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A Database Publication

electron

user

Vol. 2 No. 5 February 1985 £1

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News

All that's new in the expanding world of the Electron. 5

Beginners

IF conditionals confuse you, THEN read this simple explanation. 8

Animation

Alan Plume lifts the lid on Electron animation. 11

Lisp

An assessment of an alternative language for your micro. 12

Trig

How to get the right angle with your Electron. 14

Bouncy

Have a ball with Roland Waddilove's enjoyable little game. 16



Swatch

A demonstration of the Electron's design capabilities. 17

Software Surgery

All you want to know about the latest in software from our frank reviewers. 19

Clock

Keep a check on the time with this useful utility. 22



Craal

Are you man enough to escape the maze and win the beautiful Princess? 25

Pairs

The Electron version of the classic card game. 27

Notebook

A simple program simply explained. 30



Catcher

Flying fowls foment farmyard fun and frolics. 32

Education Castle

A second chance to win a beautiful princess - if your maths is up to it! 34

Sound Creator

An easy way to become a big noise in the Electron music world. 36

Coaster

Hypnotic graphics action for your screens. 38



Scrapbook

The pages where Electron users share their short, simple, fun routines. 40

Racer

All the thrill of the grand prix circuits. 42

Bookshelf

Reviews of three of the latest Electron books. 44

Base

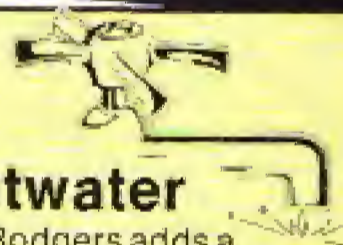
Baffled by binary, hung up on hexadecimal? We come to your aid. 45

Hotwater

Ian Rodgers adds a whole new meaning to "flow chart". 48

Micro Messages

The pages you write yourself. A selection from our mailbag. 61



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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

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'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

CLAIRE WAS SHOW STAR

TINY two years old Claire Hirst became a child celebrity overnight after she opened the latest Electron and BBC Micro User Show in Westminster.

Although Claire cannot read or write yet, she is already a child prodigy on the computer.

National newspapers, television and radio all converged on the New Horticultural Hall to watch Claire go through her paces.

And she duly obliged by demonstrating how she had written a tune on the micro and even designed a Christmas card for her mummy.



'Reliable Electron' report under fire

A REPORT claiming the Electron is the most reliable micro available in the UK has come under fire.

Critics were quick to cast doubt on the findings after it was learned that Acorn has strong links with the publishing house that commissioned the survey.

However Acorn has strongly defended the results, which reveal

that the failure rate for the Electron – based on faulty machines returned to dealers – is only four per cent.

"The survey is as reliable as it could be", an Acorn spokesman told *Electron User*. "It's just a pity that some people are trying to suggest it is biased".

It wasn't what the report stated about Acorn products which has caused the attack –

but the way it slammed other leading micro manufacturers.

The survey roasted Commodore for its "high failure rate", claiming 18 per cent of Vic 20s and 13 per cent of Commodore 64s are returned to dealers.

But it was Sinclair Research which was named as "the worst culprit". According to retailers interviewed, more than a quarter of

all Spectrums sold are returned.

And it was Sinclair, understandably smarting under the criticism, who spearheaded the counter attack.

"We reckon the true return rate is about half the figure given in this survey and 40 per cent of these are in no way faulty", said a Sinclair spokesman.

"And we are not very happy about the manner

in which this survey was conducted. It appears that a number of retail store managers were simply telephoned and quizzed on home micro return rates.

"We also believe that the survey was carried out on behalf of a company in which Chris Curry has an interest".

The survey was commissioned by Venture

Turn to Page 6

DISC DRIVE BATTLE IS JOINED

NOW that the Electron has come of age, the stage is being set for a battle of the disc drives.

Developments by Acorn and Cumana have pushed the machine into the league of systems costing hundreds of pounds more and opened the doors for users to create sophisticated databases.

The products that have dramatically boosted the Electron's capabilities and appeal are a 3½in disc interface and drive from Acorn and a range of 5¼ and 3½in disc drives complete with interface from Cumana.

Electron users got their first hands-on

experience of Acorn's new Plus 3 at the Electron and BBC Micro User Show in December when it was demonstrated using the Acornsoft database program.

The Plus 3 provides Electron users with a faster and more flexible alternative to cassettes for the storage of programs and data.

It comprises a self-contained disc interface and 3½in single-sided drive and offers 300k of storage.

A new Acorn advanced disc filing system – described by critics as better than that available for the BBC – provides facilities at the basic level, but also has features equipping it for business use.

The Plus 3 costs £229.

Cumana is supplying its full range of disc drives complete with interface for use with the Electron.

The interface costs £149.95. The 100k 3½in drive – including the interface – costs £299.95, and the 100k 5¼in drive with interface costs £289.95.

Row over Electron survey

From Page 5

UK, a magazine run by Redwood Publishing, a company in which Acorn's managing director Chris Curry and Chris Ward, an Acorn non-executive director, both have substantial interests.

"But no matter who called for the report in the first place, we still insist that it is as accurate as any other similar survey would be", said the Acorn spokesman.

"The results for the Acorn products were almost identical to ones we've had from our own internal studies. So that satisfies us as to its validity".



Acorn's Plus 3 disc drive

Joysticks snag ironed out

SOFTWARE publisher Micro Power has announced a major breakthrough for Electron users.

It has solved the problem of the joystick games that won't run while the Plus 1 add-on is fitted. This snag was first pointed out in the August issue of *Electron User*.

Now Micro Power has written a remedial routine. You load it, pick

out which game you want to play from the resulting menu – and then load the game as usual.

According to Chris Payne, Micro Power's marketing chief, this works for 20 of their 22 Electron games.

And, says Payne, with a bit of trial and

error most other publishers' games will run too.

A define option on the menu lets you enter information about which keys do what on your particular game – up, down, fire and so on.

Best news of all for readers is that *Electron User* will shortly publish a listing of the Micro Power routine.

Meanwhile Micro Power – which has been getting 20 or 30 phone calls a week from baffled joystick fans – is considering releasing the routine on a cassette.

"We don't want to charge money for it", says Payne, "just a small sum to cover our costs".

Warp drive is go

A BUG in Elite, the best-selling game from Acornsoft, is about to be ironed out.

The trouble came to light when the Electron version was released. Electron users found they could not go from one galaxy to another in

hyperdrive as is possible in the BBC game.

"We are working flat out to repair the omission", said a spokesman for Acornsoft.

"People who bought the earlier version will be offered a replacement".

Extending range of education

ACORNSOFT believes it can radically influence the development of education in the home with its new range of what it calls "learning environment" software.

The first four titles – Workshop, ABC, Talk-Back and Spooky Manor – are said to go beyond

the limitations of school curricula.

Don Clark, head of Acornsoft's home education division, said: "The programs create opportunities for learning, rather than setting up exercises with narrow, pre-determined goals.

"Through them users can explore, experiment, solve problems, even set their own challenges – all essential tasks in real life.

"Our programs are also fun to use, though not mere games. Enjoyment is important in home education

because the traditional motivations of the classroom – teachers and exams – don't exist.

"We have found that if adults find programs boring, so will children. We have designed our programs for everybody.

"They make home learning a group activity".

American operation takes a £6m blow

A DRAMATIC cutback of Acorn's operations in the United States appears to have finally killed off any plans the company had to launch an American version of the Electron.

Acorn has announced it is to reduce its US

presence by 80 per cent following poor sales.

This will have cost the company about £6 million as a result of failing in its bid to capture a major share of the educational market States-side with the BBC Micro.

This means there is even less hope of the Electron securing a foothold in the highly competitive American domestic marketplace.

An American version of the Electron was first mooted in *The Acorn Guide to The Electron* —

a Penguin publication.

In this the authors, Neil and Pat Cryer, make numerous references to an Electron being built for the United States market.

"Electrons built for the United States have different characteristics from those built for the United Kingdom", they wrote in one section.

However when contacted by *Electron User*, the official spokesman for Acorn claimed to be totally in the dark about an Electron for the States.

"There's no such machine as far as we are aware", he said.

Further enquiries at Acorn unearthed a technical man who had heard "rumours" of such a machine but insisted that it never left the drawing board.

"Unless there's a mole working away on one here at Acorn, I'm sure it never went further than the idea stage", he confided.

But what about the references to it in the *Acorn Guide*?

"I think it may well have been a case of pre-guessing on the part of the authors ..."

SHARE PRICE TUMBLES

FOLLOWING reports of Acorn's massive cutback in the USA, the company's share price slipped to one third of its previous high on the Unlisted Securities Market.

A spokesman admitted that Acorn had scaled down its US operation by four fifths

after fierce competition from native companies.

But he denied that share prices had been influenced by this.

"There are two reasons for the drop", he said.

"One is that US sales of home micros have been declining, and consequently investors think

it will happen over here next.

"The other is that they have the idea all companies on the USM will double their size every year. But as Acorn is easily the biggest company on the USM, it is much less likely to show exponential growth".

Add-on puts on the brakes

A GADGET that can put the brake on the fastest Electron game has been launched by Cambridge Computing Research.

Called the Slomo, it has a variable speed control and can slow down or even stop everything on the screen.

As well as allowing the user to cheat at games — building up amazing scores — it is useful for small children or handicapped people who cannot cope with high speeds.

Games writers can use Slomo to debug their programs, and it could also be used when taking screen photos or by people who just want to figure out how games work.

Says marketing manager Linda Tippey: "The gadget fits on the back of the Electron, extending the expansion bus, so you can still add a joystick.

"We have had lots of interest from the educational field, especially from the lower level and special schools".



NEW RECORDER GOES ON SHOW

MAKING its bow at the latest Electron and BBC Micro User Show was Acorn's new data recorder for the Electron.

The controls feature a full six key mechanism giving fast forward, rewind, play, record, pause and stop. The cue and

review facility enables rapid searching of the tape.

The three digit tape counter is a further aid.

It is battery or mains operated and comes with the necessary leads and mains adapter.

Price: £35.

YOU may have noticed that so far all the programs we have had in this series have started at the beginning and go on, line by line, to the end.

Occasionally we've sent the program whirling round a loop, but always the result was the same. They progressed relentlessly, obeying every line completely.

While programs that work this way have the benefit that they are easy to debug, they are a bit rigid. They can't make decisions, they just obey orders.

Wouldn't it be nice if there was a way that we could have a program that took decisions for us? We could have programs that could vary what they do in line with the data you give them.

This means that instead of just following the line numbers, what the program does depends on what information it is given.

Happily for Electron users there is a Basic structure that allows programs to take decisions for themselves and act according to circumstances.

This is the IF...THEN statement. Program I shows it in action.

Run it a couple of times and see what happens. You can press any letter key you want, but you only get a message if you press capital Y.

```
10 REM PROGRAM I
20 INPUT "Press a key "
key$
30 IF key$="Y" THEN PRIN
T "You pressed the Y key."
```

Program I

Line 20 just asks you to press a key and, when you hit the Return key, it stores the result in the string variable *key\$*.

The work is done in line 30 which reads almost exactly like a line of English. It looks at *key\$* and if it contains (or is equal to) Y then the Electron prints the message.

Notice that only IF the condition is true THEN the Electron goes onto processing

IF conditions are right THEN your programs can make decisions

Now your programming skills are really starting to develop

the rest of the line.

If you run the program again and press, say, T you'll find that you get no message, just the prompt to tell you that the program has ended and the Electron is waiting for something to do. Not very exciting, is it?

What's happened is that line 20 has stored T in *key\$*. Line 30 checks to see if the variable *key\$* is the same as Y.

In this case it isn't, so the condition is false and the rest of the line is ignored. No message is printed.

The Electron now looks for the next line, finds that there isn't one and so the program stops.

The rule is that IF the condition is true THEN the rest of the line is obeyed. IF the condition isn't true THEN the rest of the line is ignored and the Electron goes onto the next line if there is one.

The trouble with Program I is that if you pressed y instead of Y you didn't get the message. You know that Y and y both mean the same thing, but to the Electron they're very different. Program II checks for both y and Y.

Here line 30 checks for Y then line 40 checks for y. The message only gets printed if one of the conditions is true.

If neither y nor Y have been pressed, neither condition is true and so no message appears.

```
10 REM PROGRAM II
20 INPUT "Press a key "
key$
30 IF key$="Y" THEN PRIN
T "You pressed the Y key."
40 IF key$="y" THEN PRIN
T "You pressed the y key."
```

Program II

As you might imagine, you could use lots of these one after another to check various conditions but it might get a bit long-winded.

Program III shows that numeric variables can be used in conditions as well as the string variables we've used previously.

```
10 REM PROGRAM III
20 FOR loop=1 TO 5
30 READ x
40 IF x = 5 THEN PRINT "
x is 5"
50 NEXT loop
60 DATA 1,5,6,5,3
```

Program III

Here the FOR...NEXT loop cycles five times, each time reading a value from the data statements into the variable *x*. This means that *x* will be 1 the first time round, 5 the second time round and so on.

Line 40 contains the conditional part of the program. Each time a new value of *x* is read it checks to see if it is equal to five. If it is it prints the

message, if it isn't it just ignores the rest of that line.

As *x* has the value 5 on two occasions two messages are printed.

The next program uses exactly the same condition but this time it doesn't print out a message. It keeps a running total of how many times *x* has been equal to 5.

```
10 REM PROGRAM IV
20 count=0
30 FOR loop=1 TO 5
40 READ x
50 IF x = 5 THEN count=c
ount+1
60 NEXT loop
70 PRINT "The condition
is true ";count;" times."
80 DATA 1,5,6,5,3
```

Program IV

The difference lies in line 50. Here the IF condition is the same, it's the rest of the line after the THEN that has changed.

What happens now is that IF *x* has the value 5 THEN one is added to the variable *count*.

In this way *count* keeps track of the number of times the condition has been met. As you'll see if you think about it, this is more useful than just printing messages.

To recap on what we've covered so far we can use an IF...THEN statement to make the Electron choose between alternatives.

IF a condition is met THEN the program will do one thing otherwise it will go onto the next line and do something else.

This is the sort of logic behind such questions as "Do you want another go?" and "Which skill level?" that you find in games. What the program does depends on what you reply.

So far the only condition we've met is one using the equals sign.

Program IV counted the number of times *x* was equal to 5. Is there some way that we could make it keep track of the number of times that *x* was not equal to 5? Program V shows how it's done.


```

10 REM PROGRAM V
20 count=0
30 FOR loop=1 TO 5
40 READ x
50 IF x (>) 5 THEN count=
count+1
60 NEXT loop
70 PRINT "The condition
is true ";count;" times."
80 PRINT "This means tha
t ";count;" of the numbers
are not equal to 5"
90 DATA 1,5,6,5,3

```

Program V

Line 50 looks very much the same as before. It has a condition beginning with an IF and a THEN followed by

count=count+1

The difference is that this time the condition is

x (>) 5

instead of the

x=5

we had before.

Don't be worried by the <> sign. All it means is "not equal to". This means that line 50 reads "if x is not equal to 5, then add 1 to the value of count".

The IF . . . THEN works in exactly the same way, only adding one to count when the condition is true, that is, when x is anything but 5.

What if we wanted to count the number of times that x is less than 5? Program VI shows how it's done.

```

10 REM PROGRAM VI
20 count=0
30 FOR loop=1 TO 5
40 READ x
50 IF x (<) 5 THEN count=co
unt+1
60 NEXT loop
70 PRINT "The condition
is true ";count;" times."
80 PRINT "This means tha
t x is less than 5 on ";cou
nt;" occasions."
90 DATA 1,5,6,5,3

```

Program VI

Once again we've introduced a new symbol into our condition. Don't let it worry you, all < means is "less than".

(I remember it because < is almost like an L.)

Since x is less than 5 on two occasions the final value of count in Program VI is two.

You might guess that if we can test for a "less than" condition being true we can also test for a "more than" condition. Line 50 of Program VII shows how this is done.

```

10 REM PROGRAM VII
20 count=0
30 FOR loop=1 TO 5
40 READ x
50 IF x (>) 5 THEN count=co
unt+1
60 NEXT loop
70 PRINT "The condition
is true ";count;" times."
80 PRINT "This means tha
t x is greater than 5 on ";
count;" occasions."
90 DATA 1,5,6,5,3

```

Program VII

As you'll no doubt have guessed, > is short for "greater than". Line 50 now adds one to count for every time that x exceeds 5.

And we needn't stop there. Suppose we want to keep track of the number of times that x is either greater than or equal to five.

Obviously we could add together the results from Program IV (the number of times x is equal to 5) and Program VII (the number of times it's greater than 5).

There is, however, an easier way as shown in Program VIII.

```

10 REM PROGRAM VIII
20 count=0
30 FOR loop=1 TO 5
40 READ x
50 IF x (>=) 5 THEN count=
count+1
60 NEXT loop
70 PRINT "The condition
is true ";count;" times."
80 PRINT "This means tha
t x is either bigger than o
r equal to 5 on ";count;" o
ccasions."
90 DATA 1,5,6,5,3

```

Program VIII

It will come as no surprise to learn that >= means "either greater than or equal to". And, of course, there is the mirror-image condition which is used in Program IX.

```

10 REM PROGRAM IX
20 count=0
30 FOR loop=1 TO 5
40 READ x
50 IF x (<=) 5 THEN count=
count+1
60 NEXT loop
70 PRINT "The condition
is true ";count;" times."
80 PRINT "This means tha
t x is either less than or
equal to 5 on ";count;" occ
asions."
90 DATA 1,5,6,5,3

```

Program IX

Here <= means "either less than or equal to". What it means is that when x has a value that is either equal to or less than 5, line 50 adds increments count.

Don't let all these different logical operators (as they are known in polite society) worry you.

I've summed them all up in Table I. At first they may be a little intimidating, but after a bit of practice you'll find they become second nature.

Vary the DATA statements

in Programs IV to IX and see if you can understand the results.

Bear in mind that it doesn't matter what logical operator is in use in an IF . . . THEN statement. As long as the condition is true, the rest of the line after then THEN is obeyed. If it isn't true everything after the THEN is ignored.

And that's it for this month. Have fun playing around with IF . . . THEN statements and when you think you've mastered them try Program X for size. Try changing the DATA statements and see what happens.

```

10 REM PROGRAM X
20 count=0
30 FOR loop=1 TO 5
40 READ x
50 IF x (<2 OR x >5) THEN
count=count+1
60 NEXT loop
70 IF count (<3) THEN PRIN
T "The condition is true ";
count;" times." ELSE PRINT
"The condition is false ";(
5-count);" times
90 DATA 1,5,6,5,3

```

Program X

● If you want to know more about conditionals THEN don't miss next month's article.

Operator	Meaning
=	equals
<	less than
>	greater than
<>	not equal to
<=	less than or equal to
>=	greater than or equal to

Table I: Logical operators



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 covering 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



Animated Electron

THIS is the first of a short series of articles which will show how to achieve simple but effective animation on the Electron using only the Basic language.

As must be expected, no great speed is achieved. The intent is merely to introduce the reader to the basic techniques (no pun intended) and hopefully to foster an interest in things graphical.

The first technique we'll cover is text and character animation. This is probably the simplest method both to understand and to programme.

Smooth movement of text can be achieved by careful positioning of text using the PRINT and TAB(X,Y) commands.

Program I shows this technique moving one word around the screen.

The only important thing to remember is to erase the word at the last position before

An introduction to things graphical by ALAN PLUME

writing it at the next. Obviously you can use this method to move portions of text around the screen in almost any direction that you choose.

The next example, Program II, shows that with a little effort and using a tiny bit of graphics, the method above can be built upon.

Line 40 redefines character number 224 to be an "i" without the dot. Then using MOVE and the relative PLOT commands a "dot" (in fact two dots) can be moved down to

dot the "i". Lines 60 to 110 use the technique outlined above of displaying and then erasing to give the impression of movement.

Lines 130 onwards display another piece of text which is printed with a small delay. Once printed the Electron "realises" that the apostrophe is missing. The appropriate section of text is moved to the right and an apostrophe moved in to the gap.

The third and final example shows the use of redefined

characters with the above techniques.

A number of "frames" are formed that, when displayed one after the other, give the impression of smooth movement.

Thirteen characters are defined, once again using the VDU 23 statement familiar from the *Electron User Casting Agency* series.

These are assembled on the screen using VDU 31,X%,Y% to position the characters.

The first frame is displayed for a set time using a delay, then the appropriate parts are overwritten giving frame 2.

This is repeated for frame 3 and the whole sequence is repeated until ESCAPE or BREAK is hit.

Note that frame 1 has a space character (32) in its second line. This is to blank out the upraised arm in frame 3.



Frame I



Frame II



Frame III

Program I

```

10 REM PROGRAM I
20 MODES
30 REM
40 REM Turn cursor off
50 REM
60 VDU23,1,0;0;0;0;
70 Text$="Animation"
80 REM
90 REM Blank$ is n space
s, where n is the length of
Text$
100 REM
110 Blank$=STRING$(LEN(Text$), " ")
120 REM
130 REM X1 is horizontal
position where Text$ is to
be printed.
140 REM
150 X1=5
160 PRINTTAB(X1,0)Text$
170 FOR Y1=1 TO 30
180 PRINTTAB(X1,Y1-1)Blank$
190 PRINTTAB(X1,Y1)Text$
200 FOR delay=1 TO 50:NEXT
T delay
210 NEXT
220 FOR Y1=30 TO 1 STEP -1
230 PRINTTAB(X1,Y1)Blank$
240 PRINTTAB(X1,Y1-1)Text

```

```

$
250 FOR delay=1 TO 50:NEXT
T delay
260 NEXT

```

Program II

```

10 REM PROGRAM II
20 MODE1
30 VDU23,1,0;0;0;0;
40 VDU23,224,0,0,56,24,2
4,24,60,0
50 COLOUR 1
60 PRINTTAB(0,10)"Always
dot your "+CHR$224+"s."
70 X1=524
80 FOR Y1=1023 TO 712 STEP
P-4
90 MOVE X1,Y1:PLOT1,7,0
100 MOVE X1,Y1:PLOT2,7,0
110 NEXT
120 MOVE X1,Y1:PLOT1,7,0
130 COLOUR 2
140 Text$="And dont forge
t your apostrophes."
150 L1=LEN(Text$)
160 FOR letter=1 TO L1
170 PRINTTAB(letter-1,15)
MID$(Text$,letter,1)
180 FOR wait=0 TO 40:NEXT
190 NEXT
200 move$=" "+RIGHT$(Text
$,26)

```

```

210 PRINTTAB(7,15)move$
220 COLOUR 3
230 PRINTTAB(0,14)" "
240 FOR X1=0 TO 6
250 PRINTTAB(X1,14)" "
260 PRINTTAB(X1+1,14)" "
270 FOR wait=0 TO 40:NEXT
280 NEXT
290 PRINTTAB(7,14)" "
300 PRINTTAB(7,15)" "
310 VDU 30

```

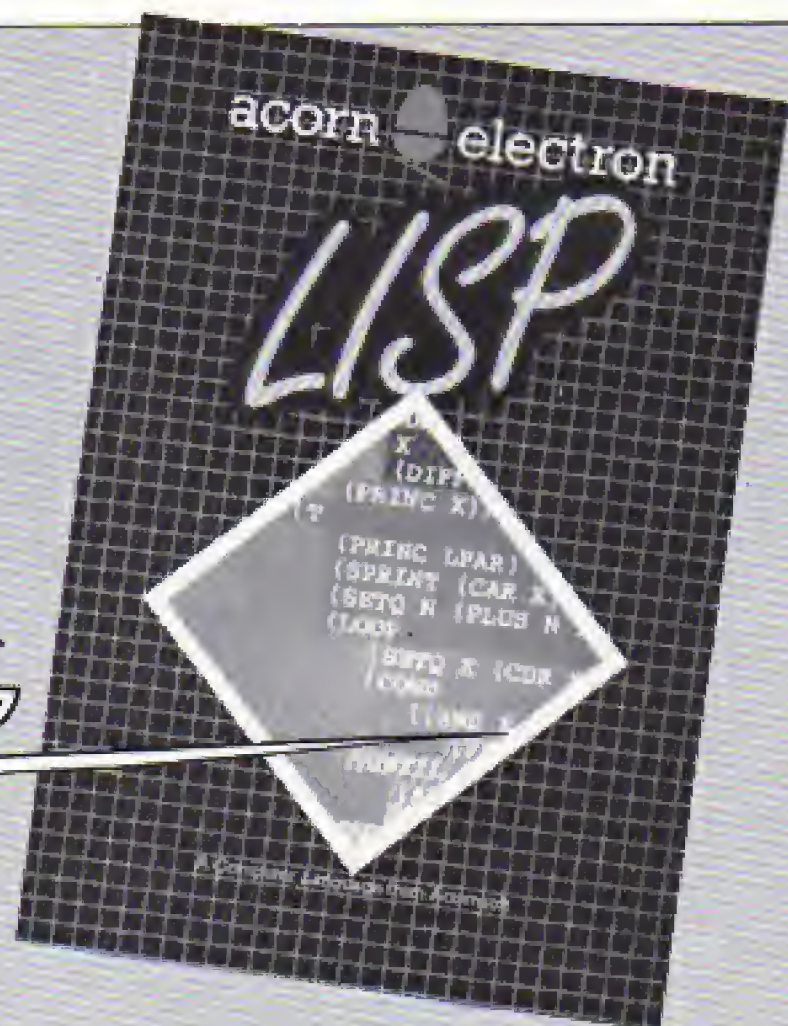
Program III

```

10 REM PROGRAM III
20 MODES
30 PRINTTAB(3,30)"EXERCISE
TIME!"
40 VDU23,1,0;0;0;0;
50 VDU23,224,0,0,0,0,0,0
,255,127
60 VDU23,225,0,96,240,24
0,240,96,252,254
70 VDU23,226,3,1,1,1,0,1
,1,1
80 VDU23,227,255,251,251
,251,243,251,251,250
90 VDU23,228,1,1,1,1,1,1
,1,3
100 VDU23,229,152,152,152
,152,152,152,152,156
110 VDU23,230,0,0,0,0,0,0
,3,7
120 VDU23,231,15,13,13,13
,12,13,13,13
130 VDU23,232,0,0,0,0,0,0
,7,15
140 VDU23,233,0,96,240,24
0,240,96,254,255
150 VDU23,234,27,49,97,19
3,128,1,1,1
160 VDU23,235,253,240,240
,240,240,240,240,240
170 VDU23,236,128,192,96,
48,16,0,0,0
180 X1=0:Y1=10
190 REPEAT
200 REM 1st figure
210 VDU31,X1,Y1,224,225
220 VDU31,X1,Y1+1,226,227
,32
230 VDU31,X1,Y1+2,228,229
240 REM 2nd figure
250 TIME=0:REPEAT UNTIL T
IME=20
260 VDU31,X1,Y1,230
270 VDU31,X1,Y1+1,231
280 REM 3rd figure
290 TIME=0:REPEAT UNTIL T
IME=20
300 VDU31,X1,Y1,232,233
310 VDU31,X1,Y1+1,234,235
,236
320 TIME=0:REPEAT UNTIL T
IME=20
330 UNTIL FALSE

```

LISP, THE LANGUAGE THAT STRIKES LIKE LIGHTNING



LISP, developed around 1960 by John McCarthy and others at the Massachusetts Institute of Technology in America, is one of the oldest computer languages still in use.

His main objective was to produce a powerful language for defining and transforming functions. Lisp was designed to manipulate abstract symbols called atoms and combinations of symbols called lists. It is a LIST Processing language.

Perhaps the most publicised use of Lisp has been in the field of artificial intelligence research. The expressive power of the language was recognised by workers who were wrestling with the difficult symbolic manipulation problems involved.

Programs have been written that hold conversations, write stories for children and summarise text.

Most mainframe computers support Lisp and now a few micros as well. There is no generally accepted standard, so as a result there are many dialects around. However, adapting Lisp to run on another machine is usually straightforward, making the language fairly portable.

Acornsoft's variant is available on cassette or ROM cartridge. The cassette version is the one considered here. The ROM cartridge will have all the facilities offered by the cassette version, plus a few extra, and a lot more memory.

The cassette and manual are sold separately, which seems a little strange. Unless you are already an expert Lisp programmer – and not many people are – then neither is much use without the other. Price of the package is about £23.

Large scale implementations may contain hundreds or even thousands of built-in functions. Consequently a small micro such as the Electron cannot hope to

provide all of them, so only the bare essentials are built into Acornsoft's Lisp.

However this should be sufficient. Fortunately, many of the standard utilities can be written in Lisp itself and appendix B in the manual lists a few of these.

Since many of the functions not provided would only be used occasionally and may have specialised uses, these can be typed in as and when needed for each application.

Acornsoft Lisp has a few extra functions not normally found in other systems. These are to allow the use of the Electron's excellent graphics and sound capabilities.

One of the most powerful is the VDU command which provides an easy interface with the Electron's machine operating system.

Lisp takes about four minutes to load. It has 5.5k of machine code interpreter and 3k of initialised Lisp workspace containing utilities and constants. These can be deleted, if not required, to gain extra memory.

When loading is complete the user is asked to select a mode – either 3, 4, 5 or 6. Once one has been selected it is not possible to change to another using MODE n, so if you want to use graphics or the 80 column mode 3 you must start up in the correct mode.

There are two main ques-

tions to be asked of Lisp:

- *What can you do with it?*
- *How easy is it to use?*

Chapter 23 in the manual answers the first question – 11 applications are listed demonstrating its use. The programs are not complete, but do provide the building blocks for constructing much larger Lisp applications, and the user is encouraged to develop them further.

The examples include: Sorting a list into alphabetical order, arbitrary precision arithmetic (how to cope with very large numbers), a Lisp pretty-printer (used to display large pieces of Lisp structure, spreading its output over many lines and using indentation to make it more legible), an animal guessing game (you think of an animal and the Electron has to try and guess it), a route finding program (also on the cassette), graphic displays (how to create pictures), and mazes and dungeons (an adventure game).

The answer to the second question is entirely subjective and everyone will have their own opinion. I have to disagree with the manual which states: "it provides a complete introduction to Lisp and assumes no previous knowledge of the language", and that "Lisp is easy to learn..."

Lisp seems very strange and confusing at first, operating on lists and atoms,

recursion being very common. Unlike Basic, you need to know and understand a large proportion of Lisp before you can even think of writing your first simple program, and this is the main stumbling block.

Lisp operates on the "lightning principle". The concepts strike you suddenly when you are almost ready to give up. Once you have been struck, everything falls into place. Strength, stamina and perseverance are required.

Acornsoft's Lisp is an excellent package for anyone interested in programming and computer languages. It will teach pattern recognition, and recursion will become second nature.

A word of warning though, it is not for the absolute beginner. Be prepared for a struggle, and remember the "lightning principle".

One last note: If you are unsure whether to invest in Lisp, try to get hold of *The Little LISPer* by Daniel P. Friedman (I borrowed it from the local library).

This is not a manual on how to use Lisp on the BBC or Electron, but it explains the structure, principles and concepts involved in a very simple and amusing manner.

You do not need Lisp or even a computer to understand and appreciate it. Read it. I think you will find Lisp fascinating.

Roland Waddilove

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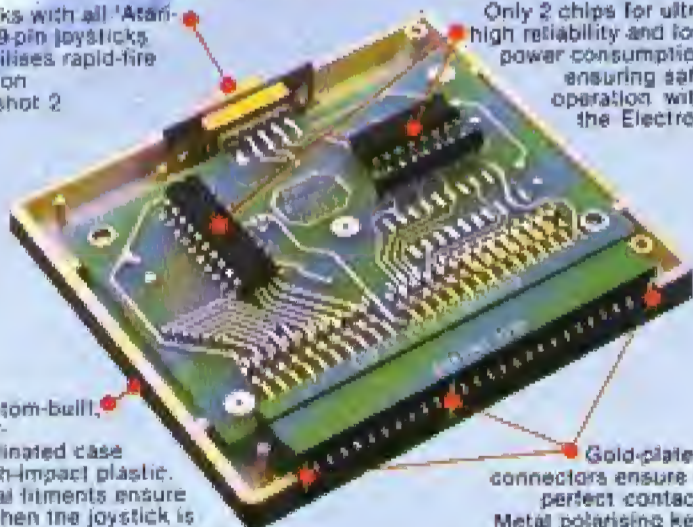
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TRIG, as you might guess from its name, is a program to help with trigonometry problems.

