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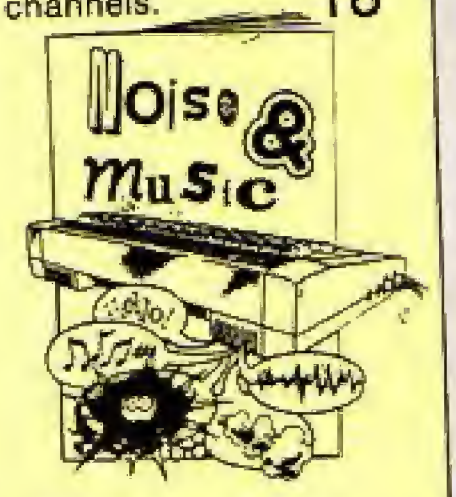

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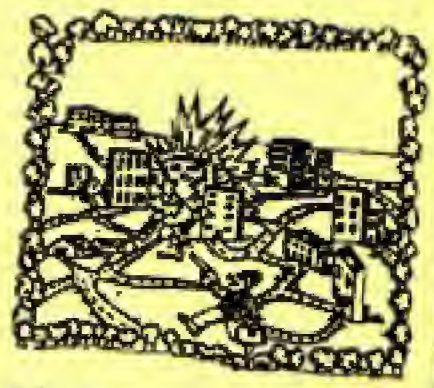

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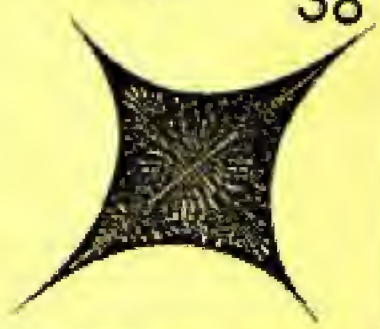

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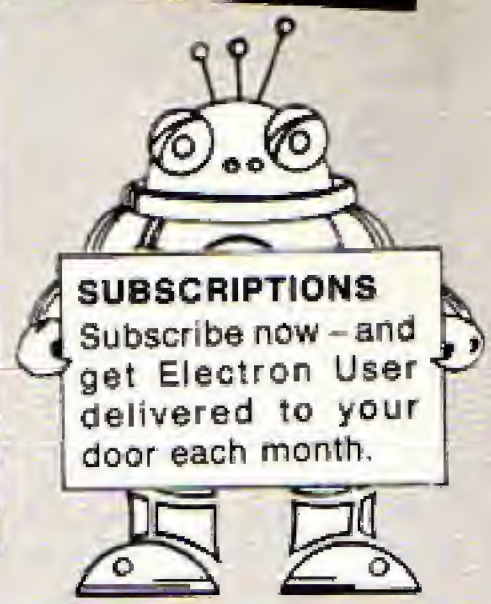

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electron user NEWS

MINI Office, the £5.95 software package, is now being used to help the handicapped.

The package, which runs on the Electron and BBC Micros, offers four business programs, including a word processor. And it is this program that is proving a hit with partially-sighted users.

As well as being easy to learn, it offers the option of giant on-screen letters. And the printout can also be in extra-large type, if desired.

Now the London-based Foundation for Communication for the Disabled is working with Database on a new version for the visually handicapped.

The modified program will give the printer a double-strike action to make the printed characters extra black.

Electron disc drive –and it's official

OFFICIAL disc drives come to the Electron with the mid-November launch of the Plus 3, the latest Acorn expansion module.

Packaged in a compact, L-shaped box the same colour as the Electron, the Plus 3 fits between the micro and the Plus 1 expansion, the disc drive being flush with the keyboard.

The unit consists of the Acorn DFS – the software that allows the Electron to talk to a disc drive – and a 3.5 inch, 320k single-sided disc drive allowing quick and reliable storage and retrieval of programs and data.

The DFS chip will be the double density 8272 floppy disc controller, the same as that to be used on the new Acorn Business Computer.

Some 10,000 Plus 3s will be produced by Christmas and will be sold at a yet to be announced "competitive" price.

Anticipation

Advance news of the Plus 3 means that Acorn has broken its policy of not announcing new products until they are generally available. This is to allow software houses to produce software in anticipation of the launch.

In the race to get the disc unit to the market, the Plus 1 has not been forgotten. October saw the release of three more cartridge ROMs for the unit, two of which are utility programs transferred from the BBC Micro.

View will give the Electron its first ROM-based word processor. Similarly Viewsheet will be the first spreadsheet on a chip for the Electron.

Combined with the ROM based software, the increased speed, storage capacity and reliability given by the disc drive moves the Electron into the realm of serious applications in both home and business.

The third cartridge is the long awaited RS423, a serial communications port. This will allow the Electron to communicate with other micros and even mainframes via a modem.

The third official expansion module for the Electron will be the seemingly illogically named Plus 2.

Available in the new year, this will be the Econet interface which will allow the Electron to network or work in tandem with other Electrons.

Communications on show

IT's no longer true to say that using a computer makes you anti-social and puts you out of touch with other members of the human race.

Communications is the name of the game – and also the theme of the Electron and BBC Micro User Show at Alexandra Palace from October 25-28.

The October release of the RS423 communications cartridge for the PLUS 1 means that the show will have even more to offer Electron users.

On a more basic level, Pace Electronics show how a schoolteacher can maintain control of a classroom full of pupils by means of an E-net networking system.

Micronet, the electronic magazine for the micro owner, is also being demonstrated in depth.

A portion of Prestel specifically aimed at the home micro user, Micronet has introduced more people to communications in the UK than any other system.

The use of the telephone to aid communication between computer owners is also covered at the show, demonstrating how exchange of data files between individual users avoids the tedium of hours of keyboard bashing.

Among many leading firms displaying their products are Acorn, Torch, Watford Electronics, Viglen, Alpha Disk, British Micro, M.T. Direct, Solidisk Technology and BBC Publications.

BUYERS MORE CHOOSEY

A CLAIM that the software industry is facing a dramatic shake out has come from David Johnson-Davies, managing director of Acornsoft.

"The market has radically changed in the last 12 months – the consumer is much more discerning now", he insists.

BUYERS of Comsoft's latest game, SAS Commander, are being given the chance to profit from their skill.

More than 100 prizes, including a top award of £50 plus £20 of software, will be given to players recording the highest scores.

SAS Commander, for the Electron and BBC Micro, costs £4.95 and allows players to kill terrorists, rescue hostages and storm buildings.

The game includes high score tables, demonstration screens, practice mode and training course.

In order to differentiate between genuine scores and false claims, each score generates a coded key that Comsoft says cannot be broken.

An entry form is included with each cassette and the closing date for entries is March 31, 1985.

ENGLISH Software has released its first title for the Electron and BBC Micro.

Spaceman Sid, available on cassette for £7.95, features scrolling screens, sliding bridges, meteor storms, 100 per cent machine code action, five different play sectors and three progressive skill levels.

The company says it will also be releasing its Jet Boot Jack game for the Electron and BBC Micro in the near future.

CURRYS BOOSTS ELECTRON

CURRYS, the High Street electrical giant, aims to grab 10 per cent of the £564 million home computer market by Christmas.

The company has selected the Electron as one of just six machines to be sold in most of its 530 stores in order to increase its share from around the current two per cent.

It will be supporting the launch with a £500,000 advertising campaign.

The other machines to be mass marketed alongside the Electron are the BBC Micro, the 48k Spectrum, Commodore C16 and CBM 64, and Toshiba's MSX, the HX-10.

Why the Electron? "It is a very nice machine and we believe that it will eventually become a big seller", said a Currys spokesman.

Fred Harris gets to grips with an Electron

ELECTRON TV SHOW RETURNS IN 1985

IF you missed Yorkshire TV's Electron-based computing show, "Me and My Micro" earlier this year, take heart – there will be another chance to see it in the new year, on Channel 4.

The five-part series, presented by Fred Harris – and his Electron – will be screened Monday evenings in January and February 1985.

Exact timings are not finalised, but a 5.30pm slot starting January 7 seems likely.

Advantage

Viewers who don't yet have an Electron can take advantage of a special starter pack from Acorn.

In addition to an Electron, user guide and programming manual, the pack contains a cassette recorder, a "Me and My Micro" book and a software cassette which ties in with the programme.

The pack costs £245.

Also coming up on Channel 4 is a new micro show, planned to run from mid-February to the end of March next year.

Jokily entitled "4 Computer Buffs", the seven-part series will feature the team from Thames TV's "Database" programme.

Fairy tale world on the screen

A NEW adventure game from Electron User allows young children to explore a fairy tale world peopled by familiar story book characters and sprinkled with magic.

The Magic Sword cassette comes with a 48 page full colour book that recounts all the events leading up to the start of the adventure.

There's a handsome prince, a beautiful princess, a castle with secret passages and mysterious dungeons, dense forests, deep caves – and a crooked house complete with wicked witch.

Colourful animated graphics and lots of exciting sound effects encourage the child to travel through the countryside and explore the castle to find the princess and release her from the witch's clutches.

The text is in double-height characters and there is a compass on screen throughout the game showing, in flashing mode, directions in which moves are permitted – a useful aid for those new to adventure games.

The complete package – cassette and storybook – is available from Database Publications, price £8.95.

BUSINESS ROM

THE Electron has become a low-cost business machine with the aid of a £29.95 add-on, according to Broadway Electronics.

The firm is the latest to produce a sideways ROM card.

It plugs into the Electron's extension port without modification, enabling software to be called up instantly.

Micros for murals

THE "A" level art students of Sandbach School in Cheshire got some unexpected design experience recently when they produced a set of murals for Acorn's new Altrincham, Manchester offices.

The idea came from John Taylor, a director of 3SL, Acorn's North West distributor.

The deal was that the lads would design and build the murals from materials paid for by Acorn. In return, they would get a BBC Micro for their school – plus a real project to get their teeth into.

In the event, Acorn was so pleased with the result that they also gave each boy an Electron as a personal memento.

Acornsoft launches new cult adventure

ACORNSOFT has launched a pre-Christmas blitz on Electron users with 20 new titles backed by a £150,000 promotional campaign.

And it is predicting it will enjoy a bumper Christmas with anticipated sales of around £2.5 million – more than double those for the same period last year.

It bases this forecast on the fact that its recent releases will boost its total of programs available for the Electron and BBC Micro to 120.

The company's latest offerings include four for the growing home education market which, according to Acornsoft, "take computer learning back to first principles".

Cocktails

The software publisher has also zeroed in on the non-hobbyist adult user, with home interest subjects ranging from how to make cocktails to a "sympathetic" weight-watchers program.

However Acornsoft expects its real Christmas sales bonanza to come from Elite, which it is touting as the new cult game for the festive season.

This integrates 3D spaceflight simulation within a non-stop galactic adventure.

It places Electron and BBC Micro users in command of a Cobra space ship on what the promotional material describes as: "A fantastic voyage of discovery and adventure, representing the ultimate test of a human's flying, combat, navigational and entrepreneurial skills".

Intergalactic trading between countless planets exposes players to danger from pirates and, should profitable contraband be carried, from police ships as well.

Acornsoft's Elite... 3D space flight simulation in a galactic adventure

Coveted

The profits gained, however, buy better defences, which help the traders survive another day and, eventually, win the coveted rank of Elite.

Acornsoft believes Elite represents the state of the art in home computer entertainment taxing a player's skills both of coordination and intellect.

Elite took two years to develop in association with Cambridge undergraduates Ian Bell and David Braben.

Priced at £12.95, the package includes a 64 page space traders flight training manual, a space ship identification chart, command reference card and function key strip, and to set the scene, a science fiction novella based on the game entitled The Dark Wheel.

GOOD DEAL

UNDER 18s saving up to buy an Electron will find it a cheaper proposition if they have an account at the Luton branch of the Leeds Permanent Building Society.

If they successfully play one of three special building society games on micros installed at the branch youngsters up to 18 receive an automatic £1 voucher printout with which to open a savings account.

And distributors Broadway Electronics will knock £5 off the price of an Electron and give free software if the purchase is made with a Leeds cheque.

Broadway is one of four Acorn dealers taking part in the pilot scheme in East Anglia.

NIGEL PETERS deciphers another programming problem . . .

HAIL CAESAR JCKN ECGUCT

THIS month we'll be using the Electron to help unravel one of the best-known ciphers in the world – the Caesar cipher. This method of writing secret messages got its name from its inventor, Julius Caesar.

It works by displacing each letter of the message a certain number of letters along the alphabet. If that sounds complicated, don't worry too much – it isn't.

All it means is that if I wanted to encode the word ELECTRON I would first decide on what the shift would be. Suppose I wanted it to be two letters. Then the encoded word would be GNGEVTQP.

This is because G is two letters along the alphabet from E, N is two letters along from L, and so on.

We could have made the shift four letters long (in which case ELECTRON is IPIGXVSR) or any other number up to 25.

The simple way to write a message in Caesar cipher is to decide on the displacement and write out two alphabets, as in Figure I.

Here the displacement is two letters. The top line, or plain, is the normal alphabet. The bottom line, or cipher, is the alphabet displaced by two letters.

Notice that when you get past Z the next letters are A and B – the alphabet wraps around.

Now it's easy to write your message. Just look up its letters in the top row and note down the corresponding letters from the cipher. USER in plain would become WUGT in cipher.

Of course you could have any of 25 cipher alphabets in a Caesar cipher, because the displacement can be anything up to 25 letters.

If the displacement is 26 letters you get back to the normal alphabet again – not so clever when you're trying to send a secret message.

Figure II, a sort of super Figure I, shows the plain alphabet on the top row with the 25 possible cipher alphabets below it. You can use it to encode your cryptic messages in Caesar cipher with the displacement of your choice.

If you want the micro version of Figure II then Program I will produce it for you.

But what, you may ask, has this to do with the Electron? Well, try decoding a Caesar cipher message such as LTTAA SDCT. It's not easy if you don't know what the displacement is.

You can spend ages searching through the table in Figure II trying out displacement after displacement until the message makes some kind of sense.

Have a go at figuring out LTAA SDCT using the table. It's not easy, is it?

Well Program II, which comes under the magnifying glass this month, makes life easier. It uses exactly the same method as above.

Let's see how it works, line by line.

The first two lines are just REM statements, telling what the program is and who wrote it. I'll do anything to see my name in print!

Line 30 is a *FX command which ensures that the keyboard is in Caps Lock. The reason for this is that the program is easier to follow than if it allowed for lower case letters as well.

The INPUT statement of line 40 asks for a sample of the coded message to be entered and this is stored in the string variable *word$*.

The next line's LEN just finds the number of characters in *word$* and stores the result in the numeric variable *length*.

Having taken a sample of the enciphered message and measured the length of the sample, the program now enters a set of two nested loops.

The effect of these is to display the sample of the cryptic message in each of the 25 alternative alphabets available. It prints out each of these alternatives with the number of letters that it is offset.

If a sample actually makes some sort of sense you press Return and get the chance to have the Electron decode the whole message. Otherwise pressing any other key allows the micro to continue printing out the alternative versions of the sample until eventually one makes sense.

Lines 60 and 170 form a FOR . . NEXT loop with the control variable *offset*. This ranges in value from 1 to 26, obviously once for every letter of the alphabet.

Each time round this outer loop line 70 sets up a string variable *clear$* and sets it to the null, or empty, string. This string is used in the inner FOR . . . NEXT loop formed by lines 80 and 130.

The inner loop takes the sample word apart, letter by letter, and rewrites it in a new alphabet with the letters offset by the variable *offset*.

Since *offset* is the control variable of the outer loop and varies from 1 to 26, this means that the inner loop rewrites the sample word with each of the 26 available alphabets.

If the person who coded the message has done the job properly, then one of them

```
Plain: ABCDEFGHIJKLMNOPQRSTUVWXYZ
Cipher:CDEFGHIJKLMNOPQRSTUVWXYZAB
```

Figure I: Offset alphabet

```
  10 LET string$="ABCDEFGH
IJKLMNOPQRSTUVWXYZ"
  20 PRINT string$
  30 FOR loop=1 TO 25
  40 string$=RIGHT$(string
$,25)+LEFT$(string$,1)
  50 PRINTstring$
  60 NEXT loop
```

Program I

```
ABCDEFGHIJKLMNOPQRSTUVWXYZ
BCDEFGHIJKLMNOPQRSTUVWXYZA
CDEFGHIJKLMNOPQRSTUVWXYZAB
DEFGHIJKLMNOPQRSTUVWXYZABC
EFGHIJKLMNOPQRSTUVWXYZABCD
FGHIJKLMNOPQRSTUVWXYZABCDE
GHIJKLMNOPQRSTUVWXYZABCDEF
HIJKLMNOPQRSTUVWXYZABCDEFG
IJKLMNOPQRSTUVWXYZABCDEFGH
JKLMNOPQRSTUVWXYZABCDEFGHI
KLMNOPQRSTUVWXYZABCDEFGHIJ
LMNOPQRSTUVWXYZABCDEFGHIJK
MNOPQRSTUVWXYZABCDEFGHIJKL
NOPQRSTUVWXYZABCDEFGHIJKLM
OPQRSTUVWXYZABCDEFGHIJKLMN
PQRSTUVWXYZABCDEFGHIJKLMNO
QRSTUVWXYZABCDEFGHIJKLMNOP
RSTUVWXYZABCDEFGHIJKLMNOPQ
STUVWXYZABCDEFGHIJKLMNOPQR
TUVWXYZABCDEFGHIJKLMNOPQRS
UVWXYZABCDEFGHIJKLMNOPQRST
VWXYZABCDEFGHIJKLMNOPQRSTU
WXYZABCDEFGHIJKLMNOPQRSTUV
XYZABCDEFGHIJKLMNOPQRSTUVW
YZABCDEFGHIJKLMNOPQRSTUVWX
ZABCDEFGHIJKLMNOPQRSTUVWXY
```

Figure II. Cipher table

Program ProObe

must make sense!

This inner loop has the control variable *slice* which varies from 1 to the value of *length*. We met *length* in line 50. It holds the number of characters in the sample word. This means that the loop cycles once for each letter in *word$*.

Line 90 looks complicated but isn't all that hard when you take it bit by bit.

The function MID$ takes one letter from the string *word$*. Which letter it takes depends on the value of *slice* which in turn depends on the stage the loop has reached.

Since *slice* varies from 1 to the length of *word$* this means that every letter of the sample word is selected in turn.

When MID$ selects a letter the ASC function in front of it gives the Ascii value of that letter. The Ascii value is just a number that represents a letter. A is 65, B is 66, and so on until Z is 90.

So, as the loop cycles, each letter of the sample is turned into a number which represents it.

Line 90 doesn't stop there, however. It also adds the value of *offset* to the Ascii code for that letter and stores the result in the variable *lettercode*.

Depending on how many times the outer loop has cycled, *offset* will vary between 1 and 26 in value.

What this means is that when the inner loop has finished, the Ascii code for each letter of the sample has been increased by the same offset.

All that is needed to see the new word produced from the sample is to take each of these codes in turn and find out what letter they stand for.

This is what line 110 has been doing. CHR$ produces the letter for that particular value of *lettercode* and stores it in the string *letter$*.

Each time round the inner loop *letter$* is added to *clear$*. When the loop stops, *clear$* holds all the letters of the original sample, *offset* letters along the alphabet.

But what, you might be wondering, does line 100 do? The answer is that it allows for the wrap around in the alphabet that we saw earlier.

Suppose the letter we were working on was Z and the offset was to be three letters. Well, you and I would have the sense to realise that we go back to A and start again. The required letter would be C.

If we didn't have line 100, however, the Electron would take the Ascii code for Z, which is 90, and add the offset to it. The answer would be 93 and line 110 would try to find out what 93 represents.

If you try:

```
PRINT CHR$(93)
```

on your Electron, you'll see that it is a square bracket, not the letter C that it should be.

Line 100 allows for this by taking away 26 from the value of *lettercode* if it's over 90. In this case, the result of subtracting 26 from 93 is 67, which is the Ascii code for C.

Once the inner loop is finished the Electron goes onto line 140 which displays the new version of the sample word and the offset that produced it.

The next line causes the program to halt until you press a key. This allows you to look at *clear$* to see whether it makes any kind of sense.

When you press a key that letter is placed in the string *wait$*. The next line examines *wait$* and if you pressed the Return key – which you do when clear$ makes some kind of sense – it takes you off to PROCmessage.

If you didn't press Return the Electron goes round the outer loop again, trying another value of *offset*.

Eventually when *offset* has got to 26, *clear$* will be the same as the coded sample and the program will go on to line 180 and end.

In this case either you haven't recognised the sample word or the person who created the ciphered text got it wrong.

And that's about it for this month. PROCmessage, which is defined in lines 190 to 310, comes into operation when you have recognised the word and pressed Return.

It asks you to type in the whole message, takes the value of *offset* and prints out the deciphered text. As it's almost the same as the first part of the program I've left it for you to try and figure out.

The only real difference is line 250 which just allows for the fact that the coded message might have spaces (Ascii code 32) in it. After all, there's no point in adding the offset to a space is there?

When you've figured it out, you might also be able to see that you could use PROCmessage to translate your secret messages into Caesar cipher.

WPKT UJC

```
  10 REM CAESAR CIPHER
  20 REM NIGEL PETERS
  30 *FX202,32
  40 INPUT "Enter test wor
d",word$
  50 length=LEN(word$)
  60 FOR offset=1 TO 26
  70 clear$=""
  80 FOR slice=1 TO length
  90 lettercode=ASC(MID$(w
ord$,slice,1))+offset
 100 IF lettercode)90 THEN
 lettercode=lettercode-26
 110 letter$=CHR$(letterco
de)
 120 clear$=clear$+letter$
 130 NEXT slice
 140 PRINT clear$, offset
 150 wait$=GET$
 160 IF wait$=CHR$(13) THE
N PROCmessage(offset):END
 170 NEXT offset
 180 END
 190 DEF PROCmessage(offse
t)
 200 INPUT "Cipher" cipher
$
 210 length=LEN(cipher$)
 220 message$=""
 230 FOR slice=1 TO length
 240 lettercode=ASC(MID$(c
ipher$,slice,1))
 250 IF lettercode()32 THE
N lettercode=lettercode+off
set
 260 IF lettercode)90 THEN
 lettercode=lettercode-26
 270 letter$=CHR$(letterco
de)
 280 message$=message$+let
ter$
 290 NEXT slice
 300 PRINT message$
 310 ENDPROC
```

Program II

The joy of giving interfaces some stick

ALMOST as soon as the Electron was available a host of add-ons were announced from several suppliers. The most prolific was a joystick interface in some form or another.

The reason why such a thriving industry has grown up around the Electron is because – unlike its big brother the BBC Micro – the Electron has no interfaces built in when it is bought.

So what is an interface? What's the difference between analogue and switched joysticks? Why do you need software to allow the use of an interface with games?

To answer these questions it is necessary to look at basic micro hardware and the Electron's operating system.

Every byte of memory in a computer – both RAM and ROM – has an address. For the 6502 processor in the Electron this can range between 0 and 65535, or the more familiar 64k.

Every computer has its memory laid out in a different way. The Electron's is shown in Figure I.

It is possible in the Electron to read and write to RAM directly from Basic with instructions, such as in Figure II.

This instruction will write the value 45 to address FE07. Do this on your own Electron and see the result.

The reason why such a dramatic effect occurs is because you are not actually writing to memory but directly to the Electron's ULA chip. So not only can we read and write to RAM, but we can also read and write to other devices which to the computer look just like memory.

This technique is called memory mapped input/output addressing, or memory mapped IO for short.

In the memory map of the Electron you will see that there are a lot of locations not used from FC00 to FDFF. These amount to 512 addresses.

Wouldn't it be useful if we could somehow get hold of some of these addresses and attach our own devices to them – such as a joystick!

If we are going to go to the trouble of building a joystick interface, what type shall it be?

There are two types – analogue and switched – and both require different interfaces.

An analogue joystick produces two signals, each of which changes in value as the stick is moved up and down and from left to right. This type is expensive to manufacture and costs around £20 to buy.

Analogue to digital converters, which are also expensive, are required to interface them to the Electron.

Switched joysticks on the other hand have five switches which close when the stick is moved in any direction or the fire button is pressed.

They cost from £7.50, but deluxe models are available for more than twice that.

Like everything, the more expensive models tend to be better quality and more reliable. But some of the cheaper models like Quickshot II are very popular because of the trigger action fire button and a rapid fire mode for those players with an aching trigger finger.

The vast majority of home computer manufacturers have adopted switched joysticks as standard. There is no doubt that games players prefer the positive feel of them to the rather sloppy analogue type.

It is interesting to note that analogue joysticks are really a hangover from the very early arcade and video games which used paddles. Remember those first tennis games?

Fortunately, while the Electron hasn't got joystick and other interfaces built in, it does have an expansion bus poking out at the rear of the case.

