

A Database Publication

THE MICRO USER

Volume 8 Number 3 May 1990 £1.50

How to use
a PC monitor
on a BBC Micro

HOTKEY

Instant action from
your Archimedes

8 BIT WIMPS

Bring desktop power
to your BBC Micro

RANDOMITY

Unpredictability in
machine code

REVIEWS

Knowledge Organiser
Teletype • Craftshop 1
Craftshop 2 • CalcSim
Rivers • Britain
Page Designer
... plus all the
latest games

ISSN 0265-4040



9 770265 404004

New horizons open
up in data storage

Top-selling guide to the BBC Micro, Master, Archimedes series and A3000

**SPECIAL OFFER
PRICE**
See below for details

HOW TO IMPROVE YOUR IMAGE

i-SCAN is the only scanner which has been specifically designed for the Archimedes. Future expansion capabilities for higher resolution and colour are already designed into the system.

i-SCAN consists of a scanning unit, expansion card, leads and software. The scanning unit has a precision motor driven paper transport mechanism which is more accurate than hand held scanners. i-SCAN can handle documents from postage stamp size up to A4 width. A full A4 page can be scanned in less than 20 seconds.

Other Archimedes scanners only produce monochrome images which are processed to produce a grey scale effect. i-SCAN images have 16 true grey levels and a resolution of 200 dots per inch (dpi), this is effectively equivalent to 800 dpi monochrome.

Software supplied with the package is completely Risc OS compatible. The scanned area is selectable to minimise memory used and subsequent editing. A window displays the scanned image where it can be enlarged or reduced. Programmable contrast adjustment caters for difficult images such as pencil drawings.

Images are saved as sprite files which can be used with !DTP, !Paint, !Draw and any other Risc OS application. Industry standard TIFF compressed files will soon be supported.



This image was scanned by i-SCAN



i-SCAN is supplied complete with expansion card, leads and software. All items carry a full one year guarantee.

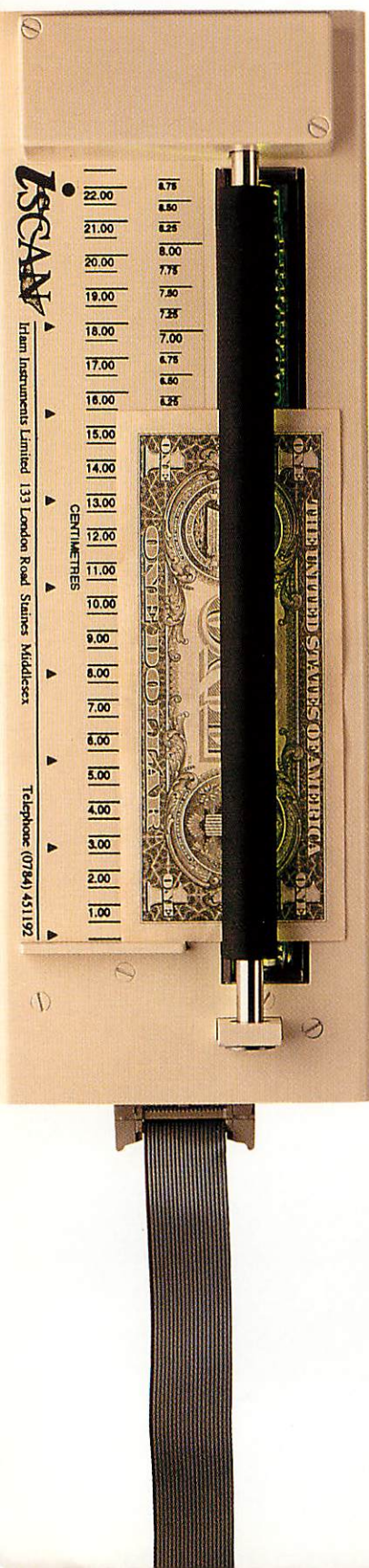
For a limited period i-SCAN will be available for £579 plus VAT (usual price £679). Desktop publishing software is available at a special offer price when purchased with i-SCAN.

Please telephone Staines (0784) 451192 for more information.

i-SCAN is manufactured by Irlam Instruments Limited, 133 London Road, Staines, Middlesex TW18 4HN.

iSCAN

Archimedes is a registered trademark of Acorn Computers.



COLOURJET 132

HIGH PERFORMANCE COLOUR INK JET PRINTER

(compatible with IBM pc, BBC micro, Nimbus etc.)

- ★ PRINTS ALL 64 SCREEN COLOURS FROM CGA AND EGA USING OPTIONAL INTEGRIX SOFTWARE
- ★ EMULATES OTHER PRINTERS (IBM3852, PJ1080A and QUADJET)
- ★ OVERHEAD TRANSPARENCY PRINTING
- ★ 80 + 132 COLUMN OPERATION, A4 WIDTH
- ★ UP TO 1280 DOTS/LINE ADDRESSABLE
- ★ FULL VIDEOTEX CAPABILITY
- ★ OPTIONAL BUFFERED RS232 (INTERNAL)
- ★ HIGHLY VERSATILE

ULTRA
LOW
NOISE

TEXTILE PRINTING
INK CARTRIDGES
NOW AVAILABLE

LIST PRICE
£636 + VAT



EDUCATIONAL DISCOUNTS AVAILABLE

INTEGRIX LTD CHURCH GRESLEY, BURTON ON TRENT

STAFFS DE11 9PT

Tel (0283) 215432

Telex 341727 INTEGX

Fax (0283) 550325



PUBLIC SECTOR CUSTOMERS:
FOR SPECIAL PRICING
CALL 0603 695051

THE MICRO USER

Managing Editor **Derek Meakin**
 Features Editor **Steve Turnbull**
 Consultant Editor **Peter Davidson**
 Production Editor **Peter Glover**
 Technical Editor **Mike Cook**
 Reviews Coordinator **Pam Turnbull**
 Advertisement Manager **John Snowden**
 Advertising Sales **Jane Conway,
 Peter Babbage,
 Martin Bailey**

Tel: 0625 878888 (All depts.)
 051-357 2961 (Subs.)
 MicroLink: MAG001
 Telex: 94081191
 Prestel Mailbox: 614568383
 Fax: 0625 879966

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

ABC 40,376
 Jan-June 1988
 ISSN 0285-4040

The Micro User welcomes new 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.

© 1990 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, listings or advertisements.

The Micro User is an independent publication and neither the BBC nor Acorn Computers Ltd are responsible for any of the articles in this issue or for any of the opinions expressed.

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

Database Publications
 is a division of
 Europress Ltd

Cover story Now you can use CD-Roms – the storage technology of the future. Find out how to cram 550Mb of data on to a disc the same size as your 5.25in floppy. Discover how you can enter this exciting new world and what other possibilities are opening up. Complete sets of major literary works are available for prices starting at £5 – yet individuals, schools and businesses can have their own resources put on to this media. Turn to Page 36

Newcomers **ON TEST**



16 Genesis
 Something completely new arrives for the Archimedes: Is it all it's cracked up to be?

40 Knowledge Organiser
 This free-text database is examined and compared with its MSdos rivals.

101 Finding a Voice
 We explore a superb new package that makes sound editing on the Arc a cinch.

Type-it-in

This symbol indicates that the feature contains at least one full length listing for you to key in on your micro.



All the major listings in this magazine are accompanied by checksums to help you key them in correctly. For full details of how to use them see the article on page 72 of the February issue.



MICRO USER CLASSIFIEDS

The best bargains in the world of the BBC Micro come from fellow readers of The Micro User. Turn to Page 114 to find just what you're looking for – from cheap modems to complete computer systems.

Specials

54 Database
 Try out a versatile data storage and retrieval system.



63 Hotkey
 Archimedes operations ready in an instant.



Hotkey grabs screens

73 BBC Wimps
 It is possible to have a desktop environment on your 8 bit BBC Micro. Start of a new series telling you how.

80 SuperCal
 What you need when a calculator isn't good enough and a spreadsheet's just too much.



99 Random
 Discover how easy it is to create unpredictable events in 8 and 32 bit machine code.



76 Superior Software
 We reveal the secrets behind the success of this leading software house in an interview with its managing director.

REGULARS: News 7 • Education Update 19 • Mad Hatter 33

Education

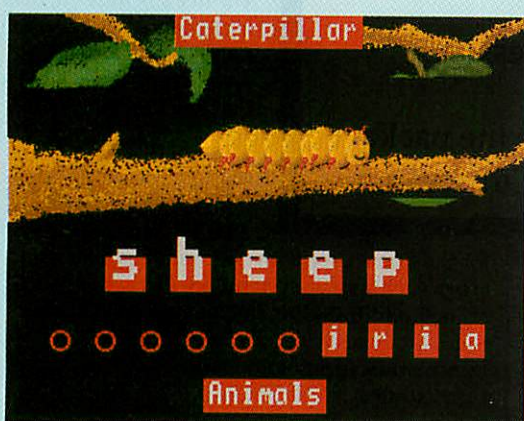
23 Adventurous Email

A thank you letter turns into a lesson as a group of pupils have a close encounter of a very strange kind.

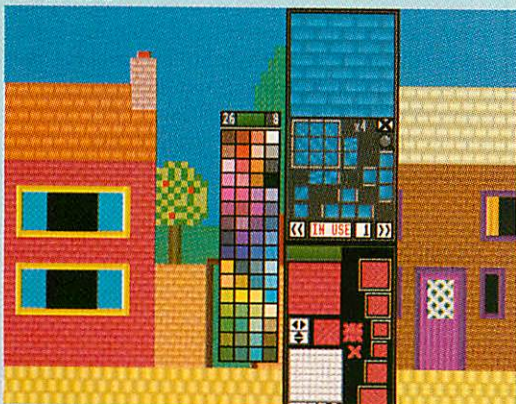
25 Education Reviews

Looking at the best in software for the BBC Micro series in schools including:

- Fun School 2
- Rivers
- Britain
- Amblesforth plotter
- Transformations
- Craftshop 1
- Craftshop 2



Fun School 2



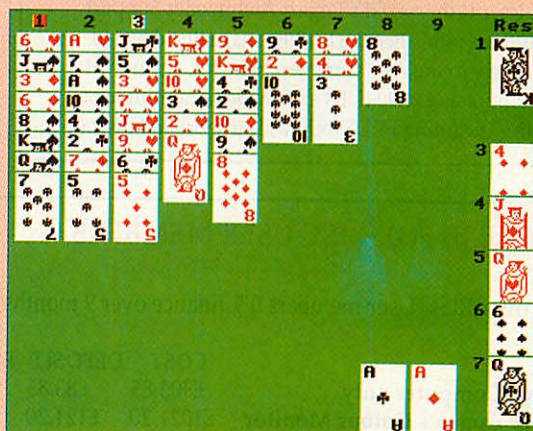
Craftshop

SOFTWARE SCENE



Our reviewers cast a critical eye over the latest games releases – **Page 47**

Type-in Game



65 King Albert

An absorbing patience game with the opportunity to try the same layout again and again.



Subscribe!

For the price of a single year's subscription you get 15 months of *The Micro User* plus the disc or tape for each issue. In addition you will get the disc or tape from the month you take out your subscription.

That's a grand total of 15 magazines and 16 discs or tapes – and you pay no more than you would for only a standard 12 month subscription!



What you'll find on this month's disc or tape:

- All the listings from this issue
- A compactor and decompactor for the courses of Golf!
- A full, compacted course for Golf!
- Hacman's index: Text file for the first year

For the Archimedes series and A3000 only:

- Demonstrations of 4Mation's Craftshop2
- DeskTop IClockCalc accessory

**Take out a subscription
NOW by filling in the
form on Page 83**

INDEX to products featured in this month's issue

Ambleforth Plotter.....	28	Centibug.....	76	Fireball II.....	12, 47	Imogen.....	78	Multitad RGB.....	12	Repton.....	77	Teletype.....	31
Apocalypse.....	9	Citadel.....	50, 77	Firetrack.....	78	Impression.....	12	Musik 5000.....	113	Repton Infinity.....	77	Tempest.....	19
Arc-TFS.....	40	Classmate.....	19	First World Plus.....	7	Inertia.....	9			Revs.....	77	The Last Ninja.....	78
Arcade Soccer.....	9	Compact Cartridge.....	9	Frak!.....	78	Inspiration.....	12	Nevryon.....	48	Revs + 4 tracks.....	77	The Olympics.....	9
Archimedes.....	Voice	Concept Kids.....	19	Freedom Fighter.....	9	Invaders.....	76	North & South.....	78	Ricochet.....	76	Thrust.....	78
Generator.....	101	Craftshop 1.....	25	Fun School 2.....	26	It's Magic.....	49	Number Investigations 28		Rivers.....	29	Transformations.....	28
ArchLock.....	36	Craftshop 2.....	25									Trivial Pursuit.....	9
				Galaforce.....	78	Killer Gorilla.....	78	Overdrive.....	77	Save-a-life.....	19	UIM.....	112
Ballistix.....	78	Dataheft.....	7	Galaxy Birds.....	76	Kings Quest IV.....	33	Page Designer.....	30	Scalebook.....	29		
Barbarian.....	78	Discover.....	19	Genesis.....	7	Knowledge Organiser 40		Perplexity.....	48, 76, 78	Sentinel.....	78	Video Courseware.....	9
Barbarian II.....	78	Dodgy Geezers.....	33	GenLock.....	36			Pictures to Words.....	20	Sim-City.....	78		
Baron.....	76	Drakkhon.....	78			LastVision.....	37	Pipe-mania.....	9	Skirmish.....	78	Winter Olympiad '88	78
Battle tanks.....	12	DTP Guide.....	7	Hard Drivin'.....	9	Last Ninja 2.....	78	PIPP.....	12	Snapper.....	78		
Bloodstone.....	11			Headhatcha.....	19	Lord of the Rings.....	33	Plan B.....	51	Space Fighter.....	76	Zalaga.....	78
Bored of the Rings.....	33	E-Type.....	9	Holed Out.....	9	Lords of Time.....	33	Pre-emptor.....	12	Speculator.....	12	Zarch.....	112
Britain.....	29	Elite.....	34, 77	Hostages.....	78			Predator.....	78	Startrader.....	52		
		Erik the Viking.....	33	HoverBod.....	52	Maddingley Hall.....	12			Sinkers Run.....	78		
Calcsim.....	28	Euclid.....	19	Hyperbook.....	20	Man at Arms.....	9	Question of Sport.....	78	Superior Soccer.....	78		
Captain Blood.....	78	Exile.....	77			MicroLaser.....	9	Qwak.....	76	Talisman.....	12		
CD-Rom.....	36			Illusionist.....	19	Mini-packs 1 to 4.....	12						

THE MICRO USER

Art for Art's sake

In our special Graphics issue NEXT MONTH we pack in features, reviews and utilities covering all aspects of computer graphics.

Plus an overview of art packages for the Archimedes.

New
from
Acorn

THE LEARNING CURVE

THE LEARNING CURVE NEW FROM ACORN

It consists of:

An A3000 Computer
The new faster PC Emulator
First Word Plus v2 Word Processor
Genesis Information System
A Video explaining how to use the package
Information on the National Curriculum



Save Over £240

The free software bundled with this package is worth £300, and yet the entire system costs only £57.50 more than the standard A3000.

Ideal For Home & Education

This system is tailor-made for the home user with children. The A3000 and other Archimedes systems are increasingly used in schools and this all-inclusive package with the excellent Genesis software will supplement Information Technology in the National Curriculum.

Just Right for Home & Business

A Word Processor is essential in all home systems, and 1st Word Plus with its built-in spelling checker is excellent. The new PC Emulator also means that over 95% of PC software (Dbase, Lotus, Wordstar etc.) will run on the A3000 straight away.

RISC User

RISC User is the world's largest Archimedes Support Group, and publishes the leading magazine devoted exclusively to the A3000 and Archimedes. An annual subscription is £16.90 (UK) and carries a multitude of benefits, including FREE technical support and discounts.

SPECIAL OFFERS FOR RISC USER MEMBERS

0% Finance

We are able to offer RISC User members 0% finance over 9 months, for example:

	COST	DEPOSIT	BALANCE	MONTHLY PAYMENTS
Learning Curve Computer only	£803.85	£83.85	£720	£80
Learning Curve Comp + Colour Monitor	£1021.20	£121.20	£900	£100

OR: ARTISAN II, PRINTER LEAD, E-TYPE GAME, DUST COVER

Learning Curve Computers are in short supply - order yours now and we will supply on a first-come first-served basis. BE ONE OF THE FIRST IN THE COUNTRY WITH THIS SUPERB SYSTEM.

ORDER FORM

Please supply: Learning Curve Computer Only (£803.85) ☐
Learning Curve Colour System (£1021.20) ☐
Information about the Learning Curve System ☐
A RISC User Subscription (£16.90 UK) ☐
0% Finance application form for: the Computer only ☐
the Colour System ☐

I enclose a cheque for £_____ (Please add £7 for courier delivery)

Or: Please debit my Access/Visa/Connect Card No _____/_____/_____/_____/_____/_____

Card Expiry Date ____/____/____ Signature _____

Name _____ RISC User/BEEBUG Memb No: _____

Address _____

Post Code _____ M5

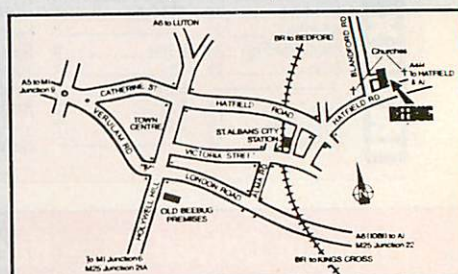
HOW TO FIND BEEBUG

BY CAR

St Albans is easily reached from A1, A5, A6, M1 and M25

BY TRAIN

We are 10 minutes walk from St Albans City Station on the King's Cross to Bedford line.
Office Hours 9am - 5pm Mon - Fri
Showroom Hours 9am - 5:30pm Mon - Sat
Showroom is open until 8pm on Thursdays.



If you would like a leaflet on the Learning Curve Computer System write to:

BEEBUG Ltd 117 Hatfield Road, St Albans, Herts AL1 4JS or Phone 0727 40303 or FAX 0727 60263

News BEAT

A3000 hint as Coleman leaves

PROMISE of an exciting new initiative on Acorn's home micro front was the parting shot of managing director Harvey Coleman as he left to return to its principal backer Olivetti.

Acorn remained tight-lipped over Mr. Coleman's comments as trade sources speculated about a possible re-launch or price cut for the A3000.

Further speculation surrounded the company's latest accounts, due out shortly after Mr. Coleman's departure. He was put in by Olivetti two years ago to sort out the financially ailing Acorn and his recall could be a signal for financial optimism.

Mr. Coleman has been promoted to become president and chief executive officer of Olivetti Systems and Networks in Canada. New managing director at Acorn is Sam Wauchope who moves up from his previous post as sales and marketing director.

Commenting on the changes, Acorn's chairman Alex Ubaldi said Mr. Coleman's promotion is recognition within the Olivetti Group of the "excellent results" achieved by Acorn under his management.

"Sam Wauchope has also been a highly significant member of the management team



OUT: Harvey Coleman



IN: Sam Wauchope

for four years and it is a reflection of our confidence both in the plans that have been laid and in Sam himself that we are now appointing him to the position of managing director", he added. "We believe that we will see some very exciting developments for Acorn as these plans come to fruition".

Making his promise to home consumers, Harvey Coleman said: "We are now doing significant business in the home and an exciting new initiative that we will shortly be announcing will enhance this particular aspect of our business".

Sam Wauchope added: "I am looking forward to seeing the plans that have been for-

mulated become reality now that Acorn's place as a quality supplier of British technology products is so widely recognised. The last 12 months have been very good for us, and I am expecting the next 12 to be equally so".

Mr. Wauchope studied economics and accountancy at Glasgow University. He joined Acorn as finance director in 1985, became sales director in 1988 and assumed additional marketing responsibilities last year.

His position as sales and marketing director will be taken over by Michael O'Riordan who until recently was group marketing director of I.T.L.

Arc trains doctors

BEFORE they are let loose on patients, many of tomorrow's doctors and dentists are learning their skills on Archimedes micros programmed to simulate the medical and clinical problems they will face when qualified.

The machines form the core of a new computer-based teaching facility in the Department of Physiological Sciences at Newcastle University's Medical and Dental Schools.

The multi-disciplinary laboratory is now equipped with an additional 16 Archimedes 410s bringing its total up to 25 systems connected by an Acorn Econet network stretching over one kilometre and used by many departments of the university.

"As a teaching resource for a medical school, the 32 bit Acorn Archimedes machines are excellent, offering both power and flexibility", said one head of the laboratory, Dr. Gary Green. "We use them to collect and process data in real time from medical monitoring equipment such as electrocardiograms, for hearing tests, speech analysis and modelling neural networks".

Staff and students use the micros to simulate and model biochemical and physiological processes, solve medical problems and reproduce clinical situations.

In one year, the teaching laboratory caters for up to 300 medical students, 70 dental students and 250 budding scientists.

Keep it safe

PUBLISHER Mandarin (01-581 9393) has produced an updated version of Datatheft, the computer security book originally written by top consultant Hugo Cornwall.

Dealing with computer security problems in industry, it costs £5.99.

DTP guide

AN updated version of The Ivanhoe Guide to Desktop Publishing has been brought out in association with the British Printing Industries Federation. It is aimed not only at those wishing to buy DTP equipment but also at members of the industry themselves.

Combining a large number of articles written by DTP experts, with product reviews and profiles it is the second edition of this useful guide, costs £5.95 and is available through most bookshops.



THE LEARNING CURVE

BEEBUG

SPRING OPEN DAY

and SHOW

Everyone is welcome at:
117 Hatfield Road, St Albans,
Herts.
 on
Sunday 22nd April 1990

An Acorn 'Qualified Dealer'

Beebug is one of the largest Acorn Dealerships in the country. You are very welcome to visit us on our Open Day and mini-exhibition. Acorn Computers themselves will be present, along with a number of other companies.

Wide Stock Range

We have a very wide stock range, from computers, printers and software, right through to spare parts, such as keyboards and power supplies. All will be available on sale.

Beebug and RISC User Magazines

We also publish the acclaimed Beebug and RISC User magazines for the BBC Micro, Master and Archimedes/A3000 computers. Back issues will be available at special prices. The editorial team will be on-hand to discuss the magazines and their contents.

Beebug DTP

Ovation, the new **DTP** system for the Archimedes will be on demonstration, along with our **scanner**, **5 1/4 disc buffer** and our new **memory upgrades** for the A3000.

Demonstrations

Our technical team will be present to demonstrate and discuss items of software and hardware that might be of interest to you.

Instant 0% Finance

Mercantile Credit will be attending so we can offer instant 0% Finance on all new Acorn Computers, enabling you to take your new computer away with you on the day.

Special Offers

Special reductions and clearance offers on a wide range of items with many available in our "£5 bargain bin".

HOW TO FIND BEEBUG

By Car - St Albans is easily reached from A1 A5 A6 M1 and M25.

By Train - We are 10 minutes walk from St Albans City Station on the King's Cross to Bedford line.

Companies represented include:

Acorn Computers

A number of Acorn staff will be on hand to demonstrate and discuss the complete range of computers including the A3000.

Colton Software

Pipedream 3, the efficient spreadsheet/ wordprocessor/ database for the Archimedes will be on demonstration together with View Professional for the BBC B and Master.

EMR Ltd

Mike Beecher will be attending to demonstrate the popular Studio 24 Plus MIDI Music package for the Archimedes as well as his range of MIDI add-ons for the BBC and Master series.

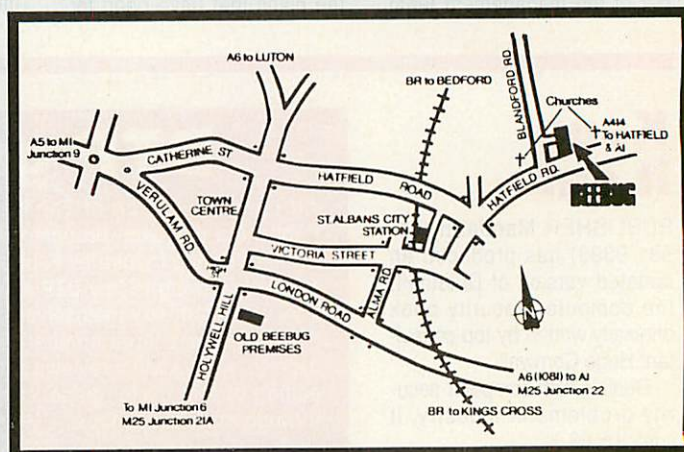
Star (UK) Ltd

See the business and professional range of Star printers in action including the new XB24-10 colour printer. The range of Star laser printers will also be on demonstration.

Fourth Dimension

Fourth Dimension will be demonstrating their excellent range of games for the BBC Micro and the Archimedes..

Events & visiting companies subject to change without notice.



Wheels for BBC Micro

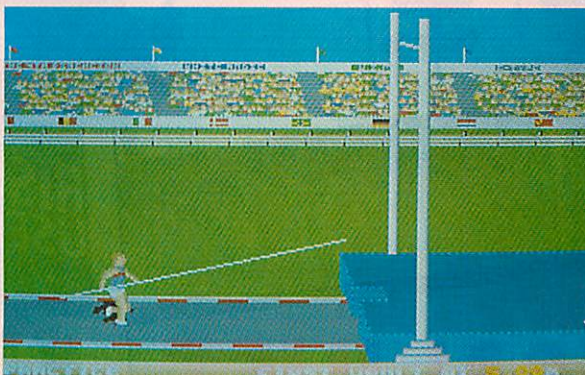
BBC Micro owners who have coveted the excellent Archimedes car racing game E-Type will soon have their own version from The 4th Dimension (0742 700661).

Author Gordon Key has been working hard to squeeze every possible feature into the conversion which will take advantage of multi-loading to increase available memory. It should be available by early May costing £9.95 for cassette, £14.95 for 5.25in disc.

BBC E-Type is just one of a number of new games from the 4th Dimension.

Apocalypse is a 3D solid graphics offering from Gordon Key who was also responsible for top selling golf simulation Holed Out. The Archimedes game features digitised sound effects and challenges players to rescue a solar system from an evil dictatorship. Price £29.95.

Sporting action is featured in the second Archimedes



The Olympics

game *The Olympics*, which includes diving, javelin throwing, swimming, pole vaulting, skeet shooting and canoeing. Several players can compete against each other. Price £19.95.

Freedom Fighter for the Archimedes is a combat action game from Arcade Soccer author Peter Gillett. Using machine guns, rocket launchers and other weaponry, the player takes on enemy troops, tanks and aircraft. Price £24.95.

Animated arcade adventure *Man At Arms* for the Archimedes features a warrior armed with a deadly sword and magic potions trying to conquer ancient castles. Price £19.95.

Due out in June for both the Archimedes and BBC Micro is 3D arcade strategy game *Inertia*, designed to test a player's thought and dexterity. Archimedes price will be £19.95. BBC cassette £9.95 and BBC 5.25in disc £12.95.

Now RTS takes on MicroLaser

DISTRIBUTION rights to the new MicroLaser from Texas Instruments have been secured by RTS Technology (01-267 7541).

The MicroLaser is a table top, entry level printer offering letter quality text and high resolution graphics at speeds of up to six pages a minute at 300 x 300 dpi.

Its modular design means that users can upgrade from the Hewlett Packard Series II emulation supported on the base model to an Adobe Postscript version containing 35 fonts by plugging in an additional cartridge.

It is supplied with a standard ram memory of 512k which can be upgraded in 1Mb increments to a maximum of 4.5Mb for sophisticated graphics tasks.

The Hewlett Packard Series II emulating version of MicroLaser costs £1,435. Adding Postscript emulation including 1.5Mb ram puts the price up to £2,495.

Musical Pursuit

ALREADY a success on other major formats, Domark's computer version of the classic board game Trivial Pursuit has now been converted to the Archimedes with more than 3,000 questions from the Genus edition.

While remaining faithful to the original board game, Trivial Pursuit on the Archimedes features new-style questions incorporating both sound and music. Ever tried naming a tune played backwards?

Complete with "TP", the animated question master, Trivial Pursuit for the Archimedes costs £29.99. On the grid for an early Summer release is the Archimedes conversion of *Hard Drivin'*, the Christmas hit from Domark/Tengen (01-780 2222).

This coin-op conversion features a speed track where the challenge lies in beating the fastest time and a stunt track where driving skills count. Price to be fixed.

Video guides

THE National Interactive Video Centre (01-387 2233) has produced two new publications designed to help users of this media.

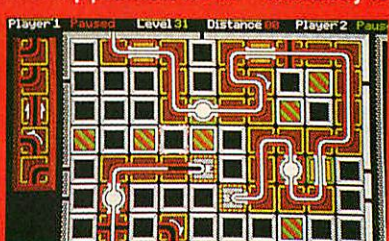
Interactive Video Yearbook 1990 combines more than 100 pages of articles and reports with a 100 page guide to the British IV market. It costs £40.

The Interactive Video Courseware Catalogue 1990 is an update of the UK's first comprehensive guide to off-the-shelf IV courseware and resource discs published by the centre in 1988. With 300 pages, it costs £25

Piping hot!

SHOWN below is a preview of *Pipe Mania* from Empire (0268 541126). This superb one or two player game tests skills of coordination and forethought as you try to build the longest route for the water to flow along. The two-player version requires enforced cooperation while you try to make the liquid flow through more of your own pipes. Next month - exclusively to

The Micro User - a playable demo of *Pipe Mania* will be available on the subscription disc. So make sure of your copy by subscribing now. See Page 129.



Cartridges for Master

JAFFA Systems (0222 887203) has announced a new Master Compact cartridge adaptor which increases the expansion capabilities of the micro by providing a cartridge socket compatible with both Master and Electron cartridges.

The printed circuit board plugs into the side expansion connector and includes a switch to select between Master or Electron cartridges. All the relevant signals are either connected or simulated to allow rom and ram boards, language and interface cartridges to be connected.

Using the adaptor, the Romplus 144 sideways rom cartridge for the Electron can now be plugged straight into the Master Compact. It holds seven roms and a 32k ram and also comes from Jaffa Systems.

The Master Compact cartridge adaptor costs £25.

RISC USER

is

MORE THAN JUST A MAGAZINE!

RISC User provides comprehensive support for everyone who is a user of the Archimedes or the new BBC Micro – the A3000.

... RISC User is the world's largest Archimedes Support Group.

When you subscribe to RISC User, you become part of a professional organisation, staffed by computer enthusiasts whose aim is to provide all the information, help and support that you may need.

When you subscribe to RISC User:

- You can benefit from our **FREE Technical Support Service**
- We have our own **Showroom** where you may browse or buy, in a friendly unpressurised atmosphere
- You can come and meet our Technical or Editorial staff **face to face** in our Showroom
- You can benefit from **BEEBUG's own quality software and hardware** products, or
- You can order from what maybe **the largest range** of Archimedes software and hardware available anywhere
- You will receive a **Retail Catalogue** with your magazine, and you can use our **Tele-sales** service and our speedy **Mail order** service by simply quoting your membership number
- You will be entitled to a **member's discount** on a wide range of products, and **special discounts** on a variety of BEEBUG's own products
- You can benefit from our **Trade-in service** should you wish to upgrade your equipment
- You can have your equipment repaired or upgraded by qualified staff in our own **Workshop**
- **And of course, you will receive ten magazines per year, totally dedicated to the Archimedes and the A3000, magazines full of:**

News on the world of Archimedes, Utilities and useful Routines, Ready to run Applications, Reviews of the latest products, Hints and Tips on programming, Advanced programming techniques, Hardware series, Tutorial articles and beginner's guides, Postbag, Technical queries and expert answers



BEEBUG LTD

117 Hatfield Road, St, Albans,
Herts AL1 4JS
Tel: 0727 40303 Fax: 0727 60263

Please send an information pack containing a sample issue for £1.50 (overseas £2.00) ☐
I would like to subscribe to RISC USER Magazine and Support Group ☐
I enclose a cheque for £ _____ (all cheques must be in pounds sterling, drawn on a UK bank) or,
Please debit my Access/Visa account No.
Card Expiry Date



Name _____

Signature _____

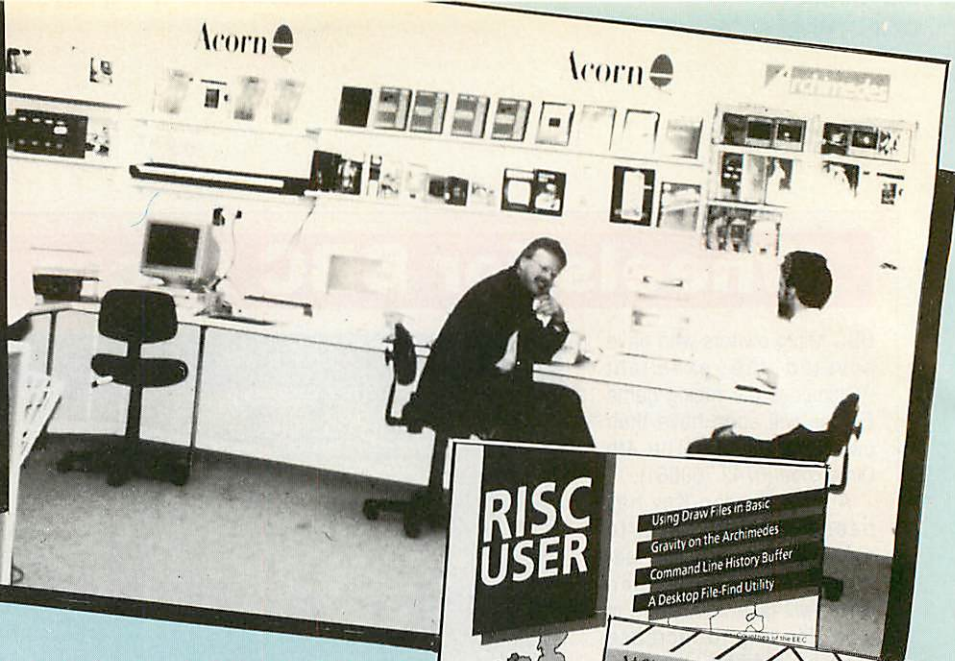
Address _____

Post Code _____

M5

RISC USER SUBSCRIPTION RATES (1 YEAR)

£16.90 UK, BFPO, CH.I
£24.00 Rest of Europe, Eire
£29.00 Middle East
£31.00 America & Africa
£34.00 Elsewhere



RISC
USER

Using Draw Files in Basic
Gravity on the Archimedes
Command Line History Buffer
A Desktop File-Find Utility

WINTER

BEEBUG

89/90

RETAIL CATALOGUE

BEEBUG SCAVENGER
HAND HELD SCANNER

ovation

BEEBUG



Court action over Email typesetting

ONE of Britain's major electronic mail typesetters Wordstream (0202 752155) has taken out a temporary High Court injunction against Typefit, a company set up by two of its former employees.

It is claimed that the ex-members of staff misappropriated Wordstream's software for use in their new business based at Ringwood.

"Typefit started mailshotting our clients saying that they could take Wordstream files. Our technology is unique and no one can take Wordstream files except us", said company head David Furlonger. "When

we realised they were mail-shotting our user base, we went to court and invoked the provisions of the 1988 Copyright Act. This means that any company which even offers a translation service of the Wordstream technology is infringing software copyright by the very possession of the proprietary software codes.

"We have grown to become a national Email typesetter after a huge investment in software research and development and we are not about to let anybody have our technology".

The day before *The Micro*

User went to press, Mr.Furlonger had returned for a second hearing.

"Typefit gave into the court a disc purporting to contain Wordstream data, despite their denials at the previous hearing", he added.

"I am being sent the disc and will be checking exactly what is on it".

Wordstream has a user base of 3,000 customers who send their computer-created typesetting text by Email to be processed at its Poole headquarters.

Typefit could not be contacted at its Ringwood number.

New RPG goes online

HERALDING the birth of a whole new concept for multi-users/role-playing games, Bloodstone is now up and running exclusively on electronic communications service MicroLink (0527 67585).

Already drawing a large following, it has notched up a number of firsts in the world of multi-roleplaying adventures.

Bloodstone is the first 24 hour, no re-set game of its kind and the first to offer total freedom of movement in three dimensions.

Up to 256 players can take part combining loving, killing, buying and selling in an environment which can be constantly changed.

Realistic combat routines rise above the fighting in other games not relying solely on strength. Dexterity, help from other characters, weapon and armour strength are taken into account to give battle a whole new dimension.

Other new features include buying and selling, a peer facility allowing players to see great distances, a think command so players can communicate telepathically, use of spells, the ability to teleport yourself to other levels and polymorph, allowing the player to change from a human into an insect, monster or any other life form.

"It is an escapist's paradise", said project coordinator for Bloodstone Ltd, Tony Cox. "If you wanted to you could practically live your life within the game, escaping from the real world, meeting other people and taking on a completely new character".

Devised by author Rob Muir, Bloodstone covers 14 levels with players aiming to rise to the rank of Lord.

There is no surcharge for MicroLink subscribers who play during the day, but a charge of 3p a minute is levied after 6pm.

UNEMPLOYED youngsters, underprivileged children and the handicapped will benefit from a fund raising scheme jointly sponsored by publishers of *The Micro User*, Database Publications and top Acorn dealer Watford Electronics.

The two companies are to collaborate on yet another open day at Watford Electronics and charity cash raised at the event will go to provide vital micro equipment for the Get Set Community Centre which caters for the needy youngsters of Watford.

Following the success of the Mid Winter Open Day in January, editorial staff of *The Micro User* will travel to Watford on Sunday, April 29 for a follow-up Spring Open Day. They will distribute back copies of the magazine and copy cover disc programs on to visitors' own discs in return for donations to the cause.

Head of Watford Electronics Nazir Jessa will then double the money raised with the total being spent on computer equipment for the centre.

"This offer could not have come at a better time", said acting manager of the centre Ervin Lewis. "We have not been open very long and have had to spend a lot of money on furnishing our premises. "We have a des-



Technical advice was a key feature of the packed open day held at Watford Electronics recently

Open day will aid youngsters

perate need of a computer but are forced to rent one on an occasional basis. It poses a great problem for us.

"If enough money is raised from this kind offer, it will be a very welcome bit of new technology which will help us start the younger children using micros and will help the older ones in their search for jobs. We could also use it for administration leaving us more time to spend with the young people".

Another new feature of the Spring Open Day will be a special section set aside for giving technical advice to educationalists.

Former teacher and education guru to Database

Publications Peter Davidson will join with staff of Watford Electronics to meet teachers and LEA representatives, discuss their problems and come up with technical solutions.

The open day will follow the format of its predecessor which attracted more than 1,300 visitors.

Staff of Acorn Computers and top software houses will be on hand to give advice on the latest software, hardware, add-ons and peripherals available and there will also be a chance to pick up bargains.

Watford Electronics (0923 37774) is at Jessa House, 250 Lower High Street, Watford and the event will be open from 10am to 4pm.

Arc springs surprises

THE first All-Archie show held in London by Cambridge International Software was voted a resounding success by attracting 1,500 visitors who travelled from as far afield as Manchester and Glasgow.

"One man had driven with his family 250 miles especially for the fair", said Mike Fowler of CIS. "He left happily enthusing that the journey had been well worthwhile".

Held at the Central Tutorial College near Russell Square, the Archimedes Spring Fair gave a full picture of the software and hardware which is available and attracted many exhibitors not normally seen at the larger shows.

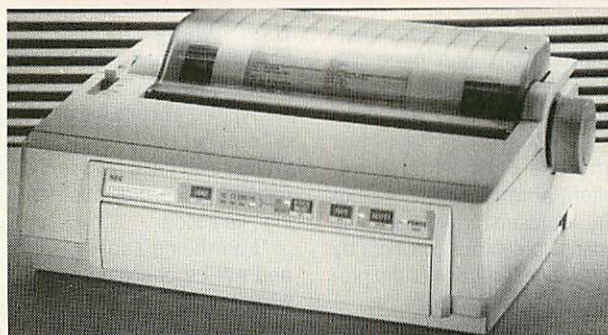
Many teachers turned up to see what is new for Archimedes machines and were not disappointed.

Two new administration packages were on show: Pre-emptor – by Pre-emptor (0752 601164) – is an intelligent authoring system that records marks and then generates worksheets tailored to the needs of the child. It is available for both BBC Micro and Archimedes.

PIPP – Primary Integrated Project Planner – is a cross-curricular database for primary teachers from CIS.

Customers were able to discuss problems and new products with the 14 exhibitors in a friendly atmosphere. Much interest was shown in Ampsounds'

Pin sharp printing



NEC Computer Peripherals (01-993 8111) has produced a replacement for its Pinwriter P2200.

Called the Pinwriter P2 Plus, the new 24-pin dot matrix model costs less but offers enhanced performance and specifications.

Printing at a creditable 192cps in draft and 64cps letter quality, the P2 Plus features a new intermediate speed font, Fast Focus, which gives NLQ at draft speeds. It comes with an increased number of fonts plus improved paper handling facilities including an auto-load feature. Price, £349.

NEC is currently expanding its direct dealer network for printer, monitor and CD-ROM products. Formerly the company had 50 direct dealers but this is being expanded to 250.

Inspiration, and Computer Concepts had its DTP package Impression hooked up to a high quality 2000 dots per inch PostScript imagesetter by Itek.

Games players were catered for with the first showing of Fireball II, the latest offering from CIS – reviewed in this issue – plus their Minipacks 1 to 4. Minerva were showing off three new games – Maddingly Hall, Talisman and Battletanks.

Also showing from ARXE Systems (01-534 1198 7-8pm only) was the unique Speculator, a Sinclair Spectrum emulator for the Archimedes. Onkar Jagpal of

ARXE said: "It may seem silly, but it shows what the Archimedes can do and we're hoping to license games to sell with it. We have tested over 200 and they run faster and better on the 32 bit machine. It also provides an upgrade path from Spectrum to Archimedes.

"More importantly we have a CP/M emulation almost completed which will run all the software from the ageing Amstrad PCW which gives another practical route to the Archimedes for non-BBC Micro users."

So successful was the event that a follow-up Summer Fair is to be held by CIS on June 16 and 17.

Micros get message across

TO get their messages across, an increasing number of advertisers opt for the display screens which can be seen in shops, bus stations, arcades and exhibitions throughout the country.

Often the images flashed on multiple monitors leave a lot to be desired, but a new distribution amplifier now promises to put BBC Micros and Archimedes machines at the heart of clear-cut public information systems.

Traditional video images can be degraded when computer graphics are distributed down long lengths of cable.

To solve this problem, Interactive Media (0902 25444) has substituted the RGB (red, green, blue) method so that high resolution screens can retain their clarity and colour detail.

Its new Multidat RGB distribution amplifier allows up to eight monitors to be connected to a single micro, opening up the possibilities for a whole new range of applications including the education field.

Multidat has an output of 0.7v or 1.0v peak to peak into 75 ohms.

The 0.7v output is especially suitable for monitors with a scart input while the 1.0v output covers other applications.

The basic Multidat has four outputs and costs £175 plus £5 carriage while the Multidat Plus offers eight outputs for £300 plus £6 carriage.

Scart output leads cost £5 each.

AS well as introducing more colour pages *The Micro User* is going green. Future issues will be printed on paper manufactured in a way which is kinder to the environment.

Publisher Database Publications is to use paper made in Scandinavia under the tight ecology rules imposed on mills there.

To reduce tree felling, it comes from the waste off-cuts of other wood processes such as furn-

More colour – especially green

iture-making, also employing a new chemithermo-mechanical process which makes more economical use of wood than older methods.

Coating of the paper further improves the environment by using slurry from the Cornish china clay industry.

Strict water purification plays an important part in its manufacture and the potentially damaging effects of chlorine bleaching have

been eliminated.

The paper comes from wood grown in the forests of Finland and Sweden where meticulous records are kept and trees are grown to maturity faster than they are felled.

"When we decided to move over to paper made by more ecologically sound methods, our problem was to find a quality product which would support Database's

improved production technology", said the company's commercial director, David Hirst. "We believe we have now found the right answer."

"This paper cuts down the use of natural resources, eliminates potentially harmful processes, but will allow us to retain the high standards of print and colour reproduction which readers of *The Micro User* have come to expect".

MONEY BACK GUARANTEE!

so you have absolutely nothing to lose...

...Join BEEBUG now

and if you are not completely satisfied you will get a full refund within 14 days of receipt of your first magazine!

BEEBUG

**is Britain's LARGEST
BBC User Group**

***As a subscriber to BEEBUG
you will benefit from:***

- Free Technical Support Service
- Showroom where you can try out the latest software and hardware
- Speedy Mail-order service
- Discounts on a wide range of products
- Special discounts on a variety of BEEBUG's own products
- Workshop repairs by qualified staff
- Trade-in service should you wish to upgrade your equipment

BEEBUG

**is the *only* magazine dedicated
entirely to the BBC Model B and
Master series**

***BEEBUG offers 10 magazines
a year packed with:***

- Ready to run applications
- Utilities and handy routines
- Tutorial articles and beginner's series
- Workshop for the more advanced programmers
- Games and games reviews
- News from the BBC world
- Reviews of the latest products
- Hints and tips on programming
- Postbag for your letters and answers to your questions

***All magazine programs plus some bonus items are also
available on individual discs or by subscription***

BEEBUG SUBSCRIPTION RATES (1 YEAR)

£16.90 UK, BFPO, CH.I
£24.00 Rest of Europe, Eire
£29.00 Middle East
£31.00 America & Africa
£34.00 Elsewhere

I would like to subscribe to BEEBUG Magazine and Support Group ☐

I enclose a cheque for £_____ (all cheques must be in pounds sterling, drawn on a UK bank) or,

Please debit my Access/Visa account No.

Card Expiry Date Signature _____

Name _____

Address _____

Post Code _____ M5

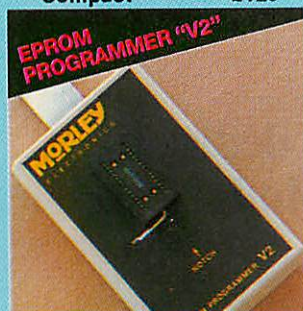


TURN YOUR BBC INTO A TELETEXT RECEIVER

- ☐ State-of-the-art unit.
- ☐ ATS (Advanced Teletext Software) supplied on ROM.
- ☐ Easily programmed to allow interactive data-processing.
- ☐ Free use of automatically updated massive database.
- ☐ Digital tuning – no manual controls
- ☐ Comprehensive user guide.
- ☐ Allows standard Teletext pages to be saved and printed.
- ☐ World's biggest selling adapter.

BBC/Master £104
Compact £120

RML Nimbus £104.20
Optional PSU £9.50



- ☐ Attractive state-of-the-art unit.
- ☐ Totally software controlled. Eprom creator utility also available.
- ☐ Programmes 27128/2764/27256 Eproms: 12 and 21 volt.
- ☐ Includes full ROM management software with numerous features. £30
- ☐ Eprom utility disc. Put all your favourite routines into sideways ROM, both basic and machine code. £5.20



- ☐ Fast to install and operate.
- ☐ User-friendly menu driven software.
- ☐ Built-in features include:
Autosaves computer's entire memory.
Freeze program at any point.
Screen dump (any mode) to printer or disc.
Allows most protected software to be backed up including disc to tape and tape to disc.
Extensive range of useful FX calls. £30

SOFTWARE ... SOFTWARE ... SOFTWARE ...

MB SOFTWARE

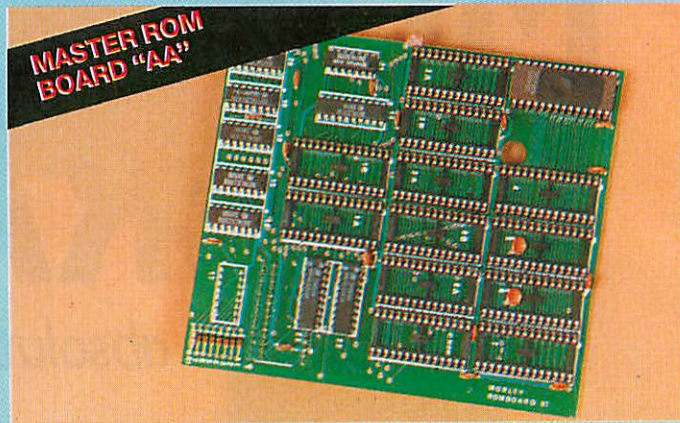
- ☐ DESIGN 7+. Commonly accepted as the brand leader in Teletext screen programs £8.60
- ☐ DESFAX. Design and run your own Teletext information/display system £17.40
- ☐ MASTERFAX. Enhanced Desfax program on the Master or compact £26.00
- ☐ MASTERCOPY. A must for any Master or Compact owner. Allows simple, intelligent file transfer between ADFS and DFS systems. You'll wonder how you managed without it £11.20

COMPUTER CONCEPTS

- ☐ Spellmaster £51.30
- ☐ Mega 3 £85.00
- ☐ Interword £49.00
- ☐ Interbase £60.00
- ☐ Intersheet £49.00

CONSUMABLES

- ☐ 27128 Blank Eproms £4.20
- ☐ 5.25" Floppy Discs x 10 £5.00
- ☐ 3.5" Floppy Discs x 10 £10.00



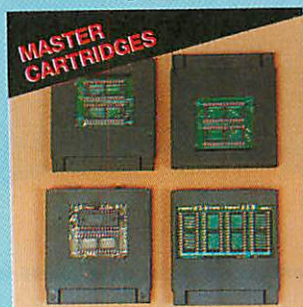
THE ULTIMATE ADD-ON FOR ALL SERIOUS MASTER USERS

- ☐ No more need to switch your computer off to insert a cartridge containing a required ROM.
- ☐ With 2 cartridges and a ROM board, a staggering 32 ROM images installed and accessible at any time.
- ☐ Allows up to an additional 8x16k and 4x32k ROMs installed inside your computer still leaving your cartridge slots free.
- ☐ Master control ROM which includes a clever file transfer program allowing files to be transferred between DFS and ADFS formats or vice versa. £40



BBC/MASTER DISC DRIVES

- ☐ All drives are 40/80 switchable with TEAC mechanisms
single £89 dual £169 power supply add £20



- ☐ The full range of Care Master Cartridges:
Dual 2 x 16k £9
Quad 4 x 16k £14
Duet 2 x 32k £12
32k NON VOLATILE RAM Cartridge (ideal for Spellmaster Dictionary) £33

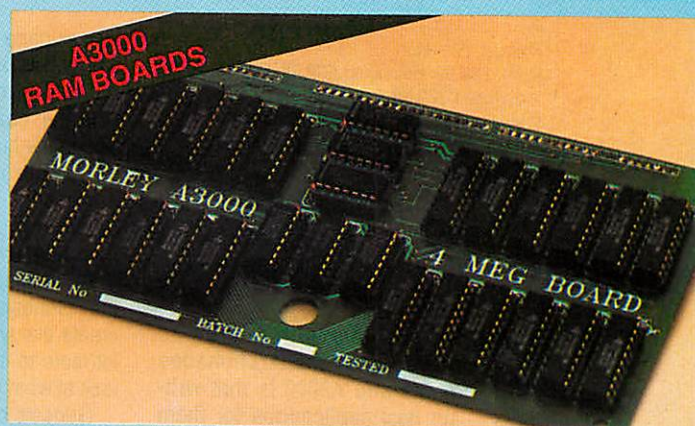


- ☐ Completely compatible with BBCs, B+s and Masters fitted with ADFS.
- ☐ High output switched mode power supply.
- ☐ Free utility disc incl: Format, Verify, Archive and Park.
- ☐ Whisper quiet internal fan.
20meg £370 30meg £420 40meg £500

TO ORDER ...

CARRIAGE: £1 on all orders. £3 on larger items (adapters). Computers + Monitors £10.
VAT: UK customers please add 15% to cost incl. carriage.
BY POST: Enclose cheque made payable

to MORLEY ELECTRONICS LTD.
BY PHONE: By quoting your ACCESS or VISA card number.
Goods usually despatched by return.
Government and Education orders welcome.



THE WORLDS MOST POWERFUL MICRO

A3000	£649	410/1	£1199
310	£899	420/1	£1699
310M	£959	440/1	£2499

SPECIAL OFFER UNTIL APRIL 1990
BUY AN A3000 OR ACORNS DESKTOP
PUBLISHER AND SAVE 30% OFF THE
COST OF A MORLEY RAM BOARD



THE A3000 OPTION ACORN FORGOT

- ☐ Easy to install simply plug in and run
- ☐ High quality Japanese Drive
- ☐ Includes full fitting kit and instructions
- Dual Drive Kit £125**

LEADS & MISC. HARDWARE ETC.

Arch Monitor Leads:		Printer Stand 80 col	£15
SCART	£8	Printer Stand 135 col	£19
9 Way 'D' (Msync)	£8	Tilt & Swivel Monitor	
Arch Serial Lead	£8	Stand	£11
Arch Printer Lead	£6	Monitor Stand/plinth	
BBC Printer Lead	£6	BBC	£13
2 to 1 Printer switch	£20	Master	£14
3 to 1 Printer switch	£30	BBC/Master SCSI	
4 to 1 Printer switch	£36	Hard Disc Interface	£50
64k Printer Buffer	£115	Eprom Eraser	£18
256k Printer buffer	£199	Eraser with timer	£23

(NOTE switching units & print buffers come with printer lead)

The Morley TELETXT ADAPTER is now available for the Archimedes. The specification including screen dumps etc., is the same as the BBC version but connection is via a Podule socket. **£125**

EXISTING USERS OF OUR BBC TELETXT ADAPTER
 WE CAN UPGRADE THE UNIT
 FOR THE ARCHIMEDES FOR
£35

RING FOR DETAILS

We are now an Acorn dealer and service centre. If you would like to have a look at the A3000 or any other Acorn/Morley products please feel free to call in and discuss your requirements with our staff.

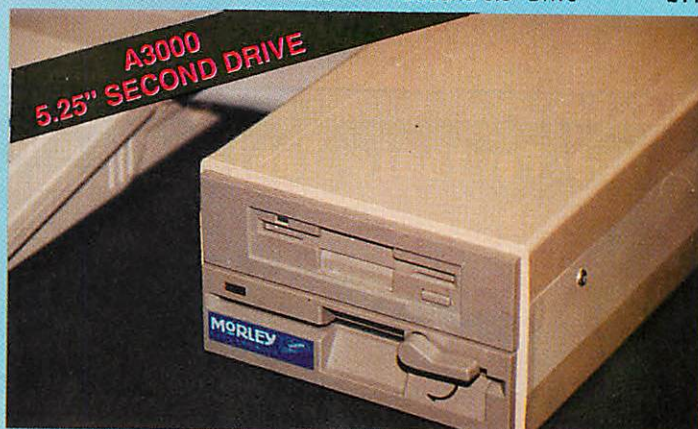
COMING SOON
ST500 Hard Disk
Interface Podule
Ring for details

THE BEST VALUE MEMORY UPGRADES

- ☐ Easy to install simply plug in and run
 - ☐ Fully compatible with all Acorn software including desktop publisher
 - ☐ A must for all serious Archimedes owners
 - ☐ Make full use of Acorn's powerful Desk-Top Publishing package
 - ☐ 1 Meg upgrade gives you a total of 2 Meg on-board
 - ☐ 1 Meg board upgradeable to 3 Meg
- | | |
|------------------|------|
| 1 Meg Upgrade | £129 |
| 3 Meg Upgrade | £349 |
| 1 Meg to 3 Meg | £229 |
| 305 1/2 Meg | £89 |
| 400 Series 1 Meg | £99 |
| 400 Series 3 Meg | £299 |

ARCHIMEDES PERIPHERALS

Colour Monitor	£220	A3000	
Mono Monitor	£73	Monitor Stand	£29
SOFTWARE		User Port & Midi Podule	£49
Pipedream3	£147	Serial Upgrade	£19
RiscOs Companion	£49	Econet Upgrade	£49
1st Word+	£69	300/400 SERIES	
Autodesk CAD	£79	Acorn Rom Podule	£56
Acorn PC Emulator	£99	2 Slot Backplane	£37
Acorn Desktop Pub.	£149	4 Slot Backplane	£59
Clares ProArtisan	£145	I/O Podule	£80
Clares Artisan	£29	Midi Podule	£65
Clares Toolkit	£34	Second 3.5" Drive	£115
Clares Toolkit+	£43		



Kit includes: 5.25" Teac 80 track drive; case; power supply; interface and leads **£169**

A3000 SCSI PODULE	£149
310/400 SCSI PODULE	£149

EXTERNAL WINCHESTERS

Including SCSI Podule, cased drive, cable and leads	
20 meg	£465
30 meg	£495
40 meg	£575
60-200 meg POA	

★★★ NEW PRODUCT ★★★

A3000 BBC Analogue + User Port Podule

Full specification BBC Analogue to digital and user port. The advanced port is accessible using ADVAL from BASICS with all BBC OS byte call supported.

Product: Genesis
Price: £99.99; Education £69.95; Site license £279.80.
Supplier: Software Solutions, Broadway House, 149-151 St Neots Rd., Hardwick, Cambridge CB3 7QJ
Tel: 0954 211760
Requirements: 1Mb Archimedes series or A3000

THE problem with micros as powerful as the Archimedes series and A3000 is that writing new applications for them is a considerable task for the inexperienced. So any program that can make this process easier must be a real boon.

Genesis claims to be such an application. To quote its newsletter it "provides a framework for creating networks of linked pages of information". Anyone familiar with the Ceefax and Oracle teletext systems understands the idea of linked pages – on

a news page you will find references to further details on a different one. The system is a network of cross-referenced data.

