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# electron

## user

Vol. 7 No. 4 January 1990 £1.25

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# CHRISTMAS SOFTWARE BARGAINS

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## Back to school

10 educational games for  
the Electron for just  
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Order on Page 45

## New source for Electron add-ons

ALREADY well known for its cream and pasties, Cornwall now has another claim to fame as the source of a promising range of new Electron add-ons.

Design engineer David Ingleby-Oddy from Truro has given the Acorn machine a boost by setting up Complex Software Systems which he describes as "a company dedicated to the production of new and exciting products for the Acorn Electron computer".

David's association with the Electron is of long standing and has strengthened over the years.

"It started when I was at college in Swindon", he told *Electron User*. "We used to use BBC Micros there so I bought an Electron which was compatible with BBC Basic."

"Since then I have spent many hours sitting in front of my Electron. As a result of this I feel I can now offer Electron users some things they have not had before".

Complex Software Systems' first and principal product is a sound expansion cartridge which boosts the single sound channel of the Electron to the four channel level of the BBC Micro.

This will give added punch to games and also allows voice synthesis program BBC Speech to be run on the Electron. The new car-



## Half million grin

**SMALL** business package Mini Office from Database Educational Software (0625 878888) has clocked up the sale of its 500,000th copy.

To mark the event a £500 video recorder was presented to the purchaser, Michael Graham, a 24-year-old electrician from Dover-by-Cockermouth, Cumbria. Mini Office broke the price mould when it was initially launched for the Electron and BBC Micro at £5.95. Celebrating Mini Office's success above is Marketing Director Chris Payne.

tridge is a redesign of a former unit produced by David in conjunction with Project Expansions. This also boosted the Electron sound, but was a basic model which never caught on.

The new version comes in a colour coordinated steel case with volume control, outputs for headphones and external amplifiers and an internal loudspeaker.

David has also completely

re-written the software to make it more compatible. It is available on disc or tape.

The same size as an AP4 disc interface, the sound expander cartridge fits into the Electron's Plus 1 slot.

As *Electron User* went to press the price of the cartridge had not been fixed but was expected to be between £49 and £55. It was due to go on sale imminently.

Another Electron product

nearing completion in Truro is a Z80 assembler/emulator software package.

Designed as a teaching aid, it allows schools and colleges who want to teach Z80 on the BBC Micro, Electron and Master to write the code and run it on the Electron.

This should be due for release early in the New Year, price to be fixed.

## Fans pick Xmas boxes

ELECTRON owners were out in force and buying like fury when 27,000 visitors packed into Alexandra Palace for the first Computer Shopper Show.

That was the word from exhibitors who got through record amounts of Electron software and add-ons at the pre-Christmas bonanza which turned into a gigantic shopping spree.

Such was its success that doors had to be closed on a "one out, one in" basis on the first two days and the Sunday saw radio broadcasts warning prospective visitors of the situation as a late-day queue of 3,000 had to be turned away.

"Visitors to our stand were just bulk buying", said Tynesoft boss Colin Courtney.

"It amounted to panic buying by Electron owners wanting to stock up with software".

Equally busy on the Electron front was John Huddleston of Pres who pronounced it a great success with excellent sales on his Electron add-ons and software.

On the bargain front, Akom was featuring special prices on Electron cassette versions of its computer crossword programs.

Education on the Electron also had a good showing. There were good deals to be had on the software ranges from AVP and Rickett Educational Media while H.S. Software was offering up to 40 per cent off its Electron packages.

## Keep your secrets

**CROWBOROUGH** Instruments (0892 662078) has come up with a handy gadget for computer security.

The Viewlock is a key-operated double pole switch which is connected in place of the existing mains plug.

It attaches to the side of the Electron with self-adhesive pads, disables the machine at the turn of a key and costs £22.42.



# Gallup Software Chart



THIS MONTH	LAST MONTH	TITLE (Software House)	COMMENTS	PRICE
1	●	<b>PAPERBOY</b> <i>Encore</i>	Back in the charts after a long absence is this chaotic and destructive child. It's a pity about the flicker and slow speed – get a Turbo.	2.99
2	▽1	<b>PLAY IT AGAIN SAM 10</b> <i>Superior</i>	An excellent arcade compilation presenting you with the golden oldies of Zalaga, 3D Dotty, Repton thru Time and debuting Qwak.	9.95
3	△9	<b>SUPERIOR SOCCER</b> <i>Superior</i>	Brilliant – full-priced and worth every penny. Whether you want to play football or just manage your favourite team you can't go wrong with this.	9.95
4	●	<b>CHUCKIE EGG</b> <i>A &amp; F</i>	Yes he's back again and this really is an oldie now. One of the first games available, you won't have have egg on your face if you buy it.	9.95
5	●	<b>STRIKE FORCE HARRIER</b> <i>Alternative</i>	Just available on a familiar budget label, this should do very well and is worth buying if you didn't catch it first time round.	1.99
6	●	<b>PLAY IT AGAIN SAM 9</b> <i>Superior</i>	Not seen before is Camelot, whereas you can renew your acquaintance with Spycat, Steve Davis and Repton. Really one of the better Sams.	9.95
7	▷7	<b>LAST OF THE FREE</b> <i>Audiogenic</i>	Still selling very well even without a budget label. You may have to search hard to buy this one now, but it's worth it.	7.95
8	●	<b>CREEPY CAVE</b> <i>Atlantis</i>	A strange place to lose your keys, but stranger things have happened. A fun, colourful and enjoyable romp that will keep you amused.	1.99
9	●	<b>ANARCHY ZONE</b> <i>Atlantis</i>	Back to outer space and your chance to save the Earth from imminent peril. An addictive shoot-'em-up which will keep you coming back for more.	1.99
10	●	<b>JOE BLADE</b> <i>Players</i>	The original mission for community conscious Joe. With a third mission about to be hit the streets, buy this one while you can.	1.99
11	●	<b>VIDEO CLASSICS</b> <i>Firebird</i>	A budget collection of some simple and fun arcade games. This title keeps re-appearing. Definitely cheap and cheerful.	1.99
12	△17	<b>PLAY IT AGAIN SAM 8</b> <i>Superior</i>	The third compilation this month with Winter Olympiad, Quest, Around the World in 40 Screens and Mr Wiz taking starring roles.	9.95
13	▽4	<b>SUBWAY VIGILANTE</b> <i>Players</i>	Yes, the London Underground is your responsibility in this kick-'em, hit-'em. Though disappointing, it's nice to see a new game.	2.99
14	●	<b>LIFE OF REPTON</b> <i>Superior</i>	Ever wondered what a baby Repton looks like, or what Repton will do when he retires? This is your chance to find out.	6.95
15	△18	<b>SNAPPER</b> <i>Acornsoft</i>	If you search hard you can still find this full-priced version. Though it's better value as part of the Sam 7 compilation.	9.95
16	●	<b>FELIX IN THE FACTORY</b> <i>Micropower</i>	A full-priced oldie which is well worth playing again. Though not a classic, it's an amusing way to while away an idle moment.	9.95
17	●	<b>ELITE</b> <i>Superior</i>	Electron users had to wait for this BBC Micro classic. If you haven't been hooked by it, you soon will be. One of the best games ever.	12.95
18	●	<b>PERCY PENGUIN</b> <i>Blue Ribbon</i>	An old favourite given a new lease of life by Blue Ribbon. If he doesn't feature as part of your collection he should do.	1.99
19	△20	<b>SMASH AND GRAB</b> <i>Blue Ribbon</i>	If you're feeling especially villainous and dastardly you can break the law in this budget title. Playable and addictive.	1.99
20	●	<b>INVADERS</b> <i>Mirrorsoft</i>	Not seen around much these days, but as expected from Mirrorsoft it's good quality. Might be worth waiting for the budget offering though.	9.95

# CHRISTMAS SOFTWARE BARGAINS

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Tallest: Spot the highest flower an exercise in visual perception

### Sum Takeaway Age 6-7 yrs

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Addition: Full hello to sums  
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Tens & Units: A vital concept in the child's future  
Multiply: Delightful visual hello to numbers over nine  
First step in those times tables and the 'X' sign

### Adder Sums Age 7-8yrs

Cheshire Cat ADDER SUMS includes  
Multiplication: Calculate the cost of items shown in the grocer's shop window  
Addition: Correctly total the shopping bill from the grocers  
Division: Share out the biscuits using the simple technique provided  
Time: Learn to tell the time of day, days of the week and the months of the year  
Tables: Make a start or improve on those important times tables

### Sum Times Age 8-9 yrs

Cheshire Cat SUM TIMES includes  
Tally & Bar Charts: An easy introduction to graphs  
Time: A moving clock for digital time  
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Co-ordinates: Important for reading maps and graphs  
Square Units: Invaluable for calculating areas etc

### Sum Measure Age 9-13 yrs

Cheshire Cat SUM MEASURE includes  
Length: Work out the length of a line in centimetres or millimetres  
Area: Find the area of a rectangle using cm<sup>2</sup>  
Volume: Give the volume of a cuboid in cm<sup>3</sup>  
Temperature: Work out the temperature shown on the thermometer  
Mass: Read the correct balance scale  
Capacity: Measure the amount of liquid in the cylinder

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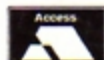
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# electron user ARCADE CORNER

**F**EW games have such a wide ranging appeal as *Elite*, and though it is a relatively old game – even *Repton* is a mere youngster in comparison – it is still extremely popular. Many newcomers to the Electron world have bought this classic title and there are quite a number of readers struggling at the controls of their Cobra Mk III in deep space.

It is also a long time since we published hints and tips for this game, so this month Christopher Chadwick provides welcome help for space traders. No cheat modes – that would make the game too easy, just good advice.

## The first trade run

The object of the game is to stay alive and eventually join the ranks of the Elite. This invariably involves writing off several Cobra Mk III spaceships, but you can afford it. In staying alive, several things will happen: You earn credits, your combat rating improves and your legal status may vary. It is impossible to improve any of these without improving the others at the same time.

At the start you will have read the manual and practised departing and docking at Lave. All you have is 100 credits, plus any extra you may have earned by atomising asteroids – always worth 0.5 credits.

Buy wine at Lave, set the controls for Leesti and take off. Remember you are trying to stay alive, so at this stage spare the heroics and get into hyperspace straight away. You are at great risk in space and this can only be minimised by spending as little time in flight as possible.

On arrival at Leesti sell the wine and buy computers. Refuel, re-arm and return to Lave to sell the computers. Repeat this trading run for as long as you can stand it.

If you can find a run between poor agricultural and poor industrial systems of safe political persuasion, use it. The best legal

# Dont cheat, beat Elite

profits are to be had in computers – industrial to agricultural – and furs – agricultural to industrial.

You cannot hope to trade effectively until you have enough credits to equip your ship for combat. The essential items are:

Equipment	Credits
Large cargo bay	400
ECM system	600
Front beam laser	1000
Extra energy unit	1500

When you have earned about 1,200 credits consider buying the large cargo bay, which will boost your carrying capacity from a tiny 20 tonnes to a more useful 35

tonnes, thus increasing your potential profit.

There isn't any point in carrying around large amounts of spare cash which could be cargo. The galaxy is not over-blessed with building societies, so you must fill your hold to the brim.

You should be able to make around 500 credits or more per journey, and so afford the beam laser and ECM within four to five runs. As a rule of thumb, don't buy extra equipment before buying fuel, missiles and cargo. There is no point in being well equipped but unable to buy cargo – and with not enough fuel to fly anywhere to sell it in any case.

The ECM system is essential. It is the only reliable way to stop missiles dead, and every one destroyed counts as a kill towards your next status rating.

The difference between the standard pulse laser and the mighty beam laser is roughly analogous to the difference between the little one that is used in your CD player and the steel cutting beast that nearly split James Bond in two in *Goldfinger*. Get one before one gets you.

The true cost of a new laser includes a refund on any that it replaces. So when upgrading a front pulse laser to a beam laser you should subtract the cost of a pulse laser from that of the new weapon.

The disadvantage of the beam laser and ECM is their heavy energy consumption. You have the kit, but not the power. An EEU comes into its own by increasing your energy replenishment rate.

## Tips from space

Regard your own missiles as purely defensive weapons. Don't target asteroids, as missiles are too expensive to waste – use lasers instead. If the E symbol appears on the screen after firing a missile don't fire again unless you are right on top of your target. The symbol means that your enemy is equipped with an ECM, which largely renders your missiles useless. The only hope you have is to get a missile into him before he can prime his ECM.

Bear in mind that there can be a considerable delay between firing and contact with the target. Are your ship's defences up to scratch?

Without an ECM you will only survive the impact of an enemy missile if your shields are fully charged and you have adequate energy to sustain the blow. The best defence is to hyperspace to another star system, but this is rarely practical.

Your remaining alternative is to accelerate to full speed and duck and weave until you can start shooting at it. If successful you will earn a kill point towards your next status promotion.

## Insurance

To avoid starting at the very beginning each time you are destroyed, save your position



to tape every time you dock. This also saves your position in ram and answering N to the "Load new commander?" prompt returns you to the last space station.

As you progress, you can buy an escape capsule for 1,000 credits. By pressing Escape before your ship explodes you will be transported to the space station in the current system. Once there, you will receive a new Cobra Mk III, identical to the one you had before.

## How to survive

Apart from political organisation, planets are also classified by their economic system and wealth. The best traders head for the very rich and the very poor as very few advantageous opportunities exist among the Average classes who are not Feudal.

However, try to avoid Anarchy and Feudal planet systems until you are Competent with credits to spare. The pirates in these systems are quite adept at knocking out ECMs, EEU's and docking computers, as well as any cargo you may be carrying.

It is good practice to cover your back by setting the hyperdrive for somewhere safe immediately on entering a dangerous system. If you are hurrying to leave, then looking at an information page rather than the

starscape will speed up the countdown.

Learn to interpret the various flight patterns of the different craft from their appearance on the flight grid scanner. The sooner you spot potential trouble, the better. It is easy to detect the presence of pirates and react appropriately – get them in your crosshairs, prime a missile and start lasering.

They show little skill, but work mob handed. When you fly through the pack they scatter and are easy to pick off. Until then they can cause considerable harm and may need a missile or two.

Vipers are invariably police craft, so avoid engaging them until you become skilled at combat, have a beam laser and fancy becoming a fugitive.

When heading for a planet set the crosshairs for the centre. Should unidentified company appear, roll the ship so that the enemy is ahead and above, but keep the planet straight ahead. If it attacks and you want to retaliate, lose speed, climb until the target is dead ahead and engage in battle. Have a missile targeted ready for use if necessary, but don't wait too long if he keeps hitting while you are missing.

If you find yourself suddenly under attack, but you can't see the enemy, see which shield – front or rear – is diminishing. Stop and dive, accelerate and roll. The attacker should now be showing on the radar.

Get into the habit of disarming the missiles when there is no immediate use for them,

especially when approaching a space station. It is foolish to inadvertently target and fire on a space station at which you wish to dock. Firstly, they won't let you in, and secondly, the police come out and attack.

If you pick a fight within range of a space station and you intend to dock, use your docking computer without delay. Of course, if you want to pick a fight, just shoot at a space station and blast the police as they come out.

Unfortunately, it occasionally happens that villains start to attack you in a space station controlled area. If this occurs you won't get any help from the police (you can never find a policeman when you want one). If you haven't got a docking computer it is best to chase the enemy out of the area, keeping the station behind you and then destroy him.

After a battle your ship's defenses will be weakened. The only way they can be recharged is to fly at full throttle, straight and level. If you use the jump key you will attract pirates and other undesirables capable of making mincemeat out of a weakened Cobra Mk III.

Always keep an eye on your energy level and shield strength. Shields are especially crucial, because they can diminish to the point where energy is taken directly from the energy banks, and this is fatal.

Finally, the most important tip is that you never know enough not to re-read the training manual!

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QUAL-SOFT COMMENT: At last an INTELLIGENT management game for the knowledgeable soccer enthusiast!

TAPE 1  
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- ★ Choose a 20 man squad to take to the finals.
- ★ Group of 4 prelims, 16 to final knockout comp.
- ★ Extra Time, PENALTY SHOOT-OUTS, where relevant.
- ★ Formation and strength information on opposition.
- ★ 2 from 9 substitutes (the FA tells us so).

### ENGLAND'S GAMES: FULL PITCH, 22 MAN, 3D GRAPHICS & SOUND EFFECTS

QUAL-SOFT comments: With 5 levels of play, 12 depths of sophistication, and "fun" graphics, this game can be enjoyed by an 8 year old youngster as a "fun" game, and by the most sophisticated as a tactical/strategy challenge of the highest order.

PACKAGE: Tape 1 plus Tape 2 plus 20 Page Manual £9.95 (57K RAM usage. Some would call this a MEGAGAME. YES IT WILL RUN ON YOUR 32k BBC.

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\* ROME '90 is an update of the classic MEXICO '86

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Please supply:  
ROME '90  
Electron ☐  
BBC'B' ☐

Name:.....  
Address:.....  
.....  
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**W**HEN I retired I bought an Electron and soon became hooked. Since then I have typed in many programs from *Electron User* and also bought many games. Now I have something like 400 programs.

With such a large amount of software I found considerable difficulty locating the disc or tape with the program that I wanted and so I created a simple database utility. That seems a long time ago now and in the course of time the database has been modified and extended to provide more facilities. In its present form it is comprehensive and user friendly, capable of being amended for different purposes.

Type in the program listing and save it. When it is run you will be presented with a title page, followed by a menu screen. First select option zero and you will be asked how many entries you wish to make (more can be added later). At the prompt, enter the title, the disc reference number (zero if not on disc), and the tape reference (zero if not on tape).

Option one allows you to browse through the database one screenfull at a time. You press Shift to see the next screen. Option two sorts the database entries into alphabetical order.

To add another title press option three

and enter the information at the prompts. Option four gives an opportunity to delete a title. Options five and six let you to change the disc and tape reference numbers, for instance, if you transfer a program from tape to disc.

Options seven and eight allow you to save and load the data file from tape or disc. Finally, option nine outputs the database to the printer.

Why waste time laboriously cataloguing tapes and discs looking for a particular program? With this handy utility you will be able to search and locate any program in a matter of seconds.

```

5 Titles
Choose one of these numbers:-
0...Begin again.
1...Read list.
2...Sort Alphabetical order.
3...Add title to list.
4...Remove title from list.
5...Change all disk/tape refs.
6...Change one disk/tape ref.
7...Save on disc/tape.
8...Recover from disc/tape.
9...Send to Printer.

```

# Filing floppies and tapes

Keep track of your software with Bill Millican's utility

```

10 REM Disk/Tape Index
20 REM By Bill Millican
30 REM (c) Electron User
40 *KEY1 PROCmenu M
50 VDU19,1,3;0;:COLOUR1
60 DIM titles(200),disk(200),t
ape$(200)
70 total=0
80 PROCintro
90 :
100 PROCmenu
110 DEFPROCmenu
120 CLS:VDU19,1,2;0;
130 PRINTTAB(15,1);total;" Titl
es"
140 PRINT"Choose one of these
numbers:-"
150 PRINT"SPC(5)"0...Begin agai
n."
160 PRINT"SPC(5)"1...Read List.
"
170 PRINT"SPC(5)"2...Sort Alpha
betical order."
180 PRINT"SPC(5)"3...Add title
to list."
190 PRINT"SPC(5)"4...Remove tit
le from list."
200 PRINT"SPC(5)"5...Change all
disk/tape refs."