On this bus are all the address and data lines straight from the 6502 processor. So it is possible to fill in those holes in the Electron's memory map with other devices. In other words – interfaces. A switched

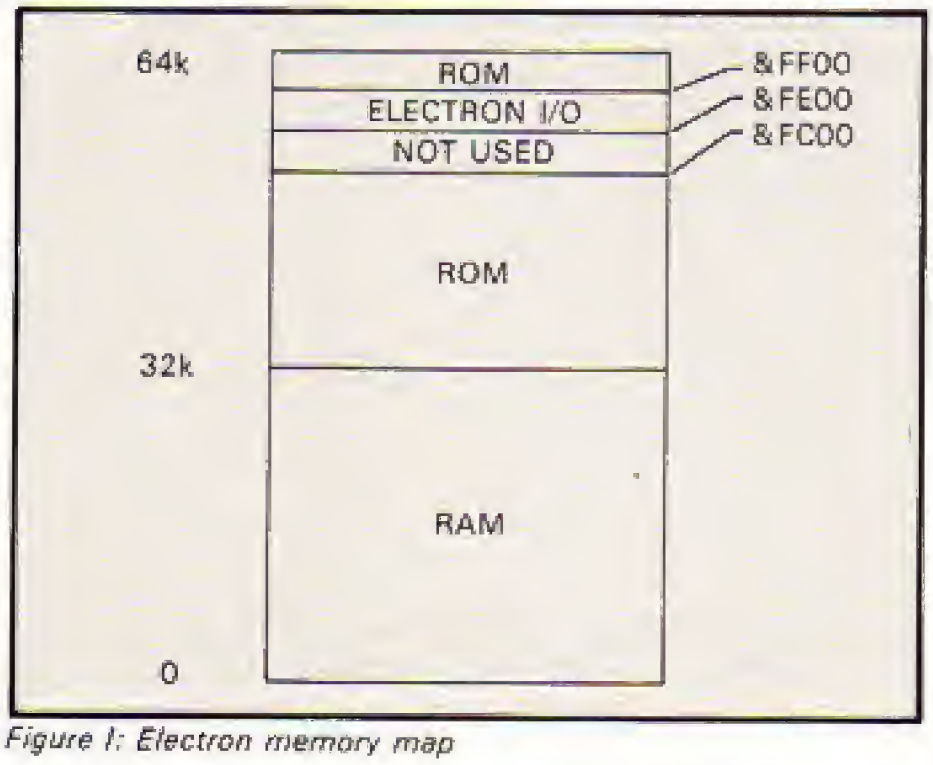

Figure I: Electron memory map

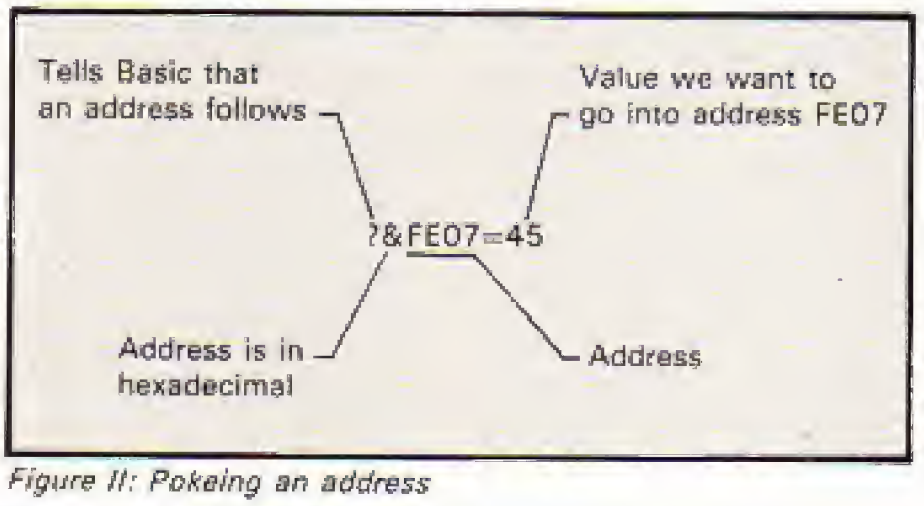

Figure II: Poking an address

By RAY THREADGOULD

joystick interface is shown in Figure III.

If we arrange for the address decode circuit to enable the buffer chip when, say, address FCC0 as in the First Byte interface, is used, then we can read in the status of the joystick switches.

This can be done from Basic like this:

```
JOYSTAT=?&FCC0
```

The variable *JOYSTAT* will normally be zero when the stick is in its centre position and the fire button is not pressed, but will change when the stick is moved or the fire button is pressed.

So with a simple instruction we can read in all the joystick information.

This is a very quick method of getting a player's response when playing a fast action game. Using an analogue joystick would necessitate an A/D converter which would slow up the Electron.

This is an important point for ardent games players who will already be aware of the decreased speed of the Electron compared with the BBC machine.

So we can now plug in a joystick interface to the Electron and in turn plug a switched joystick into that. But how do we make games look at the joystick and not at the keyboard?

When a games writer wants to test if a key is pressed there is a routine available in the Electron's operating system which can be used.

If this routine is intercepted before it looks at the keyboard and control is passed to a machine code program, the joystick can be looked at and any movements passed back to the game which still thinks that a key has been pressed.

Unfortunately, there are two ways of looking for a key press. It is also possible to trick the Electron into thinking it has an analogue joystick connected when actually it has a good old faithful switched joystick.

Confused? There's no need to be – all this has been taken care of for you on games conversion tapes supplied with an interface.

These work by loading in a program before a game is played – an operation that takes less than a minute – and running it.

The Electron operating system is patched by the routine in such a way that any scan of the keyboard is intercepted and a scan of the joystick is also made.

If the joystick has been moved the routine returns information to the calling program as if the corresponding key has been pressed.

This technique allows you to use switched joysticks on more than 99 per cent of the games on the market – including Acornsoft. That's a statistic which no doubt causes some embarrassment to the designers of the Acorn Plus 1.

In due course, most games houses will release games which will have been written to read the joystick interface directly and this will remove the need to use any additional software.

Incidentally, listings of games published in *Electron User* can also be modified to work directly with a joystick interface.

So now you know some of the finer points of joystick interfaces why not have a go and modify them?

One thing I'm certain of – you'll certainly enjoy getting them working, and you'll save punishing that hard worked Return key!

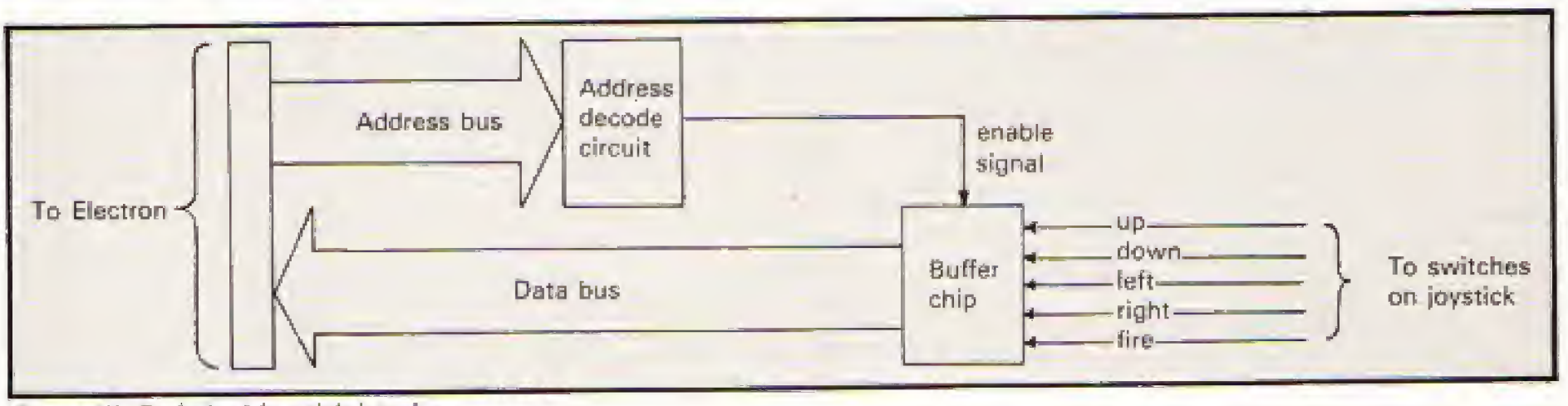

Figure III: Switched joystick interface

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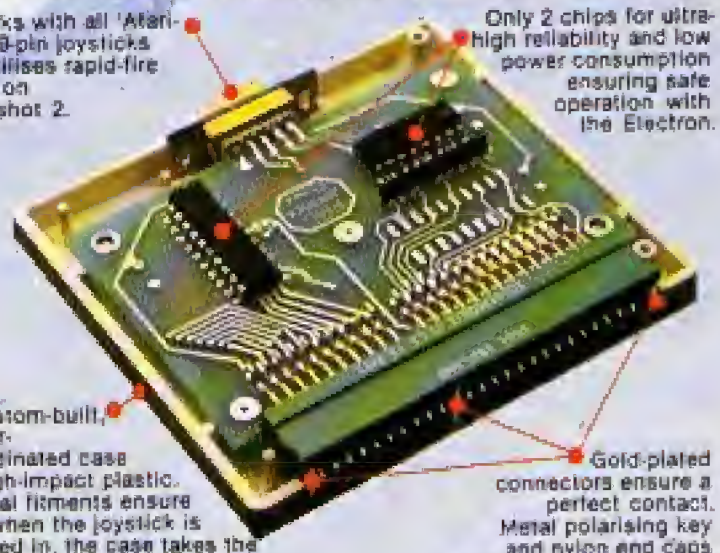

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PROCinstructions	Uses text windows to display the title and instructions.
PROCinitialise	Sets up the arrays, sets the high scores and names, defines the characters and the envelopes used.
PROCa	New ship.
PROCb	Enemy ship fires back.
PROCc	Move ground forward.
PROCd	Move enemy ship.
PROCe	Fire laser.

VARIABLES

D%	Whether it is day or not.
P%	Power left.
S%	The enemy ship.
Z%	Score.
H%	How many ships hit on screen 1.
G%	Which ground colour is black.

DOOM RUN by Allan Morriss published in July edition of *The Micro User* inspired me to write this game.

I couldn't fully understand Doom Run – there were about 70 variables – but I managed to grasp the basic principles used in creating the 3-D effect which allowed me to create my own 3-D space game, Starfighter.

The ground appears to move below the ship although nothing actually moves at all.

It is made up of three colours, two are set to green and one to black. By changing the one set to black the ground appears to move.

By selecting the colours carefully, the enemy ship appears to pass under and over certain objects rather like a sprite.

The ship is exclusive-ored with the background. The resulting colour is either the same as the ship – making it appear to pass over the object – or the same as the background – making it appear to pass under it.

A game like Starfighter must be made to run as fast as possible, so the procedure names have been kept short and the resident integer variables have been used. Unfortunately this makes the program difficult to follow.

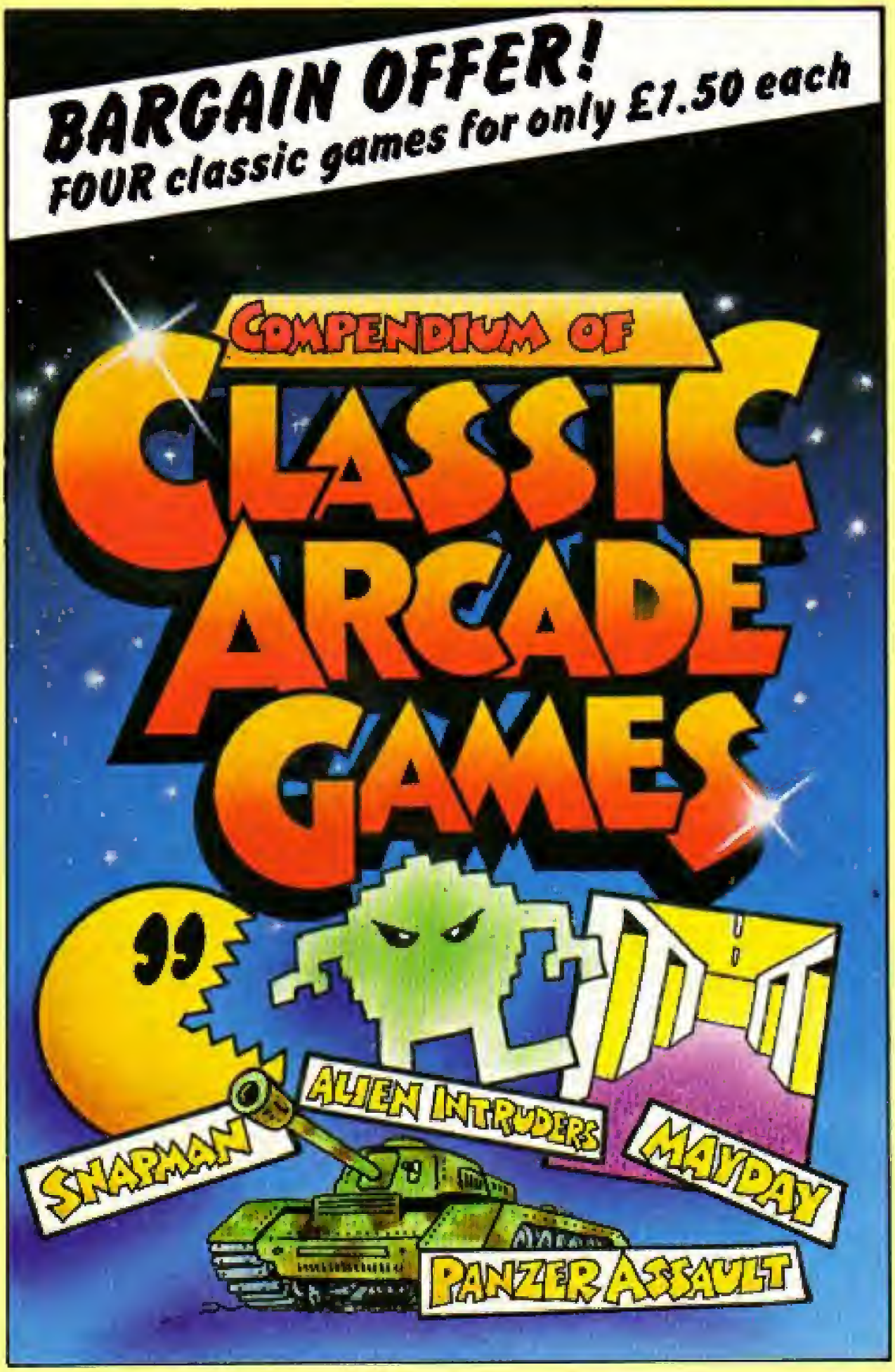
When typing in the program, some lines will be apparently too long to fit in. All the abreviations for the Basic key words must be used.

If you still have trouble, use two lines – it will not make any difference to the program.

Full listing starts on Page 53

Here's something SPECIAL from

electron user



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The Electron can help to write your tunes

Part II of NIGEL PETERS' new series on making the most of the Electron's sound channels

LAST month we talked about how to use the SOUND command to tell the Electron to make a noise.

We saw how entering:

```
SOUND 1,-15,30,20
```

or:

```
SOUND 1,-15,90,40
```

could produce noises from the micro. The basic structure of the command was seen to be:

```
SOUND channel,loudness,
      pitch, duration
```

and, for the time being, we kept channel as 1 and loudness as –15, concentrating on the *pitch* and *duration* parameters. These had ranges between 0 and 255 and controlled the highness or lowness and the length of the note.

We also saw that in the West at least our ears have learnt to expect that the *pitch* changes in regular steps. The most fundamental of these steps is the semitone.

Run Program I and you'll hear a series of notes, each being higher than the next by a regular amount. This amount is a semitone and consists of an increase of four in the *pitch* parameter.

```
10 REM PROGRAM I
20 REM SEMITONES
30 FOR rise=0 TO 44 STEP
4
40 SOUND 1,-15,52+rise,5
50 NEXT rise
60 SOUND 1,-15,100,10
```

Program I

It's not all that interesting to listen to, is it? The next basic building block of Western music is the tone.

Program II produces a rising series of notes, each one a tone apart.

```
10 REM PROGRAM II
20 REM TONES
30 FOR rise=0 TO 40 STEP
8
40 SOUND 1,-15,52+rise,5
50 NEXT rise
60 SOUND 1,-15,100,10
```

Program II

Again, it's not very interesting is it? However, there are two things to notice.

The first is that both the programs have used a FOR . . . NEXT loop which cycles around a single SOUND command. Each time round the loop control variable, *rise*, is increased by four or eight.

Since this is added to the *pitch* parameter each time round, the note rises in steps of a semitone or a tone.

```
10 REM PROGRAM III
20 REM A SCALE
30 SOUND 1,-15,52,5
40 SOUND 1,-15,60,5
50 SOUND 1,-15,68,5
60 SOUND 1,-15,72,5
70 SOUND 1,-15,80,5
80 SOUND 1,-15,88,5
90 SOUND 1,-15,96,5
100 SOUND 1,-15,100,10
```

Program III

The second thing to notice is that using FOR . . . NEXT loops ensures a regular increase in pitch for each successive note. But it's hardly exciting and sounds somehow incomplete.

Run Program III and I think you'll agree it sounds much more satisfying.

These eight notes form a scale, a musically pleasing set of sounds that somehow seem grouped together. You'll notice that if you play the first note:

```
SOUND 1,-15,52,5
```

and then the last note:

```
SOUND 1,-15,100,10
```

they seem to be the same note, but one is higher than the other. The difference is known as an octave.

```
SOUND 1,-15,148,10
```

gives the same note, another octave higher.

If you notice the differences in the *pitch* parameters of each of the SOUND commands in Program III you'll see that the differences are 8, 8, 4, 8, 8, 8, 4. This ordered sequence of increases in pitch produces a scale.

The trouble is that we can't

easily use a FOR . . . NEXT loop to play the notes as the STEP would have to keep varying. And the way Program III does it, using one SOUND after another, is rather inelegant to say the least.

Program IV shows a much better way of playing a scale.

```
  10 REM PROGRAM IV
  20 REM A BETTER SCALE
  30 FOR note=1 TO 7
  40 READ pitch
  50 SOUND 1,-15,pitch,5
  60 NEXT note
  70 SOUND 1,-15,100,10
  80 DATA 52,60,68,72,80,8
8,96
```

Program IV

Here we're back to the good old FOR . . . NEXT loop again, cycling round a solitary SOUND statement.

This is achieved by putting all the *pitch* parameters we want in the DATA statement of line 80 and READing them off one after another in line 40.

As you can see, it's a much more elegant way of doing things. Also it's very easy to change the DATA statements so you can have any scale you like.

Just put in the numbers you want and the program does the rest. With Program III we'd have had to change it line by line.

Program V shows another way of doing this. PROCpickscale allows you to choose which scale you want, while PROCplayscale does it for you.

PROCplayscale is very similar to Program IV, but we don't have to change the DATA for new scales.

This is because the DATA line doesn't contain the actual pitches of the notes to be played. It contains the numbers that have to be added to the first *pitch* to get the required note.

This is the *offset*. Each time round the loop in PROCplayscale, line 140 READs the DATA line to find the required *offset*.

Line 150 then adds this to the *basenote* picked in PROCpickscale and plays it. The result is the scale of your choice.

This technique of using an offset around a base note comes in very useful when you're writing your own tunes. You can write the program and

```
  10 REM PROGRAM V
  20 REM MORE SCALES
  30 REPEAT
  40 PROCpickscale
  50 RESTORE
  60 PROCplayscale
  70 UNTIL FALSE
  80 END
  90 DEF PROCpickscale
 100 INPUT''"What number s
hall the scale start at",ba
senote
 110 ENDPROC
 120 DEF PROCplayscale
 130 REPEAT
 140 READ offset
 150 SOUND 1,-15, basenote
+offset, 5
 160 UNTIL offset=48
 170 DATA 0,8,16,20,28,36,
44,48
 180 ENDPROC
```

Program V

all you have to do if you want to change the tune is adjust the DATA statements.

However, let's leave that for a minute and have a look at how to get the Electron to play tunes. So far all we've done is play notes which have increased in pitch by fixed amounts.

Each note (except the final one) lasted for the same amount of time and, frankly,

```
  10 REM PROGRAM VI
  20 SOUND 1,-15,100,10
  30 SOUND 1,-15,108,10
  40 SOUND 1,-15,92,10
  50 SOUND 1,-15,44,10
  60 SOUND 1,-15,72,20
```

Program VI

the whole effect was boring.

If we want to play an interesting tune we have to vary both *pitch* and *duration*. Program VI does this to produce some very simple computer music.

It's just a string of SOUND commands, one after the

```
  10 REM PROGRAM VII
  20 REPEAT
  30 READ pitch,duration
  40 SOUND 1,-15,pitch,dur
ation
  50 UNTIL duration=0
  60 DATA 100,10,108,10,92
,10,44,10,72,20,0,0
```

Program VII

other, but it works.

A better way of doing it is shown in Program VII which puts the values of both *pitch* and *duration* in a DATA line.

This plays the same tune as before, but notice that it needn't always be the same one.

You could figure out your own tune, working out its *pitch* and *duration* parameters and replace line 60 with your own values.

In fact Program VII is a Universal Tune Playing Program.

The trouble is that you have to figure out what goes into the DATA statements. Happily this isn't all that hard – you just mess around with the pitch parameters going up and down in steps of four and eight (and occasionally two).

A little practice and you'll soon get it right.

However, since you're trying to write tunes for your Electron, why not get the Electron to help you? Program VIII does the trick.

All you have to do is to enter the pitch and duration that you want for the beginning of your tune and after it play it by ear.

The Electron allows you to try out the note you want and, if it's right, add it to the tune.

When you're satisfied, just press the 3 key and you'll find the *pitch* and *duration* parameters of your tune displayed in order.

As it's written, there's only room for 20 notes, but you can increase this by changing the DIM statements. When you've written the tune, Program VII will play it for you.

And that's it for this month. I'll leave you to play around writing tunes on your Electron. If you come up with something nice, do send it in.

```
  10 REM PROGRAM VIII
  20 PROCinit
  30 REPEAT
  40 PROCmenu
  50 UNTIL counter=20
  60 END
  70 DEF PROCinit
  80 VDU 23,1,0;0;0;0;
  90 DIM pitch(20),duratio
n(20)
 100 counter=0
 110 ENDPROC
 120 DEF PROCmenu
 130 CLS
 140 PRINT '''SPC(6)"PRESS
 THE KEY FOR CHOICE"
 150 PRINT '''SPC(6)"1) PL
AY TUNE"
 160 PRINT '''SPC(6)"2) AD
D NEW NOTE"
 170 PRINT '''SPC(6)"3) DI
SPLAY NOTES"
 180 wait=GET
 190 IF wait=49 THEN PROCp
laytune:ENDPROC
 200 IF wait=50 THEN PROCa
ddnote:ENDPROC
 210 IF wait=51 THEN PROCd
isplay:END
 220 PROCmenu
 230 ENDPROC
 240 DEF PROCaddnote
 250 CLS
 260 counter=counter+1
 270 REPEAT
 280 INPUT '''"Enter the p
itch of the next note. " pi
tch
 290 pitch(counter)=pitch
 300 INPUT '''"Enter the d
uration of the next note. "
 duration
 310 duration(counter)=dur
ation
 320 PROCplaytune
 330 PRINT '''"Press the Y
 key if you want the last"'
"note in the tune."
 340 wait$=GET$
 350 UNTIL wait$="Y" OR wa
it$="y"
 360 ENDPROC
 370 DEF PROCplaytune
 380 FOR note=1 TO counter
 390 SOUND 1,-15,pitch(not
e),duration(note)
 400 NEXT note
 410 ENDPROC
 420 DEF PROCdisplay
 430 CLS
 440 PROCplaytune
 450 PRINT'' SPC(6) "PITCH
" SPC(6)"DURATION"
 460 FOR note=1 TO counter
 470 PRINTTAB(8);pitch(not
e)TAB(18);duration(note)
 480 NEXT note
 490 ENDPROC
```

Program VIII

Part ten of PETE BIBBY's introduction to programming

You can work wonders with DIM statements

LAST month we finished, for the time being, our exploration of FOR ... NEXT loops.

Now we'll be taking another look at variables and seeing how we can group together a lot of similar information under a kind of collective variable name.

For the moment let's have a look at a fairly trivial program. As you can see, Program I just INPUTs three numbers and assigns them to variable names:

```
  10 REM PROGRAM I
  20 INPUT "First number",
firstnumber
  30 INPUT "Second number"
 secondnumber
  40 INPUT "Third number",
thirdnumber
```

It's hardly going to amaze the micro world, especially since it doesn't actually do anything with the variables it has given values to.

The point to notice is that the variables have meaningful names.

The first number input is assigned to the numeric variable *firstnumber*, the second to the variable *secondnumber*, and I leave it to you to figure out the name of the final variable.

These meaningful variable names are extremely useful and the fact that Electron Basic allows you to use long variable names is a big plus in its favour. It makes figuring out how programs work a lot easier.

If Program I had been a vast 10,000 line epic, then all the way through we'd know that *firstnumber* was the first number we'd entered and so on.

These meaningful variable names help us keep track of the order that we entered the figures. The trouble is that it doesn't mean anything to the micro.

Take a look at Program II and you'll get some idea of what I'm talking about:

```
  10 REM PROGRAM II
  20 INPUT "First number",
thirdnumber
  30 INPUT "Second number"
,firstnumber
  40 INPUT "Third number",
secondnumber
```

Here the first number entered is assigned to the variable *thirdnumber*, the second to *firstnumber* and the third to *secondnumber*.

To you and me it seems stupid – there's no rhyme, reason or order to it all. The Electron, however, doesn't give a hoot and carries on regardless.

You may now be getting some inkling of what I'm talking about. In the first couple of programs we entered three numbers and, as is obvious from our use of the variable names, we wanted to keep some track of their order.

```
  10 REM PROGRAM III
  20 INPUT "First number",
firstnumber
  30 INPUT "Second number"
, secondnumber
  40 INPUT "Third number",
thirdnumber
  50 PRINT "First number",
firstnumber
  60 PRINT "Second number"
, secondnumber
  70 PRINT "Third number",
thirdnumber
```

However while giving each an individual name that is meaningful to human beings helps us, to the Electron there's nothing to show that they're linked.

Let's take a look at Program III which still uses the meaningful but unlinked variable names.

The program takes in three numbers and prints them out in the same order they were inputted. The trouble is that it's a bit laborious and the variable names, while obviously showing us their relationship, mean nothing to the micro.

