A Database Publication

electron user

Vol. 5 No. 9 July 1988 £1.25

3 great games

Battling Bunnies, Whist & Tennis

Plus 2 rom reviewed

Analyse your writing style with Easy Reader

Educational fun with Tilley the Train

COMPETITION

WIN two tickets to see the Barbarians play Australia. Plus 30 runners up prizes

REPTON

THRU TIME

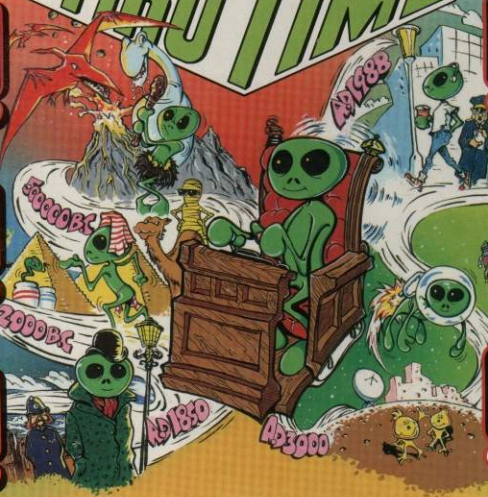
PREHISTORIC REPTON

EGYPTIAN REPTON

VICTORIAN REPTON

PRESENT DAY REPTON

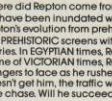
FUTURE REPTON



REPTON — THE TIME TRAVELLER

Where did Repton come from? Does he have an Egyptian mummy? Is he the real Jack the Repper? Where is he now? Where is he going to?! We have been inundated with these and many other questions about our lovable hero. Now all is revealed in 40 new screens that vividly reveal Repton's evolution from prehistory to the future.

The PREHISTORIC screens with their caves, mountains and volcanoes, have Repton battling against pterodactyls and dinosaurs to collect edible berries. In EGYPTIAN times, Repton chases around pyramids and sphinxes collecting scrolls and meeting a mummy or two! Amidst the smog and grime of VICTORIAN times, Repton collects gold coins — but can he avoid the police and the gallows? PRESENT DAY Repton has even greater dangers to face as he rushes around the city's jungle of parking meters and skyscrapers, looking for cans of cola. If the gangster's machine gun doesn't get him, the traffic wardens will. Amazingly Repton may make it to the FUTURE. As he zooms through space collecting crystals, the Martians give chase. Will he succeed or disappear forever into the infinite depths of a black hole? Only you can help Repton Thru Time!

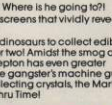

THE SCREEN EDITOR

Each copy of Repton Thru Time includes:
- the Repton 3 main program
- the Repton 3 editor and
- the 40 new game screens.

BBC Micro Cassette.....**£6.95**	Acorn Electron Cassette.....**£6.95**
BBC Micro 5¼" Disc.....**£7.95**	BBC Master Compact 3½" Disc..**£9.95**

(Compatible with the BBC B, B+ and Master Series computers).

The screen pictures show the BBC Micro version of the game.


THE CHARACTER EDITOR

PRIZE COMPETITION

If you complete all 40 screens of Repton Thru Time without using passwords, you can enter our competition. A draw will be made from all the correct entries received to select 25 prize winners. Each will receive an EGYPTIAN REPTON Cuddly Toy and a signed certificate.

Closing date: 30th September, 1988.

REPTON ORIGINAL
Cuddly Toy

SPECIAL OFFER — NEW!

A unique range of Repton Cuddly Toys is now available. Each Cuddly Toy is about 24 inches high and has a realistic face and features corresponding to the particular Repton character. They are only available from Superior Software.

REPTON ORIGINAL	**£9.95**
ARCTIC REPTON	**£9.95**
TEENAGE REPTON	**£9.95**

Postage and packing free.

SUPERIOR SOFTWARE Limited

ACORNSOFT

Please make all cheques payable to "Superior Software Ltd".

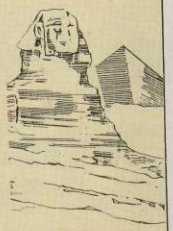
Access VISA

24 HOUR TELEPHONE ANSWERING SERVICE FOR ORDERS

OUR GUARANTEE
- All mail orders are despatched within 24 hours by first-class post.
- Postage and packing is free.
- Faulty cassettes and discs will be replaced immediately. (this does not affect your statutory rights)

Dept. RT6, Regent House, Skinner Lane, Leeds LS7 1AX. Telephone: 0532 459453.

News
Up to the minute news and views from the ever expanding world of the Acorn Electron.
5



Shadow Ram
Add the Shadow Ram Filing System – SRFS – to your micro and double its memory.
8

Sprites
Three machine code score routines are revealed this month.
11

Pendragon
More help, hints and tips from the adventure wizard's quill. Plus a map of one of Sphinx Adventure's mazes.
19

Software
Our panel of top games reviewers casts a critical eye over the latest recent releases.
15

Competition
Win a whole host of fantastic prizes in this easy-to-enter Barbarian competition.
24

Hardware Review
We examine AP2 – a rom upgrade providing many powerful extra Plus 1 commands.
25

Randall Rabbit
Help save the warren from starvation by collecting the carrots in this all-action arcade game.
28

Whist
You've got to hand it to your micro – when it comes to card games your Electron's an absolute knockout.
27

Assembly Language
More machine code as we experiment with the 6502's increment and decrement instructions.
31

Tilley the Train
Lots of educational fun for young children with this program to improve their mental arithmetic.
36

Micro Messages
The pages you write yourselves. A selection from the hundreds of letters in our mailbag.
41

Easy Reader
Find out how easy to read your writing is with this fascinating utility.
48

Tennis
Time to get in training for Wimbledon and sharpen up your tennis with your micro as an opponent.
53

Memory Map
The inner secrets of the Electron's random access memory revealed.
39

Bargains galore!

Don't miss our special offers on Pages 44 and 45.

Managing Editor **Derek Meakin**
Group Editor **Alan McLachlan**
Features Editor **Roland Waddilove**
Production Editor **Peter Glover**
Reviews Coordinator **Pam Turnbull**
Editorial Assistant **Chris Nixon**
Promotions Editor **Chris Payne**
Advertising Sales **John Snowden** **Peter Babbage**

Published by Database Publications Ltd
Europa House, Adlington Park, Adlington, Macclesfield SK10 4NP.

Telephone: 0625 878888 (Editorial, Admin, Advertising). 0625 879940 (Subscriptions).
T/Gold Mailbox: 72:MAG001. Prestel: 614568383. Telex: 265871 MONREF G. Quoting Ref. 72:MAG001.

ABC 37,575 January-June 1986

News trade distribution: Diamond-Europress Sales and Distribution, Unit 1, Burgess Road, Ivyhouse Lane, Hastings, East Sussex TN35 4NR. Tel: 0424 430422.

Printed by Carlisle Web Offset.

Electron User is an independent publication. Acorn Computers Ltd, are not responsible for any of the articles in this issue or for any of the opinions expressed.

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

Subscription rates for 12 issues, post free:
£16 UK
£23 Europe & Eire
£38 Overseas

ISSN 0952-3057

© 1988 Database Publications Ltd. No material may be reproduced in whole or in part without written permission. While every care is taken, the publishers cannot be held legally responsible for any errors in articles or listings.

ICARUS

£9.95 cassette
BBC Model B, B+, Master and Electron

£11.95 disc
BBC series: 5¼" or 3½"

Split-screen action with different views for each player. When you are both in the same area the views are the same.

Crack the code to the forcefield, pass through the portals to raid the area of valuable credits, then head for the lift.

Now *TWO* can play – and experience . . .

THE CHALLENGE OF A LIFETIME!

Starship Icarus is plummeting towards the sun, and the only hope of averting the impending cataclysm is for you to teleport on board, disable the master computer and regain control . . .

This spectacular fast-action game has a unique split-screen which means that one player can complete the game on his own – or play simultaneously with a friend – to fight the trigger-happy droids which infest the ship. With 20 levels of nerve-racking excitement, forcefields, mines, electronic doors, emergency lifts, movable walls, and opportunities to build up your armour, blaster and health ratings, this is one game you won't complete in a few weeks!

There can be no doubt that Icarus, with its incredible one- or two-player action, is one of the most exciting games ever created for the BBC Micro and Electron.

Check it out for yourself – and take up the challenge!

MANDARIN SOFTWARE

Europa House, Adlington Park,
Adlington, Macclesfield SK10 4NP.
TELEPHONE ORDERS: 0625 879920 ENQUIRIES: 0625 879940

Available from all good stockists or order direct by sending a cheque or postal order made payable to Mandarin, together with your name and address. Access or Visa owners: Phone our hotline or send your card number with your order. Price include P&P.

STOP PRESS

What the press have said:

"The best game out for the BBC this year"
– **Micronet 8000**

"With software of this calibre, Mandarin is destined for the top"
– **Micro User, July 1988**

"Icarus is superb"
– **Electron User, June 1988**

electron user NEWS

Electron draws more products

MORE companies than ever before are moving into the Electron market place.

That was the verdict of Pres managing director John Huddleston following the recent Electron & BBC Micro User Show at the New Horticultural Hall in London.

"Just looking around the exhibitors you could tell that the number of products available for the machine was up by about 50 per cent", said John.

"The response to my own products was also up on the last event, with great interest being shown for the AP3 and AP6 interfaces", he said.

One reason given by Huddleston for the increase in products is that many of the items previously only available for the BBC Micro are being adapted for use with the Electron.

"The market has changed considerably in the past 12 months with sales for both machines being roughly 50-50.

"It would appear that at last Electron owners are being catered for in the same way as BBC Micro owners were when that machine first came out", said Huddleston.

All go for the Electron at the Show

Life's an adventure

IF you have ever wondered what your trusty Electron User *editor gets up to in his spare time perhaps this photograph will give you some idea.*

Roland Waddilove – that's him on the right – is getting to grips with Corrine Russel, the star of Martech's advertising campaign for its latest game – Vixen.

On his return from the press launch he said: "It was a fantastic all-action adventure. And the game was good as well".

BIG IMPROVEMENT IN THE WEATHER

AN enhanced WeatherLink service for Electron users has been launched on MicroLink.

The result is a dramatic improvement in the quality of satellite weather pictures and the speed at which they can be downloaded.

MicroLink's top programmers worked for months to produce brand new machine specific software which has reduced download time by up to 75 per cent.

A specially designed data compression technique incorporating full error correction provides pictures three times sharper than before.

Colour resolution has been considerably heightened, making the weather maps easier to understand. The new WeatherLink graphics standard is 320 x 200 pixels.

For the first time, instead of a kaleidoscope of colours only a professional meteorologist could interpret, WeatherLink users will see a rationalised and more comprehensive picture.

On the Electron there are four colours available in Mode 1 and eight colours in Mode 2.

Although WeatherLink has the facility to put up maps of anywhere on the globe, initially only the British Isles and nearby parts of the continent will be shown.

Feedback from WeatherLink users will decide which additional geographical areas are covered in the future.

Advert eyeful

SUPERIOR Software's latest game for the Electron – Barbarian – may be a hit with games players, but is proving an embarrassment to a national magazine.

The game itself has met with approval from all quarters – but its advertising poster has caused an outcry because of its slightly raunchy content.

One publication only agreed to carry an advert providing the offending bits were covered up.

"I can't understand what all the fuss is about", said Steve Hanson, Superior's director.

"If anything the publicity that has arisen looks set to send Barbarian into the number one position in the software charts".

ACCESS & VISA HOTLINE
TEL: JACQUI 0625 528885

21st SOFTWARE

MAIL ORDER ONLY

PRESENTS A SELECTION OF HARDWARE, UTILITIES & SOFTWARE FOR THE ELECTRON

NEW BEAU JOLLY'S NEW
5 STAR GAMES Vol III
Southern Belle, W. of Exploding Fist, Thunderstruck, Frak, Caveman Capers, Strike Force Harrier & Project Thesues – **Only £7.95**

COMPUTER HITS IV
Death Star, The Miner, Thrust, Killer Gorilla, Pyscastria, Repton, Blagger, Zalaga, Ghouls, Bug Eyes II & Galapalus & Karate Force - Only £7.95

NEW RELEASES

A.S.L.	Cass
Impact	7.95
MANDARIN SOFTWARE	
Kampe	£7.95
BLUE RIBBON	
Trapper	1.99
R2	1.99
Mango	1.99
3D Ostby	1.99
Videocard Arcade	1.99

TOP TEN	Cass
Wordmaster	7.75
GODAX	
Starship (joust game)	7.95
Kaktus	7.95
SUPERIOR SOFTWARE	
Barbarian	7.75
Special	7.75
Quest	7.95
Play It Again Sam II	7.95
Repton Through Time	5.95

BACK IN STOCK FOR ELECTRON OWNERS

INCENTIVE'S ADVENTURE CREATOR

Cass only £6.99

MICRO POWER'S POWER PACK

3 Cassettes
Croaker, Tho Mine, Frenzy
All 3 for just £3.95
or £2.50 each title

NEW
P.R.E.S. AP.3
only £110.00

NEW TYNESOFT'S SAIGON
Cass only £7.95

A & F

Chukie Egg	3.90
Cylon Attack	3.90
ACORNSOFT	
Elite	10.95
Forth	8.95
Lisp	4.95
Boxer	1.00
Business Games	2.99
Desk Diary	2.99
Snapper	1.99
View Rom (Cart)	13.95
Viewsheet Rom (Cart)	13.95
Hopper Rom(Cart)	8.95
ISO Pascal Rom (Cart)	54.80
ACORN/LINKWORD	
Italian	8.95
Spanish	8.95
ATARISOFT	
Roboman	4.95
ATLANTIS SOFTWARE	
League Challenge	2.99
BLUE RIBBON	
Nightmare Maze	1.99
Castle Assault	1.99
Astro Plumber	1.99
Diamond Mine	1.99
Diamond Mine II	1.99
Darts	1.99
Joey	1.99
Ravage	1.99
Bar Billiards	1.99
Condition Red	1.99
BEAU JOLLY	
Computer Hits I	8.45
Computer Hits II	8.45
Computer Hits III	8.45
Five Star Games	8.45
Five Star Games II	8.45
BUG BYTE	
Twin Kingdom Valley	2.99
Starforce 7	2.99
Tennis	2.99
Cricket	2.99
Jack Atac	2.95
Savage Pond	2.95
Skyhawke	2.99
Ice Hockey	2.99
Hunk Dory	2.99
Plan B	2.99
Dunjunz	2.99
Squeakalliser	2.99
Templeton	2.99
Plan B II	2.99
COMSOFT	
Serpents Lair	3.95
Playbox	3.95
S.A.S. Commando	3.95
C.D.S.	
Steve Davis Snooker	7.45
Birdie Barrage	6.95
Colossus Chess IV	8.45
Brian Clough's Fortunes	12.95
DR SOFT	
747 Flight Sim.	6.95
Phantom Combat	8.45
DATABASE	
Mini Office	4.95
Micro Olympics	4.95
Majic Sword	5.45
French on the Run	9.95
DOMARK	
Star Wars	7.95

DURELL MARTECH	
Scuba Dive's Castle	3.95
Tarzan	7.50
ELITE	
Paperboy	7.75
EPIC SOFTWARE	
The Lost Crystal	10.95
The Wheel of Fortune	7.45
Castle Frankenstein	5.95
The Guest of the Holy Grail	5.95
Kingdom of Klein	5.95
FIREBIRD	
Star Drifter	2.95
GOLEM LTD	
Education II	6.50
Fun with Words	6.50
Fun with Numbers	6.50
Jigsaw	6.50
GREMLIN GRAPHICS	
Footballer of the Year	7.95
HEWSON	
Heathrow A.T.C.	6.95
Evening Star	7.95
ALL-SOFTWARE	
Bug Eyes II	6.95
Frankenstein 2000	5.95
Dungeon Capers	6.50
Psycastria	6.50
The Last of The Free	6.50
Electron Power Pack	6.95
Thunderstruck	6.75
Thunderstruck II	6.95
Sphere of Destiny	6.75
Omega Orb	6.75
Graham Gooch Test Cricket	7.75
Ziggy	6.75
Electron Power Pack II	7.95
Ranesack	7.95
Deepdark Rider	7.25
IMAGINE	
Wilma	7.45
INCENTIVE	
Confuzion	5.00
Ket Trilogy	8.45
Adventure Creator	13.25
KOSMOS SOFTWARE	
French Mistress A or B	7.95
German Master A or B	7.95
Spanish Tutor A or B	7.95
Italian A or B	7.95
Answer Back Jun. or Sen.	6.95
Answer Back Sport	8.95
Identify Europe	6.95
FACTFILE SERIES	
(Used with Answer Back Series)	
Arithmetic (6-11yrs)	4.25
Spelling (8-12 yrs)	4.25
Natural History (10+)	4.25
English Words (12+)	4.25
First Aid (12+)	4.25
General Science (14+)	4.25
Know England (12+)	4.25
Know Scotland (12+)	4.25
Supersport (14+)	4.25
20th Century History (12+)	4.25
Assassination Football (14+)	4.25
L.C.L.	
Micro French ('O' Level)	21.50
Micro Maths (24 Progs 'O' Level)	21.50
Micro English (24 Progs 'O' Level)	21.50
Mega Maths ('A' Level)	21.50

LARSOFT	
Hex	3.65
Puppet Man	3.65
The Rising of Salandra	4.55
Wychwood	3.65
The Nine Dancers	3.65
LOGOTRON	
Xor	7.75
MELBOURNE HOUSE	
Way of Exploding Fist	8.95
Dodgy Geezers	7.75
MICROPOWER	
Micropower Magic II	6.95
Micropower Magic	6.95
Jet Power Jack	2.95
Positron	2.95
Swag	2.95
Gauntlet	2.95
Chess	2.95
Killer Gorilla	2.95
U.X.B.	2.95
Fells/Evil Weevils	2.95
Felix in Factory	2.35
Felix/Fruit Monsters	2.95
Stock Car	2.95
Rubble Trouble	2.95
Bumble Bee	2.95
MIRRORSOFT	
Tetris	7.25
Spitfire 40	7.95
Harrier Strike Force	7.95
747 Steel	7.95
Here/There with Mr Man	6.95
Quick Thinking Plus	5.95
ROBICO SOFTWARE	
Rick Hansen	7.75
Project Thesius	7.95
Wyvern	7.75
Enthar 7 (5.25") Disc	16.45
Note the above disc-APE VF only	
The Hunt	7.95
Village of Lost Souls	7.95
SOFTWARE INVASION	
3D Bomb Alley	2.95
Gunsmoke	2.95
Blitzkreig	2.95
Super Pool	2.95
Votex	2.95
Chipbuster	5.95
SOFTWARE PROJECTS	
Project Graphics	5.95
SQUIRRELSOFT	
Waterspirit	6.50
Trafalgar	7.00
Cashcare	10.65
M.T.C. Cash	13.65
Building Soc. Care	8.95
Investment Care	12.95
T.V. Director	11.65
Squirrels Nuts Pack	7.95
ACORNSOFT AND SUPERIOR SOFTWARE	
Smash and Grab	6.95
Overdrive	6.50
Thorton	7.95
Death Star	7.95
Repton 2	7.95
Repton 3	7.95
Karate Combat	7.45
Thrust	6.75
Galaforce	7.75
Ravenskull	7.75

Repton 3	7.75
Acornsoft Hits Vol I	7.75
Acornsoft Hits Vol II	7.75
Superior Hits Vol III Cass.	7.75
Superior Hits III Plus 3D	12.95
Around World 40 Screens	5.95
Strykers Run	7.75
Codename Droid	7.75
Crazy Rider	7.75
Crazy Rider (Disc)	12.75
Palace of Magic	7.75
Palace of Magic (Disc)	12.75
Play It Again Sam	7.75
Elkfr	7.95
Spellbinder	7.95
Life of Repton	5.95
Bonecruncher	7.95
TYNESOFT	
Winter Olympiad 88	7.75
Indoor Games	7.95
Soldierdash	7.95
Micro Value Gold	3.99
Spy vs Spy	7.75
Citybridge	6.75
Phantom	6.75
Microvalue	3.49
The Big K.O.	6.75
Futureshock	6.75
Jet Set Willie II	6.75
Goal	6.75
Commonwealth Games	6.50
US Drag Racing	5.95
Jet Set Willy	6.50
Tynesoft Starter Pack I	6.50
Ian Botham Test	6.50
Rig Attack	3.95
Winter Games	6.50
Mousetrap	6.50
Five-A-Side Socca	2.95
Peg Leg	2.95
Bouncing Bombs	2.95
Wet Zone	2.95
Stratobomber	2.95
Caterpillar	2.95
Hyperdrive	2.95
Super Hangman	2.95
3D Maze	2.95
U.K. P.M.	2.95
Invader (I.J.K.)	2.95
Sizzo the Brave	2.95
Cylon Attack	2.95
Trek II	2.95
Space Caverns	2.95
Physics 'O' Level	2.95
Chemistry 'O' Level	2.95
Maths 'O' Level	2.95
U.S. GOLD	
Crystal Castles	8.65
Rebel Planet (text adv)	6.95
Kayleth	6.95

UTILITIES AND HARDWARE SECTION

ACORN COMPUTERS

Electron Power Supply	12.95

ADVANCED COMPUTER PRODUCTS

A.Quarter Meg Ram	75.95
Advanced Battery Ram	37.99
Advanced Control Panel	32.20

UTILITIES AND HARDWARE SECTION CONTINUED

Advanced Plus 2	11.65
Advanced Plus 6	35.95
A. R. Manager	13.65
A. Electron D.F.S. Exs	18.65
Advanced Rom Ad.	13.65
A.S. Ram	27.90
Advanced Disc Inv.	26.55
A.P.4.	75.98
A.P.3.	62.50
Plus I	47.95
AMS Mouse	65.95
FIRST BYTE	
Quickshot Joystick & I/Face	27.99
Quickshot II	9.99
Joystick Interface	18.25
BBC/E Printer Cable	£9.95
A1	
Super Smooth Power Suply + 2yr guarantee + on/off switch	20.45
P.M.S.	
EPROG2	85.00
SLOGGER	
Rombox +	51.95
Joystick Interface	18.65
Electron Expansion 2.0	10.65
Starstore II	27.25
Elkman	9.95
Starman	9.95
Stargraph	9.95
Starword	11.65
Starword Cumana	18.65
Printer Rom	18.65
16K Sideways Ram	27.95
Trek	9.95
S.E.D.F.S.	22.95
T2PS or T2CU or T2P4	22.95
T2SD or T2SEDFS	22.95
Master Ram Board	48.95
Turbo Driver	27.95
Rom Cartridge	11.65
S.E.D.I. (inc. Manual)	70.95
VINE MICROS	
Addcomm	26.00

PLUS 3 DISCS

ACORNSOFT'S

Database	18.65
BLUE RIBBON	
Games Disc 1	8.95
Starsplit	
C.D.S.	
Steve Davis	8.95
Birdie Barrage	8.95
KOSMOS SOFTWARE	
French A+B	18.65
German A+B	18.65
Italian A+B	18.65
Spanish A+B	18.65
Ans. Back Sen.	11.65
Ans. Back Jun.	11.65
Ans. Back Sport	11.65
Any Factfile	7.45
SUPERSOFT SOFTWARE	
Superior Hits III	12.75
Codename Droid	12.75
Crazee Rider	12.75
Palace of Magic	12.75
Play It Again Sam	12.75
Bonecruncher	12.75
Elkfr	12.75

BOX OF TEN C20 COMPUTER CASSETTES £4.99 inc VAT & P&P

EDUCATIONAL & GOVERNMENT ORDERS WELCOME
ALL PRICES ARE INCLUSIVE OF VAT AND CARRIAGE
OVERSEAS ORDERS PLEASE ADD £1.00 PER ITEM. INCLUDES INSURANCE

Please send me: Cass ☐ Plus 3 Disc ☐

1.		£
2.		£
3.		£
4.		£
	TOTAL	£

Please make cheques payable to:
21st Software Ltd
Access No

☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐

Visa, Mastercard, Eurocard
Card holders name

Name

Address

Send Orders to:
21st SOFTWARE LTD. Dept EU
15 Bridgefield Avenue, Wilmslow SK9 2JS
Tel: Wilmslow (0625) 528885

Post Code

Tel. No (STD)

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

Finalist for the Home Software of the Year Award

SOMERSET BRITISH MICRO COMPUTING AWARDS 1985

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

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

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

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

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

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

Now they're all together – in ONE simple package

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

TO ORDER PLEASE USE THE FORM ON PAGE 45

STAYING IN THE SHADOWS

CHRIS NIXON shows how to create your own filing system in the final part of his series on shadow ram

MOST of the techniques we've acquired over the last three articles have this month been incorporated into a complete, stand-alone mini filing system – for discs only – which stores and retrieves strings from the unused memory of your Slogger Master Ram Board.

In the May 1988 issue of *Electron User*, I introduced the idea of accessing the memory in bank zero using a fixed record length as set by the variable *size%*.

Exactly the same principles apply in this month's program, SRFS – Shadow Ram Filing System – except that the whole utility is hidden in pages &900-&B00, well away from the Basic program area.

You may think that this program seems to be no more than a souped-up version of procedures lifted from May's *Electron User* shadow ram article, and you are partially right.

But the advantage of SRFS is that it now provides all of those procedures in operating system command form – something which Basic is simply unable to do.

Seven extra operating system commands are provided by SRFS, using exactly the same command interpreter from June's utility, Twin, and note that even more commands may be added, providing of course, there is sufficient space for them.

The assembled machine code must not be greater than &300 bytes long – 768 decimal – because it must steer clear of page &C00 which is used as the SRFS input/output buffer.

All the new commands are listed in Table I, but before you get started, a reminder of how fixed-size random access records work is needed. So those of you who have followed the series so far, please bear with me.

You may divide the spare 12k area in bank zero into as many records as you wish, providing that the record size is not too large. Setting the size is achieved with the *SIZE command – simply set *S%* to your desired record size and issue a *SIZE command.

This will cause whatever value is currently assigned to *S%* to be the new record size. Note, however, that if *S%* is greater than or equal to 255, an error message

```
  10 REM Shadow Ram
  20 REM Filing System
  30 REM By Chris Nixon
  40 REM (c) Electron User
  50 REM
  60 MODE6:FORPASS=0TO2STEP
2
  70 ptr1=&52:ptr2=&54:mess
=&56
  80 txtptr=&58:count=&59:s
ize=&5A
  90 rec=&5C:ptr=&5E:byte=&
60
 100 m1=&61:m2=&64:handle=&
66
 110 size1=&67
 120 P%=&900:OPT PASS
 130 LDA &209:BPL skipvec
 140 LDA &208:STA &230:LDA
&209
 150 STA &231:LDA #patch MO
D 256
 160 STA &208:LDA #patch DI
V 256
 170 STA &209
 180 .skipvec
 190 JMP Cclear
 200 .patch
 210 STX &70:STY &71:LDX #0
 220 .wordip
 230 LDY #1:LDA comtab,X:BE
Q notfound
 240 .bytelp
 250 LDA comtab,X:CMP #13:B
EQ found
 260 LDA (&70),Y:AND #223:C
MP comtab,X
 270 BNE nextword:INX:INY:J
MP bytelp
 280 .nextword
 290 INX:LDA comtab,X:BNE n
extword
 300 INX:JMP wordlp
 310 .notfound
 320 LDX &70:LDY &71:JMP (&
230)
 330 .found
 340 STY txtptr:LDA comtab+
1,X:STA &50
 350 LDA comtab+2,X:STA &51
:JMP (&50)
 360 .Csize
 370 CLC:LDA &44C:ADC #1:ST
A size
 380 LDA &440:ADC #0:STA si
ze+1
 390 LDA size+1:BEQ sizeOK
 400 BRK:EQUB52:EQUS"Size t
oo big":BRK
 410 .sizeOK
 420 RTS
 430 .Crecord
 440 LDA &448:STA rec:LDA &
449
 450 STA rec+1:JSR mult:LDA
 ptr+1
 460 CMP #830:BCC recOK:JMP
 badram
 470 .recOK
 480 .mult
 490 LDA size:STA m1:LDA si
ze+1
 500 STA m1+1:LDA rec:STA m
2:LDA rec+1
 510 STA m2+1:LDA #0:STA pt
r:STA ptr+1
 520 LDY #16
 530 .mloop
 540 ROR m2+1:ROR m2:BCC nu
lt1
 550 CLC:LDA m1:ADC ptr:STA
 ptr
 560 LDA m1+1:ADC ptr+1:STA
 ptr+1
 570 .mult1
 580 ASL m1:ROL m1+1:DEY:BN
E mloop
 590 RTS
 600 .Cput
 610 LDA #0:STA count
 620 .putloop
 630 LDY count:LDA &C00,Y:J
SR put
 640 JSR incptr:JSR checkra
m:INC count
 650 LDA count:BEQ error:CM
P size
 660 BCC put1:BEQ put1
 670 .error
 680 BRK:EQUB50:EQUS"String
 exceeds record size":BRK
 690 .put1
 700 LDA byte:CMP #13:BNE p
utloop
 710 JMP nextrec
 720 .Cget
 730 LDA #0:STA count
 740 .getloop
 750 JSR get:LDY count:STA
&C00,Y
 760 JSR incptr:JSR checkra
```

number 52 is generated: *Size too big*.

This is because Basic cannot handle strings with a length greater than 255 characters. And as SRFS reserves one extra character in each record as the carriage return marker, this limit becomes 254.

In all, SRFS can generate three possible errors and associated error numbers, thereby enabling Basic's ON ERROR condition to fully trap any mistakes you make. We'll cover these messages as we go along.

After setting the record size, you are ready to begin storing and retrieving strings from your 12k data area. To do this, you must tell SRFS which record you want to deal with by giving *R*% a record number, and issuing a *RECORD command.

In a similar fashion to *SIZE, *RECORD makes SRFS take whatever value is in *R*%, but this time it is used as the record number. The record size is then multiplied by this number to obtain the exact position within bank zero to which SRFS will set its record pointer.

If the new pointer value exceeds the end of the 12k data area, an error number 51 will be generated: *Ram bank overflow*. This is simply to inform you that an illegal address has been obtained, and any subsequent read or writes at this address will generate the same error.

To file a string at the pointer's current position, it must first be placed in page &C00, with a statement similar to these two examples:

```
$&C00="You are facing north."
$&C00=LEFT$(A$,20)
```

Next, the string is filed with the *PUT command. To retrieve a string, follow the same steps, but use *GET instead. Obviously, this time there is no need to have placed anything into &C00 first – if you had it would be wiped out by the action of *GET.

If either a *PUT or a *GET command causes the SRFS ram pointer to extend past &3000 while in the process of storing or retrieving a record, you will also receive error number 51. And if, while PUTting or GETting, SRFS finds that the string in question is longer than the record size – as set up with *SIZE – then a different error, number 50, will be displayed: *String longer than record size*.

All three possible SRFS errors generate numbers which Basic has left free, so that if your error trapping routine spots them it knows that they were caused by the SRFS – unless you have a utility rom which also uses these numbers for its own error messages.

The next two commands are for saving and loading the complete 12k data area to or from disc, and are entered in the conventional way. That is, with a legal filename following. There

Turn to Page 10 ▶

*SIZE	Uses *S*% to set the record size
*RECORD	Uses *R*% to set the record pointer
*PUT	Places $&C00 in bank zero
*GET	Retrieves $&C00 from bank zero
*RAMSAVE	Saves all 12k of data to disc
*RAMLOAD	Loads data area from disc
*CLEAR	Wipes the 12k area clean
*HELP	Lists SRFS commands along with roms

Table I: The command list

```
m:INC count
  770 LDA count:BEQ error:CM
P size1
  780 BCC get1:BEQ get1:JMP
error
  790 .get1
  800 LDA byte:CMP #13:BNE g
etloop
  810 JMP nextrec
  820 .put
  830 STA byte:LDX ptr:LDY p
tr+1
  840 LDA #&40:PHA:PLP:LDA b
yte
  850 JMP &FBFD
  860 .get
  870 LDX ptr:LDY ptr+1:LDA
#0:PHA
  880 PLP:JSR &FBFD:STA byte
:RTS
  890 .Crsave
  900 CLC:LDA &70:ADC txtptr
:TAX
  910 LDY &71:LDA #&00:JSR &
FFCE
  920 STA handle:LDA #0:STA
ptr
  930 STA ptr+1
  940 .saveloop
  950 JSR get:LDY handle:JSR
&FFD4
  960 JSR incptr:LDA ptr+1:C
MP #&30
  970 BCC saveloop:LDY handl
e:LDA #0
  980 JMP &FFCE
  990 .Crload
 1000 CLC:LDA &70:ADC txtptr
:TAX
 1010 LDY &71:LDA #&00:JSR &
FFCE
 1020 CMP #0:BNE load:BRK:EQ
UB52
 1030 EQUS'File not on disc'
:BRK
 1040 .load
 1050 STA handle:LDA #0:STA
ptr
 1060 STA ptr+1
 1070 .loadloop
 1080 LDY handle:JSR &FFD7:B
CS endload
 1090 JSR put:JSR incptr:JMP
 loadloop
 1100 .endload
 1110 LDY handle:LDA #0:JMP
&FFCE
 1120 RTS
 1130 .Cclear
 1140 LDA #0:STA ptr:STA ptr
+1
 1150 STA size:STA size+1:ST
A rec
 1160 STA rec+1
 1170 .clear
 1180 LDA #13:JSR put:JSR in
cptr
 1190 LDA ptr+1:CMP #&30:BNE
 clear
 1200 LDA #0:STA ptr:STA ptr
+1:RTS
 1210 .Chelp
 1220 LDA #title MOD 256:STA
 mess
 1230 LDA #title DIV 256:STA
 mess+1
 1240 JSR message:LDA #6:STA
 count
 1250 LDX #0
 1260 .indent
 1270 LDA #32:JSR &FFEE:LDA
#42:JSR &FFEE
 1280 .cread
 1290 LDA comtab,X:CMP #13:B
EQ help1
 1300 AND #223:JSR &FFEE:INX
:BNE cread
 1310 .help1
 1320 JSR &FFE7:INX:INX:INX:
INX
 1330 DEC count:BPL indent:L
DX &70
 1340 LDY &71:JMP (&230)
 1350 .message
 1360 LDY #0
 1370 .messloop
 1380 LDA (mess),Y:BEQ endme
ss
 1390 JSR &FFE3:INY:BNE mess
loop
 1400 .endmess
 1410 RTS
 1420 .incptr
 1430 CLC:LDA ptr:ADC #1:STA
 ptr
 1440 LDA ptr+1:ADC #0:STA p
tr+1:RTS
 1450 .checkram
 1460 LDA ptr+1:CMP #&30:BCC
 ptrOK
 1470 .badram
 1480 BRK:EQUB51:EQUS"Ram ba
nk overflow":BRK
 1490 .ptrOK
 1500 RTS
 1510 .nextrec
 1520 CLC:LDA rec:ADC #1:STA
 rec
 1530 LDA rec+1:ADC #0:STA r
ec+1
 1540 JMP mult
 1550 .title
 1560 EQUB13:EQUS'SRFS comma
nds:":EQUB13:BRK
 1570 .comtab
 1580 EQUS'SIZE':EQUB13:EQUW
 Csize:BRK
 1590 EQUS'RECORD':EQUB13:EQ
UW Crecord:BRK
 1600 EQUS'PUT':EQUB13:EQUW
 Cput:BRK
 1610 EQUS'GET':EQUB13:EQUW
 Cget:BRK
 1620 EQUS'RAMSAVE':EQUB13:E
QUW Crsave:BRK
 1630 EQUS'RAMLOAD':EQUB13:E
QUW Crload:BRK
 1640 EQUS'CLEAR':EQUB13:EQU
W Cclear:BRK
 1650 EQUS'HELP':EQUB13:EQUW
 Chelp:BRK
 1660 BRK
 1670 ]:NEXT
 1680 OSCLI"SAVE SRFS 900 "+
STR$~P%
```

Programming

◄ *From Page 9*

must be at least one space separating the command from the filename.

