the operating system, causing a whopping great crash when it is called by the program.

The second fault is the fantastic amount of flicker when the ball moves. Hasn't the author heard of *FX19? The addition of this command would make a world of difference.

If Kansas cure these bugs and brighten up the loader a bit then it will be better value.

Roland Waddilove

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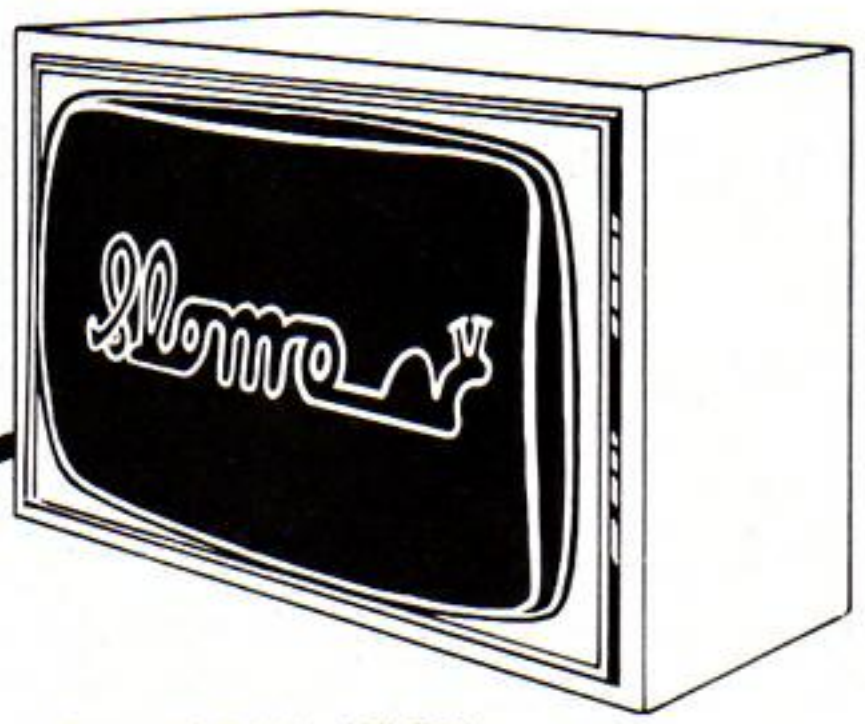

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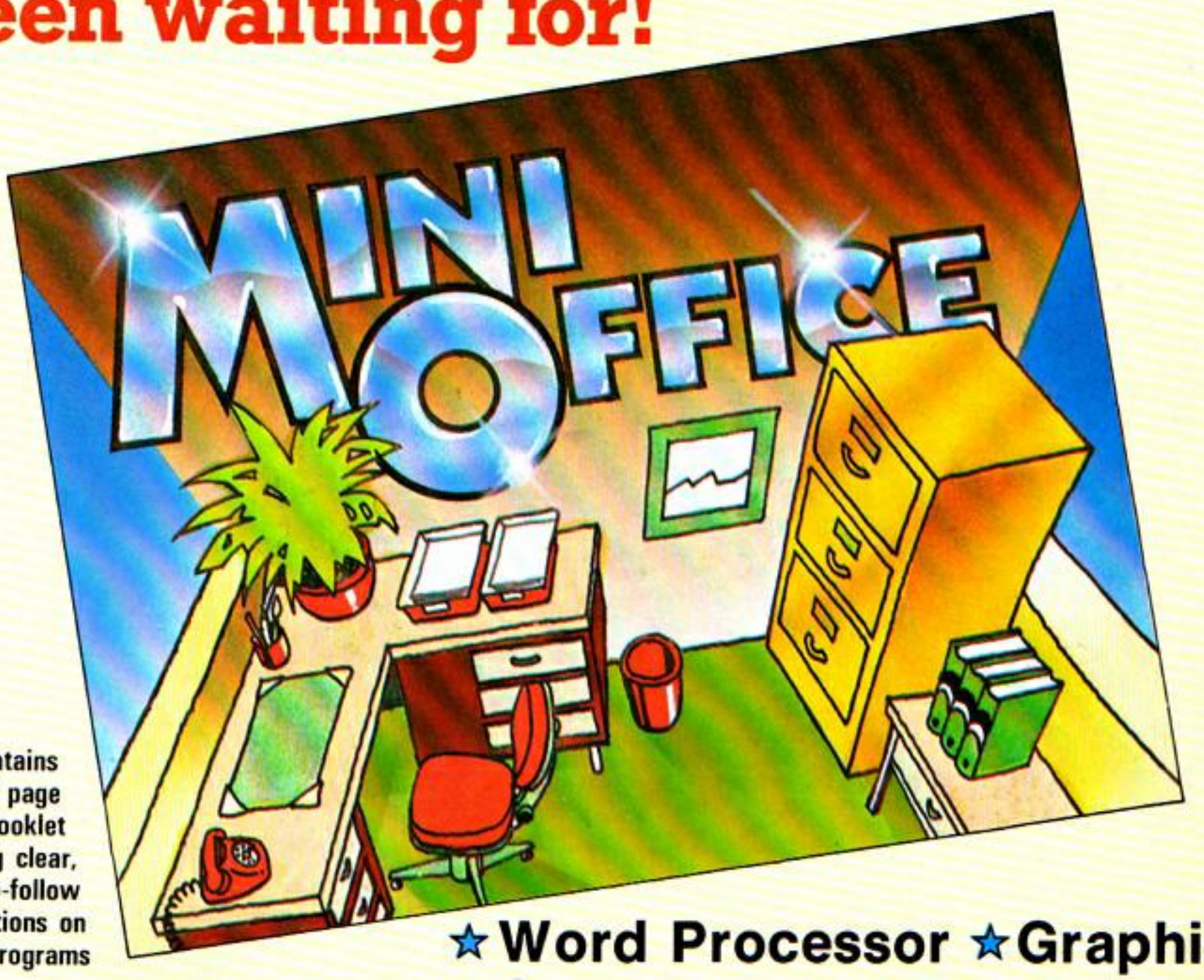

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ELECTRON JOYSTICKS

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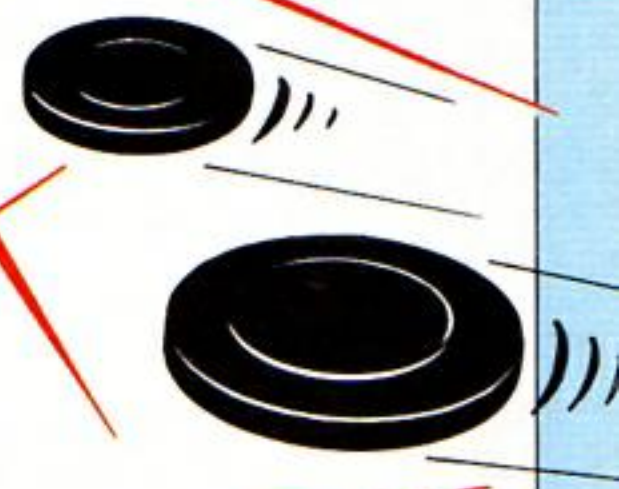
BLAST YOUR FRUSTRATIONS AWAY

EVER had one of those days when you've felt like taking a gun and blasting everything in sight? Well now you can, but there's no violence involved when you play ANTHONY MARTIN's Claypigeons.

Fifty clays will fly across the screen while you use the keyboard to get them in your gunsights.

When you think you've got it right, fire away. But beware – the Electron will comment on how good you are and it's not always very flattering.

Still, practice makes perfect and you'll get a lot of practice as you keep on trying to get all 50 of those clays.



VARIABLES

hs%(6) Six highest scores.
name$(6) Six highest scores.
score% Game score.
clay% Number of clays so far.
sx%,osx% Present and last x coordinate of gunsight.
sy%,osy% Present and last y coordinate of gunsight.
x%,ox% Present and last x coordinate of clay.
y%,oy% Present and last y coordinate of clay.
start% Random y coordinates of clay at start.
end% Random y coordinates of clay at end.
inc% Gradual change in y coordinate of clay.
shoot% 1 if fired, 0 if not fired.
hit% Indicates to random message system whether hit or not.

com$(14) 14 comments used by random message system.
message% Random number, if 3 no message.
mess% Indicates to random message system the standard of performance achieved so far.

messno% Number of message selected.

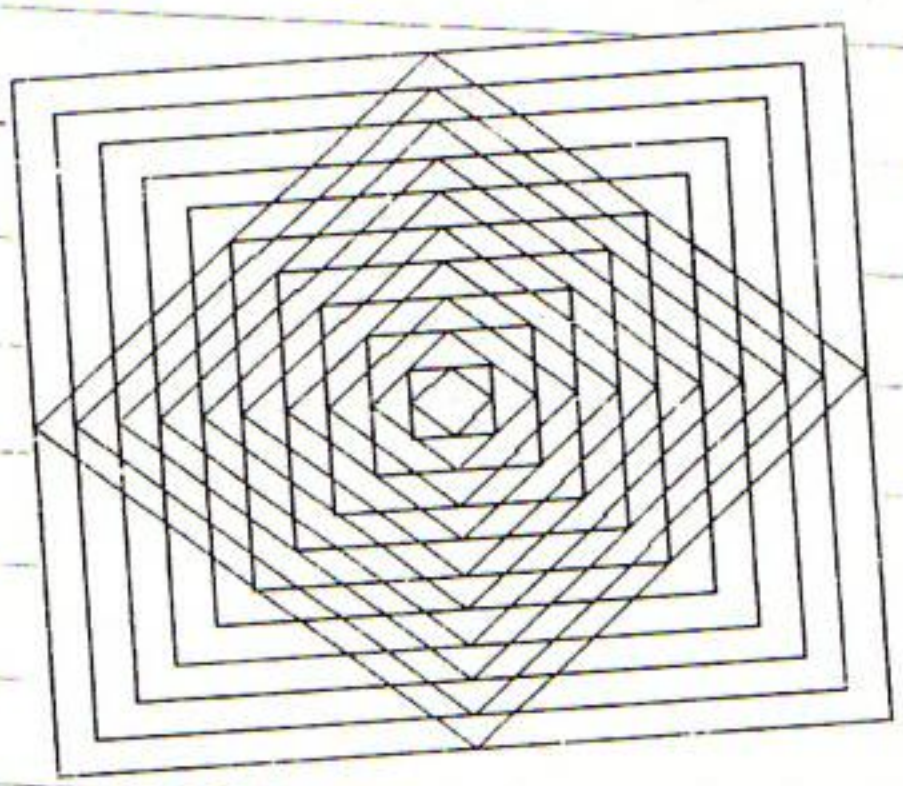
```
  10 REM Claypigeons by A
G Martin
  20 MODE1:*FX4,1
  30 VDU23,1,0;0;0;0;
  40 DIM hs%(6),name$(6),c
om$(14)
  50 ENVELOPE1,1,1,1,2,2,2
,1,126,0,0,-126,126,126
  60 ENVELOPE2,1,1,1,2,2,2
,2,126,0,0,-126,126,126
  70 FORI%=1TO6:hs%(I%)=1:
name$(I%)="AGM Software":NE
XT
  80 FORI%=1TO14:READ com$
(I%):NEXT
  90 COLOUR 2:VDU19,2,9;0;
:PRINTTAB(13,2)"CLAYPIGEONS
":COLOUR 3
 100 PRINTTAB(1,8)"Instruc
tions:"
 110 PRINTTAB(1,10)"You ha
ve 50 clay pigeons and you"
,TAB(1,12)"have to hit as m
any as possible."
 120 PRINTTAB(1,16)"To mov
e the gunsight:",TAB(1,18)"
Z = left,X = right,: = up,/
 = down",TAB(1,20)"Space ba
r for firing the gun."
 130 PRINTTAB(1,22)"Fast o
r Slow (F/S)"
 140 fs$=GET$:IF fs$="F" m
o%=5:GOTO170
 150 IF fs$="S" mo%=2:GOTO
170
 160 GOTO130
 170 MODEmo%:IF mo%=2 VDU1
9,2,3;0;
 180 VDU23,1,0;0;0;0;:*FX4
,0
 190 VDU23,224,0,0,0,24,24
,0,0,0
 200 VDU23,225,24,36,66,90
,90,66,36,24
 210 VDU23,226,128,66,0,24
,24,0,66,128
 220 VDU23,227,0,0,0,0,8,0
,0,0
 230 MOVE142,292:DRAW1108,
292:DRAW1108,908:DRAW142,90
8:DRAW142,292
 240 GCOL0,1:VDU19,1,0;0;:
FORI=296TO904STEP4:PLOT77,5
00,I:NEXT:VDU19,0,1;0;
```

Turn to Page 53

Notebook

THIS month's program, from Neil Cawthorne of Richmond, uses VDU 29 and one procedure to produce a spectacular pattern.

Try varying the position of the origin and the STEP parameter for some very different results.



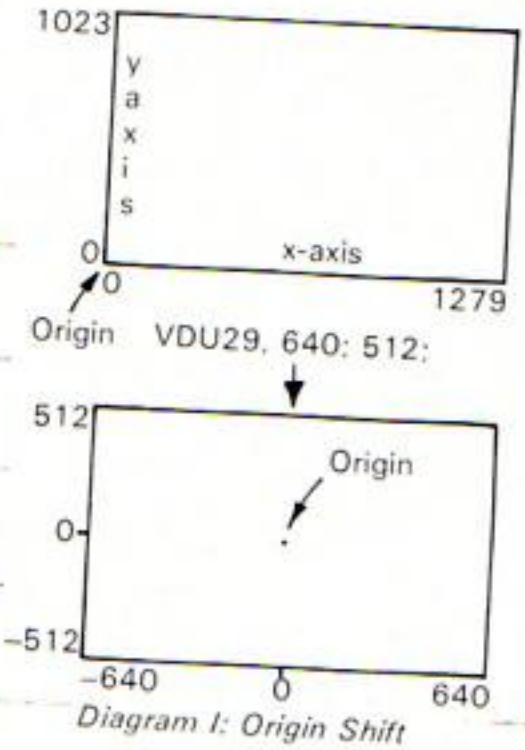


Diagram I: Origin Shift

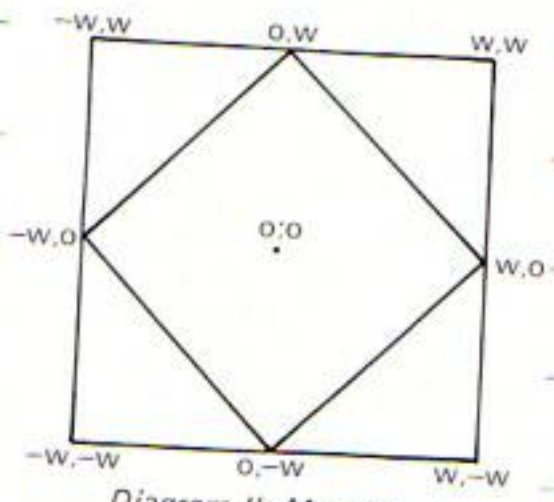


Diagram II: Mandala

PROCEDURES

10,20 The usual REMs, explaining what the program is called and who wrote it.

30 Puts the Electron in Mode 1. See what happens with the other graphics modes.

40 The VDU 29 shifts the origin into the middle of the screen at the position 640,512. Don't forget the semicolons, or havoc ensues!

50-70 Form a FOR . . . NEXT loop. Try varying the values of *radius* and also the size of the STEP parameter.

60 PROCmandala(radius) calls the procedure defined in lines 90 to 200. Each time round the loop, *radius* will have a different value and so the procedure will operate with a different value of *w*.

80 Brings the program to a halt after the loop is ended. If it was missing the program would carry on into the procedure definition with unpredictable results.

90,200 Tells the Electron that the lines between the DEF PROC and the ENDPROC of line 200 are to form a procedure called PROCmandala(w). This procedure can be called by name and the value in the brackets at the end of the name will be given to the variable *w*.

100-140 Produce the "inside" square. They MOVE the graphics cursor to the position 0,w relative to the *new* origin in the centre of the screen. Then they draw the inside lines.

150-190 These do the same for the outside square.

```
10 REM ORIGINS
20 REM NEIL CAWTHORNE
30 MODE 1
40 VDU 29,640;512;
50 FOR radius= 50 TO 500
STEP 50
60 PROCmandala(radius)
70 NEXT radius
80 END
90 DEF PROCmandala(w)
100 MOVE 0,w
110 DRAW -w,0
120 DRAW 0,-w
130 DRAW w,0
140 DRAW 0,w
150 MOVE -w,w
160 DRAW -w,-w
170 DRAW w,-w
180 DRAW w,w
190 DRAW -w,w
200 ENDPROC
```

Relocates origin

Calls the procedure

Procedure that draws the squares

Draws inside square ◇

Draws outside square □

Trevor Roberts

NIGEL PETERS concludes his guided tour around the Electron's sound commands

Finally, lets lick that ENVELOPE

WITH this article we've reached the end of our exploration of the Electron's sound facilities. You may have noticed that during our tour of the sound channels we've steered well clear of the formidable looking ENVELOPE command.

Before we get to grips with it, run Program I and make sure that you understand what's happening.

```
  10 REM PROGRAM I
  20 FOR pitch=100 TO 140
  30 SOUND 1,-15,pitch,2
  40 NEXT pitch
  50 FOR pitch=140 TO 110
STEP -1
  60 SOUND 1,-15,pitch,2
  70 NEXT pitch
  80 FOR pitch=110 TO 140
  90 SOUND 1,-15,pitch,2
 100 NEXT pitch
```

It consists of three FOR ... NEXT loops each containing a SOUND command. The first loop increases the pitch of the note played, the second decreases it and the third increases it again. The note seems to go up in pitch, then down, then up again.

Now run Program II and see if you can hear any difference.

```
  10 REM PROGRAM II
  20 ENVELOPE 4,10,1,-1,1,
40,30,30,126,0,0,-126,126,1
26
  30 SOUND 1,4,100,200
```

It sounds exactly the same doesn't it? Notice that we're only using one SOUND command with a pitch parameter of 100 yet the note is going up and down.

Something is affecting the pitch of the note produced by the SOUND command and, obviously, it's the ENVELOPE command of line 20 that's responsible.

At first sight the ENVELOPE command is a fearsome beast, followed as it is by 14 numbers. However with closer acquaintance you'll find that it's quite tame really.

The structure of the command is:

```
ENVELOPE n,s,Pi1,Pi2,
Pi3,Pr1,Pr2,Pr3,
126,0,0,-126,126,126
```

I've used the same parameter names as the User Guide for the sake of consistency. Don't let all these parameters put you off. They're not all that bad, especially the last six:

```
126,0,0,-126,126,126
```

which are always the same, just being there for reasons of compatibility with the BBC Micro.

They could be any numbers really, as the Electron ignores them, but they have to be there and it's best to get into the habit of being as compatible with the BBC Micro as possible.

That now leaves us with eight parameters, and one of those is quite easy. The *n* parameter is just a number between 1 and 16. It's used to label the envelope we're defining with the ENVELOPE command.

The Electron allows you to define up to 16 of these envelopes which can be called by number as you want them.

In Program II line 20 had an ENVELOPE command with the *n* parameter of 4. Hence the envelope defined by line 20 was labelled 4.

Used on its own the ENVELOPE command doesn't produce any noises. You can type in ENVELOPEs until you're blue in the face but the Electron will stay mute.

To hear an envelope in action you have to use the familiar SOUND command in a slightly unfamiliar way.

Have another look at line 30 of Program II. Notice anything unusual?

```
30 SOUND 1,4,100,200
```

The second parameter of the sound command, the one that controls the volume, is 4. Up until now, we've always used values between 0 and −15, never a positive number.

As you might guess, putting a positive number between 1 and 16 in the loudness parameter calls up the relevant envelope.

In this case the number was 4, so the envelope used to modify the effects of the SOUND command was envelope number 4.

Notice that the envelope has to be defined with an ENVELOPE command *before* you try to refer to it in your SOUND command.

Once you've defined an envelope you can use it as often as you want, it'll stay lurking in the Electron's memory until you switch off or redefine it with another ENVELOPE command.

The next seven parameters are the ones that do the work. The *s* parameter just sets the time period that the rest of the parameters use.

As you'll have gathered from Program II, the pitch of the note is going up and down and up again in regular steps.

The *s* parameter just tells you how long these steps are, measured in hundredths of a second. The value of *s* can vary from 1 to 127.

One thing to be wary of is the difference between the units that *s* is measured in and those that are used in the duration parameter of the SOUND command. *s* is measured in hundredths of a second, so making *s* equal to 100 means a step length of exactly one second.

Somewhat confusingly, the duration parameter of the SOUND command is measured in twentieths of a second, so a duration of 20 produces a note of exactly one second's length. Beware of mixing the two up!

The ENVELOPE command of Program II has an *s* parameter of 10, so each step of the envelope lasts 10 x 1/100 or 0.1 seconds.

Don't worry too much if you don't understand why we need the *s* parameter, it will become clearer as we use it.

Now we come to the parameters:

```
Pi1,Pi2,Pi3,Pr1,Pr2,Pr3
```

These are actually three sets of two parameters. *Pi1* and *Pr1* are linked together, as are *Pi2* and *Pr2*. I leave it to you to guess what *Pi3* is linked with.

The range of values that these parameters can take is shown in Table I.

As you have heard in Program II, the effects of the envelope on the note produced fell into three stages. This is true of the effects of any envelope which can effect the pitch of a note in up to three different stages.

The first stage is governed by *Pi1* and *Pr1*. The value given to *Pi1* decides how much the pitch of the note will vary for each step in the first stage of the envelope.

Pr1 decides how many of these steps make up the first stage of the envelope.

Take a look at Program III which gives values to *Pi1* and *Pr1* but ignores the other stages of the envelope, giving them 0 parameters.

```
  10 REM PROGRAM III
  20 ENVELOPE 10,50,5,0,0,
20,0,0,126,0,0,-126,126,126
  30 SOUND 1,10,50,200
```

You should hear the note rising in pitch in 20 half second steps.

Working along the ENVELOPE command from left to right, the first parameter we come to is the *n* parameter. This is 10, so when we want to use this envelope to effect a SOUND command we put 10 in its loudness parameter, as you can see in line 30.

The *s* parameter has the value 50 so each step that the envelope takes will last 0.5 seconds (50 x 1/100). The *Pi1* parameter has the value 5, so the pitch will increase by a value of 5 every half second.

Skipping over the 0's to get to the *Pr1* parameter we find it has the value 20, so there will be 20 increases in pitch.

Run Program III again and see if you can hear this. Try

Parameter	Range	Meaning
n	1 – 16	Envelope number
s	1 – 127 (+128)	Step length (0.01) sec (switches off auto-repeat)
Pi1	−128 to 127	Pitch increment stage 1
Pi2	−128 to 127	Pitch increment stage 2
Pi3	−128 to 127	Pitch increment stage 3
Pr1	1 to 255	Number of steps stage 1
Pr2	1 to 255	Number of steps stage 2
Pr3	1 to 255	Number of steps stage 3
D U M M I E S	126 0 0 −126 126 126 126	Dummy values used to ensure compatibility

Table I: ENVELOPE parameters

varying the values of *Pi1* and *Pr1* to see what happens.

The pitch increments *(Pi)* can lie between −128 and 127, while the number of steps in each stage *(Pr)* can take values between 1 and 255.

Don't worry if you get some strange results, all will be explained.

For the time being I'd advise you to keep *s* at 50 so you can hear the individual steps as they take place.

Now try Program IV and see if you can see what's happening.

```
10 REM PROGRAM IV
20 ENVELOPE 10,50,5,-3,0
,10,10,0,126,0,0,-126,126,1
26
30 SOUND 1,10,50,200
```

The first two parameters are the same as before, but now *Pi1* is 5 and *Pr1* is 10, giving a first stage where the pitch goes up by 5 for each of 10 steps. Since each step lasts 0.5 seconds, the first stage lasts for a total of 5 seconds.