Program IV is a step in the right direction. The variable names are all similar except for the number at the end.

The trouble is that the old problems still apply. While we could look at a listing and, at a glance, know the answer to the question: *"Is the sum of the second and third numbers inputted equal to the first number?"* on the Electron it's a lot harder. Try it.

What we want is a way of linking together a lot of variables – that is, making a list of them and being able to call them up by a number which refers to their position in the list.

```
  10 REM PROGRAM IV
  20 INPUT "First number",
number1
  30 INPUT "Second number"
,number2
  40 INPUT "Third number",
number3
  50 PRINT "First number",
number1
  60 PRINT "Second number"
,number2
  70 PRINT "Third number",
number3
```

We need something similar to *number1* and *number2* so we could call up a value with *numberx* where *x* is the position in the list of variables we want.

Electron Basic makes all

this possible. Using a DIM command we can dimension an array of variables so that we can refer to each of the variables by a single number.

Don't worry too much about that last sentence – all it means is that we can put a lot of variables into an ordered list and then pick out whichever one we want by number.

Have a go at Program V which is the same as the previous one except that it now uses one of these mysterious arrays:

```
  10 REM PROGRAM V
  15 DIM number(3)
  20 INPUT "First number",
number(1)
  30 INPUT "Second number"
,number(2)
  40 INPUT "Third number",
number(3)
  50 PRINT "First number",
number(1)
  60 PRINT "Second number"
,number(2)
  70 PRINT "Third number",
number(3)
```

Line 15 is the interloper. It introduces a new Basic keyword DIM.

All DIM does is to dimension an array, which means it sets up a series of variables all with the same name except for a number in brackets at the end. It creates a numbered list of variable names.

In Program V the DIM number (3) statement tells the Electron that you want it to put aside memory space for four variables.

The first variable is *number(0)*, the second *number(1)*, the third *number(2)* and the fourth *number(3)*.

These all have the initial value of zero. If you don't believe me add:

```
17 PRINT number(0),
   number(1),number(2),
   number(3)
```

to Program V and you'll see their values printed out.

The DIM statement of line 15 has set up four numeric variables, all with a similar name but with different numbers in brackets at the end.

If line 15 had been:

```
15 DIM number(5)
```

it would have set up six variables, all with the *number* stem followed by figures in brackets ranging from 0 to 5.

Notice that the DIM statement sets up the variables in the array – which are technically known as elements – in numerical order from 0 to whatever the figure in the brackets is.

Notice also that there is always one more variable than the number in the brackets.

This is because the list or array of variables begins with 0. Very often programmers ignore the 0 element of the array and start at 1 so as not to get confused.

This is wasteful of memory and so looked down on by the powers that be. I do it all the time!

While we're still with program V let's get acquainted now with what can go wrong with DIMs. Try leaving out line 15 altogether and you get the dreaded:

```
Array at line 20
```

message. This is telling you that you're trying to use an array you haven't set up. You'd be surprised how often this can happen.

Another goodie is when you try to make the array so big that your poor little Electron doesn't have room for it all.

If you change line 15 to:

```
15 DIM number(20000)
```

you'll get the awful:

```
Bad DIM at line 15
```

Basically you've bitten off more than you can chew with your DIM.

But enough of this. I'm sure that, like me, you'd never make such elementary errors.

Let's get back to the arrays of linked elements that we've created with DIM.

So the DIM statement has set up an array. Big deal! What's so special about an array?

What's special is that the number in brackets after each of the variables – known as the subscript – is a cunning little beast.

It doesn't always have to be a number. It's quite possible to be a variable in itself.

If this sounds like one of those mirrors reflected in mirrors sort of things, don't worry, it's a lot easier than that.

Have a look at Program VI,

→

'The subscript is a cunning little beast'

From Page 21

'Arrays are very powerful programming tools'

in which all is revealed.

The DIM of line 20 sets up six elements of an array from *number(0)* to *number(5)*.

So far so good. The important part of the program comes in the next four lines which consist of a FOR...NEXT loop. This has the control variable *index*, which ranges from 1 to 5, ensuring that the loop cycles five times.

If you don't know what line

```
   10 REM PROGRAM VI
   20 DIM number(5)
   30 FOR index = 1 TO 5
   40 PRINT "Input next num
ber"
   50 INPUT number(index)
   60 NEXT index
   70 FOR index = 5 TO 1 ST
EP -1
   80 PRINT "Number" number
(index)
   90 NEXT index
```

40 is doing then you shouldn't be reading this article!

The real meat comes with the INPUT of line 50. Here the number you enter is placed in the variable *number(index)*.

You'll notice that *number (index)* is a subscripted variable, like the ones we've met in the arrays set up with the DIM statement.

The difference is that instead of the brackets at the end of the variable containing a number such as 0,1 or 5 it contains a variable, *index*.

This isn't as odd as it may seem as, when you think about it, *index* is going to vary from 1 to 5 as the loop spins round.

The first time round the loop, *index* is 1 so *number (index)* becomes *number(1)*.

When *index* is 2, the value typed in is put in *number(2)*.

As the loop cycles and *index* changes, so each number input is placed in a different element of the array dimensioned in line 20.

Try doing this using the method of Program V and you'll see what an improvement in efficiency is brought about using an array combined with a FOR...NEXT loop.

The last three lines of the program form another FOR... NEXT loop with the loop control variable going downwards in steps of −1.

Line 80 prints out *number (index)* each time and as *index* is going down from 5 to 1 the numbers you entered are printed out in reverse order.

If you'd decided you only wanted every other number the STEP parameter of line 70 could be −2.

This would produce three numbers, in reverse order of entry. Don't just take my word for it — try it and see.

So setting up – dimensioning – arrays of linked variables (elements) and combining them with FOR...NEXT loops can give us a lot of power over how we can handle lists of numbers.

Program VII shows this in action.

Here we've actually used a

```
   10 REM PROGRAM VII
   20 INPUT "How many numbe
rs", span
   30 DIM number(span)
   40 FOR index = 1 TO span
   50 PRINT "Input next num
ber"
   60 INPUT number(index)
   70 NEXT index
   80 INPUT "Which of the l
ist would you like", positi
oninlist
   90 PRINT "The number is
";number(positioninlist)
```

variable *span* to decide how many elements we want in the array. Line 30 dimensions it according to the value entered in response to line 20.

Lines 40 and 70 form a FOR ...NEXT loop which tells you to enter the numbers you want to put into the array. This is where you regret it if you've made *span* too large.

All of that should be fairly familiar to you by now. What happens next isn't.

Line 80 asks you to enter which element of the array you wish to be printed out. In other words, which entry in the list you want referred to by its position in the list.

When you have made your choice it puts the number you enter into the variable *positioninlist*.

Then line 90 prints out that element of the array. If *positioninlist* is 3, *number (positioninlist)* will print out the third number you entered.

If it is 10, then it will print out the number in the 10th position.

As you can see, by using a variable in the subscript of an array – the bit in brackets – you can pinpoint each element of the array at will. This, as you will find later, is a very useful technique.

Finally, you may be asking yourself whether we can have string arrays as well as the numeric arrays we've been using.

The answer is yes, as Program VIII shows:

Here we've used a string array *name$* and a numeric array *mark*. The FOR ... NEXT loop gets us to enter the

```
   10 REM PROGRAM VIII
   20 DIM name$(3), mark(3)
   30 FOR topofclass=1 TO 3
   40 PRINT "Enter name of
number ";topofclass
   50 INPUT name$(topofclas
s)
   60 PRINT "Enter ";name$(
topofclass);"'s mark."
   70 INPUT mark(topofclass
)
   80 NEXT topofclass
   90 INPUT "Enter number o
f position " position
  100 PRINT name$(position)
;" got ";mark(position);" m
arks."
```

names of the top three children in a class and the marks they got.

Then all we have to do is to enter the child's position in class and the program will print out its name and mark.

I'll leave it for you to figure out how it works. It's not too different from the previous programs.

The point to note is that by having two arrays, one of names and the other of marks, we can refer to both with just one subscript.

If we had 10 parallel arrays like this we could still use the one subscript to get 10 pieces of information such as name, age, mark, sex and so on.

As you'll no doubt see, arrays are very powerful programming tools.

And there's lots more to them, as we'll find out next time.

User portal to whole new worlds

ASK any micro user what extra facilities he desires and a printer is sure to be near the top of the list.

The lack of a printer interface on the Electron must have put a number of potential users off the machine.

The Mushroom printer/user port is one of several that have been produced to fill the gap and it also includes another useful device – a BBC-type 8 bit user port.

Unpacking reveals a rather neat unit with an edge connector at one end and the normal Electron expansion connector at the other.

Down the side are the printer and user port connections, these being exactly as those on the BBC Micro.

With the unit comes a four page instruction booklet and a tape containing the software necessary to run a printer.

The booklet tells you how to connect a printer in simple, easy to follow steps. The cable required is the same as that for a BBC Micro

The software driver tape will assemble machine-code at any address in memory that you desire. It is a good idea to make several versions at various addresses and save them for use with different programs.

The other side of the tape contains a separate program, allowing you to print graphics screens. This program is for the Epson MX80, but should work with Epson-compatible printers such as the Shinwa.

Incidentally, you may feel that having to load a separate program to make the printer work is something of a nuisance, but really the assembled code loads in a matter of seconds and the advantage to doing it this way, instead of having the program in ROM, is that it makes the unit compatible with other expansions.

The other half of the unit contains the user port – basically, a device which enables the micro to communicate with the real world.

In this unit you have eight lines which can be set individually for input or output, plus two lines for handshaking. This is a fancy term for a system which makes sure that the micro and the device attached to it only transfer information when they are both ready.

As far as it goes, the booklet is clear in giving you instructions to use this port. However, it really doesn't go far enough for my liking.

The chip used to create these ports is the 6522, known as a Versatile Interface Adapter (VIA), which is the same as that used by the BBC Micro. It is quite a complex device but, if you take the trouble to master it, is extremely useful.

Applications include a switched-joystick interface, analogue/digital port, temperature controllers and plotters.

I appreciate that for Mushroom to include a treatise on its full use would have considerably increased the cost of producing the manual, but I do think that they could perhaps have pointed the user in the direction of a suitable reference.

I shall rectify this immediately by recommending a book that not only includes a detailed description of the 6522, but also gives you a number of applications to try – Interfacing Projects for the BBC Micro by Bruce Smith (Addison-Wesley £6.95).

To use this book (or, indeed, any BBC application for the user port), all you have to remember is that the Mushroom interface maps the user port one page lower in memory. That is, any references to memory at &FExx in the Beeb should be changed to &FDxx for the Electron.

To sum up, this is a very nice unit, well constructed, and assuming that you are prepared to do your own research on the VIA can be definitely recommended.

Please experiment with the user port – it will open up whole new worlds.

Barry Pickles

Snappy ROM

I HAD the opportunity recently to try out Acorn's ROM filing system with a couple of games, Hopper and Snapper.

The Plus 1 can accommodate both cartridges at once, so I plugged them in to the sockets beneath the spring loaded flaps on top and switched on.

A rather strangled beep is heard instead of the usual longer note, and by the time I had sat down Snapper had loaded. This is far better than the usual three or four minutes loading time of the cassette games.

The actual games themselves are no different to the cassette versions, but are far more convenient on ROM cartridges.

Whenever Break is pressed, or the Electron switched on, the game on the cartridge nearest to you is loaded, taking about 10 seconds.

To load the program on the cartridge furthest away, you press Break, and while the loader is being transferred Esc can be pressed to abort the process.

The ROM filing system is still active, *CAT printing a list of all the files on both cartridges. The other game can then be loaded and run with CHAIN "name".

If you want to load a program on cassette, the cassette filing system must be selected with *TAPE and the program loaded in the normal manner.

The ROM filing system is great, and I can't wait to get my hands on a paged ROM such as Lisp, or Forth if it comes out.

My only criticism is that the cartridges cannot be left in all the time.

This is because whenever Break is pressed the software on the nearest cartridge is loaded, which could overwrite an important program you were working on, and whenever you switch on to use the Electron for something a little more serious, the game loads immediately.

It's too hard to resist not having just one more go . . .

Roland Waddilove

IT'S A BOLT ON GOODY

IF you've ever envied Beeb users their sideways ROM facility, help is at hand in the form of this neat ROM/RAM expansion board from Slogger Systems.

It bolts on to the back of your Electron, the Electron bus is carried at the rear to allow other units to be attached and the unit is fully compatible with Acorn's Plus 1 interface.

The unit is very well constructed and encased in tough plastic. It provides eight sockets for eight or 16k ROMs.

On the right hand edge are three sets of jumper switches. These select the following options: all sockets accept 8/16k ROM; right hand socket accepts 4k ROM; right hand socket accepts 8k RAM; redefine ROM page numbers.

This latter option is necessary for use with the Plus 1 since it reserves certain ROM pages for its own use.

All this is explained in the manual supplied with the unit, which includes a detailed description of the ROM filing system, and is about the best piece of documentation I've seen.

The ability to use RAM in one of the sockets is something that will really come into its own when discs become available, and the manual includes a short machine-code routine to read/write to Ram or even to read any ROM plugged in.

Most of the ROMs available for the Beeb will work with this unit, including View and the Graphics ROM, but it might be as well before buying and if you are unsure to ask your dealer to try it out first.

What more can I say? It's well built, well documented and well recommended!

John King

>The
Dating
Game.

The Electron has added even more strings to its bow.

The list of top quality software for the Acorn Electron is growing all the time.

As you can see, there's already an outstanding selection of exciting programs covering everything from monsters to music and murder to marriage guidance.

And ultimately, the Electron will enjoy a range of software as comprehensive as that of its illustrious big brother, the much-acclaimed BBC Micro.

You'll find all the programs featured here at your local Acorn stockist. (To find out where that is, simply call 01-200 0200.)

Alternatively, you can send off for the Electron catalogue and order through the post by writing to Acornsoft, c/o Vector Marketing, Denington Estate, Wellingborough, Northants NN8 2RL. Tel: 0933 79300.

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Personal Software – Autumn 1983.

EDUCATIONAL 2 **£8.00**
Although similar to Educational 1 this tape is more advanced and aimed at 7 to 12 year olds. The tape includes MATH1, MATH2, AREA, MEMORY, CUBECOUNT and SPELL.

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Defending cities is great fun

City Defence
Bug Byte

AS sole defender of a group of cities you have to fight off deadly missiles using the almost inevitable laser bases.

You have four cities to defend and three bases from which you can fire. Sadly there are only 10 rockets available in each base. When your supply is exhausted the enemy continues to attack ruthlessly until your planet lies in ruin.

After you've seen off each wave of enemy missiles your supply of rockets is replenished. Provided you have managed to save at least one city from the preceding screen, away you go again.

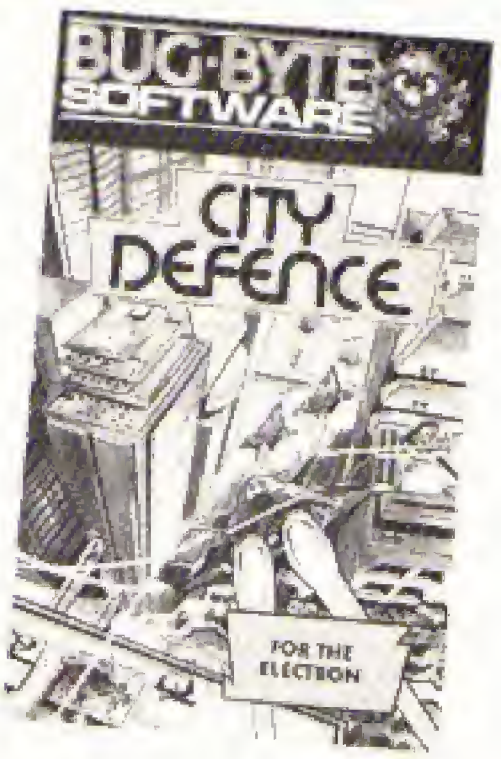
Extra cities are awarded for every 1,500 points, and other features include a two player option – very welcome when your friends play for hours – and a hi-score facility.

All in all I was impressed by City Defence. The instructions were concise yet clear and appear on screen as well as on the inlay card.

The sound was good and did not become annoying, as often happens. Indeed the sound produced by an attacking wave of missiles was really quite tuneful, although it could not be turned off if it did become tedious.

The use of graphics was fair, if not exactly startling.

Perhaps a hardened arcade fanatic might be a little disappointed at the absence of one or two features present on



the original – for example there are no spaceships appearing from time to time.

Having said that, to most people this game will provide a good deal of entertainment and is great fun to play.

Steve Yarwood

Maths for home and school

Maths level 1 (Age 4-6)
Cheshire Cat Educational Series (AmpalSoft)

THIS is one of a series being produced for the pre-school or young child. It would be equally suitable for schools or the home Electron and colour television.

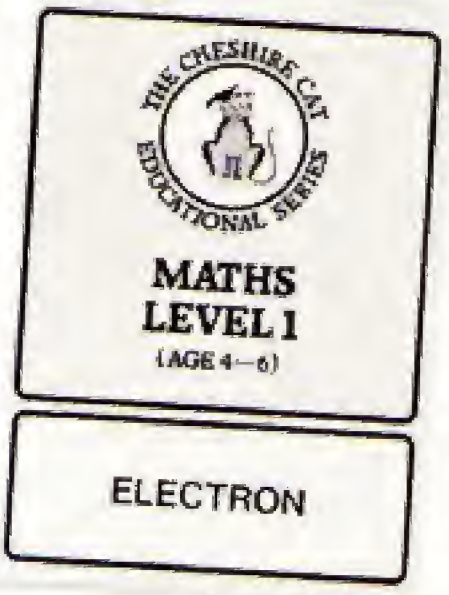
Like the others in the series, the package contains two cassettes which together contain 16 exercises.

These obviously begin at a very basic level with number recognition and matching, sorting of shapes and adding complements of five, through to matching pairs of objects which would eventually lead to some experience of set theory.

The intention is that the child would soon learn to use the programs unaided, and I am sure this would be possible.

The key inputs are, after all, remarkably clear and easy to learn.

However I would also see a



great advantage for a parent in working through these exercises with the child so that the mathematical vocabulary necessary later may be founded at this early stage.

There are also a variety of further activities which would present themselves during the operation of these programs, and a wise parent would do well to follow them up while the interest is shown by the child.

Full use is made of colour and sound so that the machine is well used. The graphics are not elaborate, but in a program of this kind they hardly need to be.

In a school situation, the child's name is input and full records are maintained of that child's performance.

One slight snag which I found at school was the time taken to load the cassettes – they contain a wealth of programs which need to be accessed quite often during a morning"s work.

Schools may be interested to know that the programs also run on the BBC Micro, and with a bit of effort can be stored on disc.

Since schools are well advised to make a backup copy and to keep the original well away from dirty fingers, I wouldn't imagine that AmpalSoft would mind the backup being on disc. It makes the running of a classroom much smoother!

Phil Tayler

Beat the wizard and keep the peace

The Eye of Zolton
Softsel

THIS review is in response to a request for help from Elizabeth Young of Stondon Massey in Essex. She says the game is fascinating and I agree.

Your ruler, the king, has had the five magic objects that enable him to maintain peace and prosperity in the land stolen by an evil wizard.

As the influence of this wizard descends upon the land, you are summoned and told by the king that he has chosen you to recover the magic objects and take them to the Temple of Zolton.

Here their beneficial influence will help the king defeat the wizard.

You begin your quest on a hilltop with the first task to equip yourself for the trials to come. You quickly discover a hut, two canyons, a lake, an island, a deadly forest and a mysterious castle.

The island is the last place you want to visit so you search everywhere thoroughly before tackling the castle.

There is a way into the castle and you will be surprised at the help you can get here, always assuming you can recognise it! Once you have figured it out you will be in the castle and the main body of the adventure.

There are some really dev-

→

From Page 27

ilish puzzles to solve, yet no real red herrings.

I will give you one tip. Though the program description says you have to return the five magic objects to the temple, they are not the only things that have to go there.

The program is written in Basic and thus easily listable. This might not help you if you get stuck however, since many of the room descriptions and word parts have been tokenised.

For those who haven't met this term before, I'll try to explain. To save memory space the programmer has substituted the more commonly used words and word parts for symbols.

The tokeniser converts these symbols into English when they are to be displayed on the screen. It also converts your input into symbols the program can understand and respond to.

The Electron itself tokenises Basic keywords, though very little information is given in the User Guide.

Overall, an ingenious series of puzzles. Despite being written in Basic it's a very nice game to play and is about average difficulty. I am impressed and have no hesitation in recommending it for all types of adventurers.

Merlin

GET IT RIGHT THIS TIME

Woodland Terror
MP Software

THIS is the sequel to Firienwood, M+P's first adventure, which took its name from the forest in which much of the action took place.

M+P claim that no prior knowledge of Firienwood is required and since I haven't as yet seen it and I've managed to finish this adventure, I have to agree.

In rescuing the golden bird of paradise in the previous game you inadvertently released an evil genie. Now, a few years later, you set out to kill the genie and restore peace to the land.

Hopefully you'll get it right this time!

You start your quest close to the castle, scene of your previous triumph, and after a couple of *turns* (hint!), you manage to reach the castle and obtain some of the equipment.

This includes a password which will see you through to the main part of the adventure.

After a few more moves the *pressure* begins to tell (yet another hint!), and you find yourself in Firienwood itself.

From this point on the tension mounts and you are presented with numerous puzzles to solve and red herrings to ignore. Also, for any Dungeons and Dragons fans who might be playing, you are frequently given the opportunity to fight goblins and thereby increase your score.

Since I managed to complete the adventure without killing a single goblin I can only assume that this option is merely to pad the adventure out a bit.

Perhaps the idea is that having completed the game, you can go through it again to try to achieve a high score. First time I ever heard of an adventure having a top ten!

Anyway, after a lot more red herrings, a trip underground and a visit to the diamond mines, you manage to complete the adventure.

At this point I felt it was all a bit of an anti-climax. In retrospect I can say that it is perfectly possible to solve this adventure without even meaning to.

Only about 20 per cent of the puzzles and locations have any bearing on what happens.

It's a large program, completely written in machine-code, very fast and has an excellent save-game routine. The layout on-screen – using different colours for text, messages and so on – is very impressive.

The thing lacking is a feeling of cohesion between the puzzles and the purpose of the adventure. In view of this I feel that the experienced adventurer would be disappointed if he bought this program.

For the novice, however, I think it is ideal. Many of the puzzles that have a direct bearing on the adventure are fairly easy to solve and there are plenty of locations to explore once the initial problems are overcome.

All in all, a competent piece of programming but for the complete novice only.

Merlin

Right up your Milky Way

The Night Sky
Bridge Software

IS gazing at heavenly bodies your scene? Do you know an Ursa Major from a Corona Borealis?

If your answers are yes, then this program is right up your street (or your Milky Way!). It will allow you to place yourself anywhere in the world, within certain generous limitations of longitude and latitude, and look at any constellation, or the sky in general.

There are more than 80 constellations listed, and they are identified by their three-letter abbreviations as used by the IAU.

Care must be taken to enter this with the correct sequence of upper and lower case letters. Of course, we Electron users know it's easier to enter lower case letters on the Electron than on the BBC Micro.

The constellations contain over 1,000 stars, although not all will be available to view from our chosen location, even though a northerly or southerly aspect may be selected.

Various options are available, one being the facility to enter ANY as the answer to the name of the constellation.

The micro will then select one and display it, having made sure it is visible. You can then use this as a test, guessing the answer before it is revealed.

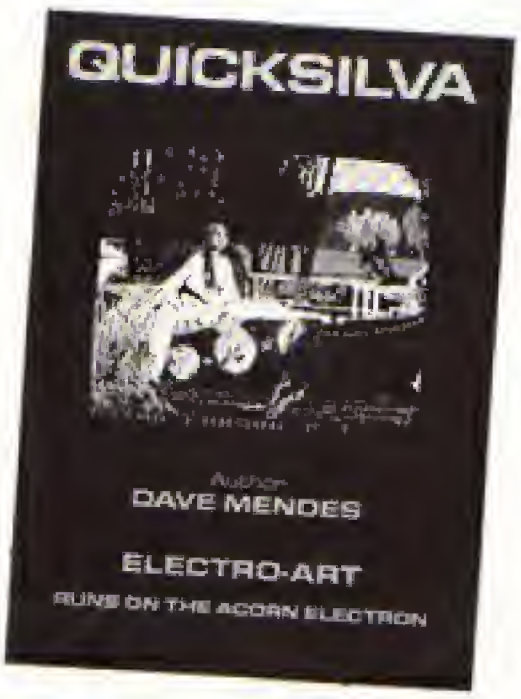
If your interest in astronomy is perhaps dormant, this is a super program to awaken it!

Phil Taylor

But is it art?

Electro-Art
Quicksilva

YET another title produced by the prolific Dave Mendes for Quicksilva, this is a graphics drawing package aimed at those wishing to implement the fine graphics capabilities of the Electron, but not being proficient enough to try it



themselves in Basic.

I must say straight away that it is not the best of its type, comparing rather badly on several points with the Salamander Graphics System, reviewed in the May issue of *Electron User*.

This tape can produce extremely detailed results as are shown on the accompanying sample pictures. Actually, I spent several frustrated minutes looking for these, before finding them at the start of the flipside.

When found, these files are well worth loading in to show the superb results possible with skill, care and patience.

One major handicap is that Electro-Art only operates in Mode 2, whereas the Salamander package allows the user to select Mode 0, 1 or 2.

I also found the controls less easy to remember than the mnemonic-type initials employed by Salamander. For instance, to colour-fill an area uses Key 1 on the Quicksilva tape, but F (for fill) on the Salamander.