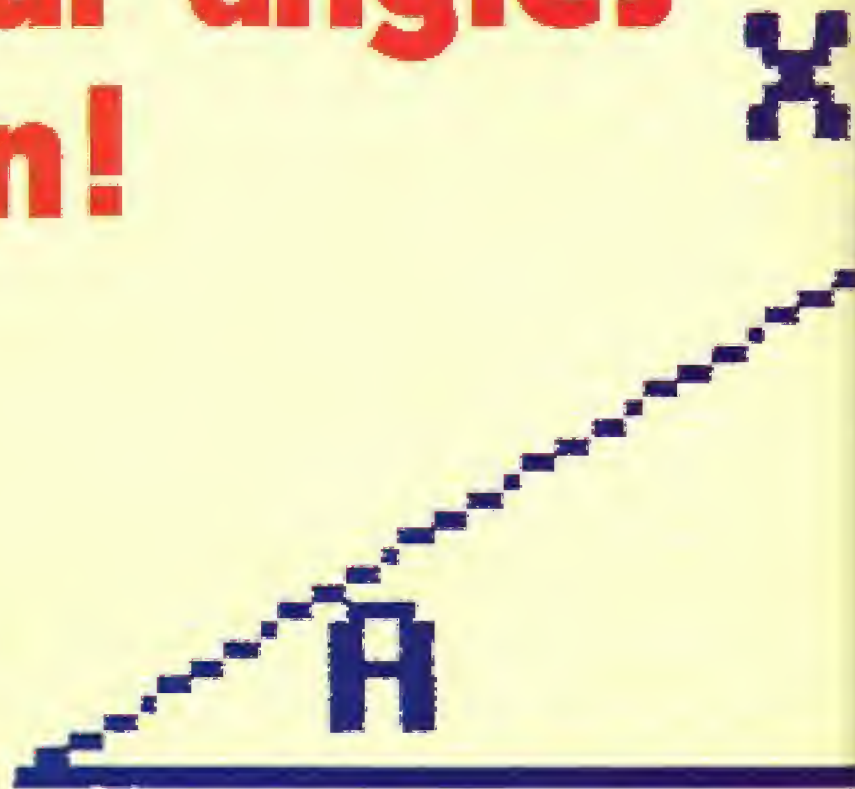
Written by GRAHAM HAWKINS it will calculate the length of the sides and the angles of any right angled triangle from a minimum of information with a minimum of fuss.

All the instructions are in the program. So get typing and let your Electron tame those triangles!

Don't be obtuse - get your angles right on!

In any triangle the unknown sides and angles can be calculated provided that at least ONE side and ONE angle, OR TWO sides are known.
This program will calculate the unknowns with the minimum of information.

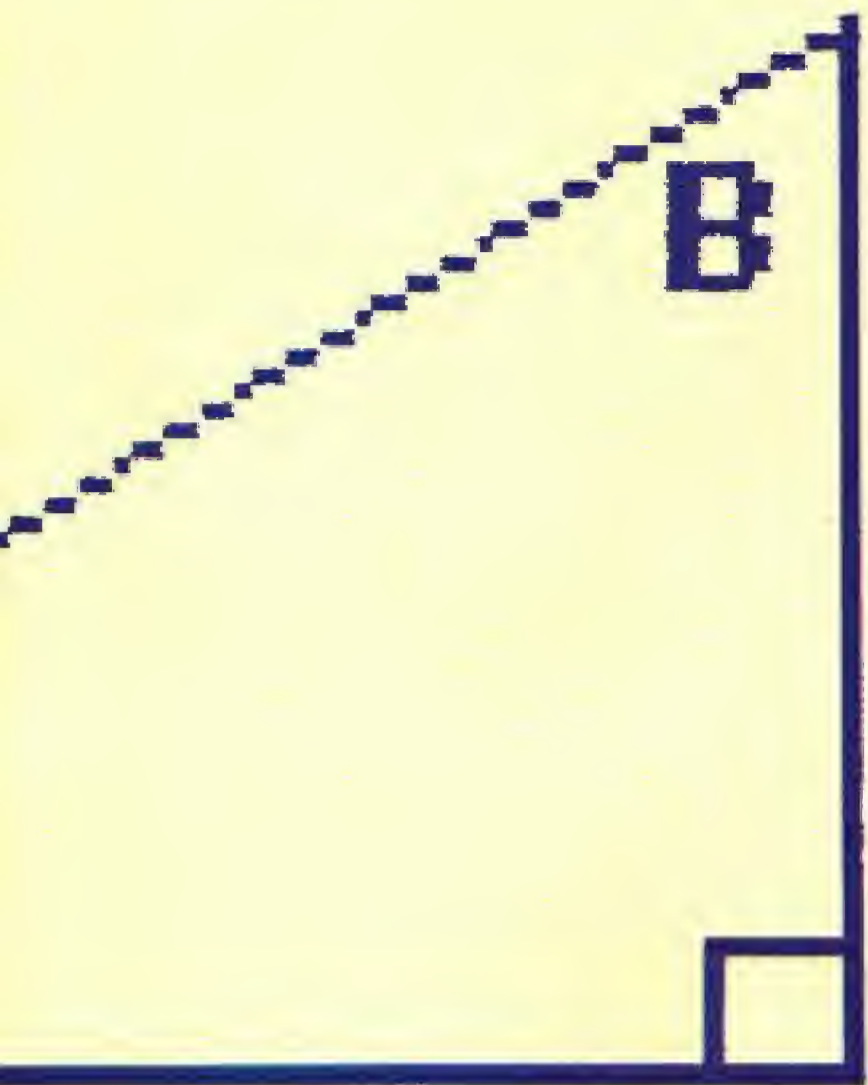
Press SPACE to continue.



```

10 REM TRIG
20 REM (C) ELECTRON USER
30 *KEY10,OLD1M
   :RUN:M
40 *FX11,0
50 *FX200,1
60 MODE 5
70 PROCtitle
80 MODE 4
90 VDU 23,1,0;0;0;0;
100 PROCinfo
110 PROCintro
120 END
130 DEF PROCintro
140 CLS
   :PROCTriangle
150 PRINT TAB(6,14)"WHAT
   INFORMATION DO YOU HAVE"
160 PRINT
   :PRINT "Do you know the
   length
   of two sides?.....
   .....PRESS 1"
170 PRINT "Do you know one
   side and one angle?.....
   .....PRESS 2"
180 PROCreturn
190 INPUT " "one_or_two
200 IF one_or_two=1
   THEN PROCsides
210 IF one_or_two=2
   THEN PROCanglesides
220 IF one_or_two>2
   THEN PROCmistake
230 DEF PROCmistake
240 PRINT
   :PRINT "YOU HAVE GIVEN
   A WRONG ANSWER ,
   PLEASE TRY AGAIN"
250 ENVELOPE 3,2,-25,-80
   ,-6,15,0,0,126,0,0,-126
   ,126,126
260 SOUND 1,3,156,27
270 FOR T=1 TO 4000
   :NEXT T
   :CLS
   :PROCintro
280 ENDPROC
290 DEF PROCsides
300 CLS
310 PROCTriangle
320 PRINT TAB(0,16)"Name
   the first side known
   X,Y or Z...."
330 INPUT TAB(37,16)" "first$
340 PRINT TAB(0,18)"Name
   the second side known
   X,Y or Z..."
350 INPUT TAB(37,18)" "second$
360 IF first$<"X"OR second$<
   "X"
   THEN PROCmistake
370 IF first$=second$
   THEN PROCmistake
380 CLS
   :PROCTriangle
390 PRINT TAB(0,16)"Enter
   length of side ";first$;
   "
   "
400 INPUT TAB(35,16)first
410 PRINT TAB(0,18)"Enter
   length of side ";second$;
   "
   "
420 INPUT TAB(35,18)second
430 IF first$="X"AND second$<
   first
   THEN PROCpythagoras
440 IF second$="X"AND first$>
   second
   THEN PROCpythagoras
450 IF first$<=0
   THEN PROCtoosmall
460 IF second$<=0
   THEN PROCtoosmall
470 IF first$<>"X" AND second
   $<>"X"
   THEN PROCnot_x
480 IF first$<>"Y" AND second
   $<>"Y"
   THEN PROCnot_y
490 IF first$<>"Z" AND second
   $<>"Z"
   THEN PROCnot_z
500 ENDPROC
510 DEF PROCnot_x
520 CLS
   :PROCTriangle
530 IF first$="Y" AND second$
   ="Z" OR first$="Z"
   AND second$="Y"
   THEN third=first*first+(s
   econd*second)
540 IF first<.5

```



Length of side Y is 1 units
 Length of side Z is 1 units
 Length of side X is 1.41421356 units
 Angle A is 45 degrees
 Angle B is 45 degrees
 PRESS SPACE TO ENTER ANOTHER SET OF MEASUREMENTS

FORMULAE

The formulae used to find the unknowns are SINE, COSINE and TANGENT thus:

$$\text{SIN} = \frac{\text{OPPOSITE}}{\text{HYPOTENUSE}}$$

$$\text{COS} = \frac{\text{ADJACENT}}{\text{HYPOTENUSE}}$$

$$\text{TAN} = \frac{\text{OPPOSITE}}{\text{ADJACENT}}$$

Press SPACE to continue.

```

THEN PROCsure
550 IF second<.5
  THEN PROCsure
560 PROClength_of
570 PRINT TAB(0,20)"Length
  of side X is ";SQR (thir
  d);" units"
580 IF first$="Y"
  THEN A=DEG (ATN (first/se
  cond))
  ELSE A=DEG (ATN (second/f
  irst))
590 B=90-A
600 PRINT
  :PRINT "Angle A is ";A;
  " degrees"
610 PRINT
  :PRINT "Angle B is ";B;
  " degrees"
620 PROCagain
630 ENDPROC
640 DEF PROCnot_y
650 CLS
  :PROCTriangle
660 IF first$="X" AND second$
  ="Z"
  THEN third=first*first-(s
  econd*second)
  ELSE third=second*second-
  (first*first)
670 IF first=second
  THEN PROCpythagoras
680 IF first<.5
  THEN PROCsure
690 IF second<.5
  THEN PROCsure
700 PROClength_of
710 PRINT TAB(0,20)"Length
  of side Y is ";SQR (thir
  d);" units"
720 IF first$="X"
  THEN B=ASN (second/first)
  ELSE B=ASN (first/second)
730 A=90-DEG (B)
740 PRINT
  :PRINT "Angle A is ";A;
  " degrees"
750 PRINT
  :PRINT "Angle B is ";
  DEG (B);" degrees"
760 PROCagain
770 ENDPROC
780 DEF PROCnot_z
790 CLS
  :PROCTriangle
800 IF first$="X" AND second$
  ="Y"
  THEN third=first*first-(s
  econd*second)
  ELSE third=second*second-
  (first*first)
810 IF first=second
  THEN PROCpythagoras
820 IF first<.5
  THEN PROCsure
830 IF second<.5
  THEN PROCsure
840 PROClength_of
850 PRINT TAB(0,20)"Length
  of side Z is ";SQR (thir
  d);" units"
860 IF first$="X"
  THEN A=ASN (second/first)
  ELSE A=ASN (first/second)
870 B=90-DEG (A)
880 PRINT
  :PRINT "Angle A is ";
  DEG (A);" degrees"
890 PRINT
  :PRINT "Angle B is ";B;
  " degrees"
900 PROCagain
910 ENDPROC
920 DEF PROCTriangle
930 MOVE 380,760
940 DRAW 780,990
950 DRAW 780,760
960 MOVE 380,760
970 DRAW 780,760
980 PRINT TAB(17,3)"X"
990 PRINT TAB(25,4)"Y"
1000 PRINT TAB(18,9)"Z"
1010 PRINT TAB(14,7)"A"
1020 PRINT TAB(23,2)"B"
1030 MOVE 750,760
1040 DRAW 750,790
1050 DRAW 780,790
1060 ENDPROC
1070 DEF PROClength_of
1080 PRINT TAB(0,16)"Length
  of side ";first$;" is
  
```

Turn to Page 57

BOUNCY

Have a ball with ROLAND WADDILOVE's enjoyable little game

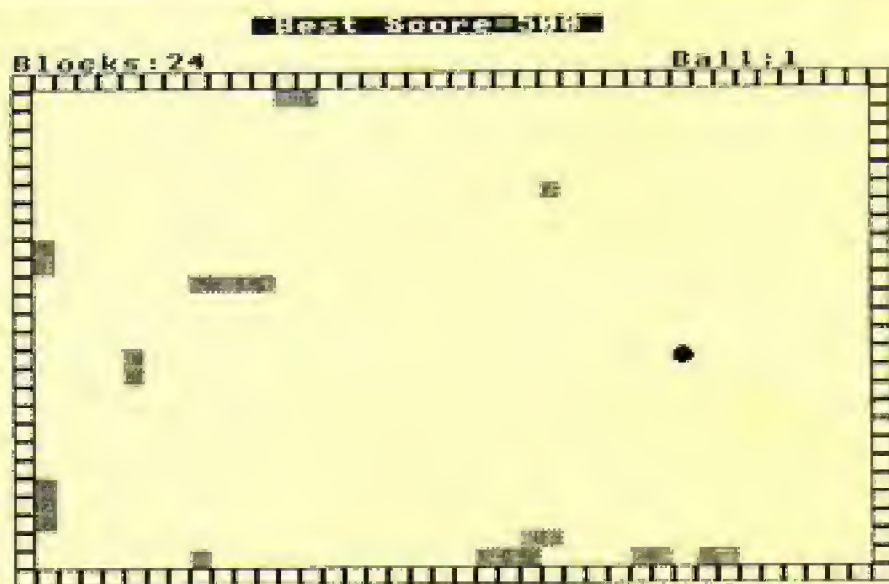
BOUNCY is a simple but enjoyable game in which you have to trap a ball which is moving around the screen, bouncing off any objects in its way.

Your only control is the space bar, which can be used to place a block just behind the ball.

After practice you should be able to build a

box by tapping the space bar and placing blocks at a selected spot as the ball flies past. When the ball bounces into the box press the space bar to trap it.

There are 25 balls in all and the object of the game is to trap them using as few blocks as possible. The lower your score the better you are.



Full listing starts on Page 53

PROCEDURES

PROCinitialise	Defines the characters used and sets the best (lowest) score.
PROCscreen	Draws the border, prints best/ball/blocks.
PROCnew_ball	Finds an empty space and prints the ball, sets the vertical and horizontal components of movement.
PROCmove_ball	Moves the ball until it is trapped, calls PROCbounce if there is a block in the way.
PROCbounce	Works out the new direction, uses FNpoint to see if there is a block in the way.
FNpoint	Sees if there is a block in the way.
PROCdelay (T%)	Waits for T% hundredths of a second.

PROCgame_over	Prints your rating, score and high score, sees if you want to play again.
PROCinstructions	Prints the instructions, sets the difficulty level.

VARIABLES

ball	Number of balls.
best	Best (lowest) score.
B%	Number of blocks placed.
I%	Loop counter.
X%,Y%	Coordinates of ball.
V%,H%	Vertical and horizontal components of movement.
E%	Flag to show whether an easy or hard game.
T%	Time delay.
a\$	Rating.

ROGER FROST
demonstrates the
Electron's design
capabilities

SWATCH is one of those programs that amaze you with the range of effects the Electron can produce.

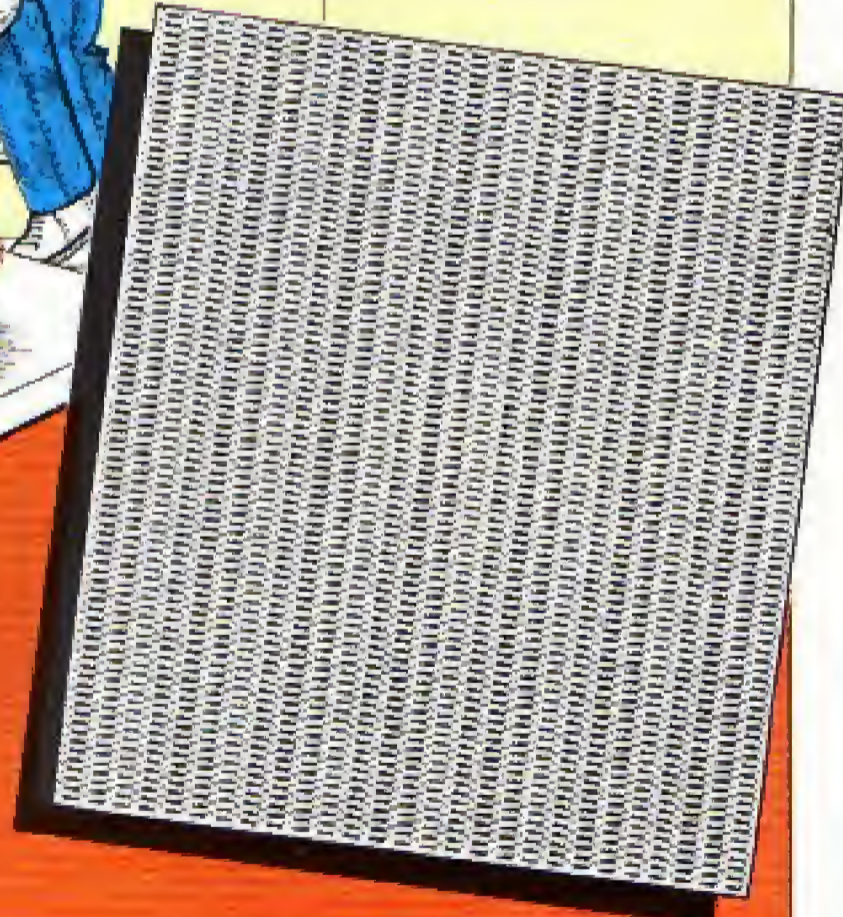
This program of lines and colours automatically turns the pages of a never-ending wallpaper pattern book or a swatch of curtain materials.

The designs vary from plain, bold colours, through Regency stripes and exciting Welsh tweeds to a range which seems to have been lifted directly from the seats of British Rail trains.

It is amazing what can be produced with just horizontal and vertical lines, and it is often hard to believe that only four colours are present on the screen at any one time.

Plan your colour schemes for home decorating, or just sit back and boggle at the versatility of your Electron.

Plan your colour schemes



```
10REM***SWATCH***
20REM***BY R.Frost***
30REM (C) ELECTRON USER
40MODE5
50VDU23;8202;0;0;0;
60GCLO,129:CL6
70colZ=0
80REPEAT
```

```
90FORstepI=8TO10
100FORN=0TO20
110GCOL2,NZ
120FORX=0TO1279STEPstepI
+4
130MOVE XZ,0:DRAWXZ,1023
140NEXT
150VDU19,3,colZ,0,0,0
```

```
160GCOLN,3
170FOR YI=0TO1023STEPstep
Z
180MOVE0,YI:DRAW1279,YI
190NEXT
200colZ=colZ+1:IF colZ>7
colZ=0
210NEXT
```

```
220NEXT
230UNTIL0
```

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

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Top Fifty chart

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Software Surgery

THE COLUMN THAT TAKES A LOOK INSIDE THE LATEST RELEASES

Classic Adventure Melbourne House

IT wouldn't really matter how good or bad this program is – as it is the only Electron version of the original Colossal Cave adventure, I'd have to recommend it.

So it comes as a bonus to find that this adaptation is superb.

I haven't played the original Crowther and Woods version so I can't say how close to the original this is. However it seems to have all the problems I have read about so it must be a full – or nearly full – adaptation of the original.

In it you play the part of a typical greedy adventurer. You come hot-footing it, flushed with success from your last adventure. You've heard of the fabulous treasure to be found in the area and are eager to get your share.

Armed with the objects you find above-ground you race off to the grating that gives access to the labyrinth of caves below.

You soon come across your first major obstacle – a large venomous snake. Its teeth soon puncture your ego as well as your skin. It is at this point that you realise that things aren't going to be quite as easy as you thought.

Careful exploration of the earlier locations soon reveals

A cave to conjure with



the solution – though the final answer is for the birds.

You'll also find the first magic word. This returns you to the building but remember to turn off your lamp – it won't last forever.

You progress slowly, solving a maze and other puzzles and finally enter the main body of the adventure. Eventually you will solve the game but it is more likely to take weeks rather than days. Well, what

else can I add? Very few adventures ever reach the standards set by this one.

It is deservedly called Classic. Somehow it is exciting to visit all these locations I have heard so much about before.

In a way it is like a legend coming to life. All I can say is it's a superb game and one that no true adventurer should be without. Magic!

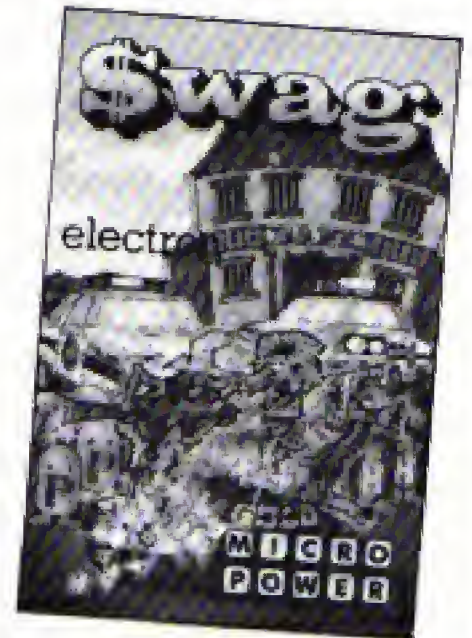
Merlin

Touch too violent?

Swag Program Power

SWAG is a rarity in arcade style games – it is a genuine two player game with the option of the second player being the micro.

The aim is to acquire jewellery to the value of £250,000 by moving your man to randomly placed



jewels and returning with them to your house.

If that sounds easy, then don't forget that your opponent is after the same treasure as you and is quite prepared to shoot you to get it.

You may also have insurance company robots on your trail. Any collision with them means a quick, empty-handed return home.

Of course you have the same advantages as your opponent. There is a different type of robot after him.

Robots can be converted from one kind to another by shooting them or by travelling to a special symbol which occurs on the screen from time to time.

Attempting to keep order in this lawless area are the police. There are three police cars which score points for your opponent if you go near them.

If you shoot one, it relentlessly follows you until you drink a can of beer and shoot it again. You can use that to your advantage by stopping the car near your opponent's home.

With all this shooting you will probably run out of ammunition, but they sell it at the bank, provided you've got gold.

Regrettably, in translating this program from a BBC Micro version, one or two things have been forgotten. The instructions give a most unsuitable group of keys to

Super for stargazers

THIS well written program enables the user to view the stars from any point on the Earth's surface on any date and at any time – all without leaving the comfort of your armchair.

Your monitor can now show a vast array of more than 450 stars in 50 major constellations.

For your part, move the telescope-style display up, down, right or left as well as zooming in and out, all via the

Constellation Superior Software

keyboard.

The well constructed program allows you to view the heavens in two different ways – as you might observe by looking up into the night sky by the varying magnitude of the stars and secondly, the display can be changed to show each constellation by a code of letters.

For example, a group of

letter Gs indicate the position of the constellation Gemini.

Using this letter code all 50 constellations are listed, the accompanying notes giving additional information to the user.

All in all a very good educational package which is simple to use. Amateur astronomers might also like to consider this one if they're fortunate enough to own an Electron.

Ken Smith

From Page 19

player two, but fear not, the actual keys are O (up), L (down), + (left), * (right) and Return (fire).

More seriously, you do not seem able to redefine the keys as you might wish.

The game is provided with many options: sound on or off, or a start for either player.

I personally worry about the glorification of theft and violence. Is this what we really want for our teenagers? The trouble is like so many of these games, it is addictive.

Rog Frost

Beat the busy bees

Pengi
Visions

PENGI type games have become quite popular lately with two or three software houses having their own versions on the market.

The game is derived from Pac-Man, but Visions' Pengi is far superior to any Pac-Man program.

You are in control of a cute little penguin who is trapped in a maze made up of large ice blocks inhabited by snow bees.

The object of the game is to line up three special white ice diamond blocks without being caught by the snow bees.



Fortunately these can be killed by squashing them with an ice block which slides along if you push it.

The graphics are excellent as is the sound, and I found it difficult enough just avoiding the snow bees, never mind lining up the ice diamond blocks.

There is a high score table of famous penguins, on screen scoring, redefinable keys, and a practice mode in which you can't be killed. If you're into arcade games you will love this one.

Roland Waddilove

No loss of power

Jet Power Jack
Micro Power

A COUPLE of months ago I played this game's BBC ver-

sion on the big brother machine and found it fascinating. It is one of those annoying addictive games which Micro Power have the knack of producing.

I was delighted on receiving the Electron version to find that it is identical - no scaled down sound or fewer features, but the full implementation with no perceptible change, not even in speed.

Perhaps I should add that I find the game a little too fast, as I prefer to achieve some degree of success straight away, and my young son also enjoys trying the games out. But we both found the initial action too speedy.

I have tried the BBC version on the Electron and found I was able to accumulate a decent score and develop a strategy.

There are five screens, which may be accessed separately from the menu. If screen 1 is chosen, and you are a better player than I, the other screens are encountered in order.

On each the basic format is the same, with a spaceship on the left needing to be refuelled with fuel which is on the right. Shades of Jet Pac, perhaps, which I enjoyed greatly in my misspent youth on a Sp*ctr*m.

The man is moved across the screen by careful use of the left/right controls, and the hover motor.

There are safe platforms to rest on briefly, but nearly everything else is quite lethal

to Jack. Each screen has different problems, with elements of other games appearing, such as the vertically moving monsters which have the same effect as the lifts in Corporate Climber.

The graphics are good, the smoothness of the movement superb. Sound is fair, and can be turned off if required. The key response is quick, precise and accurate.

I just wish my reactions were!

Phil Tayler



Galactic surprises

Galaxy Wars
Bug Byte Software

ANOTHER game from the Space Invaders camp with a few differences and a couple of surprises.

You are the little destroying machine at the bottom of your screen, moving left to right with your FUNC and Q keys, firing with the Delete key. F freezes the game.

The first screen of alien bombers are in an easy to pick off formation lined across the screen. That is, easy if you get your rhythm right.

However, watch out for the space pods which land on your level and can blow you to smithereens if you run into them.

But there's no time for complacency - as soon as you've fought them off, the H wing fighters appear on the screen. These are both hard to dodge and at times seemingly impossible to blow up.

And, after all this, you have

QUIZ HAS ALL THE ANSWERS

THIS marvellous little package is more than a quiz, more than a game and much more than so many of the educational programs on the market.

High praise you say, but consider what you get for your money.

A choice of 15 quiz topics each containing 50 questions, three different ways of answering - multiple choice, true or false and fill in the missing letters.

Then there's a facility to pass if you're really stuck, a summary of your performance and the chance to re-run the ones you passed or got wrong.

All this under the eyes of

Answer Back
Senior Quiz
Kosmos Software

the micro timekeeper.

Add to that good graphics in the form of craters, planets, space-ships and your friendly robot with his laser gun. Mix in a little sound and you have part two - a game, triggered by correctly answering a question.

A tone sounds, an alien spaceship appears from behind your planet, you hit the robot's laser fire button and try to shoot it down.

It's really compelling stuff.

But wait...there's more to come. Being the mastermind you are it won't take you long to come to grips with the correct answers to most of the 750 questions available.

Therefore create your own.

Even this can be done using the program's create, save and verify facility. Now you have a package made for the kids to do their homework with.

You set the questions and they get to shoot down all the nasties from outer space. Peace will reign in your household.

Watch out Magnus Magnusson, your job's in jeopardy.

Ken Smith

to dock with your mother ship to refuel.

All in all it's an exciting game for the arcade addict, with reasonable graphics and good sound effects.

Keith Young

Offers you can refuse

Survivor
MP Software

THE year is 1910 and you're on a cruise of the tropics when there is an accident and the ship sinks. The result is that you find yourself swimming in a shark-infested sea.

Can you survive and find your way back to civilisation, or alternatively find happiness on a tropical island?

There are very few actual puzzles to solve in this adventure. Almost everything is accomplished by choosing between two alternatives - HIDE or STAND, EAT or STARVE, ACCEPT or REFUSE.

The results of these choices can be hilarious. For instance, on entering a village you have to bribe the tribal chief. If you have what he wants he then offers you his daughter's hand in marriage.

If you accept you are given your own hut. You are then given a further choice - STAY or ESCAPE. If you STAY the game ends and presumably, you live happily ever after. If you REFUSE the chief gets angry and swops you with another village for a pig.

Here you are offered some food and, again, you have a choice - EAT or REFUSE. If you REFUSE you become

lunch for the tribe. If you EAT you are imprisoned in a hut and have to steal the witch-doctor's clothes to escape.

You'll also meet Robinson Crusoe who asks you to stay and be his friend. If you accept ... end of game again. There is also a secret civilisation in the depths of the island. If you find them, guess what? Yes, end of game yet again.

I'm not sure I'd call this an adventure as such and I'm sure I didn't manage to find all the endings - how do you get past the rhino?

Overall, a departure from the usual M&P style of adventure but there are so many alternatives in the course of the game for you to choose from, that I'm sure, like me, you'll spend your time discovering the results of all of them. It's an unusual and highly entertaining adventure.

Merlin

Memory monitor

Starmon Machine Code Monitor
Stogger Software

IF you've always thought that a monitor was an alternative to the family TV, you may think

that a machine code monitor would be a fast version. In fact Starmon is a piece of software stored on a microchip.

This type of software is sometimes called firmware, and to be able to use it you will need a sideways ROM card to plug into the expansion port at the back of your Electron.

A machine code monitor program like Starmon enables you to look at the contents of the micro's memory, both the 32k of RAM and the other 32k of ROM.

The program is very easily loaded. Just type *ST. and it's there - instantly.

Once loaded, you may well wonder what to do with it. Well, the clever part of Starmon is that it uses the memory normally occupied by Basic so running Starmon will not interfere with the program in memory.

It is easily possible to study any program - even those unlistable ones. Of course, you do not get a Basic listing. It is the contents of memory you see, but Starmon will do its best for you.

The contents of memory can be displayed in decimal, hexadecimal, binary or even octal. In addition, if Starmon thinks it detects an Ascii character it will print that. It can also disassemble code - that is, it produces a listing in

assembly language.

This all sounds very fearsome, but if you are a beginner to this kind of thing don't be put off, because you can quickly learn some skills.

For example it is very easy to alter the contents of memory without spoiling the program. I have personalised halls of fame so that they load with my name.

For the advanced user, Starmon is a very full program. With it you can search memory for bytes or strings, or move chunks of code around from one area of memory to another.

You can block fill memory, write directly to memory locations or alter the 6502 registers. There are also facilities to single step through programs, which can greatly help with debugging, or allow you to learn what machine code instructions do.

It is also possible to dump Starmon screens to a printer for future reference.

Starmon comes with a well written 42 page booklet, which makes the program easy to use. This whole package would be very useful to anybody keen to program, or even just dabble in machine code.

It is a thoroughly professional piece of firmware.

Rog Frost

TIME TO LEARN

What's the Time?
Collins Software

DRAWing and DRAWing of the clock hands seemed to be rather a slow and laborious process.

Hours introduces a little figure called Microman who works through his day to illustrate the passing of hours. There follows a fairly standard kind of test on hours, with appropriate responses from the computer.

Half hours extends this idea, and follows a similar format which again means rather tedious drawing. Quarters starts in the same vein, but then asks the child to move the hands of the clock using

the H and M keys.

Although this was much more meaningful to the youngsters I tried this on, even they showed signs of frustration at the slow rate of action.

Minutes was altogether better, attempting to explain the link between the numbers on the clock face and those curious expressions we use with minutes to or minutes past an hour.

The final part of Minutes asks the child to enter the time, by pressing the hours followed by the minutes.

If only the screen display could be made a little speedier on occasions, this would be a good piece of software for the parent to use at home.

Phil Tayler





As time

CLOCK is an Electron utility program which can be either used on its own or embodied in any program where a readout display of the time is required, such as in a game or a database program.

It starts by asking you to enter which screen mode you want to use to display the time.

Next you are asked to key in the correct time. This should be in a 24 hour format, so that 2.30pm would be entered as 14.30.0.

Pressing Return when the seconds coincide with the correct seconds on your own watch will cause the program to start counting and calculating the time. This means that you can set the time very accurately.

Then you will be asked to

enter the coordinates for the screen display position. These coordinates (X and Y) will dictate where the time is printed. They should be entered as, for example, 10,15 (column 10, line 15).

Note that the screen display position coordinates vary with the mode entered, so the X and Y values should not exceed those shown in Table 1.

After entering the screen coordinates you will be shown

Mode	X values	Y values
0	0-70	0-29
1	0-30	0-29
2	0-12	0-29
3	0-70	0-22
4	0-30	0-29
5	0-12	0-29
6	0-30	0-22

Table 1: Coordinate limits of the seven modes

SLOGGER ADVANCED SYSTEMS



ROMBOX is a sideways ROM extension unit which enables many existing BBC ROM based programs to be run on the BBC or the Electron. Fully compatible with either computer, it is strongly constructed and will also support the Plus 1 on the Electron. ROMBOX is supplied with comprehensive instructions and an inter-connecting cable for the BBC.

BBC £49.95 (Including cable)
Electron £39.50

STARMON is the only machine code monitor for the Electron and provides a powerful and easy to use command repertoire for advanced debugging and machine code programming. A ROM extension unit is required when used with the Electron. STARMON is also available for the BBC and both versions are supplied with a comprehensive and easy to follow User Manual.

BBC £27.50
Electron £22.50

All prices include V.A.T.
and postage and packing
within the U.K.



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Chatham, Kent. ME5 7BU.
Telephone: Medway (0634) 811634.

goes by ■ ■ ■

you could be keeping a check on it with this utility program by ROY PAGE

the display position you have entered. If this is correct, pressing Y will cause the time to be shown at this screen position.

Pressing N will take the program back to ask for another pair of coordinates so you can reposition the display.

To embody the Clock in one of your own programs, first include in your program Lines 40 to 80 (selection of mode may not be needed and if not line 50 can be discarded).

Then incorporate lines 200 to 300 in your program, located (and RENUMBERed) at any point where you wish to display the time. The procedures, of course, are added to the end of your program.

For those readers who are not familiar with the Electron program merging facilities, the Electron User Guide, chapter 28, pages 200 and 201 will provide further assistance.

Merging the Clock program into another program is probably best carried out as follows:

- Ensure that the Clock is saved on cassette at least twice. This is always a good idea in case the first save will not load. Then load Clock into your Electron.