In this case you, as the user, have to type in the number of the page you want to go to. But imagine the same on your Archimedes screen and, instead of being required to type a number, it just says *Click here for further details*.

At its simplest level that is the service that Genesis provides – allowing you to create this type of data network. There's a lot more to it than that but first let's take a look at what you get in the package.

Genesis comes on two discs in an A5 box with a 96 page manual plus various flyers and promotional material. Apart from the obvious step of backing up your discs Genesis definitely isn't a *load and go* application if you are using a one or two floppy drive machine. Chapter two is devoted to installation and is certainly worth reading even if you have a hard disc as it explains each of the applications.

Using the system on a hard disc is very

simple. All you need do is create a Genesis directory within your main Applications one and copy everything on both discs into it.

The manual seems clear enough and it's easy to follow through the example given in chapter three of how to create a new application. However, when trying to look up specific points the index was less than useful.

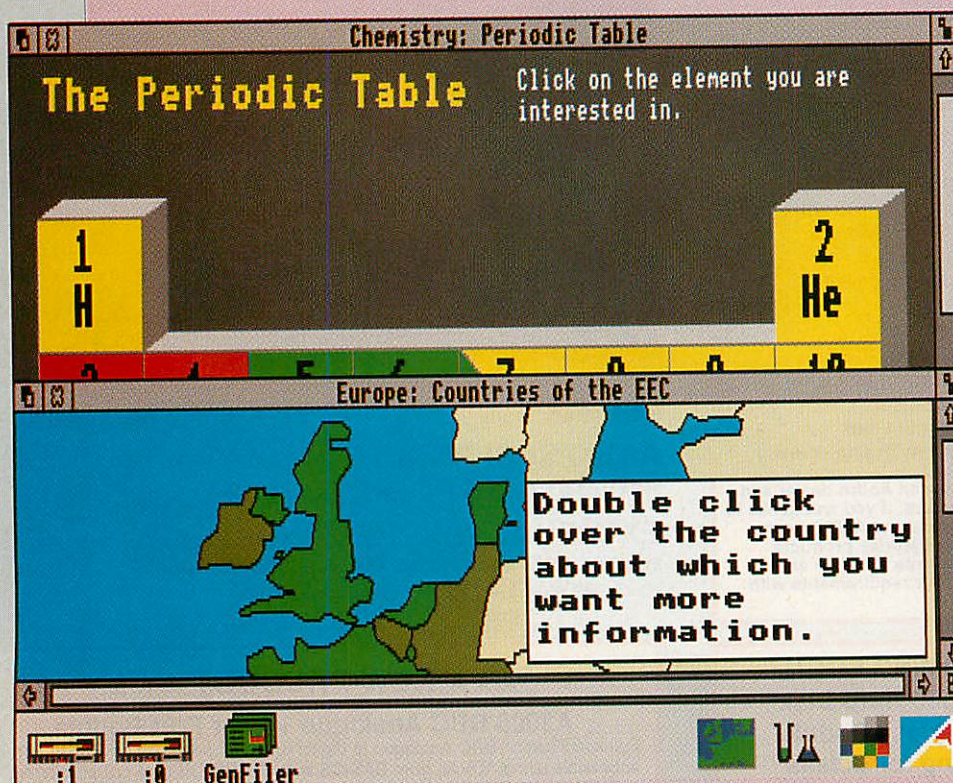
On the main Genesis disc are four applications: !Genesis, !Browser, !GenFiler and !GenLib. The first is the actual creation program, the second allows you to browse through an existing application but not change its structure.

GenFiler is a utility that handles the resources within an application – of which more later – and GenLib contains pre-created items that you can use and where you can put the common items you've created.

Unfortunately all the icons for these are the same apart from their colour which I found quite irritating – as a regular

*Geoff Brown investigates
 a versatile application
 generation package*

In the beginning...



Two sample applications

DeskTop user I look at the pictures, not the words – to identify what I want.

On the second disc are several example applications created using Genesis. You have to have either the Browser or Genesis itself loaded to run these.

When the first, called *About Genesis*, is run it brings up a simple page from which you can access others which illustrate various points about the capabilities of the software.

These include the ability to show text which may be the system font – scaled to any size – or an anti-aliased one, Draw files, Sprites – which may be digitised images, Euclid 3D pictures or Mogul animations.

The !Europe application shows the flag of a country, various statistics and, in some cases, will play the national anthem. There's a Table of Elements which from the main – home – window lets you select a specific chemical element and provides some information about it.

Finally there's a phone directory which illustrates the simple search facility that Genesis possesses, allowing you to use it as a database.

The process of creating a new application is not really one which can be done off

the top of your head – you have to sit down and plan it out. For instance, is your use a simple linear-style one where the finished product is a database or instructional process with no branches?

Or perhaps a diagnostic system where the user is going to need to choose different paths based on the answer to certain questions – perhaps for finding a fault in a car?

Alternatively you may have a large database – perhaps to do with health – where there are many initial choices leading to a set sequence which may have branches off to other related areas. Good planning is essential.

Once you've decided on your network plan you should create your resources – sprite pictures, draw files, plan the words you want to use. If music is needed the files will need to be created and so on.

It is possible to produce the network skeleton first, of course, and then fit the resources into it afterwards. In a classroom environment different groups can be working to collect various pieces of information that needs to be included with the teacher merely providing the guidance. This sort of activity is perfect for a school with limited computer resources.

To produce a new application you must load iGenesis and then using the icon bar menu select New and save the application icon to a directory viewer. The basic data is saved and the Home window is displayed.

This is the entry point and always appears first. Any text, picture or whatever has to go in a frame so clearly your next step is to create one. Simply click in the window and drag – a box will appear and open up as you move the pointer. This frame can be re-positioned and re-sized at will.

You can place text into the frame by clicking in it, at which point a cursor appears and you can just start typing. From the frame menu you can change the font and size. Any text you type in becomes a separate resource file within your new application.

It is possible to create a different type of frame where the text is actually saved with the definition rather than being a reference to a file. You can drag sprite and draw files on to a frame in order to load them – iGenLib contains many of these.

Pages

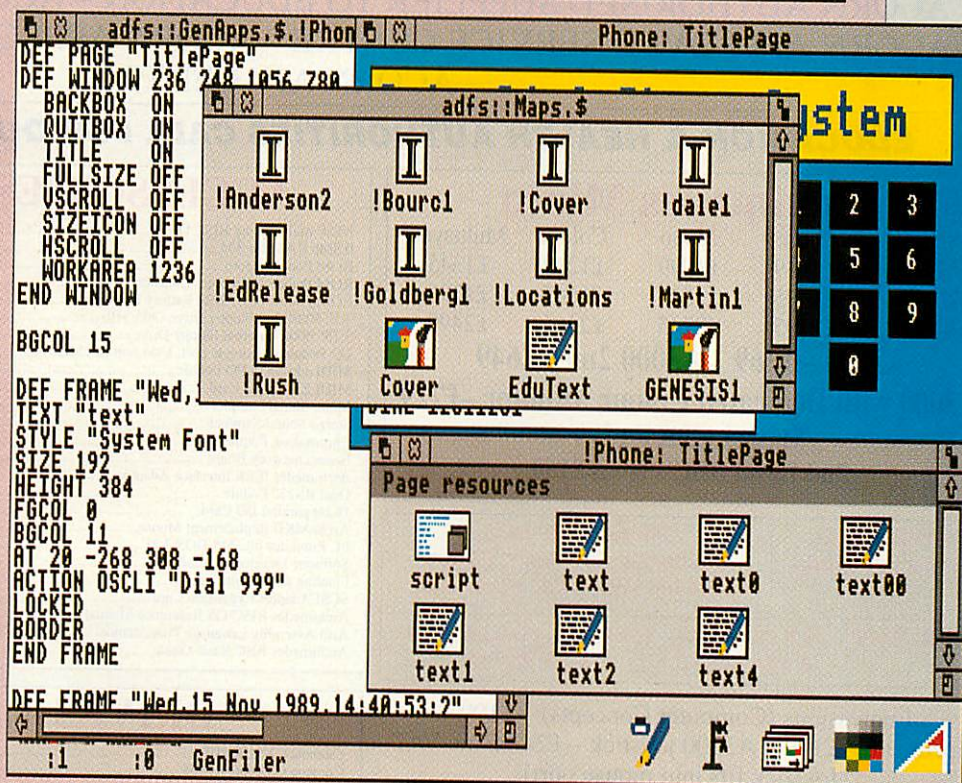
You can create a new page either from the icon bar menu or by copying the current page from its menu. This latter method forces any resource files for the original page to become shared – hence saving valuable disc space. Also if the contents of the resource is altered it changes on every page that it appears.

What makes a Genesis page special is the fact that a frame can be made to do things when clicked. The most basic operation is forcing a new page to appear. To do this you must create a link – this is very

Comparison with BookBinder

In the April issue we reviewed BookBinder by Musbury Consultants which works on a similar principle but without script files or the ability to process different file types. As BookBinder is much simpler it has less options and hence the learning curve is much reduced. However the price difference is quite significant – £55 compared with £99.99.

On this month's subscription disc there is a BookBinder book and next month there will be a Genesis application.



Script file and resources for the phone book

simple and only requires dragging the link icon from the frame menu to the new page.

Pages can also have backdrops which can be sprites or draw files. These don't do anything apart from look pretty although they could be used to provide the basic page layout. One interesting feature of the whole Genesis system is that each page and frame is actually held as a Script file which is in fact just Ascii text.

This means you could load it into !Edit and alter it, or even just start from scratch.

Many other file actions can be incorporated into a frame, including running Basic programs, loading and executing other applications and so on.

It's even possible to link the frame from one Genesis application to the page of another. It's this kind of versatility that makes Genesis the excellent program that it most certainly is.

However, Genesis is not completely without fault: The Mogul animations run very slowly.

I thought initially that this was because I was using Mode 12 and Mogul itself runs better in Mode 15 – but after changing mode it was even slower.

Given the sophistication of the script files I was disappointed in the lack of variable storage, calculations and conditionals such as IF...THEN. While I realise this

would increase the size and, possibly, slow the operation of the program, its lack makes the creation of really sophisticated applications impossible.

Interestingly the appearance of Genesis coincides with Acorn's release, in conjunction with NeXT Technology, of the CD-Rom player and its filing system – the CDFS. A CD-Rom is ideal for storing images in the form of sprites or draw files, or music and any other type of file though in a non-modifiable format. This means that a fixed application generator such as Genesis fits into the CD-Rom structure perfectly as that is exactly the type of resource storage it needs.

Genesis is an impressive product that is certainly here to stay.

Summing up

A piece of software specifically written for a certain task will always be superior to a Genesis application doing the same thing. But this ignores the fact that Genesis is very easy to use and even the uninitiated will soon get the hang of it – and you don't need to be a programmer. Genesis conforms to Acorn's user-interface standards and is a proper multi-tasking application.

Genesis may be a jack-of-all-trades but it can master many.

Diamond Computer Systems Ltd.

Southampton (0703) 232777
London 01-597 8851
Midlands (0926) 312155
Bristol (0272) 693545
Eire 061 376744
Established over 20 years

Fax 232676
Fax 590 8959
Fax 883432
Fax 693223
Fax 376740

ACCESS AND VISA WELCOME

ACORN AUTHORISED SUPPLIER TO EDUCATION – ACORN PREMIER DEALER
ACORN APPROVED SERVICE CENTRE – ACORN APPROVED ECONET CENTRE
ACORN AIV CENTRE

EDUCATION & HEALTH AUTHORITIES CALL FOR QUANTITY DISCOUNTS

Archimedes Micro

System	Basic	Mono	Colour	Multisync
401	£1049	£1099	£1219	£1345
420/1	£1495	£1545	£1665	£1790
440/1	£2195	£2245	£2365	£2490

A3000 – £569 A3000 2meg £649

A3000 with Dedicated Colour Monitor – £729

Master 128K – £379

2nd Hand BBC's from £150

Philips 8833
Colour Monitor
£199

Philips NMS 1432
Quality G-pin printer, 120cps
£125 inc VAT While stocks last

Switch Boxes2 way £12.95
4 way £14.95

10m Printer-Archimedes Lead
£29.95 inc VAT

Impressions (Computer Concepts) – £109
Pipedream – £109 A3000 joystick – £24.95 inc VAT
(Joystick fits into mouse port)

PRINTERS

CITIZEN Swift-24 Colour.....	£295
PHILIPS NMS 1432	£99
STAR LC-10 MARK II.....	£149
STAR LC-10.....	£119
STAR LC-10 COLOUR.....	£159
STAR LC24-10	£199
STAR XB24-10 COLOUR	£439
PANASONIC KX-P1124.....	£209
HP DESKJET.....	£499
HP PAINTJET.....	£649
CITIZEN 120D	£105
EPSON LX-400	£149
EPSON LX-850	£179
EPSON LQ-500	£249
EPSON LQ-850	£409
EPSON LQ-1050	£549
EPSON LQ-2550+.....	£895
EPSON SQ-2500.....	£909
OKIMATE 20.....	£159

LASERS

PHILIPS LASER with on-site maintenance	£899
CANON LASER MARK II	£1495
PANASONIC KX-P4450	£1395
HP LASERJET II.....	£899
NEC POSTSCRIPT	£2589

Call for details of our Software Club! For just £20 a year you can get 30% off software prices, along with special discounts on hardware!

ACCESSORIES

NEW multitasking RISC OS	£29
0.5Mb RAM for 305	£110
ROM Podule Acorn	£45
ROM Podule (Computer Concepts)	£45
ROM Podule (CC) With Battery Backup	£59
3.5" 800K 2nd Floppy Drive (305/310).....	£118
5.25" 800K external Floppy Drive.....	£105
I/O Podule (Analogue port, User port & 1MHz bus).....	£80
MIDI add-on to I/O Podule.....	£29
MIDI Expansion Card.....	£65
Mono Sound Sampler	£129
Stereo Sound Sampler	£166
Chromalock Podule.....	£280
Econet network Board.....	£49
Archimedes IEEE Interface Adaptor.....	£269
Dual RS232 Podule.....	£195
16 bit parallel I/O Card	£195
Archi MKII Replacement Mouse.....	£39
PC Emulator inc. MS DOS 3.21	£62
Software Developers Toolbox.....	£175
Floating point Unit.....	£549
SCSI Adaptor Expansion Card	£275
Archimedes RISC-OS Reference Manual	£79
Arm Assembly Language Prog. manual	£15
Archimedes BBC Basic Guide.....	£20

DRIVES

Cumana CXS100 40T	£74
Cumana CSX400 40/80T.....	£89
Cumana CDX800/S 40/80T.....	£175
Cumana CD800/S 40/80T.....	£195
MD400A without PSU 40/80T.....	£78
MD400B with PSU 40/80T	£88
MD802C without PSU 40/80T	£156
MD802E with PSU 40/80T.....	£169
MD802D Plynth 40/80T	£190

RAM UPGRADES

A3000 1Mb	£99
A3000 4Mb	£449
A305/310 2Mb	£325
A305/310 4Mb.....	£549
A410/1 Upgrade to 2Mb	£149
A410/1 Upgrade to 4Mb	£399

**NEW
PHILIPS XT 266, 386
with faster clock speed
and new software!
Call for details!**

Full range of PCs available. Call for details

HOW TO ORDER

Call your local shop with your Access or Visa card or send a cheque made out to the appropriate branch

Diamond Computer Systems Ltd, 114 Lodge Road, Southampton SO2 2QS
LAN Computers, 10-45 High Road, Chadwell Heath, Romford
LHC Microsales, 121 Regents Street, Leamington Spa, Warwickshire
Diamond Computer Systems Ltd, 227 Filton Avenue, Bristol
Diamond Computer Systems Ltd, Ballina, Killaloe, Co-Clare, S. Ireland

MONITORS

Vision Colour	£159
Microvitec 1431	£175
Microvitec 1431AP.....	£199
Microvitec 1451	£199
Microvitec 1451AP.....	£249
Microvitec 1441	£355
Acorn Philips	£199
Microvitec 2030CS	£379
Philips 8833 (U.K.)	£199
Microvitec 2040CS	£675
Taxan Supervision 625	£269
Taxan 770+.....	£419
Viking II	£849
CM 1686 16".....	£1249

Special offer while stocks last

DIAMOND MULTISYNC II
Autoscan 14". Ideal for utilising the high res modes on the Archimedes.
Our price includes tilt & swivel base
£299

DISKS

3.5" Qty 25	£13
3.5" Qty 50	£25
3.5" Qty 100	£48
3" Box 10	£17
3" Box 30	£48
3" Box 50	£80
5.25" box 10	£8
5 x 5.25" box 10	£30
80 capacity disk box.....	£4.95

PRINTER RIBBONS

LX800 & FX800	£2.50
LC10	£4.00
Citizen 120D	£4.00
Taxan/Canon	£3.20
Juki 6100	£1.30
Panasonic KX-P450 Toner.....	£26.95

We are also Europe's largest chain of AMIGA specialists! Full range of computers and accessories available from all stores!

ALL PRICES EXCLUDE VAT. COURIER £5. NEXT DAY SERVICE £10
E&OE. All prices correct at time of going to press and are subject to change without notice

Successful loans

THE loan scheme launched by Sherston Software (0666 840433) in January has proved a huge success, with well over 200 advisory teachers registered under it.

Using the service, Advisory teachers can borrow up to 10 Sherston titles for a term with the option to buy them at 50 per cent discount for demonstration purposes. It is also possible to borrow 10 copies of up to five titles for 21 days to allow them to be used on courses.

The most recent package that can be viewed as part of the scheme is The Concept Kids, a primary introduction software package designed specifically for the Concept Keyboard. It was commissioned by Star Microterminals and is claimed to fulfill the original brief for an engrossing and simulating series of problem solving exercises which demonstrate the keyboard to the full.

The Concept keyboard is now available from AB Micro Express (0222 733485) with either the original introductory software or the new Sherston replacement. The A3 size costs £145.50 and the A4 size is £119.50. The Concept Kids is available alone from Sherston. Price £22.

Mini BETT shows

FOR people who couldn't get to the BETT show or who couldn't face the crush of BETT, LTS (0386 792617) organised a series of three local shows sponsored by the DTI. At Bristol, Oldham and Birmingham, the shows were held during February and March.

With over 40 exhibitors at each event and a predominance of Acorn machines they were an ideal chance to view the latest software for 8 and 32 bit BBC Micros.

"I suggested the shows to the DTI, who didn't need much persuading", organiser Michael Trot, told *The Micro User* at the Oldham show.

Many of the big names in the world of education software were at the shows, including Sherston, Longman Logotron, AVP, Clare's Micro Supplies and Dabs (David Atherton Books and Software) Press. Most of the software had already

UPDATE

EMERGENCY AID



**IF YOUR LOVED ONE HAD
A CARDIAC COLLAPSE,
COULD YOU SAVE HIS LIFE?**

been on view at BETT, but among the new releases either available or announced at the show were several from Clare's including Tempest, the DTP package, Classmate, a primary word processor, a yet unnamed Risc OS music program and Illusionist – a package with similar features to Euclid but with enhanced texture mapping and a built-in animation language.

Also coming soon is Primary Healthdata, a version of the Healthdata database designed for 9 to 12 year olds.

The show organisers demonstrated Discover, a text disclosure program for the Archimedes/A3000.

Designed for use in English and European Languages, pupils have to discover the text that has been coded by characters chosen by the Passage Author.

The software is fully Risc OS compatible and is claimed to allow multiple views and windows on a document, support multi-tasking and multiple documents and give a choice of print speeds.

Discover costs £25 for a single copy or, for an extra £20 a site network licence is available.

Helping to save a life

THE February 1987 issue of *The Micro User* featured a package designed to teach emergency first aid. Inspired by the response to that feature, the author, Dr Peter Burridge, has continued to upgrade it and has now released a full resource pack for teachers.

The product has been launched by Screen Teach (0706 525021) and together with an upgraded version of the original software on

flippy 40/80 disc the package contains a VHS video by the British Heart Foundation, the How to Save a Life book, the Resuscitation for the Citizen and Beating Heart Disease booklets and several other leaflets and useful contacts for other related material.

"The response to the original feature was far greater than I expected", Dr Burridge told *The Micro User*, "so I have continued to upgrade the product.

"However, people who bought the original disc for £3 should upgrade it to a new one as there have been slight changes in recommended methods.

"I will upgrade for £6 if the discs are returned. However, if people prefer to upgrade to a complete package I will refund the £3.

"It is also important to note that the Resuscitation for the Citizen booklet referred to in the original feature has been revised and the second edition also conforms to the 1989 guidelines prepared by the Basic Life Support Working Group of the Resuscitation Council of the UK. This version is supplied in the package".

A recommended source of information are the Save-a-Life programs that will be broadcast by the BBC starting on April 30 and repeated from May 7.

The package costs £25 and a £5 donation will be made to the British Heart Foundation for each one sold.

Dongle deleted

RESPONDING to the concern of some schools that dongles may be stolen, Computer Concepts (0442 63933) have released a non-dongled network version of Impression.

The new version will be licensed to each school and will only run on their network – it will not run on other networks or on a non-networked machine.

Under the existing licence arrangement schools pay £477 for the licence and then £15 for each dongle. They can now opt to pay £700 for a network licence. Dongles

for machines not on the network and upgrades from the dongled licence scheme are also available.

"We thought that educational establishments had a legitimate worry about theft", Charles Moir, founder of Computer Concepts, told *The Micro User*, "but the vast majority of individual users are not concerned about the dongle and are unlikely to have it stolen.

"We will, therefore, continue to sell the normal version of Impression complete with a dongle".














Reforms in text

A STAND-ALONE text of the Education Reform Act for the Longman Logotron (0223 323656) product Hyperbook – reviewed in the April issue of *The Micro User* – has now been released. The price of the Hyperbook Reader software is £49 – not £45 as quoted in the review – while the authoring system is available for £15.

Master plans

A DONATION of £800 towards a workstation for Ryles Park County High School, Macclesfield has been made by Effluents Services (0625 296666), a local waste disposal company. The school plans to install 10 Masters in the suite which will be used for teaching basic skills in control technology and computer aided design.

Effluents Services told *The Micro User* that it is impressed with the way Ryles Park is looking towards the needs of pupils by providing a technology centre to equip school leavers with valuable skills for both a job in industry or further education.

 
Bless my moon boots! said
 
the astronaut, climbing
 
from his rocket. First
 
man in space! Then he
 
saw the woman on a
  
bicycle. Me first, she said.

FROM Pictures to Words is claimed to relate in many ways to English in the National Curriculum Levels 1 to 3. The suite of language development and literacy activities for children in primary schools or with special educational needs is produced by Widget Software (0707 264780).

BEEBUG Ltd

Staff Vacancies...Staff Vacancies...Staff Vacancies...Staff Vacancies...Staff Vacancies

BEEBUG are leaders in the Acorn Marketplace with exciting ongoing developments of both hardware and software for the Archimedes computer range. We also publish the highly acclaimed BEEBUG and RISC User magazines. Expansion has created several vacancies for dedicated enthusiasts with experience of Acorn Computers and associated products.

SOFTWARE DEVELOPMENT ASSISTANT

As one of the leading software producers for the Archimedes we are looking for someone to join our team working on a number of interesting new software projects.

Reporting to the Software Manager, the successful applicant's duties will include providing technical support, program testing and evaluation, overseeing software production and eventually managing complete projects.

Although this is not a programmers position, a knowledge of Basic and Assembler would be useful, together with a familiarity of popular application software.

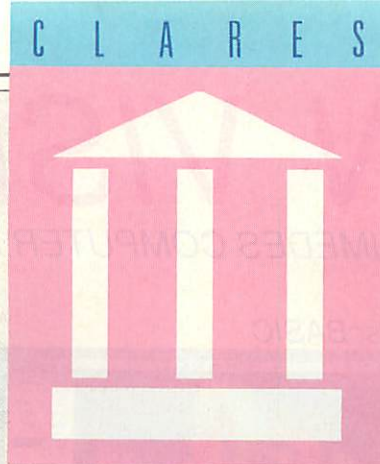
TECHNICAL SUPPORT ADVISOR

Our Technical Support team provides answers and advice on an extremely wide range of subjects, covering both software and hardware on the BBC Micro, Master and Archimedes computers.

We are looking for someone who owns a computer themselves and can demonstrate their enthusiasm on the subject. Training will be given, although a certain level of knowledge concerning existing products will be necessary along with the ability to express yourself clearly in writing and on the telephone. Experience on PC Compatibles, Commodore equipment and Econet would also be a benefit.

Salary-£6,000 to £12,000 depending upon age and experience

**Apply in writing (enclosing a c.v.) to:
The Personnel Manager, 117 Hatfield Road, St Albans, Herts. AL1 4JS**



THE · PURE · CLASSIC

The *Tempest*, a pure classic.

But, we're not talking about that play by William Shakespeare. Or the endless TV adaptations of the same. Our *Tempest* is on a different screen. It's a desk top publishing package from Clares. But like all classics it sets standards and a style that will always be ahead of the competition.

It is fully RISC OS compatible using the Outline fonts and RISC OS printer drivers.

It has been designed specifically to run on a 1 megabyte BBC A3000 or Archimedes 310 without sacrificing



any features or quality.

On an Archimedes 400 series with extra memory you can run *Tempest* and have a bigger font cache as well as huge documents.

Users of the Acorn DTP can be using *Tempest* fully within one hour. And although *Tempest* is more sophisticated than ADTP the initial menus are similar. But it's a lot faster than ADTP. And that's just act one. There are many more star features that allow you to produce a masterpiece from any Desk Top Publishing task.

Tempest DTP. You'll be hooked on this classic.

Special Introductory Offer — £129.95 (inc vat) Education £99.55 (plus vat)



A Classic Desktop Production

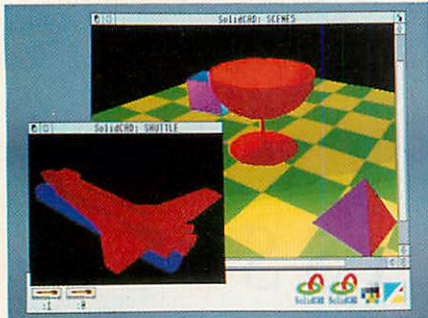


98 Middlewich Road, Rudheath, Northwich, CHESHIRE CW9 7DA.
Telephone: 0606 48511 Fax No: 0606 48512

SILICON VISION

SOFTWARE FOR THE ARCHIMEDES COMPUTER SYSTEM

SOLIDCAD



The next generation multi-tasking CAD package combining 2D Draughting and 3D Modelling techniques with advanced smooth shading and lighting effects to provide the ultimate 3D Draughting System for Architectural design, Interior design, Engineering design and Teaching CDT. Allows drawing in plan, front & side elevations and also directly in 3D to visualise a model while it is being created. Powerful zoom, pan, sweep, extrude and macro facilities are also provided to enhance design productivity.

£99.95 (ARC) **New**

SOLIDSRENDER

The most advanced Ray Tracing package for the Archimedes producing photo-realistic images of SolidCAD designs or FILM-Maker animations taking into account multiple light sources, reflections, shadows, transparencies, refractions and textures for the highest quality pictures from the leading 3D graphics experts renowned for technical excellence. The high-speed ray tracer uses sophisticated colour mixing techniques to provide the maximum range of colour shades plus anti-aliasing for smooth edges, motion blur effects, dynamic viewpoint, variable camera lens for wide angle and telephoto effects and multi-colour light sources driving the Archimedes display hardware to its limits for the best photo-realistic images within the laws of optical physics.

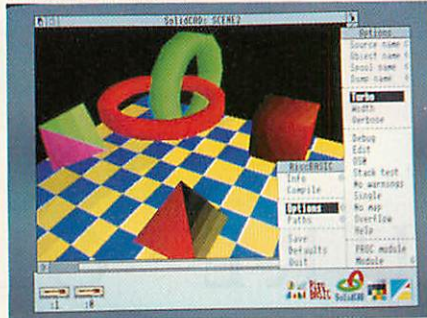
£79.95 (ARC) **New**

SOLIDTOOLS

The fully integrated environment for 3D CAD, Animation, Rendering & Hardcopy. The package includes SolidCAD, FILM-Maker, SolidsRENDER, Realtime Graphics Language, SuperDump & SuperPlot for a turnkey solution satisfying all your 3D Design and Presentation requirements.

£275.00 (ARC) **New**

RiscBASIC



The best BASIC V compiler money can buy. Here's what the reviewers say:

"If you are looking for THE compiler to go for, and are confused about which one deserves to win the very public battle that has been raging in the advertisements, well my preference is for RiscBASIC"

- RISC USER August 1989.

"In summary, BASIC V is the best version of BASIC produced and RiscBASIC provides the most compatible, fastest compiler for this language. This will be an invaluable addition to every serious BASIC programmer's toolkit. My congratulations to Silicon Vision" - Archive June 1989.

"very useful indeed for development work...produced significantly more efficient code" - Micro User July 1989.

"RiscBASIC wins the race...has the edge overall...more likely to provide the correct results" - BBC Acorn User Nov 1989.

"Still the only true BASIC V syntax compiler. If you want the best, buy Silicon Vision's complete answer"

- Micronet August 1989.

£99.95 (ARC) **New**

GERBERPLOT

The complete Gerber driver for ARC-PCB and ARC-PCB Professional Printed Circuit Board design packages producing Gerber plotfiles for driving Electro-static Photo-plotters. These plotfiles may be sent directly to photoplotter bureaus on Archimedes ADFS or MSDOS disc formats to produce the highest quality PCB artwork for professional results.

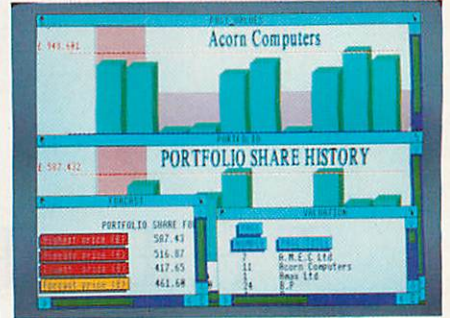
£125.00 (ARC) **New**

SUPERPLOT

The complete plotter driver for SolidCAD, Realtime Solids Modeller and Gate-Array Design System supporting the industry standard HP-GL, Graphtec, Watanabe and Plotmate plotters.

£29.95 (ARC) **New**

SHAREHOLDER



The complete share holder's management system providing all the facilities needed to automate your portfolio. Features include Company statistics, Share holdings, Transaction processing, Portfolio history, Forecasts, Dividends due, Share price updates plus built-in Calendar, Calculator and Hardcopy facilities for total integration.

£99.95 (ARC) **New**

DATAVISION

A full featured relational database management system which also includes word processing, label printing, reporting, & mail-merging facilities in one integrated environment for the Archimedes, bringing professional quality business software to the demanding user. The database manager is rich in features and includes facilities for the production of complex queries, detailed reports, browsing, sophisticated relational data entry, relational reporting, interactive & global editing, formula entry and validation. All this in an intuitive easy to use mouse driven environment.

£99.95 (ARC) **New**

FINANCIAL ACCOUNTANT

The professional business accounting and database package which includes DATAVISION together with turnkey applications for Order Processing, Invoicing, Sales ledger, Purchase ledger, Cash book, Stock management, Reporting, VAT returns plus year-end accounting complete in one integrated environment.

£175.00 (ARC) **New**

OFFICETOOLS

The complete Office Automation system for Database management, Mail merging, Wordprocessing, Label printing, Order Processing, Invoicing, Accounting, Share portfolio, Forecasting, Dividends processing, Calendar, Calculator and Presentation graphics. Includes Financial Accountant, DataVision, ShareHolder, and the Presentation System providing a turnkey solution for all your business and management requirements.

£295.00 (ARC) **New**

All software run in native mode on A300-400 Series & A3000 with RISC OS. Enquire for our free product Catalogue

SILICON VISION LTD, SIGNAL HOUSE, LYON ROAD, HARROW MIDDLESEX HA1 2AG. TEL: 01-422 2274 or 01-861 2173 FAX: 01-427 5169. TELEX: 918266 SIGNAL G.



(Access/Mastercard/Eurocard/American Express accepted)

All prices include VAT and Carriage (Overseas orders should add £4)

Marshal Anderson reports on a close encounter of the educational kind

THE adventure began when some of our fourth years – middle school – logged on to our electronic mail service. To be honest, we had made very little use of it over the past two years and kept it going basically because Sherston Software had put some money towards it.

These particular children were having their first taste of electronic mail and were writing a letter to Sherston to thank them for their help.

To everyone's surprise there was a message in the mail box waiting for us. My first assumption was that it would be one of those dull county circulars that we get from time to time that actually concern secondary schools, we still being among the few primaries with Email in the county.

After sending our letter it seemed a good opportunity to show the children how to download the message on to disc so it could be read later – watching the phone bill, you see. None of us expected this:

Help! Who are you? What year is this? Is there anybody there who can help us? There are two of us here, Jason DeVere and Emelda Grant. We do not know what has happened. We seem to be lost. Is there anybody who can receive this message, please answer. Who are you? Where are you? What year is this? God save the King!

There seemed no reason not to respond so they went ahead. Their message was short. The children introduced themselves as Mrs Kennington's class and informed the senders of the year that we have a Queen these days. The message that came back caused quite a stir. Jason and Emelda, erroneously addressing their letter to Mistress Kenningtons-Class claimed to be from Evesham – which tallied with their mailbox heading – in A.D. 1649 – which didn't.

They seemed to have little idea about where or indeed who they were, except that it had something to do with Zorg and that things were definitely not as they should be. What they needed were some terms of reference to get their memories back, and could Mrs Kenningtons-Class help by telling them the sort of clothes they would be wearing?

Jan Kennington, their class teacher, was quite happy to make this part of the class work and so off they went to the school library. Jason, apparently, would be



Bradwell Village School meets an alien

PART ONE

dressed in ruffs and plumes and Emelda in ringlets and frilly dresses.

Jason thought this fine, but Emelda was disgusted at such opulence.

They also filled us in a little about how things had started: It seems that Zorg had instructed them separately to go to the churchyard in Emberly Castle. Here they met for the first time where they had touched the gnomon on the sundial.

We soon got the answers when a message arrived from Zorg. An important, powerful creature speaking exclusively in capitals.

He/she/it informed us that Jason and Emelda were bringing an article of great

power but, as both had touched it at once, the transporter calculations were upset. Coordinates were being calculated to bring them the extra 300 years to Zorg's time and we were to leave them alone.

The next message from Jason and Emelda seemed very urgent. They asked us not to believe Zorg and enclosed a host of questions about their 17th century lives.

While filling in a lot of background knowledge, the class also managed to sort out, using maps and guide books, that the church they had vanished from was probably St Mary's. At the same time they





worked out that Jason was a royalist, Emelda a puritan – hence their different reactions to the clothes. Our children also pointed out that they were a group not a hyphenated Kennington.

However, to hedge their bets they also wrote to Zorg to find out what the object was and just what would befall who if they continued to help the lost pair.

Paranoia set in about now as Jason and Emelda, concerned that Zorg was intercepting their messages, started to encode many of them as well as being extremely cryptic about the solutions to the codes.

As an added measure they suggested we use a password which locked the messages against prying eyes. The password was also hidden in a riddle.

Zorg now tried a different tack – Jason and Emelda were just silly children playing a joke, we were to ignore them and run along and play.

This caused quite a cavalier reaction from the fourth year of Bradwell Village. Our buildings insurance didn't quite cover us for Acts of Zorg, but they wouldn't listen.

Pin-pointing Jason and Emelda's disappearance then became the task. Having found the place, the time was narrowed down by the fact that Charles was still alive

when they left. After that they went on to identifying Jason and Emelda's parents names from clues they could remember.

By now theories were developing about how this had all come about. Zorg was seen as bluffing, no one believing in his powers. But how had the children been transported?

The explanation our fourth year came up with was that in that geographical area there had been several important battles and events that changed history. Somehow, these events were so strong that they had caused a vortex or time warp, trapping the children or allowing Zorg to kidnap them.

Meanwhile things were speeding up. Having found out that Jason's mother's name was the same as the King's wife's the search was on for Emelda's father's name.

This stretched our school reference library to its limit and no one could find out who had written New Atlantis. On top of that, Zorg had changed tack again. Now he was demonstrating his power by coming up with some obscure personal details about the children in the class.

At a loss to know how Zorg could know this, they became more determined rather than worried. By this time Jason had enough of his memory back to return home

but Emelda still had a problem. Zorg seemed to be involved in this and they needed to cut his power finally.

They discovered that transmitting Zorg's first name would give them the break they needed and this arrived heavily coded. The code was cracked and the final message sent:

Dear Zorg, or should we say AMNESIA!!!! HA-HA!
Thought you could beat us eh? Well eat this! Jason and Emelda are home!! We think you've lost your mind so we're sending over a sledge hammer to knock it back in!!! WOOF! Sorry Zorgie Baby, but we've won and you've lost!
Lots of love (shove off) Paul, Tim, Liam and everyone else in Mrs Kennington's class.

And we never heard from any of them again.

The children experienced a warm glow of satisfaction – while in the staff room we wondered at the chain of events that had a group of 12-year-olds burying themselves in history books for half a term.

● Next month Marshall Anderson reveals the secrets of using Email for class projects and online adventures.

PANASONIC DISKS PRINTERS KXP1081 ORGANISERS

BBC ARCHIMEDES Z88

PARROT PSION NEC PPC512 PORTABLES PPC640 LABELS

DENHAM

COMPUTER PRODUCTS

SPECIAL OFFERS

A3000
with colour
monitor
Limited supply
£799

BBC MASTER

Master 128	£395.60
Turbo Module	£111.85
Eprom Cartridge	£12.80
IEEE Interface	£265.40
2nd Processor	£49.80
Econet Module	£47.40

ARCHIMEDES

310 Base	£832
310 Mono	£992
310 Colour	£1008
310M Base	£895
310M Mono	£955
310M Colour	£1071
410/1 Base	£1090
410/1 Mono	£1150
410/1 Colour	£1166
420/1 Base	£1570
420/1 Mono	£1630
420/1 Colour	£1646
440/1 Base	£2370
440/1 Mono	£2430
440/1 Colour	£2446

31 Brahms Rd, Basingstoke,
Hants RG22 4JH
Tel. (0256) 64752
(24hr Answer-phone)

FREE
With every Archimedes purchased
Teddy Bear, Sports Bag, Mug, Lapel
Badge, Sweatshirt, Sew on Badge,
Sports Shirt, Disc Wallet.
All items are the official Acorn
products (worth over £54)

A3000

Floppy Disk	£104.80
20Mb HD + Controller	£425.30
Econet Module	£42.30
Backplane	£36.87
Rom Expansion Card	£58.30
I/O Expansion Card	£79.40
Midi Expansion Card	£66.22
Midi Add-on to I/O	£37.40

CAMBRIDGE Z88

Z88 Computer	£195
Mains Adaptor	£8.67
128K Ram Pack	£42.35
128K Eprom Pack	£42.35
32K Ram Pack	£17.34
32K Eprom Pack	£17.34
Eprom Eraser	£33.68
PC Link II	£30.39
Parallel Cable	£22.82
Serial Cable	£8.67
BBC Link	£20.63
512K Ram Pack	£162.68
Carrying Case	£8.67

OTHER HARDWARE, SOFTWARE, DISKS, STATIONERY ETC. AVAILABLE.
PLEASE RING FOR PRICES

WE CAN SUPPLY ANY COMPUTER PRODUCT YOU REQUIRE. ALL PRICES EXCLUDE VAT.
DELIVERY FREE (UK MAINLAND ONLY). PLEASE ADD 15% VAT TO ALL ORDERS
ON-SITE MAINTENANCE CONTRACTS AVAILABLE PLEASE RING FOR PRICES

CO-PROCESSORS
PAPER

JIGSAW

from 4MATION for the Archimedes

with screens by **Rodney Matthews**

❁ JIGSAW ❁

turns any screen or sprite into a 12, 20, 32, 48 80 or 120 piece jigsaw puzzle.

❁ JIGSAW ❁

comes complete with 15 superb screens by Rodney Matthews and Dave Cowell.

❁ JIGSAW ❁

with 24 levels of difficulty, is suitable for all ages.

4MATION

Educational Resources
Linden Lea, Rock Park,
Barnstaple, Devon.
EX32 9AQ
Tel. 0271 45566
Email 01:YNK045

£29.00 + VAT
(inc P&P)

Price includes
site licence. Use
Jigsaw on all
your machines.

Product: Craftshop 1 and Craftshop 2
 Price: £29.00
 Supplier: 4Mation Educational Resources,
 Lindenlea, Rock Park, Barnstaple,
 Devon EX32 9AQ.
 Tel: 0271 45566
 Requirements: Archimedes or BBC A3000

Crafty in parts

SLOWLY but surely educational software packages are beginning to appear which exploit the power of the Archimedes series. It comes as no surprise to find 4Mation leading in this field, after all, the company has an enviable reputation for drawing the most out of the 8 bit BBC Micro.

The first task on accessing either disc via the Desktop is to initialise it. This enables you to prepare your own start-up message and is a once-only option. Make sure that you get the message you require, as it really can't be edited. Once initialised, the contents of the disc may be copied to another floppy or hard disc.

Each package contains two entirely separate programs. For Craftshop 1 these are Patterns and Stitching. The former provides 20 basic shapes and the means to alter their size or rotation.

They can be placed together to make a picture in an editing window using 16 different colours, the outline of a shape can have a different colour from the in-fill and all colours can be selected from a huge palette.

A very useful feature is the ability to move new shapes to the back. This makes it possible to construct pictures starting with top detail rather than always having to begin with the background.

A picture created in the editing window can be precisely placed in the whole drawing screen. This is treated as one object and can easily be lifted and placed elsewhere. A simple menu scheme allows block operations and sections of the screen can be marked for clearing, copying or rotating.

A really clever feature is the ability to try out and grab a palette from another screen. Effects can be created which vary from the loud and garish to very subtle.

Printing is via the Desktop and can be to any printer for which you have a suitable driver – you get ones for most Epson dot matrix and Integrex colour printers with your machine. Although I've yet to see drivers for Epson colour compatibles.

I can commend Patterns to teachers who are seeking a more structured drawing environment than that offered by a standard art package.

Stitching, the other program on disc one, merges the areas of art and mathematics by allowing you to investigate curve stitch patterns.

The mechanism for creating these is to

*Rog Frost takes
you on a tour of
two newly opened
Craftshops*

Craftshop demos

On this month's 3.5in subscription disc you will find demos of Craftshop. For details of how to receive the disc, see Page 129.

select a basic design from those offered. Simple ones consist of a pair of lines with threads joining them and more complex designs are made up of points on the circumference of a circle which are joined.

These basic designs can be modified by altering the size, numbers of threads and orientation of the pattern. Different colours may also be selected. Having achieved the desired result with one selection, more stitch patterns may be used until the whole screen has the required picture.

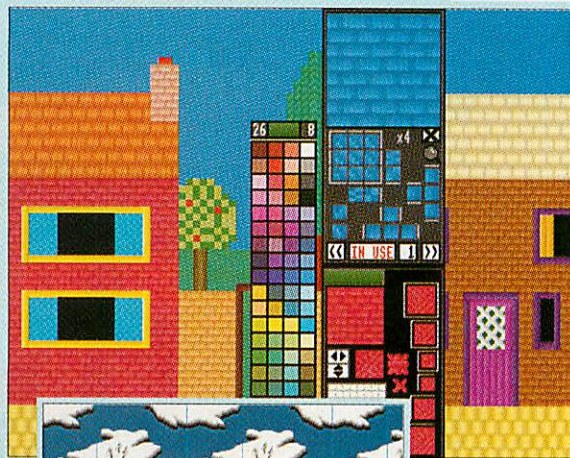
Then comes the clever bit where the power of the micro is really used. The whole screen can be rotated around the centre line to produce a wonderful three dimensional effect. It is worth experimenting with some of the supplied patterns to see just what can be achieved.

Disc two starts off with a program called Embroider which allows you to create complex stitch patterns in a small editing area and use them to produce striking whole screen effects.

This program seems to have been designed with users in mind. It is very simple to get into and you will have the satisfaction of obtaining quick results.

The colour effects are superb. You may select from a range of 64 but each stitch shows light and shading. Having completed patterns, you can change the colours either globally or in a prescribed area.

Disc two continues with a tiling program. For teachers familiar with the 8 bit BBC Micro, this will probably be the hardest one to get into, as it has no built-in colouring capability – instead, it relies on Risc OS !Paint. You can create a tessellating tile



Typical screens from Embroidery and Tiling

layout which can then have a painted sprite placed on it. It takes some getting used to, but children, no doubt, will soon cope with the pixel editing facilities offered.

Embroider is likely to be compared with the old favourite Mosaic, but really there is no comparison as the older program allows for only rectangular tiles and eight colours.

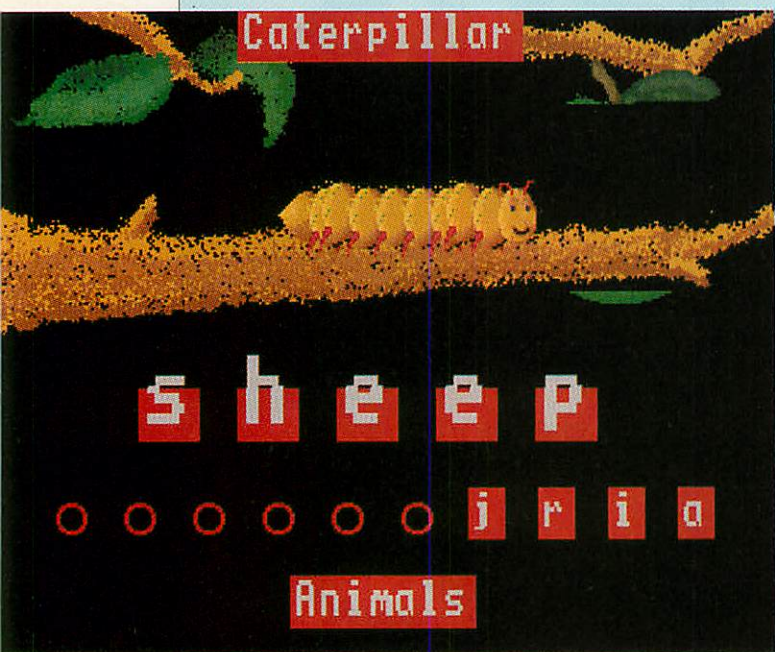
The new one has the full Archimedes range of colours, a multitude of possible shapes, plus incredible speed at the drawing stage. It is worth persevering with this piece of software: The results justify the time spent on it.

This review would not be complete without mention of the manuals. Not only are they produced using Archimedes software, they are first rate in content and presentation – and they're printed on re-cycled paper.

Summing up

Full marks all round to 4Mation for maintaining its high standards. Teachers can buy these programs with the confidence that they are thoroughly worthwhile. I look forward to seeing future Archimedes programs from the 4Mation team.

Graphics that grab



Eating your way to success on 6 to 8's

Product: Fun School 2
Price: £24.95
Supplier: Database Educational Software,
Europa House, Adlington Park,
Adlington, Macclesfield SK10 4NP.
Tel: 0625 878888
Requirements: Archimedes series or BBC
A3000

MANY parents and teachers will already be familiar with the Fun School 2 programs on the 8 bit BBC Micro (reviewed in *The Micro User* April 1989). Now Database Software, tempted by the growing number of A3000s in primary schools and homes, has produced versions of this educational software for the Archimedes series.

Three separate sets of programs are designed for different age ranges. The Under 6 disc features a large, cuddly looking Teddy. Programs for 6 to 8 year olds feature a frog, while the Over 8 package makes use of a robot character.

Children seemed to associate this robot with boys and girls may feel that the Over 8 programs are not for them. Apart from featuring these creatures as sprites within the programs, each pack comes with an appropriate badge.

The Under 6 pack contains eight programs on one disc. The first is **Shape Snap** where the items to be matched can be basic shapes on level one through to upper and lowercase letters on the highest

levels of difficulty.

Game two is **Find the Mole**: Five mole hills of different sizes are shown. Each hill has a number appropriate to its size. Youngsters select a number and are then told whether the mole is in a bigger or smaller hill. When the correct hill is selected, the mole appears.

Teddy Count involves counting teddies which dance around the screen. If the guess is wrong, the teddies line up for a second chance.

Write a Letter allows youngsters to use the screen to display large letters on the screen in a variety of colours. Text can easily be printed or the whole screen – like all Fun School screens – can be saved at the press of a key for loading into !Paint where the colours could be changed or the picture printed.

The program **Colour Train** features a steam train travelling around a circuit. You must stop it at the station which is the same colour as the engine. Just one key – or mouse button – is needed to operate this game.

Pick a Letter allows children to collect a letter from an entire alphabet to match the one already displayed. At higher levels simple words are displayed. These must be built up by collecting the required letters.

Spell a Word displays pictures of a very high quality and you must type in the word that describes the picture.

The final game is **Teddy Bear Picnic** which involves steering said bear through

a woodland maze to the picnic site. This involves skills of coordination, but its chief value comes from the language used by a child and the supervising adult.

The notes which accompany this software go to lengths to explain that children will benefit more from the programs if an adult encourages them through the tasks.

There are also eight programs on the disc for 6 to 8 year olds. These include a version of the **Colour Train** program but with the addition of simple arithmetic and a **Shopping** program where you must match the required purchase to the appropriate shop.

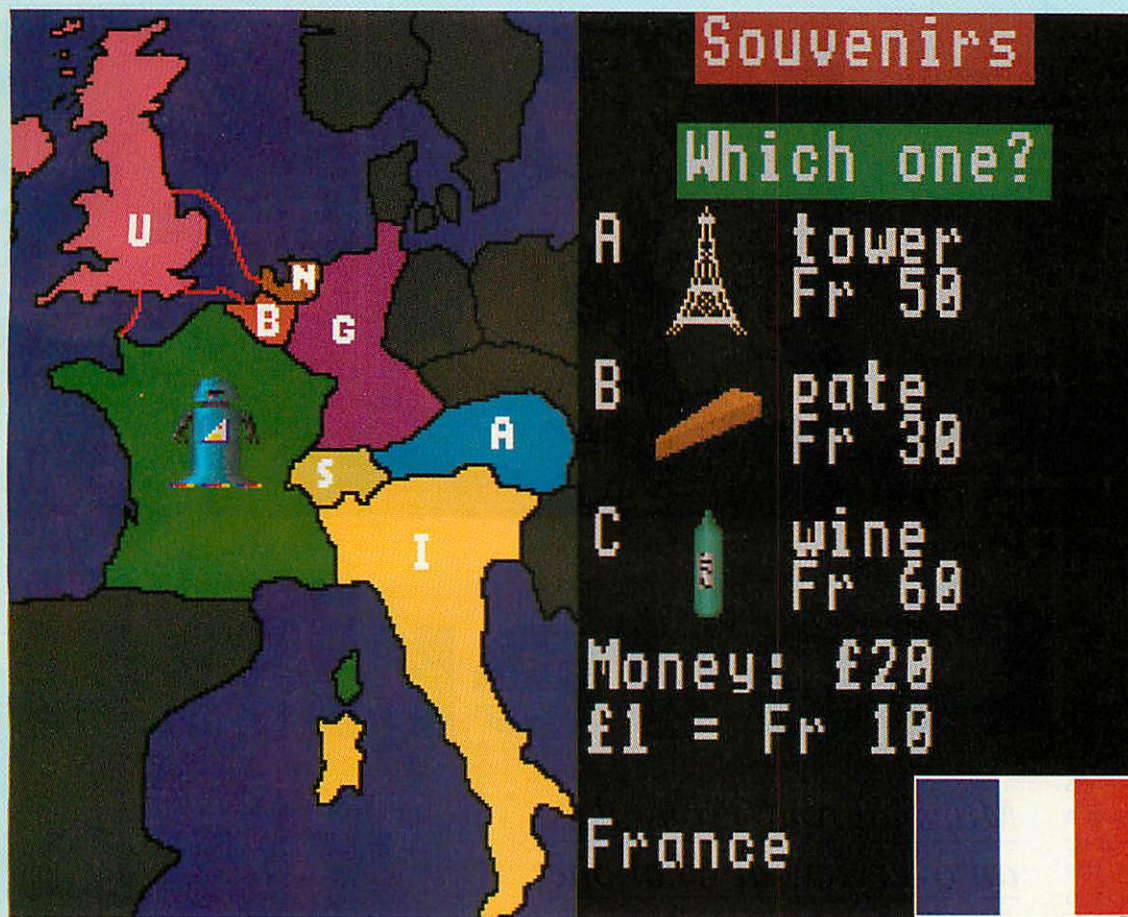
Next comes a **Maths Maze** where the frog sprite has to pass guards who ask arithmetical questions.

Treasure Hunt involves buried treasure on an island – grid coordinates are entered and advice is given of the getting warmer type.

Bounce involves throwing a ball so that it hits an apple. It sounds simple, but obstructions are put in the way and the ball has to be thrown to bounce off a number of them if the target is to be reached.

In the **Packing** program youngsters need to select and place shapes which can fit together to make rectangles.

Caterpillar is a graphically brilliant version of Hangman – with the reward for success not failure – and **Number Jump** involves steering the frog over a lily pond using leaves which display multiples of a pre-defined number. This is good tables practice, and fun too. The Over 8 software



A testing puzzle in mathematics and geography for the over 8's

involves two discs. Some teachers will find the booting of this arrangement a bit of a problem, since both discs must be inserted and clicked from the Desktop before the software will run.

Once again there are eight programs, but this time there is a bit of a sequence since the last program requires keywords given in the others.

Build a Bridge requires these older children to complete a bridge by selecting and placing the appropriate missing sections.

Passage of Guardians involves steering a robot past guardians who set anagram puzzles. **Unicorn** is a version of the old problem of the farmer, chicken, dog

and corn. All have to be moved, but some items must not be left unsupervised with others.

Logic Doors is a maze game where different coloured keys must be carried to open doors. Mapping skills are needed here.

Souvenirs involves a tour of Western Europe in search of presents. You have limited money and need to cope with exchange rates.

Code Box introduces the concept of binary numbers, while in **Mystery Machine** a heavily-coded message must be sorted so that the machine can be operated correctly.

The final program, **Escape**, is similar to Logic Doors but uses keywords gained from the previous programs.

Having knowledge of the 8 bit versions just does not prepare you for what to expect when you boot up these new versions.

The authors have gone to town with the graphic quality. This, at times, seems almost photographically good.

Some of the sound effects have also been enlivened, particularly the chuff of the train as it circles the track in a couple of the games.

Not all of the programming is perfect, however. My niggles concern the precision needed at times.

The mouse routines are hard to manage – you move a pointer and the appropriate sprite follows along behind. A small movement of the mouse can lead to real problems in accessing the next part of the program.

The keyboard option also has imperfections, since the keys auto-repeat. This sometimes makes it hard to position some of the movable sprites with accuracy.

The worse problems are reserved for the supervising adult who tries to change the difficulty level. A short stab of a key seems to produce no effect at once and then suddenly levels of difficulty flash past you.

This problem can also occur when trying to select programs. Selecting them by number is a safer procedure than using the arrow keys.



Looking for Mr. Mole in the Under 6's

Summing up

If you are looking for bright pieces of learning software to use with young children give Fun School 2 a try as its lively graphics can certainly hold attention. Education experts probably won't like the programs since they involve rather closed activities, but children, on the other hand, thoroughly enjoy them.

Products & Prices: Ampleforth Plotter £15, Transformation £15, Calcism £13, Scalebook £12, Page Designer £25, Britain £12, Number Investigations £15, Rivers £12 (mail order only)

Supplier: Himap Educational Software, 8 Wishart Road, Kidbrook, London SE3 8PP.

HIMAP has produced a wedge of software for the secondary school market that ranges widely across the curriculum covering maths, humanities and music, giving in some of these areas short but useful packages with specific and very well defined aims and objectives.

In *Calcism* a calculator keyboard is displayed on the screen and accessed by the computer keyboard. All the standard functions are available with the important addition of a display that records up to 12 key presses. This makes it possible to follow the steps taken in any given calculation with all stages and intermediate results displayed.

Most impressive is the way any bracketed part of the calculation is resolved immediately and the result of the contents of the brackets displayed. This should be a great help in demonstrating the effect brackets have on groups of numbers and the way they interact.

The calculator has a memory key and its contents are permanently displayed so that they can be brought with confidence into calculation. Along with this are trigonometrical keys and a range of other functions including logarithms, exponents, squares and raising by a power.

All in all a very useful tool at the lower end of the secondary maths curriculum – with the usual rider that other areas of education are bound to find uses for it.

Transformations is a kind of electronic blackboard program that demonstrates geometric transformations. The screen presents a grid on which to draw a shape. This may be done by entering co-ordinates or by moving an arrow around the screen and quite complex shapes can be generated. Having drawn your figure your chosen transformation is carried out.

This part of the program is very good. The shape is animated as it moves across the screen and the new shape is drawn, in reflection the shape actually turns itself over, which is very effective.

The transformations available are reflection, rotation, translation, enlargement, shear, stretch and matrix and all are shown clearly and simply. The program allows



Highly detailed maps from Britain

Covering the

Marshal Anderson takes an overview at what one producer has on offer

you, having shown an object transformed in one way, to move to a different transformation and see the effect on the same object. You can also dump the screen to an Epson-compatible printer.

This useful program can provide a dynamic introduction to what can be a complex subject for many students. Documentation is fair, but some of the package's facilities are rather well hidden by the language used.

The **Ampleforth Plotter** uses an almost identical screen layout to the **Transformation** program, again aiming for an electronic blackboard presentation with a square grid centred on 0,0.