There are a couple of plusses for Dave Mendes with some predefined triangles at the touch of a number key, as long as you can remember which is triangle one or two or three or four that is.

Both have the facility to save and load pictures using the cassette system, but Quicksilva score another plus with a built-in joystick facility – obviously an advantage.

Where Quicksilva lose totally though, is the complete absence of either a grid overlay for intricate designs or indeed any system of showing current coordinates for future manipulation.

No, in an application where user-friendliness has to be a prime consideration, I cannot really recommend this very highly. If I hadn't already seen the other system perhaps I could, but this does not emerge well from the comparison.

Phil Tayler

A REAL BOON!

Sprites Version 2
Simonsoft

WHATEVER you enjoy doing on your Electron, writing games or education programs or just playing around, this program is without doubt a real boon.

It lets you produce beautifully fluid-smooth animation in minutes with a minimum of difficulty.

A sprite, for the uninitiated, is a block of graphics which can be moved around the screen pixel by pixel giving smooth movement. The micro takes care of deleting and moving the image, leaving the background undamaged.

The package consists of three definer programs, some ready made sprites – although it's more fun to make your own – and about 20 machine code routines, each incorporating different features and using varying amounts of memory.

Writing, changing and using the sprites is simplicity itself, with the use of the resident integer variables and calls to machine code routines from your Basic program.

All this is explained in the comprehensive manual.

Also supplied are two demonstration games complete with listings. However these do not do the sprites justice, being simple and uninspiring.

What puts this program way ahead of other packages available is its many features. These include a collision detector, preset flight paths, extra-large super sprites, an amazing enlargement facility, and up to 48 sprites at once, each of which can have two alternating images giving instant animation as the sprite moves.

Simonsoft Sprites has to be one of the best things for programmers wanting to write good programs since the Electron itself.

Andrew Oldham

You'll love it, and learn too

Map Rally
Bourne Educational Software

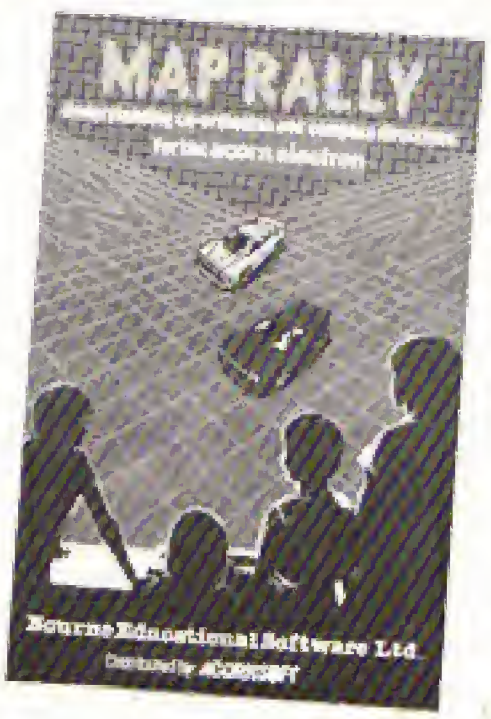
BOURNE have made many friends among primary school teachers (and children!) for their lovely Happy Letters and Happy Numbers programs for young learners.

This tape is aimed at a higher age group and combines practice in coordinates and compass directions.

There are actually two similar programs on the cassette, the first of which requires little experience of compass bearings, for the necessary prompts are made on screen.

The child takes the part of a rally driver, with the Electron acting as navigator around a course through a grid. This varies from 6×6 to 18×18, which increases the level of difficulty.

The most popular choice was that of two players



competing against each other, one with a red car, the other with blue. The courses set for each car are similar in terms of distance, but they are not the same, so nobody can benefit from someone else's successes!

The second program is very similar but the child has to calculate the desired new coordinates in order to make the move. This refinement adds a totally different skill from that already acquired in the first game.

Again the graphics are fair and the sound is quite reasonable but the great value of this tape is the superbly child-orientated feel it has.

Children love the idea of car rallies and they themselves love to compete. The fact that a considerable amount of information is learnt about compass points and coordinates is almost incidental to the child.

Yet parents and teachers can feel quite reassured that the educational purpose is fully achieved in this splendid cassette.

Phil Tayler

One for action men...

Invaders
Superior Software

WOULD you do anything for a fast action game but never look an adventure in the face? If so, then this is the game for you.

Your ship is loaded with an infinite supply of fire-power with which to blast the aliens out of existence, but you only have a limited time before they land.

For extra points you must destroy any spaceship that wanders through your territory. Watch out, though. They often drop bombs that penetrate all defences.

The keys Z and X (for left and right) and Delete (to fire), respond promptly, giving smooth action.

It may not be the most original game ever written, but the graphics and sound facilities have been used well to give an enjoyable and addictive game which is good value for money.

Richard Tacagni

KAY-ESS COMPUTER PRODUCTS

PROFESSIONAL PROGRAMS FOR THE MODEL B AND ELECTRON

EACH TAPE ONLY £5.95 (Except H.O.H.)

HOUSE OF HORRORS (B)(E) £6.95

Turn off the lights and gather around for the most creepy game of the year. How you laughed at those superstitious fools in the village when they warned you not to go near the old house. The climb up the rocky path under the afternoon sun was swift and within an hour you had passed through the outer gates of this once great house. The dust and cobwebs hadn't bothered you as you climbed the old stairs to the towers on the top level. Did you notice how low the sun had fallen before the sounds of locks clicking reached your startled ears? How can the moon be out already and what's that moving towards you??? This all action game will have you ducking and diving from the GHOSTS and ZOMBIES, and matching wits with a MUMMY, WEREWOLF, and VAMPIRE. 5 floors full of odd CORRIDORS, BROKEN FLOORBOARDS, and riddled with SECRET PASSAGES await you. Superb sound effects and graphics. Can be played using either keyboard or joysticks. Top table. Pause option.

EARLY YEARS (B)(E) For children between 3-6 years of age.
These two packages give an adult or older child a means to take a younger child through a series of simple game type tasks to enforce ideas. The emphasis is on learning through fun. Topics covered include subtraction, addition, recognition, colour, shapes, sizes, sounds/noises, co-ordination, distances, estimates, directions.

EARLY YEARS 1
A) MICKEY THE MONKEY and his apple tree make subtraction fun.
B) COLOUR BLOCKS bring sizes and colour into perspective.
C) MERRY MUSIC turns the keyboard into a musical keyboard.
D) FUNNY FACES presents a line up, which one is the suspect?
E) FRED THE FROG needs co-ordinated help to get across the pond.

EARLY YEARS 2
A) THE POND seems very active today.
B) SPEED is required to keep the cake on the conveyor belt.
C) DIRECTIONS seem to be needed by everyone in Orion village.
D) ORDER the blocks.
E) SID THE SPIDER needs some help to get out of the maze.

Watch out for HOUSE OF HORRORS at local dealers.
Dealer enquiries welcome.
All prices are FULLY inclusive for UK orders.
Please add £1 per tape for non-UK addresses.
Cheques/P.O.'s should be made payable to
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QUAL-SOFT

£9.95
(inc. VAT and p.p.)

QUAL-SOFT Comments: About our previous advert Mr J. Carter of Barnsley 'phoned', *Don't tell us what people think of LEAGUE DIVISION ONE for the BBC B, what do they say about SOCCER SUPREMO for the ELECTRON?*" Copy dates being what they are, we hadn't sold any ELECTRON games when we wrote last months advert, but now, at the time of writing we've been delivering the program for four weeks (probably eight to twelve as you read this!), and, to escape accusations of selective quotes, we will give you the first paragraph of the first letter we had received about SOCCER SUPREMO, from J. Hooley of Twickenham: "*Many thanks for the fantastic game. As soon as I received it, there was no stopping until the end of the season*". **We make that about six hours continuous play!** And in the first telephone conversation P. Wright of Swansea began: "*This is by far the best game I've found for the ELECTRON*". OK Mr Carter?

"SOCCER SUPREMO"

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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?

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- 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.

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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: .....

Make light work of listings

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

On the November tape:

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

On the October tape:

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

On the September tape:

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

On the August tape:

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

On the July tape:

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

On the June tape:

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

On the May tape:

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

On the April tape:

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

On the March tape:

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

On the February tape:

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

On the introductory tape:

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

HOW TO ORDER

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

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

Name .....

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

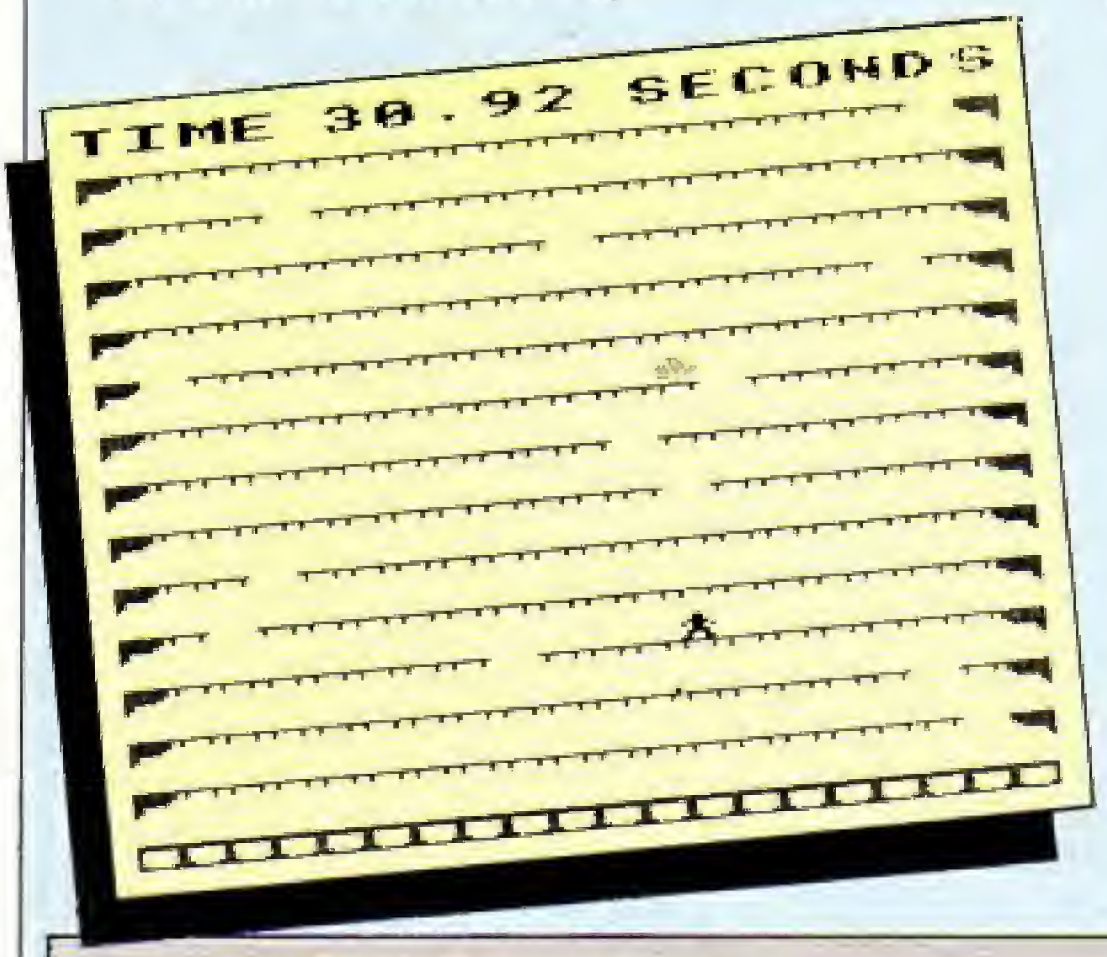
Great Balls

You'd better jump for your life in this exciting arcade action game by CHARLES FRANCIS

JUMPER is a fast arcade game in which the objective is to move the man up through gaps in floors as quickly as possible.

You have to be quick as the gaps keep moving, and if you get caught by a fireball you go back to the beginning.

Line 700 is a delay, controlling running speed – but you may find if you make the program go faster your reactions can't keep up.



```
   5REM JUMPER
   6REM BY CHARLES FRANCIS
   7REM (C) ELECTRON USER
  10DIMGP%(30),R$(8),R(8)
  20MODE1:
  30VDU23,224,255,255,255,
254,252,192,192,128
  40VDU23,225,255,66,66,0,
0,0,0,0
  50VDU 23,226,24,24,60,90
,24,60,36,102
  60VDU23,227,255,255,255,
127,63,3,3,1
  70VDU23,228,24,126,126,2
55,255,126,126,24
  80VDU23,235,255,255,129,
129,129,129,195,255
  90VDU23,240,12,12,60,47,
12,14,56,35
 100VDU23,241,48,48,60,244
,48,112,92,196
 110VDU23,1,0;0;0;0;
 120VDU19,3,4,0,0,0
 130FORI%=0TO8:R$(I%)="":R
(I%)=-1:NEXT
 140R$(1)="GRINNER":R(1)=5
0:R(0)=0
 150COLOUR1:PRINTTAB(16,1)
"JUMPER"
 160COLOUR2:PRINT''"Move t
he man ";
 170COLOUR3:PRINT;CHR$226;
 180COLOUR2
 190PRINT;" up through the
 gaps in "'"the floors.  He
 falls through gaps."
 200PRINT''"Avoid fireballs
";
 210COLOUR1:PRINT;CHR$228;
:COLOUR2
 220PRINT''"To move man us
e keys:"
 230PRINT''"       Z - MOVE
 LEFT"
 240PRINT"       X - MOVE
RIGHT"
 250PRINT"       , - JUMP
UP"
 260 PRINT''"Use keys toget
her to avoid falling back"'
"after jump.  "
 270 COLOUR3:PRINT''"
PRESS ANY KEY TO CONTINUE";
 280G$=GET$
 290MODE5
 300VDU23,1,0;0;0;0;
 320VDU19,3,4,0,0,0
 330@%=&20207
 340COLOUR2
 350 FORQ%=4TO28STEP2
 360PRINTTAB(0,Q%)CHR$224+
STRING$(18,CHR$225)+CHR$227
 370G%=RND(18)
 380GP%(Q%)=G%
 390PRINTTAB(G%,Q%)" ";
 400NEXT
 410PRINTTAB(0,30)STRING$(
20,CHR$235);
 420GP%(30)=-1
 430T%=TIME
 440 X%=0:Y%=29
 450FY%=3:FX%=RND(18):Z%=1
 460COLOUR1
 470PRINTTAB(0,1)"TIME ";
 480COLOUR3
 490PRINTTAB(X%,Y%)CHR$226
 500REPEAT
 510IFINKEY(-103)ANDGP%(Y%
-1)=X%:PRINTTAB(X%,Y%)" ":Y
%=Y%-2:PRINTTAB(X%,Y%)CHR$2
26:SOUND1,-15,96,1
 520IFINKEY(-67)+INKEY(-98
)=0THENPRINTTAB(X%,Y%)CHR$2
26
 530IFINKEY(-67)ANDX%<19:P
RINTTAB(X%,Y%)" ":X%=X%+1:P
RINTTAB(X%,Y%)CHR$240
 540IFINKEY(-98)ANDX%>0:PR
INTTAB(X%,Y%)" ":X%=X%-1:PR
INTTAB(X%,Y%)CHR$241
 550IFGP%(Y%+1)=X%:PROCDOW
N
 560Q%=2+2*RND(13)
 570COLOUR2
 580 PRINTTAB(GP%(Q%),Q%)C
HR$225
 590GP%(Q%)=RND(18)
 600PRINTTAB(GP%(Q%),Q%)"
"
 610IFX%=FX%ANDFY%=Y%THENP
RINTTAB(X%,Y%)" ":SOUND0,-1
,6,10:Y%=29
 620COLOUR1:PRINTTAB(FX%,F
Y%)" ":FX%=FX%+Z%
```

# of Fire!

VARIABLES

GP(30)	Position of gap in floor
R$(8)	Names in the Hall of Fame
R(8)	Times in the Hall of Fame (R(1) can be beaten)
X%,Y%	Man position
Y1%	=Y%+1
FX%,FY%	Fireball position
Z%	Fireball direction
T	Time taken in seconds
T%	Starting time.
G$,G%,I%,Q%	Utility variables

STRUCTURE

30-120	VDU codes
130-140	Initialise Hall of Fame
150-280	Game instructions
300-320	Colour selection
330	Sets numeric format
340-490	Screen initialisation for game.
500-710	Main loop
510-550	Move man
560-600	Move gap in floor
610 & 650	Man caught by fireball
620-670	Moves fireball
680	Time taken
700	Delay (see above)
750-920	Game end including Hall of Fame
950-1030	PROCDOWN Man falls through gap in floor
1040-1080	PROCtune1
1090-1130	PROCtune2

```
  630IFFX%=0ORFX%=19ORRND(2
0)=1THENI%=-I%
  640IFFX%=GP%(FY%+1)THENFY
%=FY%+2
  650IFX%=FX%ANDFY%=Y%THENP
RINTTAB(X%,Y%)" ":SOUND0,-1
,5,10:Y%=29
  660 IFFY%>Y%:FY%=3
  670PRINTTAB(FX%,FY%)CHR$(
228)
  680PRINTTAB(4,1)(TIME-T%)
/100;" SECONDS    "
  690COLOUR3
  700FORI%=0TO1500:NEXT
  710UNTIL Y%=3
  720T=(TIME-T%)/100
  730CLS
  740COLOUR3:PRINTTAB(5,9)"
TIME TAKEN"TAB(2,11)T;" SEC
ONDS"
  750IFR(7)>0ANDT>R(7)PROCt
une1:GOTO870
  760COLOUR1
  770IFT<R(1)PRINTTAB(4,15)
"RECORD TIME"::PROCtune1:PR
OCtune2:ELSEPRINTTAB(2,15)'
YOU REACHED THE"TAB(3,17)"H
ALL OF FAME";
  780PROCtune1:PROCtune2
  790COLOUR2:*FX21,0
  800INPUTTAB(5,20)"ENTER N
AME"TAB(9,23)N$
  810FORI%=7TO0STEP-1
  820IFT<R(I%)ORR(I%)<0 R(I
%+1)=R(I%):R$(I%+1)=R$(I%):
ELSEIFT<R(I%+1)ORR(I%+1)<0
R$(I%+1)=N$:R(I%+1)=T
  830NEXT
  840COLOUR1
  850CLS:PRINTTAB(4,1)"HALL
 OF FAME"'
  860I%=1:REPEAT:COLOUR3:PR
INT''TAB(1)R$(I%)+CHR$17+CH
R$2TAB(14)R(I%):I%=I%+1:UNT
IL I%=8ORR(I%)<0
  870COLOUR1
  880PRINT'''"   Would you
like"'"   another game?"'TA
B(7)"(Y/N)";
  890REPEAT
  900G$=GET$
  910UNTILG$="Y"ORG$="N"
  920IF G$="Y"THENCLS:GOTO3
40
  930MODE6
  940END
  950DEFPROCDOWN
  960Y1%=Y%+1
  970SOUND1,-15,0,1
  980PRINTTAB(X%,Y%)" ":Y%=
Y%+2:PRINTTAB(X%,Y%)CHR$226
  990COLOUR2
 1000 PRINTTAB(GP%(Y1%),Y1%
)CHR$225
 1010 GP%(Y1%)=RND(18)
 1020PRINTTAB(GP%(Y1%),Y1%)
" "
 1030ENDPROC
 1040DEFPROCtune1
 1050SOUND1,-15,68,2:SOUND1
,0,0,1:SOUND1,-15,80,2:SOUN
D1,0,0,1:FOR I%=0TO5:SOUND1
,-15,96,2:SOUND1,0,0,1:NEXT
 1060SOUND1,-15,100,1:SOUND
1,-15,68,2:SOUND1,-15,80,3:
SOUND1,-15,68,3
 1070SOUND1,-15,60,5:SOUND1
,0,0,1:SOUND1,-15,76,5:SOUN
D1,0,0,1:SOUND1,-15,96,1:SO
UND1,-15,88,8
 1080ENDPROC
 1090DEFPROCtune2
 1100SOUND1,0,0,3:SOUND1,-1
5,96,5:SOUND1,0,0,1:SOUND1,
-15,108,1:SOUND1,-15,96,2:S
OUND1,-15,80,1:SOUND1,-15,9
6,1:SOUND1,0,0,1
 1110SOUND1,-15,80,2:SOUND1
,0,0,1:SOUND1,-15,80,2:SOUN
D1,0,0,1:SOUND1,-15,88,1:SO
UND1,-15,90,2:SOUND1,-15,68
,1:SOUND1,-15,80,1:SOUND1,0
,0,1
 1120SOUND1,-15,68,5:SOUND1
,0,0,1:SOUND1,-15,80,5:SOUN
D1,0,0,1:SOUND1,-15,96,1:SO
UND1,-15,88,8
 1130ENDPROC
```

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

URBAN SPRAWL

TAKE on the planners and fight to save the green belt with this fast moving and original game from PATRICK HEIGHES.

Stop the planners building on the green belt round the edge of the screen. The city starts in the middle of the screen and sprawls outwards.

You are the Lone Conservationist, running around the screen blasting each building as it gets too near the belt.

Whenever you get one, the builders go back to the Town Hall in the centre and start again, giving you a breather. Then you're back in action.

The controls are simplicity itself:

Key	*Function*
Z	Left
X	Right
:	Up
/	Down
Return	Fires blaster

Your score is based on the length of time you keep the buildings off the green belt. Good luck!

```
 10 REM URBAN SPRAWL
 20 REM PATRICK HEIGHES
 30 REM (C) ELECTRON USER
 40 MODE 5
 50 VDU 23,1,0;0;0;0;
 60 VDU 19,2,2,0,0,0
 70 VDU 23,240,255,255,255
    ,255,255,255,255,255
 80 VDU 23,241,0,60,60,126
    ,24,28,116,70
 90 ENVELOPE 1,3,-17,61
    ,9,4,0,0,126,0,0,-126
    ,126,126
100 MAN=241
110 SCORE%=0
120 CITY%=0
130 FAIL%=0
140 DIR%=2
150 VERT%=20
    :HORI%=10
160 X%=15
    :Y%=15
170 PRINT TAB(X%,Y%);
    CHR$ (MAN)
180 PROCSTART
190 FOR N=0 TO 20
200 PRINT TAB(14,31);SCORE%;
210 PROCMAN
220 IF INKEY (-74)=-1
    THEN PROCSHOOT
230 IF N MOD 5=0
    THEN PROCGRD
    :SCORE%=SCORE%+2
240 IF FAIL%=1
    THEN GOTO 1290
250 NEXT N
260 GOTO 190
270 DEF PROCSTART
280 GCOL 0,2
290 MOVE 1280,0
300 PLOT 85,0,94
310 PLOT 85,1280,94
320 MOVE 1280,1024
330 PLOT 85,1152,94
340 PLOT 85,1152,1024
350 MOVE 0,1024
360 PLOT 85,1152,928
370 PLOT 85,0,928
380 MOVE 0,94
390 PLOT 85,120,928
400 PLOT 85,120,94
410 GCOL 0,3
420 PRINT TAB(8,31);"SCORE";
430 FOR N=1 TO 20
440 PRINT TAB(5+RND(8),10+
    RND(8));CHR$ (240)
450 NEXT
460 ENDPROC
470 DEF PROCGRD
480 HORI%=HORI%-2+RND(3)
490 VERT%=VERT%-2+RND(3)
500 IF POINT(HORI%+64+32
    ,(31-VERT%)*32+16)=2
    THEN FAIL%=1
    :PRINT TAB(HORI%,VERT%);
    CHR$ (240)
    :ENDPROC
510 IF HORI%<2
    THEN HORI%=2
520 IF HORI%>17
    THEN HORI%=17
530 IF VERT%<3
    THEN VERT%=3
540 IF VERT%>28
    THEN VERT%=28
550 PRINT TAB(HORI%,VERT%);
    CHR$ (240)
560 ENDPROC
570 PRINT TAB(HORI%,VERT%);
    CHR$ (240)
580 DEF PROCMAN
590 IF INKEY (-98)=-1
    THEN DIR%=1
    :GOTO 640
600 IF INKEY (-67)=-1
    THEN DIR%=2
    :GOTO 700
610 IF INKEY (-73)=-1
    THEN DIR%=3
    :GOTO 760
620 IF INKEY (-105)=-1
    THEN DIR%=4
    :GOTO 820
630 ENDPROC
640 X%=X%-1
650 V%=POINT(X%*64+32,(31-Y%)
    *32+16)
660 IF V%=0 AND CITY%=0
    THEN PRINT TAB(X%,Y%);
    CHR$ (MAN);TAB(X%+1
```

```
    ,Y%);CHR$ (32)
    :ENDPROC
    ELSE IF V%=0 AND CITY%=1
    THEN PRINT TAB(X%,Y%);
    CHR$ (MAN);TAB(X%+1
    ,Y%);CHR$ (240)
    :CITY%=0
    :ENDPROC
670 IF V%=2
    THEN X%=X%+1
    :ENDPROC
680 IF V%=3 AND CITY%=1
    THEN PRINT TAB(X%,Y%);
    CHR$ (MAN);TAB(X%+1
    ,Y%);CHR$ (240)
    :ENDPROC
    ELSE IF V%=3 AND CITY%=0
    THEN PRINT TAB(X%,Y%);
    CHR$ (MAN);TAB(X%+1
    ,Y%);CHR$ (32)
    :CITY%=1
    :ENDPROC
690 ENDPROC
700 X%=X%+1
710 V%=POINT(X%*64+32,(31-Y%)
    *32+16)
720 IF V%=0 AND CITY%=0
    THEN PRINT TAB(X%,Y%);
    CHR$ (MAN);TAB(X%-1
    ,Y%);CHR$ (32)
    :ENDPROC
    ELSE IF V%=0 AND CITY%=1
    THEN PRINT TAB(X%,Y%);
    CHR$ (MAN);TAB(X%-1
    ,Y%);CHR$ (240)
    :CITY%=0
    :ENDPROC
730 IF V%=2
    THEN X%=X%-1
    :ENDPROC
740 IF V%=3 AND CITY%=1
    THEN PRINT TAB(X%,Y%);
    CHR$ (MAN);TAB(X%-1
    ,Y%);CHR$ (240)
    :ENDPROC
    ELSE IF V%=3 AND CITY%=0
    THEN PRINT TAB(X%,Y%);
    CHR$ (MAN);TAB(X%-1
    ,Y%);CHR$ (32)
    :CITY%=1
    :ENDPROC
750 ENDPROC
760 Y%=Y%-1
770 V%=POINT(X%*64+32,(31-Y%)
    *32+16)
780 IF V%=0 AND CITY%=0
    THEN PRINT TAB(X%,Y%);
    CHR$ (MAN);TAB(X%,Y%+1);
    CHR$ (32)
    :ENDPROC
    ELSE IF V%=0 AND CITY%=1
    THEN PRINT TAB(X%,Y%);
    CHR$ (MAN);TAB(X%,Y%+1);
    CHR$ (240)
    :CITY%=0
    :ENDPROC
790 IF V%=2
    THEN Y%=Y%+1
    :ENDPROC
800 IF V%=3 AND CITY%=1
    THEN PRINT TAB(X%,Y%);
    CHR$ (MAN);TAB(X%,Y%+1);
    CHR$ (240)
    :ENDPROC
    ELSE IF V%=3 AND CITY%=0
    THEN PRINT TAB(X%,Y%);
    CHR$ (MAN);TAB(X%,Y%+1);
    CHR$ (32)
    :CITY%=1
    :ENDPROC
810 ENDPROC
820 Y%=Y%+1
830 V%=POINT(X%*64+32,(31-Y%)
    *32+16)
840 IF V%=0 AND CITY%=0
    THEN PRINT TAB(X%,Y%);
    CHR$ (MAN);TAB(X%,Y%-1);
    CHR$ (32)
    :ENDPROC
    ELSE IF V%=0 AND CITY%=1
    THEN PRINT TAB(X%,Y%);
    CHR$ (MAN);TAB(X%,Y%-1);
    CHR$ (240)
    :CITY%=0
    :ENDPROC
850 IF V%=2
    THEN Y%=Y%-1
    :ENDPROC
860 IF V%=3 AND CITY%=1
    THEN PRINT TAB(X%,Y%);
    CHR$ (MAN);TAB(X%,Y%-1);
    CHR$ (240)
    :ENDPROC
    ELSE IF V%=3 AND CITY%=0
    THEN PRINT TAB(X%,Y%);
    CHR$ (MAN);TAB(X%,Y%-1);
    CHR$ (32)
    :CITY%=1
    :ENDPROC
870 ENDPROC
880 DEF PROCSHOOT
890 SHOOTX%=X%*64+32
900 SHOOTY%=(31-Y%)*32+16
910 F%=SHOOTX%
    :G%=SHOOTY%
920 MOVE F%,G%
930 ON DIR% GOTO 940 ,980
    ,1020 ,1060
940 SHOOTX%=SHOOTX%-64
950 IF POINT(SHOOTX%,SHOOTY%)
    =3
    THEN PROChit
    :ENDPROC
960 IF POINT(SHOOTX%,SHOOTY%)
    =2
    THEN PROCmiss
    :ENDPROC
970 GOTO 940
980 SHOOTX%=SHOOTX%+64
990 IF POINT(SHOOTX%,SHOOTY%)
    =3
    THEN PROChit
    :ENDPROC
1000 IF POINT(SHOOTX%,SHOOTY%)
    =2
    THEN PROCmiss
    :ENDPROC
1010 GOTO 980
1020 SHOOTY%=SHOOTY%+32
1030 IF POINT(SHOOTX%,SHOOTY%)
    =3
    THEN PROChit
    :ENDPROC
1040 IF POINT(SHOOTX%,SHOOTY%)
    =2
    THEN PROCmiss
    :ENDPROC
1050 GOTO 1020
1060 SHOOTY%=SHOOTY%-32
1070 IF POINT(SHOOTX%,SHOOTY%)
    =3
    THEN PROChit
    :ENDPROC
1080 IF POINT(SHOOTX%,SHOOTY%)
    =2
    THEN PROCmiss
    :ENDPROC
1090 GOTO 1060
1100 DEF PROChit
1110 DRAW SHOOTX%,SHOOTY%
1120 SOUND 1,1,157,5
1130 GCOL 0,0
1140 DRAW F%,G%
1150 GCOL 0,3
1160 PRINT TAB((SHOOTX%-32)/64
    ,31-((SHOOTY%-16)/32));
    CHR$ (32)
1170 IF (SHOOTX%-32)/64=HORI%
    AND 31-((SHOOTY%-16)/32)
    =VERT%
    THEN HORI%=10
    :VERT%=15
    :COLOUR 1
    : PRINT TAB(HORI%,VERT%);
    CHR$ (240)
    :FOR WAIT%=1 TO 25
    :NEXT WAIT%
    :COLOUR 3
    :PRINT TAB(HORI%,VERT%);
    CHR$ (240)
    :VDU 7
1180 ENDPROC
1190 DEF PROCmiss
1200 DRAW SHOOTX%,SHOOTY%
1210 SOUND 1,1,157,5
1220 GCOL 0,0
1230 DRAW F%,G%
1240 GCOL 0,3
1250 COLOUR 2
1260 PRINT TAB((SHOOTX%-32)/64
    ,31-((SHOOTY%-16)/32));
    CHR$ (240)
1270 COLOUR 3
1280 ENDPROC
1290
1300 MODE 6
1310 PRINT TAB(5,5);"BAD LUCK"
1320 PRINT
1330 PRINT SPC (8)"THE GREEN
    BELT HAS BEEN"
1340 PRINT
    : PRINT SPC (13)"BUILT
    ON"
1350 PRINT
    :PRINT
    :PRINT
    :PRINT *       YOU SCORED
      ";SCORE%;"  POINTS"
1360 PRINT
    :PRINT SPC (6)"DO YOU
    WANT TO PLAY AGAIN Y/N
    ?"
1370 LET A$=GET$
    :IF A$="Y"
    THEN RUN
    ELSE IF A$="N"
    THEN END
1380 GOTO 1370
```

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

National Micro

Everything on this page is 5% less than our normal price

This special offer is exclusively for readers of Electron User and applies to mail order sales only.

National Micro Centres Computer Club

We will also send you FREE membership of NMC's Computer Club – enabling you to enjoy generous discounts on all your future purchases!

Benefits for Club members include a big saving of 10% on software and 5% on hardware purchases over £25.

Personal shoppers are welcome at our retail stores:

National Micro Centres,
36 St. Petersgate,
Stockport SK7 5NY.
Tel: 061-429 8080

Wilmslow Micro Centre,
62 Grove Street,
Wilmslow, Cheshire.
Tel: 0625 530891

PRINTERS

Now you can add a printer to your Electron, using Plus 1, we have selected four of the most popular dot-matrix printers. All allow you to condense or embolden text, offer high definition characters and allow you to produce clear-cut graphics and charts:

Brother HR5 (30cps) **£170.95**
Epson RX80 (100cps) **£272.00**
Epson RX80FT (incl. friction feed) **£315.00**

For superb correspondence-quality printing you need a daisywheel printer. Our choice is one of our best-sellers, the Silver Reed EX43. It can also be used as a superior standalone electronic typewriter **£394.25**

(Without Electron Interface: **£286.90***)*

MONITORS

You can happily operate your Electron with your domestic TV set. But more and more users are finding that for a really crisp picture you need a special monitor. We offer a monochrome and three colour monitors:

Zenith 12" (green screen) **£81.00**
Microvitec (14" colour – low res) **£217.41**
Microvitec (14" colour – med res) **£326.66**
Microvitec (14" colour – hi res) **£480.70**

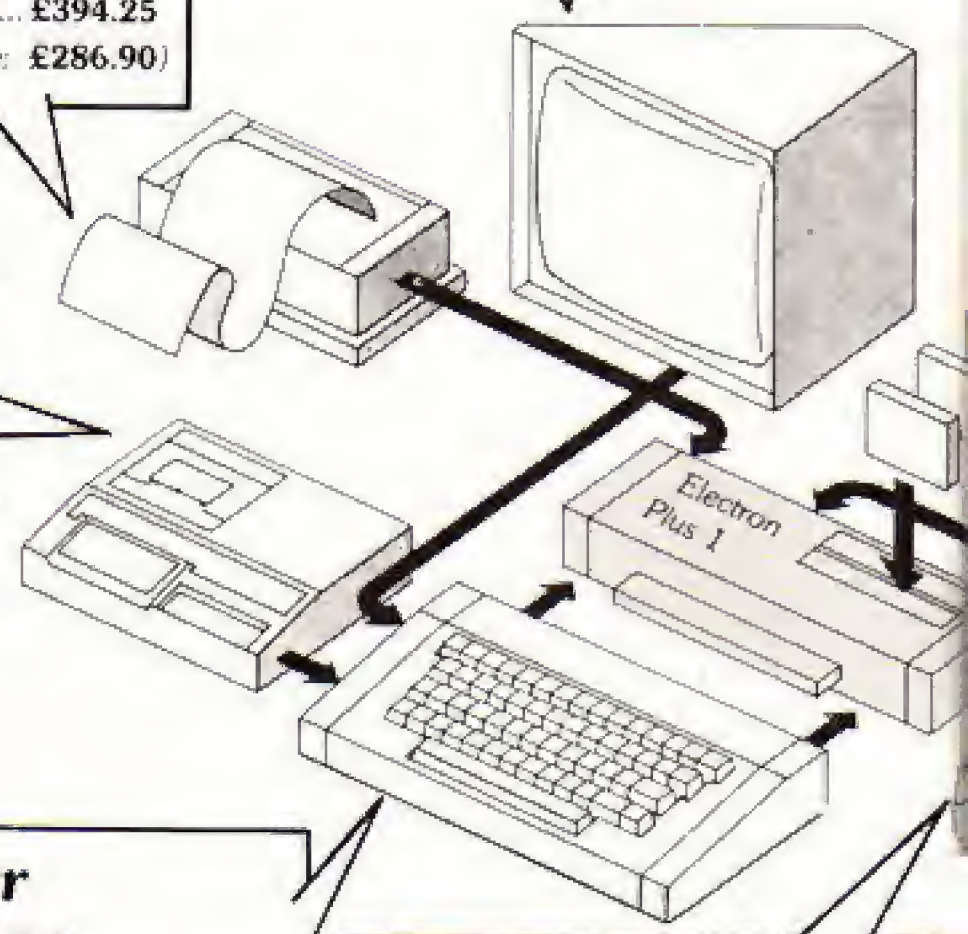
For the best of both worlds there is the 14" Nordmende, which can double as a monitor and normal TV, at a very attractive price **£238.00**

(with remote control **£251.00***)*

DATA RECORDER

From a wide selection of cassette recorders we recommend the Pye Data Cassette Recorder, which is a perfect match for the Electron. With it comes a FREE power pack and Electron lead.

£38.00



A FREE dust cover with every Electron

We have ample stocks of Electrons and can promise mainland delivery within 24 hours of receiving your order. With it comes an introductory cassette of 15 programs, a very comprehensive User Guide, an easy-to-understand DIY book on programming AND a free dust cover with the compliments of National Micro Centres **£189.00**

Electron Dust Cover *if supplied separately* ***£2.80***

JOYSTICKS

Use a joystick to play arcade games and watch your score increase dramatically! For serious games a joystick really is a must – and we have two we specially recommend. Both provide twin fire buttons.

Sureshot (self-centering action) .. **£15.67**
Clares (non self-centering) .. pair **£19.50**

These will take Kempston & Sureshot joysticks.

Selling well . . . First Byte's switched joystick interface

Since it was launched at the Electron & BBC Micro User Show the switched joystick interface from First Byte has been one of our top sellers. This plug-in cartridge takes standard Atari-style joysticks which are much more popular – and cheaper – than analogue joysticks. **£23.70**

Centres

MAIL ORDER DIVISION

Phone your order on **061-429 8080**

Answering service outside normal office hours
Or use the order form below

AT LAST! Plus 1 is the Electron add-on we've all been waiting for!

ELECTRON PLUS 1 is Acorn's answer to a growing demand from Electron users to be able to extend their micro's capabilities. With it you can add a printer and use your Electron for word processing and financial calculations. Its joystick input is designed to take two fully-proportioned joysticks – giving an entirely new dimension to games playing. And its two unique cartridge slots enable you to plug in games, educational and business programs – and that means no more waiting for programs to load. Many other manufacturers are now planning cartridges that will use Plus 1 to expand the Electron in many more exciting ways and considerably increase its power and versatility.

ELECTRON PLUS 1 is a must for every user who wants to really make the most of his micro.

Incredible value at **£56.90**

ROM CARTRIDGES

With Plus 1 you can use software cartridges on your Electron for the first time.

Now available:
- Snapper
- Hopper
- Starship Command

only **£14.95**

DELIVERY CHARGES
Hardware: £7 per item
Software: FREE

ALL PRICES GIVEN HERE INCLUDE VAT

Our Top Ten Best Sellers

Birds of Prey (Romik)
A fast moving Invaders type game where the aliens in space take the form of birds. Great value for money. **£6.99**

Pharoah's Tomb (A & F)
Seek the golden mask in this graphic adventure, solve anagrams and number puzzles – but avoid the monsters. **£7.15**

Killer Gorilla (Micropower)
Fast becoming a cult game. Dodge tumbling barrels and blazing fireballs. Gripping multi-level action. **£7.95**

Twin Kingdom Valley (Bug-Byte)
A sophisticated adventure game with all 175 locations drawn in full-screen hi-res graphics. **£8.55**

Cylon Attack (A & F)
"Outstanding . . . quite simply excellent . . . the graphics leave most other games standing". – *Electron User* **£7.15**

Chess (Acornsoft)
One of the best computer versions of the game, easy to use, with more options than its competitors. **£8.28**

Mini Office (Micro User/Electron User)
All-in-one word processor, database, spreadsheet and graphics package at an incredibly low price **£5.95**

Micro Olympics (Micro User/Electron User)
Pit yourself against the worlds greatest athletes. **£5.95**

Starship Command (Acornsoft)
Guide your craft through deep space and avoid an enemy bent on your destruction. Very addictive. **£8.28**

Chuckie Egg (A & F)
A progressive game requiring extremely high skill levels. The nightmare has begun! **£7.90**

ORDER FORM

Post to:
NATIONAL MICRO CENTRES.
36 St. Petersgate.
Stockport SK1 1HL

Please supply the following:

Item	Qty	Total £	p
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Attractive credit terms
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Please indicate method of payment:

☐ Cheque payable to National Micro Centres

☐ Access/Barclaycard No.

Name .....
Address .....
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Tel. No. .....
Signed EU13

SCRAPBOOK

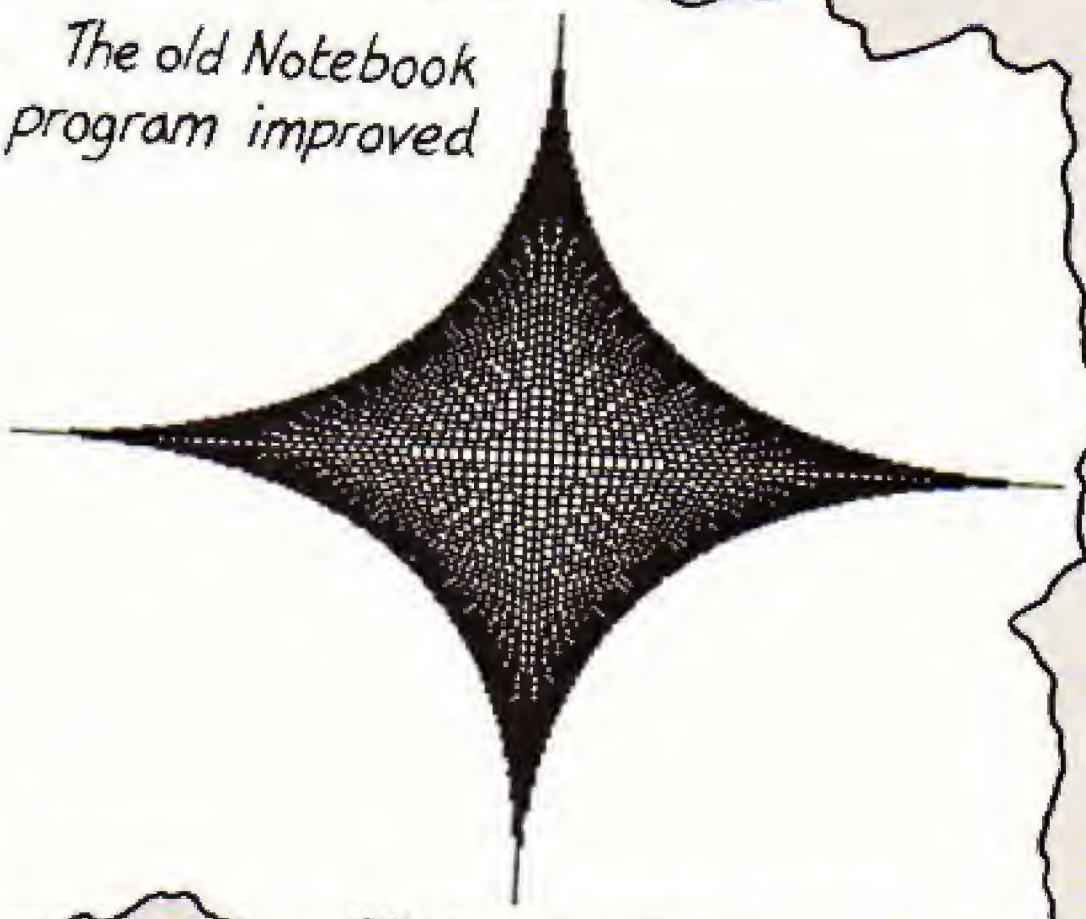
SCRAPBOOK is the feature that contains a selection of all the short, simple programs sent in by our readers. It's where we keep a record – a scrapbook would you believe – of all the interesting little routines that don't end up in the Notebook or in Program Probe but are too good for us not to share.

The emphasis this month is very much on graphics programs but next month, who knows? It's up to you and the programs you send in.

MANDALA

The old Notebook program improved

```
10 REM MANDALA
20 REM BY NIGEL PETERS
30 REM MODS BY JOHN LEWIS
40 MODE 1
50 GCOL 0,RND(3)
60 VDU 19,3,4,0,0,0,
70 VDU 23,1,0;0;0;0;
80 MOVE 500,500
90 s=RND(100):PRINT "Step ";s
100 FOR x=0 TO 500 STEP s
110 DRAW 500,1000-x
120 DRAW 500-x,500
130 DRAW 500,x
140 DRAW 500+x,500
150 NEXT
160 TIME=0:REPEAT UNTIL TIME=200
170 GOTO 40
```



CURVED SHAPES

Round the screen with Andrew Jackson

```
10 REM CURVED SHAPES
20 REM BY ANDREW JACKSON
30 MODE 2
40 VDU 23,1,0;0;0;0;
50 GCOL 0,RND(7)
60 SIZE=RND(100):B=RND(1
100):C=SIZE:D=RND(900)
70 MOVE B+C,D:MOVE B+C,D
80 FOR X=0 TO 1200 STEP
100
90 PLOT 85,COS(X)*SIZE+B
,SIN(X)*C+D
100 NEXT
110 GOTO 50
```

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

```
FORTUNE TELLER PROGRAM

  THIS PROGRAM TELLS YOUR
FORTUNE,OR SOMEONE ELSES FORTUNE.
SIMPLY TYPE IN SOMEONES NAME,AND I WILL
TELL YOU ABOUT THEM
TYPE SPACE BAR,IF YOU WANT TO TYPE IN A
NEW NAME.
```

FORTUNE TELLER

Your character described by 12 year old Helen Jones

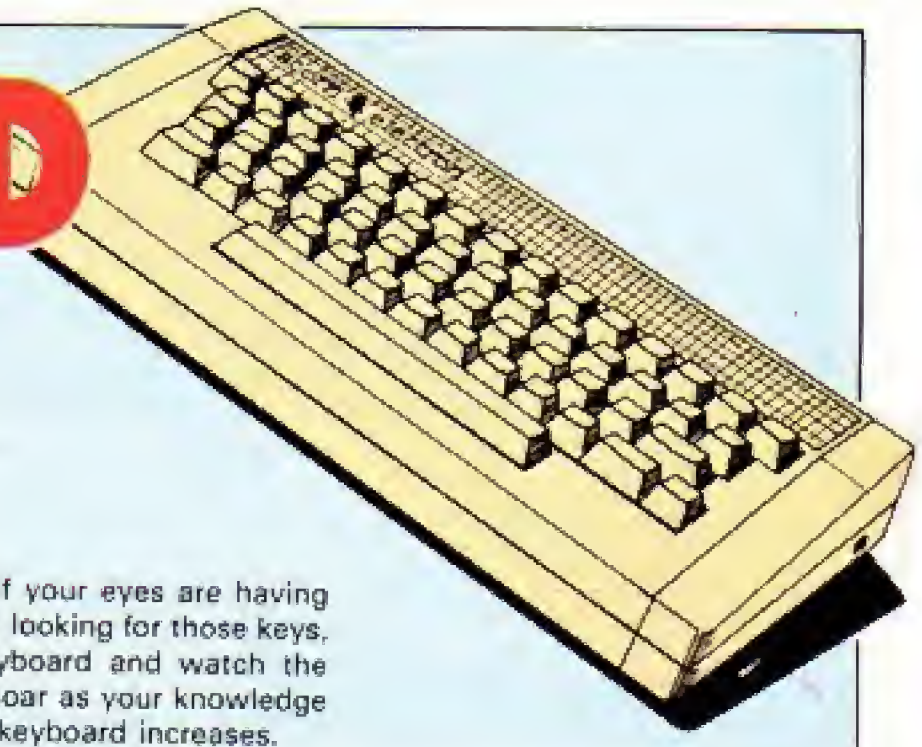
```
  10REM Fortune Teller Pro
gram
  20REM By Helen Jones
  30MODE 1
  40PRINT TAB(3,2)"FORTUNE
 TELLER PROGRAM"
  50PRINT TAB(2,5)"THIS PR
OGRAM TELLS YOUR"''"FORTUNE,
OR SOMEONE ELSES FORTUNE."
  60PRINT"SIMPLY TYPE IN S
OMEONES NAME,AND I WILL"''"T
ELL YOU ABOUT THEM"''"TYPE S
PACE BAR,IF YOU WANT TO TYP
E IN A NEW NAME."
  70G=GET
  80CLS
  90COLOUR 2
 100COLOUR 129
 110CLS
 120PRINT TAB(2,10)"PLEASE
ENTER YOUR NAME."
 130INPUT A$
 140PRINT TAB(2,12)"GLAD T
O KNOW YOU,";A$;"  I HOPE
THAT WE GET ALONG TOGETHER.
"
 150G=GET
 160COLOUR 3
 170CLS
 180PRINT TAB(0,2)"NOW ";A
$;" TYPE IN THE NAME OF THE
 PERSON WHOM YOU"''"WANT ME
TO PRAISE OR CRITISISE.....
."
 190INPUT B$
 200CLS
 210IF B$=A$ THEN PRINT TA
B(0,4)"SO,YOUR ASKING ABOUT
 YOURSELF,ARE YOU?  "'" WEL
L,YOU"
 220IF B$=A$ THEN GOTO 240
 230PRINT TAB(0,4)"WELL,";
B$
 240C=RND(6)
 250IF C=1 AND B$=A$ THEN
PRINT TAB(0,8)"ARE EXCEEDIN
GLY BEAUTIFUL.":SOUND1,-15,
100,10
 260IF C=1 AND B$<>A$ THEN
 PRINT TAB(0,8)"IS EXCEEDIN
GLY BEAUTIFUL.":SOUND1,-15,
100,10
 270IF C=2 AND B$=A$ THEN
PRINT TAB(0,8)"ARE OF ROYAL
 BLOOD"SOUND 1,-15,80,10
 280IF C=2 ANDB$<>A$ THEN
PRINT TAB(0,8)"IS OF ROYAL
BLOOD":SOUND 1,-15,80,10
 290IF C=3 ANDB$=A$ THEN P
RINT TAB(0,8)"ARE UGLIER TH
AN AN UGLY MONSTER.":SOUND1
,-15,48,10
 300IF C=3 ANDB$<>A$ THEN
PRINT TAB(0,8)"IS UGLIER TH
AN AN UGLY MONSTER": SOUND
1,-15,48,10
 310IF C=4 ANDB$=A$ THEN P
RINT TAB(0,8)" HAVE GOT DRA
GONS CLAWS":SOUND 1,-15,52,
10
 320IF C=4 ANDB$<>A$ THEN
PRINT TAB(0,8)" HAS GOT DRA
GONS CLAWS":SOUND 1,-15,52,
10
 330IF C=5 ANDB$=A$ THEN P
RINT TAB(0,8)"HAVE GOT NICE
 LEGS,SHAME ABOUT THE FACE.
":SOUND 1,-15,72,10
 340IF C=5 ANDB$<>A$ THEN
PRINT TAB(0,8)"HAS GOT NICE
 LEGS,SHAME ABOUT THE FACE.
":SOUND 1,-15,72,10
 350IF C=6 ANDB$=A$ THEN P
RINT TAB(0,8)"ARE NICE INSI
DE-SO WE'LL FORGET THE LOOK
S":SOUND 1,-15,68,10
 360IF C=6 ANDB$<>A$ THEN
PRINT TAB(0,8)"IS NICE INSI
DE-SO WE'LL FORGET THE LOOK
S":SOUND 1,-15,68,10
 370IF GET$<>" "THEN PRINT
 TAB(0,8)" I TOLD YOU TO PR
ESS SPACE BAR!":G=GET:CLS:G
OTO 180
 380CLS
 390GOTO 180
```

LINE PATTERNS

The random doodlings of M.A. Chamberlain

```
  10 REM ****************
******
  20 REM **** LINE PATTERN
S ****
  30 REM *** M.A.CHAMBERLA
IN ***
  40 REM ****************
******
  50 MODE 2
  60 VDU 23,1,0;0;0;0: COL
OUR 2:PRINT TAB(6,13);"PATT
ERNS"
  70 COLOUR 1:PRINT ''"PRE
SS 'S' TO START"''"THE PATT
ERN"
  80 A$=GET$
  90 IF A$="S"THEN 100 ELS
E 90
 100 CLS
 110 MOVE RND(1500),RND(17
500):GCOL RND,(16):DRAW RND
(1750),RND(17500)
 120 GOTO 110
```

KEYBOARD



KEN SMITH has turned learning key positions into a challenging game

KEYBOARD is a game aimed at teaching you the position of the keys on the keyboard.