- Using the direct command, DELETE 10, 190.

- Using the direct command, RENUMBER 20000 will renumber the procedure statements to a high starting point. When merged into your program, existing lines will not be overwritten by Clock.

- Ensure that the program into which you intend to merge Clock does not have line numbers greater than 19999. If it does, use a larger value for renumbering.

- With a separate cassette tape loaded into the tape recorder key in:

"SPOOL "TICK"

"Record then Return" will appear on the screen. Put the recorder into Record and, after ensuring the tape leader is past the record heads, press Return. This will stop the tape recorder (assuming your recorder has motor control).

- The command LIST followed by Return will cause the

program to be saved in Ascii format on to the tape. Then enter *SPOOL to close the spooled file.

- Load your own program and list it to ensure line numbers do not exceed 19,999.

- Reload your cassette tape on to which you "spooled" Clock and rewind to the start

position. Give the command *EXEC "TICK". The Clock program will now be merged into your program.

- Lines up to and including 80 can now be retyped into the start of your program and the renumbered lines 200 to 300 can be put in your program where you need the time to be displayed.

KEYS

When the clock is running

- Ctrl** Stops the clock display from updating the time.
- Caps Lk** Restarts the display updating.
- Delete** Stops the ticking sound.
- Shift** Restarts the ticking sound.

```

10 REM *****CLOCK***
*****
20 REM *****BY ROY A PAG
E*****
30 REM ***(C) ELECTRON U
SER*****
40 CLS
50 INPUT "CLOCK""ENTER
SCREEN MODE""( 0 TO 6 )"
:mode=GET:MODE mode
60 PROCinput_time
70 PROCset_time
80 PROCdisplayposition
90 REM *****
*****
100 REM *TO INCLUDE THIS
CLOCK WITH-*
110 REM *-IN ANOTHER PROG
RAM IT IS *
120 REM *SUGGESTED THAT L
INES UP TO *
130 REM *AND INCLUDING 80
FORM THE *
140 REM *FIRST PART OF TH
E PROGRAM. *
150 REM *LINES 200 TO 300
INC. *
160 REM *SHOULD BE INCLUD
ED WHEN *
170 REM *THE TIME IS REQU
IRED TO *
180 REM *BE PRINTED ON TH
E SCREEN. *
190 REM *****
*****
200 stoptick=0
210 REPEAT
220 PROC_time
230 tick=TIME
240 IF INKEY(-1) THEN sto
ptick=0
250 IF INKEY(-90) THEN st
optick=1
260 IF stoptick=0 THEN RE
PEAT:UNTIL TIME=tick+95: 90
UND 1,-8,192,1
270 UNTIL INKEY(-2)
280 REPEAT:UNTIL INKEY(-6
5)
290 GOTO 210
300 END
310 DEF PROCinput_time
320 INPUT "ENTER THE TIME
""(HR,MIN,SEC)""EXAMPLE
!-""12,10,30 ?"HRS,MINS
,SECS
330 ENDPROC
340 DEF PROCset_time
350 time=(HRS*360000)+(MI
NS*6000)+(SECS*100)
360 PRINT TAB(0,10) "TIME
SET TO !-:"
370 PRINT"";HRS;"!";MINS
;"!";SECS
380 TIME=time
390 REPEAT:UNTIL TIME = t
ime + 250
400 ENDPROC
410 DEF PROC_time
420 VDU 23,1,0;0;0;0;
430 time2=TIME
440 hrs=time2 DIV 360000
450 min1=time2 MOD 360000
460 min2=min1 DIV 6000
470 sec1=min1 MOD 6000
480 sec2=sec1 DIV 100
490 IF hrs>23 THEN TIME=t
ime2-(24*360000)
500 IF hrs<10 THEN PRINT
TAB(X,Y);"0";hrs;
510 IF hrs>9 THEN PRINT T
AB(X,Y);hrs;
520 IF min2<10 THEN PRINT
;"!";"0";min2;"!";
530 IF min2>9 THEN PRINT
;"!";min2;"!";
540 IF sec2<10 THEN PRINT
;"0";sec2
550 IF sec2>9 THEN PRINT;
sec2
560 ENDPROC
570 DEF PROCdisplaypositi
on
580 CLS
590 PRINT""ENTER SCREEN
""CO-ORDINATES""FOR DIS
PLAY POSITION""( X,Y)";:
INPUT,X,Y
600 CLS:COLOUR 131:COLOUR
0:PRINT TAB(X,Y)"(-OK-?)"
:VDU 20:PRINT TAB(0,0)"IS T
HIS CORRECT?""(Y OR N)"
610 Q$=GET$:IF Q$="N"THEN
CLS : GOTO 590
620 CLS
630 ENDPROC
640 REM *****
*****
650 REM *Press CTRL To St
op Clock *
660 REM *Press CAPS LK To
Restart *
670 REM *Press DELETE To
Stop Tick*
680 REM *Press SHIFT To S
tart Tick*
690 REM *****
*****

```

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 February 1985 tape:

CRAAL The mystifying maze adventure. **BOUNCY** Addictively annoying action. **PAIRS** Can you remember the cards? **BASE** A Binary/hexadecimal conversion utility. **CATCHER** Collect the eggs before they break. **CLOCK** Time-keeping utility. **RACER** Grand Prix action. **NOTEBOOK** Graphics windows. **TRIG** All the right angles.

On the January 1985 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 1984 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 1984 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 1984 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 1984 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 1984 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 1984 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 1984 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 1984 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 1984 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 1984 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 1984 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:

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Venture deep into the labyrinth of despair, beat the wizard and collect your reward in...

The Kingdom of Craal

By MIKE BIBBY

FAR far way, beyond the Ice Mountains, lies the weird and wonderful Kingdom of Craal with its magnificent palace, crystal clear lake and enchanted forest.

It is a peaceful land, ruled for many happy years by King Meek who was respected by most of his subjects for his good nature and integrity – and his rather dishy, if inefficient, handmaiden Jut.

There was one character however who was not party to this overwhelming admiration – Vadham the evil wizard.

Many years ago, he was banished to the castle dun-

geons for trying to nick the king's gold plated penknife – the one with a special blade for taking stones out of horses hooves.

In his spare time when he was not mixing spells or playing Gauntlet, he turned the dungeon into a labyrinth of despair, where only the brave had the courage to enter. Having said that, we haven't seen any of them come back yet.

You were born in Craal, the handsome son of a cobbler and many years ago you decided to seek a fortune in far off lands.

You returned many times to

visit your old mum and dad and spend the occasional happy hour in the company of the king's daughter Andrea.

What was once a childhood crush blossomed into love, and you have returned for good to claim your bride.

Alas on this last visit you found the king dead and the palace in uproar. The wizard had taken a heaven sent opportunity and, as the king opened the door down to the dungeons to let out the castle moggie, he grabbed his magnificent gold crown and disappeared into his hidey hole in



From Page 25

the depths – better than a penknife no doubt, but not much use for getting things out of horses hooves.

You, in your typical youthful manner, were only interested in your future wife – Andrea. The palace guards, the footmen, the courtesans and even Ethel the cleaner, however, were not impressed with your infatuation and by a unanimous decision volunteered your services to retrieve the crown.

They threw you head-over-heels down the dungeon steps with a warning that should you return empty handed all your beloved possessions would be forfeit, even your subscription to *Electron User*. Some people stop at nothing.

Well, you have your challenge and you don't really have much option but to accept it.

In this serious adventure you have at your disposal six single letter commands. These are n, s, e, w, l and i – for the

four compass directions, plus look and inventory. Notice – they're all in lower case.

The program will also accept other standard adventure commands such as take, drop, hit and say. These words are intelligent, which means that if you have a key and want it in a lock, all you need to say is 'Drop key'. It will automatically go in the lock.

Now there's not much point in your typing in an adventure and finding, as you do, all the solutions within the listing. In order to conceal the clues therefore, I've written the important messages in code and they're all in the data statements at the end of the program.

There's nothing clever in what I've done, and I'm sure you'll soon spot that all the printed text has been offset by three letters. The sub-routine starting at line 510 decodes it all and turns it into sensible English in the finished product.

It is imperative that great

care is taken when entering these data lines if you are to enjoy the result of your toils.

Well, I think I've told you enough now. Any more hints and it wouldn't be much of an adventure, would it?

It only remains to wish you luck when you set out in your search for the crown – you're going to need it!



Craal listing

```

10 *FX202,40
20 MODE 6
30 GOTO 100
40 DIM d$(10,4)
50 h$=STRING$(25," "):c$
=h$:o$=h$:h$="":c$="":o$=""
60 hh$=STRING$(255," "):
oo$=h$:hh$="":oo$=""
70 FOR IX=1 TO 10: FOR J
I = 1 TO 4
80 READ d$(IX,J)
90 NEXT: NEXT
100 NX = 12: TX = 7: MX
= 51
110 DIM j$(NX): DIM oI(NX
): DIM m$(MX)
120 FOR IX = 1 TO NX: REA
D hh$,cc$:GOSUB 510: j$(IX)
=oo$:hh$=cc$:GOSUB 510: oI(
IX)=VAL(oo$): NEXT IX
130 FOR IX = 1 TO MX: REA
D m$(IX): NEXT IX
140 h$="":c$="":o$=""
150 bI = TRUE: dI = TRUE
: eI = TRUE: sI = FALSE: l
I = FALSE: aI = TRUE: gI
= FALSE: fI = TRUE
160 RI = 2: xI = 3
170 GOTO 230
180 PRINT "On a visit to
the Palace of Craal, you f

```

ind the place in uproar. Th
e King is dead and his cr
own stolen by a wicked wi
zard who's fled to his den
in the palace dungeons.
"

190 PRINT "By paying rath
er too much attention to t
he ex-king's daughter, you
find yourself volunt
eered to recover it."

200 PRINT "You are thrown
into the dungeons and t
old not to come back withou
t the crown."

210 PRINT "Here begins the
adventure...."

```

220 GOTO 40
230 REPEAT
240 IF RI <> xI THEN GOSU
B 590
250 xI = RI
260 CI=0:REPEAT: GOSUB 36
0: UNTIL CI<>0
270 ON CI GOSUB 790,830,B
60,910,1070,590,900,940,101
0,1160
280 UNTIL gI
290 PRINT
300 IF oI(0)=1 GOTO 320 E
LSE PROC*(31):PRINT

```

```

310 PROC*(32):PRINT: GOTO
340
320 PROC*(29):PRINT
330 PROC*(30): END
340 PRINT:PROC*(51)
350 c$ = GET$: IF INSTR("
Nn",c$) END ELSE RUN
360 PRINT "What now?"
370 REPEAT: INPUT "===)"
c$: UNTIL c$<>"
380 IF LEN(c$)<>1 GOTO 40
0
390 CI=INSTR("nsewil",c$)
: IF CI<>0 RETURN ELSE PRIN
T "I don't recognise this s
ingle letter command - only
n,s,e,w,i,l.":RETURN
400 SI=INSTR(c$," "): IF
SI=0 PRINT "I don't underst
and - put a space between c
ommand and object, please."
:CI=0:RETURN
410 verb$ = LEFT$(c$, SI-
1): o$= " "+MID$(c$,SI+1):RE
PEAT: o$= RIGHT$(o$, LEN(o$
)-1): UNTIL LEFT$(o$,1)<>"
"
420 CI = INSTR("droptakes
zyhit", verb$)
430 IF CI<>1 AND CI<>5 AN
D CI<>9 AND CI<>12 THEN PRI

```

```

NT "I don't understand your
command." :CI=0:RETURN
440 IF CI=1 CI=7 ELSE IF
CI=5 CI=8 ELSE IF CI=12 CI=
10 ELSE IF CI=9 RETURN
450 zI=0:IX=1:MX=0: REPEA
T
460 IF LEFT$(o$,4)=LEFT$(
j$(IX),4) THEN MX = 1
470 IX = IX + 1
480 UNTIL MX=1 OR IX=MX +
1
490 IF MX=1 zI=IX-1 ELSE
PRINT "I don't understand t
he object you mean." : CI=0
: RETURN
500 RETURN
510 oo$=""
520 FOR JJI = 1 TO LEN(hh
$)
530 RRI=ASC(MID$(hh$,JJI,
1)) - 3
540 IF RRI=30 OR RRI=41 O
R RRI=34 RRI=RRI+3
550 oo$ = oo$ + CHR$(RRI)
560 NEXT
570 RETURN
580 END : ++++++

```

Turn to Page 54

PAIRS is a game relying heavily upon memory, where you have to locate, among the pack of face down cards laid out before you, a pair that match up.

Each time you do this the pair is removed from the pack, your score increases by one, and you are allowed another go.

The micro plays by the same set of rules, its ability being pre-determined by the level of play - from one to four - that you select.

Level one is the easiest, and each successive level becomes increasingly difficult, up to the last which is almost impossible to beat without resorting to pad and pencil.

A card is chosen by first entering its horizontal coordinate (A to M), and then its vertical coordinate (1 to 4).

The computer always has first go, but this is no real hardship, as it is unlikely to pick up a pair at its first attempt.



Is your memory as good as the Electron's?

Find out in ALAN GORNALL's version of the classic card game

PROCEDURES

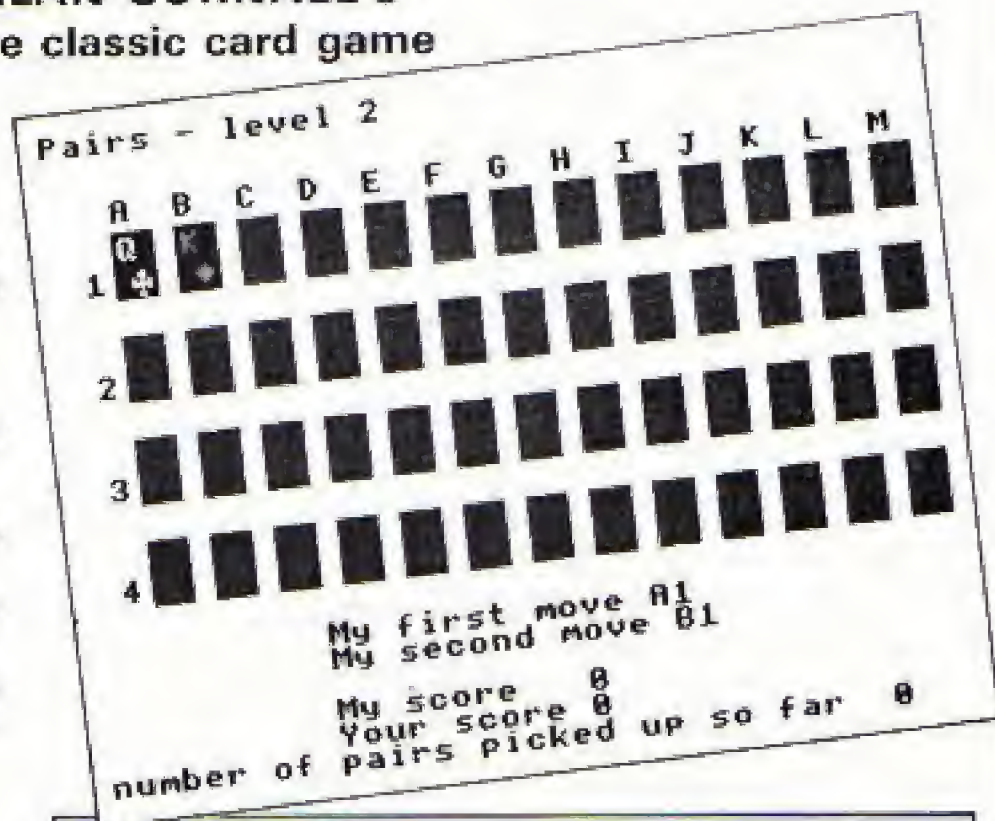
PROClevel	Decides the level of play.
PROCinit	Sets up certain variables, the user-defined characters and the one and only envelope used.
PROCshuffle	Shuffles a pack of cards.
PROCsetup	Draws pack face down, and axes.
PROCmymove	Decides and executes the program's move.
PROCstat	Displays scores.
PROCresult	Determines the consequences of either player's move.
PROCyourmove	Enters and executes the move of your choice.

Other sub-procedures are called from within these procedures during the course of a run, and these are briefly explained in REM statements in the program.

VARIABLES

M%	Your score (in games).
N%	The program's score (in games).
myscore%	The program's score (in pairs).
yourscore%	Your score (in pairs).
A\$(52)	Contains the cards in a shuffled form. Cards are removed from this array during the course of a game, as they are picked up.
Pack\$	Contains an unshuffled pack of cards.
MEM\$()	The program's memory, containing the cards and their positions on the playing surface. The extent of this memory is determined by:
MEMORY	Set during PROClevel.

The remaining variables are not included as they are either procedure-specific or flags used to see whether a specific event has occurred or not.



```

10 REM Pairs
20 REM by ALAN GORNALL
30 REM (C) ELECTRON USER
40 *KEYB MO.6:IN:INL:IN
50 *KEYISAVE*Pairs*:M:MS
AVE*Pairs*:M:IN
60 *KEY2M:0:N:0:MRUN:IN
70 REM initiation
80 ON ERROR GOTO 3260
90 MODE1
100 YDU23:8202:0:0:0;
110 PROClevel

120 PROCinit
130 PROCshuffle
140 PRINTTAB(0,4);*Pairs
-level*;LEVEL$
150 PROCsetup
160 PROCstat
170 REM core of program
180 REPEAT
190 REPEAT
200 PAIR=FALSE
210 comp=TRUE

```

Pairs listing

From Page 27

```

220 PROCymove
230 PROCresult
240 UNTIL PAIR=FALSE
250 comp=FALSE
260 REPEAT
270 PAIR=FALSE
280 PROCyourmove
290 PROCresult
300 UNTIL PAIR=FALSE
310 UNTIL FALSE
320 REM start of proced
ures
330 REM decide on level o
f play
340 DEF PROClevel
350 PRINT"Which level of
skill do you want to playat
(1 to 4) ?"
360 REPEAT
370 A$=GET$
380 UNTIL A$="1" AND A$<
="4"
390 REPEAT
400 READ LEVEL$,MEMORY
410 UNTIL LEVEL$=A$
420 DIM MEM$(MEMORY)
430 CLS
440 ENDPROC
450 REM set up variables,
etc.
460 DEF PROCinit
470 myscoreZ=0
480 yourscoreZ=0
490 pairsZ=0
500 VDU19,2,4;0;
510 VDU23,240,0,20,20,107
,127,107,0,20
520 VDU23,241,0,20,62,127
,62,20,0,0
530 VDU23,242,54,127,127,
127,62,20,0,0
540 VDU23,243,0,20,62,127
,127,127,20,62
550 DIM ST$(4)
560 ST$(1)=CHR$18+CHR$0+C
HR$0+CHR$240
570 ST$(2)=CHR$18+CHR$0+C
HR$1+CHR$241
580 ST$(3)=CHR$18+CHR$0+C
HR$1+CHR$242
590 ST$(4)=CHR$18+CHR$0+C
HR$0+CHR$243
600 ENVELOPE2,2,6,0,0,255
,0,0,126,0,0,-126,126,126
610 ENDPROC
620 REM shuffle cards
630 DEF PROCshuffle
640 SEEDZ=RND(-TIME)
650 DIM A$(52)
660 Pack$="AC2C3C4C5C6C7C
8C9CTCJCQCKCAD203D405D607D0
D9D1DJD0DKDAH2H3H4H5H6H7H0H
9HTHJHQHKHAS2S3S4S5S6S7S8S9
STSJS0S9KS"
670 DIM CX(52)
680 FOR IZ=1 TO 52
690 REPEAT
700 RandomZ=RND(52)
710 UNTIL CX(RandomZ)=0
720 A$(IZ)=MID$(Pack$,Ran
domZ+2-1,2)
730 CX(RandomZ)=1
740 NEXT
750 ENDPROC
760 REM draw pack face do
wn
770 REM and coordinate ax
es
780 DEF PROCsetup
790 FOR IZ=1 TO 13
800 FOR JZ=1 TO 4
810 PROCcard(IZ,JZ,2)
820 NEXT
830 NEXT
840 VDU5
850 GCOL0,3
860 FOR IZ=1 TO 13
870 MOVE88+IZ,804;PRINTCH
R$(IZ+64)
880 NEXT
890 FOR IZ=1 TO 4
900 MOVE44,847-128+IZ;PRI
NT;IZ
910 NEXT
920 VDU4
930 ENDPROC
940 REM draw the face of
the card,
950 REM card$, at the coo
rdinates XZ,YZ
960 DEF PROCvalue(XZ,YZ,c
ard$)
970 XZ=88+XZ
980 YZ=847-128+YZ
990 VDU5
1000 SUIT$=MID$(card$,2,1)
1010 IF SUIT$="C" OR SUIT$
="S" THEN GCOL0,0 ELSE IF S
UIT$="D" OR SUIT$="H" THEN
GCOL 0,1 ELSE GCOL 0,3
1020 MOVE XZ+20,YZ
1030 IF SUIT$="C" THEN SUI
T$=ST$(1)
1040 IF SUIT$="D" THEN SUI
T$=ST$(2)
1050 IF SUIT$="H" THEN SUI
T$=ST$(3)
1060 IF SUIT$="S" THEN SUI
T$=ST$(4)
1070 PRINTSUIT$
1080 MOVE XZ+4,YZ+40
1090 PRINTMID$(card$,1,1)
1100 VDU4
1110 ENDPROC
1120 REM draw the card its
elf at the
1130 REM coordinates XZ,YZ
in the
1140 REM desired colour
1150 DEF PROCcard(XZ,YZ,co
lourZ)
1160 XZ=88+XZ
1170 YZ=815-128+YZ
1180 GCOL0,colourZ
1190 MOVE XZ,YZ
1200 DRAW XZ,YZ+80
1210 PLOT 85,XZ+56,YZ
1220 DRAW XZ+56,YZ+80
1230 PLOT 85,IX,YZ+80
1240 ENDPROC
1250 REM the computer make
s its move
1260 DEF PROCymove
1270 PROCsearch
1280 PRINTTAB(10,24);"My f
irst move ";XZ;YZ;
1290 PROCcard(ASCXZ-64,VA
LYYZ,3)
1300 PROCto(ASCXZ-64,VALY
Z)
1310 PROCvalue(ASCXZ-64,A
SCYZ-40,A$(Z))
1320 *FX15,0
1330 A$=INKEY$(300)
1340 PRINTTAB(10,25);"My s
econd move ";XZ;YZ;
1350 PROCcard(ASCXZ-64,VA
LYYZ,3)
1360 PROCto(ASCXZ-64,VALY
Z)
1370 PROCvalue(ASCXZ-64,V
ALYZ,A$(Z))
1380 A$=INKEY$(300)
1390 PRINTTAB(0,24);STRINS
$(80," ")
1400 ENDPROC
1410 REM the computer sear
ches its
1420 REM memory, MEM$() fo
r a pair
1430 DEF PROCsearch
1440 PROCsearchpr
1450 IF pr=TRUE THEN ENDP
OC
1460 PROCsearch1
1470 ENDPROC
1480 REM PROCot and PROCto
convert
1490 REM a position in the
pack to
1500 REM a position on the
screen and
1510 REM vice versa
1520 DEF PROCot(XZ)
1530 Y=(XZ DIV 13)+1
1540 IF XZ MOD 13=0 THEN X
=13;Y=Y-1 ELSE X=XZ MOD 13
1550 ENDPROC
1560 DEF PROCto(XZ,YZ)
1570 Z=(YZ-1)*13+XZ
1580 ENDPROC
1590 REM subsidiaries to P
ROCsearch
1600 DEF PROCsearchpr
1610 pr=FALSE
1620 FOR IZ=0 TO MEMORY-1
1630 FOR JZ=IZ+1 TO MEMORY
1640 IF LEN MEM$(IZ)=0 THE
N 1600
1650 IF LEN MEM$(JZ)=0 THE
N 1670
1660 IF MID$(MEM$(IZ),1,1)
=MID$(MEM$(JZ),1,1) THEN pr
=TRUE;XZ=MID$(MEM$(IZ),3,1
);YZ=MID$(MEM$(JZ),3,1);Y1
$=MID$(MEM$(IZ),4,1);Y2$=MI
D$(MEM$(JZ),4,1)
1670 NEXT JZ
1680 NEXT IZ
1690 ENDPROC
1700 DEF PROCsearch1
1710 pos=0
1720 REPEAT
1730 eq=FALSE
1740 ual=FALSE
1750 pos=pos+1
1760 IF LEN A$(pos)=0 THEN
eq=TRUE;GOTO1030
1770 temp1$=MID$(A$(pos),1
,1)
1780 temp2$=MID$(A$(pos),2
,1)
1790 FOR IZ=0 TO MEMORY
1800 IF MID$(MEM$(IZ),1,1)
=temp1$ AND MID$(MEM$(IZ),2
,1)<>temp2$ THEN ual=TRUE;i
Z=IZ
1810 IF MID$(MEM$(IZ),1,1)
=temp1$ AND MID$(MEM$(IZ),2
,1)=temp2$ THEN eq=TRUE
1820 NEXT
1830 UNTIL eq=FALSE OR ual
=TRUE

```

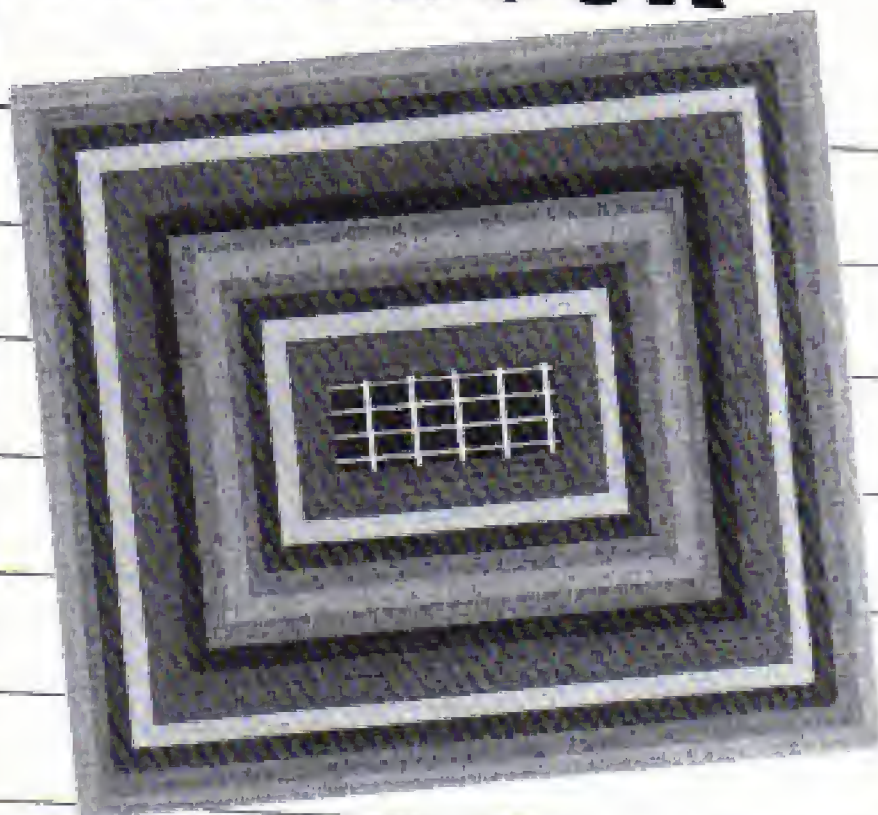
```

1840 IFual=TRUE THEN PROCa
:ENDPROC
1850 PROCot(pos)
1860 X1%=CHR$(64+X)
1870 Y1%=STR$Y
1880 REPEAT
1890 eq=FALSE
1900 pos=pos+1
1910 IF LEN A$(pos)=0 THEN
eq=TRUE:GOTO1970
1920 temp1%=MID$(A$(pos),1
,1)
1930 temp2%=MID$(A$(pos),2
,1)
1940 FOR IX=0 TO MEMORY
1950 IF MID$(MEM$(IX),1,1)
=temp1% AND MID$(MEM$(IX),2
,1)=temp2% THEN eq=TRUE
1960 NEXT
1970 UNTIL eq=FALSE
1980 PROCot(pos)
1990 X2%=CHR$(64+X)
2000 Y2%=STR$Y
2010 ENDPROC
2020 DEF PROCa
2030 PROCot(pos)
2040 X1%=CHR$(64+X)
2050 Y1%=STR$Y
2060 I2%=MID$(MEM$(IX),3,1
)
2070 Y2%=MID$(MEM$(IX),4,1
)
2080 ENDPROC
2090 REM remove a card fro
a memory
2100 DEF PROCsub(sub1$,sub
2$)
2110 PROCto(ASCsub1$-64,VA
Lsub2$)
2120 A$(Z)="
2130 IX=-1:REPEAT:IX=IX+1
2140 IF LEN MEM$(IX)=0 THE
N 2160
2150 IF MID$(MEM$(IX),3,1)
=sub1% AND MID$(MEM$(IX),4,
1)=sub2% THEN MEM$(IX)="
2160 UNTIL IX=MEMORY
2170 ENDPROC
2180 REM checks if a certa
in card is
2190 REM in memory
2200 DEF PROCrel(rel1$,rel
2$)
2210 relevant1=TRUE
2220 FOR IX=0 TO MEMORY
2230 IF LEN MEM$(IX)=0 THE
N 2250
2240 IF MID$(MEM$(IX),3,1)
=rel1% AND MID$(MEM$(IX),4,
1)=rel2% THEN relevant1=FAL
SE
2250 NEXTIX
2260 ENDPROC
2270 REM add a card to me
ory
2280 DEF PROCadd(add1$,add
2$)
2290 bit=FALSE
2300 FOR IX=0 TO MEMORY
2310 PROCto(ASCadd1$-64,VA
Ladd2$)
2320 IF LEN MEM$(IX)=0 AND
bit=FALSE THEN MEM$(IX)=A$
(Z)+add1$+add2$:bit=TRUE
2330 NEXT
2340 ENDPROC
2350 REM forced delay, hav
e to press
2360 REM a key to continue
2370 DEF PROCkey
2380 PRINTTAB(0,24);"hit a
key to continue"
2390 A$=GET$
2400 PRINTTAB(0,24);STRING
$(80," ")
2410 ENDPROC
2420 REM displays various
bits of
2430 REM relevant informat
ion
2440 DEF PROCstat
2450 PRINTTAB(10,27);"My s
core ";myscoreX
2460 PRINTTAB(10,28);"Your
score ";yourscoreX
2470 PRINTTAB(0,29);"numbe
r of pairs picked up so far
";pairsX
2480 ENDPROC
2490 REM find the result o
f a move
2500 DEF PROCresult
2510 PROCto(ASCX1$-64,VALY
1$)
2520 I1=2
2530 PROCto(ASCX2$-64,VALY
2$)
2540 I2=2
2550 IF MID$(A$(Z1),1,1)=M
ID$(A$(Z2),1,1) THEN PROCpa
ir ELSE PROCnopair
2560 ENDPROC
2570 DEF PROCnopair
2580 PROCrel(X1$,Y1$)
2590 IF relevant1=TRUE THE
N PROCadd(X1$,Y1$)
2600 PROCrel(X2$,Y2$)
2610 IF relevant1=TRUE THE
N PROCadd(X2$,Y2$)
2620 PROCkey
2630 PROCcard(ASCX1$-64,VA
LY1$,2)
2640 PROCcard(ASCX2$-64,VA
LY2$,2)
2650 ENDPROC
2660 DEF PROCpair
2670 SOUND1,2,4,15
2680 PAIR=TRUE
2690 pairsX=pairsX+1
2700 IF comp=TRUE THEN mys
coreX=myscoreX+1 ELSE yours
coreX=yourscoreX+1
2710 PROCstat
2720 IF pairsX=26 THEN PRO
Cend
2730 PROCsub(X1$,Y1$)
2740 PROCsub(X2$,Y2$)
2750 PROCkey
2760 PROCcard(ASCX1$-64,VA
LY1$,0)
2770 PROCcard(ASCX2$-64,VA
LY2$,0)
2780 ENDPROC
2790 REM the game has ende
d
2800 DEF PROCend
2810 PRINTTAB(10,0);"GAME
OVER"
2820 IF myscoreX>yourscore
X PRINT"I WIN":NX=NX+1 ELSE
IF myscoreX<yourscoreX PRI
NT"YOU WIN":NX=NX+1 ELSE PR
INT"IT'S A DRAW"
2830 PROCkey
2840 CLS
2850 PRINTTAB(10,10);"Your
score ";yourscoreX
2860 PRINTTAB(10);"My scor
e ";myscoreX
2870 PRINTTAB(0,15);"and i
n games:"
2880 PRINTTAB(15,10);"YOU
";NX
2890 PRINTTAB(15,19);"ME
";MY
2900 PRINTTAB(0,25);"Do yo
u want another game? (Y/N)"
2910 REPEAT:A$=GET$:UNTIL
A$="Y" OR A$="N"
2920 IF A$="Y" THEN RUN EL
SE END
2930 ENDPROC
2940 REM your move
2950 DEF PROCyourmove
2960 REPEAT
2970 PRINTTAB(10,24);"firs
t move ";
2980 REPEAT:X1%=GET$:UNTIL
X1%="A" AND X1%<="M":PRIN
T TAB(23,24);X1$;
2990 REPEAT:Y1%=GET$:UNTIL
Y1%="1" AND Y1%<="4":PRIN
TY1$
3000 PROCto(ASCX1$-64,VALY
1$)
3010 UNTIL LEN A$(Z)>0
3020 PROCcard(ASCX1$-64,VA
LY1$,3)
3030 PROCvalue(ASCX1$-64,V
ALY1$,A$(Z))
3040 REPEAT
3050 REPEAT
3060 PRINTTAB(10,25);"seco
nd move ";
3070 REPEAT:X2%=GET$:UNTIL
X2%="A" AND X2%<="M":PRIN
T TAB(23,25);X2$;
3080 REPEAT:Y2%=GET$:UNTIL
Y2%="1" AND Y2%<="4":PRIN
TY2$
3090 PROCto(ASCX2$-64,VALY
2$)
3100 UNTIL LEN A$(Z)>0
3110 UNTIL X1$(<>)X2$ OR Y1$
(<>)Y2$
3120 PROCcard(ASCX2$-64,VA
LY2$,3)
3130 PROCvalue(ASCX2$-64,V
ALY2$,A$(Z))
3140 PRINTTAB(0,24);STRING
$(80," ")
3150 ENDPROC
3160 REM number on left is
the level
3170 REM the other is the
number of
3180 REM cards the compute
r can hold
3190 REM in memory simulta
neously at
3200 REM that level
3210 DATA 1,6
3220 DATA 2,8
3230 DATA 3,10
3240 DATA 4,14
3250 REM error handling, e
sp. ESCAPE
3260 MODE6
3270 IF ERR(<>)17 THEN REPOR
T:PRINT" at line ";ERL
3280 END

```

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

Notebook



THIS month Notebook looks at the way VDU24 can be used to create a series of graphics windows.