When the first stage of the envelope has finished exerting its influence on the SOUND command of line 30, the second stage starts. *Pi2* has a value of −3 while *Pr2* is 10.

This means that in the second stage of the envelope, the pitch decreases by 3 for each of ten steps. As determined by the *s* parameter, each step lasts 0.5 seconds.

Since *Pi3* and *Pr3* are both 0, there is no third stage.

Program V, however, shows all three stages of the envelope in action. Notice that the duration parameter of the SOUND command has changed.

```
10 REM PROGRAM V
20 ENVELOPE 10,50,5,-3,2
,5,5,5,126,0,0,-126,126,126
30 SOUND 1,10,50,150
```

Here the values of *Pi1* and *Pi2* are the same as before, giving the same pitch increases and decreases for the first two stages.

However the number of steps in each stage has been decreased, both *Pr1* and *Pr2* being reduced to 5.

Giving *Pi3* the value 2 means that in the third stage the pitch increases again, rising 2 with every step. Having *Pr3* equal to 5 means that there will be five of these increments.

And that really is all there is to understanding the ENVELOPE command.

As you can see from the above, it's not nearly as formidable as it looks when taken step by step.

All that remains is to clear up some minor points.

You may have been suspicious of the way that the time taken up by all the steps of the envelope just happen to have equalled the duration parameter of the SOUND command used.

In Program V the 15 steps, each lasting for half a second, took up 7.5 seconds. This was also the time specified by the duration parameter of the SOUND command.

Was this coincidence? No, it wasn't. I admit to fixing it, but plead that my intentions were honourable. I just wanted to make things easier for you (and myself).

I made sure that the times set by the ENVELOPE and SOUND commands were the same to keep things simple.

Program VI shows us what happens if the time specified by the ENVELOPE command is less than that specified by the duration parameter of the SOUND command.

```
10 REM PROGRAM VI
20 ENVELOPE 10,50,5,-3,2
,5,5,5,126,0,0,-126,126,126
30 SOUND 1,10,50,200
```

As you can hear, the envelope has its wicked way with the SOUND command and then, not satisfied, starts all over again.

What's happened is that the envelope has 15 steps, which take up a total of 7.5 seconds. The SOUND command is going to last for a full 10 seconds.

For the first 7.5 seconds everything is fine, but then the envelope finishes. The SOUND command, however, still has 2.5 seconds to go, and the 10 in its duration parameter tells it that it is still under the influence of envelope 10.

The poor old SOUND command makes the best of a bad job and goes back to the beginning of the envelope and carries on under its influence for the time remaining. The envelope is said to auto-repeat.

At times you might not want this auto-repeat to happen. Of course you could do what I did above and make sure that the time periods of the ENVELOPE and SOUND commands coincide, but this isn't always practical.

There is another method, as shown in Program VII.

As you can hear, the auto-repeat has gone. The envelope has its effect for 7.5 seconds then it stops having any influence. The note stays at the final pitch for the remaining 2.5 seconds.

```
10 REM PROGRAM VII
20 ENVELOPE 10,178,5,-3,
2,5,5,5,126,0,0,-126,126,12
6
30 SOUND 1,10,50,200
```

If you look at the *s* parameter of the envelope you'll see that it is 178.

This seems to clash with what I told you earlier, *s* seeming to be out of range.

What's happened is that in order to prevent the envelope auto-repeating I've added 128 to the *s* parameter. The *s* parameter was 50, so adding 128 to this gives the 178 seen in line 20.

When the Electron comes across this out-of-range *s* parameter it realises that it isn't supposed to auto-repeat. It then takes 128 from the *s* parameter and what is left is the desired length of each step, in this case 50.

So to stop envelopes auto-repeating, add 128 to their *s* parameter.

But what, you may ask, if the envelope lasts longer than the sound, as in Program VIII? Here the envelope appears set to last for 7.5 seconds while the SOUND command only plays a note of 5 seconds in length.

```
10 REM PROGRAM VIII
20 ENVELOPE10,50,5,-3,2,
5,5,5,126,0,0,-126,126,126
30 SOUND 1,10,50,100
```

The answer is that when the duration parameter of the SOUND command is satisfied it finishes. The rest of the envelope is ignored.

And that's the end of our tour through the Electron's sound commands. If you've read the articles you should by now have a fair mastery of the micro's noises.

But don't just read about it, practise it. Although limited when compared to the BBC Micro, the Electron has available a wide range of sounds. Use them in your programs, they'll brighten them up no end.

And if you find it difficult, try Roland Waddilove's Sound Generator, which appeared in the October 1984 issue.

Have fun!

ROM card expands Electron's potential

THE Mushroom sideways ROM card from Broadway Electronics allows you to add the power of ROM software to your Electron.

This software is software on a chip, instantly available to the Electron via a * command.

As it takes over the space normally used by the Electron's Basic it still allows you your full 32k of user memory, unlike programs loaded from tape.

So what sort of information can you possibly want on extra ROMs?

Well at the moment I am writing this on the Edword word processor which is stored on a sideways ROM.

I have no access to Basic at the moment – I don't need it – but I do have access to all the normal RAM for my text.

Word processors on tape take up a lot of normal memory for themselves, so there is less free for producing letters. ROMs avoid this.

I have also put into the ROM card a memory monitor program, Spy2. This is the nosy person's guide to what goes on in programs. Because it does not use normal user memory, it is possible to study any Basic or machine code program.

The Mushroom ROM card has four sockets so it would also be possible to fit a spreadsheet program, a graphics/design program or even a game.

If you have access to an eprom programmer – a device, not a person – it is possible to store your own programs on a chip, which costs about £7.

The huge advantage of this is that an 8k program can be loaded into normal memory in about two seconds.

The ROM card fits firmly into the Electron's expansion port. I find it rather a tight fit and it needs some strength to push it on and to remove it.

Incidentally, always turn off the power to your Electron before connecting the card or inserting any ROM.

Having got your ROMs they are loaded with a * command. To use Edword you just type *EDWORD and it runs straight away.

There are two types of ROM programs. Language ROMs do not require the Basic language – they operate instead of it.

Program ROMs do require Basic and are loaded by a * command into RAM so that Basic can then be used. This is what takes two seconds.

To say that Electron ROMs, or firmware as it can be called, is in its infancy is a bit of an understatement. The only ROMs I have come across so far are designed for the BBC Micro! Many however will work for us Electron owners, although sadly one of the most popular BBC Micro ones, Wordwise, does not.

I would say this device is a very useful addition to the Electron. It provides the start for many serious computer applications and with its expansion port it means you could still connect your printer port or joysticks.

Rog Frost

You're never too young to play a Magical Adventure on the BBC Micro or Electron!

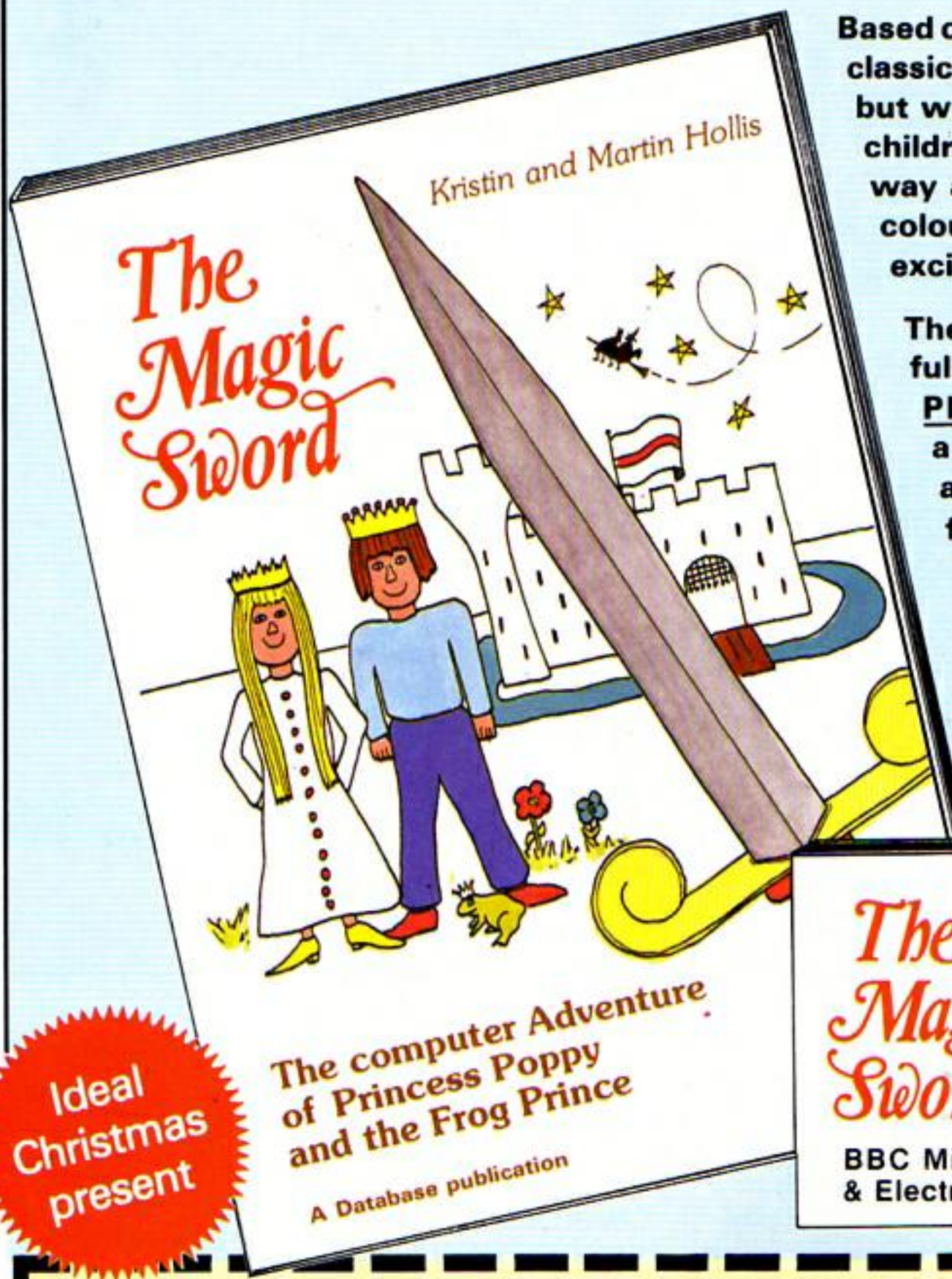


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Chart it in powerful 3D

Liven up your statistical presentation with JON WILLINGTON'S striking graphics utility program

PIE-CHARTIST is a graphics utility program occupying about 2.5k of RAM.

The user inputs data which is then displayed graphically in the form of a three dimensional pie-chart.

The routine incorporates full labelling of the chart and the four colours of Mode 1 are used to give a clear and visually attractive result.

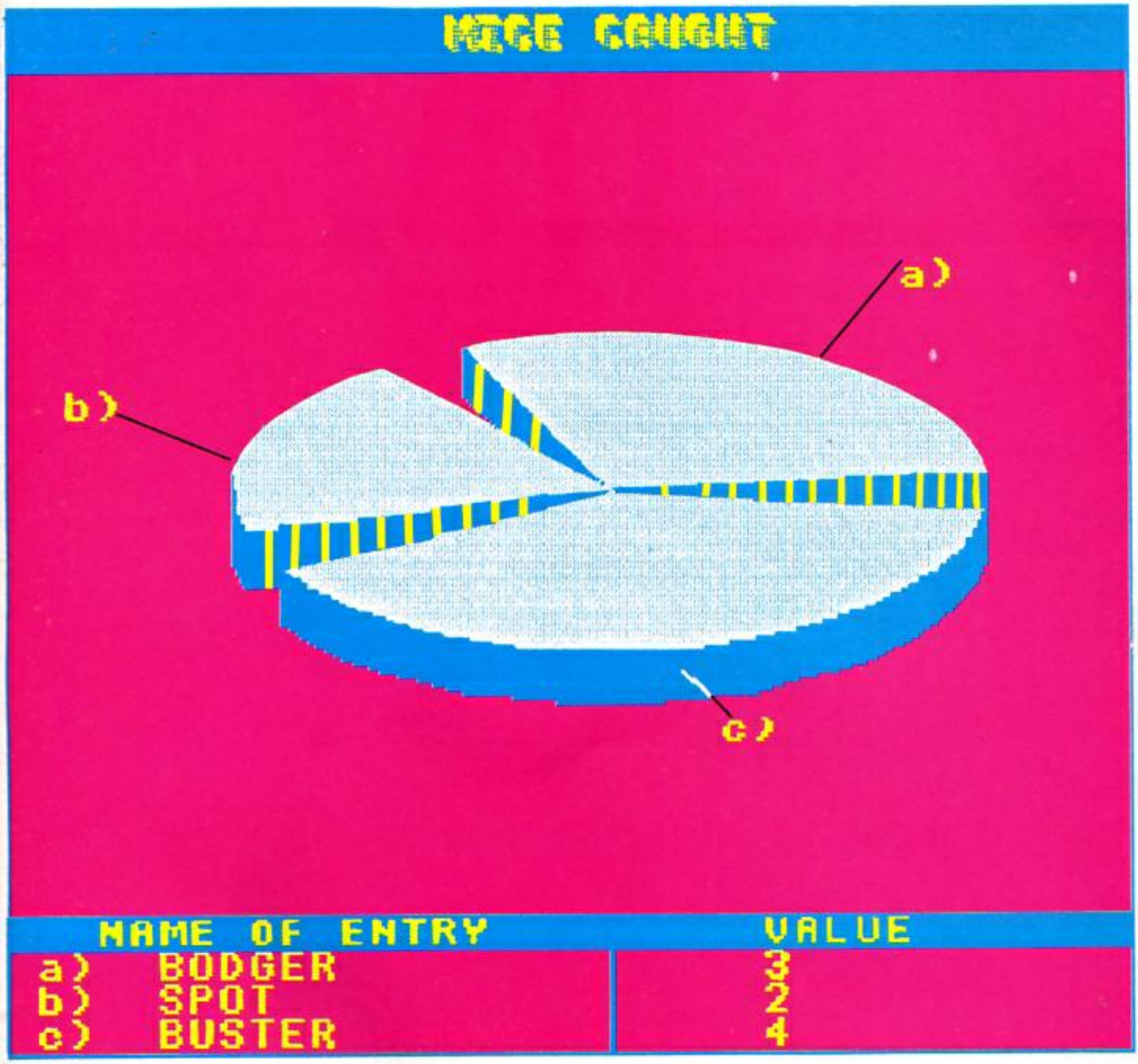
The program would prove almost impossible to transfer to any other micro, as it relies heavily on the powerful graphics commands of Electon Basic.

When the program is run, the user inputs his data in the form of a table, which is then scrolled to the bottom of the screen and the chart plotted above it.

PROGRAM CONSTRUCTION

30-60 Set mode, colours and variables.
100-180 Calculate angles of sectors and store in array H%.
200-280 Draw insides of sectors. The stripey effect is obtained by the use of the GCOL command in line 180.
300-370 Draw top of sectors.
390-440 Draw outside of pie.
460-530 Label sectors.
560-850 Input routine.
860-910 Routine for 3D lettering of title.

```
  10 REM **** PIE-CHARTIST
 ****
  20 REM ** Jon Willington
  ***
  25 REM **(C) ELECTRON US
ER **
  30 MODE1
  40 X%=640:Y%=512:J%=400:
K%=150
  50 VDU19,3,4;0;19,1,6;0;
  60 V=0:D%=-50
  70 A$="PIE-CHARTIST":PRO
Ctitle
  80 PROCinput
  90 REM* Calculate angles
 of sectors*
 100 T=48-2*N:R=T/V
 110 FOR B=1 TO N:Q(B)=Q(B
)*R
 120 Q(B)=INTQ(B)-(Q(B)-IN
TQ(B)>.5)
 130 NEXT:F=1
 140 FOR B=1 TO N
 150 H%(B,1)=F:H%(B,2)=H%(
B,1)+Q(B)
 160 F=H%(B,2)+2:NEXT
 170 P=(H%(N,2)+1)/(2*PI)
 180 GCOL11,129
 190 REM *** Draw sides of
 sectors ***
 200 VDU23,1,0;0;0;0;
 210 FOR A%=1 TO N
 220 M=H%(A%,1)/P
 230 MOVE X%,Y%:MOVEX%,Y%+
D%
 240 IF COSM>0 PLOT87,J%*C
OS(M)+X%,K%*SIN(M)+Y%:PLOT8
3,0,D%
 250 MOVE X%,Y%:MOVEX%,Y%+
D%
 260 M=H%(A%,2)/P
 270 IF COSM<0 PLOT87,J%*C
OS(M)+X%,K%*SIN(M)+Y%:PLOT8
3,0,D%
 280 NEXT:GCOL0,1
 290 REM *** Draw top of p
ie ****
 300 VDU 23,1,0;0;0;0;
 310 FOR A%=1 TO N
 320 M=(H%(A%,1)/P)
 330 MOVEJ%*COS(M)+X%,K%*S
IN(M)+Y%
 340 FOR F%=H%(A%,1) TO H%
(A%,2)
 350 MOVEX%,Y%
 360 PLOT85,J%*COS(F%/P)+X
%,K%*SIN(F%/P)+Y%
 370 NEXT:NEXT:GCOL0,3
 380 REM *** Draw outside
of pie ***
 390 FOR A%=1 TO N
 400 FOR F%=H%(A%,1) TO H%
(A%,2)-1
 410 M=F%/P:V=(F%+1)/P
 420 IF SINM>0 THEN 440
 430 MOVEJ%*COS(M)+X%,K%*S
IN(M)+Y%:PLOT0,0,D%:PLOT85,
J%*COS(V)+X%,K%*SIN(V)+Y%:P
LOT81,0,D%
 440 NEXT:NEXT
 450 REM *** Label sectors
 ***
```




```
  460 FOR M=1 TO N
  470 V=(H%(M,2)-H%(M,1))/2
:V=V+H%(M,1):V=V/P
  480 GCOL0,1:VDU5
  490 MOVE400*COS(V)+X%,150
*SIN(V)+490
  500 DRAW600*COS(V)+X%,225
*SIN(V)+530
  510 MOVE610*COS(V)+X%,233
*SIN(V)+530
  520 GCOL0,2:PRINTCHR$(96+
M):CHR$(41):GCOL0,3
  530 NEXT
  540 REPEAT UNTIL FALSE
  550 END
  560 DEFPROCinput
  570 VDU4:COLOUR128:COLOUR
1
  580 VDU23,1,0;0;0;0;
  590 INPUTTAB(2,8)"TITLE O
F CHART",A$
  600 INPUT TAB(2,10)"NUMBE
R OF SECTORS (MAX: 10)"N
  610 IF N<1 OR N>10 THEN V
DU7:CLS:GOTO600
  620 DIM Q(N),H%(N,2)
  630 PRINT''"NOW COMPLETE T
HIS TABLE"
  640 W=INKEY(150)
  650 VDU12,17,2,17,131
  660 PRINT'''"   NAME OF E
NTRY";SPC9;"VALUE";SPC10
  670 GCOL0,1
  680 MOVE0,928:PLOT1,0,-36
-(N*32)
  690 PLOT1,1279,0:DRAW1279
,928
  700 GCOL3,1:MOVE640,928
  710 PLOT1,0,-36-(N*32):CO
LOUR128:COLOUR 2
  720 FOR A=1 TO N
  730 PRINTTAB(1,3+A)CHR$(9
6+A);CHR$41
  740 INPUTTAB(5,3+A)DY$
  750 INPUTTAB(25,3+A)Q(A)
  760 V=V+Q(A)
  770 NEXT
  780 FOR G=1 TO (31-VPOS)
  790 VDU31,0,0,11
  800 VDU23,1,0;0;0;0;
  810 DELAY=INKEY5
  820 NEXT
  830 PROCtitle
  840 VDU29,0;(N*32)/2;
  850 ENDPROC
  860 DEFPROCtitle
  870 COLOUR131:PRINTTAB(0,
0)STRING$(80,CHR$32)
  880 VDU5:CV=640-(LENA$*16
)
  890GCOL0,0:MOVECV,1015:PR
INTA$:MOVECV+4,1011:PRINTA$
:GCOL0,2:MOVECV+8,1007:PRIN
TA$
  900 VDU 4
  910 ENDPROC
```

This listing is included in this month's cassette tape offer. See order form on Page 47.

Make light work of listings

To save your fingers most of the listings in *Electron User* have been put on tape.

On the January tape:
SPACE BATTLE Destroy the deadly descending aliens! **NEW YEAR** A sound and graphics greeting. **ESCAPE FROM SCARGOV** Minefield action. **PIE CHART** Statistics made simple. **CLAYPIGEON** An Electron birdshoot. **ORGAN** Music maestro please! **NOTEBOOK** An original program. **RANDOM NUMBERS** Or not so random! **SNAKES** Reptilean arcade action. **CHEESE RACE** Beat rival mice.

On the December tape:
CHRISTMAS BOX Align the presents logically. **SILLY SANTA** Sort out the muddle. **SNAP** Match the Xmas pictures. **RECOVERY** The Bad Program message tamed. **CAROL** Interrupt driven music. **AUTODATA** A program that grows and grows. **NOTEBOOK** Simple string handling.

On the November tape:
STAR FIGHTER Anti-alien missions. **SCROLLER** Wrap around machine code. **URBAN SPRAWL** Environmental action game. **SPELL** Alphabetic education. **JUMPER** Level headed action. **CAESAR** Code breaking broken. **KEYBOARD** Typing game.

On the October tape:
BREAKFREE Classic arcade action. **ALPHASWAP** A logic game to strain your brain. **SOUND GENERATOR** Tame the Electron's sound channels. **MULTICHARACTER GENERATOR** Complex characters made simple. **RIGEL 5** Out of this world graphics. **MAYDAY** Help with your morse code. **NOTEBOOK** Palindromes and string handling.

On the September tape:
HAUNTED HOUSE Arcade action in the spirit world. **SPLASH** A logic game for non-swimmers. **SORT SHOWS** How sorting algorithms work. **SORT TIME** The time they take. **CLASSROOM INVADERS** Multicoloured characters go to school. **SAILOR** Nautical antics. **MATHS TEST** Try out your mental powers.

On the August tape:
SANDCASTLE The Electron seaside outing. **KNOCKOUT** Bouncing balls batter brick walls. **PARACHUTE** Keep the skydivers dry. **LETTERS** Large letters for your screen. **SUPER-SPELL** Test your spelling. **ON YOUR BIKE** Pedal power comes to your Electron. **SCROLLER** Sliced strings slide sideways. **FLYING PIGS** Bacon on the wing.

On the July tape:
GOLF A day on the links with your Electron. **SOLITAIRE** The classic solo logic game. **TALL LETTERS** Large characters made simple. **BANK ACCOUNT** Keep track of your money. **CHARTIST** 3D graphs. **FORMULAE** Areas, volumes and angles.

On the June tape:
MONEY MAZE Avoid the ghosts to get the cash. **CODE BREAKER** A mastermind is needed to crack the code. **ALIEN** See little green men – the Electron way! **SETUP** Colour commands without tears. **CRYSTALS** Beautiful graphics. **LASER SHOOT OUT** An intergalactic shooting gallery. **SMILER** Have a nice day!

