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electron user

Vol. 5 No. 8 June 1988 £1.25

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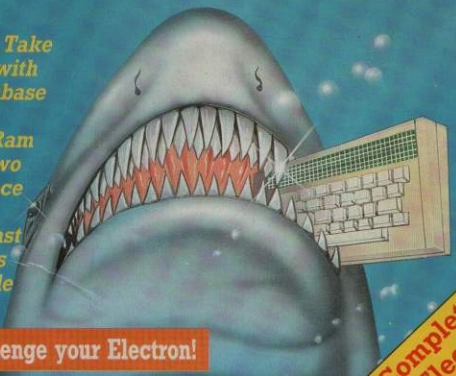

NIM Challenge your Electron!

Complete guide to all Electron software & hardware

SPYCAT

An Interactive Exposé of M.I.4½

The London Skyline Viewed from Blackhall

Outside No. 10 Drowning Street

Meeting the P.M.

Waiting to see "M"

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Spycat is a skilfully-written arcade adventure game which takes place amongst the corridors of power in Blackhall, Drowning Street and the M.I.4½ underground surveillance complex.

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Spycat is a thoroughly captivating game. To complete the adventure, you will need to use clear logical thought as well as fast reactions and arcade skills. Your life as an undercover cat may not be easy but it will always be exciting!

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CONTENTS

Vol. 5 No. 9 June 1988

News
The very latest software and hardware from the ever-expanding world of the Electron.
5

ViewSheet
This new book from Dabs Press may be just what you need to get your spreadsheets in order. Find out what we think inside.
7

10 Liners
More impressive mini masterpieces from our creative readers for you to sample.
9

Pendragon
Our resident wizard opens up his castle once more to help intrepid adventurers along their way.
10

Hardware Projects
Put the finishing touches to your Electron weather station in the last part of our do-it-yourself project.
16

Fibonacci Nim
Beat the computer in this unusual form of the classic strategy game.
20

Shadow Ram
Find out how to get your Master Ram Board to hold two Basic programs at once in Part 3 of our series.
22

Bomb Alert
You'll need to be fast on your flippers in this superb machine code underwater arcade game.
26

In Action
Make your journeys easier with our handy car route database.
29

Pullout Guide
All the current arcade games, hardware products, adventures and business packages for the Electron are in this four-page pullout.
31

Machine Code
Meet the 6502's index registers in Part 4 of our easy-to-follow tutorial.
35

Memory Map
The memory locations from &200 to &3FF are examined in detail this month.
38

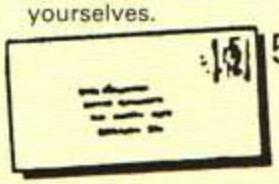
Sprites
We show you how to write scrolling games in Part 5 of our advanced machine code series.
42

ViewSheet
Complete your profit and loss predictor in the final part of our beginner's guide to spreadsheets.
44

Software
The latest top-selling games releases come under the microscope of our expert reviewers.
48

Arcade Corner
The man with all the pokes is here again to present more hints, tips and devious cheats.
56

Micro Messages
Find out what Electron users think about us, their machines and the world in general in the column you write yourselves.
57



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- ★ A program developed by an amateur astronomer to locate distant galaxies. (Saturday and Sunday)
- ★ The Beeb system being used by doctors at Guy's Hospital to provide a breakthrough in the treatment of arterial disease. (Saturday and Sunday)

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R100

electron user NEWS

Board cuts rom swapping

NEW from Jafa Systems (0222 887203) comes a product which could save Electron owners a lot of rom swapping.

ROMPlus-144 is an intelligent sideways rom board which makes it unnecessary to open the Electron.

When used as a straight rom board it holds up to eight roms and plugs into a Plus 1 slot.

It also has its own control rom, which allows users to select the currently active rom, save images to disc or cassette, or get a disassembly listing of any of the roms.

And help strings can be printed from any of the roms, or star commands passed.

Additionally, if the 32k selfmodify-protected ram is used in place of one rom, it's possible to use two-rom sets.

While the ram is present the ROMPlus-144 control rom can also be used as a ram filing system or printer buffer – even when the required rom is selected.

An extension of the Electron's built-in rom filing system, this allows saving of files in ram in RFS format.

This in turn allows either temporary storage of data between tape and disc operations or the production of RFS roms.

Price £39 – £54 with ram.

ADVENTURE PROGRAM 'BEATS BIG BROTHER'S'

AN Electron version of a critically acclaimed adventure programming system for the BBC Micro could be ready for release this summer.

Called ALPS – for Adventure Programming Language System – it is a rom-based tool for serious programmers from Alpine Software (0762 42510) and was highly praised in a recent issue of *The Micro User*. It is produced by Northern Ireland schoolteacher Philip Hawthorne who used to trade under the name Summit Software.

"Due to threatened legal action by another company claiming prior use of that name, we have been forced to change and from now on will be known as Alpine Software", he told *Electron User*.

"We have an Electron version of the ALPS rom under final test at the moment. Lack of ram being the mother of invention, we have squeezed in more features than the BBC Micro version has.

"The project is being developed in association with PRES.

It is hoped the package will be compatible with its AP3 unit and the majority of DFSs and ADFSs, as well as cassette.

On line to Europe

KEEPING up to date on European Community affairs has been made easier by MicroLink, the UK's fastest growing electronic mail service.

A large number of databases covering EEC matters is now available on MicroLink through a gateway to Echo – the European Community host organisation in Luxembourg.

Although it is one of several European online information providers, Echo is the only one to offer free services.

These include the Great European Online Dictionary of 400,000 terms in eight languages.

Electrons helping jobless

ELECTRONS are filling a number of useful roles at a home for the disabled in Crawley, West Sussex.

Handicapped himself, although not one of the 33 residents, Steve Ludlow is computer room supervisor at the Heatherly Cheshire Home.

An Electron is one of the micros used in his Manpower Services community project to teach local long-term unemployed about computing.

Two disabled residents of Heatherly are also finding Electrons useful as well as enjoyable.

"One man came here suffering from an extreme lack of self-confidence after 50 years of having all his decisions made for him", said Steve.

"Owning an Electron has helped bring him out of his shell and taught him to think for himself.

"He particularly enjoys graphics programs and the listings he finds in *Electron User*. If we didn't switch off at 10pm I'm sure he'd be at his keyboard all night.

"The other Electron user here is unable to speak and uses the machine to communicate with other people. She is also very keen on puzzles and word games".

Data defences lined up against static

WITH safety and convenience in mind, Praybourne Products has released several new items for Electron users.

If you've been having problems with static electricity corrupting data, then Touch It may just be the answer.

The device sticks to the Electron keyboard and provides a means for discharging static. Price £8.95.

To protect discs during storage or in transit, the company has released a nylon floppy wallet that can hold up to nine 3.5in discs. Price £9.95.

Another new product from Praybourne (0527 61221) is the Copy Book Holder which can hold anything from a booklet to a full sized computer manual at a convenient angle for reading.

Made of strong plastic, the unit comes in two clip together sections at £11.95.

A BARBARIAN IN YOUR ELECTRON

ELECTRON users have had a long wait, but Superior Software (0532 459453) promises it's been worth it – Barbarian is now available.

Claimed to be the most realistic and exciting of all sword fighting games, Barbarian is for one or two players.

And the scenario? You are the broadsword-wielding barbarian of the title, the ultimate warrior.

All you've got to do is rescue the beautiful Princess Mariana from the clutches of Drax,, the evil sorcerer.

As an added bonus, Superior is running a competition with the game, with a £100 first prize.

Just complete the game and write off to Superior describing the final on-screen messages. Price £9.95 – cassette only.

New introduction to word processing

A NEW word processing package designed with both individual users and organisations in mind has been released for the Electron.

WASP – Word and Symbol Processor – from National Extension College (0223 316644) is claimed to be a very accessible introduction to word processing.

All commands are actioned by single keystrokes, with all the menus and editing commands conveniently displayed on-screen.

Features include super and subscripting, full justification, emboldening and underlining. WASP can also handle the symbols required for subjects like mathematics and foreign languages.

Accompanied by a handy 18-page A5 user manual, WASP is priced at £19.95 – £5 for second and subsequent copies.

THE GALLUP CHART TOP 10

ELECTRON SOFTWARE

THIS MONTH	LAST MONTH	TITLE (Software House)	PRICE
1	3	SOCCER BOSS *Alternative*	1.99
2	1	COMBAT LYNX *Alternative*	1.99
3	2	STAR FIGHT *Alternative*	1.99
4	•	FIVE STAR GAMES *Beau Jolly*	9.95
5	4	PRO GOLF *Atlantis*	2.99
6	6	FOUR GREAT GAMES *Micro Value*	3.99
7	•	GRID IRON *Top Ten*	2.99
8	5	PAPERBOY *Elite*	9.95
9	•	WAY OF THE EXPLODING FIST *Mastertronic*	1.99
10	7	THAI BOXING *The Micro Selection*	1.99

Compiled by Gallup/Microscope

Combat Lynx loses its first place to another Alternative title – Soccer Boss. This month sees two new budget entries from Top Ten and Mastertronic, while Beau Jolly's compilation rejoins the chart at number four.

With no full-priced games in the chart at present it shows how much the budget and compilation houses now dominate the market.

A dab-hand's view

CHRIS NIXON takes a look at a new guide for ViewSheet and ViewStore from Dabs Press

IF you want to get right to the heart of a piece of popular applications software, you normally need look no further than a Dabhand Guide from Dabs Press.

These friendly, yet authoritative guides to – among other topics – the BBC Master's operating system and the View suite of software, have already earned the company an enviable reputation as a producer of definitive bibles for any given subject.

Their latest release, ViewSheet and ViewStore – a Dabhand guide, is hot off the press, and is intended to complement the three existing books in the Dabs Press series of explanatory texts for the View suite.

The reason for reviewing a book like this in *Electron User* is twofold. First, a large number of Electron owners by now have the ViewSheet cartridge and are looking around for a decent tutorial on the subject.

Secondly, ViewStore – available only for the BBC Micro – works perfectly on an Electron if you have a Rombox Plus, or Plus 1 with rom cartridge. In the Micro Messages section of the July 1986 *Electron User*, Stephen Domleo listed the different function key presses necessary to control the program on its new host.

Incidentally, for those who don't know, ViewStore is a powerful general-purpose database which is capable of being very precisely tailored to any particular application. But the accompanying manual – like ViewSheet's – makes for some heavy reading.

So with a copyright date of just March this year, some readers may think it's about time a book of this nature finally made it into print, but in my opinion it's certainly been well worth the wait.

Dabs Press is a fairly new publishing company, whose stated philosophy is to bring the accumulated learning of many years to both the novice and experienced computer user alike, using the very latest in desktop publishing techniques.

Indeed, at exactly 340 pages the neatly laid-out, laser printed and spiral bound manual doesn't look as if anything could have possibly been left out of it.

On opening the guide you are immediately presented with a huge contents page, listing a total of 19 chapters – each made up from approximately 10 sections – and six appendices. Scanning through the chapters reveals the layout of the guide, which unless understood at the start may lead to some initial confusion.

The guide is divided into two main sections, the first being labelled for first-time users. The first five chapters of this section are a complete basic introduction to using ViewSheet – I say basic, but even here the practical examples given far exceed the official Acorn manual.

The next six chapters likewise introduce the different principles and practices involved with using ViewStore, and again go way beyond the official guide in their scope.

Next comes part two of the guide, the advanced section. Here again, the first few chapters introduce the more advanced ViewSheet functions and techniques, followed immediately by the advanced section on ViewStore.

Most people – like me – will probably open the guide expecting it to be divided straight down the middle into two parts, one for each subject being covered. But it is this structure of first simple ViewSheet, simple ViewStore, then advanced ViewSheet and advanced ViewStore which makes for more enlightened reading – but also necessitates careful reading of the contents page first.

The last two chapters are devoted to ViewPlot and OverView, two different but closely related packages. ViewPlot is a utility for displaying numerical data from both Viewsheet and ViewStore in a graphical form.

Pie charts, bar graphs and cartesian graphs may all be generated by this powerful package, which is available seperately from Acornsoft. Overview is a cartridge for the Master 128, and so does not concern Electron owners.

If you are one of those people for whom the normal ViewSheet and ViewStore manuals may just as well have been the Rosetta Stone, then this book is definitely for you. Every con-

Turn to Page 8 ►

Review

◀ *From Page 7*

ceivable application for both programs is covered using clear, informative explanations.

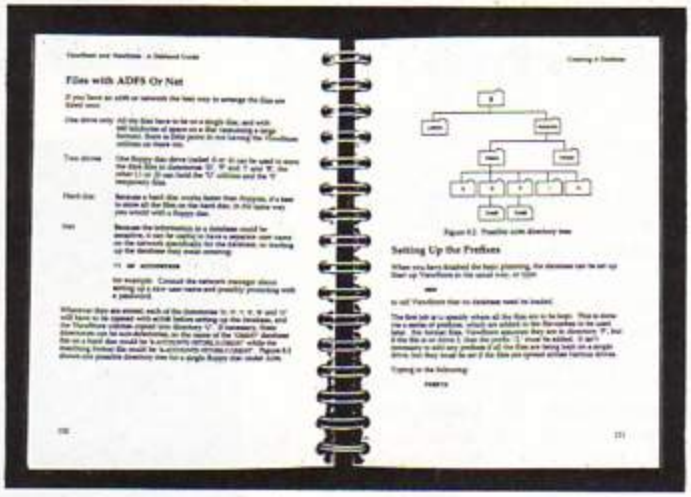
The text speaks throughout with the voice of experience, detailing all the possible mistakes and pitfalls which can rear their heads at the careless or unwary user.

Included in the book are a multitude of useful programs, providing you with anything from a sideways printer driver for use with ViewSheet, to a complete garbage collection utility for ViewStore databases. All the programs have been fully tried and tested, and are available on a separate disc for an extra charge of £7.95 for a 5.25 inch disc, or 9.95 for 3.5 inch.

To help drive the principles home, a recurring theme is used in the ViewSheet sections. An imaginary project – for analysing the average and standard deviation of the sizes of different pebbles on a beach – is returned to each time a new concept and its possible application is mentioned.

This makes it all so much easier for the first-time user to grasp the new ideas as they come, instead of having a set of stodgy numbers to contend with.

This guide is the sort of invaluable reference tool that all serious users of the View business suite need.



Two pages from the manual showing the clear layout

Being at once a beginner's primer and an expert's textbook, the ViewSheet and ViewStore Dabhand Guide is probably all you will ever need on your bookshelves – aside from our own modest introduction to ViewSheet which started in the March issue of *Electron user*.

Having read two of the previous Dabhand guides, and found them both to be irreplaceable reference works, and I for one am eagerly awaiting Dabs Press's next attempt to cut away more swathes of complexity from the software and hardware world.

Product: ViewSheet and ViewStore – a Dabhand Guide.
Publisher: Dabs Press, 76 Gardner Road, Prestwich, Manchester M25 7HU.
Price: £12.95, with separate 5.25 and 3.5in program discs available at £7.95 and £9.95 respectively.

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10 LINERS

LISTER

```
PROCfnproc
   90 DEFPROCsetup
  100 DEFPROCmenu
  150 DEFPROCscan(N%)
  190 DEFPROCrecipe
  240 DEFPROCheader(A$)
  250 DEFPROCfind
  310 DEFPROCget
  320 DEFPROCread
  330 DEFPROCadd
  410 DEFPROCosword
  430 DEFPROCcsr(C%)
  440 DEFPROChelp
  840 DEFPROCpause
  850 DEFPROCguide
  950 DEFPROCcreate
  960 DEFPROCprint
 1020 DEFPROCdisplay(N%)
30000 DEFPROCfnproc
30040 DEFPROClp(A$,Y%)
```

A sample output from the procedure and function lister

THIS month we start with a neat utility from Ken Rayner of Folkestone, Kent, which lists all functions and procedures, together with their line numbers. Simply tack it to the end of any Basic program, and call it with:

```
PROCfnproc
```

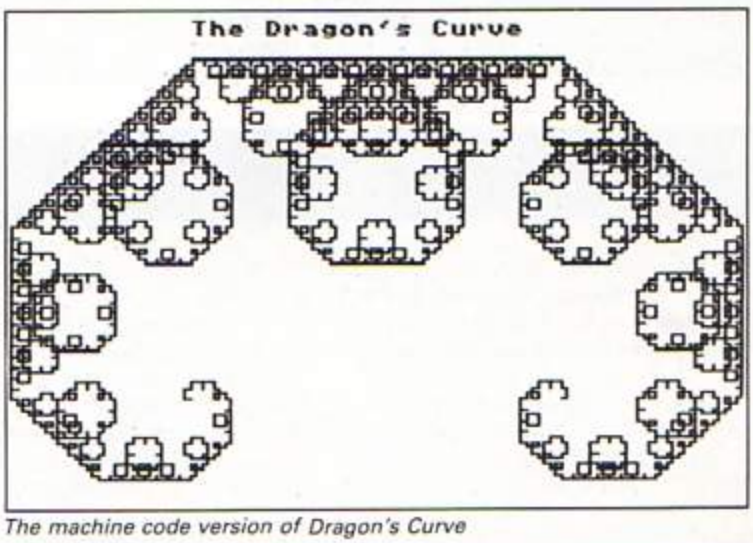
The only problem is when the procedure encounters a line number with a low byte value of &1A. This is the token Basic uses to represent the DEF FN command, and *PROCfnproc* will think it has found a function definition at that point.

Such line numbers are however rare, and the series starts with the numbers 420, 676, 932 and continues with mostly odd numbers not often used as line numbers.

```
    1 REM Proc & Func Lister
    2 REM By Ken Rayner
    3 REM (c) Electron User
    4 REM
    5 DEFPROCfnproc
    6 FORG%=PAGE TO TOP:IF?G
%=13 AND G%?1<>32 line%=G%?1
+256+G%?2:REPEAT G%=G%+1:UNT
IL?G%<>32:G%=G%-1
    7 IF?G%=221 REPEAT G%=G%
+1:UNTIL?G%<>32:IF?G%=242 PR
OClp("DEFPROC",G%) ELSEIF ?G
%=164 PROClp("DEFFN",G%)
    8 NEXT:ENDPROC
    9 DEFPROClp(A$,Y%):PRINT
STRING$(5-LENSTR$line%," ");
line%;" ";A$;:REPEAT Y%=Y%+1
:IF ?Y%=13 OR ?Y%=58 UNTIL-1
 ELSE PRINTCHR$?Y%;:UNTIL0
   10 PRINT:ENDPROC
```

ANYONE who typed in Mike Cook's Dragon Curve program from the June 1987 issue will be amazed at this 100 per cent machine code version crammed into just 10 lines from I. J. Farquarson of Putney, London.

It runs several hundred per cent faster than the original, generating the complete curve in just under 25 seconds. There is no facility for inputting the scale, but changing the start values of *length* and *recur* in line four corresponds to inputting values in the original.



The machine code version of Dragon's Curve

FAST DRAGONS CURVE

```
 1 Osw=&FFEE:Osr=&FFE0:Os
b=&FFF4:Dir=&70:Len=&71:Lev=
&72:Work=&73:Length=10:Recur
=12
    2 FOR Pass=0TO2 STEP2:P%
=&900:[OPT Pass:.Dragon:LDA
#22:JSR Osw:LDA #01:JSR Osw:
LDA #16:LDX #0:JSR Osb:]
    3 RESTORE10:FOR loop=1 T
O 70:READ Byte:[LDA #Byte:JS
R Osw:]:NEXT
    4 [OPT Pass:LDA #00:STA
Dir:LDA #Length:STA Len:LDA
#Recur:STA Lev:PHA:JSR Curve
:PLA:RTS
    5 .Curve:LDA #0:CMP Lev:
BEQ Draw:DEC Lev:LDA Lev:PHA
:JSR Curve:INC Dir:LDA Dir:A
ND #03:STA Dir:PLA:STA Lev:L
DA Lev:PHA:JSR Curve:DEC Dir
:LDA Dir:AND #03:STA Dir:PLA
:STA Lev:RTS
    6 .Draw:LDA#25:JSR Osw:L
DA#01:JSR Osw:LDA Dir:STA Wo
rk:BNE One:LDA Len:JSR Osw:L
DA #00:JSR Osw:JSR Osw:JSR O
sw:RTS
    7 .One:DEC Work:BNE Two:
LDA #00:JSR Osw:JSR Osw:LDA
Len:JSR Osw:LDA #00:JSR Osw:
RTS
    8 .Two:DEC Work:BNE Thre
e:LDA Len:EOR #&FF:SEC:ADC #
00:JSR Osw:LDA #&FF:JSR Osw:
LDA #00:JSR Osw:JSR Osw:RTS
    9 .Three:LDA #00:JSR Osw
:JSR Osw:LDA Len:EOR #&FF:SE
C:ADC #00:JSR Osw:LDA #&FF:J
SR Osw:RTS:]:NEXT:CALL Drago
n
   10 DATA 17,2,12,31,10,1,&
54,&68,&65,&20,&44,&72,&61,&
67,&6F,&6E,&27,&73,&20,&43,&
75,&72,&76,&65,18,0,1,25,5,0
,0,255,3,25,5,254,4,255,3,25
,5,254,4,0,0,25,5,0,0,0,0,18
,0,3,25,4,196,3,34,1,23,1,0,
0,0,0,0,0,0,0
```

Adventures by Pendragon

Charting success

Readers' Top 20

1	Village of Lost Souls	Robico	94%
2	Dodgy Geezers	Melbourne House	92%
3	The Hunt	Robico	90%
4	The Lost Crystal	Epic	89%
5	Myorem	Robico	87%
6	The Ket Trilogy	Incentive	86%
7	Hex	Larsoft	85%
8	Enthar Seven	Robico	81%
9	The Nine Dancers	Larsoft	80%
10	Suds	Riverdale	78%
11	Oxbridge	Tynesoft	75%
12	Puppet Man	Larsoft	74%
13	Magnetic Moon	Elk Adventure Club	72%
14	Sphinx Adventure	Acornsoft	71%
14	Kayleth	Adventure Soft	71%
16	Starship Quest	Elk Adventure Club	70%
17	Twin Kingdom Valley	Bug Byte	68%
18	Rick Hanson	Robico	67%
19	Woodbury End	Shards	64%
20	American Suds	Riverdale	63%

JUST as surely as summer follows spring it's Top Twenty time once again. The chart is compiled soley from readers' votes for their favourite adventures for the Electron.

This must be the most interesting Top Twenty I have compiled. I find it incredible that **Dodgy Geezers** should oust **The Hunt** or **The Lost Crystal** from the number two spot.

I am also amazed that the dreadful **Ket Trilogy** should prove so popular among you, the readers. It just goes to show that poor reviews do not necessarily sway the buying public – and quite right too.

However, it is an absolute delight to see Enthar Seven reach the chart. The adventure has been on the market for over two years and is the first disc-only adventure to enter the chart in this column.

This reflects the large number of questions I have been asked about this game in recent months. It is also pleasing to see that Larsoft has come of age with three titles in the top 12.

While on the subject of charts, a large number of people have written to me during the past 18 months asking for my own opinion as to the best cassette-based adventures for the Electron.

I have been reticent about giving such an opinion as one person's delight may be another's torture. However, having been asked the same question dozens of times at the recent Electron & BBC

Problems Solved

At the Electron & BBC Micro User Show I was asked many questions about **Enthar Seven, Myorem** and the perennial **Sphinx Adventure**. Certain questions cropped up again and again. I will endeavour to answer these for the benefit of you all.

In **Enthar Seven** the goggles must be worn if you wish to survive the vitriol-spitting lizard. These goggles can be found in the storeroom beyond the cave of bats. However, you will need the decibox to get past those blood-hungry mammals.

The teleport chamber in sector one can be found Northwest of the large cavern, but you must search for the passage. The radiation field hides a coin and a geiger counter, without which you will surely perish.

Once you have conquered the mutated creature and the lizard, you can continue on an Easterly path which will lead to a wooden oar and a hammer which bathes in a pool of pure acid!

In the command centre the vacuum cleaner bag must be mended with the adhesive tape if you wish to successfully clean up the dust which covers the trap door. The correct wording is: REMOVE DUST BAG FROM VACUUM CLEANER then STICK PLASTER ON DUST BAG.

In **Myorem** a lot of people seem to be having difficulties in the forest area. Once your inside the cabin, the keys to the chests can be found hanging behind the cupboard door. The small chest can then be used to carry a number of items across the rope bridge.

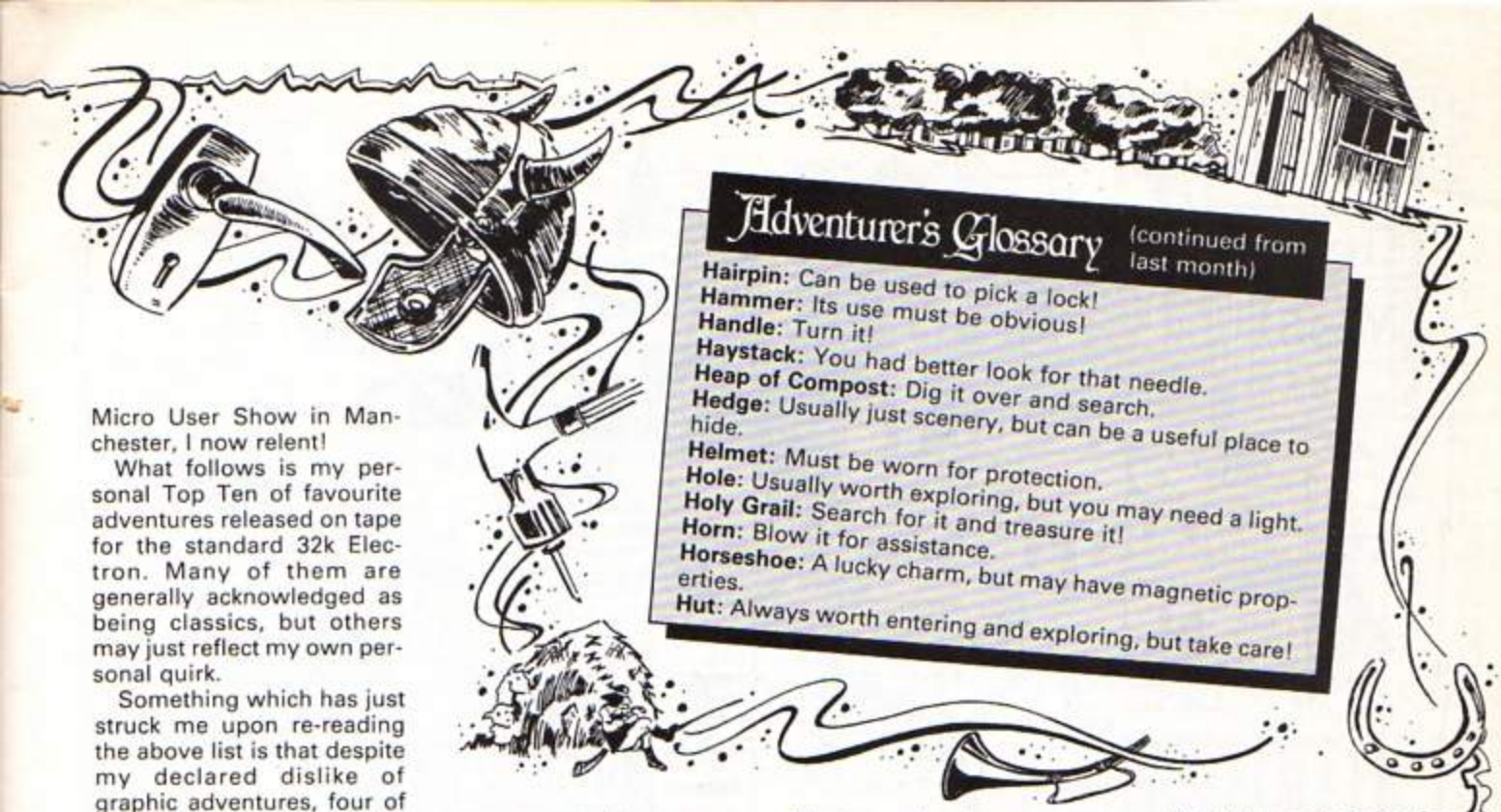
The swamp can be reached by placing the wooden plank across the quicksand. In the swamp you will discover a twig and a jar of dirty water.

The jar should be emptied then filled with crystal clear water at the pool, West then South of the cabin. You now have a primitive magnifying glass which can be used later in the game.

In **Sphinx Adventure**, crossing the lake appears to be the biggest obstacle to progress for many. I must admit this had me foxed for a long time when I first played the game.

You need the boat and the matches in order to venture across the water, but first you must recover some Stilton cheese from the goblins' dairy.