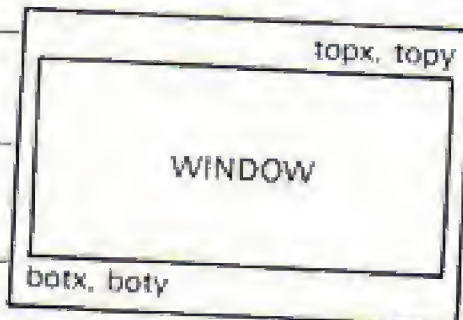


Figure 1: Graphics window

- 10,20 The usual REM statements identifying the program.
- 30,40 Change the mode and switch off the flashing cursor.
- 50-70 A FOR...NEXT loop which repeats eight times using the control variable *swap*.
- 60 Uses VDU19 to change the flashing colours (actual colour numbers 8 to 15) to steady colours.
- 80-120 A FOR...NEXT loop with control variable *colour* which cycles 15 times.
- 90 Calculates the coordinates of the bottom left corner of the graphics window (see Figure 1).
- 100 Figures out the coordinates of the top right corner.
- 110 Calls PROCwindow, giving it the parameters in the brackets, which have been worked out in the previous two lines. Since these values depend on the value of *colour* they will be different each time round the loop. This means that fifteen different windows will be defined.
- 130 Calls PROCgrid which uses the graphics commands DRAW and MOVE to draw a grid.
- 140 This endless REPEAT...UNTIL loop just keeps the prompt (>) from reappearing.
- 150-190 PROCwindow
- 160 Defines a graphics window using VDU24. The following parameters define the position of its corners. Notice the semicolons between them.
- 170 Uses GCOL0 to redefine the background colour.
- 180 Has CLG clearing the graphics window to this new background colour. Notice that only the present window is affected.
- 200-300 PROCgrid. This uses the by now familiar MOVE and DRAW commands to put a black grid on the screen. Notice that while the coordinates seem to cover the whole screen with lines, only the part inside the final graphics window appears.

Loops 15 times calculating coordinates

Defines window

Chooses black

Swaps steady colours for flashing ones

Calls final procedure

Sets background colour

Draw vertical lines

Draw horizontal lines

```

10 REM Windows and Grids
20 REM Ivan Clarke
30 MODE 2
40 VDU23,1,0;0;0;0;
50 FOR swap=8 TO 15
60 VDU 19, swap, swap-8, 0,
  0, 0
70 NEXT swap
80 FOR colour=1 TO 15
90 bx=50+(colour-1)*30:b
  y=bx
100 tx=120-(colour-1)*30
  ty=100-(colour-1)*30
110 PROCwindow(bx,by,tx,t
  y,colour)
120 NEXT colour
130 PROCgrid
140 REPEAT UNTIL FALSE
150 DEF PROCwindow(botx,b
  oty,topx,topy,colour)
160 VDU 24,botx;boty;topx
  ;topy;
170 SCOL 0,128+colour
180 CLG
190 ENDPROC
200 DEF PROCgrid
210 SCOL 0,0
220 FOR x=0 TO 1279 STEP
  64
230 MOVE x,0
240 DRAW x,1023
250 NEXT x
260 FOR y=0 TO 1023 STEP
  32
270 MOVE 0,y
280 DRAW 1279,y
290 NEXT y
300 ENDPROC
  
```

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



Based on the style of the classic computer adventures – but written so that even small children can learn to find their way around, encouraged by colourful graphics and exciting sound effects.

The pack contains a 48-page full colour storybook **PLUS** a full length multi-location adventure on cassette for only

£8.95! post free

Read the book
– then play
the game!



Please send me the complete Magic Sword pack containing storybook and cassette to:

Name _____

Address _____

- I enclose my cheque for £8.95 payable to Database Publications
 Or debit my Access/Visa card:

No. _____

Signed _____

SEND TO: Adventure offer, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY

Join in the farmyard fun!

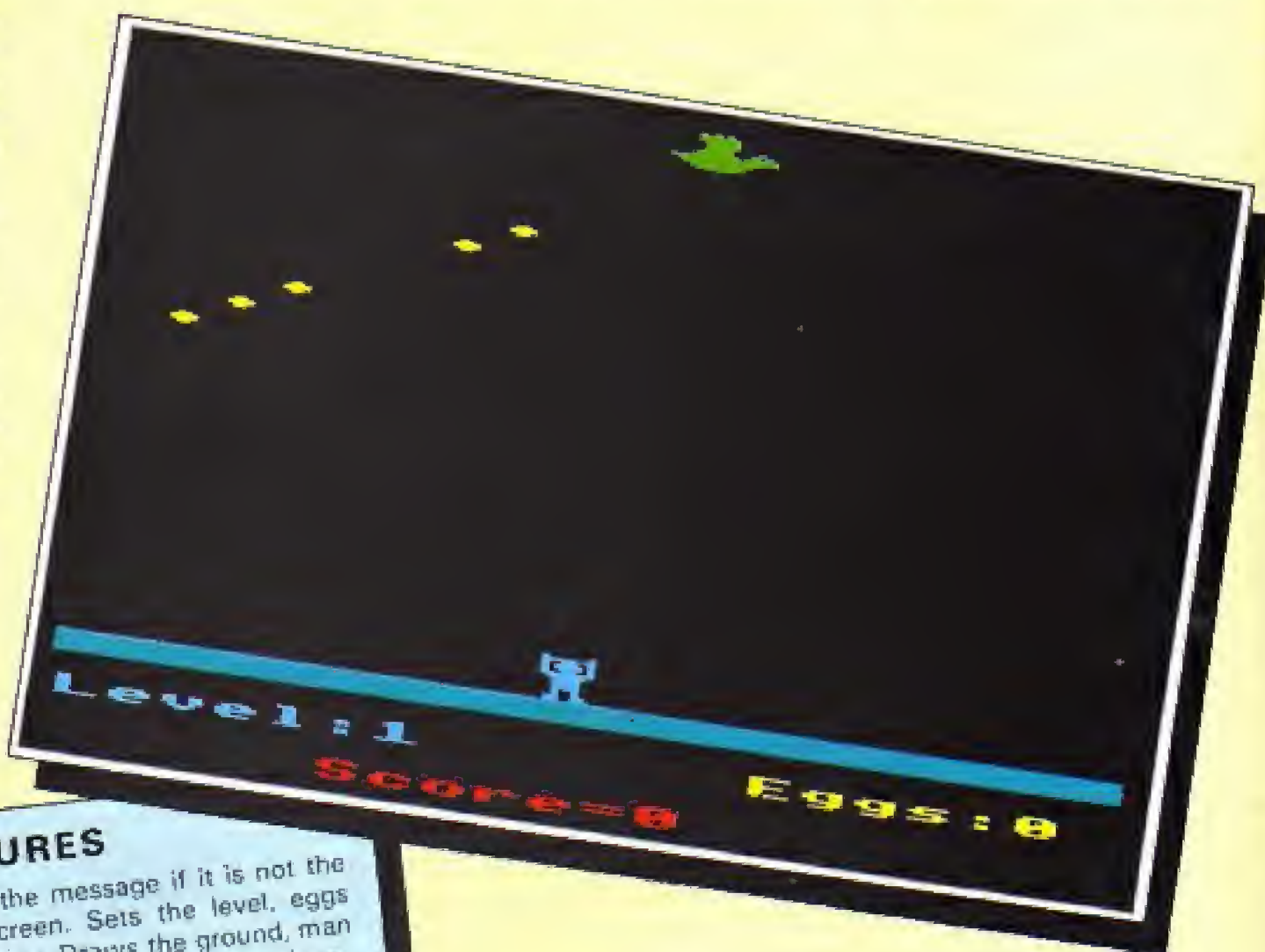
... and have a smashing time in this eggstra special game by ROLAND WADDILOVE

OLD farmer Brown has been having a spot of trouble with his chickens lately – they just will not stay still while he collects the eggs.

The birds fly to and fro, the eggs ending up everywhere.

Can you help him catch the eggs as they drop?

If you manage to catch 50 or more before the chicken reaches the bottom you move on to the next level, where everything moves faster.



PROCEDURES

PROCstart

Prints the message if it is not the first screen. Sets the level, eggs and delay. Draws the ground, man and bird. Sets the start positions. Defines the envelope and characters for the egg and ground. Sets the level, score and eggs to their initial values.

PROCinitialise

Assembles a short machine code routine to move the eggs, man and bird.

PROCassemble

Checks if keys are pressed, calls code to move the man.

PROCman

Moves the chicken to the right. If at the end of the line, move to the start of the next.

PROCbird

If there is an egg then calls the code to move it. Erases it if it is at the bottom.

PROCegg

Prints the final score and asks if you want to play again.

PROCanother

Prints the instructions.

PROCinstructions

VARIABLES

T%

Time delay.

E%

Eggs collected.

level

Level.

S%

Score.

X%,Y%

Chicken's coordinates.

Z%

Man's coordinates.

I%,J%

Loop counters.

C%,D%

Pointer to coordinates of eggs.

mm

Address of code to move man.

mb

Address of code to move bird.

me

Address of code to move eggs.



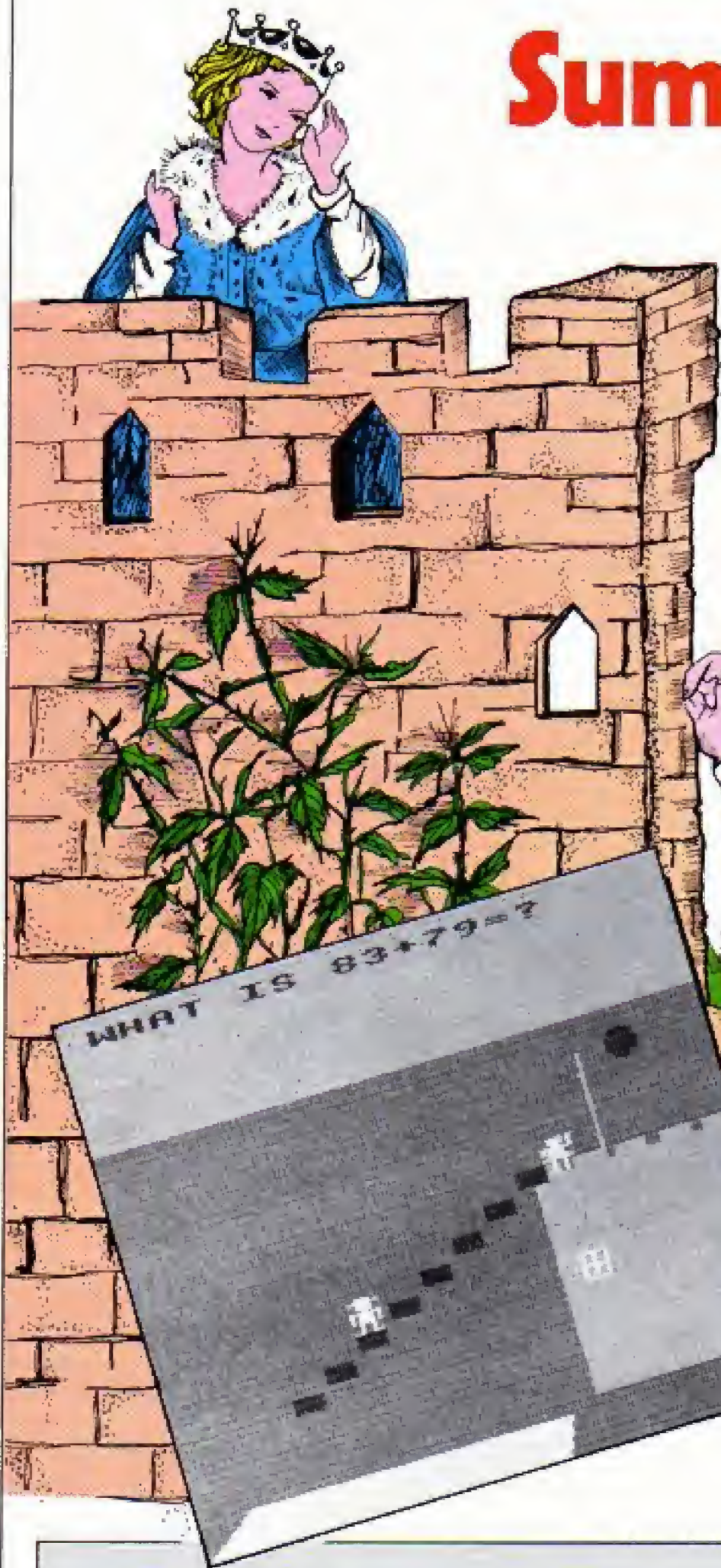
```

10 REM *****CATCHER****
*
20 REM *For Electron Use
r*
30 REM *By R.A.Waddilove
*
40 ON ERROR PROCerror
50 PROCassemble
60 PROCinitialise
70 MODE 1:VDU 23,1,0;0;0
;0;
80 PROCinstructions
90 MODE 2:VDU 23,1,0;0;0
;0;
100 REPEAT
110 REPEAT
120 PROCstart
130 REPEAT
140 TIME=0:PROCman:PROCbi
rd
150 REPEAT UNTIL TIME>TX
160 TIME=0:PROCman
170 FOR IX=1 TO 5
180 IF IX<CX(255) PROCegg
190 NEXT
200 REPEAT UNTIL TIME>TZ
210 UNTIL YI=20
220 UNTIL EX<50
230 PROCanother
240 UNTIL INSTR("Nn",GET$
)
250 MODE 6
260 END
270
280 DEF PROCstart
290 VDU 7
300 IF EX>0 COLOUR 11:COL
OUR 140:PRINT TAB(2,5):"CON
GRATULATIONS":COLOUR 12:COL
OUR 139:PRINT TAB(0,10):"Le
vel ";level+1;" coming up !
":TIME=0:REPEAT UNTIL TIME>
500
310 TX=20-level*2:SI=SZ+1
0*EZ
320 level=level+1:EX=0
330 VDU 19,8,RND(6);0;19.
9,RND(6);0;
340 COLOUR 120:CLS
350 COLOUR 2:COLOUR 129
360 PRINT TAB(0,27):STRIN
6$(20,CHR$225)
370 COLOUR 128:COLOUR 6
380 PRINT TAB(0,29):"Leve
l:";level
390 COLOUR 1
400 PRINT TAB(5,31):"Scor
e=";SI;
410 COLOUR 3
420 PRINT TAB(13,29):"Egg
s:0"
430 IX=0:YI=level:REM bir
d x,y coord.
440 RESTORE
450 FOR IX=0 TO 1:FOR JX=
0 TO 63:READ data:?(&3800+(
YI+IX)*640+JX)=data:NEXT:NE
XT
460 IX=9:REM man x coordi
nate
470 FOR IX=0 TO 1:FOR JX=

```

Turn to Page 56

Sum way to rescue a damsel!



HAVE you ever fancied yourself as a handsome prince, rescuing a damsel in distress from the castle where she's imprisoned?

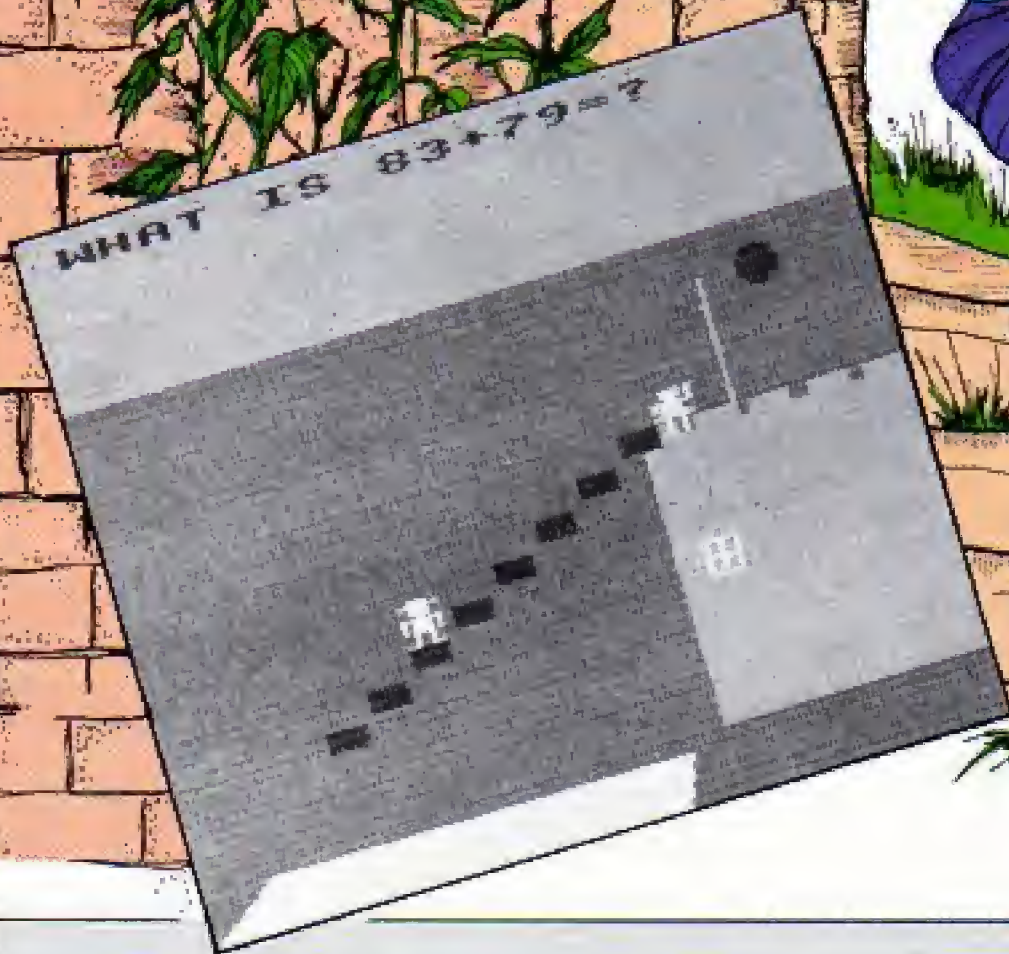
ANDREW GARDINER's

program, Education Castle, lets you find out just how successful you would be.

Can you answer the questions correctly and reach the top of the steps? Or are you bad at sums and due for a ducking?

Either way it's a great way to practice simple sums.

Now all we need is a game about frogs and princesses . . .



```
10 REM EDUCATION CASTLE
11 REM BY ANDREW GARDINER
12 REM (C) ELECTRON USER

20 ENVELOPE1,1,35,55,155,
255,155,1,126,0,0,-126,126,1
26:ENVELOPE2,1,10,10,10,230,
230,230,126,0,0,-126,126,126
:SOUND1,2,100,100:ENDZ=0:MOD
E1:PROCTITLE:MODE2:VDU23,1,0
:0:0:0:;PROCVAR:PROCSCREEN:P
ROCACTUALGAME
```

```
30 DEF PROCSCREEN
40 BCOL 0,134:CLG
50 BCOL0,4:MOVE0,0:MOVE77
0,0:PLOT85,50,75:PLOT85,800,
75
60 BCOL 0,2
70 MOVE 770,0:MOVE 800,0:
PLOT85,800,100:PLOT85,1279,0
:PLOT85,1279,100
80 BCOL 0,5:MOVE 850,500:
MOVE 1279,500:PLOT 85,850,10
0:PLOT 85,1279,100
```

```
90 VDU 23,224,255,255,255
,255,255,255,255,255
100 FOR I=850 TO 1279 STEP
90
110 MOVE I,520:VDU5:VDU224
:NEXT I
120 BCOL0,2:MOVE0,0:MOVE0,
200:PLOT85,300,200
130 BCOL0,1:MOVE 1000,500:
DRAW1000,700
140 VDU 23,225,61,61,61,25
,255,188,252,60:VDU 23,226,1
```

```
26,255,36,36,36,36,36,36
150 WOM#=CHR$225+CHR$8+CHR
$10+CHR$226
160 VDU 23,229,60,255,60,6
0,60,24,255,189:VDU23,230,18
9,189,189,36,36,36,36,231:MA
N#=CHR$229+CHR$8+CHR$10+CHR$
230
170 BCOL0,4:MOVE 880,565:V
DU5:PRINTWOM#
180 BCOL0,0:MOVE 100,265:V
DU5:PRINTMAN#
```

```

190 MOVE 1180,100:MOVE 127
9,100:BCOLO,1:PLOT85,1180,30
0:PLOT85,1279,300
200 BCOL 0,4:MOVE900,300:D
RAW950,300:DRAW950,350:DRAW9
00,350:DRAW900,300:MOVE925,3
00:DRAW925,350:MOVE900,325:D
RAW950,325
210 GCOL0,3:FOR I=700+30 T
O 700-30 STEP -4
220 J=SOR(ABS(30+30-(I-700
1*(I-700)))
230 MOVE 1100-J,1:DRAW 110
0+J,1:NEXT I
240 PROCBRICK
250 VDU 28,0,7,19,0
260 VDU 4
270 COLOUR 129:COLOUR 7:CL
S
280 ENDPROC
290 DEF PROCTITLE
300 VDU 19,0,4,0,0,0:COLOU
R 128:COLOUR 3:CLS
310 VDU 23,1,0,0,0,0:PRIN
TTAB(11,5)*"W E L C O M E"
320 PRINTTAB(16,10)*"T O"
330 PRINTTAB(3,20)*"E D U C
A T I O N C A S T L E"
340 PRINTTAB(11,28)*"by A.G
ardiner."
350 COLX=0
360 VDU 19,7,COLX,0,0,0,0
370 COLX=COLX+1
380 IF COLX=8 THEN GOTO 42
0 ELSE IF COLX=4 THEN COLX=5
390 SOUND 1,1,100,25
400 FOR xZ=0 TO 300:NEXT x
Z
410 GOTO 360
420 COLOUR 7:CLS
430 PRINTTAB(10,1)*"Educati
on Castle."
440 PRINTTAB(0,4)*"CAN YOU
ANSWER THE QUESTIONS CORRECT
LY?":COLOUR 2:PRINT:PRINT*AN
D RESCUE THE PRINCESS BY CLI
MBING A*:PRINT:COLOUR 7:PRIN
T*BRIDGE OVER TO THE CASTLE?
IF YOU CAN*:COLOUR 2:PRINT:
PRINT*THEN ENTER YOUR SKILL
LEVEL AND PLAY*
450 COLOUR 7:PRINT:PRINT*A
WAY."
460 PRINTTAB(1,15)*"Please
enter your skill level (1-99
)":PRINTTAB(1,19)*"THEN PRESS

```

```

":COLOUR 131:COLOUR0:PRINTTA
B(12,19)*"RETURN"
470 COLOUR 128:COLOUR 3
480 *FX15,1
500 SKILLX=0
510 INPUT TAB(20,22)**SKIL
L#:IF LEN SKILL#>2 THEN PRIN
T TAB(20,22):STRING#(91," ")
:PRINTTAB(20,22):STRING#(3,"
"):GOTO490:IF SKILL#="" THE
N 490 ELSE SKILLX=VAL SKILL#
520 REM IF SKILLX<1 OR SKI
LLX>99 THEN PRINT TAB(21,20)
:" ":GOTO 490
521 IF SKILLX<1 OR SKILLX>
99 THEN PRINT TAB(21,20):STR
ING#(9," "):GOTO 490
530 PRINTTAB(9,29)"Now let
's start"
540 TIME=0:REPEAT:SOUND1,2
,100,2:UNTIL TIME>200
550 ENDPROC
560 DEF PROCACTUALGAME
565 VDU 23,1,0,0,0,0:
570 QUEX=INT RND(SKILLX):q
ueX=INT RND(SKILLX)
580 PRINT TAB(1,1):"WHAT I
S ":QUEX:"+":queX:"=":
590 ansZ=0
600 *FX15,1
610 INPUT ans#:IF LEN ans#
>4 THEN PRINTTAB(0,0):STRING#
(151," "):GOTO 590 ELSE ansZ
=VAL ans#
620 IF ansZ=QUEX+queX THEN
PROCcorrect ELSE PROCwrong
630 IF endZ=0 THEN GOTO 57
0 ELSE RUN
640 DEF PROCcorrect
650 VDU4:PRINT TAB(1,4):"Y
OU ARE CORRECT !"
660 SOUND 1,-15,33,3:SOUND
1,-15,49,3:SOUND 1,-15,61,3
:SOUND 1,-15,33,3:SOUND 1,-1
5,49,3:SOUND 1,-15,61,3:SOUN
D 1,-15,33,3:SOUND 1,-15,49,
3:SOUND 1,-15,61,3:SOUND 1,0
,61,7:SOUND 1,-15,61,3:SOUND
1,0,61,3:SOUND 1,-15,61,3:S
OUND 1,-15,49,3
670 SOUND 1,0,49,3:SOUND 1
,-15,33,3
680 MOVE ACROSSX,UPX:VDU5:
GCOL0,6:PRINTMAN#
690 ACROSSX=ACROSSX+80

```

```

700 IF ACROSSX>=260 THEN U
PX=UPX+40
710 IF ACROSSX=820 AND UPX
=585 THEN MOVE 820,585:VDU 5
:GCOL0,0:PRINTMAN#:PROCend:EN
DPROC
720 MOVE ACROSSX,UPX:VDU5:
GCOL0,0:PRINTMAN#
730 VDU4:PRINT TAB(1,4):"Y
OU ARE CORRECT !":FOR tyrZ=0
TO 400:NEXT tyrZ
740 VDU4:CLS
750 ENDPROC
760 DEF PROCVAR
770 ACROSSX=100
780 UPX=265
790 ENDPROC
800 DEF PROCwrong
810 SOUND 1,-15,100,2:SOUN
D 1,-15,90,2:SOUND 1,-15,80,
2:SOUND 1,-15,70,2:SOUND 1,-
15,60,2:SOUND 1,-15,50,2:SOU
ND 1,-15,40,2:SOUND 1,-15,30
,2:SOUND 1,-15,20,2:SOUND 1,
-15,10,3:SOUND 1,-15,0,5
820 CLS
830 IF ACROSSX<=265 OR ACR
OSSX)=740 THEN 840 ELSE PROC
FALL:PROCBRICK
840 GCOL0,6:MOVE ACROSSX,U
PX:VDU5:PRINTMAN#:GCOL0,0:MO
VE 100,265:VDU5:PRINTMAN#
850 VDU4
860 PRINT TAB(1,3)*"YOU ARE
WRONG!":TAB(1,5)*"It should
have been"TAB(9):QUEX+queX
870 TIME=0:REPEAT
880 UNTIL TIME>300
890 CLS
900 PROCVAR:ENDPROC
910 DEF PROCBRICK
920 MOVE 260,240:VDU5:VDU2
24
930 MOVE 340,280:VDU5:VDU2
24
940MOVE 420,320:VDU5:VDU22
4
950MOVE 500,360:VDU5:VDU22
4
960MOVE 580,400:VDU5:VDU22
4
970 MOVE 660,440:VDU5:VDU2
24
980MOVE 740,480:VDU5:VDU22
4
990MOVE 820,520:VDU5:VDU22

```

```

4
1000 ENDPROC
1010 DEF PROCFALL
1020 MOVE ACROSSX,UPX
1030 FOR FALLX=UPX TO 45 ST
EP -15
1040 MOVE ACROSSX,FALLX:GCO
L 0,0:VDU5:PRINTMAN#
1050 GCOL0,6:MOVE ACROSSX,F
ALLX:SOUND 1,-15,FALLX/3,1:V
DU5:PRINTMAN#
1060 NEXT FALLX
1070 GCOL0,4:MOVE0,0:MOVE75
0,0:PLOT85,120,75:PLOT85,770
,75:GCOL0,3:PROCBRICK
1080 FOR fdX=29 TO 1 STEP -
2:SOUND1,-15,fdX,1:NEXT fdX:
ENDPROC
1090 DEF PROCend
1100 FOR sdX=254 TO 0 STEP
-8:SOUND 1,-15,sdX,1:NEXT sd
X
1110 GCOL0,0:CLG
1120 GCOL0,5:MOVE 300,0:MOV
E 1279,0:PLOT85,300,500:PLOT
85,1279,500:FOR briX=300 TO
1279 STEP 90:MOVE briX,530:V
DU5:VDU224:NEXT briX
1130 GCOL0,1:MOVE 600,530:D
RAW 600,800
1140 SOUND 1,-15,100,3:SOUN
D1,-15,105,3:SOUND 1,-15,100
,3
1150 MOVE 350,500:GCOL0,4:D
RAW 350,600:MOVE 430,500:DRA
W430,600:MOVE 450,600:DRAW33
0,600
1160 PLOT85,390,650:PLOT85,
450,600
1170 GCOL0,2:MOVE 415,620:M
OVE 360,620:PLOT85,415,700:P
LOT85,360,700
1180 XZ=390:YZ=715:RZ=25
1190 GCOL0,3:FOR IX=YZ+RZ T
O YZ-RZ STEP -4
1200 JX=SOR(ABS(RZ+RZ-(IX-Y
X)+(IX-YX))):MOVE IX-JX,IX:D
RAW IX+JX,IX:SOUND1,-15,IX+Y
Z,1:NEXT
1210 GCOL0,4:PLOT69,380,720
:PLOT69,400,720
1220 GCOL0,3:MOVE 0,400:VDU
5:SOUND 1,-15,0,3:VDU224:MOV

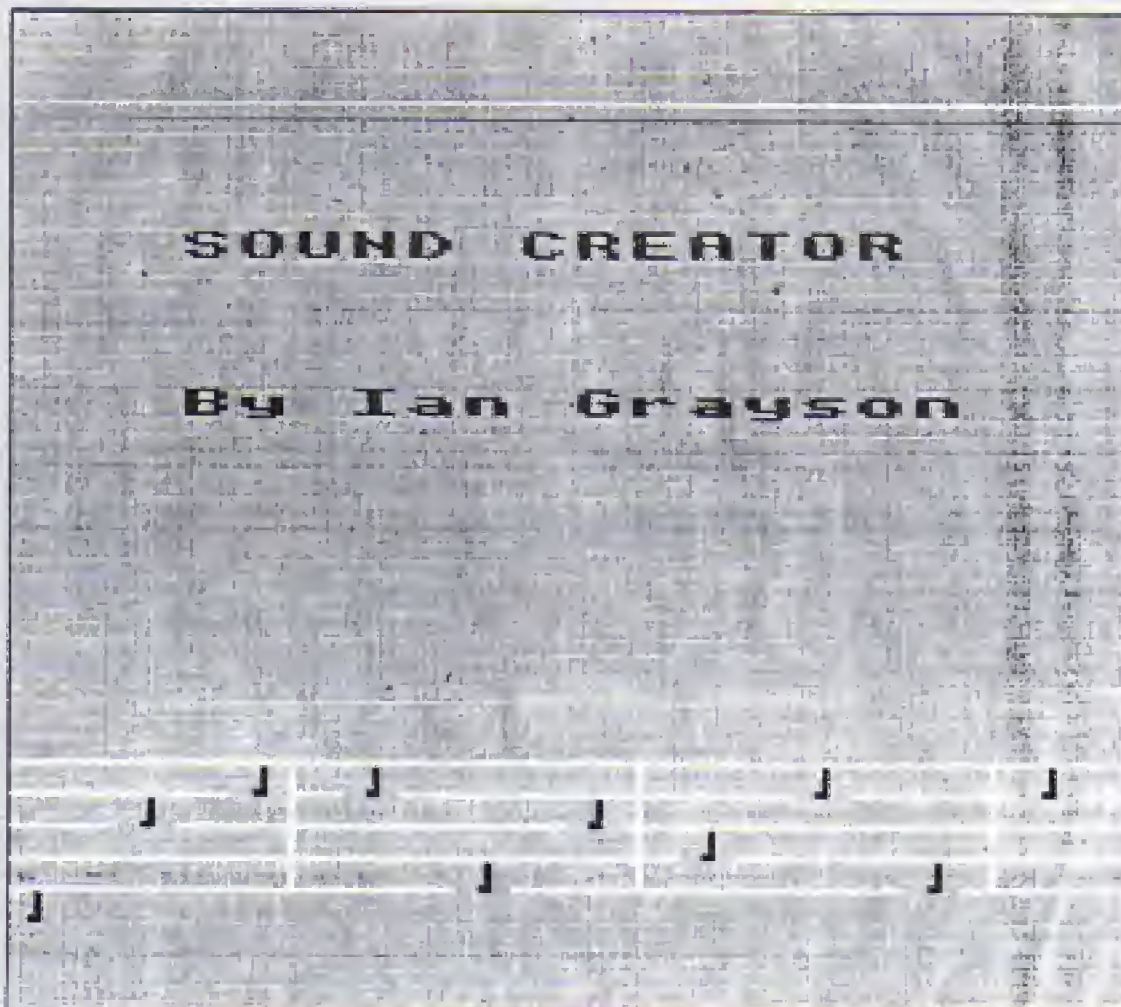
```

Turn to Page 59

IF you've been following Nigel Peters' articles on sound but are too busy or too lazy to work it all out for yourself, then Sound Creator is the program for you.