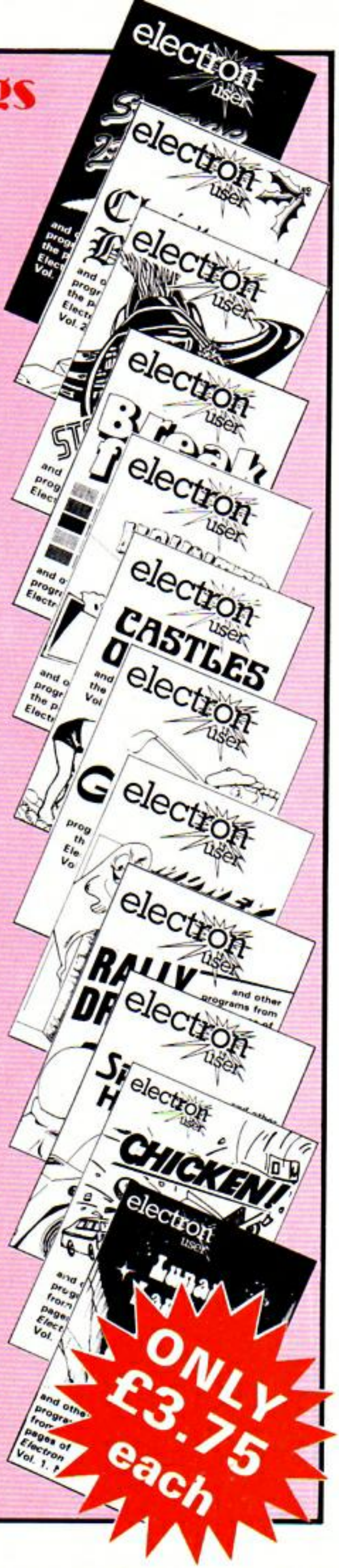
On the May tape:
RALLY DRIVER High speed car control. **SPACE PODS** More aliens to annihilate. **CODER** Secret messages made simple. **FRUIT MACHINE** Spin the wheels to win. **CHASER** Avoid your opponent to survive. **TIC-TAC-TOE** Electron noughts and crosses. **ELECTRON DRAUGHTSMAN** Create and save Electron masterpieces.

On the April tape:
SPACEHIKE A hopping arcade classic. **FRIEZE** Electron wallpaper. **PELICAN** Cross roads safely. **CHESSTIMER** Clock your moves. **ASTEROID** Space is a minefield. **LIMERICK** Automatic rhymes. **ROMAN** Numbers in the ancient way. **BUNNYBLITZ** The Easter program. **DOGDUCK** The classic logic game.

On the March tape:
CHICKEN Let dangerous drivers test your nerve. **COFFEE**
A tantalising word game from Down Under. **PARKY'S PERIL** Parky's lost in an invisible maze. **REACTION TIMER** How fast are you ? **BRAINTEASER** A puzzling program. **COUNTER** Mental arithmetic can be fun! **PAPER, SCISSORS, STONE** Out-guess your Electron. **CHARACTER GENERATOR** Create shapes with this utility.

On the February tape:
NUMBER BALANCE Test your powers of mental arithmetic. **CALCULATOR** Make your Electron a calculator. **DOILIES** Multi-coloured patterns galore. **TOWERS OF HANOI** The age old puzzle. **LUNAR LANDER** Test your skill as an astronaut. **POSITRON INVADERS** A version of the old arcade favourite.

On the introductory tape:
ANAGRAM Sort out the jumbled letters. **DOODLE** Multicoloured graphics. **EUROMAP** Test your geography. **KALEIDOSCOPE** Electron graphics run riot. **CAPITALS** New upper case letters. **ROCKET, WHEEL, CANDLE** Three fireworks programs. **BOMBER** Drop the bombs before you crash. **DUCK** Simple animation. **METEORS** Collisions in space.



HOW TO ORDER

Please send me the following *Electron User* cassette tapes:

Ten programs from our January issue	£
Nine programs from the December issue	£
Nine programs from the November issue	£
Seven programs from the October issue	£
Nine programs from the September issue	£
Fourteen programs from the August issue	£
Ten programs from the July issue	£
Ten programs from the June issue	£
Twelve programs from the May issue	£
Eleven programs from the April issue	£
Twelve programs from the March issue	£
Nine programs from the February issue	£
26 programs from the introductory issues	£
I enclose the sum of	£

Name .....

Address .....

.....

POST TO: Tape Offer, Electron User, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

REWRITE THE HIGH SCORE TABLES

So, you've got an Electron. You've also got enemies. With the Gunshot, you'll have all the opposition cowering in corners. 8-directional action and an all-in-one moulded stem allows accurate annihilation and strength to survive those all-night sessions. Dual fire buttons for fading fingers (and a rapid fire version when they're really coming thick and fast). And, if you break it (and we know you'll try) our 12-month guarantee will prove invaluable. Only £8.95.

For the Gunshot, Vulcan's totally hardware Electron interface comes with a free tape which converts all keyboard software for joystick use. And it'll allow you to destroy BBC game enemies on your Electron, too! £19.95, 12-month guarantee

See the range of Vulcan joysticks and interfaces at your local stockist ... we'll see you on the high score tables.

VULCAN ELECTRONICS LTD

Joystick Genius

200 BRENT STREET HENDON NW4 1BH TEL: 01-203 6366

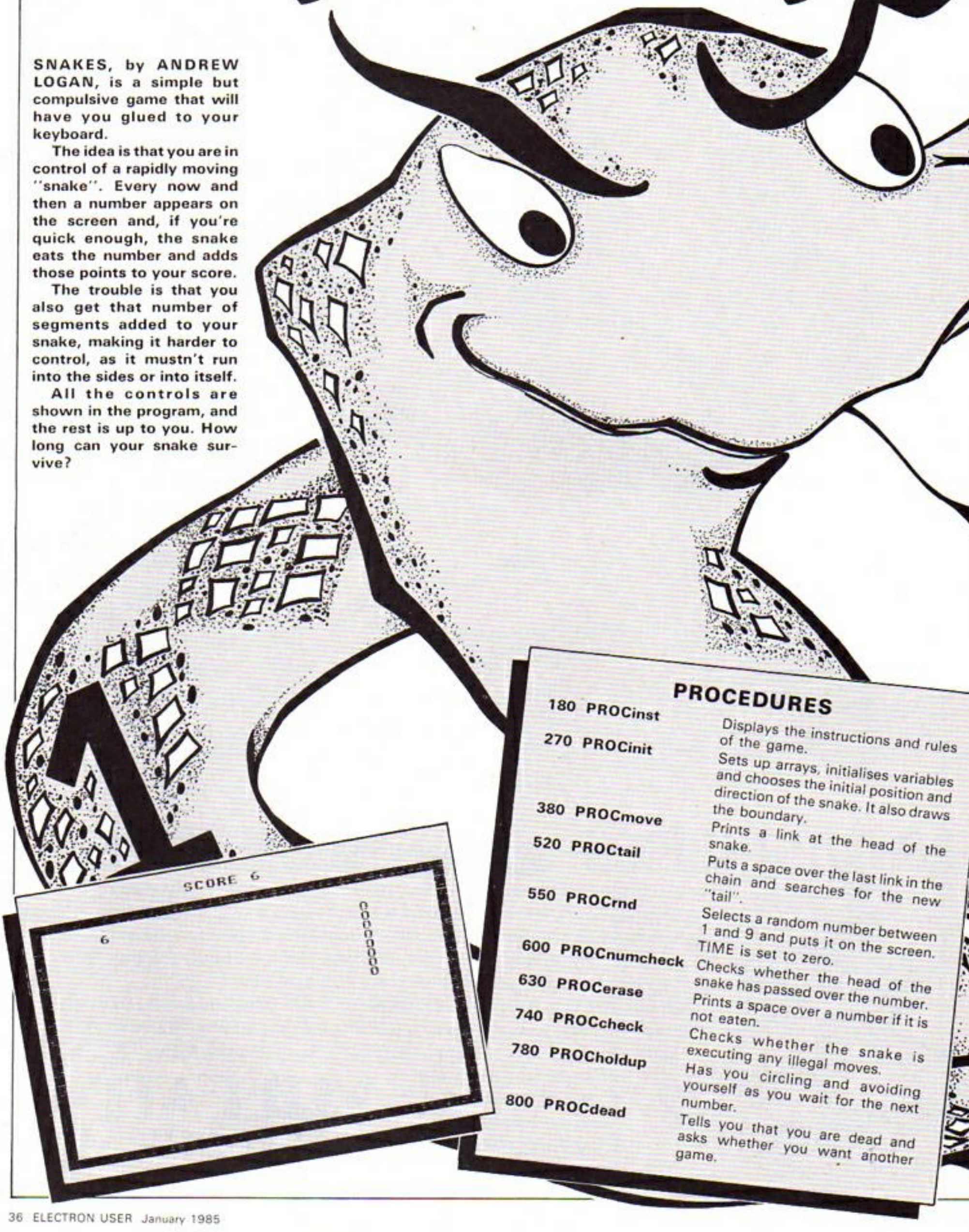
Hissing Sid is hungry!

SNAKES, by ANDREW LOGAN, is a simple but compulsive game that will have you glued to your keyboard.

The idea is that you are in control of a rapidly moving "snake". Every now and then a number appears on the screen and, if you're quick enough, the snake eats the number and adds those points to your score.

The trouble is that you also get that number of segments added to your snake, making it harder to control, as it mustn't run into the sides or into itself.

All the controls are shown in the program, and the rest is up to you. How long can your snake survive?



PROCEDURES

180 PROCinst	Displays the instructions and rules of the game.
270 PROCinit	Sets up arrays, initialises variables and chooses the initial position and direction of the snake. It also draws the boundary.
380 PROCmove	Prints a link at the head of the snake.
520 PROCtail	Puts a space over the last link in the chain and searches for the new "tail".
550 PROCrnd	Selects a random number between 1 and 9 and puts it on the screen. TIME is set to zero.
600 PROCnumcheck	Checks whether the head of the snake has passed over the number.
630 PROCerase	Prints a space over a number if it is not eaten.
740 PROCcheck	Checks whether the snake is executing any illegal moves.
780 PROCholdup	Has you circling and avoiding yourself as you wait for the next number.
800 PROCdead	Tells you that you are dead and asks whether you want another game.

Snakes listing

```
10REM **SNAKES**
20REM BY ANDREW LOSAN
30REM (C) ELECTRON USER
40MODE4:ON ERROR GOTO830
50PROCinst
60PROCinit
70REPEAT
80PROCrnd
90REPEAT
100PROCmove
110PROCtail
120PROCnumcheck
130UNTIL TIME>U% OR HIT
140IF NOT HIT PROCerase
150PROCholdup
160UNTIL 0
170END
180DEF PROCinst
190 VDU23,1,0;0;0;0;
200CLS:VDU19,1,3,0,0,0:PR
INT'''TAB(15);"S N A K E S"
;TAB(15);"=========="
210PRINT''TAB(4);"You mus
t manoeuvre a snake and eat
"'TAB(4)"numbers as you tra
vel in this game."'TAB(4)"Y
our snake increases in leng
th"'TAB(4);"according to th
e number you eat."'TAB(4);"
Note the following rules:-"
220PRINT'TAB(16);"OOOOOOO
O"'TAB(23)"O"'TAB(18);"OOOO
OO"''TAB(13);"IS ALLOWED BU
T..."''TAB(16);"OOOOOOOOO"'
TAB(18);"OOOOOOO"''TAB(14);
"IS NOT ALLOWED"
230PRINT''TAB(5);"Also yo
u are not allowed to"'TAB(5
);"reverse,hit the yellow s
ides or"'TAB(5);"crash into
 your tail."''TAB(16);"PRES
S SPACE":REPEAT UNTIL GET$=
" ":CLS
240PRINT''''TAB(2);"Move
using:-"''''TAB(13);"'I'...
.....LEFT";''TAB(13);"'X'.
........RIGHT"''TAB(13);"'/
'.........DOWN"''TAB(13);"'
:'.........UP"
250PRINT''''TAB(11);"PRE
SS SPACE TO BEGIN":REPEAT U
NTIL GET$=" "
260ENDPROC
270DEF PROCinit
280CLS
290VDU23,1,0;0;0;0;:SC%=0
300VDU23,230,255,255,255,
255,255,255,255,255
310FOR V%=2 TO 38:PRINT T
AB(V%,3);CHR$230;TAB(V%,28)
;CHR$230:NEXT
320FOR R%=3 TO 28:PRINT T
AB(2,R%);CHR$230;TAB(38,R%)
;CHR$230:NEXT
330X%=28:Y%=10:Z%=1
340N%=29:M%=10:DIM OBJ(40
,30)
350PRINTTAB(X%,Y%);"OO":P
ROCscore
360OBJ(X%,Y%)=-1:OBJ(N%,M
%)=-1
370ENDPROC
380DEF PROCmove
390SOUND0,-15,25,1
400IF INKEY-98 AND Z%=2 T
HEN PROCdead ELSE IF INKEY-
98 Z%=1
410IF INKEY-67 AND Z%=1 T
HEN PROCdead ELSE IF INKEY-
67 Z%=2
420IF INKEY-73 AND Z%=4 T
HEN PROCdead ELSE IF INKEY-
73 Z%=3
430IF INKEY-105 AND Z%=3
THEN PROCdead ELSE IF INKEY
-105 Z%=4
440 IF Z%=1 X%=X%-1 ELSE
IF Z%=2 X%=X%+1 ELSE IF Z%=
3 Y%=Y%-1 ELSE IF Z%=4 Y%=Y
%+1
450IF X%>37 THEN PROCdead
460IF X%<3 THEN PROCdead
470IF Y%<4 THEN PROCdead
480IF Y%>27 THEN PROCdead
490 IF OBJ(X%,Y%)<>0 THEN
 PROCdead ELSE OBJ(X%,Y%)=-
1
500PRINT TAB(X%,Y%);"O"
510PROCcheck:ENDPROC
520DEF PROCtail
530 PRINT TAB(N%,M%);" ":
OBJ(N%,M%)=0:IF OBJ(N%+1,M%
)=-1 THEN N%=N%+1:W%=1 ELSE
 IF OBJ(N%-1,M%)=-1 N%=N%-1
:W%=2 ELSE IF OBJ(N%,M%+1)=
-1 M%=M%+1:W%=3 ELSE IF OBJ
(N%,M%-1)=-1 M%=M%-1:W%=4
540ENDPROC
550DEF PROCrnd
560HIT=FALSE
570U%=RND(200)+200
580S%=RND(9):K%=RND(33)+3
:L%=RND(22)+4:IF OBJ(K%,L%)
=-1 THEN 580 ELSE PRINT TAB
(K%,L%);S%
590TIME=0:ENDPROC
600DEF PROCnumcheck
610IF X%=K% AND L%=Y% SC%
=SC%+S%:PROCscore:PROCprint
:HIT=TRUE
620ENDPROC
630DEF PROCerase:PRINT TA
B(K%,L%);SPC1:ENDPROC
640ENDPROC
650DEF PROCprint
660FOR C%=1 TO S%
670 IF W%=2 OBJ(N%+1,M%)=
-1:PRINT TAB(N%+1,M%);"O":N
%=N%+1:GOTO710
680 IF W%=1 OBJ(N%-1,M%)=
-1:PRINT TAB(N%-1,M%);"O":N
%=N%-1:GOTO710
690 IF W%=4 OBJ(N%,M%+1)=
-1:PRINT TAB(N%,M%+1);"O":M
%=M%+1:GOTO710
700 IF W%=3 OBJ(N%,M%-1)=
-1:PRINT TAB(N%,M%-1);"O":M
%=M%-1
710PROCmove:PROCtail
720NEXT
730ENDPROC
740DEF PROCcheck
750IF Z%<=2 AND(OBJ(X%,Y%
+1)=-1 OR OBJ(X%,Y%-1)=-1)T
HEN PROCdead
760IF Z%>2 AND(OBJ(X%+1,Y
%)=-1 OR OBJ(X%-1,Y%)=-1)TH
EN PROCdead
770ENDPROC
780DEF PROCholdup:TIME=0:
F%=RND(400)+300:REPEAT:PROC
move:PROCtail:UNTIL TIME>F%
:ENDPROC
790DEF PROCscore:PRINT TA
B(16,1);"SCORE ";SC%:ENDPRO
C
800DEF PROCdead:SOUND0,-1
5,30,20:CLS:PROCscore:PRINT
''''TAB(13);"YOU CRASHED!!
";''''TAB(11);"ANOTHER GAME
(Y/N)"
810*FX15,1
820G$=GET$:IF G$="Y" THEN
RUN ELSE IF G$<>"N" THEN 8
20 ELSE END:ENDPROC
830MODE6:REPORT:PRINT" at
line ";ERL:END
```

This listing is included in this month's cassette tape offer. See order form on Page 47.

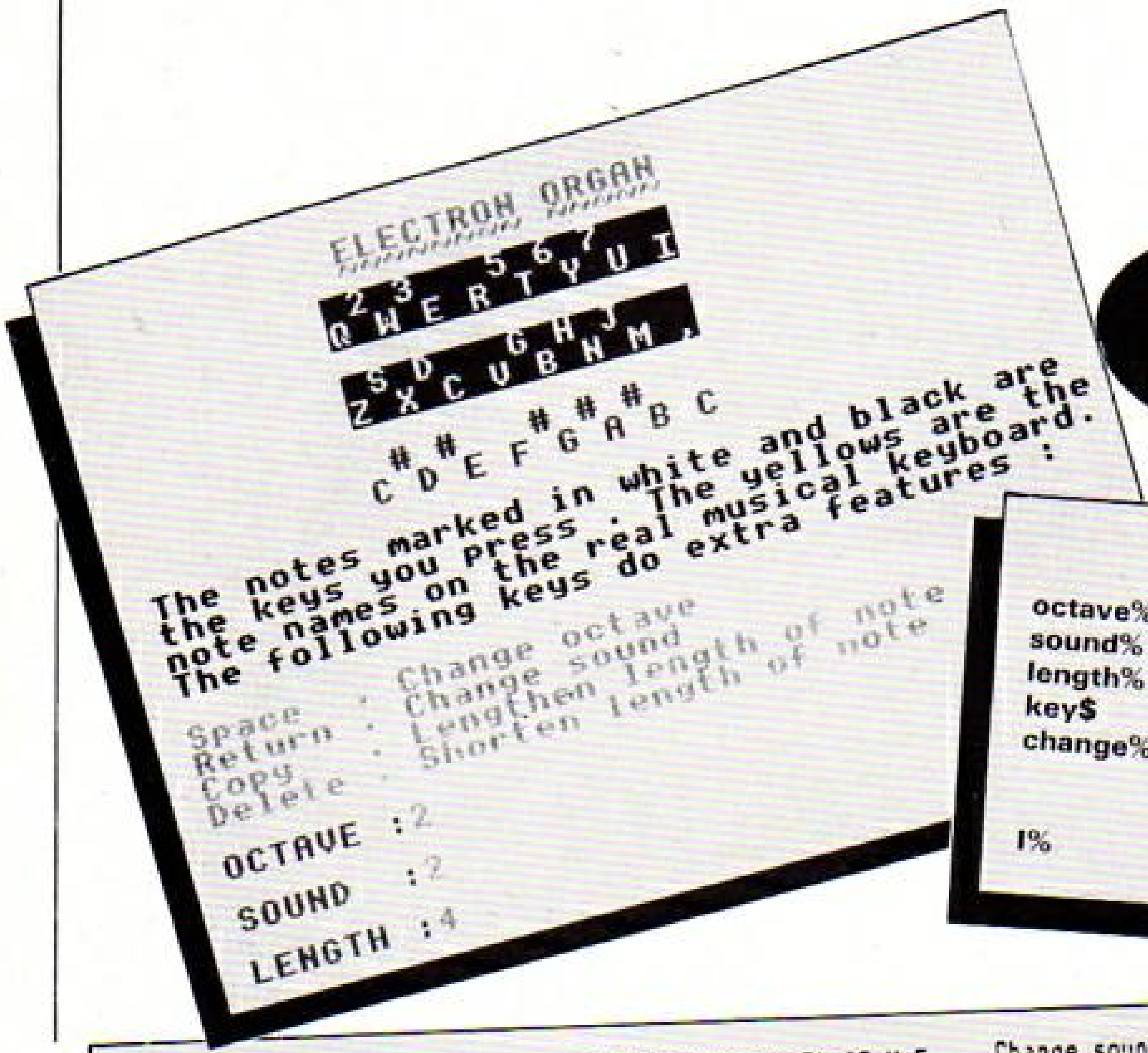
YOUR Electron turns into a musical instrument thanks to this Electron Organ program by THOMAS DUBERN.

The program does the work while you use the keys to play your own masterpieces.

The menu allows you to change octaves and types of sound and to lengthen and shorten notes at will.

The only thing it won't do is write the music for you!

Get Organised to play great music



VARIABLES

octave%	The octave number currently being used.
sound%	The different types of sound (1, 2 or 3).
length%	Length of each note when depressed once.
key$	Key being pressed at that moment.
change%	This is true if *octave%*, *sound%*, or *length%* have been changed. The micro updates values of variables on screen.
I%	Pitch value of current note.

```
 10 REM ELECTRON ORGAN
 20 REM BY THOMAS DUBERN
 30 REM (C) ELECTRON USER
 40 MODE1
 50 *FX4,1
 60 ENVELOPE1,1,-12,-24,-
48,1,1,1,126,0,0,-126,126,1
26
 70 ENVELOPE2,1,-4,0,0,40
,0,0,126,0,0,-126,126,126
 80 octave%=1:sound%=3:le
ngth%=1
 90 VDU23,1,0;0;0;0;
 100 COLOUR1:PRINT''"
     ELECTRON ORGAN"
 110 PRINT"                ^^^^
^^^^ ^^^^^^"
 120 COLOUR131:COLOUR0:PRI
NTTAB(10,4);" 2 3   5 6 7
"
 130 PRINTTAB(10,5);"Q W E
R T Y U I"
 140 PRINTTAB(10,7);" S D
 G H J   "
 150 PRINTTAB(10,8);"Z X C
 V B N M ,"
 160 COLOUR128:COLOUR2
 170 COLOUR2:PRINTTAB(10,1
0);" # #   # # #"
 180 PRINTTAB(10,11);"C D
E F G A B C"
 190 COLOUR3:PRINT'"The no
tes marked in white and bla
ck are the keys you press .
 The yellows are thenote na
mes on the real musical key
board.The following keys do
 extra features :"
 200 COLOUR1:PRINT'"Space
 . Change octave"'"Return .
 Change sound"'"Copy   . Le
ngthen length of note"'"Del
ete . Shorten length of not
e"
 210 COLOUR2:PRINT'"OCTAVE
 :"''"SOUND  :"''"LENGTH :"
 220 COLOUR1:PRINTTAB(8,23
);octave%;TAB(8,25);ABS(sou
nd%-4);TAB(8,27);length%;"
 "
 230 change%=0
 240 key$=INKEY$(1):IFkey$
="" GOTO240
 250 IFkey$=" " octave%=oc
tave%+1:change%=TRUE:IFocta
ve%=4 octave%=1
 260 IFkey$=CHR$13 sound%=
sound%+1:change%=TRUE:IFsou
nd%=4 sound%=1
 270 IFkey$=CHR$135 AND le
ngth%<255 length%=length%+1
:change%=TRUE
 280 IFkey$=CHR$127 AND le
ngth%>1 length%=length%-1:c
hange%=TRUE
 290 IFchange%=TRUE GOTO22
0
 300 I%=INSTR("Q2W3ER5T6Y7
UIZSXDCVGBHNJM,",key$):IFI%
=0 GOTO240
 310 IFI%>13 I%=I%-1
 320 I%=(I%*4)+(octave%*48)
 330 SOUND&11,sound%,I%,le
ngth%
 340 GOTO240
```

This listing is included in this month's cassette tape offer. See order form on Page 47.