Once you have this, you must journey to the castle



Adventurer's Glossary (continued from last month)

Hairpin: Can be used to pick a lock!
Hammer: Its use must be obvious!
Handle: Turn it!
Haystack: You had better look for that needle.
Heap of Compost: Dig it over and search.
Hedge: Usually just scenery, but can be a useful place to hide.
Helmet: Must be worn for protection.
Hole: Usually worth exploring, but you may need a light.
Holy Grail: Search for it and treasure it!
Horn: Blow it for assistance.
Horseshoe: A lucky charm, but may have magnetic properties.
Hut: Always worth entering and exploring, but take care!

Micro User Show in Manchester, I now relent!

What follows is my personal Top Ten of favourite adventures released on tape for the standard 32k Electron. Many of them are generally acknowledged as being classics, but others may just reflect my own personal quirk.

Something which has just struck me upon re-reading the above list is that despite my declared dislike of graphic adventures, four of my selections contain graphics! I would challenge anyone to produce a top ten of better cassette-based Electron adventures.

Now, there's an idea for a competition! I will give away copies of my Top Ten to anyone who can send in a more convincing list.

To make matters perfectly fair, I'll ask *The Micro User's* Mad Hatter to adjudicate. So get your thinking caps on and send all entries to me by June 30.

I finish by apologising for calling George Barber "Geoff" when announcing the winners of the home-written adventure contest last year.

This faux-pas has only just been brought to my notice and I ask your humble pardon George.

Until opinions never differ, happy adventuring!

Pendragon's Top 10

1	Village of Lost Souls	Robico
2	Saga of a Spy Trilogy	Robico
3	The Lost Crystal	Epic
4	The Hunt	Robico
5	Woodbury End	Shards
6	Classic Adventure	Melbourne House
7	Wheel of Fortune	Epic
8	The Puppet Man	Larsoft
9	Twin Kingdom Valley	Bug Byte
10	Suds	Riverdale

following a new and quicker route than the ones I have previously published: From the spice room go W, E, W, S, D, D, U.

At the castle you must catch the mouse using the cheese as bait and retrieve the boat from the foot of the hill. The journey back to the bear's cave is a simple W, W, S, N. Now frighten the elephant with the mouse, collect the matches and the problem is solved.

The Mithril ring will be given to you if you wave the wand in the fairy grotto. The ring can then be used for rapid teleporting and escaping from difficult situations.

Has anyone discovered the cheat in **Sphinx Adventure** which I hinted at last month? A clue to help: Try filling and emptying the water bottle a few times!

While on the subject of cheats, I have still not heard from anyone who has the discovered the amazing hacking trick in Epic's **Lost Crystal**. There is a copy of **American Suds** awaiting the first to send me the answer.

Finally, two young men, Robert Ruperd and Martin Deer both asked for help with the collected letters in **Kingdom of Hamil**. I suggest that you think in terms of anagrams.

Readers' Hall of Fame

Village of Lost Souls *– Peter Jones*
(continued from last month)

Take the oxen back to the plough, connect them up, then go ploughing. LEAD OXEN, SW, SW, GET PLOUGH, NE, ATTACH PLOUGH TO OXEN, LEAD OXEN, NW, SW, SW, S, SW, E, PLOW FIELD. Take the uncovered seal and use it to open the gatehouse. GET SEAL, W, NE, N, INSERT SEAL INTO DOORS.

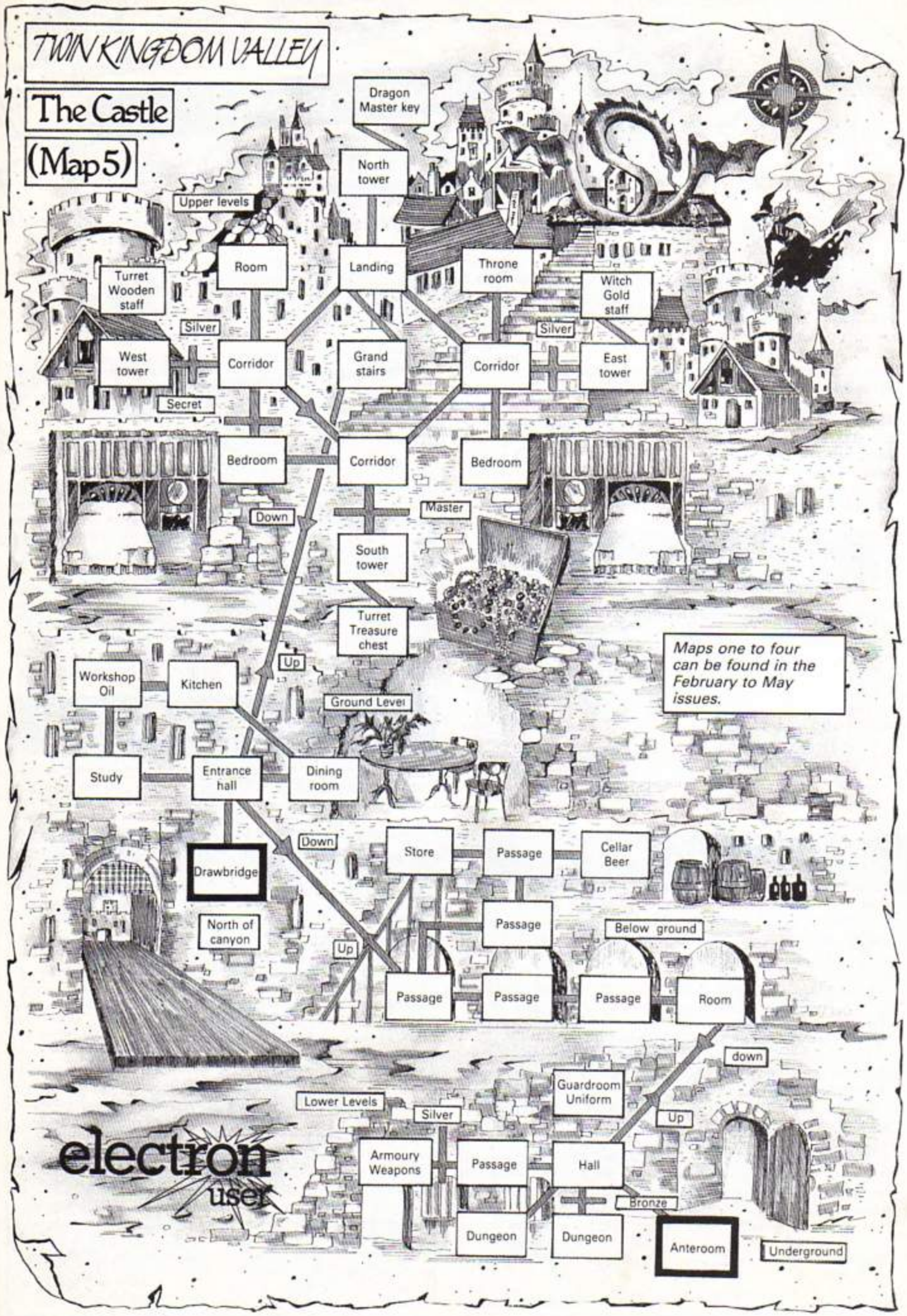
Go to the guard's dormitory. W, W, N, N. Take the gloves from the fourth locker to begin dressing to open the beehive. UNLOCK FOURTH LOCKER, OPEN FOURTH LOCKER, GET GLOVES. Return to the ruined farmhouse living area to complete your dress. S, S, E, E, N, NW, N, N, N, IN, IN, WEAR VEIL AND GLOVES.

Now find something to put the bees to sleep. OUT, OUT, SW, S, E, NE, E, E, WEAR BAND, GET ROD, W, NW, SW, S, IN, GET FLEECE, OUT, W, GET TIN, E, N, W, RUB ROD WITH FLEECE, DROP ROD AND FLEECE, GET KEY, E, NE, E, SW, UP, E, UNLOCK CHEST, OPEN CHEST, DROP KEY, GET TOBACCO, W, DOWN, IN, GET PLIERS, OUT, NE, N W, SW, W, W, DROP STAFF, GET PIPE, FILL PIPE WITH TOBACCO, GET STAFF.

Open the hive to get the wax. E, N, N, N, IN, IN, E, N, LIGHT PIPE, OPEN HIVE, DROP PIPE, GET WAX. Visit the church, clue hunting. S, W, OUT, OUT, SW, S, SE, IN. Open the way to the crypt, before going on to the lecturn. N, CUT CHAIN, DROP PLIERS, S, SW, UP, UP.

Find the rector's bible and act on the information

Turn to Page 13 ►


TWIN KINGDOM VALLEY
The Castle
(Map 5)
Dragon Master key
North tower
Upper levels
Room
Landing
Throne room
Witch Gold staff
Turret Wooden staff
Silver
Silver
West tower
Corridor
Grand stairs
Corridor
East tower
Secret
Bedroom
Corridor
Bedroom
Down
Master
South tower
Turret Treasure chest
Up
Workshop Oil
Kitchen
Ground Level
Maps one to four can be found in the February to May issues.
Study
Entrance hall
Dining room
Down
Store
Passage
Cellar Beer
Drawbridge
North of canyon
Passage
Below ground
Up
Passage
Passage
Passage
Room
down
Guardroom Uniform
Lower Levels
Silver
Up
Armoury Weapons
Passage
Hall
Bronze
Dungeon
Dungeon
Anteroom
Underground
electron user

◄ *From Page 11*

inside. TAKE BIBLE, READ BIBLE, DROP BIBLE, GET PARCHMENT, READ PARCHMENT, DROP PARCHMENT, D, D, NW, KNEEL, PRAY, STAND, EXAMINE ALTAR.

Enthar Seven – *The Boss* (continued from last month)

This is it: The final part of this long-running solution! Return to the mountains of Yarryl beyond the Lorvox household in sector two, equipped with the biscuit, the sweet, the hammer, the torch, the goggles, the translator, the flask of water, the mirror and the bracelet.

Once you reach them, select a safe spot and drop all the objects except the torch, hammer and bracelet. Set your teleport bracelet by saying SET, and proceed towards the dark tunnel. When you reach the chasm, remember you cannot jump it if you are carrying more than one object.

Also bear in mind that you can jump out of light and into light, but not from dark to dark! With a bit of careful planning you should be able to cross the chasm with both the hammer and the torch.

Hammer the rustic wall to find the scroll, then teleport back to the mountains where you can gather up your possessions. Once again you should set the bracelet. Using the translator, the scroll will give you a safe route through the Yarryl mountains. However, you will need to eat both the sweet and the biscuit for sustenance on your journey.

The guard-beast can be circumnavigated if you simply shut her kennel door, but the monument may pose the biggest problem you have yet encountered. Try to solve the puzzle of the tomb before reading the rest of this

solution as I can guarantee they will pose some real head-scratchers.

The tomb of Meta Lorvox will provide you with a cure-all pill which you will soon need to swallow. Ben's tomb is guarded and well booby-trapped. Don't be tempted to switch on your torch, but venture through the darkness to the ante-room beyond.

The laser can be destroyed using the mirror, but you must wear the goggles while performing this operation. The securibot needs careful observation before you try to pass him. Eat the pill and drink the water before you remove the memomatic from the rotting corpse. Then teleport back to the mountains.

Return to the command centre and use the memomatic to open the safe, from where you can gather the key-card. Now drop the memomatic and return to the giant hallway. Carrying just the key-card, muffler, goggles and spacesuit, and you can now venture outside to your spacecraft.

I'll leave you to negotiate the final simplistic hurdles and victory is yours! One point of interest: Of the dozens of objects in this game, I could find no obvious use for the blue flower – was it just a forget-me-not?

Adventure Anthology

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INTERFACING INTO THE WIND

JOE PRITCHARD presents a master control program as the final part of his useful weather station project

We will finish off the weather monitoring project this month by detailing the software needed to read off wind direction. There's also a program which will monitor all the interfaces, provide printed copy, and file to disc or tape all the data gathered.

First of all, the weather vane software. This is fairly straightforward, and the basic code is:

```
1000 direction = INT(ADVAL(3
)/256)
1010 FOR I%=1 TO 8
1020 IF direction > bottom(I
%) AND direction < top(I%) d
$ = direction$(I%)
1030 NEXT I%
1040 PRINT d$
```

The variables *bottom(8)*, *top(8)* and *direction$(8)* are all arrays. The string array *direction$()* holds North, North East, East, South East, South, South West, West, North West.

The *bottom()* and *top()* arrays hold the minimum and maximum values returned by the ADVAL(3)/256 function, when the wind vane is placed in the corresponding position in *direction$()*.

For instance, on my vane, I positioned it as it would be in the face of a wind blowing from the south. I then moved the vane about this central position and obtained a lower south limit, which was put in *bottom(5)*, and an upper south limit that was placed in *top(5)*.

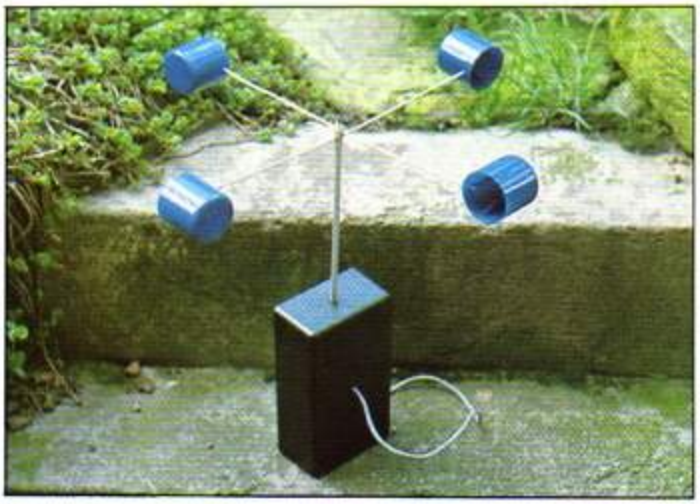
Now, any reading taken can be judged against the top and bottom limits of each of these directions and a string representing wind direction read off from the corresponding *direction$()* array.

This is shown in Program I, where lines 1230 to 1300 are responsible for reading the wind direction. The data statements are found at lines 1580 to 1600, and the arrays are initialised in line 730.

I've left the *top* and *bottom* values (to be found in that order in the data statement for each direction) set to zero for each direction. You'll need to enter these values yourself.

We now can add the final touches to our weather station itself. The wind vane and anemometer were both mounted in boxes available from electronics stockists, and were placed so they could catch the wind.

In the prototype, the anemometer box housed the wet and dry thermometer circuit board – see the illustration opposite – but the sensors for these were situated outside the box, in a housing similar to one descibed in a previous article. The biggest installation work is the cabling between the various different projects. I had the wind vane circuit in its own box, mounted fairly close to the anemometer, but not so close as to cause eddies in the wind that would affect readings of either wind direction or speed.



The anemometer box

The wiring from both of these boxes was taken to a smaller box, inside of which was a chocolate block-type connector. Into one side I connected the wires from each separate project, and to the other I attached a lead with a D-plug for connection to the Electron's Plus 1.

Before I mounted the weather station outdoors I tested it with all the wiring in place – it's easier to do it this way.

The wind sensors need to be in the best open surroundings possible. You might like to mount them on a platform like a bird table, or something similar. Again, ensure the wind vane and the anemometer don't interfere with each other.

Keep the connections between different boxes and the computer as short as possible, and don't run the lead to the computer past any mains cables, phone lines and so on, which might cause interference to be picked up by the Plus 1 a/d converter.

Program II shows a simple monitoring program, which pulls together all the projects and displays the readings in sequence.

Each piece of equipment in turn is checked, and the result displayed on screen. The program will also allow you to save readings in a Basic array, and the contents can be saved to tape or disc.

The program is fairly self-documenting, making constant use of meaningful procedure and function names. It is quite elementary, and bits could be added to it very easily.

PROCinitialise sets up the variables used, and dimensions arrays and the code space required by the program.

Note that the values given to *wet*, *dry* and *wind* depend upon which ADVAL channel you are using to monitor these parameters.

In addition, the *temp0* and *counts_per_degree* arrays need to be initialised with the values obtained when you calibrated the temperature sensor circuits. The values shown are those used for my own circuits.

PROCinput_time allows the current time to be entered whenever readings are to be taken, and the hours should be entered using a 24 hour clock format – that is, 2pm should be entered as 14.

The hours and minutes entered are then converted into hundredths of seconds so that Basic's TIME function can be used to update the time while the program is running. This time keeping isn't terribly accurate over very long periods,

but is good enough for our purposes.

PROCprint_time actually displays the current time on the screen, and is also responsible for signalling when values are to be written to the various arrays.

Line 1480 checks the time and sets a flag every so often, so that a dump of results to the arrays can be performed by *PROCcheck_time*.

Currently this flag is set every two minutes by checking when the minutes part of the time MOD 2 is zero. We could change this to dump every 10 minutes, for example, by changing the 2 after the MOD to 10.

PROCcheck_time looks at the variable *array_flag$* to see if you've set the program to dump the results to an array. It also checks the *time_out* flag set in *PROCprint_time*, and only if this is set to one and *array_flag$* equals Y are the results placed into the relevant arrays.

A pointer to the array is incremented, and if this reaches the array size limit – 30 – then *array_flag$* is set to N by the program, thus preventing any more entries.

PROCsave_arrays writes the contents of the array out to tape or disc for future analysis. As the program stands, the filename is fixed at *data* but can be altered.

Using the program is easy – simply run it and enter the current time. If you want to start saving data in arrays at any point, press the Escape key and answer Y to the "Store results in array?" prompt.

To stop storing the results, press Escape again and enter N in response to this prompt.

On the Escape screen you'll also be asked whether you want to save the arrays, and if you wish to finish with the program.

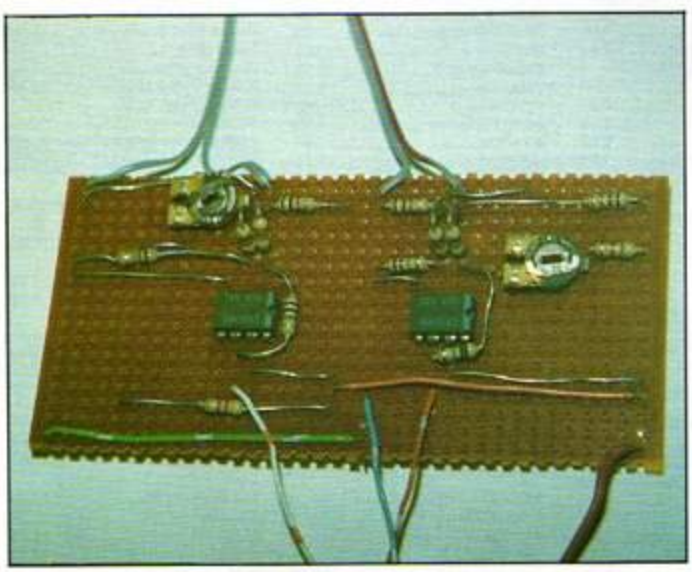
Saving the arrays will write them to tape or disc, and answering Y to the finish prompt will end the program run. Entering N will resume monitoring.

Simple extensions of this software could include:

- A more attractive display screen.
- More options offered on the Escape screen, like a print out option.
- Larger arrays.
- Saving of minimum and maximum data to disc or tape along with the arrays.

To read the files written by the program, a procedure similar to Program II could be used. Here, we simply open the file, read in the array items and print them out.

- *Next month we change tack slightly and begin to look at the cartridge slot of the Plus 1, and see how we can build a simple 8 bit digital input/output port.*



The wet and dry thermometer circuit board

Program I

```
  10 REM Weather monitor
  20 REM By Joe Pritchard
  30 REM (c) Electron User
  40 :
  50 ON ERROR GOTO 1750
  60 PROCinitialise
  70 PROCassemble
  80 PROCinput_time
  90 MODE 6
 100 REPEAT
 110 PROCevent_on
 120 PROCwind_speed
 130 PROCevent_off
 140 PROCwind_direction
 150 PROCwet_temp
 160 PROCdry_temp
 170 PROCcheck_time
 180 PROCprint_time
 190 UNTIL FALSE
 200 END
 210 :
 220 DEFPROCassemble
 230 FOR pass = 0 TO 2 STEP
2
 240 P%=code%
 250 [
 260 OPT pass
 270 .event_service
 280 PHA
 290 PHP
 300 LDA #1
 310 STA &70
 320 PLP
 330 PLA
 340 RTS
 350 :
 360 .event_on
 370 LDX #clock MOD 256
 380 LDY #clock DIV 256
 390 LDA #4
 400 JSR &FFF1
 410 LDA #14
 420 LDX #5
 430 JSR &FFF4
 440 RTS
 450 :
 460 .event_off
 470 LDA #13
 480 LDX #5
 490 JSR &FFF4
 500 RTS
 510 :
 520 ]
 530 NEXT pass
 540 ENDPROC
 550 :
 560 DEFPROCevent_on
 570 !clock = &FFFFFE0C: cl
ock?4 = &FF
 580 ?&220=event_service MO
D 256
 590 ?&221=event_service DI
V 256
 600 ?&70=0
 610 CALL event_on
 620 ENDPROC
 630 :
 640 DEFPROCevent_off
 650 ?&220=old_event
 660 ?&221=old_event1
 670 CALL event_off
 680 ENDPROC
 690 :
 700 DEFPROCinitialise
 710 DIM counts_per_degree(
2), temp0(2), code% 100, clo
ck 20
 720 DIM top(10), bottom(10
), dir$(10), time$(30), wet(
30), dry(30), win_d$(30), wi
n_s(30)
 730 FOR I%=1 TO 8:READ top
.(I%), bottom(I%), dir$(I%):N
EXT I%
 740 wet = 2 : REM depends
on which ADVAL channels you
used
 750 dry = 1 : REM as to ho
w these three variables are
set
 760 wind = 3 : REM up here
.
 770 :
 780 REM next initial value
s depend upon temp. sensor c
ircuit calibrations
 790 :
 800 temp0(wet) = 17 : temp
0(dry) = 19
 810 counts_per_degree(wet)
 = 6.4 : counts_per_degree(d
ry) = 6.9
 820 :
 830 @%=&20209
 840 old_event=?&220
 850 old_event1=?&221
 860 TIME = 0
 870 real_time%=TIME
 880 array_flag$="N"
 890 pointer%=1:minimum = 9
99: maximum = 0
 900 time_out = 0: temp_tim
e=0
 910 ENDPROC
 920 :
 930 DEFFNadval(x)
 940 =INT(ADVAL(x)/256)
 950 :
 960 DEFFNtemperature(chann
el)
 970 counts_per_degree=6.4
 980 temp0=17
 990 =(FNadval(channel)-tem
p0)/counts_per_degree
1000 :
1010 DEFPROCwind_speed
1020 real_time% = TIME
1030 TIME=0
1040 REPEAT:UNTIL(ADVAL(0)A
ND3)=0OR?&70=1
1050 REPEAT:UNTIL(ADVAL(0)A
ND3)=1OR?&70=1
1060 T=TIME/100:IF ?&70=0T=
1/T ELSE T=0
1070 IF T=0PRINTTAB(10,6)"S
till air!                " E
LSE PRINTTAB(10,6)T;"   Revs
. per Second "
1080 TIME=real_time% + TIME
1090 ENDPROC
1100 :
1110 DEFPROCwet_temp
1120 PRINTTAB(10,8)"Wet bul
b temperature: ";FNtemperatu
re(wet)
1130 ENDPROC
```

Turn to Page 19 ▶

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◀ From Page 17

```
 1140 :
 1150 DEFPROCdry_temp
 1160 PRINTTAB(10,9)"Dry bul
b temperature: ";FNtemperatu
re(dry)
 1170 IF FNtemperature(dry)
> maximum THEN maximum = FNt
emperature(dry)
 1180 IF FNtemperature(dry)
< minimum THEN minimum = FNt
emperature(dry)
 1190 PRINTTAB(10,10)"Max. T
emperature: ";maximum
 1200 PRINTTAB(10,11)"Min. T
emperature: ";minimum
 1210 ENDPROC
 1220 :
 1230 DEFPROCwind_direction
 1240 direction = FNadval(wi
nd)
 1250 direct$ = "  "
 1260 FOR I%=1 TO 8
 1270 IF direction > bottom(
I%) AND direction < top(I%)
THEN direct$=dir$(I%)
 1280 NEXT I%
 1290 PRINTTAB(10,7)"Wind di
rection is "+direct$
 1300 ENDPROC
 1310 :
 1320 DEFPROCcheck_time
 1330 IF array_flag$ = "N" O
R time_out=0 THEN ENDPROC
 1340 wet(pointer%)=FNtemper
ature(wet)
 1350 dry(pointer%)=FNtemper
ature(dry)
 1360 time$(pointer%)=STR$(I
NT(hours))+STR$(INT((hours-I
NT(hours))*60))
 1370 win_d$(pointer%)=direc
t$
 1380 win_s(pointer%)=T
 1390 pointer%=pointer%+1:IF
 pointer%>30 THEN array_flag
$="N"
 1400 time_out=0
 1410 ENDPROC
 1420 :
 1430 DEFPROCprint_time
 1440 secs = real_time%/100
 1450 minutes = secs / 60
 1460 hours = minutes / 60
 1470 PRINTTAB(10,12)"Curren
t Time is ";STR$(INT(hours))
;":";STR$(INT((hours-INT(hou
rs))*60))
 1480 IF INT((hours-INT(hour
s))*60) MOD 2 = 0 THEN IF te
mp_time<>INT((hours-INT(hour
s))*60) THEN time_out=1:temp
_time=INT((hours-INT(hours))
*60)
 1490 ENDPROC
 1500 :
 1510 DEFPROCinput_time
 1520 INPUT "Hours: ",hours
 1530 INPUT "Minutes: ",minu
tes
 1540 real_time%=((hours*60)
 + minutes) * 60 * 100
 1550 TIME = real_time%
 1560 ENDPROC
 1570 :
 1580 DATA 0,0,North,0,0,Nor
th-east,0,0,East
 1590 DATA 0,0,South-east,0,
0,South,0,0,South-West
 1600 DATA 0,0,West,0,0,Nort
h-west
 1610 :
 1620 :
 1630 DEFPROCsave_arrays
 1640 Y%=OPENOUT("data")
 1650 FOR I%=1 TO 30
 1660 PRINT#Y%,time$(I%)
 1670 PRINT#Y%,win_d$(I%)
 1680 PRINT#Y%,win_s(I%)
 1690 PRINT#Y%,wet(I%)
 1700 PRINT#Y%,dry(I%)
 1710 NEXT I%
 1720 CLOSE#Y%
 1730 ENDPROC
 1740 :
 1750 REM Escape key trap
 1760 IF ERR <> 17 THEN REPO
RT:PRINT;" at ";ERL
 1770 TIME = real_time%
 1780 VDU3
 1790 CLS
 1800 INPUTTAB(10,8)"Store r
esults in array",array_flag$
 1810 INPUTTAB(10,10)"Save a
rray ",save$
 1820 INPUTTAB(10,12)"Finish
 with program ",finish$
 1830 IF save$="Y" THEN PROC
save_arrays
 1840 IF finish$="Y" THEN EN
D
 1850 CLS
 1860 GOTO 100
```

Program II

```
  10 REM data file read
  20 REM By Joe Pritchard
  30 REM (c) Electron User
  40 :
  50 DEFPROCread_data
  60 Y%=OPENIN("data")
  70 FOR I%=1 TO 30
  80 INPUT#Y%,a$
  90 INPUT#Y%,b$
 100 INPUT#Y%,c,w,d
 110 PRINT a$,b$,c,w,d
 120 NEXT I%
 130 CLOSE #Y%
 140 ENDPROC
```

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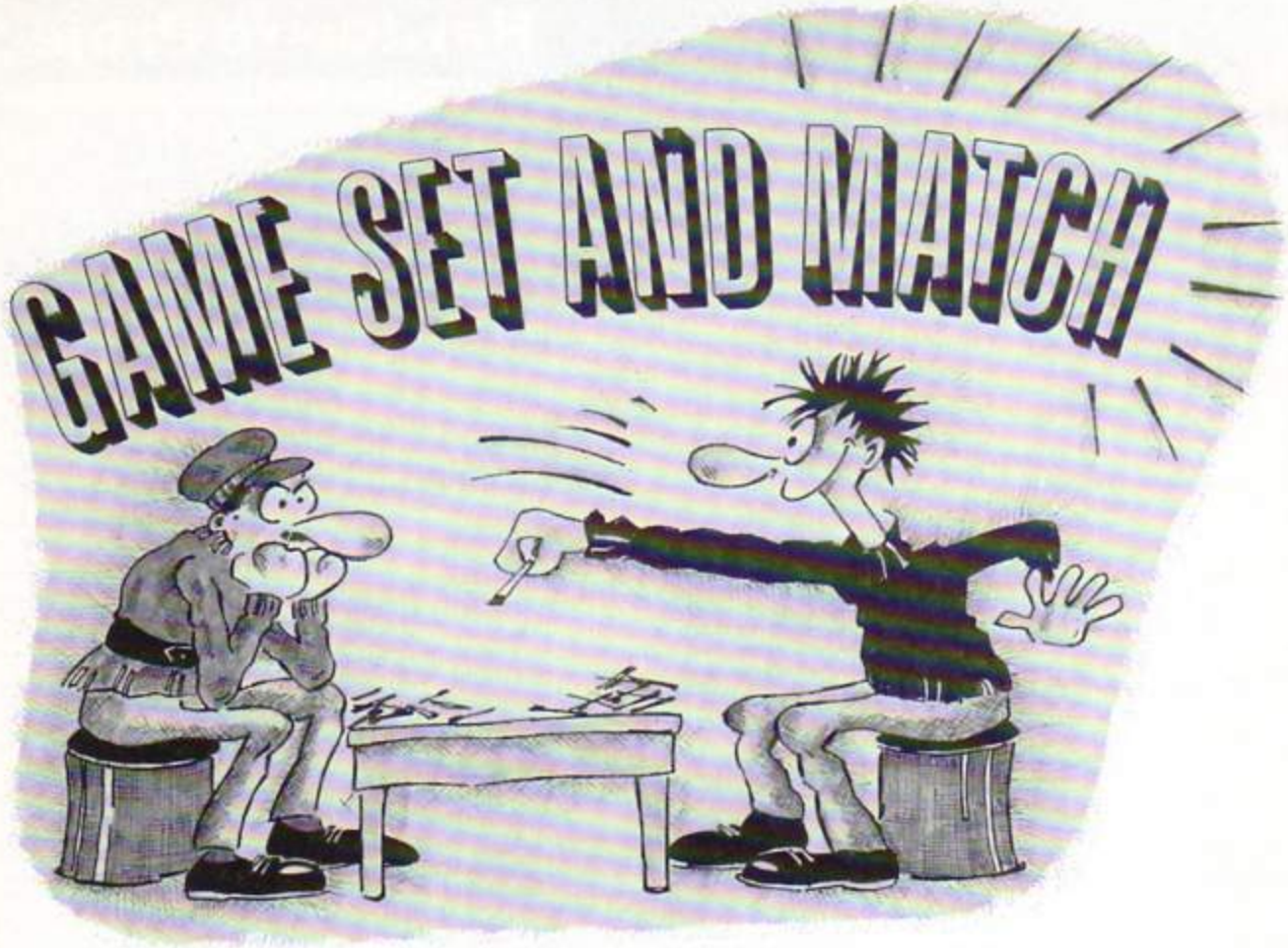


Strike a light! It's a battle for the last match in NEIL DAVIDSON's clever strategy game

FIBONACI Nim is a game of strategy, based on the popular match puzzle of the same name.