```

```

210 PRINT'SPC(5)"6...Change one
disk/tape ref."
220 PRINT'SPC(5)"7...Save on di
sc/tape."
230 PRINT'SPC(5)"8...Recover fr
om disc/tape."
240 PRINT'SPC(5)"9...Send to Pr
inter."
250 Z=GET:IFZ<48 OR Z>57 THEN 2
50
260 Z=Z-47
270 ON Z GOTO290,300,310,320,33
0,340,350,360,370,380
280 ENDPROC
290 PROCbegin:GOTO100
300 PROCread:GOTO100
310 PROCalpha:GOTO100
320 PROCadd:GOTO100
330 PROCremove:GOTO100
340 PROCchange:GOTO90
350 PROCconechange:GOTO100
360 PROCsave:GOTO100
370 PROCrecover:GOTO100
380 PROCprinter:GOTO100
390 :
400 DEFPROCintro
410 CLS
420 PRINT
430 PRINT
440 PRINTSPC5"**** DISK & TAPE
INDEX ****"
450 PRINT'SPC7"(by Bill Millic
an '89)"
460 PRINT'SPC12"Volume No.1 "
470 PRINT'SPC4"Programs on both
Disk and Tape."
480 REM
490 PRINT'SPC3"It will accept
approx.200 titles."
500 PRINT'"You are given the op
tion of saving and loading eithe
r from disc and/or tape."
510 PRINT'"To return to the MEN
U at any time press Func 1 or typ
e:-GOTO90"
520 PROCholdscreen
530 ENDPROC
540 :
550 DEFPROCholdscreen
560 PRINT'SPC8"Press the SPACE-
bar."
570 ZZ=GET
580 ENDPROC
590 :
600 DEFPROCbegin
610 CLS
620 INPUT'SPC8"How many Titles
",total
630 PRINT:FORcount=1TOTotal
640 IFcount=1 THEN660
650 PRINT"Now next title."
660 INPUT"Title "title$(count)
670 INPUT"Now the disk number "
disk(count)
680 INPUT"Now the tape ref. "
tape$(count)
690 PRINT:NEXTcount
700 PRINT'"That was the last t
itle."
710 PROCholdscreen
720 ENDPROC
730 :
740 DEFPROCread
750 CLS
760 VDU14
770 PRINT'SPC5"Title"SPC15"Disk
"SPC4"Tape""
780 FORcount=1TO total
790 PRINTtitle$(count);TAB(26)d
isk(count);TAB(33)tape$(count)
800 NEXTcount
810 PROCholdscreen
820 ENDPROC
830 :
840 DEFPROCalpha
850 CLS
860 PRINT"Titles being put int
o alphabetical order""Be patien
t-it can take a long time if th
ere are many entries!"
870 j=0
880 FORcount=1TOTotal-1
890 IF title$(count)<=title$(co
unt+1) THEN960
900 x$=title$(count+1):x1=disk(
count+1):x2=tape$(count+1)
910 title$(count+1)=title$(coun
t)
920 disk(count+1)=disk(count)
930 tape$(count+1)=tape$(count)
940 title$(count)=x$:disk(count
)=x1:tape$(count)=x2$
950 j=j+1
960 NEXTcount
970 IFj>0 THEN870
980 PRINT'SPC6"Now in alphabetic
al order."
990 PROCholdscreen
1000 ENDPROC
1010 :
1020 DEFPROCadd
1030 CLS
1040 INPUT"Name of new title "n
ew$
1050 INPUT"Disk number of new t
itle "ndisk
1060 INPUT"Tape ref.of new titl
e "ntape$
1070 total=total+1
1080 title$(total)=new$
1090 disk(total)=ndisk
1100 tape$(total)=ntape$
1110 PRINT"New title now entere
d."
1120 INPUT"Any more ( Y / N )"
,ans$
1130 IFans$="Y" GOTO1030 ELSE PR
OCholdscreen
1140 REM PROCCholdscreen
1150 ENDPROC
1160 :
1170 DEFPROCremove
1180 CLS
1190 INPUT"Title to be removed
"remove$
1200 FORcount=1TOTotal
1210 IF title$(count)=remove$ TH
EN1250
1220 NEXTcount
1230 PRINT"Not on List"
1240 GOTO1450
1250 FOR j=count TO total-1
1260 title$(j)=title$(j+1):disk(
j)=disk(j+1):tape$(j)=tape$(j+1)
1270 NEXTj
1280 title$(total)=" ":disk(tota
l)=0
1290 total=total-1
1300 PRINT"Now removed"
1310 PROCCholdscreen
1320 ENDPROC
1330 :
1340 DEFPROCchange
1350 CLS
1360 PRINT"Input new disk numbe
rs/tape refs."
1370 FORcount=1TOTotal
1380 PRINT"D " title$(count);TAB
(15);:INPUT disk(count)
1390 PRINT"T " title$(count);TAB
(15);:INPUT tape$(count)
1400 NEXTcount
1410 PRINT"New disk numbers & t
ape refs. now entered,"
1420 PROCCholdscreen
1430 ENDPROC
1440 :
1450 DEFPROCconechange
1460 CLS
1470 INPUT"Title name ",tit$
1480 FORcount=1TOTotal
1490 IF tit$=title$(count) THEN
1540
1500 NEXTcount
1510 PRINT"Not on the List."
1520 PROCCholdscreen
1530 GOTO1580
1540 INPUT"Enter the new disk n
umber ",disk(count)
1550 INPUT"Enter the new tape r
ef.",tape$(count)
1560 count=total
1570 PROCCholdscreen
1580 ENDPROC
1590 :
1600 DEFPROCsave
1610 CLS
1620 INPUT"Save to (D)isc or (
T)ape "QS:IF QS="D" THEN 1630 EL
S E IF QS="T" THEN 1640
1630 OSCLI"*DISK":PRINT"Data no
w being stored on disc.":GOTO1650
1640 OSCLI"*TAPE":PRINT"Data no
w being stored on tape."
1650 X=OPENOUT"DATA"
1660 :
1670 FORcount=1TOTotal
1680 PRINT# X,title$(count)
1690 PRINT# X,disk(count)
1700 PRINT# X,tape$(count)
1710 NEXTcount
1720 CLOSE# X
1730 PRINT"data now saved."
1740 PROCCholdscreen
1750 ENDPROC
1760 :
1770 DEFPROCrecover
1780 CLS
1790 PRINT"Insert DATA disc or
tape."
1800 INPUT"Recover from (D)isc
or (T)ape.":QS
1810 IF QS="D" THEN 1820 ELSE IF
QS="T" THEN 1830
1820 OSCLI"*DISK":PRINT"Data no
w being recovered from disc.":GOT
O1850
1830 OSCLI"*TAPE":PRINT"Data no
w being recovered from tape."
1840 :
1850 FORD=0TO2000:NEXTD
1860 :
1870 total=0
1880 X=OPENIN"DATA"
1890 :
1900 REPEAT
1910 total=total+1
1920 INPUT# X,title$(total)
1930 INPUT# X,disk(total)
1940 INPUT# X,tape$(total)
1950 UNTIL EOF# X
1960 CLOSE# X
1970 PRINT'SPC8"Data now loaded.
"
1980 PROCCholdscreen
1990 ENDPROC
2000 :
2010 DEFPROCprinter
2020 VDU2
2030 *FX6,0
2040 VDU1,27,1,108,1,5
2050 PROCread
2060 PRINT
2070 ENDPROC

```

Product: *Subway Vigilante*

Price: £2.99

Supplier: Players, Mercury House, Calleva Park, Aldermaston, Berkshire RG7 4QW.  
Tel: 0734 817421

**SUBWAY Vigilante** from Players is set several years in the future when London's Underground network has degenerated into a battleground, with drug dealers, pushers, punks and muggers fighting for supremacy. You step into this hell-hole as the *Subway Vigilante*, determined to rid the underground of these evil beings so that the normal, law abiding passenger can enjoy a safe journey.

This scenario provides the backdrop for a great deal of violent punching, kicking and head butting. The game takes place on a platform of a London Underground station. This is portrayed in full and glorious black and white – unlike the screen shots shown on the cassette instructions which look more like Spectrum ones. The playing area is made up of the lower part of the screen. The opposition are also shown in black and white along with you, the hero of the game.

You seem to have two opponents all of the time and when you manage to flatten one, it mutates into the next order of species. These may be armed with a device which looks like a chain saw, but as far as I can make out, they are no more difficult to deal with than the previous beasts. If you are knocked down, you too can get up, as you have five lives.

The controls are simple – four keys can move you forwards, backwards, left and right around the platform and in conjunction with the fire key various jabs, butts, punches and kicks are produced.

Doing damage to an opponent seemed to depend to a large extent on luck. On numerous occasions I punched one of these evil characters only to see the other one fall over. I also think they may do in each other



from time to time.

You soon develop a simple strategy. If you move to the left of the screen and stand there performing flying kicks, you can beat the opposition and only rarely get flattened yourself.

If you do well enough, you are asked to

start your tape recorder. This loads up a different scene, but it makes no difference to the gameplay. I think this second screen, which features skull and crossbones and Nazi insignia is the last. Despite some fairly large scores (obtained with the stand-at-the-left strategy), I have not seen any more.

All this leaves us with a very simple game. The loading screen portraying some fairly ugly customers is probably its best part. But lack of colour, inept beeps and poor animation all indicate one to be left on the shop shelf.

Rog Frost

Graphics.....	10
Sound .....	4
Playability .....	5
Value for money .....	6
Overall .....	6

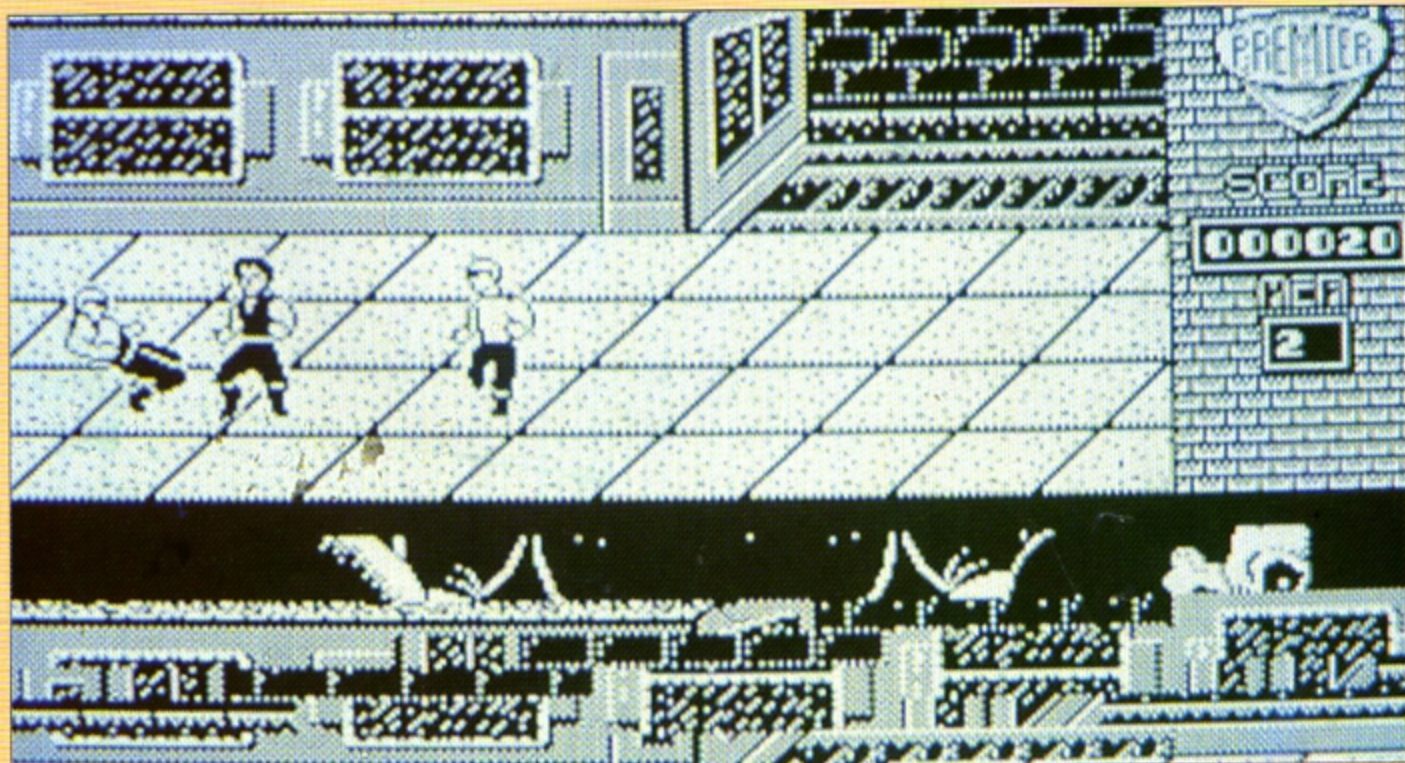
## Second Opinion

Graphically, *Subway Vigilante* is superb. The loading screen is a well drawn Mode 4 picture showing three thugs, and the game graphics – again Mode 4 – have detailed backgrounds and superbly drawn and animated sprite-like characters.

Like many martial arts games, you can usually beat each opponent with just a couple of moves. Consequently the game becomes quite dull as you repeat each manoeuvre over and over again.

Roland Waddilove

# Mash a mugger



Become a guardian angel on the London Underground

Product: *Blast!*  
 Price: £9.95 (tape)  
 Supplier: ASL, Winchester House, Canning  
 Road, Harrow HA3 7SJ.  
 Tel: 01-861 1166

# Blast



IT all begins as a straightforward astro-geo-logical survey of an anti-matter planet in the outer reaches of the galaxy. As you make your final approach there is a rumbling below your ship, the ground falls away beneath you, and you tumble into the abyss.

After minutes of grappling with the controls you finally manage to stabilise the ship

only to find yourself in the first of eight alien caverns.

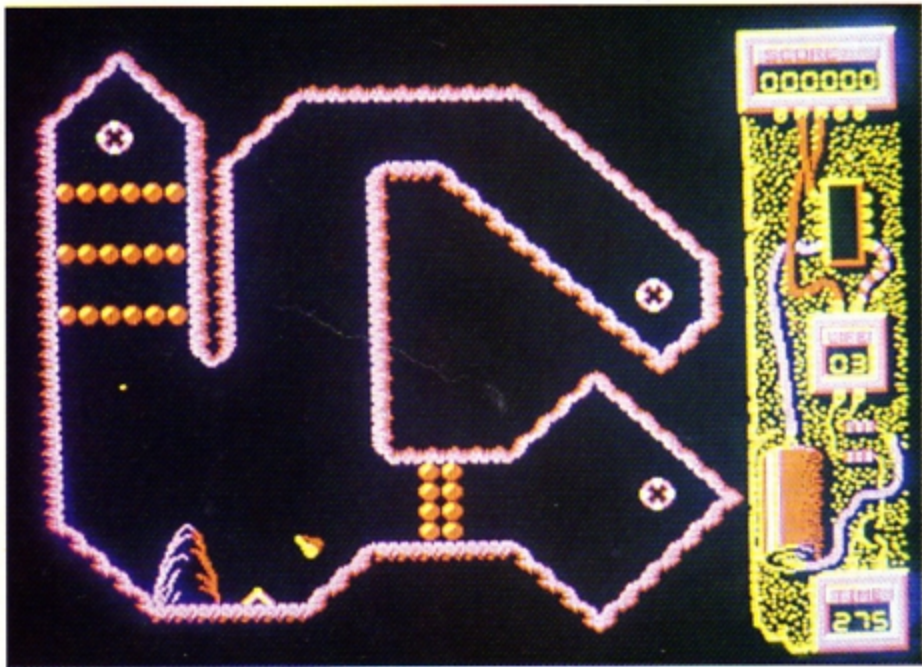
*Blast!*, from ASL, is based quite unashamedly on the Superior Software classic - *Thrust*. Most of the original elements are there - the small triangular spaceship, the relentless pull of gravity, and the ever-present threat of alien attack.

Unlike the multi-screen, scrolling, back-grounds of *Thrust*, *Blast!* limits the size of its caverns to a single screen and achieves its complexity by reducing the size of the sprites. The game controls are very similar, allowing ship rotation, thrust and fire. There is no tractor beam because you aren't required to collect any power units.

Not only does ASL provide a facility for fussy players to define their own control keys, it also panders to the needs of those less wealthy Electron gamers who are condemned to play on a monochrome monitor. During the loading procedure you are asked what type of display you will be using; a monochrome reply results in the program defaulting to a selection of colours more suited to your needs.

The object of the game is to destroy all alien command centres of which there are three in each cavern. With these out of the way you are free to attempt the next level. Not surprisingly, the aliens aren't going to leave their command centres sitting around for any old Tom, Dick, or astro-geologist to blow to pieces.

The alien offence/defence system consists of several categories. Wall-mounted gun emplacements that loose a constant volley of randomly aimed laser blasts, highly mobile, but dumb, catherine wheel devices



Product: *Tomcat*  
 Price: £1.99  
 Supplier: Players, Mercury House, Calleva  
 Park, Aldermaston, Berkshire RG7 4QW.  
 Tel: 0734 817421

## Flying high

*TOMCAT*, Players' second title released this month, takes place in the first half of the 21st century. Land has become scarce and expensive so large artificial islands were created at sea. One, Artrock 6, is used as a defense installation and is completely automated.

Unfortunately, a freak storm has damaged the controlling software causing the automatic defences to go berserk and anything approaching the island is destroyed. You as the pilot an American F14 Tomcat fighter are sent in to destroy the base.

The fine loading screen depicting an F14 Tomcat fighter is followed by an even better Mode 4 graphic display. Overlaid on this picture is the small playing window in which you get a bird's eye view of the plane flying low over the island.

These graphics are quite detailed, but the green colouring caused unpleasant stripes on my colour TV. I found it better if I switched off the colour. The display on a monitor is excellent with no colour problems.

You can fly your plane forwards, backwards, left and right, the playing window scrolling smoothly in the appropriate direction to reveal more of the landscape.

Gun emplacements pop up from the ground, swivel round and fire cannons at you while aircraft attack from the front. These can all be easily shot with your own cannon, but their sheer numbers can be overwhelming and it is easy to lose a couple of lives very quickly.

The speed of animation is sluggish, slowing even more when several objects are on screen at the same time. Switch on your Slogger Turbo, however, and the game speeds up to quite an acceptable rate.

I find it impossible to play for more than a few minutes as the frustration factor is far too high. A friend of mine has seen level two, which is much the same as level one apart from the background. The cassette files indicate that there are four levels.

While we should all be pleased that Players are sticking with the Electron mar-

trundle around the cavern walls, and less mobile, but not so dumb, homing mines gravitate towards you relentlessly.

In addition to the indestructible cavern walls there are rows of little barrier blobs that create temporary obstructions throughout the caverns. The accessibility of some of the command centres is restricted by the physical shape of the cavern itself – nasty little narrow and angled corridors are often the only route to a centre.

On the higher levels the complexity and ferocity of the onslaught increases quite dramatically. Volcanic eruptions belch streams of explosive bubbles across your path. On level four the usually obstructive, but immobile, barrier blobs succumb to the effects of gravity and begin tumbling from the skies.

The leisurely, but thoughtful, approach that has served you so well in the previous levels now has to be abandoned in favour of a less systematic, blast everything, technique. It is at times like this that you really appreciate your ship's auto-fire cannon.

You begin the game with three spaceships, each having infinite supplies of fuel and firepower. Such generosity enables the cautious player to take his or her time to complete each cavern without loss of life.

On the other hand the Joe Cool space aces out there are most welcome to try and take out the command centres before the count down timer reaches zero, thereby qualifying for a handsome bonus.

Blast! has managed to re-create the physics that worked so well for Thrust. Minute blips of thrust are necessary to maintain the ships position in space and all sideways drifts have to be compensated for with a brief thrust in the appropriate direction.