Changes are available from the opening menu and you can easily move the origin of the graph from the centre to the bottom left-hand corner of the display. You can also select the scales of the x and y axes and these may be expressions.

Once you have the display you want you can enter points on the graph as co-ordinates or expressions, or activate a pointer that can be used to highlight part of the screen, but most likely you will want to plot a graph.

The range of options is huge, offering Cartesian graphs, a graph of the gradient function, parametric equations, polar and intrinsic coordinates and differential equations with all manner of options in each. Simply enter the expression/equation you want and watch it happen on the screen.

There is a printout option and it seems that this package, more than the

Transformations program, might be used experimentally by students in groups, as it can be used at quite a simple level.

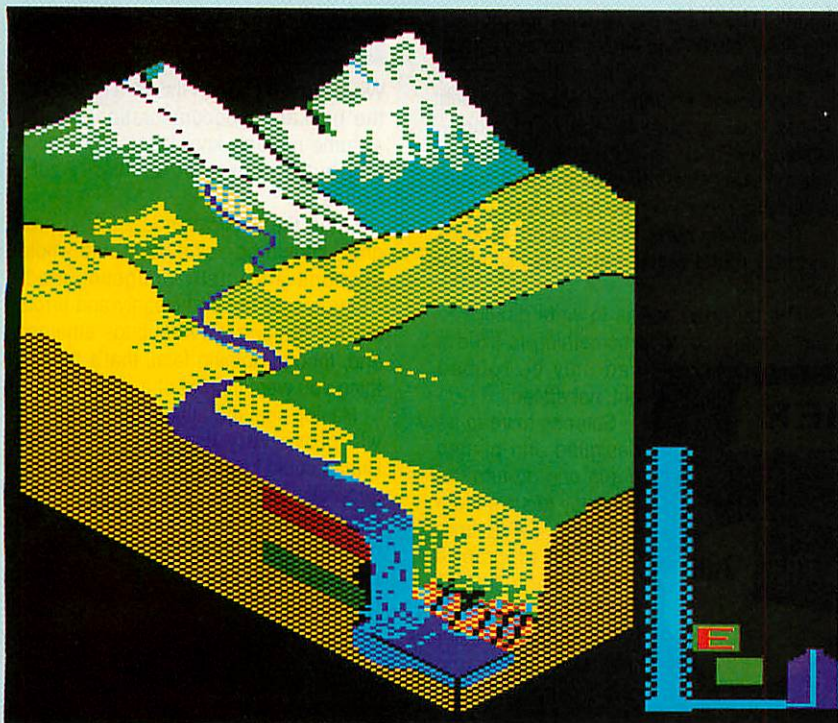
Number investigations gives a variety of programs examining the behaviour of numbers. This is very much in keeping with current thinking in maths education, and links directly with the National Curriculum.

There are five investigations on the disc. The first looks at repeated operations where a base number has its digits squared and summed, the same process then being carried out on the result.

Students then have to find *happy* numbers – those that produce a stable result after being put through this procedure rather than entering an endless loop. Eventually, by using the various options students may discover that each *sad* number ends up in a loop containing the same numbers.

The second investigation looks at *perfect* and *amicable* numbers, which involves summing the factors of a given number to see if they reproduce the starting number – perfect – or if the sum of the factors of the sum of the factors produces the starting number – amicable.

This seemed a little dry, as there are so few of these types of numbers in a given range. However, the manual suggests ways in which the principle may be extended, and this is one of the ways in which a micro can help in the investigation of numbers – to do thousands of calculations for students so that they can get on with the thinking. Fibonacci numbers figure



The flow of a river

curriculum

much in maths investigation, and various tools are presented here to experiment with the series. Students can see an explanation of the series and an illustration of the *Golden Section* as well as being able to create their own series.

There is a short experiment examining the use of a repeated number rule: If the number is even divide by two, if it is odd multiply by three and add one, the result always arrives at one.

This sort of thing can provide an excellent launching point for a wider investigation, letting the machine do the boring bit.

The final investigation looks at Fermat's work on square numbers, again letting the micro crunch the numbers for you.

All these investigations are backed by concise teaching notes and many suggestions for further work. This package should give plenty of inspiration in this area of maths and launch users into other investigations.

Scalebook is a music utility. There are options to set pitch, octave, speed and volume before you proceed to the main program.

Here you can set five different scales, choosing any key and then major, melodic minor or harmonic minor. The program produces a series of staves on screen and plays the scales while writing the notes on them. Having seen one scale you can repeat it or select the next.

This seems to be a very limited

program. You have to enter five scales before it will play, so using it for a quick illustration is difficult. Quite what other use it would have is hard to see – you couldn't use it in a room full of machines.

What is one supposed to do with the note played? Sing it back perhaps? As a rote learning device for scales it might have some value, but surely there are better ways than watching notes drawn on a screen.

Britain is a geographical package that divides into four sections. Search shows an impressive map of the UK and then offers you a choice of Topics. Choose from a list including *hills*, *rivers*, *gas* and *general*. What you get is a flashing asterisk on the map and a name. The first that appears under *gas* is Glasgow. What kind of geographical features are listed under

general then? Salisbury Plain, John O'Groats, North Forland... you get the idea.

You can opt for free choice and type in anything you like, but the chances are you will get *Sorry, not listed* if you seek the M1 or Milton Keynes or Southend. The good citizens of Corby would be wryly amused to find themselves listed under *steel* as production stopped there in 1980.

The Test section gives the same map and topics. The asterisk flashes and you have to guess the letters that make up the place name. The asterisk, for instance, flashes over Liverpool; the answer is Partington.

Resources let you select again from a list. The geographical feature is then overlaid with shading to show, for instance, that the Scots have a real thing about sheep but there are no cattle in Buckinghamshire. It produces a good motorway map.

There is also an option to set up your own test by choosing the locations that will be bleeped at by the asterisk.

The information in this program is at

best simplistic, at worst simply wrong. The approach is deterministic, that is it implies that everyone in Corby makes steel; plainly they don't. The child is presented with information in an almost unconnected form.

This kind of learning is time consuming, inefficient and above all boring. This is the kind of software that gives educational computing a bad name.

Rivers is another geographical package and divides thus: *Revise* gives you a few pages of text and illustrations on the youthful-mature-senile model of a river.

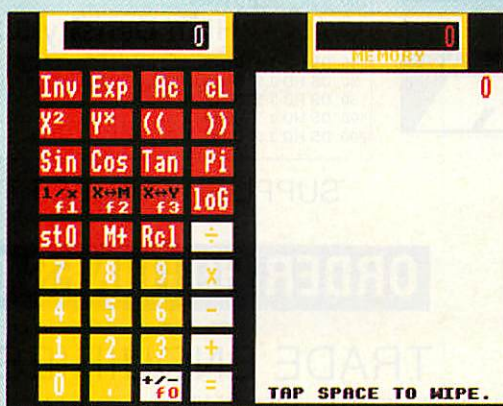
Once again we see geographical concepts presented in a way that many now think discredited. However, as models go this isn't a bad one, though it is usually hard to find a river that develops in exactly this way.

The Test section is straightforward multiple choice based on the river model. There is an option for making your own tests in the package and many may find this useful.

Then there are two games. Both ask you to identify parts of the river model on excellent graphics of the upper and lower river.

Unfortunately the games have a patronising sub-space invaders style, unlikely to appeal to the age of student tackling this subject.

And they are so badly written that hitting the right answer even if you know it can be difficult, as the program responds



Easy to use calculator

so slowly to a keypress.

Page Designer is a simple design program for producing page layouts. It is the sort of thing students might use to produce reports of projects and is very timely inasmuch as the National Curriculum makes a lot of using Information Technology for communication.

The program offers three sizes of text running vertically or horizontally and can display information as pie, column and bar

charts. There are simple tools for producing lines, boxes and circles and any shape can be filled.

The design screen is in Mode 1, which gives four colours to play with, and – although it takes a little getting used to – the package has its own internal logic. Satisfying results can be produced.

The screen dump is very good, producing truly round circles rather than squashy ones.

The program seems to write directly to the screen, so once something is fixed it can only be rubbed out, not edited.

Screens have to be designed and printed out in one go and the only way to save them is to use *SAVE from within the program – and similarly *LOAD them.

It's certainly easier than using a desktop publishing package like Pixel Perfect, but it doesn't give the flexibility or quality of output. It might be more constructive to

Summing up

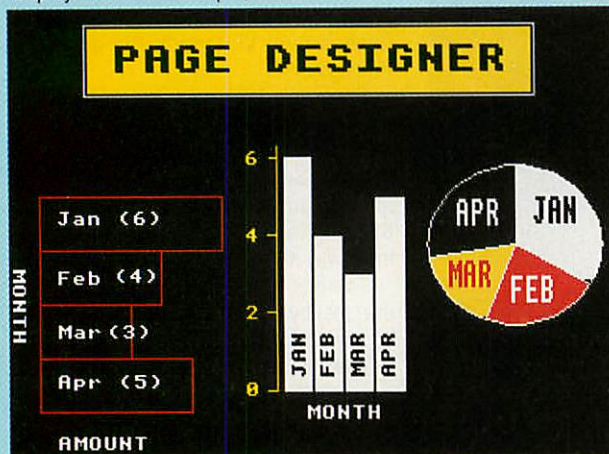
What a mixed bunch this is. Throughout the package's documentation tend to assume not only knowledge of the subject but a degree of familiarity with micros.

Often the implication is that the program should be self-evident and whole sections are totally undocumented. Programs do not end cleanly and errors are not trapped. Several bugs emerged and, though nothing fatal, that's the last thing you want in front of a class.

Having said that, the maths programs will prove very useful and perhaps Himap could look to their documentation generally and see if there isn't room for improvement. It might also widen its test bed, give their packages to a few inexperienced teachers to look at and see how they react

compare it the graphics section of an integrated package like Mini Office II or Inter Chart.

Indeed, Mini Office II will give you an entire integrated package for about the same price as Page Designer.



Simple but satisfying layouts from Page Designer

DISCS DIRECT

Cut out the middle man. We import our OWN DISCS from the far East.
Guaranteed 100% Error free + money back guarantee.

3.5" DISCS + BOXES

25 3.5" DS-DD 135 TPI with 50 Capacity Lockable Storage Box.....	£18.99
35 3.5" DS-DD 135 TPI with 100 Capacity Lockable Storage Box	£28.99
45 3.5" DS-DD 135 TPI with 100 Capacity Lockable Storage Box	£32.99
55 3.5" DS-DD 135 TPI with 100 Capacity Lockable Storage Box	£38.99
65 3.5" DS-DD 135 TPI with 100 Capacity Lockable Storage Box	£42.99
75 3.5" DS-DD 135 TPI with 100 Capacity Lockable Storage Box	£47.99
150 3.5" DS-DD 135 TPI with 2 100 Capacity Lockable Storage Boxes.....	£87.99

Quality 2nd to none. All disks passed by the following:-
American National Standard Organisation
The International Standard Organisation
The Sony Corporation
Physikalisch Technische Bindeanstalt
The Surface Standard Test



5.25" DISCS + BOXES

25 5.25" DS-DD 96 TPI with 50 Capacity Lockable Storage Box.....	£9.99
35 5.25" DS-DD 96 TPI with 100 Capacity Lockable Storage Box	£14.99
75 5.25" DS-DD 96 TPI with 100 Capacity Lockable Storage Box	£20.99
100 5.25" DS-DD 96 TPI with 100 Capacity Lockable Storage Box.....	£26.99
200 5.25" DS-DD 96 TPI with 2 100 Capacity Lockable Storage Boxes.....	£51.99

High Density 5.25" Discs

25 5.25" DS HD Discs	£17.99
50 5.25" DS HD Discs	£36.99
75 5.25" DS HD Discs	£51.99
100 5.25" DS HD Discs	£26.99
200 5.25" DS HD Discs	£51.99

High Density 5.25" Discs

10 DS HD 3.5" Discs	£16.99
30 DS HD 3.5" Discs	£47.99
50 DS HD 3.5" Discs	£77.99
100 DS HD 3.5" Discs	£137.99
200 DS HD 3.5" Discs	£247.99

SUPPLIED SUBJECT TO AVAILABILITY

DISCS DIRECT

1 Chapel Cottage,
Boyshole Lane,
Hernbay, Kent CT6 7BU

ORDER HOTLINES 0227 741298

TRADE ENQUIRIES WELCOME

Read all about it...

*Michael Noels finds
the news flooding
in on his hotline*

Product: Teletype

Price: £27.50

Supplier: Sherston Software, 8 Court
Street, Sherston, Malmesbury, Wiltshire
SN16 0LL

Tel: 0666 840433

TO you recall those far off Saturday afternoons of black and white Grandstand? Remember how those football results used to rattle off? Or the films with newsrooms full of chattering teletype machines?

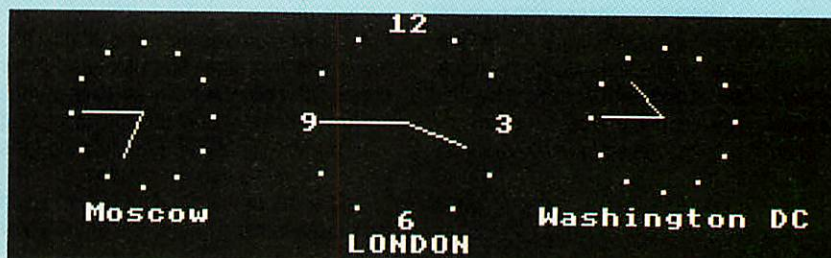
Well Sherston Software has brought it all back in a highly educational environment with Teletype. The basic idea is simple: The program simulates a newsroom's teletype, printing messages out line by line on the screen. The messages come in over a period so Teletype can mimic a *running story* as later messages add details to the earlier one. And of course, you could have several stories running at once.

Essentially that's all there is to it: A neat printer head rattles across the screen displaying a sequence of messages you've previously built up in a newsfile. The trick is in how you use it.

You could simulate the newsroom of a daily newspaper, but there's far more it can do. For instance, you can create a newsfile based on the invasion in 1066, with reports flooding in from the battlefield in real time. Sherston gives a demo of this technique used on the Fire of London.

Alternatively you might like to apply it to English, building up details of a story, its characters and incidents, message by message. Sherston uses Macbeth as an example, claiming that in today's three minute culture rendering the play into just a potted plot gives children a basis from which they can approach the real work.

Another use might be a recreation of a day in a police incident room, with several crimes on the go at once. The uses of Teletype resolve into two overall types: Involvement, where the children act on



BRING THE EXCITEMENT OF A NEWSWIRE SERVICE INTO YOUR CLASSROOM!

SHOCK HORROR - RE-LIVE HISTORICAL EVENTS - PEP UP MODERN LANGUAGES - SIMULATE INCIDENT ROOMS - USE LOTS OF HYPHENS AND EXCLAMATION MARKS!!!!

TELETYPE PROVIDES YOU WITH ANOTHER TOOL FOR EFFECTIVE TEACHING.

Teletype Newsware



Receiving messages on Teletype

what's appearing as in the newsroom and Spectatorism where they are just told what is happening and nothing else. As you've no doubt gathered, there's plenty of scope for your own creativity to come into play. Teletype's a nice example of context-free software if ever there was one.

Using the program is fairly straightforward providing you can put up with the rather tedious menu system. You can have up to five newsfiles on the go at once, each of which can contain multiple messages.

A message is the screenful of up to 26 lines of text, with exceptions. Each message can appear with a standard footer and header and the current time. It can also be echoed to the printer - you can customise the software to yours.

The essence of the simulation lies in the timing of messages. A master clock, dis-

played over the teletype, shows the current time. After each message there's a variable delay in minutes before the next appears - you have to wait until the clock ticks through the delay in real time.

In addition, each message can reset this time to whatever it wishes, allowing you to skip through a lengthy period. You can also display two extra clocks showing the time in different zones. Unfortunately the clocks are only 12 hour and don't show am or pm, so it can be difficult for students to tell whether, say, the US is ahead or behind us.

Still, the teletype simulation with its stream of messages flowing in all the time - particularly with multiple stories - is very effective. And the animation of the teletype head is lovely. Its noise is also realistic - and very irritating. Fortunately you can turn

it off. As you process the messages you can choose to Pause, Restart, Jump through to the next message with the clock automatically updating, and Stop – where the program will save your position for a restart if you want.

Although you can mix several stories in one newsfile, it's probably better for your sanity if you keep to one per newsfile. As the program can handle up to five newsfiles at once you can still combine stories – the newsfile being used is chosen at random, though weighted towards the one with most messages left.

You can create newsfiles via a simple text editor. Although fairly rudimentary it's effective. As well as entering text here, you can also specify the delay required before the next message, whether the clock is reset and so on.

There's also an option to import Ascii files from a word processor, though on my pre-production copy it wasn't implemented.

Before running a simulation you have to set up the newsfiles required. It's at this stage that you decide the initial time on the clock, how many clocks are shown, whether you want hardcopy and so on. You do this each time you run or save it all in a start-up file.

The DFS isn't too clever and can cause havoc with disc-based programs.

Fortunately Teletype has a Disc Utilities option which can help get you out of some of the *Can't extend* types of problem. The best solution, however, is simply to keep a disc free for newsfiles, which you've created one at a time. And having two drives can avert a lot of tedious disc swapping.

Throughout, Teletype tries to be as idiot proof as possible. Unfortunately at times this is taken to extremes. Having told the program that my data disc was in drive one I still kept getting prompts to put my data disc into drive one.

Unfortunately there were other examples of this worthy but irritating trait, such as being warned that I hadn't saved a file when I'd made no changes to it.

Perhaps the worst thing about the program, is the menu design. In a package with many features it is vital to get the flow of logic through menus correct, otherwise using the program degenerates into a frustrating game of hunt the option. I found the menus cumbersome, inconsistent, confusing and irritating.

For instance you've got a Main Disc menu and two other Main Menus further down. The option number for each varies, so you can never count on, say, two taking you to back up. Escape sometimes gets you up the menu tree but not always.

And some of the program design could have been better. There's no standalone or

turn-key version of Teletype, so that you can boot up a disc and get straight into a simulation, although this would be perfectly feasible. The start-up file goes some way towards it but to run a simulation you have to:

- Enter drive for data (if not drive 0).
- Choose Load Teletype option.
- Specify start-up file.
- Select Begin messages.

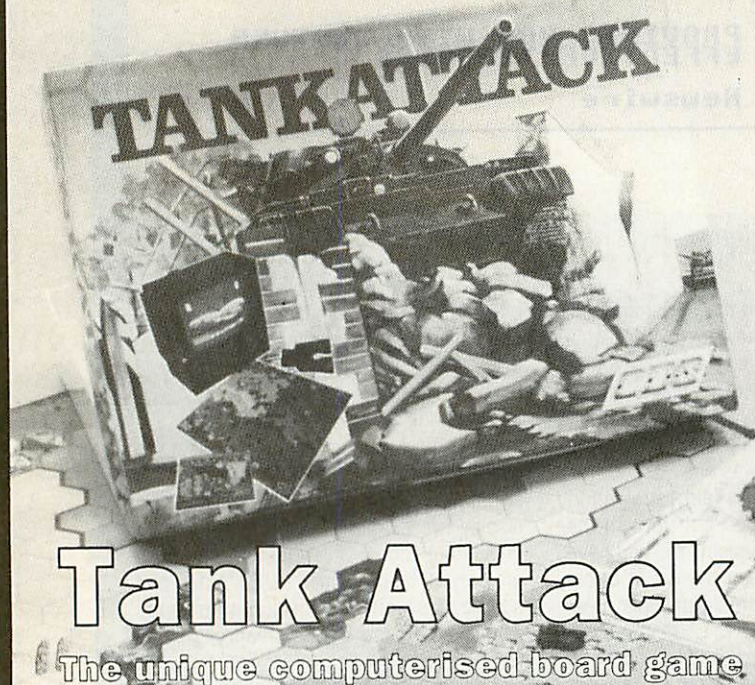
And Start-up files don't allow you to specify sound on/off or the drive for data – yet it could do so easily and make life a lot simpler. Still, once you've mastered the menus, Teletype functions well. My pre-production version had only one or two minor niggles which were on their way to being sorted out.

And the idea is both original and capable of wide application in the curriculum. Whatever your subject, you're bound to find an application for Teletype. I strongly recommend you to take a look and see.

Summing up

Teletype is an excellent program concept with lots of useful features but it is let down in the creation process by poor menu design and lack of standalone operation.

THE MICRO USER Reader offers THE MICRO USER Reader offers



Tank Attack is a computerised board game for two, three or four players, where each one takes the role of a General commanding a country's Tank Corps of one or more armoured divisions.

Your objective is to capture the enemy headquarters, which will require the planned strategic deployment of your forces and regular fire duels between your own and enemy units.

Weather, morale, skill, judgement, planning foresight, careful management of rebuild and repair facilities and luck all play a part in deciding the result of each game.

Tank attack is one of those games you keep coming back to, and at the special offer price of only £12.95 is guaranteed to give you and your friends hours of action-packed excitement.

- Control a full division of tanks and armoured cars
- See all the fighting 'live' on your computer
- Superb board and fully detailed playing pieces
- Real time graphics
- Play as allies or enemies
- Suitable for all ages

TAPE
£9.99
40t/80t DISC
£12.95

Place your order today, using the form on Page 114

After his little April joke the Mad Hatter comes clean and continues his exploration of Viking lands

Confession time

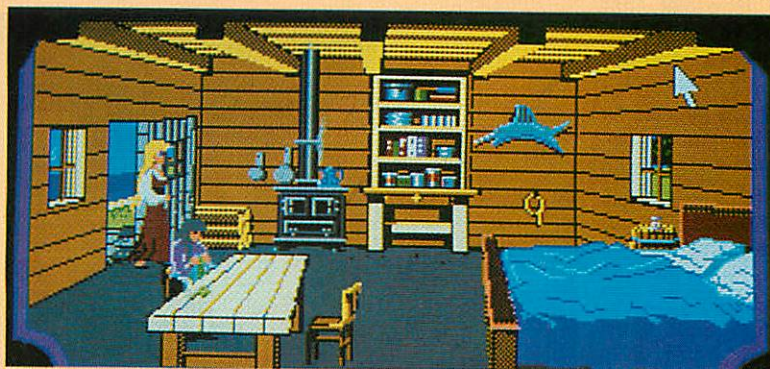
TO forstall furious fans – that is if I am fortunate enough have any left after last month's look at *Erik the Viking* – let me put you right regarding the Enchanter's Maze.

It was, after all, only a *little* leg-pull: I reversed the proper directions you needed to solve the maze. So, if you hadn't worked that out, here is the correct sequence: Ahead, right, left, left, ahead, left, open door. Actually the maze wasn't all that difficult anyway, since Red usually denotes politics of the Left and Blue those of the Right – in this country, anyway. As he used Yellow to mean Ahead, perhaps Pete is Liberally inclined.

We start this month's exploration at the Stone Quay, with the Golden Road to the north and the Spell Hound around. Four moves north will take you to the Throne Room and you'll get some threatening words from Al Kwasarmi. Ignore these and open the oak chest anyway – to reveal the jar, flask and spittoon.

Now Al Kwasarmi starts to bargain: He'll help you if you bring him six objects – if you can call *the sound of a cat moving, a woman's beard, the breath of a fish, some bird's spittle, the roots of a mountain and the sinews of a bear* all objects. Don't forget to investigate the throne – one move north – before returning to the Golden Dragon.

It's time to sail to the gravel beach, so move E, N, N, N, N, N, E, E and E. Take the spittoon and the boiled mutton and



Kings Quest IV

climb up and up to the cliff edge and then up again to the ledge with the untidy, smelly nest on it. You will be able to take the polished bent stick and the bracelet once the eagle has used the spittoon and you have given it the boiled mutton.

Back you go to the ship once more, and this time your destination is the Loch. Travelling S, W, S, S, E and S will get you there: Arm yourself with the jar or flask and the bent stick and go south and east to the grassy bank.

The bent stick turns out to be a boomerang – so throw it – and blow me down if you don't collect the amulet. Now fill your jar or flask at the pool: Examination will show that it is now full of mineral water.

It's time to move NE into the tower and then continue up until you reach the tower room in which is the gold ring. Take the ring – though Tony Marter says it is of no use in the game – and return once more to the Golden Dragon.

Your next destination is the sandy shore. So go N, W, W, N, N, W, W, N and W. Essential equipment this time consists of the spade and the jar or flask containing the mineral water. North of the sandy shore

is a fertile valley and a stone tree. Shake the tree so that a stone fruit drops from it. Now take the fruit, plant it and water it with the mineral water. Then stand back amazed as the fruit grows into the mountain roots that you need as part of Al Kwasarmi's bribe. After that, you should return to the ship and await further orders.

(To be continued next month)

Problem Corner

Todd Newman is going crazy with frustration in *Lord of the Rings* part 2a. Why do all the hobbits' swords vanish when this part is loaded? Beats me. Does anyone have an answer – apart from it being another bug? If it isn't, what is the swordless way of tackling the tentacles?

Another reader, S. Deas, needs help in *Kings Quest IV*. The only way of getting this running is on the Archimedes PC Emulator: How does he help the baby ghost in the old house? Can anyone supply the answer please.

Hatter's Helpline

A sprightly Norfolk dumpling, who wishes to be known as Foztek, points out something of interest in the parser of *Bored of the Rings*. Try entering IAN, WILL, FERG, HCW, MSX and REM for a bit of fun.

In my solution to *Lords of Time I* made two omissions in Level Six: One was deliberate and the other accidental.

The path through the Hedge Maze should include going north just

before the final move SE.

The deliberate omission concerned the jester's cap and, since a number of you have been unable to work out what to do, here is the correct procedure: Go to the south end of the long room where the cards and bell are. Shuffle the cards to produce the joker and discard the rest.

Ring the bell to summon the jester, give him the joker card and he will give you the cap. Look out for a seri-

alised treatment of Dodgy Geezers which will start next month, thanks to Barbara Gibb.

Stephen Burge has written asking where he can get disc versions of a whole pile of adventures.

If they aren't on current release, the best advice I can give anyone is to put a *Wanted* advertisement in the back of this magazine – insist on originals – and to keep an eye open for games on offer there, too.

Elite Antics

Jonathan Stanton finds Galactic Hyperspace a problem because you always land up in an Anarchy system. As a cure, he exploits a rather obscure bug in his disc version but I couldn't find it on either of my two discs, so let's look at a simpler answer if you aren't anarchically inclined.

Just activate your short-range chart and choose another system the moment you emerge. However, that won't help you in Mission One, as there is an exception to the rule here: You aren't actually targeted on an Anarchy system when, in pursuit of the stolen Constrictor, you emerge from the depths of Galactic Hyperspace.

But you *must* visit the Anarchy system shown by your short-range chart once you emerge in Galaxy Two if you are to get the next message giving the ship's whereabouts.

Ian Duffy is another reader who has encountered our mystery ship – which I think should be christened the Cloak and Dagger ship.

He has made some observations which include the point that the ship has extendable wings, giving enhanced manoeuvrability. Ian encountered it in Galaxy One while on an extended bounty hunting spree.

Dennis Hartley has several comments on the Tube version of Elite and of particular interest may be the fact that you can save a screen to disc when the game is paused by pressing Control+D.

A moan is the slowness of the docking computer: My own tactic here is to get as close to the space station as possible, line up and only then engage the docking computer so that all it has to do is match the space station's rotation.

Charles McEvoy passes on a tip for anyone interested in having combat experience against Thargoids: It is possible to enter witch space deliberately on most attempts if you carry out the following instructions.

Launch as normal – as though you were going to hyperspace to a target system – and then pause the game. Now if you press Control+X you should hear a beep. Restart the game, press H as usual, and then press Control+X again, keeping them pressed until you enter hyperspace.

You should get the double screen effect that indicates you are entering witch space, and then there are lots of lovely hostile Thargoids waiting to donate plenty of Alien Items.

This worked most times for me with the

normal 32k version and the Tube one as well, and since Charles has a Master 128, everyone should be able to go Thargoid bashing at will.

Incidentally, Charles has done something that I never even thought of attempting – flown out of witch space without hyperspacing. Mind you, it took him over three hours at full speed – that's dedicated

escape capsule to wipe his record clean. I always thought it was the old who led the young into bad habits. Seems I was wrong.

While dealing with juvenile delinquents, readers might be interested in the experience of Jonathan Sutherland, who lives in Shetland.

This canny lad blasted away at the space station at Lave, and then proceeded to wipe out the vengeful Vipers. As the last one was destroyed, Jonathan reports that lines appeared over the screen as if the screen was breaking.

This effect vanished along with the Viper and he hyperspaced to Zaonce – to find he was Cr. 3603.1 better off. Jonathan has the second tape version that was released.

J. Langford offers an Elite speed-up tip: Provided there are no ships on the scanner – he doesn't mention the Cloak and Dagger – try pressing f6 – the Data on System report – and the game should double its speed.

Mike Jordan has seen the C and D ship on his Tube version three times

– so there's hope for poor old me yet. Mike also suggests the following tactic for rock hermits. The asteroid looks like a normal one, but it doesn't blow up at the first hit – a ship is launched instead. Take the ship out, blow up the asteroid and then pick up all the goodies floating around. Don't forget that rock hermits are only found on the Master 128 and Tube versions of Elite to the best of my knowledge.

Matthew Aldridge dealt with the C and D ship by using a missile at very close range to foil its ECM system – he only had pulse lasers at the time. One reader says that this ship is energy bomb proof – does anyone care to dispute this?

John Horseman refers to an Elite cheat in a letter but gives no details. Can anyone enlighten me or (better still) send a copy of the program so that I can work out exactly what he is referring to?

Paul Weatherall has had small brother problems. In Galaxy Two he docked at Reveve to find the message initiating Mission One awaiting him – and small brother cleared the screen before he'd finished finding out where he should go to.

I'm guessing at the destination – Cearso – but can advise Paul that he should equip himself with a military laser in order to penetrate the Constrictor's armour. If any reader has started Mission One from Galaxy Two and has a different starting point, I'd be glad to hear about it



research for you.

Paul Downes offers some advanced tips on anti-Thargoid tactics for those who want to go bounty hunting for Thargon drone ships. Incidentally, Paul says that there is a maximum to the number that can be harvested at one go – 200 is the bag limit, irrespective of the amount of cargo you are carrying in the hold.

Anyway, Paul believes in putting your naval energy unit and military lasers to fullest use and he writes:

When entering Witch Space, accelerate to maximum speed and take on the mother ship at 2 o'clock high. Accurate fire should destroy it quickly. Let the shields absorb incoming fire more than one would normally allow. The naval energy unit really performs better than one would expect.

He recommends using the same evasive tactic as the Thargoids themselves – a sustained climb while weaving from side to side coupled with rapid speed changes are very effective. As a finale, Paul suggests that once the mother ships have been destroyed readers activate their docking computer and see what happens.

Alexander Hayward, a child of tender years, seems to spend most of his spare time tempting Vipers to their doom by first blasting the space station he has just quit and then zapping the police.

When he's had enough he uses his



MULTISTORE

- THE DATABASE

A multi-tasking, relational database allowing many database files to be opened at one time. Files may be linked so that relationships between files are automatically tracked. Rapid searches by any criteria, including 'sounds like' facility. Key fields for fast search, indices to allow file browsing in more than one order without sorting. Fast sort facility by single field or complex expression. Comprehensive reporting facilities allow any report, including totalled lists of fields, labels with multi-font capability, line trapping, justification, paging, multi-set stationery and even completely relational reports.

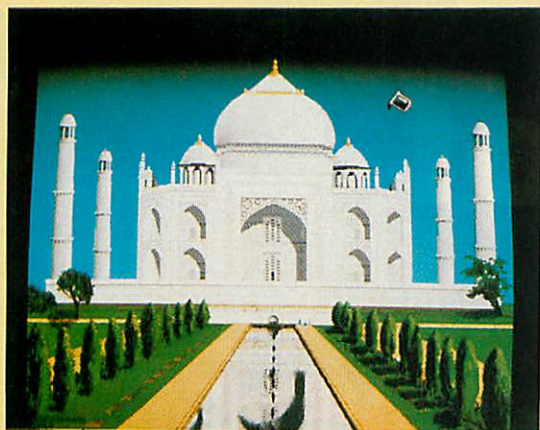
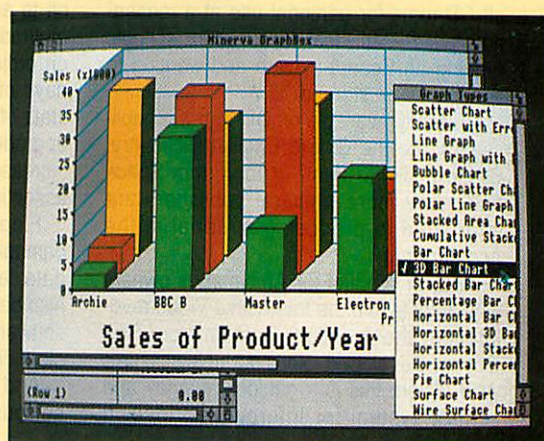
£299.00

GRAPHBOX

- THE GRAPHICS

With twenty graph types and its multi-tasking capabilities GraphBox is one of the most flexible packages for the Archimedes. Enter data through Graph Edit or drag data in from any other legal multi-tasking software and produce a graph which can then be exported to a wordprocessor or DTP package. GraphBox gives you a professional graph in a matter of minutes, whether you require a simple scatter or a more complex polar chart. These features plus the ability to enter formulae on the X, Y or Z axis and save it to the Acorn Draw or Edit applications make GraphBox an impressive data presentation package.

£79.95



ATELIER

- THE STATE OF THE ART

An art package in a class of its own, Atelier exploits the 256 colour capabilities of the Archimedes. Stunning graphics can be created easily and professionally. Atelier is multi-tasking which means your pictures or artwork can be exported to a DTP package by simply dragging them across. Comprehensive sprite editor, undo brush, patterns and definable brushes. Extremely smooth fill routines, ability to import digitised images and advanced features which allow you to wrap images onto any definable 3D shape coupled with the Sequencer to animate your images - only your imagination can hold you back.

£99.95

PROFESSIONAL SOFTWARE FOR THE ARCHIMEDES & A3000

All prices include V.A.T.



SOFTWARE

69 SIDWELL STREET, EXETER EX4 6PH. TEL: (0392) 437756 FAX: (0392) 421762

THERE can be no doubt that CD roms are the storage medium of the future. Super speed and vast storage capacities are now becoming available for the Archimedes range. Once you've tried one you'll wonder how you ever managed without it.

The latest to be released, the 550Mb Acorn unit was Developed jointly with NeXT Technology Corporation of Cambridge. The drive will play standard audio CDs, conforms to the industry standard High Sierra specification and costs around £600 for the player itself.

But you'll also need a Small Computer Systems Interface – SCSI (pronounced scuzzy) – costing £150.

NeXT Technology offers to produce one off CD-roms for personal use at a reasonable price – an ideal resource for schools running an Econet system and wanting to economise on storage.

Currently available on CD-rom are publications like the Oxford English Dictionary, British books in Print, Images from Space and many more. Several publishers are interested in producing material in the Acorn format.

Another product for Archimedes owners who want to join the Interactive Video revolution is the Archilock system from Soft Option. Developed jointly with Newcastle's Wild Vision, this is a genlock, overlay and control system for Interactive Video. It

allows Archimedes text and graphics to be mixed with external video pictures from video tape, videodisc or camera. With it video and graphics can be faded and colours made transparent, giving very flexible control over the output.

Imagine, however, being able to use your micro to control your music, and eventually video as well. Games could be marketed on CD-rom, making use of high quality sound and music, still and moving video frames and computer graphics, all controlled by the software stored on the same, incorruptible disc.

History

When the home micro was first launched on to an unsuspecting public the standard method of storing programs and data was on ordinary cassette tape. In those far-off days of computing cassette tape was the state of the art. Since then most of us have upgraded to floppy disc, the advantages of increased speed and random access being essential for serious applications.

Floppies, however, are easily lost or damaged and can only hold up to 800k of data, even on an Archimedes. They can also be noticeably sluggish when used with software such as a database requiring constant disc access.

And so today many of us are probably seriously considering, or have already

opted for, a hard disc. This is reflected in the A400 series Archimedes, two of which incorporate a 20 or 50 megabyte hard disc as standard. The A410/1 comes with a built-in hard disc controller and the drive can be bought for less than £500.

The immediate future then would seem to lie in hard disc storage, at least for those requiring more and more performance from their machines. Let's face it, isn't that why you want an Archimedes in the first place?

Advances in storage technology have produced advantages which will be felt most keenly by those applications which rely heavily on the storage of large amounts of data – mainly databases and database-related software, but including CAD and other image manipulation software which tends to be storage intensive.

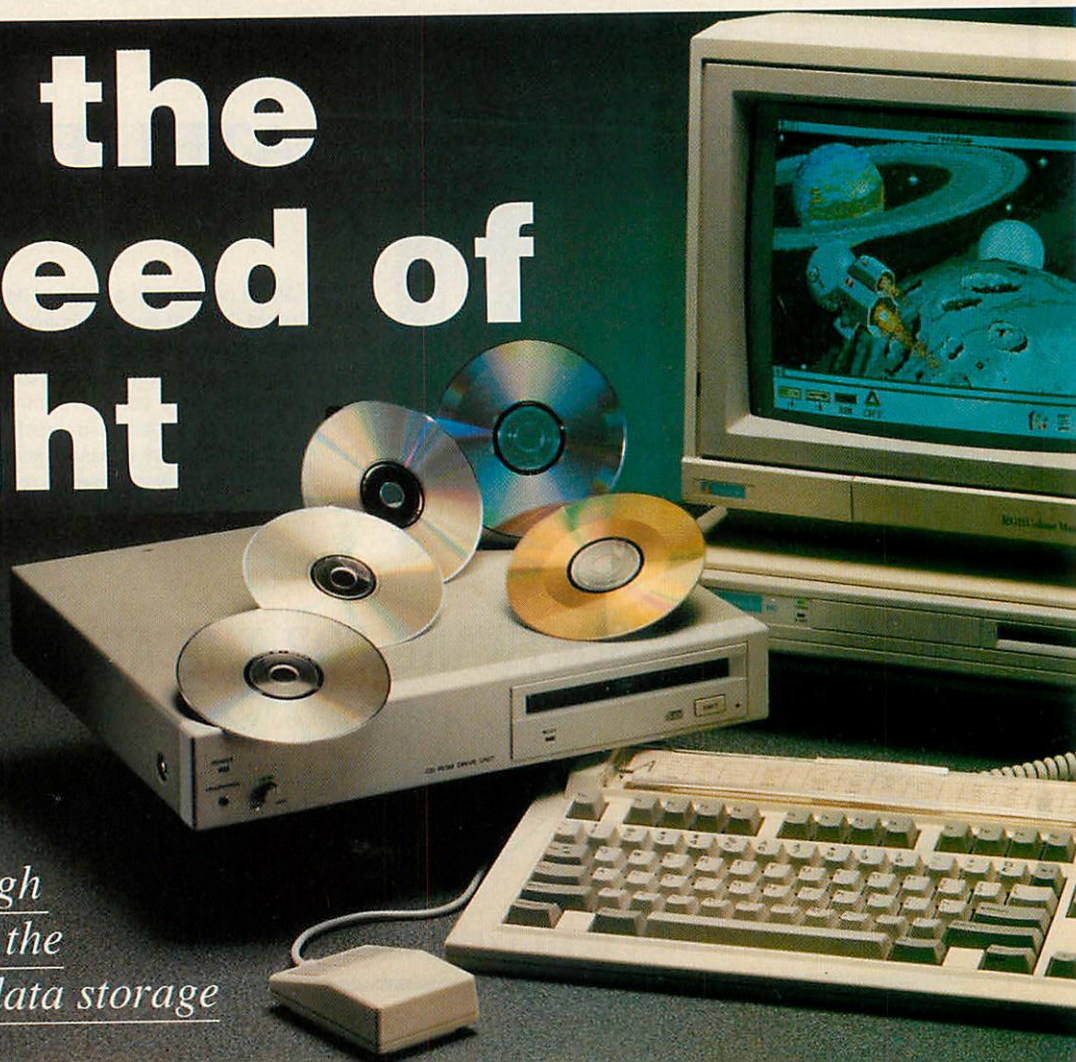
However, there are still many applications requiring mass data storage which, at present, are not suitable for computerisation. Applications such as component catalogues – car parts for instance – require not only text to be stored in the database but also large amounts of diagrammatical or pictorial data.

Further examples would be medical records which may include X-rays and other applications requiring photographic detail such as lists of properties available in an estate agents, reference material on birds, animals, plants, fish and so the list goes on.

Philips, the Dutch electronics company,

At the speed of light

*Ray McCullough
peers into the
future of data storage*



has for several years been at the forefront of optical storage technology. The first result of its research was the release, with Sony, of high quality compact discs and players for audio use. Sound information is converted to digital data and stored as a series of zeros and ones on the disc surface, thus allowing exceptionally high quality reproduction of music and vocals.

In 1986 – 900 years after William the Conqueror and the Domesday book – the BBC, together with Acorn and Philips, completed a two-year project known as the Domesday system. Philips' contribution featured the LaserVision videodisc player, developed especially for the project, thus heralding the era of optical disc computer storage. The whole system is driven by a Master.

The system uses a 12in optical disc holding 300Mb of data on each side. Information includes text, the software to control the system, Ordnance Survey maps of the whole of the UK, more than 50,000 photographs plus sound and video sequences.

This technology is commonly referred to as CD-rom, although sometimes also known as LV-rom. The original system contained two laser discs. Since then several additional ones have been produced, including topics such as ecology – a video tour of a nature reserve – volcanoes and industrial and management training packages. These discs open up a whole new

world of interactive video to users.

Recently we have seen the introduction of compact disc video, which reproduces not only high quality sound but also video output. The quality is greatly enhanced due to the fact that the data is stored digitally – still frames, for instance, are of the same standard as the moving video sequences. All this is now available for about £600.

The same type of disc is used to store data for CD-audio, CD-video and for CD-rom, although different disc sizes are employed, from 4in to 12in. The disc is manufactured of moulded polycarbonate plastic with a reflective aluminium coating on either side. Pits are created in the surface during manufacture, which cause a reflective or non-reflective spot in the aluminium layer.

Each bit of data, zero or one, is represented by one of these spots, more than five million of which can be stored on a single disc.

This data can be read by a low-power laser beam, enabling the data bits to be placed very close together – only 0.6 micrometres apart – the average integrated circuit has circuit lines more than one micrometre apart.

This makes possible a storage capacity of more than 500 megabytes per disc.

The discs cannot be written to by the user – hence the term Compact Disc Read Only Memory – and are therefore only suitable as a publishing or distribution medium.

And it is not possible to use CD-rom for your personal data storage.

But, there is still quite an advantage, as the discs themselves cost only around £5 each and can store such a large amount of information.

A typical CD-rom will store 250,000 pages of text at present – approximating 1,000 floppy discs. Future developments will increase this by four times to one million pages – enough to fill several filing cabinets.

Worm

Better still would be a system which allows data to be written to the disc, as well as retrieved. Worm discs – Write Once Read Many – can be written to only once but can be read over and over again. They behave, therefore, in a very similar way to prom devices and cannot be erased.

Here the optical drive contains two lasers. The high-power unit is used to write to previously unused areas of the disc surface. The information recorded is read using the normal low-power laser as with CD-roms.

Using Worm drives for data storage will result in many permanent copies of files – which can be an advantage in some applications. Regular backups can be made to hard disc or floppy with a final optical backup at the end of each work session. In practice, although many files are created, it will take quite a while to fill 500Mb of stor-

age, and when the limit is reached it is simply a matter of copying the required files on to a new disc and carrying on from there. Worm drives are available at present for IBM-compatibles – Archimedes and Master 512 users take note.

Magneto/optical

There is yet another type of optical system, the magnetic/optical drive, referred to as MO. These discs behave like ordinary floppy or hard discs and can be written to over and over again. The process is very similar to an eeprom – electrically erasable, programmable read-only memory – but instead of an electrical signal a magnetic field is used to rewrite the data.

Again, separate lasers are employed. The magnetic field is switched to represent zeros and a high powered laser is used to melt a very small area of the disc surface which then aligns itself magnetically with the existing field. The molten area solidifies immediately and is permanently set to zero.

All of the required bits are set to zero and the field is then switched through 90 degrees so that the "ones" can be written in the same manner. As with previous methods, the disc is read using a low-power laser. The disc is not susceptible to magnetic fields after it has been written to and can be stored near a speaker or monitor without danger of corruption.

At present these MO drives are available only for mainframe and mini computers and are extremely expensive – £9,500 for the Infinity system from Alphatronix, running on Vax and MicroVax equipment. These drives use a 5.25in removable cartridge with 650Mb capacity.

And next...?

The future, then, would seem definitely to include optical storage and we may well be using CD-rom, Worm drives or even MO storage before very long. This will have the effect of opening up many new areas to computing.

Interactive video is already becoming popular for commercial and industrial training, where the learner, for example a trainee doctor, can make his mistakes without endangering life and property.

Further educational establishments should already be investigating this technology if they wish to compete in the training market of the future.

Archilock: Price: £495 from Soft Option, Elmtree Road, Teddington, Middx, TW11 8TD. Tel: 01-977 0272

CD-rom: NeXT Technology Corporation Ltd, St John's Innovation Centre, Cambridge, CB4 4WS. Tel: 0223 341180

Interactive Video in Education, National Interactive Video Centre, 24 Stephenson Way, London, NW1 2HD. Tel: 01-388 3510



Write your own arcade smashes using the

ARCADE GAME Creator

Arcade Game Creator is a suite of programs for the Electron and BBC Micros. Taken from the pages of *Electron User*, it lets you into the secrets of writing fast-action arcade games, and provides you with a number of utilities to make design and programming easier.

Among the programs are:

- A Mode 5 sprite editor that lets you design your own multi-coloured 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 8 bytes!
- Scrolling maps.
- Score update and printing routines.
- ... and much, much more.

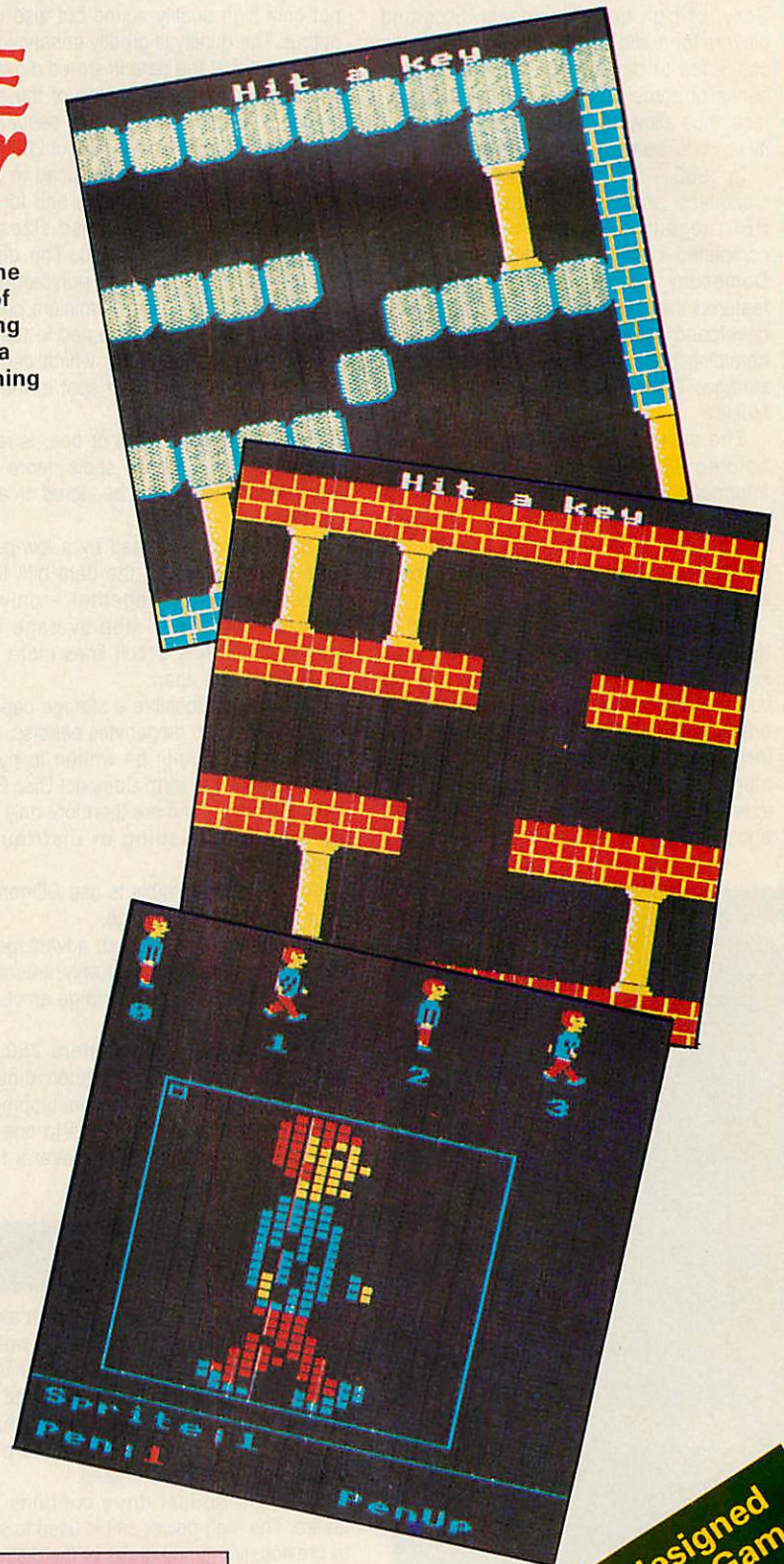
To help you make the most of the Arcade Game Creator, you will also get a comprehensive manual based on the original series.

Written in an easy to read style and with many illustrations and screen shots, it contains all the information you need to create and animate sprites, to design backgrounds and to link the two together into a complete arcade game.

If you are an aspiring games programmer, this is an offer you simply cannot afford to miss!

Arcade Game Creator

Tape + manual£9.95
Disc + manual£11.95



Screens designed
using Arcade Game
Creator

Place your order today, using the form on Page 119

PUBLIC APOLOGY

M.D. Office Supplies would like to take this opportunity to apologise to all its competitors. As always we will supply the highest standard Discs, Storage Boxes, etc. at the lowest possible prices. **IN FACT WE GUARANTEE IT.**

JUST LOOK AT THESE PHENOMINAL OFFERS

3.5" DISCS & BOXES

25 3.5" DS-DD 135 TPI WITH 100 CAPACITY LOCKABLE STORAGE BOX	£21.95
35 3.5" DS-DD 135 TPI WITH 100 CAPACITY LOCKABLE STORAGE BOX	£29.95
45 3.5" DS-DD 135 TPI WITH 100 CAPACITY LOCKABLE STORAGE BOX	£34.95
55 3.5" DS-DD 135 TPI WITH 100 CAPACITY LOCKABLE STORAGE BOX	£39.95
65 3.5" DS-DD 135 TPI WITH 100 CAPACITY LOCKABLE STORAGE BOX	£44.95
75 3.5" DS-DD 135 TPI WITH 100 CAPACITY LOCKABLE STORAGE BOX	£49.95
150 3.5" DS-DD 135 TPI WITH 2, 100 CAPACITY LOCKABLE STORAGE BOXES	£89.95
200 3.5" DS-DD 135 TPI WITH 2, 100 CAPACITY LOCKABLE STORAGE BOXES	£99.95

OUR 3.5" DISCS ARE VERY CAREFULLY SELECTED TO GIVE YOU 100% ERROR FREE PERFORMANCE. EACH DISC IS OFFERED WITH OUR 100% MONEY BACK GUARANTEE AND IS SUPPLIED WITH LABELS

5.25" DISCS & BOXES

25 5.25" DS-DD 96 TPI WITH 100 CAPACITY LOCKABLE STORAGE BOX	£12.50
50 5.25" DS-DD 96 TPI WITH 100 CAPACITY LOCKABLE STORAGE BOX	£16.50
75 5.25" DS-DD 96 TPI WITH 100 CAPACITY LOCKABLE STORAGE BOX	£22.50
100 5.25" DS-DD 96 TPI WITH 100 CAPACITY LOCKABLE STORAGE BOX	£28.50
200 5.25" DS-DD 96 TPI WITH 100 CAPACITY LOCKABLE STORAGE BOXES	£52.99

OUR 5.25" DISCS ARE VERY CAREFULLY SELECTED TO GIVE YOU 100% ERROR FREE PERFORMANCE. EACH DISC IS OFFERED WITH OUR 100% MONEY BACK GUARANTEE AND IS SUPPLIED WITH LABELS

HIGH DENSITY 3.5" DISCS

10 DS HD 3.5" DISCS	£18.99
30 DS HD 3.5" DISCS WITH 50 CAPACITY BOX	£49.99
50 DS HD 3.5" DISCS WITH 100 CAPACITY BOX	£69.99
100 DS HD 3.5" DISCS WITH 100 CAPACITY BOX	£119.99
150 DS HD 3.5" DISCS WITH 100 CAPACITY BOX	£164.99

HIGH DENSITY 5.25" DISCS

25 5.25" DS HD 1.6Mb plus 50 BOX	£19.99
50 5.25" DS HD 1.6Mb plus 100 BOX	£37.99
75 5.25" DS HD 1.6Mb plus 100 BOX	£51.99
100 5.25" DS HD 1.6Mb plus 100 BOX	£64.99
150 5.25" DS HD 1.6Mb plus 2,100 BOX	£89.95
200 5.25" DS HD 1.6Mb plus 2,100 BOX	£109.95

BULK BUYERS - BULK BUYERS - BULK BUYERS

For all you large users we have some excellent bulk rates on our superb diskettes

250 DS-DD 135 TPI	£120.00	600 DS-DD 135 TPI	£258.00
350 DS-DD 135 TPI	£160.00	750 DS-DD 135 TPI	£315.00
500 DS-DD 135 TPI	£220.00	1000 DS-DD 135 TPI	£395.00

As always Lifetime Guaranteed and 100% reliability

NEW EXCITING PRODUCTS

3.5 Stackable 150 Capacity Lock Box	£19.95
5.25 Stackable 180 Capacity Lock Box	£19.95
3.5 Atari External Drive	£79.95
Ultra quiet, reliable, excellent value, Universal Printer Stands, 80 column	£7.95
2-way Manual Data Switch available as RS232 or Centronics (please state)	£12.95
Atari Printer Leads	£5.95

PRICE & QUALITY GUARANTEE

We pride ourselves on offering you the very Highest Quality products at the best possible prices. If you should ever see a comparable product offered cheaper in this magazine DO NOT HESITATE give us a call because we won't match it.

WE WILL BEAT IT - GUARANTEED



Trade Accounts Welcome

M.D. OFFICE SUPPLIES

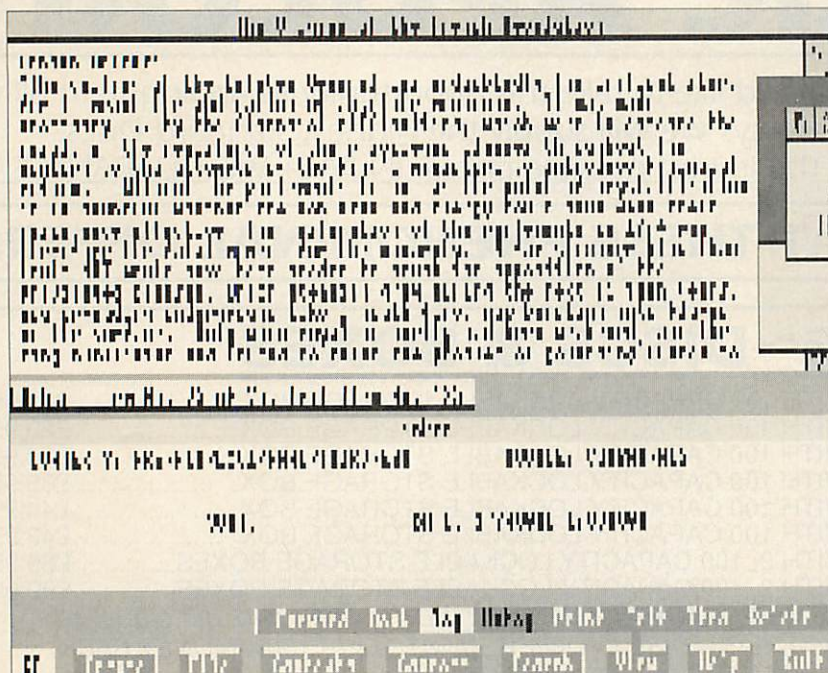
18 CRESCENT WAY, FARNBOROUGH, KENT BR6 9LS

TELESALES HOTLINES: 0689-61400

All prices include VAT and Delivery UK only. E/OE



Education Orders Welcome



Knowledge Organiser in action

The fruit of learning

Product: Knowledge Organiser
Price: £59.99 (£40 for upgrade from Arc-TFS)
Supplier: Clares Micro Supplies, 98
 Middlewich Road, Rudheath, Northwich,
 Cheshire CW9 7DA.
 Tel: 0606 48511

KNOWLEDGE Organiser – KO – the free text relational database recently released by Clares Micro Supplies, is a rewrite of the original Arc-TFS by Sean O'Conhail. Although it is completely compatible with databases which were created with Arc-TFS, the upgrade has significantly increased both the utility and appearance of the original.

KO does not use the standard Risc OS user interface, but has one which is similar to Arc-TFS which was originally designed to work under Arthur.