The object of the game is for two players to take turns at removing matches from a pile of abitrary size. The winner is the one who manages to take the last match.

Simple it may sound, but this is a very challenging puzzle requiring a great deal of thought. There is only one rule of play – each player may not remove more than double the matches taken by the other player during the previous go.

The reason why the game is called Fibonacci Nim is that the winning strategy is based on the Fibonacci series – but you will have to get your maths textbook out, because we don't intend to spoil the fun by revealing just what this is.

The game allows two humans to play against one another, or one human versus the computer, or the computer can even play itself – type 2, 1 or 0 respectively at the "Number of players?" prompt.

The computer is, of course, well aware of the Fibonacci series, and is therefore very hard to beat, but it can be done.

VARIABLES

C%	Number of counters
P%	Maximum that can be removed
R%	Number of counters removed
n1$	Player one's name
n2$	Player two's name

PROCEDURES

double()	Prints double-height text
set	Sets up the title page
box()	Draws a bordered box
play	Asks for players' details
game	Main game loop
delete	Removes matches from the pile

```
10 REM Fibonacci Nim
20 REM By Neil Davidson
30 REM (c) Electron User
40 REM
50 IF PAGE=&E00 THEN 100
60 *FX21,0
70 *K.0 *T.|MFORI%=0TO(TO
P-PAGE)STEP4:I%!&E00=I%!PAGE
:NEXT|MPAGE=&E00|MOLD|MRUN|M
80 *FX138,0,128
90 END
100 MODE1
110 ONERRORRUN
120 VDU23;8202;0;0;0;
130 PROCset
140 ONERROR CLEAR:GOTO150
150 PROCdata
160 REPEAT
170 PROCinit
180 PROCplay
190 CLS
200 PROCsquare
210 PROCgame
220 UNTIL0
230 END
240 DEFPROCinit
250 R5=5^0.5
260 R1=1+R5
270 R2=1-R5
280 F$=""
290 FORI=1 TO 10
300 F$=F$+CHR$(FNfibon(I))
310 NEXT
320 VDU23,224,&3C,&76,&EB,
&D5,&AB,&D7,&6E,&3C
330 T%=0
340 ENDPROC
350 DEFFNfibon(N%)
360 =((R1/2)^N%-(R2/2)^N%)
/R5
370 DEFFNfactor(I%)
380 FORI=10 TO 1 STEP-1
390 A%=ASC(MID$(F$,I,1))
400 IFA%<=I% I%=I%-A%:J%=A
%
410 NEXT
420 =J%
430 DEFPROCdbl(A$,X,Y)
440 VDU31,X,Y
450 A%=10:X%=&70:Y%=0
460 FORI=1 TO LENA$
470 ?&70=ASC(MID$(A$,I,1))
480 CALL&FFF1
490 IFPOS>33 PRINTTAB(X)
500 VDU23,225,?&71,?&71,?&
72,?&72,?&73,?&73,?&74,?&74,
23,226,?&75,?&75,?&76,?&76,?
&77,?&77,?&78,?&78,225,10,8,
226,11
510 NEXT
520 ENDPROC
530 DEFPROCset
540 *FX115,1
550 VDU19,3,4,0;0;0
560 PROCbox(32,32,1276,102
0,1)
570 PROCbox(0,0,1246,998,3
)
580 PROCbox(384,800,894,92
8,1)
590 PROCbox(368,784,878,91
2,2)
600 PROCbox(351,30,895,70,
1)
610 MOVE416,880:GCOL0,0:VD
U5:PROCdbl("Fibonacci Nim",0
,0)
620 MOVE412,876:GCOL0,3:VD
U5:PROCdbl("Fibonacci Nim",0
,0)
630 MOVE367,66:GCOL0,0:PRI
NT;"By Neil Davidson"
640 VDU4
650 VDU28,2,27,36,9
660 *FX115,0
670 ENDPROC
680 DEFPROCbox(X1,Y1,X2,Y2
,C%)
690 GCOL0,C%+128
700 VDU24,X1;Y1;X2;Y2;
710 CLG
720 VDU26
730 GCOL0,C%MOD3+1
740 MOVEX1,Y1:DRAWX2,Y1:DR
AWX2,Y2:DRAWX1,Y2:DRAWX1,Y1
750 ENDPROC
760 DEFPROCplay
770 VDU28,2,27,36,9
780 COLOUR131
790 CLS
800 COLOUR0:PROCdbl("How m
any players ?",0,1)
810 *FX15
820 REPEAT:A=GET-48:UNTILA
>-1 AND A<3
830 PROCdbl(CHR$(A+48),18,
1)
840 PRINT'
850 IFA=0 P1%=0:P2%=0:n1$=
"Computer":n2$="Nimachine" E
LSE IFA=1 PROCwhich ELSE IFA
=2 PROCnames
860 COLOUR2
870 PRINT'
880 IFFNquery("Do you want
to choose the number of co
unters ?")=1 PROCchoose ELSE
C%=RND(66)+15
890 ENDPROC
900 DEFPROCwhich
910 PRINT'
920 COLOUR1
930 n1$=FNinput("Your name
please ....")
940 PRINT'
950 COLOUR2
960 IFFNquery("Do you want
to go first ?")=1 P1%=1:P2%
=0:n2$="Nimachine" ELSE P1%=
0:P2%=1:n2$=n1$:n1$="Nimachi
ne"
970 ENDPROC
980 DEFPROCnames
990 PRINT'
1000 COLOUR2
1010 n1$=FNinput("Player on
e's name ....")
1020 PRINT'
1030 n2$=FNinput("Player tw
o's name ....")
1040 P1%=1:P2%=1
1050 ENDPROC
1060 DEFPROCchoose
1070 PRINT'
1080 REPEAT
1090 C%=EVAL(FNinput("How m
any counters (15 - 81) ?"))
1100 UNTILC%>14 AND C%<82
1110 ENDPROC
1120 DEFFNquery(A$)
1130 PROCdbl(A$,POS,VPOS)
1140 *FX15
1150 REPEAT:A$=CHR$(GETAND2
23):UNTILA$="Y" OR A$="N"
1160 IFA$="Y" PROCdbl("Yes"
,POS,VPOS):=1 ELSE PROCdbl("
No",POS,VPOS):=0
1170 DEFPROCsquare
1180 PROCbox(432,218,784,64
0,1)
1190 VDU28,2,27,36,9
1200 EX%=INT(C%^0.5)
1210 X1=17-EX%/2
1220 Y1%=9-INT(C%/EX%)/2
1230 S%=0
1240 X=X1:Y%=Y1%
1250 COLOUR129:COLOUR0
1260 REPEAT
1270 VDU31,X,Y%,224
1280 X=X+1:IFX>=17+EX%/2 X=
X1:Y%=Y%+1
1290 S%=S%+1
1300 UNTILS%=C%
1310 PROCbox(992,560,1120,6
72,1)
1320 VDU28,2,27,36,9
1330 PROCdbl(STR$C%,30,3)
1340 ENDPROC
1350 DEFPROCgame
1360 VDU28,2,27,36,9
1370 P%=C%-1
1380 COLOUR2:COLOUR131:PROC
dbl("Max :"+STR$P%,0,5)
1390 VDU28,2,28,36,26
1400 PL%=1
1410 COLOUR131:COLOUR1
1420 REPEAT
1430 CLS
1440 IFPL%=1 nm$=n1$ ELSE n
m$=n2$
1450 PRINTTAB(0,0);nm$;" ..
..."
1460 FORX=1 TO 500:NEXT
1470 IF(PL%=1 AND P1%=0)OR
(PL%=2 AND P2%=0) PROCmove(F
Namove) ELSE REPEAT:INPUT"Ho
w many counters do you wish
to remove ",R%:UNTILR%>0 A
ND R%<=C% AND R%<=P%:PROCmov
e(R%)
1480 PL%=3-PL%
1490 UNTILC%=0
1500 PL%=3-PL%
1510 VDU28,2,27,36,9
1520 COLOUR131:COLOUR0:CLS
1530 PROCdbl("Well done !!!
",1,1)
1540 PROCdbl("Player "+STR$
PL%+" ("+nm$+") won !!!",1,3
)
1550 COLOUR1
1560 PRINT""
1570 PROCdbl("Press Space f
or another game",2,10)
1580 S%=0:REPEAT:SOUND1,-15
,sn(S%),sn(S%+1)
1590 REPEATUNTILADVAL(-6)=1
5
1600 FORT=1 TO 40*sn(S%+1)
1610 NEXT
1620 S%=(S%+2)MOD 82:UNTILI
NKEY0=32
1630 ENDPROC
1640 DEFFNamove
1650 IFFNfactor(C%)<=P% =FN
factor(C%)
1660 =RND(P%-1)+1
1670 DEFPROCmove(N%)
1680 T%=T%+N%:C%=C%-N%
1690 PROCdelete(T%)
1700 P%=N%*2:IFP%>C% P%=C%
1710 COLOUR131:COLOUR2
1720 PROCdbl(STR$P%+" ",5,5
)
1730 COLOUR131:COLOUR1
1740 VDU28,2,28,36,26
1750 ENDPROC
1760 DEFPROCdelete(T%)
1770 S%=0
1780 X=X1:Y%=Y1%
1790 COLOUR129
1800 COLOUR0
1810 VDU28,2,27,36,9
1820 REPEAT
1830 VDU31,X,Y%,32
1840 X=X+1:IFX>=17+EX%/2 X=
X1:Y%=Y%+1
1850 S%=S%+1
1860 UNTILS%=T%
1870 PROCdbl(STR$C%+" ",30,
3)
1880 ENDPROC
1890 DEFFNinput(A$)
1900 PROCdbl(A$,POS,VPOS)
1910 B$=""
1920 *FX15
1930 REPEAT
1940 REPEAT
1950 A=GET:UNTIL(A>31 AND A
<127 AND LENB$<10) ORA=13 OR
(A=127 AND B$<>"")
1960 IFA=127 VDU127,10,32,1
1,8:B$=LEFT$(B$,LENB$-1):GOT
02010
1970 IFA=13 THEN 2010
1980 A$=CHR$A
1990 B$=B$+A$
2000 PROCdbl(A$,POS,VPOS)
2010 UNTILA=13
2020 =B$
2030 DEFPROCdata
2040 DIMsn(82)
2050 RESTORE
2060 FORI=0 TO 79 STEP2
2070 READsn(I),B:sn(I+1)=B*
2
2080 NEXT
2090 ENDPROC
2100 DATA52,4,72,1,72,1,72,
2,72,2,92,2,108,2,108,2,92,1
,88,1,72,2,88,1,88,1,88,1,88
,1,88,1,88,1,68,0.5,60,0.5,5
2,0.5,52,0.5,72,1,72,1,72,1,
92,1,108,1,108,1,92,0.5,88,0
.5,72,1,88,1,88,1,52,1,52,1,
72,0.5,72,0.5,72,0.5,72,0.5,
72,0.5,72,0.5
2110 DATA52,1
```

This listing is included in this month's cassette tape offer. See order form on Page 53.

STAYING IN THE SHADOWS

How to edit two programs at once – Part III of CHRIS NIXON's series on using Slogger's Master Ram Board

WE developed a simple shadow ram database last month, using all of bank zero's lower 12k as the data storage area. This month I'm presenting you with a complete utility which allows this same area to hold up to an 8k long Basic program, while another is being edited or run in bank one – the normal Basic program area in 64k mode.

This time I am afraid there's no sparing you from the dreaded machine code – the very nature of this month's utility necessitates the use of 100 per cent assembly language. But don't worry, the techniques used here are still basically the same as those outlined in the past two articles.

Type in Program I, and save it under a suitable filename before running. When run, the assembled machine code is saved on your tape or disc as TWIN – so make sure you don't save Program I using this name.

Now, as we have seen in the previous two articles, all the lower 12k in bank zero between locations &0000 and &3000 is never used unless you have Slogger's printer buffer rom. Therefore there is exactly the same amount of free memory going to waste as is used by the longest possible program capable of running in Modes 0, 1 and 2.

Twin takes advantage of this fact, and allows you to have two Basic programs resident in memory at the same time, so long as neither exceeds the maximum size Mode 0, 1 or 2.

One is held in the normal 64k mode program ram, in bank one, while the unused 12k in bank zero holds the second program.

To use the utility at any time, make sure you are in 64k mode, insert the tape or disc holding the previously assembled code and type *TWIN. You now have one extra operating system or star command at your disposal, namely *SWAP. What this command does is very simple, but extremely powerful.

When typed in at the keyboard, *SWAP immediately swaps all of the ram between PAGE and &3000 for the corresponding memory locations in bank zero.

The first time you do this, the message *Bank 0 loaded* will be displayed.

If you now type LIST, you will undoubtedly get *Bad program*. This is because any Basic program in memory before the *SWAP command was typed will have been placed safely in bank zero, while the contents of bank zero – probably garbage – will have been copied into the current program area.

Effectively, you now have an empty memory, as if the machine had just been turned on. You can type NEW and start to write another program, or you can load one from tape or

```
  10 REM TWIN for Slogger's
  20 REM Master Ram Board
  30 REM By Chris Nixon
  40 REM (c) Electron User
  50 REM
  60 MODE6:FORPASS=0TO2STEP
2
  70 ptr1=&52:ptr2=&54
  80 P%=&900:[OPT PASS:SE1
  90 LDA &209:BPL skipvec
 100 LDA &208:STA &230:LDA
&209
 110 STA &231:LDA #patch MO
D 256
 120 STA &208:LDA #patch DI
V 256
 130 STA &209:LDA #1:STA ba
nk
 140 .skipvec
 150 CLI:LDA #10:STA &F4:ST
A &FE05:RTS
 160 .patch
 170 STX &70:STY &71:LDX #0
 180 .wordlp
 190 LDY #1:LDA comtab,X:BE
Q notfound
 200 .bytelp
 210 LDA (&70),Y:AND #223:C
MP comtab,X
 220 BNE nextword:CMP #13
 230 BEQ found:INX:INY:JMP
bytelp
 240 .nextword
 250 INX:LDA comtab,X:BNE n
extword
 260 INX:JMP wordlp
 270 .notfound
 280 LDX &70:LDY &71:JMP (&
230)
 290 .found
 300 LDA comtab+1,X:STA &50
 310 LDA comtab+2,X:STA &51
 320 JMP (&50)
 330 .swap
 340 LDA #0:STA ptr1:LDA &1
8
 350 STA ptr1+1
 360 .swaploop
 370 LDY #0:LDA (ptr1),Y:PH
A:LDX ptr1
 380 LDY ptr1+1:LDA #0:PHA:
PLP
 390 JSR &FBFD:LDY #0:STA (
ptr1),Y
 400 LDX ptr1:LDY ptr1+1:LD
A #&40
 410 PHA:PLP:PLA:JSR &FBFD:
CLC
 420 LDA ptr1:ADC #1:STA pt
r1
 430 LDA ptr1+1:ADC #0:CMP
#&30
 440 BEQ swapdone:STA ptr1+
1
 450 JMP swaploop
 460 .swapdone
 470 LDA bank:EOR #1:STA ba
nk:CLC
 480 ADC #48:STA bankmess+5
 490 .message
 500 LDA bankmess,X:JSR &FF
E3:INX
 510 CMP #13:BNE message:RT
S
 520 JMP &8AF3
 530 .bank
 540 BRK
 550 .bankmess
 560 EQUS"Bank X loaded":EQ
UB13
 570 .comtab
 580 EQUS"SWAP":EQUB13:EQUW
swap:BRK
 590 BRK
 600 ]:NEXT
 610 OSCLI"SAVE TWIN 900 "+
STR$~P%
```

Program I

disc. But whenever you want your old program back, just type *SWAP again, and you'll be greeted with the message *Bank 1 loaded*.

Don't be confused by this message. Although we are always inside bank one, the contents of bank zero were loaded into bank one after the first *SWAP.

This reminder simply means that now *SWAP has been used a second time, the original contents of bank one have been re-loaded, and bank zero holds the new program. Type LIST, and sure enough, there is your old program, safe and sound.

It's worth noting at this point a very interesting side effect of Twin. If you had a Basic program in memory before you switched to 64k mode and typed in the listing for Twin, you will find that after the first *SWAP it will re-appear!

Likewise, if you are editing a Basic program in 64k mode and you type *SWAP, flipping back to normal mode followed by Control+Break then OLD will recover this, too.

If you think about it, you will see why this happens. Because the 64k mode uses bank one to hold a Basic program, while bank zero is used in normal mode, flipping from one mode to the other won't disturb your program – it will just be paged out. And as long as its length doesn't exceed the magic &3000 upper limit, typing *SWAP will flip it back from apparent limbo into main memory once more.

The program Twin resides in page &900, where it is safe while a Swap is in operation. If you know even a smattering of assembly language, look at the listing carefully and you will see just how simple the program really is.

A machine code equivalent of the Basic FOR ... NEXT loop is used, which first takes a look in zero page at location &18 to ascertain the current setting of PAGE.

If you look at Memory Map part I from the April 1988 issue of *Electron User*, you can see that this location actually holds the high byte of PAGE. If it's at &1D00, location &18 will hold the value &1D, or 29 decimal.

Now that Twin knows where PAGE is, a loop is started which counts up from this value, swapping each byte in bank one for the same address byte in bank zero, using the simple routines given in Part I of this series.

The loop stops when &3000 is reached, whereupon you are informed which logical bank is currently resident in user ram. Finally, location &8AF3 in the Basic rom is called.

This is the routine which Basic uses after an ordinary LOAD command to reset its internal pointers and clear out all variables – it's necessary to neatly inform Basic of the new program's size, because we have used a strictly non-standard way of loading a program.

You may like to add your own shadow ram commands to Twin, and I have made this possible by using a full-blown command interpreter, rather than simply hard-wiring Twin to just accept *SWAP.

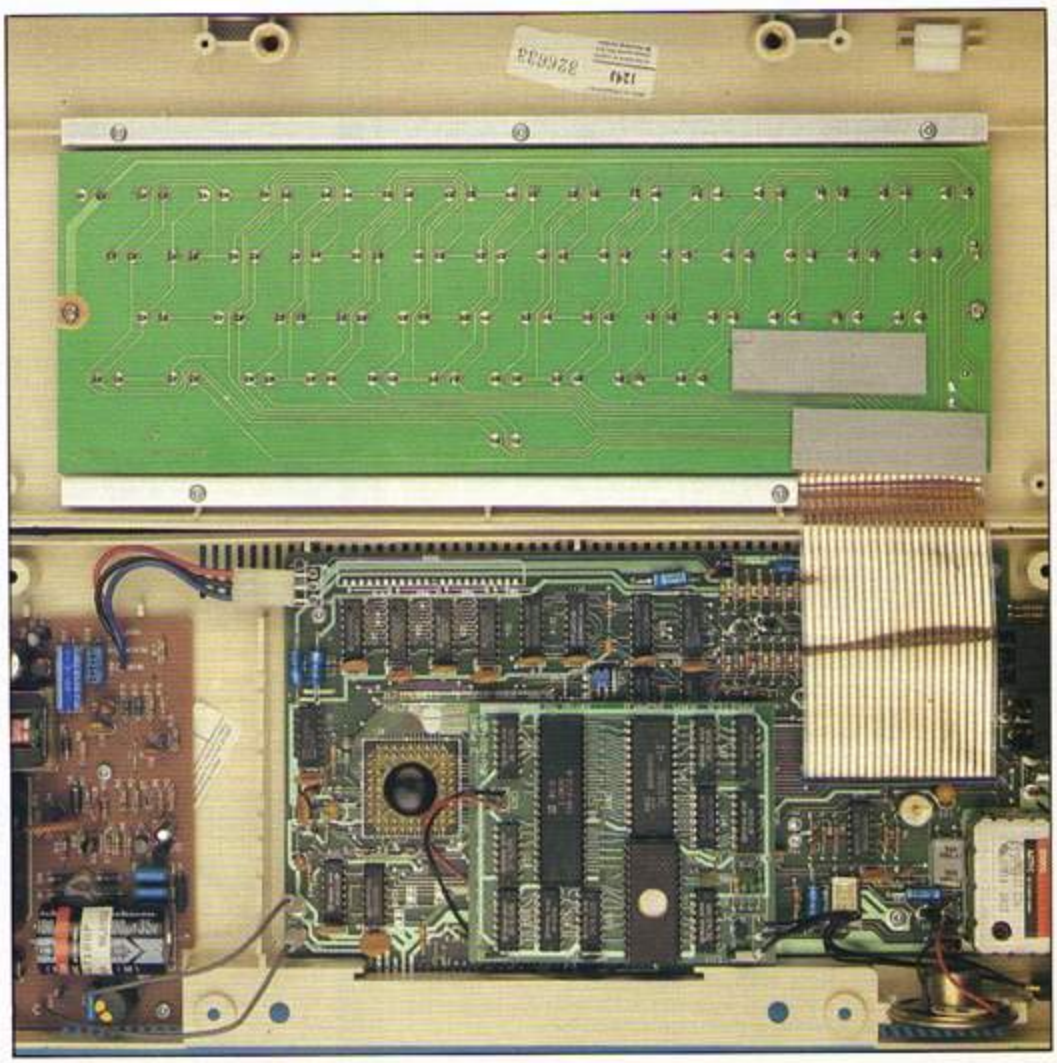
To add a new command, its name and address must be added to the command table between line 570 and 590 – line 590 contains the end of table marker. Note that line 580 is the entry for *SWAP, and the same format must be used for any extra commands.

The format is to place the command name itself, in capital letters, after the EQUS. Then put the routine's address in an EQUW statement, and finally a zero byte, or BRK instruction, at the end of the line.

Now all you have to do is add the new routine to the main program, not forgetting to label it with the same name you gave after the EQUW in the command table.

Experiment with *SWAP as much as you like, but remember – if you *SWAP a program which is too long to run in Modes 0, 1 or 2, you may not be able to *SWAP it back again – there is no guarantee against memory over the &3000 limit being overwritten by the new program.

● *Next month I'll present you with another complete utility, a shadow ram filing system.*



The Slogger Master Ram Board – including Turbo – in place on the Electron main circuit board

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    STOP PRESS
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In deep water

Dodge the man-eating sharks in this frantic race to defuse the bombs – from STEPHEN and DAVID BURNETT

THE year is 1989, and it is crisis point in the Gulf. Agents from opposing nations are systematically penetrating the waters near your country's stronghold, seeding them with deadly neutron mines.

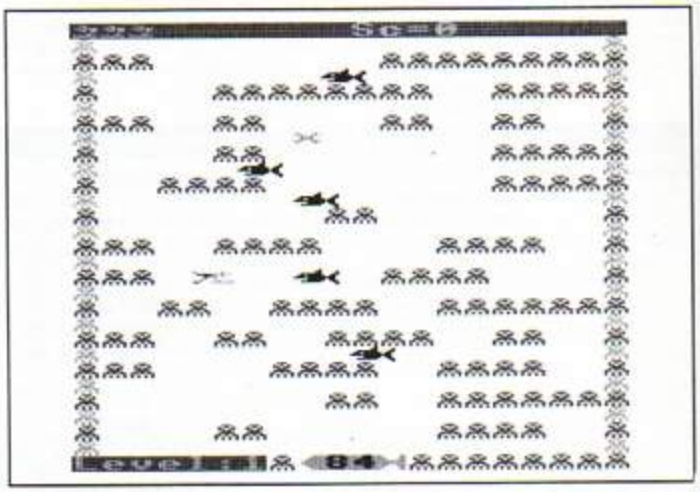
You, as your country's leading diver and bomb disposal expert – Jaques Custard – have been commissioned (at gunpoint) to keep the harbours free of any exploding items.

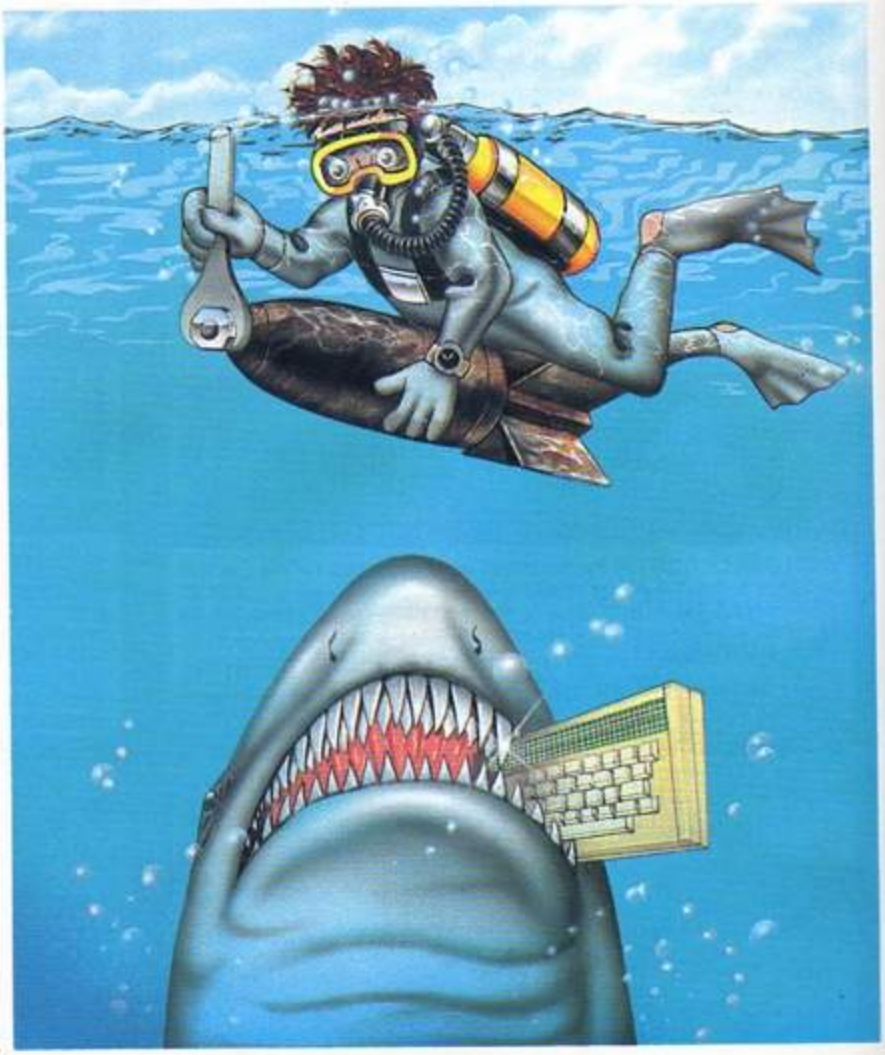
Your task is to swim around the shark-infested waters of the harbour, collecting the spanners which have been carelessly dropped by your ham-fisted assistant Penfold.