Finally, the *CLEAR command fills the whole 12k area with carriage return markers – CHR$(13) – effectively wiping it clean. Use it with care, as there will be no warning prompt given.

Actually, there is one last command, but it doesn't really count as an SRFS command. It's *HELP, which is diverted temporarily from the operating system to display the available SRFS facilities, before returning to list the Electron's rom tally.

But note that if abbreviated to *H. or made specific by following it with a rom's name – for instance *HELP DFS – it will be ignored by SRFS and will not display the available commands.

Type in Program I and save it using a suitable name, such as SHADOW. When run, the assembled machine code will be saved as SRFS, and is ready for use.

Now type *SRFS to run the utility, and when the prompt re-appears, enter Program II and run it. It demonstrates nicely the principles involved, by reading five items of data one by one and placing them in bank zero.

```
 5 REM Program II
 10 MODE 6
 20 S%=&0
 30 *SIZE
 40 FOR R%=0 TO 4
 50 *RECORD
 60 READ $&C00
 70 *PUT
 80 NEXT
 90 END
100 DATA "LOOK. THIS IS A"
110 DATA "TEST OF THE NEW"
120 DATA "ELECTRON SRFS"
130 DATA "UTILITY, WHICH"
140 DATA "IS VERY USEFUL"
```

Lines 20-30 set up the record size, and by using *R%* as the actual loop variable itself in the FOR...NEXT loop at line 40, the *RECORD command can be neatly inserted inside the start of the loop at line 50.

Line 60 reads an item of data into page &C00, and line 70 files it away to bank zero. The FOR...NEXT loop terminates after four passes at line 80, and the program ends at line 90.

The whole process is lightning fast, typically taking less than one second to store 200 strings, each with a length of 50 bytes. This, perhaps more than anything, demonstrates the usefulness of having the routines available as operating system extensions.

Now type in Program III and run it. As you can see, the strings are retrieved with equal speed.

```
 5 REM Program III
 10 MODE 6
 20 S%=&0
 30 *SIZE
 40 FOR R%=0 TO 4
 50 *RECORD
 60 *GET
 70 PRINT $&C00
 80 NEXT
 90 END
```

These two short programs are really just to demonstrate how the SRFS works in practice. Much more imaginitive programs could be written, such as adventure games, databases and so on.

It's now up to you to make what you can of your extra 12k, using the techniques discussed during this series, and we at *Electron User* will await the submission of any resultant programs with great interest.

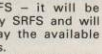
SAVE £££'s SAVE £££'s SAVE £££'s SAVE £££'s SAVE £££'s SAVE £££'s SAVE £££'s

WHOLESALE PRICES – DIRECT FROM THE WAREHOUSE!

Importers . . . Manufacturers . . . Distributors . . .

Telephone: 0664 410666

STORAGE BOXES



3.50" Lockable – Holds 40 ..... £4.95
3.50" Lockable – Holds 80 ..... £6.95
3.50" Lockable – Holds 120 ..... £8.95

5.25" Lockable – Holds 50 ..... £4.95
5.25" Lockable – Holds 100 ..... £6.97
5.25" Lockable – Holds 140 ..... £8.97

ALL WITH LOCK & TWO KEYS
DIVIDERS & ANTISTATIC!

ACCESSORIES

Mouse Mat £4.95
BBC Printer Cable £5.95
Atari etc Printer Cable £6.95
3.5" Cleaning Kit (fluid) £4.95
5.25" Cleaning Kit (fluid) £3.95
Disk Notcher (doubler) £4.95
12" Monitor Stand £11.95
14" Monitor Stand £14.95
Desk Top Copy Holder A4 ..... £14.95
Desk Top Copy Holder A3 ..... £14.95
Space Saver Printer Stand (80 col) £24.95
Economy Printer Stand (80 col) £13.95

!!! FLOPPY DISKounts!!! THE MORE YOU BUY – THE MORE YOU SAVE!!!

3.5" Bulk Packed–

Price each disk	25+	50+	75+	100+	150+
Single Sided 135 T.P.I.	84p	82p	80p	78p	76p
Double Sided 135 T.P.I.	86p	84p	82p	80p	78p

ALL DISCS ARE SUPPLIED WITH LABLES AND ARE CERTIFIED 100% ERROR FREE

5.25" Bulk Packed–

Price each disk	25+	50+	75+	100+	150+
Single Sided 48 T.P.I.	42p	37p	33p	30p	29p
Double Sided 48 T.P.I.	44p	39p	34p	32p	31p
Double Sided 96 T.P.I.	46p	41p	36p	34p	33p
Double Sided Col. 96 T.P.I.	55p	49p	45p	39p	38p
Double Sided Rev. 96 T.P.I.	55p	49p	45p	39p	38p

COLOURED DISKS, COME IN FIVE COLOURS (RED, BLUE, WHITE, YELLOW, GREEN)

REVERSIBLE DISKS HAVE TWO INDEX HOLES AND TWO NOTCHES!

ALL DISKS COME WITH ENVELOPE AND LABEL SET AND HAVE A HUB RING AND FULL GUARANTEE

BULK PACKED OFFERS – BEST VALUE IN TOWN

25 Double Sided 5.25" 96T.P.I. Disks with our storage box £11.50
50 Double Sided 5.25" 96T.P.I. Disks with our storage box £17.00
75 Double Sided 5.25" 96T.P.I. Disks with our storage box £22.50
100 Double Sided 5.25" 96T.P.I. Disks with our storage box £28.50

You can choose either 50 capacity storage box or 100 capacity storage box to go with your discs. If you want a 140 capacity storage box just add a further £2.50

20 Double Sided 3.5" 135T.P.I. Disks with our storage box £19.95
40 Double Sided 3.5" 135T.P.I. Disks with our storage box £36.95
60 Double Sided 3.5" 135T.P.I. Disks with our storage box £49.95
80 Double Sided 3.5" 135T.P.I. Disks with our storage box £64.95

You can choose either 40 capacity storage box or 80 capacity storage box to go with your discs. If you want a 120 capacity storage box just add a further £2.50

ALL BOXES COME WITH LOCK, 2 KEYS, DIVIDERS AND ARE ANTISTATIC

ALL DISKS COME WITH LABELS AND ARE 100% GUARANTEED ERROR FREE

All Disks are sent by Trackback or Courier Service at no extra cost!

MELTON COMPUTER SUPPLIES

PO Box 2, Melton Mowbray, Leicestershire.

☎ **0664 410666 (24 hrs)**

Please for our best price before placing your order
EDUCATIONAL & GOVERNMENT ORDERS WELCOME

Please ask for FREE catalogue

E&OE **Remember the price you see is all you pay (U.K. only). Prices include VAT and carriage**

SAVE £££'s SAVE £££'s SAVE £££'s SAVE £££'s SAVE £££'s SAVE £££'s SAVE £££'s

Getting your name up in lights

ROLAND WADDILOVE keeps track of the score in the final part of his sprites series

SO far in this series I have presented a Mode 5 sprite editor that enables you to create multi-coloured characters, a variety of print routines which move them in front and behind objects on screen and several map drawing facilities.

To round off this brief look at some of the techniques used in writing fast-moving all-action arcade games, this month I'll show how to keep track of the score and display it on the screen.

There are several ways of doing this, each with attendant advantages and disadvantages.

The first method we'll look at is shown in Program I, so enter and run this, not forgetting to save it first just in case you make a typing error and the Electron crashes – always a problem with machine code programs.

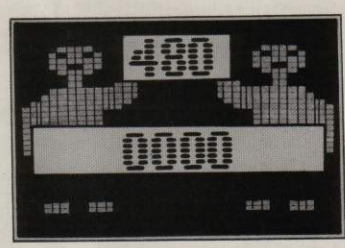
You'll see the score printed in the centre of the screen. Tap the spacebar to increment it and notice that it goes up in 10s. Actually this is an illusion, as it really increases by one each time.

Line 80 prints a row of five zeros in the middle of the screen initialising the score, but only the first four digits are updated. The extra zero tagged on to the end gives the impression that the score goes up in 10s.

The score is stored as the string "0000" at line 470, and the subroutine *score* increments the last digit by one.

If the Ascii code becomes equal to ASC"0"+10 it is reset to ASC"0" and the next digit is incremented. This is tested for ASC"0"+10 and so on for all four digits.

The score is printed by picking up each character and passing it to the operating system print routine oswrch in lines 380 to 430.



```
   10 REM Score 1
   20 REM By R.A.Waddilove
   30 REM (c) Electron User
   40 MODE 5
   50 PROCassemble
   60 PRINT TAB(0,5)"Tap th
e spacebar..."
   70 COLOUR 2
   80 PRINT TAB(4,10)"SCORE
:0000"
   90 CALL &900
  100 END
  110
  120 DEF PROCassemble
  130 oswrch=!&208
  140 FOR pass=0 TO 2 STEP
2
  150 P%=&900
  160 COPT pass
  165
  170 .main
  180 JSR &FFE0
  190 BCS exit
  200 JSR score
  210 JMP main
  220 .exit
  230 RTS
  240
  250 .score
  260 LDX #3
  270 .loop
  280 INC digits,X
  290 LDA digits,X
  300 CMP #ASC"0"+10
  310 BNE sc_ok
  320 LDA #ASC"0"
  330 STA digits,X
  340 DEX
  350 BPL loop
  360 .sc_ok
  370 LDX #0
  380 .loop
  390 LDA digits-3,X
  400 JSR oswrch
  410 INX
  420 CPX #7
  430 BNE loop
  440 RTS
  450
  460 EQUB 31:EQUB 10:EQUB
10
  470 .digits EQUS "0000"
  480 ]
  490 NEXT
  500 ENDPROC
```

Program I

The three EQUBs at line 460 hold the screen print coordinates of the score in the form VDU 31,*x*,*y*. Alter the last two parameters to position the score elsewhere.

This routine has the advantage of simplicity and compactness. It isn't particularly fast, as it uses the operating system to print the digits. However, it's quick enough for the majority of games, particularly *Electron User* listings.

The second method we'll look at uses binary coded decimal arithmetic, which, although sounding very complicated, is fairly straightforward, but it does involve a bit of extra code.

Enter and run Program II to see this technique in action, and tap the spacebar to increment the score. Notice that this time it goes up in 50s.

Again it's an illusion as the last digit – zero – remains unaltered and the program increments the score in steps of five each time.

The score is stored at &71 – labelled *digits* in line 150 – and four digits are stored in just two bytes. If you look at these in hexadecimal they would appear to be like 00 00 at the start of the program.

Adding five in lines 310 to 370 makes them 00 05, another five and they become 00 10, then 00 15 and so on. As you can see, each nybble holds a separate digit and to display the score all we need to do is write a hexadecimal print routine. You can see this at lines 420 to 530.

The left digit in each byte is rotated into the right nybble using LSR A, masked off with AND #&0F and turned into an Ascii digit by adding ASC"0". Again oswrch is used to print the characters.

How do we make the 6502 use binary coded decimal instead of ordinary arith-

Turn to Page 12 ▶

◀ From Page 11

metic? This is in fact easily done, simply execute SED – SEt Decimal mode flag in the status register – just before incrementing the score.

Don't forget to clear it afterwards with CLD – CLear Decimal mode flag – otherwise you may find your program producing odd results.

This routine is still fairly compact, and relatively simple. But as before, it isn't particularly fast, though it is quick enough for most games, especially magazine listings.

The final method is shown in Program III. Enter and run this, and as with the others, tap the spacebar to increment the score.

This is by far the longest listing, and the most complex too. However, it is extremely fast so is prefered when maximum speed is essential.

It uses the binary coded decimal arithmetic method of Program II, though the Ascii string method of Program I could have been used just as easily.

The reason this program is so much faster than the others is that it contains its own print routine, and the numbers are stored as sprites. They were designed using the sprite designer in the first article in this series.

The print routine can be seen at lines 510 to 560 and is a straight poke of eight bytes to the screen. This makes each digit half the normal Mode 5 width.

And that rounds up this series on writing arcade games. There is plenty of material in these six articles to keep you occupied for some time to come, and all the listings are available on our Arcade Game Creator tape.

Special: Arcade game creator

ALL the programs from this series revealing the secrets of writing fast-action arcade games have been put on a special cassette (£3.95) and disc (£4.95). On it you'll find everything you need to create your own machine code games.

The programs include:

- *A Mode 5 sprite editor for designing your own multicoloured characters.*
- *A selection of fast print routines that will move sprites both in front or behind other objects on the screen.*
- *Map generators that will squeeze a Mode 5 screen into eight bytes.*
- *Scrolling maps.*
- *Score print routines*

. . . and much more. This is an offer no aspiring games programmer can afford to miss!

To get this great offer, use the order form on Page 45


```
   10 REM Score 2
   20 REM By R.A.Waddilove
   30 REM (c) Electron User
   40 MODE 5
   50 PROCassemble
   60 PRINT TAB(0,5)"Tap th
e spacebar..."
   70 COLOUR 2
   80 PRINT TAB(3,10)"SCORE
:000000"
   90 CALL &900
  100 END
  110
  120 DEF PROCassemble
  130 oswrch=!&20E
  140 temp=&70
  150 digits=&71
  160 !digits=0
  170 FOR pass=0 TO 2 STEP
2
  180 P%=&900
  190 [OPT pass
  200
  210 .main
  220 JSR &FFE0
  230 BCS exit
  240 JSR score
  250 JMP main
  260 .exit
  270 RTS
  280
  290 .score
  300 SED
  310 CLC
  320 LDA digits+1
  330 ADC #5
  340 STA digits+1
  350 LDA digits
  360 ADC #0
  370 STA digits
  380 CLD
  390 LDA #31:JSR oswrch
  400 LDA #10:JSR oswrch
  410 LDA #10:JSR oswrch
  420 LDA digits:JSR print
  430 LDA digits+1
  440 .print
  450 STA temp
  460 LSR A:LSR A:LSR A
A
  470 JSR number
  480 LDA temp
  490 .number
  500 AND #&0F
  510 CLC
  520 ADC #ASC"0"
  530 JMP oswrch
  540 ]
  550 NEXT
  560 ENDPROC
```

Program II

```
   10 REM Score 3
   20 REM By R.A.Waddilove
   30 REM (c) Electron User
   40 MODE 5
   50 PROCassemble
   60 PRINT TAB(0,5)"Tap th
e spacebar..."
   70 COLOUR 2
   80 PRINT TAB(3,10)"SCORE
:"
   90 CALL &900
  100 END
  110
  120 DEF PROCassemble
  130 new=&70
  140 temp=&72
  150 digits=&73
  160 !digits=0
  170 FOR pass=0 TO 2 STEP
2
  180 P%=&900
  190 [OPT pass
  200
  210 .main
  220 JSR &FFE0
  230 BCS exit
  240 JSR score
  250 JMP main
  260 .exit
  270 RTS
  280
  290 .score
  300 LDA #&10:STA new:LDA
#&65:STA new+1
  310 SED
  320 CLC
  330 LDA digits+1
  340 ADC #5
  350 STA digits+1
  360 LDA digits
  370 ADC #0
  380 STA digits
  390 CLD
  400 LDA digits:JSR print
  410 LDA digits+1
  420 .print
  430 STA temp
  440 LSR A:LSR A:LSR A:LSR
A
  450 JSR number
  460 LDA temp
  470 .number
  480 AND #&0F
  490 ASL A:ASL A:ASL A
  500 TAX
  510 LDY #0
  520 .loop
  530 LDA numdata,X
  540 STA (new),Y
  550 INX
  560 INY:CPY #8:BNE loop
  570 CLC
  580 LDA new:ADC #8:STA ne
w
  590 LDA new+1:ADC #0:STA
new+1
  600 RTS
  610
  620 .numdata
  630 OPT FNread
  640 ]
  650 NEXT
  660 ENDPROC
  670
  680 DEF FNread
  690 RESTORE
  700 REPEAT
  710 READ byte
  720 [OPT pass
  730 EQUB byte
  740 ]
  750 UNTIL byte<0
  760 =pass
  770
  780 DATA 14,10,10,10,10,1
0,10,14
  790 DATA 6,6,6,6,6,6,6,6,
14,10,2,2,6,12,8,14,14,10,2
,6,6,2,10,14,2,6,4,12,8,10,
14,2
  800 DATA 14,8,8,8,14,2,2,10
,14,12,8,8,8,14,10,10,14,14
,10,2,2,6,4,4,4,14,10,10,10
,14,10,10,14
  810 DATA 14,10,10,14,2,2,
2,2,-1
```

Program III

FREE MYSTERY GIFT WITH EVERY ORDER!

AMAZING OFFERS

SCOOP PURCHASE

ELECTRON COMPUTERS

Includes power supply, aerial lead, user guide and 90 day warranty

ONLY £59.95

VIEW (Word Processor) ~~£29.95~~ **£14.95**

VIEW SHEET (Spreadsheet) ~~£29.95~~ **£14.95**

BUY BOTH £21.95!!

JUNE SPECIALS

LOGO ROM

~~£59.95~~ **£24.95!**

Plus 3 Games Disc £4.95

Lloytron

DATA RECORDERS

Suitable for the Electron

only £19.95

HOME INTEREST

Crazy Tracer	~~£6.99~~	Desk Diary	~~£6.99~~
Snapper	~~£6.99~~	Graphs & Charts	~~£6.99~~
Boxer	~~£6.99~~	Theatre Quiz	~~£14.95~~
Turtle Graphics	~~£6.99~~	Watch Your Weight	~~£6.99~~
Chess	~~£6.99~~	The Complete Cocktail Maker	~~£6.99~~
Business Games	~~£6.99~~		

Any Five for Only £7.95

VOLTMACE TWIN JOYSTICKS

for use with Plus One or BBC

Normally ~~£19.95~~

Now Only £16.95!

NEW GAMES

Elite – Cass **£9.50!**

Computer Hits 3 or 4
Acornsoft Hits I or II
Superior Collection Vol III
Cass
Codename Droid*
Strykers Run
Crazee Rider*
Palace of Magic*
Spitfire
Play It Again Sam*
Spellbinder
Bonecruncher
Quest
Play It Again Sam II
Winter OLympiad
Skirmish
Kourtyard
Spy Cat

Cassette ~~£9.95~~ £7.45!
***3.5" Disc ~~£14.95~~ £11.50!**

MICROPOWER GAMES

Felix in the Factory	~~£7.95~~	Stock Car	~~£6.95~~
Croaker	~~£7.95~~	Swoop	~~£7.95~~
Bumble Bee	~~£7.95~~	Jetpower Jack	~~£7.95~~
Gauntlet	~~£7.95~~	Cybertron Mission	~~£7.95~~
Killer Gorilla	~~£7.95~~	Galactic Commander	~~£7.95~~
Rubble Trouble	~~£7.95~~	Moonraider	~~£7.95~~
Electron Invaders	~~£7.95~~	Bandits at 3 O'Clock	~~£6.95~~
Felix Fruit Monsters	~~£7.95~~	Adventure	~~£7.95~~
Chess	~~£7.95~~	Swag	~~£6.95~~
Danger UXB	~~£7.95~~	Escape from Moon Base	~~£7.95~~
Frenzy	~~£7.95~~	Ghouls	~~£7.95~~
Felix meets the Evil Weevils	~~£6.95~~	The Mine	~~£7.95~~
		Gyroscope	~~£7.95~~

Any Five for Only £7.95

Micropower Magic Compilations 1 & 2

Only £5.95 each!

Electron Joystick Interface and Software

£14.95

Quickshot II Turbo Joystick

£13.95

Buy Both for only £25.00!

EDUCATION SPECIALS

Linkword Spanish	~~£14.95~~	Maths 'O' Level II	~~£12.95~~
Linkword Italian	~~£14.95~~	Where?	~~£6.95~~
Talkback	~~£6.95~~	Biology	~~£12.95~~
Workshop	~~£6.95~~	English	~~£12.95~~

BBC & ELECTRON AVAILABLE ANY TWO FOR £3.95

Maths with a Story I or 2
BBC/ELE Cass ~~£11.95~~ **£9.95 each**

The best 4 language programs (set)
The best 4 maths programs (set)
BBC/ELE Cass ~~£23.43~~ **£17.95 per set**

Answerback Junior Quiz		£7.95
Answerback Senior Quiz		£7.95
Identify Europe		£6.35
Mini Office I	~~£5.05~~	£4.45
Lisp Cartridge	~~£20.05~~	£9.95
Lisp Cassette	~~9.95~~	£2.95
Me & My Micro BOok		£1.00
Advanced User Guide		£2.95
How to Write Adventure Games (Book)	~~£5.95~~	£4.75

NEW

ELECTRON REPAIR SERVICE

Phone for details

Fantastic Offer

Brand New Ferguson 12" Green Screen Monitors (MM02)

Only £59.95

ELECTRON or BBC lead supplied FREE!

Name_____

Address _____

_____

_____

_____

I Claim my Mystery Gift EU7

VISA

Please make cheques/P.O's payable to Software Bargains & add 95p P&P. All prices include VAT

☎ **0532-687735** Out of hours Ansaphone

SOFTWARE Bargains

Order via Micronet

Goods despatched within 48 hours subject to availability

Dept EU7, 8/8A Regent Street, Chapel Allerton, Leeds LS7 4PE

Learning CAN be fun

- Use your Electron to teach and amuse your children at the same time.
- Three packages crammed full of educational programs – and so easy to use!
- Each program has been educationally approved after extensive testing in the classroom.

ONLY
£4.95 tape
£5.95
3½" disc

Ages 2-5

- Alphabet
- Colours
- Counting
- House
- Magic Garden
- Matchmaker
- Numbers
- Pelican
- Seaside
- Snap

PELICAN
Teach your children to cross the road safely at a Pelican crossing

HOUSE
Select the colours to draw a house – hours of creative entertainment

Ages 5-8

- Balance
- Castle
- Derrick
- Fred's Words
- Hilo
- Maths Test
- Mouser
- Number Signs
- Seawall
- Super Spell

NUMBER SIGNS
Provide the correct arithmetic sign and aim to score ten out of ten

BALANCE
Learn maths the fun way. Type in the answer to balance the scales

Ages 8-12

- Anagram
- Codebreaker
- Dog Duck Corn
- Guessing
- Hangman
- Maths Hike
- Nim
- Odd Man Out
- Pelmanism
- Towers of Hanoi

HANGMAN
Improve your child's spelling with this fun version of the popular game

ODD MAN OUT
Find the word that does not fit – before your time runs out

TO ORDER PLEASE USE THE FORM ON PAGE 45

Spy spoof

Program: Spycat
Price: £9.95
Supplier: Superior, Regent Street, Skinner Lane, Leeds LS7 1AX.
Tel: 0532 459 453

SPYCAT, Superior's latest release for the Electron, is based very loosely on the recent Peter Wright Spycatcher fiasco.

In it, you play the role of a shady character going by the name of Spycat. After loyally serving MI4-and-a-half for more than 50 years you hear that you are soon to be retired with only a mere pittance of a pension.

This has something to do with the ministry's cash shortages and the government's recent budget cuts.

You feel humiliated and betrayed, and resolve to steal three important classified research documents before fleeing to Greenland to write your memoirs.

To give you an idea of the thread of humour which runs throughout this extremely well-written arcade adventure, you will at some point come

across the following locations:

Blackhall, 10 Drowning Street, the sewers, Heathrow Airport, Greenland, and a location so secret that no one even knows where it is.

During your endeavours you will come across some familiar faces – enlist their support if you can. But watch out for the technical wizard Q, and his many strange and dangerous creations.

Several objects are scattered about, and the purpose of some is rather dubious to say the least. Among the items to be found are a Sinclair Z88, a pound coin, some US secrets and a passport.

During the game you control a small, cloaked figure, which is presumably a cat in a trenchcoat. It is animated quite smoothly, and responds tightly to the control keys.

The best bit of animation is when you leave the keyboard alone for a while. After a few moments, Spycat will flash at you, revealing a kinky penchant for polka-dot boxer shorts.

To use certain items, you must be standing on one of several platforms which are scattered at various useful locations. And that brings me to the worst feature of Spycat.

Every action in the game, apart from the movement of the main figure, is controlled from a small panel of icons

Spycat meets an enemy agent

at the top of the screen.

Picking up, replacing and using objects, opening doors, turning the game sound on and off and more are all done by moving a pointer to highlight the relevant icon, followed by pressing Return.

This seems silly. In a different game with a different scenario it would be a perfectly acceptable way of controlling parts of the action. In Spycat however, with its already crowded Mode 5 screen, it quickly becomes tiresome and slows down the action.

This is a shame, as it's my only complaint in an otherwise excellent game. I can see the temptation to add more of a high-tech feel to a game of this type, but the programmer has

succumbed to using positively unhelpful gimmickry.

All in all, though, Spycat is an excellent arcade adventure with a strong vein of humour underlying all the action – seeing Maggy at her desk in number 10 Drowning Street really tickled me.

If you can get used to the unwieldy icon system, this game is certainly worth the cash – it will puzzle and amuse you for days to come.

Chris Nixon

Sound	*3*
Graphics	*9*
Playability	*8*
Value for money	*8*
Overall	*7*

Margaret Thatcher at 10 Drowning Street

Cheap thrills

Product: Four Great Games
Price: £3.99
Supplier: Tynesoft, Unit 3, Addison Industrial Estate, Blaydon, Tyne & Wear NE21 4TE.
Tel: 091 414 4611

BUDGET games are the bread and butter of the Electron games market at the moment, and the vast majority of products released on budget labels are pretty good value for money.

Four Great Games is a new two-cassette compilation of four Tynesoft games previously released in their own right.

At £3.99 it's aimed at the limited pocket money end of the market, and as the blurb on the cassette inlay points out, you're paying less than £1 per game.

However, this rather hides the fact that two of the games as they stand are, in my opinion, not up to the present general standard expected of even budget software.

Kastle is the first of the four titles, and is one of the exceptions to my

Kastle – an arcade adventure

criticisms. It's an arcade adventure in which you play the part of a knight, armed with a broadsword, who must negotiate the long-forgotten castle of Keltdown forest to reach your goal.

What this goal is supposed to be is not mentioned, but perhaps that's part of the puzzle – which is quite complex, involving hidden levers, moving portcullisses and shifting platforms.

I quite enjoyed the game. There are skeletons to fight and evil black crows will swoop on you from their perches. Both can be dispatched swiftly with your sword, but must be hit before they get past your sword arm.

US Drag Racing surprised me the most. Apparently it was previously available as a full-price game on its own.

The starting screen looks impressive enough, with two powerful dragsters sitting on the line waiting for the green light. But the fun begins when you start your motor and move off.

Revving the engine is achieved by frantically pumping two keys up and down to a set rhythm. Until now, I had thought that this sort of action was reserved for sports-type simulations – it is totally inappropriate when applied to controlling a racing car of whatever description.

Having mastered accelerating off the starting line, I was in for my second surprise. The only parts of the game which are animated are the black and white edges of the two racing lanes.

Not even the occasional bit of scenery flies by to give an impression of speed, which, by the way, is incredibly slow anyway, despite the lack of animated action.

Goal fared rather better. In fact, it was my favourite out of the four, achieving by far the best animated sequences and excitement factor. You have the programming talents of Tynesoft's Dave Croft to thank for this soccer simulation.

You can control any of the white players. Depending on which is closest to the ball, control is passed to the nearest player by pressing Return.

This is an unfortunate choice of key, however, because it is also used to kick the ball when you are up close to it.

The result of a missed kick can be a sudden switch of control to another player, which can take you a moment or two to realise, leaving you way off the ball by the time the penny drops.

The opposing side is controlled by the Electron, and you can decide between two levels of difficulty. I found the lower level more than hard enough, as the computer-controlled players make fewer mistakes in manoeuvring.

The final game, **Space Caverns**, is another let-down. It's based on the popular lunar-landing games of the early eighties, except that you must negotiate your small craft through winding caverns to reach the exit.

The game looked quite promising –

the first cavern is very colourful, and leads you to expect more of the same. But after carefully nudging the rocket boosters – full mass and inertia are applied to your ship – and reaching the far wall, disappointment quickly follows.

Screen two is no more than a jumbled array of coloured triangles, with none of the coloured stippling present in the first cavern. It shows that memory must have been tight, preventing more detailed screens from being stored.

But considering what phenomenal scenarios have been squeezed into some Electron games, I find this a poor excuse, and felt quite hoodwinked.

In all, I found Four Great Games fairly average. It contains nothing to make it stand out from the crowd in a market which is steadily gaining respect in most quarters for surprisingly high standard games.

Pete Fawcett

Sound	4
Graphics	6
Playability	6
Value for money	4
Overall	4

Goal – a superb soccer simulation

Bargain challenge

Product: Way of the Exploding Fist
Price: £1.99
Supplier: Mastertronic, 8-10 Paul Street, London EC2A 4JH.
Tel: 01-377 8411

WAY of the Exploding Fist is a re-issue of a piece of software which was so well received when it first came out that it won a number of awards.

It is a karate simulation game in which your aim is to work your way through the various skill levels until you reach 10th Dan.

Unlike other similar programs, the setting is very definitely sporting. The rules of karate are adhered to in a fairly strict manner – no weapons are used except the hands and feet. As is usual with these karate simulations, the main problem is getting to grips with the mind-boggling number of actions.

There are some 16 different functions, controlled either from the keyboard or from a joystick. These give you a full range of punches, kicks, somersaults and other movements. This impressive array of actions can be used against a computer controlled opponent or another person.

The best way to practise moves is to select the two-player option, but not have a second player. Having mastered the keys required, you will be ready to tackle the computer opposition.

Your first adversary is remarkably unskilled and it should not take you long to score a victory. The next competitor is much more adept at dodging your moves and then felling you with a quick round-house kick.

With a lot of practice you will be able to beat a whole series of opponents, each a little more skilled than the previous one.

The graphics are very good with fast, flicker-free movement and the sound is adequate.

If you missed Way of the Exploding Fist first time round and haven't found it on a compilation then this re-release is a real snip.

Rog Frost

Graphics	*8*
Sound	*5*
Playability	*9*
Value for money	*9*
Overall	*8*

Budget bash-'em-up

Program: The Axe of Kolt
Price: £5.95
Supplier: The Elk Adventure Club, 2 The Beeches, Tilbury, Essex RM18 8ED.
Tel: 03752 4860

SCIENCE fiction fans will delight in having copies of Larry Horsfield's first two adventures, Magnetic Moon and Starship Quest. However, this undertaking is something of a deviation, as it is quite definitely of the Tolkien fantasy mould.

In this four part adventure you play the hero, Alaric Blackmoon, in search of the immortal Axe of Kolt. Your quest is to find and return the weapon to King Kelson in order to defeat the reptilian Xixon who are wreaking their revenge upon his kingdom.

Each of Larry's games include many screens of intricately worded introductory prose to set the scene for the ensuing escapade, and help create a cool atmosphere. Part one requires much interaction with other characters in the game in order to make progress. The atmospheric room descriptions give direct and cryptic help for decisions which you must make later in the game. My advice is to look and listen carefully.

The second part involves a trip to the forest in order to kill the evil Morgeth. Once this is achieved by completing a set of neat chaining puzzles, you have broken the back of this quest. I felt a definite sense of achievement at this point.

Part three involves some mine exploration in typical Indiana Jones fashion. You will need to examine your surroundings thoroughly, using all of your senses if you are to not only survive, but also succeed.

The last part is by far the most difficult and also the best component of this mega-jaunt. In a setting outside the Xixon fortress, you must escape and find King Kelson.

The action is cold-blooded and not for the faint-hearted. Once again it is important to take note of the location descriptions.

This enjoyable romp needed a lot of mapping and thinking, as well as direct action. Axe of Kolt is probably ideally suited for the more experienced traveller, but the Elk Adventure Club offers an excellent Help service.

Though the normal restrictions of Quilled adventures apply, I believe that this is Larry's best offering to date. A challenging adventure at a bargain price.

Pendragon

Presentation	*6*
Atmosphere	*8*
Frustration factor	*9*
Value for money	*10*
Overall	*8*

3 TANTALISING TITLES FOR YOUR ACORN ELECTRON!

Computer Hits 10 Vol. 4

SAVE UP TO **£6!**

Some of the very best games for the Electron have been crammed onto two cassettes – and they're guaranteed to keep you entertained for months!

There's Repton, Thrust and Deathstar from Superior Software, Killer Gorilla, The Mine and Ghouls from Micro Power, Psycastria and Bug Eyes 2 from Audiogenic, Zalaga from Aardvark and Blagger from Alligata.

PLUS two extra games: Superior's Galaforce and Karate Combat – making a grand total of 12 different games.

This is a compilation that's not to be missed!

Ransack

SAVE UP TO **£6!**

Control AI, the globular droid, in a revenge mission against the eight rebellious planets of the Ryvian system. Ransack, the latest game from top programmer Peter Scott, is a high-speed arcade game that will tax your skill and reactions to the limit!

"This is one for every collection"
– Guilder, Electron User, January 1987

Life of Repton

SAVE UP TO **£4!**

Here's an exciting new collection of screens for you to try and crack! Start out as a baby and work your way through the five different life stages, from infancy to old age – a total of 40 new mazes with a dazzling range of graphics. It's just what you've been waiting for! And the Repton 3 main program is included with every copy.

"If you're a fan, that alone should be enough for you to go out and buy a copy...Sound 10, Graphics 10 Playability 9, Value for Money 10 Overall 9."
– Ian Waugh, Electron User, January 1988.

Please note: If you are a subscriber, you can renew your subscription early to take advantage of these very special offers.

Suitable for	Product	Format	RRP	Special reader offer	YOU SAVE	Offer including subscription	YOU SAVE
Electron	Computer Hits 10 Vol. 4	Tape	£9.95	£6.95	£3	£18.95	£6
Electron	Ransack	Tape	£9.95	£6.95	£3	£18.95	£6
Electron	Life of Repton	Tape	£6.95	£5.45	£1.50	£17.95	£4
Electron	Life of Repton	5¼ Disc	£7.95	£5.95	£2	£18.95	£4

TO ORDER PLEASE USE THE FORM ON PAGE 45

Adventures by Pendragon

Upgrade route to adventures new

IF we are to believe the experts and wise wizards like Merlin, summer is here again and interest in micros wanes as citizens of my fair land rush out into the sun.

But experts – and even wizards – have been known to be wrong.

It is at times like this that you can spot adventure fanatics. They are the people who rise some time after 10am, have pale faces and dark rings under their eyes.

They wander aimlessly around in the midday sun muttering strange incantations like "Try UNLOCK GATE WITH RUSTY KEY", and have permanent bald scratch marks on their pates.

There are no new releases to report this month, but rumours filtering through from my vassals indicate some exciting surprises in store for this autumn.

Perhaps now is the time to upgrade your Electron to 64k with a Slogger Master Ram Board, to make the most of the goodies to come, and delight in the odd BBC Micro Level 9 adventures.

A number of readers have written with thanks for the recent series of mar[illegible] have published for T[illegible] **ingdom Valley**(TKV). They have obviously helped many adventurers make progress in this complex graphic game.

However, Mrs Madeline Charlton, of Newcastle-on-Tyne, writes:

'I am a complete beginner to adventuring, starting on Twin Kingdom Valley, and at present keep getting walloped by various nasties, ending with the infuriating "You are dead. Bye bye!" message.

At this point I cannot get the program to do anything, and have to reload. Is there any way round this irritating waste of time?'

John Rogerson, among many, echoes this complaint concerning the failure of the save game facility. For the thousands of you who have been struggling with TKV, dear Bill Trevelyan once again comes to the rescue. He explains the problem and provides a remedy.

It appears that the Electron game is a modified version of the program written for another machine, and in this, the 18-byte parameter block for Osfile was located at &35EE. The programmer evidently decided to relocate this at &B00, since the program has 18 bytes of junk at &B00-&B11. But then he forgot to alter the addresses in the body of the program.

The result is that every time *SAVE or *LOAD is entered, 18 bytes of the game's running program at &35EE onwards are wiped out, and it crashes.