Since the program gives you a score related to the time you took to find the key, you'll soon find yourself covering the keys at breakneck speed in order to improve your own high score.

Features of this program include a Top Ten scores routine, a procedure for swapping in any scores achieving Top Ten status and an enlarged letter display for a quick visual check.

So if your eyes are having trouble looking for those keys, try Keyboard and watch the score soar as your knowledge of the keyboard increases.

VARIABLES

hs%(*n*)	High score markers.
H$	High scorer strings.
score	Game score.
P	High score check marker. 0–false. 1–true.
a	Check to avoid letter being given twice in successive questions.
A	Random character variable. Determines which letter will appear on the screen.
key	Player's response.
k	Time bonus to be added to score.
A$	New high scorer's name.

PROCEDURES

QH	Enlarges letters to fill text window 8×8 characters large.
swop	Checks for position of new high score and new high scorer in the Top Ten. Swaps positions and scores.

```
  10REM KEYBOARD by KEN SM
ITH
  20REM (C)ELECTRON USER
  30MODE4
  40DIM hs%(10),H$(10)
  50FOR T=1 TO 10:READ hs%
(T),H$(T):NEXT
  60ONERRORGOTO70
  70score=0:P=0:a=0
  80VDU23,1,0;0;0;0;
  90VDU23,48,60,102,102,10
2,102,102,60,0
  100VDU28,0,31,39,0;19,0,4
;0;19,1,3;0;:CLS
  110PRINTTAB(10,3)"*******
********"
  120PRINTTAB(10,5)" KEYBOA
RD GAME "
  130PRINTTAB(10,7)"*******
********"
  140PRINT''' This game is
 to test your knowledge"''
  of the computer keyboard.
"'' You will be asked to
find 25 keys."'' The comp
uter will time you."'' Th
e faster you find the keys
 the more"'' points you wi
ll score."
  150PRINT'' Try and get y
our name in the Top Ten."
  160PRINT''' Press any k
ey to continue.":B$=GET$:CL
S
  170PRINTTAB(10,1)"*******
*******":PRINTTAB(10,2)"TOP
 TEN SCORES":PRINTTAB(10,3)
"***************"
  180PRINT''
  190FORX=1TO10:PRINTTAB(4)
;X;TAB(8);hs%(X);TAB(13)"by
 ";H$(X):PRINT:NEXT
  200PRINT''' Press any k
ey to start the game."
  210B$=GET$:CLS
  220FORG=1 TO 25
  230TIME=0
  240A=RND(26)+64
  250IF A=a THEN 240 ELSE a
=A
  260PROCQH
  270VDU28,0,31,39,12
  280COLOUR132:COLOUR3
  290PRINTTAB(11,4)"
                    "
  300PRINTTAB(13,1)"FIND TH
IS KEY."
  310key=GET
  320IF key=A THEN PRINTTAB
(16,4)"CORRECT!":SOUND1,-15
,200,5:GOTO340
  330IF key<>A THEN PRINTTA
B(12,4)"WRONG! TRY AGAIN.":
SOUND1,-15,50,10:delay=INKE
Y(100):GOTO290
  340PRINTTAB(8,7)"Time tak
en = ";TIME/100;TAB(19);"se
conds."
  350k=INT(30/(TIME/100))
  360score=score+k
  370PRINTTAB(14,10)"SCORE
= ";score
  380PRINTTAB(1,13)"HIGH SC
ORE = ";hs%(I);" by ";H$(I)
  390A=32:PROCQH
  400NEXT G:CLS
  410VDU28,0,31,39,12:CLS
  420PRINTTAB(10,10)"FINAL
SCORE = ";score:PRINTTAB(1,
13)"HIGH SCORE = ";hs%(I);"
 by ";H$(I)
  430IF score>hs%(10) THEN
P=1:ELSE490
  440IF P=1 THEN INPUTTAB(3
,16)"Type in your name then
 press RETURN."''SPC(5),A$
  450IF LEN A$>18 THEN SOUN
D1,-15,100,10:PRINTTAB(0,18
)SPC(39):GOTO440
  460PROCswop:PRINTTAB(1,13
)SPC(39)
  470PRINTTAB(1,13)"HIGH SC
ORE = ";hs%(1);" by ";H$(1)
  480PRINTTAB(3,16)SPC(36):
PRINTTAB(0,18)SPC(39)
  490PRINTTAB(3,16)"To star
t a new game press any key.
":C$=GET$:score=0:A=32:PROC
QH:GOTO100
  500DEFPROCQH
  510VDU28,15,11,25,3
  520FOR A%=0 TO 2 STEP 2:P
X=&D00:[OPT A%:.S:CLC:ROL&7
0:BCC SP:LDA#255:JSR&FFEE:J
MP C:.SP:LDA#32:JSR&FFEE:.C
:LDA&70:BEQ F:JMP S:.F:RTS:
]:NEXT A%
  530VDU23,255,0,&18,&7E,&7
E,&FF,&7E,&7E,&18
  540VDU19,0,4;0;19,1,3;0;
  550T=&C000+(8*(A-32))
  560FOR B=T TO T+7:?&70=?B
:CALL&D00:PRINT:NEXT
  570ENDPROC
  580DEFPROCswop
  590FOR P=10 TO 2 STEP -1
  600IFscore>hs%(P-1)THENhs
%(P)=hs%(P-1):H$(P)=H$(P-1)
ELSEhs%(P)=score:H$(P)=A$:E
NDPROC
  610NEXT
  620 hs%(1)=score:H$(1)=A$
  630ENDPROC
  640DATA300,I.M.QUICK
  650DATA275,U.BEATME
  660DATA250,A.LOSER
  670DATA225,IVOR NOTHERGO
  680DATA200,ANN CUFFS
  690DATA175,T.V.SET
  700DATA150,JOE KING
  710DATA125,R.U.READY
  720DATA100,WILL E.WIN
  730DATA75,I.M.LAST
```

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

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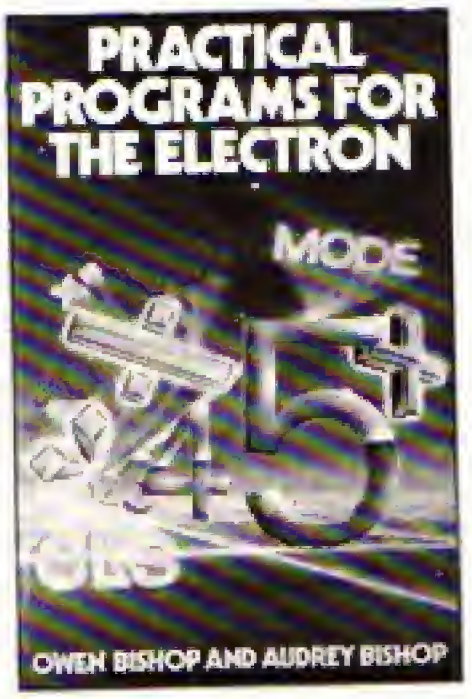
BOOK SHELF

Genuinely practical

Practical Programs for the Electron by Owen and Audrey Bishop (Granada).



I HAVE seen books of *practical* programs before, and they often prove a laborious means of performing the trivial.

This book, I am pleased to report, is of a considerably higher calibre, and the listings could be genuinely useful.

There are 14 listings, which, works out at a very modest 42½p per program, and most Electron users will find plenty to interest them here.

The range of subjects is as wide as the Electron's capabilities, and include graphics, sound and spreadsheet programs.

As usual with Granada, their listings are computer dumped, so that there is little likelihood of an error creeping in.

There is also a section on errors which might appear when tired fingers hit the wrong keys, and this shows a helpful and well thought-out attitude to the users of the book.

I found no errors in the listings, although I do confess to a few creeping in via my typing.

Each program is clearly annotated with helpful explanations of the routines used, and there are copious notes on alterations which might be tried. An interesting note is that the programs will be compatible with discs when we all upgrade.

Info File on its own would be worth the cost of this book, being a very adaptable datafile program. Certain other ones appear less useful, such as the one to plan a room such as a kitchen.

Supersound tames the Sound and Envelope commands of the Electron, and allows sounds and sound effects to be designed, adapted and played around with.

Cashflow was fascinating, producing a spreadsheet of one's finances – again this will be of use to many.

Overall it is a book which contains 14 useful listings, but more than that it will allow the user to gain familiarity with the micro so that one's own programming more closely resembles the well-structured approach of the Bishops.

Phil Tayler

Top of the list

Creative Assembler by Johnathan Griffiths (Penguin).

TWO thirds of this book is devoted to discussing the techniques involved in writing large assembly language programs with many routines listed, and one third is devoted to the novice programmer.

When I tell you that the author Johnathan Griffiths wrote Acornsoft's JCB Digger and Snapper you will get an idea of the standard of programming the author is attempting to teach.

The middle section contains explanations of macros, conditional assembly and how to create macro source files. Several examples are listed.

Section three is specifically aimed at programmers who are writing arcade games in assembly language. A number of routines are listed which

can be incorporated into your own programs.

Very little explanation is given and the reader is left to puzzle out how they work.

This section is just what the advanced programmer needs, and is the only book I have seen with an explanation of how to poke the screen directly to move characters around.

An example game is listed at the end which is a mixture of Basic and assembler.

Although one third of the book is an introduction to assembly language and the assembler, I would not really recommend it for the beginner as the jump to the second and third sections is too great.

There are other books available that are more suitable.

This is an absolute godsend for anyone struggling to write arcade games in machine code. Johnathan Griffiths' discussion of macros and program structure, and his routine for poking the screen are fantastic, making this an absolute must.

Put it at the top of your shopping list immediately.

Roland Waddilove

ABC of assembly

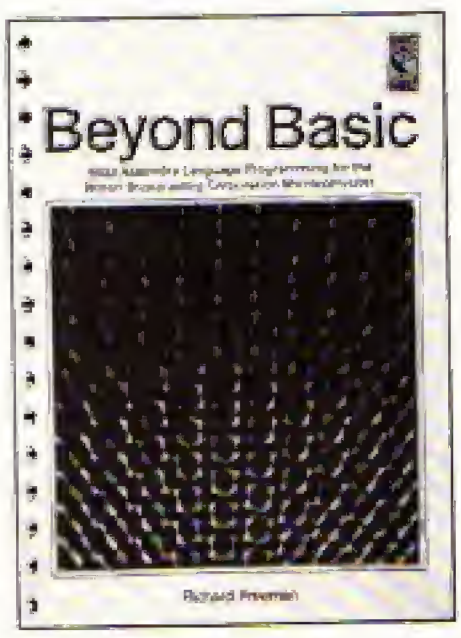
Beyond Basic by Richard Freeman (BBC NEC).

BEYOND Basic is written for anyone who has a good grasp of Basic and who wants to learn how to program in assembly language.

The chapters include addition and subtraction, jumps, addressing modes, multiplication and division, and operating system calls.

The reader is taken from his first assembly language program – simply loading the accumulator with a number – to sorting a Basic string array. Each step along the way is explained very simply and clearly.

There are many exercises at each stage to test the reader's



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C CAR	65	65	65	120	120	120	120	120	120	120	120	120	120	120
D FOOD	181	182	183	184	185	186	187	188	189	190	191	192	193	194
E FUEL	15	15	15	15	15	15	30	30	30	30	30	30	15	15
F HOLIDAY	107	131	154	170	0	16	24	38	493	491	533	565	590	579	613
G SAVINGS	367	458	530	539	545	549	494	493	491	533	565	590	579	613
H CLOTHES	73	92	106	108	109	110	99	99	98	107	113	118	116	123

Household cashflow from Practical Programs for the Electron

From Page 43

understanding of the important principals involved.

There are several books around now which aim to teach assembly language programming, but in my opinion this is by far the best text for beginners.

There is a cassette available which has all the programs in the book on it. If you're the lazy type, you can load each program from tape instead of tapping it in at the keyboard.

This is an excellent manual, which I strongly recommend.

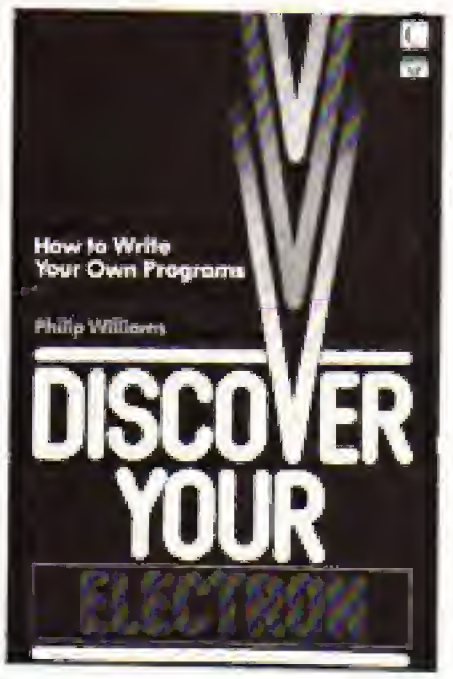
Roland Waddilove

Room to doodle

Discover Your Electron by Philip Williams (Century Publishing).

YES, the price really is just £2.95, and it contains 120 pages of information about how to program the Electron.

One slight drawback to this



seemingly lovely state of affairs is that each page measures over 12cm in width, yet the text only covers some 7cm.

Some of the enormous margin space is occasionally filled with diagrams, but mostly it simply contains huge titles which emphasise the space even more.

So perhaps Mr Williams could have condensed the book into about 70 pages of normally spaced script, but I don't suppose it would have seemed such good value . . .

Still, back to the book, which is subtitled 'How to write your own programs'.

The reader willing to try out the ideas as they are broached in the course of the book will doubtless gain much which will help towards writing programs for the Electron.

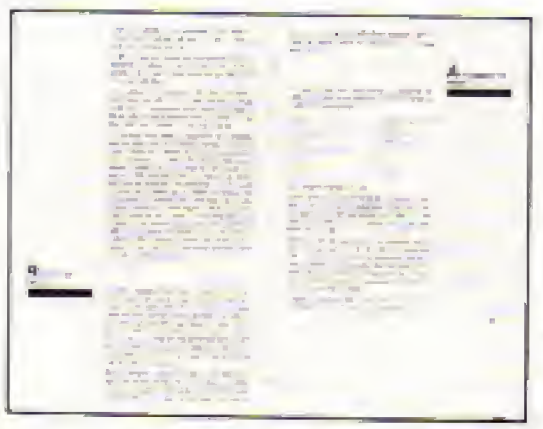
It really covers less ground than the excellent Users' Manual, but perhaps Mr Williams scores by making the steps through the book small and simple enough for the average reader to follow quite happily.

I wasn't too sure why the author explains GOTO and GOSUB at some length before he introduces the idea of a PROCedure.

As I said earlier, there is nothing at all in this book which is not dealt with in the manual. But it is user-friendly – to use the jargon – and for £2.95 it will give many people a little more encouragement as they move from playing with their Electron (or is it the Electron playing with you?) to making it do as it is told.

A useful stocking filler perhaps, and plenty of room to doodle in the margins!

Phil Tayler



Discover Your Electron leaves ample margins for notes

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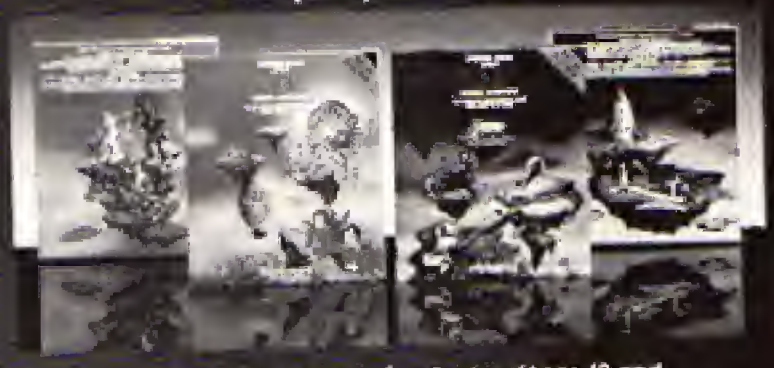

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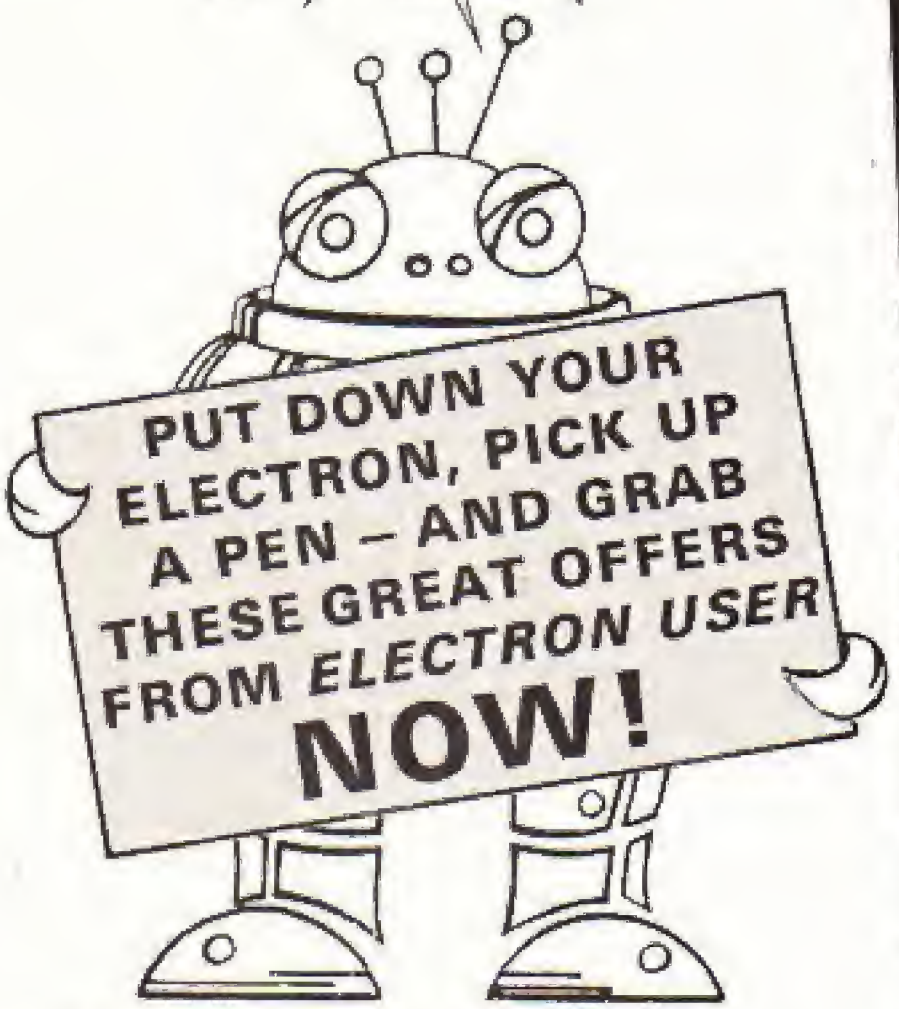

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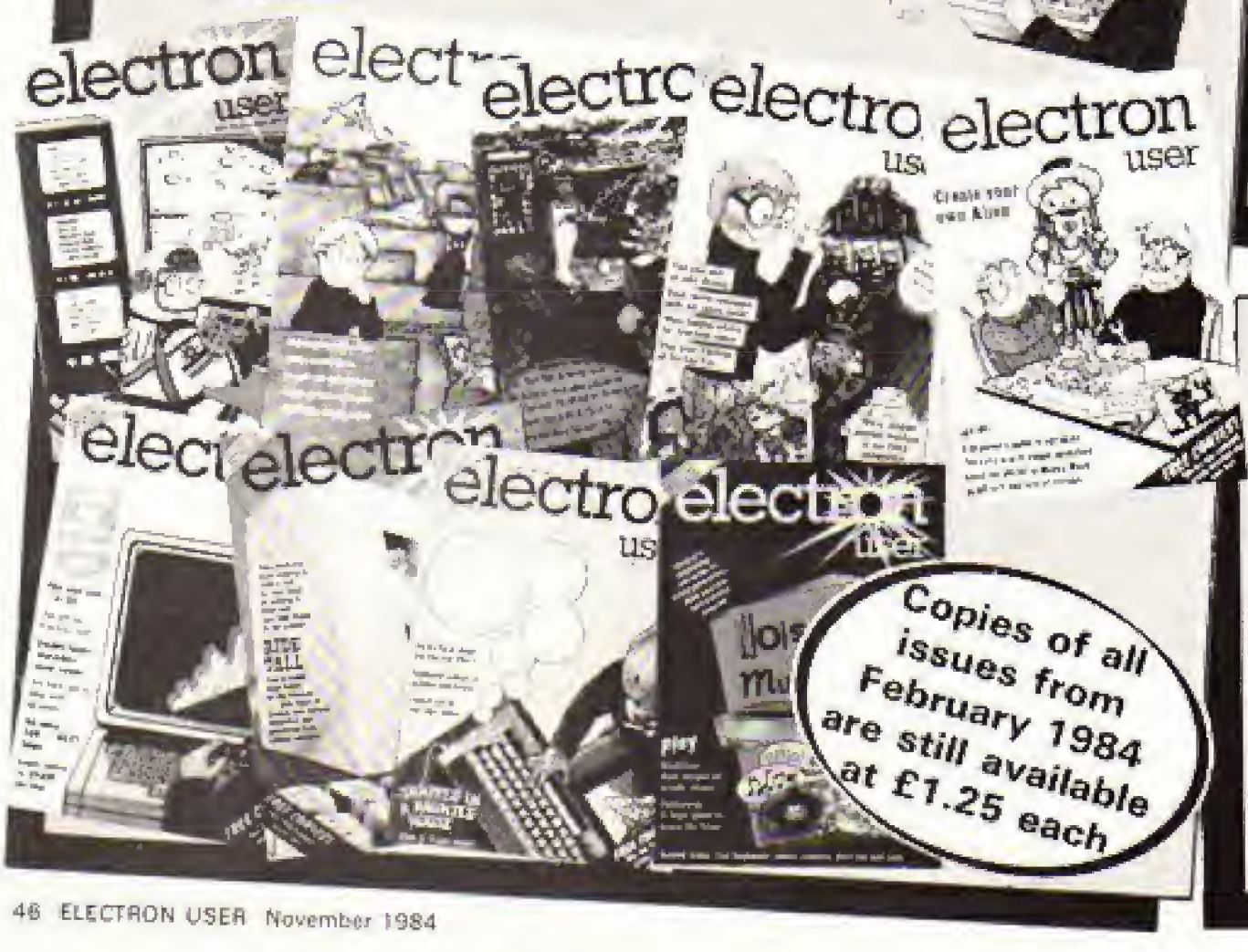

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Notebook

THIS month's program comes from Barry Pretsell of Glasgow. It uses the PLOT 85 command to produce random triangles on the screen, making a sound each time.

TAKE A TRIANGLE OR TWO...

```
10 REM TRIANGLES
20 REM BARRY PRETSELL
30 MODE 2
40 VDU 23,1,0;0;0;0;
50 REPEAT
60 GCOL 0,RND(16)
70 DRAW RND(1280),RND(1280)
80 PLOT 85,RND(1280),RND(1000)
90 SOUND 1,-15,RND(200),1
100 IF INKEY(-99) THEN REPEAT UNTIL INKEY(-74)
110 UNTIL FALSE
```

Usual Rem's — *Sets Mode and switches off cursor* — *Selects random colour* — *Eternal loop* — *Draws random triangles* — *Pause facility*

Line Nos.	
10,20	The usual REMs to name the program and who wrote it.
30,40	These select the 16 colour mode (Mode 2) and switch off the flashing cursor.
50,110	These form an endless REPEAT ... UNTIL loop.
70	Draws a baseline to the triangle.
80	Plots the triangle, RND being used to pick the third point.
90	Just makes a noise as the triangle is drawn.
100	Causes the program to pause if the space bar is pressed (INKEY(-99)) and wait until the Return key is pressed (INKEY(-74)).