Once you have collected one you must take it to the bomb to defuse part of the mechanism – but to disable each bomb five serarate spanners are needed, and time is ticking steadily away.

The sharks which infest the water are a slight problem, but they can be killed with your trusty harpoon. However, the smell of the blood which this causes will attract other sharks which appear at random positions in the bay.

After you have defused the bomb you are given an extra life, and moved on to another part of the bay, containing faster, much more deadly sharks





CONTROLS

Z	Left
X	Right
:	Up
/	Down
Space	Fire

VARIABLES

LIVES%	Time left
Xpos	Shark X position table
Ypos	Shark Y position table
level%	Level
manX	Diver X position
manY	Diver Y position
spannerX	Spanner X position
spannerY	Spanner Y position
score%	Score
spanner%	Spanners collected

PROCEDURES

won	Go to next level
found	Spanner collected
shark	Move sharks
man	Move diver
key	Keyboard input
init	Set up variables
dead	Diver killed
hiscore	High score routine
assemble	Assembles machine code

```
  10 REM Bomb Alert
  20 REM by S.J.Burnett
  30 REM & D.J.Burnett
  40 REM (c) Electron User
  50 ON ERROR GOTO 4650
  60 PROCinit
  70 PROCassemble
  80 MODE5:VDU19,0,4,0,0,0:
VDU19,2,2,0,0,0
  90 VDU23,1,0;0;0;0;
 100 PROCsetmasks
 110 PROCskill
 120 REPEAT
 130 PROCdrawmaze
 140 PROCsetup
 150 *FX11,1
 160 *FX12,1
 170 A%=10:Y%=10:CALL code
 180 PRINTTAB(?manX,?manY);
A$
 190 key=GET
 200 REPEAT
 210 PROCkey
 220 PROCshark
 230 IF ?eaten PROCdead
 240 IF ?found PROCfound
 250 PROCbomb
 260 UNTIL LIVES%<1
 270 *FX12,0
 280 COLOUR3:PRINTTAB(6,20)
;"GAME OVER"
 290 time=TIME:REPEAT UNTIL
 TIME>time+300
 300 PROChiscore
 310 PROCsetup:score%=0:spa
nner%=0:LIVES%=3:level%=1
 320 UNTIL key$="N" OR key$
="n"
 330 MODE6:END
 340:
 350 DEFPROCbomb
 360 IF TIME<time2% + 100 E
NDPROC
 370 T%=T%-1
 380 COLOUR129:COLOUR3
 390 PRINTTAB(9,29);T%DIV10
;T%MOD10
 400 COLOUR128
 410 time2%=TIME
 420 IF T%<1 T%=50+delay%:P
ROCdead
 430 ENDPROC
 440:
 450 DEFPROCscore
 460 COLOUR130:COLOUR1
 470 PRINTTAB(0,1);STRING$(
LIVES%,CHR$224);STRING$(5-LI
VES%,CHR$32);STRING$(spanner
%,CHR$233);STRING$(5-spanner
%,CHR$32);"Sc=";score%
 480 COLOUR128
 490 ENDPROC
 500:
 510 DEFPROCwon
 520 score%=score%+200:LIVE
S%=LIVES%+1:spanner%=0
 530 IF LIVES%>5 LIVES%=5
 540 level%=level%+1
 550 SOUND1,3,157,20
 560 delay%=delay%-5
 570 IF delay%<0 delay%=0
 580 PRINTTAB(0,29);"Level:
";level%:PRINT:PRINT:PROCdra
wmaze
 590 ?spannerX=2+RND(9):?sp
annerY=2*RND(12)
 600 PROCreset:*FX21,0
 610 key=GET:TIME=0
 620 ENDPROC
 630:
 640 DEFPROCfound
 650 ?found=0
 660 IF got% PROCgot:ENDPRO
C
 670 got%=TRUE
 680 spanner%=spanner%+1:IF
spanner%>5 spanner%=5
 690 SOUND1,3,157,20
 700 score%=score%+200
 710 ?spannerX=9:?spannerY=
28
 720 SOUND1,3,157,20
 730 PROCscore
 740 ENDPROC
 750:
 760 DEFPROCgot
 770 IF spanner%=5 PROCwon:
PROCscore:ENDPROC
 780 got%=FALSE:time2%=time
2%+300
 790 SOUND1,3,157,20
 800 score%=score%+200
 810 ?spannerX=2*RND(9):?sp
annerY=2*RND(12)
 820 PROCscore
 830 ENDPROC
 840:
 850 DEFPROCshark
 860 IF TIME<time1%+delay%:
A%=10:Y%=10:CALL code:ENDPRO
C
 870 A%=RND(5):Y%=RND(5)
 880 CALL code,bitmap%(0),m
ask%(0)
 890 time1%=TIME
 900 IF NOT got% COLOUR RND
(3):PRINTTAB(?spannerX,?span
nerY);CHR$232
 910 ENDPROC
 920:
 930 DEF PROCkill
 940 SOUND1,2,100,20
 950 VDU19,3,11,0,0,0
 960 time%=TIME:REPEAT UNTI
L TIME=time%+50
 970 PRINTTAB(Xpos?I%,Ypos?
I%);SPC2
 980 Xpos?I%=4*RND(4):Ypos?
I%=4*RND(7)
 990 A%=10:Y%=10:CALL code
1000 VDU19,3,7,0,0,0
1010 score%=score%+100
1020 PROCscore
1030 ENDPROC
1040:
1050 DEF PROCsetmasks
1060 mask%(0)=1
1070 FOR m=1 TO 30
1080 mask%(m)=mask%(m-1)*2
1090 NEXT m
1100 ENDPROC
1110:
1120 DEF PROCdrawmaze
1130 LOCAL x,y,flag,nogap
1140 bitmap%(0)=&1FFFFFFC
1150 bitmap%(19)=&3FFFFFFC
1160 REPEAT
1170 FOR x=1 TO 17 STEP 2
1180 B%=(RND(&3FFFFFFF) AND
&2AAAAAAA) OR &20000002
1190 bitmap%(x)=B%:bitmap%(
x+1)=B%
1200 NEXT
1210 nogap=FALSE
1220 FOR y=0 TO 30
1230 flag=0
1240 COLOUR(y MOD 2 +1)
1250 FOR x=0 TO 19
1260 IF bitmap%(x) AND mask
%(y) THEN PRINT;CHR$240; ELS
E PRINT;SPC1;:flag=flag+1
1270 NEXT x
1280 IF flag=0 nogap=TRUE
1290 NEXT y
1300 UNTIL nogap=FALSE
1310 T%=50+delay%
1320 COLOUR1:PRINTTAB(8,29)
;CHR$238;TAB(11,29);CHR$239
1330 COLOUR129:COLOUR3:PRIN
TTAB(9,29);T%
1340 COLOUR130:COLOUR1:PRIN
TTAB(14,1);SPC6;TAB(0,29);"L
evel:";level%
1350 COLOUR128:PROCscore
1360 ENDPROC
1370:
1380 DEFPROCman
1390 J%=(J%+1)MOD4
1400 ?newX=h%+?manX:?newY=v
%+?manY
1410 X%=5:CALL continue,bit
map%(0),mask%(0)
1420 PRINTTAB(?manX,?manY);
SPC2
1430 PRINTTAB(?newX,?newY);
man$(dir%+1,J%)
1440 ?manX=?newX:?manY=?new
Y
1450 ENDPROC
1460:
1470 DEFPROCkey
1480 IF INKEY(-99) AND dir%
=1 PROCright ELSE IF INKEY(-
99) PROCleft
1490 IF (INKEY(-98)+INKEY(-
67)+INKEY(-73)+INKEY(-105))=
0 ENDPROC
1500 IF INKEY(-98) h%=-1:di
r%=-1 ELSE IF INKEY(-67) h%=
1:dir%=1 ELSE h%=0
1510 v%=INKEY(-73)-INKEY(-1
05)
1520 PROCman
1530 ENDPROC
1540:
1550 DEFPROCinit
1560 ENVELOPE1,3,-17,61,9,4
,0,0,126,0,0,-126,126,126
1570 ENVELOPE2,4,90,-15,-15
,10,20,20,126,0,0,-126,126,1
26
1580 ENVELOPE3,2,-56,5,77,4
5,-99,-2,126,0,0,-126,126,12
6
1590 VDU 23,224,0,24,47,27,
2,4,127,0
1600 VDU 23,225,0,8,240,192
,64,32,24,0
1610 VDU 23,226,0,0,248,128
,96,24,0,0
1620 VDU 23,227,0,24,244,21
6,64,32,254,0
1630 VDU 23,228,0,16,15,3,2
,4,24,0
1640 VDU 23,229,0,0,31,1,6,
24,0,0
1650 VDU 23,230,0,0,248,192
,0,0,0,0
1660 VDU 23,231,0,0,31,3,0,
0,0,0
1670 VDU 23,232,0,66,231,60
,60,231,66,0
1680 VDU 23,233,0,34,119,28
,28,119,34,0
1690 VDU 23,234,0,16,24,13,
15,13,24,16
1700 VDU 23,235,128,192,252
,246,255,240,252,0
1710 VDU 23,236,1,3,63,111,
255,15,63,0
1720 VDU 23,237,0,8,24,176,
240,176,24,8
1730 VDU 23,238,7,15,31,63,
63,31,15,7
1740 VDU 23,239,131,195,231
,255,255,231,195,131
1750 VDU23,240,28,42,54,28,
62,107,85,85
1760 A$=CHR$17 +CHR$1 + CHR
$224 +CHR$17 +CHR$2 +CHR$225
1770 B$=CHR$17 +CHR$1 +CHR$
224 +CHR$17 +CHR$2 +CHR$226
1780 C$=CHR$17 +CHR$1 +CHR$
224 +CHR$17 +CHR$2 +CHR$230
1790 D$=CHR$17 + CHR$2 +CHR
$228 +CHR$17 +CHR$1 +CHR$227
1800 E$=CHR$17 +CHR$2 +CHR$
229 +CHR$17 + CHR$1 +CHR$227
1810 F$=CHR$17 +CHR$2 +CHR$
231 +CHR$17 + CHR$1 +CHR$227
1820 DIM man$(2,4),bitmap%(
19),mask%(31),code 500,hi%(1
0),hi$(10)
1830 man$(0,0)=A$
1840 man$(0,1)=B$
1850 man$(0,2)=C$
1860 man$(0,3)=B$
1870 man$(2,0)=D$
1880 man$(2,1)=E$
1890 man$(2,2)=F$
1900 man$(2,3)=E$
1910 Xpos=&70:Ypos=&76:manX
=&75:manY=&7B
1920 store1=&7C:store2=&7D
1930 newX=&7E:newY=&7F
1940 shark=&80:eaten=&82:fo
und=&83
1950 Xpointer=&84:Ypointer=
&86
1960 spannerX=&88:spannerY=
&89
1970 temp=&8A
1980 LIVES%=3:level%=1
1990 score%=0:I%=0:spanner%
=0
2000 ?spannerX=4*RND(4):?sp
annerY=4*RND(7)
2010 FOR I=1 TO 10
2020 hi%(I)=11000-I*1000:hi
$(I)="Steve"
2030 NEXT
2040 ENDPROC
2050:
2060 DEF PROCdead
2070 SOUND0,-15,100,10
2080 VDU19,0,11,0,0,0
2090 time4%=TIME:REPEAT UNT
IL TIME>time4%+100
2100 A%=10:Y%=10:?shark=32:
shark?1=32:CALL code
2110 PRINTTAB(?manX,?manY);
SPC2
2120 PROCreset
2130 VDU19,0,4,0,0,0
2140 LIVES%=LIVES%-1
2150 PROCscore
2160 ENDPROC
2170:
2180 DEF PROCfire
2190 MOVEx%,y%:GCOL3,3:DRAW
r%,y%
2200 SOUND1,1,157,4
2210 MOVEx%,y%:GCOL3,3:DRAW
r%,y%
```

Turn to Page 28 ►

Game

◀ *From Page 27*

```
 2220 ENDPROC
 2230:
 2240 DEF PROCleft
 2250 x%=?manX*64:y%=(31-?ma
nY)*32+4
 2260 I%=-1:shot=FALSE
 2270 REPEAT
 2280 I%=I%+1
 2290 IF Ypos?I%=?manY AND (
(Xpos?I%)+1)<?manX THEN shot
=TRUE
 2300 UNTIL shot OR I%=4
 2310 IF shot r%=((Xpos?I%)+
2)*64:PROCfire:PROCkill:ENDP
ROC
 2320 r%=64:PROCfire
 2330 ENDPROC
 2340:
 2350 DEF PROCright
 2360 x%=(?manX+2)*64:y%=(31
-?manY)*32+4
 2370 I%=-1:shot=FALSE
 2380 REPEAT
 2390 I%=I%+1
 2400 IF Ypos?I%=?manY AND (
(Xpos?I%)-1)>?manX THEN shot
=TRUE
 2410 UNTIL shot OR I%=4
 2420 IF shot r%=(Xpos?I%)*6
4:PROCfire:PROCkill:ENDPROC
 2430 r%=1215:PROCfire
 2440 ENDPROC
 2450:
 2460 DEFPROCsetup
 2470 ?shark=234:shark?1=235
 2480 h%=0:v%=0:dir%=-1
 2490 ?manX=16:?manY=2
 2500 ?Xpos=RND(5)+8:?Ypos=4
 2510 Xpos?1=RND(5)+8:Ypos?1
=8
 2520 Xpos?2=RND(5)+8:Ypos?2
=14
 2530 Xpos?3=RND(5)+8:Ypos?3
=16
 2540 Xpos?4=RND(5)+8:Ypos?4
=24
 2550 ?eaten=0:?found=0
 2560 TIME=0:time1%=0:time2%
=0
 2570 got%=FALSE
 2580 ENDPROC
 2590:
 2600 DEFPROCreset
 2610 PROCsetup
 2620 PRINTTAB(?manX,?manY);
A$
 2630 CALL code
 2640 key=GET
 2650 ENDPROC
 2660:
 2670 DEFPROChiscore
 2680 CLG:*FX21,0
 2690 IF score%>hi%(10) PROC
update
 2700 CLG:COLOUR1
 2710 PRINTTAB(1,1);"TODAYS
HIGH SCORES"
 2720 COLOUR3:PROCtable
 2730 COLOUR2:PRINTTAB(1,30)
;"another game(Y/N)"
 2740 REPEAT key$=GET$
 2750 UNTIL key$="Y" OR key$
="y" OR key$="N" OR key$="n"
 2760 ENDPROC
 2770:
 2780 DEF PROCskill
 2790 GCOL0,131:CLG:GCOL0,13
0:CLG:GCOL0,128:CLG
 2800 COLOUR1:PRINTTAB(1,16)
;"enter skill level"
 2810 REPEAT:PRINTTAB(6,18)"
(1 to 4)";TAB(9,20);SPC10
 2820 INPUTTAB(9,20)skill%
 2830 UNTIL skill%>0 AND ski
ll%<5
 2840 delay%=50-skill%*10
 2850 ENDPROC
 2860:
 2870 DEFPROCupdate
 2880 COLOUR3
 2890 PRINTTAB(2,12);"Congra
tulations";TAB(3,14);"you're
 on the";TAB(2,16);"high sco
re table"
 2900 time=TIME
 2910 REPEAT UNTIL TIME=time
+ 300
 2920 slot=0
 2930 REPEAT slot=slot+1
 2940 UNTIL score%>hi%(slot)
 2950 FOR pos=9 TO slot STEP
-1
 2960 hi%(pos+1)=hi%(pos):hi
$(pos+1)=hi$(pos)
 2970 NEXTpos
 2980 hi%(slot)=score%:hi$(s
lot)=""
 2990 CLG:COLOUR2:PROCtable
 3000 COLOUR3
 3010 PRINTTAB(2,28);"enter
your name"
 3020 INPUTTAB(10,slot*2+4)n
ame$
 3030 hi$(slot)=LEFT$(name$,
9)
 3040 CLG
 3050 ENDPROC
 3060:
 3070 DEFPROCtable
 3080 FOR pos=1 TO 10
 3090 score$=STR$(hi%(pos))
 3100 PRINTTAB(1,pos*2+4);LE
FT$("0000000",7-LEN(score$))
;score$;SPC2;hi$(pos)
 3110 NEXT pos
 3120 ENDPROC
 3130 DEF PROCassemble
 3140 FOR PASS=0 TO 2 STEP2
 3150 P%=code
 3160 [OPT PASS
 3170 STA store1
 3180 STY store2
 3190 LDX #5
 3200 .loop
 3210 CPX store1:BEQ move
 3220 CPX store2:BEQ move
 3230 DEX
 3240 LDA#31:JSR &FFEE
 3250 LDA Xpos,X:JSR &FFEE
 3260 LDA Ypos,X:JSR &FFEE
 3270 LDA#17:JSR &FFEE
 3280 LDA#3:JSR &FFEE
 3290 LDA shark:JSR &FFEE
 3300 LDA shark+1:JSR &FFEE
 3310 JMP test
 3320 .move
 3330 DEX
 3340 LDA Xpos,X
 3350 CMP manX
 3360 BEQ zero
 3370 BCC increaseX
 3380 SEC:SBC #1:STA newX
 3390 LDA#236:STA shark:LDA#
237:STA shark+1
 3400 JMP cont
 3410 .increaseX
 3420 CLC:ADC #1:STA newX
 3430 LDA#234:STA shark:LDA#
235:STA shark+1
 3440 JMP cont
 3450 .zero
 3460 STA newX
 3470 .cont
 3480 LDA Ypos,X
 3490 CMP manY
 3500 BEQ none
 3510 BCC increaseY
 3520 SEC:SBC #1:STA newY
 3530 JMP continue
 3540 .increaseY
 3550 CLC:ADC #1:STA newY
 3560 JMP continue
 3570 .none
 3580 STA newY
 3590 .continue
 3600 LDA Xpos,X
 3610 ASL A:ASL A
 3620 CLC:ADC &0601:STA Xpoi
nter
 3630 LDA &0602:ADC #0:STA X
pointer+1
 3640 LDA newY:ASL A:ASL A
 3650 CLC:ADC &0604:STA Ypoi
nter
 3660 LDA &0605:ADC #0:STA Y
pointer+1
 3670 STX temp          \STORE
X TEMP
 3680 LDX #8:LDY #3
 3690 .loop2
 3700 LDA (Xpointer),Y
 3710 AND (Ypointer),Y
 3720 BNE oldY
 3730 DEX:BEQ Xtest
 3740 DEY:BPL loop2
 3750 LDA #4
 3760 CLC:ADC Xpointer
 3770 STA Xpointer
 3780 LDA Xpointer+1
 3790 ADC #0
 3800 STA Xpointer+1
 3810 LDY #3
 3820 JMP loop2
 3830 .oldY
 3840 LDX temp          \REST
ORE X
 3850 LDA Ypos,X
 3860 STA newY
 3870 ASL A:ASL A
 3880 CLC
 3890 ADC &0604:STA Ypointer
 3900 LDA &0605:ADC #0:STA Y
pointer+1
 3910 .Xtest
 3920 LDX temp          \REST
ORE X
 3930 LDA newX:ASL A:ASL A
 3940 CLC
 3950 ADC &0601:STA Xpointer
 3960 LDA &0602:ADC #0:STA X
pointer+1
 3970 LDX #8:LDY #3
 3980 .loop3
 3990 LDA (Xpointer),Y
 4000 AND (Ypointer),Y
 4010 BNE oldX
 4020 DEX:BEQ print
 4030 DEY:BPL loop3
 4040 LDA #4
 4050 CLC:ADC Xpointer
 4060 STA Xpointer
 4070 LDA Xpointer+1
 4080 ADC #0
 4090 STA Xpointer+1
 4100 LDY #3
 4110 JMP loop3
 4120 .oldX
 4130 LDX temp          \REST
ORE X
 4140 LDA Xpos,X
 4150 STA newX
 4160 .print
 4170 LDX temp          \REST
ORE X
 4180 CPX #5
 4190  BNE over
 4200 LDY newY:CPY spannerY
 4210 BNE end
 4220 LDY newX:CPY spannerX
 4230 BEQ take
 4240 INY:CPY spannerX
 4250 BNE end
 4260 .take
 4270 LDA #&FF:STA found
 4280 JMP end
 4290 .over
 4300 LDA#31:JSR &FFEE
 4310 LDA Xpos,X:JSR &FFEE
 4320 LDA Ypos,X:JSR &FFEE
 4330 LDA#32:JSR &FFEE:JSR &
FFEE
 4340 LDA#31:JSR &FFEE
 4350 LDA newX:STA Xpos,X:JS
R &FFEE
 4360 LDA newY:STA Ypos,X:JS
R &FFEE
 4370 LDA#17:JSR &FFEE
 4380 LDA#7:JSR &FFEE
 4390 LDA shark:JSR &FFEE
 4400 LDA shark+1:JSR &FFEE
 4410 .test
 4420 LDA Ypos,X
 4430 CMP manY
 4440 BNE next
 4450 LDY Xpos,X
 4460 DEY
 4470 CPY manX
 4480 BEQ dead
 4490 INY
 4500 CPY manX
 4510 BEQ dead
 4520 INY
 4530 CPY manX
 4540 BNE next
 4550 .dead
 4560 LDA #&FF
 4570 STA eaten
 4580 .next
 4590 TXA:BEQ end
 4600 JMP loop
 4610 .end
 4620 RTS:]
 4630 NEXT PASS
 4640 ENDPROC
 4650 ON ERROR OFF
 4660 MODE6
 4670 *FX12,0
 4680 REPORT
 4690 PRINT" at line ";ERL
 4700 END
```

This listing is included in this month's cassette tape offer. See order form on Page 53.

Taken a turn for the worse

If your sense of direction is as poor as CHRIS NIXON's, this utility will help put you back on the right track

AS those of you who have to travel often know only too well, driving for long distances around the country can be extremely tiring.

Certainly the last thing you want to worry about is getting lost midway between the start and finish of your journey.

Carmate is an aptly named piece of software which can take most of the worry out of long road journeys.

It is essentially a database in which you can store and retrieve complete route descriptions, giving details of which roads to take, the right motorway exits and so on.

Unlike some databases, Carmate is both simple to use yet powerful enough to allow 300 different routes to be stored on an ordinary 40 track DFS disc.

Plus 3 owners can modify the program to store either 900 or 1,800 entries on one disc, depending on whether their drive is double-sided or not.

The idea is to load Carmate before setting out on a long car journey, and select option one – Examine a route – from the main menu.

Then enter the names of the two places between which you are travelling, and if they are already on the disc you will be presented with a concise description of which roads to take, and the approximate distance in miles. This information can be printed out if desired as a handy dashboard record.

The disc data file itself is 90,002 bytes long, enough for 300 entries of 300 bytes each, plus two bytes at the file's start which hold the current number of entries in the database.

Carmate caters for the minimum possible disc size, which is 100k on a 40 track disc.

However, if you have a Plus 3, change the value assigned to *maxitem%* in line 70 from 300 to either 900 if you have a single sided ADFS drive, or 1800 for a double sided drive.

Then change the OSCLI command in line 260 to *SA.ROUTES 0+41EB2 if you have a single sided ADFS drive, or *SA.ROUTES 0+83D62 if it is double sided. These changes will give you 900 or 1,800 possible entries respectively.

When you first use Carmate you will be informed that there is no data file on disc. Press C to create a new routes file, and make sure that you have a disc in the drive with at least 90k free.

Alternatively insert another disc on which you know is a previously created file and press Return to go back to the main menu.

COMPUTING IN ACTION

The program recognises whether you are using the ADFS or DFS, and acts accordingly. All file handling between the two systems is identical, but if the ADFS is being used Carmate must perform a *MOUNT every time the main menu appears.

The second option from the main menu is List all routes. Selecting this allows you to find out exactly which routes you have stored on disc so far.

Page mode is enabled for this option, so you must press Shift to scroll the list up – alternatively press Escape at any time to abort the listing.

Option three is Add a new route. As your database will be empty the first time you use it, this will be the most frequently selected option.

You will be asked for the start town, destination and total distance between them in miles. This is quickly worked out by using the key on any road map with the help of a ruler.

Next you are prompted to enter the route description. You have 240 characters in which to furnish concise directions – I have found this to be quite ample when simple abbreviations are used, but you can be as descriptive as the space permits.

Press Return when finished, and your new route description will be entered into the disc file. The program is completely error trapped, and you cannot exceed the file limit of 300 entries.

If an error does occur for any reason – for instance, if there is insufficient room on disc to create a new data file – you will be informed, but you won't lose control of the program.

Carmate runs in Mode 4, partly because it is a lot faster than Mode 1, but mainly because there is not enough memory available in Mode 1 if you have a Plus 3, because it leaves PAGE at &1D00.

However, four colours are actually present on screen by making use of Roland Waddilove's palette switching techniques, as detailed in the November 1985 issue of *Electron User*.

Unfortunately, you may not get a colour display if you have a Cumana disc interface and Slogger SEDFS, due to an annoying bug in this system which resets the event vector when switching off the drive motor.

By far and away the best feature of Carmate is its ability to furnish you with a hard copy of any selected route.

With a printout pinned to your dashboard, all your worries about wandering around in circles for hours should just fade away – along with your petrol bill.