The interface is not difficult to learn but it does mean yet another technique with which to come to grips.

Clares seems to have done this with a number of its packages, and frankly it detracts from what are often excellent applications. If Risc OS is the best Wimp

system in the world for micros and the easiest for programmers to work with, why not use it?

When you first load KO its icon appears on the icon bar and when this is clicked the application takes over the whole machine. As long as there is sufficient ram any applications on the icon bar will remain and be accessible when you exit KO.

The size of database it can handle is limited only by the disc space available. The creation procedure for each new database requires you to specify the expected size and value of a number of parameters adjusted by use of the mouse. It would have been more convenient to allow direct entry via the keyboard as well.

Six parameters can be changed, all affecting the amount of space required for each database:

- The maximum length allowed for Context code explainers. As each code is created, an explanation field is linked to it.
- Number of context codes to be used.
- Maximum permissible length of the source code descriptions.
- Number of sources to be filed.
- Average length of each of the text items.
- Number of text items.

Source codes can be up to 10 charac-

On the icon bar

*Lawrence
 Brightman explores
 free text databases
 and sees how the
 only Archimedes
 offering compares
 with its MSdos
 counterparts*

ters long, while context codes can be up to six. Further user-defined search/data – linker – fields can be specified and you can specify the length and placement of their windows using the mouse.

Although no limit is given for the number of these additional fields, it should be remembered that they will take up disc space, as each field is given space for each entry so this will be a factor in their number, especially if disc space is limited.

Although the average length and number of text fields is specified during the installation process, KO is quite flexible, allowing either longer or shorter entries up to a maximum of 200 lines.

It can search files created using Clares' Graphic Writer, Acorn's First Word Plus or Colton's Pipedream, or any Ascii files, although it will only display the first 200 lines.

A very sophisticated text referencing system could be established using KO in connection with any of the above word processors or Ascii files, with Risc OS allowing easy access both ways between KO and the word processor.

Although KO allows editing of Ascii text fields as you view them, the text files from these word processors cannot be edited within KO but only viewed or their text

printed for the first 200 lines.

In the other direction there is full capability to export any Ascii files created or edited using KO's editor into the different formats of the above word processors.

Facilities are similar to those in Arc-TFS, so a previous user of the latter can be up and running with KO in short order. No programming is involved – in fact, the structure and use of the database is one of the easiest I have seen.

Searches can be conducted using any fields defined for that database. One field is specified at a time, but additional searches can be done on each subset, thereby allowing AND/OR searching within, and in addition to, the subset which was obtained on previous searches. The results of searches can be individually tagged to make further subsets for later searching.

The contents and pointers of the context and source fields are loaded into ram when the database is called up, so searches are speedy.

Text string searches within the text field are done through disc access, which will be significantly slower, unless a fast hard disc or ram disc is used.

Once the search fields are selected and the codes or words specified for each selected field, KO goes through the entire database, counting the number of text entries located.

The search completed, each entry can be viewed, edited and printed via the View menu, moving forwards or backwards within the subset selected by the Search routine.

Unfortunately, when text is searched and found it is not highlighted, so you can only be certain it's there somewhere on the screen.

Editing is allowed while viewing, as is tagging which can produce a resident subset that can also be searched.

Printing is allowed as well at this stage, either of the Linker fields or the text field too. Text can be imported or exported using any of the word processors mentioned or Ascii files.

In addition, files can be either directly or indirectly loaded using a Z88 and a serial link.

If files are imported rather than just viewed editing is allowed, but they will be kept to a maximum of 200 lines each. If you attempt to load a file larger than this, you are warned, and if you persist, only the top 200 lines will be saved as an import.

A DeKode utility enables use of any word processor file containing Ascii data for importation – it simply strips out any non-Ascii characters. In addition, files from three online databases, Infocheck, Neris, National Educational Resources Information Service, and Prestel, can be loaded directly into DeKode for importation into KO.

As DeKode has been designed to be expandable, Clare's is interested in anyone who writes a Basic routine for other semi-Ascii file types, for inclusion of their routine within DeKode.

Facing the competition

How does OK compare with MSdos free text databases like Textmaster, Gofer, Turbosearch, Magellan, Viewlink and Zyindex?

With many of these packages, the files which constitute the database have to be indexed first, allowing faster searches than could be done using straight disc accessed string searches but subsequent additions requires re-indexing.

All read Ascii files and perhaps two or more word processor files directly, and possibly dBase databases.

Keywords are used in some, while others depend only on Boolean text searches, although, as in Gofer, these searches can contain three or four words in one search, with AND, OR, NOT and NEARBY searches possible.

Graphics can be used, to a minimal extent with Textmaster and Magellan, which can be used for other purposes than free text databases, allows the viewing of Lotus spreadsheet files.

KO's main limitation is the inability to view a file's graphics contents – although only in comparison with Textmaster – and the limiting of a search to AND/OR relationships, although it may be argued that NOT and NEARBY have limited usefulness.

On the other hand, none of the MSdos packages allowed specification of user-defined linker fields, which KO does.

KO has a form of indices in the use of these linker fields, and as they are loaded in ram, searches on them are as fast as possible.

The MSdos packages lose speed because their indices all have to be disc accessed, their antiquated limit of 640k coming into play here.

However, their indices are based

on the text files rather than separate linker fields.

KO's searches of the text fields are only normal string searches, which take longer than indexed files but more are generated.

The organisation made possible by the use of user-defined linker fields in KO is superior to the organising capabilities of all the MSdos packages, which also require at least as much of a learning curve as KO for you to become accustomed to their use.

Although KO has that 200 line limitation, in relation to the limited field display on the other packages this really isn't a problem.

There is lack of highlighting of selected text search strings within KO's text field, which was present, however, in most of the MSdos packages. The ability of some to search databases is not a real factor, as KO could search other Archimedes databases as well, depending on whether or not their data was in Ascii form.

It would be useful to be able to search spreadsheets, but most of the MSdos applications could not do so either, their ability being limited to searching the spreadsheet file names or labels – Magellan was able to search entire Lotus spreadsheets. Most spreadsheets can be converted to text files, so this is not a real problem anyway.

A limitation of some, but not all, of the MSdos packages lay in their unreliability regarding large numbers of files, in which either searches were not correctly carried out, or fell over with an error message.

KO does not have this limitation, at least with the number of files I searched, as long as the data was in one of the word processor or Ascii formats mentioned.

Summing up

KO is a significant improvement upon Arc-TFS and is very good value for money. It could be further improved by the use of highlighted search strings within located text fields, and perhaps by allowing viewing graphics in scanned text files. It would also be an aid to see more than 200 lines within a text file.

But these are not vital, and KO provides well for most eventualities and requirements of a free text database.

It also compares well with MSdos free text packages, either being as good as or better than them in most applications. This is despite the fact that they are in most cases much more expensive.

KO can be used by anyone requiring to store lots of text items, the organisation of which has gone beyond simply using directories and searches using word processors or outliners. It would be an aid for any researcher or student.

**10% DISCOUNT
ON ALL SOFTWARE
PURCHASED OVER A TWELVE
MONTH
PERIOD WHEN YOU
BUY HARDWARE
FROM US**

A3000 STARTER KIT
A3000
MONITOR (COLOUR)
WITH A FREE PRINTER
WORTH OVER £200.00
£925.00 + VAT

A3000 UPGRADES

A3K1 Monitor Plinth	£24.95
A3K2 System Housing	£69.50
A3K3 External Podule Case	£14.95
A3K6 Disc Buffer Board	£48.95
A3K8 3.5" Additional Floppy Disc Upgrade	£75.00
A3K9 5.25" Additional Floppy Disc Upgrade	£99.95
A3K12 65 Host DFS and DFS Filer	£19.95
A3K7 Hard Disk Upgrade (inc controller card)	£429.50

ARCHIMEDES

Archimedes	Price
A3000	£649.00
410/1	£1199.00
420/1	£1699.00
440/1	£2499.00

DISC BOXES

Lockable	
40 Disc	£7.95
100 Disc	£9.95

ARCHIMEDES TELEPAD

Digitiser with mouse, emulation and stylus
pen by CTS **£374.95**

LASERS

MAKE	MODEL	PPM	PRICE
Panasonic	KX-P4450	11	£1436.00
Canon	MK IV	4	£1080.00
Epson	GQ5000	6	£1440.00
Qume	Publisher	6	£2376.00
Qume	Publisher II	6	£1228.00
QMS	Postscript	10	£3422.00
Brother	HL8	8	£1617.00

NOW OPEN!

CALDERGLEN'S NEW
6,000 sq ft Northern office
with approx 2,000 sq ft fully
equipped and totally dedi-
cated to demonstration and
training areas with extra
facilities for education and
business.
Special needs customers also
fully catered for

7 days a week

CALDERGLEN offer a unique service – on
site teacher training for RISCOS, also a
complete training workshop for indepth in-
struction on all hardware including ECONET.
Courses for familiarisation of ART + DE-
SIGN PACKAGES, DTP, SPREADSHEETS
etc. Take the uncertainty out of buying
hardware and software packages – try them
first at CALDERGLEN – Free of charge.

PRINTERS

HYUNDAI			
Model	Draft	NLQ	Price
80 Col HPP 910	216	37cps	£145
80 Col HPP 1810	240	100cps	£212
136 Col 920	216	37cps	£230
136 Col	210	100cps	£277

JUKI			
Model	Draft	NLQ	Price
55 10 (P) 80 Col	180	30cps	£141
7100 24 Wire	288	96cps	£467
7200 CP 24 WAE	324	108cps	£1167

EPSON			
Model	Draft	NLQ	Price
LX800	150	25cps	£244
FX850	200	40cps	£369
EX800	250	50cps	£506
132 FX1050	264	54cps	£482
136 EX 1000	250	50cps	£667
136 PFX 8000	833	80cps	£1367

1 Meg upgrades from £145
A full range of hard disks available from £199

PANASONIC 80 COLUMN

Model	Draft	NLQ	Price
KXP 1081	144	28	£130
KXP 1180	192	38	£178

136 COLUMN

KXP 1592	216	45	£266
KXP 1595	288	61	£368

TEACHERS AND ACADEMICS NATIONWIDE

**Have you missed out
on the special
Acorn teachers
support facility?
If so, phone
CALDERGLEN**

**for their own specially
designed package**

MONITORS

Make	Model	Special price
Philips	8833 colour	£209
Philips	8832 colour	£189
Tandata		£165
Texan 770		£434
EIZO 8060H		£460

If you require any other manufacturers monitors
please ring for a quote

HEALTHCARE

**A complete care manage-
ment system for residential
nursing homes including
drug stock control at point
of administration, cardex,
patients records, personel
accounts with options of
payroll, diary and staff duty
rosta and more covering the
1984 Good Homes Act!**

AMIGA

A500 Computer, Mouse & Modulator
SPECIAL PRICE £365.00 inc VAT

A500 Batman Pack + 10 games and
Photon Paint valued at over £200
AMAZING PRICE ONLY £399.00 inc VAT

At CALDERGLEN we believe we offer a service second to none. Such as full familiarisation of programs, hands on evaluation of hardware, on site programmers to discuss your problems or our service engineer to discuss future upgrades to your equipment. Full training facilities are also available. Private customers and teachers across the country have found CALDERGLEN mean service.

Southern customers will soon be able to enjoy the high standard of service offered to our northern high street education and business customers. See the next edition for full details of our open days at our new southern demonstration + training offices.

MAIL ORDER

Payment by credit card, cheque or cash.

All prices subject to VAT (unless otherwise stated) plus P&P except disks.

CALDERGLEN
COMPUTERS
CARING IS OUR BUSINESS

279 KEIGHLEY ROAD
COLNE
LANCS
Telephone 0282 871717 (sales) (9 lines)
Fax: 0282 861726
0282 869338 (technical support)

PROBLEM *Solved*

Your technical questions answered by **MIKE COOK**

Cheap hard discs?

I OWN a Master 512 with dual drives and printer and I have been looking into the idea of adding a hard disc to my system. When I looked at the drives for a BBC Micro I found the price starts at around £350, which I consider as being over the top.

I have started to wonder if I could fit a standard PC hard disc: After looking around I find these can be bought for about £150 and this I consider a more reasonable price. But how can it be fitted? – **C.R. Maughan, Ketley, Telford, Shropshire.**

● *It does sound like a marvellous idea to use a low cost hard disc from another machine, but there are two problems.*

The first is that they are not physically compatible so some form of interface adaptor will have to be made.

This is not so much of a problem, however once you have connected them together you need to write a filing system to make them talk to each other.

You can't use an existing BBC Micro hard disc filing system because it will be expecting to talk to different hardware and also you would be in breach of copyright.

The fact is that writing one is a much more daunting task than designing the hardware, and as far as I know has not been tackled.

Swapping drives

I HAVE a Master Compact with an extra 5.25in drive, DFS and ADFS and would like to know if it is possible to swap the drive numbers to make the 5.25in drive numbers 0 and 2 and the 3.5in drive numbers 1 and 3.

I would like to do this because a lot of software not available on Compact format is there for the BBC Master on 5.25in in DFS.

However, when I try running the pro-

Topics on the agenda...

- *Swapping drive identities*
- *65Host printer problems*
- *Rom replacement troubles*
- *Missing cursor and colour changes*
- *Monitor to Chameleon compatability*
- *Crashing with Quest Paint*
- *Hard discs on the cheap*
- *Reducing a noisy speaker*
- *Limited colour for Archie*

grams on the 5.25in drive I invariably find that at some point the program tries accessing drive 0 and the whole thing comes to a halt.

Also as most of the software is protected I cannot transfer them from DFS to ADFS or 5.25in to 3.5in, which leaves me with only a small selection of software to choose from. – **Peter Clinch, West Berlin.**

● *It is quite simple to swap over the drive identities. There is a row of links on each drive close to the cable connector which can decide the drive number of a device, so changing them will change the drive.*

For something a little more convenient you could break into the disc cable and insert a double pole changeover switch.

Improved emulation

I HAVE recently bought an Acorn A3000 after many years of using a BBC B. Naturally I was looking forward to using some of my rom images on it until finances permitted me to buy appropriate native software.

After several frustrating hours attempting to get my document printed from Slogger's Starword, I eventually realised that the 6502Host emulator does not have access to the A3000 printer port. Is it possible to get 6502Host to access the printer

port as I find it hard to imagine what use this emulator is if you cannot print anything from it? – **R. Hewett, Swanley, Kent.**

● *Good news: On the RISC OS 2.0 Extras disc there is a new version of 6502Host that will access the printer port. This disc is available from dealers.*

Worn-out connector

ABOUT a month ago I found that my BBC B would crash for no reason – usually with a listing in – then on power-up the screen would be blank.

A friend said it could be the ULA, so I ordered one. In the meantime I started a check on the pin-out from the keyboard and found a couple of dry joints. A quick run over with the iron and I was back in business.

I've had no further trouble but tend to keep the top off, as the micro gets a little hot. And I've now got a spare ULA.

From reading your Problem Solved I've noticed that this is a fairly common fault. Perhaps your readers could try the suggested cure themselves or get someone with a test meter to do it for them.

It seems that the problem is caused initially if you don't have a rom board and keep changing the roms. Disconnecting and connecting the ribbon cable tends to loosen the soldered joints. – **R. Harvey, Weston-Super-Mare, Avon.**

● *Thanks. Another cause of the problem can be the ribbon cable connectors themselves. These are the insulation displacement type and are subject to intermittent connections when they get old.*

Flashing dots

I OWN an Issue 4 BBC B containing DFS, AMX Superart and Wordwise Plus roms and don't know much about the internal workings of my micro. It has recently developed a problem which I will attempt to



describe to you. Firstly, there is no cursor when in Mode 7 or Wordwise, yet it still appears in the other six modes. The second part of the problem is with the colours and graphics. When I change the screen to Modes 0 or 3 it becomes randomly covered in dots which flash from blue to yellow.

In Modes 1 and 5 any character typed in flashes blue, yellow and red and in Modes 4 and 6 the screen is randomly covered in red dots and alternately flashing yellow and blue dots. Obviously this affects any software involving graphics.

Please could you tell me what I should do to correct the problem, I would be extremely grateful for any advice. – **Richard Bromley, Warrington, Cheshire.**

● *The two problems might be related. I am assuming you are changing mode using MODE and not a VDU 22 command, as the latter does not reset the value in HIMEM.*

I am also assuming that any attempt to change the graphics colours has no effect. If that is the case it all points to the IC6, the video ULA. You could test this by checking that the signal on pin 25 is going up and down – this is what controls the cursor flashing rate.

If this is not working you can try replacing the 6845 video controller chip.

Incidentally, did you know that you can replace the teletext chip with a SAA5056 to get Hebrew characters in Mode 7 or an SAA5057 for a Cyrillic alphabet?

Chameleon monitor

I WAS very interested in your January Body Building feature. I want to use the Chameleon circuit and would just like to check that my present monitor, a Microvitec Cub number 1431 MZ, will be suitable before I buy the kit.

On opening the back it seems to have the links mentioned in the article in the positions appropriate to Digital RGB. Will it be safe for me to proceed? – **F. Bridges, Kingswinford, West Midlands.**

● *From what you tell me, your monitor should be suitable for use with the*

Chameleon. However, I omitted to mention in my article that when you change over the links the brightness control no longer works.

If this results in the screen being too bright or dark you can adjust the output of the Chameleon by altering the 220Ω resistor which is in series with the output.

While we are on the subject of the Chameleon, I am afraid a small error crept into the circuit diagram. The resistors marked 5K6 should be 6K8. This will make the smallest brightness step exactly equal. Also note that the resistors connected to the 74LS189 should be of 1 per cent tolerance.

Random crashes

MY issue 7 BBC Micro has lived a happy life until recently when it started to crash occasionally. The fault was diagnosed by Watford Electronics as being hot ram chips, which were eventually replaced. The problem recurred at first but was corrected.

Recently I upgraded to a sideways rom board, also from Watford, to accommodate their MkII 1.54T DDFS rom, Basic, Disc Doctor, Edword, Dumpout 3 and Replay roms. I bought their Quest Paint software and the problem surfaced again.

I'd switch on the micro and load the software. It would either crash after 15 to 30 minutes or hang up when I tried to enter the I/O menu, causing the art drawn to be corrupted. During Basic programming, while not using Quest Paint, the micro would again hang up, and, for instance, the I/O menu would appear corrupted when a program was listed.

The micro was again sent to Watford Electronics for repair, and at first the staff couldn't find anything wrong. Showing them Quest Paint being used until it crashed changed their minds and the micro was returned, again apparently fixed, with a brand new motherboard.

The problem had, it seemed, been cured. However, a few weeks later it returned and I've resorted to using the micro without Quest Paint plugged in and haven't had any problems.

I would like to know whether my micro has seen the last of its days or whether the Quest Paint chip is faulty, considering the

fact that it also crashed on a second BBC issue 7.

Although this is rather a long-winded problem I'm desperate for an answer as I am considering buying Watford's Wapping Editor package and want to know the chances of this crashing on me. – **Roderick Forsythe, Brentwood, Essex.**

● *The problem with many descriptions of faults like yours is that they lack any technical information. I am not sure what I can do by letter that Watford Electronics has not been able to do with extensive hands-on experience.*

It is notoriously difficult to track down an intermittent fault and it is doubtful whether removing your Quest Paint chip has really performed a cure. Replacing the motherboard does not leave many things that could still be wrong with your machine.

It is very remotely possible that there is an intermittent fault on the rom itself causing it to stop working, in which case a replacement might be a cure.

If your micro continues to work correctly without this rom then it is worth a try. I am afraid there is no way of predicting whether you will get trouble with any other package.

Monitor match

I HAVE an Amstrad CTM640 colour monitor which has a 6 pin DIN plug and I would like to know if it could be connected to an Archimedes. The pins are as follows:

Pin 1 – Red	Pin 4 – Sync
Pin 2 – Green	Pin 5 – GND
Pin 3 – Blue	Pin 6 – LVM

I hope you can help. – **D. Richardson, Wednesbury, West Midlands.**

● *It looks as though yours is a TTL RGBI monitor. This means that each gun can be off, half on or full on. As such it can only display a limited range of colours – 16 in all – but as the Archimedes does not supply a luminance signal it would only show eight.*

Given the quality of this type of monitor I would be very reluctant to connect one to my Archimedes even if it did work.

RANDOM rasping noises keep being emitted from my BBC Master 512's loudspeaker. This does not affect the micro's performance, but I'm worried that something is wrong.

Occasionally on startup the machine produces strange patterns on screen and hangs up. It has no extra roms fitted, as I mainly use rom images.

Also could you please tell me if there is any way to utilise the 512k of extra memory in normal BBC mode? – **R. Burgess, Battersea, London.**

● *Such a sound is normally a sign of a loose connection in the audio circuitry, typically in the speaker lead itself. To track it down you need to remove the lid and try to generate it yourself by waggling leads and gently pushing areas of the circuit board.*

Curing a rasping speaker

Once when someone saw me doing this to a micro I was accused of trying to fault find by faith healing and the "laying on of hands".

If the machine hangs up on power up probably the reset circuitry is wrong. Is this condition cured by pressing the Break key? If so it is likely to be the timing capacitor C21 – it might have been fitted the wrong way round, or needs replacing.

The 512k of memory is only available to the second processor, and so can't be used by the processor in the normal BBC mode.

B&S COMPUTING (Nottm) Ltd

258 Derby Road, Bramcote, Nottingham NG9 3JN

Telephone: (0602) 491202

Fax: (0602) 491322



ACORN APPROVED DEALER ***** CITIZEN SUPER DEALER ***** STAR REGISTERED DEALER

ARCHIMEDES COMPUTERS

(carriage free)

	Base	Mono	Colour	Multi-Sync
A3000	£649	£709	£849	£1069
A310	£899	£959	£1099	£1319
410/1	£1199	£1259	£1399	£1619
420/1	£1699	£1759	£1899	£2119
440/1	£2499	£2559	£2699	£2919
PC Emulator (with system)	£85			
A3000 Monitor Plinth (with system)	£29			

OFFER 1

Buy your Archimedes on 0% finance.
Please phone or write for full details.

or OFFER 2

Buy your Archimedes on **Low Cost**
finance over 24 months at a flat rate of
just 5% per annum (Typical APR 10.5%)

or OFFER 3

We will allow you 10% of the purchase
price of your Archimedes towards any
other Hardware or Software purchased
from us at the same time.

Please note - Offers 1, 2 and 3 only apply when you
purchase an Archimedes from us at the above prices.

ARCHIMEDES SOFTWARE

(carriage £1.50)

1st Word Plus	£69
System Delta Plus	£59
SigmaSheet, Gamma Plot	each £59
Render Bender	£59
Artisan	£29
Atelier	£85
Auto Sketch	£69
ISO Pascal, Fortran 77	each £95
Logistix	£95

(carriage £2.50)

Acorn Desk Top Publisher	£125
Ansi C (Release 3)	£125
Lisp, Assembler, Prolog X	each £180
Pipe Dream (Version 3)	£135
Pro-Artisan	£135

ARCHIMEDES GAMES

(carriage £1.50)

Orion, Missile Control	each £12
Freddys Folly, Alerion	each £12
Jet Fighter, Hover Bod	each £12
Word Up-Word Down	£15
Zarch, Repton 3, Ibox the Viking, Pacmania, Terramex	each £15

ARCHIMEDES EXPANSION

(carriage £1.50)

1Mb RAM Upgrade (A3000)	£199
1Mb RAM Upgrade (400/1 Series)	£199
A3000 Serial Port Upgrade	£19
A3000 User/ Midi Port Upgrade	£49
(carriage £6.00)	
2nd 3.5" Drive (305 & 310)	£115
2nd 3.5" Drive (400/1 series)	£125

PRINTERS (carriage £6.00)

Free printer lead and paper with all printers
purchased (Please state machine)

Citizen

120D	£124
Swift 24	£269

The Star 'Business Series'

LC10	£139
LC10 Colour	£179
LC10-II	£159
LC15	£279
LC24-10	£229
LC24-15	£349

The Star 'Professional Series'

FR10	£339
FR15	£439
XB24-10	£439
XB24-15	£579
FR/XB Colour upgrade	£39

The Star 'Laser Series'

Laser 8	£1395
Laser 8 DB	£1895

**The STAR Professional Series and
Laser Series come complete with one
years on site warranty.**

We stock an extensive range of ribbons
and paper - Please phone us for details

We often have available refurbished BBC
Model B, B+, Master 128's and associ-
ated peripherals. Please phone our sales
staff for full details and prices.

**UK CUSTOMERS: Please add 15% VAT to
all prices (INCLUDING CARRIAGE)**

Government departments and educational
establishments official orders welcomed

All prices are correct at time of going to press and are
subject to change without prior notification. All goods
are subject to availability. Finance is subject to status.
B & S Computing (Nottm) Ltd. are licenced credit
brokers. Full written details are available on request.

BBC MASTER 128

(carriage £6.00)

Master 128 complete with View 3, View
Sheet, DFS, ADFS, BASIC, The BASIC
Editor and Terminal£395
Master 65C102 Co-Processor£115
**Take advantage of our system prices
which enable you to obtain a complete
system at a reduced price.
Please telephone us for full details.**

MONITORS

(carriage £6.00)

Philips CM8833 (Colour)	£199
Taxan 770+ (Multi Sync)	£490
Philips BM7502 (Green mono)	£64

DISC DRIVES double sided 40/80T (carriage £6.00)

Without Power supply

Single drive 5.25"	£90
Dual drive 5.25"	£180
With Power supply	
Single Drive 5.25"	£105
Dual Drive 5.25"	£195
Dual Drive in plinth 5.25"	£229

(carriage £1.50)

Acorn 1772 DFS kit (for BBC B)	£45
Acorn ADFS ROM (B+/B with 1770)	£25

DISCS AND DISC BOXES

(carriage £1.50)

B&S 5.25" 96tpi Double Sided	£10
B&S 3.5" 135tpi Double Sided	£13
(B&S Branded discs are supplied in plastic library cases)	
40 disc lockable box (3.5")	£7
50 disc lockable box (5.25")	£7
80 disc lockable box (3.5")	£9
100 disc lockable box (5.25")	£9

**THIS ADVERT ONLY SHOWS A PART OF
OUR EXTENSIVE RANGE. TO RECEIVE OUR
CURRENT CATALOGUE OR DETAILS OF
FINANCE, PACKAGES, ETC. PLEASE RE-
TURN THIS COUPON.**

Name

Address

.....

.....

.....

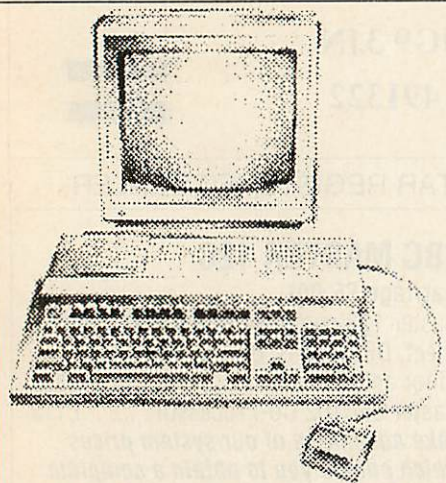
.....

.....

Catalogue ☐ Finance ☐

Archimedes ☐ Master ☐

DABHAND COMPUTING LTD



A 3000 base unit £599
A 3000 plus med. res. colour monitor & lead ... £779
A410/1 £1199
A420/1 *£1699
A440/1 *£2499

WE OPERATE THE TEACHERS, ACADEMICS & ACORN SHAREHOLDERS SCHEMES OFFERING GENEROUS DISCOUNTS AND EASY TERMS OF PAYMENTS. PLEASE RING FOR DETAILS

We don't think there is a better Archimedes deal around, but if you think different, call us and we will attempt to beat any advertised price.

ARCHIMEDES A3000

User & Midi Podule £46
 Serial Upgrade £19
 Monitor Stand (Acorn) £29
 Monitor Stand (Pres) £24
 OAK 20Mb SCSI disc Upgrade £549
 1 Mb RAM Expansion £149
 5.25" External floppy disc interface £15
 External 40/80T 5.25" c/w PSU £129

ARCHIMEDES 400 series

20 Mb Hard Disc Upgrade £189
 40 Mb Hard Disc Upgrade £319
 50 Mb Hard Disc Upgrade £459
 64 Mb Hard Disc Upgrade £499
 105 Mb SCSI Hard Disc £699
 215 Mb SCSI Hard Disc £999
 I/O Expansion Card £79
 Midi Expansion Card £65
 1 Mb RAM Upgrade £69
 OAK SCSI Board £189
 OAK SCSI 45 Mb Disc & Board £449
 ARM 3 Upgrade (30 MHZ) £595
 ARM 3 Upgrade (20 MHZ) £495
 5.25" External floppy disc interface £30
 Scanlight Junior Scanner (CC) £179
 Scanlight Senior Scanner (CC) £399
 Sheet Feeder for above (CC) £149
 Scavenger Junior Scanner (Beebug) £189

NEW RELEASES

Ring for availability

Apocalypse (3D Space Game) £24.95
 FontFX (Special Effects for Draw/Impress) £12
 Datastore Utilities Disc £12
 The Pawn (Magnetic Scrolls Adventure) £26.04
 The Guild of Thieves (Mag. Scrolls Adv.) £26.04
 Rotor (Arcade Strategy Game) £19.95
 Talisman (Minerva Graphical Adv.) £12.95
 Battle Tank (Minerva) £12.95
 Maddingly Hall (Minerva Adv.) £12.95
 Trivial Pursuits £24.95
 Fireball II (Superb Breakout Game) £19.95
 Arc DFS (DFS Filing System) £26.04
 VIDC Enhancer (Modes 96 - 118) £29.95

CHECK OUT OUR PRICES!
NO UK CARRIAGE CHARGES
 (UK Residents add 15% VAT)

MONITORS

Philips CM8833 £225
Acorn badged Colour £199
EIZO 9060SZ Multisync . £475
Taxan 770+ Multisync £425

All monitors come with free lead. State computer type when ordering.

ARCHIMEDES SOFTWARE

Acorn Desktop Publisher £119.95
 ANSI C V.3 Compiler + free C Front £139.95
 Arcade Soccer £14.95
 ArcComm (BBC Soft) £24.95
 Armadeus (Sound Sampler) £69.95
 Armadeus (Sampler Board) £139.00
 Artisan 2 (16 Colours) £49.95
 Atelier (Minerva 256 Colours) £79.95
 Casino (Minerva Desktop Games) £14.95
 Caverns (Minerva Arcade Game) £17.35
 C-Front (Mitre Front End for ANSI C) £17.35
 Disc Tree 2 (Mitre Hard Disc Utility) £39.95
 Euclid 2 (3D Drawing) £57.95
 E-Type (Driving Simulation) £14.95
 E-Type 100 Miles / Designer ea. £14.95
 Family Favorites (Minerva Compilation) £14.95
 First Word Plus V2 (Acorn) £79.95
 Fireball 2 (Superb breakout clone) £24.95
 Fugitives Quest (Robico Adventure) £23.95
 Genesis (Hypermedia System) £86.95
 Graphbox (Minerva) £69.95
 Holed Out (Golf Game) £14.95
 Holed Out Extra Courses, Designer £12.95
 Ibx the Viking (Arcade Adventure) £15.95
IMPRESSION NOW IN STOCK £139.95

Interdictor (Flight Simulator) £24.95
 Mini Hyperpacks (3 games per pack) £24.95
HYPERPACK (12 Games) £79.95
 Multistore Database (Minerva) £199.00
 PC Emulator + free PCE Sh/ware 1&2 .. £99.00
 Pipedream 3 (WP) £129.00
 ProArtisan (256 Colours) £79.95
 Render Bender (Clares) £59.95
 Render Bender Demo Discs (Clares) £10.00
 Render Bender Demo Discs (Dabhand) £10.00
 Stranded (Robico Adventure) £23.95
 System Delta Plus (Minerva) £69.00
 Thundermonk (Arcade Adventure) £14.95
 Trivial Pursuit (Board game) £24.95
 U.I.M. (Submarine Battle) £24.95
 Worra Battle (Oak Tank Battle) £14.95
 Worra Plot (Draw > HPGL Plotter Driver) £24.95
 World Class Leader Board (U.S. Gold) .. £19.95

TERMS: UK residents add 15% VAT to all prices, except books. **Delivery FREE on all postal items in the UK.** Export, no VAT, carriage at cost. (quotations available). Europe maximum £2.50 software, £35 hardware. Access/Visa cards accepted by post/phone/in person. We are authorised Acorn dealers. Official orders accepted from public sector/education/PLCs, otherwise cash with order. Tender invitations welcome. Callers welcome. We are about 800yds north of J 17, M62. Fax: 061-766 8425. Price subject to change without notification. Goods offered subject to being unsold.

DABHAND COMPUTING (Dept MU)
 5 Victoria La, Whitefield, Manchester, M25 6AL

061 766 8423



The Best in the North West ...

SPECIAL OFFER

FREE WITH EVERY
410/1 - 3MB RAM - Price £1199
 (or 10% of marked price while stocks last)

BOOKS (no VAT)

C: A Dabhand Guide £14.95
 Archimedes Assembly Language £14.95
 Archimedes Operating System £14.95
Above Dabs Press books have accompanying disc - add £5 for 5.25", £7 for 3.5"
 Archimedes First Steps £9.95
 BASIC V: A Dabhand Guide £9.95
 RISCOS PRM's now in stock £79.95
 NEW Acorn DTP Advanced U.G. £14.95
 BBC Basic Guide (Acorn) £19.95
 Master 128 Ref. Man.Pts 1&2 (ea.) £14.95
 New Advanced User Guide £19.95
Additional Arc Software Manuals (Acornsoft)
 First Word Plus, DTP, Assembler (ea.) £10
 ANSI C Version 3 £29

SPECIALS

Voltmax Joystick (Replaces mouse) £24.95
 Draw Format Clip Art (Use with Draw/DTP) . £29.95
 Star LC10, Integrex, HP Paintjet colour printer sprite dumps (multitasking) £26.04

CONSUMABLES

3.5" Floppy Discs (10 in plastic box) £8.65
 Printer Ribbons (most makes) £call

MASTER COMPUTERS

Master 128 £399
 Master Colour Monitor £175
 Eprom Cartridge £10.95
 BBC Dust Covers £9.95

PORTABLE COMPUTING

Psion MC400 Mobile Computer £699
 Psion Organiser LZ64 £159
 Psion PC Comms Link £54
 Z88 32k Portable Computer £195
 Z88 All-in-one Pack £239
 Z88 - Arc Link £24.95
 Z88 - A Dabhand Guide (Book) £14.95
 128k RAM cartridge £41.26
 32k EPROM cartridge £16.48
 BBC Link £20.61
 Z88 SpellMaster £56.95
 Mains Adaptor £8.65
All Psion/Z88 accessories and s/ware available

PRINTERS

9-PIN PRINTERS (free lead)

Citizen 120-D (Serial option add £20) £129

24-PIN PRINTERS (free lead)

Panasonic KX-P1124 £249
 Sheet Feeder for above £99
 Citizen Swift 24 £299
 Colour Kit for above £39

COLOUR PRINTERS (free lead)

Integrex Colourjet 132 £509
 HP Paintjet £795

LASER PRINTER (free lead)

HP Laserjet IIP Printer £995
 Additional 1Mb RAM for IIP £199

JUST LOOK AT OUR PRICES
FOR STAR PRINTERS!

LC10 £159
 LC10 Colour £189
 LC24-10 £209
 Sheet Feeders £59

FIREBALL II

...break
out again

Price: £24.95
Supplier: Cambridge International
Software, 8 Herbrand Street, London
WC1N 1HZ
Tel: 01-833 4023

THE 8 bit BBC Micro – along with the majority of other types of machine – have versions of Breakout, usually upgraded to include lots of extra features apart from just knocking bricks out of walls.

An early version appeared for the Archimedes many moons ago called Fireball and now we have the sequel, Fireball II.

Loading up the software reveals that not only do you get Fireball II on the disc – complete with pretty icon – but also the original which, while similar in many ways to its successor, is still worth playing.

Double-clicking the Fireball II icon loads an extremely simple but effective title screen which gives way to a colourful menu. On the right are the scores and statistics and in the middle are the various control keys.

Apart from the standard pause and sound controls, there's also music on, suicide, mouse sensitivity, quit and screen editor. Pressing the spacebar takes you into the the first screen which is a simple

set of blocks to be knocked out.

However, as with all games of this type, things aren't that simple. You click the left-hand mouse button and the ball shoots upwards, bounces off a brick and about one in ten times a capsule will begin to float down – or rather head downwards, bouncing left and right making it that much harder to collect. The

options are quite extensive and appear to come in three basic varieties – the currently active ones appear in a box in the top left of the screen. Some types can be combined, while others cancel previous effects.

Bat effects include reverse controls, sticky bat, laser, double, extended, shadow bats, protected and normal. Ball

modifications can double the number of balls – cumulative up to 10 – add up to 10 balls, drill through one-hit bricks. There's also a jump to next level.

There are 14 types of bricks. The first eight just score points and have one hit, but the others can take more damage before disappearing. There's also an invisible brick that's invincible.

Two types drop bombs – which can be deflected if you have protection, and one type has two hits but re-appears after a short time.

The combination of all these options means that you get a set of complicated screens that will at first drive you mad trying to knock them out. However the game as a whole is not too difficult to get into and you'll soon work out what to avoid and what to go for.

The screen editor is extremely easy to use, affording you all the facilities to load and save the entire set of 60 screens.

It also means that you can play the ones provided in a sort of cheat mode because you get infinite lives from the editor.

I found Fireball II good fun and the music is very catchy.

Lazarus



Sound	7
Graphics.....	8
Playability.....	9
Value for money	6
Overall	7

Price: £9.95

Supplier: Superior Software, PO Box 6,
Brigg, S. Humberside DN20 9NH
Tel: 0652 58585

PERPLEXITY

Confused? You will be...

NOW could the ever-popular Repton, with its combined puzzle and arcade action elements, be improved? The answer lies in Perplexity, which could be described as a 3D version of Repton.

The inlay is reminiscent of Pacmania on the Archimedes – and that's just a 3D version of Snapper. While that's fast and colourful, Perplexity shows that the 32 bits are only an advantage, not a necessity.

You wander around 16 screens collecting diamonds, some of which are visible while others are formed by pushing two green boulders together. Each time you collect all the jewels on one screen you move on to the next.

It sounds easy, but accidentally push one rock against a wall and it could mean going back to the start. On several occasions I wished I'd had a pull option as well as the push one. To add to your problems, a few monsters are lurking around, so

beware. Most of the boulders form diamonds when pushed against another but some – identified with a question mark – are mystery ones and form one of four other objects. They are positioned at different places in each game, so even if you know a particular screen well, you could still run in to trouble.

While you must collect all the diamonds to complete a level it's up to you whether or not you collect the mystery objects created. Three of the four are useful but the other should be avoided.

One certainly worth collecting, is an hourglass which provides extra time. With only 500 seconds to complete each screen this is a welcome bonus. Extra lives can be obtained by collecting four bottles of the magic potion sometimes formed when the mystery boulders touch.

Don't collect the control key swap object unless it's blocking your way and you have no option. Sometimes they

swap the actions of all four keys; at other times they only swap two. If you are forced to collect one you can look for another and, if you're lucky, it may reverse the original swap.

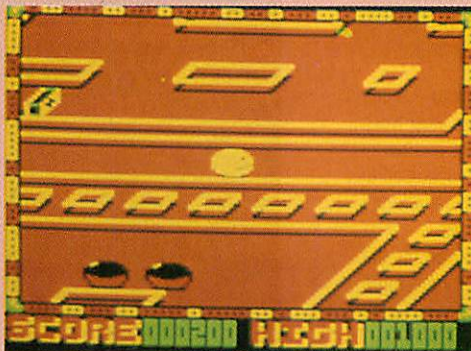
However, once one of these is collected, you may be doomed to pressing

the right key for left and the left key for right. In this situation it's very easy to accidentally push a key against a wall.

The final mystery object is a 500 point bonus. As well as the boulders, mystery boulders and monsters you'll find a few other items. Some of the passages are

locked and you'll find keys scattered in the maze. Only ones facing the correct way will open a lock, so find it and push it round.

Once it touches the lock the way will be cleared and you can proceed. There are only enough keys for the number of locks, so careful thinking about how to get the locks to



NEVRYON

...a sideways blast

Price: £14.95 (5.25in disc),
£15.95 (3.5in disc)

Supplier: Fourth Dimension, P.O. Box
4444, Sheffield
Tel: (0742) 700661

IT'S time to save the universe again. On this occasion your planet, Nevryon, is being attacked by aliens lusting after your supplies of titanium. As usual, you are the planet's last hope and with you go the remaining resources and the last six

ships. A nicely drawn title scrolls up to reveal a whole set of options – volume control, skill level, speed, start on different level – which requires a password – colour or mono screen switch, screen resolution and sound volume control.

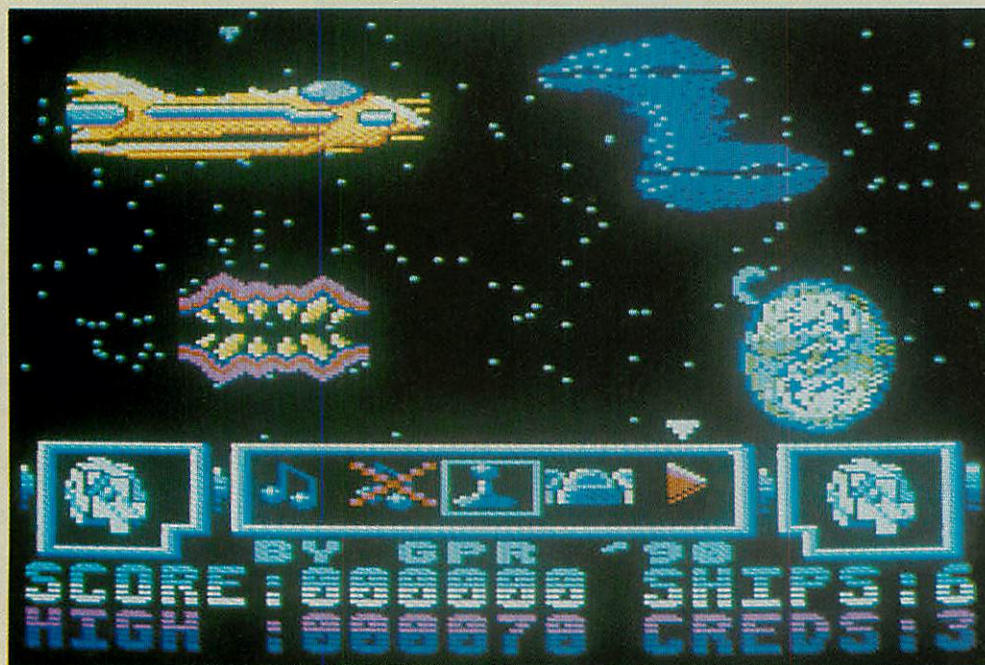
From there you move to the map and

icon display which give you further options such as a choice between keyboard and joystick, sound on/off and start game. There's also current and high scores plus number of ships and credits remaining. There are two levels for each of the four scenarios and after each scenario is completed you are returned to this screen.

You get six ships and three credits at the start, the credits allowing you to restart from the point where you lost your last ship. If you use the passwords to jump the levels you don't get any credits.

The game play area is a fairly thin strip across the top of the screen – and the terrain scrolls from right to left. You can manoeuvre your ship from the left of the screen to two thirds of the way to the right plus up and down using the usual control keys. The game is quite simple: Fly along shooting the aliens, blowing up various parts of the terrain as necessary, avoiding missiles and bullets, flying carefully around various structures and finally blowing up the big thing at the end.

For every 10 aliens you remove you get a bonus pod which adds to your fighter's capabilities – rapid fire lasers, battering ram, gun droid and missiles. The gun droid is a little ball that tags along with you and fires a stream of bullets of its



the keys is essential. If you block a key you may as well give up on a screen or use the remaining time to explore the maze and work out a strategy for next time.

Black boulders are just obstacles and can be pushed out of the way, but be careful not to push one into a position that will block you later.

A lot of useful information is provided, probably the most important being the scanner map which is constantly updating. This shows your position in the maze together with all the diamonds and green boulders. Unfortunately it doesn't show things like the black boulders, lock, keys or monsters. Once you have collected four bottles of magic potion you gain an extra life.

Perplexity is very compulsive and will keep you trying to improve on your last performance.

Louise Collinson

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

own. Missiles are fired off at regular intervals from your ship and are much more destructive than bullets – you really need these last two once you reach the final object.

The first two levels are based around the alien spaceship into which you fly. You must get through all the defences consisting of gun towers and forcefield generators to reach the fortress at the end.

Next up is the asteroid base which is similar in content but also houses rock-throwing mushrooms. After this comes the surface of the alien planet and its cave system and things begin to get even more outlandish.

Finally there's the alien beast. You actually travel through it and there's quite a surprise awaiting you in this section.

This game is a very good attempt to copy the sideways scrolling games commonplace on 16 bit machines. However the implementation is not as clean as it could be: Where one sprite crosses another you get a black corner, and the whole playing area is being software scrolled. This results in the graphics getting flickery when a lot is happening. Having said that it's a good game and fun to play.

Definitely worth getting hold of.

Geoff Brown

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

IT'S MAGIC

...out for a spell

Price: £2.99 (tape) mail order only
Supplier: Central Computing, 61
Beech Road, Gillway, Tamworth,
Staffs ST9 8QQ.

THIS two-part text adventure is set 200 years in the future when a career as a showbiz personality or pop singer no longer appeals to school-leavers. They want to be magicians – but more like Merlin than Paul Daniels.

To do this they must join the International Union of Magicians. However, the Union doesn't want a sudden influx of semi-skilled members, so it decided that all prospective candidates would have to earn their nomination by learning the 14 basic spells.

This put them on the short list. The handful of successful candidates would be announced at the annual banquet and only those present would be admitted to the elite band of magicians.

The first part starts at the school gates where you are assaulted by the leader of the Mob.

You are told you must return later to participate in the ritual book-burning ceremony or the Mob will ensure that you never get to the Magicians' Ball.

Your first task is to find your schoolbooks and return for the bonfire so that the Mob won't bother you again, leaving you free to search for spell plaques hidden around a town that boasts a shopping centre, library, police station, wax museum, bad housing, and a park.

Provided you remembered to examine the books you will be on the first rung of the ladder. Your next task is to enlist the help of your girlfriend, Diane, who wears a *Just Seventeen* T shirt – which is a lie 'cos she's only 16.

Now you're ready to do your bit for nature conservation, with just rewards, as Woody will save you several times if necessary. But make too many silly mistakes and he won't bother. The spells are in capital let-

ters on plaques, and to learn them you must read the plaque.

The name of each spell is self-explanatory – for example bounce allows you to jump higher and alien changes you or something into something else.

Some spells are simply cast, while others have to be cast at something or someone, while *spelling mistakes* can be cancelled with the reverse spell, although in the first part just touching a plaque will suffice.

The emphasis in part one is on learning the spells, the easier ones being used to discover the more elusive ones.

I thoughtlessly cast *grav* without a roof over my head and I soon discovered that aliens can't read plaques – at least in the beginning. It was slow but rewarding progress from *another annoying school-leaver to on the verge of membership*.

Part two begins with you dreaming about Universal Magic. Poor Woody got the chop, but Diane is still with you. As you are no longer a novice your spells are more effective, allowing you to cast while an alien.

In contrast to the first part, the problems must now be solved in a certain order.

The map for this part can be split into three sections – up to the wood, the brick building complex and, finally, the countryside and banquet hall. It's easy to find a quick way back to the brick building, but there's a slightly less obvious method for returning to the asylum.

The loading screen for part one could damage your eyesight but part two has an animated picture of a wizard. Pressing the spacebar a few

times sends him into manic mode.

The programming is very user friendly and inputs such as *Ask Diane for help* are understood, as are multiple commands separated by a full stop or comma.

A very comprehensive help sheet is available if you send an sae to Central Computing.

In part one Status reminds you which spells you know and can cast safely, as well as any that are active.

Part two replaces this with an indication of whether the location is inside or outside.

Most adventurers are familiar with the save and load to tape facility but not so recognisable are the store and recall commands.

They are rare on the BBC Micro, but commonplace on other micros and allow you to save your current position, giving instant recall.

It's amazing how audacious this makes your adventuring!

Author Simon Maren has written an absorbing adventure about enterprising youth. Stubbornly refusing to be conformist, his storyline and quirky puzzles are refreshingly original, often with a sideways swipe at more conventional adventures.

Barbara Gibb

Presentation	6
Atmosphere	9
Graphics	n/a
Value for money	9
Overall	8

That crowns it all

Featuring...

Citadel: Locations of crowns and crystals
Startrader: Locations of Armageddon Device segments – tip
Hoverbod: Extra lives/level jump pokes
Plan B: Infinite energy/ammunition and extra keys – pokes for compilation disc version
PLUS Summary of the March 1988 to February 1989 Hac-Man columns

*Hac Man
walks through
solid walls to
reveal some
of the hidden
treasures of
the Citadel*



WELCOME to another mixed bag of the best hints, tips, cheats and pokes for all BBC and Archimedes arcade games. If the craze for arcade-adventures in recent years could be tracked back to a single progenitor, arguably it would be Superior Software's *Citadel*.

It is certainly one of the games that I have most enjoyed playing, so I was quite surprised to notice from my recently-compiled Hac Man index – part two of which appears in this issue – that I have only ever mentioned it in one previous column.

Both the letters page of *The Micro User* and I have received many queries about *Citadel*. One of the most recurrent has been a request for help in finding the three crowns, one of which can be seen on the title page.

The fact that so many readers have experienced problems in finding the crowns might be because two of them are hidden in rooms linked to the main game by invisible passages in apparently solid walls.

I fail to see how any normal player could ever be expected to find them because I cannot imagine that many people go around 100 rooms of an arcade-adventure jumping at the nearest wall just to see what will happen.

Nevertheless, on with the hunt: The first crown – which is red/magenta – is located just off the bottom of the well shaft at map reference 3,-4.

Make sure that you have pulled the lever that lowers the level of the water in the well, and that you are carrying the snowflake. Go down to the bottom of the well shaft – map reference 2,-4.

You will find that the water there has frozen over, so drop the snowflake on the pedestal to make sure it stays that way. Jump up the ledges on the right-hand side

and you will find another screen, with the crown on the far side. The two hidden rooms are at map reference -8,0 – just to the left inside the Witch's House – and at -3,-1 – just to the left of the cellar. To get the yellow/magenta/red crown in the Witch's House you must first place a trampoline on the pedestal just outside her house.

Bounce on the trampoline until you can get on to the roof, then jump down the chimney. Make your way straight left to the top of the ladder, taking care to shoot the monk who homes in on you as soon as you approach. From the top of the ladder, press left and jump: You should find yourself inside the wall. Walk straight through to find the crown. To get the green/yellow crown in the cellar you must be carrying one of the trampolines. Work your way through the water and drop it on the pedestal on screen-2,-1. Bounce on the trampoline until you have gained sufficient height, then jump off and aim for the 2 of

your map position as displayed on the screen. If you hit it squarely you should, as before, find yourself inside the ceiling. Walk along this invisible passage to find the last crown. This, incidentally, is the one that you can see if you let the game run through its demo.

The next most common distress call has been for help in locating the five crystals that are the cornerstones of the entire game. They are located in the freezer, the witch's house, the pyramid, the lab and inside the door marked C in the central tower at the top of the castle.

The crystal in the freezer is almost a giveaway and a little logical thinking will soon have it in your grasp. To get the one behind the C door you must start the lift at map location -1,3 and jump from it to land on the central tower. Press Return to enter it. To get the one in the witch's house you will need the skull and the two bones which can be found at map locations -3,5, 3,2



Storming the Citadel

and -14,-2 respectively.

Proceed as described, evading the monk's attentions as before, but this time climb down the ladder. Make your way across to the right-hand side of this screen and walk through into the witch's domain.

As soon as you appear in this room the witch will start to fly towards you, so tarry not. Jump over the cauldron with each ingredient in turn: This has the effect of dropping it in the cauldron.

When you have mixed the three ingredients retreat to the left-hand side of the screen and wait for the witch to come for you. As she passes over the cauldron she will disappear in a ball of flame, leaving the way clear. Go down and you will find the crystal.

The yellow surface area of the pyramid contains a hidden maze. Once you have got through it you will need the two Sphinx heads to freeze the mummies. Drop the green idol from the mountains and you will find that you are now carrying a crystal.

To get the one in the lab, you must first start the well wheel. Next fire the cannon, using the cannon ball and the gunpowder – the pink pot marked with a P. This will break down a wall, allowing you to get to the crystal.

From here, the finish of the game is not far away...

From outer space

To add an international flavour to the column, here are a few useful cheats for Bug-Byte's Plan B, which come from Bent Melby of Frederiksberg, Denmark.

These pokes are for the version that appears on Bug-Byte's own compilation disc. If you own the game on cassette and you want to cheat, look no further than the first edition of Impact's Cheat It Again Joe. Anyway, to kick Bent's pokes into action, put the disc into the drive and type:

*LOAD PLANC

Press Return and then type in any or all of the following pokes – depending on the nature of the help you require – pressing Return after each line:

Poke	Command
Infinite energy	?&3F6F=&60
Infinite ammunition	?&48AB=&4C:&48AC=&65:&48AD=&40
Extra keys	?&3F01=x, where x is the required number of keys.

Finally, type CALL &4CB3 to start the game with your chosen modifications in place. The only point to note is that you should not be too greedy when selecting the number of keys with which you intend to start. If you are carrying 255 at any point the number will be reset to zero if you collect one more. Bent says around 40 should be more than sufficient to ensure success.

The second great year

To continue with the Hac Man index started last month, here is a summary of the columns of the second year – March 1988 to February 1989:

March 1988

Around the World in 40 Screens passwords
Airwolf Master conversion used as an example of methods of defining VDU23 character definitions

Paperboy Master conversion

Crazee Rider enhanced version – 5.25in disc – to Solidisk FourMeg board conversion

April 1988

Codename:Droid solution and pokes – tape, 5.25in disc and Master Compact versions

May 1988

Stryker's Run infinite or extra lives and bug fix – Play It Again Sam Master Compact, standard and enhanced versions

Thrust infinite lives and fuel – Play It Again Sam Master Compact

Grand Prix Construction Set fix to allow user tracks to be saved – Master Compact version

Discussion of compatibility of Master Compact games on ADFS machine with 3.5" drive

Codename:Droid on Play It Again Sam II feature

Codename:Droid vs Spellmaster fix for clash

June 1988

Stryker's Run infinite and extra lives – Play It Again Sam 5.25in disc standard and enhanced versions

Thrust infinite lives and fuel – Play It Again Sam tape and 5.25in disc

Mineshaft Master conversion

Dunjunz mapper

Starquake addendum to transporter codes

Elite back issues blurb

Zarch cheat mode

Apologies for errors in April's Master Compact software on other machines article and cheat for Stryker's Run

July 1988

Barbarian feature

Summer Olympiad feature

Bolo feature

Repton Thru Time feature

Pipeline feature

Exile feature

Daxis feature

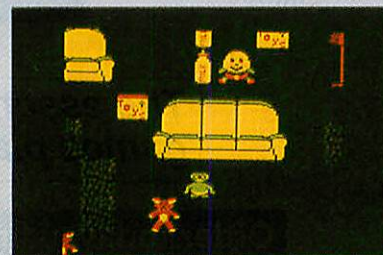
Condition:Red passwords

Repton 2 pokes – original and Play it Again Sam tapes and discs

August 1988

Life of Repton complete passwords

AMX Pagemaker and **Stryker's Run** clash



Life of Repton

Acorn Teletext Adaptor and **Codename:Droid**, **Psycastris**, **Sphere of Destiny** or **Impact** clash

Arkanoid level jump and start on last level cheats

Crazee Rider level jump

Ransack extra lives and level jump

Omega Orb extra lives

The Living Daylights hint

September 1988

Arkanoid cassette infinite lives

Kourtyard cheat mode

Impact cheat mode

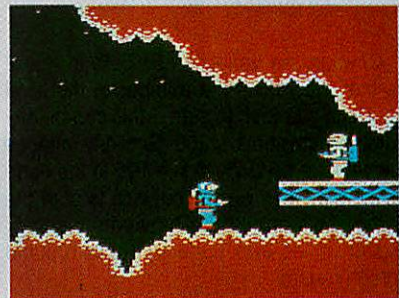
Vegas Jackpot cassette Master conversion

Superman feature

Spy vs Spy feature

Citadel hints + feature

Explanation of printed errors/problems plus warning not to save on to original discs



Codename: Droid

October 1988

Bonecruncher tape loading problems plus passwords

Thunderstruck solution

Rocket Raid cheat

November 1988

Bonecruncher disc extra lives and feature

Anarchy Zone passwords

Zarch high score

Uridium hints

Spellbinder hint

Saracoid cheat mode

Star Wars cheat

Ransack infinite lives

Palace of Magic invulnerability – tape, 5.25in disc and Compact disc versions

December 1988

Christmas releases: **Play It Again Sam 3** and **4**, **By Fair Means or Foul**, **Exile**, **A Question of Sport**, **Repton Infinity**, **Superman**, **Summer Olympiad**, **Circus Games** and **Mayday Squad**

Way of the Exploding Fist feature and Master conversion

Lothlorien information

Hac Man hi-score table

January 1989

Bolo feature

Maltese Joe's Pool Challenge feature

FireTrack II feature

Ravenskull level 1 solution (part 1)

February 1989

Rogue for the Master 512 co-processor

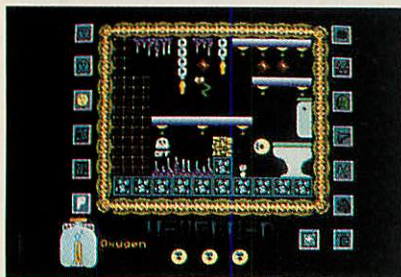
Clogger vs Exmon II conflict resolved

Ravenskull level 1 solution (part 2)

Way of the Exploding Fist tape to Master conversion

Labyrinth infinite lives

Hover – no bover



Alex Strong of Southampton has sent me a couple of useful tips for Minerva's **Hoverbod** that will allow you to select your start level and the number of lives you require. To enter them, proceed as follows. Exit from the desktop to Basic and type:

```
LOAD "GAME"
LIST 2
LIST 190
```

Change the variable **LEVEL%** in line 2 so that it contains the number of the level on which you wish to start – this can be any number between 1 and 9. Similarly, change the value of **LIVES%** in line 190 to the number of lives with which you wish to start the game. This should be between 1 and 5. Higher values work perfectly but corrupt the screen display.