When you are expected to fly a ship through tortuously twisting narrow caverns the accuracy of the collision detection routines is of paramount importance. There is nothing more frustrating to an ace pilot than to see his ship consumed by flame when he knows for certain that he missed the wall with millimetres to spare.

Blast's routines are perfection. You can fly your ship to within a pixel of an object in complete confidence, knowing that the craft will not spontaneously combust.

The graphics used throughout will never win any prizes for style or originality, but I don't consider this to be a major failing. Blast's main strength is its superb gameplay.

This is a game that responds to the skilful player. With four fingers working in unison

the ace pilot can pivot his craft is the narrowest of tunnels while simultaneously blasting mines and command centres.

Within half an hour you can be flinging the ship about at high speed on the lower levels in an attempt to reap the largest possible time bonus. I enjoyed it and I'm sure you will too.

Steve Brook

Sound .....	7
Graphics .....	7
Playability .....	9
Value for money .....	8
Overall .....	8

## Second Opinion

*There is no doubt as to where the programmer of Blast got the idea for this arcade game – Thrust. The graphics are different, but the gameplay is essentially the same.*

*Fly your spaceship through the caverns and destroy the alien command centres. Your ship has momentum and also weight, making it difficult to manoeuvre in small spaces – most of the caverns are small and have gun emplacements too.*

*Blast is good, addictive fun and will appeal to all Thrust devotees. However, it is quite expensive.*

Roland Waddilove

ket, perhaps future offerings could be more playable than this one.

Rog Frost

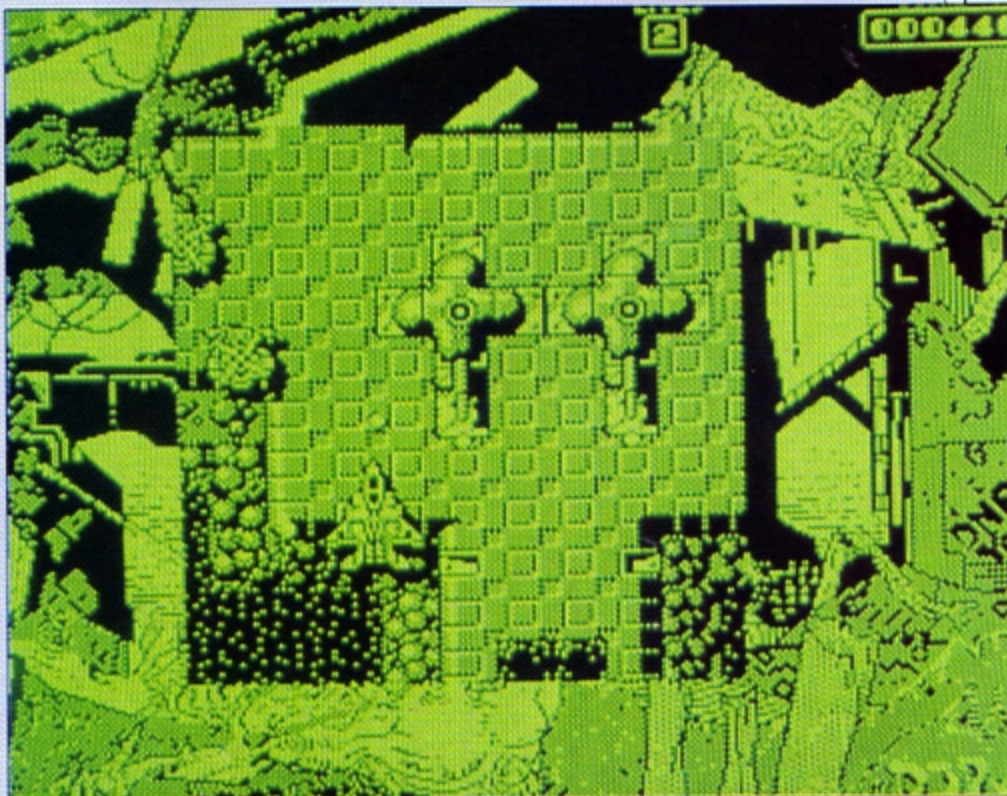
Graphics .....	10
Sound .....	4
Playability .....	5
Value for money .....	6
Overall .....	6

## Second Opinion

*Graphically, Tomcat is brilliant. The loading screens are superbly drawn and the game graphics are among the best seen on the Electron. In parts, Tomcat features parallax scrolling where one section of the background scrolls at a different rate to another section – this is the first time this has been attempted on the Electron.*

*Unfortunately, the poor Electron hasn't got the brute processing power to implement this type of format. Players is to be commended for attempting it and Turbo owners will find it a graphic delight. Don't bother if you have an ordinary, slow Electron.*

Roland Waddilove



# Electronic sunburst

John Geraghty offers an impressive graphic demonstration of the Electron's capabilities

**W**E have seen many graphic demonstrations over the past seven years at *Electron User*, but none have impressed us so much as this amazing sunburst display. The speed, colours and effects are stunning and superbly show off the micro's power.

It is said that the simplest ideas are often best, and when it comes to producing fascinating displays on your micro there is none simpler or better than the Roses algorithm. To see an example of this enter and run Sunburst I.

All this program does is accept an input of an angle, and repeatedly turning through this angle, draws about a central point. However, note what happens if you enter a number which is an exact divisor of 360 – you get a regular polygon. Otherwise the design goes around several times before returning to the initial point. Try entering 222 and see what happens. You should get the display shown in Figure 1.

The trick of the Roses algorithm is simply to make the radius,  $R\%$ , of the design a variable rather than a constant. Enter the following lines, then enter 222 for the degree increment:

```
45 INPUT "Radius factor";n%
90 R%=FNr
255 R%=FNr
300 DEF FNr
310 =500*COS RAD(deg%*n%)
```

Try different values and see what happens.

This is the basic algorithm. It can be taken further by adding colour and using triangle plotting to produce a solid design. Enter these lines and again try 222 and 6 when prompted:

```
101 MOVE FNx,FNy
256 GCOL 3,R% MOD7 +1
260 PLOT 85,FNx,FNy
```

This is the type of pattern produced by the second program, Sunburst II. In addition, there are several machine code routines to overlay stippled colours, change the palette and scroll the screen, giving a constantly changing display.

Sunburst II features a cycle of six patterns, each lasting several minutes. The data – degree increment and radius factor – for each pattern is held in pairs in a data statement at the end of the listing. You may be able to find additional values and incorporate them – just make sure the data ends with the dummy values 999,999.

The high resolution display and large array consume a lot of memory, so there aren't any REM statements in the program. Here is the outline:

**PROctitle:** Draws the title screen mask in colour eight, which is invisible because the flashing colours have been turned off by

**FX9.** When the pattern is drawn by **PROCpattern**, everything inside the mask is in colours 8 to 15 and everything outside is in colours 0 to 7. The pattern is EORed on to the screen, and because colours 0 to 7 have been defined as background only the masked area can be seen. Later, colours 0 to 7 are redefined to show the whole screen.

**PROCinit:** Sets up the variables, assembles the machine code and works out the VDU codes for the first pattern using **FNpoint**. This function returns TRUE when the data set is complete. While this is going on the machine code routine **Rnd-col** clears the screen in a random way.

**FNpoint:** Works out the colour and the coordinates of the next point. The Basic SIN and COS functions aren't used as it is quicker to work them out from the previous values.

**PROCfx:** Calls **PROCpat-init** to reset the variables for the next pattern. The data for the new pattern is calculated in the time interval caused by the delay. It also switches the colour palette according to whether the title screen is showing or not. This is determined by the flag **title%**. Finally, it can apply an overlay of stippled colours in various ways.

Feel free to experiment with the pattern data at the end of the listing – there are many more interesting and colourful patterns just waiting to be discovered.

```

10 REM Sunburst I
20 REM By John Geraghty
30 REM (c) Electron User
40 MODE2
50 GCOL0,7
60 INPUT""degree increment";d
eg incX
70 CLS
80 GCOL0,7
90 VDU29,640,512;
100 degX=0
110 RX=500
120 MOVE FNx,FNy
130 :
140 REPEAT
150 PROCpoint
160 UNTIL degX=0
170 PROCpoint
180 END
190 :
200 DEF FNx
210 =RX*SINRADdegX
220 :
230 DEF FNy
240 =RX*COSRADdegX
250 :
260 DEF PROCpoint
270 degX=(degX+deg incX)MOD360
280 DRAW FNx,FNy
290 ENDPROC

```

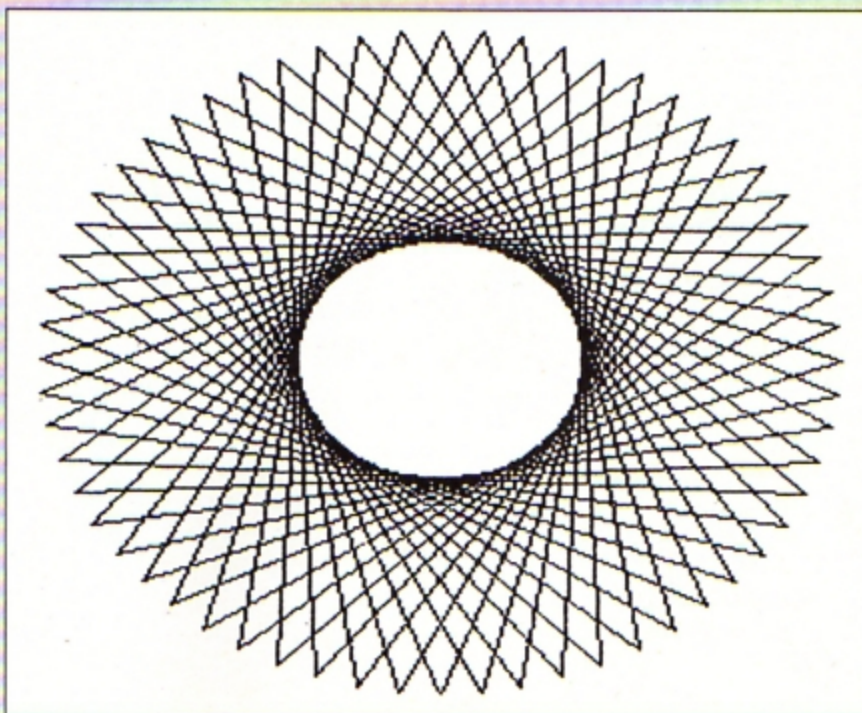


Figure 1: The basic sunburst pattern produced by the listing on the left

```

10 REM Sunburst II
20 REM By John Geraghty
30 REM (c) Electron User
40 :
50 TS="SUNBURST"
60 ON ERROR PROCerr
70 IF PAGE>800 PROCreloc
80 MODE5
90 DIM vduX 362*5
100 PROCinit
110 MODE2
120 PROCtitle
130 :
140 REPEAT
150 PROCpattern
160 PROCfx
170 UNTIL FALSE
180 :
190 DEF PROCinit
200 *FX9,0
210 *FX16
220 IX=TRUE
230 PROCassemble
240 PROCpat init
250 VDU23,1,0;0;0;29,640,512;
23,240,240,240,240,240,0;19,0,3
;0;19,2,1;0;
260 COLOUR2:PRINTTAB(6,24)"Hold
on..."
270 ?c1=240: ?c2=240
280 LX=0
290 REPEAT
300 LX=LX+1:IF LX=6 LX=0:CALL r
nd col
310 UNTIL FNpoint
320 dummy=FNpoint+FNpoint
330 ENDPROC
340 :
350 DEF PROCpat init
360 READ nX,deg incX
370 IF nX=999 RESTORE:GOTO360
380 cosi=COSRADdeg incX
390 sini=SINRADdeg incX
400 old cosi=1:old sini=0
410 cosn=COSRAD(deg incX*nX)
420 sinn=SINRAD(deg incX*nX)
430 old cosn=1:old sinn=0
440 RX=800:yX=RX:xX=0
450 vdu indX=vduX-5

```

```

460 ENDPROC
470 :
480 DEF FNpoint
490 vdu indX=vdu indX+5
500 IF RX>700 ?vdu indX=7 ELSE
?vdu indX=RX*138 DIV100 MOD7+1
510 !(vdu indX+1)=&10000*yX+xX
520 ncos=old cosn*cosn-old sinn
*sinn
530 old sinn=old sinn*cosn+old
cosn*sinn
540 old cosn=ncos
550 RX=800*ncos
560 cos=old cosi*cosi-old sini*
sini
570 old sini=old sini*cosi+old
cosi*sini
580 old cosi=cos
590 xX=RX*old sini:yX=RX*cos
600 =(yX>796 AND xX=0)
610 :
620 DEF PROCtitle
630 ?&FE07=48
640 GCOL0,128+8
650 VDU24,0;296;1271;724;:CLG:V
DU26
660 GCOL0,8
670 VDU5
680 AX=10:XX=&70:YX=0
690 FOR charX=1 TO LENTS
700 ?&70=ASCMIOS(T$,charX,1)
710 CALL osword
720 ?&72=?&71: ?&76=?&77
730 IF charX=6 ?&74=?&74-4
740 :
750 FOR LX=1 TO 5
760 byteX=?(&71+LX)
770 vposX=852-LX*20
780 posX=(charX-1)*164
790 FOR IX=posX TO posX+120 STE
P32
800 byteX=byteX*2
810 IF byteX AND 64 MOVEIX,vpos
X:VDU240:MOVEIX,vposX-552:VDU240
820 NEXT:NEXT:NEXT
830 VDU29,640,512;
840 ?&FE07=16
850 ENDPROC
860 :

```

```

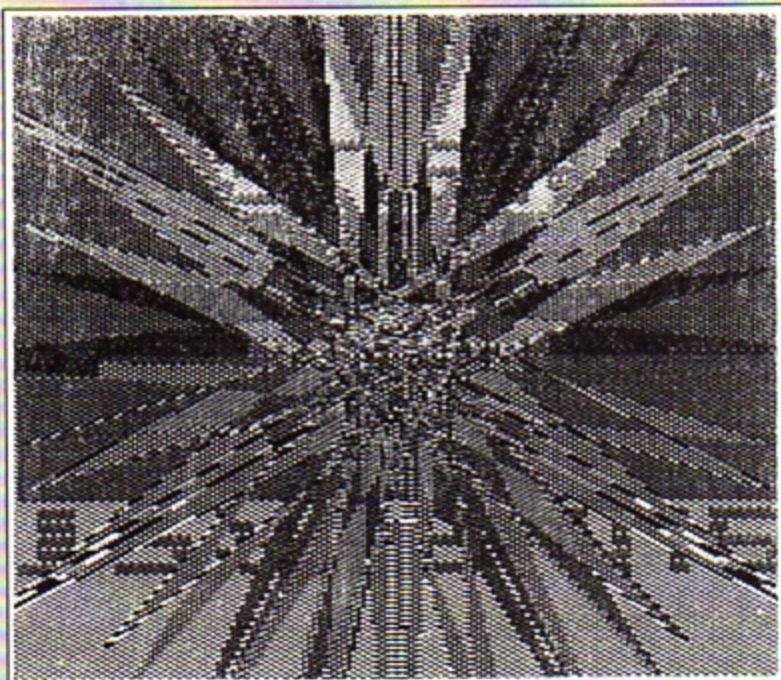
870 DEF PROCpattern
880 FOR CX=0 TO 7:VDU19,CX,0;0;
19,CX+8,CX+8,0;0;:NEXT
890 IF IX IX=FALSE ELSE YX=0:CA
LL shut col
900 !vdu start=vduX:!vdu end=vd
u indX+5
910 CALL pattern
920 MOVE-150,-80:MOVE150,-80:PL
OT85,0,150
930 GCOL0,1
940 MOVE-150,-80:DRAW150,-80:DR
AWO,150:DRAW-150,-80
950 YX=-1:XX=49:CALL colour
960 ENDPROC
970 :
980 DEF PROCfx
990 PROCpat init
1000 delay=FALSE
1010 titleX=TRUE
1020 TIME=3000
1030 REPEAT
1040 actX=RND(8+titleX)-(1+title
X)
1050 :
1060 FOR CX=-titleX TO 7
1070 IF delay IF nX=222 IF CX<6
FOR d=0 TO 100:NEXT:GOTO1090
1080 IF delay IF FNpoint dummy=F
Npoint+FNpoint:CX=7:NEXT:UNTIL TR
UE:ENDPROC
1090 IF RND(100)>98 delay=NOT de
lay
1100 :
1110 ?pb=CX+8:?(pb+1)=CX+8
1120 AX=titleX:CALL palette
1130 IF delay FOR d=0 TO 30:NEXT
1140 ?pb=RND(8)+7:?(pb+1)=actX+8
1150 AX=titleX:CALL palette
1160 NEXT
1170 :
1180 IF TIME>3300 titleX=FALSE:T
IME=0
1190 IF TIME>3000 IF titleX=FALS
E titleX=TRUE:FOR CX=0 TO 7:FOR d
=0 TO 100:NEXT:VDU19,CX,0;0;:NEXT

```

```

:VDU19,8,7;0;
1200 IF RND(10)>5 UNTIL FALSE
1210 YX=RND(4)-2:XX=RND(63)
1220 IF YX<2 CALL colour ELSE IF
NOT title% IF TIME>5 CALL colour
1230 UNTIL FALSE
1240 :
1250 DEF PROCassemble
1260 screen=&70:col addr=&72:tem
p=&74
1270 rows=&75:rnd=&76:c1=&77
1280 c2=&78:vdu start=&79:vdu en
d=&7B
1290 scr hi=&34E:osword=&FFF1
1300 osbyte=&FFF4:oswrch=&FFEE
1310 :
1320 FOR pass=0 TO 2 STEP2
1330 PX=&A00
1340 [OPT pass
1350 .colour
1360 JSR super pix:TYA:BEQ norm
col
1370 BMI rnd col:CMP #1:BEQ jmp
1380 JMP scroll col:jmp JMP shu
t col
1390 :
1400 .norm col
1410 LDA #0:STA screen:LDA scr h
i
1420 STA screen+1:LDY #0
1430 .nloop
1440 LDA c1:EOR (screen),Y
1450 STA (screen),Y:INY:LDA c2
1460 EOR (screen),Y:STA (screen)
,Y
1470 INY:BNE nloop:INC screen+1
1480 BPL nloop:RTS
1490 :
1500 .rnd col
1510 LDX #0
1520 .rloop1
1530 LDA #0:STA screen:STA scree
n+1
1540 LDY #3:LDA rnd
1550 .rloop2
1560 ASL A:ROL screen+1:DEY
1570 BNE rloop2:STA screen
1580 LDA scr hi:CLC:ADC screen+1
1590 STA screen+1
1600 .rloop3
1610 LDY #7
1620 .rloop4
1630 TYA:AND #1:BEQ rover
1640 LDA c2:JMP rover2
1650 .rover
1660 LDA c1
1670 .rover2
1680 EOR (screen),Y:STA (screen)
,Y:DEY
1690 BPL rloop4:LDA screen+1:CLC
1700 ADC #8:STA screen+1:BPL rlo
op3
1710 LDA rnd:ASL A:ASL A:CLC
1720 ADC rnd:CLC:ADC #3:STA rnd
1730 DEX:BNE rloop1:RTS
1740 :
1750 .shut col
1760 STY temp:LDX #7:LDY #0
1770 .sloop1
1780 STX screen:LDA scr hi:STA s
creen+1
1790 .sloop2
1800 TXA:AND #1:TAY:LDA c1,Y
1810 LDY temp:BNE not title
1820 LDA #&C0:AND (screen),Y
1830 JMP restore title
1840 .not title DEY:EOR (screen)
,Y
1850 .restore title
1860 STA (screen),Y:LDA screen:C
LC