Written by IAN GRAYSON of Wakefield, this menu-driven utility has the Electron producing noises using random SOUNDS and ENVELOPES.

When you hear something you like the program will display all the necessary parameters for you to recreate them in your own programs.



```

10 REM SOUND CREATOR
20 REM By Ian Grayson
30 REM (C)ELECTRON USER
40 REM MAIN LOOP
50 A=0:Q=2
60 MODE2
70 VDU23;B202;0;0;0;
80 PROCTITLE
90 MODE1
100 VDU23;B202;0;0;0;
110 PROCMENU
120 REM PROCEDURES
130 REM The Menu
140 DEFPROCMENU,
150 VDU19,0,4;0;
160 CLS
170 PRINTTAB(17,4)"MENU"
180 PRINTTAB(7,7)"1. SELE
CT CHANNEL"
190 PRINTTAB(7,9)"2. GENE
RATE SOUND"
200 PRINTTAB(7,11)"3. INS
PECT ENVELOPE VALUES"
210 PRINTTAB(7,13)"4. REP
EAT LAST SOUND"
220 PRINTTAB(13,20)"ENTER
CHOICE?"
230 A$=GET$
240 IFA$="1" THEN PROCCHA
NNEL
250 IFA$="2" THEN PROCGEN
ERATE
260 IFA$="3" THEN PROCVAL
UES

```

```

270 IFA$="4" THEN PROCREP
EAT
280 GOTO230
290 ENDPROC
300 REM Repetition of gen
erated sound
310 DEFPROCREPEAT
320 CLS
330 PRINTTAB(5,12)"PRESS
SPACE TO RETURN TO MENU"
340 IFA=0 AND Q=2 THEN PR
OCMENU
350 SOUND0,1,P,255
360 IFA$=" " THEN PROCFLU
SH
370 A$=INKEY$(1000)
380 GOTO350
390 ENDPROC

```

```

400 REM Generate the soun
d
410 DEFPROCGENERATE
420 IFQ=2 THEN PROCMENU
430 CLS:PRINTTAB(10,12)"P
RESS SPACE TO STOP"
440 A=RND(128):B=RND(128)
:C=RND(128):D=RND(255):E=RN
D(255):F=RND(255)
450 ENVELOPE1,0,A,B,C,D,E
,F,126,0,0,-126,126,126
460 IFP>7 THEN P=100
470 SOUND0,1,P,50
480 IFA$=" " THEN PROCFLU
SH
490 A$=INKEY$(500)
500 GOTO440
510 ENDPROC
520 REM Envelope values
530 DEFPROCVALUES
540 CLS
550 IFA=0 THEN PROCMENU

```

PROCEDURES

PROCMENU

Prints out the menu and asks for your choice. It then goes to the chosen procedure.

PROCCHANNEL

Asks for the sound channel. If 0 is chosen then the pitch value is then asked for.

PROCGENERATE

Generates the random sound and returns to the menu. Displays all the needed values (SOUND, ENVELOPE).

PROCVALUE

Repeats the generated sound. Draws out the title page.

PROCREPEAT

Flushes all buffers to stop the sound when not wanted.

PROCTITLE

PROCFLUSH

VARIABLES

A\$ Reads the keyboard buffer.
A-F Random ENVELOPE values.
Q Sound channel (0 or 1).
P Pitch value (100 or 0-7).

```

560 PRINTTAB(12,10)"SOUND
";B;",";P;",";100"
570 PRINTTAB(7,12)"ENV.1,
0, ";A;",";B;",";C;",";D;",";
";E;TAB(7,14)";F;",";126,0,0
,-126,126,126"
580 PRINTTAB(6,22)"PRESS
SPACE TO RETURN TO MENU"
590 IFA$=" " THEN PROCHEM
U
600 A$=INKEY$(500)
610 GOTO590
620 ENDPROC
630 REM Choose the sound
channel
640 DEFPROCCHANNEL
650 CLS
660 PRINTTAB(10,12)"WHICH
CHANNEL (0/1)"
670 A$=INKEY$(0)
680 IFA$="0" THEN Q=0:GOT
O 710
690 IFA$="1" THEN Q=1:P=1
OO:PROCHEM
700 GOTO670
710 CLS
720 PRINTTAB(6,12)"WHICH
PITCH VALUE (0-7)"

```

```

MENU
1. SELECT CHANNEL
2. GENERATE SOUND
3. INSPECT ENVELOPE VALUES
4. REPEAT LAST SOUND
ENTER CHOICE?

```

```

730 A$=GET$
740 IFA$="0" THEN P=0:PRO
CMENU
750 IFA$="1" THEN P=1:PRO
CMENU
760 IFA$="2" THEN P=2:PRO
CMENU
770 IFA$="3" THEN P=3:PRO
CMENU
780 IFA$="4" THEN P=4:PRO
CMENU
790 IFA$="5" THEN P=5:PRO
CMENU
800 IFA$="6" THEN P=6:PRO
CMENU
810 IFA$="7" THEN P=7:PRO

```

```

CMENU
820 GOTO730
830 ENDPROC
840 REM Title page
850 DEFPROCTITLE
860 COLOUR129:CLS:COLOUR1
I
870 PRINTTAB(3,7)"SOUND C
REATOR"
880 COLOUR7
890 PRINTTAB(3,12)"By Ian
Grayson"
900 VDU23,239,B,B,B,B,B,B
,24,24
910 GCOL0,0
920 FORI=256TO128STEP-32

```

```

930 MOVE0,I
940 DRAW1279,I
950 NEXT
960 FORI=0TO18STEP2
970 Y=23+RND(5)
980 PRINTTAB(X,Y)CHR$(239
)
990 NEXT
1000 FORI=320TO1120STEP400
1010 MOVEI,256
1020 DRAWI,128
1030 NEXT
1040 TIME=0
1050 IFTIME=700 THENENDPRO
C
1060 GOTO1050
1070 ENDPROC
1080 REM Stop sound by flu
shing all buffers
1090 DEFPROCFLUSH
1100 *FX15
1110 PROCHEM
1120 ENDPROC

```

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

EPIC ADVENTURES...EPIC ADVENTURES...EPIC ADVENTURES...EPIC ADVENTURES...EPIC ADVENTURES



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"Having now tried all the Epic Adventures, they must be the yardstick by which all other adventures for the Electron should be judged."
ELECTRON USER

"The Wheel of Fortune for the BBC and Electron is a highly-recommended state-of-the-art adventure."
SHIELDS GAZETTE

"This has to be the adventure of 1984. It really is superb."
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.....qty THE KINGDOM OF KLEIN	£7.95	£9.95	No Graphics on Electron

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EPIC ADVENTURES...EPIC ADVENTURES...EPIC ADVENTURES...EPIC ADVENTURES...EPIC ADVENTURES

GOIN' FASTER THAN A ROLLER COASTER

COASTER is a short graphics routine which runs in Mode 1, drawing a spiral which curves in three dimensions.

Next it gives the impression of movement, creating what looks like a moving conveyor belt or roller coaster.

Lines 40 to 150 draw the spiral. They do this by drawing a damped cosine curve 20 times across the screen.

Each curve is drawn a few pixels to the right of the previous one. The size of the oscillations decreases as the waveform proceeds.

The curve is drawn in three colours - white, yellow and red - on a black background.

It gives a picture that looks like a striped football scarf.

The final section of the program - lines 160 to 220 - consists of a continuous

loop which uses the VDU 19 command to animate the image.

As the program stands, the roller coaster effect uses red and white colours. This can easily be changed by altering the relevant lines.

For example, for a blue and cyan roller coaster, make the following alterations:

```
180 VDU 19,E,6;0;  
200 VDU 19,E,4;0;
```

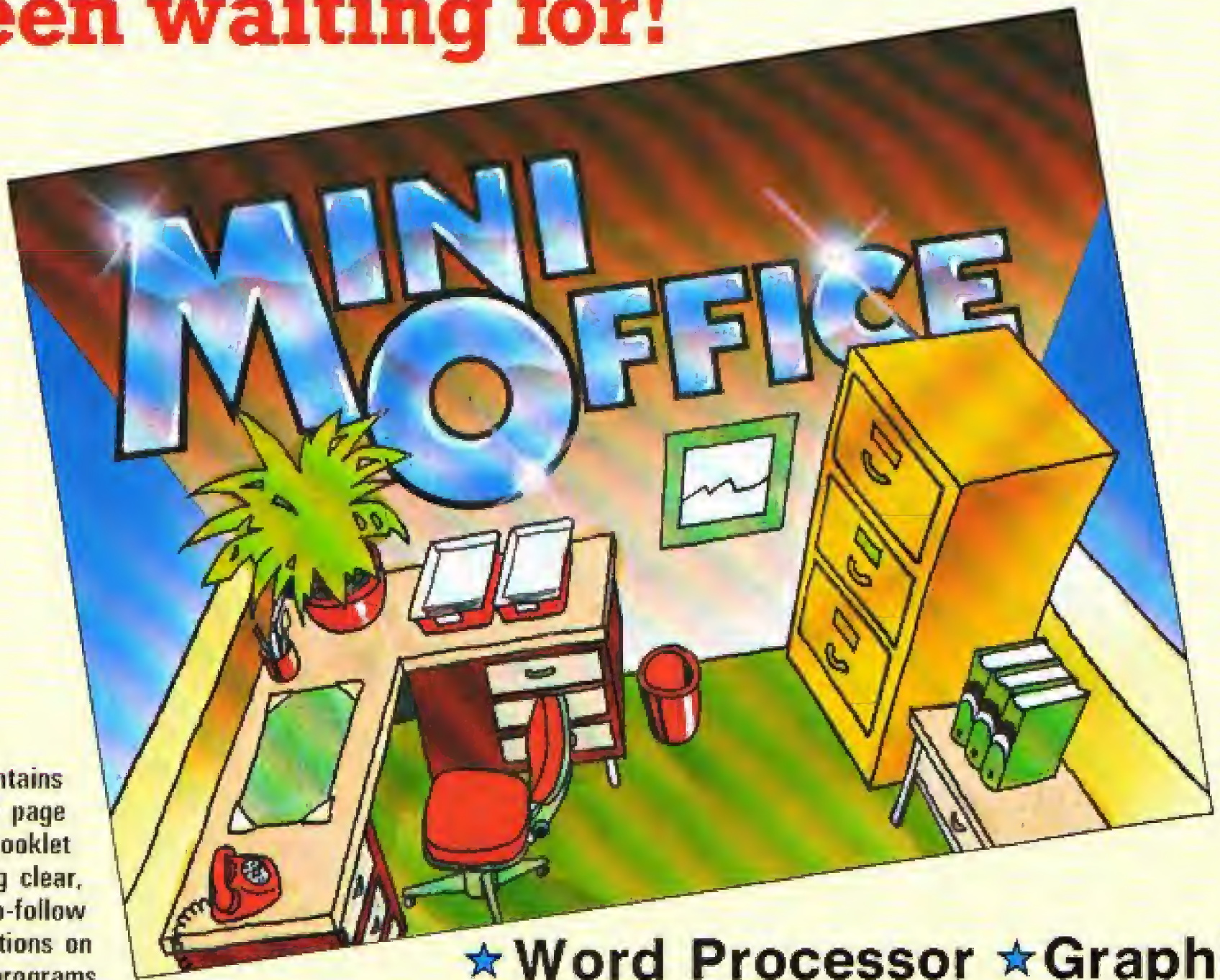
Using green and white or black and yellow also produces quite effective displays.

```
10 REM ***** COASTER  
   *****  
20 REM ***** By Jon Willingt  
   on ****  
30 REM *** (C)ELECTRON  
   USER ***  
40 MODE 1  
50 DEF FNx(X,E)=X*100+E  
60 DEF FNY(X,E)=COS (X)*  
   EXP (-X/8)*(500-E)+512  
70 X=16*PI /255  
80 FOR E=0 TO 180 STEP 10  
90 C=0  
100 MOVE 0,1023  
110 FOR X=K TO 4*PI STEP K  
120 C=C+1  
   :GCOL 0,C  
130 DRAW FNx(X,E),FNY(X  
   ,E)  
140 IF C=3  
   THEN C=0  
150 NEXT  
   :NEXT  
160 REPEAT  
170 FOR E=1 TO 3  
180 VDU 19,E,7;0;  
190 W=INKEY (5)  
200 VDU 19,E,1;0;  
210 NEXT  
220 UNTIL FALSE
```

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

Get yourself taken for a ride with JON WILLINGTON's clever graphics routine

Just what you've been waiting for!



Contains
32 page
booklet
giving clear,
easy-to-follow
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Word Processor: Ideal for writing letters and reports. There is a constant display of both time and word count, plus a words-per-minute display to encourage the budding typist! A unique feature is the double-size text option in both edit and printer mode – perfect for young children and people with poor vision.

Spreadsheet: Enables you to use your micro for home accounts or pocket money records. It creates a display of numbers in rows and columns. Continuous updating is possible, and a changed figure can be instantly reflected throughout the rest of the spreadsheet. Your results can be saved, to be used for future updates,

or can be fed into its associated program....

Graphics: Part of the spreadsheet section, it lets you draw bar charts, pie charts and histograms to give a graphic presentation of your figures.

Database: You use this for storing information, just like an office filing cabinet. Facts you have entered can be quickly retrieved by just keying in a word or part of a word. They can be sorted, replaced, saved for future use or printed out.

If you want to start doing more with your micro than just playing games, this package is your ideal introduction to the four most popular applications for professional computers. All the programs have been designed for simplicity, so even a child can use them. Easy, fully-detailed instructions are included.

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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 – our scrapbook – 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.



K.B. Turner is being friendly in a multi-coloured way

```

10 REM HELLO
20 REM K.B.TURNER
30 MODE 2
40 MOVE 415,399
50 GCOL 0,9
60 DRAW 864,399:DRAW 864
,624:DRAW 415,624:DRAW 415,
399
70 MOVE 479,431
80 GCOL 0,14
90 DRAW 800,431:DRAW 800
,592:DRAW 479,592:DRAW 479,
431
100 VDU 5
110 MOVE 416,623:FOR C=1
TO 6:GCOL 0,C:VDU 42:NEXT C
COL 0,1:VDU 42
120 FOR X=1 TO 6
130 MOVE 416,623-32*X:GCO
L 0,7-X:VDU 42
140 MOVE 800,623-32*X:GCO
L 0,X+1:VDU 42
150 NEXT X
160 MOVE 400,430:FOR C=6
TO 1 STEP -1:GCOL 0,C:VDU 4
2:NEXT
170 MOVE 401,527:VDU 72,6
9,76,76,79
180 MOVE 0,0
190 N=2
200 REPEAT
210 FOR C=1 TO 6
220 N=N+1
230 IF N>6 THEN N=1
240 VDU 19,N,C:0:0:
250 FOR I=1 TO 20:NEXT
260 NEXT C
270 N=N+1:IF N>6 THEN N=1
280 UNTIL FALSE
    
```

Trigonometry is OK, K.B. – but where's the wine?

```

10 REM WINE GLASS
20 REM K.B.TURNER
30 INPUT "COLOUR NUMBER",
C
40 MODE 4
50 VDU 23,1,0:0:0:0:
60 GCOL 3,7
70 VDU 19,7,C:0:0:
80 FOR A=1 TO 2*PI-1 STE
P 0.0522
90 MOVE 640+300*SIN(A),7
23+300*COS(A)
100 DRAW 640+50*SIN(A+0.9
*PI),400+COS(A+0.9*PI)
110 NEXT A
120 FOR A=0 TO 2*PI STEP
0.0522
130 MOVE 640+240*SIN(A),7
23+300*COS(2*PI-1)+20*COS(A
140 DRAW 640+50*SIN(A+PI/
2),400+COS(A+PI/2)
150 NEXT A
160 FOR A=0 TO 2*PI STEP
0.0522
170 MOVE 640+50*SIN(A),40
0+COS(A)
180 DRAW 640+50*SIN(A+0.9
*PI),150+COS(A+0.9*PI)
190 NEXT A
200 FOR A=0 TO 2*PI STEP
0.0522
210 MOVE 640+50*SIN(A),15
0+COS(A)
220 DRAW 640+150*SIN(A+PI
),50+20*COS(A+PI)
230 NEXT A
240 REPEAT UNTIL FALSE
    
```

COLOUR NUMBER?



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

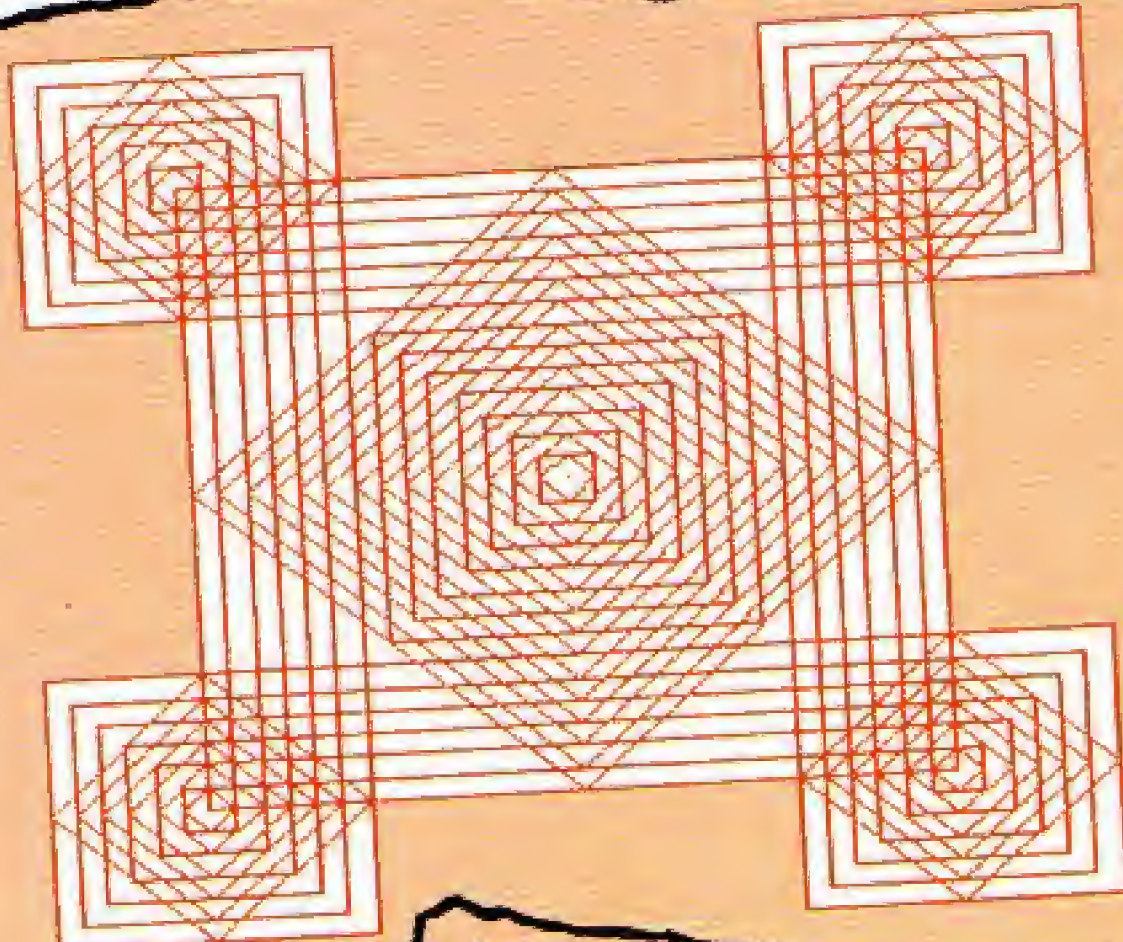
Sue Timms revisits January's Notebook program

```
10 REM ORIGINS REVISITED
20 REM NEIL CANTHORNE
30 REM ADDITONS BY SUE T
IMMS
```

```
40 MODE 1
50 VDU 23,1,0;0;0;0;
60 VDU 19,1,4,0,0,0
70 GCOL 0,1
80 VDU 29,640;512;
90 FOR radius= 0 TO 350
```

```
STEP 25
100 PROCwandala(radius)
110 NEXT radius
120 FOR repeat=1 TO 4
130 READ x,y
140 PROCoutside(x,y)
150 NEXT repeat
160 REPEAT UNTIL FALSE
170 DEF PROCoutside(x,y)
180 FOR radius= 0 TO 150
```

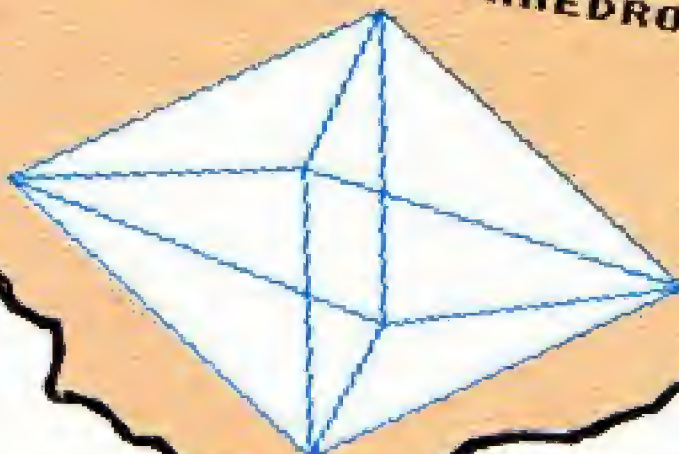
```
STEP 25
190 VDU 29,x;y;
200 MOVE x,y
210 PROCwandala(radius)
220 NEXT radius
230 ENDPROC
240 DEF PROCwandala(w)
250 MOVE 0,w
260 DRAW -w,0
270 DRAW 0,-w
280 DRAW w,0
290 DRAW 0,w
300 MOVE -w,w
310 DRAW -w,-w
320 DRAW w,-w
330 DRAW w,w
340 DRAW -w,w
350 ENDPROC
360 DATA 290,062,290,162,
990,062,990,162
```



MOVE, DRAW and SOUND combine in Piers Jarman's program

```
10 REM OCTAHEDRON
20 REM by PIERS JARMAN
25 REM EATON NR.GRANTHAM
30 MODE 1
40 COLOUR 1
50 VDU 23,1;0;0;0;0
60 MOVE 640,256;DRAW 688
70 DRAW 640,768;DRAW 592
80 DRAW 640,256;DRAW 960
90 DRAW 640,768;DRAW 320
100 DRAW 640,256;MOVE 688
110 DRAW 960,512;DRAW 592
120 DRAW 320,512;DRAW 688
130 PRINT TAB(9,4)"THIS IS AN OCTAHEDRON"
140 SOUND 1,-15,97,5
150 SOUND 1,-15,105,10
160 SOUND 1,-15,90,5
170 GOTO 140
180 END
```

THIS IS AN OCTAHEDRON



BE A RACE ACE

RACER gives you all the thrill of the race track as you use your Electron's keyboard to drive around the circuit.

The idea is to steer your car using the Z and X keys to go left and right respectively.

You gain points as you speed along, but you also lose them should you hit any of the white bollards that mark the track.

Also there are cars

coming towards you that you must avoid at all cost. Hit these head-on and you'll lose more points.

As if this isn't enough there are nine levels of play, with the track becoming longer and narrower on each level.

When you reach the finish the Electron will tell you your score and compare it with the high score.

Then it's off on the road again.

By
ALAN GRIFFITHS

```

10 REM RACER
20 REM BY ALAN GRIFFITHS
30 REM (C) ELECTRON USER
40 MODE 5
50 ON ERROR GOTO 120
60 PROCinit
70 *FX11,10
80 *FX12,10
90 PROCstart
100 REPEAT
    :PROCnew
    :UNTIL AZ>BX*100
    AND CX=7
    :REPEAT
    :PROCfinish
    :UNTIL DX=40
110 TIME =0
    :REPEAT UNTIL TIME =100
120 PROCscore
130 *FX 15
140 *FX12,0
150 PRINT TAB(0,10);*ANDTHE
    R GAME? (Y/N)*
160 A$=INKEY$ (200)
    :IF A$="" GOTO 160
170 IF A$="Y" RUN
180 MODE 6
    :END
190 DEF PROCcheck IF roadX(
    EX)>FX OR roadX(EX)+P1
    (=FX PROCcrash
    ELSE GX=GX+1
200 EX=EX+1
    :IF EX=19 EX=0
210 IF X2=17 AND YX=FX
    PROCcrash2
220 ENDPROC
230 DEF PROCcrash GX=GX-10
    :SOUND 0,-15,52,3
    :ENDPROC
240 DEF PROCcrash2 GX=GX-20
    :SOUND 1,-15,4,5
    :ENDPROC
250 DEF PROCnew
260 IF INKEY (-96)PRINT
    TAB(FX,13);" "
270 IF INKEY (-98)FX=FX-1
280 IF INKEY (-67)PRINT
    TAB(FX,13);" "
290 IF INKEY (-67)FX=FX+1
300 H2=RND(3)-2
    :CX=CX+H2
    :roadX(12)=CX
310 IF CX<=2 CX=CX+1
320 IF CX>=10 CX=CX-1
330 PRINT TAB(FX,13);
    CHR$ 241
340 PRINT TAB(CX,31);B$

```



```

350 PRINT TAB(FX,12);"
      "
360 PRINT TAB(FX,13);
      CHR# 241
370 PRINT TAB(0,0);"SCORE
      ";GX" TIME ";JX
380 IX=IX+1
      :IF IX=19 IX=0
390 IF GX=IX PROCcar
400 GX=GX+1
      :IF GX=16 PROCcheck
410 COLOUR 3
      :XX=IX+1
420 JX=TIME -JX
      :JX=JXDIV 100
430 ENDPROC
440 DEF PROCcar UX=
      SND(3)
      :COLOUR UX
      :PRINT TAB(CX+VX,30);
      CHR# (241)
      :WX=WX+1
      :TX=GX*WX
      :XX=0
      :YX=CX+VX
      :ENDPROC
450 REM ***** PROC
      START *****
460 DEF PROCstart
470 VDU 23,240,204,204
      ,51,51,204,204,51
      ,51
480 VDU 23,241,189,231
      ,165,36,60,189,255
      ,153
490 VDU 23,242,60,126
      ,255,255,255,255,126
      ,60
500 CLS
505 VDU 23,1,0;0;0;0
510 FOR KX=1 TO 31
      :PRINT TAB(MX,KX);B#
520 NEXT
530 FOR KX=8 TO (B#
      LEN (B#)-3)
      :PRINT TAB(KX,15);
      CHR# (240)
      :NEXT
540 IF PX=7 DX=9
550 IF PX=6 DX=8
560 IF PX=5 DX=8
570 PRINT TAB(OX,16);"START
      "
580 PRINT TAB(FX,13);
      CHR# 241
590 TIME =0
      :COLOUR 1
      :REPEAT UNTIL TIME =100
      :PRINT TAB(4,13);
      CHR# 242
      :VDU 7
      :COLOUR 2
      :REPEAT UNTIL TIME =200
      :PRINT TAB(4,13);
      CHR# 242
      :VDU 7
      :VDU 19,1,3;0;
      :COLOUR 1
      :REPEAT UNTIL TIME =300
      :PRINT TAB(4,13);
      "90"
      :VDU 7
600 REPEAT UNTIL TIME =350
      :PRINT TAB(4,13);"
      "
      :VDU 19,1,1;0;
      :COLOUR 3
610 TIME =0
      :JX=TIME
620 ENDPROC
630 REM ***** PROC
      INIT *****
640 DEF PROCinit
650 FX=10
      :HX=7
      :CX=7
      :B#=" "
      :IX=0
      :AX=0
      :EX=0
      :GX=0
      :JX=0
      :BX=0
      :DX=0
      :SX=25
660 S=440
      :T=600
      :I#="RACER"
      :DIM roadX(30)
      :WX=1
670 VDU 5
680 VDU 19,0,4,0,0;0
      :VDU 15,1,0,0,0,0
690 SCOL 1,0
700 MOVE 5,1
      :PRINT I#
710 SCOL 1,1
720 MOVE 5-8,1-8
      :PRINT I#
730 VDU 4
740 WAIT#INKEY# (100)
750 VDU 19,1,1,0,0,0
754 CLS
755 PRINT TAB(0,10)"1 IS
      EASY, 9 IS HARD"
760 INPUT TAB(0,5);"INPUT
      LEVEL(1-9)",B#
      :IF B#<1 OR B#>9
      GOTO 760
770 IF B#<3 B# =B#+1
780 IF B#<3 PX=7
790 IF B#>3 AND B#<7 B# =
      " "
800 IF B#>3 AND B#<7 PZ=6
810 IF B#>6 B#=" "
820 IF B#>6 PX=5
830 IF PX=7 VX=3
840 IF PZ=6 VX=3
850 IF PX=5 VX=2
860 IF B#>8 SX=20
870 IF B#>9 SX=20
880 TX=5X
890 ENDPROC
900 REM ***** PROC
      FINISH *****
910 DEF PROCfinish
920 IF INKEY (-98)PRINT
      TAB(FX,13);" "
930 IF INKEY (-98)FX=FX-1
940 IF INKEY (-67)PRINT
      TAB(FX,13);" "
950 IF INKEY (-67)FX=FX+1
960 CX=7
      :DX=DX+1
970 IF FX<CX FX=FX+1
980 IF FX>CX+PX FX=FX-1
990 PRINT TAB(FX,13);
      CHR# 241 TAB(CX,31);B#
1000 PRINT TAB(FX,12);"
      "
1010 PRINT TAB(FX,13);
      CHR# 241
1020 PRINT TAB(0,0);"SCORE
      ";GX" TIME ";JX
1030 DF=CHR# (240)
1040 IF DX=18
      THEN B#=" "+STRING$(
      LEN (B#)-2,DF)+"."
1050 IF DX=19 AND PX=7
      B#="FINISH."
1060 IF DX>19 AND PX=7
      B#=" "
1070 IF DX=19 AND PX=6
      B#="FINIS."
1080 IF DX>19 AND PX=6
      B#=" "
1090 IF DX=19 AND PX=5
      B#=" "
1100 ENDPROC
1110 REM ***** PROC SCORE
      *****
1120 DEF PROCscore
1130 CLS
      :COLOUR 3
1140 LX=GX*(82*100-JX)+(5X+1
      0)
1150 IF LX>MX
      THEN MX=LX
1160 PRINT TAB(6,11);"SCORES"
1170 PRINT TAB(5,2);"*****
      "
1180 PRINT TAB(3,4);"HIGH
      SCORE ";MX
1190 PRINT TAB(3,6);"YOU
      SCORED ";LX
1200 ENDPROC

```

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

BOOK SHELF

First principles of graphics and sound

Electron Graphics and Sound by Steve Money (Granada).

THE Electron programmer has quite an extensive list of graphics and sound commands at his fingertips. The number and variety of these can be quite bewildering to the newcomer.

The aim of this book is to explain the basic principles involved in producing interesting graphic displays and sounds.

The emphasis is more on useful routines than games programs, and many of the procedures could be used in your own programs.

The reader is taken from



first principles – drawing a line and plotting a point – to the quite complex procedure of

producing a perspective view of a wire frame object. All is explained in a clear and concise manner.

The sound section is not as good as the graphics. The author seems unaware that the Electron can only use one sound channel at a time and actually lists a program to play a series of notes on two channels simultaneously.

It was obviously written on a BBC Micro and sounds more like a rude noise on the Electron.

However I can recommend this book to anyone interested in producing lively graphic displays. But take the sound section with a pinch of salt.

Roland Waddilove

Open up a new world

Electron Machine Code for Beginners by Ian Sinclair (Granada).

EVER been frustrated with sluggish Basic – fed up of waiting for your program to catch up?

Although the Electron uses BBC Basic, arguably the best and fastest around, it's not much good for smooth animation effects or efficient utilities as it's too slow and it occupies too much memory.

The simple answer is machine code, the language of the micro's processor. Unlike Basic, it doesn't have to be translated by the micro as it runs.

However machine code is just a series of meaningless numbers, so the simple answer is assembly language.

As the Electron already has an assembler on-board, all you need is a fair knowledge of Basic – and Ian Sinclair's book.

The text deals with



everything from ROM and RAM to bits and bytes. It assumes no prior knowledge of assembly language, and explains the inner workings of the micro and the possibilities of assembly.

The later chapters cover the methods and principles involved in an example assembly listing, with all mathematical

processes being kept in separate appendices at the back where they are easily found – or ignored.