MICROPOWERMICROPOWERM
GHOULS
commodore 64
(SUPER-FAST LOADING TIME)
electron
B.B.C. MICRO
Run through the creepy mansion to rescue the power jewels. Dodge ghostly ghouls and bouncing spiders, leap over poison-smeared spikes, scamper along moving platforms and contracting floorboards, and use powerful springs to propel you onto overhanging ledges. Superb animation and spine-tingling sound effects.
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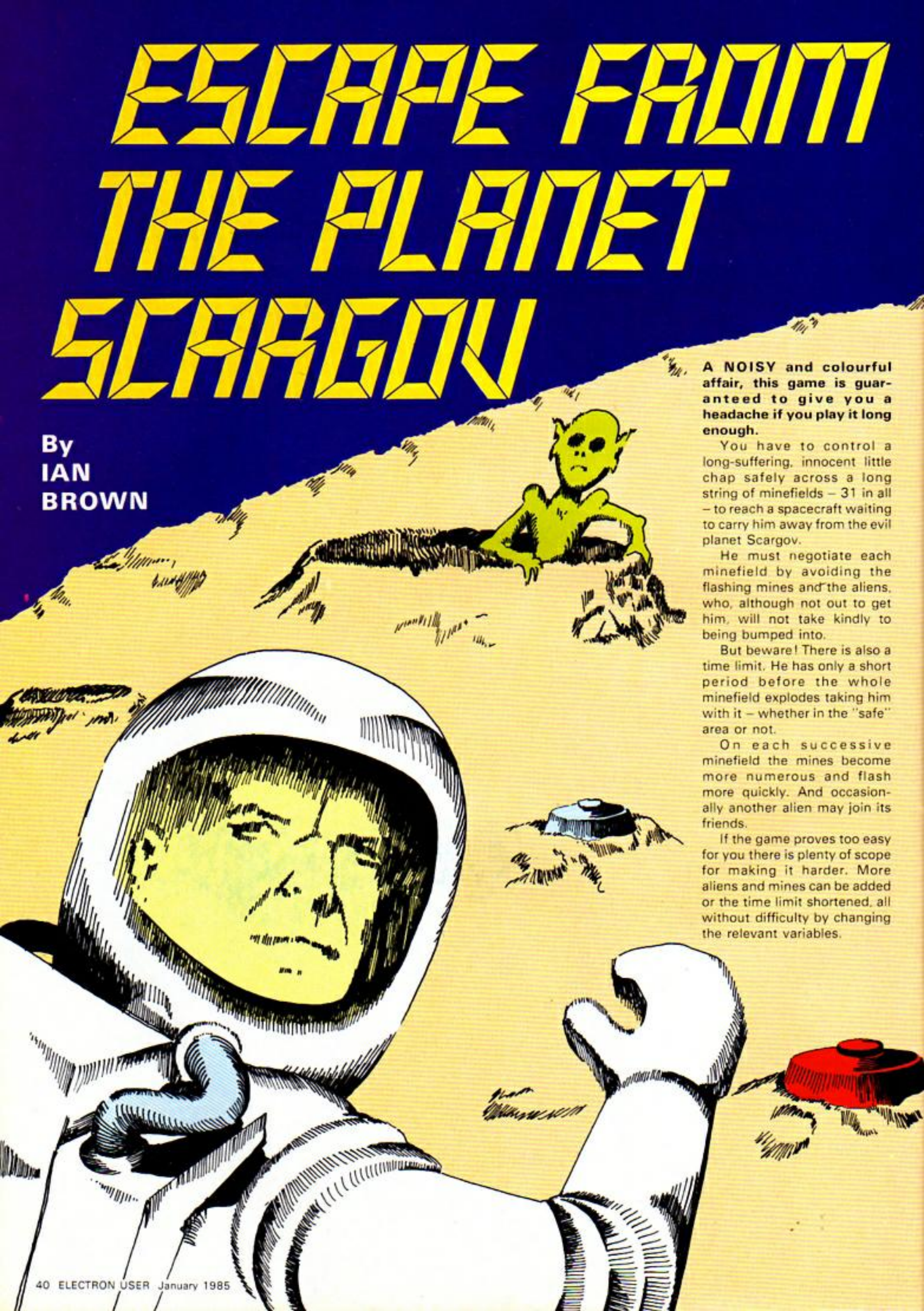
ESCAPE FROM THE PLANET SCARGOV

By
IAN
BROWN



A NOISY and colourful affair, this game is guaranteed to give you a headache if you play it long enough.

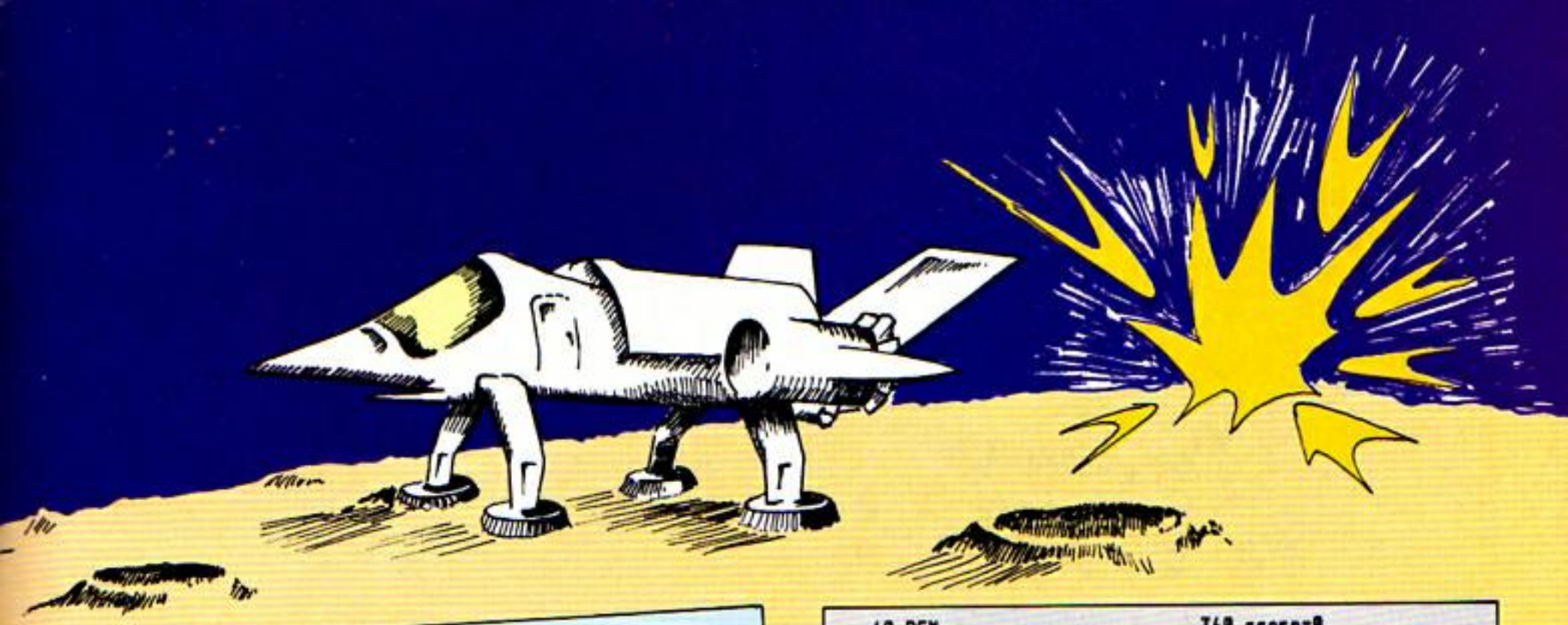
You have to control a long-suffering, innocent little chap safely across a long string of minefields – 31 in all – to reach a spacecraft waiting to carry him away from the evil planet Scargov.

He must negotiate each minefield by avoiding the flashing mines and the aliens, who, although not out to get him, will not take kindly to being bumped into.

But beware! There is also a time limit. He has only a short period before the whole minefield explodes taking him with it – whether in the "safe" area or not.

On each successive minefield the mines become more numerous and flash more quickly. And occasionally another alien may join its friends.

If the game proves too easy for you there is plenty of scope for making it harder. More aliens and mines can be added or the time limit shortened, all without difficulty by changing the relevant variables.



VARIABLES

score	Score.
nextaim	Next score to be reached to earn an extra life, 10,000, 20,000 etc.
screen	Current minefield – 1 to 31.
lives	Number of lives left
safecol%	Colour of safe area.
fieldcol%	Colour of minefield area.
x%, y%	X and y coordinates of man's current position on screen.
alien	Number of aliens.
bx%, by%	Temporary storage of mine positions.
key, keym	Keyboard GETs.
rnd%	Random number used for generating aliens' movements.
time%	Time left until minefield explodes.

ARRAYS

ax%(a%), ay%(a%)	X and y coordinates of alien number a% on screen.

FLAGS

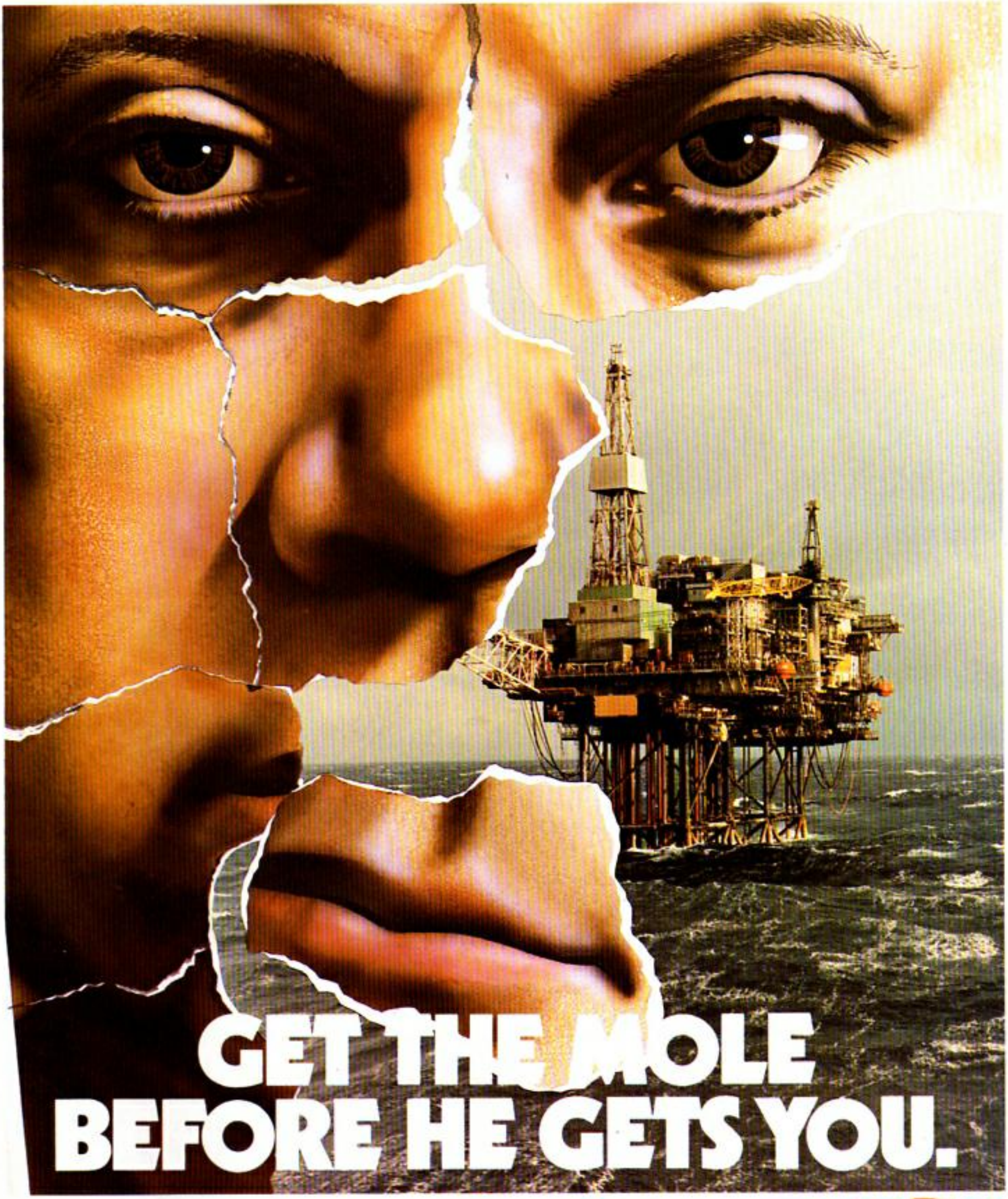
lose	Life lost.
win	Field crossed successfully.
dead	All lives spent.
escape	Field 31 crossed, game completed.

PROCEDURES

250 init	Initialisation routines. Sets up envelopes, VDU 23s, dimensions, initial variables and flags.
430 screen	Sets up screen display, colours, flash rate, positions of aliens, mines etc.
810 man	Controls man from keyboard input (NB GCOL 4,0 is used throughout to avoid complications due to overplotting etc).
940 alien	Moves aliens randomly. (The positions of all five aliens are worked out regardless of the number actually on screen to slow the game down in the earlier screens).
1070 update	Checks for fatal moves, running out of time, completing a screen.
1180 win	On completing a screen. New screen chosen, score given, new life if appropriate.
1310 lose	On losing a life.
1420 escape	On completing screen 31 and so finishing the game.
1590 dead	Another game?
1690 start	Offers the option of instructions.
1780 instructions	Game blurb and list of keys.
2030 error	Called if an error occurs.

```
  10 REM
  20 REM  'Escape from Pla
net Scargov'
  30 REM
  40 REM        Written  f
or the
  50 REM         ACORN ELE
CTRON
  60 REM              by
  70 REM          Ian M. B
rown
  80 REM
  90 MODE 1
 100 PROCinit
 110 PROCstart
 120 MODE 5
 130 REPEAT
 140 PROCscreen
 150 REPEAT
 160 PROCman
 170 PROCalien
 180 PROCupdate
 190 UNTIL lose OR win
 200 IF win PROCwin ELSE P
ROClose
 210 UNTIL dead OR escape
 220 MODE 2
 230 IF escape PROCescape
ELSE PROCdead
 240 MODE 6:END
 250 DEF PROCinit
 260 ON ERROR MODE 6:PROCe
rror:END
 270 ENVELOPE1,1,134,-213,
123,23,54,23,0,0,0,0,0,0
 280 ENVELOPE2,1,1,-2,1,1,
1,1,0,0,0,0,0,0
 290 VDU 23,224,255,195,16
5,153,153,165,195,255:REM m
ine
 300 VDU 23,225,24,62,56,4
8,120,124,254,255:REM alien
 310 VDU 23,226,56,56,18,2
54,56,40,40,108:REM man
 320 *FX11,0
 330 VDU23,1,0;0;0;0;
 340 DIM axX(5),ayX(5)
 350 0%=&0905
 360 score=0
 370 dead=FALSE
 380 escape=FALSE
 390 nextaim=10000
 400 screen=1
 410 lives=3
 420 ENDPROC
 430 DEF PROCscreen
 440 VDU 23,1,0;0;0;0;
 450 safecolX=RND(6)
 460 VDU 19,1,safecolX;0;
 470 REPEAT fieldcolX=RND(
6):UNTIL fieldcolX<>2 AND f
ieldcolX<>5 AND fieldcolX<>
safecolX
 480 VDU 19,2,fieldcolX;0;
 490 VDU 19,3,fieldcolX+8;
0;
 500 *FX9,20
 510 OSCLI"FX10,"+STR$(29-
(4*(screen MOD 8)))
 520 win=FALSE:lose=FALSE
 530 xX=64:yX=640
 540 alien=screen DIV 8+2
 550 FOR aX=1 TO alien
 560 axX(aX)=RND(13)*64+12
8
 570 ayX(aX)=RND(12)*64+19
2
 580 NEXT
 590 *FX21,5
 600 SOUND1,2,30,-1
 610 COLOUR 1:PRINTTAB(5,2
8)"Time  1000"TAB(0,30)"Fie
ld ";screen TAB(12,30)"Live
s ";lives
 620 VDU 5
 630 GCOL 0,1:MOVE 0,208:M
OVE 1200,208:PLOT 85,0,976:
PLOT 85,1200,976
 640 GCOL 0,2:MOVE 192,208
:MOVE 1016,208:PLOT 85,192,
976:PLOT 85,1016,976
 650 FOR bX=1 TO 5*(screen
```

Turn to Page 55



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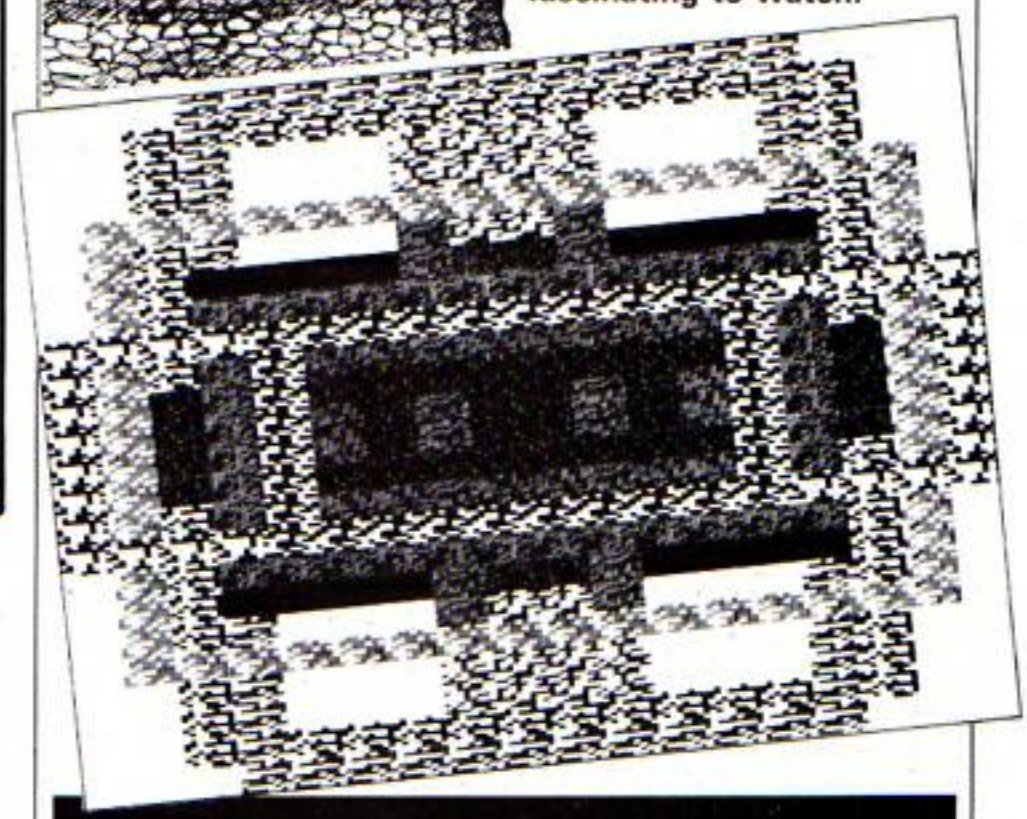
AZTEC

AZTEC is another lovely little graphics listing from DAVID DAVIES of West Glamorgan. Using random characters plotted into rectangles, the program creates intricate and colourful patterns which are fascinating to watch.



Aztec listing

```
10 MODE 5
20 REM ****AZTEC
30 REM ****By David Davies
40 REM (C) ELECTRON USER
50 MODE 2
60 *FX9,250
70 *FX10,250
80 VDU 23,1,0;0;0;0
90 CLS
100 X%=RND(9)
110 X2%=19-X%
120 Y%=RND(15)
130 Y2%=31-Y%
140 VDU 23,224,RND(255)
    ,RND(255),RND(255)
    ,RND(255),RND(255)
    ,RND(255),RND(255)
    ,RND(255)
150 COLOUR RND(4)-1
160 COLOUR RND(4)+127

170 FOR N%=X% TO X2%
180 PRINT TAB(N%,Y%)
    CHR$ 224
190 NEXT N%
200 FOR O%=X% TO X2%
210 PRINT TAB(O%,Y2%)
    CHR$ 224
220 NEXT O%
230 FOR P%=Y% TO Y2%
240 PRINT TAB(X%,P%)
    CHR$ 224
250 NEXT P%
260 FOR Q%=Y% TO Y2%
270 PRINT TAB(X2%,Q%)
    CHR$ 224
280 NEXT Q%
290 VDU 19,RND(3),RND(15)
    ,0,0,0
300 T%=INKEY (200)
310 GOTO 100
320 END
```

This listing is included in this month's cassette tape offer. See order form on Page 47.

SCRAPBOOK

SCRAPBOOK is the feature that contains a selection of all the short, simple programs sent in by our readers.

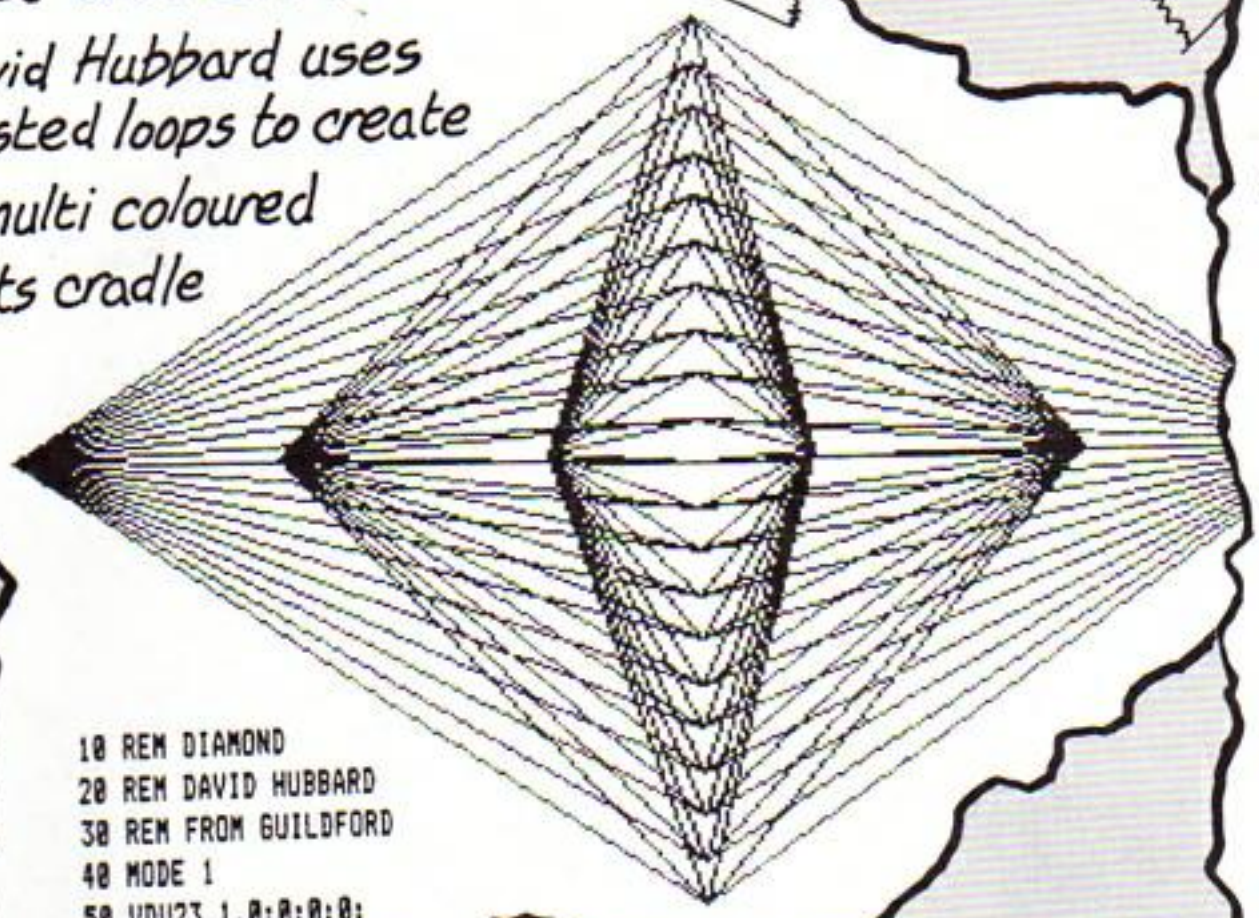
It's where we keep a record — in a scrap book, would you believe – of all the interesting little routines that don't end up in the Notebook or in Program Probe but are too good for us not to share.