Trevor Roberts

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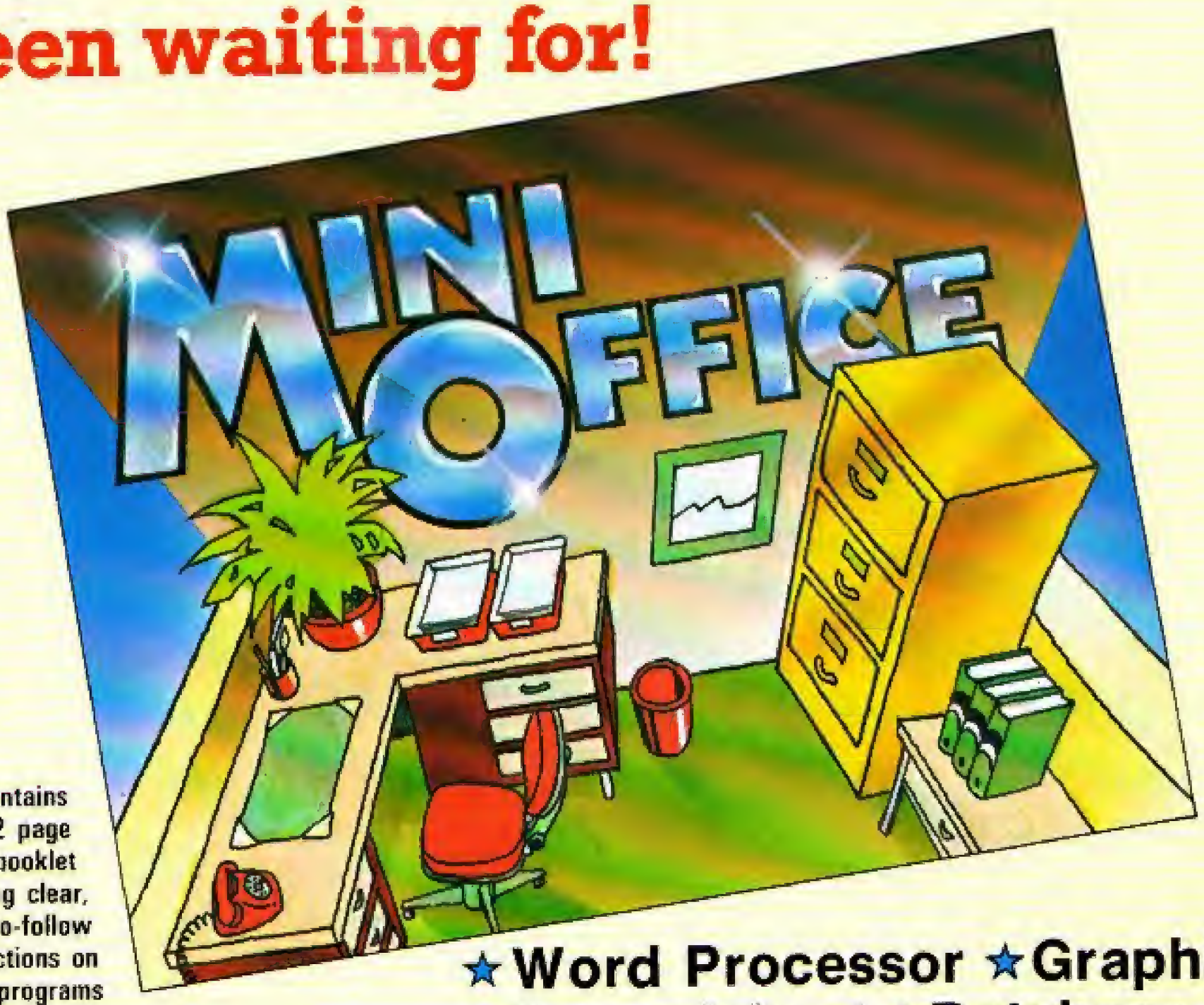

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Star Fighter listing

From Page 15

```
  10REM *** STAR FIGHTER ***
  20REM * By R.A.Waddilove *
  30REM
  40PROCinitialise
  50MODE 1
  60PROCinstructions
  70MODE 2:VDU 23,1,0;0;0;0;
  80REPEAT
  90DX=TRUE:IX=0:PX=44:HX=0
 100REPEAT
 110PROCscreen:PROCa
 120REPEAT:IFSX<226ANDRND(10)=1PROCb
 130PROCc:PROCd:IFINKEY(-74)PROCe
 140UNTILPX<20RHX=10
 150IF PX>1PROCnext ELSE PROCcrash
 160UNTIL PX<2
 170PROCend
 180UNTIL INSTR("Nn",key$)
 190MODE6:*FX229,0
 200PRINT''"STAR FIGHTER was by"''"by R.A.Waddilove ";:*FX15,0
 210*FX4,0
 220*FX12,0
 230END
 240
 250DEF PROCinitialise
 260*FX11,0
 270*FX4,1
 280*FX229,1
 290*KEY10,"OLD:MRUN:M"
 300DIMpX(44,1),name$(2),scoreX(2):name$(0)="R.A.Waddilove      ":scoreX(0)=5000:name$(1)=name$(0):scoreX(1)=3000:name$(2)=name$(0):scoreX(2)=1000
 310JX=44:FORIX=98TO450STEP8:pX(JX,0)=810+40*COS(RADIX):pX(JX,1)=150+30*SIN(RADIX):JX=JX-1:NEXT
 320VDU 23,224,66,153,189,255,255,189,153,66
 330VDU 23,225,68,146,186,254,254,186,146,68
 340VDU 23,226,0,36,66,90,126,90,66,36
 350VDU 23,227,0,0,36,90,126,90,36,0
 360VDU 23,228,0,0,36,60,60,36,0,0
 370VDU 23,229,0,0,20,28,20,0,0,0
 380VDU 23,230,0,0,0,16,16,0,0,0
 390VDU 23,231,0,0,0,0,16,0,0,0
 400VDU 23,232,0,0,24,24,24,0,0,0
 410VDU 23,233,170,85,170,85,170,85,170,85
 420ENVELOPE1,1,-4,-2,-1,15,10,10,0,0,0,0,0,0
 430ENVELOPE2,1,-8,-8,-8,100,1,1,0,0,0,0,0,0
 440ENDPROC
 450
 460REM new ship
 470DEF PROCa
 480PROCc:VDU4:PRINTTAB(9,20)"<>":VDU5:XX=RND(500)+300:YX=RND(200)+700:MX=4:NX=-4:SX=231:GCOL3,8:MOVEXX,YX:TIME=0:FORIX=1TO2000:IFTIME>20PROCc:TIME=0
 490NEXT:VDU5X:TIME=0:IFNOTDXHX=0
 500ENDPROC
 510
 520DEFPROCscreen
 530PROCcolour_off:PROCsky:PROCground:PROCwindow:PROCsights:PROCinstruments:PROCcolour_on
 540ENDPROC
 550
 560DEF PROCcolour_off
 570FORIX=0TO14:VDU19,IX,0;0;:NEXT:VDU19,15,9;0;
 580ENDPROC
 590
 600DEF PROCcolour_on
 610FORIX=8TO13:VDU19,IX,7;0;:NEXT:IFDXVDU19,3,5;0;19,6,6;0;19,14,6;0;19,4,4;0;19,5,3;0;ELSEVDU19,3,4;0;19,6,1;0;19,14,1;0;19,4,0;0;19,5,6;0;
 620VDU 19,7,0;0;19,15,0;0;
 630ENDPROC
 640
 650DEF PROCground
 660YX=604:CX=1:WX=2:REPEAT:FORIX=1TOWXDIV2:YX=YX-4:GCOL0,CXMOD3:MOVE0,YX:DRAW1280,YX:NEXT:WX=WX+1:CX=CX+1:UNTILYX<200:VDU29,640;0;:GCOL0,3:FORXX=-640TO640STEP16:MOVEXX,600:DRAW0*IX,100:NEXT:VDU26:GX=0
 670ENDPROC
 680
 690DEF PROCinstruments
 700GCOL0,6:MOVE0,270:DRAW400,470:DRAW880,470:DRAW1280,270:MOVE200,0:DRAW400,100:DRAW880,100:DRAW1080,0:MOVE400,100:DRAW400,470:MOVE880,100:DRAW880,470:MOVE0,245:DRAW380,435:DRAW380,110:DRAW160,0:MOVE1115,0:DRAW900,110:DRAW900,435:DRAW1279,245
 710FORIX=400TO450STEP8:MOVE420,IX:PLOT17,460,0:NEXT:FORIX=275TO325STEP8:MOVE420,IX:PLOT17,460,0:NEXT:FORIX=114TO200STEP8:MOVE420,IX:PLOT17,316,0:NEXT
 720VDU29,640;50;:MOVE20,0:FORIX=0TO360STEP60:MOVE0,0:PLOT85,30*COS(RADIX),30*SIN(RADIX):NEXT:FORRX=400TO432STEP8:MOVERX,0:FORIX=380TO160STEP-20:DRAWRX*COS(RADIX),RX*SIN(RADIX):NEXT,
 730MOVE0,0:MOVE-400,-50:PLOT85,0,-20:MOVE0,0:MOVE400,-50:PLOT85,0,-20:VDU26:GCOL0,8:MOVE480,436:VDU5:PRINT"RANGE":MOVE480,315:PRINT"SCORE":MOVE416,160:PRINT"POWER":VDU4:COLOUR135:COLOUR5:PRINTTAB(8,24);IX:GCOL0,8:MOVE810,150:DRAWpX(PX,0),pX(PX,1)
 740MOVE860,150:FORIX=10TO360STEP10:DRAW810+50*COS(RADIX),150+40+SIN(RADIX):NEXT
 750ENDPROC
 760
 770REM move ship
 780DEF PROCd
 790AX=XX+MX+16*(INKEY(-73)-INKEY(-88)):IFAX>1350GRAX<-100AX=IX
 800BX=YX+NX+16*(INKEY(-65)-INKEY(-2)):IFBX>1100ORBX<500BX=YX
 810MOVEXX,YX
 820IFSX=224ORTIME<500VDUSX:MOVEAX,BX:VDUSXELSEVDUSX:MOVEAX,BX:VDUSX-1:SX=SX-1:TIME=0
 830XX=AX:YX=BX:IFRND(5)=1MX=RND(33)-17:NX=RND(33)-17
 840IFSX=224ENDPROC
 850FORIX=0TO20*(SX-224):NEXT:VDU4:PRINTTAB(9,20);5*(SX-225);CHR$32:VDU5
 860ENDPROC
 870
 880REM fire laser
 890DEF PROCe
 900PROCc:GCOL3,15:MOVE810,150:DRAWpX(PX,0),pX(PX,1):PX=PX-1:MOVE810,150:DRAWpX(PX,0),pX(PX,1):GCOL3,8:SOUND1,1,100,7:MOVE388,504:DRAW640,690:MOVE872,504:DRAW640,690:MOVE388,504:DRAW640,690:MOVE872,504:DRAW640,690:IFPOINT(640,690)<>12ENDPROC
 910PROCc:TIME=0:IX=IX+100*(SX-223):VDU4:PRINTTAB(8,24);IX:VDU5:HX=HX+1:AX=XX:BX
```

Star Fighter listing

From Page 53

```
=Y%:M%=X%:N%=Y%:R%=8*RND(4)
:MOVEX%,Y%:VDU5%:IFS%<227S%
=232ELSES%=230
 920FORI%=1TO20:MOVEA%,B%:
VDU5%:MOVEM%,N%:VDU5%:MOVEX
%,Y%:VDU5%:SOUND&10,-15,RND
(4)+3,10:FORJ%=1TO10:IFTIME
>20PROCc:TIME=0
 930NEXT:MOVEA%,B%:VDU5%:M
OVEM%,N%:VDU5%:MOVEX%,Y%:VD
U5%:A%=A%-2*R%:B%=B%-R%:M%=
M%+2*R%:N%=N%-R%:Y%=Y%+R%:N
EXT:IFM%<10PROCa
 940ENDPROC
 950
 960REM move ground forwar
d
 970DEF PROCc
 980G%=(G%+1)MOD3:IFG%=2VD
U19,2,0;0;19,1,2;0;
 990IFG%=1VDU19,1,0;0;19,0
,2;0;
 1000IFG%=0VDU19,0,0;0;19,2
,2;0;
 1010ENDPROC
 1020
 1030DEF PROCwindow
 1040GCOL0,7:MOVE0,300:MOVE
400,300:PLOT85,400,500:PLOT
85,880,300:PLOT85,880,500:P
LOT85,1280,300:MOVE1280,0:P
LOT85,0,300:PLOT85,0,0:MOVE
0,910:MOVE0,880:PLOT85,400,
500:PLOT85,364,480:MOVE1280
,910:MOVE1280,880:PLOT85,88
0,500:PLOT85,914,476
 1050GCOL0,6:MOVE0,300:DRAW
364,480:DRAW0,880:MOVE0,916
:DRAW400,500:DRAW880,500:DR
AW1280,916:MOVE1280,878:DRA
W920,480:DRAW1280,300
 1060ENDPROC
 1070
 1080DEF PROCsights
 1090GCOL0,6:MOVE560,640:DR
AW540,640:DRAW540,660:MOVE5
60,740:DRAW540,740:DRAW540,
720:MOVE720,640:DRAW740,640
:DRAW740,660:MOVE720,740:DR
AW740,740:DRAW740,720
 1100ENDPROC
 1110
 1120DEF PROCsky
 1130VDU4:COLOUR 132:COLOUR
 15:CLS:PRINT TAB(0,30)"Set
ting Up Screen #";:PROCtune
:IFD%PRINT;1;:GCOL0,5ELSEPR
INT;2;:FORI%=1TO100:GCOL0,R
ND(6)-1:PLOT69,RND(1280),RN
D(400)+600:NEXT:GCOL0,4
 1140VDU29,100;924;:MOVE100
,0:FORI%=0TO360STEP10:MOVE0
,0:PLOT85,100*COS(RADI%),10
0*SIN(RADI%):NEXT:IF D% VDU
26:ENDPROC
 1150GCOL0,4:PLOT69,640,690
:GCOL0,5:FORI%=270TO450STEP
2:X%=100*COS(RADI%):Y%=100*
SIN(RADI%):N%=1:FORJ%=-X%TO
X%STEP8:N%=N%+1:IFRND(N%)<4
PLOT69,J%,Y%
 1160NEXT,:VDU26
 1170ENDPROC
 1180
 1190REM ship fires back
 1200DEF PROCb
 1210IFD%VDU19,4,8;0;ELSEVD
U19,4,5;0;
 1220PROCc:SOUND1,2,250,5:G
COL3,15:MOVE810,150:DRAWp%(
P%,0),p%(P%,1):P%=P%-1:MOVE
810,150:DRAWp%(P%,0),p%(P%,
1):GCOL3,8:*FX19
 1230*FX19
 1240IFD%VDU19,4,4;0;ELSEVD
U19,4,0;0;
 1250ENDPROC
 1260
 1270DEF PROCnext
 1280PROCc:PROCtune:D%=FALS
E:H%=0:P%=43:VDU4,19,15,8;0
;:COLOUR132:COLOUR15:PRINTT
AB(1,31)"Survived Screen #1
";:FORI%=0TO2000:IFTIME>20P
ROCc:TIME=0
 1290NEXT:PROCc:PROCtune:PR
INTTAB(1,31)"*** Stand By !
 ***";:FORI%=0TO2000:IFTIME
>25PROCc:TIME=0
 1300NEXT
 1310ENDPROC
 1320
 1330DEF PROCtune
 1340SOUND1,-15,60,3:SOUND1
,-15,80,3:SOUND1,-15,96,3:S
OUND1,-15,88,10:SOUND1,-15,
108,15
 1350ENDPROC
 1360
 1370DEF PROCcrash
 1380VDU4:FORI%=1TO50:SOUND
&10,-15,4,5:VDU30,11:COLOUR
RND(16):VDU31,RND(19),RND(2
9),233,233,8,8,10,233,233:+
FX19
 1390VDU31,0,31,10:NEXT
 1400SOUND&10,-15,5,40:SOUN
DO,-15,6,250
 1410VDU4:FORI%=1TO50:VDU30
,11:COLOURRND(16):VDU31,RND
(19),RND(29),233,233,8,8,10
,233,233:*FX19
 1420VDU31,0,31,10:NEXT
 1430SOUND&10,0,0,0
 1440FORI%=1TO2000:NEXT
 1450ENDPROC
 1460
 1470DEF PROCend
 1480GCOL0,7
 1490MOVE0,0:MOVE1280,0:PLO
T85,640,512:PLOT85,1280,102
4:PLOT85,0,1024:MOVE0,0:PLO
T85,640,512
 1500COLOUR128:VDU19,0,0;0;
:CLS
 1510VDU22,1,19,1,6;0;:PROC
tune
 1520COLOUR2:PRINT'''"*****
*":COLOUR3:PRINT"  STAR FI
GHTER  SCORES  ":COLOUR2:P
RINT"******"
 1530VDU28,0,30,39,8
 1540IF I%>score%(2) PROChi
_score
 1550CLS:COLOUR1
 1560PRINT"     1. ";score%
(0);TAB(15);name$(0)''"
 2. ";score%(1);TAB(15);nam
e$(1)''"     3. ";score%(2)
;TAB(15);name$(2)''''CHR$17
;CHR$2;STRING$(36,"+")
 1570COLOUR3:PRINT'''''"Do y
ou want to play again ?":C
OLOUR1:PRINT"( Y or N )";
 1580REPEAT key$=GET$
 1590UNTIL INSTR("YyNn",key
$)
 1600CLS:VDU22,2,23,1,0;0;0
;0;
 1610ENDPROC
 1620
 1630DEF PROChi_score
 1640*FX21,0
 1650CLS:COLOUR1:PRINT"Your
 score is ranked ";
 1660IF I%>=score%(0) PRINT
"first.":INPUT'''"What is yo
ur name...";name$(0):score%
(0)=I%:I%=0
 1670IF I%>=score%(1) AND I
%<score%(0) PRINT"second.":
INPUT'''"What is your name..
.";name$(1):score%(1)=I%:I%
=1
 1680IF I%>=score%(2) AND I
%<score%(1) PRINT"third.":I
NPUT'''"What is your name...
";name$(2):score%(2)=I%:I%=
2
 1690IF LENname$(I%)>20 nam
e$(I%)=LEFT$(name$(I%),20)
 1700ENDPROC
 1710
 1720DEF PROCinstructions
 1730COLOUR130:CLS:COLOUR12
9
 1740VDU23,1,0;0;0;0;28,4,5
,35,1,12
 1750PRINT''TAB(6)"STAR FIG
HTER PILOT"
 1760VDU26,28,1,30,38,7,12
 1770PRINT''" Bandits have
been raiding the planet"''"
 M1101/3 which must be prot
ected at"''" all costs."
 1780PRINT'''" You are on y
our last mission , a one"''
" way trip to fame and glor
y -"
 1790PRINT'''" Shoot down a
s many raiders as you"''" c
an before your power runs o
ut."
 1800PRINT'''" Press space.
..";:VDU7
 1810REPEAT UNTIL GET=32
 1820CLS
 1830PRINT''" The further a
way the ship is when"''" yo
u hit it, the more points y
ou get."''" Your laser use
s up power- be careful"''"
not to miss, and if you get
 too"''" close, the enemy s
hips fire photon"
 1840PRINT" torpedoes whic
h drain your power."
 1850PRINT''''" Press space
..";:VDU7
 1860REPEAT UNTIL GET=32
 1870CLS
 1880PRINT''" Your controls
 are :-"''" UP = CAPS LK/F
UNC"''" DOWN = CTRL"''" LEF
T = ;"''" RIGHT = :"''" FIR
E = RETURN"
 1890PRINT''''" Press space
..";:VDU7
 1900REPEAT UNTIL GET=32
 1910ENDPROC
```

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

TEST YOUR SPELLING

. . . with this entertaining and educational game by STEVE LUCAS

THIS program was written to help children with their spelling.

Very young children find difficulty relating the capital letters on the keyboard to their equivalent small letters so the only response required by them is hitting the space bar.

When the program is run you will be asked how many children are to use it. The program stores details of the performance of each child so that the teacher or parent can check their progress. You are given the option of turning off the sound effects.

Each child is presented with 10 questions chosen at random from the 60 data lines in the program. These can be adapted for children of different ages by changing the vocabulary.

A dictionary definition of the word appears at the bottom of the screen and four alternative spellings of the word appear in turn. The pupil should hit the space bar when the correct alternative is displayed.

A wrong answer causes the computer to display what the correct response should have been, together with the alternative selected. A correct answer increments the score.

VARIABLES

X	Pupil number
SC(X)	Scores
AD	Random choice of start question
DX	Number of answer selected
A$(X,Y)	Holds the words
N$(X)	Pupil's name
XX,YY	Used for sound effects
AA$	Holds keyboard response
B$(X)	Holds definitions
A%(X)	Holds number of correct answer

PROCEDURES

PROCtitles	Gives instructions
PROCread_data	Reads data into arrays
PROCerror	Error handling
PROCcorrect	Correct response
PROCwrong	Wrong answer
PROCspacebar	Waits for space bar to be pressed
PROCyes	Prints results to printer (if available)
PROCno	Prints results to screen in paged mode