All that is required is to alter the addresses to refer to a parameter block at &B00, and the game works perfectly. To do this, you load the main program VALLEY – it runs from &B00 to &5C40 – and enter the following corrected slab of code:

```
[P%=&B5A
[LDA#0:LDX#&11:STA&B00,X
[DEX:BPL&B5C:LDA#&90
[STA&B0E:LDX#&F0:JSR&B97
[TSX:INX:STX&B0A:LDX=0
[STX&B0E:INX:STX&B0B:INX
[STX&B0F:LDX#&F9:JSR&B97
[LDA#&1F:STA&B0B:LDA#&43
[STA&B0F:LDA#0:STA&B0A
[STA&B0E:LDX#&F5:LDA&B0A
[STA&B02:LDA&B0B:STA&B03
[LDA#0:STX&B00:LDX#&B8
[STX&B01:LDX#0:LDY#&B8
[JMP&FFD0:LDX#&F0:JSR&BC5
[LDX&2F:TXS:LDX#&F9
[JSR&BC3:LDX#&F5:LDA#&FF
[STA&B0E:BNE&BA5
```

Then save the corrected program.

This month I begin a series of maps of mazes which I hope will enable a number of readers to extricate themselves from dead ends in some adventures.

We start off with a map of the coloured rooms and iron passages in **Sphinx Adventure**. Next month I will feature a map of the Witherton maze in **Project Thesius.**

Until machine code is easier on the eye, happy adventuring.

Adventurer's Glossary (continued from last month)

Ice sheet: Must surely be crossed.
Ice wall: Try breaking it.
Idol: A treasure or perhaps an important hiding place.
Imp: Mischievous and cannot be trusted.
Inn: A source of liquid refreshment and information. Try looking and listening.
Iron door: May need an iron key.
Iron grating: A key or a saw may be needed.
Island: A boat or a raft must be found or constructed if you wish to travel there.
Jail: There is often no escape. However, a trapdoor or a key may help in your plight.
Jelly fish: Dangerous – must be killed or avoided.
Jester: A fool indeed but a source of wisdom most profound. Perhaps he needs a joker.
Jewelry: Just a valuable treasure.

◀ From Page 19

Problems Solved

I begin by thanking Steven Wyeth for his solution to **Project Thesius**. Yes, Steven, next month I will publish a list of some BBC Micro adventures which run with Slogger's Master Ram board.

I must also thank A. Davidson of County Durham for his superb solution to **Stranded**, which I will feature in a future Hall of Fame.

I received a message on the castle fax machine from Alan Buckley who cannot cross the lake in **Sphinx Adventure**. I answered this problem in the column last month Alan.

Andrew Mendham should travel N, E, N, S, E, W, E, S, N, S, E, W, E, S, N, S, E, W, E, S, N, from the pirate's hide-out if he wishes to meet the Sphinx.

Tim Wye helpfully points out that to begin **Savage Island 2** you must type the password: SAY 123.

Tim, Wai lin Li, My Hoa Lam and Lisa Hudson all wax lyrical about Larsoft adventures. I agree wholeheartedly with them that they are the best available for the price.

However, they experience difficulty in **Wychwood**. The problem is easily solved if they throw the flag at the bull then clear the leaves and examine the hollow.

Tom Kols asks where to find Mr Video in **Dodgy Geezers**. He also asks whether the pickaxe is needed.

Mr Video will meet you in the snooker hall and you will be arrested if you carry the pickaxe around town, but it is needed later in part 2. So, decide where to stow it. You must choose Tricks, Mr Video and Soapy for your gang.

The password to part 2 is an anagram of TREV and PETE.

Finally, in **American Suds**, Peter, David and Ross Jenkins must use the flares from the wardrobe to attract the helicopter.

Examination of the desk will reveal a pin which can be used to draw blood to sign the contract! Look under your seat on the aircraft to find the tool to make your escape.

Readers' Hall of Fame

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

Get some of the objects requested by going SE, NE, OUT, N, N, N, IN, IN, E, NW. Wear the necklace then SE, W, OUT, OUT, SW, S, E, NE, E, N, E, NE. Examine the floor, get the crucifix then SW, W, S, NW, SW, W, IN.

Fill the chalice with water, then go SW, NW, and put the crucifix on the altar. Remove the necklace and put that on the altar then drop the staff.

Explore the manor gardens. SE, NE, NE. Get the paddle, then go SW, OUT, E, NE, E. Get the cheese, then go NW, SW, SW, W, W, W, W, E, E, E, E, E, SW. Drop the tin chalice and hammer. Go NE, sniff the cheese, IN, GET RELIQUARY, OUT, drop the cheese, W, W, S, SE, get the goat, NW, N, W, get the spade.

Dig in the kitchen garden. W, W, S, S, S, S, S, DIG, DIG, DIG, and get the garlic. Now visit the church crypt. N, N, N, N, NE, E, E, E, E, SE, W, IN, N, DOWN, DOWN. Eat the garlic and get the ring then return the reliquary to the altar with UP, UP, S, SW, NW. Put the reliquary on the altar and get the staff.

Before visiting the water mill go SE, NE, OUT, E, NE, NE, UP, NE, JUMP DOWN, drop the goat, go S, get the coracle and go N, IN, GET ROPE, OUT. Make your way to the occult laboratory.

Go SW, then drop the paddle and coracle. SW, E, S, GET MALLET, N, NW, SW, SW, W, W, S, S, UP, GET MATTRESS, DOWN, SW, W, W, IN, NW, S, IN, Tap the third barrel with the mallet, then drop it and go IN, READ GRIMOIRE, BREAK STAFF, DROP JUNK.

Call the Demon by getting the chalk, and drawing a pentacle. Say AZAPHAS, drop the gloves and chalk. Walk out and fall in the pit. OUT, OUT, E. Use the gauntlets to free yourself and collect the other items for the altar.

Drop everything, wear the gauntlets, push the stone and remove the gauntlets. Wear the band, get the spade, ring, rope and mattress. Go in, wear the circlet and get the sceptre.

Return these items to the altar. UP, S, drop the gauntlets, spade, mattress, rope and ring. Go SW, OUT, N, NE, E, E, E, SE, W, IN, SW, NW, remove the circlet and put it and the sceptre on the altar.

The Stolen Lamp *– Paul Davies*

Go South, West, South. Buy the carpet and go North, East, North, East. Drop the carpet and hand-grenade and go West, South, West, West, North, West. Read the message and go East, East, South, East, East, North, East.

Get the hand-grenade and carpet and go West. Say the secret word and go North, Down. Get the sledgehammer and say the secret word. Go South, South, East, Down.

Get the diamond and go North, East. Thump the statue and go East. Get the red-herring and go East. GET GOLD, West, West, West, North. Get the bracelet and the girl. Smash the column and get the box. Go East, East. Get the ruby and go West, West, North and drop the box.

Pull the pin and drop the grenade. Go South and look. Go North and drop the carpet. Get the key and go East, East. Get the silver and go East, then drop the bracelet.

Smash the enchantress and get the bracelet. Go North and get the necklace. Go North and get the mirror. Go South, South, West and unlock the door. Go to the bathroom and drop the girl.

Go to the door and go North, North. Get the pearls and go South, West and get the ring. Go West and get the emerald. Drop the herring and go North. Get the lamp and go South, East, East, South, West, West.

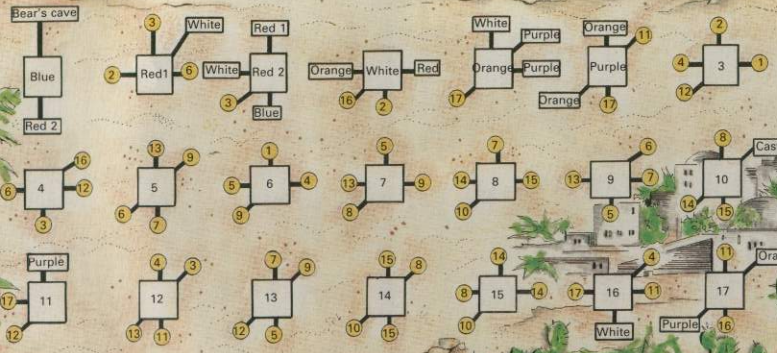
Get the carpet and go South, South, South. Say the secret word and go West, North, Down, North, West, West, South, West. Get the goblet and smash the pick-pocket. Go East, South, East, East, North, East.

Success is yours!

SPHINX ADVENTURE

Maze No.1

Coloured Rooms and Iron Passages



electron user

SLOGGER

WHAT PRICE QUALITY?
WHAT PRICE COMPATIBILITY?

To quote a well known phrase, "You only get what you pay for"

This we feel sums up SLOGGERS pricing policy. Our goods may not always be the cheapest, but the products are most certainly the best.

THE PEGASUS 400 DISK DRIVE SYSTEM

Using only top quality components, the system comprises of:

The SLOGGER 40/80 Track double sided 5.25" Disk Drive which maintains

* 400k storage per disk, built in power supply.
* Manufacturers (NEC/TEAC) 1 year guarantee.
* Internal Power Supply unit.
* Compatibility with the inexpensive (yet most reliable) 5.25" disks.
* Reliability at 3 m/s step rate (four times faster than some drives).

The SLOGGER PEGASUS Disk Interface which boasts

* Excellent Computer Aided Design (CAD) production
* Acorn approved design and standard WD1770 floppy disk controller
* NEW Type-Ahead facility when used with Master RAM Board
* READ/WRITE Shadow Screen when used with Master RAM Board
* 90 page documentation usually provided as a separate purchase
* Compatibility with the ACP ADFS Version 1.1, which offers a total 640k when used with SLOGGERS 5.25" Disk Drive

The SLOGGER SEDFS ROM, about which the Electron User magazine enthused

"I can recommend SEDFS unreservedly"
"Anyone considering upgrading to disk"
"SEDFS is the logical choice"

The quality of SEDFS speaks for itself, unlike other filing systems it offers

* No loss of Electron memory, PAGE=&E00 (not &1D00)

Full Acorn DFS (BBC Model B and MASTER SERIES) compatibility

* All utilities built in, requires no additional menacing utility disk

PEGASUS 400 (Including Interface).....£159.50 (inc VAT)
PEGASUS INTERFACE (Only) .....£74.95 (inc VAT)

MASTER RAM BOARD

Upgrade your Electron to a 64K Machine

* Fits inside the Acorn Electron, uses no cartridge ports.
* Compatible with ALL reliable Electron hardware (except TURBO DRIVER).
* Compatible with ALL Electron software, switching between 64K mode, TURBO mode (yes. . . the TURBO DRIVER IS BUILT IN), and normal mode.
* For correctly written software, HIMEM is ALWAYS AT 8000 in 64K mode so leaving 28000 bytes for BASIC or WORD PROCESSING in ALL screen modes.
* Doubles the speed of Word Processing.
* Upto 300% speed increase for games.
* Additional 12K for use as Printer Buffer with Expansion ROM 2.0.
* Installation Service (See Details below) for those not confident of desoldering the 6502 Microprocessor

NEW FEATURES

* 64K Mode fully compatible with 98% of Level 9 BBC Adventure games.
* NEW OS 2.1 – PLAY ACORNSOFT'S ELITE WITH SLOGGERS JOYSTICK INTERFACE.

Master RAM Board Kit – code MR2 – Now Only £49.95

INSTALLATION SERVICE

Send your computer to us and we will upgrade and return your computer on the same day that we receive it

Order MR1 £59.95

BICASSO

With the power of the illustrator software you can now use your Electron to create drawings & graphic pictures controlled by the famous Digimouse.

The mouse is connected to your computer through the user port which requires one slot of the Rom Box Plus or Plus One.

The illustrator software is loaded from disc and contains all the programs and examples of what can be done with this package. The software is also programmed to print your creativity onto a printer.

The Bicasso packages are:-

Digimouse, User port, Illustrator (5.25" disc) £75.00
Digimouse, Illustrator (5.25" disc).....£49.50

ROMBOX PLUS

SLOGGER's answer to the PLUS 1

Q. Why not buy the Acorn Plus 1?
A. Because "Excellent though the Plus 1 is, I think there is still room for improvement" said the Electron User Magazine.

The ROMBOX PLUS has this improved specification:

1. Four ROM/RAM sockets to free the cartridge slots for more important add-ons. Each socket can take the usual 8K/16K ROMs but can also take 16K RAMS offering a staggering 64K SIDEWAYS RAM
2. The PLUS1 Cartridge slots.
3. The PLUS1 centronics printer port.
4. The Expansion ROM 2.0
5. Switched Joystick interface available.
6. Analogue Joystick interface under development.

Still Only £54.95

64k ACORN ELECTRONS

THESE ELECTRONS ARE FITTED WITH THE MASTER RAMBOARD AND ARE FULLY TESTED AND GUARANTEED WHEN PURCHASED DIRECT FROM SLOGGER

64k ELECTRON (Switchable) £99.00

EXPANSION ROM 2.0

for ROMBOX PLUS or PLUS 1

- Supports Printer Buffer with 8K/16K sideways RAM or 12K with MASTER RAM BOARD.
- RSAVE command to save ROM images to tape or disc.
- RLOAD command to load Sideways RAM with a ROM image.
- ROMS command to display ROM/RAM in system.
- JOYSTICK command for the SLOGGER Joystick Interface
- Allows cassette loading in high resolution.
- Supports all standard functions (Printer, ADC, RS423)
- Simply fits into internal ROM socket.

"There is room for improvement in the operating system. No doubt this was the idea behind Expansion 2" *Electron User, July 87*

Only £11.95

(£5 if purchased with 32K SIDEWAYS RAM or JOYSTICK INTERFACE)

32K SIDEWAYS RAM CARTRIDGE

for ROMBOX PLUS or PLUS 1

- Ever popular on the BBC
- Best used with EXP ROM 2.0

(1) Save ROM backups for loading into Sideways Ram.
(2) Set up a 16k Print Buffer

- Splits as 2x16k pages VIEW and VIEWSHEET in one slot!!!
- Write protect option . . . prevents corruption of software.

" A very powerful piece of hardware" *Electron User July 87*

ONLY £34.50
(£39.50 with EXP ROM 2.0)

SLOGGER EPROM CARTRIDGE

- Carries TWO 8K/16K ROM/EPROM software
- Compatible with PLUS 1, ROMBOX PLUS and BBC Master.
- Simply plugs into cartridge slot

£10.00 for a limited period

ROM SOFTWARE

STARSTORE 2 ..... £29.95
SEDFS upgrade ROM for CUMANA owners ... £24.95

* BARGAIN CORNER *

STARWORD	Word Processor	£19.95
STARSTORE	Database	£9.95
STARGRAPH	Graphic Utilities	£9.95
ELKMAN	ROM/RAM Manager	£9.95
STARMON	Machine code Monitor	£9.95
PRINTER ROM	Simplified Printer Control	£9.95
STAR TREK	Machine code dissassembler	£9.95
PDG	Printer Driver	£9.95

TAPE TO DISK ROMS VERSION 2

- Transfer the majority of Tape programs to disk
- Acornsoft, Superior and Micropower no problem
- Compatible with programs copied using Version 1
- More successful than ever before
  - T2P3 for the Acorn Plus 3
  - T2CU for the Cumana DFS
  - T2P4 for AP4 and EOO DFS
  - T2SD for the Solidisk DFS
  - T2SEDFS for the SEDFS
  - T2PEG400 for Pegasus 400

ONLY £24.95

- Upgrade 1-2 only £5 with original ROM

5.25" 40/80 Switchable double sided 3MS drive inc PSU
£129.00

Panasonic Printer NLQ, Epson compatible
£179.00

Advanced User Guide
£3.95

NOTE

Slogger has moved to Bristol, so please note our new address and Telephone number. Please accept our apologies if any inconvienience has been caused by our move

JOYSTICK INTERFACE

for ROMBOX PLUS or ACORN PLUS 1

- Uses inexpensive ATARI-type joysticks
- Compatible with ALL Tape and Disk systems.
- Emulation of keys by Expansion ROM 2.0
- Can be used with well written games either WITH OR WITHOUT A JOYSTICK OPTION

"The ultimate Joystick Interface" *A&B July 87*

"Well worth saving up for, I can recommend it to all Arcade Addicts" *Electron User May 87*

Only £14.95

- Requires Electron Expansion 2.0 Only £5 with this unit

JOYSTICKS

Switched Joysticks for the Slogger Joystick Interface

Quickshot I	£4.00
Quickshot II	£6.00

Please contact us for your Local dealer

HELP!

Contrary to what the critics used to say the Electron market is now established and respected. There are a variety of very good products available already (some better than the BBC) but I'm sure there are plenty more possible. Please contribute by writing to Helpline at our new address, giving your idea, and why you think it's suitable for the Electron. You never know you may receive a reward in the post.

All prices include VAT P&P UK Mainland only

SEND FOR THEM TODAY

Cheques payable to
SLOGGER LTD. Tel: 0272 237496

☐ Access No _____ Expiry Date _____
☐ Visa _____ _____
Name _____
Address _____

PLEASE SUPPLY	Cost
1 _____	£ _____
2 _____	£ _____
3 _____	£ _____
4 _____	£ _____
5 _____	£ _____
Total	£ _____

Please send orders to SLOGGER LTD, 7, APSLEY ROAD, CLIFTON, BRISTOL BS8 2SH

Meet the BARBARIANS

Barbarian – the Ultimate Warrior is now available for the Electron User. To commemorate its arrival, Superior Software offers you a chance to add this game to your collection. For the first prize winner there is also the opportunity of a lifetime – to meet the Barbarian and Australian Rugby Football teams and to see them in action. The second prize is a book full of facts and history about swords and the art of fencing. There are also 30 runners-up prizes in this superb competition – making a total value of over £500

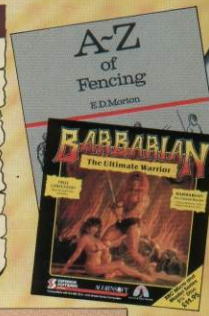
1st Prize Two tickets to see the Barbarians play the Australian Rugby Football Team at Cardiff Arms Park on November 26. See the match and meet the teams after this prestigious centenary celebration game. *PLUS* a copy of Barbarian *PLUS* any three Superior games of your choice.

2nd Prize A book to tell you all about fencing: The Martini A-Z of Fencing by E D Morton. *PLUS* a copy of Barbarian *PLUS* any two games from the Superior catalogue

30 Runners up prizes Any game of your own choice from Superior – choose the latest release, Barbarian, or any golden oldie you want.

WHAT YOU HAVE TO DO

Below are the silhouettes of five swords and eight possible names for them – match these and you could win one of 32 fantastic prizes. Photocopy or cut out your completed entry form and send it to arrive no later than July 29. The winners will be the first correct entries pulled from the sack.



A. Sabre
B. Main Gauche
C. Rapier
D. German Dusack
E. Epee
F. Roman sword
G. Colichemarde
H. Foil

ENTRY FORM

If you think that sword 1 is a colichemarde then put G next to the number 1.

ANSWERS

1 _____ 4 _____
2 _____ 5 _____
3 _____

Name _____

Address _____

_____

_____ Postcode _____

Send your completed entires to: **The Barbarian Competition, Electron User, Europa House, Adlington Park, Adlington, Macclesfield SK10 4NP.**

More power under your bonnet

CHRIS NIXON gives the new Advanced Plus 2 rom from Pres a trial spin

SINCE the rights to produce the Plus 1 were signed over to Pres – then ACP – way back in the mists of time, wonderful things have happened to Acorn's unwanted offspring.

And now comes the arrival of the new AP2 rom from Pres. It's a complete replacement for the existing Plus 1 rom, and like all of Pres's other products it's been well worth waiting for.

Those of you who have heard about and envied the BBC Master's enhanced operating system need pine no more, for a good selection of its star commands – and some new ones – are now available for your Electron.

These extra commands are made possible due to the fact that the original Plus 1 rom uses only about 3k of the 8k rom. This means that there were five whole kilobytes of space going to waste, and Pres has finally put it to good use.

A quick session with a screwdriver sees the AP2 firmly installed inside your Plus 1. It sits in the same socket as the original rom, with the half-moon notch facing in the same direction, toward the right.

When your system is bolted together again and the power turned on, typing *HELP +1 shows you just what's now under the bonnet of your Electron, and a pretty impressive list it is too.

You can now disable and re-enable any roms other than the default language or the Plus 1 rom itself, using the Master-like *UNPLUG and *INSERT commands. Furthermore, the language to be selected upon the next Control+Break may be set using *LANG.

Typing *ROMS generates a list of all your roms, with an inverted U beside those which are currently unplugged. The default language as set by *LANG – normally Basic – is indicated by an inverted asterisk.

The contents of any rom can be saved to disc or tape, and loaded back into sideways ram, if present. What is most impressive about the AP2 is that it automatically copes with all of Pres's various sideways ram variations, including the AQR, ABR, ASR and the new AP7.

If you want to load a rom image, you don't even need to specify which bank it's to go in, unless you want to – the AP2 will search the rom sockets and prompt you when it finds a bank of ram.

While on the subject of sideways ram, the AP2 includes some invaluable utilities normally available only in extra service roms. *LOCK will write-protect the selected bank of sideways ram, while *UNLOCK performs the reverse process, allowing you to write information again.

And to save a bit of time, all ram banks can be globally locked or unlocked, with *LROMS and *UROMS. Using either of these commands will produce a *ROMS display, where any unlocked bank will have an R shown beside it.

The AP2's repertoire of disc handling commands should bring a tear of joy to those of you who are used to digging out the utility disc whenever a !BOOT file needs to be built, or a *DUMP is required.

Furthermore, there is a built-in ADFS formatter – *FORMAT – which detects whether you have ADFS version 1.00, and will accordingly generate the ZYSysHelp file. If you have a more up-to-date version, this file will be omitted from the formatted disc.

There's also the vital *VERIFY command which allows you to test the integrity of suspect discs, and there's even a version of the formatter which will automatically verify the disc after formatting, called *VFORMAT.

Even the humble *DUMP command is greatly enhanced over other versions. It automatically takes the current screen mode into account, and generates a dump which will always fill the display horizontally, but never exceed the current screen width – even in Modes 2 and 5.

Perhaps the most useful function as far as games players are concerned is the *KILL command. This completely disables the Plus 1, and even a Control+Break won't re-enable it.

I use *KILL all the time now, and find it invaluable when there are games to review which would normally crash due to the presence of the Plus 1.

Tape users aren't left out either. Included in AP2 is a software fix for the old tape loading problems when in high memory modes. Although it won't cure everything, you'll find tape loading in general to be more reliable with the AP2 present.

Overall, I was most impressed with the AP2. It now seems such an integral part of my Electron that I'm not sure what I'd do without it – I would hate to go back to manually disabling the Plus 1, for instance, and it's a matter of course now to *UNPLUG any roms which are interfering with a particular project.

As a complete upgrade for your Plus 1, £12.65 seems a small price to pay for what is much more than an ordinary third party utility rom. The AP2 is the definitive Plus 1 rom, and should have been written by Acorn itself in the first place.

PRES AP2 Support ROM 1.13
ADC/Printer/RS423 drivers
*HELP +1 for * commands
*AQRPAGE <page>
*BUILD <file>
*DUMP <file>
*FORMAT <ADFS drive> (<SML>)
*INSERT <bank>
*KILL
*LANG <bank>
*LIST <file>
*LOADROM <file> (<bank>) (L)
*LOCK <bank>
*LROMS
*ROMS
*SAVEROM <file> <bank> (S)
*TYPE <file>
*UNLOCK <bank>
*UNPLUG <bank>
*UROMS
*VERIFY <ADFS drive>
*VFORMAT <ADFS drive> (<SML>)

AP2's command list

Product: Advanced Plus 2
Price: £12.65
Supplier: Pres, 30 Guildford Road, Lightwater, Surrey GU18 5SN.
Tel: 0276 72046

Europress GROUP

The Europress Group is one of Britain's most dynamic companies. Its divisions include Database Software, Mandarin Software and the publishers of this magazine, Database Publications.

We are currently seeking applicants for the following positions at our prestigious new headquarters at Adlington, on the edge of the Peak District National Park.

Assistant Manager (Software Projects)

The position involves day to day supervision of projects from their early stages through to launch, including liaison with in-house and third party programmers.

Experience of 8/16 bit micros is essential together with a knowledge of design, programming and quality assurance techniques. It is important that applicants are fully aware of the software market, especially that of games and leisure products, and can evaluate products with this in mind. Salary commensurate with experience.

Programmer for Maintenance/Conversion Work

Applicants should be familiar with 8 bit micros and have a knowledge of programming in Z80 and 6502 machine code as well as Basic. Experience of 16 bit machines is an advantage but not essential. But a willingness to learn other languages is vital.

The position initially involves product maintenance/conversion work although in due course there will be opportunities to work on exciting new products now being planned. Salary commensurate with experience.

Software Technical Support

An assistant is required in our software department to undertake product testing, quality assurance and customer liaison. Experience of day to day use of 8/16 bit micros is essential but programming skills are not necessary. Salary commensurate with experience.

Applicants for these positions should send a full CV to:

Barbara McCullough, The Europress Group, Europa House, Adlington Park, Adlington, Macclesfield SK10 4NP.

Tel: 0625 878888

Publishing ◦ Electronic mail
Exhibitions ◦ Public Relations
Computer software & hardware

THE GALLUP CHART TOP 10
ELECTRON SOFTWARE

THIS MONTH	LAST MONTH	TITLE (Software House)	PRICE
1	1	SOCCER BOSS *Alternative*	1.99
2	3	STAR FIGHT *Alternative*	1.99
3	2	COMBAT LYNX *Alternative*	1.99
4	4	FIVE STAR GAMES *Beau Jolly*	9.95
5	5	PRO GOLF *Atlantis*	2.99
6	•	PSYCASTRIA *Alternative*	1.99
7	9	WAY OF THE EXPLODING FIST *Mastertronic*	1.99
8	•	FOUR GREAT GAMES 3 *Microvalue*	3.99
9	6	FOUR GREAT GAMES *Microvalue*	3.99
10	•	AROUND THE WORLD IN 40 SCREENS *Superior*	6.95

Compiled by Gallup/Microscope

Budget house Alternative really takes the chart by storm again this month, holding the top three positions. Superior's Around the World re-enters at 20 and is its only representative; perhaps the long-awaited Barbarian will improve the situation.

Four Great Games Three makes its debut – and you can read what our reviewer thinks of this, as well as a review of Way of the Exploding Fist in this issue of *Electon User*.

IT'S A KNOCKOUT

Beat the computer's hand in this full-blown whist simulation from ROBERT CHARLTON

WHIST is a two-player version of the popular card game Knock-out Whist in which the Electron takes on the role of the other player. Even if you already know the rules, read on – there are a variety of ways to play.

This version is played over a total of seven rounds. In round one, seven cards each are dealt, and the game is started by the player whose name is shown next to the word Lead.

A card is played by typing the number shown beneath it, and the opponent has to match this with a higher value card of the same suit to win the trick. Whoever wins a trick becomes the lead for the next go.

If the opponent has no card of the same suit, then two choices are possible. Any other card may be layed down, in which case the opponent automatically wins that trick.

But if the card is a member of the current trump suit – indicated at the middle left of the screen – then whoever placed the trump automatically wins that trick, unless it was placed first and the opponent counters with a higher trump.

The player beginning a round has the choice of trumps for that round – the computer will decide for itself, and will tell you its choice. When it is your turn to choose trumps, simply press the first letter of the desired suit. Full prompts are given and your choice is then displayed.

The winner of each round is the player with the most tricks. If both players have an equal number, the pack is cut at random as a tie-break, the higher card deciding the winner.

After the first round, if a player completes any subsequent round without scoring, then the whole game is automatically given to the other player. But note that no one can lose in round one, which is essentially a practice round.

The winner of the game, unless won by default, is the player who has won the most rounds. The computer plays quite intelligently, but if you think carefully – and luck is on your side – you should be able to at least draw most of the time.

SOME USEFUL HINTS

- When laying your first card, it's advisable to place one of a higher value.
- If you have no trumps in your hand at all, and do not have a card of the same suit as the computer, lay the lowest value card of any suit that you have – this saves your better cards for the next go.
- Try to save your trump cards – don't use them all up at the start unless it's vital.
- When selecting trumps, choose the suit which matches the majority of cards in your hand.

And finally, remember that Aces count high – that is, more than a King. So fix your eye-shade firmly on your forehead, and settle down to some fast dealing.

VARIABLES

C%	Number of cards in round
D%	Number of tricks you have
E%	Number of computer's tricks
F%	The "lead" player
P%	Practice round flag
R%	Current round
T%	Trump suite
W%	Winner of the round
D$()	The deck of cards
H$()	Holds both hands

PROCEDURES

shuf	Shuffles the pack
huma	Gets player's card
comp	Gets computer's card
deal	Deals random cards
disp	Prints the screen
draw	Draws a card
admn	Decides the winner
cut	Cuts the pack

Turn to Page 51 ▶

Carrot quest

Save the starving rabbits in this fast action arcade game by ANTHONY HOUGHTON

TIMES are hard in Woody Warren. Last month's drought virtually destroyed the local carrot crop, and the small rabbit colony now faces starvation.

And to make things worse, the evil Baron de Bunniford – always one to look out for himself – ordered his hench-rabbits to hoard an immense pile of carrots in his strongrooms as soon as the drought set in.

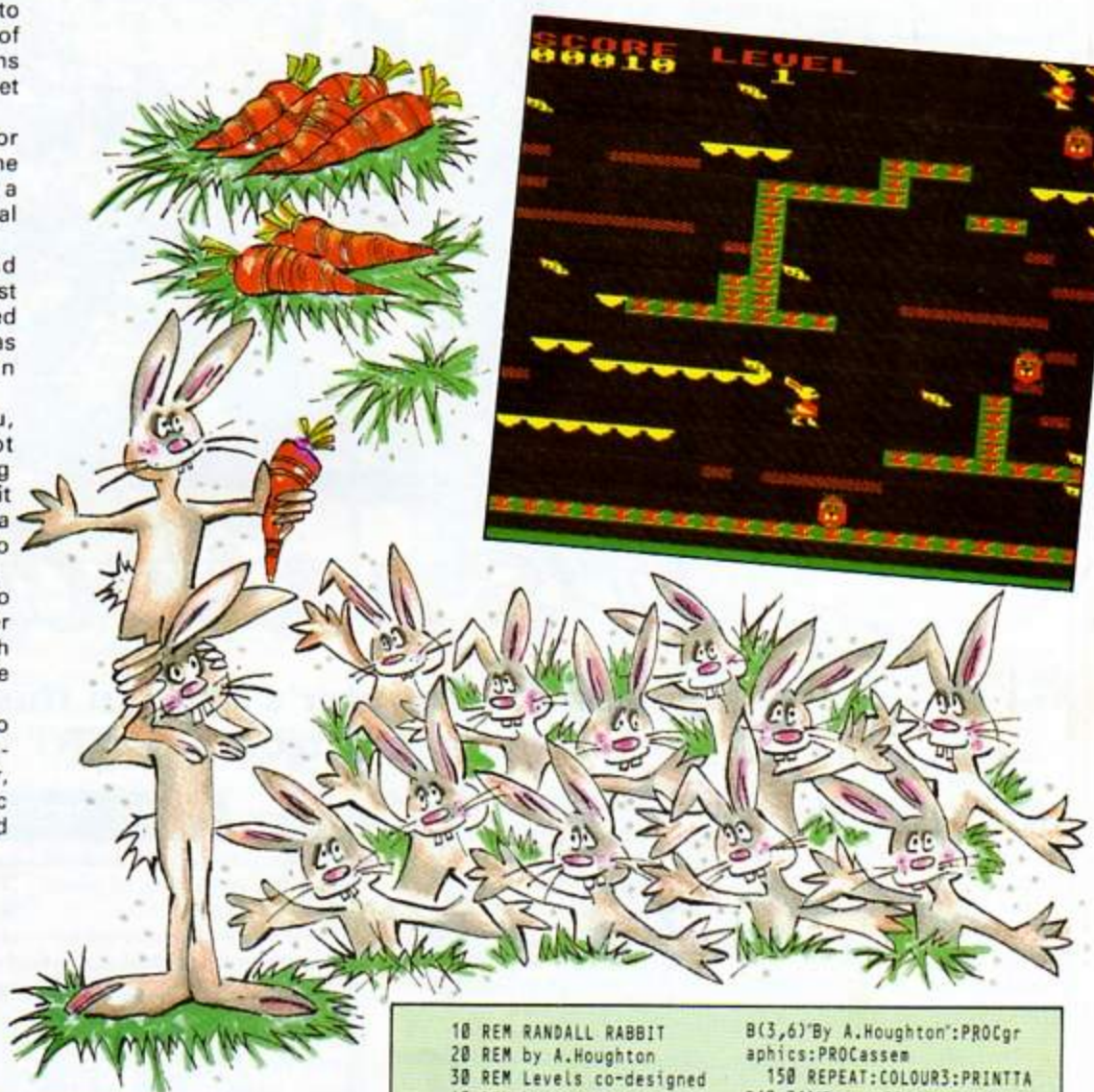
Desperate times call for desperate measures, so the elder rabbits settled on a plan to recover their vital food stocks.

You, the youngest and fittest in the colony, must breach the Baron's fortified warren and bring back as many carrots as you can carry.

But unknown to you, armies of deadly carrot monsters are standing guard over the Baron's illicit hoard, just waiting for a tender young bunny to wander into their clutches.

You can leap from level to level, dodging under or over the carrot monsters to reach your booty, but beware the disintegrating platforms.

If you stand on one for too long it will disappear, plunging you to the warren floor, where the cannibalistic Baron will have you served up as rabbit stew.