This month it's very much a graphics show. Next month – who knows? It's up to you.

So if you enjoy messing about with your Electron and want to share your discoveries with other Electron users, send them in to us.

DIAMOND

David Hubbard uses nested loops to create a multi coloured cats cradle



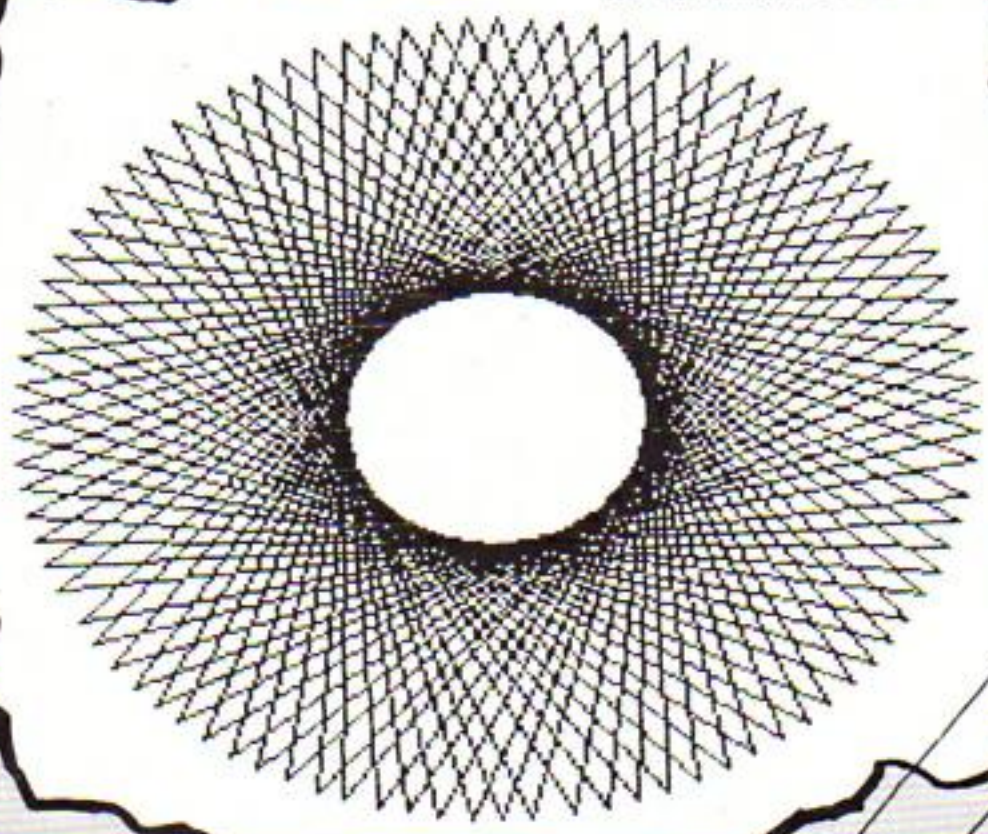
```
10 REM DIAMOND
20 REM DAVID HUBBARD
30 REM FROM GUILDFORD
40 MODE 1
50 VDU23,1,0;0;0;0;
60 FOR A=0 TO 1023 STEP
50
70 FOR B=0 TO 1279 STEP
250
80 GCOL 0,RND(3)
90 MOVE 640,A
100 DRAW B,512
110 NEXT B
120 NEXT A
130 REPEAT: UNTIL FALSE
```

STAR

Tony Wearing uses trigonometry to give symmetry

```
10 REM STAR
20 REM TONY WEARING
30 REM HITCHIN,HERTS
40 MODE 4
50 VDU 19,2,7,0,0,0
60 VDU 19,1,0,0,0,0
70 VDU 23,1,0;0;0;0;
80 MOVE 600+450*SIN(1/2)
,500+450*COS(1/2)
90 FOR X=1 TO 470 STEP 5

100 M=600+450*SIN(X/2)
110 K=500+450*COS(X/2)
120 DRAW M,K
130 NEXT
140 REPEAT:UNTIL FALSE
```



Send your programs to Scrapbook, *Electron User*, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

VDU 19

demonstrated by K.Parker

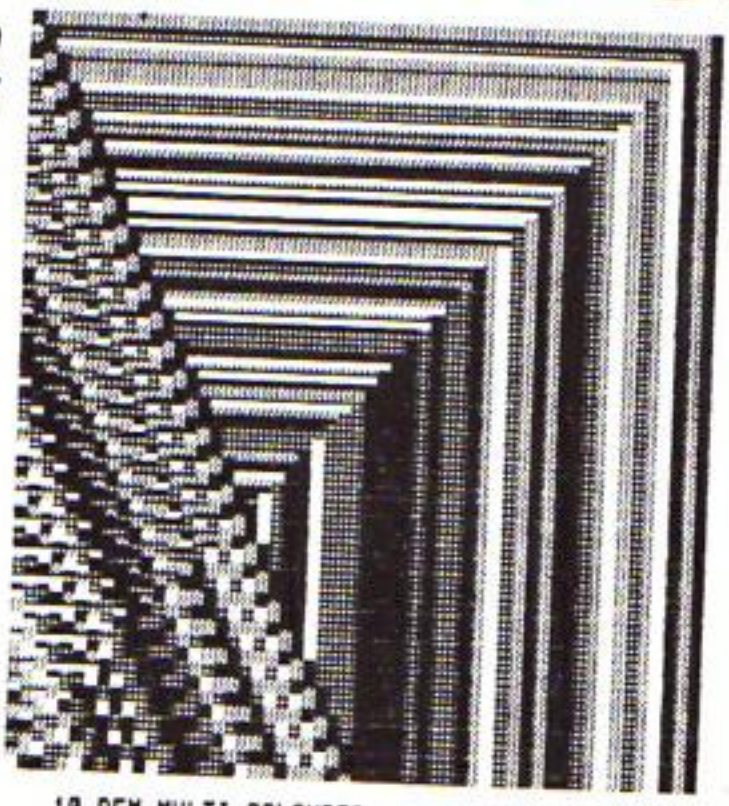
```
MODE 0

BACK   TEXT
I%=0   J%=3
```

```
  10 REM VDU 19 DEMONSTRAT
ION
  20 REM K.PARKER
  30 REM BRADFORD
  40 FOR M%=0 TO 6
  50 MODE M%
  60 VDU23,1,0;0;0;0;
  70 CLS
  80 PRINT TAB(8,16) "MODE
";M%
  90 FOR I%=0 TO 7
 100 FOR J%=0 TO 7
 110 VDU 19,0,I%;0;19,3,J%
;0;
 120 PRINT TAB(8,20)"BACK
  TEXT"
 130 PRINT TAB(8,22)"I%=";
I%"   J%=";J%
 140 K=INKEY(150)
 150 NEXT:NEXT
 160 END
```

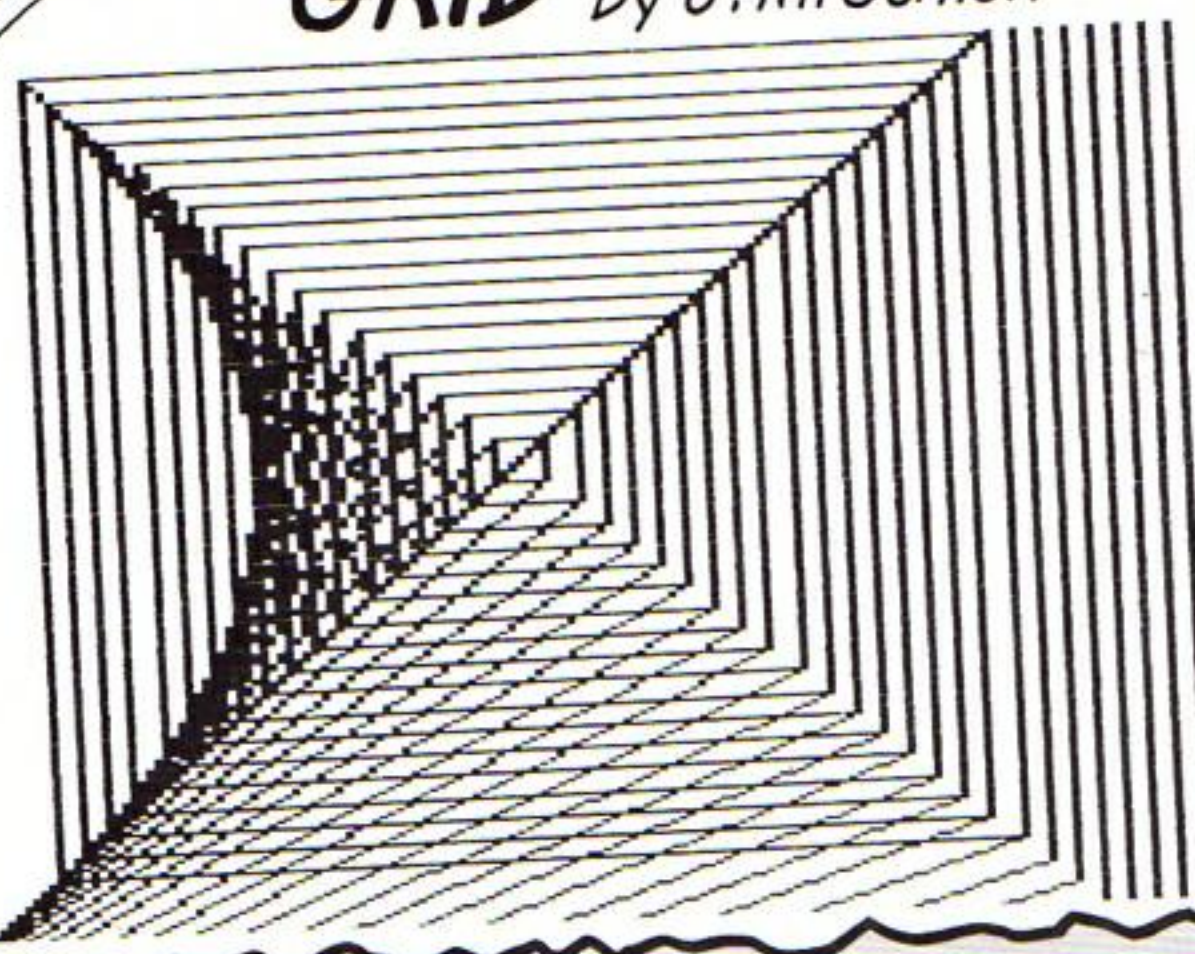
MULTI COLOURED CUBE

Paul Simpson uses GCOL Ø to provide the colour changes

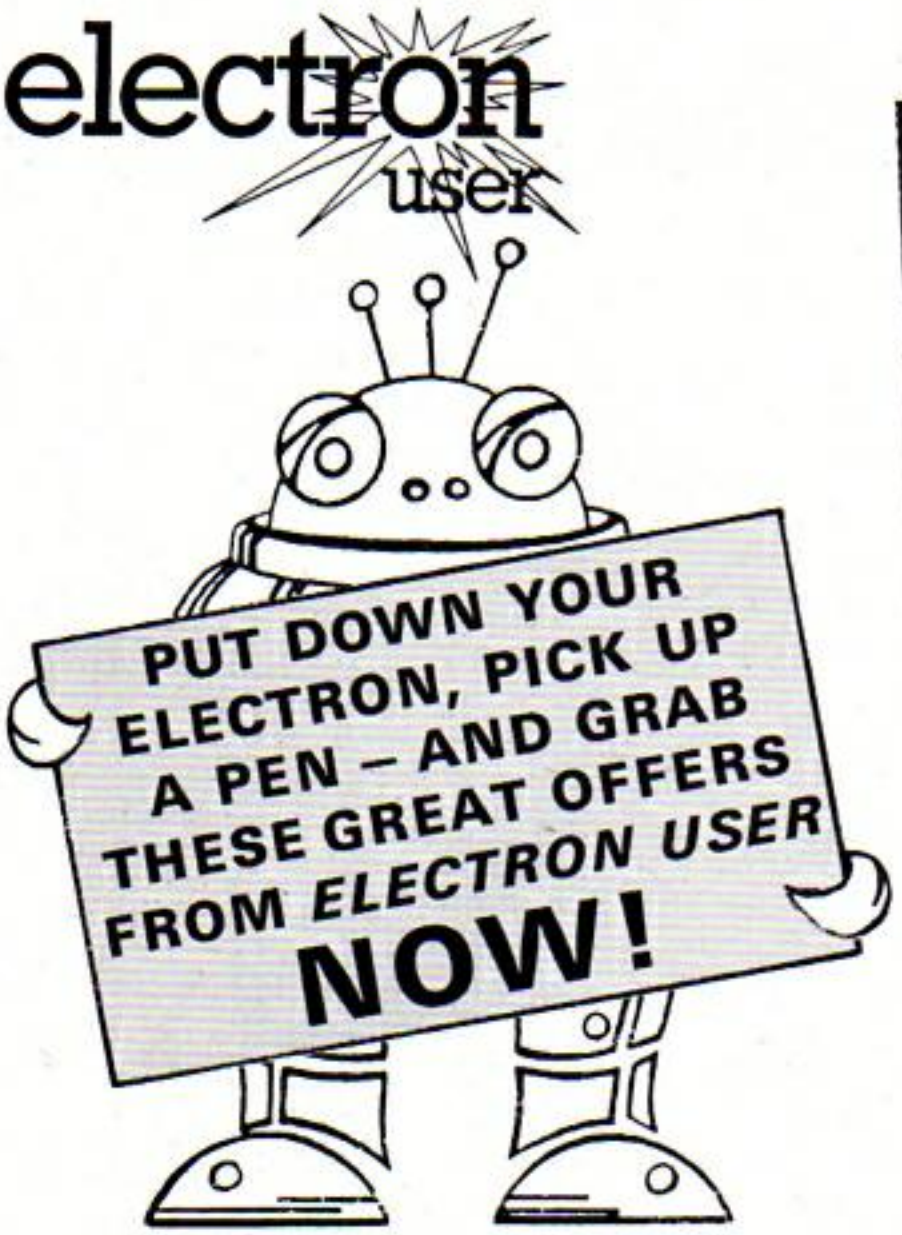


```
  10 REM MULTI-COLOURED
CUBE
  20 REM PAUL SIMPSON
  30 REM HARROGATE
  40 MODE 5
  50 REPEAT
  60 VDU 23,1,0;0;0;0;
  70 FOR x=1 TO 2000
  80 FOR y=1 TO 2000
  90 GCOL 0,RND(15)
 100 MOVE x,y
 110 DRAW x,y
 120 DRAW y,x-y
 130 DRAW y,x-y
 140 DRAW y,x+y
 150 DRAW x,y+x
 160 NEXT
 170 NEXT
 180 UNTIL FALSE
```

GRID by J.M.Conlon



```
10 REM * WRITTEN BY *
20 REM * J.M.CONLON *
30 MODE 2
35 VDU 23,1,0;0;0;0;
40 A=100
50 B=1000
60 C=500
70 FOR L=1 TO 20
80 MOVE A,A
90 DRAW C,C
100 MOVE C,C
110 DRAW A,B
120 MOVE A,B
130 DRAW A,A
140 MOVE A,A
150 DRAW B,A
160 A=A+25
170 B=B-25
180 C=C-25
190 NEXT L
200 GCOL 0,RND(7)
210 GOTO 70
```



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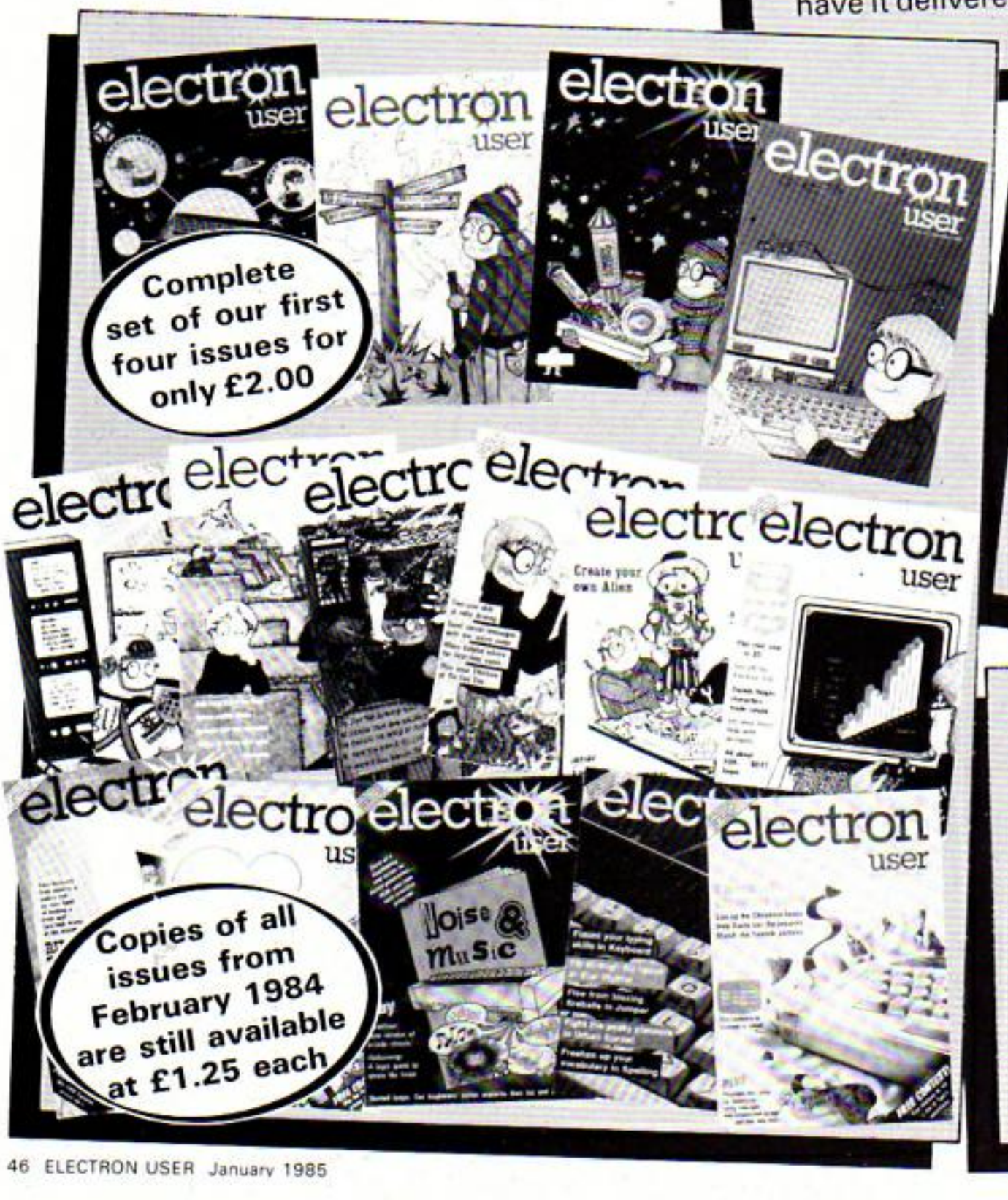

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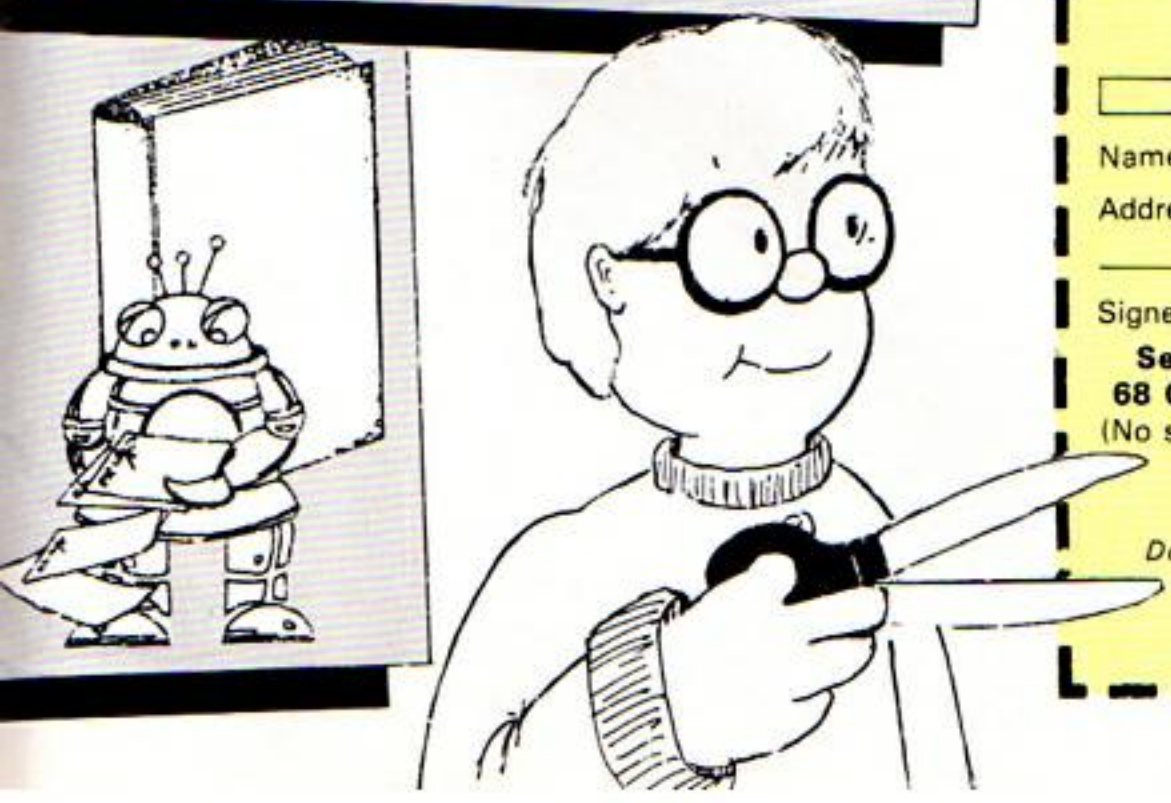