```



The multicolour version of this is stunning

```

1870 ADC #8:STA screen
1880 BCC sloop2:INC screen+1
1890 BPL sloop2:DEX:BPL sloop1
1900 RTS
1910 :
1920 .scroll col
1930 LDX #&20:STX rows:LDX #0
1940 STX screen:LDX scr hi:STX s
creen+1
1950 .scrow
1960 LDA screen:STA col addr:CLC
1970 ADC #&80:STA screen:LDA scr
een+1
1980 STA col addr+1:ADC #&02
1990 BPL scover:LDA #&30
2000 .scover
2010 STA screen+1:LDA #&13:JSR o
sbyte
2020 LDA screen+1:LSR A:ROR scre
en
2030 TAY:LDX #3:LDA #&97:JSR osb
yte
2040 LDA screen:ASL screen:TAY
2050 LDX #2:STX temp
2060 LDA #&97:JSR osbyte
2070 LDY #0:LDX #&40
2080 .sloop
2090 LDA (col addr),Y:EOR c1
2100 STA (col addr),Y:INY
2110 LDA (col addr),Y:EOR c2
2120 STA (col addr),Y:INY
2130 BNE sc hi ok:INC col addr+1
2140 .sc hi ok
2150 DEX:BNE sloop
2160 DEC temp:BNE sloop
2170 .row end
2180 DEC rows:BNE scrow:RTS
2190 :
2200 .super pix
2210 STX c1:TXA:AND #85
2220 ASL A:STA c2:TXA
2230 AND #170:LSR A:ORA c2
2240 STA c2:RTS
2250 :
2260 .pattern
2270 LDX #2:LDY #0
2280 .ploop
2290 LDA #&FF:BMI pout
2300 LDA #&12:JSR oswrch:LDA #&0
3
2310 JSR oswrch:JSR read vdu

```

```

2320 LDA #&19:JSR oswrch
2330 TXA:BEQ tri:DEX:LDA #&04
2340 BNE plot opt
2350 .tri
2360 LDA #85
2370 .plot opt
2380 JSR oswrch:JSR read vdu
2390 JSR read vdu:JSR read vdu
2400 JSR read vdu:LDA vdu start
2410 CMP vdu end:BNE ploop
2420 LDA vdu start+1:CMP vdu end
+1
2430 BNE ploop:.pout RTS
2440 :
2450 .read vdu
2460 LDA (vdu start),Y:JSR oswrc
h
2470 INC vdu start:BNE rend
2480 INC vdu start+1:.rend RTS
2490 :
2500 .palette
2510 PHA:LDA #&13:JSR osbyte
2520 JSR osw12:PLA:BNE rend
2530 .fore too
2540 LDA pb:SEC:SBC #8:STA pb
2550 LDA pb+1:SBC #8:STA pb+1
2560 .osw12
2570 LDA #&0C:LDX #pb MOD&100
2580 LDY #pb DIV&100:JMP osword
2590 :
2600 .pb
2610 EQU0 0
2620 EQU0 0
2630 J:NEXT:ENDPROC
2640 :
2650 DEF PROCrelac
2660 OSCLI("KEYO *TAPEM FX=PAGE
:TX=&E00:TOP=13:REPEAT STX=SF:L
X=LENSTX+1:TX=TX+LX:FX=FX+LX:UNTI
L FX>TOPM PAGE=&E00M OLDM RUN
M"):OSCLI("FX138,0,128"):END
2670 :
2680 DEF PROCerr
2690 ON ERROR OFF
2700 *FX9,25
2710 VDU22,6:HINEM=&6000
2720 PRINT':REPORT:PRINT " at Li
ne ";ERL
2730 :
2740 DATA 222,6,264,11,330,13,34
2,14,24,14,320,13,999,999

```



**T**HE Electron is now well into its seventh year, having been released way back in autumn 1983. So long ago in fact, that some of our youngest readers might not have been born! Ageing whizz kids like me however, can remember those heady days when the Electron was King. Those were the days. In retrospect the past always seems rosy as memories dim and events get muddled in our minds. What was really happening five years ago this month?

"Electron heads for success in 1985" proclaimed the headlines in *Electron User's* news pages. The lead story went on to say that "Excellent Christmas sales of the Electron are being seen as an indication the machine could become the big computer success story of 1985". W.H. Smiths reported: "The sales rate for the Electron has almost tripled in a few weeks".

The Plus 3 ADFS disc system had just been released for £229 and also an RS423 interface was announced – but that piece of hardware never materialised. And what happened to the doomed Plus 2 Econet interface demonstrated by Acorn at shows?

Acornsoft announced the release of ISO-Pascal, one of the most important pro-

gramming languages currently in use, and Logo was on the way. Skywave was also selling the cult programming language Forth, on a rom chip.

Latest releases on the software scene were Warp 1 from Icon, Stranded from Superior, Bumble Bee and Ghouls from Micropower and Pinball Arcade from Kansas City Systems.

Phi Mag Systems announced a Phloopy super fast tape system that emulated a disc

system, but was really a cassette. One spent a few weeks attached to my micro and I thoroughly enjoyed it. However, it soon broke down, the Phloopy idea never really caught the public's imagination, and Phi Mag Systems eventually disappeared.

Voltmace was selling its Delta 3B joystick – it still is – and Qual-Soft was boasting that Soccer Supremo was "Not so much a game, more a way of life". It has been updated and is now called Rome '90 – the adverts are still running in *Electron User*. And Superior Software was there on the inside back page with Overdrive and Smash and Grab.

*Electron User's* cover featured a superb pie chart generator from the talented Jon Willington (the listing can be found in this month's In Action feature). Pete Bibby was up to Part 12 of his Introduction to Programming, and Merlin was providing the adventure hints and tips. A relatively unknown newcomer, Roland Waddilove, provided a machine code shoot-'em-up, while Dave Robinson's utility displayed New Year greetings cards.

● It is interesting to see how some names have come and gone, but others are still with us. Next month I'll time warp back to 1984 – can you remember what was happening in February that year?

**Barry Woods takes a trip down memory lane**

# TIME WARP 1985

Don't miss out on the mass of material that's appeared in *Electron User* over the past few months. Bring yourself up to date with this back issue bundle, packed with games, utilities, features and programming tutorials.

Here's what you'll find in the  
June 1989 – November 1989 bundle:

**July 1989 issue:**

**Games:** Jet Bike arcade adventure, educational fun with Ladder Adder, Time bomb arcade fun. **Utilities:** Speedy Reader. **Reviews:** Predator, Stormcycle, Sam 8. **Features:** Jafa Systems interview, Disc error codes documented, 10 Liners, Philosophers Quest and Palace of Magic mapped.

**August 1989 issue:**

**Games:** Rollerball, Bingo. **Reviews:** Alps, Turtle Worlds, White Magic, Play it Again Sam 9. **Features:** Map of Kayleth, Repton Infinity tips. **Utilities:** Disc Housekeeper, Mode 2 screen compacter, Titration, Chemical Equations.

**September 1989 issue:**

**Game:** Snakes. **Reviews:** Keyword, Basic Editor Plus, Ballistix, Sam 10. **Features:** Arcade Corner, Electron history. **Utilities:** Attribute editor, magazine database.

**October 1989 issue:**

**Game:** Spinning frustration, Jet Bike, Robokill. **Reviews:** Rodeo Games, Hi Q Quiz, Spooksville, Rombard. **Features:** Exile solution, Electron carrying case. **Utilities:** Elkpaint, Disc Menu.

**November 1989 issue:**

**Game:** Storker's Run, Shopping Spree, Dollar Dash, Octavia. **Reviews:** Arcade Soccer, White Magic 2, Citizen printer. **Features:** Exile solution, Flowcharts, buyer's guide to printers. **Utilities:** Scroller.

**December 1989 issue:**

**Games:** Wishing Wells. **Reviews:** Ricochet, Play It Again Sam II, System 80, Superior Soccer, Sign Writer, Time Lines. **Features:** Ravenskull solution, American Suds map, Break key protector. **Utilities:** Word square solver, screen faser, calendar maker, extended renumber.

# electron user

## BACK ISSUE BUNDLE

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ever wanted to  
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**TO ORDER PLEASE USE THE FORM ON PAGE 45**

**B**ERTIE BOUNCE is a bright sky blue rubber ball and unfortunately he has become lost. In this vertically scrolling arcade game – a rarity on the Electron – your task is to guide him back home.

The path you take is made up of small blocks, some of which can be rolled over while others must be bounced over as they will destroy Bertie. You may find that rolling on to one type of block makes Bertie stick to the spot, while another makes him bounce high into the air. Some make him appear to be drunk and you lose control of his actions for a few seconds.

The program is written in Basic, but despite this it runs extremely quickly – you won't need your Turbo switched on for this game. In fact, an extra line has been added to slow down the frantic action:

```
320 FOR DELAY=1 TO 200:NEXT
```

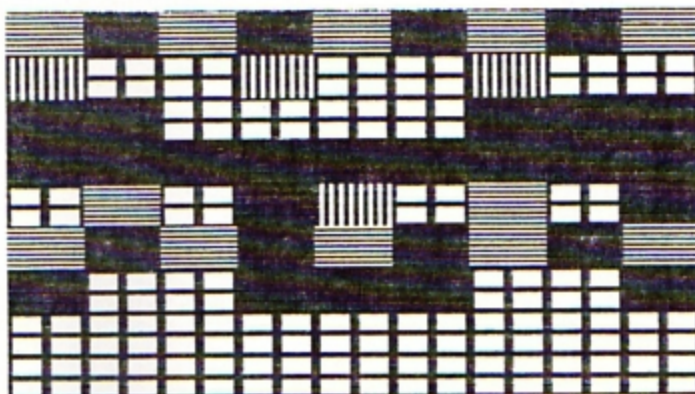
If you still find the game too difficult increase the delay loop to 300 or 400. If it is too easy reduce it to 100 or 50.

#### CONTROLS

Z	Left
X	Right
Space	Bounce

# BOING!

**Nicholas Darwin bounces on to your screen with an unusual arcade game**



```
10 REM Bounce
20 REM By Nicholas Darwin
30 REM (c) Electron User
40 MODE 5
50 VDU 23,1,0;0;0;0;
60 GOSUB 700
70 REV=0
80 VDU 23,240,255,129,129,129,
129,129,129,255
90 GOTO 110
100 VDU 23,240,0,0,252,4,4,228,
36,36
110 VDU 23,224,255,255,255,255,
255,255,255,255
120 VDU 23,225,255,0,255,0,255,
0,255,0
130 VDU 23,226,85,170,85,170,85,
170,85,170
140 VDU 23,227,85,85,85,85,85,85,
5,85,85
150 VDU 23,241,255,129,137,129,
137,129,137,255
160 VDU 23,242,126,188,216,224,
224,216,188,126
170 REM VDU 23,240,0,0,0,0,0,0,
0,0
180 VDU 23,228,0,0,0,24,24,0,0,
0
190 VDU 23,229,0,0,60,126,126,1
26,60,0
200 VDU 23,230,60,126,255,255,2
55,255,126,60
210 PROCstart up
220 VDU 19,1,6;0;
230 FL=1
240 STI=0
250 X=10
260 ZX=0
270 FLA=0
280 E=0:F=0
290 HI=0
300 CO=0
310 ZX=X
320 FOR DELAY=1 TO 200:NEXT
330 IF CO=324 END
340 STI=STI-1
350 IF STI<0 STI=0
360 F=E
370 IF FLA=1 HI=HI+1:IF HI>1 FL
A=2:GOTO 390
380 IF FLA=2 HI=HI-1:IF HI=0 FL
```

```
A=0:SOUND 0,-15,4,1
390 IF REV=1 THEN 430
400 IF INKEY(-98) AND HI=0 X=X-
1:IF X<1 X=1
410 IF INKEY(-67) AND HI=0 X=X+
1:IF X>18 X=18
420 GOTO 450
430 IF INKEY(-67) AND HI=0 X=X-
1:IF X<1 X=1
440 IF INKEY(-98) AND HI=0 X=X+
1:IF X>18 X=18
450 REM
460 IF INKEY(-99) AND HI=0 AND
STI=0 THEN FLA=1
470 E=ASC FNreadcharacter(X,19)
480 IF FL=1 C=LE(1,CO):CO=CO+1:
FL=2 ELSE FL=1
490 COLOUR 2:PRINT TAB(1,0);AS(
C)
500 PRINT TAB(0,0);VDU 11
510 IF CHR$ E=CHR$ 146 GOTO1420
520 IF HI>0 GOTO 580
530 IF CHR$ E=CHR$ 128 GOTO1420
540 IF CHR$ E=CHR$ 129 HI=0:FLA
=1
550 IF CHR$ E=CHR$ 130 STI=35
560 IF CHR$ E=CHR$ 131 AND REV=
1 REV=0:SOUND 1,-15,120,1:GOTO 58
0
570 IF CHR$ E=CHR$ 131 AND REV=
0 REV=1:SOUND 1,-15,120,1
580 REM
590 COLOUR2:PRINT TAB(ZX,21);CH
R$ F:COLOUR1:PRINT TAB(X,20);CHR$
(228+HI)
600 VDU4
610 GOTO 310
620 REM *****
630 DEF FNreadcharacter(cX,rX)
640 XI=POS:YI=VPOS
650 VDU 31,cX,rX
660 AX=135
670 CX=(USR(&FFF4) AND &FFF0) D
IV 8100
680 VDU 31,cX,rX
690 =CHR$CX
700 MS=CHR$ 224+CHR$ 224:MS=CHR
$ 225+CHR$ 225:OS=CHR$ 226+CHR$ 2
26:PS=CHR$ 227+CHR$ 227:QS=CHR$ 2
40+CHR$ 240:RS=CHR$ 242+CHR$ 242
710 DIM AS(25),LE(1,330)
```

```
720 AS(1)=QS+QS+MS+MS+MS+MS+
QS+QS
730 AS(2)=MS+MS+MS+MS+MS+MS+
MS+MS
740 AS(3)=MS+MS+MS+QS+QS+QS+QS+
MS+MS
750 AS(12)=QS+QS+QS+OS+QS+QS+OS
+QS+QS
760 AS(4)=MS+MS+MS+MS+MS+MS+
MS+MS
770 AS(5)=QS+QS+PS+QS+QS+PS+QS+
QS+PS
780 AS(6)=MS+QS+MS+QS+PS+MS+QS+
MS+QS
790 AS(7)=QS+QS+QS+QS+MS+QS+QS+
QS+QS
800 AS(8)=MS+QS+QS+MS+MS+MS+QS+
QS+MS
810 AS(9)=QS+QS+QS+QS+QS+QS+QS+
QS+QS
820 AS(10)=QS+QS+QS+QS+MS+MS+MS
+MS+MS
830 AS(11)=MS+MS+MS+MS+MS+QS+QS
+QS+QS
840 AS(13)=MS+MS+MS+MS+MS+MS+
MS+MS
850 AS(14)=MS+MS+MS+MS+QS+MS+MS
+MS+MS
860 AS(15)=OS+OS+OS+OS+OS+OS+OS
+OS+OS
870 AS(16)=QS+QS+QS+MS+QS+QS+OS
+QS+QS
880 AS(17)=QS+QS+QS+RS+RS+RS+RS
+RS+RS
890 AS(18)=RS+RS+RS+RS+RS+RS+QS
+QS+QS
900 AS(19)=QS+QS+QS+RS+RS+RS+QS
+QS+QS
910 AS(20)=RS+RS+RS+QS+QS+QS+RS
+RS+RS
920 AS(21)=RS+QS+RS+QS+RS+QS+RS
+QS+RS
930 AS(22)=QS+RS+QS+RS+QS+RS+QS
+RS+QS
940 AS(23)=MS+MS+MS+MS+QS+MS+MS
+MS+MS
950 AS(24)=CHR$240+CHR$240+CHR$
240+""FINISH""+CHR$240+CHR$24
0+CHR$240
```

```

960 FOR A=1 TO 330
970 READ LE(1,A)
980 NEXT
990 DATA 1,9,1,9,9,2,5,3,4,6,2,
8,9,9,9,9,10,9,9,9,11,9,4,12,1,9,
9,9,3,3,4,6,13,14,9,9,13,14,9,9,3
,3,3,9,9,1,1,8,9,9,9,1,1,12,15,15
,9,9,1,1,15,9,9,3,3,9,9,9
1000 DATA 16,4,9,9,12,12,11,11,9
,9,9,10,10,9,9,9,1,1,4,9,9,4,9,9,
4,9,9,5,6,7,4,9,9,6,5,9,3,2,1
1010 DATA 9,9,8,1,8,1,1,8,8,10,9
,9,11,9,9,5,9,6,1,9,9,10,9,9,8,8,
10,10,9,9,4,1,9,9,9,4,9,4,9,9,11,
11,9,9,9,10,10,4
1020 DATA 9,9,20,9,9,9,19,9,9,4,
9,9,18,9,9,9,17,9,9,15,9,9,4,7,
8,9,9,10,19,6,9,4,5,9,9
1030 DATA 1,9,2,9,9,3,9,9,12,5,8
,9,9,20,4,22,9,21,9,22,9,21,9,4,9
,9,4,9,4,9,11,9,9,9,22,9,22,9,21,
9,22,9,21,9,21,9,22,9,22,9,22,9,2
1,9,22,9,21,9,22,9,9,4,9,4,9,9,4,
9,9,9,9,9,2,22
1040 DATA 15,15,9,9,9,9,9,9,23,9
,9,9,19,3,9,22,9,9,21,16,9,9,4,1,
12,9,5,9,8,11
1050 DATA 9,9,9,9,9,9,9,9,9,9,9,
9,9,9,9,9,9,9,9,24,9,9,9,9,9,9,9,
9,9,9,9,9,9,9,9
1060 RETURN
1070 DEF PROCstart up
1080 COLOUR 3
1090 CLS
1100 GCOL 0,1
1110 X=500:Y=500:R=200
1120 MOVEX,Y+R
1130 FOR I=0 TO 2*PI STEP PI/10
1140 DRAW X+R*SINI,Y+R*COSI
1150 NEXT
1160 FOR A=1 TO 19
1170 PRINT TAB(A,1);CHR$225
1180 PRINT TAB(A,29);CHR$225

```

```

1190 NEXT
1200 FOR A=1 TO 29
1210 PRINT TAB(1,A);CHR$227
1220 PRINT TAB(19,A);CHR$227
1230 NEXT
1240 PRINT TAB(6,14);CHR$229+CHR
$32+CHR$229
1250 MOVE 450,450
1260 DRAW 550,450
1270 DRAW 520,420
1280 DRAW480,420
1290 DRAW450,450
1300 GCOL 0,2
1310 PRINT TAB(2,28);"I-Inst. S-
start"
1320 MOVE 280,900:DRAW 280,800:D
RAW 320,850:DRAW 280,900:DRAW 280
,850:DRAW 320,850
1330 MOVE 380,900:DRAW 350,850:D
RAW 380,800:DRAW 410,850:DRAW 380
,900
1340 MOVE 440,900:DRAW 440,800:M
OVE 470,800:DRAW 470,900:DRAW 510
,800:DRAW510,900
1350 MOVE 560,900:DRAW 540,850:D
RAW560,800:DRAW 580,850:DRAW 570,
850:DRAW590,850
1360 SOUND 1,-15,120,3:SOUND 1,-
15,110,3:SOUND 1,-15,120,3:SOUND
1,-15,110,3
1370 SOUND 1,-15,120,3:SOUND 1,-
15,110,3:SOUND 1,-15,120,3
1380 SOUND 1,-15,60,3:SOUND 1,-1
5,50,3:SOUND 1,-15,60,3:SOUND 1,-
15,50,3:SOUND 1,-15,60,3
1390 SOUND 1,-15,50,3:SOUND 1,-1
5,60,3:SOUND 1,-15,50,3:SOUND 1,-
15,60,3:SOUND 1,-15,60,3:SOUND 1,
-15,70,3:SOUND 1,-15,60,3:SOUND 1
,-15,65,3
1400 K$=INKEY$:IF K$="I" PROCin
struct:GOTO1070
1410 IF K$="S" CLS:ENDPROC ELSE
GOTO 1400

```

```

1420 CLS
1430 TT=(C0/324)*100
1440 PRINT TAB(4,8);"Oh dear!"
1450 PRINT TAB(2,12);"Completed
";INT(TT);"%"
1460 IF TT<30 COLOUR1:PRINT TAB(
4,18);"RUBBISH!!" ELSE IF TT<60 C
OLOUR 2:PRINT TAB(4,18);"PUNY!!"
ELSE IF TT<80 COLOUR3:PRINT TAB(4
,18);"OKAY" ELSE IF TT<100 COLOUR
1:PRINT TAB(4,18);"NOT BAD!"
1470 SOUND 1,-15,60,2
1480 SOUND 1,-15,64,4
1490 FOR T=60 TO 40 STEP -5
1500 SOUND 1,-15,T,3
1510 NEXT
1520 FOR G=1 TO 2000:NEXT
1530 GOTO 70
1540 DEF PROCinstruct
1550 VDU22,4:PRINTTAB(10,2);"INS
TRUCTIONS"
1560 PRINT TAB(0,5)"You control
Bertie Bounce, the little":PRINT:
PRINT"blue ball. He decided to ta
ke a short":PRINT:PRINT"cut home
through concrete city, but"
1570 PRINT:PRINT"unfortunately,
he forgot it was a":PRINT:PRINT"d
angerous place"
1580 PRINT:PRINT"Can you get him
home?":PRINT:PRINT"I doubt it!"
1590 GO=GET:VDU22,5:PRINT
1600 PRINT "Special blocks...":P
RINT"CHR$224;" needs to be jumped
":PRINT"CHR$225;" makes you jump"
:PRINT"CHR$226;" makes you sticky
":PRINT"CHR$227;" makes you drunk
!":PRINT"CHR$242;" is unjumpable"
1610 PRINT:PRINT"Z=Left X=Right
"
1620 PRINT"Space=Jump":PRINT:PRI
NT"By N.Darwin"
1630 GO=GET:CLS
1640 ENDPROC

```

electron  
user

**MAIL ORDER OFFERS**

electron  
user

**MAIL ORDER OFFERS**

# Save on batteries!

For your personal stereo, radio or TV

You know how expensive it is to replace your batteries when they run down. Even with rechargeable batteries you still have to wait 14 hours for a full charge.