CONTROLS

Z	Left
X	Right
Shift	Jump

VARIABLES

lives	Number of lives left
level	Current level
round	Number of missions completed
vmon	Vertical position of monster
hmon	Horizontal position of monster
carrots	Number of carrots gathered

PROCEDURES

assem	Assemble machine code
screen	Set up the next level
hmon	Set up the horizontal monster positions
vmon	Set up the vertical monster positions
bonus	Award bonus score
won	Get ready for next round

```
   10 REM RANDALL RABBIT
   20 REM by A.Houghton
   30 REM Levels co-designed
   40 REM by A.J.Docherty
   50 REM (c) Electron User
   60 IF PAGE<&1901 THEN 110
   70 *FX21,0
   80 *K.0 *T.|MFORI%=0TO(TO
P-PAGE)STEP4:I%!&1900=I%!PAG
E:NEXT|MPAGE=&1900|MOLD|MRUN
|M
   90 *FX138,0,128
  100 END
  110 *FX16
  120 *FX229,1
  130 ENVELOPE1,1,50,-20,10,
4,10,10,126,0,0,-126,126,126
:ENVELOPE2,1,10,-1,0,5,90,0,
126,0,0,-126,126,126:ENVELOP
E3,1,2,5,0,5,90,0,126,0,0,-1
26,126,126
  140 MODE5:VDU23;8202;0;0;0
;19,3,2;0;:PRINTTAB(3,4)"RAN
DALL RABBIT":COLOUR2:PRINTTA
B(3,6)"By A.Houghton":PROCgr
aphics:PROCassem
  150 REPEAT:COLOUR3:PRINTTA
B(0,31)"Press SPACE to play"
;:REPEATUNTILGET=32:level=1:
round=0
  160 ?speed=245:lives=5:?sc
ore=0:score?1=0:REPEAT:PROCs
creen:CALLmain:IF?carrots=10
PROCbonus
  170 IF?carrots=10ANDlevel>
5PROCwon:UNTIL0 ELSEIF?carro
ts=10UNTIL0
  180 SOUND&11,2,80,13:A%=!r
a AND&FFFF:DA%=!rg AND&FFFF:
FORM%=0TO2:FORN%=0TO7:*FX19
  190 FORX%=0TO16STEP8:AD%=A
%+M%*&140+N%+X%:?AD%=?AD% EO
R(?(DA%+M%*24+N%+X%)):NEXT,,
  200 FORN%=1TO1000:NEXT:liv
es=lives-1:UNTILlives=0
  210 COLOUR2:PRINTTAB(4,14)
SPC(12)TAB(4,15)" GAME  OVER
"TAB(4,16)SPC(12):GCOL3,129
```

```
:CLG:CLG:UNTIL0
  220 DEFPROCwon:GCOL3,131:C
LG:GCOL0,128:CLG:COLOUR2:PRI
NTTAB(2,10)"Congratulations!
""TAB(3)"You have won!":COL
OUR3:PRINTTAB(1,14)"But it w
on't be so""TAB(3)"easy thi
s time!"
  230 round=round+1:IFlives<
7lives=lives+1
  240 TIME=0:REPEATUNTILTIME
>200:GCOL3,130:CLG:GCOL3,129
:CLG:GCOL3,131:CLG:IF?speed<
255 ?speed=?speed+1
  250 level=1:ENDPROC
  260 DEFPROCbonus:FORN%=50T
0150STEP5:SOUND1,-15,N%,1:NE
XT:FORN%=1TO5*level+25*round
:CALLinsc:CALLpscore:SOUND&1
0,-15,6,1:NEXT:level=level+1
:ENDPROC
  270 DEFPROCscreen:CLS:COLO
UR1:PRINTTAB(0,1)"SCORE LEVE
L":CALLpscore:PRINTTAB(8,2);
level+round*5
  280 IFlives>1FORL%=1TOlive
s-1:X%=40-3*L%:Y%=0:CALLcalc
:!os=!ad-&3C0:!od=&990:X%=3:
Y%=24:CALLprint:NEXT
  290 RESTORE(300+40*level)
  300 COLOUR2:COLOUR128:READ
C%:FORN%=1TOC%:READX%,Y%,L%:
PRINTTAB(X%,Y%+3)STRING$(L%,
CHR$134);:NEXT
  310 COLOUR3:COLOUR129:READ
C%:FORN%=1TOC%:READX%,Y%,L%:
PRINTTAB(X%,Y%+3)STRING$(L%,
CHR$135);:NEXT
  320 COLOUR1:COLOUR128:READ
C%:FORN%=1TOC%:READX%,Y%,L%:
PRINTTAB(X%,Y%+3)STRING$(L%,
CHR$132);:NEXT
  330 FORN%=1TO10:READX%,Y%:
X%=X%*2:CALLcalc:!os=!ad:!od
=&A20:X%=1:Y%=16:CALLprint:N
EXT
  340 FORN%=0TO47:N%?hmon1=0
:NEXT
  350 READM%:IFM%<>0FORN%=0T
OM%-1:READL%,R%,V%:PROChmon:
NEXT
  360 READM%:IFM%<>0FORN%=0T
OM%-1:READH%,T%,B%:PROCvmon:
NEXT
  370 ?rx=0:?ry=24:?rf=0:?rs
=0:?rd=0:?rv=0:!ra=&90079C0:
!os=!ra:X%=3:Y%=24:CALLprint
:ENDPROC
  380 DEFPROCvmon:X%=H%:Y%=T
%:CALLcalc:!os=!ad:!od=&A30:
X%=2:Y%=16:CALLprint
  390 vmon1?(N%*12+5)=&FF:vm
on1?(N%*12)=H%:vmon1?(N%*12+
1)=T%:vmon1?(N%*12+2)=B%:vmo
n1?(N%*12+3)=T%:vmon1?(N%*12
+4)=1:ENDPROC
  400 DEFPROChmon:X%=L%:Y%=V
%:CALLcalc:!os=!ad:!od=&A30:
X%=2:Y%=16:CALLprint
  410 hmon1?(N%*12+5)=&FF:hm
on1?(N%*12)=L%:hmon1?(N%*12+
1)=L%:hmon1?(N%*12+2)=R%:hmo
n1?(N%*12+3)=V%:hmon1?(N%*12
+4)=1:ENDPROC
  420 DATA6,3,14,1,6,4,3,17,
5,3,1,17,2,3,18,6,0,22,6
  430 DATA18,12,4,3,12,5,1,8
,6,5,8,7,1,15,7,2,8,8,1,8,9,
1,8,10,1,8,11,1,7,12,2,7,13,
2,4,14,7,16,18,1,16,19,1,16,
20,1,16,21,1,13,22,7,0,27,20
  440 DATA13,0,5,1,3,5,3,0,7
,1,0,9,6,17,9,1,7,10,1,18,11
,2,13,13,5,18,15,1,17,17,1,0
,19,1,18,19,1,7,24,6
  450 DATA7,0,0,2,19,3,19,7,
9,11,1,12,8,17,14,18,19,21,1
9,23,3,2,38,1,0,34,15,12,34,
25,0
  460 DATA14,8,4,5,2,4,5,14,
4,6,14,6,4,10,16,1,6,17,2,0,
18,4,11,18,1,10,21,1,11,25,1
,0,27,3,9,27,2,12,27,2,15,27
,5
  470 DATA20,4,5,1,4,6,1,18,
6,2,4,7,1,4,8,4,4,9,1,8,9,1,
4,10,1,8,10,1,13,10,7,8,13,1
,13,13,1,0,14,6,8,16,1,13,16
,1,8,19,1,13,19,1,8,22,1,13,
22,1,8,25,1
  480 DATA21,0,6,1,3,8,1,0,9
,1,0,12,1,12,13,1,9,14,2,7,1
5,1,14,15,1,16,15,3,19,16,1,
16,17,1,4,19,2,14,19,1,18,19
,1,6,21,2,18,21,2,19,22,1,3,
23,2,6,25,2,19,25,1,4,27,1
  490 DATA2,0,17,0,19,5,19,7
,14,12,19,11,0,15,17,16,0,22
,5,5,2,18,38,8,10,38,23,2,4,
5,12,30,11,21
  500 DATA1,0,27,3,7,6,20,1,
6,21,1,6,22,1,6,23,6,11,20,1
,11,21,1,11,22,1,56,0,5,2,5,
5,1,8,5,2,12,5,2,16,5,4,0,6,
1,2,6,1,4,6,1,6,6,1,8,6,1,10
,6,1,12,6,1,14,6,1,16,6,1,18
,6,1,0,7,2,4,7,3,8,7,2,12,7,
2,16,7,1,18,7,1,0,8,1,2,8,1,
4,8,1,6,8,1
  510 DATA8,8,1,10,8,1,12,8,
1,14,8,1,16,8,1,18,8,1,0,9,1
,2,9,1,4,9,1,6,9,1,8,9,2,12,
9,2,16,9,1,18,9,1,0,11,1,0,1
3,1,2,15,4,8,15,2,11,15,2,14
,15,2,18,15,2,19,17,1,16,19,
2,10,20,1,1,21,5
  520 DATA12,21,1,14,21,1,0,
23,2,2,25,2,18,25,2,3,27,17
  530 DATA1,1,5,1,8,1,12,1,1
8,1,19,8,12,11,8,21,19,22,9,
25,0,3,14,0,21,26,10,25,30,0
,13
  540 DATA5,9,20,2,7,21,2,6,
22,1,0,27,8,19,27,1
  550 DATA26,3,4,1,6,4,1,17,
4,1,3,5,1,6,5,1,17,5,1,0,6,4
,6,6,12,6,7,1,6,8,1,6,9,1,6,
10,1,7,16,1,11,16,1,14,16,1,
17,16,1,11,17,1,14,17,1,17,1
7,1,11,18,1,14,18,1,17,18,1,
11,19,1,14,19,1,17,19,1,11,2
0,7
  560 DATA30,11,3,2,0,4,3,4,
4,2,18,4,2,4,6,2,18,6,2,4,8,
2,18,8,2,0,10,6,7,10,2,13,10
,2,18,10,2,10,12,3,16,12,2,0
,13,1,2,15,2,0,17,1,9,17,2,1
2,17,2,15,17,2,18,17,2,2,19,
2,19,19,1,0,21,1,19,21,1,2,2
3,4,19,23,1,9,25,2,12,25,2,1
5,25,5
  570 DATA0,5,1,5,2,5,7,7,0,
15,7,15,12,18,15,18,0,19,19,
26,3,14,32,4,8,36,13,16,36,2
6,1,2,11,25
  580 DATA12,7,7,1,5,8,2,9,8
,1,6,3,1,0,24,1,0,17,2,14,3,
6,8,4,5,15,7,3,9,7,1,12,21,5
,19,27,1
  590 DATA30,10,3,1,10,4,1,5
,3,1,4,4,2,4,5,1,4,6,1,4,7,1
,5,12,3,4,16,9,2,20,1,2,21,1
,2,22,1,6,20,1,6,21,1,6,22,1
,2,23,5,10,7,2,11,10,1,18,9,
1,17,11,1,10,13,1,10,14,1,10
,15,1,16,13,1,16,14,1,16,15,
1,14,16,3,10,20,1,10,23,1,10
,24,1
  600 DATA19,19,5,1,0,4,1,11
,3,2,2,6,2,0,8,1,0,10,1,2,12
,3,9,13,1,3,20,3,7,22,1,7,24
,3,0,27,17,19,5,1,11,13,2,19
,13,1,18,15,1,18,18,1,18,21,
1,11,24,1
  610 DATA0,0,5,7,0,21,4,22,
3,7,17,0,11,14,12,17,19,21,1
3,22,3,10,36,5,0,32,18,4,28,
25,4,2,0,15,16,7,14,26,7,16,
34,12,26
  620 DEFPROCassem:DIMQ%2000
,table 60:FORN%=0TO27:table!
(N%*2)=N%+&140+&5BC0:NEXT:IF
INKEY-256=1 timer=&29F ELSEt
imer=&2A0
  630 os=&70:od=&72:ns=&74:n
d=&76:ad=&78:FORP=0TO2STEP2:
P%=Q%:[OPTP
  640 .sprite STX&7A:STY&7B:
JSRprint:LDAns:STAos:LDAns+1
:STAos+1:LDAnd:STAod:LDAnd+1
:STAod+1:LDX&7A:LDY&7B
  650 .print STY&80:.prlp1 L
DY&80:.prlp2 DEY:LDA(od),Y:E
OR(os),Y:STA(os),Y:CPY#0:BNE
prlp2
  660 LDAod:CLC:ADC&80:STAod
:LDAod+1:ADC#0:STAod+1:LDAos
:CLC:ADC#&40:STAos:LDAos+1:A
DC#1:STAos+1:DEX:BNEprlp1:RT
S
  670 .calc LDA#0:STAad+1:TX
A:LDX#3:.rolp ASLA:ROLad+1:D
EX:BNErolp:STAad:TYA:ASLA:TA
Y:LDAtable,Y:CLC:ADCad:STAad
:LDAtable+1,Y:ADCad+1:STAad+
1:RTS
  680 .check JSRcalc:LDY#0:L
DA(ad),Y:RTS
  690 .carrots EQUB0:.score
EQUW0:.fall EQUB0:.speed EQU
B0
  700 .dead EQUB0:.vert EQUB
0:.rx EQUB0:.ry EQUB0:.rf EQ
UB0:.rs EQUB0:.rd EQUB0:.rv
EQUB0:.ra EQUW0:.rg EQUW0
  710 .jmso EQUW&11:EQUW3:EQ
UW20:EQUW4
  720 .mvrab LDAvert:BEQchku
ndr:CMP#&FF:BEQchkundr:DECve
rt:BEQatoj:LDA#&FF:STArv:JMP
chkun2:.atoj LDA#&FF:STAvert
:LDA#0:STArv:JMPnkjm
  730 .chkun2 LDXrx:INX:LDAr
y:CLC:ADC#3:TAY:JSRcheck:CMP
#&FF:BEQjmflr:CMP#&F0:BEQjmf
lr:CMP#5:BEQjmflr:JMPnkjm:.j
mflr LDA#&FF:STAvert:LDA#0:S
TArv
  740 .chkundr LDXrx:INX:LDA
ry:CLC:ADC#3:TAY:JSRcheck:CM
P#&FF:BEQrabmv:CMP#&F0:BEQra
bmv:CMP#5:BEQdissolve:INCfal
l:LDA#1:STArv:LDAvert:BNEnkj
m2:LDA#0:STArd:.nkjm2 JMPnkj
m
  750 .dissolve LDXrx:INX:LD
Ary:CLC:ADC#6:TAY:LDA#31:JSR
&FFEE:TXA:LSRA:JSR&FFEE:TYA:
JSR&FFEE:LDA#17:JSR&FFEE:LDA
#1:JSR&FFEE:LDA#17:JSR&FFEE:
LDA#128:JSR&FFEE
  760 LDA#135:JSR&FFF4:DEX:C
PX#127:BNEntgon:LDX#32:.ntgo
n TXA:JSR&FFEE
  770 .rabmv LDAfall:CMP#7:B
CCnsplt:STAdead:RTS:.nsplt L
DA#0:STAfall:STArv:STAvert:S
TArd:LDA#&81:LDX#&9E:LDY#&FF
:JSR&FFF4:TYA:BEQnklf:LDA#&F
F:STArd
  780 .nklf LDA#&81:LDX#&BD:
LDY#&FF:JSR&FFF4:TYA:BEQnkri
:INCrd
  790 .nkri LDA#&81:LDX#&FF:
LDY#&FF:JSR&FFF4:TYA:BEQnkjm
:LDA#3:STAvert:LDA#&FF:STArv
:LDA#7:LDX#jmso MOD256:LDY#j
mso DIV256:JSR&FFF1
  800 .nkjm LDArx:CLC:ADCrd:
CMP#&FF:BEQstoph:CMP#38:BEQs
toph
  810 LDXrd:CPX#1:BNEntckri:
CLC:ADC#2:.ntckri TAX:LDYry:
STX&90:STY&91:JSRcheck:CMP#&
FF:BEQstoph:INC&91:LDX&90:LD
Y&91:JSRcheck:CMP#&FF:BEQsto
ph:INC&91:LDX&90:LDY&91:JSRc
heck:CMP#&FF:BEQstoph
  820 LDArx:CLC:ADCrd:STArx:
JMPnstph
  830 .stoph LDAvert:CMP#&FF
:BNEnstph:LDA#0:STArd:.nstph
 LDAry:CLC:ADCrv:CMP#25:BNEn
tb:STAdead:.ntb CMP#&FF:BEQj
tos:LDYrv:CPY#1:BEQnbnce:LDX
rx:INX:TAY:JSRcheck:CMP#&FF:
BNEnbnce:.jtos LDA#&FF:STAve
rt:STArv:JMPbonce
  840 .nbnce LDAry:CLC:ADCrv
:STAry:.bonce
  850 LDAra:STAos:LDAra+1:ST
Aos+1:LDArg:STAod:LDArg+1:ST
Aod+1:LDArd:CMP#&FF:BNErnfl:
LDA#0:STArf:.rnfl CMP#1:BNEr
nfr:LDA#&90:STArf
  860 .rnfr LDArd:BEQncs:LDA
rs:EOR#&48:STArs:.ncs CLC:AD
Crf:STArg:STAnd:LDA#9:STAnd+
1:LDXrx:LDYry:JSRcalc:LDAad:
STAra:STAns:LDAad+1:STAra+1:
STAns+1
  870 LDX#3:LDY#24:JSRprint:
JSRcarchk:LDAns:STAos:LDAns+
1:STAos+1:LDAnd:STAod:LDAnd+
1:STAod+1:LDX#3:LDY#24:JMPpr
int
  880 .carchk LDYry:STY&91:L
DA#3:STA&93:.otklp LDA#2:STA
&92:LDXrx:STX&90:.inklp
  890 LDX&90:LDY&91:JSRcheck
:CMP#8:BEQcart:INC&90:DEC&92
:BNEinklp:INC&91:DEC&93:BNEo
tklp:RTS
  900 .cart LDA#7:LDX#carso
MOD256:LDY#carso DIV256:JSR&
FFF1:JSRinsc:JSRpscore
```

Turn to Page 30 ►

Game

◀ From Page 29

```
 910 INCcarrots:LDAcarrots:
CMP#10:BNEntea:STAdead:.ntea
 920 LDAad:STAos:LDAad+1:ST
Aos+1:LDA#&20:STAod:LDA#&A:S
TAod+1:LDX#1:LDY#16:JMPprint
 930 .carso EQUW1:EQUW1:EQU
W100:EQUW5
 940 .insc SED:CLC:LDAscore
:CLC:ADC#1:STAscore:LDAscore
+1:ADC#0:STAscore+1:CLD:RTS
 950 .pscore LDA#31:JSR&FFE
E:LDA#0:JSR&FFEE:LDA#2:JSR&F
FEE:LDA#17:JSR&FFEE:LDA#2:JS
R&FFEE:LDAscore+1:JSRscbyt:L
DAscore:JSRscbyt:LDA#48:JMP&
FFEE
 960 .scbyt TAX:LSRA:LSRA:L
SRA:LSRA:JSRdig:TXA:AND#&F:.
dig CLC:ADC#48:JMP&FFEE
 970 .hmon1 EQUD0:EQUW0:.vm
on1 EQUD0:EQUW0
 980 .hmon2 EQUD0:EQUW0:.vm
on2 EQUD0:EQUW0
 990 .hmon3 EQUD0:EQUW0:.vm
on3 EQUD0:EQUW0
1000 .hmon4 EQUD0:EQUW0:.vm
on4 EQUD0:EQUW0
1010 .mxy EQUB0
1020 .hmonmv LDA#0:STAmxy:L
DX#hmon1 MOD256:LDY#hmon1 DI
V256:JSRmvhm:LDX#hmon2 MOD25
6:LDY#hmon2 DIV256:JSRmvhm:L
DX#hmon3 MOD256:LDY#hmon3 DI
V256:JSRmvhm:LDX#hmon4 MOD25
6:LDY#hmon4 DIV256:JMPmvhm
1030 .mvhm STX&9A:STY&9B:LD
Y#5:LDA(&9A),Y:BNEhmex:RTS:.
hmex LDY#0:LDA(&9A),Y:TAX:LD
Y#3:LDA(&9A),Y:TAY:JSRcalc:L
DAad:STAos:LDAad+1:STAos+1
1040 LDY#4:LDA(&9A),Y:LDYmx
y:CLC:ADC(&9A),Y:STA(&9A),Y:
LDY#1:CMP(&9A),Y:BEQcmnd:INY
:CMP(&9A),Y:BNEdcmnd
1050 .cmnd LDY#4:LDA(&9A),Y
:CMP#&FF:BEQcmtr:LDA#&FF:STA
(&9A),Y:JMPdcmnd:.cmtr LDA#1
:STA(&9A),Y
1060 .dcmnd LDY#0:LDA(&9A),
Y:TAX:LDY#3:LDA(&9A),Y:TAY:J
SRcalc:LDAad:STAns:LDAad+1:S
TAns+1:LDA#&30:STAod:STAnd:L
DA#&A:STAod+1:STAnd+1
1070 LDX#2:LDY#16:JSRprint:
JSRmonchk:LDAns:STAos:LDAns+
1:STAos+1:LDAnd:STAod:LDAnd+
1:STAod+1:LDX#2:LDY#16:JMPpr
int
1080 .monchk LDY#3:LDA(&9A)
,Y:STA&91:LDA#2:STA&93:.otrl
p LDA#2:STA&92:LDY#0:LDA(&9A
),Y:STA&90:.inrlp
1090 LDX&90:LDY&91:JSRcheck
:CMP#0:BNErabhr:INC&90:DEC&9
2:BNEinrlp:INC&91:DEC&93:BNE
otrlp:RTS
1100 .rabhr LDA#&FF:STAdead
:RTS
1110 .vmonmv LDA#3:STAmxy:L
DX#vmon1 MOD256:LDY#vmon1 DI
V256:JSRmvhm:LDX#vmon2 MOD25
6:LDY#vmon2 DIV256:JSRmvhm:L
DX#vmon3 MOD256:LDY#vmon3 DI
V256:JSRmvhm:LDX#vmon4 MOD25
6:LDY#vmon4 DIV256:JMPmvhm
1120 .escp LDA#27:STAdead:L
DA#126:JMP&FFF4
1130 .main LDAspeed:STAtime
r:LDA#0:STAdead:STAcarrots:S
TAfall:.mainloop
1140 LDA#&81:LDX#&8F:LDY#&F
F:JSR&FFF4:TYA:BNEescp
1150 JSRmvrab:JSRhmonmv:JSR
vmonmv:JSRwait
1160 LDAdead:BEQmainloop:RT
S
1170 .wait BITtimer:BMIwait
:LDAspeed:STAtimer:LDA#19:JM
P&FFF4
1180 ]NEXT:ENDPROC
1190 DEFPROCgraphics:RESTOR
E1280:FORN%=&900TO&A4FSTEP4:
READA$:!N%=EVAL("&"+A$):NEXT
1200 VDU23,128,85,0,0,0,0,0
,0,0
1210 VDU23,129,85,170,0,0,0
,0,0,0
1220 VDU23,130,85,170,85,0,
0,0,0,0
1230 VDU23,131,85,170,85,17
0,0,0,0,0
1240 VDU23,132,85,170,85,17
0,85,0,0,0
1250 VDU23,134,255,255,126,
126,60,24,0,0
1260 VDU23,135,255,129,195,
231,231,195,129,255
1270 ENDPROC
1280 DATA0,1000000,0,70E1E1
70,96523010,8080482C,1110,10
10100,660F0F0,3C3C0F0F,0,808
0800,10101,10000000,FC3693C,
E0E06020,4C6E6E,0
1290 DATA0,1000000,0,70E1E1
70,96523010,8080482C,1110,10
10100,660F0F0,3C1E0F0F,0,808
0800,10101,30101000,F0FE178,
30908090,4C6E6E,80808080
1300 DATA96A4C080,10102143,
0,E07878E0,0,8000000,0,10101
00,660F0F0,C3C30F0F,8880,808
0800,236767,0,F3C69C3,707060
40,80808,80000000
1310 DATA96A4C080,10102143,
0,E07878E0,0,8000000,0,10101
00,660F0F0,C387F0F,8880,808
0800,236767,10101010,F0F78E1
,C0901090,80808,C0808000
1320 DATA70780C08,3050,C880
0000,70F260C0,7073355,6F4D6F
0F,C0C8844,CE46CE0E,2D2C0C0F
,3070F2D,8686060E,80C0E86
```

This listing is included in this month's cassette tape offer. See order form on Page 45.

Adventure Anthology

This superb collection contains four of the best adventures taken from the pages of Electron User. In addition there is an unpublished masterpiece written by Bill Trevelyan, one of the magazine's foremost contributors. They range from mini adventures ideally suited to the novice adventurer, right through to large, complex programs containing many mind-boggling puzzles designed to test the most experienced player.

The Golden Crown: The King has been robbed of his crown by a devious adversary. A knighthood and countless wealth is promised to whosoever can recover the crown.

Johnny: In this adventure by Bill Trevelyn you are cast in the role of a young boy. Your objective is to get to school on time. This is no simple task though, and many pitfalls and puzzles await you along the way.

Dracula: Take a deep breath and step across the threshold into Dracula's castle. Find Drava's Scroll of Runes and retrieve the lost fortunes.

Craal: A classic adventure in which you have to find the magical crown and return it to its rightful owner.

Necromancer: A peaceful village has been terrorised by an evil wizard. Search him out and take back the stolen treasures.

These exciting adventures will keep you engrossed for weeks – and at less than £1 each this has to be one of the best bargains for intrepid adventurers ever devised.

Only **£4.95**

To order please turn to the form on Page 45

Spoilt for choice

Learn how to make decisions in Part 5 of PETE BIBBY's machine code series

NO rest for the wicked this month, as we plough on into machine code at a rapid rate of knots. What with covering 16 new instructions and a brand new register, it's no surprise that by the end of the article we'll be going round in circles – or rather, loops.

The first of the instructions we'll meet is the increment operation. All this does is to tell the 6502 to increment – increase by one – the value held in a register or memory location.

INX increases the value in the X register, while INY increases the value held in the Y register.

To increment the value in a memory location, INC is the mnemonic, followed by the location's address. Strangely though, there isn't a command to directly increment the accumulator.

Program I shows our incrementing command in action. It's not spectacular, but it works and shows what it does so be satisfied for now.

You can experiment to your heart's desire later when you have seen some more useful applications in action. By now most of the program should need no explanation – which saves me a lot of trouble.

You should be able to see that the accumulator receives the value 65 – the Ascii value of A – which is then copied to the X register by way of the TAX we met last time. (Few things are certain in assembly language programming except a dearth of memory and TAXs.)

```
10 REM Program I
20 MODE 6
30 codeStart=&2000
40 oswrch=&FFEE
50 osnewl=&FFE7
60 P%=codeStart
70 [
80 LDA #ASC('A')
90 TAX / transfer 65 to X re
gister
100 INX / increment the valu
e in X
110 TXA / transfer contents
of X to accumulator
120 JSR oswrch
130 JSR osnewl
140 RTS
150 ]
160 CALL codeStart
```

Once we've got the value in the X register the program then goes on to INX, so that the 65 now has one added to it, making it 66. This is duly transferred from the X register back to the accumulator – TXA – and a call to oswrch has the letter B appearing on the screen.

As we originally put the Ascii code for A into the accumulator, this proves to those of little faith that INX actually has increased the value in the X register, though we have to move it back to the accumulator to see it printed.

Complementing the increment commands are three decrements. These are DEX, DEY and DEC which take one away from the value held in the X register, Y register and a specified memory location respectively.

Table I shows the mnemonics and their actions.

Try varying Program I so you get experience of using them all. Don't you agree it's infuriating that you can't simply increment the accumulator?

Taking a break from assembly language for a moment, have a look at Program II. Composed of pure, old-fashioned Basic, it's mainly just a FOR...NEXT loop which prints out a line of nine asterisks. While this may not be riveting stuff, consider for a moment how you'd do it in machine code.

Using what we know so far, you can't. But with the help of two new sets of commands and a smidgen of knowledge about yet another register, you'll find that you can create the assembly language version of a FOR...NEXT loop and so increase the power of your machine code programs.

Mnemonic	Effect
INX	Add one to X register
INY	Add one to Y register
INC &2100	Add one to value at address &2100
DEX	Subtract one from X register
DEY	Decrease Y register by one
DEC &75	Reduce value in location &75 by one

Table I: Increment and decrement instructions – one at a time

```
10 REM Program II
20 MODE 6
30 start=1
40 finish=9
50 FOR loop=start TO finish
60 PRINT "*";
70 NEXT loop
80 PRINT
```

The new register is the status – or P – register. It's eight bits wide, just like our previous registers, but there the resemblance ends. So far we've been used to moving around all eight bits of a register at once with gay abandon, but with the status register this isn't possible.

In fact, the status register is really considered as a collection of individual bits – or flags – each being used to denote various things that are happening during the course of a program.

Their actual positions within the status register doesn't matter – we never

Turn to Page 32 ▶

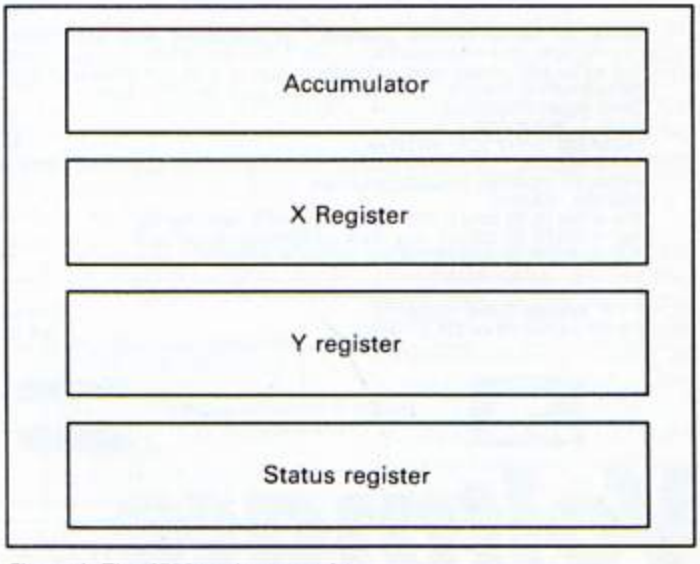


Figure I: The 6502 registers so far

◀ From Page 31

need to know. Figure I shows our new schematic view of the 6502 while Figure II takes a closer look at bits of the status register itself.

Having mentioned that the status register consists of eight separate bits which are used to flag various occurrences inside the micro, we'll now blithely ignore five of them and just concentrate on three.

As you might have guessed from Figure II, these are the negative flag, the zero flag and the carry flag. Let's take a look at each one in turn.

At its simplest, the negative – or N – flag is used to denote whether the result of the previous operation was a negative number. If it was, then this particular bit of the status register is set to one to indicate what's happened, otherwise it's cleared – or reset – to zero.

If you're into the intricacies of signed binary arithmetic then you might view this as the most significant bit of a result being copied into the N flag. If you're not, don't worry. You'll soon see how easy it is to use.

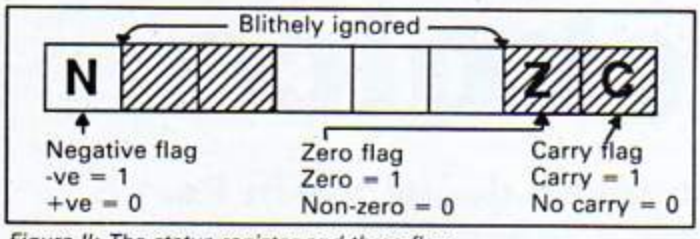


Figure II: The status register and three flags

As you might surmise from this, the zero – or Z – flag shows whether the last instruction resulted in a zero value. If it did, then the flag is set to one to show that this has happened. If it hasn't then it's cleared to zero.

If you think that's a little back-to-front, I agree, but that's the way it is. A zero result puts one in the zero flag, a non-zero result puts zero in it.

The final flag we'll be looking at is the carry – or C – flag. If this reminds you of doing your sums at school then you're on the right track.

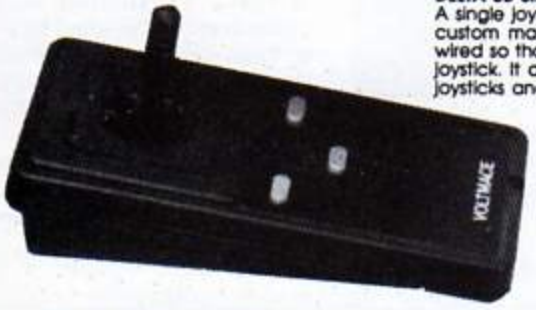
Remember when you added two numbers in a column – say six and eight – and the answer came to 10 or more? You wrote down the smaller figure – in this case four – and carried the one over to the next column.

It's the same with machine code, except now we're adding bytes, and the carry operation comes in

Mnemonic	Flag	Condition
BNE	Z=0	Branch if Not Equal
BEQ	Z=1	Branch if EQual
BCC	C=0	Branch if Carry Clear
BCS	C=1	Branch if Carry Set
BPL	N=0	Branch if PLus
BMI	N=1	Branch if MInus

Table II: Branch commands and the flags that trigger them

JOYSTICKS—THE COMPLETE SOLUTION



DELTA 3B SINGLE for a BBC B or ELECTRON PLUS 1 £12.95
A single joystick that in some ways can act as two. The custom made special "low noise" potentiometers are wired so that it will work as a left hand or right hand joystick. It can even run some programs written for two joysticks and has the fire buttons of both.

SPECIAL OFFERS

Webwars	£1.99
Repton 2	£2.99
Both for	£4.49

DELTA 3B TWIN for a BBC B or ELECTRON PLUS 1 £19.95
A direct but improved alternative for the original ACORN joysticks, with 2 joysticks wired to one plug. As with all our joysticks they have the fast action sprung to centre return of the steel shafted nylon covered joystick. The light action makes them ideal to hold and the 3 fire buttons allow left or right-handed use.

DELTA 3S SINGLE-MASTER COMPACT or ELECTRON FIRST BYTE INTERFACE £12.95
The same light, hand-held, fast, light action of a 3B but fitted with switches for use with a switched joystick interface, such as a First Byte.

FIRST BYTE INTERFACE £19.95
PLUS 1 INTERFACE £49.95
SLOGGER JOYSTICK INTERFACE £19.95
To run a Delta 3S switched joystick on a Plus 1 which runs many of the new Acorn compatible joystick programs.

SPECIAL OFFERS
Buy a DELTA 3S and a FIRST BYTE INTERFACE together for £29.95
Buy a DELTA 3B SINGLE and PLUS 1 INTERFACE together for £59.95
Buy a DELTA 3S and SLOGGER JOYSTICK INTERFACE together for £29.95

This Months special offer – Discs
3.5" Double Sided 135tpi £10 for 10
5.25" DS/DD 40 or 80T £5 for 10

Available from your dealer or direct from us

VISA

Voltmace

Unit 9 (Dept. EU)
Bondor Business Centre
London Road
Baldock
Herts SG7 6HP
Telephone: (0462) 894410

when there's a one left over from the most significant bit of the result. In this case the carry bit in the status register is set to show what's happened.

In effect, the carry bit acts as a ninth bit to a byte. We'll see how it's used in addition next month, but for the moment all you need to know is that the carry is set when the result of an addition is more than 255 – the maximum value a single byte can hold.

So, we're concentrating on three bits of the status register, and the state of the various bits depends on what's happening in the current program. So far, so good. But what has this got to do with reproducing Program II in assembly language?

The answer is everything, because by keeping track of the status bits we can make our assembly programs branch to a different part of the program, according to which particular flags in the status register are set or clear.

The 6502 allows us to jump in a similar manner to Basic's notorious GOTO command. We can go forward or backwards, jumping over whole sections of code or creating loops.

Such instructions are known as branch commands, and Table II shows six of them and the conditions needed for that branch to be taken.

If the condition is met – a flag has a particular value – then the program jumps to the address supplied with the command.

If the condition isn't met then the command is ignored and the program moves on to the next instruction.

So by using the branches we can get the program to perform jumps, depending on the current condition of the status flags. But how do we actually effect these flags? To do this, we'll have to learn about another group of commands: Comparison instructions.

These are CMP, CPX and CPY and what they do is to compare a specified value with the value in the accumulator or X or Y register.

Mnemonic	Effect
CMP #65	Compare value in accumulator with 65
CPX store	Compare X with value in location labelled *store*
CPY #finish	Compare Y value with value of *finish*

Table III: Comparisons compared

Notice the word compare – nothing happens to either value, they're just looked at and left untouched. Only the flags in the status register are altered, according to the result of the most recent comparison. Table III shows all of the available comparison commands.

What happens is that – for reasons we'll ignore for the moment – the carry flag is set and then the value specified in the comparison command is subtracted from the register specified.

Now there are three things that can happen, and in each case the result on the status flags is different.

In the first case the number in the register is larger than the value specified. This results in the carry flag being left set while the zero and negative flags are cleared as the result – which isn't used – is neither negative or zero.

The second case is when the two values are equal. In this case the carry flag still remains set, the negative flag is cleared but the zero flag is set to one to show that the result is zero.

In the final case, where the value in the register is less than that being taken away, the carry flag is reset to zero (it's been "borrowed" for the take-away), the zero flag is cleared and the negative flag is set.

Table IV sums up the effects of the different cases on the status flags.

And now, with all that theory behind us, you should be able to understand what's happening in Program III, our assembly language version of Program II.

Here, an initial value is stored in the X register and every time round the loop it is incremented by one. As soon as this happens the value in the X register is compared with *finish* and the program moves on to the BNE – Branch if Not Equal – instruction.

If the two values aren't equal, then the zero flag is zero and the branch is taken back to *loop*. Only when they are equal does the program drop out of the loop. The result is an assembly language equivalent of a FOR...NEXT loop.

Value difference	N	Z	C
Register greater	0	0	1
Register equal	0	1	1
Register less	1	0	0

Table IV: Different conditions, different flags

```
10 REM Program III
20 MODE 6
30 codeStart=&2000
40 oswrch=&FFEE
50 osnewl=&FFE7
60 start=0
70 finish=9
80 asteriskCode=42
90 P%=codeStart
100 [
110 LDA # asteriskCode
120 LDX #start
130 .loop
140 JSR oswrch
150 INX
160 CPX #finish
170 BNE loop
180 JSR osnewl
190 RTS
200 ]
210 CALL codeStart
```

```
10 REM Program IV
20 MODE 6
30 first=5
40 second=10
50 REPEAT
60 PRINT "*";
70 first=first+1
80 UNTIL first>second
90 PRINT
```

```
10 REM Program V
20 MODE 6
30 codeStart=&2000
40 oswrch=&FFEE
50 osnewl=&FFE7
60 first=5
70 second=10
80 asteriskCode=42
90 P%=codeStart
100 [
110 LDA # asteriskCode
120 LDX # first
130 .loop
140 JSR oswrch
150 INX
160 CPX # second
170 BCC loop \ first is
less than second
180 BEQ loop \ first is
equal to second
190 NOP / when this poin
t is reached
200 NOP / first must be
greater than second
210 JSR osnewl
220 RTS
230 ]
240 CALL codeStart
```

And that's all we're going to cover for this time. Program IV continues my obsession with asterisks. It's in Basic again but this time I've used a FOR...NEXT loop.