Turn to Page 30 ▶

◀ From Page 29

COMPUTING IN ACTION

```
10 REM Car Companion
20 REM By Chris Nixon
30 REM (c) Electron User
40 ONERRORGOTO790
50 CLOSE#0:OSCLI"FX16":A%
=0:X%=&70:Y%=0:disc%=USR(&FF
DA)AND 256:IFdisc%=8 disc$="
ADFS" ELSE disc$="DFS"
60 MODE4:PROCassem:PROCse
tup:REPEAT:PROCmenu:UNTIL0
70 DEFPROCsetup:DIMdata%
300:disc%=1:item%=0:maxitem%
=300:town1%=0:town2%=19:mile
s%=38:info%=40
80 CH%=OPENUP"ROUTES":IF
CH%=0 PROCnewfile:GOTO80
90 items%=BGET#CH%:items%
=BGET#CH%*256+items%:CLOSE#0
100 ENDPROC
110 DEFPROCmenu:OSCLI"FX13
,4":IFdisc%=8 OSCLI"MOUNT"
120 PROCtitle("CAR MATE Tr
avel Route Database"):PRINTT
AB(3,5)"By Chris Nixon - (c)
Electron User"
130 PRINTTAB(0,8);:PROCbig
("Filing system "+disc$+" :
"+STR$items%+" Routes on dis
c")
```

```
140 PRINTTAB(12,12);:PROCb
ig("Do you want to:"):PRINTT
AB(10,17);:COLOUR0:COLOUR129
:PROCbig(" 1) Examine a Rout
e "):PRINTTAB(10,21);:PROCbi
g(" 2) List all Routes "):PR
INTTAB(10,25);:PROCbig(" 3)
Add a new Route ")
150 COLOUR1:COLOUR128:PRIN
TTAB(4,30);:PROCbig("Press e
ither "):COLOUR0:COLOUR129:P
ROCbig("(1)"):COLOUR1:COLOUR
128:PROCbig(" or "):COLOUR0:
COLOUR129:PROCbig("(2)")
160 COLOUR1:COLOUR128:PROC
big(" or "):COLOUR0:COLOUR12
9:PROCbig("(3)"):COLOUR1:COL
OUR128:PROCbig(":"):VDU10
170 OSCLI"FX14,4":REPEAT:G
%=GET-48:UNTILG%>0 AND G%<4:
ONG%GOTO180,190,200
180 PROCexamine:ENDPROC
190 PROClist:ENDPROC
200 PROCadd:ENDPROC
210 STOP
220 DEFPROCbig(B$):VDU23,1
,0;0;0;0;:FORM%=1TOLENB$:X%=
0:Y%=&9:?&900=ASC(MID$(B$,M%
,1)):A%=10:CALL&FFF1:L%=1
230 FORX%=224TO225:VDU23,X
%:FORY%=0TO3:VDU?(&900+L%):V
DU?(&900+L%):L%=L%+1:NEXT:NE
XT:VDU224,8,10,225,11:NEXT:V
DU23,1,1;0;0;0;:ENDPROC
```

```
240 DEFPROCnewfile:OSCLI"F
X14,4":PROCtitle("No Route D
ata on disc")
250 PRINTTAB(16,8);:PROCbi
g("EITHER:"):PRINT""SPC3"I
nsert Data Disc and press RE
TURN":PRINTTAB(18,16);:PROCb
ig("OR:"):PRINT""SPC4"Pres
s C to create new Data File"
;
260 REPEAT:G$=GET$:UNTILG$
="C"ORG$="c"ORG$=CHR$13:IFG$
=CHR$13 ENDPROC ELSE PROCtit
le("Creating new data file -
Please wait:"):OSCLI"SA.ROU
TES 0+15F92":CH%=OPENUP"ROUT
ES":BPUT#CH%,0:BPUT#CH%,0:CL
OSE#0:ENDPROC
270 STOP
280 DEFPROCassem
```

```
290 *FX13,4
300 FOR i=0 TO 2 STEP 2
310 P%=&A00
320 [OPT i:SEI
330 LDA #patch MOD256:STA
&220
340 LDA #patch DIV256:STA
&221
350 CLI:RTS
360 .patch
370 PHP:PHA:TXA:PHA:TYA:PH
A
380 LDA #251:STA &FE08
390 LDA #250:STA &FE09
400 LDX #97
410 .pause
420 LDY #10
430 .loop
440 DEY:BNE loop
450 DEX:BNE pause
460 .colour
470 LDA #16:STA &FE08
480 LDA #17:STA &FE09
490 PLA:TAY:PLA:TAX:PLA:PL
P
500 RTS
510 ]
520 NEXT:CALL&A00
530 ENDPROC
540 DEFPROCtitle(B$):CLS:P
RINTTAB(20-LENB$/2,1);:PROCb
ig(B$):ENDPROC
```

```
550 DEFPROCexamine:IF item
s%=0 PROCtitle("There are no
 Routes to examine"):PRINTTA
B(6,12);:PROCbig("Press RETU
RN for Main Menu:"):VDU10:RE
PEAT:UNTILGET=13:ENDPROC ELS
E PROCtitle("Examine a Route
")
560 PRINTTAB(0,10);:REPEAT
:INPUT"Start Town ",T1$:UNTI
LLENT1$<=19 AND LENT1$>1:PRI
NT":REPEAT:INPUT"Destination
 Town ",T2$:UNTILLENT2$<=19
AND LENT2$>1
570 PRINTTAB(6,20);:PROCbi
g("Searching - Please wait .
..."):CH%=OPENUP"ROUTES":RT%=
0
580 PTR#CH%=300*RT%+2:S1$=
"":FORL%=0TO18:B%=BGET#CH%:S
1$=S1$+CHR$B%:NEXT:IF INSTR(
S1$,T1$)=0 GOTO 610
590 S2$="":FORL%=0TO18:B%=
BGET#CH%:S2$=S2$+CHR$B%:NEXT
:IF INSTR(S2$,T2$)=0 GOTO 61
0
```

```
600 mile%=BGET#CH%:mile%=B
GET#CH%*256+mile%:RT$="":REP
EAT:B%=BGET#CH%:RT$=RT$+CHR$
B%:RT%=RT%+1:UNTILB%=13:CLOS
E#0:PROCshow:ENDPROC
610 RT%=RT%+1:IFRT%=items%
CLOSE#0:VDU7:ENDPROC ELSE 5
80
620 DEFPROCadd:IF items%=m
axitem% PROCtitle("Database
Full"):PRINTTAB(6,12);:PROCb
ig("Press RETURN for Main Me
nu:"):VDU10:REPEAT:UNTILGET=
13:ENDPROC ELSE PROCtitle("A
dd a new Route")
630 PRINTTAB(0,8);:PRINT"S
tart Town ?";:!&980=(data%+t
own1%):?&982=18:?&983=32:?&9
84=127:X%=&80:Y%=9:A%=0:CALL
&FFF1
640 PRINT"Destination Tow
n ?";:!&980=(data%+town2%):?
&982=18:?&983=32:?&984=127:X
%=&80:Y%=9:A%=0:CALL&FFF1
650 INPUT"Distance in mil
es ",mile%:data%?miles%=mile
% MOD256:data%?(miles%+1)=mi
le% DIV256
660 PRINT""Input the Rout
e (Max 240 chars):":!&980=(
data%+info%):?&982=239:?&983
=32:?&984=127:X%=&80:Y%=9:A%
=0:CALL&FFF1
```

```
670 CH%=OPENUP"ROUTES":PTR
#CH%=300*items%+2:FORL%=0TO2
99:BPUT#CH%,data%?L%:NEXT:PT
R#CH%=0:items%=items%+1:BPUT
#CH%,items% MOD 256:BPUT#CH%
,items% DIV 256:CLOSE#0:ENDP
ROC
680 DEFPROCshow:PROCtitle(
T1$+" to "+T2$):PRINTTAB(9,6
);:PROCbig("Distance = "+STR
$mile%+" miles")
690 PRINTTAB(7,12);:PROCbi
g("Concise Route Description
:"):PRINT"":PROCjustify(RT
$):PRINTTAB(11,30);:PROCbig(
"Print-out (Y/N)? "):VDU10:R
EPEAT:G$=GET$:UNTILG$="Y"ORG
$="y"ORG$="N"ORG$="n":IFG$="
N"ORG$="n" ENDPROC
700 CLS:VDU2:A$=T1$+" to "
+T2$:PRINTA$:PRINTSTRING$(LE
NA$,"-"):PRINT:PRINT"Distanc
e = ";STR$mile%;" miles":PRI
NT:PRINT"Concise Route Descr
iption:":PRINT":PROCjustify(
RT$):VDU3:ENDPROC
710 DEFPROCjustify(J$):ptr
%=1:count%=1
720 C%=INSTR(J$," ",ptr%):
IFC%=0 PRINTRIGHT$(J$,LENJ$-
ptr%+1):ENDPROC
730 size%=C%-ptr%+1:count%
=count%+size%:IFcount%>40 PR
INT:count%=1:GOTO 720
740 PRINTMID$(J$,ptr%,size
%);:ptr%=ptr%+size%:GOTO 720
```

```
750 DEFPROClist:IF items%=
0 PROCtitle("There are no Ro
utes to list"):PRINTTAB(6,12
);:PROCbig("Press RETURN for
 Main Menu:"):VDU10:REPEAT:U
NTILGET=13:ENDPROC ELSE PROC
title("Listing all routes -
ESC for Main Menu")
760 VDU28,0,31,39,5,14:CH%
=OPENUP"ROUTES":FORT%=1TOite
ms%:PTR#CH%=300*T%-298:S1$=
"":REPEAT:B%=BGET#CH%:S1$=S1$
+CHR$B%:UNTILB%=13:S1$=LEFT$
(S1$,LENS1$-1)
770 PTR#CH%=300*T%-298+19:
S2$="":REPEAT:B%=BGET#CH%:S2
$=S2$+CHR$B%:UNTILB%=13:S2$=
LEFT$(S2$,LENS2$-1)
780 PRINTS1$;" to ";S2$:NE
XT:CLOSE#0:PRINT'SPC7;:COLOU
R0:COLOUR129:PRINT"Press RET
URN for Main Menu";:COLOUR1:
COLOUR128:REPEAT:UNTIL GET=1
3:VDU28,0,31,39,0:ENDPROC
790 IFERR=17 THEN RUN
800 PROCtitle("ERROR - PRE
SS RETURN FOR MAIN MENU"):PR
INTTAB(0,15);:REPORT:REPEAT:
UNTIL GET=13:RUN
```

electron user

Guide to software & hardware products

ARCADE GAMES

Product	Format	Price	Supplier
Chuckie Egg	Cassette	£3.90	**A & F
Cylon Attack	Cassette	£3.90	**A & F
Elite	Cassette	£12.95	Superior
Boxer	Cassette	£1.00	Superior
Snapper	Cassette	£1.99	Superior
Hopper	Cartridge	£8.95	Superior
Crazy Er*bert	Cassette	£1.99	Alternative
Video Pinball	Cassette	£1.99	Alternative
Triple Deckers	Cassette	£1.99	Alternative
Bug Eyes II	Cassette	£7.95	ASL
Frankenstein 2000	Cassette	£6.95	ASL
Caveman Capers	Cassette	£7.95	ASL
Psycastria	Cassette	£7.95	ASL
Thunderstruck	Cassette	£7.95	ASL
Thunderstruck II	Cassette	£7.95	ASL
Omega Orb	Cassette	£7.95	ASL
Sphere of Destiny	Cassette	£7.95	ASL
Power Pack II	Cassette	£9.95	ASL
Graham Gooch Test Cricket	Cassette	£9.95	ASL
Ziggy	Cassette	£8.95	ASL
Ransack	Cassette	£9.95	ASL
Despatch Rider	Cassette	£8.95	ASL
Impact	Cassette	£9.95	ASL
Robotron	Cassette	£4.95	Atarisoft
League Challenge	Cassette	£2.99	Atlantis
Creepy Cave	Cassette	£2.99	Atlantis
Survivors	Cassette	£2.99	Atlantis
Nightmare Maze	Cassette	£1.99	Blue Ribbon
Castle Assault	Cassette	£1.99	Blue Ribbon
Astro Plumber	Cassette	£1.99	Blue Ribbon
Diamond Mine	Cassette	£1.99	Blue Ribbon
Diamond Mine II	Cassette	£1.99	Blue Ribbon
Darts	Cassette	£1.99	Blue Ribbon
Joey	Cassette	£1.99	Blue Ribbon
Ravage	Cassette	£1.99	Blue Ribbon
Bar Billiards	Cassette	£1.99	Blue Ribbon
Condition Red	Cassette	£1.99	Blue Ribbon
3D Dotty	Cassette	£1.99	Blue Ribbon
Mango	Cassette	£1.99	Blue Ribbon
Return of R2	Cassette	£1.99	Blue Ribbon
Trapper	Cassette	£1.99	Blue Ribbon
Video Card Arcade	Cassette	£1.99	Blue Ribbon
Games Disc I	3.5in disc	£9.99	Blue Ribbon
Games Disc II	3.5in disc	£9.99	Blue Ribbon
Steve Davis Snooker	Cassette	£1.99	Blue Ribbon
Golf	Cassette	£1.99	Blue Ribbon
Computer Hits I	Cassette	£9.95	Beau Jolly
Computer Hits II	Cassette	£9.95	Beau Jolly
Computer Hits III	Cassette	£9.95	Beau Jolly
Computer Hits IV	Cassette	£9.95	Beau Jolly
Five Star Games I	Cassette	£9.95	Beau Jolly

Turn to Page 32 ►

Guide to software and hardware

+ Not available at time of going to press.
* Electron-compatible BBC Micro products.
** Company no longer trading

Product	Format	Price	Supplier
Five Star Games II	Cassette	£9.95	Beau Jolly
Five Star Games III	Cassette	£9.95	Beau Jolly
Five Computer Hits	Cassette	£5.95	Beau Jolly
Uranians	Cassette	£2.99	Bug Byte
Tennis	Cassette	£2.99	Bug Byte
Cricket	Cassette	£2.99	Bug Byte
Jack Atac	Cassette	£2.99	Bug Byte
Savage Pond	Cassette	£2.99	Bug Byte
Skyhawke	Cassette	£2.99	Bug Byte
Ice Hockey	Cassette	£2.99	Bug Byte
Hunky Dory	Cassette	£2.99	Bug Byte
Plan B	Cassette	£2.99	Bug Byte
Plan B2	Cassette	£2.99	Bug Byte
Dunjunz	Cassette	£2.99	Bug Byte
Squeakaliser	Cassette	£2.99	Bug Byte
Templeton	Cassette	£2.99	Bug Byte
Serpent's Lair	Cassette	£3.95	Comsoft
S.A.S Commando	Cassette	£3.95	Comsoft
Colossus Chess IV	Cassette	£9.99	C.D.S
Brian Clough's Fortunes	Cassette	£9.99	C.D.S
Classic Card & Board Games I	Cassette	£5.95	Database
	3.5in disc	£7.95	
Classic Card & Board Games II	Cassette	£5.95	Database
	3.5in disc	£7.95	
Electron User 10 of the Best I	Cassette	£5.95	Database
	3.5in disc	£6.95	
Electron User 10 of the Best II	Cassette	£5.95	Database
	3.5in disc	£6.95	
Electron User 10 of the Best III	Cassette	£5.95	Database
	3.5in disc	£6.95	
747 Flight Simulator	Cassette	£6.95	Doctor Soft
Phantom Combat	Cassette	£8.45	Doctor Soft
Star Wars	Cassette	£9.95	Domark
Paperboy	Cassette	£7.75	Elite
Star Drifter	Cassette	£2.95	Firebird
Kourtyard	Cassette	£9.95	Go-Dax
Skirmish	Cassette	£9.95	Go-Dax
Birdstrike	Cassette	£1.99	Firebird
The Hacker	Cassette	£1.99	Firebird
Heathrow A.T.C.	Cassette	£6.95	Hewson
Evening Star	Cassette	£7.95	Hewson
Mikie	Cassette	£7.45	Imagine
XOR	Cassette	£7.75	Logotron
Mission Icarus	Cassette	£9.95	Mandarin
Way of Exploding Fist	Cassette	£8.95	Mastertronic
Micropower Magic	Cassette	£6.95	Micropower
Micropower Magic II	Cassette	£6.95	Micropower
Jet Power Jack	Cassette	£2.50	Micropower
Positron	Cassette	£2.50	Micropower
Swag	Cassette	£2.50	Micropower
Gauntlet	Cassette	£2.50	Micropower
Chess	Cassette	£2.50	Micropower
Killer Gorilla	Cassette	£2.50	Micropower
U.X.B	Cassette	£2.50	Micropower
Felix & Evil Weevils	Cassette	£2.50	Micropower
Felix in the Factory	Cassette	£2.35	Micropower
Felix & Fruit Monsters	Cassette	£2.50	Micropower
Stock Car	Cassette	£2.50	Micropower
Rubble Trouble	Cassette	£2.50	Micropower
Bumble Bee	Cassette	£2.50	Micropower
BBC Mastermind	Cassette	£9.95	Mirrorsoft
	5.25in disc	£12.95	
BBC Quizmaster	Cassette	£5.95	Mirrorsoft
	5.25in disc	£8.95	
Caesar The Cat	Cassette	£6.95	Mirrorsoft
	5.25in disc	£9.95	
Caesar's Travels	5.25in disc	£12.95	Mirrorsoft
Fleet Street Editor	5.25in disc	£39.95	Mirrorsoft
Fonts & Graphics (F.S.E)	5.25in disc	£14.95	Mirrorsoft

Product	Format	Price	Supplier
Walt Disney Graphics (F.S.E.)	5.25in disc	£14.95	Mirrorsoft
Quick Thinking Plus	Cassette	£6.95	Mirrorsoft
	5.25in disc	£9.95	
Look Sharp	Cassette	£7.95	Mirrorsoft
	5.25in disc	£10.95	Mirrorsoft
Spitfire 40	Cassette	£9.95	Mirrorsoft
	5.25in disc	£12.95	
Harrier Strike Force	Cassette	£9.95	Mirrorsoft
	5.25in disc	£12.95	
Tetris	Cassette	£8.99	Mirrorsoft
	5.25in disc	£12.99	
Quest	Cassette	£9.95	Superior
	5.25" disc	£11.95	
+ Exile	Cassette	£9.95	Superior
	5.25" disc	£11.95	
+ Barbarian	Cassette	£9.95	Superior
	5.25" disc	11.95	
Smash and Grab	Cassette	£7.95	Superior
Overdrive	Cassette	£6.95	Superior
Spycats	Cassette	£9.95	Superior
Repton	Cassette	£9.95	Superior
Repton 2	Cassette	£9.95	Superior
Repton 3	Cassette	£9.75	Superior
Life of Repton	Cassette	£6.95	Superior
	3.5in disc	7.95	
Around The World in 40 screens	Cassette	£6.95	Superior
Death Star	Cassette	£9.95	Superior
Citadel	Cassette	£9.95	Superior
Palace of Magic	Cassette	£9.75	Superior
	3.5in disc	£14.95	
Karate Combat	Cassette	£8.95	Superior
Thrust	Cassette	£7.95	Superior
Galaforce	Cassette	£9.95	Superior
Ravenskull	Cassette	£9.95	Superior
Acornsoft Hits Vol I	Cassette	£9.95	Superior
Acornsoft Hits Vol II	Cassette	£9.95	Superior
Superior Hits Vol III	Cassette	£9.95	Superior
	3.5in disc	£14.95	
Stryker's Run	Cassette	£9.95	Superior
Codename Droid	Cassette	£9.95	Superior
	3.5in disc	£14.95	
Crazee Rider	Cassette	£9.95	Superior
	3.5in disc	£14.95	
Play it again Sam	Cassette	£9.95	Superior
	3.5in disc	£14.95	
	5.25in disc	£11.95	
Play it again Sam 2	Cassette		Superior
Elixir	Cassette	£9.95	Acornsoft
	3.5in disc	£14.95	
	5.25in disc	£11.95	
Spellbinder	Cassette	£9.95	Superior
	5.25in disc	£11.95	
Bonecruncher	Cassette	£9.95	Superior
	5.25in disc	£11.95	
TV Director	Cassette	£12.95	Squirrelsoft
Winter Olympiad 88	Cassette	£9.95	Tynesoft
Indoor Games	Cassette	£9.95	Tynesoft
Boulderdash	Cassette	£9.95	Tynesoft
+ Saigon	Cassette	£9.95	Tynesoft
Micro Value Gold	Cassette	£4.99	Tynesoft
Spy vs Spy	Cassette	£9.95	Tynesoft
Phantom	Cassette	£7.95	Tynesoft
Microvalue I	Cassette	£3.99	Tynesoft
Microvalue II	Cassette	£3.99	Tynesoft
Microvalue III	Cassette	£3.99	Tynesoft
The Big K.O.	Cassette	£7.95	Tynesoft
Future Shock	Cassette	£7.95	Tynesoft
Jet Set Willy	Cassette	£7.95	Tynesoft
Jet Set Willy II	Cassette	£7.95	Tynesoft
Goal	Cassette	£7.95	Tynesoft

Product	Format	Price	Supplier
Commonwealth Games	Cassette	£7.95	Tynesoft
US Drag Racing	Cassette	£7.95	Tynesoft
Ian Botham Test Cricket	Cassette	£7.95	Tynesoft
Winter Olympics	Cassette	£7.95	Tynesoft
Mousetrap	Cassette	£7.95	Tynesoft
Five-Aside Socca	Cassette	£2.99	Tynesoft
Rig Attack	Cassette	£2.99	Tynesoft
Peg Leg	Cassette	£2.99	Tynesoft
Bouncing Bombs	Cassette	£2.99	Tynesoft
Wet Zone	Cassette	£3.95	Tynesoft
Stratobomber	Cassette	£2.99	Tynesoft
Caterpiller	Cassette	£2.99	Tynesoft
Hyperdrive	Cassette	£2.99	Tynesoft
Super Hangman	Cassette	£2.99	Tynesoft
3D Maze	Cassette	£2.99	Tynesoft
U.K. P.M.	Cassette	£2.99	Tynesoft
Invader (I.J.K.)	Cassette	£2.99	Tynesoft
Bozo the Brave	Cassette	£2.99	Tynesoft
Cylon Attack	Cassette	£2.99	Tynesoft
Trek II	Cassette	£2.99	Tynesoft
Space Caverns	Cassette	£2.99	Tynesoft
Crystal Castles	Cassette	£8.65	U.S. Gold
Kayleth	Cassette	£6.95	U.S. Gold

EDUCATIONAL PROGRAMS

Product	Format	Price	Supplier
Fun School ages 2-5	Cassette	£4.95	Database
	3.5in disc	£5.95	
Fun School ages 5-5	Cassette	£4.95	Database
	3.5in disc	£5.95	
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Indexed linked

Part 4 of PETE BIBBY's machine code primer looks at the index registers

WITH the nine new assembler mnemonics, two new registers and four addressing modes we're going to cover this month, the pace is hotting up. So straight down to work.

Up to now, we've only covered one of the 6502's registers, the accumulator or A register. There are two others frequently used, the X and Y registers. Figure I shows (diagrammatically) the registers we've used so far.

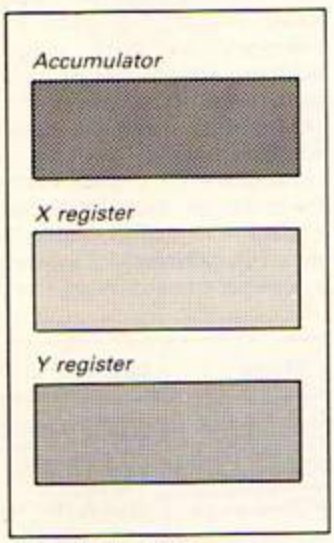

Figure I: The 6502 registers so far

Like the accumulator, these index registers – as they're known – are 8 bits wide, allowing them to hold numbers between zero and 255. And like the accumulator they have instructions that allow values to be loaded straight into them. These are LDX for LoaD the X register and LDY (guess).

Now these registers aren't as versatile as the accumulator as they don't have all its mathematical and logical powers. Yet you'll often want to do some maths with values held in X and Y. Because of this there are the TXA and TYA instructions which transfer – or, more accurately, copy – values from the X and Y registers to the accumulator.

Can you guess what the TAX and TAY mnemonics do? If you have any doubt, take a look at Table I which lists all the new instructions we'll come across this time.

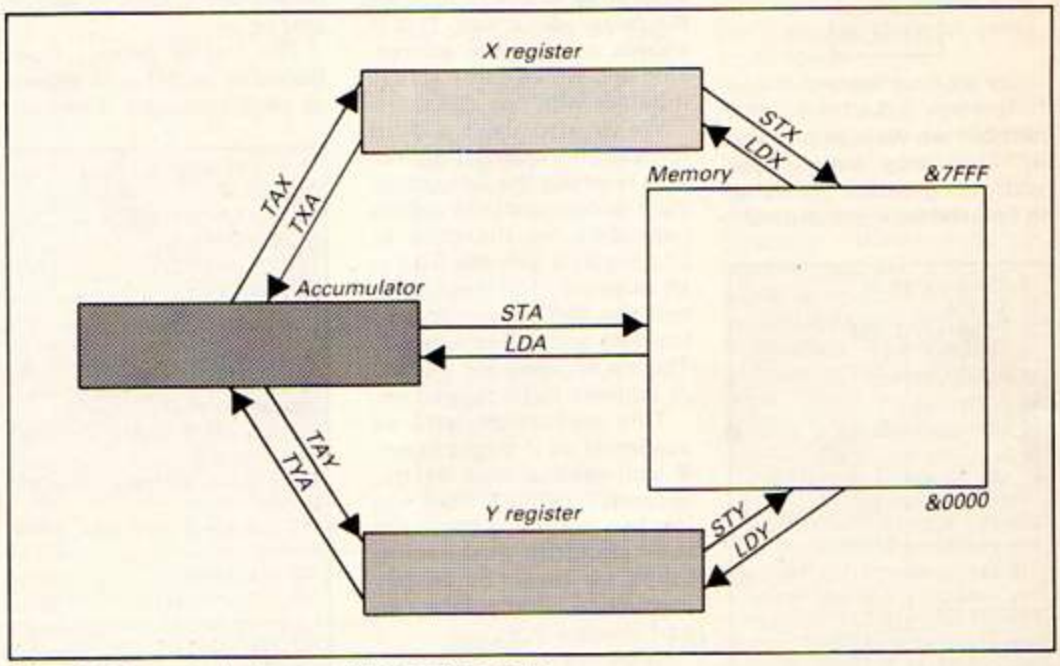

Figure II: The routes between registers and memory

Mnemonic	Action
LDX	Load the X register
LDY	Load the Y register
STA	Copy from accumulator into memory
STX	Copy from X register into memory
STY	Copy from Y register into memory
TXA	Copy X register into accumulator
TXY	Copy Y register into accumulator
TAX	Copy accumulator into X register
TAY	Copy accumulator into Y register

Table I: This month's crop of instructions

```
10 REM Program I
20 MODE 6
30 codeStart=&2000
40 oswrch=&FFEE
50 P%=codeStart
60 [
70 LDA #&41 \ immediate addr
essing
80 LDX #2*33 \ X register ho
lds result of expression
90 LDY #INT(67.2) \ assemble
r deals with function
100 JSR oswrch
110 TXA \ contents of X copi
ed to A
120 JSR oswrch
130 TYA \ contents of Y copi
ed to A
140 JSR oswrch
150 RTS
160 ]
170 CALL codeStart
```

Program I

Program I uses two of our new instructions to print out our ABCs again. Now I know we've done this before without using the X and Y registers, but bear with me. I'm trying to show how the new registers and their associated instructions work, not write the best or most consistent assembly language programs. We'll run later, for the moment let's walk.

Close inspection of Program I will show I've included a bit of revision from last month. The comments will explain all.

Three more instructions next. These are known as the store instructions. They take values from the registers and place them in specified memory locations. They are STA, STore the Accumulator – STX and STY.

Program II shows two of them in action. Again it's a rather contrived example, but examine the assembly listing with care. Make sure that you know what's going on. A little time spent on the basics will be rewarded as we delve deeper in the next three months.

Try modifying Programs I and II making use of the nine mnemonics shown in Table

Turn to Page 36 ►

◀ *From Page 35*

I. Figure II shows what each one does.

One thing to notice about Program II is that we've used LDA in a rather different way. Line 130 is:

```
LDA &2100
```

Up till now we've always followed LDA by the number we wanted put into it. This was immediate addressing where the value to be used by the instruction

```
10 REM Program II
20 MODE 6
30 codeStart=&2000
40 oswrch=&FFEE
50 P%=codeStart
60 number=65
70 address=&2100
80 [
90 LDX #number \ X register,
 immediate addressing
100 STX address \ contents o
f X copied to &2100
110 LDY #number+1 \ Y regist
er, immediate addressing
120 STY address+1 \ contents
 of X copied to &2101
130 LDA &2100 \ absolute add
ressing
140 JSR oswrch
150 LDA address+1 \ absolute
 addressing
160 JSR oswrch
170 RTS
180 ]
190 CALL codeStart
```

Program II

follows the opcode immediately. The hash sign warns the assembler that the next byte is a value not an address.

In line 130, however, we use LDA to read in the value found inside the memory location at &2100. In the first case the thing that came after the instruction was a number, in the second it's an address which tells the assembler where to look for the required number. This is known as absolute addressing and we've come across it before with our JSRs.

We've also used a third form of addressing, implied. This is where the instruction itself contains all the details necessary for the 6502 to find the data it needs. TAX is an example. The instruction tells the 6502 where to find the data and where to put it. There's no need for a value or address to be tagged on.

This discussion isn't as academic as it might seem. If you take a look at the assembly listings from the last two programs you'll see that absolute addressing takes up three bytes per instruction, immediate two and implied one.

Knowing which addressing mode to use can save you precious bytes when you're short of memory. This desire to save bytes is shown in the fourth example of addressing we'll cover this month, zero page.

The Electron's memory ranges from location &0000 to &FFFF, and the bytes up to &7FFF are ram (you can read and write to it and its contents disappear when the power's off) and &8000 to &FFFF being rom (holding Basic and the operating system).

Assembly language programmers tend to think of this in 256-byte chunks. The first is the locations from &0000 to &00FF, the second from &0100 to &01FF, the third from &0200 to &02FF and so on.

The first of these – from &0000 to &00FF – is known as page zero, and is special.

```
10 REM Program III
20 MODE 6
30 codeStart=&2000
40 oswrch=&FFEE
50 P%=codeStart
60 number=65
70 address=&70
80 [
90 LDX #number \ immediate a
ddressing
100 LDY #number+1
110 STX &0070 \ absolute add
ressing
120 STY &71 \ zero page addr
essing
130 LDA &70 \ zero page addr
essing
140 JSR oswrch
150 LDA address+1 \ zero pag
e addressing
160 JSR oswrch
170 RTS
180 ]
190 CALL codeStart
```

Program III

One reason is that the locations &0070 to &008F are reserved for the programmer's use – the other locations are used as a kind of scratchpad by the operating system. The second reason is that some commands can use the zero page addressing mode.

All this means is that if you're referring to an address in page zero, you can leave off the initial two zeroes of the address: The assembler will know what you mean.

Hence instead of:

```
LDA &0070
```

you can use:

```
LDA &70
```

to load the accumulator wih the value held in memory address &70, the 113th location in page zero. And you save yourself a byte of memory as zero page addressing only uses two bytes, as opposed to the three bytes taken by absolute addressing.

Program III, another artificial bit of programming, shows it in action. Table II lists the addressing modes we've covered.

Mode	Example
Immediate	LDA #65
Absolute	LDX &2100
Implied	TAX
Zero page	LDA &7F

Table II: Addressing modes with examples

If you cast your mind back to last time, you'll recall that we used assembly language to draw a line. This was done by way of the appropriate VDU codes and

Low byte, high byte order of addressing the 6502

BY now you should be used to using two byte hex numbers to specify addresses. For example, &7D00 can, and does, refer to a memory location. To store the value in the accumulator there we'd use the instruction STA &7D00.

However, that's in our convenient mnemonic terms. The 6502 itself likes things in hex (or more accurately, a binary representation), stored in a string of contiguous memory locations.

In this case the hex for STA is &8D, so you might think that in memory the code would look like:

```
8D 7D 00
```

It doesn't, though. The 6502 likes addresses with the low byte coming before the high byte. We say that it likes addresses in low byte, high byte fashion. This means that STA &7D00 translates as:

```
8D 00 7D
```

Don't be too hard on the 6502 for this quirk, it's quite understandable. After all, when you're doing your hundreds, tens and units sums, you start with the low column – the units – first. Similarly the 6502 finds it easier to start with the low byte.