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*It will pay for itself within weeks*



**TO ORDER PLEASE USE THE FORM ON PAGE 45**



# The mains way to communicate

**Grahame Cohen is a real live wire using the Verran AC Datalink**

**C**OMMUNICATING through the mains is nothing new. For a number of years now intercoms have been available which plug into ordinary three pin wall sockets using the AC ring main to transmit information. However, this was only possible because the signal was clear enough for us humans to understand, even if a little interference was encountered.

Computers require more accuracy and the ring main is hardly an ideal environment, although convenient, to send data as it is prone to voltage spikes, surges, fluctuations and interference.

The Verran AC Datalink has been designed to cope with all these problems by transmitting packets of information using frequency modulation (FM) which is bandwidth efficient and resistant to noise. This, combined with error detection of each packet of data, prevents almost 100 per cent of all errors.

The AC Datalink cuts out the need for extensive cabling. It can transmit and receive either parallel Centronics or serial RS232 standards, which means it is compatible with nearly all computers and can be used for shared connection to printers, plotters, modems or other computers with appropriate communications software.

The Datalink is solidly constructed in black plastic, with 11 LEDs vertically aligned on the semi-circular front. Lifting a flap at the rear of the unit reveals a power socket, a thoughtful inclusion to reduce the need for mains adaptors. Below the socket are two rows of DIP switches to configure the unit to suit most peripherals.

Two cables of generous length run from the back of the unit, one plugs into a wall socket for power and data transmission, the other has a male RS232 connector. Also supplied are three adaptors – an RS232 gender changer, Datalink to Centronics and Datalink to parallel port. These connect to the male RS232 lead and between them will allow connection to most peripherals and computers. The unit itself is fairly small in size and will sit neatly on the floor or by the side of the peripheral.

Each Datalink is individually boxed with its own well written and concise manual. You do, of course, need two – one unit must connect to the computer and the other to the peripheral. As you increase the number of Datalinks on a single ring main a fall off in performance is experienced. Verran recommends up to five pairs per ring main.

In practice it is possible to have many more, as a fall off in performance only occurs when all five are transmitting at the same time, which is unlikely, especially if you are sharing less than five peripherals.

For instance, 10 Electrons can share two printers. In this situation each would be given a separate address by use of the DIP switches. In order to send data to a printer you select its address on the Datalink

attached to the computer. This means that switching from one peripheral to another involves fiddling with DIP switches, tedious if you often swap over.

Another problem is that of queueing. If two computer operators decide to send data to the printer at the same time, all the data will arrive simultaneously and the machine will consequently print garbage. You must check that the printer is not in use before printing. The more machines connected in the network the more confusing this can become.

Setting up the Verran Datalink is quick and easy – it took me under 15 minutes. First I moved my printer to another room and attached a Datalink to both Electron and printer, configured the DIP switches and then sent a screen dump across via ring main.

It was exciting hearing the printer jump into action as I remotely controlled it. The screen dump was perfect – the Datalink certainly works well. Information is transmitted at about 800 characters per second (16000 baud). That's roughly an A4 page every three seconds – certainly fast enough for any printer.

If Datalink is used in an office where confidential information may be transmitted it would be easy for unauthorised persons to tap into it with a similar Datalink. To prevent this you can set a security code of up to four million combinations using the DIP switches.

Another very useful Datalink function is that of standards conversion. If, for instance, you had a serial printer and you wanted to control it from your Centronics port, no problem.

Simply configure the Datalink on the printer end to transmit to the printer in serial standard. This has great advantages, as it ensures compatibility between almost any pair of machines you have or are likely to acquire.

For ad-hoc cabling the Datalink certainly captures the market. Just imagine how much easier it makes exhibitions and demonstrations. No need for expensive temporary cabling and it is also much more flexible, giving you the ability to change a display without rewiring. When the exhibition is over simply unplug and go.

Datalink has been primarily designed for office and business use. Despite its high price of £201.25 I am sure some will find their way into homes and schools, especially if there is little space or more than one computer, or if a wife banishes a noisy printer to the cupboard under the stairs.

The AC Datalink cannot replace traditional cabling, particularly when it involves a large number of permanent machines, but if you require to set up a network quickly, or if office moves are expected, it would no doubt be a cost effective and convenient solution.

**Product: AC Datalink**

**Price: £201.25**

**Supplier: Verran Electronics, Cedarwood, Chineham Business Park, Basingstoke, Hampshire RG24 0WD.**

**Tel: 0256 816555**

**T**HE snow is falling heavily on the castle battlements and the cave is freezing once again – who cracked that joke about global warming? I sit here contented under the ghost of Merlin, and enter the fourth year of writing these epistles to you. The quill may be worn, but my heart is strong and my Electron sturdy. What a year this promises to be.

Now is the time to work hard at solving those adventures that for so many moons have gathered dust on my cobwebbed shelves. Among the rogues that I have neglected – either through overwork or complexity of the animal – are **Red Moon**, **Quondam**, **The Seventh Star**, **Island of Xaan** and **Gateway to Karos**.

You will no doubt immediately notice three Acornsoft titles there. Thanks to a massive reader response to my plea last month, I am now making enormous headway through **Gateway to Karos** and hope to have a solution for you very soon.

In the meantime a few timely tips might help other wayfarers who may be stuck in this glorious adventure. To read the ancient book, ensure you are wearing the iron circlet. Get the axe from the woodcutter's hut to cleave a way through the undergrowth.

Put the plank across the pit in the passage to journey further, but also ensure that you have broken the big jar with the hammer. Remove your armour to lighten your load if the ladder keeps breaking when you climb it in the cave. To avoid being shipwrecked sail parallel to the coast and look carefully at each location.

**Quondam** is a very different beast and I am fast revising my opinion that **Ferryman Awaits** is the most difficult adventure on the Electron. Has anyone finished **Quondam**?

It is a standard treasure collecting affair set in a magical medieval land. But the adventure is full of traps and very complex, apparently illogical puzzles.

Despite the fact that the game is driving me to distraction it is an excellent jaunt and will keep any quester glued to his Electron for hours. It therefore puzzles me that as part of Topologika's wholesale recoding of old Acornsoft adventures, they have not chosen to re-release this one.

Now is also the time to enjoy the more

# Adventures

## By Pendragon

recent offerings, and I have had a most pleasant month wandering through Topologika's **Avon** and **Murdac**, battling against Captain Lizard in **Blood of the Mutineers** and trying to solve the **Mathews Murders**. All are firmly in the top flight of Electron adventures and if you are looking for a new quest you won't go far wrong with any of them.

I am most impressed with Avon and must congratulate Topologika for breathing new life into the Electron, by not only releasing all the Acornsoft conversions but also by writing brilliant new adventures like **Avon** and **Murdac** for our machine.

When you consider that you have the

choice of the entire Robico, Topologika, Acornsoft and Epic stables, the adventuring world really is an Electron user's oyster. If you happen to have a Slogger Master Ram board fitted to your Electron, the number of BBC Micro adventures you can play becomes enormous.

Staying with the Acornsoft theme, this month's featured map is of the opening scenario to **Kingdom of Hamil**. This should relieve adventurers who may still be stuck at the outset of this real teaser of a game.

Next month I continue this popular series with a guide to the openings to Kansas City's **Ring of Time**. That's it for now, so until the Reaper calls again, happy adventuring.

## Dusting off the cobwebs



### Readers Hall of Fame

**Acheton** Bob Purder

Continuing from Star-room 1, drop everything, take the lamp and turn it off, SAY ZOOG and turn it on again. Return to the slab, take the paint, bottle and pot. Now go to the niny room, take the niny and rod. Go to REMBR, turn the lamp off, take the paint, SAY ZOOG, drop the paint and turn the lamp on again.

Now comes a comical, but difficult part of the game. Go to the cliff and drink the gin, then jump, jump again and go out into the desert – it was dry gin you see.

Drop the rod and pot, and go to the oasis.

Once there, climb the tree, jump, collect the skull and take everything. Now return, collecting the perfume and vial and using the barrel to transport the water.

Take the rod and pot back to the slab room, drop both and fill the bottle. Now journey to Star-room 2 and drop the perfume, vial and rug, then turn the lamp off, SAY ZOOG and turn it on again.

Go back to the slab, take the matches, keys and pillow and get ready for a bit of travelling. Go West, West, West, North, East, Down, take the wine and go UP.

Travel West, West and take the clock. Go Up, North-West, drop the wine, then continue North-West, West, enter the maze, take the horn and leave. Go North, turn the

lamp off, go South-West then drop the pillow and clock. Continue East, East, North, East and water the plant.

Go South, West and In, take the herbs and go Out. Venture West, West, South, South, East, West, South, West and take what you find there.

Now journey East, North, East, North, light the match then light the maze, drop the match, go South, South, take what you find and return North, North, North, North, North. Turn the lamp on and go South, South-East then turn the lamp off.

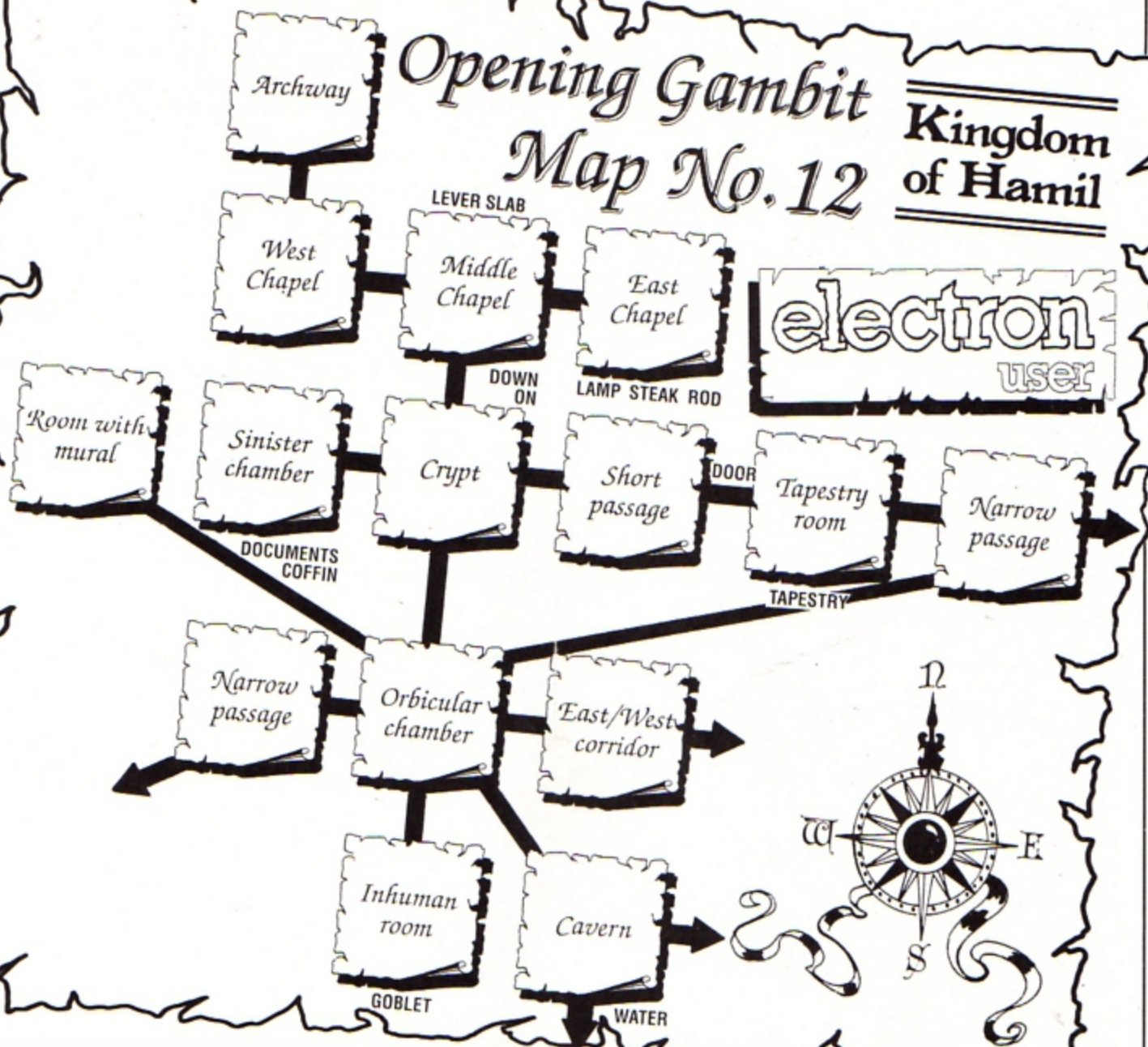
Drop the fleece, turban, spice and horn. Turn the lamp off once more, SAY ZOOG and finally turn the lamp on again.

(Continued next month)

# Opening Gambit Map No. 12

Kingdom  
of Hamil

electron  
user



## Problems Solved

### The Axe of Kolt Harry Bastien

Begin by going Down, Down, South, South, South-West and South to the lampmaker. There you should talk, buy the lamp, examine it and talk some more, buy the tinderbox and talk again.

Now go South, Wait, Wait, talk, buy the oil and go South to the furrier. Talk, buy the fur and journey North and West to the armourer where you should talk and try to buy the axe.

Travel East and East to the beggar, talk to him and give him a coin. Now for a bit of walking: Go West, North, North, North, North-East, North, North, Up, East, East, North-East, wear the coat, Up and light the lamp.

Go Up again and East then East. Now enter the snow, go Up and RUN EAST. Enter the cave, sleep then upon awakening go Out. Now travel Down, Down and South to the Horse Dragoons. Remembering the clue

the beggar gave you, SAY FOREST, and go East, East, East, South and South to the ferryman.

Talk to him before going North, North, West and South to the sawmill. Talk then journey North, East and North to the blacksmith. Talk and give him the rod, then go South, South and In.

Talk to the Innkeeper and try to buy some ale before leaving. Now travel North and East to the old lady. Talk to her before you venture West, West, West and North to the farmer.

Once again engage in conversation and SAY SIEVE. Now go South, West, West, North-West, West, West, West and West to the armourer. Talk and buy the axe with which you can now chop logs. Go East, East, East, East, South-East, East, East, North and CHOP LOGS.

Get the sieve, go South, East, East and East to SIEVE SOIL. Then get the key and GIVE KEY, go West, South and In and buy

some ale. Now leave the Inn and travel North, North to the blacksmith and give him the ale and the rod.

Go South, West and South to the sawyer and GIVE ROD. SAY FERRY, get the planks and journey North, East, South and South to the ferryman.

GIVE PLANKS and return North, North and North to the blacksmith's apprentice. Talk to him and SAY NAILS before indulging on a bit more travelling: South, West, West, West, West, North-West, West, West, West and South to the toolmaker.

Talk and buy the hammer, then return North, East, East, East, South-East, East, East, East, East, South and South to the ferryman. GIVE HAMMER, GIVE NAILS and BOARD FERRY.

Thus ends part one of this adventure. The code for entry to part two is: CLTH LGCH.

(To be continued)

# Adventures

By Pendragon

## A guide to Electron text adventures

Part two of the serialisation of my much requested database of Electron text adventures. The following legend will help you understand some of the symbols I have used:

The Druids Circle  
Mission XP2  
Tomb of Death  
Pony Express  
Fire Island  
(Released in a limited number,  
and now very rare)

Hollsoft, 79 Hinde House Lane,  
Sheffield S4 8GZ

The Adventure Creator (utility)  
The Ket Trilogy

Incentive Software, 54 London  
Street, Reading RG1 4SQ  
Tel: 0734 591678

Ring of Time  
The Five Spheres BBC  
Magic Adventure BBC G  
Dracula Island  
Revenge of Zor  
The Ferryman Awaits  
(All six of these adventures are  
now very difficult to find)

Kansas City Systems, Unit 3,  
Sutton Springs Wood,  
Chesterfield S44 5XF  
Tel: 0246 850357

Plane Crash  
Quest for the Pendragon

Labyrinth Software, 22 Nelson  
Street, Retford,  
Nottinghamshire DN22 6LP  
Tel: 0777 701669

The Rising of Salandra (two  
adventures)  
Wychwood  
The Nine Dancers  
The Puppet Man  
Hex

Larsoft  
(Larsoft has ceased trading,  
and these adventures can only  
be obtained from third party  
distributors)

In Search of Atahaulpa  
Annabel Gray

Lee Software, 35 Osprey  
Gardens, Worle, Weston-  
super-Mare, Avon BS22 8UN

Colossal Adventure BBC A  
Dungeon Adventure BBC A  
Adventure Quest BBC A  
Snowball BBC A  
Return to Eden BBC A  
The Worm in Paradise BBC A  
Lords of Time BBC A  
Emerald Isle BBC AG  
Red Moon BBC A  
The Price of Magic BBC A  
Lancelot BBC AG @  
Knight Orc BBC AG @  
Gnome Ranger BBC AG @  
Ingrid's Back BBC AG @  
Scapeghost BBC AG @

Level 9 Computing, PO Box 39,  
Weston-super-Mare, Avon  
BS24 9UR  
Tel: 0934 814450  
(Most Level 9 adventures will  
run on expanded 64k Electrons,  
though some may need a bit of  
coaxing - indicated by the @  
symbol)

Stolen Lamp  
Special Operations G  
(These adventures are now  
available through Argus  
Publishing)

MC Lothlorien, 56a Park Lane,  
Poynton, Cheshire SK12 1RE  
Tel: 0625 876642

BBC Released for the BBC Micro  
but will run on an Electron if  
fitted with Slogger's Master  
Ram board

D Disc only adventures  
G Graphics available  
A For advanced adventurers  
only

Village of Lost Souls  
Locks of Luck  
What's Eeyore's?