Program V shows an assembly language version which I'll leave for you to figure out – though I will tell you that NOP stands for No OPeration and does nothing!

● *Once you've understood the code, try writing your own loops to create REPEAT...UNTIL loops with different operators, such as <= or <>, in the final condition. That's an intellectual challenge which should keep you occupied until next month, when we'll be looking at some simple sums and three new addressing modes.*

PRES

THE ADVANCED PLUS 3

Now you can turn your Electron & +1 into a full disc system – no more waiting for tape loading or 'bad block'/'data?' messages. A.P.3. gives you . . .

1. A fully Acorn compatible 1770 interface
2. 80 track 3.5" disc drive, as used by Acorn (320k capacity)
3. Separate PSU
4. Acorn ADFS
5. Welcome disc
6. Utilities
7. Full documentation
8. All the advantages of the original Plus 3 PLUS extra ROM socket.

UNBEATABLE PRICES

OUR TOP SELLING PRODUCT

All this without dramatically increasing the required desk space!
Now well into the SECOND THOUSAND production.
Remember – 2nd drives (3.5 or 5.25) can be added and the AP3 drive can be used on a BBC or Master computer! Also most Electron disc-based software is supplied on 3.5" ADFS discs.
The only fully compatible disc upgrade running Acorn's own preferred filing system (supplied on: Plus 3, Master 128, Master Compact and now the Archimedes)

EXTRA BONUS
3 games on disc – SNAPPER – DRAUGHTS – REVERSI

COMPLETE PACKAGE ONLY
£99.00 excl VAT; £113.85 inc VAT

ADVANCED PLUS 1 . . . The plus 1 is the main expansion for the Electron. It provides the Centronics parallel printer, printer port, joystick interface and 2 cartridge slots into which go ROM cartridges including View, Viewsheet, Pascal, Logo and our own popular AP4 disc upgrade.
£43.43 excl VAT; £49.95 inc VAT

ADVANCED PLUS 6 . . . a fully buffered 6 ROM expansion module for the Electron user. AP6 is fitted inside the advanced Plus 1 or a modified Acorn Plus 1 (when used with the Acorn Plus 3, 5 ROM sockets are available). All sockets are designed to accept either ROM/EPROMS or RAM chips. A further feature is the optional AP7 upgrade.
"A marvellous piece of design . . . don't hesitate, buy it!"–*EU, May '88*
£33.00 excl VAT; £37.95 inc VAT
UPGRADE SERVICE for the original Acorn Plus 1 to Advanced Plus 1 and AP6. This will provide all the benefits of AP6 and also includes the printer circuit modification for some modem printers. (AP6 can be fitted to original Plus 1 by users with soldering experience) for upgrade service add £7.00 + VAT to AP6 price ie
£40.00 excl VAT; £46.00 inc VAT
Incl. Mod, Fitting + Testing & Carriage. Send to:
P.R.E.S. Service Department, PO Box 34, Bradford BD17 6DE

ADVANCED ROM ADAPTER 2
An Acorn approved cartridge containing a card with special 'zero' profile sockets that allow you to fit compatible 8k or 16k EPROMS/ROMS. The cartridge is fully enclosed providing complete protection for your ROMS. Simple to use – No switching – complies fully to the Acorn (sideways) Rom filing system.
"The best ROM cartridge is by far the ARA 2...*A&B Dec 86*
£13.00 excl VAT; £14.95 inc VAT

ADVANCED BATTERY-BACKED RAM
A standard Acorn approved cartridge but containing 32k (2 x 16k) of sideways RAM. The added bonus is the battery-backed feature that holds the RAM contents when the power is switched off! Different ROM images can be loaded into either bank from ROM images previously saved. The banks can also be locked to imitate ROM use. Now it is possible to have View & ViewSheet in one cartridge every time you switch on. Other uses include &E00 ADFS, printer buffer, ROM software development. The use of ABR is simplified by the newly written PRES software utilities which include:- SaveROM, LoadROM, Lock, Unlock, Printer Buffer, Zero and MakeROM a new utility to put your own software from disc or tape into ABR & use the ROM filing system. All software is supplied in ABR with a simple menu to transfer the utilities to your own media. No hardware switching – totally software controlled. Instructions for using supplied software and necessary information for users developing their own applications.
"It's a superb add-on and a must for all serious Electron users". . . *Electron User*
£34.77 excl VAT; £39.95 incl VAT

ADVANCED QtrMeg RAM
A quarter megabyte is a whole 256k of extra sideways RAM. AQR provides this in a standard size, Acorn approved cartridge. Although ROM images can be loaded (with the appropriate software) into the various 16 banks of 16k RAM; AQRs primary and best use is as a RAM DISC. On an Electron this is achieved by using our ADFS 1.1 or ADFS &E00, both supplied with the necessary initialisation software to configure AQR as a 256k RAM DISC (the latter also regains 3.75k of main user memory on a Plus 3 system).
£69.52 excl VAT; £79.95 inc VAT

NEW PRODUCT

NEW ** ADVANCED PLUS 2 ROM
We feel this is one of the best, low cost, additions we have produced for the Electron & +1 user, especially for Plus 3, AP3 & ABR users.
Now with this easy to fit upgrade you can add:

1. Fix for Tape filing system in Hi-res screen modes.
2. *ROMS – to display all ROMs/ROM images present on the system.
3. *UNPLUG – disable ROM/RAM image.
4. *INSERT – enables or inserts a previously unplugged ROM.
5. *KILL – to totally disable the Plus 1.
6. *LOCK – to lock a sideways RAM bank in ABR, AQR, AP7.
7. *LROMS – to lock all sideways RAM banks found.
8. *UNLOCK – to unlock a sideways RAM bank in ABR, AQR, AP7.
9. *UROMS – to unlock all sideways RAM banks found.
10. *SAVEROM – saves a copy of a ROM image to the current filing system.
11. *LOADRUN – loads a ROM image from the current FS into a RAM bank.
12. *FORMAT – will format an ADFS disc for Plus 3 or AP3.
13. *VERIFY – reads and tests every sector on an ADFS disc.
14. *VFORM – formats and verifies an ADFS disc in one command.
15. *BUILD – creates a text file that can be used by *EXEC (ie !BOOT).
16. *LIST – displays a numbered listing of a text file.
17. *TYPE – displays a file on screen with no line numbers.
18. *DUMP – to view a file's contents on screen.
19. *LANG – selects a default language to be booted on <CTRL-BREAK>
20. *HELP – provides a full 'help' list on all the ROM's commands
    STOP PRESS
21. *AQRPAGE – selects the specified page in any AQR present.

Now there is no need to search for your utilities disc every time you want to Format/Verify a disc, Build a !Boot file or Lock/unlock/Load a ROM image into ABR PLUS much more . . . the ideal companion from the company that produces the Acorn Plus 1.
£11.00 ex VAT; £12.65 inc VAT

NEW ** USER PORT **
A new low cost unit for those who just require a user port interface. Supplied in a standard size, Acorn approved cartridge, with the standard connector on top. Inside is a spare ROM socket which can also be configured for high priority use such as mouse software.
£19.99 ex VAT; £22.95 inc VAT

NEW ** ADVANCED PRINTER BUFFER
Newly written software from PRES that will use sideways RAM (ie ABR) to take text on its way to a printer from the computer & then continue to 'feed' the printer on demand while the computer is freed as soon as it has delivered up to 14k of text to the buffer. As printers are much slower than computers, this means you can carry on editing text in View while the printer takes text from the buffer at its own speed. Included are commands to turn the buffer ON/OFF, purge the buffer, control the effect <ESCAPE> has on the buffer and produce a buffer status report. Supplied on 3 .5" ADFS or 5.25" DFS disc.
£9.00 ex VAT; £10.35 inc VAT

NEW LOW PRICES

ADFS VERSION 1.1
Suitable for existing Plus 3 or A.P.4 users. This new version has the software fixes for Zysyshelp, write protect disable & compaction. Also Winchester code has been replaced with the necessary driving software to handle AQR as a 256k RAM DISC. Please note – ADFS is Acorns adopted standard filing system supplied on the Plus 3, Master 128, Master Compact & now the Archimedes. Supplied on 16k ROM with Welcome disc & utilities. Please state 3.5"/5.25" welcome disk.
£14.95 ex VAT; £17.19 inc VAT
(ADFS manual supplied separately)

ADFS E00
For ELectron users with either Plus 3 or A.P.4 and 32k of S/W RAM i.e. ABR. All the benefits of ADFS but without all the loss of RAM! Includes all the software 'fixes' as in version 1.1 as well as the AQR/RAM DISC code and an 'FX' call for managing the new & original ADFS. One of the most frequent questions we are asked: "How do I get back the memory lost on my Plus 3 system?" Answer: PRES ADFS &E00 regains 3.75k leaving page @ &E00 the same as Tape!
ADFS E00 supplied; 3.5" ADFS (manual available separately)
£14.95 ex VAT; £17.19 inc VAT
5.25" ADFS (manual avail. sep.) **£14.00 ex VAT; £16..10 inc VAT**
5.25" DFS (2 discs+ADFS manual) **£19.00 ex VAT; £21.85 inc VAT**
(See Special Package Prices)

NEW ** PRES ABR SOFTWARE
The new PRES ABR software now available separately containing: SaveROM, LoadROM, Lock, Unlock, Printer Buffer, Zero and MakeROM a new utility to put our own software from disc or tape into ABR & use the ROM filing system. Supplied on 3.5" ADFS or 5.25" DFS disc.
3.5"£9.99 ex VAT; £11.49 inc VAT
5.25"£8.99 ex VAT; £10.34 inc VAT

NEW ** ADVANCED GAMES COMPENDIUMS – ON DISC
With so many of our products providing more 'serious' add-ons for the Elk; we thought it was time to allow easy access to some of the favourite games ON DISC! . . . Three volumes of popular games, previously only available on tape, now 'instantly' loadable from menu on disc. Each volume contains EIGHT menu selectable games. Available on 3.5" ADFS or 5.25" DFS.

Vol. I	Vol. II	Vol. III
Invaders	Felix and the Fruit Monsters	Danger UXB
Jet Power Jack	The Mine	Ghouls
Killer Gorilla	Rubble Trouble	Felix and the Evil Weevils
Stock Car	Swag	Adventure
Bandits @ 3	Cybertron Mission	Positron
Bumble Bee	Moonraider	Swoop
Croaker	Frenzy	Chess
Felix in the Factory	Escape Moonbase Alpha	Galactic Command

3.5"£9.99 ex VAT each volume; £11.49 inc VAT
5.25"£8.99 ex VAT each volume; £10.34 inc VAT

DISC DRIVES	Ex VAT	+VAT
Cumana 5.25" dbl/sided 40/80 track, switchable, inc. psu.	£129.56	£149.00
Cumana 5.25" sing/sided 40 track, inc. psu.	£112.17	£129.00
Cumana 3.5" dbl/sided 80 track, inc. psu.	£112.17	£129.00
PRES special 3.5" sing/sided 80 track, inc. psu. *ONLY*	£59.00	£67.85

DISCS
3.5" 10 in plastic library box – ideal for Plus 3 users £19.95
5.25" 10 dble/sided dble/dens. £12.99
5.25" 10 sing/sided sing/dens. £8.99
5.25" Twin Gift Pack £1.49

VIEW CARTRIDGE . . . the Acornsoft word processor for the Electron and Plus 1. Inc. full documentation. £14.95
VIEWSHEET CARTRIDGE . . . the Acornsoft spreadsheet for the Electron and Plus 1. Inc. full documentation. £14.95
VIEW & VIEWSHEET . . . both products as above *special price*. £22.00
LISP CARTRIDGE . . . the Acornsoft language cartridge for the Electron and Plus 1. ..... £9.99

ACCESSORIES

NEW ** ELECTRON POWER SWITCH
For those who are fed up with removing the power connector every time when resetting the computer or for those whose jack-plug connector has become unreliable by removing the power at random! This useful accessory provides a double-pole in-line switch with a new power jack-plug already attached: just connect to the existing lead, having removed the old jack-plug.
£3.96 ex VAT; £4.55 inc VAT

AP3 2nd DRIVE LEAD
Replaces existing drive cable with one containing an extra connector for adding a second drive configured as Drive 1.
£5.96 ex VAT; £6.85 inc VAT

PLUS 3 2nd DRIVE ADAPTOR
Converts the fitting at the back of the original Acorn Plus 3, to take a standard disc drive connector when adding a second drive which has been configured to Drive 1.
£6.91 ex VAT; £7.95 inc VAT

A.D.F.S Guide Manual £5.00

SPECIAL PACKAGE PRICES

AP1 + AP3	£130.39 ex VAT	£149.95 inc VAT
AP1 + AP6	£69.52 ex VAT	£79.95 inc VAT
AQR + ADFS 1.1	£78.00 ex VAT	£89.70 inc VAT
ABR + 3.5" ADFS E00	£44.30 ex VAT	£50.95 inc VAT
ABR + 5.25" ADFS E00	£43.33 ex VAT	£49.95 inc VAT
ABR + 5.25" DFS (ADFS E00)	£47.00 ex VAT	£54.95 inc VAT

MUSIC 5000 – NOW AVAILABLE
The popular BBC Music System – Music 5000 for the Electron – provides mixing desk, stave editor etc.
Please call for details and requirements.
£99.00 ex VAT; £113.85 inc VAT

NEW PRODUCT
Adventure games disc on disc for Electron users:- Ultimate Prize, Dreamtime, Pirates Peril, Tarnda Scheme + Stranded
3.25" ADFS £6.95 ex VAT; £7.99 inc VAT

***** NEW EXCLUSIVE MAIL ORDER PRODUCT FROM PRES *****
THE TIMES COMPUTER CROSSWORD VOLUME 1

	Ex VAT	+VAT
ADFS 5.25"	£13.00	£14.95
ADFS 3.5"	£13.00	£14.95
DFS 5.25"	£11.26	£12.95
Cass	£8.65	£9.95

***** NEW *****
AP3 INTERFACE ONLY ..... £52.00 ex VAT £59.80 Inc VAT

PRINTER
Printer ideal for Electron Plus 1. Panasonic KX-P1081 Graphic Epson Compatible NLQ ready to connect including cable, delivery and VAT
..... £155.65 ex VAT £179.00 inc VAT

ELECTRON ADVANCED USER GUIDE . . . further reading and information for the Electron user. £3.95
ELECTRON ASSEMBLY LANGUAGE . . . book by Bruce Smith containing many examples of how to program in assembler. £2.95
Software on disc for the above 3.5" ADFS £3.50 – 5.25" DFS £2.50

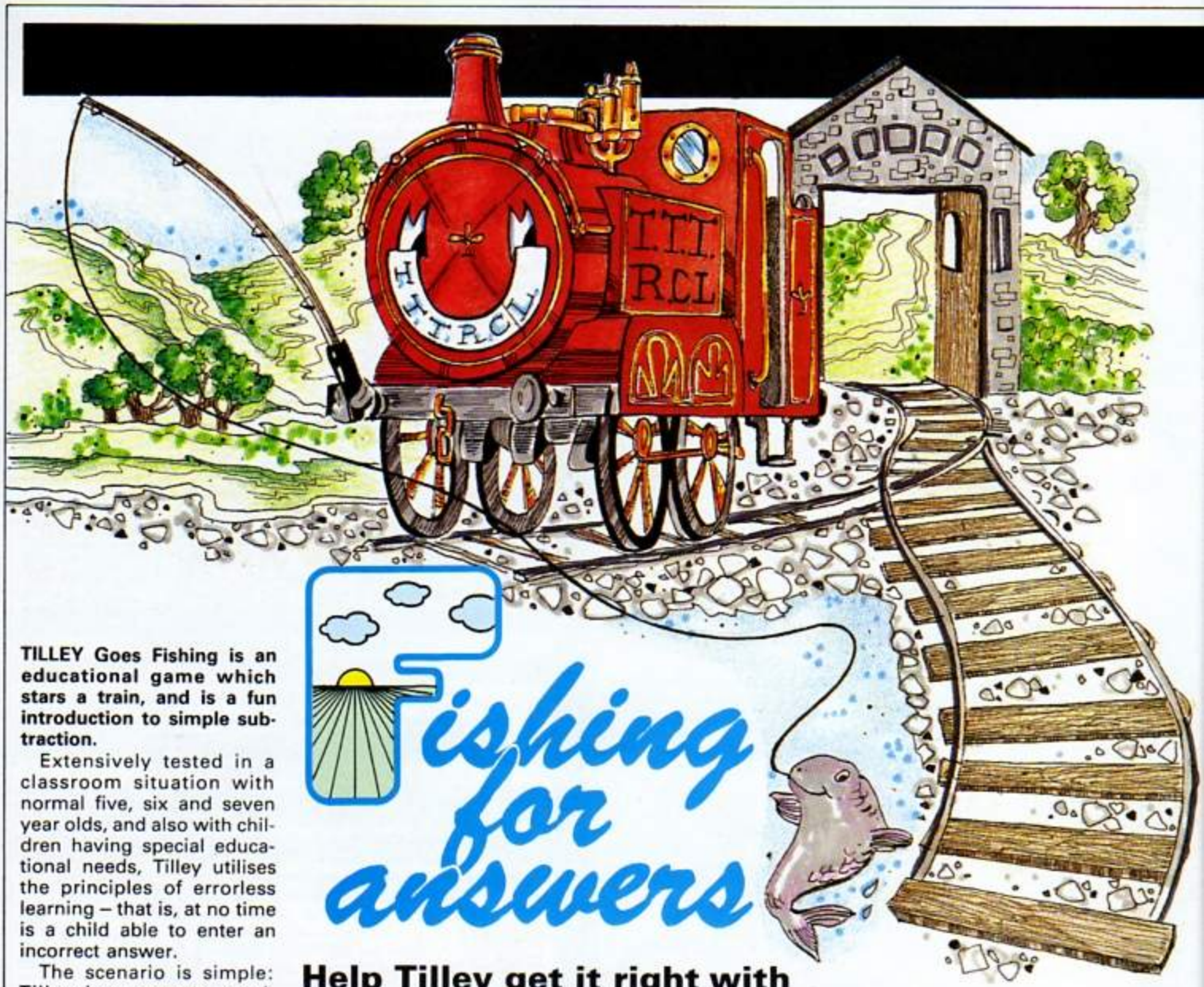
COMING SOON
ADVANCED PLUS 7 . . . upgrade for AP6 allows for 2 banks of 16k battery backed sideways ram which can be fully write protected.
BASIC EDITOR+ . . . the ultimate basic toolkit for the Electron. £TBA
1MHZ bus, . . . a new single 1MHZ bus in standard size cartridge at a budget price ..... £TBA

Please send order to:-
P.R.E.S. LTD.,
6 Ava House, High Street,
CHOBHAM, Surrey, England.
GU24 8LZ. Tel: 0276 72046
(Mail order only)
All our prices include UK delivery & VAT

(in event of any query– please include your tel. no.)

Product Qty @ Total

Name .....
Address .....
.....
.....
Postcode .....
Tel: ..... I enclose payment for £ .....
Credit Card No.: ..... Exp date ..... (Ref E106)



Fishing for answers

Help Tilley get it right with this educational maths game from RON HAGLEY

TILLEY Goes Fishing is an educational game which stars a train, and is a fun introduction to simple subtraction.

Extensively tested in a classroom situation with normal five, six and seven year olds, and also with children having special educational needs, Tilley utilises the principles of errorless learning – that is, at no time is a child able to enter an incorrect answer.

The scenario is simple: Tilley has gone to catch some fish from the top of her favourite bridge, but she needs some help with working out just how many are left in the water.

The child – or children – must follow a simple subtraction process through to its correct conclusion, by making use of both the numeric and graphical display of the sum in progress.

First, the main screen is drawn, with Tilley sitting atop a red bridge. Then a random number of fish appear in the river beneath, with a flashing question mark beside them.

This is a prompt to enter the correct number of fish, and at this point it should be noted that all keyboard input is numeric and does not require the use of the Return key.

When the child has entered the right number – for 10, the 1 and 0 keys are pressed – that number will appear at the top of the screen, forming the first part of the sum.

Now Tilley will begin to fish, dropping her line into the water one or more times. As each fish is caught, it disappears from the water to be placed in a growing line on the bridge beside Tilley. Therefore the subtraction can be seen in real action, allowing for a much better grasp of what is happening.

When Tilley has finished, another flashing question mark will appear, this time expecting for an answer the number of fish that were caught.

When the right answer has been entered, it will appear at the top of the screen after the first number. The two are separated by a minus sign, and an equals sign follows the second number.

Now the sum has been displayed, a third question mark will appear, prompting for the answer to the whole sum. This can be worked out either numerically, by examining the written sum, or by counting the number of fish left in the water.

There is a reward for getting each sum right, in the form of the rather apt nursery rhyme tune: "One, two, three four five, once I caught a fish alive ...". The sum – and all the fish – will then disappear, and the water will be re-populated ready for the next sum.

The game is fully error-trapped, never generating zero or a negative number of fish, and to avoid needless frustration arising from accidental pressing of the Break key it can only be halted by pressing Control+Break.

PROCEDURES

title	Draws the title screen
Tilley	Prints Tilley
dataload	Defines the characters
pause	Delay loop

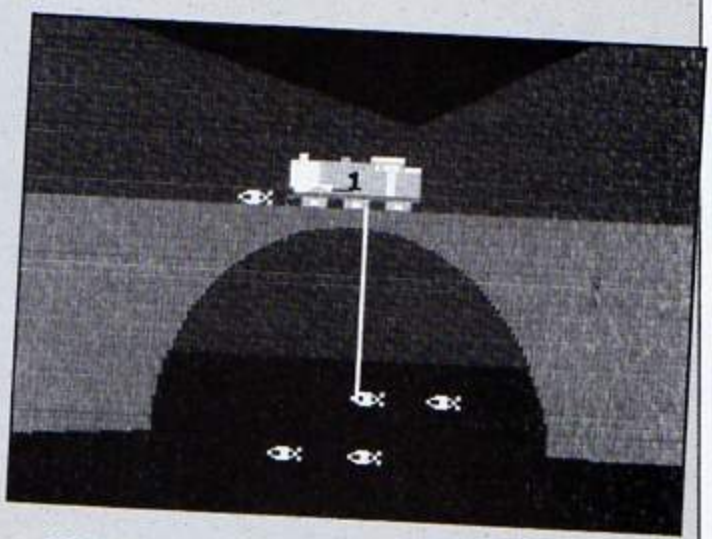
```
  10 REM TILLEY
  20 REM By R.F. Hagley
  30 REM (c) Electron User
  40 REM
  50 MODE 2
  60 VDU23;8202;0;0;0;
  70 PROCdataload
  80 PROCtitle
  90 CLG
 100 Y=750
 110 X=500
 120 PROCTilley(X,Y)
 130 PROCpicture
 140 END
 150 DEFPROCdataload
 160 VDU23,224,24,24,24,127
,127,127,127,127
 170 VDU23,225,127,127,127,
127,127,127,127,126
 180 VDU23,226,60,56,0,0,0,
3,3,0
 190 VDU23,227,0,0,0,0,0,0,
0,1
 200 VDU23,228,3,7,0,0,15,1
2,12,15
 210 VDU23,229,0,0,63,255,1
92,0,0,0
 220 VDU23,230,0,6,6,255,25
5,255,255,255
 230 VDU23,231,255,254,254,
255,255,255,31,158
 240 VDU23,232,192,255,0,0,
195,195,195,195
 250 VDU23,233,129,0,0,0,0,
0,0,0
 260 VDU23,234,7,0,0,0,0,0,
0,0
 270 VDU23,235,0,1,1,0,0,0,
0,1
 280 VDU23,236,0,0,255,255,
0,0,0,0
 290 VDU23,237,0,0,0,0,0,0,
224,96
 300 VDU23,238,32,0,0,0,0,0
,0,0
 310 VDU23,239,0,0,15,250,2
50,250,255,255
 320 VDU23,240,127,127,127,
127,127,127,127,63
 330 VDU23,241,255,255,0,0,
240,48,48,240
 340 VDU23,242,224,0,0,0,0,
0,0,0
 350 VDU23,243,15,15,0,5,5,
5,0,0
 360 VDU23,244,128,128,128,
128,128,128,128,192
 370 VDU23,245,0,0,240,16,1
6,16,63,63
 380 VDU23,246,63,63,63,63,
63,63,63,63
 390 VDU23,247,63,63,0,0,25
2,204,204,252
 400 VDU23,248,120,0,0,0,0,
0,0,0
 410 VDU23,249,240,240,0,22
4,239,239,192,192
 420 VDU23,250,192,192,192,
192,192,192,192,192
 430 VDU23,251,192,192,0,0,
0,48,48,0
 440 VDU23,252,0,255,0,0,0,
0,0,0
 450 VDU23,253,0,0,0,0,0,19
2,192,0
 460 VDU23,254,0,57,125,154
,154,125,57,0
 470 VDU23,255,255,255,255,
255,255,255,255,255
 480 VDU5
 490 GCOL 0,130
 500 CLG
 510 ENDPROC
 520 DEFPROCthomas(X,Y)
 530 GCOL0,0
 540 MOVE X,Y
 550 PRINT CHR$224;CHR$32;C
HR$243;CHR$249
 560 MOVE X,Y-30
 570 PRINT CHR$225;CHR$237;
CHR$32;CHR$250
 580 MOVE X,Y-60
 590 PRINT CHR$226;CHR$238;
CHR$253;CHR$251
 600 GCOL0,4
 610 MOVE X,Y
 620 PRINT CHR$32;CHR$230;C
HR$239;CHR$245
 630 MOVE X,Y-30
 640 PRINT CHR$227;CHR$231;
CHR$240;CHR$246
 650 MOVE X,Y-60
 660 PRINT CHR$228;CHR$232;
CHR$241;CHR$247
 670 MOVE X,Y-90
 680 PRINT CHR$234;CHR$233;
CHR$242;CHR$248
 690 GCOL0,1
 700 MOVE X,Y-60
 710 PRINT CHR$229;CHR$236;
CHR$236;CHR$236
```

This is one of hundreds of programs available FREE for downloading on

MicroLink

In addition to these many BBC Micro programs in the MicroLink library will also run on the Electron.

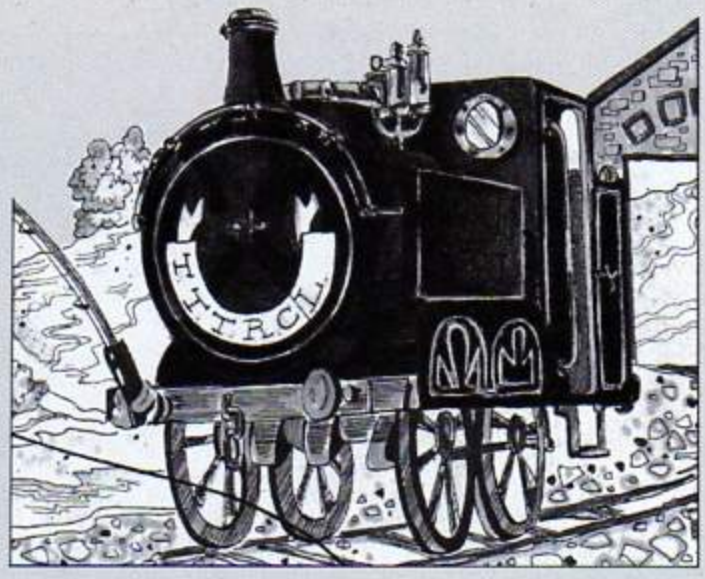
```
 720 GCOL0,3
 730 MOVE X,Y-30
 740 PRINT CHR$32;CHR$235;C
HR$244
 750 ENDPROC
 760 DEFPROCpicture
 770 GCOL0,1
 780 VDU29,640;250;
 790 X=380:Y=0:MOVE X,Y
 800 FOR I=1 TO 31
 810 Y=Y+X/10:X=X-Y/10
 820 DRAW X,Y
 830 NEXT
 840 DRAW -640,0
 850 FOR N=0TO 410 STEP 3
 860 PLOT 77,-640,N
 870 NEXT
 880 MOVE 380,0
 890 DRAW 630,0
 900 FOR N=0TO 390 STEP 3
 910 PLOT 77,630,N
 920 NEXT
 930 MOVE 0,-100
 940 GCOL0,6
 950 FOR N=-350 TO 150 STEP
3
 960 PLOT 77,0,N
```



```
 970 NEXT
 980 GCOL0,7
 990 MOVE -640,650
1000 FOR N=550 TO 1000 STEP
3
1010 PLOT 77,0,N
1020 NEXT
1030 GCOL0,2
1040 MOVE 100,550:DRAW -640
,750:PLOT 85,-640,550
1050 MOVE 100,550:DRAW 640,
810:PLOT 85,640,550
1060 PROCfish
1070 ENDPROC
1080 DEFPROCfish
1090 VDU19,15,0,0,0,0
1100 C=RND(10)
1110 IF C<2 THEN 1100
1120 D=RND(9)
1130 IF D>=C THEN 1120
1140 E=C
1150 IF C=10 E=9
1160 A%=-150:B%=100
1170 FOR N=1 TO E
1180 IF A%=300 B%=B%-100
1190 IF A%=300 A%=-150
1200 GCOL0,0
1210 MOVE A%,B%:PRINT CHR$2
54
1220 A%=A%+150
1230 NEXT
1240 IF C<10 GOTO 1260
1250 MOVE 0,-200:PRINT CHR$
254
1260 GCOL0,8
1270 MOVE 330,0:PRINT CHR$6
3
1280 *FX15,1
1290 Q%=INKEY(100)
1300 Q%=Q%-48
1310 IF Q%=0 Q%=10
1320 IF Q%=C GOTO 1340
1330 GOTO 1290
1340 VDU7
1350 MOVE 330,0
1360 GCOL0,6
1370 PRINT CHR$255
1380 NO%=Q%+48
1390 IF NO%=58 THEN 1420
1400 GCOL 0,0:MOVE 330,0:PR
INT CHR$NO%
1410 GOTO 1430
1420 GCOL0,0:MOVE 330,0:PRI
NT CHR$49;CHR$48
1430 PROCpause(150)
1440 GCOL0,6:MOVE330,0:PRIN
T CHR$255;CHR$255
1450 IF NO%=58 THEN 1490
1460 GCOL0,15:MOVE -270,730
1470 PRINT CHR$NO%
1480 GOTO1510
1490 GCOL0,15:MOVE -330,730
1500 PRINT CHR$49;CHR$48
1510 MOVE -200,730:PRINT CH
R$45
1520 PROCpause(150)
1530 E%=-150:F%=100:H%=-230
:I%=435
1540 FOR N=1 TO D
1550 GCOL0,0
1560 IF E%=300 F%=F%-100
1570 IF E%=300 E%=-150
1580 MOVE E%+10,410:DRAW E%
+10,F%-20
1590 GCOL0,6:MOVE E%,F%
1600 PROCpause(200)
1610 PRINTCHR$255
1620 MOVEE%+10,F%-20
1630 DRAW E%+10,150
1640 G%=350
1650 IF E%=0 G%=380
1660 IF E%>10 G%=340
1670 GCOL0,2:DRAW E%+10,G%
1680 GCOL0,1:DRAW E%+10,410
1690 E%=E%+150
1700 GCOL 0,0
1710 MOVE H%,I%:PRINT CHR$2
54
1720 H%=H%-100
1730 IF H%<-700 I%=I%+50
1740 IF H%<-700 H%=-230
1750 PROCpause(100)
1760 NEXT
1770 *FX15,1
1780 MOVE-400,540:GCOL0,0:P
RINT CHR$63
1790 LETQ%=INKEY(100)
1800 Q%=Q%-48
1810 IF Q%=D THEN 1830
1820 GOTO 1790
1830  VDU7
1840 GCOL 0,2:MOVE-400,540:
PRINT CHR$255
1850 GCOL0,0:MOVE-400,540:P
```

Turn to Page 38 ▶

Game



```
RINT CHR$(Q%+48)
 1860 PROCpause(150)
 1870 GCOL0,2:MOVE-400,540:P
RINT CHR$255
 1880 GCOL0,15:MOVE -110,730
:PRINT CHR$(Q%+48)
 1890 MOVE0,730:PRINT CHR$61

 1900 MOVE 90,730:GCOL0,8:PR
INT CHR$63
 1910 Q%=INKEY(100)
 1920 Q%=Q%-48
 1930 IF Q%=C-D THEN 1950
 1940 GOTO 1910
 1950 GCOL0,7:MOVE 90,730:PR
INT CHR$255
 1960 GCOL0,15: MOVE 90,730:
PRINT CHR$(Q%+48)
 1970 VDU19,15,15,0,0,0
 1980 FOR n=1 TO 2
 1990 RESTORE
 2000 FORN=1 TO 24
 2010 READ PITCH,DUR
 2020 SOUND 1,-15,PITCH,DUR
 2030 T%=TIME:REPEAT UNTIL T
IME>T%+5*DUR
 2040 NEXT
 2050 NEXT
 2060 DATA88,8,88,8,80,4,72,
4,72,8,80,4,88,4,92,4,100,4,
100,4,92,4,92,8,92,8,92,8,88
,4,80,4,80,8,72,4,68,4,60,4,
68,4,80,4,72,4,72,8
 2070 FOR N=100 TO -200 STEP
 -100
 2080 MOVE -150,N:GCOL0,6
 2090 PRINT CHR$255;CHR$255;
CHR$255;CHR$255;CHR$255;CHR$
255;CHR$255
 2100 NEXT
 2110 FOR N=435 TO 485 STEP
50
 2120 GCOL0,2:MOVE-730,N
 2130 PRINT CHR$255;CHR$255;
CHR$255;CHR$255;CHR$255;CHR$
255;CHR$255;CHR$255;CHR$255
 2140 NEXTN
 2150 GCOL0,7:MOVE-330,730
 2160 PRINT CHR$255;CHR$255;
CHR$255;CHR$255;CHR$255;CHR$
255;CHR$255;CHR$255;CHR$255
 2170 GOTO 1090
 2180 ENDPROC
 2190 DEFPROCpause(T%)
 2200 TIME=0
 2210 REPEAT
 2220 UNTIL TIME=T%
 2230 ENDPROC
 2240 DEFPROCtitle
 2250 PROCthomas(50,900)
 2260 PROCthomas(50,200)
 2270 PROCthomas(950,200)
 2280 PROCthomas(950,900)
 2290 GCOL0,4
 2300 PROCshadow("Tilley",41
0,700)
 2310 PROCshadow("goes fishi
ng",200,500)
 2320 PROCpause(400)
 2330 ENDPROC
 2340 DEFPROCshadow(A$,x,y)
 2350 VDU5
 2360 GCOL0,3:MOVE x-8,y-8:P
RINT A$
 2370 GCOL0,4:MOVE x,y:PRINT
 A$
 2380 ENDPROC
```

This listing is included in this month's cassette tape offer. See order form on Page 45.