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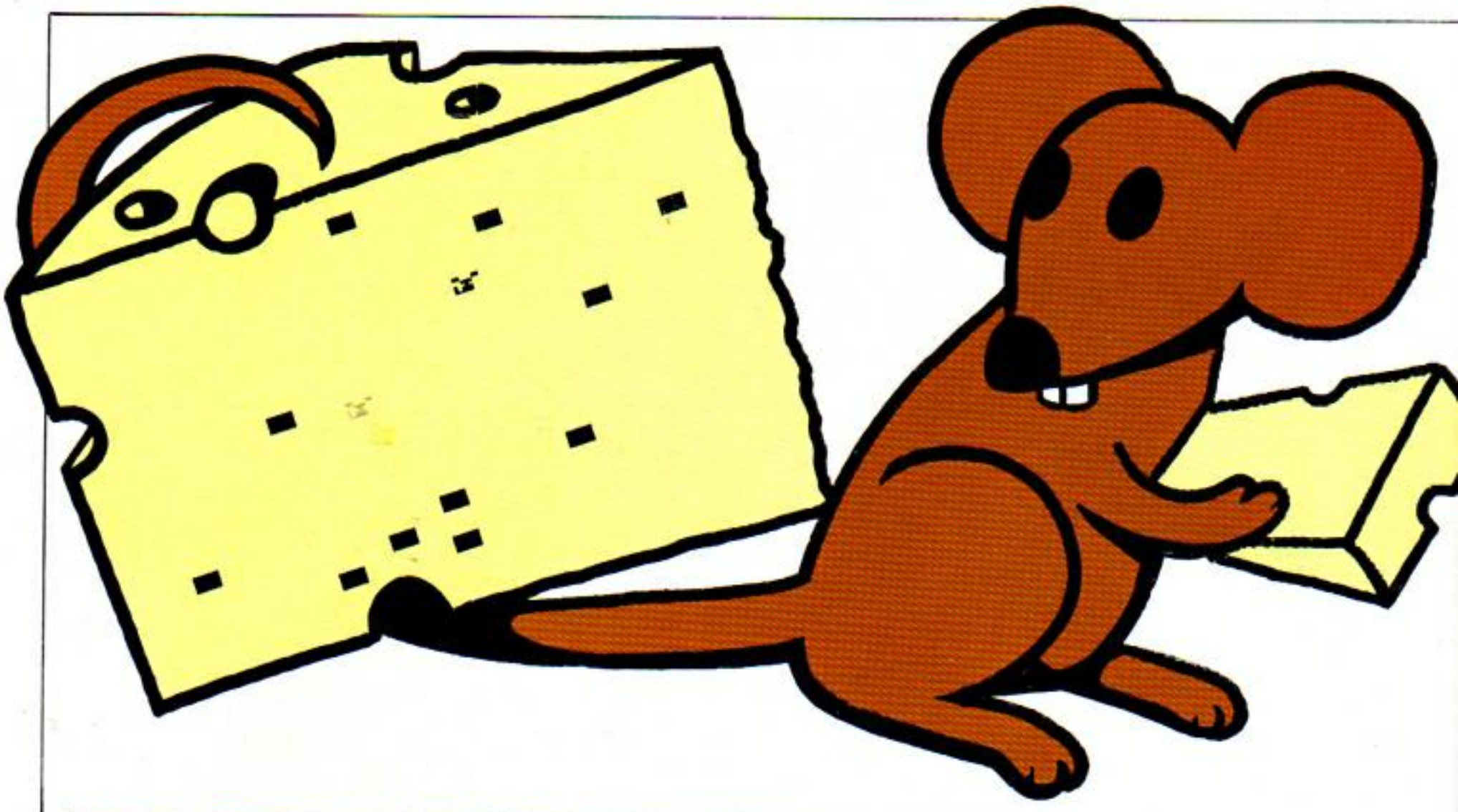


```
10 REM THE GREAT CHEESE
   RACE
20 REM BASED ON AN IDEA
   BY SIMON FROST
30 REM AUTHOR ROG FROST
40 REM (C) ELECTRON USER
50 MODE 6
60 VDU 23;8202;0;0;0;
70 PROCintro
80 MODE 5
90 P%=480
   :Q%=520
100 X%=520
   :Y%=480
110 SC%=0
   :PO%=0
120 VDU 23,254,127,127
   ,127,127,127,127,127
   ,127
130 VDU 23,255,255,255
   ,255,255,255,255,255
   ,255
140 VDU 23,224,99,99,28
   ,28,72,92,92,124
150 VDU 5
160 GCOL 0,2
170 FOR CHEESE=1 TO 12
180 MOVE RND(30)*40,
   RND(23)*40+100
   :VDU 254
190 NEXT
200 TIME =0
210 REPEAT
220 GCOL 0,0
230 MOVE X%,Y%
   :VDU 255
240 MOVE P%,Q%
   :VDU 255
250 IF INKEY (-105)
   THEN Y%=Y%-40
260 IF INKEY (-66)
   THEN Q%=Q%+40
270 IF INKEY (-73)
   THEN Y%=Y%+40
280 IF INKEY (-98)
   THEN Q%=Q%-40
290 IF INKEY (-104)
   THEN X%=X%+40
300 IF INKEY (-67)
   THEN P%=P%-40
310 IF INKEY (-103)
   THEN X%=X%-40
320 IF INKEY (-83)
   THEN P%=P%+40
330 GCOL 0,0
   :MOVE P%,Q%
   :GCOL 0,3
   :MOVE X%,Y%
   :VDU 224
340 GCOL 0,0
   :MOVE P%,Q%
   :VDU 255
   :GCOL 0,1
   :MOVE P%,Q%
   :VDU 224
350 IF POINT(X%+50,Y%-30)=2
   OR POINT(X%+10,Y%+5)=2
   THEN SC%=SC%+1
   :GCOL 0,0
   :MOVE X%-60,Y%+20
   :MOVE X%+60,Y%+20
   :PLOT 85,X%-60,Y%-60
   :PLOT 85,X%+60,Y%-60
   :SOUND 1,-15,100,5
360 IF POINT(P%+50,Q%-30)=2
   OR POINT(P%+10,Q%+5)=2
   THEN PO%=PO%+1
   :GCOL 0,0
   :MOVE P%-60,Q%+20
   :MOVE P%+60,Q%+20
   :PLOT 85,P%-60,Q%-60
   :PLOT 85,P%+60,Q%-60
   :SOUND 1,-15,52,5
370 UNTIL SC%=6 OR PO%=6
   OR SC%+PO%=10
   OR TIME >4000
380 *FX15,0
390 MODE 6
400 VDU 19,0,4,0,0,0
410 PRINT '''''TAB(2)"White
   scored ";SC%''''
   TAB(2)"Red scored ";PO%
   '''''''''''TAB(2)"space
   bar for next game"
420 REPEAT UNTIL GET =32
   :VDU 20
   :GOTO 80
430 DEF PROCintro
440 VDU 19,0,4,0,0,0
450 PRINT TAB(8,10)"THE
   GREAT CHEESE RACE"
460 J=INKEY (200)
   :CLS
470 PRINT '''"This is a
   two player game in
   which"'"each mouse
   is trying to eat the"'
   "yellow pieces of chees
   e."'"Player 1 has a
   red mouse moved with"'
   "A-up,Z-down,X-left,C-r
   ight."
480 PRINT '"Player 2 has
   a white mouse moved
   with"'"(-left,)-right,
   *-up,?-down."
490 PRINT '''"The object
   is to score 6 before
   your"'"opponent."'
   "Sometimes you will
   be lucky and will"'
   "score more than 1
   for a piece of cheese.
   "'''''''"Press space
   to start."
500 REPEAT UNTIL GET =32
510 CLS
520 VDU 20
530 ENDPROC
```

This listing is included in this month's cassette tape offer. See order form on Page 47.

Get set for the great

CHEESE RACE

THE Great Cheese Race is a two player game written for the Electron by ROGER FROST.

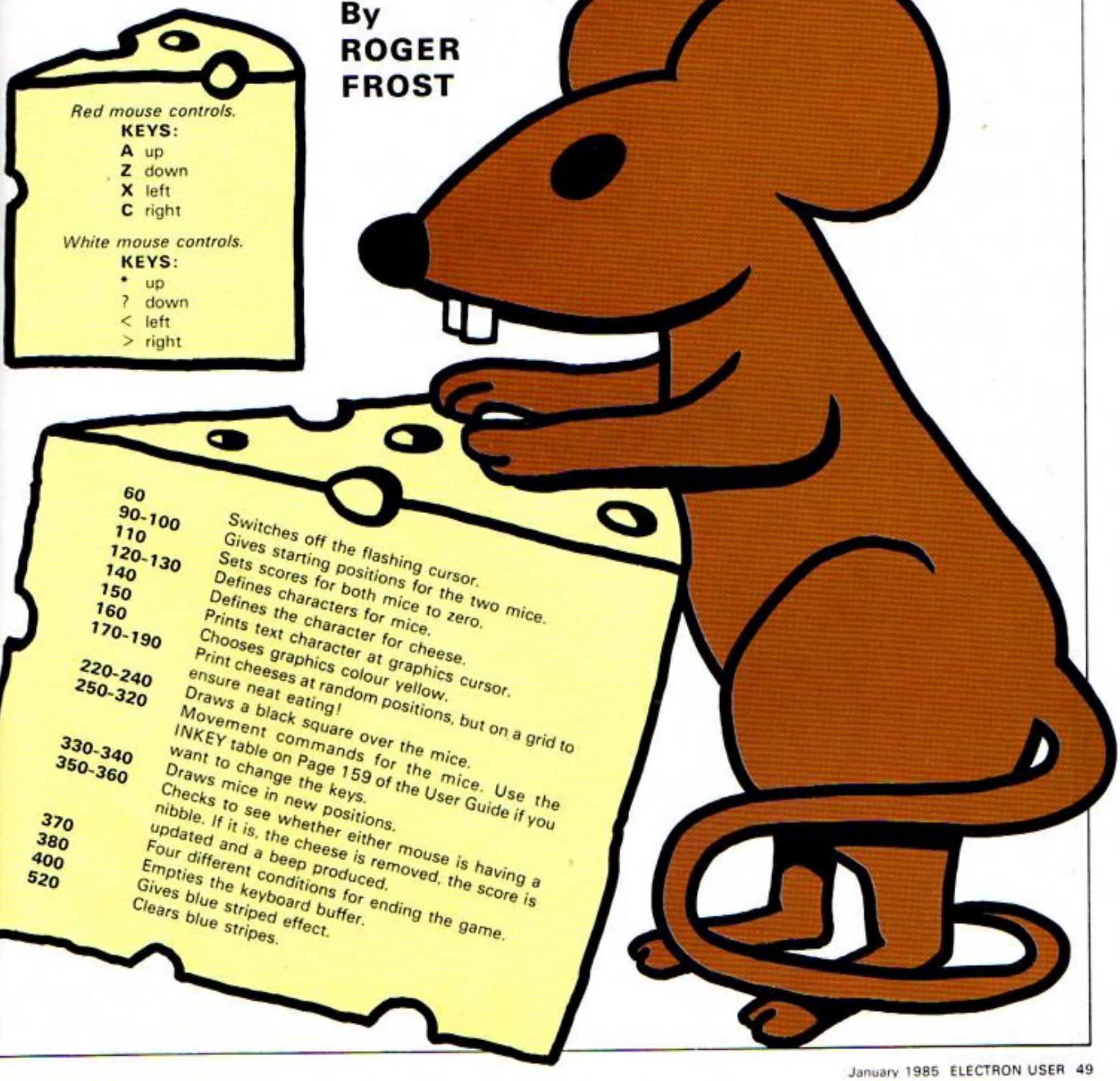
Each player controls a mouse, using the keyboard to guide the beastie to the yellow cheeses scattered around the screen.

Of course as soon as your mouse gets to a cheese it eats it.

You get a point for each cheese your creature eats – sometimes you get two, if you're lucky.

The first mouse to score six is the winner. And there are no cats to spoil your fun!

By ROGER FROST



Red mouse controls.
KEYS:
A up
Z down
X left
C right

White mouse controls.
KEYS:
• up
? down
< left
> right

```
 60        Switches off the flashing cursor.
 90-100    Gives starting positions for the two mice.
 110       Sets scores for both mice to zero.
 120-130   Defines characters for mice.
 140       Defines the character for cheese.
 150       Prints text character at graphics cursor.
 160       Chooses graphics colour yellow.
 170-190   Print cheeses at random positions, but on a grid to
           ensure neat eating!
 220-240   Draws a black square over the mice.
 250-320   Movement commands for the mice. Use the
           INKEY table on Page 159 of the User Guide if you
           want to change the keys.
 330-340   Draws mice in new positions.
 350-360   Checks to see whether either mouse is having a
           nibble. If it is, the cheese is removed, the score is
           updated and a beep produced.
 370       Four different conditions for ending the game.
 380       Empties the keyboard buffer.
 400       Gives blue striped effect.
 520       Clears blue stripes.
```

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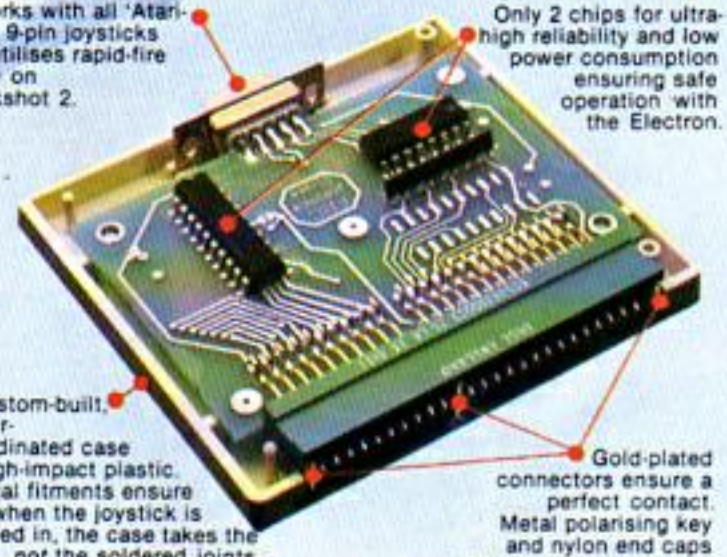

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NEW! RELEASE

MR. WIZ £7.95

From the author of Percy Penguin, Mr. Wiz is a fast-action multi-scene game. Guide Mr. Wiz around the garden to eat the cherries whilst avoiding the evil gremlins. The gremlins can be killed by dropping apples on them or by throwing the crystal ball. Extra points can be gained by eating the magic mushroom, but beware...this is the home of the gremlins and makes them permanently furious! Sound effects and tunes, hi-score, rankings. Superb arcade-style action.

NEW RELEASE

CHESS £7.95

A highly versatile implementation of Chess. Play black or white against the computer or a human opponent. The skill level of the computer's play can be varied widely, and moves are entered either by co-ordinates, cursor control, or joystick control. Moves can be taken back if an error has been made, and the board can be modified at any time. Games can be "saved" or "loaded", and the last game can be replayed. The computer will, if requested, suggest your moves.

NEW RELEASE

CENTIBUG £7.95

The centibug descends from the top of the screen weaving intimidatingly between the mushrooms. Your objective is to shoot all the segments of the centibug before it reaches the bottom of the screen.

Features include: spiders, snails, flies, 6 skill levels, hi-score, rankings, and increasing difficulty.

ALIEN DROPOUT £7.95

A novel and unusual program. Arcade-action with this exciting multi-stage shooting game. The objective of the game is to shoot the aliens out of their "boxes" before the "boxes" fill up. Once full, the aliens fly down relentlessly, exploding as they hit the ground. The game features include: 6 skill levels, rankings, hi-score, increasing difficulty.

STRANDED £7.95

An adventure game using hi-resolution full-colour graphics. You are stranded on a strange planet, and your mission is to return to civilisation and home. Many of the locations are shown graphically, including the spaceship, the cliffs, the mountains, and (if you succeed) your home. You must carefully explore your environment searching for hidden clues to help you in your quest.

NEW RELEASE

WORLD GEOGRAPHY £7.95

This program covers 166 countries which are divided into 8 categories of difficulty. Each country is pinpointed on an accurate hi-resolution screen map of the world, and the user is asked the capital and/or population. At the end of the test, the percentage of correct answers is given, so that the student can monitor his geographical knowledge.

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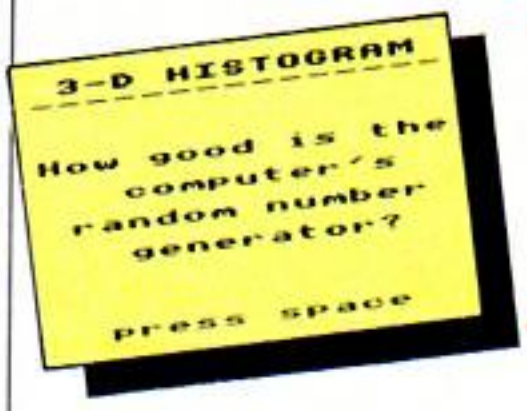
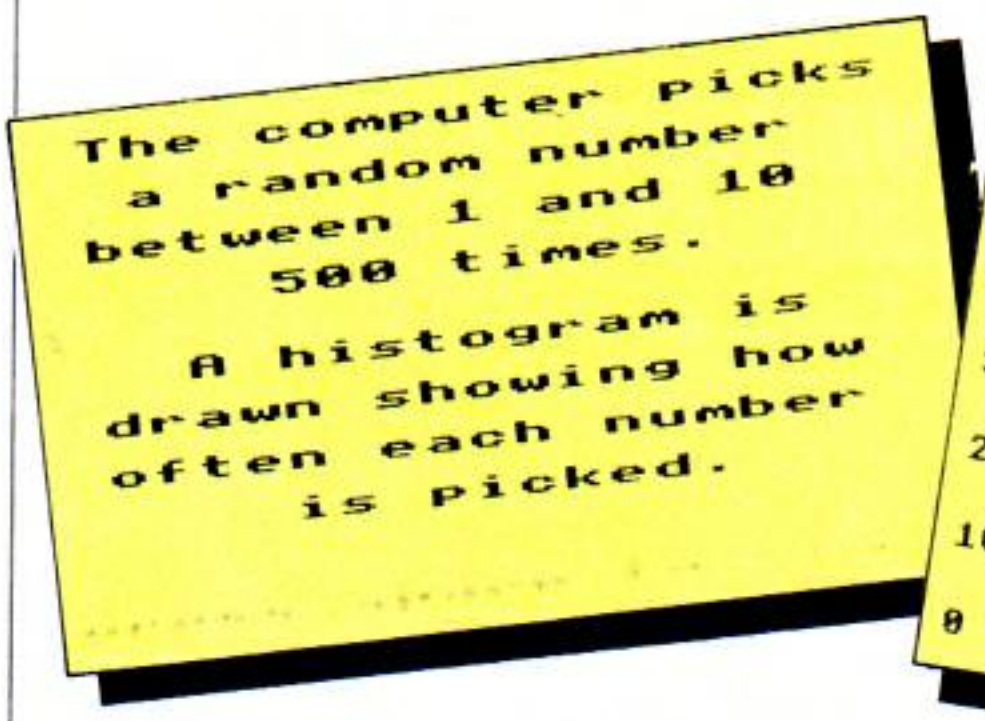
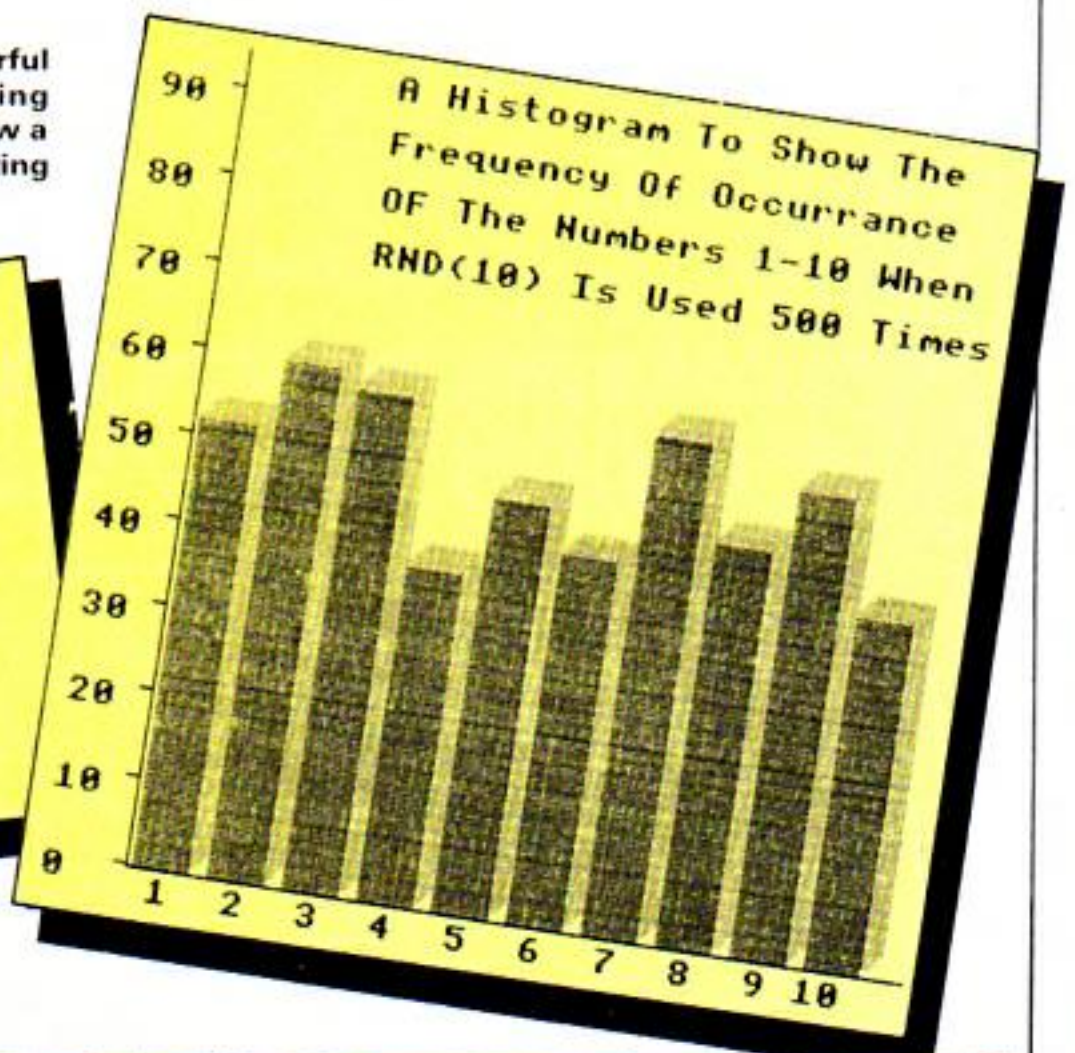


RANDOM NUMBERS

SO you thought the Electron picked numbers in a truly random fashion.

ROLAND WADDILOVE's 3D bar chart proves different – and in a colourful and thought provoking way. Does anyone know a better method of getting random numbers?






```
10REM 3-D GRAPH
20REM By R.A.Waddilove
30REM ELECTRON USER
40MODE 2
50PROCtitle
60MODE 1
70DIM box%(10)
80PROCdraw_axies
90FOR loop%=1 TO 50
100PROCrandom_numbers
110FOR number%=1 TO 10
120height%=box%(number%)*10
130PROCdraw_bar
140NEXT
150NEXT
160VDU 7
170END
180
190DEF PROCtitle
210VDU 5
220GCOL 0,4:MOVE 204,808
230PRINT"3-D HISTOGRAM"
240MOVE 200,804
250PRINT"3-D HISTOGRAM"
260GCOL 0,7:MOVE 196,800
270PRINT"3-D HISTOGRAM"
280VDU 4
290VDU 23,1,0;0;0;0;
300PRINTTAB(2,8)"----------
----"
310COLOUR 3
320PRINT'''" How good is th
e"'"     computer's"'"   ran
dom number"'"     generator?"
330COLOUR 6
340PRINT''''"     press space
"
350REPEAT UNTIL GET$=" " : V
DU7
360CLS : COLOUR 3
370PRINT''''" The computer p
icks"'"  a random number"'"
between 1 and 10"'"     500 t
imes."
380PRINT''"   A histogram is
"'" drawn showing how"'" oft
en each number"'"     is pick
ed."
390COLOUR 1
400PRINT'''"press space to s
tart"
410REPEAT UNTIL GET$=" " : V
DU 7
420ENDPROC
430
440DEF PROCdraw_bar
450GCOL 0,2
460MOVE x%+72,0
470MOVE x%,0
480PLOT 85,x%+72,height%
490PLOT 85,x%,height%
500GCOL 0,1
510MOVE x%+24,height%+24
520PLOT 85,x%+72,height%
530PLOT 85,x%+96,height%+24
540PLOT 85,x%+72,0
550PLOT 85,x%+96,24
560x%=x%+96
570ENDPROC
580
590DEF PROCrandom_numbers
600FOR boxes%=1 TO 10
610n%=RND(10)
620box%(n%)=box%(n%)+1
630NEXT
640x%=4
650ENDPROC
660
670DEF PROCdraw_axies
680VDU 19,0,4;0;
700VDU 29,132;52;
710MOVE -4,1000
720DRAW -4,-4 : DRAW 1100,-4
730VDU5
740FOR scale%=0 TO 900 STEP
100
750MOVE -112,scale%
760PRINT;scale% DIV 10
770MOVE -20,scale%
780DRAW -8,scale%
790NEXT
800MOVE 24,-16
810PRINT"1  2  3  4  5  6  7
 8  9 10"
820VDU 4
830VDU 23,1,0;0;0;0;
840PRINT TAB(10,1)"A Histogr
am To Show The";TAB(10,3)"Freq
uency Of Occurrance";TAB(10,5)
"OF The Numbers 1-10 When";TAB
(10,7)"RND(10) Is Used 500 Tim
es"
850VDU30
860ENDPROC
```

This listing is included in this month's cassette tape offer. See order form on Page 47.