BBC

Magus  
(Magus has ceased trading,  
but Village of Lost Souls has  
been recoded by Robico)

The Hobbit  
Lord of the Rings  
Hampstead  
Denis Through the Drinking  
Glass  
Terrormolinos  
Dodgy Geezers  
Classic Adventure

BBC

Melbourne House, 2-4 Vernon  
Yard, Portobello Road, London  
W11 2DX  
Tel: 01-727 8070

Labyrinth of La Coshe  
Adventure  
Wizard's Challenge  
Eldorado Gold  
(All these adventures are like  
gold dust and very difficult to  
come by)

Micro Power, Northwood  
House, North Street, Leeds  
LS7 2AA  
Tel: 0532 458800

The Pen and the Dark  
The Saga of  
Eric the Viking  
Secret Diary of  
Adrian Mole  
Growing Pains of  
Adrian Mole  
The Archers

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Sadim Castle  
Valley of the Kings  
Blue Dragon  
Survivor  
Woodland Terror

MP Software  
(MP Software has ceased trad-  
ing and these adventures are  
only available through third  
party distributors)

The Banished Prince

Orbit Software, 7 Brookside  
Avenue, Stockton Heath,  
Warrington WA4 2XG  
Tel: 0925 66741

The Staff of Law  
Galadriel in Distress  
Super Agent Flint  
Return of Flint  
Flint Strikes Back  
Twin Orbs of Aalinor  
Inner Space  
Hexagram of Trutania Valley  
Stranded on Iloofrax  
Philosopher's Stone  
Grounded  
Adventure of the Stone

Potter Programs, 7 Warren  
Close, Sandhurst, Camberley  
GU17 8JR  
Tel: 0252 877608

Continued next month

# Just having a ball

**Neil Davidson reveals how he came to write the latest arcade game released by Superior**

**R**ICOCHET is about a little red bouncy ball's quest to save the world from yet another evil dictator, who has stolen the five hourglasses of time. You have to retrieve them and teleport safely out of each level.

The game's origins can be traced back to the last few months of 1985 when Roland Waddilove's articles on machine code graphics were first published in *Electron User*.

At the time, I knew next to nothing about machine code, so although I could draw pretty pictures, I couldn't manipulate them. To rectify this omission I bought a book on machine code and avidly read it from cover to cover and wrote little programs until I was reasonably fluent in it.

My interest in writing a commercial game was rekindled in late 1988 by a series of articles on the same subject in *Electron User*, again by Roland Waddilove. This time, however, I had the means to put some of my ideas into practice.

I approached David Williams, and asked him if he would be interested in attempting to write a 100 per cent machine code game. He agreed and so we started.

I began writing the game in May 1988, and started in what I now recognise to be completely the wrong way. Instead of sitting down and planning out the game on paper,

like any normal, sane, person would do, I decided to rush in headlong and write the code without really thinking about it.

I wrote it backwards, starting with little unconnected bits of code which I thought might be useful, and racked my brain to think of some adequate way to link them up.

One consequence of this method was that I often stumbled across inefficient, and even redundant, pieces of code which I duly deleted and rewrote. Perhaps the most obvious example of this is the graphics – we originally started with about twice as many characters as we have now, and I rewrote some of the relevant code up to four times.

The game took a long time to write – about a year and a half, on and off – and I sometimes uncovered code which I was sure had some deep and meaningful relevance, but couldn't be exactly sure what it was.

One of the most persistent bugs turned out to be in a piece of the code which I had completely forgotten about a year previously. It can be very frustrating to look through pages of code for a missing colon,

or a SEC instead of a CLC.

In retrospect, I would advise potential authors to plan out their games, especially the memory needed for the sprites and code. You don't want to be in the position I was, scouring the code for places where a byte or two could be saved – yes, it really was that bad.

You should, of course, make frequent backups of the code. I found it annoying when I frequently deleted several day's work by mistake, but it could have been worse.

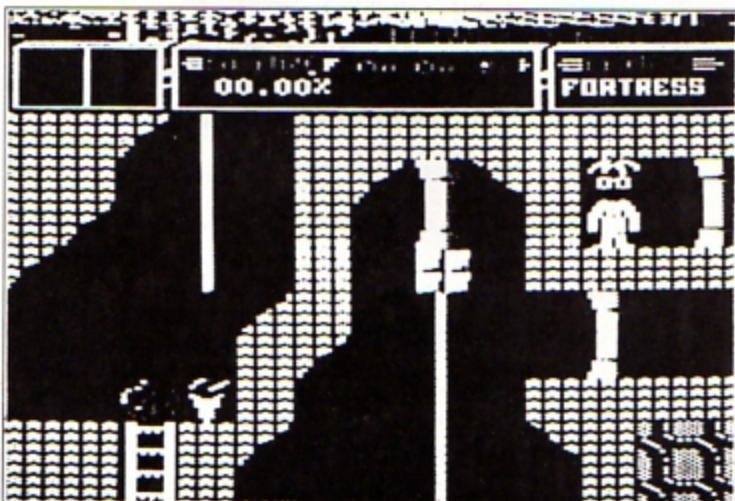
The graphics in the game came from David Williams, Nick Weston and Guy Burt. I was lucky that I could afford not to worry too much about this aspect myself.

There are five levels, each one harder than the last. There are over 330 different screens in all. The first level, entitled Fortress, is intended to be the easiest of the five, although some people might disagree.

In it you meet some of the puzzles you will need to solve. How will you manage to bribe the robber in his cute little striped shirt? What is lurking inside the wicker laundry basket, and how will you entice it out? What part does the strange alchemist in his white lab coat play in all this?

As you progress you will find, I hope, that the puzzles become slightly more sophisticated. How to make the slug disappear on level two? Find the best way to navigate to the infuriating cargo hold on the UFO.

Even if I haven't managed to persuade you that I think the game is well worth buying – after all, I am very slightly biased – I hope you will have a go at writing your own game. To coin a cliché, you'll never know until you've tried.



*Ricochet is the result of 18 months' work*

# Here's how you can get the very best out of your Electron

Within the pages of these three books you'll find ALL the information you need to fully harness the power of your Electron. They cover Basic, machine-code programming and the operating system, and between them they also show how to combine all three to create more powerful and effective programs.

For the give away price of just £7.95 for the three, these books represent exceptional value and are a must for any serious Electron user.

## Electron Advanced User Guide

This detailed guide to the Electron's operating system is packed full of invaluable information. It shows you how to:

- Implement the powerful \*FX/OSBYTE calls
  - Write your own paged roms
  - Program the ULA
  - Make every byte count where program space is tight
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- ...and much, much more.

This essential handbook will help you to exploit the full potential of your Electron. And for just £2.95, saving £6.50 off the recommended price, can you afford not to miss this offer?

## Electron Assembly Language

The Electron Assembly Language reference guide will help you get to grips with machine code in next to no time. Whether you're a beginner or are already fairly proficient, there is something for you in this book.

It has over 200 pages packed with hints, tips and example programs on subjects ranging from basic hex, binary and decimal number theory and logical operators, through addressing modes, stacks and loops, to subroutines, jumps and calls.

Every aspect of machine-code programming is covered in this book in a friendly, readable style, and there's also a comprehensive index. If you want to get more out of your micro, but thought machine code was indecipherable, this is the book for you. *Save £3 off the recommended retail price.*

## Getting started in BBC Basic on the BBC Micro & Electron

This is the ultimate guide available on BBC Basic. Written by a leading expert on the language, it will lead you through each Basic function in a simple, easy-to-follow style.

Whether you are a beginner or more advanced, there are examples of commonly-needed routines and neat tricks you can use to make Basic jump through hoops.

By working through its many examples you will gain a clear insight into structured programming and will quickly acquire the ability to use structured techniques in creating your own programs. *Save £3 off the recommended retail price.*

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# Chart it in 3D

**Enliven all those statistical presentations with Jon Willington's graphics utility**

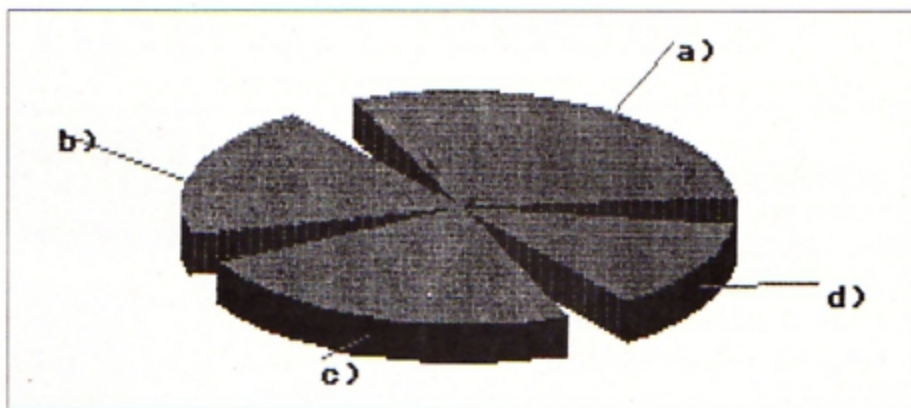
**P**IE Chartist is a clever graphics utility program occupying about 2.5k of ram. The user inputs data which is then displayed graphically in the form of a three dimensional pie chart.

The routine incorporates full labelling of the chart and the four colours of Mode 1 are used to give a clear and visually attractive result. The program would prove almost impossible to transfer to any other micro, as it relies heavily on the powerful graphics commands of Electron Basic.

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

## PROGRAM CONSTRUCTION

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



The 3D pie chart is drawn in four-colour Mode 1

```

10 REM *** PIE-CHARTIST ***
20 REM * Jon Willington **
25 REM *(C) ELECTRON USER *
30 MODE1
40 XZ=640:YZ=512:JX=400:KX=150
50 VDU19,3,4;0;19,1,6;0;
60 V=0:DZ=-50
70 AS="PIE-CHARTIST":PROctitle
80 PROCinput
90 REM* Calculate angles of sectors*
100 T=48-2*N:R=T/V
110 FOR B=1 TO N:Q(B)=Q(B)*R
120 Q(B)=INTQ(B)-(Q(B)-INTQ(B)>.5)
130 NEXT:F=1
140 FOR B=1 TO N
150 HX(B,1)=F:HX(B,2)=HX(B,1)+Q(B)
160 F=HX(B,2)+2:NEXT
170 P=(HX(N,2)+1)/(2*PI)
180 GCOL11,129
190 REM *** Draw sides of sectors ***
200 VDU23,1,0;0;0;0;
210 FOR AX=1 TO N
220 M=HX(AX,1)/P
230 MOVE XZ,YZ:MOVEXX,YZ+DX
240 IF COSM>0 PLOT87,JX*COX(M)+XZ,KX*SIN(M)+YZ:PLOT83,0,DX
250 MOVE XZ,YZ:MOVEXX,YZ+DX
260 M=HX(AX,2)/P
270 IF COSM<0 PLOT87,JX*COX(M)+XZ,KX*SIN(M)+YZ:PLOT83,0,DX
280 NEXT:GCOL0,1
290 REM *** Draw top of pie ***
300 VDU 23,1,0;0;0;0;
310 FOR AX=1 TO N
320 M=(HX(AX,1)/P)
330 MOVEJX*COX(M)+XZ,KX*SIN(M)+YZ
340 FOR FX=HX(AX,1) TO HX(AX,2)
350 MOVEXX,YZ
360 PLOT85,JX*COX(FX/P)+XZ,KX*SIN(FX/P)+YZ
370 NEXT:NEXT:GCOL0,3
380 REM *** Draw outside of pie ***
390 FOR AX=1 TO N
400 FOR FX=HX(AX,1) TO HX(AX,2)
410 M=FX/P:V=(FX+1)/P
420 IF SINM>0 THEN 440
430 MOVEJX*COX(M)+XZ,KX*SIN(M)+YZ:PLOT0,0,DX:PLOT85,JX*COX(V)+XZ,KX*SIN(V)+YZ:PLOT81,0,DX
440 NEXT:NEXT
450 REM *** Label sectors ***
460 FOR M=1 TO N
470 V=(HX(M,2)-HX(M,1))/2:V=V+H
X(M,1)=V/V/P
480 GCOL0,1:VDUS
490 MOVE400*COX(V)+XZ,150*SIN(V)+490
500 DRAW600*COX(V)+XZ,225*SIN(V)+530
510 MOVE610*COX(V)+XZ,233*SIN(V)+530
520 GCOL0,2:PRINTCHR$(96+M);CHR$(41):GCOL0,3
530 NEXT
540 REPEAT UNTIL FALSE
550 END
560 DEFPROCinput
570 VDU4:COLOUR128:COLOUR1
580 VDU23,1,0;0;0;0;
590 INPUTTAB(2,8)"TITLE OF CHART",AS
600 INPUT TAB(2,10)"NUMBER OF SECTORS (MAX: 10)"N
610 IF N<1 OR N>10 THEN VDU7:CLS:GOTO600
620 DIM Q(N),HX(N,2)
630 PRINT"NOW COMPLETE THIS TABLE"
640 W=INKEY(150)
650 VDU12,17,2,17,131
660 PRINT"" NAME OF ENTRY";SPC9;"VALUE";SPC10
670 GCOL0,1
680 MOVE0,928:PLOT1,0,-36-(N*32)
690 PLOT1,1279,0:DRAW1279,928
700 GCOL3,1:MOVE640,928
710 PLOT1,0,-36-(N*32):COLOUR128:COLOUR 2
720 FOR A=1 TO N
730 PRINTTAB(1,3+A)CHR$(96+A);CHR$41
740 INPUTTAB(5,3+A)DYS
750 INPUTTAB(25,3+A)Q(A)
760 V=V+Q(A)
770 NEXT
780 FOR G=1 TO (31-VPOS)
790 VDU31,0,0,11
800 VDU23,1,0;0;0;0;
810 DELAY=INKEY5
820 NEXT
830 PROctitle
840 VDU29,0;(N*32)/2;
850 ENDPROC
860 DEFPROCtitle
870 COLOUR131:PRINTTAB(0,0)STRINGS(80,CHR$32)
880 VDU5:CV=640-(LENAS*16)
890GCOL0,0:MOVECV,1015:PRINTAS:MOVECV+4,1011:PRINTAS:GCOL0,2:MOVECV+8,1007:PRINTAS
900 VDU 4
910 ENDPROC

```

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EU1

**G**RAFIX is a pair of utilities which enable complex graphics programs written in ordinary Basic to be converted into machine code. It can be looked upon as a primitive form of Basic compiler and could be used for, say, converting loading or menu screens written in Basic into machine code.

First run Coder to assemble some machine code routines in memory. Now load the graphics program and insert a \*ON at the start and a \*OFF at the end like:

```
10 *ON
20 MODE 2
30 FOR I=1 TO 25
40 GCOL 0,RND(8)-1
50 PLOT 85,RND(1280),RND(1024)
60 NEXT
70 *OFF
```

Run the program as normal and while it is drawing a special data file of VDU codes will be automatically saved. Load and run Linker when it has finished. This will take the data file and tag some machine code on to it and save the resultant program to tape or disc.

This final graphics program can be used in several ways. You can \*RUN it, or you can \*LOAD and then call its starting address or

#### \* VDU Linker \*

Where do you wish to store the program?

Address: &900

Data's filename: DATA

Program name: PIC1

*Linking the VDU data file and machine code execution routine*

you can call it from within a machine code program using a simple JSR.

Coder is responsible for creating a block of data which increases in size as each graphic command is executed. The data is then saved with a filename supplied by you. This coding of the program is achieved by intercepting the oswrch operating system routine at &FFEE, and copying the accumulator contents – the VDU code – to a specified memory location, called *location%* in the listing. It then increments *location%* so that the next intercepted VDU code is stored one byte further on.

The first two bytes of this block contain a counter which is updated as the coding continues. This is later used by a machine code execution routine to detect the end of the graphic data.

In fact the data is stored at the end of the Basic graphics program. First though, you need to decide how much space to allocate for variables used by the program. This space is allocated in single page (256 bytes) chunks and typing Return at the prompt selects the default value of one page.

Linker supplies the machine code execution routine and is responsible for splicing it with the data file. It asks first of all for the address the program is to be run from, which can anywhere in the available ram. Then it asks for the datablock's filename and for a filename to assign to the resultant program.

With the aid of these two utilities you can write fast machine code graphics programs with ease.