C & F ASSOCIATES

BARGAIN PRICE ELECTRON SOFTWARE

ADDICTIVE	PRICE
Football Manager	2.99

ALTERNATIVE	
All Titles	1.99

A.S.L.	
Omega Orb	6.75
Graham Gooch	7.75
Ransack	7.75
Despatch Rider	7.20
Ziggy	7.20
Power Pack 2	7.75
Impact	7.95

ATLANTIS	
Creepy Cave	1.99
Cops & Robbers	1.99
League Challenge	2.99

BEAU-JOLLY	
10 Computer Hits 4	7.95
10 Computer Hits 3	7.75
5 Star Games	7.75
5 Star Games 2	7.75
5 Star Games 3	7.95

BUG-BYTE	
Dunjunz	2.95
Plan B	2.95
Plan B2	2.95
Squeakaliser	2.95
Templeton	2.95

CDS	PRICE
Colossus Chess 4	7.75

DATABASE	
French on the Run	7.75
Mini Office	4.95

DOMARK	
Star Wars	7.75

DR. SOFT	
Phantom Combat	2.99

GODAX	
Kourtyard	7.95
Skirmish	7.95

IMAGINE	
Yie Ar Kung Fu 2	7.20

INCENTIVE	
Adventure Creator	12.95
Confuzion	1.99

LARSOFT	
Hex	3.95
Puppet Man	3.95
Nine Dancers	3.95
Wychwood	3.95
Rising of Salandra	4.95

LOGOTRON	
Xor	7.75

MIRRORSOFT	PRICE
Strike Force Harrier	3.95
Spitfire 40	7.75

ROBICO	
Myorem	7.95
Village of Lost Souls	7.95
The Hunt	7.95

ROBICO SPECIAL OFFERS	
Rick Hanson	2.95
Project Thesius	2.95
Rick Hanson Trilogy	10.95

SUPERIOR	
Barbarian	7.95
Quest	7.95
Play It Again Sam 2	7.95
Elixir	7.75
Elixir (+ 3 disc)	12.95
Spellbinder	7.75
Bone Cruncher	7.75
Repton Thru Time	5.95
Life of Repton	5.95
Life of Repton (5.25 Disc)	6.95
Play It Again Sam	7.75
Play It Again Sam (+3 disc)	12.95
Palace of Magic	7.75
Palace of Magic (+3 disc)	12.95
Palace of Magic (5.25 disc)	10.95
Around the World	5.95
Superior Collection 3	7.75
Acornsoft Hits 1	7.75

SUPERIOR (continued)	PRICE
Acornsoft Hits 2	7.75
Ravenskull	7.75
Elite	10.95
Death Star	1.99
Overdrive	1.99
Tempest	1.99
Invaders	1.99
Percy Penguin	1.99
Mr. Wiz	1.99
Smash 'n' Grab	2.99

TYNESOFT	
Saigon	7.95
Indoor Sports	7.95
Boulder Dash	7.95
Winter Olympiad 88	7.75
Spy vs. Spy	7.75
Phantom	6.75
The Big KO	6.75
Commonwealth Games	6.75
Micro Value (4 games)	3.95
Micro Value 2	3.95
Micro Value 3	3.95
Micro Value Gold	3.95

US GOLD	
Beach Head	6.95

Orders normally despatched by First Class Post on day of receipt. But allow max. of seven days. ***All prices include VAT & P&P (Overseas orders add £1)***

Name _____ Title _____ Cost _____

Address _____

Make of Computer _____ Total _____

Access orders accepted

Make PO/Cheques payable to:

C & F ASSOCIATES

and send to:

C & F ASSOCIATES
CRANFORD HOUSE, WOOLSERY,
BIDEFORD, N. DEVON EX39 5QW.
Tel: (0392) 413418

Electron Memory Map Part 3

This month we examine page three of the Electron's memory, which is split into three parts: The VDU variables, the cassette/rom filing system workspace and the keyboard buffer.

The VDU variable workspace is probably of most interest.

It holds all the information about the current screen mode, and a bright programmer can make clever use of this area.

For instance Robin Nixon's Custom Character series – which started in February 1988 – fooled the computer into printing 40 characters across the screen in Mode 2 by poking illegal information into all sorts of page three locations.

TABLE 1 – The VDU Variables

Address	Use
&300/&301	Graphics window left column in pixels.
&302/&303	Graphics window bottom row in pixels.
&304/&305	Graphics window right column in pixels.
&306/&307	Graphics window top row in pixels.
&308	Text window left hand column.
&309	Text window bottom row.
&30A	Text window right hand column.
&30B	Text window top row.
&30C-&30F	Current graphics origin in external coordinates.
&310-&313	Current graphics cursor in external coordinates.
&314-&317	Old graphics cursor in external coordinates.
&318	Current text cursor X coordinate.
&319	Current text cursor Y coordinate.
&31A	Line within current graphics cell containing the current graphics point.
&31B-&31E	Either graphics workspace or first part of VDU queue.
&31F-&323	The VDU queue.
&324-&327	Current graphics cursor in internal coordinates.
&328-&349	Graphics coordinate workspace.
&34A/&34B	Text cursor position.
&34C/&34D	Text window width in bytes.
&34E	High byte of bottom of screen memory.
&34F	Character size in bytes for the current mode.
&350/&351	Address of screen top left corner.
&352/&353	Number of bytes per character row.
&354	High byte of screen memory size.
&355	Current screen mode.
&356	Screen display type: 0 = 20k mode. 1 = 16k mode. 2 = 10k mode. 3 = 8k mode.
&357	Current text foreground colour.
&358	Current text background colour.
&359	Current graphics foreground colour.
&35A	Current graphics background colour.
&35B	Current foreground graphics PLOT mode as set by GCOL.
&35C	Current background graphics PLOT mode as set by GCOL.
&35D/&35E	VDU jump vector.
&35F	Old setting of cursor start register.
&360	Number of logical colours in the current mode minus one.
&361	Number of pixels per byte minus one for the current mode, or zero if text only mode.
&362	Left hand colour mask.
&363	Right hand colour mask.
&364	X coordinate of text input cursor.
&365	Y coordinate of text input cursor.
&366	Normally 127.
&367	Font flag. If a bit is set, the corresponding section of the character set is held in ram. Bit 7 for chars 32-63. Bit 6 for chars 64-95. Bit 5 for chars 96-127. Bit 4 for chars 128-159. Bit 3 for chars 160-191. Bit 2 for chars 192-223. Bit 1 for chars 224-255.
&368-&36E	Font location bytes. Each entry in this block contains the high address byte of the corresponding zone block (see &367).
&36F-&37E	The current palette. These bytes contain the currently defined logical colours, in descending order.

Turn to Page 40 ▶

◀ From Page 39

TABLE 2 – The CFS/RFS variables

Address	Use
&380-&39C	BPUT file header block.
&39D	BPUT buffer offset for next byte in cassette buffer.
&39E	BGET buffer offset for next byte in cassette buffer.
&39F-&3A6	Unused in OS 1.2.
&3A7-&3B1	BGET filename.
&3B2-&3BD	Filename terminated by zero.
&3BE-&3C1	Load address of file.
&3C2-&3C5	Execution address of file.
&3C6/&367	16 bit current block number.
&368-&3C9	Block length.
&3CA	Block flag type. Indicates whether a file is locked.
&3CB-&3CE	RFS EOF+1.
&3CF/&3D0	16 bit checksum.
&3D1	Sequential block gap as set by *OPT 3,n.
&3D2-&3DC	Filename of file being searched for, terminated by zero.
&3DD/&3DE	Number of next expected BGET block.
&3DF	Copy of last block flag read.
&3E0-&3FF	Keyboard input buffer.

electron user MAIL ORDER OFFERS electron user MAIL ORDER OFFERS

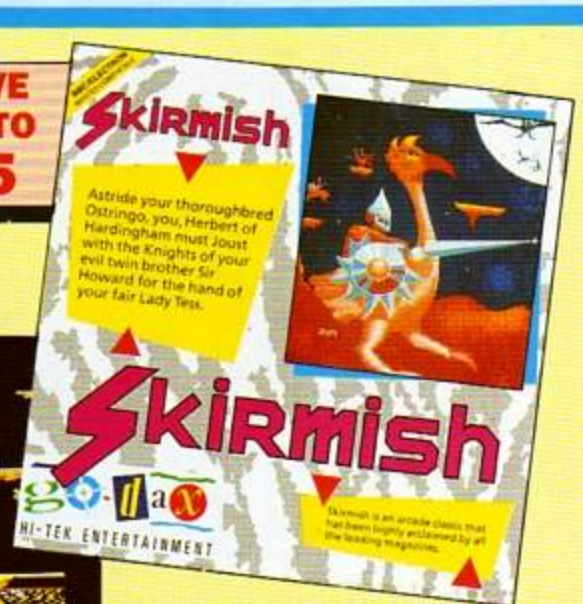
Get yourself in a flap with Skirmish!

SAVE UP TO £5

Sit astride a giant blue ostrich and engage in exciting futuristic jousting contests against opponewnts riding giant green buzzards.

This superb one-or-two-player game features beautifully animated sprites, with a plabability that's second to none.

"I can recommend Skirmish wholeheartedly. It is one of the most playable games I have ever seen and will certainly lead to a severe case of repeated late nights . . . Playability: 11 out of 10"
– Hac-Man, The Micro User, March 1988



Suitable for	Product	Format	RRP	Special reader offer	YOU SAVE	Offer including subscription	YOU SAVE
Electron	Skirmish	Tape	£9.95	£7.95	£2	£19.95	£5

TO ORDER PLEASE USE THE FORM ON PAGE 45

MICRO MESSAGES

Why there's a Plus too few

I HAVE heard of a Plus 1, 3 and 4 for the Electron, but not a Plus 2. Could you tell me if there is such a product? If there is, what is it used for, and if not, why not?

On another note, could you help me in finding a screen dump routine for use with commercial software, that works like your Snapshot utility published in the September 1987 issue of Electron User*?*

But instead of dumping the screen to disc, is there one which will print it out directly? Perhaps it is possible to alter Snapshot to achieve this. My setup is an Electron, Plus 1 and an Epson FX-80 printer. – **R. P. De la Haye, Emsworth, Hants.**

● Acorn originally intended the Plus 2 to be an Econet system. It produced a prototype, but it never got into full scale production. However, there is such a product as the Plus 2, but not in the sense that you are probably imagining. The new Advanced Plus 2 rom from Pres is a replacement for the Plus 1 rom.

It offers a complete new set of star commands, as well as removing some of the old Plus 1 bugs. The AP2 is reviewed in detail on Page 47 of this issue.

We're afraid that it is not feasible to alter Snapshot to dump directly to the printer.

A full screen dump would need to be incorporated into the listing, which as it stands does nothing more than wait for the Control key to be pressed, then save the screen to disc. You could then dump it to the printer using a separate utility.

Tape translation

BEING a discerning Electron user, always eager to type in a promising program, I recently saw the translator program by Pierre Dupont. This promised to be an invaluable aid to my French lessons at school.

I typed it in and checked it through, then wondered why it would not work. I read through the instructions and saw to my horror that the program was for disc users only.

As this program would no doubt be of great use to other tape users as well, I was wondering if you could print a version for cassette based systems. Even a small upgrade for the existing program would be great. – **Stephen Andreassen, Urmston, Manchester.**

● Pierre has very kindly given us the following upgrade which allows tape users to use the translator.

Replace line 300 with:

```
300 DEFPROCload:PROCtitle("
LOAD dictionary"):INPUT""
Filename ",dic$
```

and delete line 330.

Back the drive for discs

HAS anybody noticed a slight difference in the last three releases from Superior Software? Here's a clue – take a look at its advertisements where you are given the prices and formats. There's something missing ...

OK, if you haven't already found it, I'll tell you. For some reason, Superior is not producing discs for the Electron any more – probably because not many people bought them the first time around.

We were all moaning that there weren't any discs available, and when they began to appear, we didn't buy them. They're only a couple of pounds more, and for that you get increased reliability, not to mention almost instant loading.

I suggest that those of you who feel as I do, that this has been a missed opportunity, should write to the software houses again – and this time, if we're lucky and more discs become available, for goodness sakes buy them!

While I'm on the subject, it may be a good moment to point out that many people are awaiting an occasion such as this to start saving for a disc drive. So even if you don't have one yet, write a letter anyway. – **J. Brasier, Strelley, Nottingham.**

● Superior Software has issued the following statement to us which it hopes will clear up its policy concerning Electron discs:

"It is not normally viable to produce single games on Electron discs, because of the large number of possible formats and the relatively low sales generated.

"It is mainly compilations which will now appear on disc for the Electron, but for various commercial reasons Play it again Sam 2 will be available only on cassette for the Electron".

We can see their point, but if enough disc drive users write to Superior and other software houses, we may yet convince them otherwise.

Frak! instructions

I HAVE enclosed my copy of the Frak! instructions for P. Sanderson (Micro Messages, June 1988). I had the original version of Frak!, with the screen designer instructions included.

I also have a request to make. Can anyone come up with a poke for Superior's Citadel? Preferably for infinite energy, as I am having a hard time of it. – **J. Fish, Chelmsford, Essex.**

● Unfortunately, we can't reproduce the actual cassette inlay, as it would be an infringement of copyright. However, here's the

Turn to Page 42 ▶

◀ From Page 41

gist of it:

☐ Escape+Return enters the designer.
☐ Q and W cycle through the various shapes available.
☐ Z, X, / and : move the current shape around the screen.
☐ I fixes the screen in memory.
☐ Control+C clears the screen.
☐ Control+S saves the current set of screens to tape.
☐ Control+L loads a previously saved set of screens.
☐ Escape returns you to the Frak! demo – but remember to press I to record the current screen.

You won't be allowed to record a screen if there isn't at least one key, and Trogg, on the screen.

Trogg can only be placed on or removed from the screen when the left-hand edge of the playing area is visible. Don't put too many platforms near the top of the screen – the game becomes too difficult to play.

Don't worry about trying to fill the whole playing area if you don't want to. If when trying to record a screen, you get a *No Room* error, either scrap it or trim it down a bit.

How screens are stored

CONCERNING the March 1988 issue of Electron User, *in your arcade game programming series the writer explains where the screen is stored in memory, but fails to say exactly how it is stored.*

I have tried in vain to plot a colour to the screen and read the memory location used. Please put me out of my misery.

Also I think it would be an idea to run two major series: One about Basic programming which follows on from the techniques explained in the User Guide, and another along the same lines, but teaching assembly language programming. Included in the two series could be relevant applications for the new skills learnt.

● The screen memory is stored in encoded form, so it is quite difficult to extract a pixel from within a byte unless you know the coding used.

In Mode 5 four pixels are encoded in every byte, and the bits which go to make up the pixels are interlaced within the byte.

Bits seven and three make up the first pixel, six and two are the second, five and one the third and four and zero the fourth.

Only two bits are used per pixel because the colours range from zero to three, and this can be stored in two bits using binary notation.

We have run series on Basic programming in the past, catering for beginners through to explaining more advanced techniques. And Pete Bibby's current series on assembly language is aimed directly at the newcomer to 6502 machine code.

Starship grounded

I WISH to point out an error in February's Arcade Corner. The poke given for Starship Command was incorrect.

The program as shown will generate the error message No such variable at line 30. *So to correct the listing, place line 50 at line 15, and delete line 50. Thanks for an excellent magazine.* – **Mathew Gullick (11), Pudsey, West Yorkshire.**

Printer Driver

I AM a subscriber to your good magazine, and until now I have never had any complaints. I have just bought myself a printer and invested in the word processor View.

My typeface is pretty flat and unimpressive, so diving into my archives of Electron User *I came up with the Printer Driver II from the August 1987 issue.*

However, I have a cassette based system and my version of View seems to dislike the command LOAD when used without discs. It says Not with cassette, *so I have to use READ instead.*

But READ seems to read the driver straight in as text, and all I get is a load of mumbo-jumbo on the text editing screen.

I hope you can tell me how to get this utility to work on my small but useful system, and look forward in anticipation to a reply. – **David Styles, Enfield, Middlesex.**

● We've had quite a few letters along this line, from people who couldn't get the assembled driver to load properly. The correct method – which strangely enough isn't mentioned in the Electron View manual, but is in the BBC Micro version – is to type:

```
PRINTER filename
```

where *filename* is the name of the desired driver – in this case DRIVER.

Editor error

IN the March 1986 issue of Electron User, *there is a disc editor utility by Roland Waddilove. At the time, I typed in the program but didn't actually get to use it seriously.*

This week, while trying to organise my discs, I came across it again and decided to put it to the test, in the process discovering a fault in the listing.

In the list of control keys, Shift+Cursor up/down are used to display the first or second 128 bytes of a sector. Line 90 reads:

```
 90 IF key$="" 0%=0:PROCdi
splay
```

But Shift+Cursor up is a £ sign. So line 90 should read:

```
 90 IF key$="£" 0%=0:PROCdi
splay
```

Thank you anyway for a really useful utility which I look forward to using in earnest in the future. – **R. A. Brookes, Barnehurst, Kent.**

● In those days we used an older method of typesetting listings, and the £ sign was reproduced – as it is on most ordinary printers – as an apostrophe.

Tiny treats

I HAVE recently bought an Acorn Electron, and as I don't like typing in long programs I'd like to take some of your valuable Micro Messages space to thank you for 10 Liners.

I like these as they are

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

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

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

short and very good. – **Adam Galpin, Chard, Somerset.**

● It's the contributors who we in turn must thank, for producing what seems to be a very popular page.

And by the way, our special thanks to David Sharpe for tantalising some of you with his April fool joke in May's 10 Liner page. Colour on a black and white monitor, indeed!

Interface for a mouse

I WOULD like to thank you for such an interesting and informative magazine, and ask you for some advice on how I can upgrade my computer with a mouse and CAD package.

I also believe I would need an interface. I have an Electron with a Plus 1, and a Panasonic KX-P1080, which is a marvellous printer.

And is there any way I can stop View outputting seven to eight blank lines at the top of the page when I print?

Also, I'm thinking about writing one or two programs – could you tell me the average royalties paid? – **Kevin Sutherland (13), Lockerbie, Dumfriesshire.**

● You certainly do need an interface to drive a mouse. If you can get the cash, you might find Slogger's Bicasso package worth a try. It includes user port, mouse and Nidd Valley's Illustrator software for £75.

View will by default reserve eight blank lines at the top and bottom of a page. These are in fact setable margins and are defined as follows:

The top four blank lines are known as the top margin, and the next four as the header margin. The bottom eight lines are likewise split into a footer margin and a bottom margin.

If you are not using headers and footers, as shown in the View manual, then you can set these all to zero with the following embedded commands right at the top of text:

```
TM 0
HM 0
FM 0
BM 0
```

As far as royalties go, they vary considerably from company to company. But rest assured – if you write a best-seller, you'll be rich!

Helpful service

I WOULD like to express my gratitude to Mr. John Wyke of Jafa Systems.

Having experienced a couple of problems with the construction of the Electron Mode 7 adapter kit, I contacted Mr. Wyke for technical advice which was freely given with courtesy and professionalism.

The result is that the fault has been traced to my monitor. Seldom have I found such helpful service, and it has been a pleasure to deal with Mr. and Mrs. Wyke.

I would unreservedly recommend their products to your readers, as not only are they excellent value for money – especially as some products are available in kit form, which appears to be rare in the computer hardware field – but their attitude is an object lesson in customer relations.

Thank you Jafa for supporting the Electron. You are a rare luxury to those of us who enjoy electronics as well as computing.

This letter was written using the BBC Micro version of Wordwise Plus, thanks to the Jafa Mode 7 adapter. – **Mr. F. G. Fletcher, Shiregreen, Sheffield.**

Search for Pascal

HELP! I am trying to locate a piece of software on cassette called S-Pascal. This used to be available from Acornsoft for the Electron. I made enquiries to Acorn to find out from where it could be obtained, but received no useful answer.

So if any reader, or someone in the trade, knows where I can find this cassette, please let me know. – **D.M. Mayes, 66 Shaw Road, Boston, Lincs PE21 8NN.**

Call up turbo techniques

ALAS, there was a misprint in my letter from the May 1988 issue of Electron User. *The text in the third box should read:*

```
?&FE07=?&282
```

and not as it appeared.

After reading Andrew Bury's letter in the February edition about speeding up the Electron, I decided to investigate the feasibility of disabling interrupts while in Basic.

This is perfectly possible, although there are certain drawbacks: Disabling interrupts cannot be done directly from Basic, so add the following line to any program you wish to speed up:

```
P%=&90:[.on CLI:RTS:
.off SEI:RTS:]
```

Then to speed up the program at any point, use:

```
CALL on
```

and to put things back to normal:

```
CALL off
```

The disadvantages of disabling interrupts are that the TIME function will no longer work.

In addition, flashing colours won't flash, using the cassette and printer will be dodgy and the keyboard will not be scanned.

However, keys can still be read directly using Basic's negative INKEY command. And the operating system does seem to re-enable interrupts for the duration of certain vital tasks like printing or cassette access – but don't bank on it.

The sort of programs which will benefit the most from these techniques are those which involve a lot of number-crunching in a high resolution mode.

A typical example would be Geoff Stanton's Loggems 10 Liner from the March 1987 issue of Electron User, *which runs in Mode 1.*

On average, my programs seem to run up to 30 per cent faster with interrups disabled. The machine theoretically might crash, but it hasn't happened to me – yet!

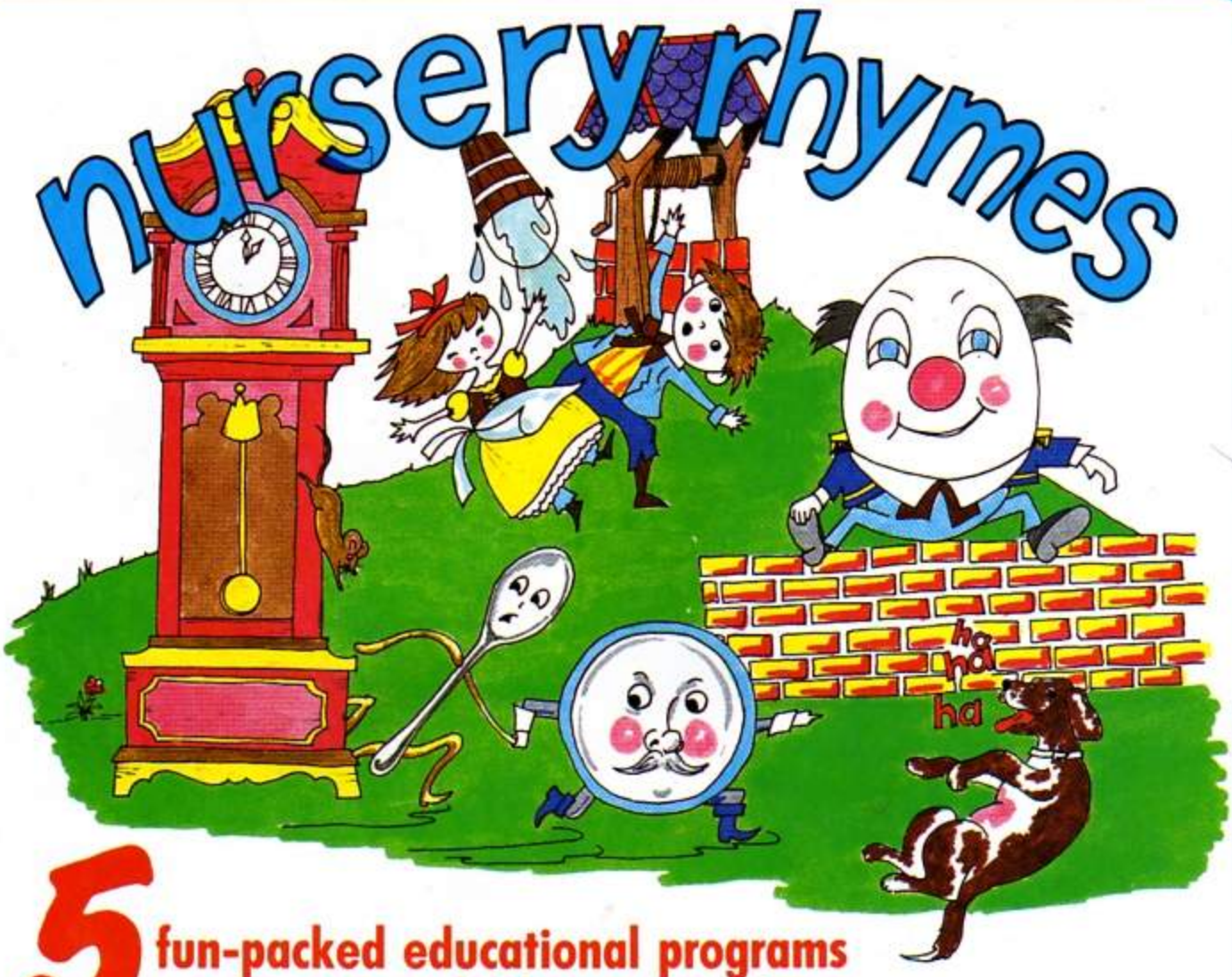
*On another note, what does *FX178 do? According to the Advanced User Guide this call is undefined, but it has appeared in a number of Electron User programs.* – **Phil Bender, Sunderland.**

● The *FX 178 command turns the keyboard off, until a *FX 178,255 is encountered.

This speeds things up further, but as it completely disables the keyboard event, you can thereafter only read keys from within machine code by paging in roms seven or eight.

This particular technique was detailed by Michael Jacobsen in the August 1986 issue of *Electron User.*

nursery rhymes



5 fun-packed educational programs ... for young children everywhere

This delightful collection of programs is based around children's favourite Nursery Rhymes. There's plenty of sparkling colour, sound and captivating animation to keep them riveted – and as they play they'll be learning all the way.

- ★ Tell the time with Hickory Dickory Dock.
- ★ Assemble the jigsaw in Humpty Dumpty.
- ★ Learn to spell with Jack and Jill.
- ★ Match the animals in See Saw Marjory Daw.
- ★ Play an exciting game in Hey Diddle Diddle.

Children from two to nine will be entertained for hours with these interactive programs. Don't miss out on this beautiful gift for your family – and at a very special price.

ONLY £5.95 (cassette)
£6.95 (3½" disc)

Suitable for any Acorn Electron

TO ORDER PLEASE USE THE FORM ON PAGE 45

electron MAIL ORDER OFFERS

electron ORDER FORM

★ Special price if accompanied by subscription or renewal

All prices include postage, packing and VAT
Overseas orders sent exclusively by Air Mail

Valid to July 31, 1988
Please enter number required in box

£p

Electron User subscription

UK £15 3001
Europe & Eire £23 3003
Overseas £38 3004

Commence with _____ issue

Renewal

UK £15 *3002*
Europe & Eire £23 *3476*
Overseas £38 *3477*

Computer Hits 4 *(see page 18)*

Tape only ★ £3.95 £6.95 *3032/3033*

Ransack *(see page 18)*

Tape only ★ £3.95 £6.95 *3038/3039*

The Life Of Repton *(see page 18)*

Tape ★ £2.95 £5.45 3034/3035
5.25" Disc ★ £3.95 £5.95 3036/3037

Skirmish *(see page 40)*

NEW

Tape only ★ £4.95 £7.95 *3040/3041*

Electron User back issues

£1.75 UK
£2.75 Europe
£3.75 Overseas

January 1987	3210
February 1987	3211
March 1987	3212
April 1987	3213
May 1987	3214
June 1987	3215
July 1987	3216
August 1987	3217
September 1987	3218
October 1987	3219
November 1987	3220
December 1987	3221
January 1988	3222
February 1988	3223
March 1988	3224
April 1988	3225
May 1988	3226
June 1988	3227

Cassette tape annual subscription

UK £35 *3005*
Europe/Overseas £45

Commence with _____ issue

Renewal

UK £35 *3006*
Europe/Overseas £45

Electron User tapes/discs

Tape £3.95, Discs £4.75. Add £1 for Europe/Overseas

			Tape	3.5" Disc
Grid Warrior	Jan 1987	3310		3410
Maze	Feb 1987	3311		3411
Super Boss	Mar1987	3312		3412
Dragons Doom	Apr 1987	3313		3413
Hectic Henry	May 1987	3314		3414
Hungry Harry	June 1987	3315		3415
Mazebugs	July 1987	3316		3416
Arena	Aug 1987	3317		3417
Mr Miner	Sept 1987	3318		3418
Witchcraft	Oct 1987	3319		3419
Fawkes' Run	Nov 1987	3320		3420
Santa on the Tiles	Dec 1987	3321		3421
Cosmic Guerrillas	Jan 1988	3322		3422
Super Digga	Feb 1988	3323		3423
Shove Penny	Mar 1988	3324		3424
Go-Pig	Apr 1988	3325		3425
Keyboard Gremlins	May 1988	3326		3426
Bomb Alert	June 1988	3327		3427
Carrot Quest	July 1988	3328		3428

Readers in Europe (inc Eire) add £2. Overseas add £5 per item unless otherwise indicated

The Sound Master

SPECIAL OFFER

£9.99 *3000*

Add £2 for Europe (inc. Eire)/£7 for Overseas

Arcade Game Creator

Tape	£3.95	*3118*
3.5" Disc	£4.95	*3127*
5.25" Disc	£4.95	*3010*

Adventure Anthology *(see page 30)*

NEW

Tape £4.95 *3044*

Knitwear Designer

Tape £8.95 *3128*
5.25" Disc £9.95 *3129*

Add £2 for Europe (inc Eire); £5 for Overseas

Nursery Rhymes *(see page 44)*

Tape £5.95	3.5" Disc £6.95
3018/3019	

Add £1 for Europe/Overseas

Education Special Vol. 2

Classroom Computing on the Electron

Magazine + Electron Cassette £3.95 *3007*
Magazine + Electron 3.5" Disc £4.95 *3008*

Add £2 for Europe (inc Eire); £4 for Overseas

Fun School *(see page 14)*

		Tape £4.95	3.5" Disc £5.95
Ages 2-5	*3080/3108*		
Ages 5-8	*3081/3109*		
Ages 8-12	*3082/3110*		

Add £1 for Europe/Overseas

Getting Started in BBC Basic

£2.95 *3100*

Advanced User Guide

(see page 32) £3.45 *3072*

Mini Office *(see page 26)*

Tape £5.95 *3062*

Add £1 for Europe/Overseas

Magic Sword

Tape £5.95	3.5" Disc £6.95
3065/3105	

Add £2 for Europe (inc Eire); £5 for Overseas

Ten of the Best

		Tape £5.95	3.5" Disc £6.95
Volume 1	*3068/3111*		
Volume 2	*3069/3112*		
Volume 3	*3070/3113*		
Volume 4	*3120/3121*		

Add £1 for Europe/Overseas

French on the Run

Tape £9.95 *3115*

Add £1 for Europe/Overseas

Classic Card and Board Games

No. 1	Tape	£5.95	*3090*
	3.5" Disc	£7.95	*3092*
No. 2	Tape	£5.95	*3091*
	3.5" Disc	£7.95	*3093*

Add £1 for Europe/Overseas

Electron Dust cover

£3.95 *3058*

Add £1 for Europe/Overseas

Magazine Binder

£3.95 *3059*

Add £3 for Europe (inc Eire); £7 for Overseas

TOTAL _____

Send to: Database Publications, FREEPOST, Macclesfield, Cheshire SK10 4YB

(No stamp needed if posted in UK) Please allow 28 days for delivery

Order at any time of the day or night

Telephone Orders: **0625 879920**

Fax Orders:	*Orders by Prestel:*	*MicroLink/Telecom Gold*
0625 879966	Key *89, then 614568383	72:MAG001

Don't forget to give your name, address and credit card number

ENQUIRIES ONLY: 0625 879940 9am-5pm

Payment: please indicate method (✓)

Expiry Date ___/___

☐ Access/Mastercard/Eurocard/Barclaycard/Visa

No. _____

☐ Cheque/Eurocheque made payable to Database Publications Ltd.

Name _____ Signed _____

Address _____

_____ Post Code _____

Tel _____

EU7

Loadsa Bargains.. Loadsa Bargains..

NEW TITLES THIS MONTH

Barbarian	£7.50
Saigon	£7.50
Micro Values 1	£3.99
Micro Values 2	£3.99
Micro Values 3	£3.99
Steve Davis Snooker	£1.99
Grid Iron	£1.99

TRIPLE DECKERS

3 Games on 1 Cassette for £1.99

1. Grand Prix/Day at the Races/Manic Mole
2. Invasion Force/Haunted/Parachute
3. Lunar Invasion/Lander/Jam Butty
4. Howzat/Fishing/Golf
5. Starfight/Skramble/Karate Warrior
6. Cavern Capers/Snap Dragon/Castle of Sand
7. Atom Smash/Knock Out/Reaction Tester
8. Grebit/Mr. Freeze /Fruit Worm
9. Break Free/Missile Jammer/Code Breaker

TOWERHILL SPECIAL

KOURTYARD £3.95

ACORNSOFT TITLES

Talkback	£1.50
Workshop	£1.50
Sphinx Adventure	£1.00
Starship Command	£1.00
Hopper	£1.00
Chess	£1.00
Desk Diary	£1.00
Business Games	£1.00
Boxer	£1.00
Me and My Micro	£1.00
Snapper	£1.00
Complete Cocktail Maker	£1.00
Watch Your Weight	£1.00
Linkword Italian	£2.25
Linkword Spanish	£2.25
Turtle Graphics	£2.25
Advanced User Guide	£3.25
Lisp	£1.99

SPRING BARGAINS

4 FANTASTIC GAMES IN EACH COLLECTION
£3.99 each or both £7.50

Acornsoft Hits Vol 1:
*Magic Mushroom – Maze – Planetoids – Monster

Acornsoft Hits Vol 2:
*Starship Command – Meteors – Arcadian – Snooker

CURRENT TITLES

Five Star Games Vol 3	£7.50
10 Computer Hits Vol 4	£7.50
Life of Repton	£5.50
Spellbinder	£7.50
Elixir	£7.50
Bone Cruncher	£7.50
Omega Orb	£6.25
Dispatch Rider	£6.95
Ransack	£7.50
Ziggy	£6.95
Impact	£7.50
Graham Gooch Cricket	£7.50
Powerpack II (7 Games)	£7.50
Play it again Sam	£7.50
Palace of Magic	£7.50
Collosus 4 Chess	£7.50
Superior Hits Vol 3	£7.50
Around World 40 Screens	£5.50
Paper Boy	£7.50
The Lost Crystal	£9.95
The Hunt	£7.50
Village of Lost Souls	£7.50
Spitfire 40	£7.50
Spy v Spy	£7.50
Brian Clough Football	£12.50
Five Star Games Vol 1	£7.50
Five Star Games Vol 2	£7.50
10 Computer Hits Vol 1	£7.50
10 Computer Hits Vol 2	£7.50
10 Computer Hits Vol 3	£7.50
Winter Olympiad '88	£7.50
Star Wars	£7.50
Quest	£7.50
Spycat	£7.50
Boulderdash	£7.50
Indoor Sports	£7.50
Tetris	£6.95
Icarus	£7.50
Phantom Combat	£2.99
Repton II	£2.99
Karate Combat	£2.99

IVAN BERG SERIES

English CSE/GCE	£2.00
Biology CSE/GCE	£2.00
Maths 1 CSE/GCE	£2.00
Maths 2 CSE/GCE	£2.00

BUDGET TITLES

Pengwyn	£1.99
Xanagrams	£1.99
Stock Car	£1.99
Mini Office	£4.95
Dog Fight	£2.99
Combat Lynx	£2.99
Warehouse	£2.99
Suds	£3.99
Peter Scott Trilogy	£2.99
Cascade (50 Games)	£2.99
Daredevil Dennis	£1.99
Snooker (Visions)	£1.99
Tarzan (Martech)	£2.99
Football Manager	£2.99
Last of the free	£3.99
XOR	£4.99

ROM CARTRIDGES

View (Wordprocessing)	£11.95
Viewsheet	£11.95
Lisp	£7.75
Logo	28.50

ACORN CASSETTE RECORDERS

Complete with lead and power supply
£22.95

TOWERHILL COMPUTERS LTD

5 Acacia Avenue, Cherry Court Way
Leighton Buzzard LU7 7DG
Telephone: Leighton Buzzard (0525) 385329

VISA

Loadsa Bargains..