Claypigeons listing

From Page 25

```
  250 VDU24,150;300;1100;90
0;
  260 COLOUR 2:score%=0:cla
y%=0
  270 PRINTTAB(1,1)"Score "
:score%;,TAB(10,1)"Clays ";
clay%;
  280 sx%=200:sy%=350:osx%=
sx%:osy%=sy%
  290 REM The next instruct
ion sets up
  300 REM the number of cla
ys per game.
  310 FOR numberofclays%=1T
050
  320 shoot%=0:hit%=0:PROCc
lay
  330 NEXT
  340 MODE1:VDU23,1,0;0;0;0
;
  350 PROCsort:PRINTTAB(2,2
5)"Another game (Y/N)";
  360 yn$=GET$:IF yn$="N" C
LS:PRINTTAB(15,15)"Bye for
now";:VDU5:END
  370 IF yn$="Y" VDU5:GOTO1
70
  380 GOTO360
  390 :
  400 DEFPROCclay
  410 REM This procedure se
ts up the
  420 REM random flight pat
h for each
  430 REM clay and propels
it.
  440 TIME=0:REPEAT UNTIL T
IME>100+RND(5000):VDU5
  450 start%=RND(580)+320:e
nd%=RND(580)+320:inc%=(end%
-start%)DIV61
  460 dir%=RND(2):IFdir%=2
dir%=-16:x%=1000:GOTO480
  470 x%=140:dir%=16
  480 y%=start%:ox%=x%:oy%=
y%
  490 VDU4:PRINTTAB(1,28)SP
C(19);
  500 clay%=clay%+1:PRINTTA
B(10,1)"Clays ";clay%;:VDU5

  510 SOUND&11,1,20,3
  520 FORdelay=1TO1000:NEXT
  530 FORJ%=1TO62
  540 GCOL0,1:MOVEox%,oy%:V
DU224
  550 GCOL0,7:MOVEx%,y%:VDU
 224
  560 PROCshoot
  570 ox%=x%:oy%=y%
  580 x%=x%+dir%:y%=y%+inc%
  590 NEXT
  600 GCOL0,1:MOVEsx%,sy%:V
DU 225:sx%=200:sy%=350
  610 IF shoot%=0 VDU4:PRIN
TTAB(1,28)"Too slow ";:VDU5
  620 ENDPROC
  630 :
  640 DEFPROCshoot
  650 REM This procedure en
ables the gun
  660 REM sight to be moved
 and a shot
  670 REM to be fired.One s
hot only is
  680 REM allowed per clay.
  690 GCOL0,1:MOVEosx%,osy%
:VDU 225
  700 GCOL0,7:MOVEsx%,sy%:V
DU 225
  710 osx%=sx%:osy%=sy%
  720 IF shoot%=1 GOTO740
  730 IFINKEY(-99) shoot%=1
:GCOL0,0:MOVE150,300:PLOT21
,sx%+32,sy%-16:SOUND1,2,150
,3:PLOT21,1100,300:GCOL0,1:
:PLOT21,sx%+32,sy%-16:PLOT2
1,150,300:PROCcheck:ENDPROC
  740 IFINKEY(-67)sx%=sx%+2
4
  750 IFINKEY(-98)sx%=sx%-2
4
  760 IFINKEY(-73)sy%=sy%+1
6
  770 IFINKEY(-105)sy%=sy%-
16
  780 ENDPROC
  790 :
  800 DEFPROCcheck
  810 REM This procedure ch
ecks the
  820 REM position of the c
lay and sight
  830 REM when a shot has b
een fired.It
  840 REM also prints rando
m messages.
  850 IFsx%(x%+16 AND sx%)x
%-16 GOTO870
  860 GOTO880
  870 IFsy%(y%+16 AND sy%)y
%-16 hit%=1:score%=score%+1
:VDU4:PRINTTAB(1,1)"Score "
;score%;:VDU5:PROCexplode
  880 message%=RND(3)
  890 IF message%=3GOTO970

  900 IFscore%=0mess%=1:GOT
O940
  910 IF score%*10 DIV clay
%>7 mess%=10:GOTO940
  920 IF score%*10 DIV clay
%>3 mess%=6:GOTO940
  930 mess%=2
  940 messno%=RND(2)+mess%
  950 IF hit%=1 messno%=mes
sno%+2
  960 VDU4:PRINTTAB(1,28)co
m$(messno%):VDU5
  970 ENDPROC
  980 :
  990 DEFPROCexplode
 1000 REM This procedure ex
plodes the
 1010 REM clay if it has be
en hit.
 1020 GCOL0,1:MOVEsx%,sy%:V
DU 225
 1030 GCOL0,1:MOVEx%,y%:VDU
 224
 1040 SOUND0,-15,14,15
 1050 FORI%=4TO16STEP4
 1060 GCOL0,7:MOVEx%+I%,y%+
I%:VDU 227
 1070 MOVEx%-I%,y%+I%:VDU 2
27
 1080 MOVEx%+I%,y%-I%:VDU 2
27
 1090 MOVEx%-I%,y%-I%:VDU 2
27
 1100 FOR delay%=1TO10:NEXT

 1110 GCOL0,1:MOVEx%+I%,y%-
I%:VDU 227
 1120 MOVEx%-I%,y%+I%:VDU 2
27
 1130 MOVEx%+I%,y%-I%:VDU 2
27
 1140 MOVEx%-I%,y%-I%:VDU 2
27
 1150 NEXT
 1160 TIME=0:REPEAT UNTIL T
IME>100
 1170 J%=62:GCOL0,1:MOVEx%,
y%:VDU 226
 1180 ENDPROC
 1190 :
 1200 DEFPROCsort
 1210 REM This procedure in
vites the
 1220 REM last player to ty
pe his/her
 1230 REM name if the score
is in the
 1240 REM top 6 scores then
lists the
 1250 REM 6 highest scores
in order.
 1260 PRINTTAB(2,1)"Score =
 ";score%;
 1270 PRINTTAB(2,3)"Highest
 scores";
 1280 PRINTTAB(2,4)"=======
=======";
 1290 FOR I%=1TO6
 1300 IFscore%>=hs%(I%)GOTO
1330
 1310 NEXT
 1320 GOTO1410
 1330 FOR J%=6 TO I%+1 STEP
-1
 1340 hs%(J%)=hs%(J%-1)
 1350 name$(J%)=name$(J%-1)

 1360 NEXT
 1370 hs%(I%)=score%
 1380 PRINTTAB(1,6)"Type yo
ur name";
 1390 *FX15,0
 1400 INPUT name$(I%)
 1410 *FX4,1
 1420 PRINTTAB(0,6)SPC(39):
line%=6
 1430 FORI%=1TO6
 1440 line%=line%+2
 1450 PRINTTAB(2,line%)name
$(I%);TAB(18,line%)hs%(I%);

 1460 NEXT
 1470 ENDPROC
 1480 :
 1490 REM The following DAT
A statements
 1500 REM can be altered to
any suitable
 1510 REM messages,but only
19 letters.
 1520 DATA No score yet!
 1530 DATA Missed
 1540 DATA Not too good
 1550 DATA Hopeless
 1560 DATA That's better
 1570 DATA You've woken up!

 1580 DATA Too hard for you
?
 1590 DATA Are you trying?
 1600 DATA Keep trying
 1610 DATA You can do it!
 1620 DATA Momentary lapse?
 1630 DATA Too confident?
 1640 DATA Dead eye Dick
 1650 DATA Are you Wyatt Ea
rp?
 1660 :
```

This listing is included in this month's cassette tape offer. See order form on Page 47.

Planet Scargov listing

From Page 41

```
MOD 8+1)
  660 bx%=RND(13)*64+128
  670 by%=RND(12)*64+192
  680 GCOL 0,3:MOVE bx%,by%
:VDU 224
  690 NEXT
  700 GCOL 0,0:MOVE 184,192
:DRAW 184,976:MOVE 1024,192
:DRAW 1024,976
  710 MOVE 1096,888:PLOT 0,
0,-48:PLOT 81,48,48:PLOT 81
,0,-48:PLOT 1,16,-48:PLOT 1
,16,0
  720 PLOT 0,-112,0:PLOT 1,
16,0:PLOT 1,16,48:PLOT 0,0,
48:PLOT 0,48,0:PLOT 81,-24,
80
  730 GCOL 4,0:MOVE x%,y%:V
DU 226
  740 FOR a%=1 TO alien
  750 MOVE ax%(a%),ay%(a%):
VDU 225
  760 NEXT
  770 VDU 4
  780 *FX21,5
  790 TIME=0
  800 ENDPROC
  810 DEF PROCman
  820 key=INKEY0:IF key=-1
ENDPROC
  830 *FX21,0
  840 VDU 5
  850 MOVE x%,y%:VDU 226
  860 IF key=90 AND x%>64 x
%=x%-64
  870 IF key=88 x%=x%+64
  880 IF key=47 AND y%>304
y%=y%-64
  890 IF key=58 AND y%<960
y%=y%+64
  900 SOUND1,-1,x% DIV 5,2
  910 MOVE x%,y%:VDU 226
  920 VDU 4
  930 ENDPROC
  940 DEF PROCalien
  950 VDU 5
  960 FOR a%=1 TO 5
  970 IF a%<=alien MOVE ax%
(a%),ay%(a%):VDU 225
  980 rnd%=RND(5)
  990 IF rnd%=1 AND ax%(a%)
>192 ax%(a%)=ax%(a%)-64
 1000 IF rnd%=2 AND ax%(a%)
<960 ax%(a%)=ax%(a%)+64
 1010 IF rnd%=3 AND ay%(a%)
>272 ay%(a%)=ay%(a%)-64
 1020 IF rnd%=4 AND ay%(a%)
<912 ay%(a%)=ay%(a%)+64
 1030 IF a%<=alien MOVE ax%
(a%),ay%(a%):VDU 225
 1040 NEXT
 1050 VDU 4
 1060 ENDPROC
 1070 DEF PROCupdate
 1080 time%=1000-TIME
 1090 IF time%<100 SOUND1,-
1,250,1
 1100 IF time%<0 time%=0:lo
se=TRUE
 1110 PRINTTAB(10,28)time%
 1120 IF x%>960 win=TRUE
 1130 FOR a%=1 TO alien
 1140 IF x%=ax%(a%) AND y%=
ay%(a%) lose=TRUE
 1150 NEXT
 1160 IF POINT(x%,y%)=3 los
e=TRUE
 1170 ENDPROC
 1180 DEF PROCwin
 1190 SOUND 1,1,25,-1
 1200 *FX10,0
 1210 COLOUR 3
 1220 PRINTTAB(0,30)"Field
";screen;" crossed!   ";
 1230 score=score+time%*ali
en
 1240 PRINTTAB(0,28)"Score
";score;SPC10
 1250 IF screen=31 escape=T
RUE
 1260 IF score>nextaim live
s=lives+1:nextaim=nextaim+1
0000
 1270 TIME=0:REPEAT UNTIL T
IME>250
 1280 screen=screen+1
 1290 CLG
 1300 ENDPROC
 1310 DEF PROClose
 1320 *FX9,2
 1330 *FX10,2
 1340 VDU 19,2,15;0;
 1350 VDU 19,1,8;0;
 1360 SOUND 0,-1,RND(3)+3,-
1
 1370 lives=lives-1
 1380 IF lives=0 dead=TRUE
 1390 TIME=0:REPEAT UNTIL T
IME>150
 1400 CLG
 1410 ENDPROC
 1420 DEF PROCescape
 1430 VDU 23,1,0;0;0;0
 1440 *FX9,20
 1450 *FX10,20
 1460 w$="CONGRATULATIONS!"
 1470 FOR r%=1 TO LENw$
 1480 COLOUR r% MOD 6+9
 1490 PRINTTAB(1+r%,10)MID$
(w$,r%,1)
 1500 NEXT
 1510 COLOUR 3
 1520 PRINT''"Scargov is de
feated!"
 1530 COLOUR 5
 1540 PRINT''"# YOU HAVE ES
CAPED #"
 1550 COLOUR 6
 1560 PRINT'" (You scored "
;score;")"
 1570 REPEAT UNTIL 0
 1580 ENDPROC
 1590 DEF PROCdead
 1600 VDU 23,1,0;0;0;0;
 1610 *FX21,5
 1620 PRINTTAB(5,12)"D E A
D !"
 1630 PRINTTAB(0,15)"You sc
ored ";score
 1640 PRINTTAB(0,20)"Anothe
r go (Y/N)?";
 1650 REPEAT key=GET:UNTIL
 key=78 OR key=89
 1660 IF key=89 RUN
 1670 *FX12,0
 1680 ENDPROC
 1690 DEF PROCstart
 1700 COLOUR 3
 1710 PRINTTAB(7,2)"Escape
from Planet Scargov"
 1720 COLOUR 1
 1730 PRINTTAB(12,5)"by  Ia
n M. Brown"
 1740 PRINTTAB(2,14)"Instru
ctions (Y/N)? "
 1750 REPEAT key=GET:UNTIL
 key=78 OR key=89
 1760 IF key=89 PROCinstru
ctions
 1770 ENDPROC
 1780 DEF PROCinstructions
 1790 PRINTTAB(14,30)"Press
  Space"
 1800 VDU 28,0,28,39,8
 1810 COLOUR 2
 1820 PRINT"    Marooned fo
r some unknown reason on"''
"the  distant  PLANET SCARG
OV, you  find"''"that the o
nly way of escape is across
 a"
 1830 PRINT''"system of mine
fields, layed down by the"'
'"EVIL EMPEROR  before  the
 government of"''"the plane
t overthrew him."
 1840 PRINT''"    Legend ha
s  it  that  there are 31"'
'"separate  minefields, all
  of which you"''"must cros
s to reach a waiting spaces
hip"''"at the other side."
 1850 REPEAT UNTIL GET=32
 1860 CLS
 1870 PRINT"    You  must
negotiate  each minefield"'
"by avoiding the  flashing
MINES to reach"'"the other
side."
 1880 PRINT''"    You  will
 also  find  a  number  of"
'"dangerous ALIENS scrounqi
ng about on the"'"minefield
s - avoid contact with thes
e."
 1890 PRINT''"    You have o
nly a short time  to cross"
'"each minefield before it
detects you and"'"destroys
the whole area!"
 1900 REPEAT UNTIL GET=32
 1910 CLS
 1920 PRINTTAB(18)"KEYS"
 1930 PRINTTAB(15,4)"Z  --
left"
 1940 PRINTTAB(15,6)"X  --
right"
 1950 PRINTTAB(15,8)":  --
 up"
 1960 PRINTTAB(15,10)"/  --
 down"
 1970 PRINT''TAB(1);CHR$224
;" mine";SPC10;CHR$225;" al
ien";SPC10;CHR$226;" you"
 1980 COLOUR 3
 1990 PRINTTAB(10,19)"G O O
D    L U C K !"
 2000 REPEAT UNTIL GET=32
 2010 ENDPROC
 2020 :
 2030 DEF PROCerror
 2040 *FX12,0
 2050 PRINT'
 2060 REPORT:PRINT" at line
";ERL'
 2070 ENDPROC
```

This listing is included in this month's cassette tape offer. See order form on Page 47.

Space Battle listing

From Page 15

```
,3
 1790REM ***** missile ****
*
 1800DATA 32,32,32,32,32,32
,0,0,64,64,64,64,64,64,0,0
 1810REM ***** colours ****
*
 1820DATA 1,3,4, 3,7,1, 3,6
,1, 1,3,2, 1,3,5, 5,3,1, 3,
5,1, 2,7,6, 6,3,2, 6,3,4
 1830
 1840DEF PROCasseable
 1850RESTORE 1720
 1860FOR I%=0 TO 79
 1870READ J%:I%?&900=J%
 1880NEXT
 1890aliendata=&900:explosi
ondata=&920
 1900basedata=&930:missiled
ata=&940
 1910position=&950:sound2=&
A1A
 1920!sound2=&FFF10010:soun
d2!4=&000A0004
 1930osbyte='&20A AND &FFFF
 1940osword='&20C AND &FFFF
 1950oswrch='&20E AND &FFFF
 1960temp=&70:base=&72:alie
n=&74
 1970rnd=&76:dead=&79:missi
le=&7A
 1980count=&7C:speed=&7D:sc
ore=&7E
 1990time=&80:sound1=&85
 2000!sound1=&00010001:soun
d1!4=&00020078
 2010FOR pass=0 TO 2 STEP 2
 2020P%=HIMEM
 2030[ OPT pass
 2040LDA #&40:STA temp
 2050LDA #&5E:STA temp+1
 2060JSR fx19
 2070LDX #50
 2080.loop1
 2090LDY #31
 2100.loop2
 2110LDA aliendata,Y:STA (t
emp),Y
 2120DEY
 2130BPL loop2
 2140CLC
 2150LDA temp:ADC #32:STA t
emp
 2160LDA temp+1:ADC #0:STA
temp+1
 2170DEX
 2180BNE loop1
 2190LDA #&90:STA base
 2200LDA #&76:STA base+1
 2210LDY #15
 2220.loop1
 2230LDA basedata,Y:STA (ba
se),Y
 2240DEY
 2250BPL loop1
 2260LDA #RND(255):STA rnd
 2270LDA #0:STA dead  \dead
=false
 2280LDA #100:STA count \al
iens left
 2290LDA #0:JSR wait
 2300LDA #100:JSR wait
 2310
 2320\main program loop
 2330.mp
 2340JSR fire
 2350JSR movebase
 2360JSR movealiens
 2370LDA speed:JSR wait
 2380LDA dead
 2390BNE end
 2400JSR movebase
 2420LDA speed:JSR wait
 2421JSR movebase
 2422JSR movealiens
 2423LDA speed:JSR wait
 2430LDA count
 2440BEQ return
 2450LDA dead
 2460BEQ mp
 2470.end
 2480JSR landed
 2490.return
 2500RTS
 2510
 2520.movealiens
 2530JSR fx19
 2540LDX #198
 2550.alienloop1  \get addr
ess
 2560LDA position,X:STA ali
en
 2570LDA position+1,X:STA a
lien+1
 2580BEQ aliennext \if blow
n up
 2590LDY #0
 2600LDA (alien),Y:CMP #85
 2610BEQ alienok  \if not e
xploding
 2620TYA:STA position+1,X
 2630LDY #15  \erase explos
ion
 2640.alienloop3
 2650STA (alien),Y
 2660DEY
 2670BPL alienloop3
 2680JMP aliennext
 2690.alienok
 2700LDA rnd   \random numb
er in Y
 2710AND #&48:ADC #&38
 2720ASL A:ASL A
 2730ROL rnd+2:ROL rnd+1:RO
L rnd
 2740LDA rnd:AND #7:ASL A:T
AY
 2750LDA table1,Y:STA temp
 2760LDA table1+1,Y:STA tem
p+1
 2770JMP (temp)  \on y goto
...
 2780.alienprint
 2790LDA temp+1:CMP #&58  \
off top ?
 2800BMI aliennext
 2810LDY #15
 2820LDA (temp),Y
 2830BNE aliennext \if some
thing there
 2840.alienloop2  \move ali
en
 2850LDA (alien),Y:STA (tem
p),Y
 2860LDA #0:STA (alien),Y
 2870DEY
 2880BPL alienloop2
 2890LDA temp:STA  position
,X
 2900LDA temp+1:STA positio
n+1,X
 2910CMP #&76   \landed ?
 2920BMI aliennext
 2930INC dead
 2940.aliennext  \decrement
loop
 2950DEX:DEX:CPX #254 \fini
shed ?
 2960BNE alienloop1
 2970RTS   \end move alien
subroutine
 2980.table1
 2990EQUW zero
 3000EQUW one
 3010EQUW two
 3020EQUW three
 3030EQUW four
 3040EQUW five
 3050EQUW six
 3060EQUW seven
 3070.zero
 3080CLC    \add 16
 3090LDA alien:ADC #16:STA
temp
 3100LDA alien+1:ADC #0:STA
 temp+1
 3110JMP alienprint
 3120.one
 3130CLC   \add &150
 3140LDA alien:ADC #&50:STA
 temp
 3150LDA alien+1:ADC #&1:ST
A temp+1
 3160JMP alienprint
 3170.two
 3180CLC   \add &140
 3190LDA alien:ADC #&40:STA
 temp
 3200LDA alien+1:ADC #&1:ST
A temp+1
 3210JMP alienprint
 3220.three
 3230CLC    \add &130
 3240LDA alien:ADC #&30:STA
 temp
 3250LDA alien+1:ADC #&1:ST
A temp+1
 3260JMP alienprint
 3270.four
 3280SEC    \sub 16
 3290LDA alien:SBC #16:STA
temp
 3300LDA alien+1:SBC #0:STA
 temp+1
 3310JMP alienprint
 3320.five
 3330SEC    \sub &150
 3340LDA alien:SBC #&50:STA
 temp
 3350LDA alien+1:SBC #&1:ST
A temp+1
 3360JMP alienprint
 3370.six
 3380SEC    \sub &140
 3390LDA alien:SBC #&40:STA
 temp
 3400LDA alien+1:SBC #&1:ST
A temp+1
 3410JMP alienprint
 3420.seven
 3430SEC    \sub &130
 3440LDA alien:SBC #&30:STA
 temp
 3450LDA alien+1:SBC #&1:ST
A temp+1
 3460JMP alienprint
 3470
 3480.fx19
 3490LDA #19:LDX #0:LDY #0:
JMP osbyte
```

```
 3500
 3510.wait
 3520PHA
 3530LDX #time MOD 256
 3540LDY #time DIV 256
 3550LDA #1:JSR osword  \re
ad clock
 3560PLA:CMP time
 3570BPL wait
 3580LDA #0:STA time   \zer
o clock
 3590STA time+1:STA time+2
 3600STA time+3:STA time+4
 3610LDX #time MOD 256
 3620LDY #time DIV 256
 3630LDA #2:JMP osword  \re
turn
 3640
 3650.movebase
 3660LDA base:STA temp
 3670LDA base+1:STA temp+1
 3680]
 3690IF joy THEN [OPT pass:
LDA #1:JSR joystick:] ELSE
[ OPT pass:LDX #&BE:JSR ink
ey:TYA:]
 3700[ OPT pass
 3710BEQ baseright
 3720SEC
 3730LDA base:SBC #16:STA b
ase
 3740LDA base+1:SBC #0:STA
base+1
 3750.baseright
 3760]
 3770IF joy THEN [ OPT pass
:LDA #2:JSR joystick:] ELSE
 [ OPT pass:LDX #&AE:JSR in
key:TYA:]
 3780[ OPT pass
 3790BEQ baseprint
 3800CLC
 3810LDA base:ADC #16:STA b
ase
 3820LDA base+1:ADC #0:STA
base+1
 3830.baseprint
 3840LDA base+1:CMP #&76
 3850BMI baserestore
 3860SEC:LDA base:SBC #&40
 3870LDA base+1:SBC #&77
 3880BMI baseok
 3890.baserestore
 3900LDA temp:STA base
 3910LDA temp+1:STA base+1
 3920.baseok
 3930JSR fx19
 3940LDY #15
 3950.baseloop1
 3960LDA #0:STA (temp),Y
 3970LDA basedata,Y:STA (ba
se),Y
 3980DEY:BPL baseloop1
 3990RTS
 4000
 4010.fire
 4020]
 4030IF joy THEN [ OPT pass
:LDA #0:JSR joystick:] ELSE
 [ OPT pass:LDX #&B6:JSR in
key:TYA:]
 4040[ OPT pass
 4050BNE firepressed
 4060RTS
 4070.firepressed
 4080LDA base:STA missile
 4090LDA base+1:STA missile
+1
 4100JSR fx19
 4110LDX #21
 4120.fireloop
 4130SEC
 4140LDA missile:SBC #&40
 4150STA missile
 4160LDA missile+1:SBC #&1
 4170STA missile+1
 4180LDY #0:LDA (missile),Y
 4190BNE firehere
 4200LDY #14
 4210.fireloop1
 4220LDA missiledata,Y
 4230STA (missile),Y
 4240DEY:BNE fireloop1
 4250DEX:BPL fireloop
 4260.firehere
 4270LDA base:STA missile
 4280LDA base+1:STA missile
+1
 4290JSR fx19
 4300LDX #21
 4310.fireloop
 4320SEC
 4330LDA missile:SBC #&40
 4340STA missile
 4350LDA missile+1:SBC #&1
 4360STA missile+1
 4370LDY #0:LDA (missile),Y
 4380BNE fireok
 4390LDA #0:LDY #14
 4400.fireloop1
 4410STA (missile),Y
 4420DEY:BNE fireloop1
 4430DEX:BPL fireloop
 4440.fireok
 4450LDY #0:LDA (missile),Y
 4460CMP #85
 4470BEQ explosion
 4480RTS  \end fire routine
 4490.explosion
 4500LDX #sound1 MOD 256
 4510LDY #sound1 DIV 256
 4520LDA #7:JSR osword
 4530LDY #15
 4540.fireloop2
 4550LDA explosiondata,Y
 4560STA (missile),Y
 4570DEY:BPL fireloop2
 4580DEC count  \aliens lef
t
 4590SED:CLC  \score=score+
10
 4600LDA score+1:ADC #5:STA
 score+1
 4610LDA score:ADC #0:STA s
core
 4620CLD
 4630LDA #31:JSR oswrch  \p
rint score
 4640LDA #6:JSR oswrch
 4650LDA #28:JSR oswrch
 4660LDA score
 4670LSR A:LSR A:LSR A:LSR
A
 4680CLC:ADC #48:JSR oswrch
 4690LDA score:AND #&0F
 4700CLC:ADC #48:JSR oswrch
 4710LDA score+1
 4720LSR A:LSR A:LSR A:LSR
A
 4730CLC:ADC #48:JSR oswrch
 4740LDA score+1:AND #&0F
 4750CLC:ADC #48:JMP oswrch
 4760
 4770.landed
 4780CLC
 4790LDA base:ADC #8:STA te
mp
 4800LDA base+1:ADC #0:STA
temp+1
 4810LDA #0:LDY #15
 4820.landloop1
 4830STA (base),Y
 4840DEY:BPL landloop1
 4850LDX #19
 4860.landloop1
 4870SEC
 4880LDA base:SBC #&48:STA
base
 4890LDA base+1:SBC #&1:STA
 base+1
 4900SEC
 4910LDA temp:SBC #&38:STA
temp
 4920LDA temp+1:SBC #&1:STA
 temp+1
 4930LDY #7
 4940.landloop2
 4950LDA basedata,Y:EOR (ba
se),Y
 4960STA (base),Y
 4970LDA basedata+8,Y:EOR (
temp),Y
 4980STA (temp),Y
 4990DEY:BPL landloop2
 5000TXA:PHA
 5010LDX #sound2 MOD 256
 5020LDY #sound2 DIV 256
 5030LDA #7:JSR osword
 5040LDA #10:JSR wait
 5050PLA:TAX
 5060LDY #7
 5070.landloop2
 5080LDA basedata,Y:EOR (ba
se),Y
 5090STA (base),Y
 5100LDA basedata+8,Y:EOR (
temp),Y
 5110STA (temp),Y
 5120DEY:BPL landloop2
 5130DEX:BNE landloop1
 5140RTS
 5150]
 5160IF joy PROCadval ELSE
[ OPT pass:.inkey LDA #129:
LDY #255:JMP osbyte:]
 5170NEXT
 5180ENDPROC
 5190
 5200DEF PROCadval
 5210[ OPT pass
 5220.joystick
 5230BNE ad1
 5240TAX:TAY:LDA #128:JSR o
sbyte
 5250TXA:AND #1:RTS
 5260.ad1
 5270CMP #1:BNE ad2
 5280TAX:LDY #0:LDA #128:JS
R osbyte
 5290TYA:AND #&C0:CMP #0:RT
S
 5300.ad2
 5310LDX #1:LDY #0:LDA #128
:JSR osbyte
 5320TYA:AND #&C0:CMP #&C0:
RTS
 5330]
 5340ENDPROC
```