Safe from Armaggeddon

A3000 owner Christopher Jordan of Walton-on-Thames, Surrey has a tip that I'm sure will be of use to players of **Startrader** from Gem Electronics.

The purpose of the game is to locate the nine segments of the de-activation code for an Armageddon device set by the evil Kargans, to quote my colleague Terry Blunt in his review. It's a pretty standard scenario, but this should not be held against it.

Books which give the location of one of these segments can be bought – for a mere ten million credits each – from any planet that has a space station factor of 20. Each planet offers only one book, so you must find nine such planets and, under normal circumstances, accumulate a total of ninety million credits – not an easy task.

However, Christopher's tip allows you to discover the locations of two or more segments once you have sufficient funds to buy just one book.

First make ten million credits in the usual way and find a planet that has a space station factor of 20. Save the game, dock with the space station and buy the book that gives you the location of one of the segments and make a note of it. Leave the space station and restart the game. If you then reload the data file that you saved just before you docked, you will still have your ten million credits, plus the location of one of the segments.



You can now leave this space station and find another of a similar rating. When you do, proceed as before: Save your position, enter the station, dock, buy the book, note the position of this segment, restart the game and blast off again.

It's easy, but it certainly sounds as though it could spoil the fun.

**THE
MICRO
USER**

Reader offers

**THE
MICRO
USER**

Reader offers

Boost your micro's sound output with Archimedes and BBC Micro SOUNDBLASTER

Extend the sound capabilities of your BBC Micro, Archimedes, A3000 or Music 5000 by routing the output through the Soundblaster's high quality amplifier and speakers.

The up to the minute amplifier implements the latest microchip technology to produce an ear-shattering output. Twin volume controls enable you to adjust the output and balance to suit.

The quality 50 watt speakers consist of a woofer for thumping bass output, a mid-range unit for crisp music and effects and a tiny tweeter which pumps out the highest frequencies the ear can hear.

The package comes complete with mains adaptor and full instructions. No soldering is required – simply plug in, boot up your favourite software and turn up the volume.

**ONLY
£34.99**



*The essential peripheral for all
games players and musicians*

Order today, using the form on Page 119

Data basics

*Make the most of
your micro with
this powerful
database system
by Richard Hull*

DATABASE programs come in many different guises, from simple, dedicated name and address files to the total versatility and fully programmable capabilities of InterBase. Now here's a program that lies in between – it has a simple design but also a programmable front end to make life easier.

The listing here is basically a database manager, which means that it can store and retrieve records but has no idea what that data is for.

To make this clearer: A dedicated name and address database can ask you to input a name, an address and a telephone number – the program has details as to what the data that it holds actually means.

But a database manager will store and retrieve only as instructed – and the data has no meaning.

It is up to you to add that using the built-in programming language.

The advantage of this procedure is that you can design one front end that holds names and addresses, another to store your record collection, a third to keep account transaction records – all using the same database manager.

However, in order to find individual records there must be a special key field unique to each. This is what the database manager uses to locate each record within the file.

The front end itself is programmed from a language built into the database manager that's a simple cross between Basic and Assembly language.

How to use it

Type in the listing and ensure you've made no mistakes using the checksums, then save and run it.

Remember this program is on this month's subscription disc and there's also a demo data file based on a diary.

You are presented with the main Mode 0 screen with three boxes. The top left one contains the program name, the one top-right is where command line entry occurs

```
Database v4.76 (inc. DPL/2)
Written and Designed by
Richard Hull (c) 1989
```

```
Escape
>create test
User id: 10101
Date: 08/03/90
```

```
Creating file: test
No. of characters per record (Max 1400): 200
No. of records in the file: 5
Writing file: please wait.
```

National Curriculum

Certain areas of the National Curriculum require knowledge of how to enter and retrieve information from a database.

This program and its associated language provide a simple method of reaching these targets.

Program features

- Powerful programming language.
- Use of templates to assist entering record data.
- Spool data to an ascii file depending on matching with a string.
- Numeric calculations.
- File datestamping

Limitations

Due to its length and the commands used this program will only function on a Master or Compact. It cannot work on tape systems.

ronment – and the current date. You are ready to add data using:

WRITE

If you want to add more than one record specify the number after the command. You are now asked for a key reference for this record, which must be unique. You can now enter data in the main area of the screen, perhaps a name and address. Exactly where you put the information in the screen area is up to you.

When finished press Escape and the program will scan the text area. You can abort by pressing Escape again before the cursor reaches the end. Finally the record is written to the file.

To look at a specific record you need to know its key reference and type:

READ key ref

However you can search the whole file for either a string in the key reference or in the main text itself. Close the file using CLOSE.

So that's the basics of using this command line-controlled database. Next month we'll show you how to can write complete programs to control it and use it to its best advantage.

Database jargon

Database: All the data about a particular subject held together in one file. For example, all the names and addresses in a name and address database.

Record: A set of related data about one item within a database. For example, the name and address of one person.

Field: One particular piece of information in a record, say surname or post code. However in this program all the data for each record is held in one free-form field.

and the main window is where all output and the main record input takes place.

Let's create a test file so you can see how it works in direct command mode. Enter:

CREATE Test

You are prompted for the maximum size of the record in bytes and the number expected.

All the data in a record is held as one free-form field and you can structure it as you wish.

Enter 200 for the byte size and 5 for the number of records, pressing Return after each. There's a short pause while the file is prepared.

When the file is ready you need to open it. Type:

OPEN Test

After the disc has whirled there is a request for your five-digit user number – this is most appropriate in a network envi-


```

10 REM > Database
20 REM by Richard Hull
30 REM (c) The Micro User
40 :50 MODE 128:intcLock=FALSE:REM
internal real time clock ?
60 DIM store% 1500,cb% 256,code% 25,v
ar% 256,p$(600),lb$(50),lb%(50)
70 PROCscreen:PROCassemble:ON ERROR P
ROCerr
80 REPEAT:PROctwind(2):VDU 3,31,0,yp%
,62
90 UNTIL EVAL("FN"+FNexec(FNinput(&B2
))) :MODE 131:END
100 :
110 DEF PROCscreen:yp%=0:ch%=0:prime%=
0:ovf%=0:tm%=0:ptr%=3:lf%=1:kf%=FALSE
120 asc%=0:RESTORE 380:FOR k%=0 TO 2:R
EAD x%,y%,a%,b%:PROCbox(x%,y%,a%,b%):NEX
T
130 PROctwind(1):PRINT"Database v4.7
6 (inc. DPL/2)"
140 PRINT"Written and Designed by""R
ichard Hull":d%=FNreset:ENDPROC
150 DEF PROctwind(n%):RESTORE 390:FOR
k%=1 TO n%:READ x%,y%,a%,b%:NEXT
160 VDU 28,x%,y%,a%,b%:ENDPROC
170 DEF PROCbox(x%,y%,a%,b%):MOVE x%,y
%:DRAW a%,y%:DRAW a%,b%:DRAW x%,b%
180 DRAW x%,y%:MOVE x%+16,b%:MOVE a%+1
6,b%:PLOT 85,x%+16,b%-16
190 PLOT 85,a%+16,b%-16:MOVE a%+16,y%-
16:PLOT 85,a%,b%-16:PLOT 85,a%,y%-16
200 ENDPROC
210 DEF PROCos($cb%):PROccall(&FFF7):E
NDPROC
220 DEF FNinput(n%):!cb%=cb%+&10:cb%?2
=n%:cb%?3=32:cb%?4=127
230 A%=0:PROccall(&FFF1):=$cb%+&10)
240 DEF FNexec(text$):yp%=VPOS:IF text
$="" OR LEFT$(text$,1)="\" :="cr"
250 $cb%=text$:c%=0:REPEAT:c%?cb%=c%?c
b% OR &20:c%=c%+1:UNTIL c%?cb%<33
260 $cb%=LEFT$(text$,INSTR($cb%," ")
-1):c%=c%+1
270 IF ?cb%<42 c%=1:PROctwind(3):CLS:P
ROCos(FNstr):="cr" ELSE :=$cb%
280 DEF PROCerr:VDU 3:PROCos("fx21,3")
:PROctwind(2):VDU 31,0,yp%
290 IF ERR=29 OR ERR=30 PRINT "No suc
h command": ELSE REPORT
300 PRINT:yp%=VPOS:ENDPROC
310 DEF FNfilopen:PRINT "No file open
":=FNerr
320 DEF FNerr:yp%=VPOS:fnd=TRUE:=FALSE

```

SUBSCRIBE NOW!

If you prefer to save the wear and tear on your fingers you'll find this listing - together with all the others from this issue - on this month's disc, sent free if you subscribe to *The Micro User*.

```

330 DEF FNreset:VDU 2,1,27,1,64,1,27,1
,81,1,76,3:=FALSE
340 DEF PROCclear:FOR d%=store% TO sto
re%+1495 STEP 4:!d%=0:NEXT:ENDPROC
350 DEF FNclock:A%=14:?cb%=1:PROccall(
&FFF1):=STR$(cb%?2)+STR$(cb%?1)+STR$(
cb%?0)
360 DEF FNwait(t):t=t*100:ti%=TIME:REP
EAT:UNTIL ti%+t<TIME:PROCos("fx21"):=FA
LSE
370 DEF PROccall(addr%):X%=cb% MOD256:
Y%=cb% DIV256:CALL addr%:ENDPROC
380 DATA 0,1023,600,800,640,1023,1240,
800,0,760,1240,20
390 DATA 1,5,36,1,41,5,76,1,1,30,76,9
400 :
410 REM ## Options ##
420 DEF FNquit:d%=FNclose:=TRUE
430 DEF FNcr:=FALSE
440 DEF FNcls:FOR n%=2 TO 3:PROctwind(
n%):CLS:NEXT:yp%=0:=FALSE
450 DEF FNcat:PROctwind(3):CLS:PROCos(
"INFO *"):=FALSE
460 DEF FNcalc:PRINT ;EVAL FNstr:yp%=y
p%+1:=FALSE
470 DEF FNcreate:f$=FNstr:PROctwind(3)
:CLS:PRINT"Creating file: ";f$
480 PRINT "No. of characters per reco
rd (Max 1400) :";REPEAT
490 PRINT TAB(41,2)SPC(4)TAB(41,2):;ch
ar%=VAL(FNinput(4))
500 UNTIL char%>0 AND char%<=1400:char
%=15+76*(char% DIV 76+1)
510 PRINT "No. of records in the file
: ";REPEAT:PRINT TAB(28,4)SPC(4)
520 PRINT TAB(28,4):;len%=VAL(FNinput(
4)):UNTIL len%>0:ch%=OPENOUT(f$)
530 PRINT #ch%,char%:PRINT TAB(0,6)"Wr
iting file: please wait."
540 EXT #ch%=len%*char%+5:d%=FNclose:P
ROctwind(2):VDU 31,0,yp%:=FNdatestamp
550 DEF FNdatestamp:f$=FNstr:PROCwrt:P
ROCwrt_id_dt(f$,i$+"D",d$):=FNerr
560 DEF PROCwrt:PRINT "User id: ";yp
%=VPOS:i$=FNinput(5)
570 IF intcLock d%=FNclock:ENDPROC ELS

```

```

EPRINT"Date: ";yp%=VPOS:d$=FNinput(8)
580 d$=LEFT$(d$,2)+MID$(d$,4,2)+RIGHT$
(d$,2):ENDPROC
590 DEF PROCwrt_id_dt(f$,i$,d$):$(cb%+
&12)=f$+CHRS13:!cb%=cb%+&12
600 cb%?2=EVAL("&"+i$):cb%?6=EVAL("&"+
d$):cb%?&E=3:A%=1:PROccall(&FFDD):ENDPRO
C
610 DEF PROCrd_id_dt(f$):$(cb%+&12)=f$
+CHRS13:!cb%=cb%+&12:A%=5
620 PROccall(&FFDD):id$=STR$(cb%?2:d$
=RIGHT$("000000"+STR$(cb%?6,6)):ENDPROC
630 DEF FNopen:d%=FNclose:f$=FNstr:ch%
=OPENUP(f$)
640 IF ch%=0 PRINT "Not found":=FNerr
650 PROCwrt:PROCrd_id_dt(f$):yp%=VPOS
660 IF RIGHT$(id$,1)<"D" PRINT"Not a
Datafile":d%=FNclose:=FNerr
670 PROctwind(3):CLS:PRINT"File ";f$;"
last opened on ";
680 PRINT LEFT$(d$,2)"/"MID$(d$,3,2)
"/"RIGHT$(d$,2);
690 PRINT" by User ";RIGHT$("00000"+LE
FT$(id$,LEN(id$)-1),5);"."
700 PROCwrt_id_dt(f$,i$+"D",d$):INPUT
#ch%,char%:len%=(EXT #ch%)-5
710 rec%=len%/char%:prime%=FNprime(rec
%):=FALSE
720 DEF FNclose:PROCclear:prime%=0:ch%
=0:CLOSE #ch%:=FALSE
730 DEF FNhash(t$):t$=FNconv(t$):n%=0:
FOR t%=1 TO LENt$
740 n%=n%+ASC(MID$(t$,t%,1))*ASC(MID$(
t$,t%-1,1)):NEXT:n%=n% MOD prime%
750 DEF FNprime(t%):REPEAT:t%=t%-1:d%=
1:REPEAT:d%=d%+1:UNTIL t% MOD d%=0
760 UNTIL t%=d%:t%
770 DEF FNread:LOCAL ovf%,g$,addr%:err
%=FALSE:IF prime%=0 :=FNfilopen
780 ovf%=-1:g$=FNstr:addr%=FNhash(g$):
REPEAT:ovf%=ovf%+1
790 PROCgrpr(addr%,char%,3):UNTIL FNco
nv($store%):=FNconv(g$) OR $store%=""
800 IF $store%="" PRINT "Record not f
ound":yp%=VPOS:err%=TRUE:=FALSE
810 PROctwind(3):CLS:IF kf% VDU ptr%
820 PRINT"Key field: ";$store%;TAB(27)
;"Overflow: #";ovf%:VDU ptr%
830 PRINT:CALL print:IF asc%<>0 PROCsp
ool
840 FOR n%=1 TO lf%:VDU 1,13:NEXT:VDU
3:=FALSE
850 DEF FNwrite:IF prime%=0 :=FNfilope
n
860 n$=FNstr:IF n$="" n$="1"
870 FOR s%=1 TO VAL(n$)
880 PROctwind(3):CLS:PRINT"Key field:
";g$=FNinput(14):addr%=FNhash(g$)
890 ovf%=0:REPEAT:PROCgrpr(addr%,15,3)
900 IF FNconv($store%)<>FNconv(g$) AND
!store%<>0 ovf%=ovf%+1
910 UNTIL FNconv($store%):=FNconv(g$) O
R !store%=0 OR EOF #ch%
920 IF EOF #ch% PROctwind(2):VDU 31,0,
yp%:PRINT "No room in file":=FNerr
930 PRINT TAB(27,0)"Overflow: #";ovf%T
AB(70,0);s%
931 IF tm% VDU28,1,31,76,9:PROCos("pri
nt "+tm%):PROctwind(3)
940 PROCeditor(char%-15):PROCgrpr(addr
%,char%,1):NEXT:=FALSE
950 DEF FNerase:d%=FNread:IF err%:=FA
LSE
960 PROctwind(2):VDU 31,0,yp%:PRINT "
Are you sure ? ";
970 IF FNconv(FNinput(3))<>"yes" PRINT
"Aborted":=FALSE

```

MICRO MEMORIES

Facts and tips you may have forgotten...or never known

ACCIDENTALLY saving a file on top of another on a DFS format disc is simple to do and yet it's so easy to prevent. All you have to do is enter:

* ACCESS filename L

The file is then locked and, until it is unlocked, you can't save a file with the same name or erase it. Remember though, you can still format the disc, so the file is not completely safe. And as there's always a risk that your disc may become faulty you should always keep a backup.

To unlock a file you enter:

* ACCESS filename


```

980 FOR n%=0 TO char%-1:n%?store%=0:NE
XT:PROCgrpr(addr%,char%,1):=FALSE
990 DEF FNedit:d%=FNread:IF err%:=FAL
SE
1000 PROCeditor(char%-15):PROCgrpr(addr
%,char%,1):=FALSE
1010 DEF PROCgrpr(addr%,no%,wr%)
1020 PROCgbbp(ch%,store%,no%,5+(addr%+o
vf%)*char%,wr%):ENDPROC
1030 DEF PROCgbbp(?cb%,cb%!1,cb%!5,cb%!
9,A%):PROCcall(&FFD1):ENDPROC
1040 DEF FNconv($cb%):FOR n%=0 TO LEN($
cb%)-1:n%?cb%=n%?cb% OR &20:NEXT
1050 :=$cb%
1060 DEF FNchar:A%=135:=(USR &FFF4 AND
&FF00) DIV &100
1070 DEF PROCeditor(c%):depth%=2+c% DIV
76:PROCos("fx4,1"):PROCos("fx229,1")
1080 IF depth%<20 PRINT TAB(0,depth%)ST
RINGS(76,"");
1090 x%=0:y%=2:VDU 31,0,2:REPEAT:g%=GET
:IF g%>135 AND g%<140 VDU g%-128
1100 IF VPOS<2 VDU 10 ELSE IF VPOS>dept
h%-1 VDU 11
1110 IF g%=13 PRINT
1120 IF g%=127 VDU 8,32,8
1130 IF g%>31 AND g%<127 VDU g%
1140 UNTIL g%=27:PROCos("fx4"):PROCos("
fx229"):store%=g%+CHR$13:n%=15
1150 VDU 31,0,2:REPEAT:n%?store%=FNchar
:n%=n%+1
1160 VDU 9:UNTIL n%=char%?(store%+char
%):&FF:ENDPROC
1170 DEF FNtemplate:tm$=FNstr:IF FNconv
(tm$)="off" tm%=0:=FALSE
1180 tm%=OPENIN(tm$):CLOSE #tm%
1190 IF tm%=0 PRINT "Template file not
found":yp%=VPOS
1200 :=FALSE
1210 DEF FNbuild:tm$=FNstr:IF prime%=0
:=FNfilopen
1220 PROctwind(3):CLS:PRINT"Building te
mplate file: ";tm$:g$=""
1230 PROCeditor(char%-15):tm%=OPENOUT(t
m$):n%=15:REPEAT
1240 BPUT #tm%,n%?store%:n%=n%+1:UNTIL
n%?store%=&FF:CLOSE #tm%:=FALSE
1250 DEF FNprinter:ptr%=2:IF FNconv(FNs
tr)<>"on" ptr%=3:=FALSE
1260 PRINT "Print key ref. (y/n): ";:R
EPEAT:PROCos("fx21"):k%=GET OR &20
1270 UNTIL k%=110 OR k%=121:VDU k%:kf%
=(k%-121):PRINT "No. of LF: ";
1280 x%=POS:y%=VPOS:REPEAT:PRINT TAB(x%
,y%)CHR$32;CHR$8;:lf%=VAL(FNinput(2))
1290 UNTIL lf%>0:=FNerr
1300 :=FALSE
1310 DEF FNsearch:se%=FALSE
1320 DEF FNextract:se%=TRUE
1330 IF prime%=0 :=FNfilopen
1340 PROctwind(3):CLS:f$=FNstr
1350 PRINT"Key references will be spool
ed to: ";f$'
1360 PRINT"String to be searched for: "
;:target$=FNconv(FNinput(14)):PRINT
1370 PRINT"Search concentrated on key r
eference or record data (k/r): ";
1380 REPEAT:w%=GET OR&20:UNTIL w%=107 O
R w%=114:VDUw%:IFse% VDU 28,1,30,76,15
1390 ch2%=OPENOUT(f$):CLS:FOR addr%=0 T
O rec%-1:PROCgrpr(addr%,char%,3)
1410 IF w%=107 PROCrsearch ELSE PROCrd
search
1420 NEXT:CLOSE #ch2%:CLS:PRINT "Searc
h complete.":=FALSE
1430 DEF PROCrsearch:IF INSTR(FNconv($
store%),target$) OR (target$="*" AND !st

```

```

ore%<>0) PROCkrfound:ENDPROC ELSE ENDPRO
C
1440 DEF PROCkrfound:PRINT"Match found,
Key ref.: "$store%
1441 PRINT #ch2%,$store%:IF se% ENDPROC
1450 PRINT"View record/Next match (v/n
): ";:REPEAT:PROCos("fx21"):l%=GETOR&20
1460 UNTIL l%=110 OR l%=118:VDU l%:IF l
%=118 PROCrdrec($store%)
1470 CLS:ENDPROC
1480 DEF PROCrdsearch:IF !store%=0 ENDP
ROC
1490 fnd%=FALSE:n%=15:REPEAT
1500 IF (n%?store% OR &20)=ASC(LEFT$(ta
rget$,1)) fnd%=FNmatch
1510 n%=n%+1:UNTIL fnd% OR n%=char%:IF
fnd% PROCkrfound
1520 NEXT:ENDPROC
1530 DEF FNmatch:f%=0:FOR o%=1 TO LEN(t
arget$)
1540 IF (?n%+store%+o%-1) OR &20)=ASC(
MID$(target$,o%,1)) f%=f%+1 ELSE o%=LEN(
target$)
1550 NEXT:IF f%=LEN(target$) :=TRUE ELS
E :=FALSE

```

Get it
right ✓

```

1560 DEF FNscan:IF prime%=0 :=FNfilopen
1570 PROctwind(3):CLS:f$=FNstr:ch2%=OPE
NIN(f$):REPEAT:CLS:err%=FALSE
1580 INPUT #ch2%,key$:PRINT"Key ref.: "
key$;" Skip or read (s/r): ";
1590 REPEAT:PROCos("fx21"):k%=GET OR &2
0:UNTIL k%=114 OR k%=115:VDU k%
1600 IF k%=114 PROCrdrec(key$)
1610 UNTIL EOF #ch2% OR err%:CLOSE #ch2
%:=FALSE
1620 DEF PROCrdrec($cb%+c%):d%=FNread
1630 PRINTTAB(48,0)"Press SPACE for nex
t match";:PROCos("fx21"):d%=GET:ENDPROC
1640 DEF FNutility:f$=FNstr:f%=OPENIN(f
$):CLOSE #f$
1650 IF f%=0 PRINT "Utility file not f
ound":=FNerr
1660 PRINT"Warning: All open files wil
l"SPC(8)"now be closed."
1670 PRINT "Press Return to continue";
:PROCos("fx21"):REPEAT:UNTIL GET=13
1680 PROCos("key 0 CHAIN "+CHR$34+f$+CH
R$34+"|J|M")
1690 PROCos("fx138,0,128"):=TRUE
1700 DEF FNascii:ascfnm$=FNstr:asc%=0
1710 IF FNconv(ascfnm$)="off":PRINT "
Spooling off":=FNerr
1720 asc%=OPENOUT(ascfnm$):CLOSE #asc%

```

10 = 0 0	450 = AF82 4	890 = A065 F	1320 = F3BC C	1760 = F7 5
20 = 0 0	460 = B1D1 9	900 = 10A B	1330 = F917 C	1770 = 829 C
30 = 0 0	470 = 96ED 2	910 = 946C 0	1340 = 312E 2	1780 = 5E9E E
40 = 9719 9	480 = 9EB9 6	920 = EE56 9	1350 = E6A9 8	1790 = 4BFE 0
50 = E79B 7	490 = 5442 7	930 = 82F4 3	1360 = 6B56 2	1800 = 8B74 5
60 = CCF1 E	500 = 6485 A	931 = 5661 D	1370 = F006 9	1810 = FA1E 9
70 = 11C1 0	510 = 3723 8	940 = 894A A	1380 = 779F 5	1820 = 5B32 E
80 = 1F8C 9	520 = 344E 0	950 = 279C 6	1390 = ED99 8	1830 = 9B87 E
90 = 9BD8 0	530 = A571 4	960 = E79C 4	1410 = B2BD E	1840 = 16AB 8
100 = 9719 C	540 = C00C B	970 = EF65 5	1420 = CFF5 B	1850 = D01F 2
110 = BC05 2	550 = 5A49 8	980 = 26B8 F	1430 = 57AA 9	1860 = F424 F
120 = EAB7 E	560 = F491 6	990 = 1220 E	1440 = D346 4	1870 = DC0D F
130 = 34CC D	570 = A761 F	1000 = 109B D	1441 = 2B16 F	1880 = 9381 A
140 = 2AAB 6	580 = E58 3	1010 = 510D 7	1450 = 8CBF 9	1890 = F8CD 2
150 = 87F7 A	590 = A40B 6	1020 = A7BF E	1460 = 3F00 4	1900 = B876 9
160 = BDFF 9	600 = 1282 8	1030 = 7598 7	1470 = 9234 2	1910 = 56C8 B
170 = AD5B B	610 = DCFA 0	1040 = C490 3	1480 = ED16 A	1920 = EA58 D
180 = 17A F	620 = AE2F 1	1050 = A211 1	1490 = EF37 2	1930 = D7A0 9
190 = 6631 4	630 = 7695 F	1060 = AC6D D	1500 = 6AFE 5	1940 = 369 9
200 = EDOF B	640 = 9697 C	1070 = E112 B	1510 = 3E5 C	1950 = 4352 7
210 = 9C1E 1	650 = 7252 7	1080 = 786 F	1520 = E531 8	1960 = 4A41 C
220 = 5251 6	660 = 9796 3	1090 = 75A9 F	1530 = 3AEA 5	1970 = 9288 A
230 = B70A 2	670 = 1531 D	1100 = 9C9C 5	1540 = ED01 9	1980 = B9CF 2
240 = 2A7F 5	680 = 7E78 A	1110 = 43E7 7	1550 = 1F1A 7	1990 = E601 4
250 = 98C 4	690 = 852B 4	1120 = B9ED 1	1560 = FC83 2	2000 = A17E 8
260 = 705D 1	700 = 814B D	1130 = 7AE3 6	1570 = 356 9	2010 = D2FC 6
270 = DEC1 1	710 = 1D99 3	1140 = 2F8D F	1580 = EAD5 4	2020 = B5D1 F
280 = 7E8F B	720 = 372F F	1150 = 25B5 9	1590 = 16F9 0	2030 = 406B 7
290 = 6BC1 A	730 = AA6A 3	1160 = 8487 B	1600 = 83BE 2	2040 = CC66 3
300 = 7098 F	740 = 9CF9 0	1170 = 64D8 3	1610 = F6C2 6	2050 = 498F 6
310 = 488B D	750 = 6EBE F	1180 = EFD5 5	1620 = 66D8 1	2060 = 60B3 7
320 = 59AC F	760 = 9666 5	1190 = ACE5 7	1630 = C3C1 0	2070 = 40D3 4
330 = 8246 1	770 = 92CC 0	1200 = F424 4	1640 = 126C 3	2080 = 47FE C
340 = C743 3	780 = 3F44 4	1210 = F7CC F	1650 = DDB9 C	2090 = 175E C
350 = DC70 0	790 = 21FC 9	1220 = C7D8 8	1660 = BEF5 4	2100 = 8D7D 3
360 = 6640 2	800 = 5729 F	1230 = 1C6A 8	1670 = D1DF D	2110 = 3C1A 9
370 = 2E3C 9	810 = CCEB 4	1240 = 797A 4	1680 = ADB2 D	2120 = 42CD F
380 = 428D 8	820 = 30DF F	1250 = A66 3	1690 = CDB8 5	2130 = E149 5
390 = D348 D	830 = 9845 D	1260 = 88C6 3	1700 = C81F 2	2140 = 1056 A
400 = 9719 B	840 = F0DD 0	1270 = E449 D	1710 = CF38 1	2150 = EC9A 2
410 = 0 B	850 = B8E2 3	1280 = DA87 7	1720 = EF45 8	2160 = BACA 6
420 = B147 5	860 = F089 5	1290 = C2C D	1730 = E4E8 1	2170 = 78F4 2
430 = 45C9 0	870 = 79E9 0	1300 = F424 B	1740 = D9C2 5	2180 = 51D8 4
440 = 8361 4	880 = 758E 7	1310 = CC11 1	1750 = 41DF 6	



```

:PRINT "Spooling records to: "ascfnam$
1730 :=FNerr
1740 DEF PROCspool:asc%=OPENUP(ascfnam$
):PROCgbbp(asc%,store%,15,EXT #asc%,1)
1750 FOR n%=15 TO char% STEP 76:PROCgbbp
b(asc%,store%+n%,76,EXT #asc%,1)
1760 BPUT #asc%,13:NEXT:store%=STRINGS
(76,"")+CHRS13
1770 PROCgbbp(asc%,store%,77,EXT #asc%,
1):CLOSE #asc%:ENDPROC
1780 DEF FNlist:f$=FNstr:ch2%=OPENIN(f$
)
1790 IF ch2%=0 CLOSE #ch2%:PRINT "No s
uch reference file":=FNfilopen
1800 PROCTwind(3):VDU 12,ptr%:PRINT"List
ing key ref. file: "f$
1810 n%=0:REPEAT:INPUT #ch2%,key$:PRINT
TAB(n% MOD 4*19)key$;
1820 n%=n%+1:UNTIL EOF #ch2%:CLOSE #ch2
%:VDU 3:=FALSE
1830 DEF FNdisplay(i%,j%):PROCTwind(3):
t$=FNstr:PRINTTAB(i%,j%);
1840 IF $(cb%+c%)="$ " t$=CHRS34+t$+CHRS
34
1850 IF INSTR(t$,CHRS34)=1 PRINTMID(t$,
2,LEN(t$)-2); ELSE PRINTVALt$;
1860 :=FALSE
1870 DEF FNprogram:f$=FNstr:f%=OPENIN(f
$):res=0

```

```

1880 IF f%=0 PRINT "Program file not f
ound":CLOSE #f%:=FNerr
1890 p%=0:REPEAT:p%=p%+1:p$(p%)="":REPE
AT:k%=BGET #f%
1900 IF k%>31 AND k%<127 p$(p%)=p$(p%)+
CHRSk%
1910 UNTIL k%=13:IF LEFT$(p$(p%),1)=". "
PROCLabel
1920 UNTIL EOF #f%:CLOSE #f%:p%=0:REPEA
T:p%=p%+1
1930 UNTIL EVAL("FN"+FNexec(p$(p%)))=yp
%=0:PROCTwind(2):CLS:=FALSE
1940 DEF FNstr:IF LEFT$( $(cb%+c%),1)="$
" :=$var% ELSE :=$(cb%+c%)
1950 DEF FNstring:$var%=EVAL$(cb%+c%):=
FALSE
1960 DEF PROCLabel:lb%=lb%+1:lb$(lb%)=F
Nconv(RIGHT$(p$(p%),LENp$(p%)-1))
1970 lb$(lb%)=p$(p%)="":ENDPROC
1980 DEF PROCLbnd(lb%):f%=FALSE:co%=0:
REPEAT:co%=co%+1
1990 IF FNconv(lb%)=lb$(co%) f%=co%
2000 UNTIL f% OR co%=lb%:ENDPROC
2010 DEF FNjump:PROCLbnd(FNstr)
2020 IF f%=FALSE PRINT "Label not foun
d: ";FNstr:=FNerr
2030 p%=lb$(f%):=FALSE
2040 DEF FNcompare:c$=EVALFNstr
2050 IF c$=$var% res=0
2060 IF c$>$var% res=+1
2070 IF c$<$var% res=-1

```

```

2080 :=0
2090 DEF FNbeq:IF res=0 :=FNjump ELSE :
:=0
2100 DEF FNbne:IF res<>0 :=FNjump ELSE
:=0
2110 DEF FNbpl:IF res=+1 :=FNjump ELSE
:=0
2120 DEF FNbmi:IF res=-1 :=FNjump ELSE
:=0
2130 DEF FNbnf:IF fnd=FALSE :=FNjump EL
SE :=0
2140 DEF FNbfo:IF fnd=TRUE :=FNjump ELS
E :=0
2150 DEF PROCassemble:ptr=&70:st=store%
+15:FOR pass=0 TO 2 STEP 2
2160 P%=code%:LOPT pass:print LDA #st
MOD 256:STA ptr:LDA #st DIV 256
2170 STA ptr+1:pr2 LDY #0:.pl LDA (ptr
),Y:BEQ stop:JSR &FEE3:INY:BNE pl
2180 INC ptr+1:JMP pr2:stop RTS:]NEXT
:ENDPROC

```

All program listings in this issue
can be downloaded FREE on...

MicroLink

COMPUTERS, SOFTWARE & PERIPHERALS AT DISCOUNT PRICES

ACORN MASTER SERIES

	r.r.p.	Ex. VAT	Offer Ex. VAT
AMB15 Master 128	£439.00		£395.00
MASTER 128 DISC DRIVES AND UPGRADES			
ADC06 Master Turbo upgrade	£120.00		£110.00
ADF14 Erom cartridge	£11.95		£11.00
ANB21 DNFS ROM	£17.91		£17.00
ANB22 Econet upgrade kit	£42.95		£40.00
ANB23 Disk upgrade kit	£84.34		£75.00
ANB29 ADFS ROM	£26.08		£25.00
ANC21 Universal 2nd processor	£75.00		£60.00
ANB28 17/70 DFS upgrade	£49.00		£46.00
CSX200 Cumana 40 track double sided 200k	£94.78		£84.00
CSX400S Cumana 80 track double sided 400k*	£112.17		£97.00
CDX400 Cumana 2x40 track double sided 400k	£181.74		£149.00
CDX800S Cumana 2x80 track double sided 800k*	£216.52		£180.00
	*switchable to 40 track		
CS200	£112.17		£97.00
CS400S Specified as above but	£129.57		£105.00
CD400S with power supply	£213.04		£180.00
CD800S	£242.61		£200.00

ACORN A3000

A3000	£649.00	£585.00
-------	---------	---------

MONITORS

1431/MS Microvitec 14" standard res. colour metal	£216.52	£195.00
1431/DS Microvitec 14" standard res. colour plastic	£216.52	£195.00
1431/AP/MS As 1531/MS with added PAL	£242.61	£220.00
1451/MS Microvitec 14" medium res. colour metal	£260.00	£235.00
1451/DS Microvitec 14" medium res. colour plastic	£260.00	£235.00
1451/AP/MS As 1451/MS but with PAL	£300.00	£270.00
1441/MS Microvitec 14" high res. colour (0.31mm dot pitch)	£440.00	£400.00
1441/DS Microvitec 14" high res. plastic	£440.00	£400.00
1455/DA2 Microvitec Archimedes monitor	£270.00	£250.00
T.TECH 501 Microvitec 14" touch sensitive screen	£260.00	£235.00
2030/CS2 Microvitec 20" colour monitor	£389.69	£355.00

ACORN ARCHIMEDES

	r.r.p.	Ex. VAT	Offer Ex. VAT
A310 SERIES			
AKB15 Archimedes A310 Base only	£899.00		£755.00
AKB15/AFK11 Archimedes A310 Colour System	£1119.00		£945.00
AKB15/1455DA2 Archimedes A310 + Microvitec 1455	£1169.00		£1050.00
A310M SERIES			
AKB30 Archimedes A310M (with PC Emulator)	£959.00		£810.00
AKB30/AFK11 Archimedes A310M Colour System	£1179.00		£1000.00
ACORN ARCHIMEDES UPGRADES			
AKA62* RiSC-OS operating system	£29.00		£27.00
AKD50 Floppy disk drive	£115.00		£105.00
AKD52 20mb hard disk and expansion card for 300 series	£499.00		£449.00
AKA01 Backplane	£39.00		£37.00
AKA05 ROM expansion card	£59.00		£56.00
AKA15 Midi add-on to I/O	£39.00		£37.00
AKA16 Midi Podule	£69.00		£64.00
AKA10 I/O expansion card	£85.00		£77.00
AKA42 PC emulator	£99.00		£90.00
AKA51 0.5 Mb RAM for Arch. 305	£149.00		£139.00

UPGRADES FOR A3000 SERIES

AKA53 1Mb RAM	£199.00	£185.00
AKA12 User Port/Midi	£49.00	£46.00
AKA18 Serial Upgrade	£19.00	£18.00

ACORN ARCHIMEDES 400/1 SERIES

	r.r.p.	Ex. VAT	Offer Ex. VAT
A410/1 Archimedes 410/1 Base only	£1199.00		£1025.00
A420/1 Archimedes 420/1 Base only	£1699.00		£1400.00
A440/1 Archimedes 440/1	£2499.00		£2120.00

UPGRADES FOR A400/1 SEREIS

AKA52 1Mb RAM Upgrades	£199.00	£175.00
AKA51 2nd Floppy Upgrade	£125.00	£110.00

LASERS AND PRINTERS

We supply the whole range of printers from most popular manufacturers including:
AMSTRAD BROTHER CANON CITIZEN EPSON HP JUKI NEC
OLIVETTI PANASONIC QMS QUME SEIKOSHA SIEMENS STAR
ALL AT HIGH DISCOUNT - PHONE FOR LATEST OFFER PRICE

Full DTP systems supplied including S/W, scanners etc.

All prices exclude VAT and are available for a limited period and are subject to availability.

Phone for best price and products not listed

We supply a full range of computers from: AMSTRAD, EPSON, OLIVETTI, PHILIPS, SHARP, AST, ZENITH, SCHNEIDER... Phone for prices.

WILLOW SOFTWARE

Dept MU4/90

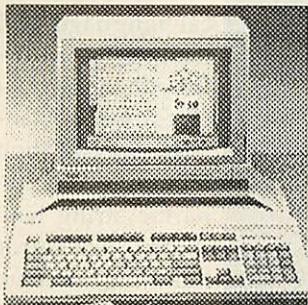
Mail Orders Office • Callers by appointment

Tel: (0934) 876031

Willow Software
The Willows
Wrighton Lane
Congresbury
Bristol
BS19 5BQ



	BASIC	COLOUR
A3000 1meg	£671.21	£899.41
A3000 2meg	£820.71	£1048.91
A410/1	£1240.96	£1468.66
A420/1	£1758.46	£1986.16
A440/1	£2586.47	£2814.16



COMPUTERS ON OUR SUPER BUY NOW PAY LATER SCHEME PLEASE TELEPHONE

BUY NOW PAY LATER PRICES

WITH 3 MONTHS TO PAY 10% DEPOSIT

	BASIC	COLOUR
A3000 1meg	709.03	949.38
A3000 2meg	858.53	1098.88
A410/1	1309.90	1550.26
A420/1	1856.15	2096.50
Master 128	479.60	706.60
Amiga 800 Pack	389.99	617.69
Atari ST 520	389.99	617.69

ALL our prices
include V.A.T.

Master 128	£454.37
Cambridge Z88 Lap Top	£218.44
Panasonic KX P1081	£159.00
Panasonic KX P1180	£216.55
Citizen 120D	£149.00
Seikosha SL80 24pin	£287.00
Star LC10	£178.71
Star LC10 Colour	£223.50
Philips 8833 colour	£260.50
Philips 8801 colour	£194.95
Philips 8832 colour	£229.63
Tatung Colour Std/Res	£175.00
Ahkter 40/80 400K Sgle no PSU	£99.37
Ahkter 40/80 800K Dual no PSU	£199.76
Ahkter 40/80 400K Sgle & PSU	£131.69
Ahkter 40/80 800K Dual & PSU	£276.20

OAK COMPUTERS

20 Mb Ext HDisc (B & Master)	£595.41
SCSI 20Mb Add HDisc A3/410	£475.24
SCSI 20Mb Ext HDisc A3000	£584.49
SCSI 45Mb Add HDisc A3/410	£606.34
SCSI 45Mb Ext HDisc A3000	£715.59
SCSI Card for A3000	£217.41
SCSI Card for A3/410	£217.41

ACORNSOFT

Desk Top Publisher (A)	£137.08
ISO Pascal ROM (BMC)	£55.20
Lisp (BMC)	£18.40
Logistix (A)	£102.46
Micros in Business (BMC)	£39.95
Twin (A)	£30.00
View 3.0 (B)	£47.84
View Index (BMC)	£11.96
View Plot (BMC)	£23.95
View Professional (BMC)	£79.94
View Sheet (BMC)	£47.84

COMPUTER CONCEPTS

Inter-Base (BMC)	£55.20
Inter-Chart (BMC)	£29.44
Inter-Sheet (BMC)	£45.08
Inter-Word (BMC)	£45.08
Inter-Chart (A)	£23.00
Inter-Sheet (A)	£35.88
Inter-Word (A)	£35.88
Mega 3 Rom(BMC)	£87.99
Spell Master (BMC)	£47.19
Impression (A)	£154.22

CLARES MICRO SUPPLIES

Alpha Base (A)	£44.94
Artisan 2 (A)	£53.95
Toolkit (A)	£35.95
Interdictor (A)	£31.45
Knowledge Organiser (A)	£53.95
Fontwise package (BMC)	£26.99

IMPACT SOFTWARE

Arcade Soccer (A)	£17.95
E-Type (A)	£17.95
Holed Out (A)	£17.95
U.I.M. (A)	£26.95
White Magic (A)	£17.95
The Olympics (A)	£17.95

PRES

Adv. Control Panel (BMC)	£32.08
Adv. Disc Investigator (BMC)	£26.73
Adv. Disc Toolkit (BMC)	£32.08
Adv. File Manager (BMC)	£25.87

PRES Archimedes products less 10%

MINERVA SYSTEMS

System Delta+Card Index (BM)	£58.45
System Delta Plus (A)	£71.95
Atelier (A)	£89.95

DABS PRESS

Master Guide Book	£11.65
Viewstore/Sheet Book	£11.65
View Guide Book	£11.65
"C" A Dabhand Guide	£13.45
Z88 A Dabhand Guide	£13.45
Archimedes Beginners Guide	£8.95



Made in with Confidence

PMS

Genie in a Box (BMC)	£71.41
Genie Junior (BMC)	£22.49
Genie Master Cartridge (M)	£71.41
Genie Utilities (BMC)	£8.94
Genie Real Time Clock (BC)	£26.08

This advert contains just
a few of the items we have
Please telephone or send a
SAE for our FULL price lists

COMPUTECK Ltd.

Dinting Lane Industrial Estate
Glossop
Derbyshire SK13 9NU
Visa-Master-Lombard Cards
Telephone 0457 865953
Telefax 0457 869917

We specialise in "Trading in" and
buying Used Hardware & Software

Post and Packing Charges
£1.00 for small, £2.45 for medium items.
Expensive products £8.50 for courier

USED STOCK SELECTION

COMPUTERS & HARDWARE

Acorn	BBC B 1770 DFS Series 4	264.50
Acorn	BBC B 1770 DFS Series 7	267.50
Acorn	BBC B 8271 DFS Series 4	264.50
Acorn	Z80 Second Processor	161.00
Misc.	Z80 Second Processor	103.50
Misc.	Zenith Green Screen	46.00
Viglen	Single Drive 40/80 no PSU	64.40
A T P L	Sideways ROM/RAM Board BBC	28.75
Acorn	Master ROM Cartridge	9.20
Acorn	Prestel Adaptor (BM)	46.00
Acorn	Speech Upgrade BBC B	17.25
Acorn	Teletext Adaptor	46.00
Acorn	Twin Joysticks (B)	9.20
Database	Z80 to BBC Link	16.10
Misc.	Cheetah Mach I Joystick	11.50
Misc.	Cheetah Speech System BBC B	13.80
Misc.	Delta 14b Joystick (B)	9.20
Misc.	Delta 3b Joystick (B)	5.75
Misc.	Delta 3s Joystick	4.60
Misc.	IFEL 16K Sideways RAM Module	15.00
Misc.	Magic Modern V21/V23	69.00
Misc.	Printer Shaver 6 Comps to 1 Pr	184.00
Misc.	Prism Modern 1000 Inc Software	69.00
Misc.	Prism Modern 2000 Inc Software	69.00
Misc.	Tetral printer Shaver Box	26.45
Misc.	Timer Kit	9.20
Misc.	UV Stat Epromer	19.55
Marley	AA Board (M)	28.75
Marley	Care dual 2x 16K cartridge	9.20
Marley	Quad Cartridge 4x 16K	11.50
Nidd Vail	Digimouse & Grafik (B)	28.75
PRES	Advanced Rom adaptor MK II	9.20
Solidisk	Teletext Adaptor	69.00
Viglen	Cartridge System for BBC B	9.50
Vine	ROM Board 3 (M)	11.50
Watford	16K Disc RAM Board (B)	23.00
Watford	Aries 820 RAM Board (B)	34.50
Watford	Quest Mouse & Paint	40.25

BOOKS

Acorn	Advanced User Guide BBC	10.00
Acornsoft	Programmers Ref Manual (A)	19.95
Acornsoft	View Ref Manual	6.00
Misc.	100 Progs for the BBC B	3.00
Misc.	30 Hour Basic	4.00
Misc.	36 Games for BBC	3.00
Misc.	Adv'd Progm'g BBC / Mike James	3.00
Misc.	Assembly Lang Prog I/linbaum	4.00
Misc.	Assembly Lang. by J Ferguson	4.00
Misc.	Basic Programming BBC	3.00
Misc.	Basic ROM user Guide Plumley	6.00
Misc.	BBC Ass. Lang Bruce Smith	4.00
Misc.	BBC Basic by A P Stephenson	3.00
Misc.	BBC Disc Companion / J Latham	3.00
Misc.	BBC Revealed by J Rushton	2.00
Misc.	Beyond Basic / R Freeman	4.00
Misc.	Business Programming BBC	4.00
Misc.	Companion to BBC Micro	3.00
Misc.	Disk Systems for BBC I Sinclair	3.00
Misc.	Expert Guide to BBC M James	3.00
Misc.	Further Progm'g / A Thomas	2.00
Misc.	Further Programming P Bishop	5.00
Misc.	Graphics & Sound by S Money	3.00
Misc.	Graphics Book and Tape (B)	5.00
Misc.	I/Facing & Control on BBC	5.00
Misc.	Learning Prolog Tom Canlon	5.00
Misc.	MCS6500 Manual	4.00
Misc.	The Book of Listings	2.00
Misc.	Utilities for BBC / J Aughton	3.00

SERIOUS SOFTWARE

A M S	3D Zoon (BM) Disc	13.80
A M S	AMX Art & Paint Pot (B) ROM	25.00
A M S	AMX Design (BM) ROM	34.50
A M S	AMX Super Art ROM (B)	28.75
A M S	Extral Extrial (BM) Disc	13.80
A M S	Mouse & Super Art (M) Disc	34.50
A M S	Stop Press (B) ROM	28.75
A M S	Stop Press Discs (M)	28.75
A M S	Utilities (BM) Disc	8.05
Acorn User	User Dump ROM	13.80
Acorn User	User Rom	13.80
Acorn User	View Chart (BM) Disc	6.90
Acornsoft	BCPL ROM (B)	36.01
Acornsoft	BCPL Stand alone Gen (BM) Disc	13.80
Acornsoft	Business Games (B) Tape	3.45
Acornsoft	Database (B) Disc	8.05
Acornsoft	Fortran 77 (A) Disc	69.00
Acornsoft	GXR ROM (B) ROM/Tape	19.00
Acornsoft	Hi-View (B) Disc	25.30
Acornsoft	Linkword German (Tape)	11.50
Acornsoft	Linkword Italian (Tape)	11.50
Acornsoft	Logo (E) ROM & Tape	18.00
Acornsoft	Logic Mushrooms (B) Disc	3.60
Acornsoft	Maze (B) Disc	3.45
Acornsoft	Overview (B) ROM	57.50
Acornsoft	Printer Driver Gen. (BM) Disc	6.90
Acornsoft	View (BM) ROM	34.50
Acornsoft	View Index (BM) Disc	6.90
Acornsoft	View Plot (C) Disc	17.25
Acornsoft	View Sheet (BM) ROM & Disc	25.00
Acornsoft	Viewsheet (BMC) ROM	34.50
Acornsoft	Worksheet (B) Disc	6.90
BBC Pubs	Music (B) Tape	4.60
BBC Pubs	Painting (B) Tape	3.45
BBC Pubs	VU-Type (B) Tape	6.90
Beebug	Asiagad (M) Disc	6.90
Beebug	Billboard (B) Disc	9.20
Beebug	Design (B) Disc	11.50
Beebug	Exmon II (B) ROM	17.25
Beebug	Help (ROM) (B)	11.50
Beebug	Masterfile (B) Disc	13.80
Beebug	Paintbox (B) Disc	9.20
Beebug	Printwise (BM) Disc	17.25
Beebug	Quickcalc (B) Disc	9.20
Beebug	Rommit (B) ROM	23.00
Beebug	South (B) ROM	20.70
Beebug	Spellcheck (B) Disc	11.50
Beebug	Spilles (B) Disc	6.90
Beebug	Studio 8 (B) Disc	13.80
Beebug	Teletext (B) Tape	4.03
Beebug	Teletext Pack (B) Disc	8.05
Beebug	Toolkit (B) ROM	13.80
Beebug	Toolkit Plus (B) ROM	20.70

Beebug	Vocab Tester (B) Tape	9.20
Clares	Altroom (C) Disc	17.25
Clares	Altroom (M) Disc	13.80
Clares	Altroom Pack (C) Discs	23.00
Clares	Altroom/Acorn (M) Discs	17.25
Clares	Beta Base (B) Disc	16.50
Clares	Brom Pack (BMC) ROM	17.25
Clares	Griddisk (B) Disc	6.90
Clares	Replica II (B) Disc	8.05
Comp Con	Caretaker (B) ROM	13.80
Comp Con	Communicator (B) ROM	34.50
Comp Con	Graphics (BM) ROM	17.25
Comp Con	Grimlin (B) ROM	17.25
Comp Con	Inter-Sheet (BMC) ROM	34.50
Comp Con	Inter-word (A) ROM	34.50
Comp Con	Printmaster (BMC) ROM	17.25
Comp Con	Workwise (BMC) ROM	20.70
Dabs Pres	MOS Plus (M) ROM	8.05
Database	Academy Game Creator (B) Disc	6.90
Incentive	Graphic Adv Creator (B) Tape	11.50
Incentive	Graphic Adv Creator (B) Disc	13.80
Islelog	Music System II (B) Tape	6.90
Micro Pow	Basic Extension (B) ROM	17.25
Minerva	Signa Sheet (A) Disc	45.00
Minor	Admin Extra (B) Disc	8.05
Minor	Free Sheet Editor (B) Disc	28.75
Misc.	*TREC Disassembler by Slogger	10.50
Misc.	ACE (M) 2xROM	34.50
Misc.	ADU by Pineapple (BM) ROM	17.25
Misc.	AIDS II by Soft Smith	9.95
Misc.	Cashbook by Micro Aid Disc	9.50
Misc.	Cashbook by Technomatic ROM	13.80
Misc.	Family History Micro Aid (A)	17.25
Misc.	Graphics Pack (B) Tape Salaman	3.45
Misc.	Graphical (B) Disc	6.90
Misc.	Graphical (B) Tape	5.75
Misc.	Health Data (BM) Disc	6.90
Misc.	Image by Cambridge (B) Disc	17.25
Misc.	Image V2 (B) Tape Copier	4.90
Misc.	Instant Recall Database (B) Tape	6.90
Misc.	Mega Maths 'A' Level 2 x Disc	17.25
Misc.	Orkaid Pascal (B) ROM/Disc	45.00
Misc.	Purplelight (B) Disc	9.20
Misc.	Ref Light File (B)	9.20
Misc.	Sciways (BM) ROM	25.00
Misc.	Share Analyst - Synergy Soft	19.95
Misc.	Slave - ROM (B)	23.00
Misc.	Spy (B) ROM	13.80
Misc.	Supermarket (B) Disc	11.50
Misc.	Vector 1 Tape to Disc	6.90
Misc.	Vector 2 Disc to Disc	6.90
Misc.	View Guide & Utilities (BM) Disc	8.05
Misc.	Villain Viewdata (B) ROM	23.00
Misc.	Vu Calc (Palm) (B) Tape	9.20
Misc.	Vu Calc (B) Tape	11.50
Misc.	Wordwise Books/Disc P Beverley	9.95
Misc.	XOR Designer (B) Disc	10.35
Misc.	ZOOM Teach Code Monitor (B)	11.50
Misc.	Time Watch (A) Disc	19.95
Misc.	Master Copy (M) ROM	9.20
Misc.	Genie Utilities (M)	34.50
Misc.	Genie Utilities (BM) Disc	4.60
Misc.	Commstar (BM) ROM	17.25
Misc.	Microtel Terminal (B) ROM	9.20
PRES	Adv d Disc toolkit (BM) Rom	23.00
PRES	Adv d ROM Manager (BM) ROM	9.20
Solidisk	ALPS (B) ROM	13.80
Watford	Speech (BM) Disc	4.60
Watford	Beetmon (B) ROM	23.00
Watford	Colour Art (B) Disc	6.90
Watford	Office Mate (B) Disc	6.90
Watford	Quest Fonts Disc (BM) Disc	11.50

GAMES

Acornsoft	Arcade Action (B) Tape	1.73
Acornsoft	Aviator (B) Disc	8.05
Acornsoft	Boxer (B) Disc	4.60
Acornsoft	Carousal (B) Disc	4.60
Acornsoft	Cube Master (B) Tape	2.30
Acornsoft	Elite (C) Disc	8.05
Acornsoft	Free Fall (B) Disc	4.60
Acornsoft	Hills Val 1 (C) Disc	6.90
Acornsoft	Me & My Micro (E) Tape 8 Games	1.73
Acornsoft	Meleors (B) Tape	2.30
Acornsoft	Monsters (B) Disc	4.60
Acornsoft	Planetoid (B) Disc	4.60
Acornsoft	Revs (B) Disc	6.90
Acornsoft	Revs (BM) Tape	4.60
Acornsoft	Rocket Roid (B) Tape	2.30
Acornsoft	Snapper (B) Disc	4.60
Acornsoft	Snapper (B) Tape	1.73
Acornsoft	Starship Command (B) Tape	2.30
Acornsoft	Super Invaders (B) Tape	1.73
Acornsoft	White Knight II (B) Tape	4.60
CDS	Birdie Barrage (B) Tape	1.73
Darnark	Not a Penny More (B) Disc/Book	6.90
Darnark	Trival Pursuit (B) Tape	4.60
Darnark	Trival Pursuit (B) Disc	6.90
Firebird	Cholo (B) Disc	6.90
Leisure G	Kensington (B) Tape	3.45
Leisure G	Scrabble (B) Disc	6.90
Leisure G	Scrabble (B) Tape	3.45
Melborne	The Hobbit (B) Tape	3.45
Melborne	Way of the Exploit (B) Disc	6.90
Micro Pow	Castle Quest (B) Disc	4.60
Micro Pow	Inogen (C) Disc	4.60
Micro Pow	Magic 10 Hills (C) Disc	4.60
Micro Pow	Magic II (C) Disc	4.60

MORE NEW RELEASES FROM DABS PRESS

Z88 PipeDream: A Dabhand Guide

from John Allen - expert Z88 journalist

Z88

PipeDream, the built in word processor, spreadsheet and database built into the Z88 is an extremely powerful tool, and John Allen, author of many articles of the Z88, and experienced user has produced what must be the ultimate tutorial and reference work on the software. With many example documents and templates, this book takes you from first principles to a thorough understanding of the program. Linking to PipeDream on other machines such as the BBC and Archimedes is also covered.

Only £14.95 all inclusive

AVAILABLE 24th APRIL

Also still available is our first book on the famous Cambridge portable marvel, Z88: A Dabhand Guide, written by Trinity Concepts, authors of the Z88 operating system. Also priced at £14.95

THE LATEST DABHAND GUIDE

We have moved! Please note our new address and telephone number for all correspondence.

**DABS PRESS (MU5)
22 WARWICK STREET
PRESTWICH
MANCHESTER
M25 7HN
TEL: 061-773 8632
FAX: 061-773 8290**

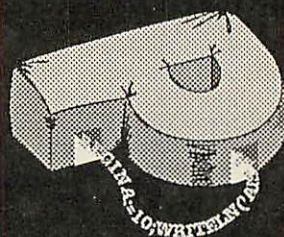
For personal callers Warwick St. is in the centre of Prestwich Village, just off Bury New Road.

Dabs Press books and software are available from all good bookshops and Acorn dealers, or in case of difficulty direct from the above address. Access/Visa/official orders accepted. Free catalogues on request. Prices include 15% VAT (on software) and UK postage. Foreign deduct VAT but add £2.50 Europe/surface, £12 airmail.