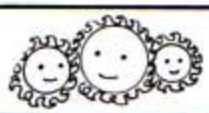
BUGBYTE
AT £2.75 EACH
Uranians
Hunkydory
Tennis
Savage Pond
Cricket
Starforce
Ice Hockey
Twin Kingdom Valley
Jack Attack
Templetation
Dunjunz
Squeakalizer
Sky Hawk
Plan B II

ALTERNATIVES AT £1.99
Dead or Alive
Mineshaft
Video Pinball
Microball
Rik the Roadie
Soccer Boss
Olympic Spectacular
Crazee Erbert
Licence to Kill
Confusion
Night Strike

CDS BLUE RIBBON AT £1.99
Bar Billiards
Mango
3D Dotty
Trapper
Return of R2
Video Card Arcade

ATLANTIS

League Challenge	£2.99
Survivors	£2.99
Panic	£1.99
Cops and Robbers	£1.99
Creepy Cave	£1.99
Pro Golf	£2.99



Bargains of the Month

Elite	£9.00
Phantom Combat	£2.99
Repton II	£2.99
Karate Combat	£2.99
Psycastria	£2.99

SUPERIOR at £1.99 each

Fruit Machine
Invaders
Draughts
Reversi
Stranded
Mr. Wiz
Chess
Smash 'n' Grab
Repton I

Percy Penguin
Alien Dropout
World Geography
Centi Bug
Zany Kong Junior
Overdrive
Tempest
Death Star

ALL PRICES INCLUDE V.A.T. AND P&P.
OVERSEAS ORDERS ADD £1.00

PMS MULTI-FONT NTQ

Near Text Quality Typesetting Software

NEW ELECTRON VERSION See you at the BBC Show Manchester

"Quite simply the best font software available for the BBC" – NTQ users say it – the reviewers agree –

If you want to produce quality worksheets, newsletters, OHP slides, menus, leaflets, concert programmes and tickets, exam papers, reports, invoices or just add style to your personal letters – ~†œ's for you.
Use NTQ with VIEW, WORDWISE, WORDPOWER or BASIC with ANY EPSON compatible printer (MX and FX).
FONT LIBRARY CONTAINS OVER 50 HIGH QUALITY FONTS – standard typefaces + foreign languages + maths/science symbols + fancy styles.
Write or phone for leaflet, full list of fonts and sample printout.
MIX FONTS, HEIGHTS WIDTHS AND PITCHES IN ONE LINE OF TEXT – just like this:

MULTI-HEIGHT
MULTI-FONT
BACKGROUNDS
ÁÓÄÆÇÈâòôùõìe
MULTI-WIDTH
MULTI-PITCH
INVERSE
∝±÷×√≑≡≠~≃≈♩♪

ONLY £24.95 inc VAT (add £1 carriage)
NTQ is 2 roms + disk + user guide

PMS
Permanent Memory Systems
38 MOUNT CAMERON DRIVE
EAST KILBRIDE G74 2ES
SCOTLAND
03552-32796 (24 Hour)

DELTA COMPUTERS

BBC MASTER SERIES

Archimedes	Ring for price
Master 128	£395.00
Master Compact Entry System	£349.00
Master Compact Colour System	£555.00

DISC DRIVES

5802 400K DS DD 40/80T.	£104.95
5802DB Dual 800K 40/80T.	£204.95
5802D as 5802DB+PSU	£234.95
Opus DDOS (With a drive)	£40.00

SPECIAL OFFERS

Acorn Electron + Acorn Cass player + 3 games + all leads and manual	£79.99
As above + Slogger Rom box + Starword	£119.99
Tatung Std. Res. Col. Monitor	£169.00
Acorn Med. Col. Monitor	£239.00
Philips 8833 Col. Monitor	£259.00
Brother HR5 Printer	£69.99

PRINTER RIBBONS

Brother M1009	£3.25
Brother HR5	£3.25
Canon PC1080A	£3.25
Epson FX,MX,RX 80	£2.70
Epson LX80, LX86	£2.70
Epson FX, MX, RX 100	£3.35
Panasonic KX-P1081	£3.99
Citizen 120D/LSP10	£4.60
Citizen MSP10,20	£2.70
Citizen MSP15,25	£3.25
Kaga 810	£3.25
M Tally MT80	£3.50
Seikosha GP100/250	£2.65
Shinwa CP80	£3.50

PRINTERS (inc lead)

Brother HR5	£69.95
Brother HR10 d/wheel inc Tractor feed	£149.00
Citizen 120D	£169.00
Star LC10	£195.00
Panasonic KX-P1081	£169.00
Amstrad DMP3000	£179.00
Amstrad DMP3160	£199.00

All orders over £100 receive free Touchpad for BBC B (only). (while stocks last).
MINIMUM ORDER £10.00

All prices include VAT
Please add £5 carriage on orders over £100
Mail Order only at this address
Trade and Educational enquiries welcome
85 Union Street Oldham Lancs
061-626 3841

A nice sense of style

Feed your View files through PAUL MEARA's text analyser to find out just how readable they really are

EASY reader is a simple style analyser, based on current studies of linguistics. It reads each sentence of a text file and gives you an idea of how readable they are.

The program scores the sentences on a readability scale from 1 – incredibly hard – to 100 – very easy – and gives you feedback on stylisitic features such as sentence length, clause structure, and the amount of technical jargon found.

It works by calculating the length of each sentence and the number of syllables each contains. These results are then fed into a formula which calculates readability on a scale from 0 to 100. Easy to read texts have high scores, while hard texts score badly.

You can see what these scores mean in practice by referring to Table I. The readability score is based on work by R. Flesch, and it is broadly comparable with the better known FOG index. The FOG index is an American scale for measuring reading levels. The formula used to obtain a FOG rating is: (Average sentence length + percentage of hard words found) × 0.4.

Easy Reader particularly dislikes long sentences and long words. If your text contains lots of these then the program will judge it as being very hard to read.

Any View files can be processed, on disc or tape, and the program should be able to handle texts of any length. If your file is very long and you only want to assess part of it, you can use the View WRITE command to create a smaller file first.

Score	Where normally found	Suitability
0-30	Very hard scientific texts	Very serious readers only
30-50	Difficult academic writing	Students or similar readers
50-60	Quality newspapers	Intelligent teenagers
60-70	Reader's Digest type articles	About 75 per cent of the population
70-80	Fairly easy fiction	About 80 per cent of the population
80-90	Popular daily newspapers	An average 11 year old
90-100	Comics and childrens' books	Beginning readers

Table I: How to interpret the readability scores

```
Style report for TEXT

Sentence No. 1                          v. hard          v. easy
this is ... reader                      |||||||||||||||||||||||||||||||||||||||| 99

Diagnostics:
   This sentence is 7 words long. Its clause structure is simple
   and it contains the following hard words and jargon:
    none

Sentence No. 2                          v. hard          v. easy
 while ... readable text                |||||||||||||||||||||||||||||||||||||||| 54

Diagnostics:
   This sentence is 17 words long. Its clause structure is complex
   and it contains the following hard words and jargon:
    ..detailed..guidelines..producing..readable
```

Figure I: Easy Reader in action

If your text contains lots of tables or figures, it's a good idea to edit these out before running it through Easy Reader. And although the program was designed to work with View, it should cope with most other word processor files too.

Type in Program I and save it as READER. Before you run it, make sure that PAGE is set no higher than &1D00, or Easy Reader will crash when it finds a longish sentence.

Most Electrons will never have PAGE set higher than &1D00, but some specialist roms can conceivably grab more memory for themselves.

When run, the program will ask you for the name of the file you want to assess. Type it in and hit Return. Next, you will be prompted to enter a threshold level of difficulty.

This is the point below which Easy Reader will provide detailed diagnostics for a given sentence. For instance, should you enter 60 at this point, then any sentence with a FOG rating lower than this will be described in some detail as to why it is rated hard to

```
Style report for TEXT

This table shows you how EASY READER rated your text overall.
Each sentence is rated on a scale from 0 (hard to read) to 100 (easy to read).
The table shows how many sentences fell into each readability band.

Score:     0-9   10-19  20-29  30-39  40-49  50-59  60-69  70-79  80-89    90+
No. of
Sents:       0      0      0      0      0      1      0      0      0      1

see documentation for how to interpret these scores
```

Figure II: The report summary

read.

So type in a number between 1 and 100, and hit Return. The program will then ask you if you want a hard copy – or printout – to which press Y or N accordingly. Processing will commence immediately, and Easy Reader should run along on its own until it reaches the end of your file.

Each sentence's number will be printed on the screen, followed by the first and last word of the sentence – helping you to compare the printed report later on with the original text.

On the right is a small readability scale, and a sentence's score will be marked on it both graphically, and as a number. This scale is re-drawn for each each new sentence, so if printed out on paper you will have a complete record.

Figure I shows you the screen display while Easy Reader is in action, and it has found the second sentence to be more complex in structure than the first.

When it has finished processing your file, it will display a summary of the analysed text. Ten headings are printed, each one representing a 10-number wide score zone.

The number of sentences which fell into a particular zone are printed beneath the relevant heading, as shown in Figure II.

Any sentences which score less than the threshold level will have a further, more detailed breakdown displayed. This tells you how simple or complex the clause structure was, and lists all of the hard words that were found.

If the program says that one of your sentences is hard to read, you will generally be able to make it more readable by avoiding "hard" words.

Any words which Easy Reader considers to be in this category are listed in the sentence analysis.

Splitting a long sentence into two shorter ones also helps the readability rating a great deal. But remember, it isn't always good style to keep using simple sentences.

Use Table I to help you decide what level of reader you are aiming at, and try to get your sentences scoring in this general area.

One or two hard sentences in a page of text won't really matter, but if your text is consistently marked as very unreadable, or too easy, maybe you need to re-work it totally.

Easy Reader isn't a very clever analyser, and you shouldn't take it too seriously. After all, it thought that this article was wonderful.

```
  10 REM EASY READER
  20 REM By Paul Meara
  30 REM (c) Electron User
  40 REM
  50 ON ERROR GOTO 150
  60 MODE 3
  70 PROCsetup
  80 REPEAT
  90 PROCgetsent
 100 IF OK=TRUE PROCread(ST
ART%,FINISH%)
 110 UNTIL EOF#A%
 120 PROCclose
 130 PROCshowtotals
 140 END
 150 PROCerror
 160 STOP
 170 DEFPROCpause
 180 PRINT 'L$' "Hit space
 bar to go on"L$
 190 *FX15,0
 200 REPEAT:Z=GET:UNTIL Z=3
2
 210 CLS
 220 ENDPROC
 230 DEFPROCsetup
 240 DIM D(20)
 250 L$=STRING$(79,"_")
 260 START%=&2F00
 270 INPUT ""file to be an
alysed? " FL$
 280 A%=OPENIN(FL$)
 290 PRINT ""Threshold for
 diagnostic report?""(type
in a number between 1 and 10
0)"
 300 REPEAT: INPUT THOLD%:
UNTIL THOLD%>0 AND THOLD%<10
1
 310 PRINT "Do you want a
hard copy? Y/N"
 320 Z=GET
 330 IF Z=89: C1=45: C2=94
: HCOPY=TRUE
 340 IF Z<>89 VDU3: C1=224:
 C2=225: HCOPY=FALSE
 350 HWORD%=17-INT(SQR(THOL
D%))
 360 VOWEL$="aeiouy"
 370 SMARK$=".;?!":WMARK$="
"+SMARK$: PUNC$=",/()-"+CHR
$(34)
 380 CMARK$="/but/so/when/w
ho/which/that/if/despite/bec
ause/although/while/"
 390 SENTNO%=0
 400 VDU23 224,255,129,129,
129,129,129,129,255
 410 VDU23 225,255,255,255,
255,255,255,255,255
 420 CLS
 430 IF HCOPY=TRUE VDU2
 440 PRINT "L$
 450 PRINT "Style report f
or "FL$
 460 ENDPROC
 470 DEFPROCgetsent
 480 OK=TRUE
 490 SENTNO%=SENTNO%+1
 500 N%=START%:FINISH%=0
 510 REPEAT
 520 N%=N%+1:C%=BGET#A%:C$=
CHR$(C%)
 530 IF C%>127: REPEAT:C%=B
GET#A%:UNTIL C%=13: REPEAT:C
%=BGET#A%:UNTIL C%=13
 540 IF INSTR(PUNC$,C$)>0 O
R C%<32 OR C%>127 C%=32
 550 IF INSTR(SMARK$,C$)>0
FINISH%=N%
 560 ?N%=(C% OR 32)
 570 IF EOF#A% OR N%>(HIMEM
-20) PROCnotok
 580 UNTIL FINISH%<>0
 590 ENDPROC
 600 DEFPROCnotok
 610 OK=FALSE: FINISH%=N%
 620 IF EOF#A%  ELSE PRINT
 ""This sentence is too long
 to handle"
 630 ENDPROC
 640 DEFPROCread(i%,j%)
 650 PROClabel
 660 W%=0:SL%=0:CL%=0:HW$="
":LW$="":W$=""
 670 IF (j%-i%)<12 PRINTTAB
(40)"I can't make sense of t
his sentence":ENDPROC
 680 REPEAT: PROCnextword:
UNTIL i%>=j%
 690 PROCfeedback
 700 ENDPROC
 710 DEFPROClabel :REM prin
ts first and last words of c
urrent sentence
 720 PRINT'L$
 730 PRINT "Sentence No. "
;SENTNO%;TAB(40)"v. hard";SP
C(20);"v. easy"
 740 N%=0:W$="":REPEAT:N%=N
%+1:W$=W$+CHR$(?(i%+N%)):UNT
IL(LEN(W$)>5 AND ?(i%+N%)=32
) OR ((i%+N%)>=j%):PRINT W$"
...";
 750 N%=0:W$="":REPEAT:N%=N
%+1:W$=CHR$(?(j%-N%))+W$:UNT
IL(LEN(W$)>5 AND ?(j%-N%)=32
) OR ((j%-N%)=i%+1):PRINT W$
;
 760 ENDPROC
 770 DEFPROCnextword
 780 LASTWORD$=W$:W$=""
```

Turn to Page 50 ▶

Feature

◀ From Page 49

```
  790 REPEAT:i%=i%+1:UNTIL ?
i%>32:REM strips blanks
  800 REPEAT: W$=W$+CHR$(?i%
): i%=i%+1:UNTIL(INSTR(WMARK
$,CHR$(?i%))>0) OR (i%>j%)
  810 W%=W%+1
  820 IF LEN(W$)<4 SL%=SL%+1
:W$="":ENDPROC
  830 FOR w%=1 TO LEN(W$)-1
:
  840 IF INSTR(VOWEL$,MID$(W
$,w%,1))>0 AND INSTR(VOWEL$,
MID$(W$,w%+1,1))=0 THEN SL%=
SL%+1  :REM counts syllables
  850 NEXT
  860 IF INSTR(CMARK$,"/"+W$
+"/")>0 CL%=CL%+1 :REM check
s clauses
  870 IF LEN HW$>200 ENDPROC
  880 IF LEN(LASTWORD$)<HWOR
D%  AND (LEN(LASTWORD$)+LEN(
W$)>HWORD%+2) HW$=HW$+".."+L
ASTWORD$+" "+W$ ELSE IF LEN(
W$)>HWORD% HW$=HW$+".."+W$
  890 ENDPROC
  900 DEFPROCfeedback
  910 IF W%<4  PRINTTAB(50)"
too short to analyse":ENDPRO
C
  920 P=INT (206.84-(85*SL%/
W%)-(1.02*W%))
  930 IF P>99 P=99
  940 IF P<1 P=1
  950 P%=2+INT((P^1.75)/100)
  960 D%=P DIV 10:D(D%)=D(D%
)+1
  970 PRINTTAB(40) STRING$(P
%-1,CHR$(C1));CHR$(C2);STRIN
G$(34-P%,CHR$(C1));" ";P
  980 IF P>=THOLD% ENDPROC
  990 PRINT "Diagnostics:"
 1000 PRINT "  This sentenc
e is ";W%" words long. Its c
lause structure is ";
 1010 IF CL%>1 PRINT "very "
;
 1020 IF CL%>0 PRINT "comple
x" ELSE PRINT "simple"
 1030 PRINT "  and it conta
ins the following hard words
 and jargon:"
 1040 IF LEN(HW$)=0 HW$="non
e"
 1050 PROClongprint(HW$)
 1060 ENDPROC
 1070 DEFPROClongprint(z$)
 1080 REPEAT
 1090 IF LEN(z$)>70: z=70:RE
PEAT:z=z-1:UNTIL MID$(z$,z,1
)=".":PRINT"   ";LEFT$(z$,z)
:z$=MID$(z$,z+1)
 1100 UNTIL LEN(z$)<=70
 1110 PRINT "    ";z$
 1120 ENDPROC
 1130 DEFPROCclose
 1140 PRINT "
 1150 IF EOF#A% PRINT "end o
f text"
 1160 CLOSE#0
 1170 VDU3
 1180 PROCpause
 1190 ENDPROC
 1200 DEFPROCshowtotals
 1210 IF HCOPY=TRUE VDU2
 1220 CLS
 1230 PRINT L$
 1240 @%=&00007
 1250 PRINT "Style report f
or "FL$
 1260 PRINT L$
 1270 PRINT "This table sho
ws you how EASY READER rated
 your text overall.""Each s
entence is rated on a scale
from 0 (hard to read) to 100
 (easy to read).""The table
 shows how many sentences fe
ll into each readability ban
d."
 1280 PRINT 'L$
 1290 PRINT "Score:    0-9
 10-19  20-29  30-39  40-49
 50-59  60-69  70-79  80-89
   90+"
 1300 PRINT L$:PRINT "No. of
""Sents:";
 1310 FOR I=0 TO 9:PRINT D(I
);:NEXT
 1320 PRINT 'L$
 1330 PRINT "see documentat
ion for how to interpret the
se scores"
 1340 VDU3
 1350 PROCpause
 1360 ENDPROC
 1370 DEFPROCerror
 1380 REPORT: PRINT " at lin
e "; ERL
 1390 CLOSE#0
 1400 VDU3
 1410 ENDPROC
```


PROJECT EXPANSIONS
for the ELECTRON

PLUSCOM
A UTILITY ROM
40 commands on a 16k rom-a command for everyone
from error extension to character designer ·· PRICE >> £16·95

SOUND EXPANSION
THE 4 CHANNEL SOUND CARTRIDGE
at last-- bbc sound command capabilities ···plugs into the plus 1 — including >>> SPEECH! worth £9·99
PRICE >> £45·95

ALSO:
USER PORT inc ROM socket £34·95
EPROM Programmer £45·95
MOUSE ART software £9·95
all prices inclusive of post, etc

M&S ASSOCIATES
40 MEYRICK DRIVE, NEWBURY, BERKSHIRE, RG14 6SX
0635 45774

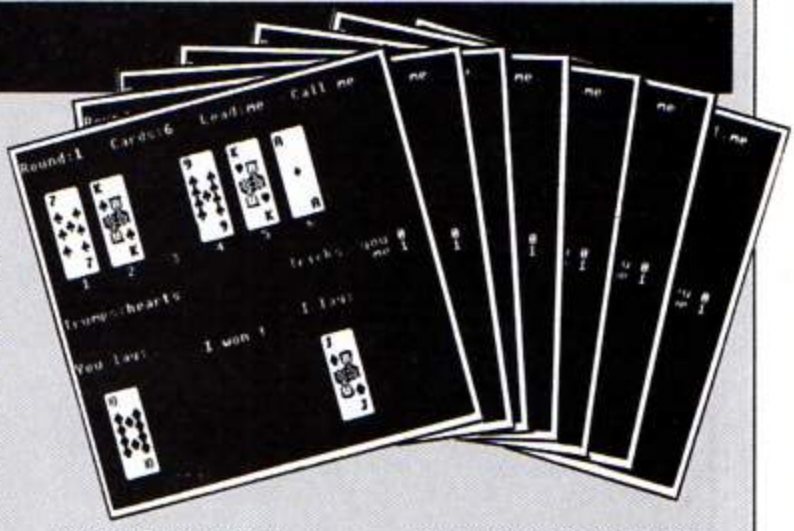
MITHRAS SOFTWARE
Best selling software for your Electron at Bargain prices
New titles available from day of release

	RRP	Ours		RRP	Ours
Repton thru the ages	6.95	5.50	Skirmish	9.95	6.95
Saigon	9.95	7.50	Evening Star	9.95	7.50
Barbarian	9.95	7.50	Spitfire 40	9.95	7.50
Spycat	9.95	7.50	Phantom Combat	–	2.95
Icarus	9.95	7.50	Rick Hanson Trilogy	23.95	12.95
Quest	9.95	7.50	The Lost Crystal	11.95	9.95
Impact	9.95	7.50	The Quill	16.95	12.95
Tetris	8.95	6.95	The Hunt	9.95	7.50
Ziggy	8.95	6.95	Village of Lost Souls	9.95	7.50
Star Wars	9.95	7.50	Project Thesius	9.95	7.50
10 Computer Hits Vol. 4	9.95	7.50	Myorem	9.95	7.50
Five Star Games Vol. 3	9.95	7.50	Kayleth	7.95	6.50
Xor	9.95	5.50	Oxbridge	7.95	6.25
Ransack	9.95	7.50	Wheel of Fortune	5.95	5.25
Despatch Rider	8.95	6.95	Castle Frankenstein	4.95	4.50
Play it Again Sam	9.95	7.50	Quest for Holy Grail	4.95	4.50
Play it Again Sam Vol 2	9.95	7.50	Kingdom of Klein	4.95	4.50
Palace of Magic	9.95	5.95	Rising of Salandra	–	4.50
Bonecruncher	9.95	7.50	The Nine Dancers	–	3.65
Elixir	9.95	6.95	The Puppet Man	–	3.65
Spellbinder	9.95	7.50	Hex	–	3.65
Superior Collection Vol. 3	9.95	7.50	Wychwood	–	3.65
Around World 40 Screens	6.95	5.50	Golden Baton	–	2.50
The Life of Repton	6.95	5.50	Waxworks	–	2.50
Boulderdash	9.95	7.50	Wizard Akyrz	–	2.50
Paper Boy	9.95	7.50	Perseus and Andromeda	–	2.50
Kourtyard	9.95	6.50	Escape from Pulsar 7	–	2.50
Spy vs Spy	9.95	7.50	Circus	–	2.50
Colossus Chess	9.95	7.50	Scott Adams Scoops (3 Adv)	–	1.95
Winter Olympiad '88	9.95	7.50			
Indoor Sports	9.95	7.50	**DISCS**	**5.25"**	**3.5"**
Pro Golf	–	2.95	Bonecruncher	9.50	–
Soccer Boss	–	1.99	Spellbinder	9.50	–
Way of the Exploding Fist	–	1.99	Elixir	–	10.95
Plan B2	–	2.95	Life of Repton	6.35	–
Micro Value Vol. 3	–	3.65	Play it Again Sam	9.50	11.95
Warehouse	–	2.50	Palace of Magic	9.50	10.95
5 Computer Hits	–	2.50	Codename: Droid	–	11.95

A full list of our Electron titles is sent with each order
ALL PRICES INCLUDE VAT & P&P IN UK. ORDERS NORMALLY DESPATCHED WITHIN 24 HOURS OF RECEIPT BY FIRST CLASS POST BUT PLEASE ALLOW 7 DAYS
(Orders to Europe and Eire add 50p for each item. Worldwide add £1 for 1st and 50p for each other item. Please send cheque payable through a UK bank or give full details of your Visa, MasterCard or Eurocard).
Please Quote Electron (A BBC list is available on request) and send cheque, P.O., Access or Visa number and cardholder's name to:

MITHRAS SOFTWARE
PO Box 151, Maulden, Bedford, MK45 2YH
Tel: (0525) 402630

Knock Out Whist listing



◄ From Page 27

```
  10 REM Knock out whist
  20 REM by Robert Charlton
  30 REM (c) Electron User
  40 ONERRORIFERR=17 RUN EL
SEMODE6:PRINT':REPEAT:PRINT"
 at line ";ERL
  50 MODE6:PROCchars
  60 IFPAGE>&E00 PROCreloc
  70 MODE1:VDU23,1,0;0;0;0;
:DIMH$(7,1),D$(26):REPEAT:PR
OCinit:PROCplay:P%=FALSE
  80 REPEAT:PROCshuf:C%=C%-
1:R%=R%+1:PROCplay:UNTILQ%:U
NTILNOT FNanot:END
  90 DEFPROCplay:PROCdeal(C
%):PROCdisp:IFNOTP% PROCcall
(W%):W%=FALSE
  100 oF%=F%:FORG%=1TOC%:IFF
%=1 PROChuma:PROCcomp ELSE P
ROCcomp:PROChuma
  110 PROCadmn:PROCclear:NEX
T:IFE%>D% W%=2 ELSE IF E%<D%
 W%=1 ELSE PROCcut
  120 IFNOTP% AND E%=0 Q%=2
ELSE IFNOTP% AND D%=0 Q%=1
  130 IFoF%=1 F%=2 ELSE F%=1
  140 ENDPROC
  150 DEFPROCchars:VDU23,239
,76,82,82,82,82,82,76,0,23,2
40,54,127,127,127,62,28,8,0,
23,241,8,28,28,107,127,107,8
,28,23,242,8,28,62,127,62,28
,8,0,23,243,8,28,62,127,127,
127,28,62
  160 VDU23,224,42,63,16,20,
17,17,16,19,23,225,168,248,1
6,80,16,16,16,144,23,226,9,8
,8,8,10,8,31,21,23,227,200,8
,136,136,40,8,252,84
  170 VDU23,228,15,63,48,116
,113,209,208,19,23,229,224,2
48,24,92,28,22,22,144,23,230
,9,104,104,56,58,24,31,7,23,
231,200,11,139,142,46,12,252
,240
  180 VDU23,232,15,63,48,52,
49,17,16,19,23,233,224,248,2
4,88,24,16,16,144,23,234,9,8
,8,24,26,24,31,7,23,235,200,
8,136,140,44,12,252,240
  190 VDU23,245,0,0,0,6,102,
105,105,102,23,246,8,7,8,126
,126,153,153,126,23,247,32,1
92,32,120,126,150,150,102
  200 VDU23,248,102,105,105,
126,30,4,3,4,23,249,126,153,
153,126,126,16,224,16,23,250
,102,150,150,102,96,0,0,0:EN
VELOPE1,1,4,-4,4,2,2,2,126,0
,0,-126,126,126:ENDPROC
  210 DEFPROCinit:M$=CHR$10+
CHR$8+CHR$8+CHR$8:B$=CHR$245
+CHR$246+CHR$247+M$+CHR$248+
CHR$249+CHR$250
  220 K$=CHR$224+CHR$225+M$+
B$+M$+CHR$226+CHR$227:Q$=CHR
$228+CHR$229+M$+B$+M$+CHR$23
0+CHR$231
  230 J$=CHR$232+CHR$233+M$+
B$+M$+CHR$234+CHR$235:W%=0:R
%=0:C%=7:P%=TRUE:T%=RND(4):F
%=RND(2):Q%=FALSE:E%=0:D%=0:
PROCshuf:ENDPROC
  240 DEFPROCshuf:CLS:COLOUR
2:PRINTTAB(14,10);"* Shuffli
ng *":P$="DQCKHJC3S5C8D9H3S9
DAHKH7S4DTH5SKS6D2HTC2S8D6C9
HQH2CAS3D5SJC4DJC7H4D8CQH9C5
CJD3DKS7HAS2D7C6CTSQH8D4STSA
H6"
  250 FORL%=1 TO 26:c%=RND(5
3-L%):D$(L%)=MID$(P$,(2*c%)-
1,2):P$=LEFT$(P$,2*(c%-1))+M
ID$(P$,(2*c%)+1):NEXT:PRINTT
AB(14,10);SPC13:ENDPROC
  260 DEFPROCdeal(num%):p%=1
:FORL%=1TOnum%:H$(L%,0)=D$(p
%):p%=p%+1:H$(L%,1)=D$(p%):p
%=p%+1:NEXT:E%=0:D%=0:ENDPRO
C
  270 DEFFNsuit(c$):s$=LEFT$
(c$,1):IFs$="H" =1 ELSEIFs$=
"C" =2 ELSEIFs$="D" =3 ELSEI
Fs$="S" =4 ELSE =0
  280 DEFFNlett(val):IFval>=
2 AND val<=9 =CHR$(val+48) E
LSEIFval=10 =CHR$239 ELSEIFv
al=11 ="J" ELSEIFval=12 ="Q"
 ELSEIFval=13 ="K" ELSEIFval
=14 ="A" ELSE =""
  290 DEFFNname(n):IFn=1 ="h
earts  " ELSEIFn=2 ="clubs
 " ELSEIFn=3 ="diamonds" ELS
EIFn=4 ="spades  " ELSE =""
  300 DEFFNcol(suit):IFsuit=
1 OR suit=3 =1 ELSEIFsuit=2
OR suit=4 =0 ELSE =-1
  310 DEFFNnum(c$):n$=RIGHT$
(c$,1):IFn$="T" =10 ELSEIFn$
="J" =11 ELSEIFn$="Q" =12 EL
SEIFn$="K" =13 ELSEIFn$="A"
=14 ELSE =VAL(n$)
  320 DEFPROCdisp:COLOUR1:PR
INTTAB(0,1);"Round:";COLOUR2
:PRINTTAB(6,1);R%:COLOUR1:PR
INTTAB(10,1);"Cards:"
  330 COLOUR2:PRINTTAB(16,1)
;C%:COLOUR1:PRINTTAB(20,1);"
Lead:":COLOUR2
  340 IFF%=1 PRINTTAB(25,1);
"you" ELSE PRINTTAB(25,1);"m
e "
  350 COLOUR1:PRINTTAB(30,1)
;"Call:":COLOUR2
  360 IF P% PRINTTAB(35,1);"
---" ELSE IFW%=1 PRINTTAB(35
,1);"you" ELSE PRINTTAB(35,1
);"me "
  370 COLOUR1:PRINTTAB(0,15)
;"Trumps:";:COLOUR2:PRINTFNn
ame(T%):COLOUR1:PRINTTAB(25,
15);"Tricks: you ";
  380 COLOUR2:PRINT;D%:COLOU
R1:PRINTTAB(34,16);"me ";:CO
LOUR2:PRINT;E%:COLOUR1:PRINT
TAB(0,19);"You lay:";TAB(25,
19);"I lay:"
  390 PROCshow:ENDPROC
  400 DEFPROCdraw(X%,Y%,card
$):V%=FNnum(card$):su%=FNsui
t(card$):co%=FNcol(su%):num$
=FNlett(V%)
  410 S$=CHR$(239+su%):VDU29
,X%;Y%-256;5,24,8;8;120;248;
:GCOL0,131:CLG:GCOL0,co%
  420 IF V%<=10 OR V%=14 PRO
Ccard(V%) ELSEIFV%=11 PROCja
ck ELSEIFV%=12 PROCquee ELSE
IFV%=13 PROCking
  430 GCOL0,0:PLOT69,8,248:P
LOT69,8,8:PLOT69,120,248:PLO
T69,120,8:GCOL0,128:GCOL0,3:
VDU29,0;0;26,4:ENDPROC
  440 DEFPROCcard(v%):IFv%=1
4 v%=1
  450 RESTORE480:FORL%=v%TO1
0:READs$:NEXT:MOVE16,240:PRI
NTnum$:MOVE80,48:PRINTnum$:A
$="":FORL%=1 TO v%:A$=A$+MID
$(s$,(L%*2)-1,1)+"0"+MID$(s$
,(L%*2),1)+"0"
  460 A%=EVAL("&"+LEFT$(A$,2
)):B%=EVAL("&"+RIGHT$(A$,2))
:MOVEA%,B%:PRINTS$:A$=""
  470 NEXT:ENDPROC
  480 DATA1C5C3B1A18165A5856
37,1C5C391A18165A5856,1C1916
5C59563A37,1C19165C59563A,1C
19165C5956,1C165C5639,1C165C
56,3C3936,3C36,39
  490 DEFPROCjack:MOVE16,240
:PRINT"J":MOVE80,48:PRINT"J"
:MOVE16,192:PRINTS$;J$;S$:EN
DPROC
  500 DEFPROCquee:MOVE16,240
:PRINT"Q":MOVE80,48:PRINT"Q"
:MOVE16,192:PRINTS$;Q$;S$:EN
DPROC
  510 DEFPROCking:MOVE16,240
:PRINT"K":MOVE80,48:PRINT"K"
:MOVE16,192:PRINTS$;K$;S$:EN
DPROC
  520 DEFPROCshow:FORY%=1 TO
 C%:PROCdraw(48+(160*(Y%-1))
,896,H$(Y%,0)):PRINTTAB((Y%*
5)-2,12);Y%:SOUND1,-15,Y%*5,
2:NEXT:ENDPROC
  530 DEFFNkey(mi%,ma%):*FX2
1,0
  540 REPEAT:A$=GET$:UNTILA$
>=STR$(mi%) AND A$<=STR$(ma%
):=VALA$
  550 DEFPROCwipe(n):VDU24,4
8+(160*(n-1));640;176+(160*(
n-1));896;:CLG:VDU26:ENDPROC
  560 DEFPROClay(n%,p%):IFp%
=0 PROCdraw(64,320,H$(n%,p%)
)
  570 IFp%=1 PROCdraw(832,32
0,H$(n%,p%))
  580 ENDPROC
  590 DEFPROChuma:COLOUR1:CO
LOUR130:PRINTTAB(0,19);"You
lay":COLOUR2:COLOUR128:REPEA
T:PRINTTAB(8,19);:hn%=FNkey(
1,C%):PRINT;hn%:le%=TRUE:hs%
=FNsuit(H$(hn%,0)):IFF%=2 PR
OChumchk
  600 IFhs%=0 le%=FALSE
  610 IFNOTle% PRINTTAB(8,19
);"Illegal":SOUND1,-15,0,2:P
ROCdel(2):PRINTTAB(8,19);SPC
7
  620 UNTILle%:COLOUR1:COLOU
R128:PRINTTAB(0,19);"You lay
":COLOUR2:PROCwipe(hn%):PROC
lay(hn%,0):PRINTTAB(8,19);"
":ENDPROC
  630 DEFPROChumchk:PROCgval
s(cn%):IFhs%<>cs% AND FNchec
k(cs%,0)=TRUE le%=FALSE
  640 ENDPROC
  650 DEFFNcheck(su%,hand%):
FORL%=1TOC%:IFFNsuit(H$(L%,h
and%))=su% L%=C%:NEXT:=TRUE
  660 NEXT:=FALSE
  670 DEFPROCcomp:IFG%=C% PR
OClast ELSE IFF%=2 PROCmyld
ELSE PROCyould
  680 COLOUR2:PRINTTAB(31,19
);cn%:PROClay(cn%,1):PRINTTA
B(31,19);" ":ENDPROC
  690 DEFPROClast:FORL%=1TOC
%:IFH$(L%,1)<>"" cn%=L%
  700 NEXT:ENDPROC
  710 DEFPROCmyld:h%=FNfind(
5,T%,0,FALSE,TRUE):c%=FNfind
(T%,0,0,FALSE,TRUE)
  720 IF(FNnum(H$(h%,1))<7 A
ND FNnum(H$(c%,1))>FNnum(H$(
h%,1))) ORh%=0  cn%=c% ELSE
cn%=h%
  730 ENDPROC
  740 DEFPROCyould:hs%=FNsui
t(H$(hn%,0)):hv%=FNnum(H$(hn
%,0)):IFFNcheck(hs%,1)=FALSE
 PROCothr:ENDPROC
  750 IFFNhigh(hs%,hv%)=FALS
E cn%=FNfind(hs%,0,0,TRUE,FA
LSE) ELSE cn%=FNfind(hs%,0,h
v%,TRUE,FALSE)
  760 ENDPROC
  770 DEFFNhigh(s%,v%):FORL%
=1TOC%:PROCgvals(L%):IFcs%=s
% AND cv%>v% L%=C%:NEXT:=TRU
E
  780 NEXT:=FALSE
  790 DEFPROCothr:IFFNcheck(
T%,1)=TRUE cn%=FNfind(T%,0,0
,TRUE,FALSE):ENDPROC
  800 cn%=FNfind(5,0,0,TRUE,
FALSE):ENDPROC
  810 DEFPROCadmn:PROCgvals(
cn%):hs%=FNsuit(H$(hn%,0)):h
v%=FNnum(H$(hn%,0)):IFcs%=hs
% AND cv%>hv% PROCcmpwin:END
PROC ELSE IFcs%=hs% AND hv%>
cv% PROChumwin:ENDPROC
  820 IFcs%=T% PROCcmpwin:EN
DPROC ELSE IF hs%=T% PROChum
win:ENDPROC
  830 IFF%=2 PROCcmpwin ELSE
 PROChumwin
  840 ENDPROC
  850 DEFPROChumwin:PROCf:D%
```