This listing is included in this month's cassette tape offer. See order form on Page 47.

Happy New Year listing

From Page 17

```
  760 :
  770 DEFPROCdouble(letter$
,X,Y)
  780 COLOUR2:COLOUR128
  790 ?D%=ASC(letter$)
  800 CALL &FFF1
  810 VDU23,240,D%?1,D%?1,D
%?2,D%?2,D%?3,D%?3,D%?4,D%?
4
  820 VDU23,241,D%?5,D%?5,D
%?6,D%?6,D%?7,D%?7,D%?8,D%?
8
  830 PRINTTAB(X,Y)CHR$240
  840 PRINTTAB(X,Y+1)CHR$24
1
  850 ENDPROC
  860 :
  870 DEFPROCgrid
  880 FOR Xpos%=64 TO 1216
STEP 64
  890 MOVE Xpos%,64
  900 PLOT29,Xpos%,960
  910 NEXT
  920 FOR Ypos%=64 TO 960 S
TEP 64
  930 MOVE 64,Ypos%
  940 PLOT29,1216,Ypos%
  950 NEXT
  960 ENDPROC
  970 :
  980 DEFPROCborder
  990 col$=CHR$17+CHR$3
 1000 holly$=col$+CHR$224
 1010 col$=CHR$17+CHR$1
 1020 berry$=col$+CHR$225
 1030 border$=holly$+berry$
 1040 horiz$=STRING$(10,bor
der$)
 1050 PRINTTAB(0,1)horiz$
 1060 PRINTTAB(0,30)horiz$;
 1070 vert$=berry$+CHR$11+C
HR$8+holly$+CHR$11+CHR$8
 1080 vert$=STRING$(15,vert
$)
 1090 PRINTTAB(0,30)vert$
 1100 PRINTTAB(19,30)vert$
 1110 ENDPROC
 1120 :
 1130 DATA 53,8,592,624,73,
12,576,640,73,4,568,648,73,
8,560,656,89,8,552,664,81,1
2,544,672,73,4,536,680,81,8
,536,680,89,8,528,688,73,12
,528,688,73,4,520,696,89,8,
520,696,101,8,512,704,109,2
4,512,704,109,8
 1140 DATA 512,704,101,12,5
12,704,89,4,504,712,89,8,50
4,712,73,8,504,712,81,12,50
4,712,73,4,496,720,81,8,496
,720,89,8,496,720,73,12,496
,720,61,4,496,720,61,8,496,
720,53,8,496,720,73,24,496,
720,109,8,496,720
 1150 DATA 101,12,496,720,8
9,4,480,736,89,8,480,736,73
,8,480,736,81,12,480,736,73
,4,496,720,81,8,496,720,109
,8,512,704,101,12,512,704,8
9,4,528,688,89,8,528,688,10
1,8
 1160 DATA 536,680,109,24,5
44,672,121,8,560,656,101,12
,576,640,89,4,592,624,89,8,
592,624,73,8,480,624,81,12,
544,656,73,4,592,672,81,8,6
24,688,89,4,656,704,81,4,67
2,720,73,12,688,736,61,4,70
4,752,61,8,720,776,53,8,752
,802,73,24
 1170 DATA 0,0,0,0
 1180 :
 1190 DEFPROCerror
 1200 IF ERR=17 THEN END
 1210 VDU22,6
 1220 REPORT:PRINT" at line
";ERL
 1230 ENDPROC
```

This listing is included in this month's cassette tape offer. See order form on Page 47.

Micro Messages

*FX16,0 helps cure those loading problems

I HAVE been experiencing difficulty loading some commercial software. If the loader for the main program changed to Mode 1 or Mode 2, then the main program just would not load.

As this has only happened in the last month or so I thought it was the Electron becoming unreliable in its old age (nine months).

A friend with an Electron was also having problems, and someone came up to me at the Manchester Electron and BBC Micro Show complaining that a program he had bought would not load.

Something Mike Cook said made me realise what was happening and how to solve the problem.

The common factor was that we all had Plus 1s. In Mode 1 or 2 the Electron runs at approximately half the speed of the BBC and this is only just fast enough to read the tape.

When the Plus 1 is added the Electron slows down even further due to the analogue to digital converter having to be read and other housekeeping tasks related to the Plus 1.

It is now too slow to read each data item as it goes past on the tape and the program will not load. A long list of Data? error messages are printed on the screen.

The solution is to speed up the Electron. One way would be to disconnect the Plus 1. This is rather inconvenient as all the leads must be removed, the Electron turned over, the Plus 1 unscrewed and pulled out, the Electron turned the right way and the leads plugged back in.

*A simpler method is to turn off the ADC channels with *FX16,0. The resulting saving in processing time is sufficient to allow the Electron to read each data item, store it and be ready for the next. Programs will now load in Mode 1 or 2.*

*This method is not without problems though as *FX16,0 disables the joysticks.*

A piece of software I have for review at the moment will not load unless this command is executed, but the program has a joystick option which assumes that the joysticks are on – the default condition.

So if the joysticks are on I can't load the program, and if I switch the joysticks off I can load the program but can't use it as it will not respond to the joysticks.

*If you are a user having problems with a program which loads in Mode 1 or 2 try *FX16,0 to speed up the Electron.*

*If you are a programmer then you can't assume that the joysticks are on, so please enable them with *FX16,4.* – **Roland Waddilove, Widnes.**

'Borrowed' software

I SUGGEST that you might invite your readers to assist owners of Electrons by compiling a list of those items of BBC Micro software which run on the Electron.

Many such titles will apparently run as they are, while others need only alterations to a title page. A regular reference list of such titles would be very helpful. – **Miss D. Hillage, Sennen, Penzance.**

● A good point Miss Hillage, which we'll pass to the Micro Messages Experts Forum (our readers). If any of you have run BBC Micro programs on the Electron please let us know.

Easy way to switch

HAVING read Noise & Music by Nigel Peters in the October issue of Electron User, I would like to reply to his question: "Has any enterprising person attached an on/off switch to their Electron".

There is always an easy and a hard way about things, so I opted for the easy one.

All you need is a wall socket with a switch on it, a length of three core cable and a normal plug.

Wire up the plug with the length of wire and the other end into the back of the socket.

Then plug the Electron's adapter (power supply socket) into the socket, plug the normal plug into another socket somewhere (which needn't be removed) and just use the switch on the socket as a power switch for the Electron. – **E. Wilson, Parkgate, South Wirral.**

Lost, one acorn

I HAVE just been bought an Acorn Electron and when I press the Break key the little picture of the Acorn goes. Can you tell me why it does this? – **C.J. Oram, Chelmsford, Essex.**

● At first we suspected that Merlin might have something to do with it, but the answer is somewhat different and concerns "hard" and "soft" resets.

When you just press the Break key by itself you get a soft reset, which clears the screen and empties the memory but doesn't affect things like the function keys.

When you press Ctrl and the Break key at the same time you get a hard reset, which does affect, among other things, the function keys, and gives you your Acorn again.

Printer problems

I OWN an Electron with Plus 1 interface and have recently bought an Alphacom 81 to complement the computer.

Although the printer is very good and will serve my needs I have one slight problem.

When the printer has printed 80 characters (buffer max) it then starts to skip many of the characters that follow as if it is having trouble keeping up although I do believe it is printing at the correct speed.

Possibly the problem lies within the buffer, because I can control the printout by using the Shift-Ctrl keys,

→

WHAT would you like to see in future issues of Electron User?

What tips have you picked up that could help other readers?

Now's here is your opportunity to share your experiences.

Remember that these are the pages that you write yourselves. So tear yourself away from your Electron keyboard and drop us a line.

The address is:

Micro Messages
Electron User
Europa House
68 Chester Road
Hazel Grove
Stockport
SK7 5NY.

Micro Messages

From Page 61

allowing the printer to print only approx 80 characters at a time.

Can you advise me of any special code that I can tell the computer in order to aid the printer? – **Mr D.W. Bartlett, RAF Abingdon, Oxon.**

★ ★ ★

HELP! I recently bought a Plus 1 expansion unit and a Silver Reed daisy wheel printer, model EXP 500.

I am experiencing great difficulty in altering the printer characteristics and do not understand how to implement the ESC codes within a program.

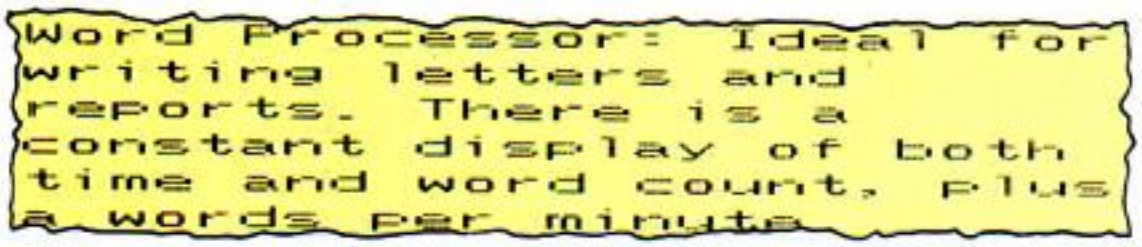
The printer manual is far from explicit, and I would be obliged if you could give me some assistance or recommend a publication which may help.

I am a novice programmer, so things need to be explained in simple terms. – **J. Platt, Bradford, W. Yorks.**

● The trouble with queries about specific printers is that unless you've used that printer you can't answer the queries.

Here at *Electron User* we've had experience of using Kaga, Epson and Brother printers, but no others.

Could our readers help? Which printers have you used with the Electron, and have you had any problems?



Oh Brother, I'm in the dumps

TODAY I received my December copy of your excellent magazine and after devouring all information contained therein, last page "Oh Brother" in Micro Messages, I nearly fell out of my chair! To say I have the same experience as Ben Still is an understatement.

Having taken early retirement after 40 years in industry, to while away my remaining years I looked round for something to do on these long winter nights, and investing in a computer was the ideal solution.

Not wishing only for games etc. the Electron with all its extension facilities would give me what I wanted for domestic use.

I duly purchased a machine in August and was informed all I needed was a cable to connect a printer. Imagine my surprise – for a further £56.90 plus a ribbon cable, I had a Plus 1 ready for the next stage.

An advert in your magazine illustrated the Brother HR-5 connected to the Plus 1, and this was duly purchased. Then the fun started . . .

I eventually printed all my listings by the yard – better than sliced bread – and from the samples enclosed the various print styles, but no screen dump or graphics.

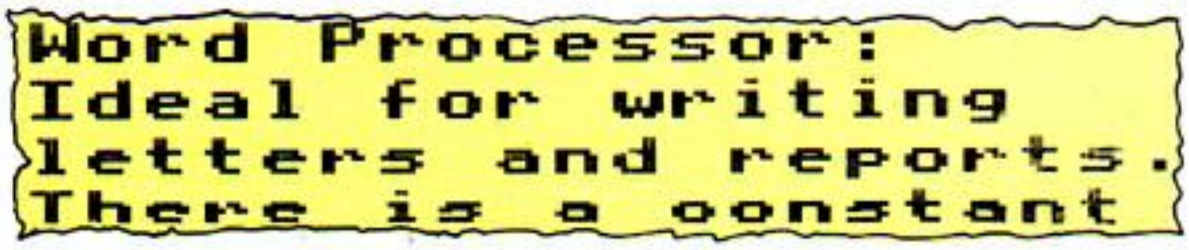
I telephoned Brother. They said it was up to the computer manufacturer to supply the program.

I telephoned 0223 210111 Acorn Computers, and a gentleman informed me that as I had paid my money and taken my choice, hard luck. He did not want to know about my troubles.

If I could have foreseen the above no way would I have invested in the Electron system, as I am now stuck with it and after every enquiry I make for a screen I'm left with a blank wall.

Would you please forward my name and stamp to Ben Still for any information he may obtain, that I may eventually screen dump. – **Ken Davies, Stourbridge, West Midlands.**

● Don't hold your breath, but one of our tame hacks has promised us a printer dump for the Brother. As soon as we have it it'll go in the magazine.



Slowcoach cassettes

I HAVE just been given a cassette of games for the BBC Micro and loaded them into my daughter's Electron, where they appear to run very slowly.

Is there any way to modify the programs or instruct the computer to speed things up? Being a complete computer novice I need help. – **John McIntosh, Glasgow.**

● The short answer is that BBC programs will run more slowly on the Electron because of the way that it is designed.

Programs can be speeded up using various techniques (take a look at appendix E of the excellent User Guide) but novices might find them a little difficult.

No volume control

PLEASE could you show me how to adjust the volume on the Electron.

I've tried everything from SOUND 1,-15,50,5 to SOUND 1,-1,50,5 and the volume will not change.

Is it just because you cannot do it on the Electron? Or is it just my machine? – **Matthew Hicks, aged 12, Weybridge, Surrey.**

● We're afraid that it's just not possible to adjust the volume of the sound on the Electron. No matter what the volume parameter is, from –1 to –15, the note is played at the same loudness level.

And if you ask why the Electron allows all these different values, the answer is that it's to ensure compatibility with the BBC Micro.

More from Merlin

I'M wishing to second David Thompson's proposal in Micro Messages for a regular feature on adventures.

I'm sure Merlin is a charming person, and no doubt has an enchanting time when he pops out for these spells, but please tell him we need him.

As for Twin Kingdom Valley, I can't get anywhere with it, so I could sure use some tips.

I keep getting bonked on the head by the gorilla. It's infuriating to have to re-load the program every time I get deaded, which happens with sickening regularity.

Come on Merlin – all we adventurers are waiting on your wisdom with baited breath. – **Katy King, Hemel Hempstead, Herts.**

● We all agree that it's a wizard idea and, from next month, our resident spellbinder will start a more-or-less regular column.

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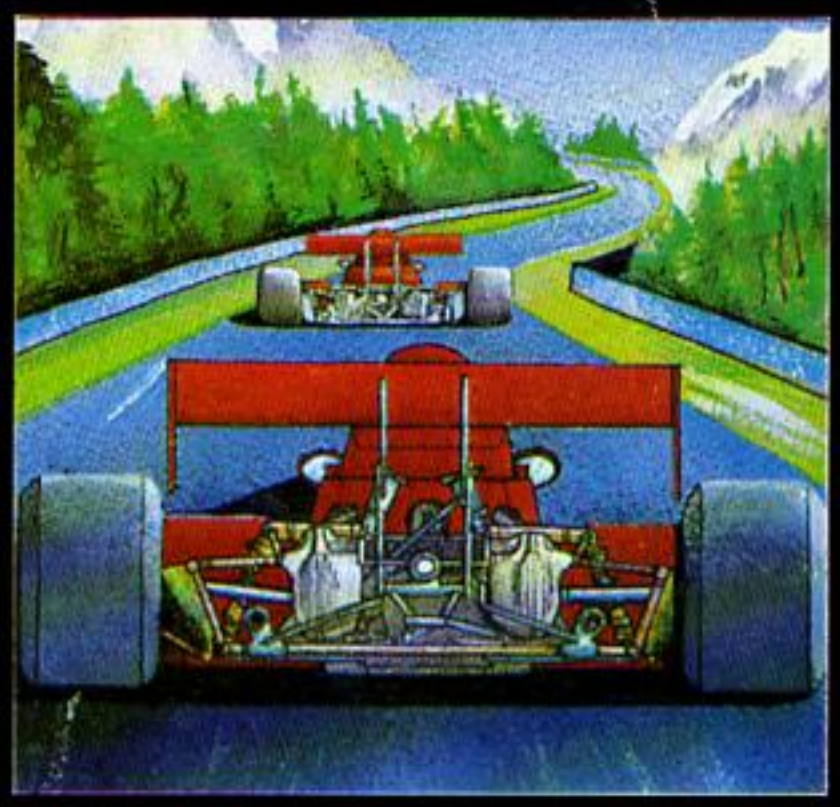
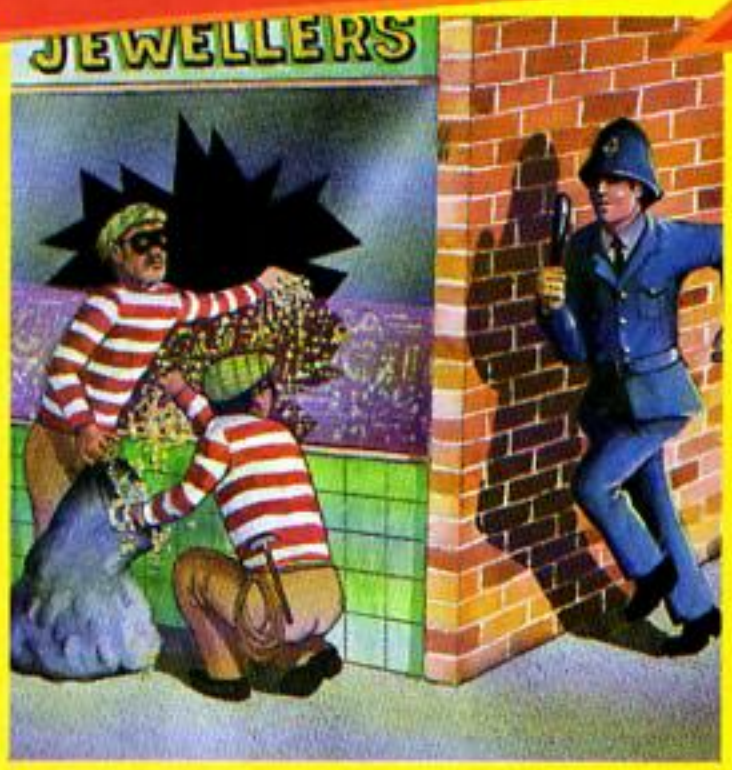


OVERDRIVE (32K) **£7.95**

A highly-addictive multi-stage 3D race game. You steer your car left and right, accelerate and decelerate as the opposing cars weave about the road. There are five different stages including night, snow, desert and riverside scenes. To qualify for the next stage, you must finish in the top twelve. Incredible graphics give the impression that you really are taking part in the race. Highly recommended, and destined to become another top-seller for Superior Software.

BOTH TITLES ARE NOW AVAILABLE FOR THE B.B.C. MICRO AND THE ACORN ELECTRON.



SMASH AND GRAB (32K) **£7.95**

An excellent and original arcade-style game in which you take the role of a robber aiming to snatch bags of gold from the bank. A policeman is after you ... he is able to jump at you or squat down and try to hit you with his truncheon. You must also keep clear of the flying police cones and floating dustbin lids. There are three fascinating screens of action including play streets with bouncing balls, one-way streets, conveyor belts, traffic lights and police-boxes. A novel and amusing game.

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