061-773 8632

CAMBRIDGE PASCAL

Full featured Pascal Compiler for the Acorn
Archimedes



**DABS
PRESS**

Cambridge Pascal is a comprehensive version of the Pascal language and includes many extra enhancing features over the standard specification including full dynamic string handling, local error handling, random access files, direct access to 'star' commands and RISC OS SWI calls. It is 100% Desktop compatible but can

also be run from the command line. All programs compile into fast, efficient machine code.

Cambridge Pascal requires any Archimedes running RISC OS with at least 1Mb of RAM. Hard discs and extra memory are useful, but the system is perfectly workable with this minimum configuration.

Price £79.95 (£69.52+VAT). Site licences available. Free demonstration disc and full specification sheet available on request.

DEMO DISC FREE ON REQUEST

ARCHIMEDES FIRST STEPS

Beginners Guide to the
Archimedes & BBC A3000

This book is the perfect introductory guide to the Archimedes, to guide you through the first few months of ownership, acting as an easy-to-read supplement to the User Guide.

The book describes in detail how to put the RISC OS Desktop to best use, and also documents the programs on the Applications Discs provided with the machine.

But the book also goes beyond this and describes the sort of software and hardware additions available to the Archimedes owner, and how to choose and install them.

The many features of this book include:

- Applicable to all Archimedes with RISC OS
- Using the Desktop, RAMdisc and ADFS
- Edit, Paint, Draw and Maestro
- The Task Manager
- The BBC and PC emulators
- Hardware and software additions
- Illustrated throughout

AVAILABLE NOW!

PRICE £9.95

ONE OF OUR BEST SELLERS

THE BEEB BODY BUILDING COURSE

A tale of two syncs

THERE are undoubtedly a lot of those pesky PCs and clones about. Of course popularity has never been equated with quality – look at how many Dickens stories there are compared with the number of hours of Crossroads – but, nevertheless, I am often asked if there is anything that can be done with a PC system.

Well, it is a far, far better thing that can be done with the monitor than can ever be done with the micro.

In other words, the monitor can be a useful addition to any BBC Micro set-up. Unfortunately the two systems are not directly compatible, mainly with regard to their sync pulses, so this month let's look at how they can be made to work together.

There are a plethora of different monitors and standards masquerading as the so-called PC standard, so first we'll see how they compare to the true micro standard.

First of all we have the MDA – Monochrome Display Adaptor – which was used only with the earliest of machines. This is the equivalent of a black and white monitor and takes the composite video produced at the back of a BBC Micro.

Perhaps the most common of the lower cost systems is the CGA or Colour Graphics Adaptor. This can be used in various modes similar to the original BBC B, but it can display 16 different colours as opposed to the Model B or Master's eight. Nevertheless the monitor used for this was still a TTL input.

TTL stands for Transistor Transistor Logic and it simply means a logic signal with zero volts representing off and anything over 3.5 volts representing on. The extra colours are achieved by using what is known as an RGBI TTL input as opposed to a straightforward RGB TTL input. Put simply, each colour – red green or blue – can be on or off.

The I or intensity line determines how brightly a colour is to be displayed. As this signal is digital we can in effect have the

Mike Cook finds a use for PC systems in the BBC Micro environment

eight Model B colours in either bright or dim versions. The EGA or Extended Graphics Adaptor, has an identical system of colours but better resolution, so the monitors normally have a finer dot. In addition, in order to get higher resolution the scan line frequency is changed from the normal 15.75 KHz to 21.85 KHz.

This allows more lines to be scanned in each frame and so cuts flicker. However, in order to cope with software that required CGA graphics, most EGA monitors can work at both scan rates.

Finally the VGA – Video Graphics Array – has a virtually unlimited number of colours, achieved by using analogue rather than digital inputs. In this way each colour can be gradually turned up to the exact amount needed.

Again the resolution has been increased, necessitating the scan line frequency being increased to 31.5 KHz. This is similar to the set-up used in some of the modes – like Mode 20 – available on the Archimedes.

Many, but not all, VGA monitors will also work with the two slower scan frequencies, in which case they are often called multi-sync or auto-scan.

Just to confuse things, there is also a Hercules high resolution monochrome standard, but we'll not be concerned with that here.

Some PC monitors have a frame rate of 60Hz instead of the usual 50Hz; this is not too much of a problem as the two rates are so close that they are normally within locking range. If they will not lock the picture will slowly roll: All is not lost, however, as

Converting a BBC B

Unfortunately the vertical sync is not available in the correct polarity and so we have to employ a cunning little wheeze to invert it. First locate IC48 – the middle IC below the metal box of the UHF modulator. You will probably find that it is soldered in.

Take a small sharp pair of side cutters and snip off pin 10. Solder a short wire from the IC side of the leg to pin 14 of the same IC. Now locate S31 just below IC48 and remove the link. From the centre pin of the three solder a wire to pin 11 of IC41 which is about 7cms by 8cms from the top right hand corner.

Now to make the horizontal sync patch. Fortunately pin 6 of the RGB socket is easy to disconnect: The wire stands proud of the socket and it is easily snipped halfway up. Solder a wire from the socket side to pin 8 of IC33 – this can be found about 6cms in and 5cms down from the top left hand corner of the board

Converting a Master

Due to the way the printed circuit board is laid out this is a little tricky. To make the vertical sync patch, locate IC25 – 110cms in by 85cms down from the top right hand corner of the board – and with a small sharp pair of side cutters and snip off pin 9. Solder a short wire from the IC side of the leg to pin 4 of the same IC.

Now to make the horizontal sync patch. Unfortunately pin 6 of the RGB socket is not as easy to disconnect on the Master as the BBC Micro due to the design of the socket. You need to use a small grinding wheel of the type supplied with many miniature drills to break the connecting metal strip to the centre connection.

Solder a wire from the socket side to pin 8 of IC34 – this is located just to the left of IC25. Strictly speaking this is not the horizontal sync but a mixed sync signal.

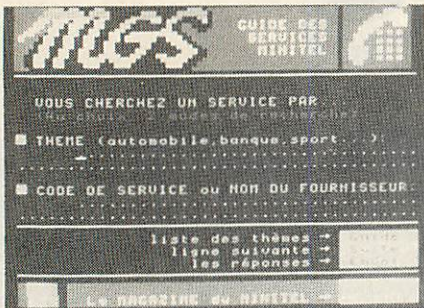
But most separate sync monitors won't mind triggering their line sync off this because they are so much faster, and the design of the Master makes these syncs invert during frame flyback, so they are always available.

EXCLUSIVE!

Open the door to Minitel

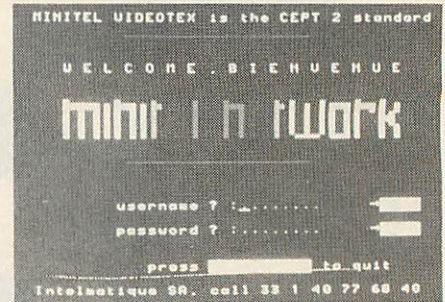
Minitel - France's Teletel videotex system - is the most successful on-line network ever. It offers many thousands of separate services ranging from education to booking train and plane tickets, international finance to regional site-seeing, leisure activities to business opportunities and so much more.

Its five million regular users spend tens of millions of hours on it each year, dwarfing any other system - anywhere in the world.

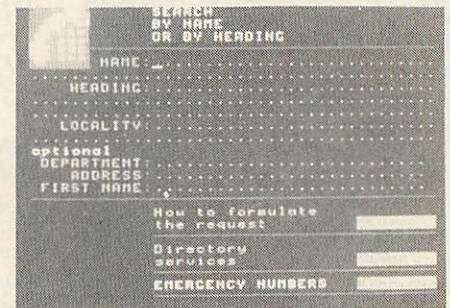


And now Minitel is available in the UK via MinitelNet, which turns your BBC Micro into a fully functional Minitel workstation with direct connection to Paris.

The software program "T" is a complete emulation of the standard Minitel terminals. You can wander around the system, chat to other users (in French and often in English), find the information you need and capture it to disc.



Connect time costs you from just 15p* per minute (the normal price for calling France is 35p per minute cheap rate and 46p per minute standard rate!), while the software is just £49.95, including full documentation and a 120 page Minitel directory detailing (in English) hundreds of the most frequently used services and how to access them.



Do you ever get bored with the English videotex systems and find them lacking in variety? Why not try Minitel? For just 15p per minute there's so much there you could well find you spend more time logging on to Minitel than any other system. Order your copy today using the form below (remember, you don't need a stamp), or call our Credit Card Hotline on 051 357 2860.

* From 7p per minute on-line time, plus 8p per minute for PSS or Mercury.

On-line time is provided by Aldoda International. Full details are include in each package.

Compatible with any BBC Micro or Acorn Master with any Viewdata (1200/75) or 1200 baud full duplex modem.

This offer is available only in the UK. Despatch is normally within 48 hours but please allow up to 28 days delivery

ORDER FORM

Please send me my copy of "T" the Minitel terminal emulator for just £49.95 on the following format:
(Please tick/complete all relevant boxes and sections).

- ☐ 40T Disc ☐ 80T Disc (Discs are for sideways ram) ☐ 16k Rom
☐ I enclose a Cheque/PO made payable to Swift Software.

☐ Access/Visa No. Expiry Date

Name Company (If applicable)

Address

Post Code Daytime Tel.

Credit Card Hotline: 051 357 2860



**MU5
FREEPOST
Ellesmere Port
South Wirral L65 3EE**

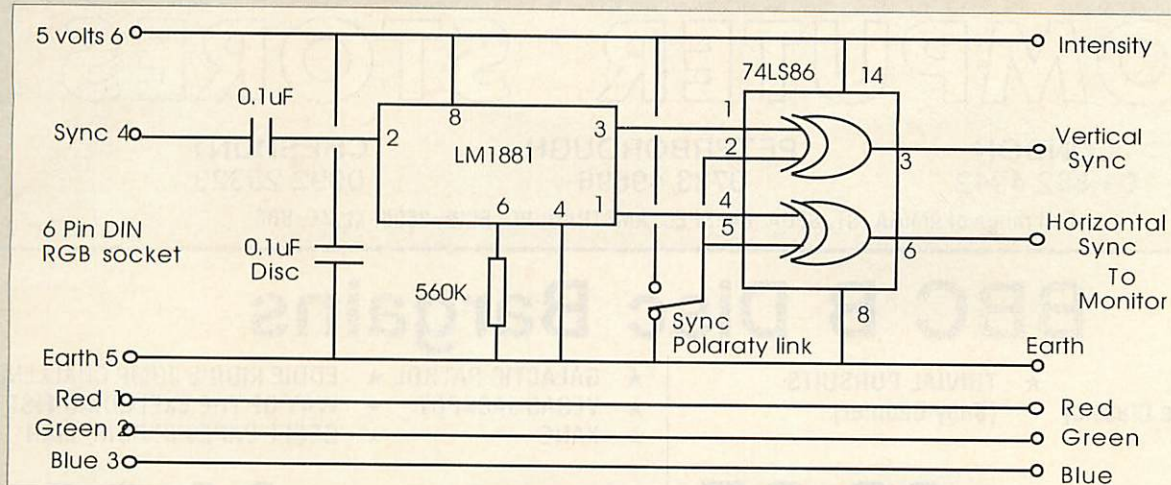


Figure 1: Sync separator

there is certain to be an adjustment potentiometer inside the monitor.

The picture height control, perhaps inside the monitor as well, might have to be adjusted if the system was originally used with a 60Hz rate. Remember to be careful when delving inside a monitor as high voltages are present even when it is disconnected – seek assistance if you are unsure.

Clearly then, if we want a PC monitor to use on our Model B or Master, it needs to be a CGA one. Alternatively we can use an EGA one if it will work with the lower sync rate. For an Archimedes we need a VGA monitor and it needs to be a multi-sync version if we want to use all the modes.

Well that sounds straightforward, but there are two snags. The first is what to do with the intensity input of the monitor. Very simply, you can either connect it to 5 volts if you want a bright display or zero volts for a dimmed one.

The second problem is more tricky. Most CGA and EGA monitors have two sync inputs which require feeding with separate horizontal and vertical synchronising pulses.

The problem is that the Model B and Master only produce one sync output consisting of the two signals mixed – known as a composite sync signal. Ironically they are generated separately inside the micro and mixed before they come out.

So we have to provide the monitor with separate sync pulses and we can do this in two ways. We can separate the two signals in a circuit between the monitor and micro or we can prevent them from being mixed together in the first place and feed the two signals out of our micro.

The first solution has the advantage of not requiring any modification to the micro, thereby leaving it usable on any monitor system. However it calls for extra circuitry and therefore costs money.

The second solution has the advantage of costing nothing, but requires internal modification to the micro. Let's look at both

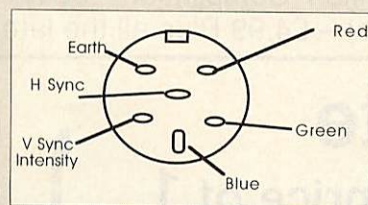


Figure 11: Connecting a monitor to a modified computer

solutions so you can choose which you prefer.

In order to separate the two sync signals we have to effectively filter the composite signal and then reconstruct the original logic levels.

Fortunately a single integrated circuit will perform these functions, the LM1881. We can mount it on a small board and power it from the 5 volts provided on the micro's RGB socket. The full circuit is shown in Figure 1.

As the output drive from the LM1881 is a little limited it is passed through an Exclusive OR gate to beef it up. This also offers an opportunity to invert the sync pulses if necessary by an optional link. Most monitors require negative-going pulses but a few need them to be positive-going.

The board has a 6 way socket for the input: This is the same as the BBC Micro's RGB socket and should be wired up with a one to one cable. On the output side there is a 7 way socket and the cable should be wired up to suit the monitor being used. All parts for this circuit are available as Body Build pack No. 58 along, with a small printed circuit board.

However, spending money is not the only solution. If you don't mind putting your micro under the knife you can come up with a modification that costs you nothing.

The RGB socket is a 6 way one and we first need to make the mixed sync output – pin 4 – into a vertical or frame sync output. Then the 5 volts output – pin 6 – has to be

made into a horizontal or line sync output.

The exact details will depend on which 8 bit micro you have and are given in the adjoining panels. However, only make these modifications if you have the confidence and skill to reverse them. If you are at all in any doubt use the extra circuitry.

Having modified your micro, you no longer have the 5 volt output available to connect to the monitor's intensity input. However, you should use the vertical sync output because this spends most of the time up at 5 volts. The only time it is at zero volts is during frame flyback when there is no video output anyway.

Figure 11 shows the connections to be made to the monitor at the back of a modified micro. Well, there you have it. At last a practical use for a PC system. See you next month.

WARNING

Remember to be careful when delving inside a monitor as high voltages are present – even when it is disconnected. Seek expert assistance if in doubt.

BEEB BODY BUILDING PACK ORDER FORM

Pack 58 – Sync separator

- ☐ Kit of all components, lead and PCB£14.00
- ☐ Assembled and tested kit£38.00

- Name..... Educational establishment orders accepted.

- Address
 ■
 ■
- Make cheques payable to
 Musbury Consultants and send to:
 8 Fairhill, Helmshore, Rossendale,
 Lancs BB4 4JX.*

-
 Post code
All prices include VAT and P&P
- Foreign orders add £3.00 if airmail delivery is required. Copies of previous articles are available – contact Musbury Consultants for details.*

LOGIC

COMPUTER STORES

LONDON
01 882 4942

PETERBOROUGH
0733 49696

CHESHUNT
0992 25323

Full range of AMIGA, ST, SEGA, 64, SPEC, AMSTRAD, PC, PCW, 2600, XL/XE, BBC

BBC B Disc Bargains

★ SCRABBLE
★ WAR (Arcade Classic)

★ TRIVIAL PURSUITS
(Baby Boomer)

★ GALACTIC PATROL ★ EDDIE KIDD'S JUMP CHALLENGE
★ VEGAS JACKPOT ★ WAY OF THE EXPLODING FIST
★ KANE ★ GEOFF CAPES STRONG MAN

ALL THREE FOR £8.95

ALL SIX FOR £4.99

Also available: Tarzan – £1.99 Smash Hits 7 Compilation – (£5.99)
Trivial Pursuits (Young Players) – £4.99 Plus all the latest titles for your BBC

BBC B Cassette

29 great games for the price of 1

● Galactic Patrol ● Vegas Jackpot ● Eddie Kidd Jump Challenge
● Kane ● Geoff Capes Strongman ● Way of the Exploding Fist ● Jet Pac
● Knightlore ● Nightshade ● Sabre Wolf ● Pirate Adventure ● Voodoo
Castle ● Strange Odyssey ● Buckaroo Banzai ● Temple of Terror
● Psycastria ● Thunderstruck ● Ultron ● Contraption ● Wizzy's Mansion
● Space Ranger ● Last of the Free ● The Genesis Project ● Chrysalis
● Space Agent Zelda ● International Megasports ● Bug Eyes II ● Drain
Mania ● Flip

**All for
£9.95**

BBC B Sale

Lord of the Rings.....£2.99
Moon Cresta.....£1.99
Yes Prime Minister.....£1.99
Brian Cloughs Football Fortunes.....£2.99
Krackout.....£1.99
Trivial Pursuits (Young Players).....£1.99
Trivial Pursuits (Baby Boomer).....£1.99
Kensington.....£2.99
Starmaze.....£1.99
Octopus Sketchpad.....£2.99
Atic Atac.....£1.99
Alien/Dragons Tooth.....£1.99

BBC B Sale

Diary of Adrian Mole.....£1.99
Confuzion.....£1.99
The Key Trilogy.....£2.99
First Steps with Mr Men.....£1.99
Contraption.....£1.99
Colourspace.....£1.99
Cyclon Attack.....£1.99
Programmers Revenge.....£1.99
Castle Dracula.....£1.99
Frankenstein.....£1.99
The Page Program.....£2.99
Record Keeper.....£2.99

BBC B sale

Waterloo.....£2.99
Tapper.....£1.99
Football Manager.....£1.99
Dr. Who.....£3.99
Smash Hits 7.....£4.99
Mystery of the Java Star.....£3.99
Football Manager.....£2.99
Frac.....£1.99
Mr Wiz.....£1.99
Strykers Run.....£2.99

LOGIC – Everthing for the home computer

**DISCS ● RIBBONS ● BOXES ● PRINTERS ● CABLES ● PAPER ● LEADS ● BOOKS ● SOFTWARE ● COMPUTERS
MONITORS ● DUST COVERS ● JOYSTICKS ● MICE ● POWER SUPPLIES ● SURGE PROTECTORS**

WHERE TO BUY:

Either at – 19 The Broadway
The Bourne
Southgate
London
N14 6PH

Unit 6
Midgate
Peterborough
Cambs
PE1 1TN

5 Lynton Parade
Cheshunt
Herts
EN8 8LF

Or Mail Order
Logic Sales
5 Lynton Parade,
Chestnut, Herts EN8 8LF
Tel: 0992 640050

Postage + Packing – 1-3 items 75p, 4 or more £1.00

Only a key press away

*Gareth Long
tackles the problem
of grabbing screens
using Risc OS on
the 32 bit
Archimedes series
and BBC A3000
with a very versatile
relocatable module*

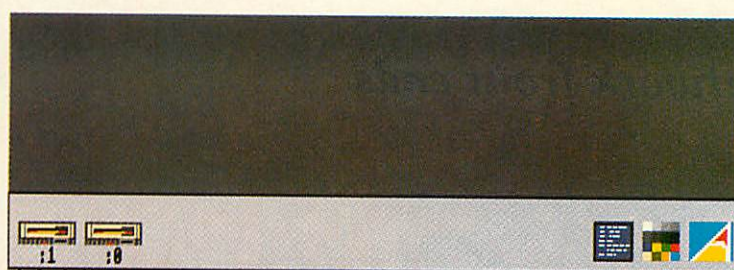
THE ScreenGrabber utility from the December 1988 issue of *The Micro User* provided a useful facility for taking a snapshot of the Archimedes screen under Arthur 1.20. However, after Risc OS was released, the original was rendered about as useful as a bio-degradable plastic gnome. So here's the new updated module: HotKey.

Admittedly, ScreenGrabber's way of working was a bit naughty, so a different method was needed to provide the same effect. Unfortunately this resulted in a complete re-write of the code, so I took the opportunity to make a few additions making it easier to add your own code, or star commands to be acted upon when a hot key is pressed.

Type in the listing, using the checksums to make sure you've made no typing errors, save and run. The module will be assembled and saved to disc under the name HotKey in the Modules directory of your work disc. If you don't have a directory by that name you'll have to create one. At this point you can press f1 to load the module – in future you can double-click it from the DeskTop or use:

```
*RMLoad HotKey
```

Those who just want a snapshot of the



```
*help hotkey
```

```
==> Help on keyword HotKey
*HotKey switches the Hot Key system on or off,
*HotKey can take an ASCII keycode to allow a key to be programmed from the
default to activate the utility. The default is the 'print' key.
*HotKey without a parameter reflects the current state.
Syntax: *HotKey [<ON/OFF>] [<key>]]
```

```
==> Help on keyword HotKey
Module is: Hot Keys 1.00 (27 Oct 1989)
```

```
Commands provided:
HotKey
```

```
It has help on:
Key
*
```

Any screen can be saved with the user-transparent HotKey module

screen need look no further. Just type:

```
*HotKey ON
```

Press Return and from here on pressing the Print key causes the module to save the current screen to the disc in drive as screen0000 and return you to the application you were using.

However, this new module is capable of more than just saving the screen with a keypress. You now have access to the command HotKey with which you may switch the utility on or off by specifying after the command. Optionally you may postfix this with an Ascii number for the key you wish to use as the *Hot Key*. The default entry is in decimal, though you may change the base by prefixing it with the base number:

```
*HotKey ON 160
*HotKey ON 2_11010110
*HotKey ON 16_D4
```

Next set up your star command using the system variable *KeyPress* using the *SET command. By default it is set to the command *GrabScreen*, but you can change it to any valid star command. For example:

```
*Set Alias$KeyPress Mount 0
*HotKey On 129
```

will *Mount the disc in drive 0 whenever

function key 1 is pressed.

You can use the default command in your own applications independently of HotKey by typing *GrabScreen. This works by incrementing a system variable – *GrabScreen%Number* – each time it is used and taking this as a postfix for the file name, so that files are saved as Screen1, Screen2 and so on without the need for any complex poking.

In this way you can save screens up to Screen9999 – the maximum 10 characters allowed by ADFS – if you have enough space.

Programmers can use the module for other purposes by adding their own machine code into the program within the code subroutine. Examples of this may include a mini-printer dump program or a debugging utility.

The module reserves 256 bytes for such a purpose, and this is pointed to on entry to the code routine by R12. You should take care, however, only to use X-SWIs and not to call any code which would return the ARM to user mode – this subroutine is called in interrupt mode.

With a bit of imagination you can easily modify the code provided to do anything you want within reasonable bounds. Some of the most interesting utilities should now be only a keypress away.

Turn to Page 122

multi-media

hyper-text

reports

databases

desktop publishing

presentations

electronic books

network front ends

Genesis

music

sprites

animation

3D pictures

draw files

linking

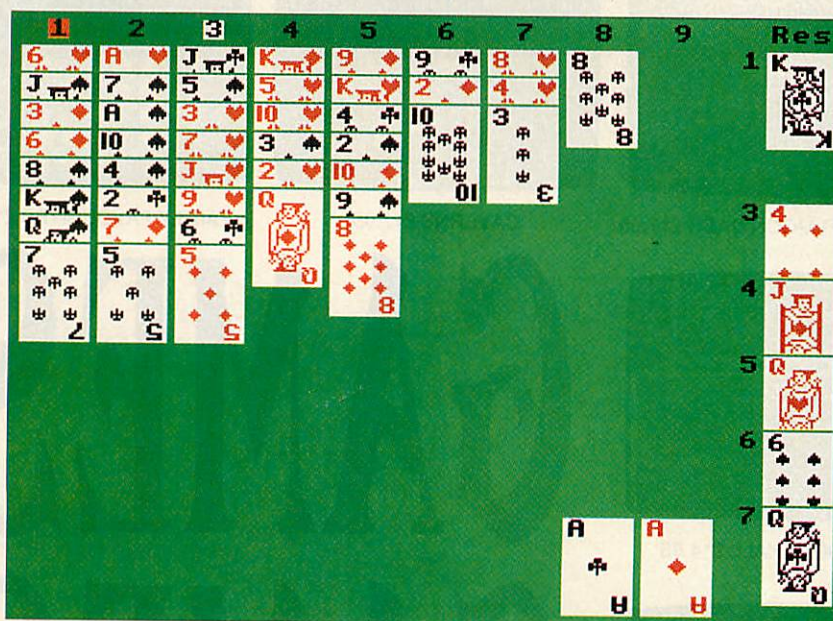
text



Broadway House, 149-151 St Neots Road
Hardwick, Cambridge CB3 7QJ
0954 211760 Telecom Gold 74: YKK255

Now choose a card

*Albert Gardner
finds a new version
of an old game that
tries his patience
to the limit*



The start position

KING Albert Patience is quite the best single-pack version ever invented and is a genuine test of skill rather than luck. With practice you should be able to win about one game in two if you play well. Here's a micro-based version.

The program deals the cards for you face up in nine columns, with nine cards in the first column, eight in the second and so on down to one in the last column. The remaining seven cards form the *Belgian Reserve* and are placed separately to the right. To win you must extract the aces as they become available and build each one in suit up to its king.

You are only allowed to move one card at a time and the only ones available to be moved are at the bottom of any column, the top of any suit pile or any card in the Belgian Reserve.

You can move such a card either to its own suit pile if next in sequence, or to the bottom of a column if in downward sequence and opposite colour, or to any empty column regardless of its value. You can never move any card into the Belgian Reserve.

The program will make sure you obey the rules, but success is up to you. To win you must try to create empty columns – and don't be too keen to put kings in them.

Not only can you use them to take a card which is blocking another column, but also you can use them to shift sequences from one column to another.

For example, suppose one column has 8S at the bottom and another has the sequence 7H, 6C, 5D, 4C at the bottom. If there are two empty columns, say 6 and 8, you can move the entire sequence on to the 8S as follows: 4C to column 6, 5D to

column 8, 4C to 5D leaving column 6 empty, 6C to column 6, 7H to 8S, 6C to 7H leaving column 6 empty, 4C to column 6, 5D to 6C, 4C to 5D.

Notice that the last two moves regain the two empty columns for further use.

At the start the program asks for a deal number. For a random deal enter 0, or to replay a previous one enter the appropriate number and, when asked, the number of redeals. The second program now loads and presents the requested deal. Any redeals are carried out automatically.

To move a card, simply state where *from* and where *to* by hitting the appropriate keys as shown in the table. If you try to make an illegal move the program will beep and pop up a window with a message telling you what's wrong.

To help you understand any message the *from* is always highlighted in red and the *to* in white.

Type in each listing – ensuring it is correct with the checksums – saving the first as King and the second as King2. Run King to play the game.

Helping hand..

When you quit, the program will display the deal number and number of redeals for you to note if you want to try the same deal again in a later session.

If you can manipulate every column so that no card is covered by a higher card, ignoring any in the Belgian Reserve, the program will complete the patience for you.

A nice easy deal to get you started is number 187489, redeals 0 and a slightly harder one is 1567, redeals 0. But for a real challenge, try 2285, redeals 0. It can be done, but can you manage it?

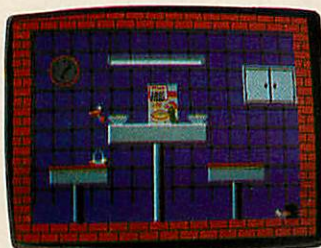
Moving cards around

From	
The bottom of a column	1 to 9
The Belgian Reserve	R followed by 1 to 7
A suit-pile	P followed by S,H,C or D
To	
The bottom of a column	1 to 9
Its suit-pile	P
Other options	
S	Restart the same deal
D	Redeal a different deal
Q	Quit

MAIN VARIABLES

col%(a,0)	The number of cards in column a.
col%(a,b)	The b'th card in column a.
from%	The <i>from</i> column
to%	The <i>to</i> column
L%	Number of redeals
M%	Deal number
Pk%	The shuffled pack
P%(s)	The number of cards in suit-pile s
P%	The total number of cards put to suit-piles
S%	Suit of card
V%	Value of card
W%	Won game indicator
X%,Y%	Screen position of top-left corner of card
Z%	Screen position of bottom-left corner of card

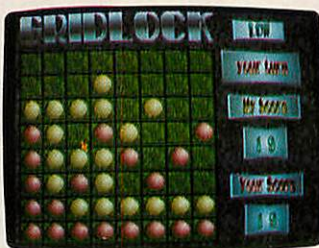
ARCHIMEDES & A3000



BUG HUNTER/MOON DASH £17.95



CAVERNS £17.95



FAMILY FAVOURITES £19.95



CASINO £19.95



MADDINGLY HALL £14.95

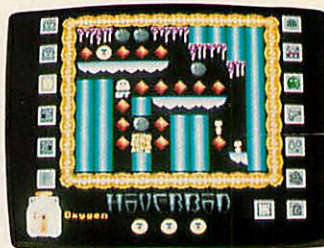
GAMES
GAMES
GAMES



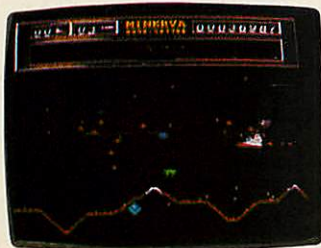
JET FIGHTER £14.95



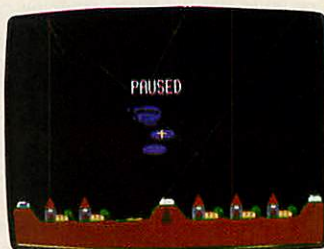
IBIX THE VIKING £19.95



HOVERBOD £14.95



ORION £14.95



MISSILE CONTROL £14.95



THUNDERMONK £14.95



BATTLE TANK £14.95



TALISMAN £14.95



FREDDY'S FOLLY £14.95



SOFTWARE

69 SIDWELL STREET, EXETER EX4 6PH. TEL: (0392) 437756 FAX: (0392) 421762

Listing I

```

10 REM King Albert Patience Loader
20 REM by Albert Gardner
30 REM (c) The Micro User
40 MODE7
50 PROCprt("KING ALBERT PATIENCE",5,1
,1):PROCprt("by",8,3,0)
60 PROCprt("Albert Gardner",10,6,1)
70 PROCvdu:PROCassemble
80 PRINTTAB(11,14);CHR$133;"Deal Num
ber ";:INPUT"MX
90 IFNX=0 LX=0 ELSE PRINTTAB(15,16);C
HR$133;"Redeals ";:INPUT"LY
100 IF PAGE>81100 THEN PAGE=81100
110 CHAIN"KING2"
120 DEFPROCvdu
130 VDU23,224,15,7,6,6,130,206,241,200
140 VDU23,225,248,240,16,177,19,83,35,
223
150 VDU23,226,196,227,208,200,200,200,
200,0
160 VDU23,227,11,243,3,7,11,19,19,0
170 VDU23,228,31,15,4,5,8,6,68,99
180 VDU23,229,248,241,115,83,89,93,161
,25
190 VDU23,230,95,114,137,144,160,192,1
60,0
200 VDU23,231,15,117,147,9,5,5,5,0
210 VDU23,232,255,255,255,255,255,255,
255,255
220 VDU23,233,206,219,219,219,219,219,
206,0
230 VDU23,234,80,216,248,112,32,0,0,0
240 VDU23,235,32,112,248,112,32,0,0,0
250 VDU23,236,32,112,248,248,32,0,0,0
260 VDU23,237,112,168,248,168,32,0,0,0
270 VDU23,238,32,112,248,216,80,0,0,0
280 VDU23,239,32,112,248,112,32,0,0,0
290 VDU23,240,32,248,248,112,32,0,0,0
300 VDU23,241,32,168,248,168,112,0,0,0
310 VDU23,242,34,119,127,127,62,28,8,0
320 VDU23,243,8,28,62,127,62,28,8,0
330 VDU23,244,8,28,62,127,127,42,8,0
340 VDU23,245,28,28,107,127,107,8,8,0
350 VDU23,246,1,1,3,3,7,15,31,63
360 VDU23,247,128,128,192,192,224,240,
248,252
370 VDU23,248,127,127,127,127,61,1,1,3
380 VDU23,249,254,254,254,254,188,128,
128,192
390 VDU23,252,7,4,6,12,21,18,21,56
400 VDU23,253,252,120,176,50,37,82,138
,15
410 VDU23,254,68,139,136,144,144,144,1
44,0
420 VDU23,255,19,229,5,9,9,9,9,0
430 ENDPROC
440 DEFPROCprt(AS,LX,CX,DX)
450 IF DX=CHR$141+AS
460 XX=(40-(LENAS))/DIV 2 -1
470 FORIX=LXTOLX+DX:PRINTTAB(XX,YX);CH
R$(128+CX);AS=NEXT
480 ENDPROC
490 DEFPROCassemble
500 FORIX=0TO2 STEP2:PX=8900:LOPT IX
510 STA$70:STX$80:STY$81:LDA#10:LDX#87
0:LDY#0:JSR&FF1:LDA#23
520 JSR&FEE:LDA#250:JSR&FEE:LDX#8
530 .Lpx LDY#8:LDA#0
540 .Lpy LSR#70,X:ROLA:DEY:BNElpy
550 JSR&FEE:DEX:BNElpx
560 LDA#250:JSR&FEE:LDX#80:LDY#81:RTS
570 : NEXT
580 ENDPROC

```

Get it
right ✓

10 =	0 0	300 =	3F76 3
20 =	0 0	310 =	A6C7 F
30 =	0 0	320 =	1EA6 7
40 =	8AFC C	330 =	DC4D 0
50 =	1535 F	340 =	AF6 9
60 =	1F8E 7	350 =	D0F7 2
70 =	98C4 9	360 =	2A67 1
80 =	84AB 1	370 =	4104 9
90 =	A496 1	380 =	E0EC 1
100 =	2399 3	390 =	2A5A 3
110 =	DC62 F	400 =	8D84 7
120 =	E7C9 4	410 =	3D71 D
130 =	D945 F	420 =	F76C 8
140 =	CEAD D	430 =	ED0F 2
150 =	2B2 6	440 =	686 E
160 =	45D7 8	450 =	246E 5
170 =	5705 4	460 =	A5ED E
180 =	52B6 2	470 =	2EBA 1
190 =	F85B 9	480 =	ED0F E
200 =	305 2	490 =	98E9 D
210 =	7E5D 8	500 =	F20E 5
220 =	BE3C F	510 =	9C0B 3
230 =	4AA5 5	520 =	F925 8
240 =	CD5 8	530 =	EF9F E
250 =	1B79 9	540 =	4DA6 8
260 =	DE7D B	550 =	A1D4 A
270 =	9DB4 9	560 =	2AD5 9
280 =	C6E6 F	570 =	DA42 0
290 =	320D 1	580 =	ED0F 7

Listing II

```

10 REM King Albert Patience
20 REM by Albert Gardner
30 REM (c) The Micro User
40 ONERROR GOTO 2260
50 *TV0,1
60 MODE1:PROCinit
70 IF NX=0 NX=TIME
80 AX=RND(-NX)
90 FORAX=0TOLX:PROCshuffle:NEXT
100 REPEAT
110 PROCdeal:WX=0:PX=0:QX=0:errX=0:fro
ax=1:toX=1
120 REPEAT:VDU29,0,0;FX=fromX:PROCget
IS(1)+IS(2)+IS(3):FS=AS:fromX=NX
130 IFerrXORFX<10PROCnum(FX,2)ELSEPROC
blank(FX)
140 IFerrXORtoX<10PROCnum(toX,2)ELSEPR
Ocblank(toX)
150 errX=0
160 IF fromX=14 THEN 290 ELSE IF fromX
>11 THEN TS="":WX=TRUE:GOTO 250
170 IF fromX<10 THEN 190 ELSE PROCget(
IS(fromX-10))
180 IF fromX=11 fromX=NX+9 ELSE SX=NX-1
:fromX=17
190 PROCnum(fromX,1):PROCget(IS(1)+IS(
2)):TS=AS:toX=NX
200 IftoX=10 toX=17
210 PROCnum(toX,3)
220 IFFS=TS VDU7:GOTO250
230 IFFS="P" PROCfrom_pile ELSEIF TS="
P"PROcto_pile ELSEPROCmove_cards
240 IFFNwon PROCauto
250 UNTIL WX=TRUE
260 IFFS="D"THEN LX=LX+1:PROCshuffle:6
0T0110 ELSE IFFS="S"THEN 110
270 IFTS="P" PROCwon ELSE WX=FALSE
280 UNTIL WX=FALSE
290 MODE 7
300 PRINTTAB(8,10)"Deal Number was ";M
X;TAB(10,12)"Redeals ";LX
310 PRINTTAB(10,12)"Redeals ";LX
320 *FX200
330 END
340 DEFPROCinit
350 VDU19,2,2,0,0,0:turn=8900
360 DIMcolX(16,20),PX(3),PKX(51),IS(3)
370 *FX200,1
380 FORIX=0TO51:PKX(IX)=IX:NEXT
390 vs="A23456789"+CHR$(233)+"JQK"
400 IS(0)="HDSK":IS(1)="1234567"
410 IS(2)="89P":IS(3)="RSDQ"
420 fromX=1:VDU 23,8202,0,0,0;
430 ENDPROC
440 DEFPROCshuffle
450 FORIX=0TO51
460 JX=RND(52)-1
470 KX=PKX(IX):PKX(IX)=PKX(JX):PKX(JX)
=KX:NEXT
480 ENDPROC
490 DEFPROCget(SS)
500 REPEAT:AS=GETS:NX=INSTR(SS,AS)
510 IFNX UNTILTRUE ELSE PROCmessage("O
ne of:",SS):UNTILFALSE
520 IFQX=0GOTO540 ELSE GCOL0,130:CLG:F
ORQX=7T09:IFcolX(QX,0)>11 PROCcard(QX,1)
530 NEXT:QX=0:VDU26
540 ENDPROC
550 DEFPROCmessage(AS,B$)
560 IFQX=2 ENDPROC
570 QX=1:VDU7,24,800,184,1052,280,18,0
,131,18,0,0
580 CLG:MOVE800,280:PRINT;AS:MOVE800,2
48:PRINT;B$
590 ENDPROC
600 DEFPROCfrom_pile
610 IF PX(SX)=0 GOTO750
620 IF colX(toX,0)=0 GOTO650
630 IF FNbot(toX)/DIV 4 <>PX(SX)GOTO730
640 IF(FNbot(toX)/MOD 4)/DIV 2=SX/DIV 2 G
OTO740
650 PX(SX)=PX(SX)-1
660 DX=4*PX(SX)+SX-4
670 PROCcard(7+2*SX+5*(SX>1),2-(DX<0))
680 colX(toX,0)=colX(toX,0)+1
690 colX(toX,colX(toX,0))=DX+4
700 PROCcard(toX,1):PROCsuit
710 ENDPROC
720 :
730 errX=-1:PROCmessage("Not in","Sequ
ence"):ENDPROC
740 errX=-1:PROCmessage("Wrong","colou
r"):ENDPROC
750 errX=-1:PROCmessage("Empty","colum
n"):ENDPROC
760 :
770 DEF PROcto_pile
780 IfcolX(fromX,0)=0GOTO750
790 DX=FNbot(fromX)
800 RX=DXMOD 4
810 IF DX/DIV 4 <>PX(RX) GOTO730
820 PROCcard(fromX,0)
830 colX(fromX,0)=colX(fromX,0)-1
840 IfcolX(fromX,0)>0PROCcard(fromX,1)
850 IF fromX<11 GOTO870
860 IfcolX(fromX-1,0)>0 PROCcard(fromX
-1,1)
870 SX=RX:PX(SX)=PX(SX)+1
880 PROCcard(7+2*SX+5*(SX>1),2)
890 PX=PX(0)+PX(1)+PX(2)+PX(3)
900 IFPX=52 WX=TRUE
910 ENDPROC
920 DEF PROCmove_cards
930 IfcolX(fromX,0)=0 GOTO750
940 DX=FNbot(fromX)
950 IfcolX(toX,0)=0 GOTO980

```

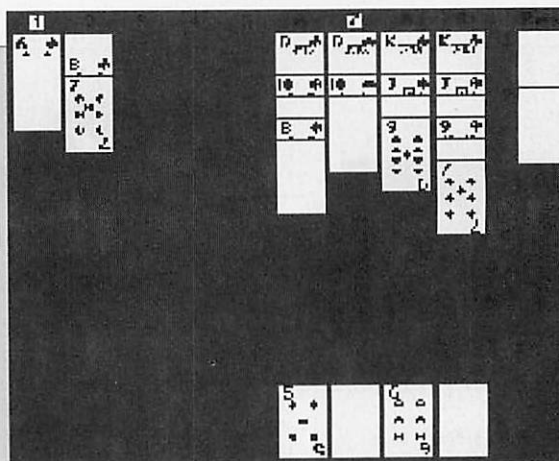


```

960 IF FNbot(to%)DIV 4 <> 1+DXDIV 4 GOT
0730
970 IF((FNbot(to%)MOD 4)DIV 2=(DXMOD 4
)DIV 2) GOT0740
980 col%(to%,0)=col%(to%,0)+1
990 col%(to%,col%(to%,0))=0%
1000 PROCcard(from%,0)
1010 col%(from%,0)=col%(from%,0)-1
1020 IFcol%(from%,0)>0PROCcard(from%,1)
1030 Iffrom%<11 GOT01050
1040 IFcol%(from%-1,0)>0 PROCcard(from%
-1,1)
1050 PROCcard(to%,1):PROCsuit
1060 ENDPROC
1070 DEFPROCdeal
1080 GCOLD,130:CLG
1090 VDU5:GCOLD,0
1100 FORI=1TO16:PROCnum(I,2):NEXT
1110 MOVE1166,1008:PRINT;"Res";
1120 FORI=0TO3:P%(I)=0:NEXT
1130 K%=0
1140 FORJ=1TO9
1150 FORTO=1TO10-J%:col%(to%,J%)=Pk%(K
%):col%(to%,0)=J%
1160 PROCcard(to%,1):PROCsuit:K%=K%+1
1170 NEXT
1180 FORTO=1TO16
1190 col%(to%,1)=Pk%(K%):col%(to%,0)=1
1200 PROCcard(to%,1):K%=K%+1
1210 NEXT
1220 ENDPROC
1230 DEFPROCcard(O%,U%)
1240 IFU%>1X%=120*O%-104:Y%=178:Z%=16:C
%=DX:GOTO1310
1250 C%=FNbot(O%):S%=C%MOD 4:IFO%>9 Y%=
2246-128*O%:X%=1160 ELSE Y%=1014-48*C%
(O%,0):X%=120*O%-104
1260 IFY%<160 Z%=0 ELSE Z%=Y%-160

```

Get it
right ✓



Nearing
completion

```

1270 IF0%<6 OR 0%>7 OR Y%>345 GOT01290
1280 IFP%(14-2*0%)>0 Z%=186
1290 IF U%=1 OR from%<10 OR from%>15 GO
T01310
1300 IFcol%(from%+1,0)>0 Z%=Y%-126
1310 VDU24,X%;Z%;X%+104;Y%+2;
1320 GCOLD,130:CLG
1330 IFU%=1 OR U%=2 PROCshow
1340 VDU26
1350 ENDPROC
1360 DEFPROCshow
1370 VDU24,X%;Z%;X%+104;Y%;
1380 GCOLD,131:CLG:GCOLD,-(S%<2)
1390 VDU29,X%+6;Y%-36;MOVED,32
1400 V%=ASCHIPS(v$,1+C%DIV 4,1):VDUV%
1410 MOVE66,-92:A%=V%:CALL turn:IFC%=2
PROCace ELSEIFC%<4 PROCmid ELSEIFC%<40 P
ROCspots ELSE PROCpic
1420 ENDPROC
1430 DEFPROCsuit
1440 IFto%>9 ENDPROC
1450 IFcol%(to%,0)<2 ENDPROC
1460 V%=(col%(to%,col%(to%,0)-1))MOD 4:
VDU26,18,0,-(V%<2),25,4,X%+72;Y%+44;242+
V%
1470 ENDPROC
1480 DEFPROCpic
1490 MOVE18,10:B%=4*V%-72:VDUB%,B%+1,8,
8,10,B%+2,B%+3
1500 MOVE18,-42:A%=B%+3:CALLturn:A%=B%+
2:CALLturn:VDU8,8,10:A%=B%+1:CALLturn:A%
=B%:CALLturn
1510 PROCmid
1520 ENDPROC
1530 DEFPROCmid
1540 MOVE32,-32:VDU242+S%
1550 ENDPROC
1560 DEFPROCace
1570 MOVE18,-16
1580 VDU246,247,8,8,10,248,249
1590 ENDPROC
1600 DEFPROCspots
1610 V%=C%DIV 4:IFV%<3PROCpips(2,1):PRO

```

SUBSCRIBE NOW!

If you prefer to save the wear and tear on your fingers you'll find this listing - together with all the others from this issue - on this month's disc, sent free if you subscribe to *The Micro User*.

10 = 0 0	350 = 3F7F E	690 = AFB 2	1030 = 5032 9	1370 = 7288 4	1710 = C76D 6	2050 = D8D4 8
20 = 0 0	360 = CE73 A	700 = D385 C	1040 = 2E4 D	1380 = 7C8 5	1720 = E1A8 4	2060 = CBBF E
30 = 0 0	370 = 2FD3 A	710 = ED0F C	1050 = D385 4	1390 = 4E26 3	1730 = AE13 6	2070 = 97B9 B
40 = 8706 6	380 = 2C7D 1	720 = 9719 F	1060 = ED0F E	1400 = 5AC0 1	1740 = 233B 3	2080 = 4AC7 2
50 = DD0C 4	390 = F3F5 3	730 = 3F64 F	1070 = E7AB 0	1410 = A005 0	1750 = ED0F 7	2090 = 38D6 2
60 = 304F 8	400 = 4D81 C	740 = D72F B	1080 = C3D2 1	1420 = ED0F 7	1760 = A8BA 6	2100 = E978 1
70 = B4B E	410 = 5B13 F	750 = 3A53 9	1090 = A7C9 C	1430 = F4D2 0	1770 = 23C 3	2110 = 2C83 3
80 = 1612 D	420 = 9E50 9	760 = 9719 1	1100 = F5AE 9	1440 = ED0F 0	1780 = ED0F 0	2120 = C3E2 8
90 = 2F41 D	430 = ED0F 8	770 = 75E8 A	1110 = 5E83 D	1450 = 7370 4	1790 = 5B82 0	2130 = ED0F 8
100 = BFBA 3	440 = 3A21 F	780 = 9B93 4	1120 = B35F 8	1460 = C0BF 2	1800 = DF2C A	2140 = 2E6B D
110 = CF3A 4	450 = B254 4	790 = A1A6 2	1130 = 582F 2	1470 = ED0F 1	1810 = CB83 F	2150 = 4A09 E
120 = D47 B	460 = 9448 C	800 = 3302 3	1140 = D0B4 6	1480 = 51C2 7	1820 = E542 C	2160 = FDFB 5
130 = F100 8	470 = 4BD0 0	810 = 243E A	1150 = 9439 0	1490 = BA37 6	1830 = DFD8 B	2170 = 1E54 2
140 = 249F 8	480 = ED0F 1	820 = 298D A	1160 = D7EB 7	1500 = 1866 4	1840 = 72C5 B	2180 = F24C 5
150 = C2AD B	490 = C730 7	830 = 6BD 8	1170 = 24BD F	1510 = 368F 4	1850 = B5E7 D	2190 = D274 1
160 = F349 E	500 = 29E A	840 = 24C9 5	1180 = B605 5	1520 = ED0F E	1860 = 8F7D 0	2200 = 440D 3
170 = F08D 4	510 = B477 F	850 = 8F10 0	1190 = 24CC 6	1530 = 2017 E	1870 = 3677 7	2210 = 2C83 3
180 = C954 4	520 = C2D2 0	860 = 2E4 E	1200 = F967 D	1540 = 137D 6	1880 = FC15 E	2220 = 2C83 3
190 = AB81 5	530 = 3765 F	870 = 69E7 0	1210 = 2C83 F	1550 = ED0F F	1890 = 59A1 B	2230 = F599 3
200 = 2782 B	540 = ED0F A	880 = 549C C	1220 = ED0F 5	1560 = AA9C C	1900 = 3AE7 9	2240 = 453B 5
210 = B8C1 7	550 = 5FC9 A	890 = D260 5	1230 = 3F74 F	1570 = F2BD 4	1910 = F24E 3	2250 = 9719 5
220 = F8B3 D	560 = 4A33 8	900 = E8F5 D	1240 = E415 3	1580 = 9C60 F	1920 = BFBA C	2260 = 1193 A
230 = 3DED 8	570 = EE26 D	910 = ED0F 3	1250 = 35DD 5	1590 = ED0F A	1930 = 26DF 0	2270 = C9C4 E
240 = FABB B	580 = 3095 C	920 = 45D1 F	1260 = 7C6D C	1600 = 3D8A 7	1940 = BA4C 4	2280 = 6849 0
250 = DB50 A	590 = ED0F 7	930 = DC43 0	1270 = F44 7	1610 = D821 D	1950 = C9D3 2	2290 = 9719 8
260 = EFCF 3	600 = A652 8	940 = A1A6 9	1280 = EA04 1	1620 = 6B33 8	1960 = ED0F 9	2300 = 6619 3
270 = CB3B 8	610 = B2BF 1	950 = B65E 7	1290 = F1A1 D	1630 = ED0F 9	1970 = 58EF 9	2310 = 39B A
280 = 682B 5	620 = B34E 8	960 = AA2D D	1300 = 9AAB 7	1640 = EA48 1	1980 = 6CBC 1	2320 = 6619 E
290 = 1092 F	630 = E580 3	970 = 4D62 7	1310 = D917 E	1650 = BE1A 4	1990 = 5168 7	2330 = 39B 2
300 = DA19 C	640 = F3CC 8	980 = 29DA 6	1320 = C3D2 1	1660 = 2128 A	2000 = ED0F C	2340 = 5ACB 8
310 = D63C D	650 = F978 E	990 = AA27 C	1330 = EE6C 4	1670 = 7D37 C	2010 = D468 2	2350 = C212 F
320 = 71C B	660 = B36F 5	1000 = 298D B	1340 = B962 6	1680 = 10C0 C	2020 = 53DB C	2360 = FCAF F
330 = FD2E 4	670 = F439 2	1010 = 6BD D	1350 = ED0F F	1690 = ED0F E	2030 = 9CFD F	2370 = B9C1 E
340 = 344C B	680 = 29DA B	1020 = 24C9 D	1360 = 6F25 D	1700 = 2263 9	2040 = CA2C 2	2380 = 17E8 4

MIDNIGHT GRAPHICS

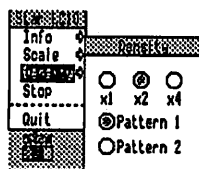
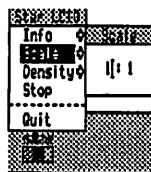
Multitasking Colour Sprite Dumps for the Archimedes

LC10 Colour Printer Sprite Dump

- Scaling available - any ratio is possible.
- Draft, double or quad density, for optimum speed or optimum quality
- Choice of special dithering patterns for best effect

The printer driver uses a dithering pattern to produce the required colour on the printout. The first pattern produces bright sharp colours, very similar to those on screen. The second pattern is used to reduce the 'moire' effect but results in more subdued colours.

A great deal of thought has been put into the patterns to produce the optimum results, bearing in mind the method the LC10 uses to perform its colour printing. Experimentation with the two possibilities will result in improved performance.



Integrex & HP Paintjet Colour Sprite Dumps



- Two dumps which have been developed to provide more accurate colour representation than using the standard Risc OS printer drivers. Both are multitasking and install on the icon bar in the same way as the LC10 dump.
- The HP Paintjet dump has an Overhead Projection mode which allows you to utilise this useful feature, enabling you to create slides and transparencies for use in presentations. (This mode enabling the printer to place more ink onto the print surface).

Render Bender Demonstration Discs

- Two sets of four discs, each disc containing one demonstration.
- The first set compiled by Clares Micro Supplies.
- The second set compiled by Dabhand Computing.

High Quality Draw Format Clip Art for the Archimedes



5 Victoria Lane
Whitefield
Manchester
M25 6AL

Prices

Printer dumps

LC10 Printer dump.....£26.04

Integrex Printer dump£26.04

HP Paintjet Printer dump£26.04

Draw Format Clip Art

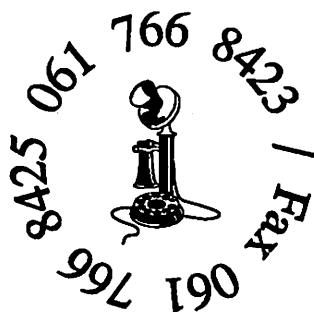
Set One (5 Discs of clip art) £29.95

Render Bender Demo Discs

Set 1 (4 discs)£8.65

Set 2 (4 discs)£8.65

TERMS: UK residents add 15% VAT to all prices, except books. NO UK Postage Charges. Export, no VAT, carriage at cost. (quotations available). Europe maximum £2.50 software, Access/Visa cards accepted by post/phone/in person. Official orders accepted from public sector/education/PLCs, otherwise cash with order. Price subject to change without notification.




```

>
Cpips(74,1) ELSEPROCpips(2,2):PROCpips(7
4,2)
1620 RESTORE (2290+10*V%):REPEAT:READA%
,B%:IFA%THEN PROCpips(A%,B%):UNTILFALSE
ELSE UNTILTRUE
1630 ENDPROC
1640 DEFPROCnum(I%,G%)
1650 IFI%<10MOVE120*I%-62,1008:GOTO1680
1660 MOVE1120,2246-128*I%
1670 IFI%<17 I%=I%-9 ELSEI%=32
1680 VDU18,0,G%,232,8,18,0,0,48+I%
1690 ENDPROC
1700 DEFPROCpips(A%,B%)
1710 IFB%=1 MOVE38,-A% ELSE MOVE16,-A%
1720 IFA%<40 E%=234 ELSE E%=238
1730 VDUE%+S%
1740 IFB%=2 MOVE64,-A%:VDUE%+S%
1750 ENDPROC
1760 DEFPROCblank(I%)
1770 MOVE1120,2246-128*I%:VDU18,0,2,232
1780 ENDPROC
1790 DEF PROCwon
1800 SOUND&11,-15,105,5:SOUND1,0,0,5
1810 SOUND&203,-15,57,10
1820 SOUND&201,-15,73,10
1830 SOUND&202,-15,85,10
1840 SOUND1,0,0,5
1850 SOUND&201,-15,73,15
1860 SOUND&202,-15,85,15
1870 SOUND&203,-15,105,15
1880 PROCprint("Congratulations!",32,86
0,0,1)
1890 PROCprint("Y O U ' V E   D O N E

I T !",32,790,3,0)
1900 PROCprint("Would you like another
game ? ",32,720,3,1)
1910 *FX 15,1
1920 REPEAT
1930 FS=GETS
1940 UNTIL FS="Y" OR FS="N"
1950 IF FS="N" W%=FALSE ELSE L%=L%+1:PR
OCshuffle
1960 ENDPROC
1970 DEF PROCprint(a$,X%,Y%,B%,F%)
1980 GCOL 0,B%:MOVE X%,Y%:PRINT a$
1990 GCOL 0,F%:MOVE X%+4,Y%+4:PRINT a$
2000 ENDPROC
2010 DEFPROCauto
2020 Iffrom%<10PROCnum(from%,2)ELSEPROC
blank(from%)
2030 Ifto%<10PROCnum(to%,2)ELSEPROCblan
k(to%)
2040 TS="P":IFW% ENDPROC
2050 IFP%<49 Q%=TIME:SOUND3,-15,52,14:
SOUND3,-15,101,7:REPEAT:UNTILTIME>Q%+105
2060 *FX212,248
2070 PROCmessage(" Auto"," Finish")
2080 VDU26:Q%=2:*FX212,144
2090 J%=P%:REPEAT
2100 FORfrom%=1TO16:PROCto_pile:IFP%>J%
SOUND&11,-(7+2*P%/13),1+2*P%,50:J%=P%
2110 NEXT
2120 UNTIL W%
2130 ENDPROC
2140 DEFFNbot(Q%)
2150 =col%(Q%,col%(Q%,0))

2160 DEFFNwon
2170 FORI%=1TO9
2180 IFcol%(I%,0)<2 GOTO2220
2190 FORJ%=2TOcol%(I%,0)
2200 IFcol%(I%,J%)DIV 4>col%(I%,J%-1)DI
V 4 J%=50:I%=50
2210 NEXT
2220 NEXT
2230 IFI%>20 =FALSE
2240 =TRUE
2250 :
2260 ONERROR OFF
2270 MODE7:REPORT:PRINT" at line ";ERL
2280 GOTO300
2290 :
2300 DATA0
2310 DATA38,1,0
2320 DATA0
2330 DATA38,1,0
2340 DATA38,2,0
2350 DATA20,1,38,2,0
2360 DATA20,1,38,2,56,1,0
2370 DATA26,2,38,1,50,2,0
2380 DATA14,1,26,2,50,2,62,1,0,0

```

All program listings in this issue
can be downloaded FREE on...

MicroLink



Trading Since 1987

Acorn
The choice of experience.