Also included is a major section on checking and debugging assembly programs, as well as several pages about a machine code monitor – perhaps a little premature for beginners.

The book is well thought out and, apart from a few mistakes, well written.

I have one minor complaint about the layout. A vital section on saving and loading programs was placed in the middle of another chapter about data in assembly programs. Surely this would have been better as a separate chapter or appendix?

However, this is an excellent and easy to understand introduction to the art of machine code programming which will open up whole new fields of program writing.

Andrew Oldham



Valuable, but slow

Instant Arcade Games for the Electron by Jean Frost (Pan).

THIS has been written for people with little programming knowledge to help them create their own arcade games. There is also a listing for an adventure game and character generator.

The main control loop for an arcade game is listed. After typing this in you enter the procedures used.

Here you have a choice of several different versions of each procedure, all with the same line numbers and all of which work with the main control loop.

There are seven different backgrounds, 13 different aliens, 15 different players and various checking and scoring routines. You just choose which one you want and type it in.

As you can imagine quite a large variety of games can be produced. The games look quite reasonable, but are incredibly slow.

I fell asleep three times playing the example! This is a simple space invader type of game with just one invader. It takes well over a minute for your laser base to crawl from one side of the screen to the other.

The book is valuable in that it teaches how to structure games programs, explaining every procedure in detail, but the arcade type games themselves are not really playable as they are so slow.

A reasonably good programming book, but not suitable if you want to play some fast arcade games.

Roland Waddilove

NICE & EASY

ARE you confused between binary and decimal? Do you find you don't have enough fingers to count in hexadecimal? Do you go cold when you see a & in front of a number?

Never fear, because MARK FENTON has come to your aid with his intriguing utility Base.

ing utility Base.

It's completely menu-driven and couldn't be easier to use.

Just tell your Electron which conversion you want, enter the number and the program does the rest.

It's as easy as ABC. Or is it &ABC?

PROCEDURES

PROCinit

Sets up variables and shows instructions.

PROCdisplay

Sets up main menu.

PROCact_on_it

Acts on user's choice.

PROCbi_to_dec

Changes binary to decimal.

PROCfill_in

"Pads out" binary numbers with leading zeros to make eight bits.

PROCbi_dec_work

Works out binary to decimal conversion.

PROCbi_to_hex

Changes binary to hex.

PROCdec_to_hex

Changes decimal numbers to hex.

PROCdec_to_bi

Gives binary representation of a decimal number.

PROCdec_to_bi_work

Calculates decimal to binary conversion.

PROChex_to_dec

Displays hex numbers as decimals.

PROChex_to_bi

Shows hex number in eight bit binary.

PROCon

Turns cursor on.

PROCoff

Turns cursor off.

FNanother_go

Asks for another go.

PROCchoice

Takes user's choice from main menu.

PROCassemble

Assembles machine code for double height routine.

PROCdb1

Uses machine code to produce double height letters.

FNcheck_binary

Checks for a correct binary number.

FNcheck_hex

Validates hex input.

FNcheck_decimal

Validates decimal number input.

PROC_B_R_E_A_K

Restores program after Break has been pressed.

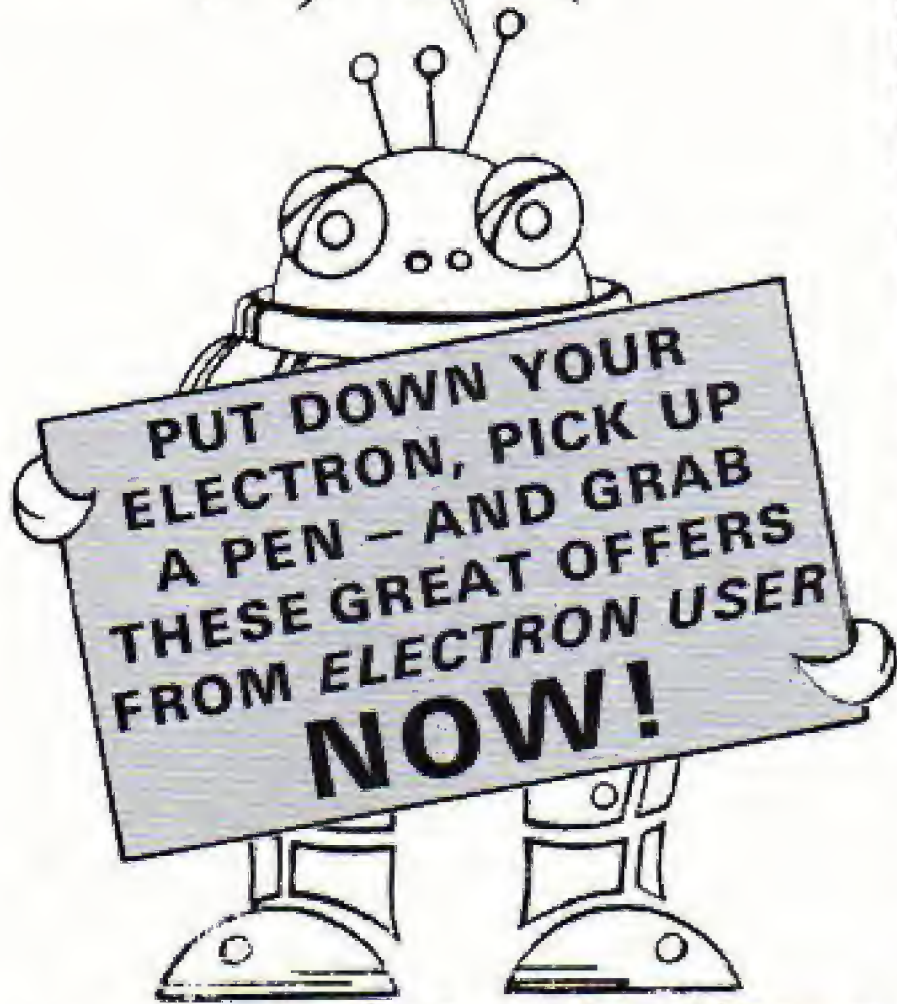
```

10 REM BASE
20 REM MARK FENTON
30 REM (C) ELECTRON USER
1984
40 REM
50 DIMA$(8):PROCassemble
60 *KEY=0:MODEL:MODE1:KPRO
C_B_R_E_A_K:KIM
70 *FX$,1
80 ONERRGOTO1010
90 MODE1:PROCoff:PROCini
t:CLS
100 REPEAT
110 PROCdisplay
120 PROCchoice
130 PROCact_on_it
140 CLS:UNTIL0
150 REM SHOWS INSTRUCTION
S AND SETS UP VARIABLES
160 DEFPROCinit
170 *FX$:
180 PROCdb1("++Base**",15
,1,2)
190 PROCdb1("This is a sh
ort utility program that",:
,VPOS+2,1)
200 PROCdb1("will change
numbers from:-",1,VPOS+2,1)
210 PROCdisplay
220 COLOUR1:PRINT"Pressi
ng Escape Will Take You Bac
k To""The Main Menu"
230 PRINT"Press space to
begin"
240 REPEATUNTILNOTINKEY-9
9:REPEATUNTILINKEY-99
250 ENDPROC
260 REM SHOWS SCREEN DISP
LAY
270 DEFPROCdisplay:PROCo
f
+
280 PROCdb1("++Base**",15
,1,2):COLOUR3
290 PRINTTAB(0,10):"(!) B
inary To Decimal"
300 PRINT"(2) Binary To
Hexadecimal"
310 PRINT"(3) Decimal To
Binary"
320 PRINT"(4) Decimal To
Hexadecimal"
330 PRINT"(5) Hexadecima
l To Decimal"
340 PRINT"(6) Hexadecima
l To Binary"
350 ENDPROC
360 REM ACTS ON CHOICE
370 DEFPROCact_on_it
380 CLS
390 ON opt GOTO 400,410,4
20,430,440,450 ELSE 390
400 PROCbi_to_dec:ENDPROC
410 PROCbi_to_hex:ENDPROC
420 PROCdec_to_bi:ENDPROC
430 PROCdec_to_hex:ENDPRO
C
440 PROChex_to_dec:ENDPRO
C
450 PROChex_to_bi:ENDPROC
460 ENDPROC
470 DEFPROCbi_to_dec
480 CLS:PROCdb1("Change B
inary To Decimal",1,2,1)
490 PROCdb1("NUMBER ?",1
,VPOS+2,1):"FX15":INPUTLINE"
"A$
500 IFNOTFNcheck_binary C
LS:VDU7:PROCdb1("ONLY ENTER
BINARY NUMBERS",0,0,2):TIM
E=0:REPEATUNTILTIME>=300:G
O480
510 SUM=0
520 IF LENA$(B PROCf:1) _
n
530 IF LENA$(B VDU7:PROCD
b1("ONLY EIGHT BIT NUMBERS
(=11111111)",1,VPOS+2,3):T
IME=0:REPEATUNTILTIME>=300:
GOTO480
540 IFNOTFNcheck_binary V
DU7:PROCdb1("INCORRECT BINA
RY NUMBER",1,VPOS+2,3):TIME
=0:REPEATUNTILTIME>=300:G
O480
550 PROCbi_to_dec_work
560 Y=VPOS:PROCdb1("The f
ull eight bit number is ",1
,Y+2,1):PROCdb1(A$,POS+1,Y+
2,1):PROCdb1(A$,1,Y+4,1):PR
OCdb1(" in decimal is ",POS
+1,Y+4,1):PROCdb1(STR$(SUM)
,POS+1,Y+4,1)
570 IF FNanother_go THEN4
80 ELSE ENDPROC
580 REM FILLS UP BINARY N
UMBERS WITH 0'S UP TO 8 BIT
S
590 DEFPROCfill_in
600 LOCALW$
610 W$=STRING$(8-LENA$),
"0")
620 A$=W$+A$
630 ENDPROC
640 REM WORKS OUT BINARY
TO DECIMAL CONVERSION
650 DEFPROCbi_to_dec_work
660 FORI=1 TO 8
670 IF MID$(A$,I,1)="1" S
UM=SUM+(1*2^(8-I))
680 NEXT
690 ENDPROC
700 REM CHANGES BI TO HEX
710 DEFPROCbi_to_hex
720 CLS:PROCdb1("Change B
inary To Hexadecimal",1,VPO
S+1,1)

```

Turn to Page 50

electron user

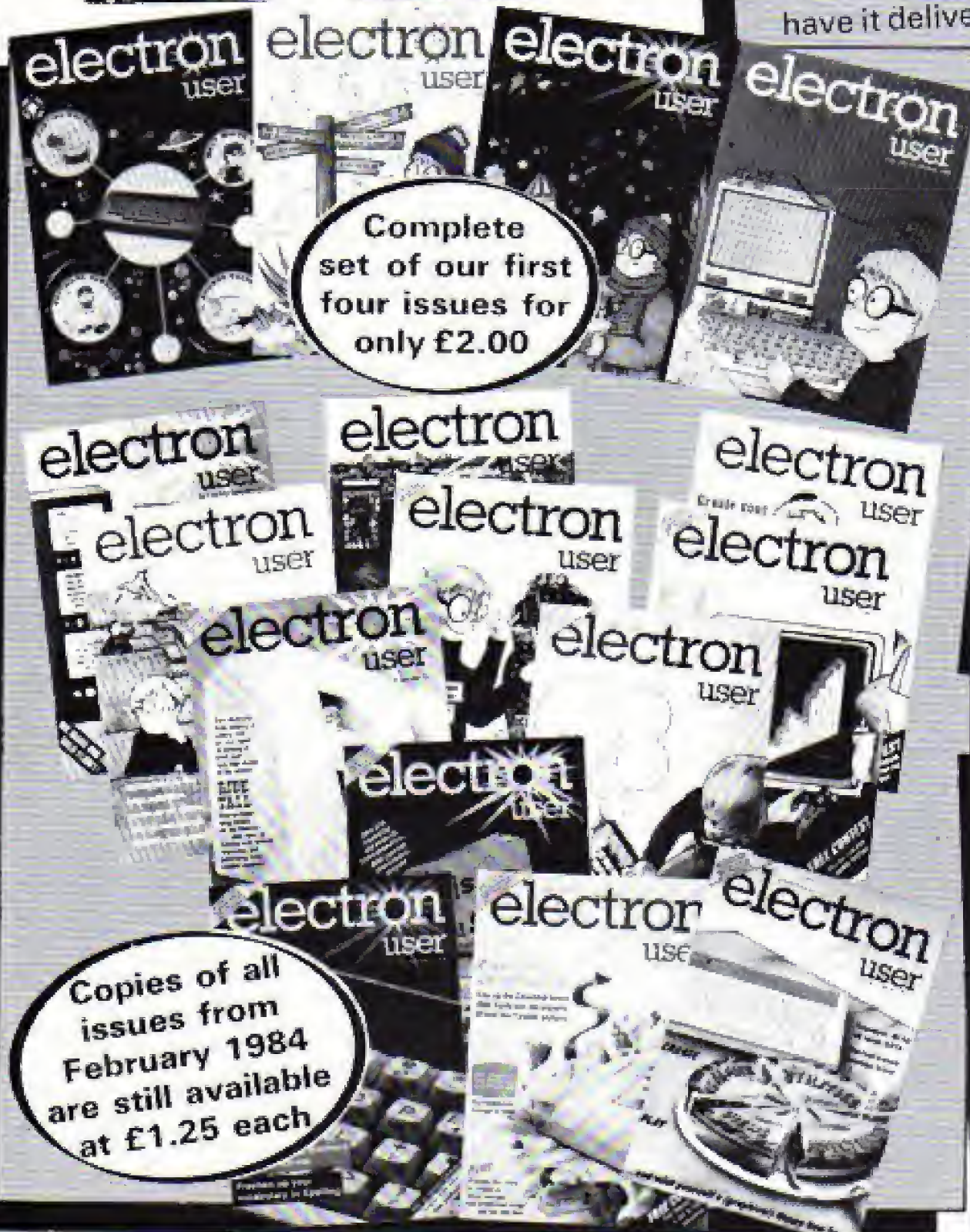


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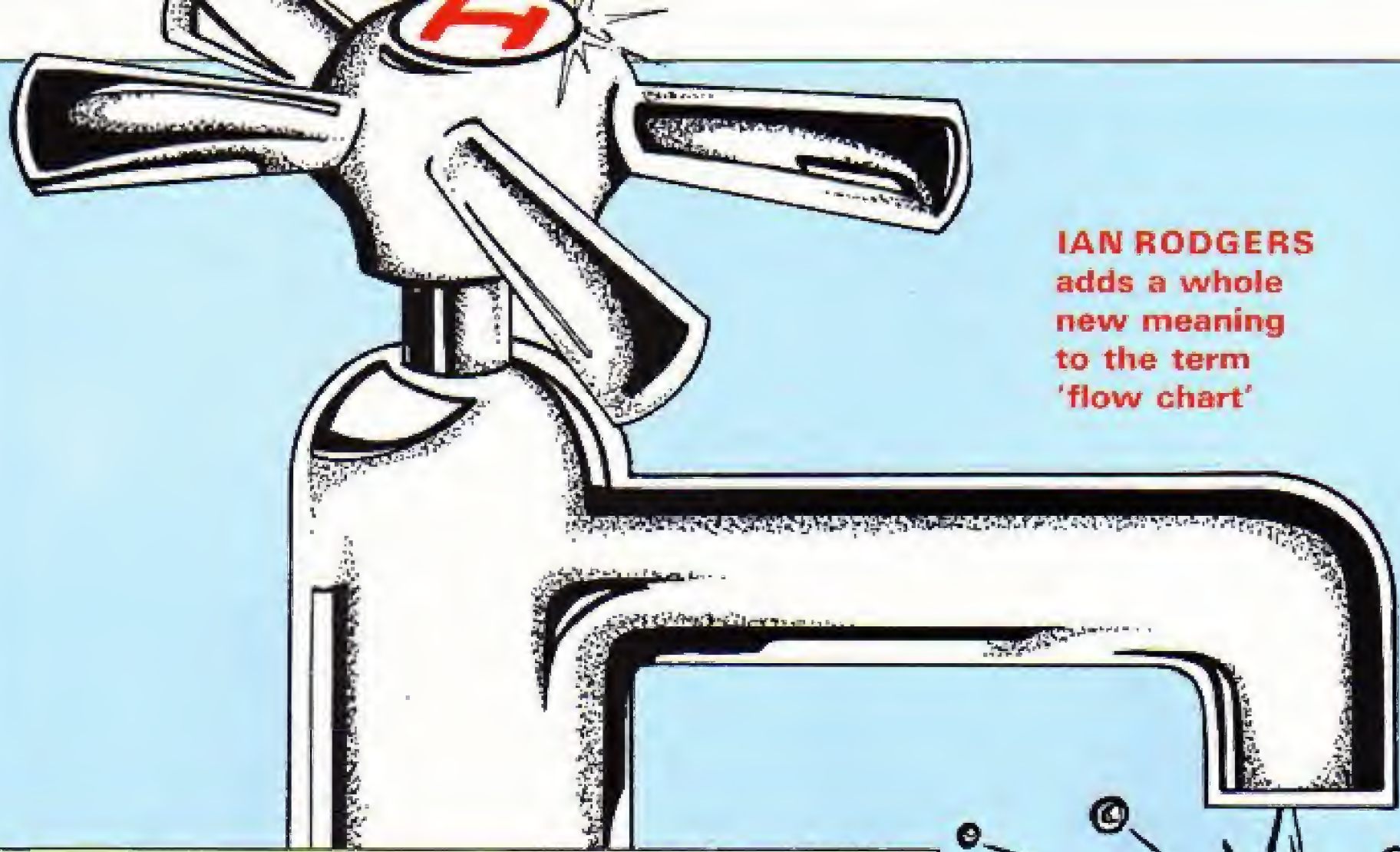
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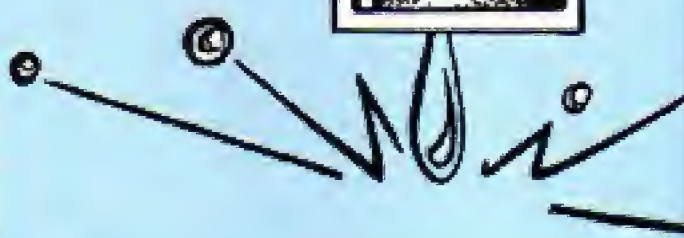
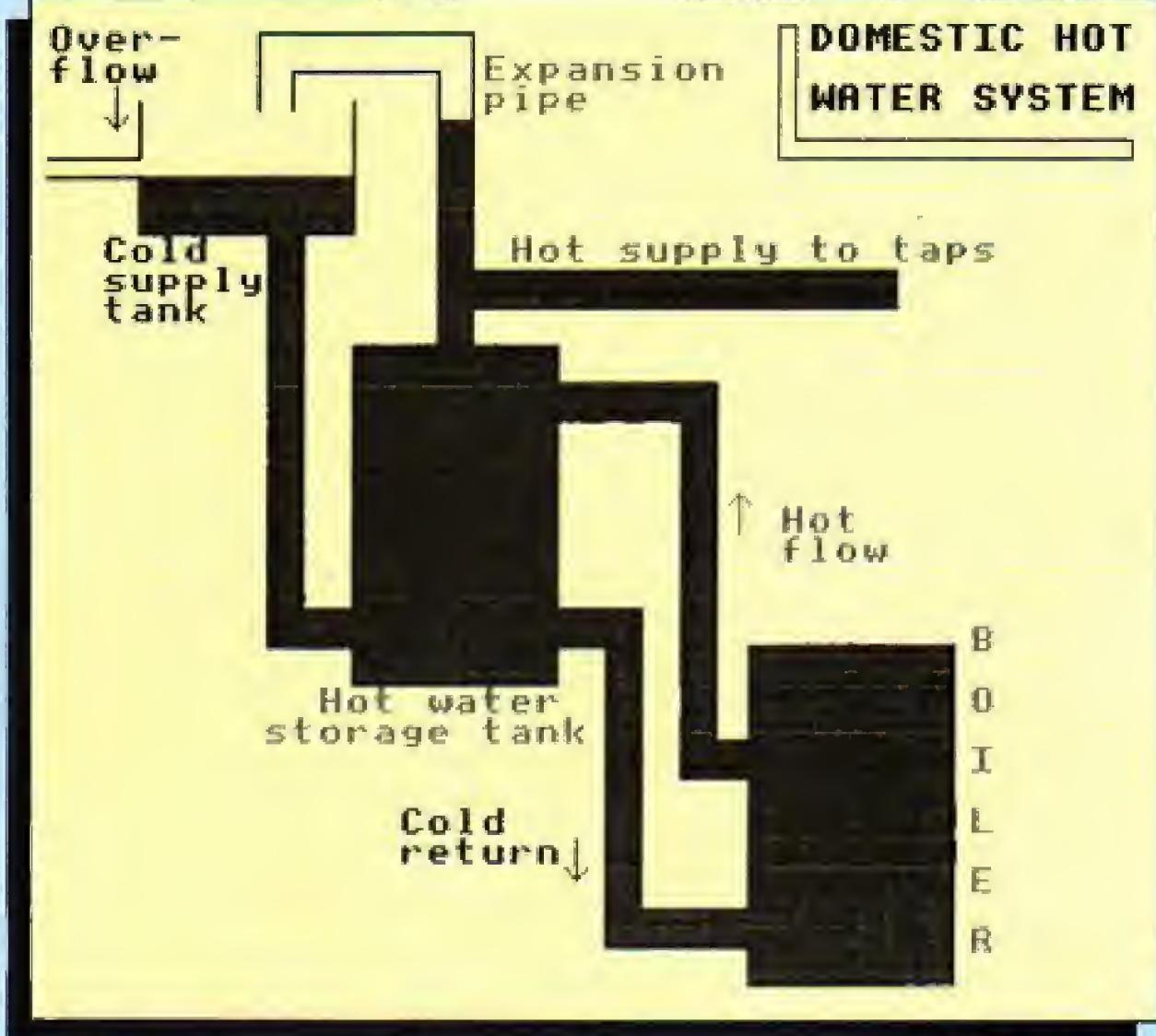
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IAN RODGERS
 adds a whole
 new meaning
 to the term
 'flow chart'



HOT Water makes use of the Electron's graphics commands to produce a coloured diagram of a domestic hot water system. It's simple yet effective, showing the Electron's design potential.

And we doubt whether it will stop at Hot Water. Here at *Electron User* we've noticed that a program we feature one month sparks off lots of ideas for other ones.

We wonder what will follow next. A diagram of a steam engine or a car piston? Maybe an animated electrical circuit diagram? You'd better send us some, or you'll be in hot water!

Get your diagrams on tap

Hot Water listing

```

10 MODE 1                :DRAW 300,800                :MOVE 880,1023                :ED=787
   :VDU 23,1,0;0;0;0;    :DRAW 360,800                :DRAW 860,1023                :ST=600
   :VDU 19,2,6,0,0,0    :DRAW 360,933                :DRAW 860,880                :FOR F=605 TO 639
   :PROCDRAW            :MOVE 110,800                :DRAW 1279,880                :DRAW ST,F
   :PROCFILLUP          :DRAW 110,860                :DRAW 1279,900                :DRAW ED,F
20 PROCLABEL            :DRAW 0,860                  :DRAW 880,900                  :NEXT F
   :GOTO 20              :MOVE 0,880                  :DRAW 880,1023                270 MOVE 364,325
30 DEF PROCDRAW         70 DRAW 110,880                170 ENDPROC                    :ED=599
40 MOVE 250,1013        :DRAW 110,943                180 DEF PROCFILLUP            :ST=364
   :DRAW 500,1013        :MOVE 360,933                190 GCOL 0,2                  :FOR F=325 TO 676
   :DRAW 500,763        :DRAW 360,943                200 MOVE 831,4                :DRAW ST,F
   :DRAW 1000,763       80 ENDPROC                    :ED=1067                       :DRAW ED,F
   :MOVE 1000,723       90 DEF PROCLABEL            :ST=832                         :NEXT F
   :DRAW 500,723        100 VDU 23,224,0,0,0,0,8    :FOR F=4 TO 359                280 MOVE 464,682
   :DRAW 500,683        ,28,42,73                    :DRAW ST,F                       :ED=499
   :DRAW 600,683        110 VDU 23,225,8,8,8,8,8    :DRAW ED,F                       :ST=464
   :DRAW 600,643        ,8,8,8,                            :NEXT F                           :FOR F=682 TO 920
   :DRAW 790,643        120 VDU 23,226,73,42,28    :MOVE 664,45                    :DRAW ST,F
   :DRAW 790,263        ,8,0,0,0,0                    :ED=830                           :DRAW ED,F
   :DRAW 830,263        130 COLOUR 1                :ST=664                           :NEXT F
   :DRAW 830,363        :PRINT TAB(17,7)"Hot          210 MOVE 664,45                :ED=830                           :NEXT F
   :DRAW 1070,363       supply to taps";              :FOR F=45 TO 79                290 MOVE 500,724
   :DRAW 1070,0         TAB(27,16)"Hot";TAB(27        :DRAW ST,F                       :ED=1000
   :DRAW 830,0          ,17)"flow";TAB(25,16);        :DRAW ED,F                       :ST=500
   :DRAW 830,40         CHR$(225);TAB(25,15);        :NEXT F                           :FOR F=724 TO 757
   :DRAW 660,40         CHR$(224);TAB(34,20)        :DRAW ST,F                       :DRAW ST,F
50 DRAW 660,360         "B";TAB(34,22)"O";            :DRAW ED,F                       :DRAW ED,F
   :DRAW 600,360        TAB(34,24)"I";TAB(34        :NEXT F                           :NEXT F
   :DRAW 600,320        ,26)"L";TAB(34,28)"E";        220 MOVE 664,80                :FOR F=79 TO 360
   :DRAW 360,320        TAB(34,30)"R"          :ED=699                           :DRAW ST,F
   :MOVE 830,80         140 VDU 19,2,6,0,0,0    :ST=664                           :DRAW ED,F
   :DRAW 700,80         150 COLOUR 2                :FOR F=79 TO 360                :NEXT F
   :DRAW 700,400        :PRINT TAB(2,7)"Cold";        :DRAW ST,F                       :FOR F=365 TO 399
   :DRAW 600,400        TAB(2,8)"supply";            :DRAW ED,F                       :DRAW ST,F
   :DRAW 600,603        TAB(2,9)"tank";TAB(19        :NEXT F                           :DRAW ED,F
   :DRAW 750,603        ,27);CHR$(225);TAB(19        :NEXT F                           :NEXT F
   :DRAW 750,223        ,28);CHR$(226);TAB(13        230 MOVE 600,365                :FOR F=365 TO 399
   :DRAW 830,223        ,26)"Cold";TAB(13,27)        :DRAW ST,F                       :DRAW ST,F
   :DRAW 830,80        "return"          :DRAW ED,F                       :DRAW ED,F
   :MOVE 360,320        :COLOUR 1                    :NEXT F                           :NEXT F
   :DRAW 360,360        :PRINT TAB(16,1)"Expansio        240 MOVE 753,224                :FOR F=400 TO 801
   :DRAW 260,360        n";TAB(16,2)"pipe";        :ED=830                           :DRAW ST,F
   :DRAW 260,800        TAB(10,22)"Hot water";        :ST=753                           :DRAW ED,F
   :DRAW 110,800        TAB(8,23)"storage tank"        :DRAW ST,F                       :DRAW ED,F
60 MOVE 360,400         160 COLOUR 2                :DRAW ED,F                       :NEXT F
   :DRAW 360,683        :PRINT TAB(0,0)"Over-";        :NEXT F                           :NEXT F
   :DRAW 460,683        TAB(0,1)"flow";TAB(2        250 MOVE 753,258                :FOR F=224 TO 258
   :DRAW 460,973        ,2);CHR$(225);TAB(2        :ED=787                           :DRAW ST,F
   :DRAW 290,973        ,3);CHR$(226)        :ST=753                           :DRAW ED,F
   :DRAW 290,933        :COLOUR 3                    :FOR F=258 TO 601                :DRAW ST,F
   :MOVE 250,933        :PRINT TAB(28,0)"DOMESTIC        :DRAW ED,F
   :DRAW 250,1013       HOT";TAB(28,2)"WATER        :NEXT F
   :MOVE 360,400        SYSTEM"          :DRAW ST,F
   :DRAW 300,400        260 MOVE 600,605                :DRAW ED,F

```

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

Base listing

From Page 45

```
730 *FX15
740 PROCdb1("NUMBER ?",1,
VPOS+2,1):INPUTLINE"*A$
750 IFNOTFNcheck_binary C
LS:VDU7:PROCdb1("ONLY ENTER
BINARY NUMBERS",0,0,2):TIM
E=0:REPEATUNTILTIME)=300:GO
TO720
760 SUM=0
770 IF LENA$<B PROC:111_i
n
780 IF LENA$>B VDU7:PROCd
b1("ONLY EIGHT BIT NUMBERS(
<=11111111)",1,VPOS+2,2):T
IME=0:REPEATUNTILTIME)=300:
GOTO720
790 IF NOT FNcheck_binary
VDU7:PROCdb1("INCORRECT BI
NARY NUMBER",1,VPOS+2,2):TI
ME=0:REPEATUNTILTIME)=300:G
OTO720
800 PROCbi_to_dec_work
810 Y=VPOS:PROCdb1("The e
ight bit number is ",1,Y+2,
1):PROCdb1(A$,POS+1,Y+2,1):
Y=Y+2:A$=A$+" in Hex is &"
STR$*SUM:PROCdb1(A$,1,Y+2,1
)
820 IFFNanother_go THEN 7
20 ELSE ENDPROC
830 REM CHANGES DECIMAL T
O HEX
840 DEFPROCdec_to_hex
850 CLS:PROCdb1("Decimal
To Hexadecimal",1,1,1):PROC
db1("NUMBER ?",1,4,1):"FX15
":INPUTLINE"*A$
860 IF NOT FNcheck_decima
1 CLS:PROCdb1("ENTER DECIMA
L NUMBERS ONLY",0,0,2):VDU7
:TIME=0:REPEATUNTILTIME)=30
0:GOTO850
870 A$=A$+" In hex is &"
STR$*VALA$:PROCdb1(A$,1,6,1
)
880 IFFNanother_go THEN 8
50 ELSE ENDPROC
890 REM CHANGES DEC TO BI
900 DEFPROCdec_to_bi
910 CLS:PROCdb1("Decimal
To Binary",1,1,1):SUM=0:PRO
Cdb1("NUMBER ?",1,4,1):"FX1
5":INPUTLINE"*A$
920 IF NOT FNcheck_decima
1 CLS:PROCdb1("ENTER DECIMA
L NUMBERS ONLY",0,0,2):VDU7
:TIME=0:REPEATUNTILTIME)=30
0:GOTO910
930 IF VALA$>255 OR VALA$
<0 OR ( VALA$=0 AND A$<)"0
") VDU7:PROCdb1("ONLY EIGHT
BIT ( <=255)",1,6,2):TIME=0
:REPEATUNTILTIME)=300:GOTO9
10
940 PROCdec_to_bi_work
950 PROCdb1(A$,1,6,1):PRO
Cdb1(" In Binary is ",POS,6
,1):FORIX=8 TO 1STEP-1:PRO
Cdb1(STR$AX(IX),POS,6,1):NEX
T:PRINT
960 IFFNanother_go THEN 9
10 ELSE ENDPROC
970 REM WORKS OUT BI TO D
EC CONVERSION
980 DEFPROCdec_to_bi_work
990 B=VALA$
1000 FORI=1 TO 8
1010 AX(I)=B MOD 2
1020 B=B DIV 2
1030 NEXT
1040 ENDPROC
1050 REM CHANGES HEX TO DE
CIMAL
1060 DEFPROChex_to_dec
1070 CLS:PROCdb1("Hexadeci
mal To Decimal",1,1,1):PROC
db1("HEX NUMBER WITH '&' ?",
1,3,1):"FX15":INPUTLINE"*A
$
1080 IFFNcheck_hex CLS:PRO
Cdb1("ONLY ENTER HEX NUMBER
S",0,0,2):VDU7:TIME=0:REPEA
TUNTILTIME)=300:GOTO1070
1090 PROCdb1(A$,1,5,1):PRO
Cdb1(" In decimal is ",POS+
1,5,1):PROCdb1(STR$EVALA$,P
OS+1,5,1)
1100 IFFNanother_go THEN 1
070 ELSE ENDPROC
1110 DEFPROChex_to_bi
1120 REM CHANGES HEX TO BI
NARY
1130 CLS:PROCdb1("Hexadeci
mal To Binary",1,1,1):PROCd
b1("HEX NUMBER WITH '&' ?",
1,3,1):"FX15":INPUTLINE"*A$
1140 IFFNcheck_hex CLS:PRO
Cdb1("ONLY ENTER HEX NUMBER
S",0,0,2):VDU7:TIME=0:REPEA
TUNTILTIME)=300:GOTO1130
1150 IF EVAL A$>255 OR EVA
L A$<0 VDU7:PROCdb1("ONLY E
IGHT BIT ( <=255)",1,5,2):T
IME=0:REPEATUNTILTIME)=300:
GOTO1130
1160 B$=A$:SUM=0:A=EVALA$:
A$=STR$A
1170 PROCdec_to_bi_work
1180 A$=B$:PROCdb1(A$,1,5,
1):PROCdb1(" In Binary is "
,POS+1,5,1):FORIX=8TO1STEP-
1:PROCdb1(STR$(AX(IX)),POS,
5,1):NEXT:PRINT
1190 IFFNanother_go THEN 1
130 ELSE ENDPROC
1200 REM 2 PROCEDURES TO T
URN THE CURSOR ON AND OFF
1210 DEFPROCcon:VDU23,1,1;0
;0;0;0;0;0:ENDPROC
1220 DEFPROCoff:VDU23,1,0;
0;0;0;0;0:ENDPROC
1230 REM CHECKS FOR ANOTHE
R GO
1240 DEFFNanother_go
1250 PROCdb1("Press Space
For Another Choice",1,VPOS+
2,1)
1260 PROCdb1("Or Press Any
Other Key To Return To The
",1,VPOS+2,1)
1270 PROCdb1("Menu",1,VPOS
+2,1)
1280 *FX15
1290 REPEAT:a=INKEY0:IFINK
EY-1 OR INKEY-2 OR INKEY-65
OR(a<>)-1AND a<>32) THENUNT
ILTRUE:=0 ELSE IF a=32THENU
NTILTRUE:=1 ELSE UNTILFALS
E
1300 REM***** E R R O R
H A N D L I N G R O U T I
N E*****
1310 IF ERR=17 CLS:GOTO100
1320 VDU7
1330 IFERR=20CLS:PROCdb1("
Please Enter a Number Withi
n a",1,0,2):PROCdb1("reason
able range !!!",1,4,2):VDU7
:TIME=0:REPEATUNTILTIME)=30
0:PROCact_on_it:CLS:GOTO100
1340 IFERR=20 ORERR=26CLS:
PROCdb1("Please Enter Corre
ct Numbers When",0,0,2):PRO
Cdb1("Prompted To Do So",0,
3,2):TIME=0:REPEATUNTILTIME
)=300:PROCact_on_it:CLS:GOT
O100
1350 REPORT
1360 PRINT" at line ";ERL:
*FX12
1370 *FX4
1380 PROCcon:END
1390 REM GETS USERS CHOICE
FOR MAIN MENU
1400 DEFPROCchoice:*FX15
1410 COLOUR1:PRINT"STRING
$(40,"=")TAB(0,8):STRING$(4
0,"="):PROCdb1("Your Choice
?",0,26,2)
1420 REPEAT
1430 opt=GET-48
1440 UNTILopt>0 AND opt<?
1450 ENDPROC
1460 REM ASSEMBLES M/C FOR
DBL HEIGHT( SEE ELECTRON U
SER JULY 1984)
1470 DEFPROCassemble
1480 FORIX=0TO2STEP2
1490 PX=0000
1500 OPTIX
1510 STA&70:STX&79:STY&7A
1520 LDA#10:LDX#&70:LDY#0:
JSR&FFF1
1530 LDA#23:JSR&FFEE:LDA#2
55:JSR&FFEE:LDA#71:JSR&FFEE
:JSR&FFEE:LDA#72:JSR&FFEE:
JSR&FFEE:LDA#73:JSR&FFEE:JS
R&FFEE:LDA#74:JSR&FFEE:JSR&
FFEE:LDA#31:JSR&FFEE:LDA#79
:JSR&FFEE:LDA#7A:JSR&FFEE:L
DA#255:JSR&FFEE
1540 LDA#23:JSR&FFEE:LDA#2
55:JSR&FFEE:LDA#75:JSR&FFEE
:JSR&FFEE:LDA#76:JSR&FFEE:J
SR&FFEE:LDA#77:JSR&FFEE:JSR
&FFEE:LDA#78:JSR&FFEE:JSR&F
```