Incidentally, it's a convention that we write hex numbers with an even pair of digits, even if we have to add a leading zero. This means that &9 is written &09 and &3EF is written &03EF.

oswrch. Program IV uses the same technique to draw a triangle, the program emulating the effects of:

```
VDU 22,5
VDU 25,4,200,0,0,0
VDU 25,85,100,0,200,0
```

These VDU codes are held in the data statements at the end of the listing. The heart of the program is the loop which cycles 14 times. Inside this loop is the routine:

```
[
LDA #code
JSR oswrch
]
```

For each cycle of the loop these two instructions are assembled, but with different values read into code each time. The result is that when the loop has finished, some 70 bytes of code have been assembled in the locations from &2000 to &2045.

```
10 REM Program IV
20 MODE 6
30 codeStart=&2000
40 oswrch=&FFEE
50 P%=codeStart
60 REM loop to read in VDU c
odes
70 FOR loop=1 TO 14
80 READ code
90 REM assembler entered eac
h loop cycle
100 [
110 \ latest code value plac
ed in memory location P%
120 LDA #code
130 \ opcode for subroutine
call placed in memory
140 JSR oswrch
150 ]: REM quit assembler
for this cycle
160 NEXT loop
170 REM drop out of loop
180 [ \ one last entry to as
sembler
190 RTS \ finish off assembl
ed routine
200 ]: REM quit assembler
210 CALL codeStart
220 REM VDU codes
230 DATA 22,5
240 DATA 25,4,200,0,0,0
250 DATA 25,85,100,0,200,0
```

Program IV

The routine at line 180 just adds the RTS to finish things off while the final CALL of line 210 sets the newly-assembled routine (or collection of routines) going. The result is the triangle.

Program IV is just ripe for playing around with. Look up the VDU codes in your Electron's manual and see what you can do. And when you've tired of that, have a glance at Program V.

```
10 REM Program V
20 MODE 6
30 codeStart=&70
40 oswrch=&FFEE
50 P%=codeStart
60 [
70 .start
80 LDX #&41
90 STX &8E
100 LDY &008E
110 STY &8F
120 LDA &8F
130 JSR oswrch
140 JSR start
150 RTS
160 ]
170 CALL codeStart
```

Program V

The previous program used a Basic loop. If you look closely at Program V you'll see there's a loop, but this time it's written in assembly language. And if you run it, you'll find you can't stop it, short of using brute force.

I'll leave you to figure out how it works and where the assembled code is stored. Notice how the lack of comments makes the mnemonics appear fairly obscure. When you've cracked that, see if you can write a routine that will swop the values in the X and Y registers. And then try it without using the accumulator.

● *That's all for now. Next month we'll be exploring some rather better ways of looping in assembler.*

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Memory Map

Part 2

IN the second part in this series of fact sheets providing a complete description of the Electron's memory map we'll move on to look at page two, starting at &200.

The lower third is dedicated to the main operating system vectors, while the last two thirds is used to store system variables.

We haven't forgotten page 1 – &100 to &1FF. This is relatively uninteresting though, as it is the 6502 stack. The bottom half should always be free so it's possible to use it as a scratchpad.

TABLE 1

Address	Use
&200/&201	USERV – *LINE and *CODE use this.
&202/&203	BRKV – the break vector, nothing to do with the Break key.
&204/&205	IRQ1V – the main interrupt vector.
&206/&205	IRQ2V – not used on the Electron.
&208/&209	CLIV – used by the command line interpreter.
&20A/&20B	BYTEV – used by osbyte (*FX) calls.
&20C/&20D	WORDV – used by osword calls.
&20E/&20F	WRCHV – used by oswrch (VDU) calls.
&210/&211	RDCHV – used when reading characters from input stream.
&212/&213	FILV – used when loading and saving.
&214/&215	ARGSV – read/write file arguments.
&216/&217	BGETV – read a byte from a file.
&218/&219	BPUTV – write one byte to a file.
&21A/&21B	GBPBV – get/put a block of bytes from/to a file.
&21C/&21D	FINDV – open or close a file.
&21E/&21F	FSCV – filing system control vector.
&220/&221	EVENTV – points to event handling routine.
&222/&223	UPTV – pointer to user print routine.
&224/&225	NETV – not used on the Electron.
&226/&227	VDUV – unrecognised VDU commands.
&228/&229	KEYV – used for reading the keyboard.
&22A/&22B	INSV – used for inserting characters into a buffer.
&22C/&22D	REMV – remove character from buffer.
&22E/&22F	CNPV – count/purge buffer vector.
&230/&231	INDV1 – not used.
&232/&233	INDV1 – not used.
&234/&235	INDV1 – not used.

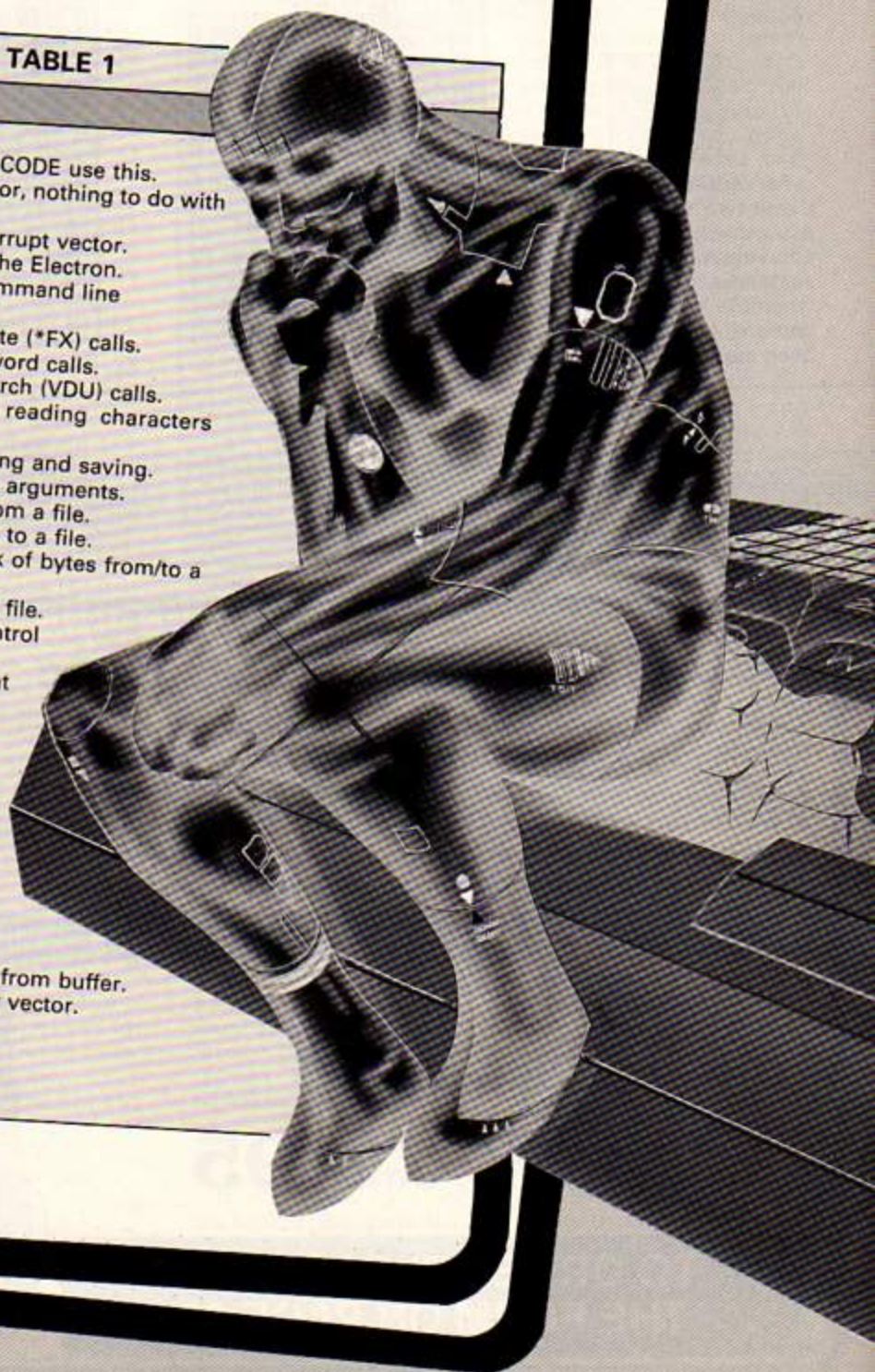

TABLE 2

Address	Use
&238/&239	Address of rom pointer table.
&23A/&23B	Address of rom table.
&23C/&23D	Address of key translation table.
&23E/&23F	Address of VDU variables.
&240	CFS timeout counter – frame flyback synchronised.
&241	Currently selected input buffer.
&246	Character definition explosion status.
&24A	Rom enabled before last BRK.
&24B	Number of Basic rom.
&24C	Current ADC channel number.
&24D	Maximum ADC channel number.
&24E	ADC conversion accuracy.
&251	Flashing colour countdown timer.
&252	Flashing colour mark period count.
&253	Flashing colour space period count.
&254	Keyboard auto-repeat delay set by *FX11.
&255	Keyboard auto-repeat rate set by *FX12.
&258	Break/Escape key options set by *FX200.
&25A	Caps Lk and Shift key state.
&262	Sound output suppression flag set by *FX210.

Address	Use
&263	Bell (Control+G/VDU 7) channel number.
&264	Bell amplitude/ENVELOPE number.
&265	Bell frequency.
&266	Bell duration.
&26A	Number of items in VDU queue.
&26C	Current escape character.
&275	Escape key status set by *FX229.
&287	Break key interception flag – &4C=JMP.
&288/&289	Address to jump to when Break key is pressed.
&28C	Current language rom.
&28D	Last Break type – 0=soft, 1=power up, 2=hard.
&28F	Start up options set by *FX255.
&292-&296	System clock 1.
&297-&29B	System clock 2.
&2A0	Rom table – complete list of currently active roms.
&2B1/&2B2	INKEY countdown timer.
&2B6-&2B9	Low bytes of last ADC conversions.
&2BA-&2BD	High bytes of last ADC conversions.

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Going for a scroll

In Part 5 of his sprites series ROLAND WADDILOVE reveals how to create entertaining scrolling map arcade games

THIS month I'm continuing with the theme of maps. Or to be more precise, creating your own massive multi-screen arcade games.

The main problem facing the majority of programmers attempting to write such a game is how on earth they can fit all the screens into the Electron's small memory.

A single Mode 5 screen takes up 10k, and as there's only around 15k of memory available for the game, it's quite clear that they can't be stored in the normal manner. So how is it done?

Last month I dealt with static screens, like the ones used in Superior Software's Citadel and Palace of Magic, or Tynesoft's Mousetrap and Phantom.

Now I'll move on to show how scrolling map games are written. The most famous of these is Superior Software's Repton series. The technique is also used in Tynesoft's Boulderdash.

The method used to achieve this is similar in some respects to the one used for static maps last month, and I've used the same graphic characters for the scrolling map.

So if you've already entered last month's listing you can save yourself some typing here.

Enter and run this month's to see the scrolling map technique in action. Use the A, Z, < and > keys to scroll the display up, down, left and right. The screen dump shows what you should be seeing on the screen.

Although the view is limited to a small window in the centre of the screen, the only real limitation to its size is speed. The larger the map, the slower will be the scrolling.

If you have played both the BBC Micro and Electron versions of Repton you'll have noticed that while the BBC Micro uses full screen (hardware) scrolling, the Electron's display is restricted to a small (software scrolled) window, like the program here. This is simply to keep the speed up to an acceptable level.

The map is 16 x 16 blocks and the display is a window of 5 x 5 blocks which can be moved over the whole area. You can see the screen data at the end of the listing.

Each type of block is numbered, and to keep the typing down to a reasonable level I have only used five in this map, numbered zero to four. Though there's no reason why you couldn't have up to 128 different types.

It's up to you to decide how many types of block to use. The sprite data does consume a fair bit of ram – 96 bytes per block – so it's a trade off between space and variety of graphics.

The 96 times multiplication table at line 1320 will need expanding, and extra sprite data will need to be added for the extra blocks.

The single map in the listing takes up 256 bytes, which although consuming far more memory than previous screens, is still reasonably small. Repton for instance, comes with eight screens, and this, using the method outlined here would take up just 2k of ram – quite acceptable.

The *drawmap* subroutine at line 780 draws five rows of five blocks, starting at row *ycoord*, column *xcoord*, and this is the heart of the scrolling map technique.

The map isn't actually scrolled as such, what the program does is to either increment or decrement the *xcoord* or *ycoord* and redraw it on screen. The subroutine *move*reads the keyboard and updates *xcoord* and *ycoord* if the control keys are pressed. Then *drawmap* draws the section of map.

The only thing to watch out for is that *xcoord* or *ycoord* doesn't exceed 11. The map is 16 blocks wide and we display five blocks, 5 plus 11 is 16 so this is the edge of the map.

You could easily add extra characters like Repton, boulders, diamonds and so on. These are simply extra blocks in the map. Boulders could be block number five, diamonds could be six,

```
  10 REM Scrolling Map
  20 REM By R.A.Waddilove
  30 REM (c) Electron User
  40 PROCassemble
  50 MODE 5
  60 VDU23,1,0;0;0;0;
  70 PRINT TAB(3,3)"Press A
Z < >"
  80 VDU 28,4,25,15,9
  90 COLOUR 131
 100 CLS
 110 VDU 26
 120 COLOUR 128
 130 !pos=&5800+5*16+10*&14
0
 140 CALL &900
 150 END
 160
 170 DEF PROCassemble
 180 *FX16
 190 index=&50
 200 tindex=&51
 210 addr=&52
 220 xcount=&54
 230 ycount=&55
 240 new=&56
 250 xcoord=&58
 260 ycoord=&59
 270 temp=&5A
 280 pos=&5C
 290 FOR pass=0 TO 2 STEP 2
 300 P%=&900
 310 [ OPT pass
 320 LDX #0
 330 STX xcoord
 340 LDY #0
 350 STY ycoord
 360 .main
 370 SEI
 380 JSR drawmap
 390 CLI
 400 JSR &FFE0:BCS esc
 410 JSR move
 420 JMP main
 430 .esc
 440 RTS
 450
 460 .move
 470 CMP #ASC"A"
 480 BNE down
 490 LDA ycoord
 500 BEQ end_move
```

Repton could be seven and so on.

You wouldn't even need to keep track of Repton's coordinates. If he is at the centre of the display, he will be at *xcoord* + 2,*ycoord* + 2. You could then move him round by moving character seven up, down, left or right in the map, updating *xcoord,ycoord* accordingly.

Try adding your own Repton-like character to the program, and see if you can make him move in a realistic way – so he doesn't walk through walls! You'll need to design a sprite and add it to the data in the listing.

Note that for extra speed the sprite data has been modified. The editor presented in Part 1 of the series in the February 1988 issue of *Electron User* was used to design the blocks, and the print routine from the following month was used to print it.

The data was then read from the screen into data statements as three horizontal, character-high strips 32 bytes wide. This means a simple, and extremely fast, indexed print routine routine can be implemented.

● *Next month I'll show how to keep track of the score in your high speed games.*

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```
510 DEC ycoord
520 RTS
530 .down
540 CMP #ASC"2"
550 BNE left
560 LDA ycoord
570 CMP #11
580 BEQ end_move
590 INC ycoord
600 RTS
610 .left
620 CMP #ASC","
630 BNE right
640 LDA xcoord
650 BEQ end_move
660 DEC xcoord
670 RTS
680 .right
690 CMP #ASC"."
700 BNE end_move
710 LDA xcoord
720 CMP #11
730 BEQ end_move
740 INC xcoord
750 .end_move
760 RTS
770
780 .drawmap
790 LDA ycoord
800 ASL A
810 ASL A
820 ASL A
830 ASL A
840 ADC xcoord
850 STA index
860 LDA pos
870 STA addr
880 LDA pos+1
890 STA addr+1
900 LDY #5
910 STY ycount
920 .yloop
930 LDA addr
940 STA temp
950 LDA addr+1
960 STA temp+1
970 LDA index
980 STA tindex
990 LDA #5
1000 STA xcount
1010 .xloop
1020 LDA addr
1030 STA new
1040 LDA addr+1
1050 STA new+1
1060 LDY index
1070 INC index
1080 LDA scr,Y
1090 JSR print
1100 LDA addr
1110 ADC #4*8
1120 STA addr
1130 LDA addr+1
1140 ADC #0
1150 STA addr+1
1160 DEC xcount
1170 BNE xloop
1180 LDA temp
1190 ADC #(3*&140)MOD256
1200 STA addr
1210 LDA temp+1
1220 ADC #(3*&140)DIV256
1230 STA addr+1
1240 LDA tindex
1250 ADC #16
1260 STA index
1270 DEC ycount
1280 BNE yloop
1290 CLI
1300 RTS
1310
1320 .mult
1330 EQUW 0
1340 EQUW 1*96
1350 EQUW 2*96
1360 EQUW 3*96
1370 EQUW 4*96
1380
1390 .print
1400 ASL A
1410 TAY
1420 LDA mult,Y
1430 ADC #sprites MOD256
1440 STA ploop+1
1450 LDA mult+1,Y
1460 ADC #sprites DIV256
1470 STA ploop+2
1480 LDX #3
1490 .ploop1
1500 LDY #31
1510 .ploop
1520 LDA &3000,Y
1530 STA (new),Y
1540 DEY
1550 BPL ploop
1560 CLC
1570 LDA new
1580 ADC #&40
1590 STA new
1600 LDA new+1
1610 ADC #&1
1620 STA new+1
1630 LDA ploop+1
1640 ADC #32
1650 STA ploop+1
1660 LDA ploop+2
1670 ADC #0
1680 STA ploop+2
1690 .p1
1700 DEX
1710 BNE ploop1
1720 RTS
1730
1740 OPT FNscrdata
1750
1760 .sprites
1770 EQUS STRING$(96,CHR$0)
1780 OPT FNsprdata
1790
1800 ]
1810 NEXT
1820 ENDPROC
1830
1840 DEF FNsprdata
1850 RESTORE 1940
1860 FOR I%=0 TO 4*4*24-1 S
TEP 4
1870 READ a$
1880 [ OPT pass
1890 EQUD EVAL("&"+a$)
1900 ]
1910 NEXT
1920 =pass
1930
1940 REM Brick
1950 DATA 2D2D2D2D,F02D2D2D
,F0F0F0F,F00F0F0F,2D2D2D2D,F
02D2D2D,F0F0F0F,F00F0F0F,F0F
0F0F,F00F0F0F,4B4B4B4B,F04B4
B4B,F0F0F0F,F00F0F0F,4B4B4B4
B,F04B4B4B,2D2D2D2D,F02D2D2D
,F0F0F0F,F00F0F0F,2D2D2D2D,F
02D2D2D,F0F0F0F,F00F0F0F
1960 REM Pillar bottom
1970 DATA 0,0,FAFCFCF8,F8FC
FCF8,F0F0F0F0,F0F0F0F0,0,0,0
,0,FCF8F8FA,FCFCF8FA,F0F0F0F
0,F0F0F0F0,0,0,0,33331111,F8
FAF8,F8F0F8F0,F0F0F0,F0F0F0F
0,0,C0C08080
1980 REM Pillar top
1990 DATA 11113333,0,F0F0F8
F0,FAFCF800,F0F0F0F0,F0F0F00
0,8080C0C0,0,0,0,F8FCFCF8,FC
FCF8FA,F0F0F0F0,F0F0F0F0,0,0
,0,0,F8FCF8FA,F8F8FAF8,F0F0F
0F0,F0F0F0F0,0,0
2000 REM Stone
2010 DATA 2D162503,2D5A2D5A
,A55AA50F,A55AA55A,A55AA50F,
A55AA55A,864A8608,A54BA54B,2
D5A2D5A,2D5A2D5A,A55AA55A,A5
5AA55A,A55AA55A,A55AA55A,A54
BA54B,A54BA54B,255A2D5A,1122
516,A55AA55A,F5AA55A,A55AA55
A,F5AA55A,A54BA54B,80C864A
2020
2030 DEF FNscrdata
2040 RESTORE 2170
2050 scr=P%
2060 FOR Y%=1 TO 16
2070 READ a$
2080 FOR X%=1 TO 16
2090 [ OPT pass
2100 EQUB EVAL(LEFT$(a$,1))
2110 ]
2120 a$=MID$(a$,2)
2130 NEXT
2140 NEXT
2150 =pass
2160
2170 REM Screen
2180 DATA 1111111111111111
2190 DATA 1000000000000001
2200 DATA 1044440440444401
2210 DATA 1040040040000401
2220 DATA 1040030440400401
2230 DATA 1000020040040401
2240 DATA 1044440440444401
2250 DATA 1000000400400001
2260 DATA 1044444444404441
2270 DATA 1000000040004001
2280 DATA 1444404444404401
2290 DATA 1000000000000401
2300 DATA 1044404444440401
2310 DATA 1040300004030001
2320 DATA 1000200400020401
2330 DATA 1111111111111111
```

Trouble on the horizon

Spot lean times coming with the final part of CHRIS NIXON's series on ViewSheet

I INTRODUCED you to ViewSheet's windows last month, and showed how they can be used to produce useful bar charts from ordinary data on your sheet.

In this, the final article in the series, we'll remove last month's dummy figures and extend Clever Soft's profit and loss analyser to provide real, month-by-month computed figures, thereby completing our full size trouble-shooting spreadsheet.

First of all load in last month's spreadsheet, which contains the bar chart display. If you missed any of the last two articles, Listing I is an up-to-date spreadsheet exactly as we left it at the end of last month's article.

To enter it into ViewSheet, start at the top of the listing and work downwards, placing the slot cursor over each slot reference as shown on the left, and entering the contents shown on the right.

Now that we are going to further work on the sheet, the current window definitions must go. This is because the top and side margins have been turned off, and you'd need a lot of guesswork to edit a sheet without having them present.

Normally, any window definitions will be saved along with your sheet, but there are two ViewSheet commands associated with just the definitions. They are:

```
SW filename
LW filename
```

As you can probably guess, the first command saves the current window definitions, while the second loads a previously saved set of definitions into the current sheet.

This can be a very useful technique for loading one of your favourite window set-ups into a freshly written sheet, thereby saving the effort of setting them up from scratch.

For our purposes however, we simply need to make a temporary record of our windows on disc, while we update the sheet. Then they can be loaded back in again to add the finishing touch.

So from ViewSheet's command mode, type:

```
SW WINDOWS <Return>
```

When the prompt returns, press Break to clear the windows back to their default state.

Don't worry – ViewSheet will return you immediately to its command mode with the sheet still intact.

Now press Escape to enter edit mode, and you will see that the top and side margins are with us once more, and the bar chart has disappeared.

Now we can get down to the business of upgrading our profit and loss predictor.

To replace the dummy end-of-month figures given in slots B31-B41, we need to create 11 more Sales Figures blocks, similar to January's – which appear between rows 9-19 – and arrange them side by side, starting immediately to the right of January.

At this point I must mention that owners of standard 32k Electrons will not be able to fit all 12 months into one sheet in this fashion – there just isn't enough memory.

The best idea is to split the sheet into two six-monthly parts. To do this, follow the instructions below for replicating January's figures, but stop after entering the sixth month. Save the sheet as PART1, then alter the names of the existing months to (JUL) - (DEC) and save again as PART2.

If you have to do it this way, then all following instructions apply equally to both parts. However, if you have Slogger's Master Ram Board, simply save your work and flip into 64k mode before reloading and continuing.

Make sure you are in Mode 3 – the additions we are about to make will not fit into the sheet on an unexpanded Electron if a higher-memory mode is used. Press Func+1 – Replicate – and in answer to the From – To? prompt, type:

```
A9A19-E9
```

If you remember last month's article, the trick with replication is to get the

```
LA  SLOT=A1
CONTENTS=CLEVER


0      .......A.......B.......C.......D.......E.......F.......G.......H.......I
......1 CLEVER  SOFT    LTD
......2
......3 PRODUCT   NAME:    ALIEN SHOOTUP
......4 AUTHORS %RYLTY:       15
......5 ARTWORK  COSTS:      500
......6 PRODCTN   COST:     3.95
......7 RETAIL   PRICE:     9.95
......8
......9 ------- ------- -------         -------
.....10 SALES   FIGURES   (JAN)         SALES
.....11
.....12 UNITS     MADE:      600         UNITS
.....13 OVERALL   COST:     2870         OVERALL
.....14 UNITS     SOLD:      350         UNITS
.....15 GROSS   INCOME:   3482.5         GROSS
.....16
.....17 GROSS   PROFIT:    612.5         GROSS
.....18 NET     PROFIT:   98.125         NET
.....19 ------- ------- -------         -------
```

Figure I: After replicating the first column

dash in the correct part of the argument. When used as we have used here, it means: Copy all slots in the range A9 to A19 into the same relative vertical positions, starting at E9.

Press Return – if you haven't already – and after a brief pause you'll see an identical column appear, descending from slot E9, making your screen look like Figure I.

You can see that column D remains blank. That's because we ideally want 12 identically laid-out monthly reports, side by side, and things would look very cluttered if there were no break between the blocks.

We still have 10 minutes or so of replication ahead of us, so back to work. Press Func+1 again, and this time type:

```
B9B19-F9
```

Now replicate the third column, using:

```
C9C19-G9
```

You will be prompted:

```
R)elative, N)o change?
C17-(((C4/100)*C15)
```

and the C17 will be highlighted. Again, referring to last month's article will remind you that when formulae are being replicated, ViewSheet needs to know whether you want them copied relatively or verbatim.

Now this is where the concepts can become difficult to grasp, so just to refresh your memory: We are not simply copying the information as displayed in the slots – each formula must be properly replicated, so any references by the copied column to itself are adjusted for the replicated C column's new position.

All slot references in a formula which is undergoing replication are highlighted in turn. Pressing R – Relative replication – at that point means you want that slot reference adjusted relatively to take into account its new position. Pressing N – No change – means you want that part of the formula copied verbatim.