Authorised
Dealer



Dept MU4
17 Carlton Road
Leyland, Preston
PR5 1LP
Tel: (0772) 421984
Fax: (0772) 622917

Callers by
appointment
only.
9am - 7pm
Mon-Sat

Archimedes

BBC A3000	£674.00
A410/1	£1189.00
A420/1	£1699.00
A440/1	£2469.00
Acorn Colour Monitor	£230.00
(If Bought with Computer)	£220.00
Philips CM8833	235.00

Accessories

A400/1 1 Mb Ram Upgrade	£115.00
ARM3 Upgrade (A400/1)	£672.75
A3000 Ram Upgrade 1Mb	£172.50
(3Mb board with 1Mb Fitted)	
Serial Upgrade A3000	£20.70
Acorn A3000 Monitor Stand	£31.05

All Pres Products Available

Printers

Star LC10£161.00	
Star LC10 Colour	£205.85
Star LC24-10	£246.10
Panasonic KX-P1124	£270.00



Other Printers Available

Modems

Dataphone Designer	£104.00
Dataphone Pro-4	£458.85

Bulk Diskettes

All our diskettes are Certified 100% Error Free. In the rare event that a disk fails it will be replaced immediately.

Quantity	25	50	100	250	500	1000
 5 1/4 DS/DD 96tpi	£7.50	£14.50	£27.00	£62.50	£120.00	£230.00
 3 1/2 DS/DD 880K	£16.25	£30.00	£55.00	£117.50	£210.00	£391.00
Sony Bulk	£21.25	£40.00	£75.00	£167.50	£315.00	£600.00

Software (Archimedes)

C.C. Impression D.T.P.	£149.95
PC-Emulator	£108.95
(If Bought with Computer)	£69.00
Interdictor	£29.95
Atelier	£89.95
Multi-Store	£244.95
Fun School 2 (All ages)	£16.95
Hyper Pack (12 Games)	£79.95
Mini Packs (1 - 4)	£24.94
4th Dimension Games:	
E-Type	£16.95
E-Type Extra 100 Miles	£14.95
The Olympics	£16.95
Arcade Soccer	£16.95
Holed Out	£16.95
Holed Out Vol. 1 & 2 (Each)	£14.95
U.I.M.	£24.95

Printer Ribbons

(Ribbons supplied are compatible unless otherwise stated.)

Citizen 120D	£3.40
Panasonic KXP 1080, 1081, 1090	£3.00
Panasonic KXP 1124	£3.30
Star LC10	£2.50
Star LC10 4 Colour	£5.75
Star LC24/10 or 15	£3.90

Many more Ribbons Available
All Prices Include V.A.T.
Minimum Order Value £7.50

Hardware Carriage Charges
2-3 Days £4.00
Next Day £10.00
Consumables & Software
Free Carriage
Allow 14 Days for Delivery

Please Note

This is only a small
selection of our
products.
Orion Computers is a
Licensed Credit Broker

MICROFIX

A3000	£585	A410/1	£1075
A310M	£846	A420/1	£1475
A310	£755	A440/1	£2175

COLOUR MONITOR (Tandata)	£195
COLOUR MONITOR (CM8833)	£239
COLOUR MONITOR (Acorn)	£210
TAXAN 3D MULTISYNC (The Best)	£525

40 MEG/28mS H.Disc Kit (A400)	£335
Mounting Shell & Data Cables	£15
(Mounting Shell & Data Cables free with Hard Disc kit)	

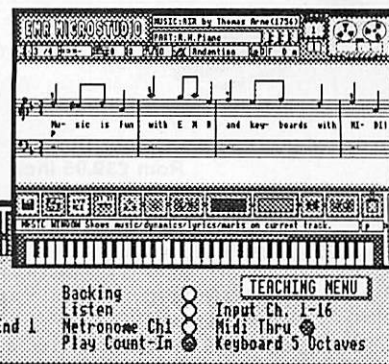
Free membership to our software club allowing you to buy all titles at 10% less than RRP. To register; send your (Name, Address, Postcode, Tel, Machine . . . etc)

**17 Dover Street, Canterbury, Kent
Telephone: 0227 455419**

All mail order prices exclude VAT

MICROSTUDIO

A new kind of music program that teaches you to play and read music ...



The first interactive learning program for all beginners!

- ★ Listen to the tune and accompaniment on your Midi keyboard
- ★ Learn any part by following the music pointer on-screen
- ★ The music waits for you to get it right at your own pace
- ★ Keyboard notes and names show where to put your fingers
- ★ A comprehensive teaching menu lets you choose many options
- ★ Enjoy learning as the ARC talks back to you, adds novel sound effects and even tells you when you make a mistake!
- ★ Learn ANY piece of music - create your own in MicroStudio - or Studio24Plus V2 for fingering, dynamics, tempo changes, etc

Also designed for young people to use as a realtime

24-track recording studio for use with ANY Midi keyboard

- ★ Edit notes from the Score Page and print each part on a dot-matrix printer - even transposed instantly for clarinet, sax, etc
 - ★ Write lyrics to your music and watch the music add the words
 - ★ Add extra ARC sounds from set provided or from Studio24Plus
- Price only £79 inc VAT (For all ARCs. Needs Acorn/EMR Midi Interface)
- NEW Associated Board Piano & Inst.Grades discs for study in MicroStudio**
- NEW Music Library disc sets - Ghostbusters to Peer Gynt - from only £9.95**
- with easy-play music track as well as original music score parts to study.
- EMR LTD, 14 Mount Close, Wickford, Essex SS11 8HG. Tel: 0702 335747**

PINEAPPLE SOFTWARE

STOP PRESS - NOW AVAILABLE!

Archimedes full colour real time video digitizer

- ★ Resolution 512 x 256
- ★ 16 bits per pixel storage
- ★ Full PAL delay line decoder
- ★ Comprehensive software module with many star commands and SWI's to manipulate image
- ★ 16 Bit version £315 / 12 Bit version £285

Please write or telephone Pineapple for full details.

HOME ACCOUNTS

This very popular program from Pineapple offers the simplest solution to keeping track of all your home accounts. The program is unbelievably simple to use but still offers all the essential features such as automatic standing order handling, statement reconciliation etc. Any number of accounts may be stored on disc and transfers between accounts requires only a single operation. Available for Model 'B', Master and Compact with disc drive

PRICE £19.95 P&P free

ADFS UTILITIES ROM

ADU is an invaluable utility for all ADFS users. It adds over 22 new *commands to the ADFS filing system as well as providing an extensive Menu facility with over 35 sub commands covering areas such as repeated disc compaction, saving and loading Rom images, auto booting of files and many more.

Transferring of files from DFS to ADFS is very simple using the *DFSADFS command. Backing up of discs of different sizes is also allowed, so Winchester may be backed up easily to a predetermined number of floppies.

PRICE £29.00 P&P free

*Pineapple has produced one of the 'Ultimate' computer based video digitisers - Acorn User, April 1990
FREE demo disc available
Please add 15% VAT to all prices

BBC PCB DESIGNER

PCB is a powerful Rom based printed circuit design program suitable for all BBC computers including the Archimedes. Its fast high density 1:1 or 2:1 scale print routine allows prototype boards to be made directly from a printout. The 2:1 print routine provides artwork quality suitable for the most discerning PCB manufacturer. A second Eprom is optionally available to add a powerful auto-track routing facility to the program. This utilises a 'rats-nest' input routine and allows any component to be 'picked-up' and moved around the board without having to re-specify track requirements.

The full auto route facilities are available even on an un-expanded Model 'B' computer

*PCB autoroute is remarkable. No similar software comes near the price: - Acorn User, August '88
*Although it appears expensive, there is nothing else remotely similar even on other micros for less'.

- Beebug, April '88

PCB Manual track routing	£85.00	
PCB Auto-routing	£185.00	P&P free
PCB Plotter driver	£35.00	

DIAGRAM II

Still the only BBC drawing package to allow really large diagrams (up to 30 mode 0 screens) to be created. The unique scrolling and indexing system allows easy access to any part of the diagram, and the rapid line drawing routines allow diagrams to be drawn really quickly. The print routines provide unequalled flexibility with infinitely variable H & V scales and 90 deg rotation if required. The smallest scale allows up to 18 mode 0 screens to be printed on an A4 sheet with clearly readable text and full use can be made of wide carriage printers.

*The quality of printing is the last factor which makes Diagram II so outstanding. The package really is capable of producing top quality diagrams'. - ETI, March '88.

Specially reduced price £25.00 P&P free

MARCONI TRACKERBALLS

We now have an adapter available to link the trackerball to the Archimedes.

Bare Trackerball (no software)	£49.83	For Model 'B' (inc. IconArt)	£54.83
For Master with Pointer Rom	£54.83	Pointer Rom for Master	£12.50
Adapters to drive Mouse software	£8.00	Archimedes Adapter	£19.95

Trackerballs also available for other computers - please 'phone
Postage and Packing on trackerballs £1.75

ROLAND PLOTTERS

DXY 880A	£545.00	DXY 1100	£625.00	DXY 1200	£865.00
DXY 1300	£1125.00	P&P on all plotters £10.00			

IBM SOFTWARE and HARDWARE

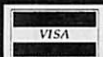
EASY-PC	£98.00	Spice Age from	£70.00	ECA-2	£675.00
PCB Turbo	£395.00	LCA-1 logic analyser	£450.00		
DATA CAP RS232 serial data analyser	£25.00				

Full range of Elonex Computers available please 'phone for prices

Please address all enquiries to:

PINEAPPLE SOFTWARE

Dept. MU, 39 Brownlee Gardens, Seven Kings, Ilford, Essex IG3 9NL. Tel: 01-599 1476



WeServe of Hampshire

Educational Specialist



Star LC10 Mono
£155.00 (£134.78 + VAT)

Colour Dump
Rom £39.95 inc.

Star LC10 Colour
£203.00 (176.52 + VAT)
(with Cable and Paper)

STAR LC 2410
with cable & paper
£229.00 (£199.13 + VAT)

Taxan 770 + LR
with cable
£458.00 (£398.26 + VAT)

STAR XB 2410
with cable & paper
£455.00 (£395.65+VAT)

PANASONIC KXP1081
with cable & paper
£144.00 (£125.22+VAT)

CITIZEN 120D
with cable & paper
£125.00 (£108.67+VAT)

PANASONIC KXP1124
(24 pin) with cable & paper
£259.00 (£225.22+VAT)

EPSON LX400
With cable & paper
£159.00 (£138.26+VAT)

PANASONIC KXP1180
with BBC cable & paper
£155.00 (£134.78+VAT)

EPSON LQ400
(24 pin) with cable & paper
£255.00 (£221.74+VAT)

PRINTERS/CABLES/Etc.

PRINTER RIBBONS
Ex VAT Inc VAT
LX800 & FX800 Print Ribbon 2.30 2.65
LC10 Print Ribbon 4.00 4.60
120D Print Ribbon 4.00 4.60
Taxan/Canon Ribbon 3.22 3.70
Juki 6100 Print Ribbon 1.30 1.50

Ex VAT Inc VAT
HP Deskjet + 570.00 655.50
Citizen Swift 24 247.83 285.00
Juki 6300 D/W 346.96 399.00
Amstrad LQ3500di 190.43 219.00
1.5m (4 foot) BBC cable 4.00 4.60
2.0m (6 foot) BBC cable 6.00 6.90
IBM/Archimedes cable 1.8M 6.00 6.90
LX/LQ Sheet Feeder 62.61 72.00
LC10/LC2410 Sheet Feeder 51.30 59.00
2 way Printer Switch 18.00 20.70
Printer Dust Covers 4.00 4.60

UPGRADES/8271

Ex VAT Inc VAT
27128 250nS 21V 5.00 5.75
8271 controller 38.26 44.00
6264 LP 150nS 4.78 5.50
Acorn 8271 DFS 45.22 52.00
Acorn 1770 DFS 45.22 52.00
Arch 1m Ram upgrade 100.00 115.00
410/1 20m Hard Disc 28ms 198.26 228.00
A3000 Ext. Drive VF 13.00 14.95
A3000 1m Ram upgrade 128.70 148.00
Acorn Trackerball 46.00 52.90
Acorn Bitstik 173.04 199.00
A3 Concept Keyboard 124.00 142.60

ROMS/SOFTWARE

Ex VAT Inc VAT
Inter-Word Rom 35.65 41.00
Inter-Base Rom 46.96 54.00
Wordwise Plus Rom 37.39 43.00
MEGA 3 Rom 71.30 82.00
Spell Master Rom 40.00 46.00
View 3 Rom 40.00 46.00
DTP-Acorn 120.87 139.00
ViewStore Rom 35.65 41.00
OverView I & II 64.35 74.00

Phone for BBC/Archimedes Software
catalogue 100's of titles inc. Edu.

MONITORS

Ex VAT Inc VAT
Philips CM8802 173.04 199.00
Philips CM8852 216.52 249.00
Philips CM Stand 18.26 21.00
Philips BM7502 Green 62.61 72.00
Philips BM7522 Amber 60.00 69.00
Philips TV Tuner 60.00 69.00
Taxan KX1202 Green 60.00 69.00
Microvitec 1431 173.04 199.00
Microvitec 1451 216.52 249.00
(Prices inc. BBC Cable)

MASTER/ARCHI

Ex VAT Inc VAT
Master Compacts from 330.43 380.00
Master 128K Micro 404.35 465.00
Archimedes 410/1 1199.00 1378.85
Archimedes A3000 649.00 746.35
Master Cartridges 8.65 9.95
Reference Manuals 14.00 14.00
Master & B Dust Covers 3.00 3.45
BBC B's from 152.17 175.00

Big discounts on Master/Archi Systems.
Educational Discount prices phone.

Philips CM8833

£234.00 (£203.48 + VAT)

VOLTMACE JOYSTICKS

Delta 14B 12.61 14.50
Delta 3B single 11.26 12.95
Delta 3B twin 17.35 19.95

DISKETTES (100% Error free)

(lifetime warranty) Ex VAT Inc VAT
10 Banana Reversible 8.65 9.95
10 3.5" D/S 135ipi 5.65 6.50
50 3.5" D/S 135ipi 26.03 30.25
100 3.5" D/S 135ipi 52.00 59.80
10 96tpi D/S D/D in box 5.17 5.95
50 96tpi D/S D/D in boxes 17.17 19.75
100 96tpi D/S D/D in boxes 32.09 36.90
10 3M High Density 3.5" 25.00 28.75
10 3M High Density 5.25" 10.00 11.50
100 Disc Box 5.25" + lock 6.52 7.50

5 1/4 DISC DRIVES

Ex VAT Inc VAT
Cumana CSX 100 40T 74.78 86.00
Cumana CSX400 40/80T 89.57 103.00
Cumana CDX 800S 40/80T 175.65 202.00
Cumana CD800S 40/80T 195.65 225.00
MD400A 400k No PSU 40/80T 78.26 90.00
MD400B 400k & PSU 40/80T 88.70 102.00
MD802C 800k No PSU 40/80T 156.52 180.00
MD802E 800k & PSU 40/80T 169.57 195.00
MD802D 800k & stand 40/80T 190.43 219.00
Phone for Hard discs + Torch

Phone for our 28 page catalogue

EDUCATIONAL & GOVERNMENT ORDERS WELCOME

All products have a 12 month no quibble guarantee

Prices subject to variation without prior notification

We are closed Saturday afternoons

Postage 92p (80p + VAT) Securicor £6.90 (£6.00 + VAT)

WeServe



Larger items
delivered
by Securicor



Micro Dept.
128 West Street,
Portchester,
Hants.
PO16 9XE
Tel: 0705 325354

CARE ELECTRONICS

800 St. Albans Road, Garston, Watford, Herts. WD2 6NL.

Tel: 0923 672102 Fax: 0923 662304

For your convenience first price Ex VAT, Second Inc VAT

CARE MASTER SMART CARTRIDGE

At the press of a button halt any program running and execute any one of a host of useful built in, or user defined functions and once completed will return to the program and continue. Built in functions include:- Tape to Disc, Screen Dump to Disc or Printer, Sound On/Off, Autosave and much more £30.00 £34.50c

CARE MASTER ROM CARTRIDGES

For Interword and Spellmaster etc.

1. Dual cartridge takes 2 Rom	£10.00	£11.50c
2. Single Zif takes 2 Rom	£14.00	£16.10c
3. Dual Zif takes 2 Rom	£18.00	£20.70c
4. 32k Switchboard Cartridge for 32K Roms	£12.00	£13.80c
5. Quad Cartridge takes 4 Roms including double height type	£14.00	£16.10c
Morley AA (Internal) Rom Board	£40.00	£46.00c

BBC B ROM CARTRIDGE SYSTEM

BBC B Low Profile Rom System	£13.00	£14.95c
BBC B Spare Cartridges	£3.00	£3.45c
BBC B Cartridge Storage Rack	£1.20	£1.38c

HEAT TRANSFER RIBBONS

Print onto normal computer paper Iron onto T-Shirt
Heat transfer ribbons black for Star LC10, Epson FX80, FX100, LX80, Okidata ML80 £10.00 £11.50c
Citizen 120D £11.00 £12.65c
Star LC10 multicolour £17.00 £19.55c
Star LC10 (Black) £12.00 £13.80c
Epson FX800 (Black) £11.00 £12.65c
Heat transfer colour pens, five in a set £15.00 £19.95
Small heat transfer pens £12.00 £13.80

Phone for further details

EPROM PROGRAMMER V2

Programs 8K, 16K, 32K CMOS or NMOS devices voltage selectable 21V or 12.5V. Complete with comprehensive software which includes Rom management system, plugs into the user port £30.00 £34.50d
Eprom Utilities Disc £6.00 £6.90c
Eprom eraser with timer £25.00 £28.75d

TECHSOFT CAD PACKAGES

for the Master and Archimedes

Designer for the Master	£113.00	£129.95c
Designer intro for the Archimedes	£73.00	£83.95c
Designer for the Archimedes	£193.00	£221.95c

A3000 RAM BOARDS

1 Meg Ram Board Upgradable to 3 Meg	£129.00	£148.35d
4 Meg Ram Board Upgrade	£349.00	£401.35d

MORLEY TELETXT ADAPTOR

Comes complete with 16K ATS Rom, Manual and utilities Disc at the unbeatable price of £90.00 £103.50d

LABELMASTER PLUS

Now includes user definable Label sizes and Mailing list facility.
Labelmaster BBC B £15.00 £17.25c
Labelmaster Plus for Master, Compact, Archimedes. Please state model when ordering £17.35 £19.95c

PRINTER SWITCHERS

Two computers to one printer or vice versa	£20.00	£23.00b
Three computers to one printer or vice versa	£30.00	£34.50b
Four computers to one printer or vice versa	£36.00	£41.40b

Please note that the above units switch all lines, are suitable for all types of printers and computers using Centronics Parallel and INCLUDE LEAD
For advice or a quote on your installation please phone
User port switcher 2 to 1 & off £25.00 £28.75d

CARE READY MADE LEADS RANGE

BBC/Master RGB-Euro (Scart)	£9.00	£10.35c
BBC/Master RGB-7 Pin Hitachi	£7.00	£8.05c
BBC/Master RGB-7 Pin Ferguson	£7.00	£8.05c
Centronics to Centronics Printer	£11.00	£12.65c
User Port Extension lead 0.5M	£9.00	£10.35c
1MHz Bus Extension lead 0.3M	£10.40	£11.96c

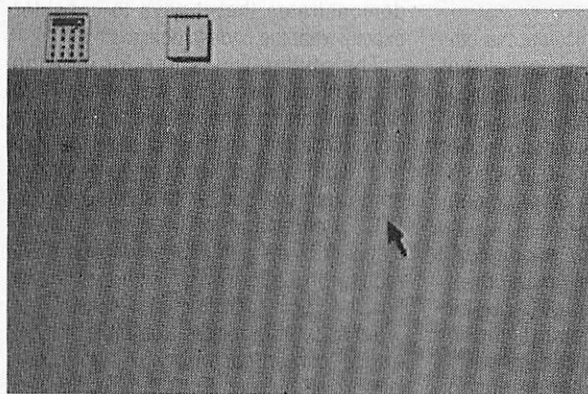
Wide range of leads in stock-please phone

Government & Educational orders welcome. How to Order: Enclose your cheque or P/Order made payable to CARE ELECTRONICS. Access or Visa cards welcome Please allow 7 days for delivery. Please add Post & Packing - a=£11.50; b=£3.45; c=£1.38; d=£2.30



Harness your Wimp power

Not to be outdone by its 32 bit big brother, Glenn Marshall provides a desktop system for the 8 bit BBC Micro



ARCHIMEDES owners are often treated to an explanation of how to use the Wimp system on their machine. Now here's a short series on producing a Wimp-style system for the 8 bit BBC Micro.

Although most of the graphic routines are written in assembly language, you don't need to know how they work in order to use them. In fact the finished product – a desktop system – is just a collection of Basic programs.

The direct screen access method is used to achieve the speed required when updating the display. While Acorn frowns on this for 8 bit machines, it's the only realistic way of achieving our aims – the built-in graphics routines are just too slow.

Graphic effects are produced by storing values in the screen memory addresses. Try typing:

```
MODE 3:??6400=255
```

Notice that a white block of pixels appears. This is because that particular position on the screen is controlled by the memory address &6400. If we write our data directly to the screen like this from machine code we can produce very fast graphics. We will be using Mode 3 for the

desktop and also for all the examples. You may be thinking you've just read a typographical error as Mode 3 doesn't support graphics. However, remember that we are writing our own graphic commands, so we are not tied down to what the operating system decrees.

Mode 3 is useful for two reasons, the most important being that it allows 80 characters horizontally. This is needed if a menu is to support an option that is longer than a few characters and still look presentable. The second reason is that it uses 16k of screen memory as opposed to the 20k used by Mode 0 – the only other one that supports 80 character width.

In Mode 3 the screen memory starts at &4000 and ends at &7E7F. The screen is laid out as 80 bytes controlling the pixels horizontally and 200 bytes vertically. This gives the impression that the resolution is only 80 by 200 pixels. However, there are 640 pixels horizontally because each bit within a byte controls eight pixels.

Try this:

```
MODE 3:??6400=195
```

Notice you get the pattern 11000011 – 0 is black and 1 is white. Now to make things awkward, the screen bytes are ordered in an illogical manner – or so it seems at first.

7	6	5	4	3	2	1	0	8 pixels 1 bit/pixel
&4000	&4008							&4278
&4001	&4009							&4279
&4002	&400A							&427A
&4003	&400B							&427B
&4004	&400C							&427C
&4005	&400D							&427D
&4006	&400E							&427E
&4007	&400F							&427F
BLANK	BLANK							BLANK
BLANK	BLANK							BLANK
&4280								
&7987								
BLANK	BLANK							BLANK
BLANK	BLANK							BLANK
&7C00	&7C08							&7E78
&7C01	&7C09							&7E79
&7C02	&7C0A							&7E7C
&7C03	&7C0B							&7E7D
&7C04	&7C0C							&7E7E
&7C05	&7C0D							&7E7F
&7C06	&7C0E							&7E7E
&7C07	&7C0F							&7E7F
BLANK	BLANK							BLANK
BLANK	BLANK							BLANK

You would expect the bytes controlling the screen to be laid out relating to the actual screen bytes, going from 0-79 for the first row, 80-159 for the second row, and so on.

Figure 1 shows the layout for Mode 3 – note that the values shown are offset by &4000, so location zero is really &4000 and location five is &4005.

This means that if we are to use the screen in a similar manner to a piece of graph paper we must design a routine that

Monthly disc

All listings for this article are contained on this month's subscription disc. Alternatively they can be obtained by sending £2 and a formatted disc to Glenn Marshall, 147 Warwick Road, Scunthorpe, South Humberside DN16 1HH.



allows us to enter X and Y coordinates and then convert this to the appropriate screen memory address:

```
Address =
84000+(X*8)+(YDIV8)*640+(YMOD8)
```

This formula must now be converted into efficient machine code because it will be called by nearly all the other graphic routines. We cannot, therefore, use normal multiplication routines as they are far too slow.

We can use HIMEM to calculate the offset value, assuming that the application programs will be written in Basic. The high byte of this is stored in location &7 and the low byte is always zero. Notice that we use HIMEM instead of the value &40 to ensure that the routine will work in other screen modes without modification.

As the values for X and Y will be converted into numbers greater than 255 we use two byte variables. The X*8 can be achieved by shifting the input byte left three times, making sure we catch any bits being rotated out – lines 480 to 500 in Listing L-1-I on the subscription disc.

Now to convert the Y value. We can quickly produce (YDIV8)*8 by using AND #&F8 – line 530. If we then multiply this value by 80 we will get (YDIV8)*640. To produce *80 efficiently we can shift twice, storing the answer as the high byte, giving the original value *64. The lower three bits have been cleared by the AND #&F8 and so we don't need to worry about them.

We now have *64 in the accumulator, so two shifts will give us *16, again catching any bits shifted out. We then add the *16 to *64 to give *80. This is carried out in lines 540 to 560.

The only part of the formula left is Y MOD 8, which can be produced by using AND #7 – line 570. We then add the Y value, the X value and the offset together and we have a finished routine. Listing L-1-I contains a full version of *position* where the resulting address is held in *y1b* and *y1h*.

Now that we can access the screen memory as though it is a piece of graph paper, we can produce a routine to plot shapes using the *position* routine. To draw a filled rectangle we would start at the left side, draw to the right, drop down a line, move back to the left and repeat until we reach the bottom.

Using this as our method – algorithm – the code from lines 290 to 450 will produce a filled rectangle starting at pixel position *x1,y1* and to the size of *x2* pixels horizontally, and *y2* pixels vertically.

Try running Listing L-1-I – lines 80 to 100 take the annoying separating lines out of Mode 3 – and note the time it takes to fill a screen should be 1.13 seconds. Although much faster than Basic, it is still not all that fast – you can follow it with your eye.

The problem lies with the code not being efficient enough. Examining it, we can see

that inside the loop are some actions which we should minimise – loops are always the first part of a program you should look at if it is not performing as well as you require. The main point is that we call *position* for every pixel we plot.

We already know that each byte on a row is eight away from the next, so we can simply add eight to the *y1b/y1h* variables directly. This means we only call *position* when the Y value changes. There's an improved version in Listing L-1-II. It shows a four fold speed increase and also demonstrates that it pays to consider exactly what the code is doing.

The routine works fine for drawing blocks of one colour, but we cannot use it to draw detailed shapes like a calculator icon. To do this we must change the routine slightly. First we need to design a sprite using a similar technique to the VDU23 command in Basic. We draw a matrix of boxes and fill them in where we require pixels to be set. Figure 11 shows how the calculator icon design looks.

As each pixel relates to a bit in a byte, we just convert each block of eight pixels into a byte number. For example, the first byte will be all the bits except for the top one set, so the value will be:

$$1+2+4+8+16+32+64 = 127 = \&7F$$

Once we have the sprites' data in this format we can read a byte at a time from a list in memory and store them in screen

 **The finished product is just a collection of Basic programs** 

memory. For this we need a 16 bit pointer – *coll/colh* – to access each byte of colour, though in two colour modes it's just a pattern of blacks and whites.

To get the colour we use LDA (*coll*), Y then store it to the screen as before, incrementing the pointer ready for the next colour.

It would be desirable to be able to choose whether to use a pointer or a fixed colour for the fill, so we add a flag called *pass* – lines 460 to 550 in Listing L-1-III show the code.

For clarity in an 80 column mode, it's usually better if you draw sprites in black on a white background, which makes them stand out more, so VDU19 is used to reset the colours. We could just invert the sprite data – 0 becomes 1 and vice versa.

One of the main features of Wimps is the ability to draw a menu, icon, window or pointer on to the screen and when it is finished with, pull it off, leaving the previous display undisturbed.

To do this we'll save the screen in a sec-

tion of memory as we draw the sprite and – when we've finished with it – restore the original, giving the impression that the sprite has disappeared. We can add this to our sprite routine with another 16 bit pointer.

At the point where we read a colour and store it to the screen we add a few lines to save the old byte in a block of memory. Listing L-1-IV gives the full version.

The routine is now much more flexible, and the variable *pass* causes a number of effects depending on its value:

Value	Effect
0	Draw a sprite and save the screen
1	Draw fixed colour and save the screen
2	Draw a sprite
3	Draw a fixed colour
>127	Restore a sprite

The sprite restore facility simply reads the stored data as though it was reading a colour and stores it to the screen.

Listing L-1-IV contains the new sprite listing and Listing L-1-V includes code to test it. The sprite restore facility reads the stored data as though it was reading a colour and stores it to the screen. The calculator icon is drawn over the text and when it is restored the screen returns to its original state. Note that *stl* and *sth* have to be pointed to the beginning of the saved data to do this correctly.

Now try Listing L-1-VI which draws two calculators correctly. However, neither of the sprites are restored successfully. The problem is that the micro has no way of knowing where the sprites data is in memory or where the data needs to be written back to.

The answer is to add the sprite parameters and the address where the data is stored to the end of the saved data. Each sprite then has a tail of information so that a restore routine can read it and restore each sprite. We will need two new routines, one to handle drawing sprites and one to handle restoring them; both will access the original sprite routine.

Listing L-1-VII contains all four routines in their up-to-date versions. Notice most of the parameters are transparent, which means that the registers have the same values after the routine has been used as they did before. This is important, as one routine may call another that uses the same variables. If the second changes a value it may upset the caller.

These routines are not only the backbone of this article, but are the principle ones of many games. To keep you busy you could try moving a sprite around the screen. It is a simple matter of drawing a sprite and erasing it after a period long enough for it to fool our eyes into thinking that the sprite is moving.

● Next month we will see how to produce an interrupt-driven pointer, consider other graphic routines and start work on producing the desktop.



HSV COMPUTER SERVICES LIMITED (MU)

23, Hampstead House, Town Centre, Basingstoke, RG21 1LG
All prices include carriage + V.A.T.

Bulk disks - Fully Guaranteed

	25	50	75	100	200	
5.25" DS/DD 48TPI	8.95	14.95	21.50	26.95	52.95	
5.25" DS/QD 96TPI	9.50	16.50	23.25	29.95	57.95	
	10	20	30	40	50	100
3.5" DS/DD 135	7.95	15.50	22.50	29.50	35.50	69.95

**Filofax type
stationary**
250 sheets
£7.50

Lockable Disk Boxes

50 x 5.25"	£5.95
100 x 5.25"	£7.95
120/140 x 5.25"	£9.95
50 x 3.5"	£5.95
100 x 3.5"	£7.95

Stationery . . . Stationery . . . Stationery . . . Stationery

Micro - Perf all edges	500	1,000	2,000
9.5" x 11" 60gsm	—	£9.50	£15.95
True A4 70gsm	£8.50	£12.95	£23.95
True A4 80gsm	£8.95	£13.95	£25.95
True A4 90gsm	£9.75	£14.95	£27.95

Labels	1,000	2,000	4,000
3.5" x 1.5" (1 across)	£5.25	£9.50	£17.95
3.5" x 1.5" (2 across)	£5.75	£10.50	£19.95
4.0" x 1.5" (1 across)	£5.75	£10.50	£19.95
4.0" x 1.5" (2 across)	£6.75	£11.95	£22.95
2.75" x 1.5" (3 across)	£4.75	£8.50	£15.95

Special Disks + Box Offer

100 capacity disk box only £4.95
When purchasing 50 or more disks.
(3.5" or 5.25")

Branded disks

Sony 3.5" DS/DD 135TPI	£13.95
3M 5.25" DS/DD 48TPI	£7.95
3M 5.25" DS/QD 96TPI	£12.95

Order Hotline
(0256) 463507



Orders under £8 in value carry a small order charge of £2

GET LOST..

ACORN APPROVED DEALER



PHONE:
01 760 0274
01 667 0851

... in the world of creative computing at **SABRE TECHNOLOGIES**
a dedicated **ARCHIMEDES** CENTRE

We can supply A LARGE RANGE OF ARCHIMEDES SOFTWARE AND A COMPREHENSIVE RANGE OF ARCHIMEDES HARDWARE!

A3000 SPECIAL DEALS

PACK 1 SABRE MEGA PACK

Includes A3000, Colour Monitor, Mouse Manuals, Risc-OS, Applications Disks, also includes the games Holed Out, E-Type, Interdictor, Art Package Artisan, Wordprocessor Wordwise +, at the amazing price of

£999.00 (inc VAT and postage within UK mainland)

PACK 2 SMALL BUSINESS PACK

Includes A3000, Colour Monitor, Mouse Manuals, Risc-OS, Applications Disks, Pipedream (Latest version of this Intergrated Business Package) P.C. Emulator and Star LC10 Colour Printer.

ONLY £1350.00 inc VAT

PACK 3 STANDARD PACK

Includes A3000, Colour Monitor, Mouse Manuals, Risc OS, Applications Disks

ONLY £899.00 inc VAT

PACK 4 BUDGET PACK

Includes A3000, Mouse, Manuals, Risc OS, Applications Disks

ONLY £729.00 inc VAT

ARCHIMEDES 400/1 SERIES

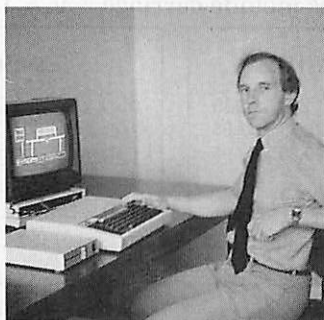
410/1 Colour System	£1475.00 (inc)
420/1 Colour System	£1920.00 (inc)
440/1 Colour System	£2675.00 (inc)

SOFTWARE SPECIAL OFFERS

Business/Art/Utilities	Plague Planet	£11.50
Alps	Star Trader	£15.95
Risc Basic	Trivial Pursuit	£24.99
Pro Artisan	UIM	£24.99
Artisan 2	Missile Control	£10.95
Presenter II	All in Boxing	£11.95
Armadeus	World Class Leaderboard ..	£24.50
Film Maker	Caverns	£14.95
Knowledge Organiser	Arcade Soccer	£16.50
View	Fugitives Quest	£24.50
Graphbox	Jet Fighter	£12.95
Euclid	Cheat it Again	£7.50
System Delta Plus (V2.0) ...	Holed Out	£16.95
Games	Holed Out Extra	£13.50
Cops	Interdictor	£29.95

Cheques and Postal Orders made payable to
SABRE TECHNOLOGIES
Units 74/75, Inshops, 66/74 Church Street, Croydon,
Surrey CA0 1AB

WE ARE OPEN MONDAY - SATURDAY 9.00am - 5.30 pm.



IN THE Spotlight

*Pete Davidson
interviews
Steve Hanson of
Superior Software*

● When did Superior Software start, and what was its first product?

Superior Software started in autumn 1982. Its first four products were: *Galaxy Birds*, *Space Fighter*, *Centibug* and *Invaders*. The first three were written by Richard Hanson, the founder of Superior Software.

● How did those games compare with Superior's later releases?

These games were produced only for the BBC Micro and only in cassette form. Although relatively simple, they are still fun to play.

● A few years ago it was common to hear tales of programmers getting rich very quickly. Photographs of them standing next to their newly-acquired sports cars were a common sight in

the press. Is it still a rewarding occupation?

Only a very few highly talented programmers are getting a good income out of producing computer games. Nowadays they are much more complex than those released a few years ago and take much, much longer to write.

Games produced by teams of two or more programmers are now quite common. For example, *Ricochet* had two game authors, two graphics designers and a loading screen designer.

● There must be a lot of people who've written a game and don't know what to do with it. How should they go about submitting it to a company like Superior, and how much could they expect to earn if it was accepted?

Although getting rich fast is not so easy for programmers nowadays, nevertheless a

good game by a new author can, if it is carefully marketed, earn the author a few thousand pounds.

We are always looking for new games for the BBC/John and Archimedes micros, and several by previously unknown authors are at present under development.

They may be released as individual titles, as occurred with *Ricochet* and *Perplexity*, or be included in compilations, as with *Qwak* (on *Play It Again Sam 10*) and *Baron* (on *Play It Again Sam 11*).

We are interested in receiving games for evaluation for the BBC Micro, the John and the Archimedes. They can be submitted on either disc or cassette.

It is very important that sufficient documentation is provided so that the game can be played in full. If a cheat version is available, this should also be submitted, as it can save a lot of time in checking the higher levels.

● Some people feel that they can make all the money for themselves if they think of a good name for a software house and publish their own games. What are the pitfalls they could meet by adopting this approach?

Unfortunately it's not quite so easy. The game code is only the first step. You then need to check compatibility with all the different types of BBC Micros and various add-ons, and apply some protection to prevent piracy.

You then need the cassettes and discs, the printed labels, the printed inlays and instructions and the cassette/disc cases.

For most of these items bulk purchase is much cheaper than buying just a few items – so you need capital. Having sorted out the duplication, you will have your product. You've then got to sell it.

● Games are released in many forms – full price, budget, compilation, in a big box with a detailed manual or in a plastic case with brief instructions.

How do you decide what sort of packaging to use and how to price the product?

We try to keep to a standard size packaging for cassettes and discs, as this is preferred by retail outlets such as W.H.



Pandemonium



Hostages – soon to be released

Smiths. It also makes for attractive collections of games in people's homes.

We also try to stick to standard prices. Our prices of £9.95 for cassette, £11.95 for 5.25in disc and £14.95 for Master Compact discs have remained the same for several years, which in practice means that our prices have been reduced.

However, unreasonably high prices tend to promote piracy, as has happened to a large extent with the Atari ST and Amiga markets, and may happen with the Archimedes market if software houses are not careful.

The exceptions to our standard packag-

ing and prices are our mega-games such as Elite, Revs + Revs 4 Tracks, Exile and Repton Infinity.

Each of these include a large booklet (for Exile there are two booklets, a novella and an instruction manual), which requires the larger video type case. The higher prices relate to the extra costs of the booklets and the higher development and royalty costs.

● At present you sell games for all Acorn micros from the Electron to the Archimedes series. What is the present

split between the various micros and how do you see this changing in the future?

The market split has not changed appreciably over the past two or three years, with the BBC Micro sales being highest, followed by Electron sales, with Archimedes being a long way behind.

We are very committed to the BBC Micro and Electron market and will continue to produce new and original games for these computers for several years to come.

There are so many hundreds of thousands of BBC Micro and Electron micro in schools and homes, with a very strong second-hand market, that we expect the BBC Micro and Electron markets to remain buoyant for several years to come.

We will also be publishing a few very high quality games for the Archimedes, such as Hostages and Superior Golf, but we don't intend to jump on an Archimedes bandwagon to the detriment of BBC Micro/Electron computer owners.

● What do you consider the most important elements for a good game on the BBC Micro?

A good game on the BBC Micro requires the same attributes as a good game on any computer, that is playability, good use of graphics and sound and originality.

The BBC Micro owner is probably more keen on strategy type games than other computer users, which helps to explain the massive success of the Repton games and arcade adventures like Citadel and Ricochet.

● What is the most popular game that Superior has ever released?

The most popular individual title was, surprisingly, Overdrive – now on our Superior Collection compilations.

The most popular series of games was, and continues to be, Repton games, which have now sold well over 100,000 units on the BBC Micro and Electron.

One of the biggest groups of Repton addicts are housewives. Once their hus-



bands and children are safely out of the way, on goes *The Life of Repton* and another couple of screens are sorted out. The highest selling games at present are the *Play It Again Sam* compilations, now up to number 12.

All these compilations, from number 1 through to number 12 are almost equally popular. It's not surprising since the collection includes, at affordable prices, nearly all the best games ever produced for the BBC Micro and Electron, such as *Thrust*, *Stryker's Run*, *Galaforce*, *Killer Gorilla*, *Frak!*, *Imogen*, *The Sentinel*, *Firetrack*, *Snapper*, *Winter Olympiad 88*, *Zalaga*, *Skirmish* and *The Last Ninja*.

If readers have ideas for future inclusions, please let us know.

● What is your own favourite game on the BBC Micro, and why?

You might expect me to choose one of the mega-games such as *Elite* or *Exile*, but I don't get too much time for game-playing so I prefer the sort where you can get enjoyment from a short playing time, but which exercise the mind.

At present I find both *Ricochet* and *Perplexity* provide very enjoyable relaxation. Occasionally I'll have another stab at trying to complete *Repton 2*.

● Why did Superior decide to specialise on the Acorn games market and remain there rather than expand in to other types of software and other micros?

Superior has been publishing games for the BBC Micro from the start and has built up a reputation for good quality and original games.

This was recognised by Acorn Computers who, in 1986, agreed to Superior taking over Acornsoft releases. Other software houses who published over the full range of computers tended to neglect the BBC Micro market or produced second-rate products, almost as an afterthought.

Superior has always placed the BBC Micro/Electron market first and hence has been successful in this niche.

● One of the latest trends in games software is to licence the name of a film or use a famous person to promote a product. This obviously costs a lot of money, so why is it done? Doesn't it

lead to a more expensive product or one of lower quality?

Licensing is now very popular throughout the software leisure market. The advantage to the publisher is that much of the marketing has already been done, hence costs can be much reduced and quality does not need to be reduced to offset licensing costs.

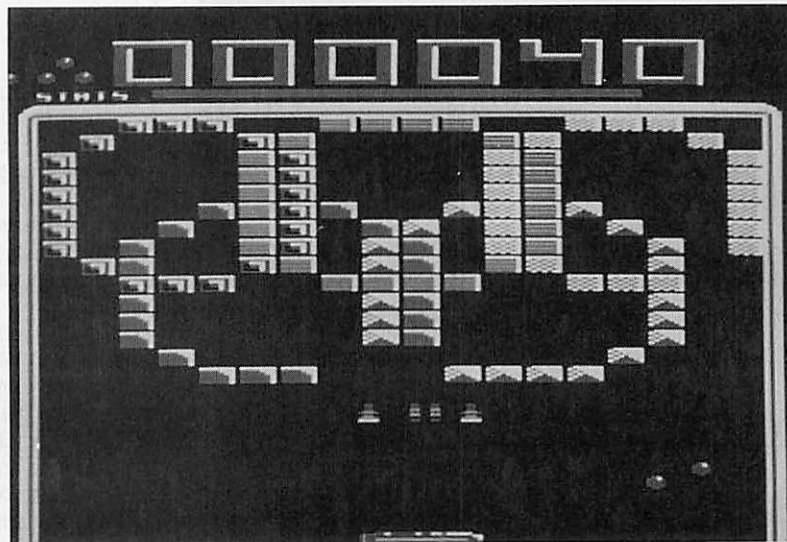
Such products would not be successful if the consumer did not want them. Although we have licensed film rights, as with *Predator*, and BBC television game rights, as with *A Question Of Sport*, most of our licensing deals are for products previously released on other computer for-

ple couldn't even tell you who the publisher is. However with software it's the software house whose name is promoted rather than the author's. In fact, many games in the past were released without a mention of the author. Do you think this is fair and what is Superior's policy on promoting the author's name?

We always acknowledge the authors on our game inlays or instructions and we encourage authors to get in touch with magazines and discuss their games and give hints.

One problem with promoting the author's names is that many write one game, sometimes very successfully, and that's it. With authors who consistently produce top quality games, such as the very talented Peter Scott, we freely and very happily acknowledge his authorship.

I think it is well known that he programmed such brilliant games as *The Last Ninja*, *Superior Soccer* and *Barbarian II*. He is now working on *Hostages*.



Hyperball - super fast action

● What are the problems associated with converting games to the BBC Micro from 16 and 32 bit micros and do you have any plans for this type of conversion on the future?

The main problem associated with converting games to the BBC Micro and Electron from 16 and 32 bit micros is that players (and reviewers) will inevitably compare the result with the original games, and may then be disappointed.

However *Ballistix* was a very successful conversion of the Atari ST and Amiga release by Psygnosis, and our version of *Sim City*, to be released later this year, will be based more on the Amiga version of the game (which was selected as the Top Game of 1989 in America) than the Commodore 64 one.

However *Ballistix* was a very successful conversion of the Atari ST and Amiga release by Psygnosis, and our version of *Sim City*, to be released later this year, will be based more on the Amiga version of the game (which was selected as the Top Game of 1989 in America) than the Commodore 64 one.

● What does the future hold for Superior Software?

We will continue our present a mix of totally new releases, such as *Ricochet* and *Perplexity*, licensed games such as *Predator* and *Last Ninja 2* and *Play It Again Sam* compilations.

Licensing deals with companies such as Infogrames should also bring to Acorn computers the very best of products from the American and European markets, such as *Sim City*.

● Games can usually be categorised - adventure, shoot-em-up or simulation for example. Would you consider releasing any type of game or are there some that you would avoid... and why?

We try to release a full range of games, although we find that arcade adventures and strategy games are particularly popular in the BBC Micro/Electron market. Very good shoot-em-ups, such as *Galaforce* and *Firetrack*, also do well.

On each *Play It Again Sam* compilation we try to give a mix of the various types of game to keep everyone in the family happy.

● When you buy a record it's the artist and title that are important - many peo-

"Beat the Boss" MARK STAR

TEACHERS. . . you asked for it. . . now it's here!!!

The "Beat The Boss" Starter Pack!!!

This cadet version of "Beat the BOSS" is for the younger aspiring business executives operating in teams.

It is the same dynamic business simulation, the same structure, the same decision system. But it's more flexible and easier to control. Its demands and challenges have been designed for the younger age group (11+).

It is in fact an easy run-in to computer assisted learning & business education.

The package includes player's guides, tutor guides, a chart showing the decision inter-relationships & decision determinants and the model work-sheets.

PRICE £40 plus £3 carriage and handling plus 15% VAT

BUT SPECIAL INTRODUCTORY PRICE OF £35

on all orders received before 31st July, 1990

ALSO £5 discount to customers who already have the standard "Beat the BOSS"

Available for RML "Nimbus" and for 80 track DS DFS BBC

RBRC Software

The Guild House, 32 Worple Road
Wimbledon, London SW19 4EF

TELEPHONE ORDERS

01-946 8641 — Please quote order number and
for which machine.

(081-946 8641 after May 6th 1990)

context

Archimedes is a trademark of Acorn Computers Ltd

BANK MANAGER for disc systems only

The most advanced and versatile personal bank account management program available for all BBC computers. Consistently acclaimed!

"data entry is a delight. . . professional. . . excellent product" — Micro User April '86
Enter cheques and receipts. Standing orders any frequency. Automatic date sequencing. Reconcile statements. Search, amend and delete. Unreconcile. Move forwards or backwards. Analyse expenditure. Forward cash flow forecast. Up to 36 simultaneous 'bank accounts' online, inter-account transfers, 9999 standing orders, 99 analysis categories. 12 actual and 12 budgets per category, over 4,000 postings on an 80k disc. Reports to screen or printer. Graphics. Foreign currency support. Password. File recovery. Auto exec file. Field editing. Itemised look ahead. Programmable report writer.

Standard Bank Manager for the BBC B, B+ £17.50

BANK MANAGER MASTER for disc systems only

Includes all of the facilities of the Standard Bank Manager plus ADFS file system support, shadow screens, uses sideways RAM, 40 or 80 column screen reports. Improved graphics, m/c windows, function key support and onscreen labels, additional functions added to the already extensive report facilities.

Bank Manager Master for the MASTER and MASTER COMPACT £22.50

ARCHIMEDES BANK MANAGER

All facilities of Master version plus high speed 'native' mode, wild card analysis enquiry, analysis code sort and other enhancements.

"Impressed, ideal, easy to use." — Micro User, March '88

Archimedes and A3000 Bank Manager £25.00

BANK MANAGER BUSINESS UTILITIES for disc systems only

For the 'professional' who also uses the BANK MANAGER to control the business accounts the BUSINESS UTILITIES add double entry trial balance and programmable spreadsheet analysis reports. Generated from cheque and cash transactions keyed into BANK MANAGER. Just pass the reports to your accountant! Available for all BANK MANAGER versions state which.

Bank Manager Business Utility Pack 1 £12.00

TYPING TUTOR

Quickly learn to touch type. Over 90 smoothly graded lessons graduate you from the basic home keys to complete keyboard mastery. Unique word scan line checking. Target WPM and percentage correct. Revise the targets or lessons as required. Audio key click for positive key depression. Establish a typing rhythm using the automatic metronome. Free format option. Disc version includes several enhancements e.g. on screen keyboard, exact mode, on screen parameters. Recommended.

Cassette £12.50, Disc for BBC B, B+, Master and Compact £12.50
Archimedes and A3000 £15.00

ALL PRICES FULLY INCLUSIVE FREE POSTAGE WITHIN UK
Enquiries and Credit card orders telephone 0234-838347
Please state: cassette, 3.5" disc, 5.25" 40k disc, or 5.25" 80k disc
and computer type (B. Compact, Master or Archimedes).



CONTEX COMPUTING

(REF. MU)

15 WOODLANDS CLOSE, COPLÉ, BEDFORD MK44 3UE

NOW
FOR RISC OS

A LOW COST DISC BASED

PROFESSIONAL ACCOUNTING PROGRAM

"MICRO-TRADER"

INTEGRATED SALES PURCHASE AND NOMINAL LEDGERS

Turn any BBC Computer from the humble Model B to the latest Archimedes into a fast, powerful business tool. 'Micro-Trader' can provide easy to use and timesaving computer accounts for businesses with a turnover up to £21 million per year.

Designed for business use by a business man. 'Micro-Trader' offers full Sales and Purchase Ledger facilities including SALES INVOICE and STATEMENT PRINTING with a capacity of up to 1,000 accounts and 5,000 transactions per month.

Nominal Ledger features a quick and easy entry of everyday transactions. Up to 6 Bank Accounts, full V.A.T. facilities, Journal Posting. Full Reporting for individual accounts, Audit Trail, Trial Balance, Profit & Loss and Balance Sheet.

"MICRO-STOCK"

Stock Control program, fully integrated with 'Micro-Trader'. 4,000 Stock Items with user defined Codes. Invoice and Credit Notes and Cash Sales routine. Full Stock Held Reports.

£75.00 + V.A.T.

"EXTENDED PAYROLL"

Micro-Aid Full Feature Extended Payroll. For use stand alone or integrated with 'Micro-Trader'.

£49.95 + V.A.T.

ONLY
£200
+ V.A.T.

"MICRO-MAILER"

A Mailmerge program, fully integrated with 'Micro-Trader'. With a user Database.

£30.00 + V.A.T.

ARCHIMEDES

Improved program for RISC OS features faster searches, larger capacity and improved analysis facilities.

Archimedes

PHONE TODAY FOR A FREE FACT SHEET

MEADOW COMPUTERS

11, LONDON STREET, WHITCHURCH, HAMPSHIRE, RG28 7LH

Telephone: Whitchurch (0256) 892008

When simple calculators are not enough and spreadsheets are just too much, Mike Jackson's program fits the bill

Example screen				Comments
+	WEEK1	150.00	150.00	Value, no sign: balance=value
	WEEK2	100.00	250.00	Value & sign: balance as calculated
	NETT		250.00	Subtotal: magenta on screen
	LABEL			No sign, no value: no balance
	NETT	250.00	250.00	Subtotal now ordinary value*
	10%	25.00	25.00	percentage*
	WEEK3	250.00	250.00	
+			250.00	Sign, no value: balance=line above
+	WEEK4	200.00	450.00	
+	20%	40.00	490.00	percentage*

* values calculated and inserted automatically.

A typical SuperCal screen

Clevercalc!

YOU know how it is. You're working on a set of figures, like your home accounts or your 1990 budget forecasts, but now you need to see what will happen if you change some of the figures – or perhaps you just got something wrong.

Using an ordinary calculator, you'll have to re-enter some, perhaps all, of your calculations. This is messy, time consuming and boring – and you may not get a print-out. Of course, you could use a spreadsheet but they can be clumsy and hard work for smaller calculations.

SuperCal not only stores all your entries, it carries out all calculations, lets you edit any entry and then automatically does recalculations. All you have to do is type in the figures you want to calculate, with the sign and an optional label.

But it doesn't stop there: You can use subtotals and percentages which will be updated for you at all times. You can print pages, plus save and load files. There's even a small calculator built in for sums within sums, which can also be printed. And nearly all at the press of a key.

Type in the listing and make sure you've made no errors using the checksums. Save and then run it.

You'll see a red line at the top and bottom of the screen. Below the top line is a green arrow, which marks the current line. At the top is the status panel which will be explained later. At the bottom is the main prompt which tells you to press an arrow key, Return or one of the red function keys.

The example shows a typical screen display. In the left column is the sign, next is the label, then the value. The fourth column shows the balance for each line which is calculated for you.

Three calculation pages can be selected with f1, f2 and f3 – the number of the cur-

rent one is displayed next to the P in the status line. Each has 18 lines which you can select with the cursor keys; press Return to enter or edit a line.

The bottom panel now changes to reveal a prompt to type in the operator (*, /, + or -) for this value. Type it in and press Return. Now you'll get the prompt for the label, which can be any five characters. Last you get the prompt to type in the value. Type in a number – you can use a decimal point – and press Return.

For all these steps pressing Return leaves the current value unchanged. To delete use a single space for the first two and zero for the last. As soon as you've finished you'll see the results automatically calculated for you and printed in the right hand column.

You can leave out any of the sign, label or value. The notes in the example show you what happens if you leave out the sign or value. You can omit the label except when using subtotals and percentages.

And that's all there is to entering your own calculation. Try entering the first two lines of the example.

Subtotals

Look at **NETT** on lines three and seven of the example. You can block off part of your calculation and carry its subtotal forward. To do this, move to the line immediately below the block, press f0, type in the label and press Return. The label and the result are now printed in magenta. No value is given and the result is the same as the line above.

To use the subtotal later in the calculation, copy the original on to a fresh line. Using the example, move to line three and press f6. Move to line seven and press f6 again. The line will now be printed as an

ordinary line in yellow. The label will be **NETT** and the value will be automatically written in for you. This will be the same as the original value and will change automatically whenever the subtotal changes. You can edit to add a sign, but not a value.

The only conditions are that the label must be identical and that it must come after the original subtotal. It will even work on a different page, so you can use a subtotal to carry balances forward. To see it in action, change the value on line two from 100 to 200.

Percentages

Look at lines 8 and 12 in the example. To get a percentage enter a line as usual, but for the label put the number and the % sign, with a maximum of five characters – don't put in a value. When the line is displayed, the value will be calculated and entered for you, using the value from the line above. This will be changed for you whenever the value above is changed.

A percent of a percent will not be updated. You cannot take a percentage of a subtotal direct but can convert the subtotal to a value first, as with **NETT**.

Other options

The calculator works by default to two decimal places – as for money. To remove this limit, press Shift+f3. A list of the red key options will be displayed if you press Shift+f0. Pressing Escape and calculation errors will always take you back to the main screen and prompt. Changing the decimal places mid-page may make the display untidy you can re-format by changing page or pressing Escape. Dividing by zero gives a result of zero.

Special functions

Insert line: Move the line marker to where you want to insert a blank line and press f4. The rest of the page from there is moved one line down. If the bottom line is occupied you'll hear a beep and you won't be able to insert.

Sometimes a line looks empty when it's not, so if you get beeped when it looks clear delete the bottom line with f5.

Delete line: Move to the line to be deleted and press f5. The rest of the page below it will be moved up one line.

Line copy: Move to the one to be copied and press f6. On the status panel, the CP marker will change to Y to show the line is stored. You can carry out any other tasks, including change of page.

When ready, move to the line you want to copy to, and press f6 again. The label and value will be copied and CP will change back to N. To add a sign, edit the line as normal, press Return, type the sign, then press Return three times. If the line is occupied, it will be automatically inserted if there's room.

To copy twice, press f6 again to restore before changing lines. To move a line, press f6 to copy it, then f5 to delete it and finally put it in the new position.

Printing: The whole display between the red lines will be printed if you press f7.

Filing: To load a file press f9, type in the file name as prompted and press Return. To save a file press f8 and follow same procedure. All three pages are saved and loaded together including signs, subtotals and percentages.

Quick calculator

You may need to do a series of small calculations where you only need the total in the main calculator. Press Shift+f1. You will be asked if you want to print the results. Press Y for yes, or N for no.

You will now see a blue box. Type in the sign followed immediately by the number then Return. The result will be displayed next to the = sign on the line below. Repeat this until you have calculated all the numbers you want. Then press E or e and Return.