Hexadecimal To Decimal
HEX NUMBER WITH '&' ?
&FE In decimal is 254

Press Space For Another Choice

Or Press Any Other Key To Return To The
Menu

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Base listing

From Page 50

```

FEE:LDAN#31:JSR&FFEE:LDAN#79:
JSR&FFEE:LDAN#7A:CLC:ADC#1:J
SR&FFEE:LDAN#255:JSR&FFEE:RT
S
1550 ]
1560 NEXT
1570 ENDPROC
1580 REM USES ASSEMBLED M/
C TO PRODUCE DBL HEIGHT
1590 DEFPROCdbl(a$,X,Y,C):
COLOURC
1600 LOCALX:FORX=1TOLENA
$:AX=ASC(MID$(a$,X,1)):XX=
X+X-1:Y=Y:CALL&D00
1610 NEXT
1620 ENDPROC
1630 REM CHECKS FOR A CORR
ECT BINARY NUMBER
1640 DEFFNcheck_binary
1650 REPEAT:IFLEFT$(A$,1)=
" " A$=RIGHT$(A$,LENA$-1)
1660 UNTILLEFT$(A$,1)<" "
1670 LOCALIX,LZ:LZ=-1
1680 FORIX=1TOLENA$

```

```

1690 IFMID$(A$,IX,1)<"1"
ANDMID$(A$,IX,1)<"0" LZ=LZ
1700 NEXT
1710 =LZ
1720 REM CHECKS FOR A CORR
ECT HEX NUMBER
1730 DEFFNcheck_hex
1740 REPEAT:IFLEFT$(A$,1)=
" " A$=RIGHT$(A$,LENA$-1)
1750 UNTILLEFT$(A$,1)<" "
1760 LOCALIX,AX
1770 IFLEFT$(A$,1)<"&"=-1
1780 FORIX=2 TO LEA$
1790 AX=EVAL("&"*MID$(A$,I
X,1))
1800 NEXT
1810 =0
1820 REM CHECK FOR CORRECT
DECIMAL
1830 DEFFNcheck_decimal
1840 REPEAT:IFLEFT$(A$,1)=
" " A$=RIGHT$(A$,LENA$-1)
1850 UNTILLEFT$(A$,1)<" "
1860 LOCALIX,LZ:LZ=-1
1870 FORIX=1TOLENA$
1880 IF ASCMID$(A$,IX,1)<4

```

```

0 OR ASCMID$(A$,IX,1)>57 LZ
=0
1890 NEXT
1900 =LZ
1910 DEFPROC_B_R_E_A_K
1920 DIMAX(9):PROCOFF:PROC
assemble:ON ERROR GOTO 1310
1930 *FX11
1940 *FX4,1
1950 CLS:PROCdbl("PLEASE T
RY NOT TO PRESS BREAK AS IT

```

```

",0,0,2):VDU7:PROCdbl("AS
IT COULD PROVE LETHAL",0,3,
2):VDU7:TIME=0:REPEATUNTILT
IME>=200:CLS:VDU7
1960 GOTO100
1970 ENDPROC

```

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

****Base****

This is a short utility program that will change numbers from:-

- <1> Binary To Decimal
- <2> Binary To Hexadecimal
- <3> Decimal To Binary
- <4> Decimal To Hexadecimal
- <5> Hexadecimal To Decimal
- <6> Hexadecimal To Binary

Pressing Escape Will Take You Back To The Home Menu
Press Space To Begin

'EXCELLENT thoroughly recommended'

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Electron and BBC BASIC, Quick Reference Guide for Programmers (154 pages)

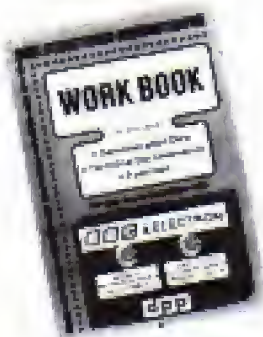
This guide brings to your attention the vast array of superb programming facilities available and should prove an invaluable aid to any programmer whether beginner or experienced, in producing better programs more quickly.

The review in the October issue of 'ELECTRON USER' said:-

"... It's cheap, but it's also excellent. What you get for your money is an alphabetical guide to over 200 reserved words and operating system commands. Elaborating on these are some extremely useful example programs and a brief note on the differences between the BBC Micro and the Electron. The main part of the book is taken up with the directory of keywords - and what a treasure trove it is... lucid, thorough and surprisingly readable... thoroughly recommended".



Data Structures Demonstrator - Cassette (55k of programs) and Workbook (93 pages)



This coordinated package of cassette plus workbook runs on either the BBC or the Electron. If you are writing programs which need to have data added, deleted, or retrieved then this package should be a must. You are not alone in finding it difficult to imagine how your computer handles Data Structures (Linked lists; Hash tables; Binary trees etc). Our programs make it visible and the workbook provides exercises to ensure you can more quickly understand and then use Data Structures.

"It looks very useful"; It should help a lot of students grasp the concepts more readily"; "My students think it's fantastic" (Lecturers comments).

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**'NO BETTER
VALUE'**

Bouncy listing

From Page 16

```

10 REM *** BOUNCY ***
+
20 REM *By R.A.Waddilove
+
30 ON ERROR IF ERR(>17) R
EPORT:END
40 MODE 1
50 PROCInstructions
60 MODE 4
70 PROCInitialise
80 REPEAT
90 PROCscreen
100 FOR ball=1 TO 25
110 PROCnew_ball
120 PROCmove_ball
130 NEXT ball
140 PROCgame_over
150 UNTIL INSTR("Nn",key$
)
160 END
170
180 DEF PROCInitialise
190 VDU 23,224,170,85,170
,85,170,85,170,85
200 VDU 23,225,60,126,255
,255,255,255,126,60
210 VDU 23,226,255,129,12
9,129,129,129,129,255
220 best=500
230 ENDPROC
240
250 DEF PROCscreen
260 BX=0:CLS:VDU 19,1,3:0
;23,1,0;0;0;0;
270 PRINT TAB(0,31);STRIN
G$(40,CHR$226);CHR$(30);CHR
$(11)""STRING$(40,CHR$226
)
280 FOR IX=5 TO 30
290 PRINT TAB(0,IX);CHR$2
26;TAB(39,IX);CHR$226;
300 NEXT
310 COLOUR 129:COLOUR 0
320 PRINT TAB(11,1);" Bes
t Score=";best;" "
330 COLOUR 128:COLOUR 1
340 PRINT "Blocks:";BX;TA
B(30);"Ball:"
350 ENDPROC
360
370 DEF PROCnew_ball
380 PROCdelay(100):VDU 7
390 PRINT TAB(35,3);ball
400 REPEAT
410 IX=RND(30):YZ=RND(25)
+5
420 UNTIL POINT(32*(IX+1)

```

```

,1023-32*YX)=0 OR POINT(32*
(IX-1),1023-32*YX)=0 OR POI
NT(32*IX,1023-32*(YX+1))=0
OR POINT(32*IX,1023-32*(YX-
1))=0
430 VX=1:HX=0:trappedX=FA
LSE
440 PRINT TAB(IX,YX)CHR$2
25
450 ENDPROC
460
470 DEF PROCmove_ball
480 REPEAT IF FNpoint PRO
Cbounce
490 IF INKEY(-99) b$=CHR$
224:BX=BX+1:PRINT TAB(7,3):
BX ELSE b$=" ":PROCdelay(1)
500 IF EX THEN +FX19
510 PRINT TAB(IX,YX);:IX=
IX+HX:YZ=YZ+VZ:+FX19
520 PRINT b$;TAB(IX,YI)CH
R$225
530 UNTIL HX+VX=0
540 ENDPROC
550
560 DEF PROCbounce
570 SOUND &10,-15,5,1
580 ON RND(2) GOTO 590,61
0
590 VX=0:HX=1:IF FNpoint=
0 ENDPROC
600 VX=1:HX=0:IF FNpoint=
0 ENDPROC
610 VX=0:HX=-1:IF FNpoint
=0 ENDPROC
620 VX=-1:HX=0:IF FNpoint
=0 ENDPROC
630 VX=1:HX=0:IF FNpoint=
0 ENDPROC
640 VX=0:HX=1:IF FNpoint=
0 ENDPROC
650 HX=0:VZ=0:SOUND 1,-15
,0,10
660 ENDPROC
670
680 DEF FNpoint=POINT(32*
(IX+HX),1023-32*(YX+VX))
690
700 DEF PROCdelay(TX)
710 TIME=0:REPEAT UNTIL T
IME>TX
720 ENDPROC
730
740 DEF PROCgame_over
750 PROCdelay(100)
760 VDU 22,5,23,1,0;0;0;0;
+
770 COLOUR 129:COLOUR 3
780 PRINT "STRING$(100," "

```

```

);TAB(4,3);"R A T I N G"
790 COLOUR 128:COLOUR 2
800 IF BX<best best=BX
810 PRINT TAB(3,10);"Your
score:";BX
820 PRINT TAB(3,15);"Best
score:";best
830 IF BX>500 a$="Appalli
ng..."
840 IF BX>400 AND BX<499
a$="Very poor..."
850 IF BX>300 AND BX<401
a$="More practice needed"
860 IF BX>200 AND BX<301
a$="Quite good"
870 IF BX<201 a$="*** Exc
ellent ***"
880 PRINT TAB((20-LEN a$)
DIV 2,23);a$
890 COLOUR 129:COLOUR 3
900 PRINT TAB(0,30);" A
nother Game ? ";
910 MOVE 0,31:DRAW 0,992:
DRAW 1276,992:DRAW 1276,31:
DRAW 0,31
920 MOVE 0,832:DRAW 1276,
832:MOVE 0,64:DRAW 1276,64
930 +FX21,0
940 REPEAT key$=GET$
950 UNTIL INSTR("YyNn",ke
y$)
960 VDU 22,4
970 ENDPROC
980
990 DEF PROCInstructions
1000 +KEY10 "OLD;MLISTD7IM
:N:LLISTIM"
1010 white$=CHR$17+CHR$3:b
lue$=CHR$17+CHR$2
1020 VDU 19,1,4;0;19,2,6;0
;23,1,0;0;0;0;

```

```

1030 COLOUR 129:PRINT STRI
NG$(120," ");TAB(7,1);"B O
U N C Y - B O U N C Y"
1040 COLOUR 128:COLOUR 2
1050 PRINT TAB(0,5);"This
is a very simple game in wh
ich you""have to trap a b
all bouncing around the""
screen. You can do this by
pressing the""space bar w
hich places a block just""
behind the ball."
1060 PRINT "white$;"";b
lue$;" Try to build a box a
nd trap the ";white$;"";
"";blue$;" ball when i
t bounces into it. ";white
$;"";"";blue$;" Use
as few blocks as possible.
";white$;"";
1070 PRINT "Press..."
1080 PRINT "E";blue$;" for
an easy game.""white$;"H"
;blue$;" for a hard game."
1090 COLOUR 3:PRINT TAB(0,
31)"ESCAPE will return you
to this page.";
1100 +FX21,0
1110 REPEAT key$=CHR$(GET
OR 32)
1120 UNTIL INSTR("eh",key$
)
1130 IF key$="e" EX=TRUE E
LSE EX=FALSE
1140 ENDPROC

```



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

Craal listing

From Page 26

```

590 in=TRUE:PROCm(RZ-1)
600 PRINT "You can see a
round you :-"
610 FZ=FALSE
620 FOR IX = 1 TO NX
630 IF oX(IX) (<) RZ THEN
GOTO 650 ELSE FZ=TRUE
640 GOSUB 1300
650 NEXT IX
660 IF NOT FZ PRINT "Nothi
ng of interest."
670 PRINT
680 RETURN
690 DATA 0,0,0,0
700 DATA 3,9,0,0
710 DATA 0,2,4,0
720 DATA 0,0,5,3
730 DATA 0,0,0,4
740 DATA 0,7,0,0
750 DATA 6,0,0,0
760 DATA 0,0,7,9
770 DATA 2,0,0,0
780 DATA 0,0,0,0
790 IF dX(RZ,1) = 0 PRINT
" Not allowed": RETURN
800 IF RZ = 7 AND aZ THEN
PROCm(33):PRINT: RETURN
810 RZ = dX(RZ,1)
820 RETURN
830 IF dX(RZ,2) = 0 PRINT
" Not allowed": RETURN
840 RZ = dX(RZ,2)
850 RETURN
860 IF dX(RZ,3) = 0 PRINT
" Not allowed": RETURN
870 IF dX(RZ,3) = 0 AND f
X THEN PROCm(34):PRINT: fZ=
FALSE
880 IF dX(RZ,3) = 7 AND o
X(7) = 0 THEN oX(7)=0: PROC
m(35):PRINT
890 RZ = dX(RZ,3)
900 RETURN
910 IF dX(RZ,4) = 0 PRINT
" Not allowed": RETURN
920 RZ = dX(RZ,4)
930 RETURN
940 IF oX(zX)=1 PRINT "You
already have it" : RETURN
950 IF oX(zX)(<) RZ PRINT "
It's not here": RETURN
960 IF zX < IX PRINT "You
can't take that" ELSE oX(zX
)=1
970 RETURN
980 IF oX(zX)=1 oX(zX) =
RZ ELSE PRINT "You don't ha
ve it": RETURN
990 ON (RZ-1) GOSUB 1230,
1250,1240,1290,1240,1240,13
10,1240,1240
1000 RETURN
1010 h$="": FOR IX = LEN(o
$) TO 1 STEP -1
1020 h$=h$+MID$(o$,IX,1)
1030 NEXT IX
1040 IF o$ = h$ THEN qX =
TRUE :PROCm(50): RETURN
1050 PRINT "Okay," + CHR$(
34) + o$ +CHR$(34)
1060 RETURN
1070 PRINT "Your invento
ry contains:-"
1080 FZ = FALSE
1090 FOR IX= IX TO NX
1100 IF oX(IX)(<)1 THEN GOT
O 1120 ELSE FZ=TRUE
1110 GOSUB 1300
1120 NEXT IX
1130 IF NOT FZ PRINT "Nothi
ng at all."
1140 PRINT
1150 RETURN
1160 IF oX(zX)(<) RZ PRINT "
It wasn't here to hit": RET
URN
1170 IF oX(11)(<)1 PROCm(36
): RETURN
1180 IF zX(<)6 AND zX(>)3 PR
INT "This has no effect wha
tsoever."
1190 IF zX=6 AND aZ THEN a
Z=FALSE: PROCm(37):PRINT: o
X(6)=0: RETURN
1200 IF zX=3 AND sX = FALS
E THEN PROCm(38):PRINT".":
sZ = TRUE: oX(8) = 2 : RETU
RN
1210 IF zX=3 AND sX = TRUE
PROCm(39): RETURN
1220 RETURN
1230 IF zX = 8 AND eX THEN
PROCm(40):PRINT: oX(zX) =
0: eX = NOT eX:oX(11) = 1
1240 RETURN
1250 IF zX = 7 AND NOT bZ
AND IX THEN PROCm(41):PRINT
: IX=FALSE
1260 IF zX=9 PROCm(42): oX
(zX)=0:oX(12) = 3
1270 IF zX = 10 THEN dX =
FALSE
1280 RETURN
1290 IF oX(7) = 5 AND oX(1
2) = 5 THEN PROCm(43): bZ =
FALSE: oX(12) = 0:oX(7) =
1
1300 RETURN
1310 IF zX(<) 10 GOTO 1350
1320 IF dX THEN PROCm(44):G
OTO 340
1330 IF ( NOT IX) OR (oX(7
)(<)8 AND oX(7)(>)1) THEN PRO
Cm(45): GOTO 340
1340 IF oX(2)=0 PROCm(46):
oX(1)=0:oX(2)=8:oX(8)=8
1350 IF zX=7 AND NOT bZ TH
EN IX=TRUE: PROCm(47):PRINT
1360 IF zX=9 OR zX=12 THEN
PROCm(48):PRINT:PROCm(49):
GOTO 340
1370 RETURN
1380 PRINT "A "; j$(IX):"
";
1390 IF IX=1 PROCm(10)
1400 IF IX=2 PROCm(11)
1410 IF IX=3 AND NOT sX PR
OCm(12)
1420 REM IF IX=3 AND eX PR
OCm(13)
1430 IF IX=3 AND sX PROCm(
14)
1440 IF IX=4 PROCm(15):PRI
NT: PROCm(16):PRINT: PROCm(
17)
1450 IF IX=5 PROCm(18)
1460 IF IX=6 PROCm(19)
1470 IF IX=7 AND NOT bX AN
D NOT IX PROCm(21)
1480 IF IX=7 AND NOT bX AN
D IX PROCm(22)
1490 IF IX=7 AND bZ PROCm(
23)
1500 IF IX=8 PROCm(20)
1510 IF IX=9 PROCm(24)
1520 IF IX=10 AND dX PROCm
(25)
1530 IF IX=10 AND NOT dX P
ROCm(28)
1540 IF IX=11 AND NOT aZ P
ROCm(26)
1550 IF IX=12 PROCm(27)
1560 PRINT
1570 RETURN
1580 DATA iluh,;,sloh@ri@d
vkhv,3,yhaglj@pdklqh,5,pl
uuru,9,wuroo,8,qzdui,;,odps
,3,frlq,3,sdufkphq,7,fxuw
lq,<,vzrug,3,yrxfkhu,3
1590 DATA "d@udwkh@vsdvh
,@xqiulhgol@urrr@ziwk@wkh
@dssduhqwo@lqh@solfdpoh@#
vljq@#Duprxu!@#rq@wkh#zdoal
"
1600 DATA "d@ydvw@fdyhuq@z
lwk@d@odujh@#srra@ri#zdwhu
l#@#sdwk@ohdqvd@oraj@l#w@#
hgjh!"
1610 DATA "dq@h(wuhpho!@#wl
jkw,@Hdvw@#Zhyv@wxqgho!"
1620 DATA "d@vkrsl@Ryhu@wkh
h@frxqwhu@lv@dvljq=@Hehqhh)
hu@v@Hqwhusulvhy!"
1630 DATA "d@vpdoo@#kdpehu
,@l#w@zdoov@#lulghvfqh@#zl
wk@vsdunolqj@fu!vwdav,vdyh@
rqh!"
1640 DATA "d@udwkh@jorrr!
@#dyh,@#uhpiqlvfhq@#r
i@rag@plqh@zrunlqjvi!"
1650 DATA "zkdw@orrv@olnh
@d@khu@l#w@#fhoal!"
1660 DATA "dq@rag@glw!@#fk
dpheu@wkdw@#orrv@wr@kdyh
@ehhq@sloodjhg@orqj@djr!"
1670 DATA "wkh@zl)duq@v@#f
kdpheu@Dv@qr@rgh@kdv@hyhu@
vxuylyhg@wklv@h(shulhgh,##
wkhuh@lv@qr@h(wdqw@ghvfulsw
lraq!!!!"
1680 DATA "exuqlqj@euloold
qwo@lq@d#frughu!"
1690 DATA "qrz@txlwh@frral
"
1700 DATA "zlw@d@qrwlfh@#
qr@krw@prqh!@ru@frxqwhuihlw
@frlqv+!"
1710 DATA "zlw@d@qrwlfh@#
hpsw!@#rq@lwl!"
1720 DATA "lq@elw@rq@wkh@
iorru!"
1730 DATA "hajudyhg="
1740 DATA "vdi@pluuru@zru
g@wr@zl)duq@phhw,"
1750 DATA "Eh@vxuh@irx@kdy
h@wkh@jrog@wr@juhhuw!@"
1760 DATA "zlw@d@exvlqhv
@olnh@dul!"
1770 DATA "zhdulqj@qdun@jo
dvvhvi!"
1780 DATA "zruwk@lwy@zhijk
w@lq@jroql!"
1790 DATA "qrw@ihw@olwl!"
1800 DATA "exuqlqj@euljkw
o!!!"
1810 DATA "lq@d@udwkh@edw
whuhg@frglwlrq!"
1820 DATA "qu!@dv@d@erah@d
qq@frpsahwo!eodqni!"
1830 DATA "lq@txlwh@jrrg@#

```

```

rqqwlrq#0#dqg#qrw#dw#doo#g
dpsl"
1840 DATA "fryhuhq#lq#eorr
gl"
1850 DATA "uhdqiqj=#H(fkdg
jh#wklv#yrxfkhuwrjhwkhu#zlw
k#dq#roq#odps#dqg#irx#oo###
#jhw#d#qhz#odps#iuhh#"
1860 DATA ".#zulqjlqj#zhwi
"
1870 DATA "Wkh#zli#)dug#v#h:
hv#oljkw#xsl#Kk#hdnhv###ir
xu#frlq#wr#ex:#k#lpyhai#d#qu
lq#dqg#q#q#qlv#sshduvl"
1880 DATA "\rx#sxw#rq#wkh#
furzq#kh#v#ohiw#ehklqg#q#dq
g#ilqg#irxuvhai#edfn#lq#wkh
#sdodfh,###Nlqj#ri#Fudda,#d
qg#kdss:#hyhu#diwhul"
1890 DATA "Rk#ghdu,#irx#yh
#jrw#qr#prqh:#0#dqg#wkh#zli
#dug#zdv#krsiqj#irx#g#ex:
#k#l#p#d#q#s#l#w#ru#wzri"
1900 DATA "Qdwxudooi#kh#nlo
ov#irxl"

```

```

1910 DATA "Wkh#qzdui#uhixv
hv#wr#ohw#irx#sdvwl"
1920 DATA "D#zrug#wr#wkh#z
lvh=#irx#uh#jrlqj#wr#wkh#rq
o:#urrr#lq#wkh#sodfh#ziwkrx
w#l#w#rzq#q#q#d#w#udo#skrvskru
hvfhqfhi"
1930 DATA "Dq#ludwh#qzdui,
#lqixuldwhq#e#l#wkh#oljkw#ir
x#yh#ohw#lq,#wkurzv#klv#xqo
lw#odps#dw#irxl#Lw#odqgv,#l
q#wkh#urrr#irx#yh#axvw#ohi
w,#vkdwhuhgi"
1940 DATA "\rx#kdyhq#w#jrw
#dq#wklqj#ghfhq#w#r#k#w#zli
wkl#Jhw#d#vzrugl"
1950 DATA "Wkh#qzdui#idoov
#qhdg,#wkhq#g#lvdsshduv#lqiu
rqw#ri#irxu#h#hvi"
1960 DATA "Wkh#yhqglqj#pdf
klq#vkdwhuhv#l#D#frlq#q#gu
rsv#rxw"
1970 DATA "Judwklwrxv#y#lro
hqfh#grhvg#w#k#hos#dq#irqhl"
1980 DATA "Wkh#frlq#idoov#

```

```

lqr#wkh#varw#lq#wkh#y#h
qglqj#pdfklqhl#irx#duh#jlyh
q#d#vzrugl#k#d#w#v#zki#l#w#v#
fdooq#wkh#Duprxul#"
1990 DATA "Xqirumxqdwhoi,#
irxu#odps#jrhv#rxwl"
2000 DATA "Lqwhuhvwlqj#Vr
phwklqj#v#k#dsshqglqj#wr#k#k
h#sdufkphqwl#Wdnh#d#orrn#l#l
"
2010 DATA "\rx#yh#jrw#d#lq#h
z#odps#"
2020 DATA "Wkh#fxumd#lq#i#od
uhv#xsi#irx#qlh#lq#wkh#e#e#o
d#h#l"
2030 DATA "Wdnlqj#dqy#d#q#d#j
h#ri#wkh#vxqghq#soxqjh#lq
wr#gdunghv,#wkh#qzdui#iurp
#qh#w#grru#l#frphv#lq#dqg#sro
lvkhv#irx#ri#l"
2040 DATA "Wkh#iluh#jrhv#r
xwl#irx#vhh#d#frlq#lq#l#w#d#v
khvl"
2050 DATA "\rxu#odps#oljkw
vl"

```

```

2060 DATA "Lw#exuvv#w#lqwr#
iodph#"
2070 DATA "\rx#vxqghqoi#uh
doi#v#wkdw#l#w#zdv#f#y#l#d#o#wr
#wkh#j#d#p#l#Ryhu#r#p#h#z#l#w#j#u
#l#h,#irx#n#l#o#o#irxuvhai"
2080 DATA "Wkh#pluuru#qlv#v
royhv#dqg#irx#ilqg#q#q#q#q#ir
xuvhai#sxoohg#wkurx#jk#wkh#j
ds#l#w#v#v#h#ohi#w#lqwr#wkh#zli
#dug#v#urrr#"
2090 DATA "Zkdw#d#vkdph#0#0#
dqg#irx#zhuh#qr#lqj#vr#h#h#zh
oo#wrr#l#6#r#irx#z#d#q#w#d#q#w#k#h#u
#j#r#0#+\20#"
2100 DEF PROCm(m)
2110 hh#=#m#(m):@OSUB 51@
2120 IF in PRINT"You are i
n ";oo#; ELSE PRINToo#;
2130 in = FALSE
2140 ENDPROC

```

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

ELECTRON, BBC Model B
(any OS, BASIC I/II)

QUAL-SOFT

£9.95
(inc. VAT and p.p.)

"There is one fault though. I am going to lose a lot of sleep over it, it is so addictive". Steven Wiseman of Liverpool.

"Many thanks for the fantastic game. As soon as I received it, there was no stopping until the end of the season". J. Hooley of Twickenham.

"I am writing to say what a wonderful football program SOCCER SUPREMO is. It really is the best football game on the market at the moment". Anthony Hayes of Redcar.

"SOCCER SUPREMO"

NOT SO MUCH A GAME, MORE A WAY OF LIFE!

You have just been appointed Manager of a newly promoted 1st Division Club, and it is up to you to transform this very ordinary side into one that can realistically challenge for the 1st Division Championship within the next 5 seasons. You must assess your side's capabilities and then, through your youth policy and the transfer market, reinforce the strengths and eliminate the weaknesses. It's all so easy... or is it?

*** "3-D", 22 MAN, FULL PITCH, FULL MATCH GRAPHICS SIMULATION

- 42 match season, 21 home games, 21 away games.
- Transfer market (Rush, Robson, Hoddle etc).
- 4-4-2, 4-3-3 and 4-2-4 team formation.
- In match tactical adjustments.
- Opposition skills related to League record.
- Opposition: 21 of the current 22 DIV 1 sides
- Match injuries: Your physio reports
- Team selection by names. (enter initials)
- Home/away bias, opposition tactical play
- Tactical substitutions

And many more features, but will take a full page advert if we are to continue, (That'll be O.K. Ad. Man).

The game will be posted on the same day as the receipt of order. ACCESS telephone authorisations should take no more than two days to arrive.