Try it out and amaze your friends

# SPEEDY MACHINE CODE GRAPHICS

Try turning  
Basic graphics  
programs into fast  
machine code by using  
Mark Davidson's utilities

#### Listing: 1

```
10 REM VDU Coder
20 REM By Mark Davidson
30 REM (c) Electron User
40 MODE 6
50 PROCinitialise
60 PROCcompile
70 PRINT:PRINT
80 CALL &900
90 END
100
110 DEF PROCinitialise
120 ptr=&74
130 PRINT TAB(12,1);"* VDU Code
r *"
```

```

140 INPUT TAB(1,5);"Filename: "
file$
150 PRINT TAB(1,9);"Variable space? (Default=1 page)"
160 INPUT TAB(1,11);": "space$
170 IF space$<1 space$=1
180 ENDPROC
190
200 DEF PROCcompile
210 VDU 28,0,23,39,13
220 FOR I=0 TO 3 STEP 3
230 P%=&900
240 [OPT I
250 \Enable *ON and *OFF commands

```

```

260 SEI
270 LDA &208:STA oscli temp
280 LDA &209:STA oscli temp+1
290 LDA #oscli MOD 256:STA &208
300 LDA #oscli DIV 256:STA &209
310 CLI
320 RTS
330
340 \Start of OSCLI intercept
350 .oscli STX &70:STY &71
360
370 LDY#0
380 .first loop
390 LDA (&70),Y:CMP first,Y
400 BNE next
410 INY:CPY #3:BNE first loop
420 JMP on
430
440 .next
450 LDY #0
460 .second loop
470 LDA (&70),Y:CMP second,Y
480 BNE os
490 INY:CPY #4:BNE second loop
500 JMP off
510
520 .os
530 LDX &70:LDY &71:JMP (oscli
temp)
540
550 .first EQU$*"ON"+CHR$13
560 .second EQU$*"OFF"+CHR$13

```

```

570
580 .oscli temp EQUW 0
590
600 \Initialise the 'intercept'
610 \and 'save' routines
620 .on SEI
630 LDA &20E:STA oswrch temp:LD
A &20F:STA oswrch temp+1:LDA #(new
MOD 256):STA &20E:LDA #(new DIV
256):STA &20F
640 CLC:LDA &12:STA ptr:LDA &13
:ADC #space$:STA ptr+1
650 LDA ptr:STA param1:STA param2:STA param3:STA count+1
660 LDA ptr+1:STA param1+1:STA param2+1:STA param3+1:STA count+2
670 LDA ptr:CLC:ADC #1:STA count+6:LDA ptr+1:ADC #0:STA count+7
680 LDA ptr:CLC:ADC #2:STA new+1:LDA ptr+1:ADC #0:STA new+2
690 LDY #0:TYA:STA (ptr),Y:INY:STA (ptr),Y
700 CLI:RTS
710
720 .oswrch temp EQUW 0
730
740 \The intercept routine
750 .new STA &FFFF:PHA
760 .count INC &FFF:BNE pass:IN

```

## \* VDU Coder \*

Filename: DATA

Variable space? (Default=1 page)

: 2

```

0A05 00 00      param2 EQUW 0
0A07 00 00      EQUW 0
0A09 00 00      param3 EQUW 0
0A0B 00 00      EQUW 0
0A0D 00 00      param4 EQUW 0
0A0F 00 00      EQUW 0
0A11 44 41 54   .addr EQU$ file$+CHR$13
41 0D

```

Installing the machine code routines

```

C &FFF
770 .pass
780 INC new+1:BNE not hit zero
790 .hit zero INC new+2
800 .not hit zero LDA new+1
810 STA param4
820 LDA new+2:STA param4+1
830 PLA
840 JMP (oswrch temp)
850 \End of intercept routine
860
870 \Restore old vector content
S
880 \of OSCLI and OSWRCH and save data
890 .off LDA oscli temp:STA &20
8:LDA oscli temp+1:STA &209
900 LDA oswrch temp:STA &20E:LD
A oswrch temp+1:STA &20F
910 LDA #0:LDX #(block MOD 256)
:LDY #(block DIV 256):JSR &FFDD:R
TS
920 .block EQUW addr
930 .param1 EQUW 0
940 EQUW 0
950 .param2 EQUW 0
960 EQUW 0
970 .param3 EQUW 0
980 EQUW 0
990 .param4 EQUW 0
1000 EQUW 0
1010 .addr EQU$ file$+CHR$13
1020 J
1030 NEXT
1040 ENDPROC

```

### Listing: II

```

10 REM VDU Linker
20 REM By Mark Davidson
30 REM (c) Electron User
40 MODE6
50 CLEAR
60 code$=TOP+512
70 PROCinitialise
80 PROCmc code
90 PROCget data
100 PROCsave file
110 PRINT:PRINT
120 END
130
140 DEF PROCinitialise
150 PRINT TAB(11,1);"* VDU Linker *"
160 PRINT TAB(0,5)"Where do you wish to store the program?"
170 INPUTTAB(0,8);"Address: &"address$

```

```

180 Address$=EVAL("&"+address$)
190 ENDPROC
200
210 DEF PROCmc code
220 FOR I=4 TO 6 STEP2
230 O%=code$:P%=Address$
240 [ OPT I
250 LDA #((data+2) MOD 256)
260 STA loop+1
270 LDA #((data+2) DIV 256)
280 STA loop+2
290 LDA #0
300 STA size
310 STA size+1
320 .start
330 LDA size
340 CMP data
350 BEQ p1
360 INC size
370 BNE loop
380 INC size+1
390 JMP loop
400 .p1 LDA size+1
410 CMP data+1
420 BEQ p2
430 INC size
440 BNE loop
450 INC size+1
460 .loop LDA data+2
470 JSR &FFEE
480 INC loop+1
490 BNE pass
500 INC loop+2
510 .pass JMP start
520 .p2 RTS
530 .size EQUW 0
540 .data
550 J
560 NEXT
570 ENDPROC
580
590 DEF PROCget data
600 INPUT"Data's filename: "input$
put$
610 line$="LOAD "+input$+" "+STR$"0%
620 OSCLI(line$)
630 ENDPROC
640
650 DEF PROCsave file
660 INPUT"Program name: "output$
ts
670 line$="SAVE "+output$+" "+STR$"code$+" "+STR$(O%+?O%+(256*?(O%+1))+2)+" "+STR$"Address$+" "+STR$"Address$
680 OSCLI(line$)
690 ENDPROC

```



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**Wayne Boyd presents  
two very useful disc  
editors, one ADFS and  
the other DFS**

**A** DISC editor is a powerful tool for examining the contents of a disc. With it you can recover deleted program files and data and repair corrupt discs. Two versions have been featured a long time ago in *Electron User*, but many new readers have requested re-runs of some of the best utilities from past issues.

So here are updated versions of two discs editors – one for DFS and one for ADFS users. They are identical in use and utilise very similar listings, but the two filing systems require different operating calls to access them.

Run the program and enter a disc address to examine at the prompt. This number, which should be in hexadecimal, is the sector number counting from the start of the disc. The sector is loaded and displayed in hexadecimal and Ascii on a Mode 0 screen. If this isn't the sector you want to edit, or if you are simply browsing, use the up and down cursor keys to move to the next or previous sector.

When you get to the correct sector press H and the cursor will move to the top left number – the first byte of the sector. You can move to any byte using the cursor keys and enter any hex value by typing it in at the keyboard. Press Return when you have fin-

ished editing the sector. You'll then be asked whether you want to write the modified sector to disc – press Y or N, but before you do, double check that you have not accidentally deleted or altered the wrong thing.

Next comes a menu with three options: Re-edit sector, Load new sector or Quit program.

You can re-edit the same sector – although there's probably not much point unless you have made a mistake – or load

and edit a new one. A printout of the current sector may be obtained at any time by pressing the Copy key.

Take care when modifying disc contents, as it is quite easy to erase valuable data or even corrupt the disc so that it becomes unreadable.



```
10 REM *****
20 REM * DFS DISC EDITOR *
30 REM * By Wayne Boyd *
40 REM * (c) Electron User *
50 REM *****
60 REM
70 MODE0: PROCsetup: PROCtit
le: REPEAT
120 PROCinput: REPEAT: PROCrea
d: PROCdis: UNTIL happy: happy=FA
LSE
180 PROCedit
190 PROCcheck: IF load=TRUE TH
EN load=FALSE:GOTO 120
210 IF write=TRUE THEN write=F
ELSE GOTO 180
220 PROCwrite: GOTO 190: UNTIL
FALSE: END
260 DEFPROCsetup: happy=FALSE:
write=FALSE: load=FALSE: omit=FA
LSE:VDU 19,0,0;DIM buffer 256:
DIM block 16:osword=&FFF1: ENDPRO
C
360 DEFPROCtitle:PRINTSTRING$(8
0,"*"):PRINTTAB(31)" DFS DISC EDI
TOR":PRINTTAB(27)" Written By Wa
yne G Boyd ":PRINTSTRING$(80,"*")
:VDU28,1,31,79,25: PRINT":CLS:
ENDPROC
420 DEFPROCread:IF da$="" da$="
00"
440 dadd=EVAL("&"+da$):?block=0
:REM error number
460 block!1=buffer :REM load ad
dress
```

```
470 block?5=3
480 block?6=&53
490 block?7=dadd DIV 10
491 block?8=dadd MOD 10
520 block?9=&21
530 AX=&7F:XX=block MOD 256:YX=
block DIV 256:CALL osword:
580 AX=&000904:ENDPROC
600 DEFPROCmaindis:cu=0:FOR IX
=1 TO 16:a$="":PRINT " ";:FOR KX
=1 TO 16:cu=cu+1:byte=? (buffer+cu
):IF byte<32 OR byte>126 THEN a$=
a$+"." ELSE a$=a$+CHR$(byte)
710 PRINT " ";:byte DIV 16:"byte
MOD 16;: NEXT: PRINT " ";a$: N
EXT:ENDPROC
760 DEFPROCdis:VDU28,0,24,79,8:
CLS:PROCmaindis:VDU28,1,31,79,25
:CLS:PRINT "Enter new sector addr
ess : &":PRINT " OR
USE THE CURSOR KEYS": *FX4,1
830 PRINTSPC(47)" TO ADJUST THE
SECTOR":PRINTSPC(47)" USE ONLY T
HE UP & DOWN":PRINTSPC(47)" CORSO
R KEYS":PRINTSPC(47)" 'H' When ha
ppy":PRINTTAB(2,2)"Sector addres
s : ";dadd:" / &":STR$dadd:PRINT
TAB(2,3)"Track : ";dadd DIV 10:
831 PRINTTAB(2,4)"sector : ";d
add MOD 10
900 PRINTTAB(29,0);" ";:PRINT
TAB(29,0);:GS=GET$: IF ASC(G$)=13
5 THEN back=TRUE:PROCprintout
930 IF G$="H" THEN happy=TRUE:
ENDPROC
```

```
940 IF ASC(G$)=138 THEN dadd=d
add-1:da$=STR$dadd:ENDPROC
950 IF ASC(G$)=139 THEN dadd=d
add+1:da$=STR$dadd:ENDPROC
960 IF ASC(G$)<48 OR ASC(G$)>7
0 THEN GOTO 900
970 PRINTGS;:GG$=GET$:IF ASC(GG
$)=13 THEN GG$="":GOTO 1030
1000 PRINTGG$;:GG$=GET$: PRINT
GG$;
1030 da$=GS+GG$+GG$; ENDPROC
1050 DEFPROCinput: VDU28,0,24,79
,8: CLS: PRINTTAB(3,5)" By pressi
ng the [COPY] key in the EDITOR o
r the SEARCHER sections of this "
: PRINTTAB(2,6)" program you will
get a print out of the sector be
ing worked on at that time": VDU2
8,1,31,79,25:CLS
1110 INPUT "Enter the sector a
dress : &"da$:ENDPROC
1130 DEFPROCedit_controls: PRINT
TAB(0,0)SPC(80):PRINTTAB(40,1)SPC
(40):PRINTTAB(40,2)SPC(40):PRINT
AB(40,3)SPC(40):PRINTTAB(40,4)SPC
(40):PRINTTAB(40,0)" ....EDI
T....":PRINTTAB(40,2)" Use curso
r keys to ":PRINTTAB(40,3)" move
cursor and enter":PRINTTAB(40,4)
" the values required":PRINTTAB(
40,5)" [RETURN] when happy": EN
DPROC
```

```

1210 DEFPROCch: yy=(total-1
) DIV 16: col=(total-1) MOD 16: x
x=6+col-2+(col*2): PRINTTAB(xx,yy
); "G DIV 16; "G MOD 16;: ENDPROC
1270 DEFPROCsnd
1280 GG=GET:IF GG>47 AND GG<71 T
HEN ELSE GOTO 1280
1300 PRINTCHR$(GG);:input$=CHR$(
G)+CHR$(GG):input=EVAL("&"+input$
): xx=((x-4)DIV 3)-1+56: yy=y: yv
al=y*16:xval=xx-55:total=yval+xva
l+1:?(buffer+total)=input: IF inp
ut>31 AND input<127 THEN PRINTTAB
(xx,yy);CHR$(input); ELSE PRINTTA
B(xx,yy);: "
1370 ENDPROC
1380 DEFPROCedit:PROCedit_contro
ls: x=4:y=0:VDU28,0,24,79,8: st=3
: chr=FALSE:REPEAT:PRINTTAB(x,y);
:G=GET:IF G=135 THEN back=FALSE:P
ROCPrintout
1480 IF G=13 THEN ENDPROC
1490 IF G=138 THEN y=y+1
1500 IF G=139 THEN y=y-1
1510 IF G=137 THEN x=x+st
1520 IF G=136 THEN x=x-st
1530 IF x<4 THEN x=49
1540 IF x>49 AND chr=FALSE THEN
x=55:chr=TRUE:st=1
1550 IF x<55 AND chr=TRUE THEN x

```

```

=49:chr=FALSE:st=3
1560 IF x>70 AND chr=TRUE THEN x
=55
1570 IF y>15 THEN y=0
1580 IF y<0 THEN y=15

```



```

1590 PRINTTAB(x,y);: IF chr=TRU
E AND G>31 AND G<127 THEN PRINTCH
R$(G);:yval=y*16:xval=x-55:total=
yval+xval+1:?(buffer+total)=G:PRO
Case_ch:x=x+1:PRINTTAB(x,y);

```

```

1610 IF chr=FALSE AND G>47 AND
G<71 THEN PRINTCHR$(G);:PROCsnd:x
=x+3:PRINTTAB(x,y);
1620 UNTIL FALSE
1630 DEFPROCcheck:VDU28,1,31,79,
25:PRINTTAB(0,0)SPC(80):PRINTTAB(
40,1)SPC(40):PRINTTAB(40,2)SPC(40
):PRINTTAB(40,3)SPC(40):PRINTTAB(
40,4)SPC(40):PRINTTAB(40,5)SPC(38
): IF omit=TRUE THEN omit=FALSE:G
OTO 1740
1670 PRINTTAB(47,2)"DO YOU WANT
TO WRITE": PRINTTAB(47,3)"THIS S
ECTOR TO THE ": PRINTTAB(47,4)"DI
SC (Y/N) ":G$=GET$:IF G$="Y"
THEN write=TRUE:PRINT"YES":ENDPRO
C
1720 PRINT"NO":PRINTTAB(0,0)SPC(
80):PRINTTAB(40,1)SPC(40):PRINTTA
B(40,2)SPC(40):PRINTTAB(40,3)SPC(
40):PRINTTAB(40,4)SPC(40):PRINTTA
B(40,5)SPC(38)
1740 PRINTTAB(40,0)" You can no
w choose to :-":PRINTTAB(40,2)"
1. RE-EDIT SECTOR":PRINTTAB(40,3)
" 2. LOAD NEW SECTOR":PRINTTAB(4
0,4)" 3. QUIT PROGRAM":PRINTTAB(
40,5)" :";
1790 G$=GET$:IF G$="1" THEN load
=FALSE:write=FALSE:ENDPROC
1810 IF G$="2" THEN load=TRUE:wr
ite=FALSE:ENDPROC

```

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```

1820 IF G$="3" THEN CALL!-4
1830 GOTO 1790:ENDPROC
1850 DEFPROCwrite: ?block=0:block
!1=buffer:block?5=3:block?6=848:b
lock?7=dadd DIV 10:block?8=dadd M
OD 10:block?9=821:AX=87F:XX=block
MOD 256:YX=block DIV 256:CALL os
word:IF ?block>0 PRINT"Disc error
":END
1990 omit=TRUE:ENDPROC
2010 DEFPROCprintout: VDU28,0,24
,79,8: VDU2: PRINT" SECTOR :
8";STR$"dadd: PROCmaindis: PRINT:
VDU3: CLS:PROCmaindis: IF back=T
RUE THEN VDU28,1,31,79,25
2070 ENDP

```

```

10 REM *****
20 REM * ADFS DISC EDITOR *
30 REM * By Wayne Boyd *
40 REM * (c) Electron User *
50 REM *****
60 REM
65 *ADFS
66 *MOUNT
70 MODE0: PROCsetup: PROCtit
le: REPEAT

```

```

120 PROCinput: REPEAT: PROCrea
d: PROCdis: UNTIL happy: happy=FA
LSE
180 PROCedit
190 PROCcheck: IF load=TRUE TH
EN load=FALSE:GOTO 120
210 IF write=TRUE THEN write=F
ALSE ELSE GOTO 180
220 PROCwrite: GOTO 190: UNTIL
FALSE: END
260 DEFPROCsetup: happy=FALSE:
write=FALSE: load=FALSE: omit=FA
LSE:VDU 19,0,4;0;:DIM buffer 256:
DIM block 16:osword=8FFF1: ENDP
C

```

```

360 DEFPROCtitle:PRINTSTRINGS(8
0,"*"):PRINTTAB(31)"ADFS DISC EDI
TOR":PRINTTAB(27)" Written By Wa
yne G Boyd ":PRINTSTRINGS(80,"*
"):VDU28,1,31,79,25: PRINT":CLS:
ENDPROC

```

```

420 DEFPROCread:IF da$="" da$="
00"
440 dadd=EVAL("&"da$):?block=0
:REM error number
460 block!1=buffer:REM load ad
dress
470 block?5=8:REM read command
480 block?6=0:REM disc address
MSB 1st
490 block?7=dadd DIV 256:block?
8=dadd MOD 256:block?9=1:REM 1 s
ector

```

```

520 block?10=0:REM unused
530 AX=872:XX=block MOD 256:YX=
block DIV 256:CALL osword:IF ?blo
ck>0 PRINT"Disc error":END
580 AX=8000904:ENDPROC

```

```

600 DEFPROCmaindis:cu=0:FOR IX
=1 TO 16:a$="":PRINT" ":FOR KX
=1 TO 16:cu=cu+1:byte=? (buffer+cu
):IF byte<32 OR byte>126 THEN a$=
a$+"." ELSE a$=a$+CHR$(byte)
710 PRINT" ";byte DIV 16;byte
MOD 16;:NEXT:PRINT" ";a$:N
EXT:ENDPROC

```

```

760 DEFPROCdis:VDU28,0,24,79,8:
CLS:PROCmaindis:VDU28,1,31,79,25
:CLS:PRINT" Enter new sector addr
ess : &";PRINT" OR

```

```

USE THE CURSOR KEYS": *FX4,1
830 PRINTSPC(47)" TO ADJUST THE
SECTOR":PRINTSPC(47)" USE ONLY T
HE UP & DOWN":PRINTSPC(47)" CORSO
R KEYS":PRINTSPC(47)" 'H' When ha
ppy":PRINTTAB(2,2)"Sector addres
s : ";dadd;" / &";STR$dadd:PRINT
TAB(2,3)"Track : ";dadd DIV 16:PR
INTTAB(2,4)"sector : ";dadd MOD 1
6

```

```

900 PRINTTAB(29,0);" ";:PRINT
TAB(29,0);:G$=GET$: IF ASC(G$)=13
5 THEN back=TRUE:PROCprintout
930 IF G$="H" THEN happy=TRUE:
ENDPROC

```

```

940 IF ASC(G$)=138 THEN dadd=d
add-1:da$=STR$dadd:ENDPROC
950 IF ASC(G$)=139 THEN dadd=d
add+1:da$=STR$dadd:ENDPROC

```

```

960 IF ASC(G$)<48 OR ASC(G$)>7
0 THEN GOTO 900

```

```

970 PRINTG$;:GG$=GET$:IF ASC(G$
)=13 THEN GGG$="":GOTO 1030
1000 PRINTGG$;:GGG$=GET$: PRINT
GGG$;

```

```

1030 da$=G$+GG$+GGG$: ENDP
1050 DEFPROCinput: VDU28,0,24,79
,8: CLS: PRINTTAB(3,5)" By pressi
ng the [COPY] key in the EDITOR o
r the SEARCHER sections of this "
: PRINTTAB(2,6)" program you will
get a print out of the sector be
ing worked on at that time": VDU2
8,1,31,79,25:CLS
1110 INPUT "Enter the sector a
ddress : &"da$:ENDPROC

```

```


```



```

1130 DEFPROCedit_controls: PRINT
TAB(0,0)SPC(80):PRINTTAB(40,1)SPC
(40):PRINTTAB(40,2)SPC(40):PRINTT
AB(40,3)SPC(40):PRINTTAB(40,4)SPC
(40):PRINTTAB(40,0) ....EDI
T....":PRINTTAB(40,2)" Use curso
r keys to ":PRINTTAB(40,3)" move
cursor and enter":PRINTTAB(40,4)
" the values required":PRINTTAB(
40,5)" [RETURN] when happy": END
PROC

```

```

1210 DEFPROCasc_ch: yy=(total-1
) DIV 16: col=(total-1) MOD 16: x
=6+col-2+(col*2): PRINTTAB(xx,yy
);:G DIV 16;:G MOD 16;: ENDP
1270 DEFPROCsnd

```

```

1280 GG=GET:IF GG>47 AND GG<71 T
HEN ELSE GOTO 1280
1300 PRINTCHR$(GG);:input$=CHR$(
G)+CHR$(GG):input=EVAL("&"input$

```

```

): xx=((x-4)DIV 3)-1+56: yy=y: yv
al=*16:xval=xx-55:total=yval+xva
l+1:?(buffer+total)=input: IF inp
ut>31 AND input<127 THEN PRINTTAB
(xx,yy);CHR$(input); ELSE PRINTTA
B(xx,yy);".";
1370-ENDP

```