Turn to Page 52 ►

Knock Out Whist listing

◀ From Page 51

```
=D%+1:COLOUR1:PRINTTAB(25,15
);"Tricks: you ";:COLOUR2:PR
INT;D%:COLOUR1:PRINTTAB(34,1
6);"me ";
  860 COLOUR2:PRINT;E%:PRINT
TAB(14,20);"You won!":PROCde
l(3):PRINTTAB(17,20);SPC8:F%
=1:ENDPROC
  870 DEFPROCcmpwin:PROClose
:E%=E%+1:COLOUR1:PRINTTAB(25
,15);"Tricks: you ";:COLOUR2
:PRINT;D%:COLOUR1:PRINTTAB(3
4,16);"me ";:COLOUR2
  880 PRINT;E%:PRINTTAB(14,2
0);"I won !":PROCdel(3):PRIN
TTAB(17,20);SPC7:F%=2:ENDPRO
C
  890 DEFPROCclear:VDU28,0,3
1,39,20,12,26:H$(hn%,0)="":H
$(cn%,1)="":ENDPROC
  900 DEFPROCcall(p%):IFp%=1
 PROCgsuit:ENDPROC ELSE PROC
choose:ENDPROC
  910 DEFPROCgsuit:COLOUR1:C
OLOUR130:PRINTTAB(0,17);"Cho
ose trumps H/C/D/S";:COLOUR2
:COLOUR128:PRINTTAB(21,17);"
:";:*FX21,0
  920 REPEAT:A$=GET$:UNTILIN
STR("HCDS",A$):PRINTA$:A$=A$
+" ":T%=FNsuit(A$):COLOUR1:P
RINTTAB(0,15);"Trumps:";:COL
OUR2:PRINTFNname(T%)
  930 PRINTTAB(0,17);SPC24:E
NDPROC
  940 DEFPROCchoose:h%=0:c%=
0:d%=0:s%=0:FORL%=1 TO C%:PR
OCgvals(L%)
  950 IFcs%=1 h%=h%+1 ELSEIF
cs%=2 c%=c%+1 ELSEIFcs%=3 d%
=d%+1 ELSEIFcs%=4 s%=s%+1
  960 NEXT:T%=FNbig(h%,c%,d%
,s%):COLOUR2:PRINTTAB(0,17);
"I choose ";FNname(T%):COLOU
R1
  970 PRINTTAB(0,15);"Trumps
:";:COLOUR2:PRINTFNname(T%):
PROCdel(3):PRINTTAB(0,17);SP
C18:ENDPROC
  980 DEFFNbig(a%,b%,c%,d%):
IF a%>=b% AND a%>=c% AND a%>
=d% =1
  990 IF b%>=a% AND b%>=c% A
ND b%>=d% =2
 1000 IF c%>=a% AND c%>=b% A
ND c%>=d% =3
 1010 =4
 1020 DEFPROCgvals(a%):cs%=F
Nsuit(H$(a%,1)):cv%=FNnum(H$
(a%,1)):ENDPROC
 1030 DEFFNanot:CLS:COLOUR1:
IFQ%=1 PRINTTAB(3,10);"The c
omputer beat you in round ";
R% ELSEIFQ%=2 PRINTTAB(3,10)
;"You beat me in round ";R%;
", well done!"
 1040 COLOUR2:PRINTTAB(10,20
);"Play again (Y/N) ?":REPEA
TA$=GET$:UNTILINSTR("YyNn",A
$):IFINSTR("Nn",A$) CLS:PRIN
T"Bye!":END
 1050 =TRUE
 1060 DEFPROCcut:REPEAT:PRIN
TTAB(13,23);"A draw!";TAB(10
,25);"Cut for winner":COLOUR
1:PRINTTAB(0,19);"You pick:"
;TAB(25,19);"I pick:"
 1070 COLOUR2:c1$=D$(RND(13)
):c2$=D$(RND(13)+13):PROCdra
w(64,320,c1$):PROCdel(2.5)
 1080 PROCdraw(832,320,c2$):
cv%=FNnum(c2$):hv%=FNnum(c1$
):PRINTTAB(13,23);SPC7;:COLO
UR1
 1090 PRINTTAB(0,19);"You la
y: ";TAB(25,19);"I lay: ":CO
LOUR2:PRINTTAB(10,25);SPC14;
TAB(13,23);:UNTILhv%<>cv%
 1100 IFhv%>cv% PROCf:PRINT"
You won!":D%=D%+1:F%=1 ELSE
PROClose:PRINT"I won !":E%=E
%+1:F%=2
 1110 *FX21,0
 1120 W%=F%:PROCdel(3):PRINT
TAB(13,23);SPC8:ENDPROC
 1130 DEFFNfind(su%,ns%,min%
,lo%,hi%):max%=15:FORL%=1 TO
 C%:PROCgvals(L%):IFcs%=su%
AND cs%<>ns% PROCtest
 1140 IFsu%=5 AND cs%<>ns% P
ROCtest
 1150 NEXT:=cn%
 1160 DEFPROCtest:IF lo%=TRU
E AND cv%<max% AND cv%>min%
max%=cv%:cn%=L%
 1170 IF lo%=TRUE AND cv%<ma
x% AND cv%>min% max%=cv%:cn%
=L%
 1180 IFhi%=TRUE AND cv%>min
% min%=cv%:cn%=L%
 1190 ENDPROC
 1200 DEFPROCdel(Q%):TIME=0:
REPEATUNTILTIME>(Q%*100):END
PROC
 1210 DEFPROCf:RESTORE1220:R
EPEAT:READp%,d%:SOUND1,-15,p
%,d%:SOUND1,0,0,1:UNTILp%=12
0:ENDPROC
 1220 DATA100,1,108,2,100,1,
120,6
 1230 DEFPROClose:SOUND1,1,3
0,4:SOUND1,0,0,2:SOUND1,1,10
,6:ENDPROC
 1240 DEFPROCreloc:*K.1 *T.|
MF.L%=@TO TOP-PA. S.4:L%!&E0
0=L%!PA.:N.|MPA.=&E00|MO.|MG
.70|M
 1250 *FX138,0,129
 1260 END
```

This listing is included in this month's cassette tape offer. See order form on Page 45.

TWO WAYS TO ENSURE YOU GET

A Database Publication

electron user

EVERY MONTH

1. Complete and mail subscription form on Page 45
2. Hand this form to your newsagent.

Please reserve me a copy of Electron User magazine every month until further notice.

☐ I will collect
☐ I would like it delivered to my home.

Name _____

Address _____

_____

_____

Note to newsagent: Electron User should be obtainable from your local wholesaler, or contact Mike Rice Circulation Manager on 0424 430422

NEW

ROMPLUS-144
INTELLIGENT SIDEWAYS ROM UNIT
with BUILT IN RAM FILING SYSTEM AND PRINTER BUFFER
Fits into a Plus One/ROMbox Plus slot and holds 7 ROMs plus a 32k RAM
ROMs software selectable via integral OS ROM. Compatible with NTQ fonts, Wordwise, VIEW, etc
Price only £39 + £15 for RAM

ELECTRON MODE 7 ADAPTOR
What the reviewers said:
"Here at last is a true Mode 7 adaptor . . . and very impressive it is too"–*Electron User, Aug '87*
"A quality product well made . . . buy it"–*A&B Computing, Feb. '88*
"Go on, spoil yourself"–*Acorn User, May '88*
Prices: Full Unit–£89; Kit (Bare pcb, ROM + Parts list + layout)–£25 + £10 for case

MODE 7 SCREEN EDITOR
"Vudata" from Tendene Software on 3.5" disc. **Price £10**

ORIGINAL E2P SECOND PROCESSOR KIT
"An excellent add-on"–*A&B Computing, April '86*
Price (Bare pcb, construction notes) with software on cassette–£15, on 3.5" disc or ROM–£20

ALL PRICES ARE INCLUSIVE OF POSTAGE, ETC.
Please allow 28 days delivery

JAFA SYSTEMS
9 Lon-y-Garwa, Caerphilly, Mid-Glamorgan
Telephone (0222) 887203

KOSMOS SOFTWARE

Whatever your subject...

French, First Aid, Football, Spelling, Science, Spanish, Sport, Scotland, England, English Words, German, General Knowledge, Geography, Italian, Arithmetic, Natural History.

Let your computer help you learn

Write or phone for a FREE 20 page illustrated catalogue of our Leisure and Educational Software

KOSMOS SOFTWARE LIMITED
FREEPOST (no stamp needed)
DUNSTABLE, Beds. LU5 6BR
Tel: 05255 3942 or 5406

ANYONE FOR TENNIS?

That's the question of the day with FRASER BAIN's fast two player game

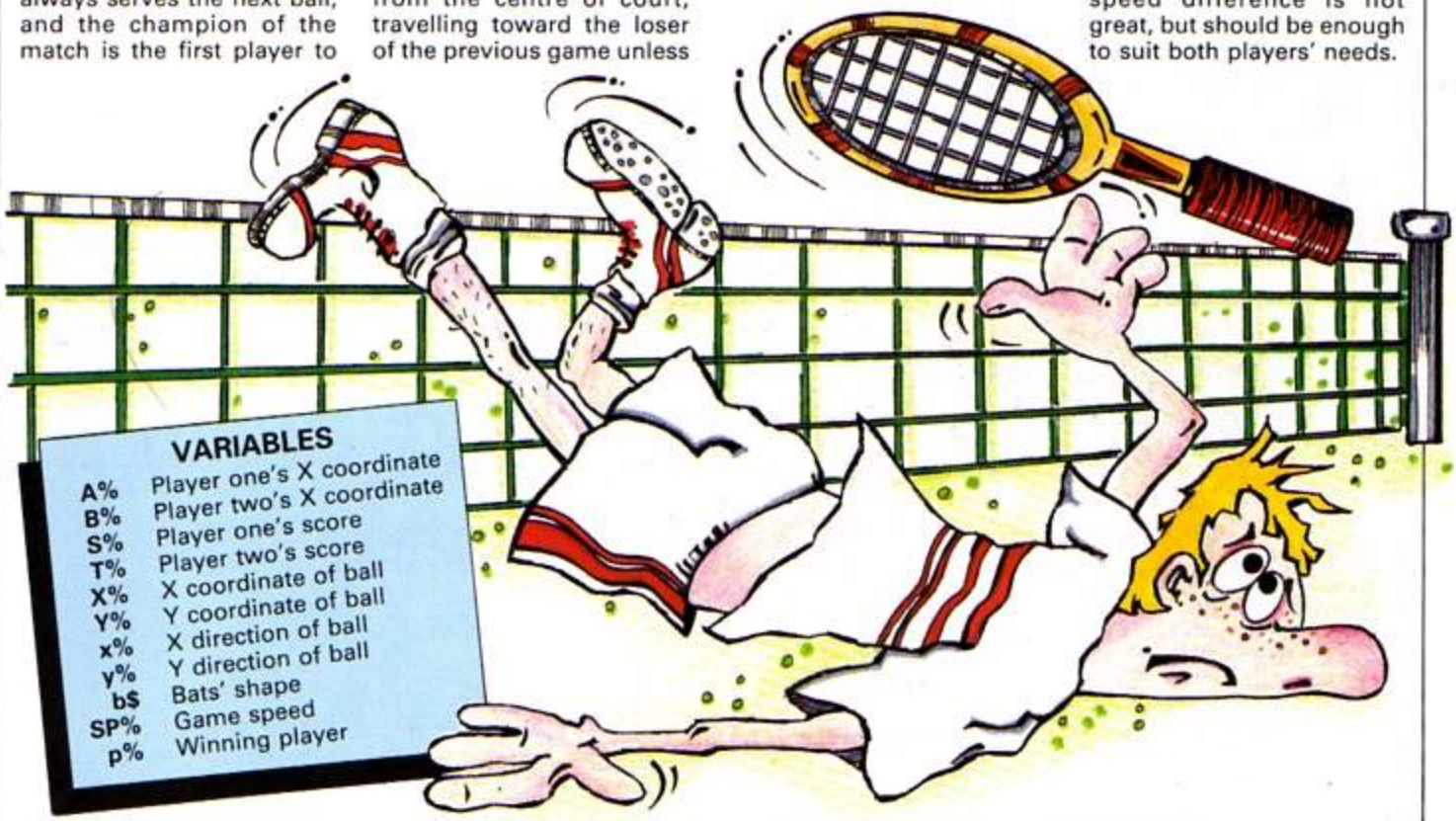
THE crowd is wild. Your opponent is sweating. Your racket seems like a living extension of your arm, and you know that this time nothing is going to get between you and the championship.

Tennis is a two player game based on the popular video tennis games of the late 1970s.

Each player controls a bat, facing the other across the court, and the object is simply to keep the ball in play until your opponent lets it go past.

The winner of a game always serves the next ball, and the champion of the match is the first player to win 10 games – hence the name Tennis.

The ball is always served from the centre of court, travelling toward the loser of the previous game unless a new match has begun, in which case the ball is always served toward the left-hand player. Before each match starts you have the option of a fast or a slow game. The speed difference is not great, but should be enough to suit both players' needs.



VARIABLES

A%	Player one's X coordinate
B%	Player two's X coordinate
S%	Player one's score
T%	Player two's score
X%	X coordinate of ball
Y%	Y coordinate of ball
x%	X direction of ball
y%	Y direction of ball
b$	Bats' shape
SP%	Game speed
p%	Winning player

```
   10 REM Tennis
   20 REM By Fraser Bain
   30 REM (c) Electron User
   40 *FX16
   50 MODE4:VDU23,1,0;0;0;0;
23,225,24,126,126,255,255,12
6,126,24,23,224:FORI%=1TO8:V
DU255:NEXT
   60 S%=0:T%=0:b$=" "+STRIN
G$(4,CHR$224)+" ":REPEATy%=R
ND(3)-2:UNTILy%<>0
   70 PRINTTAB(13,6)"T E N -
 N I S"TAB(12,12)"By Fraser
Bain"TAB(11,15)"(c) Electron
 User"TAB(9,19)"(F)ast OR (S
)low game?":REPEATG%=GETAND&
DF:UNTILG%=70ORG%=83:SP%=0:I
FG%=83SP%=25
   80 REPEATMODE4:VDU23,1,0;
0;0;0;
   90 MOVE319,0:DRAW319,1024
  100 MOVE1153,0:DRAW1153,10
24
  110 PRINTTAB(1,2)"PLAYER 1
"TAB(1,29)"PLAYER 2"TAB(2,15
)"SCORE"TAB(4,10);S%;TAB(4,2
0);T%
  120 A%=20:B%=20:X%=RND(22)
+11:Y%=15
  130 REPEATx%=RND(3)-2:UNTI
Lx%<>0
  140 PRINTTAB(A%,2)b$TAB(B%
,29)b$TAB(X%,Y%)CHR$225
  150 FORI%=1TO2000:NEXT:SOU
ND1,-15,110,2
  160 REPEATFORI%=1TOSP%:NEX
T
  170 H%=(INKEY-98-INKEY-67)
:IFH% ANDA%+H%>9THENIFA%+H%<
31A%=A%+H%:PRINTTAB(A%,2)b$
  180 H%=(INKEY-104-INKEY-10
5):IFH% ANDB%+H%>9THENIFB%+H
%<31B%=B%+H%:PRINTTAB(B%,29)
b$
  190 VDU31,X%,Y%,32:X%=X%+x
%:Y%=Y%+y%:IFX%=340RX%=11x%=
-x%:VDU31,X%,Y%,225:SOUND1,-
15,200,1ELSEVDU31,X%,Y%,225
  200 IF(Y%=3ANDX%>=A% ANDX%
<=A%+4)OR(Y%=28ANDX%>=B% AND
X%<=B%+4)y%=-y%:SOUND1,-15,1
30,2
  210 UNTILY%<20RY%>29:SOUND
1,-15,160,2:SOUND1,-15,140,1
:y%=1:IFY%<3T%=T%+1:y%=-1ELS
ES%=S%+1
  220 UNTILS%=10ORT%=10:PRIN
TTAB(4,10);S% TAB(4,20);T%:p
%=S%=10
  230 PRINTTAB(16,15)"FINAL
SCORE"TAB(12,17)"Player ";p%
+2;" beat Player ";1-p%;
  240 PRINTTAB(11,19)"with t
he score of 10 - ";:IFp% PRI
NT;T% ELSEPRINT;S%
  250 PRINTTAB(16,25)"PRESS
SPACE":REPEATUNTILINKEY-99:R
UN
```

LIGHTSPEED SOFTWARE

Dept EU
31A BROADWEIR BRISTOL BS1 TELEPHONE: 0272-225604

24 HOUR ANSWER PHONE FOR ALL QUERIES

New titles available on release day

TITLE	OUR PRICE	TITLE	OUR PRICE
ADVENTURE CREATOR	12.50	PALACE OF MAGIC	7.65
BONECRUNCHER	7.75	PALACE OF MAGIC (5.25" disc)	10.60
COMPUTER HIT 10 V3	7.75	PALACE OF MAGIC (3.5" disc)	12.50
COMPUTER HIT 5	5.90	PHANTOM COMBAT	3.50
CRAZEE RIDER	7.75	PSYCASTRIA	6.90
ELITE	10.50	RAVENSKULL	7.75
ELIXIR	7.75	REPTON 3	7.75
ICARUS	7.75	ROUND WORLD 80 SCRN	6.75
IMPACT	7.75	SKIRMISH	7.50
INDOOR SPORTS	7.75	STAR WARS	7.75
KOURTYARD	7.50	SUPERIOR COL VOL 3	7.75
MINI OFFICE	4.90		

ALL PRICES ARE INCLUSIVE OF VAT AND DELIVERY INSIDE THE UK.
PLEASE MAKE CHEQUES P.O.s PAYABLE TO
"LIGHTSPEED SOFTWARE"
ALL ORDERS DESPATCHED WITHIN 24 HOURS, BUT PLEASE ALLOW 7 DAYS

ADVERTISERS' INDEX

21st Software....6
C&F Associates....38
Centec Disk Supplies....10
Delta....47
Impact Posters....55
Jafa Systems....52
Lightspeed Software....54
Mandarin Software....4
Mithras Software....50
Peter Donn....54
PMS....47
PRES....34, 35
Project Expansions....50
RODH Designs....54
Slogger....22, 23
Software Bargains....13, 54
Superior Software....2, 56
Towerhill....46, 47
Voltmace....32

BBC/ELECTRON 'IMAGE' V.2

'IMAGE' was the ultimate tape back up system, now, it's even better

You can be completely assured that this is the best and most able program of its type available. It can deal with:

- Locked programs
- Programs of any length
- 300† and 1200 BAUD
- Files
- ?'s (Ctrl codes) in Filename
- Multiple back ups
- False or trick block info.
- Changing Filename†
- Continuous data stream†
- Locking and unlocking programs

It is VERY IMPORTANT INDEED purchasers take note that 'IMAGE' is for sale strictly for making BACK-UPS of your own software for your own use, for protecting your own programs, or as an aid to putting software on disk (by removing locks from tape software). Any person found using the program for illegal purposes runs the risk of being prosecuted.

To receive your copy of 'Image' send a cheque or P.O. for the sum of **An Astounding £5.80 to:**

Peter Donn, Dept. EU, 38 Fitzwarren, Thorpe Bay, Essex

Please state BBC or Electron version. V1 owners can obtain V2 by sending £1.50+V1 without case

AA269 † BBC version only

ROM/RAM EXPANSION BOARD 2 for the PLUS 1

sideways

will hold 7 ROMS or 6 ROMS plus 16k RAM

.fits inside the plus1 .easy to fit yourself .clear instructions given
.write protect switch .only five leads to solder on, connector to board
.plugs into plus1 rom socket .ours working with 64k Electron & dual discs
.options: with 16k ram (2×6264) £37·50 .without ram £30·95

1MHz BUS & ROM BOARD

.plugs into any cartridge slot . 2 rom sockets
.standard idc bus connector (as BBC)
.£17·95 .gold plated edge contacts
all prices incl. no more to pay (UK)
enquiries tel. 0703·260900 (best after 3pm)
36 Sarum Road, EASTLEIGH, HANTS, SO5 2AN.

R.O.D.H. Designs

EVEN MORE AMAZING OFFERS!

NORMALLY £9.95 – NOW ONLY £7.35!!

5 Star Games Vol. 3
Boulderdash
Colossus 4 Chess
G. G. Test Cricket
Gold Run
Icarus
Impact
Indoor Sports
Spitfire 40
Spy vs Spy
Star Wars
Star Force Harrier
Tarzan

BUDGET TITLES

ANY 5 for £7.95

3D Dotty
Billiards
Bird Strike
Brian Jacks
Eddie Kidd
Geoff Capes Strongman
Grid Games
Mango
Return R2
Steve Davis Snooker
Trapper
Vegas Jackpot
Video Card Arcade
Way of the Exploding Fist

NORMALLY £2.95 EACH — SPECIAL DEAL — ANY 5 FOR £9.95!

Cricket
Hunki Dory
Ice Hockey
Squeakalizer
Twin Kingdom Valley
Uranians
Jack Attac
Plan B
Roboto
Sky Hawk
Star Force Seven
Templeton
Tennis
Savage Pond

NORMALLY £7.95 – NOW ONLY £5.95!!

Big K.O.
Commonwealth Games
Ian Botham Cricket
Jet Set Willy
Jet Set Willy 2
Oxbridge
Phantom
Psycastria
Sphere of Destiny
Thrust
Thunderstuck II

VISA

Please make cheques/P.O's payable to Software Bargains & add 95p P&P. All prices include VAT

☎ **0532-687735** Out of hours Ansaphone

SOFTWARE Bargains

Order via Micronet

Goods despatched within 48 hours subject to availability

Dept EU7, 8/8A Regent Street, Chapel Allerton, Leeds LS7 4PE

THE IMPACT GAMES CLUB

OUR GUARANTEE

1. Over 200 titles always in stock.
2. Over 98% of all orders are sent out on the day they are received by 1st Class Post.
3. We immediately replace any faulty games purchased from us.
4. Prices are fully inclusive - nothing else to pay.

Plus we'll send you a free copy of our comprehensive club magazine featuring over 200 games, reviews, 1/2 price offers, compilation titles breakdown, competitions and the latest up-to-the-minute news.

BARBARIAN
(Superior Software)

A brilliant conversion of the number 1 best seller from Palace Software. The animated fighting is superb and the game has all the features of the original - not one for the faint of heart.

ARCHIMEDES GAMES

CONQUEROR	£19.95
ZARCH	£15.95
MINOTAUR	£11.95

FREE HELPSHEETS/MAPS

Spend over £4 on games and you may choose any ONE of the following helpsheets/solutions and maps absolutely FREE:- Spend over £10 and you may choose any TWO FREE:-

Spycat	(Helpsheet + map)	Codename: Droid	(Solution + map)
Plan B2	(Solution + map)	Thunderstruck	(Solution + map)
Quest	(Helpsheet + map)	Thunderstruck 2	(Solution + map)
Ravenskull	(Solution + 4 maps)	The Lost Crystal	(Solution)
Citadel	(Solution + map)	Last of The Free	(Solution + map)
Plan B	(Solution + map)	Kourtyard	(Helpsheets + maps)
Spy Vs Spy	(Helpsheet)	Gisburnes Castle	(Solution + map)
Spellbinder	(Helpsheet + map)	Palace of Magic	(Solution + map)
Elixir	(Helpsheet + map)	Impact	(Helpsheets +passwords)
Paperboy	(Helpsheet)	Icarus	(Helpsheet)
Twin Kingdom Valley	(Solution +map)		

Repton Thru Time
(Superior Software)

This superb new set of 40 screens makes Repton's previous problems look trivial. Follow Repton from the prehistoric era, where dinosaurs were the least of his problems, through the Egyptian, Victorian and present time zones. Ultimately see what the future holds for our hero. Set against the stars, Repton will find that things are not always what they seem.

Cassette.....£5.50 BBC 5 1/4" Disc....£6.35
Master Compact.....£7.50

* = Electron disc available
M = Master compatible

TITLE & PUBLISHER	BBC or Electron Cassette	BBC (or Electron) 5¼" Disc	Master Compact (or Electron) 3½" Discs
SUPERIOR			
Repton Thru Time M	5.50	6.35	7.50
Barbarian M	7.50	9.50	11.95
Spycat M	7.50	9.50	11.95
Quest M	7.50	9.50	11.95
Play It Again Sam 2 M	7.50	9.50	11.95
Boniecruncher M	7.50	9.50 *	11.95
Spellbinder M	7.50	9.50 *	11.95
Play It Again Sam M	7.50	9.50 *	11.95 *
The Life of Repton M	5.50	6.35 *	7.50
Elixir M	7.50	9.50 *	11.95 *
Palace of Magic M	7.50	9.50 *	11.95 *
Repton Around the World M	5.50	6.35	7.50
Crazee Rider M	7.50	9.50	11.95 *
Codename: Droid (Stryker's 2) M	7.50	9.50	11.95 *
Grand Prix Cons. Set M (BBC Only)	7.50	9.50	11.95
Repton 3 M	7.50	9.50	11.95
Revs & 4 Tracks (BBC Only) M	10.35	11.95	15.95
Elite M	10.35	11.95	15.95
Acorn Hits Vol 1 or 2 M	3.99	9.50	11.95
Sup. Coll. 1 or 2 (BBC Only) M	7.50	9.50	11.95
Superior Coll. 3 (Elec Only)	7.50	9.50	11.95 *
Speech (BBC Only) M	7.50	9.50	11.95
Citadel M	7.50	9.50	11.95
Ravenskull M	7.50	9.50	11.95
Thrust M	3.99	9.50	11.95
Galaforce M	7.50	9.50	11.95
TYNESOFT			
Saigon M	7.50	11.95	11.95
Winter Olympiad '88 M	7.50	11.95	11.95
Spy vs Spy M	7.50	11.95	11.95
The Big KO M	6.35	10.35	10.35
Boulderdash M	7.50	11.95	11.95
Indoor Sports M	7.50	11.95	11.95
Phantom M	6.35	10.35	10.35
Oxbridge M	6.35	-	-
Commonwealth Games M	6.35	10.35	10.35
Future Shock M	7.50	11.95	11.95
Microvalue (4 games)	3.99	-	-
Microvalue 2 (4 games) (Elec Only)	3.99	-	-
Microvalue 3 (4 games) (Elec Only)	3.99	-	-
Two Classic Games (Elec Only)	3.99	-	-

M = Master compatible

TITLE & PUBLISHER	BBC or Electron Cassette	BBC 5¼" Disc
ACORNSOFT		
Aviator (BBC Only)	4.95	-
Revs & Revs 4 Tracks (BBC Only)	2.99	4.99
ASL		
Breakthrough M	7.50	9.50
Impact M	7.50	9.50
Powerpack 1 (7 games) (Elec Only)	7.50	-
Powerpack 2 (7 games) (Elec Only)	7.50	-
Ziggy M	6.95	8.75
Ransack M	7.50	9.50
Despatch Rider M	7.50	9.50
Thunderstruck	2.99	-
Thunderstruck 2 M	6.35	9.50
Sphere of Destiny M	6.35	9.50
Omega Orb M	6.35	9.50
Graham Gooch Test Cricket M	7.50	9.50
BBC SOFT		
Bismark (BBC Only) M	-	11.95
Black Queen (BBC Only) M	-	11.95
White Knight Mk12 (BBC Only) M	-	11.95
BEAU JOLLY		
Five Star Games 1 (5 games)	4.95	-
Five Star Games 2 (5 games)	4.95	-
Five Star Games 3 (7 games)	7.50	-
Computer Hits 3 (10 games)	4.95	-
Computer Hits 4 (12 games)	7.50	-
Computer Hits 5 (5 games)	4.95	-
BUGBYTE		
Bugbyte Comp. 1 (4 games) M	-	4.99
Bugbyte Comp. 2 (4 games)	-	4.99
Dunjunz M	2.99	4.99
CDS		
Colossus Bridge (BBC Only) M	9.50	11.95
Colossus Chess (BBC Only) M	7.50	11.95
Steve Davis Snooker M	1.99	4.50
Brian Clough Football M	7.50	9.95
DOMARK		
Not a Penny More (BBC Only) M	11.95	15.95
Star Wars M	7.50	10.35
Living Daylights (BBC Only)	7.50	10.35
Trivial Pursuits (All BBC Only)		
Genus Edition M	11.95	15.95
Young Players M	11.95	15.95
Baby Boomer M	11.95	15.95

M = Master compatible

TITLE & PUBLISHER	BBC or Electron Cassette	BBC 5¼" Disc
ELITE		
Paperboy	7.50	11.95
FIREBIRD		
Sentinel (BBC Only)	7.50	11.95
Cholo (BBC Only)	-	14.35
GODAX		
Cyboto M	7.50	9.50
Skirmish M	4.95	5.95
Kourtyard M	7.50	9.50
GREMLIN GRAPHICS		
Krakout (BBC Only)	7.50	11.95
Footballer of the Year	7.50	-
HEWSON		
Evening Star M	7.50	11.95
Uridium (BBC Only) M	7.50	11.95
INFOGRAMME		
Apocalypse (BBC Only)	7.50	11.95
LOGOTRON		
XOR M	7.50	10.35
MANDARIN		
Icarus M	7.50	9.50
	6.35	11.95
MARTECH		
War (BBC Only)		3.99
MIRRORSOFT		
Tetris M	6.95	10.35
Spitfire '40 M	7.50	10.35
Strike Force Harrier	7.50	10.35
ROBICO		
Village Of Lost Souls (BBC Only) M	7.50	10.35

BUDGET CASSETTES
BBC B or Electron

HOW TO ORDER

Simply fill in this coupon and send with a cheque or a postal order to Impact Posters.

- All games despatched by 1st class post
- FREE postage and packing. (Overseas add £1)
- Despatch normally same dayas order (over 98%)

IMPACT Posters
Impact Posters
Neepsend House
1 Percy St.
Sheffield S3 8AU
Tel. (0742) 769950

To: Impact Posters, Neepsend House, 1 Percy St., Sheffield, S3 8AU

Please send me the following games:

TITLE	FORMAT (Cassette etc.)	COMPUTER	PRICE

I enclose a cheque P.O (made payable to Impact Posters) for £

(BLOCK CAPITALS PLEASE)

Name.....

Address.....

.....

.....

Postcode.....

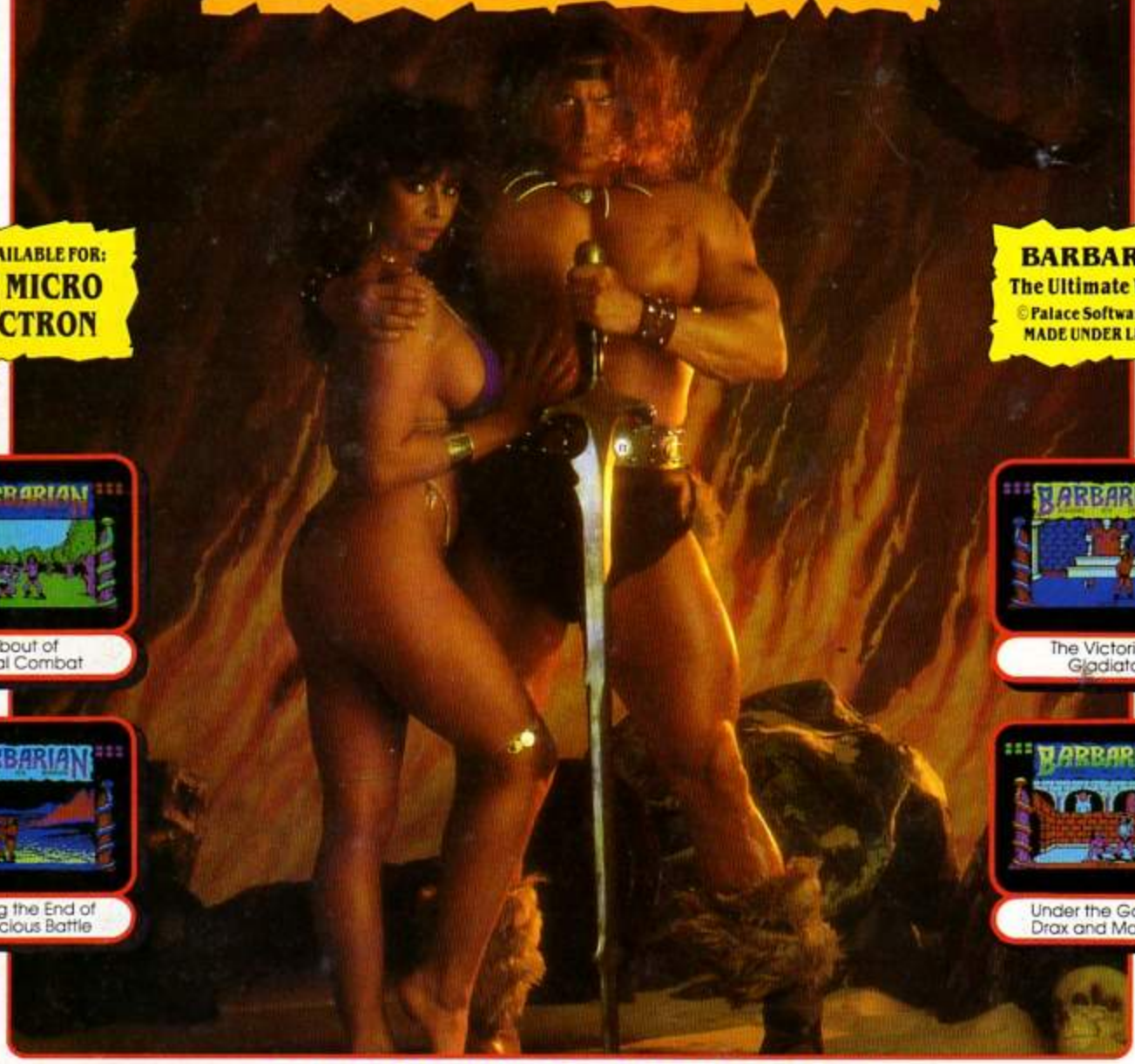
Please send me **FREE** helpsheets/solutions/maps for the following games (from those above)

1.....(Orders over £4)

2.....(Orders over £10)

BARBARIAN

The Ultimate Warrior



NOW AVAILABLE FOR:
BBC MICRO
ELECTRON

BARBARIAN
The Ultimate Warrior
©Palace Software, 1987
MADE UNDER LICENCE

A bout of Mortal Combat

The Victorious Gladiator

Nearing the End of a Ferocious Battle

Under the Gaze of Drax and Mariana

THE ULTIMATE WARRIOR • THE ULTIMATE GAME

At last, BARBARIAN, the most realistic and exciting of sword-fighting games reaches the BBC Micro and Electron.

One or two players—fight against the computer or a friend.

The evil sorcerer Drax has abducted the beautiful Princess Mariana to satiate his nefarious desires. A powerful warrior is sought to vanquish against Drax's demonic guardians and free the princess? You are that warrior: a mighty barbarian wielding your broadsword with deadly skill.

BBC Micro Cassette	£9.95	Acorn Electron Cassette	£9.95
BBC Micro 5¼" Disc	£11.95	BBC Master Compact 3½" Disc	£14.95

(Compatible with the BBC B, B+ and Master Series computers)

Please make cheques payable to "Superior Software Ltd".

PRIZE COMPETITION

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

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

Closing Date: 30th September, 1988.

SUPERIOR SOFTWARE Limited

ACORNSOFT

PALACE SOFTWARE

VISA

24 HOUR TELEPHONE ANSWERING SERVICE FOR ORDERS

Dept. B4, Regent House, Skinner Lane, Leeds LS7 1AX. Telephone: 0532 459453