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THE QUEST FOR THE HOLY GRAIL: To become a knight of the round table you must find the Holy Grail and return with it to Camelot. Your search will take you through forest, swamp, castle, dungeons and rivers, and on the way you will meet many characters, some friendly some hostile. Can you outwit them all and solve the many puzzles to successfully complete your quest? – **£7.95**
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From Page 55

```
  10 REM SPELLING ...for t
he ACORN ELECTRON and BBC m
odel B (O.S. 1.2)
  20 REM BY STEVE LUCAS
  30 REM  (C) ELECTRON USE
R
  40 REM an educational pr
ogram
  50 REM which can be adap
ted for pupils of all ages
  60 *FX6,0
  70 REM THE ABOVE LINE SE
TS THE PRINTER IGNORE CHARA
CTER..only relevant if prin
ter is attached.
  80 REM When you have ful
ly debugged this program, C
HANGE this line to *FX229,1
 to disable the Escape key.
...essential in a classroom!
  90 ON ERROR MODE6: PROCe
rror
 100 *KEY 10 OLD|M RUN|M
 110 REM next line turns o
n sound
 120 *FX210,0
 130 MODE6
 140 REM turn off cursor
 150 VDU23,1,0;0;0;0;
 160 REM increase the dime
nsions of the arrays in the
 next line if you add more
Vocab !
 170 DIMA$(61,4),AX(61),B$
(61),N$(50)
 180 VDU19,0,3,0,0,0
 190 VDU19,1,4,0,0,0
 200 PROCtitles
 210 PROCread_data :REM RE
AD DATA FOR QUESTIONS
 220 CLS:INPUTTAB(2,10);"H
ow many children are there
";number
 230 INPUT'''"Do you want
sound  (Y)es or (N)o ",soun
d$
 240 IF sound$="N" THEN *F
X210,1
 250 DIM SC(number):REM AR
RAY HOLDS SCORES
 260 MODE4:VDU19,0,1,0,0,0
,19,1,7,0,0,0:REM CHOOSE FO
RGROUND/BACKGROUND COLOURS
 270 FOR X=1 TO number
 280 SC(X)=0:REM SET SCORE
TO ZERO
 290 REM choose random que
stion
 300 AD=RND(50)
 310 FOR XP=1 TO 10: REM s
et ten questions
 320 REM now print the wor
ds in background colour
 330 VDU23,1,0;0;0;0;
 340 PRINTTAB(2,1)"press (
space bar) when the correct
"
 350 PRINT"  spelling of t
he word is shown."
 360 PRINTTAB(2,30);B$(AD)
 370 REM flush keyboard bu
ffer
 380 *FX15,0
 390 PP=1
 400 REPEAT
 410 VDU7: REM Use any sou
nd effect to suit
 420 PRINTTAB(10,PP+5);A$(
AD,PP)
 430 TIME=0
 440 REPEAT UNTIL TIME >10
0 :REM adjust time delay to
 suit
 450 PRINTTAB(0,PP+5);STRI
NG$(40," ")
 460 PP=PP+1
 470 IF PP>4 THEN PP=1
 480 UNTIL INKEY$(0)=" "
 490 LET DX=PP-1
 500 IFDX=0 THEN DX=4: REM
 DX = THE NUMBER OF THE ANS
WER SELECTED
 510 IFAX(AD)=DX THEN PROC
correct ELSE PROCwrong: REM
 CHOOSE PROCEEDURE FOR RIGH
T/WRONG ANSWER
 520 AD=AD+1: REM INCREMEN
T'S THE QUESTION SET
 530 CLS: NEXT XP:REM SET
NEXT QUESTION
 540 CLS:INPUTTAB(5,10);"W
hat is your name ",N$(X): R
EM N$(X) holds names of pup
ils. Make sure that the arr
ay is DIMensioned large eno
ugh
 550 PRINT TAB(2,16);"You
scored :-   ";SC(X);" out o
f 10 !"
 560 IF X<>number THEN PRI
NT TAB(1,20);"Now let the n
ext pupil have a go" ELSE P
RINT TAB(1,20);"please call
 the teacher"
 570 PRINT TAB(5,24);"Pres
s (space bar) when ready"
 580 REPEAT UNTIL GET=32 :
REM wait for space bar
 590 CLS
 600 NEXT X: REM NEXT CHIL
D'S GO
 610 REM routine to print
the results..needs a printe
r and interface
 620 CLS: PRINT TAB(2,10);
"do you have a printer atta
ched ?": REPEAT AA$=GET$ :U
NTIL AA$="Y" OR AA$="N"
 630 IF AA$="Y" THEN PROCy
es ELSE PROCno
 640 CLS
 650 PRINT TAB(0,15);"Do y
ou want to play again? (Y)e
s/(N)o"
 660 REPEAT
 670 AA$=GET$
 680 UNTIL AA$="Y" OR AA$=
"N"
 690 IF AA$="Y" THEN RUN E
LSE MODE6: PRINTTAB(0,15);"
Thank you for playing. Good
bye.":END
 700 END
 710 DEFPROCtitles
 720 PRINT TAB(10)"SPELLIN
G QUIZ"
 730 PRINT TAB(8,2);"An ed
ucational game"
 740 PRINT'''"This program
will keep the score for"
 750 PRINT"groups of up to
 50 children."
 760 PRINT"You can get the
 results printed out "'"lat
er."
 770 PRINT"You will be fir
st asked how many pupils th
ere are."
 780 PRINT'"Each pupil wil
l then be presented with  t
en questions chosen at rand
om."
 790 PRINT'"The aim of the
 program is to select the c
orrect spelling of some com
mon words."
 800 PRINT"Press the (SPAC
E BAR) when you think    th
e correct spelling is displ
ayed."
 810 PRINT TAB(5,24);"PRES
S (SPACE BAR) TO CONTINUE";
 820 REM WAIT FOR SPACE BA
R
 830 REPEAT UNTIL GET=32
 840 CLS:ENDPROC
 850 DEFPROCread_data
 860 RESTORE
 870 FOR ZX=1 TO 60
 880 FOR YX=1 TO 4
 890 READ A$(ZX,YX)
 900 NEXT YX
 910 READ AX(ZX),B$(ZX)
 920 NEXT ZX
 930 ENDPROC
 940 REM data for question
s contains 4 alternative an
swers, number or correct on
e and definition
 950 DATA capital,kapital,
capitol,capertal,1,of chief
 importance
 960 DATA dissappointing,d
isappointing,disapointing,d
issapointing,2,not up to ex
pectation
 970 DATA whipet,whippet,w
ippet,whippit,2,a type of d
og
 980 DATA transperent,tran
sparent,transparant,transpe
rant,2,can be seen through
 990 DATA nececity,necesit
y,necessety,necessity,4,som
ething which is needed
1000 DATA asasination,assa
ssination,assasination,asas
sination,2,murder
1010 DATA bronkitis,bronch
itis,bronchituus,broncitis,
2,an illness
1020 DATA centenary,centen
ery,centanery,sentenery,1,h
undredth anniversary
1030 DATA sentrafugal,cent
rafugal,centrifugul,centrif
ugal,4,force of a spinning
object
1040 DATA conventional,con
vensional,conventionul,konv
ensional,1,the normal respo
nse
```

```
 1050 DATA alocation,alocca
tion,allocation,allocatiun,
3,to assign
 1060 DATA compulsory,compu
lsary,compulsery,compullsor
y,1,something you have to d
o
 1070 DATA controler,contro
llor,controller,controlor,3
,person in charge
 1080 DATA calendar,calende
r,callendar,callender,1,tab
le of the year's dates
 1090 DATA appreciate,aprec
iate,apreciete,appresiate,1
,set a high value on
 1100 DATA style,styal,stia
l,stile,1,design
 1110 DATA sterilise,steral
ise,steralize,sterilize,4,t
o get rid of microbes
 1120 DATA sindicate,syndic
ate,syndecate,sindecate,2,g
roup of people
 1130 DATA tempreture,tempe
rature,tempereture,tempratu
re,2,degree of heat
 1140 DATA hidrogen,hydrgen
,hydrogen,hydrogan,3,a chem
ical element
 1150 DATA bugerigar,bugari
gar,budgerigar,budgeregar,3
,a type of bird
 1160 DATA administer,admin
ster,adminester,adminestar,
1,look after affairs
 1170 DATA pharmacy,pharmar
cy,pharmercy,pharmacy,4,che
mists shop
 1180 DATA possession,poses
ion,possesion,posession,1,o
wn
 1190 DATA retaleate,retali
ate,retalyate,retalate,2,ge
t your own back
 1200 DATA stomach,stumuch,
stomache,stomake,1,part of
the body
 1210 DATA rhitha,ritha,rhy
thea,rhytha,4,part of music
 1220 DATA sucessful,succes
ful,successful,sucesful,3,d
o it correctly
 1230 DATA substansial,subs
tanshul,substantial,substan
tiel,3,not inconsiderable
 1240 DATA spatious,spachio
us,spasious,spacious,4,plen
ty of room
 1250 DATA oxigen,oxegen,ox
ejun,oxygen,4,a gas
 1260 DATA orchid,orkid,orc
hyd,orcid,1,flowering plant

 1270 DATA navigation,navig
ashion,navigatian,navigatiu
n,1,sail a ship on course
 1280 DATA necesary,neccess
ary,necessary,neccesary,3,n
eeded
 1290 DATA mecanical,mechan
ical,mecanicle,mecanicol,2,
works by machinery
 1300 DATA imposibal,imposs
ible,imposible,impossable,2
,not allowed
 1310 DATA idolise,idolize,
idlise,idlize,2,to love
 1320 DATA halucination,hal
lucination,hallucinatian,ha
lucinatian,2,illusion
 1330 DATA forcable,forcibl
e,forsable,forsible,2,done
using force
 1340 DATA extraction,extra
cshion,extraktion,extracsio
n,1,take out
 1350 DATA envelope,henvelo
pe,envylope,envalope,1,used
 for sending letters
 1360 DATA endles,hendles,e
ndlless,endless,4,without e
nd
 1370 DATA computer,computa
r,computter,computur,1,an e
lectronic machine
 1380 DATA situation,sithua
tion,situasion,situachion,1
,position you are in
 1390 DATA assembel,assembl
e,asemble,asembel,2,bring t
ogether
 1400 DATA acumalate,accumu
late,acumalate,accumerlate,
2,heap up
 1410 DATA content,contant,
contente,kontent,1,satisfie
d
 1420 DATA expreshun,expres
ion,expression,hexpression,
3,wording or phrase
 1430 DATA encountar,encoun
tur,encountter,encounter,4,
close contact
 1440 DATA manual,manuel,ma
nuarl,manurl,1,done by hand
 1450 DATA flasching,flashi
ng,flachsing,flashing,4,a
lamp turning on & off
 1460 DATA ampliffier,ampli
fier,amplyfier,amplyfier,2
,makes louder
 1470 DATA whasteful,wastfu
ll,wastefull,wasteful,4,not
 economical
 1480 DATA figure,fighure,p
higure,phigre,1,shape
 1490 DATA concider,conside
r,considure,concidur,2,cont
emplate
 1500 DATA vibrasion,vibrat
ion,vibrasian,vabratian,2,m
ove continuously
 1510 DATA altaring,alterin
g,alturing,haltering,2,chan
ging
 1520 DATA probalie,probabl
ey,probably,probebly,3,most
 likely
 1530 DATA complicated,comp
lhicated,complecated,compla
cated,1,involved
 1540 DATA casette,cassette
,casete,cassete,2,type of t
ape
 1550 DATA contol,kontroll,
controll,control,4,power of
 directing and restraining
 1560 DEFPROCcorrect :REM R
OUTINE FOR CORRECT RESPONSE
 1570 CLS: PRINT TAB(10,10)
;"C O R R E C T !"
 1580 REM choose sound effe
ct to suit
 1590 FOR XX=1 TO 3: FOR YY
=1 TO 255 STEP3: SOUND 1,-1
5,YY,0: NEXT YY,XX
 1600 LET SC(X)=SC(X)+1: RE
M INCREMENT THE SCORE OF TH
E Xth PUPIL !
 1610 PROCspacebar
 1620 ENDPROC
 1630 DEF PROCwrong
 1640 CLS: REM PROCEEDURE F
OR INCORRECT RESPONSE
 1650 PRINT TAB(15,10);"W r
o n g !"
 1660 PRINT TAB(0,15);"It w
as      :-"
 1670 PRINT TAB(20,15);A$(A
D,AX(AD)): REM CORRECT SPEL
LING
 1680 PRINT''"You guessed :
-",A$(AD,DX)
 1690 REM SOUND EFFECT FOR
WRONG ANSWER
 1700 FOR XX=1 TO 3: FOR YY
=150 TO 50 STEP-1
 1710 SOUND 1,-15,YY,0: NEX
T YY,XX
 1720 PROCspacebar
 1730 ENDPROC
 1740 DEFPROCyes
 1750 VDU2:REM TURN PRINTER
 ON
 1760 PRINT"Name","Score ou
t of ten"
 1770 FOR X=1 TO number
 1780 PRINT N$(X),SC(X): NE
XT X
 1790 VDU3 :REM TURN PRINTE
R OFF AGAIN
 1800 ENDPROC
 1810 DEFPROCno
 1820 VDU14: REM SELECT PAG
ED MODE
 1830 CLS
 1840 PRINT"Name","Score ou
t of ten"
 1850 FOR X= 1 TO number
 1860 PRINT N$(X),SC(X)
 1870 NEXT X
 1880 PRINT TAB(5,24);"Pres
s <SPACE BAR> to continue"
 1890 REPEAT UNTIL GET=32
 1900 VDU14: REM PAGED MODE
 OFF
 1910 ENDPROC
 1920 DEFPROCerror
 1930 CLS:PRINT "";:REPORT:
PRINT " at line "ERL
 1940 END
 1950 ENDPROC
 1960 DEFPROCspacebar
 1970 *FX15,0
 1980 PRINTTAB(4,31)"Press
<Space Bar> to continue";
 1990 REPEAT UNTIL GET=32
 2000 ENDPROC
```

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

Try this assembly language scrolling routine by DERRICK GARNER

Scroll it in code

CODE SCROLLER is a short assembly language routine which provides a wrap-around screen in Mode 4 or 5.

The routine as presented scrolls the whole of the screen off to the left and brings it back to the starting position from the right.

This in itself may not appear too useful. But if line 580 (CPX #&20) is altered to read CPX# (any hex number between &01 and &20) then one can scroll as many lines as required, starting from the top of the screen.

For example:

```
580 CPX#&08
```

will scroll just the top eight lines and leave the remainder of the screen intact.

However, before you start playing around with the program, save it in case a typing error has been made. Machine code is lethal if it has been mistyped.

If you need to scroll a part of the screen other than the top, all you do is calculate the new address where the scrolling is to start and alter the program accordingly.

This start address depends on where you want the scroll to start and is given by the equation:

Start Location=&5800+ (Y*&140)

Here, *Y* is the first line to be scrolled, the lines being numbered 0 to 31 from top to bottom.

Once the start location has been found, the three addresses contained in lines 110 to 180 must be changed in line with this new location.

Suppose you just want to scroll the bottom eight lines of the screen. These lines are

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Multi-Forth 83 is also compatible with the MOS and specially vectored to enable a system to be reconfigured. It contains a Standard 6502 Assembler, a Standard Screen Editor and a unique Stack Display Utility, too.

At a later date a Cartridge version for the Acorn 'Plus I' will be available, but for now Multi-Forth 83 is sold as a 'Bare' ROM which means an interface is needed for the Standard Acorn Electron.

This unique Eprom comes with an extensive Manual and, at £45+VAT it is superb value. Order it using the coupon, adding £2.30 p&p (£5 for Europe, £10 outside) or, for more information, simply tick that box instead. Either way, you'll be one step ahead of the competition.

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MULTI-FORTH 83 FOR THE ACORN ELECTRON

numbered from 24 to 31, so the formula for giving the start address is:

Start Location=&5800+(24*&140)

which is &7600.

Now we've got the start address, we can make the necessary changes to lines 10 to 180.

First of all we put the start address into the accumulator by putting #&76 and then #&00 after the LDA of lines 110 and 120.

This gives:

```
110 LDA #&76:STA &71
120 LDA #&00:STA &70
```

Next, we have to give the Electron the address of the location eight bytes above the start address. To do this we just add eight to the start address.

In this case, our start address is &7600, so adding eight to it gives us &7608. As before, we split the number in two and pass it to the Electron in lines 140 and 150:

```
140 LDA #&76:STA &73
150 LDA #&08:STA &72
```

Finally, we add &138 to the start location – which gives us &7738 – and pass this address to the Electron via lines 170 and 180:

```
170 LDA #&77:STA &75
180 LDA #&38:STA &74
```

Having changed all the addresses so that the routine affects only the bottom eight rows of the screen, we now inform the Electron that we want all eight of these rows to scroll with:

```
580 CPX #08
```

Now all you have to do is run the program, press the space bar and there's your eight lines scrolling left. Try changing the figure after the CPX and see what happens.

Have fun.

```
   1REM   ****************
**
   2REM   *
 *
   3REM   * DERRICK GARNER
 *
   4REM   *
 *
   5REM   ****************
**
   6REM
  10*KEY1"MODE6|M|N LIST|M
"
  20FORI=0TO2STEP2
  30REM***PROGRAM LOCATION
***********
  40PX=&D00
  50REM**ALL NUMBERS ARE H
EXADECIMAL**
  60[OPTI
  70\Loop counter to check
 for sideways movement
  80LDA#&00:STA&76
  90.ADDRESS
 100\Addr of first screen
byte stored at zero page
 110LDA#&58:STA&71
 120LDA#&00:STA&70
 130\Addr of eighth screen
 byte stored at zero page
 140LDA#&58:STA&73
 150LDA#&08:STA&72
 160\Addr of start of last
 eight bytes of LINE 0 stor
ed at zero page
 170LDA#&59:STA&75
 180LDA#&38:STA&74
 190\Loop counters
 200LDX#&00
 210LDY#&00
 220.FIRST
 230\Store contents of fir
st 8 bytes in zero page
 240LDA(&70),Y
 250STA&80,Y
 260INY
 270CPY#&08
 280BNE FIRST
 290LDY#&00
 300.LOOP1
 310\Move LINE 0 eight byt
es to left
 320LDA(&72),Y
 330STA(&70),Y
 340INY
 350\Check page boundary e
.g.Y<>0
 360BNELOOP1
 370\Increase contents of
Loc &71 and &73 if page bou
ndary crossed e.g.Y=0
 380INC&71
 390INC&73
 400.LOOP2
 410\Continue to move LINE
 0 left
 420LDA(&72),Y
 430STA(&70),Y
 440INY
 450\Check to see if last
8 bytes of LINE 0 has been
moved left
 460CPY#&38
 470BNELOOP2
 480LDY#&00
 490.LAST
 500\Store contents of zer
o page in last 8 bytes of L
INE 0
 510LDA&80,Y
 520STA(&74),Y
 530INY
 540CPY#&08
 550BNELAST
 560INX
 570\Check if all 32 lines
 of screen have been moved
left 8 bytes
 580CPX#&20
 590BEQFINI
 600.CHANGE
 610\Increase all addresse
s to start of next line if
all 32 lines have not been
moved left
 620CLC
 630LDA&70
 640ADC#&40
 650STA&70
 660LDA&71
 670ADC#&00
 680STA&71
 690CLC
 700LDA&72
 710ADC#&40
 720STA&72
 730LDA&73
 740ADC#&00
 750STA&73
 760CLC
 770LDA&74
 780ADC#&40
 790STA&74
 800LDA&75
 810ADC#&01
 820STA&75
 830\Reset loop counter
 840LDY#&00
 850\Go back to begining a
nd start moving next line a
cross screen
 860JMP FIRST
 870.FINI
 880\Increase column Loop
counter
 890INC&76
 900LDA&76
 910\Check if column 39 ha
s been moved all the way ac
ross the screen and off to
the left
 920CMP#&28
 930\If it has go to end o
f routine
 940BEQ DONE
 950\If it hasn't go back
to the begining and start a
gain
 960JMP ADDRESS
 970.DONE
 980\Back to Basic
 990RTS
1000]
1010NEXT
1020REM***TEST PROGRAM****
************
1030MODE5
1040VDU5
1050VDU23,1,0;0;0;0;
1060COL0,130
1070CLG
1080COL0,1
1090MOVE640,1024
1100PLOT85,1279,0
1110COL0,0
1120MOVE300,150
1130MOVE640,724
1140PLOT85,979,150
1150COL0,2
1160MOVE500,300
1170PRINT"PRESS"
1180MOVE350,200
1190PRINT"SPACE BAR"
1200REPEAT
1210*FX15,1
1220I$=GET$
1230IFI$=" "CALL&D00
1240UNTILFALSE
```

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

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Micro Messages

Rumours surround the 'interesting beast'

*RECENTLY I have bought a Plus One interface for my Electron. When I type *HELP I get the message:*

Expansion 1.00
ADC/Printer/RS423
OS 1.00

I was rather confused at this message as my Plus One does not have an RS423 interface.

Does this mean that Acorn will be updating the Plus One later? If so, will I be getting an upgrade? – **Mark Stanley, Weymouth, Dorset.**

PS. Keep up the good work on a terrific magazine that I get every month.

● The Plus One is a very interesting beast, not least because it purports to be something that it is not. Certainly Acorn have an RS423 up and running for the Plus One.

The rumour is that the guy who wrote the software was told that there would be an RS423 and allowed for it, while the guy who did the hardware was told that it wasn't going to be included.

The result, so the story goes, is the misguided message.

Rumour also has it that the RS423 interface, which will slot into one of the Plus One's cartridge sockets, will be available before Christmas.

Missing commas

I THINK you may have made a mistake in the First Byte joystick program that you printed in September's Micro Messages. Surely you've left out a couple of inverted commas in lines 25 and 26? I think they should read:

```
  25 OSCLI("FX248,"+STR$(S
U MOD 256)+",0")
  26 OSCLI("FX249,"+STR$(S
U DIV 256)+",0")
```

This should now work. – **Kevin Wards, Glamorgan.**

● Quite right Kevin, we hang our heads in shame. Happily we think most people will have figured it out.

Short, but effective

I WROTE this short program in my lessons last week and I find it quite effective:

```
10 REM CIRCLES
20 REM NEIL HAYWARD
30 MODE 2
40 VDU 23,1,0;0;0;0;
50 REPEAT
60 MOVE 900,500
70 FOR t=10 TO 360 STEP
10
80 x=400*COS(RAD(t))
90 y=400*SIN(RAD(t))
100 MOVE 900,500
110 PLOT 85,x+500,y+500
120 NEXT
130 GCOL 0,RND(16)
140 *FX9,2
150 *FX10,2
160 UNTIL FALSE
```

– **Neil Hayward (14), Windsor, Berks.**

● You're quite right Neil, it's very effective indeed, especially considering that it's all done in Basic.

BBC has the edge on speed

COULD you explain why programs I have typed from your sister publication, BBC Micro User, run significantly slower on my Electron than on the BBC itself.

I noted a similarly dramatic increase in speed when I ran Electron Golf (Electron User July 1984) on the BBC.

The differences are most notable in the production of sound and animation. Is my machine faulty? – **I. Reid, Market Harborough, Leics.**

● The answer is that, owing to some cost-cutting arrangements of the Electron's memory chips, it takes twice as many goes to get information from its memory as the BBC Micro.

This means that in programs and modes that access a lot of memory the BBC has the edge.

You'll find that in some modes, such as Mode 6, this makes little appreciable difference, whereas in Mode 2 all the extra colours slow things down noticeably.

When programs go from the Electron to the BBC, the reverse applies. If you really want to see a fast game, try September's Haunted House on a BBC Micro.

Software for four year olds

COULD you help me with a query regarding the Electron which I recently bought for my four year old son.

I now find that I am having great difficulty buying software suitable for his age range.

My local W.H. Smith gave me an Acornsoft booklet listing games etc, but these do not cover pre-reading skills, number, counting, shape, size etc.

I now wonder whether I should have bought the Sinclair Spectrum as the range of software for the pre-school child is excellent.

I do hope you can help me. – **Mrs D.A. Davidson, Liverpool.**

● Actually Mrs Davidson, there's a great deal of educational software available for the Electron, as you'll see from the adverts and reviews in *Electron User*.

The problem is that after all the fanfare of last Chrstmas a lot of dealers stocked up with software. When the Electron supplies failed dismally to meet demand they were left with a lot of unsold stock and are now wary of buying more.

Happily the situation is changing rapidly and the advent of Christmas should help.

And if you can't wait, try a mail order dealer.

Filling in Mike Cook!

I WAS very interested in Mike Cook's Quick on the Draw program and like some of your

→

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

other correspondents, wanted a filling procedure.

After hours of trying to understand the program and using bits and pieces out of it I came up with the following listing which will fit in with the line numbers as they are in Electron User:

```
 335IF A$="F" THEN PROC_FI
LL
 2252PRINT "F - To FILL a s
hape previously drawn"
 2254PRINT "    move the do
t inside the shape,"
 2256PRINT "    then press
RETURN."
 2310DEF PROC_FILL
 2320PRINT"FILL";
 2330PROC_BAND1
 2340GCOL0,0
 2350PLOT69,XX,YX
 2360GCOL3,CX
 2370PROC_FILL1(4)
 2380YCX=YCX-2
 2390MOVEXCX,YCX
 2400PROC_FILL1(-4)
 2410ENDPROC
 2420DEF PROC_FILL1(NX)
 2430XCX=XX:YCX=YX
 2440REPEAT
 2450PLOT77,XCX,YCX
 2460YCX=YCX+NX
 2470SX=POINT(XCX,YCX)
 2480UNTILSX=CX OR YCX>1000
 OR YCX<0
 2490ENDPROC
```

Having a four year old son I also found that if line 1920 was replaced by the following four lines, it made life much easier:

```
 1920 IF XX>1279 THEN XX=12
79:SOUND 1,-15,54,10
 1922 IF XX<0 THEN XX=0:SOU
ND 1,-15,54,10
 1924 IF YX>1000 THEN YX=10
00:SOUND 1,-15,62,10
 1926 IF YX<0 THEN YX=0:SOU
ND 1,-15,48,10
```

– John Richardson, Chester-le-Street, Co. Durham.

● Many thanks John, it's always interesting to hear from people who've improved our programs.

Electron on the air

AFTER reading about an incident reported in the July edition of Electron User by T. Skinner I felt I had to write to tell what I do on the subject.

He said that he picked up his Electron's sound coming through on his radio.

I also discovered this. I tuned in my radio in, turned up the volume and got great sound effects on my games.

The best frequency was about 94.5 VHF. **– G. Tatton, St. Annes on Sea.**

● We can't get it to work here but from the number of letters we've got, it's no rare occurrence. Let's bring this correspondence to a close.

Instant BBC

DO you want to know how to turn your Electron into a BBC Micro? Type in the following and press Break.

```
 10 *KEY10"|L|J BBC COMPU
TER|_|@|CBASIC|_|@|E>|J|U|_
|A|E"
```

Stephen Manser, Tonbridge, Kent.

● Many thanks for the tip Stephen. Any ideas of how to use software to get an RS423 and a User Port as well?

Gorilla scoreboard

AFTER seeing the record for Killer Gorilla was 116,800 I was doubtful that a score like that was possible but after receiving a copy of 'Killa' the Upgrade from Bit Twiddlers I began to believe it.

Although my highest score without it is only 52,200 I have been very successful with my scores.

My two highest scores are 333,600 and 347,000! I hope you believe these scores because they are not made up.

I would highly recommend it to anyone as it has at least doubled my liking of Killer Gorilla. **– Chris Jones (age 12), Cheadle Hulme, Cheshire.**

● It's amazing the number of letters we've had about high scores on Killer Gorilla. Certainly it seems to have captured the games player's imagination. Yours is by far the highest score so far. Incidentally, how are you all doing at Micro Olympics?

Mayday mishap

SOS. Surely there's something wrong with the Mayday program on Page 48 of the October issue of Electron User? I reckon lines 340 and 350 are missing but can't work out what they should be. Am I right? **– Tom Sharp, Cleethorpes.**

● Curses! You are right. The program was fine when the page was laid out, the trouble is a bit of the listing dropped off.

Our apologies to all those frustrated embryo radio hams, we promise to use stickier glue in future. Here are the missing lines:

```
 340 ENDPROC
 350 DATA A,25,B,5222,C,52
52,D,522,E,2,F,2252,G,552,H
,2222,I,22,J,2555,K,525,L,2
522,M,55,N,52,O,555,P,2552,
Q,5525,R,252,S,222,T,5,U,22
5,V,2225,W,255,X,5225,Y,525
5,Z,5522," ",!
```

Just type these in, ignoring the unnumbered data, and the program will work. Honest!

AND A CYLON BASE STAR FROM BOOTS!

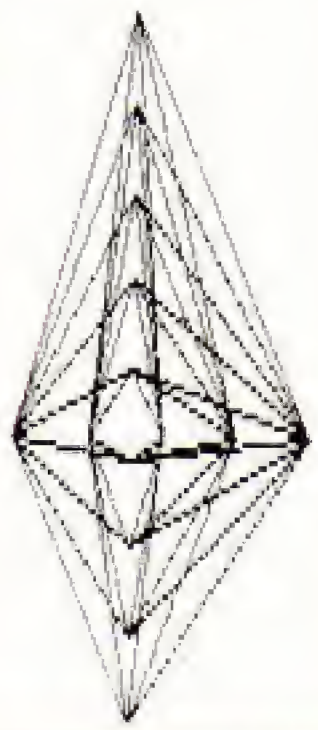
I THOUGHT you might be interested in the following program – it uses nested loops to draw a 3D diamond.

Aficionados of Battlestar Galactica may also note the similarity to a Cylon Base Star!

Furthermore, by altering the range of numbers assigned to A and B, and by altering the size of the step, lots of different effects can be achieved. **– Les Wilson, Leighton Buzzard, Beds.**

```
  10 REM DIAMONDS
  20 REM LES WILSON
  30 MODE 5
  40 VDU 23,1,0;0;0;0;
  50 FOR A=200 TO 800 STEP
 125
  60 FOR B=200 TO 1272 STE
P 125
  70 GCOL 0,RND(3)
  80 MOVE 600,A
  90 DRAW B,500
 100 NEXT B
 110 NEXT A
 120 REPEAT UNTIL FALSE
```

● Nice one Les, especially when I learn that you won't have an Electron until November and wrote it on one at your local Boots.



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MR. WIZ £7.95

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

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CENTIBUG £7.95

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

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

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

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

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