```

1380 DEFPROCedit:PROCedit_contro
ls: x=4:y=0:VDU28,0,24,79,8: st=3
: chr=FALSE:REPEAT:PRINTTAB(x,y);
:G=GET:IF G=135 THEN back=FALSE:P
ROCprintout

```

```

1480 IF G=13 THEN ENDP
1490 IF G=138 THEN y=y+1
1500 IF G=139 THEN y=y-1
1510 IF G=137 THEN x=x+st
1520 IF G=136 THEN x=x-st
1530 IF x<4 THEN x=49
1540 IF x>49 AND chr=FALSE THEN
x=55:chr=TRUE:st=1
1550 IF x<55 AND chr=TRUE THEN x
=49:chr=FALSE:st=3
1560 IF x>70 AND chr=TRUE THEN x
=55

```

```

1570 IF y>15 THEN y=0
1580 IF y<0 THEN y=15

```

```

1590 PRINTTAB(x,y);: IF chr=TRU
E AND G>31 AND G<127 THEN PRINTCH
R$(G);:yval=*16:xval=x-55:total=
yval+xval+1:?(buffer+total)=6:PRO
Casc_ch:x=x+1:PRINTTAB(x,y);
1610 IF chr=FALSE AND G>47 AND
G<71 THEN PRINTCHR$(G);:PROCsnd:x
=x+3:PRINTTAB(x,y);
1620 UNTIL FALSE

```

```

1630 DEFPROCcheck:VDU28,1,31,79,
25:PRINTTAB(0,0)SPC(80):PRINTTAB(
40,1)SPC(40):PRINTTAB(40,2)SPC(40
):PRINTTAB(40,3)SPC(40):PRINTTAB(
40,4)SPC(40):PRINTTAB(40,5)SPC(38
): IF omit=TRUE THEN omit=FALSE:G
OTO 1740

```

```

1670 PRINTTAB(47,2)"DO YOU WANT
TO WRITE": PRINTTAB(47,3)"THIS S
ECTOR TO THE ": PRINTTAB(47,4)"DI
SC (Y/N) ";:G$=GET$:IF G$="Y"
THEN write=TRUE:PRINT"YES":ENDPRO
C

```

```

1720 PRINT"NO":PRINTTAB(0,0)SPC(
80):PRINTTAB(40,1)SPC(40):PRINTTA
B(40,2)SPC(40):PRINTTAB(40,3)SPC(
40):PRINTTAB(40,4)SPC(40):PRINTTA
B(40,5)SPC(38)

```

```

1740 PRINTTAB(40,0)" You can no
w choose to :-":PRINTTAB(40,2)"
1. RE-EDIT SECTOR":PRINTTAB(40,3)
" 2. LOAD NEW SECTOR":PRINTTAB(4
0,4)" 3. QUIT PROGRAM":PRINTTAB(
40,5)" ";:

```

```

1790 G$=GET$:IF G$="1" THEN load
=FALSE:write=FALSE:ENDPROC
1810 IF G$="2" THEN load=TRUE:wr
ite=FALSE:ENDPROC

```

```

1820 IF G$="3" THEN CALL!-4
1830 GOTO 1790:ENDPROC
1850 DEFPROCwrite: ?block=0:block
!1=buffer:block?5=10:block?6=0:bl
ock?7=dadd DIV 256:block?8=dadd M
OD 256:block?9=1:block?10=0:AX=87
2:XX=block MOD 256:YX=block DIV 2
56:CALL osword:IF ?block>0 PRINT"
Disc error":END
1990 omit=TRUE:ENDPROC

```

```

2010 DEFPROCprintout: VDU28,0,24
,79,8: VDU2: PRINT" SECTOR :
8";STR$dadd: PROCmaindis: PRINT:
VDU3: CLS:PROCmaindis: IF back=T
RUE THEN VDU28,1,31,79,25
2070 ENDP

```

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# MICRO MESSAGES

*I HAVE been reading your excellent magazine for some years now and I wonder if you can help me with some of my problems. How can you read and write directly to and from tape using the datashift register in the ULA? I have tried to do this a number of times and always failed – the machine crashes.*

*Could you also tell me how to produce random numbers with a Gaussian frequency distribution? Finally, could you print a supplement to your memory map series describing the operating system rom in greater detail? – R. Moore, Northumberland.*

● Reading and writing to tape using the ULA is very complicated and as the operating system performs this so well we can't see why you would want to do it yourself. The best way to find out how to do it is to use a disassembler to follow the operating system routines. We haven't tried it in practice, but in theory here's what you must do.

First cassette input or output mode must be selected by poking &FE07. This is a multi-function register. For cassette output bits two and one must be 10 (binary) and 00 for input. Take care not to change mode or alter the Caps Lk led. You can turn the cassette on or off with bit six.

When data is being read from cassette the first seven bits of &FE06 are used as a timer and should be set to zero. It isn't required for writing to tape.

The cassette datashift register is at &FE04 and writing to this causes data to be output to tape. After the last bit has been written a transmit data empty interrupt is generated. A high tone must be recorded on tape before the data.

In cassette input mode data is input serially into the cassette datashift register at &FE04 and when it is full it can be read and stored in memory. The receive data full interrupt should be enabled to ensure the 6502 knows when a byte can be read. The interrupt clear and paging register is at &FE05. The best random number generator we have seen is the one in the Basic rom. It's

## The write way to tape programs

extremely short and very efficient. Use a disassembler to look at the routine at &AF51.

### Going round in circles

*I AM eight years old and bought an Acorn Electron about four months ago. Can you please tell me how to go about drawing a circle on my micro? I can draw several using a loop, but can't draw just one. – Philip Murray, Ballymena, N. Ireland.*

● We are a bit puzzled by your request Philip. Surely, if you go round the loop once then you'll draw just one circle? Alter the start and end of the loop counter so that they are the same.

### Sheet that's full of errors

*I HAVE an Electron and Slogger Rombox Plus. Several months ago I bought both View and Viewsheets cartridges in a combined deal. I have used View quite a lot, with complete success, but when I started to use Viewsheets I found I was inundated with error messages in many of the slots.*

*The location of the errors changed when I altered the input numbers, and sometimes when I simply forced a recalculation without changing anything. To make sure I am not asking the program to do something impossible like calculating the square root of minus*

*one, I entered a very simple sheet where each slot is greater by one than the slot to its left or above it. I set the format to no decimal points to make sure that there are no long recurring decimals to complicate matters.*

*The cartridges were bought from Pres, who very kindly changed the Viewsheets cartridge for another, despite the length of time since I bought it. There is no improvement, and the errors now occur in different places. Pres suggested that the trouble may be due to an incompatibility of speeds between the cartridge and my Electron.*

*I feel I cannot ask the supplier to keep on sending me replacements in the hope that one will eventually work, particularly as it may be my computer that is at fault. Do you think that I could overcome the difficulty by getting my Electron fitted with Slogger's Master Ram Board which claims to offer increased speed? I could also make use of the extra memory.*

*Is Viewsheets particularly fussy? Perhaps another cartridge would be less critical? – Peter Baldwin, Woking, Surrey.*

● We can't imagine how the speed of the Electron could possibly cause the error messages. A faster Electron – by adding a Master Ram Board or Turbo – would make the screen update quicker and the recalculations less time consuming. It won't alter the error messages.

The first suspect is your sheet itself. Are you sure it is correct? Are you trying to enter a very large sheet into Mode 0, 1 or 3 and running out of memory? Check the data first (try a small, simple, sheet), then if possible, try the cartridge on another micro. Can any readers offer any help?

## Sizing up your Electron

*JUST recently I became the owner of an Electron computer. What is the memory size? What type of interface would I need in order to be able to use a 5.25in disc drive?*

*I know I would need a Plus 1 in order to use a joystick, but is this not capable of taking a disc drive? – David Corringham, Grimsby, South Humberside.*

● The Electron has 32k of random access memory and 32k of read only memory. You need a disc interface to use a disc drive and this unit plugs into the Plus 1. Pres can supply a Plus 1, disc interface – AP3 or AP4 – and a disc drive.

## Screen dump for pie charts

*I AM the owner of two Electrons, one of which I have had for five trouble-free years in use as a games machine. The other is fitted with a Plus 1, AP4 and Cumana 40/80 track disc drive, and is used mainly as a*

word processor with View. The printer is an NEC PC-8023BE-N which produces good quality results with the printer driver by Julie Boswell.

We have taken Electron User since 1984 and cannot recall if there has been a program, cartridge or software to dump such things as graphics, pie charts and so on. How can I tell if my printer is Epson compatible? — David Boucher, Grimsby, South Humberside.

● We have published many screen dumps over the past seven years, the most recent being in the August 1989 issue in Micro Messages. Try it, and if it works correctly your printer is Epson compatible.

## Power failure causes blackout

I HAVE been reading Electron User for nearly four years and find it very interesting. My son is a football nut and now that two football games are available he desperately wants one.

However, we have been having problems with our Electron and I don't know if it is worth buying any new games. It beeps when plugged in to signal it is on, but it carries on doing this beep at intervals, reverting to switch-on mode, complete with Acorn symbol.

It can do it in the middle of a game, but it seems to settle down when it has been switched on for an hour or so. Also, sometimes the games lose their colour. These are probably two different faults.

Have you any idea what this beeping fault is, and if it is simple to fix? My husband knows a little about electronics and if we had a simple diagram and it was a straightforward soldering job then he could probably fix it. — Anne Dunn, Roughton, Hertfordshire.

● The beep is heard and the start-up screen is always displayed when the power is switched on. Therefore it follows that the power is being cut and then re-connected. It sounds as if you have a fault in the wire carrying power to the Electron, perhaps a break in the cable.

The fault is likely to be at either the plug which goes into the Electron — Pres can supply a new one — or the wire at the point it goes into the power supply block which plugs

All programs printed in this issue are exact reproductions 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.

into the mains. Unscrew the power supply and check the wires and connections.

The same fault is probably present in the monitor or TV aerial cable. Check the connections at both ends for a break.

## Loads of tape problems

IN the last few days I have been unable to save a program in Basic and then load it back into the computer. After a few blocks are printed on the screen a Data? message is displayed. I have a Plus 1, a Panasonic KX-P1081 printer and a tape recorder connected to the computer. I also have a spare tape recorder.

Although a program appears to save correctly it will not then load with either cassette recorders, which have different cables. Similarly, with View, I can type in a page of text, apparently save it successfully, but when I try to read it back into the computer, after the first three or four blocks the error message Not all read in is printed.

The odd thing is that I can successfully load most commercial tapes that I have, and even tapes containing programs that I have typed in from the magazine. It is almost as if the listings are being corrupted in either save or load mode. Checking the sound on the cassette recorder seems to indicate that the program is being recorded OK. — S.H. Braithwaite, Lincoln.

● Finding and solving tape problems is a hit

and miss affair that can usually only be sorted out by trial and error. Try adjusting the volume and tone controls, and clean the read/write heads with alcohol — the sort you get in cassette cleaning kits, not the liquor you drink. Check the azimuth of the read/write heads — using the tiny screw next to the heads adjust it until the sound is loud and clear and not muffled and dull.

Finally, remember that the Electron experiences some difficulty in reading and writing to tape when running in Modes 0 to 3. First change to Mode 6 when you want to save or load programs and data.

## A conversion for Pacman?

I AM an 11-year-old Electron user with Master Ram Board, Plus 1 and 3.5in disc drive. I enjoy programming as much as playing games. A couple of times, I have been into amusement arcades and have played Pacmania which I thoroughly enjoyed. My friend owns a 48k Spectrum and also has the game.

Would it be possible to produce a version of Pacmania for the Electron? — Martin Webb, Orpington, Kent.

● Pacmania isn't available for the Electron, but as it is such a straightforward game idea we think it should be possible to convert it.

## Old listings for new users

ALTHOUGH I own a BBC Micro, I buy Electron User as well as The Micro User because you generally have more listings in one issue than in The Micro User. You also have features not shown in the other magazine. You should have a Golden Oldies section where you reprint listings from early issues.

Anthony Houghton and John Geraghty are exceptionally good contributors and I congratulate them on their programs, particularly Time Bomb from the July 1989 issue and Ceemags from the September issue.

Recently, I have been having problems with some of your listings. Eliminator from the May 1989 issue is one. The PROCbonus procedure is bugged with the words OSCLI.

IS it possible to join an Electron to a BBC Master computer? I believe there is only one way to do it, and that is through the RS423 ports. I have just noticed that one is now being sold for the Electron by Jafa systems.

If so, can the Terminal emulator on the Master be used to transfer data, or would the Electron require similar software, or is the emulator strictly for Econet use only? Overall, is there anything to be gained by joining the micros together, as I believe the Master would be slowed down by the Electron? Would this be the case even though I have a Master Ram Board?

## Making the Master connection

On a different subject, I use a 512k co-processor board on my Master and I find it excellent, but would a setup of Electron, Plus 1, AP5, AP4, disc drive, Watford's co-pro adaptor and 512k board make the Electron IBM compatible or is the software different on the Electron? — G. Cranch, Hoddesdon, Hertfordshire.

● It is possible to join the Electron and Master, the easiest way being through the RS423 ports — providing you have a suitable

hardware add-on for the Electron. Data can be transferred from one micro to the other using comms software running on both micros. Terminal Emulator is fine, but the documentation is so poor that you may have problems getting it to work.

Neither micro's speed will be affected, and apart from the ability to pass data without the need for floppy discs or cassettes, there is nothing to be gained. You can't run IBM software on the Electron.

Now in your October 1989 issue I have been frustrated by the Spinning Frustration game on Page 18. I typed it in twice, but the program crashes half way through making the blocks. I suspect that you have printed an error between lines 700 and 1100 of the listing.

If it is my fault, should I stop getting your magazine? — **Stephen Scott, Engerfield Green, Surrey.**

● The OSLI words are not bugs, but legitimate Basic commands. It sounds as though you have a very old BBC Micro with Basic version one. Press Break and type REPORT — if the copyright message is 1981 then you have Basic I.

If you upgrade your Basic to version two — unplug your old language rom chip and plug in a new one — you'll be able to run many more, though not all, *Electron User* listings.

We have had many requests for re-prints of old programs and utilities from early issues of *Electron User* so we have started a new series on Page 19 looking back to the early days of Electron computing.

## Ravenskull problem solved

WHEN I looked on the front cover of the November 1989 issue of *Electron User* it was stated that there was a solution to Ravenskull. When I looked in the magazine I couldn't find anything about it. Could you please tell me where it is? — **Lee Harrison, Wigan.**

● Unfortunately, due to lack of space we were unable to squeeze the Ravenskull solution into the November issue, but no one told the editor, who wrote the cover words. However, you'll find the article in the December 1989 issue.

## The right upgrade path

I HAVE an Electron, Plus 1, Project Expansions User Port, cassette player and a Centronics 737-1/737-2 printer. I am a newcomer to computers and have learnt a lot by hands-on experience, and also from your excellent publication.

I have just bought a Cumana disc drive and would like to know how to connect this with my current set up, thereby dispensing with the cassette player. I assume I need some kind of interface. If so, which is the cheapest that will also let me use my printer? It won't be used for playing games, more of a small office type useage for letters, and maybe a little later when I master graphics, for producing club notices.

My Electron has the date 1982 on the label underneath and reports that it is OS 1.0. Can you tell me how many k it is please. I would like to increase the k, whatever it is. How do I do this? There is space for a plug-in chip in the back of the I/O port. Do I just buy a chip

## The magazine that really matured

IN your September 1989 issue I read a short article called From Little Acorns and felt a touch of nostalgia. I was one of those fortunate, or maybe unfortunate, people who paid a deposit in 1983 and eventually received their *Electron* later, paying a king's ransom for the privilege.

However, it spent most of its life in its box never to see the light of day. The quality of educational software never really materialised, the games were rather childish and expensive and alas, the early days of *Electron User*, I feel, were aimed at primary school level. Subsequently I lost interest, probably a common story with many computer owners. The only major addition was a Plus 1.

All is not lost, last October I started a two year BTECH day release course in computer studies. The high level language taught is Pascal and I am also doing an evening class on microelectronics with practical exercises using the Z80 microprocessor. My wife is studying O level GCSE maths and word processing using Wordperfect on an Amstrad PC.

After years of hiding, the *Electron* has come out of its box and hopefully my wife and I can get some use out of it. First and foremost it needs modernising and hopefully calling on your expertise and that of your readers I can turn it into a useful educational and business tool.

I have tabulated a series of questions, the answers to which will hopefully guide me through the maze of possible add-ons:

- ☐ Can the *Electron* be adapted to run faster?
- ☐ Can a second processor be added?
- ☐ Can the ram be expanded to 64k, 128k, 256k and so on?
- ☐ Can Mode 7 be overcome and all BBC Micro software run?
- ☐ Can it support 3.5 and 5.25in floppies?
- ☐ Can it support a hard disc drive?
- ☐ Is Pascal available?
- ☐ Can it run Wordperfect or another word processing package?
- ☐ Is there a program available that supports O level maths?
- ☐ Can you suggest a letter quality or NLQ printer that would produce graphics in either black and white or colour?
- ☐ Can the *Electron* support an IBM emulator and run IBM software?
- ☐ Should I put the *Electron* back in its box and spend £1,000 on a desktop PC? I must add that having glanced at *Electron User* on

and plug it in. If so, which one and where from? — **Gerry Emson, Farnham, Surrey.**

● All disc interfaces will allow you to use your printer — they have no effect on it at all. The interface you require plugs in to one of the rom cartridge slots on the Plus 1.

Pres can supply a range of disc interfaces



Early days, with *Electron Eddie* much in evidence

bookshelves of newsagents over the past few months I must congratulate you on producing a periodical that has more appeal for the inquisitive mind than the comic book trivia that appeared in the first editions in 1983. — **R.D. Collar, Portland, Dorset.**

● You have missed so much over the past six years we hardly know where to start. A Slogger Master Ram Board will increase the *Electron's* ram to 64k and also increase its speed, particularly in Modes 0, 1 and 2.

A second processor can be added and PMS produced a cheap, plug-in unit for well under £100. Jafa Systems can add a Mode 7 simulator that will enable you to run a lot — but not all — of BBC Micro software that requires this mode.

Pres will be happy to kit you out with both 3.5 and 5.25in disc drives, but unfortunately hard drives aren't available. Pascal was available for quite some time, but is now in short supply, so you'll have to scour the dealers for a copy.

Many good printers are available, and the Panasonic KX-P1081 seems to be a favourite with many readers. We'll have to ask our readers if they have discovered any good maths programs suitable for GCSE.

The *Electron* can't run Wordperfect, but View is an extremely powerful, popular and cheap word processor. The *Electron* can't emulate an IBM, nor can it be made to run its software.

Although a great deal can be achieved with the humble *Electron*, if you have a budget of £1,000 to spend then it would be a good idea to look around for a PC compatible system, as it is more suited to your needs.

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You say you want to increase the k, but don't know what it is. Why then, do you want to increase it? You have 32k. It, in fact, represents the size of the memory and the only way of increasing this is with a Slogger Master Ram Board. This also has the side effect of speeding up the micro.

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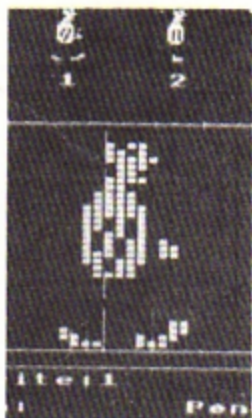
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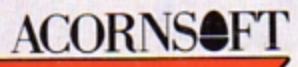
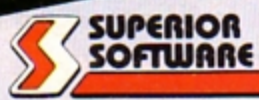


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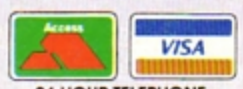
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