QUAL-SOFT
Dept. EU,
18, Hazlemere Rd.,
Stevenage,
Herts. SG2 8RX
Tel: (0438) 721936

Please supply a copy of SOCCER SUPREMO. I enclose a cheque, postal order, ACCESS card authorisation for £9.95

(Please state Electron or BBC)

Name:
Address:
.....
.....
CARD NO:

Catcher listing

From Page 33

```

0 TO 31:READ data:(%3000+(
25+IX)+640+9*32+JX)=data:NE
XT:NEXT
400 FOR IX=0 TO 5:IX?CX=2
55:NEXT
490 ENDPROC
500
510 REM *** data for bir
d ***
520 DATA 0,0,0,0,0,0,0,0,
0,0,0,0,0,0,65,130,195,19
4,65,65,65,194,194,130,193,
195,193,193,194,195,195,130
,193,193,193,193,130,130,19
5,0,0,0,0,0,0,65,0,0,0,0,
0,65,130,195,0,0,0,0,0,13
0,195
530 DATA 195,65,0,0,0,0,0
,0,195,194,195,65,0,0,0,0,1
93,195,194,193,195,0,0,0,19
5,194,193,194,195,0,0,0,193
,195,192,195,195,0,0,0,195,
193,195,130,0,0,0,0,195,130
,0,0,0,0,0,0,195,0,0,0,0,0,
0,0
540 REM *** data for man
***
550 DATA 40,60,10,32,32,3
2,40,16,0,60,1,7,15,5,40,40
,0,60,2,11,15,10,40,40,20,6
0,5,16,16,16,40,32,0,0,0,0,
0,0,16,16,52,40,52,40,32,32
,32,32,56,40,56,40,16,16,16
,16,0,0,0,0,0,0,32,32
560
570 DEF PROCinitialise
580 %FX16,0
590 ENVELOPE1,1,4,0,16,4,
0,16,126,0,0,-126,126,126
600 VDU 23,224,0,0,24,60,
60,24,0,0
610 VDU 23,225,170,255,85
,255,170,255,85,255
620 CX=%A00:DX=%A10:REM e
ggs coords.
630 SI=0:level=0:EI=0
640 ENDPROC
650
660 DEF PROCassemble
670 from=%70:to=%72:count
er=%74
680 number=%70
690 FOR pass=0 TO 2 STEP
2
700 PI=%900
710 [ OPT pass
720 .getadd

```

```

730 LDX #2 \calculate ad
dresses
740 .loop2
750 LDA number,X:PHA
760 LDY number+1,X
770 LDA #400:STA number,X
780 LDA #430:STA number+1
,X
790 TYA:BEQ done_y
800 .loop1
810 CLC
820 LDA number,X:ADC #400
:STA number,X
830 LDA number+1,X:ADC #4
2:STA number+1,X
840 DEY:BNE loop1
850 .done_y
860 PLA:TAY
870 BEQ done_x
880 .loop1
890 CLC
900 LDA number,X:ADC #420
:STA number,X
910 LDA number+1,X:ADC #4
0:STA number+1,X
920 DEY:BNE loop1
930 .done_x
940 DEY:DEY
950 BPL loop2
960 RTS
970
980 .me \move man
990 LDA #31:STA counter
1000 LDA from:CMP to:BEQ e
nd
1010 .print
1020 JSR getadd
1030 LDX #2
1040 .loop2
1050 LDY counter \move cha
racter
1060 .loop1
1070 LDA (from),Y:STA (to)
,Y
1080 LDA #0:STA (from),Y
1090 DEY:BPL loop1
1100 CLC \next row
1110 LDA from:ADC #80:STA
from
1120 LDA from+1:ADC #2:ST
A from+1
1130 CLC
1140 LDA to:ADC #80:STA t
o
1150 LDA to+1:ADC #2:STA
to+1
1160 DEY:BNE loop2
1170 .end
1180 RTS

```

```

1190
1200 ];PI=%75:[OPT pass
1210
1220 .mb \move bird
1230 LDA #63:STA counter
1240 JMP print
1250
1260 .me \move egg
1270 JSR getadd
1280 LDY #21
1290 .loop1
1300 LDA (from),Y:STA (to)
,Y
1310 LDA #0:STA (from),Y
1320 DEY:BPL loop1
1330 RTS
1340 ]
1350 NEXT
1360 ENDPROC
1370
1380 DEF PROCcan
1390 ?%70=%21:??%71=%25:??=%22
+(INKEY(-90) AND ??>0)-(INK
EY(-105) AND ??<19):??%72=%2X
:??%73=%25:CALL .me
1400 ENDPROC
1410
1420 DEF PROCbird
1430 ?%70=IX:??%71=YI:IF IX
<10 IX=IX+1 ELSE IX=0:YI=YI
+1
1440 ?%72=XI:??%73=YI:CALL
.me:RI=RND(5):IF RI?CX=255 R
I?CX=IX:RI?DX=YI+2:VDU 31,X
I,YI+2,224:SOUND#13,-15,100
,1
1450 ENDPROC
1460
1470 DEF PROCegg
1480 ?%70=IX?CX:??%71=IX?DX
:IX?DX=IX?DX+1:IF IX?DX<25
??%72=IX?CX:??%73=IX?DX:CALL
.me ELSE ??%72=0:??%73=32:CALL
.me:IF IX?CX=%21 EI=EI+1:SDU
ND#12,1,0,4:PRINT TAB(18,29
);EI:IX?CX=255 ELSE IX?CX=2
55:SOUND#13,-15,0,1
1490 ENDPROC
1500
1510 DEF PROCanother
1520 SOUND 1,-15,0,20
1530 TIME=0:REPEAT UNTIL T
IME>300
1540 SI=SI+EI+10
1550 COLOUR 7
1560 PRINT TAB(0,1);"Hard
luck..."
1570 PRINT "you only caught"

```

```

1580 PRINT "EI;" eggs."
1590 COLOUR 5
1600 PRINT ""Your final sc
ore"
1610 PRINT "is ";SI;". "
1620 %FX21,0
1630 KI=INKEY(500)
1640 COLOUR 3
1650 PRINT ""Another game
...?"
1660 SI=0:EI=0:level=0
1670 ENDPROC
1680
1690 DEF PROCinstructions
1700 PRINT TAB(15)"C A T C
H"
1710 PRINT TAB(14)"-----
-----"
1720 COLOUR 2
1730 PRINT ""Old farmer Bro
wn has been having a few"
1740 PRINT "problems with
his chickens lately. They"
1750 PRINT "just will not
stay still while he""coll
ects the eggs."
1760 PRINT ""The chickens
fly to and fro - their eggs
"
1770 PRINT "ending up ever
ywhere."
1780 PRINT ""Help farmer B
rown catch the eggs as they
"
1790 PRINT "fall. If you m
anage to catch over 50"
1800 PRINT "then you move
on to the next (harder).""
"level."
1810 COLOUR 3
1820 PRINT "SPC(5);""2 = le
ft";SPC(14);""/ = right"
1830 COLOUR 1
1840 PRINT TAB(9,31)"Press
space to start...";
1850 %FX21,0
1860 REPEAT UNTIL GET=32
1870 ENDPROC
1880
1890 DEF PROCerror
1900 IF ERR=17 RUN
1910 CLS
1920 REPORT
1930 PRINT " at line ";ERL
1940 END

```

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

Trig listing

From Page 15

```

1090 PRINT TAB(0,16)"Length
      of side ";second$;"
      is ";second;" units
1100 ENDPROC
1110 DEF PROCanglesides
1120 CLS
      :PROCTriangle
1130 PRINT TAB(0,16)"Name
      the side known X,Y or
      Z....."
1140 INPUT TAB(33,16)" "side$
1150 PRINT TAB(0,18)"Name
      the angle known A or
      B....."
1160 INPUT TAB(33,18)" "angle$
1170 IF side$<"X"
      THEN PROCmistake
1180 IF angle$>"B"
      THEN PROCmistake
1190 CLS
      :PROCTriangle
1200 PRINT TAB(0,16)"Enter
      length of side ";side$;
1210 INPUT TAB(30,16)side
1220 IF side<=0
      THEN PROCtoosmall
1230 PRINT TAB(0,18)"Enter
      angle ";angle$;" in
      degrees
1240 INPUT TAB(30,18)angle
1250 IF angle>=90
      THEN PROCtoobig
1260 IF angle<=0
      THEN PROCtoobig
1270 IF angle$="A"
      THEN PROCa
      ELSE PROCb
1280 DEF PROCa
1290 IF side$="X"
      THEN Y=SIN (RAD angle)*si
      de
      :Z=side*side-(Y*Y)
1300 IF side$="Y"
      THEN X=side/ SIN (
      RAD angle)
      :Z=X*X-(side*side)
1310 IF side$="Z"
      THEN X=side/COS (
      RAD angle)
      :Y=X*X-(side*side)
1320 B=90-angle
1330 IF side$="X"
      THEN PROCprintxa
1340 IF side$="Y"
      THEN PROCprintya
1350 IF side$="Z"
      THEN PROCprintza
1360 END
1370 ENDPROC
1380 DEF PROCprintxa
1390 CLS
      :IF angle<.5
      THEN PROCsure
      ELSE PROCTriangle
1400 PRINT TAB(0,16)"Length
      of side X is ";side;
      " units"
1410 PRINT TAB(0,18)"Length
      of side Y is ";Y;" units
1420 PRINT TAB(0,20)"Length
      of side Z is ";SQR (Z);
      " units"
1430 PRINT TAB(0,22)"Angle
      A is ";angle;" degrees"
1440 PRINT TAB(0,24)"Angle
      B is ";B;" degrees"
1450 PROCagain
1460 ENDPROC
1470 DEF PROCprintya
1480 CLS
      :IF angle<.5
      THEN PROCsure
      ELSE PROCTriangle
1490 PRINT TAB(0,18)"Length
      of side Y is ";side;
      " units"
1500 PRINT TAB(0,16)"Length
      of side X is ";X;" units
1510 PRINT TAB(0,20)"Length
      of side Z is ";SQR (Z);
      " units"
1520 PRINT TAB(0,22)"Angle
      A is ";angle;" degrees"
1530 PRINT TAB(0,24)"Angle
      B is ";B;" degrees"
1540 PROCagain
1550 ENDPROC
1560 DEF PROCprintza
1570 CLS
      :IF angle<.5
      THEN PROCsure
      ELSE PROCTriangle
1590 PRINT TAB(0,18)"Length
      of side Y is ";SQR (Y);
      " units"
1590 PRINT TAB(0,16)"Length
      of side X is ";X;" units
1600 PRINT TAB(0,20)"Length
      of side Z is ";side;
      " units"
1610 PRINT TAB(0,22)"Angle
      A is ";angle;" degrees"
1620 PRINT TAB(0,24)"Angle
      B is ";B;" degrees"
1630 PROCagain
1640 ENDPROC
1650 DEF PROCb
1660 IF side$="X"
      THEN Z=SIN (RAD angle)*si
      de
      :Y=side*side-(Z*Z)
1670 IF side$="Z"
      THEN Y=side/ SIN (
      RAD angle)
      :Y=X*X-(side*side)
1680 IF side$="Y"
      THEN X=side/COS (
      RAD angle)
      :Z=X*X-(side*side)
1690 A=90-angle
1700 IF side$="X"
      THEN PROCprintxb
1710 IF side$="Y"
      THEN PROCprintyb
1720 IF side$="Z"
      THEN PROCprintzb
1730 END
1740 ENDPROC
1750 DEF PROCprintxb
1760 CLS
      :IF angle<.5
      THEN PROCsure
      ELSE PROCTriangle
1770 PRINT TAB(0,16)"Length
      of side X is ";side;
      " units"
1780 PRINT TAB(0,18)"Length
      of side Y is ";SQR (Y);
      " units"
1790 PRINT TAB(0,20)"Length
      of side Z is ";Z;" units
1800 PRINT TAB(0,22)"Angle
      A is ";A;" degrees"
1810 PRINT TAB(0,24)"Angle
      B is ";angle;" degrees"
1820 PROCagain
1830 ENDPROC
1840 DEF PROCprintyb
1850 CLS
      :IF angle<.5
      THEN PROCsure
      ELSE PROCTriangle
1860 PRINT TAB(0,18)"Length
      of side Y is ";side;
      " units"
1870 PRINT TAB(0,16)"Length
      of side X is ";X;" units
1880 PRINT TAB(0,20)"Length
      of side Z is ";SQR (Z);
      " units"
1890 PRINT TAB(0,22)"Angle
      A is ";A;" degrees"
1900 PRINT TAB(0,24)"Angle
      B is ";angle;" degrees"
1910 PROCagain
1920 ENDPROC
1930 DEF PROCprintzb
1940 CLS
      :IF angle<.5
      THEN PROCsure
      ELSE PROCTriangle
1950 PRINT TAB(0,16)"Length
      of side X is ";X;" units
1960 PRINT TAB(0,18)"Length
      of side Y is ";SQR (Y);
      " units"
1970 PRINT TAB(0,20)"Length
      of side Z is ";side;
      " units"
1980 PRINT TAB(0,22)"Angle
      A is ";A;" degrees"
1990 PRINT TAB(0,24)"Angle
      B is ";angle;" degrees"
2000 PROCagain?
2010 ENDPROC
2020 DEF PROCagain
2030 PRINT TAB(3,26)"PRESS
      SPACE TO ENTER ANOTHER
      SET OF"
2040 PRINT TAB(14,28)"MEASUREM
      ENTS"
2050 key=INKEY (20000)
2060 IF INKEY (-99)
      THEN PROCintro
      ELSE PROCgoodbye
2070 ENDPROC
2080 DEF PROCinfo
2090 PROCTriangle
2100 PRINT TAB(0,14)"TRIG
      by G.P.Hawkins"

```

Trig listing

From Page 57

```

2110 FOR T=1TO 4000
: NEXT T
2120 PRINT TAB(0,13)"In any
triangle the unknown
sides and angles can
be calculated provided
that at least ONE side
and ONE angle, OR TWO
sides are known."
2130 PRINT TAB(0,18)"This
program will calculate
the unknowns with the
minimum of information"
2140 PRINT TAB(6,29)"Press
SPACE to continue."
2150 key=BET
2160 CLS
: PROCTriangle
2170 PRINT TAB(0,13)"GUIDELINE
S"
2180 PRINT TAB(3,15)"The trian
gle must have a RIGHT
ANGLE."
2190 PRINT TAB(3,17)"The side
opposite the right angle
is the HYPOTENUSE, in
this example side X"
2200 PRINT TAB(3,20)"in the
example angle 'A' has
side"
2210 PRINT TAB(7,21)"'Z' ADJACE
NT and side 'Y' OPPOSITE."
2220 PRINT TAB(6,29)"Press
SPACE to continue."
2230 key=BET
2240 CLS
: PROCTriangle
2250 PRINT TAB(0,13)"FORMULAE"
2260 PRINT TAB(2,15)"The formu
lae used to find the
unknowns are SINE, COSINE
and TANGENT thus:"
2270 PRINT TAB(17,18)"OPPOSITE
"
2280 PRINT TAB(11,19)"SIN
= -----"
2290 PRINT TAB(17,20)"HYPOTENU
SE"
2300 PRINT TAB(17,22)"ADJACENT
"
2310 PRINT TAB(11,23)"COS
= -----"
2320 PRINT TAB(17,24)"HYPOTENU
SE"
2330 PRINT TAB(17,26)"OPPOSITE
2340 PRINT TAB(11,27)"TAN
= -----"
2350 PRINT TAB(17,28)"ADJACENT
"
2360 PRINT TAB(6,30)"Press
SPACE to continue."
2370 key=BET
2380 CLS
: PROCTriangle
2390 PRINT TAB(0,13)"EXAMPLE"
2400 PRINT TAB(2,15)"SINES
COSINES and TANGENTS
are usually obtained
from books of tables."
2410 PRINT TAB(1,17)"To find
angle B given Y=2.67
and Z=4.80"
2420 PRINT TAB(2,19)"Would
be written : "
2430 PRINT TAB(17,21)"2.67"
2440 PRINT TAB(9,22)"TAN B
= -----"
2450 PRINT TAB(17,23)"4.80"
2460 PRINT TAB(15,25)"=0.556"
2470 PRINT TAB(0,27)"from
tables INVERSE TAN =
29.08 =B"
2480 PRINT TAB(6,30)"Press
SPACE to continue."
2490 key=BET
2500 ENDPROC
2510 DEF PROCreturn
2520 PRINT TAB(0,26)"DO NOT
FORGET: Press
after each
entry"
2530 FOR FLASH=0TO 500
STEP 10
2540 PRINT TAB(22,26)"
"
2550 PRINT TAB(22,26)"RETURN"
2560 NEXT FLASH
2570 ENDPROC
2580 DEF PROCgoodbye
2590 CLS
2600 PRINT TAB(16,16)"GOODBYE"
2610 PRINT TAB(0,31)"PRESS
SPACE TO RE-RUN PROGRAM"
2620 key=INKEY (20000)
2630 IF INKEY (-99)
THEN PROCintro
ELSE PROCgoodbye
2640 FOR T=1TO 5000
: NEXT T
: CLS
2650 END
2660 DEF PROCpythagoras
2670 CLS
: PROCTriangle
: PROCBurp
2680 PRINT TAB(5,16)"According
to Pythagoras :The squar
ep of the hypotenuse is
equal to the sum of the
squares of the other
two sides."
2690 PRINT TAB(4,20)"Therefore
the length of side X
must always be greater
than Y or Z."
2700 PROCre_enter
2710 ENDPROC
2720 DEF PROCtoobig
2730 CLS
: PROCTriangle
: PROCBurp
2740 PRINT TAB(2,16)"The sum
of the angles of a trian
gle equal 180
degrees."
2750 PRINT TAB(2,20)"Therefore
";angle"; must be less
than 90 and greate
r than 0 degrees."
2760 PRINT TAB(5,23)"Please
check your entry."
2770 PROCre_enter
2780 ENDPROC
2790 DEF PROCtoosmall
2800 CLS
: PROCTriangle
: PROCBurp
2810 PRINT TAB(2,16)"REMEMBER:
a triangle has THREE
sides."
2820 PRINT TAB(2,18)"Please
check your entry figures
and re-enter a POSIT
IVE number."
2830 PROCre_enter
2840 ENDPROC
2850 DEF PROCre_enter
2860 PRINT TAB(6,26)"PRESS
SPACE TO RE-ENTER YOUR
"
2870 PRINT TAB(14,28)"MEASUREM
ENTS"
2880 key=INKEY (20000)
2890 IF INKEY (-99)
THEN PROCintro
ELSE PROCgoodbye
2900 ENDPROC
2910 DEF PROCburp
2920 ENVELOPE 3,2,-25,-80
,-6,15,0,0,126,0,0,-126
,126,126
2930 SOUND 1,3,156,27
2940 ENDPROC
2950 DEF PROCsure
2960 CLS
2970 PRINT TAB(0,8)"*****
*****
****"
2980 PRINT TAB(0,5)"As you
have entered a measureme
nt of less than .5
will you please check
that your entry
was correct."
2990 PRINT TAB(0,4)"*****
*****
****"
3000 ENDPROC
3010 END
3020 DEF PROCtitle
3030 VDU 23,1,0;0;0;0
3040 COLOUR 7
3050 COLOUR 129
3060 CLS
3070 PRINT TAB(6,5)"T R I
G"
3080 PRINT TAB(6,10)"for the"
3090 PRINT TAB(7,15)"Acorn"
3100 PRINT TAB(5,20)"Electron.
"
3110 FOR PITCH=0TO 200
STEP 4
3120 SOUND 1,-15,PITCH,2
3130 NEXT PITCH
3140 CLS
3150 PRINT TAB(4,5)"A program
to"
3160 PRINT TAB(6,8)"work out"
3170 PRINT TAB(2,11)"all the
unknowns"
3180 PRINT TAB(7,14)"in any"
3190 PRINT TAB(4,17)"TRIGONOME
TRY"
3200 PRINT TAB(6,20)"problem."
3210 FOR PITCH=200TO 0
STEP -4
3220 SOUND 1,-15,PITCH,2
3230 NEXT PITCH
40 ENDPROC

```

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

Education Castle listing

From Page 35

E 70,460: SOUND1, -15, 10, 3: VDU 224: MOVE140, 500: SOUND1, -15, 20, 3: VDU224: MOVE230, 530: SOUND1, -15, 30, 3: VDU224

1230 MOVE 240, 530: DRAW230, 530: DRAW230, 600: MOVE300, 530: DRAW290, 530: DRAW290, 600

1240 BCOLOR, 2: MOVE290, 600: MDV E230, 600: PLOT85, 290, 700: PLOT 85, 230, 700

1250 BCOLOR, 3: X1=260: Y1=725: R X=25: FOR I1=X1+R1 TO Y1-R1 5 STEP -4: J1=SGR(ABS(I1-R1)-(I1-Y1)*(I1-Y1)): MOVE I1-J1, I1: DRAW I1+J1, I1: SOUND1, -15, I1, I1: NEXT

1260 BCOLOR, 0: MOVE 500, 300: DRAW 600, 300: DRAW600, 400: DRAW 500, 400: DRAW500, 300: MOVE550, 300: DRAW550, 400: MOVE600, 350: DRAW500, 350

1270 BCOLOR, 2: PLOT89, 350, 730: PLOT89, 270, 730

1280 MOVE 320, 740: BCOLOR, 7: DRAW260, 740

1290 MOVE 280, 741: MOVE240, 741: PLOT85, 280, 750: PLOT85, 240, 750

1300 MOVE 290, 700: DRAW 310, 700: DRAW 310, 650: MOVE230, 700: DRAW210, 700: DRAW210, 650

1310 MOVE 290, 620: DRAW 230, 620: MOVE230, 600: DRAW290, 600

1320 MOVE 360, 690: DRAW360, 700: DRAW310, 640

1330 MOVE 410, 700: DRAW310, 640

1340 BCOLOR, 4: MOVE 1079, 0: MOVE 1279, 0: PLOT85, 1079, 250: PLOT85, 1279, 250

1350 VDU28, 0, 5, 19, 0: VDU4: COLUR129: COLUR0: CLR

1360 VDU23, 1, 0, 0: 0: 0: 0: 0: 0: 0: 0

1370 PROCFLAG

1380 SOUND1, -15, RND(55)+100, 5

1390 PRINTTAB(0, 2) " THANK YOU FOR"

1400 SOUND1, -15, RND(55)+100, 5

1410 TIME=0: REPEAT UNTIL TIME>200

1420 PRINTTAB(0, 2) " S A V E M E."

1430 SOUND1, -15, RND(55)+100, 5

1440 TIME=0: REPEAT UNTIL TIME>200

1450 SOUND1, -15, RND(55)+100, 5

1460 PRINTTAB(0, 2) " G O D B L E"

1470 SOUND1, -15, RND(55)+100, 5

1480 TIME=0: REPEAT UNTIL TIME>300

1490 SOUND1, -15, RND(55)+100, 5

1500 END?

1510 ENDPAGE

1520 DEF PROCFLAG

1530 VDU 23, 235, 127, 191, 223, 239, 247, 251, 253, 254



1540 VDU 23, 236, 254, 253, 251, 247, 239, 223, 191, 127

1550 FLAG=CHR#235+CHR#236+CHR#8+CHR#9+CHR#10+CHR#236+CHR#235

1560 MOVE 600, 900: VDU5: BCOLOR, 4: PRINT FLAG

1570 VDU4: CLR: ENDPAGE

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

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... 'Very good indeed' ... ABS Computing - Jan/Feb 1984

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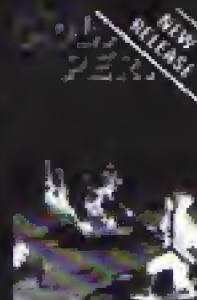
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Micro Messages

HELP! Take pity on an inexperienced, eager adventurer!

I have had my Electron for a couple of months now and I am learning all the time, but one thing I cannot master is adventures or to be precise one adventure (I've only tried one!).

Having had a go at an adventure of my cousin's I thought that adventures were fun (though obviously not easy) and I decided on getting one. The one I chose was Program Power's Adventure.

Trouble is I cannot seem to get very far with it, in fact I have come to a dead end.

I have searched the forests (and got lost) and the cavern (by typing in "Open Sesame") but that's it. I seem to have been everywhere, but I know I have not, so where to now?

I have picked up a scarf, a lamp, a green frog (which when killed turns into a princess and runs away, but the princess cannot be followed!), a wicker cage, a glass slipper and oil.

The computer does not understand WAVE so I have tried rubbing everything but the answer is NOTHING HAPPENS, except on the lamp where the answer is NOTHING HAPPENS HERE, which I suspect means: 'nothing will happen here but it might elsewhere'. Am I right?

By the way, I have occasionally found the axe in the forest but I am not always successful.

So please, please, please help me on my way. I just want you to help me to get to the next stage, find the next place to go, please help me Merlin, I

Help! Take pity on a poor adventurer

am thinking of chucking the game out! — Jenny Tremlett, Tadworth, Surrey.

● Merlin will be notified, Jenny.

Complete recovery

MANY thanks for Dave Robinson's superb Recover program. (Electron User, December). As a person prone to taping over the end of saved programs I was delighted to find that this program could bring back what was left of it and the program could be resurrected.

It came in very useful only today when I taped over the end of the Xmas Carol program, which I am using as part of a compilation of programs I'm sending to a friend instead of a Christmas card. — Graham McCann, Callander, Perthshire.

Joy — what joy?

WITH reference to Micro Messages in the August edition of Electron User — "Joy for First Byte interface owners ... can now use it with all Acornsoft games ..." This is

just not so!

It will not work with Chess, Draughts, Reversi and so on, in fact any game relying upon operation by the use of two coordinates to indicate a particular spot on the screen.

Can any genius suggest a procedure that will so operate? — J. Clewson, Stauton.

● None of our resident geni can come up with a program that would work for every occasion. Over to the readers.

Turning to the Electron

YOU recently reviewed a copy of Practical Programs for the Electron by the Bishops, but have you seen the cover?

Among the letters and numbers there is distinctly of DIVIDE ÷ SIGN!

Surely everyone who uses a computer knows that there is no such sign, just a / for divide.

Having ordered all the back-copies of Electron User I have watched with interest the correspondence about not being able to get the top line of text on television screens.

Readers may be interested to hear my experience.

I recently bought a Philips 2006 and was very disappointed when I too lost the top line, but I contacted an engineer who adjusted the set with no trouble.

He dropped the picture area down low enough to get the top line on, without showing the teletext lines when used normally.

It may be that more people can do this without resorting to programming techniques?

Electron User seems to be

growing up faster, especially by including a review of the Mushroom-Printer/User port add-on.

I could not afford a BBC and decided on the Electron, but regret not having any interfacing facilities.

This interface gives the chance of having the user-port and allowing the computer to control something.

I bought Bruce Smith's book but I must admit, I find it very difficult to follow.

I work in research, and several colleagues who have family financial restrictions are turning to and buying the Electron.

We are not games players and want to learn serious programming and start doing some interfacing.

I write to ask if you would start a series on "interfacing with the Electron", using say, the user port as the Mushroom unit.

This may give the more technically minded user a new insight into what the Electron can do. — C.M. Hawkes, Runcorn, Cheshire.

● We hope to start an interfacing series soon, but it would be based on the Plus 1 interface.

Get down to training

RECENTLY I spent one week's holiday at my cousin's, who owns a BBC Micro. One of the programs which he showed me was one which just played well known tunes.

Maybe you could show how this is done — translating written or staved music, into

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

sound commands? It could appear in your "noise and music" feature.

Finally, in your request on *Micro Olympics*, I am doing quite abysmally. My best event is the javelin, in which I have thrown 87.95m.

I have beaten my computer at the 100m, three times, but literally given up at the 1500m.

I'm pathetic at all the jumps, especially the long jump (I'm not telling my best).

I think it is an original game, but isn't there a better way of controlling the man than banging the keys? I must admit, I can't think of one. — **A. Manning, Huddersfield, Yorks.**

● It is impossible to do well at the Olympics if you "bang" the keys. Use finger rather than wrist movement and quickly tap the keys. Using this method, the world record can be beaten in all events.

As with the real Olympics, plenty of training is necessary. Good luck.

A jump too far

I RECENTLY received a First Byte joystick interface and a Quickshot II joystick. I found playing games much, much easier but I later discovered that *Micro Olympics* is not convertible.

Can you convert the program by any other means rather than using the conversion tape? If so how?

By the way, *Micro Olympics* is a brilliant game, but is it actually possible to beat the computer at the long jump? I have tried time and time again, but without success. — **Liam Ruddock (aged 12).**

● *Micro Olympics* is not designed to be used with joysticks, because as they are all different it would have been impossible to set a standard for them.

If you run fast enough the long jump (and all the other events) are possible.

Don't miss out!

HAVING missed the December edition of *Electron User*, I think you should print the date of publication for the coming edition, as those of us with sieve-like memories forget to subscribe. — **Jonathan Mercer, South Woodham-ferrers.**

● You don't know what you missed! But you can make sure it doesn't happen again by turning to Page 47.

High-score plea

I MUST say how grateful I am to *Electron User*. It has helped my programming methods to improve greatly. The magazine caters for those who do not have an 'O' level in BBC Basic!

The VDU characters are great but could you tell me what happened to them in the December issue, I am mystified.

After reading the Claim to Fame by David Thompson in *Micro Messages* in December issue, it has come to my attention that a high-score table would be a great idea.

I'm sure there's hundreds more that agree with Dave and I. Please, please add another PAGE!

I can't really boast about my

high-scores but at least it's a start.

Chuckie Egg336,400
Felix/Factory.....14,300
Croaker.....14,360
Pengi.....68,000
Twin Kingdom
Valley completed...1,024
Starship Command ..480

How about using screen photographs as proof of high score? — **No name, but address in Bridlington, East Yorks.**

Marks out of ten

I MUST tell you of the excellent service I have received since I bought my *Electron* in August.

I bought it from *Micro Power*. I paid the standard price of £199, but also received a cassette recorder. The package was delivered in only 36 hours.

However, I found that the cassette player was faulty. I returned it, and received a replacement in only five days. I would recommend *Micro Power* to anyone.

I also purchased a game by Durell Software called *Mine-shaft* — the game is superb, please review it — from a shop in Gloucestershire.

I had difficulty loading it and returned it to Durell. I received a replacement also in five days. I would like to thank the company for their excellent

service.

Could you please give marks out of 10 for each game for, say, graphics, sound and so on and include the price in your reviews?

Keep up the good work! —

Nigel Jacques, Loughborough, Leics.

● The trouble with a score table is that it's very hard to get standardisation on the scores. One man's 10 would be another's 5 and so on. We feel it's better to get a general assessment of the game.

To change the subject, it's nice to hear of good service. All we usually hear about are the complaints.

Elite warning

A GRIM warning to future buyers of *Elite* for the *Electron* who have seen it on the BBC *Micro* and read the reviews.

It is not quite the same on the *Electron*.

I found that after saving my credits, where I bought my *Galactic Hyperdrive*, I could not use it.

There is no colour, less enemy ships and it's drastic flashing.

Acornsoft's spokesperson said: "There are no plans at the moment to debug the program as the faults do not interfere with the playing of the game".

— **D. Fiveash, Tolworth, Surrey.**

Comments from afar..

GREETINGS from Swaziland. First let me congratulate you all for a most useful magazine which really does assist the first-timer, and especially those of us who are a little longer in the tooth.

I bought my *Electron* after the delivery hoo-ha in April this year and on my return to Swaziland I decided to buy in all copies of your magazine — a most wise decision which has allowed me to follow feature articles in sequence as a

training course.

Now for one or two comments. Could your book reviewers please give fuller details, such as the name of the publisher and the ISBN?

There are no well-known booksellers in the High Street here in which to browse and by the time *Books In Print* catches up with a title the details have been forgotten.

As to your listings — yes, they do cause problems from time to time, although they are

better than other magazine listings I have seen.

Needless to say, more, and yet more, educational programs would be my suggestions for the future.

May I close by also thanking you for the prompt delivery service — I may be 7,000 miles away, but the December issue has been thoroughly enjoyed.

My good wishes to all your staff. — **W.L. Roberts, Mbabane, Swaziland.**



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BBC £7.95. Electron £7.95

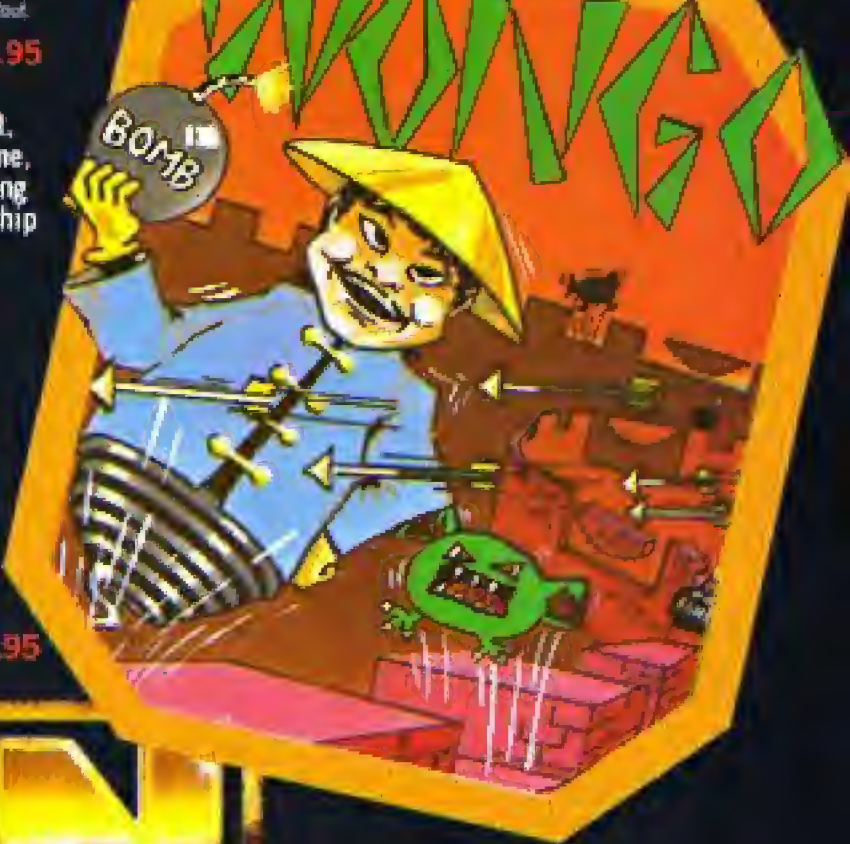
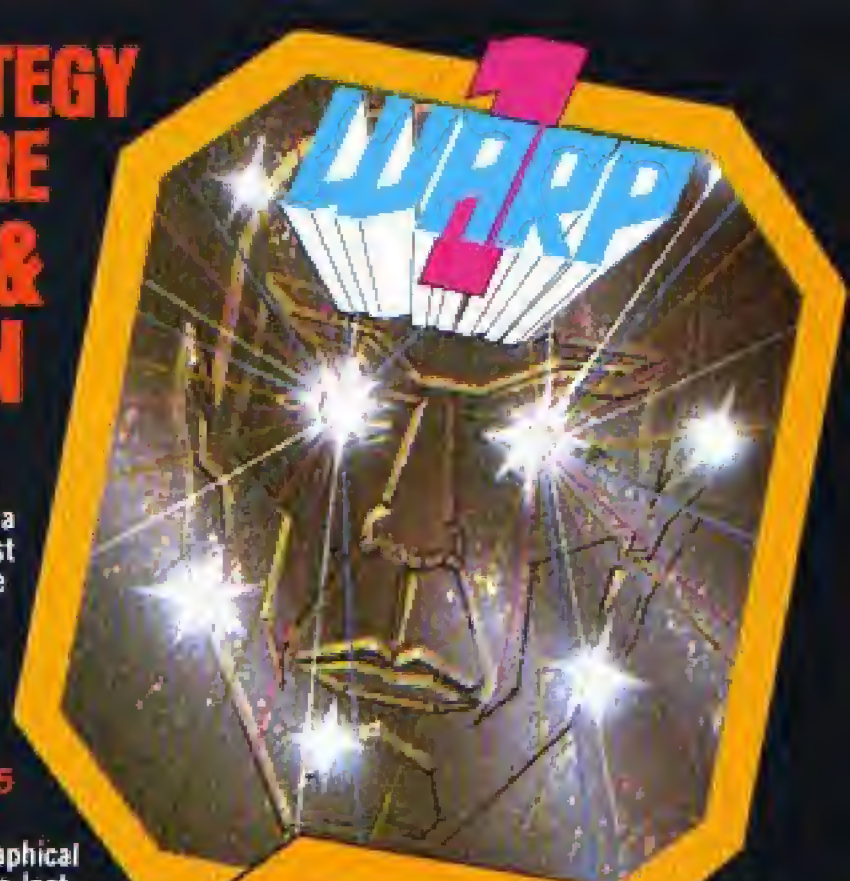


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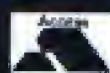
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