```
LA  SLOT=A1
CONTENTS=CLEVER

0       .......A.......B.......C.......D.......E.......F.......G.......H.......I
.......1CLEVER  SOFT    LTD
.......2
.......3 PRODUCT   NAME:    ALIEN SHOOTUP
.......4 AUTHORS %RYLTY:       15
.......5 ARTWORK  COSTS:      500
.......6 PRODCTN   COST:     3.95
.......7 RETAIL   PRICE:     9.95
.......8
.......9 ------- ------- -------        ------- ------- -------
......10 SALES   FIGURES   (JAN)        SALES   FIGURES   (FEB)
......11
......12 UNITS      MADE:      600       UNITS      MADE:      600
......13 OVERALL    COST:     2870       OVERALL    COST:     2870
......14 UNITS      SOLD:      350       UNITS      SOLD:      350
......15 GROSS    INCOME:   3482.5       GROSS    INCOME:   3482.5
......16
......17 GROSS    PROFIT:    612.5       GROSS    PROFIT:    612.5
......18 NET      PROFIT:   98.125       NET      PROFIT:   98.125
......19 ------- ------- -------        ------- ------- -------
```

Figure II: February's module completed

So, press R to start with, because we want the reference to slot C17 to be copied with a relative adjustment for the destination column – it's going to become G17.

C17 will promptly disappear from the edit line, and the C4 will now be highlighted. This time we want to leave well alone, because C4 is a slot near the top left of the screen – in among the master production figures – and it holds the author's percentage royalty cut.

We need this reference to remain the same throughout all 12 months, otherwise our sheet would be inaccurate. So press N to copy the reference unchanged, and the C4 will disappear to be replaced with the last slot reference of the equation, C15. This must be copied relatively, to become G15, so press R once more.

ViewSheet will carry on in this fashion for the other formulae in column C, prompting you for each slot reference it finds – nine for the whole column.

If you are still not sure when to press R and when to press N, remember that any slot reference with a row number greater than nine should be copied relatively, as it will be part of column C. Press N for anything else.

You should begin to see what is happening. We now have our report for February laid out before us, with only one defect – column G is a total clone of January's figures from column C. So move to slot G10 and enter (FEB). Ignore the cloned figures in the rest of column G for the time being, because we want to get the rest of the year laid out first.

Your sheet should now look like Figure II. Using the replicate function as shown above, now create 10 similar blocks for March to December, starting at column I and extending right up to column AU. Your sheet, when finished, should be 46 columns wide in total, and you will probably feel pretty exhausted!

It is here, after producing just the first six months, that owners of unexpanded Electrons should save the sheet as PART1, alter the names of the months to (JUL) - (DEC) and save again as PART2. All following instructions are assumed to be used with the six months in PART1 for clarity's sake, although they apply to PART2 as well.

All that hard work was well worthwhile, because we can now link all 12 modules to our bar chart and begin entering test figures for the full year – which at present is still covered with the cloned results from January's result column.

But first we must perform the linking. What we need to do is ensure the value shown in the net profit slot from each month's module appears in the result range B30-B41. This, as you will remember, is where the bar chart looks to find its data – and at present it contains just fake figures.

So move to slot B30, and enter the reference C18 – the slot containing January's net profit. Then move to B31 and enter G18, which is February's net profit. Continue down column G until the slot references for all 12 months' profit figures are entered.

Now we are almost done. Our sheet is complete, save for the actual monthly data – which is for you to enter and experiment with. So press Escape, and reload your window definition with:

```
LW WINDOWS <Return>
```

Press Escape again, and your screen should show the new bar chart. Pretty uninspiring, isn't it? The reason that all the bars are the same length, of course, is that all 12 months still contain the data originally copied from January's

Turn to Page 46 ▶

◄ From Page 45

results column. So it's time now for us to change things.

Scroll up the screen until the actual monthly modules appear in the top window, as shown in Figure III. This is actually the best way to keep the sheet now, with the data being edited in window zero, while the bar chart updates itself accordingly in window one.

We are interested in altering only three sections of the sheet: The master production cost block at the top left of the sheet, and the Units made and Units sold slots present in all 12 monthly modules.

The data contained in these areas should be altered according to the following rules: To make a major production cost alteration, change some of the figures in the master production cost block at the top left of the sheet. For instance, you may want to see how using cheaper production methods affects the overall monthly profits – in which case you'd alter slot C6.

The whole sheet will then recalculate, giving a totally new bar chart. Then to adjust to your liking the sales results for a newly revised cost of production, alter the Units made and Units sold slots for the months you are are interested in. Hopefully, you should be able to work out the most cost-effective marketing strategy possible for your product, by careful manipulation of this – and any similar – sheet. Not to mention what fun it is too!

Bear in mind, however, that if your profits end up greater than about £250 for any month, you will need to alter the adjustment formulae in slots A50-A61. These formulae, as you will remember, ensure that the monthly figures stay within the 70 character width of window one.

Each formula in this range divides a month's profit results by 3.5, so it is a simple matter to change this constant to 4, 5 or whatever you wish. Do remember to alter all of these formulae, or the bar chart will be a distortion of the facts – but this isn't necessarily undisirable, as most business executives will tell you!

That brings us to the close of this short introductory series on using ViewSheet. We hope that as a result of it, more Electron owners will realise just what sort of computing power lies beneath that innocent-looking keyboard, and make creative use of it in whatever way they can.

There are, of course, many more powerful facilities available with ViewSheet. However, these are probably best excluded from what is really a series for beginners – those of you who are interested should by now have enough background knowledge to trudge successfully through the more advanced sections of the ViewSheet manual.

There is also no reason at all why ViewSheet cannot be used in the classroom, perhaps to help illustrate business studies courses. Especially as it's also great fun to experiment with – a valuable criterion for any method of education.

A spreadsheet similar to the one I've presented over the last few months could form the basis for a fascinating project, involving pupils in a competition to construct the most efficient business possible.

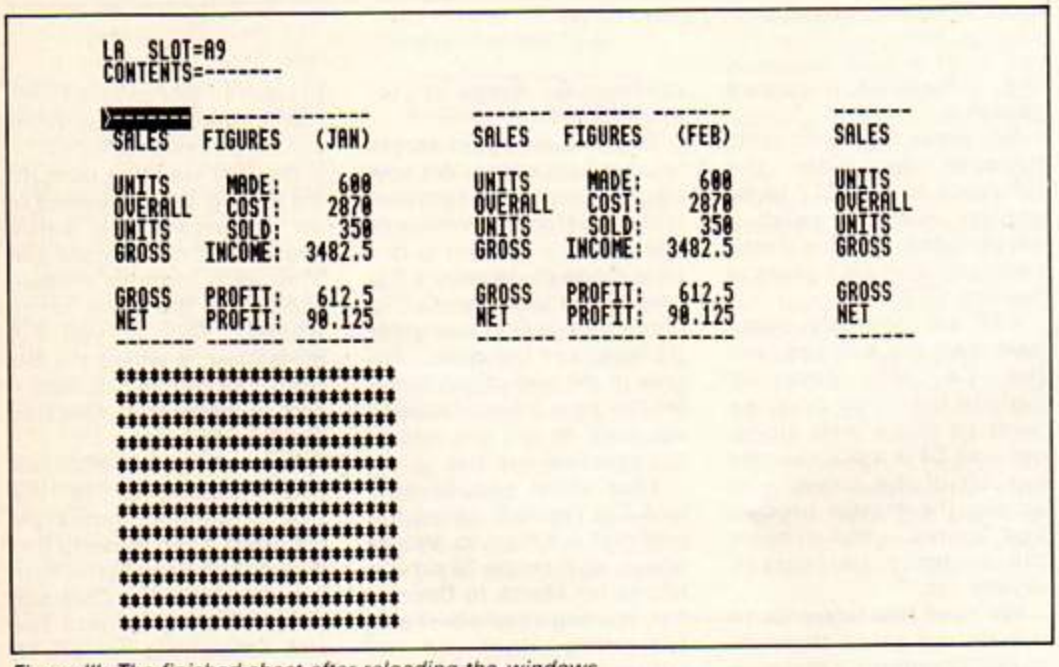


Figure III: The finished sheet after reloading the windows

Slot	Contents						
A1	CLEVER	A35	JUN	B3	NAME:	B36	79.914
A3	PRODUCT	A36	JUL	B4	%RYLTY:	B37	88.692
A4	AUTHORS	A37	AUG	B5	COSTS:	B38	125.254
A5	ARTWORK	A38	SEP	B6	COST:	B39	140.657
A6	PRODCTN	A39	OCT	B7	PRICE:	B40	170.264
A7	RETAIL	A40	NOV	B9	-------	B41	236.518
A9	-------	A41	DEC	B10	FIGURES	C1	LTD
A10	SALES	A50	B30/3.5	B12	MADE:	C3	ALIEN
A12	UNITS	A51	B31/3.5	B13	COST:	C4	15
A13	OVERALL	A52	B32/3.5	B14	SOLD:	C5	500
A14	UNITS	A53	B33/3.5	B15	INCOME:	C6	3.95
A15	GROSS	A54	B34/3.5	B17	PROFIT:	C7	9.95
A17	GROSS	A55	B35/3.5	B18	PROFIT:	C9	-------
A18	NET	A56	B36/3.5	B19	-------	C10	(JAN)
A19	-------	A57	B37/3.5	B30	90.125	C12	600
A30	JAN	A58	B38/3.5	B31	88.34	C13	500+C12*C6
A31	FEB	A59	B39/3.5	B32	85.75	C14	350
A32	MAR	A60	B40/3.5	B33	83.925	C15	C14*C7
A33	APR	A61	B41/3.5	B34	79.64	C17	C15-C13
A34	MAY	B1	SOFT	B35	74.391	C18	C17-((C4/100)*C15)

Listing I: The up-to-date spreadsheet listing from last month

Last month the View Sheet article contained some errors.

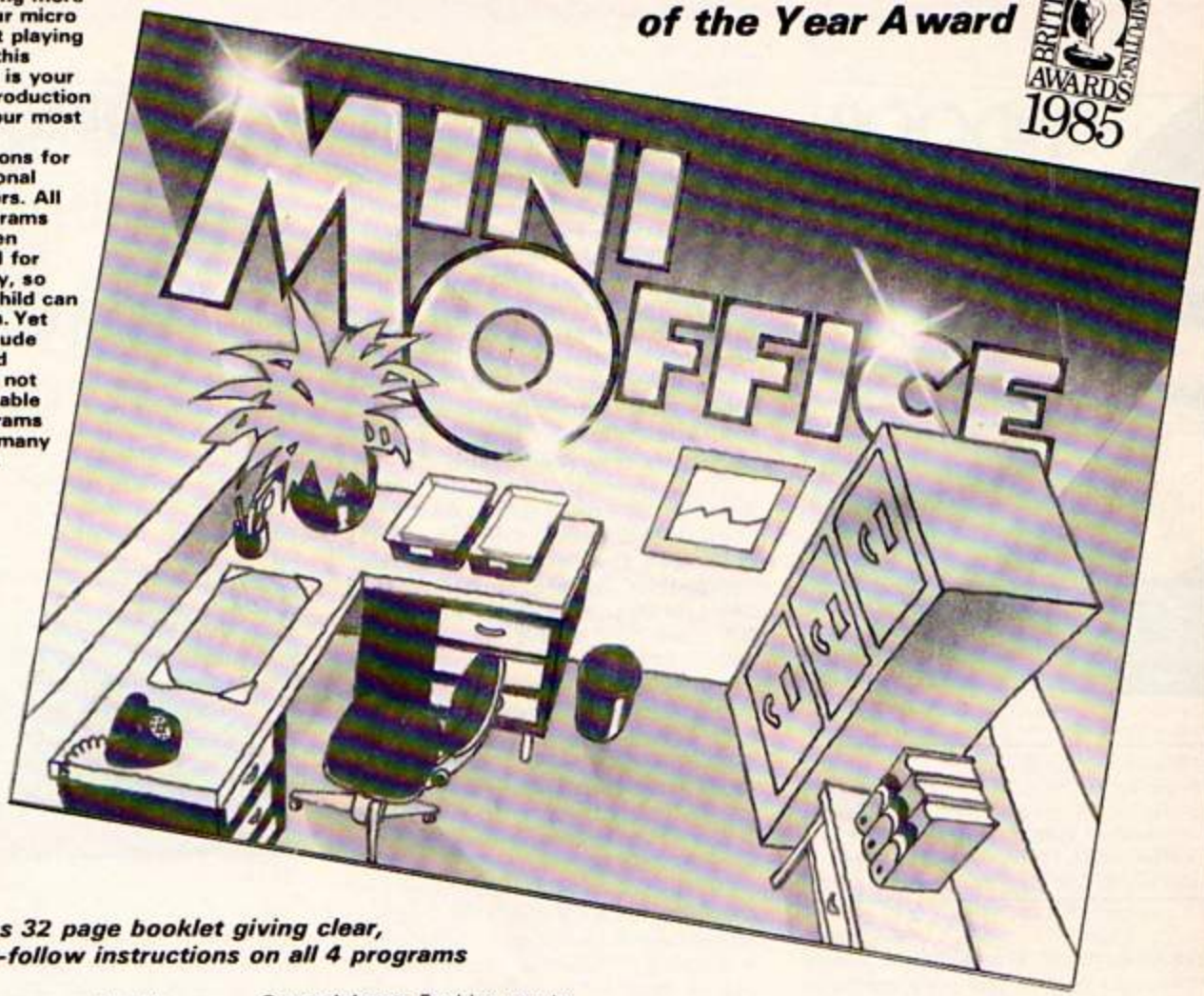
The slot references in Listing I should have been for column B. Column A, which should have contained the months JAN to DEC, was omitted. See Listing I for the correct details.

In Mode 3 the bottom bar chart window must be entered and scrolled to show the bottom few lines, unless you have a 64k Electron – in which case use Mode 0.

If you want to start doing more with your micro than just playing games, this package is your ideal introduction to the four most popular applications for professional computers. All the programs have been designed for simplicity, so even a child can use them. Yet they include advanced features not yet available on programs costing many times as much!

Finalist for the Home Software of the Year Award

NOMINATED FOR BRITISH MICRO COMPUTING AWARDS 1985



Contains 32 page booklet giving clear, easy-to-follow instructions on all 4 programs

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

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

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

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

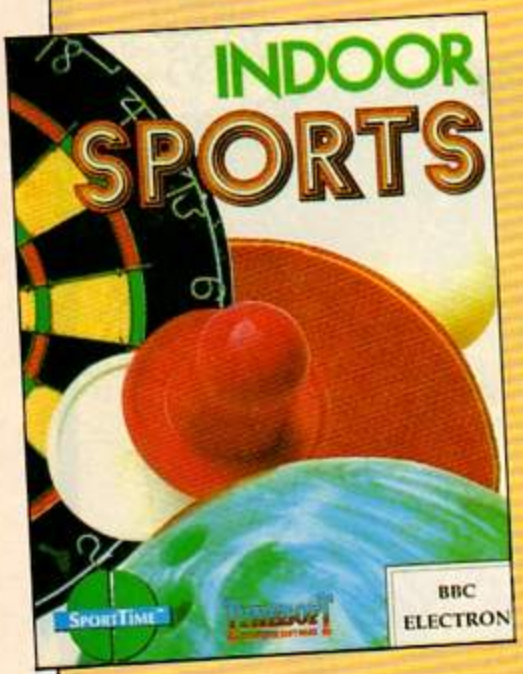
☆ **Word Processor** ☆ **Spreadsheet**
☆ **Database** ☆ **Graphics**

Now they're all together - in ONE simple package

Four full-scale programs for an incredible low, low price! **£5.95 cassette**

TO ORDER TURN TO THE FORM ON PAGE 53

Leisure interests



Product: Indoor Sports
Price: £9.95
Supplier: Tynesoft, Unit 3, Addison Industrial Estate, Blaydon, Tyne & Wear NE21 4TE
Tel: 091-414 4611

WHEN Tynesoft brings out a sports simulation of any type, it's certainly something to sit up and take a look at. So Indoor Sports got the treatment. There are four events on the tape – two less than its recent Winter Olympiad '88 – so I was anxious to find out whether it really justified its top of the range price tag. I was to be pleasantly surprised.

First on the tape is **10-Pin Bowling**. This realistic simulation is controlled by three keys, of which two are used to position your figure within the lane. All subsequent action is controlled with the spacebar – which led to some initial confusion.

After setting your position, the computer cycles through all the available levels of spin, as shown by the spin meter at the top of the screen. Pressing the spacebar sets the spin, and the computer will begin cycling through the shot angles – displayed on the lane by an arrow.

As soon as this is fixed – by releasing the spacebar – your figure begins his run-up to the line. At the right moment the spacebar must again be pressed to bowl – or so I thought – but at this point my figure kept either falling flat on his face, or dropping the ball on his foot.

This continued until I finally understood the ambiguous phrase in the cassette inlay: "Press Space and the bowling action is recorded". What this rather unhelpful instruction means is that you must press it during, not after, the run-up, when your figure happens to be in the best posture for bowling. The bowl will then follow automatically when the figure reaches the line, using the previously recorded posture.

Once this sank in, I settled down to enjoy a really great game. As the ball coasts down the lane the view shifts to cover the run, and when the ball approaches the skittles the viewing angle changes to show the action from behind and slightly above the ball.

The hit itself is simulated very realistically, with some skittles teetering for a while before either toppling over or remaining upright. The frustration caused by the ball rolling straight into the gully was balanced by the nerve-wracking anticipation when it actually remained on course.

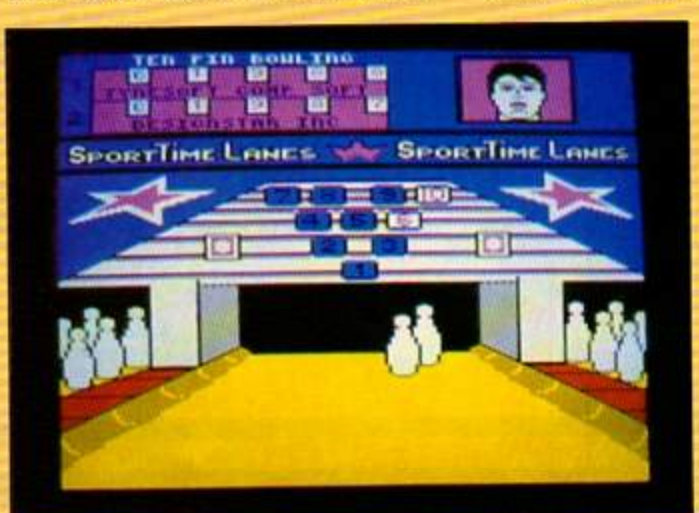
Darts is next on the tape, and as a mediocre to bad player I thought this would be one to skip over quickly. Not a bit of it. The skills needed are, of course, totally different when playing the real thing, so Tynesoft has added its own skill requirements, making this an addictive game in its own right.

You start off face to face with an accurately drawn dart board. Below is the aiming window, which is the same width as the board. To either side of this window are two meters, one for power and the other for the angle of shot elevation.

Inside the aiming window is a dart, which can be slid left and right. Slid is the operative word, because if it passes over the mid-point, a weird sort of gravity sucks the dart to the other side of the window. Hence aiming requires some concentration.

Pressing Return when the dart is where you want it sets the angle meter into action, which is in the form of a continuously growing and shrinking circle sector. Releasing Return fixes the angle and starts the power meter climbing, which is represented by

Air ball



10-Pin bowling

three volume meter type bars. Finally, releasing Return throws the dart with the selected settings.

The scene then changes to a comfortable-looking pub, where a log fire crackles gently in the corner. In the centre of the screen, poised in front of the dart board – now hanging from the far wall – stands your figure. From behind, which is your only view of him, he could easily pass himself off as Eric Bristow.

Immediately he throws his dart. Well, it's more of a flick of the wrist than a throw, but attention is focused on the dart, now flying through the air. This part is quite well done, although there is no inertia on the dart, nor is its flight trajectory particularly curved.

I was both surprised and pleased to see that it is possible to hit the metal frame. I was therefore well able to match my real life performance on the Electron, thankfully unwitnessed by any grinning bystanders.

After each throw the enlarged board re-appears, showing the exact spot where the dart hit. Your score is then chalked up, by real chalk – a nice touch – and after three throws it's the Electron's turn.

In actual fact, although very competent and a consistently high-scorer, the Electron tended to hit the frame more than I did – usually when attempting to show off by going for double-top.

I'd only fault the game on the slight inaccuracy of the darts' position on the board, which seemed to be different sometimes for the same angle and power settings.

Now on to **Table Tennis**, my favourite of the four. When the game has loaded, you are presented with a proper perspective view of a ping-pong table, with a bat floating in mid-air at either end. Four keys control your bat, one each for moving it left, right, flipping it over for a back-hand stroke and hitting the ball.

Hitting it is not strictly necessary, because as long as the ball hits your bat it'll bounce back up the table. However, you won't win by playing a lazy game like this. The real skill in Table Tennis is to press the hit key at the right moment as the ball approaches your bat.

This causes the bat to swing into the screen, and the direction of the rebound depends on which way your bat is facing. The actual angle is determined by the closeness of the ball to the bat when the key is pressed. The further the ball is from your bat when you hit it, the sharper the ball's angle will be as it goes back across the table.

Here lies the way to beat the computer, which seems incapable of producing clever shots for itself. Because the bats can only move at a smooth, slowish pace, you can fool the computer with a sharply-angled shot which just clips the other end of the table and the Electron won't be able to shift its bat across in time to return the shot.

But if you swipe too early the ball will shoot straight past your bat's tip to lose you a point.

Pressing the hit key with the ball at varying degrees of closeness results in realistically varying shot angles, and this results in a really satisfying, skilful game.

Table Tennis conforms to the proper rules of the sport, where 21 points wins a game, and service swaps to the other player after every five serves.

Also, this event – like the other three – has several variable playing options, to keep up the interest. You can determine the computer's skill level, and the number of games required to win the match. Most importantly, you can select a two-player option, as Table Tennis really comes into its own when played against someone else.

Finally, and most interesting of all, is **Air Ball**, a strange hybrid of ice hockey and the old video game, Pong. You and your opponent each control a bat which looks like part of a pin-ball machine, and the object of the exercise is to hit the Smartie-shaped puck into your opponent's goal.

It's quite easy to beat the computer, even on the highest level, but it's no mean feat when there's another person at the controls. The game is fast and furious – by Electron standards – and very addictive, as long as you can find a volunteer to play against you.

Sometimes the game ends in a deadlock, with the puck vibrating furiously between the two bats – but if this is successfully broken it can gain you the advantage of sudden surprise as the puck shoots away up the field.

Air Ball is an unusual game, and it really needs the stimulus of a second player to bring it into its own. The poor old computer opponent seems to get stuck bouncing the puck off a wall more often than not, and isn't really up to much even when playing properly.

Indoor Sports contains a good mixture of entertainment, addictiveness and competitive spirit. If you have Winter Olympiad, you'll be pleasantly surprised at the different approach of these programs, and I enjoyed all four immensely.

Chris Nixon

Sound	2
Graphics	8
Playability	9
Value for money	9
Overall	8

Table tennis

Darts

Zap 'n blast spectacular

Product: Icarus
Price: £9.95
Supplier: Mandarin Software, Europa House, Adlington Park, Adlington, Macclesfield SK10 4NP.
Tel: 0625 878888

WHILE transporting a shipment of battle droids to the Andromeda system, the starship Icarus' master computer suffered a major malfunction. Having lost navigational control, the Icarus is on a collision course with the sun and if its matter drive explodes there will be an almighty bang.

Icarus is a one or two player game written by Julian Avis, the author of Dunjunz. By reducing the number of players from four to two Julian has been able to double the playing area available to each player – and also reduce the congestion around the keyboard.

T reach the ship's computer you have to fight your way through 20 decks of droid-infested starship. Laser in hand, you blast away at the automaton army. More astute players will soon notice that no matter how many metal menaces you destroy, their numbers remain constant. This is because reinforcements are free to enter the deck via the service lifts – your main objective must be the deactivation of these.

Great care should be exercised when blasting a lift as the highly polished doors will reflect your laser bolts. Not until you have deactivated every service lift on a deck will you be allowed access to the emergency lift – and the next level.

The duration of your solitary life is determined by a combination of factors, which are displayed as a series of bar graphs. Each player's damage and armour levels reflect the degree of injury that can be inflicted and sustained.

Charge affects the rate at which your laser recharges when not in use. The final graph is the one showing the state of your health. Allow this to reach zero and you'll no longer have to worry about the spaceship's appointment with the sun.

Your chances of completing the mission can be greatly increased by collecting tokens. Depending upon the type, they can be used to boost firepower, armour, or recharge rate. Credit tokens can be inserted into vending machines in exchange for health points.

The two-player option prevents Icarus from becoming a monotonous zap and blast game. Your way will often be barred by security coded forcefields and if two people are playing one can concentrate on cracking the code while his partner fends off the battle droids.

The only let down is the speed. Although it is normally quite fast, the game really slows when there are a lot of aliens on screen. A Slogger Turbo makes the world of difference.

As a one-player game Icarus is superb. Play it with a friend and you'll experience the excitement of true two-player arcade action.

Jon Revis

Sound	*8*
Graphics	*8*
Playability	*10*
Value for money	*9*
Overall	*9*

This'll drive you dotty...

Product: 3D Dotty
Price £1.99
Supplier: Blue Ribbon Software, CDS House, Beckett Road, Doncaster DN2 4AD.
Tel: 0302 211134

3D DOTTY is a simple game in which your aim is to eat all of the dots on a screen. Success will take you through a series of eight rooms, similar in style, but of increasing complexity.

Each screen consists of three large platforms drawn in 3D perspective. The higher platforms are supported on substantial pillars, and this creates the first difficulty in eating all of the dots as some of them are behind pillars and can't be seen.

There are even some junctions behind pillars and these are quite a problem to negotiate. The levels are linked by ladders.

Your main problem is to avoid the fungus, which appears as a fast-moving but rather shapeless snake. Contact with this nasty substance causes a very rapid loss of energy and a fairly swift loss of life.

Fortunately, you can drop anti-fungal barriers behind you, which will force it to chase you via a different route giving you a short breather. These barriers last for a few seconds and you can have up to three on a screen at a time.

The game's graphics are adequate, and I like the 3D effect, but the main character is rather small, and I am sure the fungus could have been made more interesting.

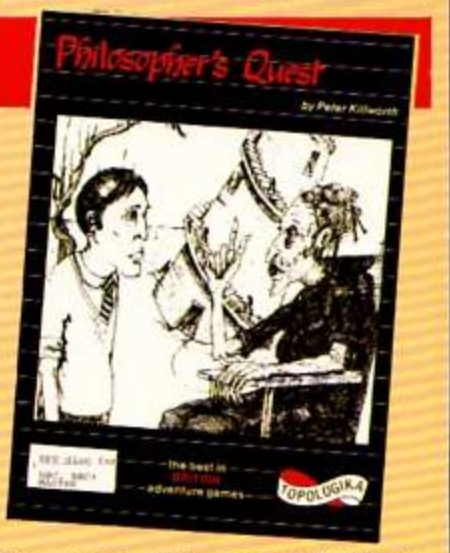
The sound is about par for this type of game. If you like persistent footstep beeps then it's fine. If not you can select the silent play option. Keyboard or joystick options can be chosen at the start of each game.

3D Dotty is a quite a good budget-priced game with nice graphics, fast gameplay and it is fun to play. But for me, it lacks that compulsive edge that keeps me coming back for more. But at just £1.99 you can't really go wrong, and it has got to be worth a try.

Rog Frost

Graphics	*6*
Sound	*5*
Playability	*6*
Value for money	*7*
Overall	*6*

Old favourite revamped



Program: Philosopher's Quest
Price: £9.95 (40T and 80T 5.25in disc)
Supplier: Topologika, PO Box 39, Stilton, Peterborough PE7 3RL.
Tel: 0733 244682

THIS adventure was originally published by Acornsoft in 1982 and sold 25,000 copies on tape and disc. You would imagine therefore, that there seemed little point in another company re-releasing it, as most respectable adventurers would already have a copy of the original.

However, it has been totally rewritten by its author, Peter Killworth, and in many respects is a different game from its predecessor.

Philosopher's Quest is now in disc form only, which means it is much larger with extra locations and a thicker layer of atmosphere, thanks to more detailed room descriptions.

The constant disc access slows down responses, but that gives you more time to think. Philosopher's Quest is not a difficult adventure by the standards of, say, Acheton, but you will need to do a lot of head-scratching.

Magic wands can be dangerous things. The one you found in the junk shop off Market Street was no exception. It was a mistake to wave it while the cranky old shopkeeper's back was turned. One wave of that wand and you have been transported into a parallel existence in the same shop on another plane in a complex of caves.

A voice echoes in your mind: "Go and seek the treasure, mortal, and bring it back here in payment for the misuse of my wand. You will need every ounce of cunning to deal with the serpent in the Garden of Eden, the ancient mariner, and myriad other problems too difficult to mention".

So the scenario is set, leaving you as the hero to think, and, having thought, to act and think again.

All the familiar characters are still in the adventure – the old lady who has lost her dogs, the albatross and the whale – but the order in which you solve the game has changed quite dramatically. The M. E. passages are still bound to fox you and the solicitor's office will require a visit or two.

A novel and intelligent addition to this game is the facility to construct your own database disc and thus save wear and tear on the original copy.

The game also comes with an excellent hint booklet, a leaflet all about playing adventure games and marvellous packaging.

Philosopher's Quest should appeal to a wide adventure-buying public. Whether or not you have played the original Acornsoft version of this game, I recommend this revamped escapade without reservation.

Pendragon

Presentation	10
Atmosphere	9
Frustration factor	8
Value for money	8
Overall	9

Atmospheric adventure

Program: Hex (The Legend of Vianna)
Price: £3.95 (mail order only)
Supplier: Larsoft, 4 Chantry Road, Bristol BS8 2QD.

HE's done it again. Geoff Larsen's last adventure, The Puppet Man, gave rise to an excess of superlatives in my review. Now, I shakily pluck out my thesaurus in an attempt to find more words of praise of his latest Quilled masterpiece.

While on a hiking holiday in Cornwall way back in 1902 you find yourself in Padstow during the Hobby Horse celebrations. After the celebrations you talk to a couple of local Cornishmen in one of the taverns.

When you tell them of your interest in myth and folklore they recount the legend of Vianna, a witch who lived in the area some 200 years earlier.

Common to most witches of her time she had been ceremonially put to death by the local populace. People say that now, at certain times she returns to stalk the night with various demons.

Thus the scene is set and as you accept a lift in a carriage to Bude the next day, the story you heard the previous evening sends a shiver down your spine.

With no obvious purpose, it will take you some time to realise exactly what your quest is to be. As with previous Larsoft adventures, flags are set as you move, which put into operation certain important events.

For instance after about 30 moves the trinket shop will be open for business, and 30 moves later a fisherman will appear outside the inn and explain that the tide is turning. Shortly afterwards a means of reaching the island will be uncovered.

That is as much of the plot as I can give away without spoiling the enjoyment for you.

However, I will say that it is essential that you talk to the characters you meet, as they will provide the most important hints to unravelling this mystery.

Once again this Larsoft adventure is only restricted by the utility which Geoff has used to write it. I long ago groaned at having to use two word, verb-noun input. Considering such limitations, the adventure reeks atmosphere and is incredibly addictive.

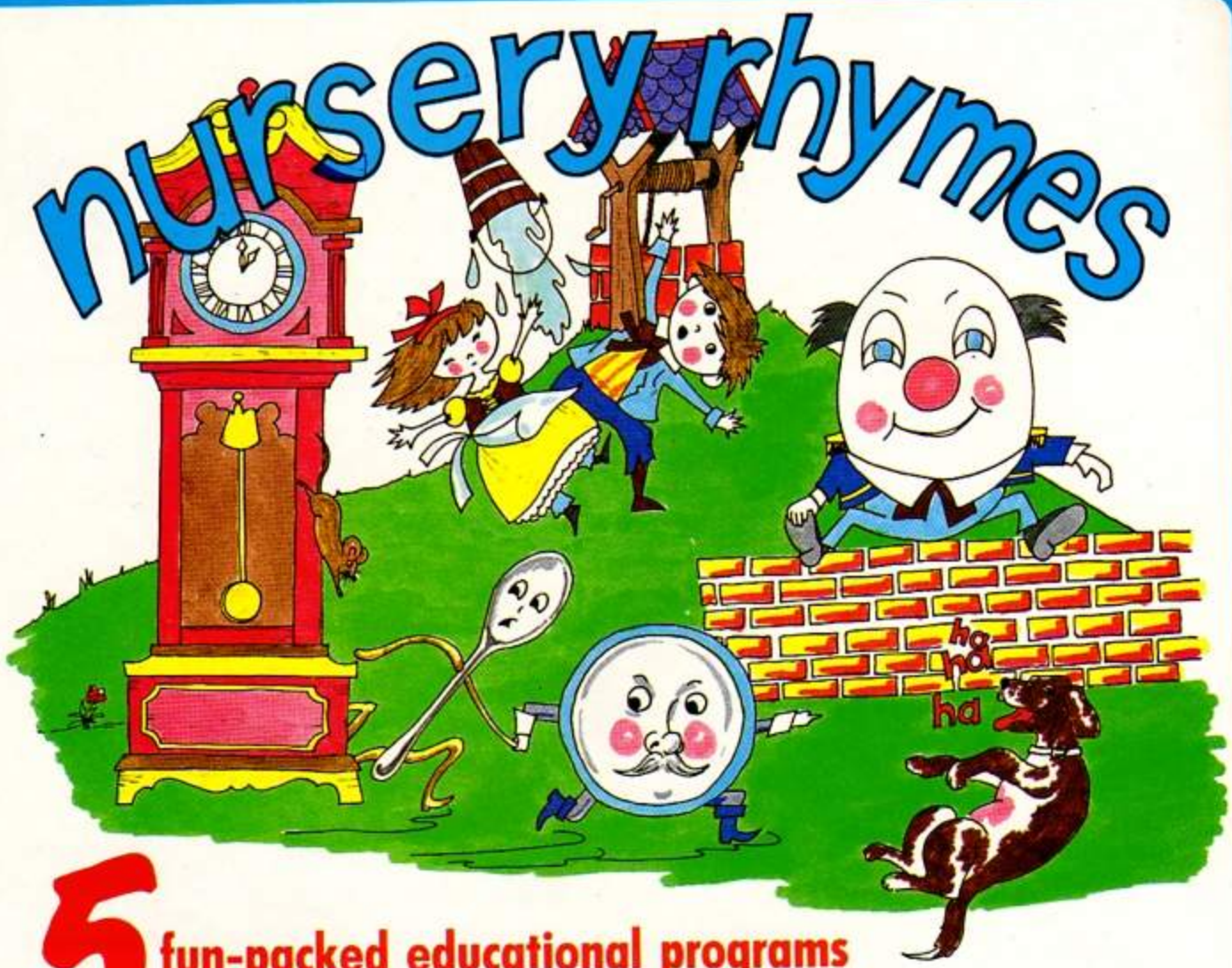
I won't go so far as to say that Hex surpasses The Puppet Man in quality, as it is constructed and carries a plot in a totally different vein. However, once again the Quill has been taken to its limits by the creativity and ingenuity of Geoff Larsen.

This adventure immediately jumps into my all-time Top Ten of personal favourites.

Pendragon

Presentation	9
Atmosphere	8
Frustration factor	9
Value for money	10
Overall	9

nursery rhymes



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electron user ARCADE CORNER

Compiled by MARTIN REED

THIS month's pokes and tips come from Alix Jones from Bellingdon, Bucks, Scott Moore from Angmering, West Sussex and Steve Simmonds from Rubery Rednal, Birmingham.

Many thanks to everyone for all the excellent contributions. However, many of the top Electron games are also available for other machines, so please mark your letters and any accompanying sheets or maps with your name and the code letters EU.

Share your hints, tips, pokes and cheats with fellow *Electron User* arcade addicts – but please ensure they are all your own work. Send them to:

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Boffin – Addictive

Here are a few tips for this delightful platform game. One major problem for newcomers is the large black blobby creature with tentacles. It first appears on level two, blocking your way to the owl, then at regular intervals throughout the game.

The secret is to squash it by jumping on it from a substantial height without your umbrella. However, you will lose a life if you do not land in the exact centre of its head, so be careful.

On later screens these creatures – once squashed – hatch into winged creatures that flap up and down until you jump off, allowing you to get to normally inaccessible ledges.

Level four introduces the spider – beautifully animated, but quite deadly. Spider screens are normally designed so that there is a long passage filled with potholes for you to run through – with the spider in hot pursuit.

However, many of the later screens are designed so the spider ends up on the same level as the owl, with you on a trampoline just below.

As you bounce up towards the owl, the spider will inch forwards and kill you just before you get there. You must, therefore, get a good head start on it before venturing back into the path of its jaws.

Many of the spider screens involve jumping down in front of the spider and running for your life. The best way to get a good lead is to put your umbrella up only at the last minute. This way, you will fall as quickly as possible – an essential skill to acquire because the spider starts to move while you are falling.

Vegas Jackpot – Mastertronic

To increase your initial cash reserves, put the fully rewound cassette into the recorder and type:

```
LOAD""
```

When the first file has loaded, enter the following:

```
100 REM
RUN
*LOAD VEGAS
```

When the Vegas file has loaded, type:

```
PAGE=6144
LIST 1000
```

Change *coin*% to the required value. This can be as high as you like, but the screen display will be corrupted if you choose a value over 9999. Now type RUN to start the game.

If you want to change the value of *coin*% partway through the game, press Break then type:

```
OLD
RUN
PAGE=6144
```

and change *coin*% in line 1000 as before. Type RUN to continue with this new value.

Codename: Droid – Superior Software

Here are a few hints for Codename: Droid to complement last month's map – help for anyone who may still be having problems with this superb arcade adventure.

The first and most important point to note is that you must collect everything you come across, especially the four sets of plutonium rods. Everything has a purpose, no matter how obscure it may appear at the time, and you will need everything to complete the game.

The two crates – on sector three of the surface defence and sector one of the crew's quarters – give you six passcards and two energy cells – you'll certainly need them.

The microfilm maps show the layout of each sector – including the positions of the guards – and are invaluable when planning an attack strategy.

They become essential when travelling by jetpack – your precious fuel burns away with every passing second, so you must take care to use your brief powers of flight wisely.

Shoot all Volgans on sight. Ask no questions – it's either them or you. At quite a few stages in the game you will come to long corridors patrolled by a number of Volgans. Although this is a daunting prospect, it can be put to your advantage.

The Volgans also shoot on sight and one will often kill another if the first happens to be in the second's line of fire. The remainder can then be dispatched with carefully laid mines. This technique also conserves your blaster energy, so it's certainly not to be sniffed at.

As the instructions show, you can run, kneel or crawl. This last movement is very useful for getting into awkward corners, and it can also save your life – a metal block in the surface defence and a crane in the missile factory will suddenly fall as you pass underneath, killing you instantly if you are not on your hands and knees.

The Series 7000 Herbert droid on the far side of sector one of the crew's quarters seems to be causing problems. Drop a mine next to him, then walk into it and he will explode. However, this does give your suit energy a hammering, so make sure it is well charged.

When you get down to Sector One of the Missile Factory, you will come to two control buttons. Make sure you push the left hand one, then the right. If you push them in the wrong order, you will very quickly be killed by a falling crane.

MICRO MESSAGES

Pokes, cheats and compatible roms

I HAVE a few answers to questions which appeared in recent Micro Messages pages, which were not cleared up completely by your solutions.

First, to clarify Andrew Cossar's problem – from the April 1988 issue – of using games with Slogger's Turbo board.

The codes you gave to disable the Plus 1 will still cause the same problems, leaving some games still refusing to load.

To totally disable the Plus 1 when in 64k or turbo modes the new pokes given below must be used. With many games the Plus 1 is disabled automatically in the loader program – using the normal Plus 1 pokes – which explains why some games won't work at all when trying them in turbo mode.

To solve this particular problem load the first file from tape, list it to find the old Plus 1 disable pokes, replace them with those below and run the loader. The program should load and run in turbo mode with no problems:

```
*FX 163,128,1
?&212=&55
?&213=&F2
?&2AC=0
```

My second point concerns the answer you gave to Very Confused in the same issue, who was unsure how to use the Plan B cheat from January's Arcade Corner. The poke must be RUN, and the game loaded from the file called PLANB on tape – not CHAINed from the beginning as you stated.

Now for some more useful information. Not long ago I read that Electron User *was interested in any BBC Micro roms which were Electron compatible, so here is a list of some that I have tried successfully:*
Rom Manager, NLQ Rom (Watford Electronics); View, ViewSheet, ViewStore, Lisp, Logo, Pascal, Micro Prolog (Acornsoft); GDump (D A Computers); Caretaker, Printmaster, Wordwise Plus, Intersheet, Interchart (Computer Concepts)

And finally, a question: Is the new Pegasus 400 interface from Slogger totally BBC compatible, or is it another very good emulation like their SEDI?

I usually rely on Electron User *reviews to point out such things, but I notice that there has only been one in the last eight months!* – **David Brown, Whalley Range, Manchester.**

● The hardware scene has been fairly quiet lately, but is now hotting up slightly with new products from various companies due for release.

The Pres AP6 is reviewed in this issue, and the new AP2 and ADFS roms will be covered in next month's *Electron User*.

The Pegasus disc interface should be almost 100 per cent compatible with the BBC Micro as it is based around the WD1770 FDC, as are most modern BBC Micros – including all of the Master series. We hope to review this next month.

Train crash

NO matter how many times I try, I cannot get the Southern Belle train simulation working from the Five Star Games III compilation.

It loads the first part, then the screen goes black and nothing happens. Island and Planet on the introductory cassette don't work either – can you help?

Also, if my Electron were fitted with a Mode 7 adapter and a four-channel sound cartridge system, would it mean I could order any Mode 7 BBC Micro game and use it on the Electron? And is Superior going to produce any games on rom cartridge? – **Luke Horton, Liss, Hampshire.**

● We had problems with Southern Belle, too. You have to disable the Plus 1 with the codes given in last month's Micro Messages, or if you have Slogger's turbo board and want the game to run in turbo mode, use David Brown's alternative pokes on this page.

As far as we know, an Electron fitted with the new four-channel sound unit from Project Expansions, and a Jafa Mode 7 adapter, should run all full-blown BBC software which uses strictly Acorn documented routines only and avoids doing anything clever with memory locations.

Unfortunately, few BBC Micro games programmers stick to Acorn approved guidelines. We are doubtful whether Superior will be producing its games on Electron cartridges.

Elusive Frak! designer

I MUST congratulate Dave Croft and the team at Tynesoft for another fantastic game in Winter Olympiad 1988. The game has the best grahpics I have seen on any computer – it fully deserved its Golden Game award.

My best times are 1.49 (Bob sled), 0.35 (Speed skating), 115 (Ski jump), 1.05 (Giant slalom) and 2.33 (Biathlon).

I have Frak! from the excellent Five Star Games III, but the instructions were very poor. I read in the Frak! review in the April 1986 issue of Electron User *that it has a screen designer built in.*

Please could you list the necessary keys for using the designer? – **P. Sanderson, Chesterfield, Derbyshire.**

● We couldn't find out how to access the screen designer on the version of Frak from Five Star III either. Perhaps some reader can help.

Dutch plea

I AM a teacher in a Dutch school, working with children from 4 to 11 years old. We have three Electrons, and the children love the programs we type in from Electron User. *However, we have a problem in that we are probably the only school*

Turn to Page 58 ►

◀ From Page 57

in Holland using these machines.

Some schools over here have BBC Micros, but a lot of their programs are just not compatible with the Electron – and besides, most of their software is on disc. We simply don't have the money for a disc drive, and have to be content with just using cassettes.

We know that there are many good programs for the Electron in England, and we enjoy buying them or typing in program listings from your magazines – Electron User *in particular – but we would like more!*

The Fun School tapes are magnificent, and so is Educational Computing. We ordered Nursery Rhymes as well, but these programs are locked and we need to translate the English for the children – and some teachers, too.

So we would like to ask whether there are any readers – who are perhaps also teachers – who have educational programs for us? We have a great lack of geography, history and biology programs, but reading and arithmetic tutors would be welcome too. – **M. de Bruin, Basisschool De Kinderboom, Kalkoenstraat 11, 1022 BA Amsterdam, The Netherlands.**

Pig problems

I WISH to bring to your attention a mistake in Bill Vincent's Go-Pig program from the April 1988 issue of Electron User.

Line 3480 appears to be the culprit, perhaps because Bill used character codes which the printer cannot produce. I have changed the line as follows:

```
3480 b$=CHR$224+CHR$225+CHR
$8+CHR$8+CHR$10+CHR$226+CHR$
227
```

It now works perfectly with the above alteration, and is a delight to play. Thanks again, Electron User *– I don't know what I'd do without you.* – **Paul Clark, Warrington, Cheshire.**

● Don't thank us, thank Bill! Seriously, we have been experiencing more glitches in the listings than usual over the past few months.

This month you'll find all the corrections which so many of you have kindly written in with, and our thanks to everyone involved even if their name isn't printed.

ALL programs printed in this issue are exact reproduction of listings taken from running programs which have been thoroughly tested.

However on the very rare occasions that mistakes may occur corrections will be published as a matter of urgency. Should you encounter error messages when you type in a program they will almost certainly be the result of your own typing mistakes.

Unfortunately we can no longer answer personal programming queries concerning these mistakes. Of course letters about suggested errors will be investigated without delay, but any replies found necessary will only appear in the mail pages.

Shove it!

I EXPECT that I am one of the many eager readers of the March Electron User *who were puzzled by the description of Shove Penny.*

Okay to the end of page 19: "Wait until it is where you" – but where? Then at the bottom of page 21: "Hold the key down". I am still holding it down until I know what to do next.

Then the definition of PROCpause *in line 1150 is unfinished until we know what* L% *can become. Mr. Editor, this is a bit below your high standard!*

I also have a problem with February's Character Builder. The key repeat rate as set up in line 590 seems very short – shouldn't it be 20 to match the delay rate set up in line 580? And what is the function of:

```
PRINT":*.
```

in lines 620 and 650? They seem to disable the Electron so that it will neither save nor load, or do anything else for that matter. I've cut these lines out and it seems to work all right. – **G.D. Price, Kingsley, Warrington.**

● The gremlins seem to have been having a field day just lately – the last two lines at the foot of page 21 are actually the missing text from the end of page 19. The completed sentence is:

"Wait until it is where you want to fire from, and press Space. Hold the key down, and the power meter on the right of the screen will begin to climb."

And the truncated definition of *PROCpause* is in fact the last line of the program, and should be:

```
1150 DEFPROCpause:FOR L%=1
TO 2000:NEXT:ENDPROC
```

And our apologies to everyone who was unable to get Shove Penny to run.

As far as Robin Nixon's Character Designer goes, the repeat rate is set up faster than the delay rate so that people can, if they wish, rapidly repeat the current function.

If both rates were set to 20, it would be faster to press the key repeatedly rather than to hold it down.

And the PRINT in lines 620 and 650 cannot possibly disable the Electron – it simply perform three carriage returns, followed by a disc or tape catalogue.

Snapper solved

AS soon as I had collected my copy of Electron User *from the newsagent, I saw on the front cover: "Arcade corner – cheating with Snapper".*

I tried the cheat as soon as I got home. The merging went fine, but as soon as it had loaded file "?", it simply halted and waited for me to type something in.

Eventually I found that there is a line missing from the end of the upgrade. Before SPOOLing it, type:

```
1780 ENDPROC
```

and it should work fine. – **Philip Hounsell, Eastleigh, Hants.**

Listing Hissteria

I HAVE just spent a very frustrating couple of weeks trying to debug Hiss, from the March 1988 issue of Electron User, *with no success.*

*The problem seems to occur at lines which contain a *FX command inside quotation marks.*

What purpose do these quotes serve? I've never seen them used in this way before, and they are certainly giving my Electron a bad case of indigestion. – **R.A. Biscare, Glasgow.**

● Every OSCLI command in Hiss disappeared due to an unforgivable mistake – all our Electrons were being used at the time, so we borrowed a BBC Micro from *The Micro User* to prepare the file for typesetting.

What we didn't realise was that it only had the older, less sophisticated Basic I inside. As you may or may not know, Acorn's older Basic has no OSCLI command, hence it cannot recognise any it comes across in a program and simply strips them out.

The offending lines

should be as follows:

```
  230 OSCLI "FX21":Z%=GET:OS
CLI "FX138,0,"+STR$Z%
 1620 OSCLI "FX21":REPEAT:Z%
=INSTR(" Oo",GET$):UNTILZ%>0
 2230 OSCLI "FX21":OSCLI"FX1
2"
```

It serves us right really, for using an inferior computer rather than our solid, reliable Electron!

Letterhead improvements

IN the letterhead design program accompanying Julie Forester's article in the March 1988 issue of Electron User something must have thrown a spanner in the works. May I suggest the following. Change line 200 to:

```
200 IF G=34 THEN *SAVE HEA
DINGS 5800 5BC0
```

If you are using cassettes, the on-screen prompt produced by this line causes the screen to scroll up and destroy part of the heading. I couldn't see the point of line 70, so I replaced it with:

```
70 *OPT 1,0
```

And in line 190 the TAB should be (0,3) not (0,5) – but in fact, is not needed. The line could be:

```
190 IF G=31 PROCscreen_dump
```

Line 670 should be removed. It sends a Tab character to the printer, causing the logo to be printed too far to the right. Not all printers can accommodate 1280 points across the page – most can only manage 960 at the most. The solution is to change line 750:

```
750 FOR N=0 TO 2
```

I would also suggest:

```
180 IF G<>32 THEN 190
185 *FX4,0
186 *OPT 1,1
187 CLS:END
```

It is also a good idea to delete the END from line 190, so that the logo may be edited further if the printed version is not to your liking.
– John Bloxham, Stratford-upon-Avon, Warwickshire.

● These modifications work fine, except that there is no need to replace line 70. Just put the *OPT 1,0 at line 45. And we can see no reason for changing line 200, as both versions achieve exactly the same result.

Newmarket cured

I AM responding to the letter from N. Gill in the March 1988 issue of Electron user, *concerning a so-called bug in the Newmarket program.*

It does not really freeze during the swap routine – it is just that all text is printed on the same spot on the screen. This makes it – to put it mildly – somewhat hard to see. Just type Mode 6 and watch the result.

The real problem is indeed variable Z *at lines 160-180. It becomes a random number with a value between 40 and 52, and as the program progresses the trouble starts at line 740 when the value of* da% *gets higher than* Z.

This situation causes a subscript error, because at line 180 an array N%() *is dimensioned with its maximum subscript determined by* Z. *I found this out by adding a line 5:*

```
5 ON ERROR MODE 6:REPORT
:PRINT" at line ";ERL:END
```

Instead of freezing, the screen will clear and the message Subscript at line 740 *will appear. The solution to the problem is to delete lines 160 and 170, and change the following lines to:*

```
 180 DIM N%(52),C(52),$(52)
 290 FOR I%=1 TO 52:N%(I%)=
I%:NEXT:FOR I%=52 TO 2 STEP-
1:D%=RND(I%):T%=N%(D%):N%(D%
)=N%(I%):N%(I%)=T%:NEXT
```

After these alterations the program runs very well, but it left me with two questions: Why was variable Z introduced, and did it have to DIM an array with a random number?

The variable A% *at line 170 should change* Z *into 52 if* A%=*1, but nowhere in the program is* A% *set to 1. In addition to this line 40 may be changed into:*

```
40 *KEY10 E%=0:MG%=0:MF%=
0:M
```

Maybe the author could answer these questions? – **H. Berkenveld, Holland.**

● Thanks are due to you, and everyone else who attempted over the past three months to sort out this problem.

Our version never crashed, so we're not sure what's going on.

Clock revealed

TO help P. Eisler of London and the many others who use television sets, I have found a method of lowering the display of the Clock utility from the January 1988 issue of Electron User.

Change line 470 to:

```
 470 LDY #0:LDA #0:.L3 STA
(&96),Y:INY:CPY #8:BNE L3:LD
A &96:CLC:ADC #8:STA &96:LDA
 &97:ADC #1:STA &97
```

And using VDU 28,0,24,39,2 will stop hardware scrolling in 40 column modes. – **M. Farley, Dagenham, Essex.**

Keeping the peace

COULD you please tell me how to switch off the sound when playing games? I live in a flat and use my Electron sometimes very late at night, and feel I may be upsetting other residents.

Reading Joe Pritchard's review of Project Expansion's user port in the March 1987 issue of Electron User, *could you please tell me if the user port can be used with a light pen? If not, what interface would I need?*

And regarding Robin Nixon's review of the Tarantula touch tablet from the March 1987 issue, do you know where I can obtain this product, how much it costs, and whether I need a Plus 1?
– Philip Tee, Oxton, Birkenead.

● To turn off the sound completely, use *FX210,1 before loading a game. Most games provide a keypress to toggle this FX call on and off, but this should work for those that do not.

Light pens work by sending a signal back into the micro when they detect the electron gun passing over their light-sensitive tips, and careful timing is used to extrapolate the pen's position over the screen.

All the necessary circuitry is contained inside the BBC Micro's 6845 video chip. This is not present on the Electron, and you can't use other devices like a user port to do the job instead.

The Tarantula touch tablet used to be made by Wigmore House, but unfortunately it is no longer available.

Mail pages to the rescue

I WAS on the point of throwing away two expensive game tapes because they would only load the header screens. All I got after that were Rewind tape *messages and obeying these did not work.*

I was combing through my back issues of Electron User,

Turn to Page 60 ▶

Tracing the logic

◀ From Page 59

when in the December 1986 Micro Messages I found a letter entitled Recovering corrupted files.

Following the advice given, much to my delight the tapes loaded perfectly. As I had spent several weeks trying unsuccesfully to load these in the normal fashion, I am very grateful to Electron User, *which is always a source of great help to me.*

I could not have returned these tapes to the manufacturers as the firm has gone bust, so you can imagine my relief. – **Mrs F. Whitehead, Denton, Manchester.**

● This just goes to show just how useful those old back issues can be.

It also highlights the value of the Micro Messages section, which has always been a forum for a multitude of assorted technical hints and tips. We rely on these – please keep them coming in.

IN the September 1987 issue of Electron User *you published a letter from Mick Green of the Netherlands in connection with the utility Super Tracer from the July 1987 issue.*

He says that he found the top left hand corner of the screen to be an inconvenient location for the trace, as do I, and he was able to re-direct the trace output to a user-defined coordinate.

My knowledge of assembly language is sadly lacking, and I am unable to follow his good example. I would therefore appreciate a published modification, with sufficient instructions for altering the print position myself. – **Jeff Somerville, Shoeburyness, Southend on Sea.**

● This modification will allow you to specify your own screen positions for Super Tracer's output:

```
460 LDA #31:JSR oswrch
462 LDA #??:JSR oswrch
464 LDA #??:JSR oswrch
```

Simply replace the question marks in line 462 with the desired X coordinate, and do the same for the Y coordinate in line 464.

Put the boot into View

I ALWAYS use a rom image of View in sideways ram, which of course means that it must be initialised with Control+Break before it will work properly.

I would like to write a !BOOT file on disc that sets up View in ram, and also sets up the various options such as screen colours, FJI flags and so on, to my own preferences.

However, I obviously need a way to fully initialise my rom image from within software, and this is the part that defeats me. – **Andy Wells, Sheffield.**

● Any rom which doesn't need to claim private workspace – that is, raise PAGE – can be safely initialised from software by poking its *rom type byte* into the operating sytem's internal rom tally.

Briefly, a language rom – like View – has a type byte of &C2, whereas a service rom – like the ADFS – has a type byte of &82.

Simply poke the corresponding value for your rom image into location &2A0 + the socket number of your sideways ram.

So if your sideways ram is in socket 6, you would use:

```
?&2A6=&C2
```


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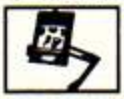

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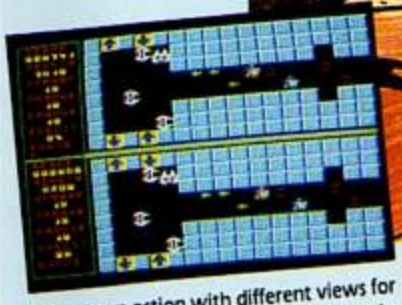

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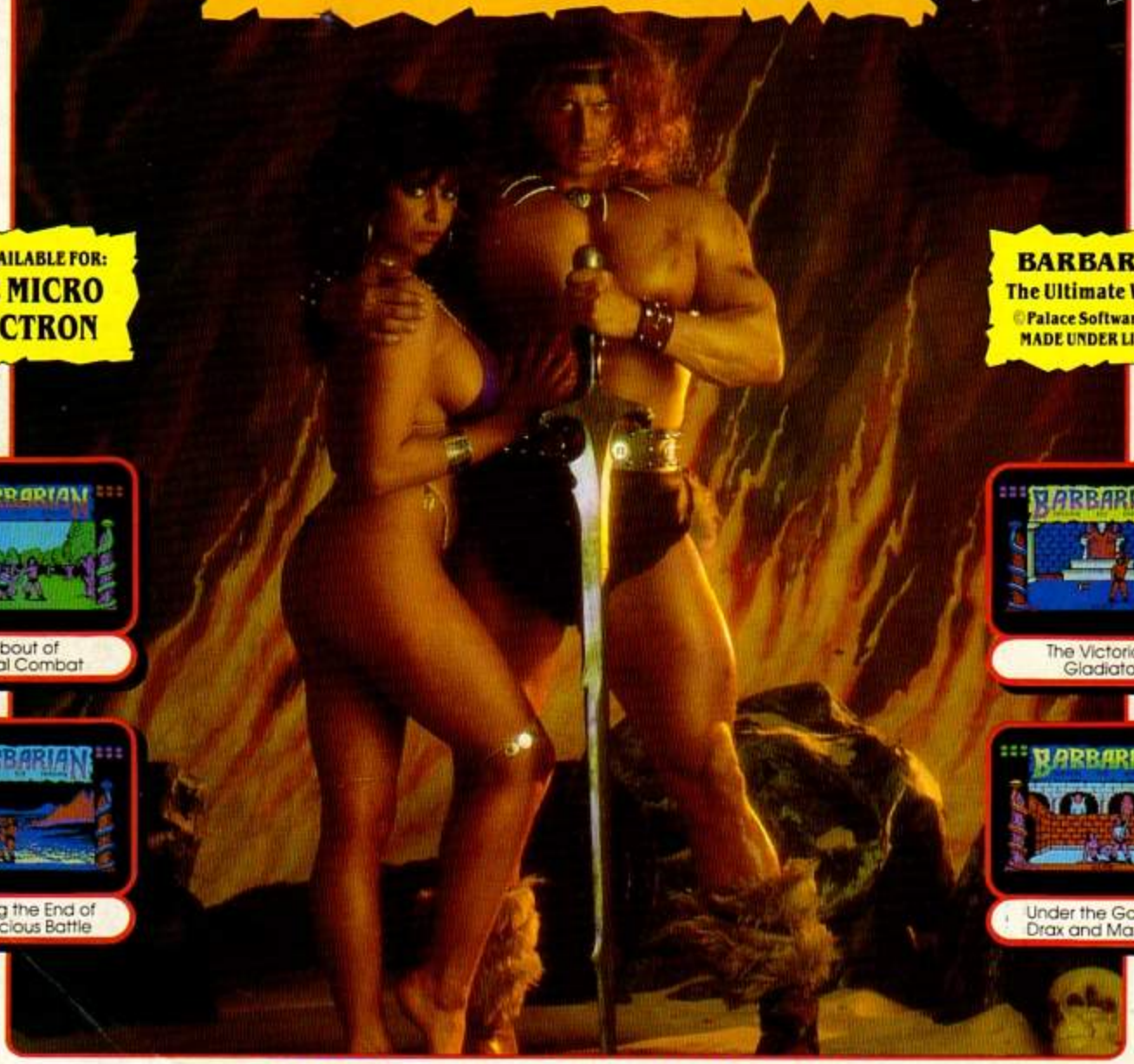

NOW AVAILABLE FOR:
BBC MICRO
ELECTRON

BARBARIAN
The Ultimate Warrior
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A bout of Mortal Combat

The Victorious Gladiator

Nearing the End of a Ferocious Battle

Under the Gaze of Drax and Mariana

THE ULTIMATE WARRIOR • THE ULTIMATE GAME

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PRIZE COMPETITION

£100 is the first prize in our competition, with 20 congratulatory certificates for runners-up.

To enter the competition, you must complete the game and write to us describing the final messages that you receive.

Closing Date: 30th September, 1988.

SUPERIOR SOFTWARE Limited

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