You can include percentages by simply typing % immediately after the number and before Return. Here percent works as on an ordinary calculator, so *10% will give you the bare percent. The printout will look like this:

```
+100  =100
*10%  =10
```

You can also use brackets like this:

```
+10*(20-5) =150
```

Once finished, the result of the Quick Calculator is stored. You can transfer it to the main calculator using Shift+f2. The result will become the value on that line.

```
10 REM SuperCal
20 REM by Mike Jackson
30 REM (c) The Micro User
40 DIM IS(75),V(75),SS(75),A(75),T(75),TL(3)
50 ON ERROR PROCgah
60 *FX4,1
70 VDU23,1,0;0;0;0;:FX225,240
80 CLS:PRINTTAB(0,2)CHRS145;STRINGS(39,CHRS172);TAB(0,21)CHRS145;STRINGS(39,CHRS172)
90 CPS="N":P=0:DS="":*FX6,0
100 G=0:N=1:L=3:LL=3:A%=820209:PROCT:P
ROCKey
110 END
120 DEF PROCkey
130 PRINTTAB(0,L-P)CHRS130;"J "
140 PRINTTAB(0,23)CHRS130;"^keys(J)";CHRS132;"OR";CHRS130;"Return (Edit)";CHRS132;"OR";CHRS130;"fKey";CHRS132;CHRS136;"?";CHRS137
150 K=GET
160 IF(K>135ANDK<140)PROCNL ELSE IF K=13 PROCADD ELSE PROCRED
170 ENDPROC
180 DEF PROCNL
190 IFK=136 L=P+3 ELSE IFK=137 L=P+20
200 IF(K=139 AND L-P>3)L=L-1
210 IF(K=138 AND L-P<20)L=L+1
220 PRINTTAB(1,LL-P) " ";TAB(0,L-P)CHRS130;"J ":LL=L:PROCKey
230 ENDPROC
240 DEF PROCADD
250 PRINTTAB(0,23)CHRS130;TAB(17,23)CHRS136;CHRS132;"J";CHRS137;CHRS157;CHRS131
260 PRINTTAB(1,23)" +/-* or space:";TAB(23,23)STRINGS(16," "):INPUTLINETAB(23,23)SS
270 IFSS=" "ELSEIF(SS="+"ORSS="-"ORSS="*"ORSS="/")SS(L)=SS ELSESS(L)=" "
280 PRINTTAB(1,23)"Label or space:";TAB(23,23)STRINGS(16," "):INPUTLINETAB(23,23)IS
290 IFIS>" " IS(L)=LEFT$(IS,5)
300 PRINTTAB(1,23)" Value or 0:";TAB(23,23)STRINGS(16," "):INPUTTAB(23,23)VS
310 IFLEFT$(VS,1)="-"VS=RIGHT$(VS,LENV$-1)
320 IFVS>" " V(L)=VALVS
330 PRINTTAB(1,23)CHRS156;TAB(3,23)STRINGS(36," ")
340 IF TL(N)<L TL(N)=L
350 IF T(L)=1 TL(L)=0
360 RS=RIGHT$(IS(L),1):IF RS="%" PROCpnt
370 PROCline
380 RS=RIGHT$(IS(L+1),1):IF RS="%" L=L+1:PROCpnt:PROCline:L=L-1
390 PROCans
400 ENDPROC
410 DEF PROCline
420 PRINTTAB(0,L-P)STRINGS(40," ")
430 IF T(L)=1 PRINTTAB(4,L-P)CHRS133;TAB(7,L-P)IS(L):ENDPROC
440 PRINTTAB(4,L-P)CHRS131;SS(L);TAB(7,L-P)IS(L)
450 IF V(L)>0 PRINTTAB(13,L-P)V(L)
460 ENDPROC
470 DEF PROCans
480 FOR X=L TO TL(N)
490 IF T(X)=0 A(X)=FNA ELSE A(X)=A(X-1):PROCLK
500 PRINTTAB(23,X-P)STRINGS(17," ")
510 IFT(X)=0 C=134 ELSE C=133
520 PRINTTAB(24,X-P)CHRS136
530 IFA(X)<>0PRINTTAB(25,X-P)A(X)
```

SUBSCRIBE NOW!

If you prefer to save the wear and tear on your fingers you'll find this listing – together with all the others from this issue – on this month's disc, sent free if you subscribe to *The Micro User*.

```
540 NEXT:PROCKey
550 ENDPROC
560 DEF FNA
570 IF SS(X)=""THEN =V(X) ELSEIFSS(X)=""ANDV(X)=0 ELSE NS=STR$(A(X-1))+SS(X)+STR$(V(X)):EVAL NS
580 DEF PROCred
590 IF K=128 PROCchp
600 IF K=240 PROCTotal
610 IF K=247 PROCprntr
620 IF K=244 PROCins
630 IF K=245 PROCdel
640 IF K=248 PROCdout
650 IF K=249 PROCdin
660 IF K=129 PROCqc
670 IF K=130 V(L)=A:PROCline:PROCan
680 IF(K=131AND DS="")DS="U":A%=80000:PROCT ELSEIFK=131 DS="":A%=820209:PROCT
690 IF(K>240 AND K<244)PROCNp
700 IF K=246 PROCcopy
710 PROCkey
720 ENDPROC
730 DEF PROCTotal
740 LS="Subtotal Label:"R":PROCIp:IF IN$="VDU7:PROCKey
750 IS(L)=INS:IF L>TL(N) TL(N)=L
760 T(L)=1
770 PROCline:PROCan
780 ENDPROC
790 DEF PROCip
800 PRINTTAB(0,23)CHRS130;LS;TAB(17,23)CHRS136;CHRS132;"J";CHRS137;CHRS157;CHRS131;STRINGS(16," ")
810 INPUTTAB(23,23)INS
820 PRINTTAB(1,23)CHRS156:PRINTTAB(3,23)STRINGS(36," ")
830 ENDPROC
840 DEFPROCins
850 IF(TL(N)+1)-P>20 VDU7:ENDPROC
860 TL(N)=TL(N)+1
870 FORX=TL(N) TO L+1 STEP-1
880 IS(X)=IS(X-1):SS(X)=SS(X-1)
890 T(X)=T(X-1):V(X)=V(X-1)
900 NEXT
910 IS(L)=""V(L)=0:T(L)=0:SS(L)=""
920 OL=L:FOR L=L TO TL(N):PROCline:NEXT:L=OL
930 IF G=1 G=0:ENDPROC
940 PROCans
950 ENDPROC
960 DEFPROCdel
970 FORX=L TO TL(N)-1
980 SS(X)=SS(X+1):IS(X)=IS(X+1):V(X)=V(X+1):T(X)=T(X+1)
990 NEXT
1000 SS(TL(N))=""IS(TL(N))=""T(TL(N))=0:V(TL(N))=0
1010 IF(TL(N)>4 AND TL(N)>=L)TL(N)=TL(N)-1
1020 OL=L:FOR L=L TO TL(N):PROCline:NEXT:L=OL
1030 PRINTTAB(0,(TL(N)+1)-P)STRINGS(40," ")
1040 PROCans
1050 ENDPROC
1060 DEFPROCcopy
1070 IF CPS="N" MS=IS(L):VM=FNM:CPS="Y":PROCT:ENDPROC
```



```

1080 IF(I$(L)>" " OR V(L)>0) THEN G=1:PRO
Cins
1090 I$(L)=NS:V(L)=VN:NS="" :VN=0
1100 CPS="N":PROCT
1110 PROcline
1120 IF L>TL(N) TL(N)=L
1130 PROCans
1140 ENDPROC
1150 DEF FNM
1160 IF T(L)=1 A(L) ELSE=V(L)
1170 DEFPROCnp
1180 IF(K=241 AND N>1)L=3:P=0:N=1 ELSE
IF K=241 PROCkey:ENDPROC
1190 IF(K=242 AND N<2)L=21:P=18:N=2 EL
SE IF K=242 PROCkey:ENDPROC
1200 IF(K=243 AND N<3)L=41:P=38:N=3 EL
SE IF K=243 PROCkey:ENDPROC
1210 LL=L:CLS:PROCT
1220 PRINTTAB(0,2)CHR$145;STRING$(39,CH
R$(72));TAB(0,21)CHR$145;STRING$(39,CHR$1
72)
1230 OL=L:FORL=L TO TL(N):PROcline:NEXT
:L=OL
1240 PROCans
1250 ENDPROC
1260 DEFPROCT:GX=80000
1270 FOR X=0 TO 1
1280 PRINTTAB(0,X)CHR$141;CHR$129;"Supe
rCal";TAB(18);CHR$132;"D:";DS;SPC3;CHR$1
33;"C:";CPS;SPC4;CHR$131;"P:";N
1290 NEXT:IF DS="" GX=820209
1300 ENDPROC
1310 DEF PROCpntr
1320 VDU2,21
1330 FORX=P+3 TO TL(N)
1340 IF(S$(X)=""ANDI$(X)=""ANDV(X)=0AND
A(X)=0)PRINT:GOTO1360
1350 IF V(X)=0 PRINTTAB(5)$(X);TAB(8)I
$(X);TAB(30)A(X)ELSE PRINTTAB(5)$(X);TA
B(8)I$(X);TAB(15)V(X);TAB(30)A(X)
1360 NEXT:VDU6,3:PROCkey
1370 ENDPROC
1380 DEF PROCdout
1390 LS=STRING$(2," ")+"File to save:"R
:PROcIp
1400 Z=OPENOUT INS
1410 FORX=3 TO 75
1420 PRINT#Z,$$(X),I$(X),V(X),T(X),A(X)
1430 NEXT
1440 PRINT#Z,TL(1),TL(2),TL(3)
1450 CLOSE#Z:PROCkey
1460 ENDPROC
1470 DEF PROCdin
1480 LS=STRING$(2," ")+"File to load:"R
:PROcIp
1490 Z=OPENIN INS
1500 IF Z=0 PROCkey:ENDPROC
1510 FORX=3 TO 75
1520 INPUT#Z,$$(X),I$(X),V(X),T(X),A(X)
1530 NEXT
1540 INPUT#Z,TL(1),TL(2),TL(3)
1550 CLOSE#Z:K=241:N=2:PROCnp
1560 ENDPROC
1570 DEF PROCclk
1580 OL=L:FORL=X+1 TO 70:IF I$(L)=I$(X)
V(L)=A(X):IF L=P+21 PROcline
1590 RS=RIGHT$(I$(L+1),1):IF RS="X" L=L
+1:PROCnpnt:IF L=P+21 PROcline
1600 NEXT:L=OL
1610 ENDPROC
1620 DEF PROCqc:PRINTTAB(0,23)STRING$(3
9," ")
1630 PRINTTAB(0,22)CHR$130;"Print Minic
al?(Y/N)"
1640 Q=GET:IF DS="" GX=820209
1650 PRINTTAB(1,22)"100% or E(e):R ";T

```

All program listings in this issue
can be downloaded FREE on...

MicroLink

```

AB(17,22)CHR$136;CHR$132;"1";CHR$137;CHR
$157;CHR$131;TAB(21,23)CHR$130;"="
1660 AS="0":REPEAT
1670 INPUTTAB(23,22)V$:PS=V$:IF(V$="E"O
RV$="e")THEN1730
1680 CS=LEFT$(V$,1):IFASC(CS)>48 VDU7:P
RINTTAB(23,22)STRING$(16," "):GOTO1670
1690 IFINSTR(V$,"X")$=LEFT$(V$,1):V$=R
IGHT$(V$,LENV$-1):V=VALV$+VALA$/100:V$=S
$+STR$(V):IF S$=""AS=STR$(V):A=V:GOTO 1
710
1700 AS=AS+V$:A=EVALA$:AS=STR$(A)
1710 PRINTTAB(23,23)CHR$130;A;STRING$(1
0," "):TAB(23,22)STRING$(20," ")
1720 IF(Q=890RQ=121)VDU2,21:PRINTPS;TAB
(13)"=";A:VDU6,3
1730 UNTIL(V$="E"ORV$="e"):PRINTTAB(1,2
2)CHR$156;STRING$(37," "):TAB(17,23)STR
ING$(21," ")
1740 IFLEFT$(AS,1)="-"AS=RIGHT$(AS,LENA
S-1):A=EVALA$
1750 PROCkey:ENDPROC
1760 DEF PROCagh
1770 VDU7,6,3:K=241:N=4:PROCnp:ENDPROC
1780 DEF PROCnt
1790 NS=LEFT$(I$(L),LEN I$(L)-1)
1800 PS=VAL NS:V(L)=V(L-1)*PS/100

```

```

1810 ENDPROC
1820 DEF PROCclp
1830 CLS:PRINTTAB(0,4):RESTORE1910
1840 FORX=0 TO 12
1850 READ AS
1860 IFX<10 PRINTTAB(0,X+4)CHR$129;"
f";X;TAB(9,X+4);CHR$131;AS
1870 IFX>9 PRINTTAB(0,X+4)CHR$129;"SHIF
T f";X-9;TAB(9,X+4)CHR$131;AS
1880 NEXT:PRINT
1890 PRINTCHR$130;"New Page to return t
o SuperCal"
1900 REPEAT:K=GET:UNTIL(K>240ANDK<244):
N=4:PROCnp:ENDPROC
1910 DATA Subtotals,Page1,Page2,Page3,I
nset,Delete,Copy,Print,Save,Load
1920 DATA Quick Calculator, Transfer AC
result,Decimal

```

Basic I

IF you have Basic I the
checksum for line 1490 will
be 8D5F 3 and the cumula-
tive check digit will be wrong
from this point onwards.

You can check your ver-
sion of Basic by pressing
Control+Break and then typ-
ing REPORT followed by
Return. If the copyright date
is 1981 you have Basic I.

Get it
right ✓

```

10 = 0 0
20 = 0 0
30 = 0 0
40 = B581 1
50 = BE26 D
60 = E383 C
70 = FE9C E
80 = 66EA 5
90 = DA7 3
100 = F584 1
110 = F02E A
120 = E09D 4
130 = 7EB 0
140 = EA58 3
150 = 7BDA A
160 = 3588 C
170 = ED0F 1
180 = 29EB D
190 = 53E7 4
200 = AB7A D
210 = B238 B
220 = 262E 2
230 = ED0F D
240 = D7F1 1
250 = 2247 4
260 = 6C2E 7
270 = 3BD1 7
280 = 2F48 1
290 = DE05 5
300 = 180B E
310 = 2095 2
320 = FA7 4
330 = 5366 A
340 = CCC2 E
350 = 54BE C
360 = EF9 7

```

```

370 = 7CE9 D
380 = 8A5E 0
390 = B8AF D
400 = ED0F 2
410 = E285 C
420 = 7F6B F
430 = D928 8
440 = AD76 1
450 = 1544 4
460 = ED0F 9
470 = 5AEC F
480 = 39DE 4
490 = 9B9D 5
500 = 7370 7
510 = F22F 5
520 = F44F 5
530 = F16 1
540 = 8DE5 0
550 = ED0F 7
560 = 9E1C C
570 = F452 A
580 = FEF3 3
590 = FAFB 0
600 = ABF F
610 = ED5B F
620 = F979 2
630 = C1AC 1
640 = CF5E 8
650 = AF60 5
660 = C 6
670 = 63BF 3
680 = 980E 4
690 = 2CA0 4
700 = 82A3 B
710 = 2DE F
720 = ED0F 3

```

```

730 = 9CCE 1
740 = DB2E 5
750 = 67ED 5
760 = 10EE 2
770 = 13DF D
780 = ED0F D
790 = 63C1 C
800 = A5EB 2
810 = 7EFF 0
820 = 7E36 7
830 = ED0F 2
840 = 796 9
850 = B2C0 6
860 = DCB3 1
870 = A189 F
880 = 86B3 2
890 = CA 4
900 = 2C83 3
910 = 570D 5
920 = 829F 0
930 = FCBC 3
940 = B8AF 5
950 = ED0F 5
960 = 7AE3 D
970 = 323E E
980 = F500 E
990 = 2C83 E
1000 = CD7A 6
1010 = E798 7
1020 = 829F 7
1030 = 656F 1
1040 = B8AF 6
1050 = ED0F E
1060 = 391 2
1070 = 326A C
1080 = 56FA 7
1090 = FB63 0
1100 = F80A 4
1110 = 7CE9 F
1120 = 1CF2 B

```

```

1130 = B8AF 6
1140 = ED0F 7
1150 = 5F90 6
1160 = 7248 D
1170 = 4A05 F
1180 = FE97 F
1190 = 6559 6
1200 = BC39 C
1210 = 6A52 D
1220 = 6910 7
1230 = 150F E
1240 = B8AF 3
1250 = ED0F 2
1260 = 31E8 7
1270 = 4524 F
1280 = 96AF F
1290 = 736 5
1300 = ED0F A
1310 = BC32 C
1320 = 2956 C
1330 = 4881 1
1340 = 7F80 5
1350 = B06D C
1360 = F964 9
1370 = ED0F D
1380 = 87F D
1390 = 72 4
1400 = 638D 6
1410 = ED12 6
1420 = 530B A
1430 = 2C83 F
1440 = ED12 3
1450 = 6790 5
1460 = ED0F E
1470 = EB17 E
1480 = 420E F
1490 = 6B39 5
1500 = A6 9
1510 = ED12 C
1520 = 831C 2

```

```

1530 = 2C83 5
1540 = 795F 3
1550 = FB21 5
1560 = ED0F 6
1570 = 3F6E B
1580 = FDA6 E
1590 = 8B85 D
1600 = BDDB 5
1610 = ED0F B
1620 = 2E10 E
1630 = 3329 6
1640 = FC6B 0
1650 = FCBE D
1660 = A260 A
1670 = 8122 7
1680 = DE49 D
1690 = 47F7 2
1700 = F857 3
1710 = 2ABC 3
1720 = 146B B
1730 = AE9B 5
1740 = 6BB D
1750 = 4B80 1
1760 = 432E F
1770 = 6BA9 9
1780 = 5E58 6
1790 = AB06 4
1800 = 9D03 0
1810 = ED0F 6
1820 = 927C D
1830 = 3DB2 A
1840 = F9B3 8
1850 = D84C 9
1860 = D859 9
1870 = C9D5 0
1880 = F700 E
1890 = C816 6
1900 = 9430 3
1910 = 6508 3
1920 = BD99 5

```


Up to 7 issues FREE!

(worth £13.40)

THE MICRO USER

Yes – you will only pay for 24 issues when you take out a subscription for the next 31 issues of *The Micro User*. **That means SEVEN issues completely free!**

And if you take out a 12 month subscription we'll extend it by an extra THREE copies.

What's more, as a subscriber you'll also be able to take advantage of our many exclusive money-saving offers which will be posted to you every month.

But note: This particular offer MUST end on April 30 – so complete the form alongside and return it without delay!




● If you are a current subscriber you haven't been forgotten. Take advantage of this unrepeatable offer by asking for early renewal of your subscription, which will then be extended as necessary.

ORDER FORM

Valid to
May 31, 1990




15 MONTH SUBSCRIPTION

(UK only)

	New	Renewal
 With Tape £23 <input type="checkbox"/> 2401 <input type="checkbox"/> 2402		
 With 5.25" disc (40T) £23 <input type="checkbox"/> 2403 <input type="checkbox"/> 2404		
With 5.25" disc (80T) £23 <input type="checkbox"/> 2405 <input type="checkbox"/> 2406		
 With 3.5" ADFS disc £27 <input type="checkbox"/> 2407 <input type="checkbox"/> 2408		
With 3.5" Archimedes disc £27 <input type="checkbox"/> 2409 <input type="checkbox"/> 2410		

31 MONTH SUBSCRIPTION

(UK only)

	New	Renewal
 With Tape £41 <input type="checkbox"/> 2411 <input type="checkbox"/> 2412		
 With 5.25" disc (40T) £41 <input type="checkbox"/> 2413 <input type="checkbox"/> 2414		
With 5.25" disc (80T) £41 <input type="checkbox"/> 2415 <input type="checkbox"/> 2416		
 With 3.5" ADFS disc £49 <input type="checkbox"/> 2417 <input type="checkbox"/> 2418		
With 3.5" Archimedes disc £49 <input type="checkbox"/> 2419 <input type="checkbox"/> 2420		

12 MONTH SUBSCRIPTION

(outside UK)

	New	Renewal
Europe & Eire (Surface mail) £28 <input type="checkbox"/> 2365 <input type="checkbox"/> 2114		
Overseas (Airmail) £45 <input type="checkbox"/> 2004 <input type="checkbox"/> 2113		

24 MONTH SUBSCRIPTION

(outside UK)

	New	Renewal
Europe & Eire (Surface mail) £51 <input type="checkbox"/> 2421 <input type="checkbox"/> 2422		
Overseas (Airmail) £85 <input type="checkbox"/> 2423 <input type="checkbox"/> 2424		

Only subscription applications received by Wednesday, April 25 can be guaranteed to start with next month's issue.

Payment: please indicate method (✓)

☐ Cheque/Eurocheque made payable to Database Publications Ltd.

☐ Access/Mastercard/Eurocard/Barclaycard/Visa/Connect

No.

Expiry

Date

Name Signed

Address

Post Code

Daytime telephone number in case of queries

**Send to: Database Direct, FREEPOST,
Ellesmere Port, South Wirral L65 3EB**

(No stamp needed if posted in UK)

*Products are normally despatched within 48 hours of receipt
but delivery of certain items could take up to 28 days*

Order at any time of
the day or night

Orders by phone: 051-357 1275

Orders by Fax: 051-357 2813

Orders by MicroLink: MAG001

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

General Enquiries: 051-357 2961

MU5

Watford Electronics

Jessa House, 250 Lower High Street, Watford WD1 2AN, England

Tel: Watford (0923) 37774 Tlx: 8956095 Fax: (0923) 33642

Shop Hours: 9am to 6pm (Mon.-Sat.) Thursday 9am to 8pm. FREE customer car park.

All prices exclusive of VAT; subject to change without notice & available on request.

Credit Card Orders (ACCESS & VISA) Tel (0923) 33383 or 50234 (24 Hours)



The choice
of Experience



The choice
before and after
the experience

Archimedes *micro*

System Basic Mono Colour Multiscan

Please telephone or write in
for our
NEW LOW PRICES

(Securicor carr. £10 on Archimedes)

Archimedes A3000

- A3000 Microcomputer **£599**
- A3000 + Learning Curve pack **£699**
- 3.5" External Drive **£99**
- Monitor Stand **£22**
- External Podule Case **£14**
- Serial Upgrade **£19**
- Dust Cover Micro only **£5**
- Dust Cover for Micro + Monitor **£9**
- User port/MIDI upgrade **£49**



NEW A3000 LEARNING CURVE

A very special offer pack consisting of the remarkable A3000 Archimedes microcomputer, Integral disc drive and a mouse. Welcome guide and user manual. A pair of application disc containing Painting package, Drawing Application, Text and program editor, Music package, Games & Utilities programs. First Word Plus wordprocessor and spelling checker, IBM PC Emulation package, Genesis applications, which contains: GEN DTP, Address & phone book, Scrap book, Recipes, Composers, Green issues, Planets, Story writing and Personal organiser. A demonstration Video Cassette and A parent's guide to the National Curriculum. All this plus Watford's incredible deal of a FREE upgrade to 2MB of RAM and FREE on-site maintenance cover for 12 months.

ACCESSORIES

- NEW Multitasking RISC OS **£29**
- MEMCI Upgrade **£49**
- ARM 3 Upgrade **£399**
- ROM Podule Acorn **£45**
- ROM Podule (Computer Concepts) **£45**
- ROM Podule (C C) with Battery Backup **£59**
- 2 Podule Backplane (Watford) **£25**
- 4 Podule Backplane (Watford) **£35**
- Backplane FAN only (for Hard Disc) **£8**
- 3.5" 800K 2nd Floppy Drive (305/310) **£118**
- 5.25" 800K external Floppy Drive **£85**
- I/O Podule (with Analogue port, User port, & 1MHz bus) **£80**
- MIDI add-on to I/O Podule **£29**
- MIDI Expansion Card **£65**
- Clares Armadeus Sound Sampler Board **£69**
- Sound Sampler Mono (Armadillo) **£129**
- Sound Sampler Stereo (Armadillo) **£166**
- Sound Sampler Stereo/Midi (Armadillo) **£186**
- Chromalock Podule (Wild Vision) **£275**
- Econet Network Board **£46**
- Archimedes IEEE Interface Adaptor **£269**
- Dual RS232 Podule **£195**
- 16 bit parallel I/O Card **£195**
- NEW - Archi MK II Replacement Mouse **£39**
- RB2 - An Archimedes Marconi Tracker Ball **£47**
- PC Emulator (RISC OS) incl. MSDOS 3.21 **£62**
- Software Developers Toolbox **£159**
- Floating Point Unit **£549**
- SCSI Adaptor Expansion Card **£185**
- Archi Real-time Digitiser **£249**
- Keyboard Extension Lead **£6**

Archi Books, see page 12 of our advert

0% FINANCE

We are once again able to offer 0% finance for the purchase of an Archimedes or BBC Master micros and some peripherals. For further details please write in or telephone: 0923 37774 ext. 223, 203 or 201

Unbeatable SPRING SALE

Offers on Archimedes Micro
(Extended by Popular Demand)

When you purchase an Archimedes Micro from Watford, look what you get FREE with it

Micro Free Offer

- A410/1 Upgraded to 2MB RAM & a 20MB Hard Disc, worth £299 (A420)
- A420/1 Upgraded to 4MB RAM & a 40MB Hard Disc, worth £679 (A440)
- A440/1 A TAXAN 770+ 14" Multisync Monitor
- A3000 Upgraded to 2MB, worth £159
- Plus 12 months FREE On-Site Maintenance

Turbo Charge Your Archimedes (at an affordable price)

Increase the speed of your Archimedes by a factor of THREE to SIX times (depending on the software you are running), with Watford's ARM3 Upgrades.

- ARM-3 20MHz Upgrade **£349**
- ARM-3 30MHz Upgrade **£399**

Convert your Archi 410 to a 420 or 440 with Watford's unique Upgrade Kits

- UP10 - to 2MB RAM + 20MB Hard Disc **£265**
 - UP15 - to 2MB RAM + 40MB Hard Disc **£359**
 - UP20 - to 4MB RAM + 20MB Hard Disc **£475**
 - UP30 - to 4MB RAM + 40MB Hard Disc **£569**
 - UP40 - to 4MB RAM + 53MB Hard Disc **£649**
- (P.S. When purchased with an A410/1, the upgrades will be fitted at no extra cost)

Archimedes RAM Upgrade

All our memory upgrades are simple to fit. No soldering required.

- R302-A3000 - to 2MB RAM Upgrade **£115**
 - R304-A3000 - to 4MB RAM Upgrade **£349**
 - R311-A305 - to 1MB RAM Upgrade **£99**
 - R312-A305/310 - to 2MB RAM Upgrade **£285**
 - R314-A305/310 - to 4MB RAM Upgrade **£499**
 - R412-A410/1 - to 2MB RAM Upgrade **£109**
 - R414-A410/1 - to 4MB RAM Upgrade **£319**
- (Carriage on Add-ons £3)

Watford's 20Meg & 40Meg Archimedes Hard Disc

Watford Electronics' 20Meg & 40Meg hard disc fits internally into the Winchester slot provided. It is fully compatible with Acorn's hard disc upgrade, (the only difference is our low price). Price includes the Hard Disc Drive, Controller Podule & fitting instructions. (Self parking hard drives.) P.S. The 310 upgrade requires a backplane and a fan.

- 3HDP - Hard Disc Podule only **£175**
 - 3HD20 - 20Meg H' Disc + Podule for 310 **£319**
 - 3HD40 - 40Meg H' Disc + Podule for 310 **£439**
 - 2 Podule backplane (Watford) **£25**
 - 4 Podule backplane (Watford) **£38**
 - Fan for the backplane **£8**
 - 4HD20 - 20 Meg Hard Disc for 410 **£169**
 - 4HD40 - 40 Meg Hard Disc for 410 **£285**
 - A3000 Hard Disc Podule only **£195**
 - A3000 20 Meg Hard Disc + Podule **£369**
 - A3000 40 Meg Hard Disc + Podule **£489**
- (Carriage £7)

Desk Top Publisher

- Acorn's Archi DTP Package **£125**
- Impression DTP Package **£135**

WORDPROCESSORS

- Wordwise + Disc **£20**
- Image Writer **£25**
- Interword Disc **£20**
- 1st Word Plus - 3 **£72**
- Archie Spell Master **£39**
- P. Spellchecker **£40**
- View **£45**
- Viewspell **£32**
- Viewindex **£12**
- Graphic Writer **£23**

DATABASES

- AlphaBase **£36**
- Viewstore **£45**
- Interbase Disc **£20**
- Multistore **£195**

SPREADSHEETS

- Intersheet Disc **£20**
- Sigmasheet **£55**
- Viewsheets **£45**

BUSINESS GRAPHICS

- GammaPlot **£50**
- Interchart Disc **£20**

INTEGRATED PACKAGES

- Logistix - Database, Spreadsheet, Time Management & Business Graphics **£89**
 - Pipedream 3 - Wordprocessor, Database & Spreadsheet **£125**
- (P&P on above £2)

GRAPHICS, ART, DESIGN & GAMES

- | GRAPHICS | | GAMES | |
|---------------|-----|-----------------|-----|
| Atelier | £84 | Holed Out Golf | £17 |
| Pro Artisan | £85 | Hyperpack (12) | £79 |
| Archeffect | £20 | Hoverbod | £11 |
| Autosketch II | £75 | Ibix the Viking | £14 |
| Graph Box | £64 | Inter Dictor | £25 |
| Kermit | £46 | Jet Fighter | £10 |
| Linguinity | | Minotaur | £11 |
| Presenter II | £39 | Missile Control | £11 |
| Render Bender | £59 | Orion | £12 |
| | | Pacmania | £14 |
| | | Repton 3 | £17 |
| | | Thundermonk | £11 |
| | | Zarch | £15 |

SILICON VISION Corner

- | | | | |
|--------------------------|-----|---------------|------|
| Data Vision | £74 | Film-Maker | £59 |
| Gerber Plot | £93 | Office Tools | £219 |
| Risc Basic | £74 | ROBO LOGO | £54 |
| Solid CAD | £74 | Share Holder | £74 |
| Super Plot | £20 | Solids Render | £59 |
| Super Dump | £20 | Solid Tools | £199 |
| Arc PCB Professional | | | £275 |
| Gate Array Design System | | | £67 |
| Financial Accounts | | | £129 |
| Realtime Solids Modeller | | | £110 |

LANGUAGES (Archimedes)

- | | |
|-----------------------------|-----------|
| ISO-PASCAL; FORTRAN 77 | £89 each |
| ANSI C Release 3 | £129 |
| Assembler; LISP or Prolog X | £155 each |
| LOGOTRON LOGO | £55 |
| ROBO LOGO | £56 |
| RISC BASIC | £85 |
| TWIN EDITOR | £25 |
| BASIC Compiler | £89 |
- (P&P £2 on above packages)

MINERVA's Archimedes Software

Sigmasheet	£55	Sales Ledger*	£53
Home Accounts*	£40	Purchase	
Stock Manager*	£53	Ledger*	£53
Nominal Ledger*	£53	Reporter	£29
Ancestry	£59	Mailshot	£29
Gammplot	£50	MultiStore	£195
System Delta+	£55		
System Delta + Reference Manual			£25
Order Processing/Invoicing*			£53
School Administrator			£118
* Requires System Delta			
(P&P on above items £2)			

Archimedes to BBC Serial Link Mk 2

Using this simple data link, it is possible to solve all your BBC to Archimedes data transfer problems. The kit is supplied with a disk, and the necessary cable to connect the two computers.

New RISC OS Version

Only £15

Archimedes 5.25"/3.5" Disc drive Interface

With this interface it is possible to connect almost any 5.25"/3.5" disc drive with its own power supply to the Archimedes. Up to 4 disc drives can be connected. NO SOLDERING is involved. Supplied complete with necessary lead.

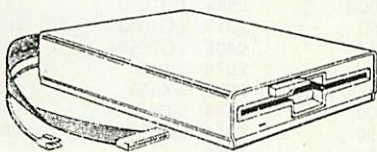
Only £21

BBC MASTER

MASTER 128K Micro incl. Acorn's View, Viewsheets, ADFS, BASIC Editor & TERMINAL plus FREE OFFER (see below)

£439 (carr £7)

FREE OFFER



A 5.25" Double Sided, 40/80 track switchable 400K Disc Drive complete with cables and a Utilities disc incl. 2 games, plus

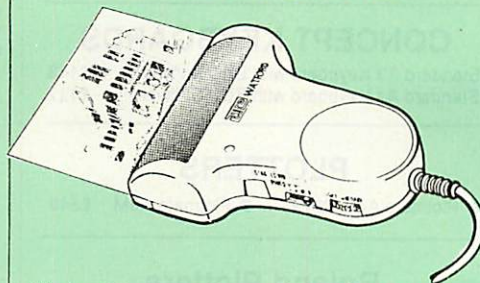
Gemini's OFFICE MATE & OFFICE MASTER packages on Disc consisting of: Database, Spreadsheet, Beeplot graphics. Accounts packs: Cashbook, Final Accounts, Mailist, Easyledger, Invoice & Statements, Stock Control. FREE with every BBC Master purchased from us during April

ADD-ONS & ACCESSORIES

Turbo 65C102 Add-on Module	£115
Econet Module for the Master	£47
Twin ROM Cartridge for Master	£9
Quad ROM Cartridge for Master	£14
Master Reference Manual I (No VAT)	£14
Master Reference Manual II (No VAT)	£14
Master Advance Ref Manual (No VAT)	£17
64K Upgrade Kit for B+	£32
Acorn 1772 DFS Kit complete	£49
ECONET Upgrade Kit for BBC B	£42
ALL ECONET UPGRADES Available	
ARIES' IEEE Interface for BBC B & Master	£238
Morley Teletext Adaptor with ATS Rom	£99
Filestore E01S	£899
Filestore E40s	£749
Filestore E60S	£949
Ecolink	£270

(Carr. £2 to £7 depending on the weight)

Archi Mk II Hand Scanner



Watford Electronics is now able to offer a complete hand held scanning package, possibly the most essential addition to any desktop publishing system. The package includes the most comprehensive utility software available for the Archimedes, a high quality, ergonomically designed to fit the shape of your hand, (see drawing above) scanner, which is fitted with a warning LED that will indicate if the scanner is being moved too quickly for accurate results. Additional twin guide rollers ensure precise tracking over the image, to make the best use of the high resolution available with this system. The yellow/amber illumination of our Mk II scanner, enables you to achieve optimum accuracy. It is capable of scanning up to an amazing 400 DPI. The scanning area is 4" wide and the height is only limited by the maximum amount of memory available.

On board ROM software supplied, is the most sophisticated Archimedes scanner software yet written.

Price £149 (P&P £4)

Special Discount Scheme

For Teachers, Lecturers & Education. Please phone for further details.

Z88 Portable Micro



Only: £195 (Carr £4)

FREE

With every Z88 purchased from us, we are giving away absolutely FREE, a Z88 to BBC Interface Link, 4 rechargeable batteries and a compact Mains Battery Charger worth £38.

ACCESSORIES

32K RAM Pack or 32K EPROM Pack	£18.00
128K RAM Pack or 128K EPROM Pack	£45
512K RAM Pack	£175
Z88 Eprom Eraser Unit	£35
Z88 Spellmaster for Pipedream	£51
Z88 Carrying Case	£9
Z88 Computing Book	£9.95
AA Nicad Rechargeable Battery	£1.50
Battery Charger Compact & Fast	£6
Z88 Serial Printer Cable	£9
Z88 Parallel Printer Cable	£25
● Z88 to BBC Link	£20
● Z88 to PC Link II	£30
● Z88 to Macintosh	£52
● Z88 Mains Adaptor	£9
● Z BASE	£56
● Z TAPE	£42
● Z TERM	£42
● Z88 Modem	£149

By popular demand, we are now supplying refurbished and fully guaranteed BBC Micros with Disc Filing System

(Please telephone for price & availability)

Extended Finance Available

We are able to offer low cost finance to all our customers, including 0% finance on certain items. For further details please refer to page 9, column 3 of our advert.

ULTIMUM – Archimedes A3000 Podule Racking System

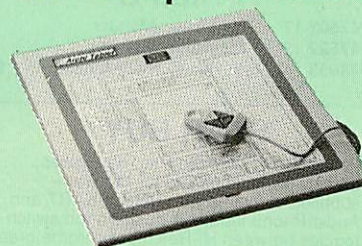
When Acorn originally designed the Archimedes micro, they released to all interested parties the specification of the expansion podule. This has now become the accepted standard for all manufacturers of Archi peripherals. The A300 & A400 both allowed expansion internally up to 2 or 4 podules. However, a newcomer to the affray has caused some upset. A3000 has only a single podule expansion slot, on the outside. There has been deliberation in the industry about a controversial "mini-podule" to be fitted to a special rack. This would entail a re-design of all the available podules onto a smaller board and understandably the manufacturers have rejected the idea completely. As always, Watford have come up with the only real solution to the A3000 expansion problem. The Ultimum Podule Racking System allows up to 3 full size standard A300/A400 series podules to be fitted to the computer. There is also provision for a hard disc drive and podule. Ultimum has its own PSU. There is also an IEC mains output socket for a monitor. It mounts on top at the rear of the computer, and allows direct access to the floppy drive and reset button, rather than obstructing access as on other non standard systems.

Watch this space for launch details.

FREE On-Site Maintenance

This month we are also offering at no extra cost to all our customers, 12 months, On-Site Maintenance on all Archimedes Micros, Philips, Microvitec, and Multiscan COLOUR Monitors. Also on the full range of Panasonic Printers. Should your machine fail, simply telephone the maintenance engineer, who will call in within 12 working hours to repair the unit. (P.S. This offer is over and above our Unbeatable Winter Sale Offers on Archimedes Micros). (Offer applicable only when bought at prices advertised in this advert).

Archi Graphic Tablet



This package allows Archimedes users to take advantage of the low cost graphpad (sometimes called a digitiser tablet, but not to be confused with a video digitiser).

The Archi Graphpad offers performance and accuracy comparable to other graphics tablets priced at well over £400, and has the useful addition of a liftable cover, which can hold tracing material or menu templates securely.

The software, which is in the form of a relocatable module (RM), intercepts the system calls which control the mouse, and so allows virtually all mouse based Archimedes software to be controlled using the tablet without any modification. The only exceptions are programs which use the serial port, as the tablet is physically connected to this port itself.

The software is supplied with a special adaptor lead to connect the tablet to the Archimedes' serial port, and a power lead which plugs onto the Archimedes' main board.

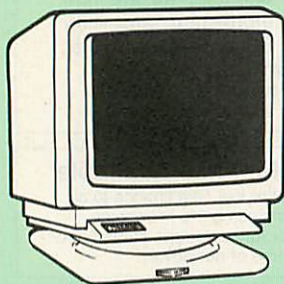
(For further details, please telephone or write in for our FREE catalogue.)

Special Price £249 (carr. £4)

(Price includes Tablet, Leads & Software)
Stylus Optional Extra £29

Continued → → → → → → → → →

MONITORS



12 months
FREE
maintenance
on site

MICROVITEC 14"

- 1431 - Standard resolution as used on the BBC television computer programme £175
- 1451 - Medium resolution, suitable for word processing in mode 0 £219
- 1455 - MS Medium resolution, ideal for Archimedes £220
- 1441 - High res, exceeds the capabilities of the BBC Micro £359
- 1431AP RGB + PAL and AUDIO £199
- 1451AP RGB + PAL and AUDIO £255
- 2030 CS 20" Med Res £380
- 2040 CS 20" Hi Res £675
- Dust Cover for Microvitecs £5.50
- Touchtec 501 Touch Screen £239

14" MULTISCAN COLOUR

- TAXAN 775 Plus - 0.28 Dot pitch Ultra high resolution, anti-static screen £399
- TAXAN 770 LR Low Radiation, auto-scanning Ultra High Res £429
- TAXAN Multiscan 870 16" Monitor £575
- TAXAN Viking 19" Paper White, High Resolution (1152 x 896 with Archi 400 series) £799
- EIZO 8060H - For technical info. read the review in Micro User, Jan. '89 £389
- EIZO 9060SZ Low Radiation, Super High Resolution, Antistatic screen, multiscan monitor for a wide range of applications. 800 dots x 600 lines. Display for high res VGA 0.28 Dot pitch £469

TAXAN 12"

- Super Vision 3 - Type 625 Super Hi-res RGB Colour, Green/Colour Switch £269

PHILIPS

- BM7502 12" Hi-res Green Monitor £70
- BM7522 12" Hi-res Amber Monitor £71
- CM8833 14" Med. Res Colour Monitor £215

STAR BUY

- PHILIPS 14" Medium Res, dark glass, attractively finished Colour Monitor - supplied complete with RGB, SKART and Audio/Phono Inputs. A push-button switch toggles between Hi-Res monochrome green text mode and full colour display. (Please state the type of Connecting Lead you require).

ONLY £189

Dust Cover for Philips Monitors £6
(Securicor carriage on Monitors £7)

SWIVEL BASES

By simply placing your monitor on one of our front adjustable professional swivel bases (see drawing at the top), you can easily adjust the monitor viewing angle.

for 12" Monitors £8 (carr. £2.50)

for 14" Monitors £12 (carr. £2.50)

Anti Glare VDU Screen

These extremely effective, easy to install, 12" & 14" VDU screens eliminate harmful glare, improves contrast on colour monitors. Increases productivity in offices. A must for wordprocessor users.

Price £12

SPARE LEADS

BNC Lead for Zenith or Philips	£3
Skart Monitor Lead	£5
RGB lead for TAXAN Monitors	£3
Archimedes Colour Monitor Lead	£7.50

CONCEPT KEYBOARDS

Standard A3 Keyboard with BBC Software	£143
Standard A4 Keyboard with BBC Software	£117

PLOTTERS

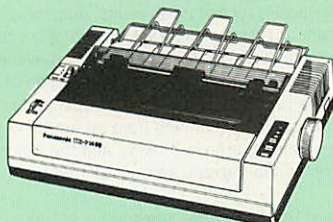
- Plotmate A4S £379
- Plotmate A3M £549

Roland Plotters

(Official Roland Appointed Distributor)

- DPX 2500 POA £595
- DXY 1200 £835
- DXY 1100 £1015
- DXY 1300

Panasonic KX-P1081



12 MONTHS
FREE
MAINTENANCE
ON SITE

SALE OFFER only: £127

(Price includes, FREE a 4ft Printer Lead, and a Dump Out 3, Screen Dump ROM worth £35 with every printer purchased from us)

KX-P1180 Printer Offer

Panasonic KX-P1180 printer, Dump Out 3, Screen Dump ROM & a BBC printer lead.

Offer Price £136

Panasonic Printers

- KX-P1124 24pin 80col. 192/63 CPS £219
- KX-P1540 24pin 136col. 240/80 CPS £425
- KX-P1592 9pin 136col. 216/45 CPS £275
- KX-P1595 9pin 136col. 288/61 CPS £345
- KX-P1624 24pin 132col. 192/63 CPS £349
- KX-P1695 9pin 132col. 330/861 CPS £349
- KX-P4420 NEW 8PPM Laser - Launch Offer £999

● Panasonic KX-P4450i LASER PRINTER

Latest technology at Watford's special offer price

- Spare Toner £29
- Drum Unit £149
- 1MB RAM Upgrade £299
- 2MB RAM Upgrade £585
- A4 Feeder £55
- Developer £115

Panasonic Accessories

Cut Sheet Feeders

KX-P1592/1595 (P32)	£175	KX-P1540 (P35)	£175
KX-P1124 (P36)	£85	KX-P1180 (P37)	£79

BUFFERS

P12 4K buffer Board for 1081	£55
P42 32K buffer Chip for 1592/1595	£16
P43 32K Buffer Chip for 1540/1124/1180	£16

Serial Interfaces

P17 P1081/1592	£32	P19 P1124/1180	£55
----------------	-----	----------------	-----

Original Panasonic Ribbons

Guaranteed to last 3 million characters

P110 for KX-P1081, 1592 & 1595	£8
P115 for KX-P1180	£8
P145 for KX-P1124	£8
P140 for KX-P1540	£10
Colour Ribbons for KX-P1081, 1592 & 1595	
Brown, Blue or Red	£9.95 each

INTEGREX COLOUR JET

- Colour Jet 132 Printer £515
- Paper Roll £6.50
- Screen Dump Software £10
- Colour Cartridge £19.50
- Black Cartridge £11.25
- 100 A4 OHP transparencies £55
- 8K Serial Interface Optional £123

Citizen Printer Swift 24 £249

NEC P2 Plus Pinwriter £279

- Pinwriter Serial Interface (optional) £55
- P2200 Cut Sheet Feeder £59
- Additional Font Cartridge £25

NEC PINWRITER P6/P7 Plus

- NEC P6+ 80 columns £439
- NEC P7+ 136 columns £575
- Colour Option £74
- Serial Interface £73
- Cut Sheet Feeder £125
- NEC Ribbons for P6 £8; P7 £9.50

Hewlett-Packard Printers

- HP Quiet Jet Plus £437
- HP Desk Jet Plus £549
- HP Paint Jet Colour £699
- HP LaserJet Series IIP £855
- HP LaserJet Series II £1265
- HP Laserjet II TONER £85
- HP Scan Jet £1499
- 1Meg Ram Add-on Laser Jet II £349
- 1Meg Ram Add-on Laser Jet IIP £275

12 months
FREE
maintenance
on site

Star Printers

- LC10 Printer £136
- LC10 Colour £195
- LC15 £275
- LC24-10 Printer £215
- LC24-15 £339
- NB24-10 Printer £399
- XB24-10 Colour £399
- XB24 Colour Kit £35
- LC10 Ribbon Colour £5
- XB24-15 Colour £515
- Cut Sheet Feeder £55

EPSON PRINTERS

- EX800 £429
- EX1000 £564
- FX850 £315
- FX1050 £405
- FX1060 £679
- GQ5000 Laser £999
- LQ400 £198
- LQ850 £459
- LQ550 £269
- LQ860 Colour £510
- LQ1050 £575
- LQ1060 £649
- LQ2550+ £925
- LX400 £132
- LX850 £195
- SQ850 £490
- SQ2550 £895

CUT SHEET FEEDERS for

- EX800/FX800/850/LQ800/850 £130
- FX1000/LQ1000/1050 £175
- LQ2550 £390
- LX400/800/850/LQ400/500/550 £69

TRACTOR FEED for

- LQ800 £44; LQ850/FX850 £69; LQ1050/FX1050 £85; LQ2500 £90; LQ2550 £90.

ACCESSORIES

- EX800/1000 Colour Option £55
 - EX800/1000 Colour Ribbon £14
 - LQ2500 Colour Option £65
 - Multifont Card for LQ550/850/1050 £95
- (Securicor Carriage on Printers £7)

EPSON PRINTER INTERFACES

All these interfaces fit inside the printer

RS232	£32	RS232 + 2K Buffer	£52
IEEE 488	£40	RS232 + 8K Buffer	£79

PRINTER LEADS

- BBC Centronics 4' long £5
- BBC Centronics 6' extra long £7
- Compact's Special Centronics Lead £7
- Archimedes Printer Lead 6' £6
- Nimbus Centronics Lead £6
- IBM Parallel Lead 6' £6
- Double Ended 36 way Centronics Lead 4' £7
- Double Ended 36 way Centronics Lead 6' £9
- MSX Centronics Parallel Lead 4' £12
- RS232 Leads (Various) P.O.A.

Listing Paper (Perforated)

● 1,000 Sheets 9.5" x 11" Fanfold Paper	£7
● 2,000 Sheets 9.5" x 11" Fanfold Paper	£11
● 1,000 Sheets 9.5" x 11" NCR 2 Part Fanfold	£19
● 1,000 Sheets 15" x 11" Fanfold Paper	£9
● 1,000 Sheets true A4 Fanfold Paper 70gms	£11
● 2,000 Sheets true A4 Fanfold Paper 70gms	£19
● Teleprinter Roll (Econo paper)	£4

(All our Fanfold paper is Micro perforated leaving a smooth clean edge when the tractor feed strips are detached).

Carriage 1K Sheets £2.50, 2K Sheets £3.00

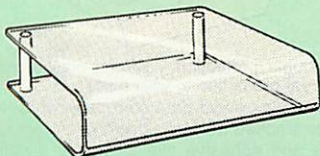
PRINTER LABELS

(On continuous fanfold backing sheet)

1,000 90 x 36mm (Single Row)	£5.00
1,000 90 x 36mm (Twin Row)	£4.90
1,000 90 x 49mm (Twin Row)	£7.50
1,000 102 x 36mm (Twin Row)	£6.25

Carriage on 1,000 Labels £1.00

Perspex Printer Stand



Give your Computer System a touch of Class with our elegant, smoke finished Perspex Printer stand.

80 Column version	£16 (carr £3)
136 Column version	£20 (carr £4)

Professional Printer Stand



This new professional printer stand takes hardly more space than your printer. Due to the positioning of the paper feed and re-fold compartments ie. one above the other, the desk space required for your printer functions is effectively halved. Additional

facilities include: Easy access to paper from both sides, used with both top and bottom feed paper and with its dial controlled paper feed system with adjustable deflector plates it ensures smooth paper flow and automatic refolding.

80 Column version £28 (carr. £3)

132 Column version £30 (carr. £4)

Printer Ribbons & Various Dust Covers

Type	Ribbons	Dust Covers
Brother HR15/20	£3.00	—
BBC Micro	—	£3.50
BBC Master	—	£4.00
Archimedes Micro pair	—	£9.00
Citizen 120D	£3.95	£4.50
RX/FX80/MX80	£3.00	—
DMP2000	£3.75	£4.75
EX/LQ800	£4.50	£4.50
EX/LQ1000	£6.75	£5.00
RX/FX80/85/800/MX80	£3.25	—
RX/FX100/1000	£5.00	—
Kaga/Taxan KP810/815	£4.90	£5.00
LQ500/550/800/850	£4.50	£6.00
LQ1050/LQ2500	£7.00	—
LX80/86/800/850	£3.25	£4.50
M1009/GLP	£3.80	£3.75
NEC P2200	£6.00	£5.00
Panasonic KX1080/81	£3.50	£4.75
Panasonic KX-1124	£8.00	£5.00
SQ2500	£23.00	£5.50
Star LC10/NL10	£4.25	£5.00
Star LC24-10	£5.00	£6.00
Olivetti Ink Jet	—	—
Cartridges (set of 4)	£9	—

Our attractive Dust Covers are manufactured from translucent PCV. The seams are stitched and edges are taped to prevent splitting due to continuous use.

Universal Printer Sharers/Changer

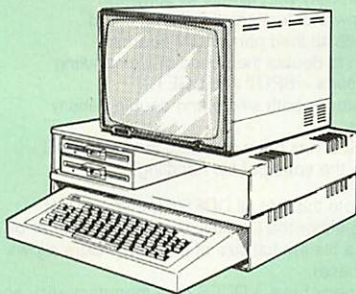
Connect upto 5 Micros to 1 printer or 5 Printers to 1 Micro with our combined, Sharer/Changer. These Units are made to a very high standard. For extreme reliability, they all have Printed Circuit Boards mounted inside the case, (not a Spaghetti Junction of wires). Internal connection is made via high quality ribbon cables.

(Ideal for School environments)

Connects	Serial	Centronics	P&P
2 to 1	£20	£22	£3
3 to 1	£27	£30	£3
5 to 1	£36	£39	£4

(Cables extra at £6 each. Please specify type required when ordering)

PLINTHS FOR BBC MICRO, MASTER & PRINTERS



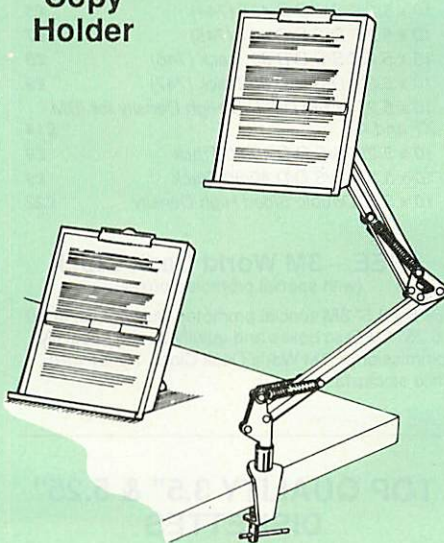
Protect your computer from the heat of your VDU. Our micro plinths have slots for maximum ventilation. The single plinth is suitable for a BBC and VDU, whilst the double height version provides enough room for our stacked disc drive and other peripherals like, Eprom programmer, music unit or simply discs & stationary. The computer slides neatly in the lower section allowing easy access to remove the lid.

The single printer stand is equally sturdy but instead of cooling slots it has elegant cutouts on the sides. This allows easy access to paper from all sides. Colour: BBC Beige.

Single BBC Plinth	420 x 310 x 105mm	£13
Double BBC Plinth	420 x 310 x 210mm	£24
Printer Plinth	420 x 310 x 105mm	£12
Single Master Plinth	490 x 310 x 105mm	£14
Double Master Plinth	490 x 310 x 210mm	£26

(Carr. Single plinth £2; double plinth £3)

Copy Holder



Whether you want to type in your latest program or the draft of a new trilogy, Watford's manuscript holders are superb for holding your paper at the ideal height and angle to allow you to read and type in ease and comfort.

Available in 2 full A4 versions, desk resting and shelf clamping. Paper is held firmly by means of a plastic retaining ruler and a clip grip. (for resting books or magazines, the desk top version is recommended).

Desk Top £7 (carr. £3)

Angle poise £12 (carr. £3)

Handy Printer Switch

A handy two way compact printer switch that enables you to connect 2 Micros to 1 printer, or 2 printers to 1 Micro. Attaches easily to your printer, monitor, etc. A low cost solution for educational establishments. Ideal for those wishing to use a dot matrix and a laser printer. Available in two configurations.

Compact AB Switch Centronics £19

Compact AB Switch RS232 £18

(Cables extra at £6 each)

MEGABUFFER 256



The Smallest 256K Printer Buffer Unit in the world 38mm x 130mm x 134mm.

This new Megabuffer 256 from Watford is a full featured 256K Printer Buffer. The features are:

- Improves efficiency by making more efficient use of computer and printer.
- Compatible with any computer and printer that uses Centronics Parallel connections including all BBCs, IBM PCs, etc.
- Total compatibility with all software.
- Cheaper phone bills when using your Modems.
- Ideal for those doing large graphics screen dumps that are slow to print.
- Multi-Copy facility allows you to print several copies via Megabuffer without going through your computer.
- Data Dump facility is included.
- Built in text unit for both the buffer & your printer.

Only £119 (carr £5)

Payment may be made by credit card, Connect card or cheque, but we also have available a range of finance terms, see the feature in our advert.

THE EPSON RX-FX-KAGA Printer Commands Revealed

So you bought yourself a new printer, because the salesman in the shop showed you how clever it is and impressed you are with all sorts of printouts to show its capabilities – he may even have offered you a special price.

However, now that you have got it home and connected it to your BBC microcomputer, you are wondering how to make it perform these magical tasks. The manual seems to give no clues, and when you type in the example programs, the computer throws the LPRINT statements back in your face.

Now what do you do, when this £400 piece of high technology refuses even to move its head, and you have stayed up until 2 in the morning with copious supplies of coffee, desperately trying to print something out? Once again, Watford Electronics comes to your help with our new book entitled 'THE EPSON RX-FX-KAGA PRINTER COMMANDS REVEALED'.

This book describes in plain, easy to understand English, how to use and make the most of your KP810, PW1080A or any other Epson FX80 compatible printers like Panasonic KX-P1080/1, etc., with the BBC Micro, both from Basic and Wordwise.

It describes in detail how to obtain the maximum in graphics capability from your printer and includes full indexes allowing you to cross index the numerous commands. Every command is explained in detail, with an accompanying BBC Basic program and an example of its use from Wordwise.

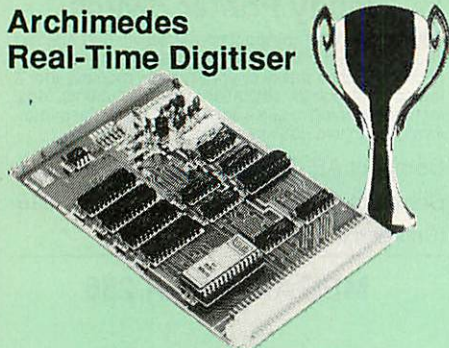
£5.95 (No VAT)



CREDIT CARD 24 HOUR
Ansaphone Hot Lines
(0923) 50234 or 33383

Continued → → → → → → → →

Archimedes Real-Time Digitiser



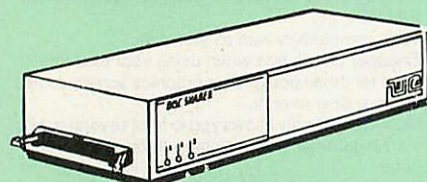
Now supplied with NEW RISC OS Version Software

Watfords' Archimedes Video Digitiser is the most sophisticated digitiser ever designed for a micro. It provides a fast and flexible means of capturing images from a video camera or recorder for display and manipulation on the Archimedes range of Micros. Off-air television signals may also be digitised via a video recorder or TV tuner. Please write for further details.

Price £249

A Set of Colour Filters for colour image grabbing using a video camera **£16**
New Risc-OS Software Upgrade **£39**

DISC DRIVE SHARER



(Ideal for educational establishments)

At last, a low cost alternative to the Econet system. Watford's Intelligent Disc Drive Sharer allows you to connect 3 BBC micros (model B, B+ and Master series) to a single or double disc drive. Running under any DFS or DDFS, this intelligent unit will automatically queue the computers. Each computer has a status light dedicated to it. If it is green you will get immediate access to the disk, and red means that you are next in line. The unit plugs directly into the disc drive socket on each computer and is powered by the mains. (N.B. Not for use with ADFS.)

Launch Price : **£65** Price includes 3 Cables

DISC PLONKER RACK



When using ones micro, there is a tendency to have more than one Disc on the desk. This exposes them to the hazards of fingerprints, scratches, dust, coffee and an untidy desk.

Why not protect your valuable data from all these hazards with the help of our extremely handy and low cost DISC PLONKER RACK. Holds up to eight 5.25" discs.

Protection at Only: **£2**

Acorn & Watford DFSs

- Watford sophisticated DFS ROM **£16.00**
- Watford DFS Kit complete **£69.00**
- We will exchange your existing ROM for Watford's ultimate DFS ROM at only **£12.00**
- DFS Manual (comprehensive) **£6.95**
- Acorn DNFS ROM **£17.00**
- Acorn ADFS ROM only **£25.00**
- Acorn 1772 DFS ROM Kit **£49.00**

(The single Density DFS system is now old technology. Like Acorn, Watford too have decided to replace it with the their more up-to-date 1770 DDFS interface. We have informed most of the software houses of this decision in order that they can ensure compatibility with our highly sophisticated and fully Acorn compatible DDFS).

Watford's MkII 1772

Single/Double Density DFS

Many of our customers have wanted to use our superior DDFS and Acorn ADFS together. Now our Mk II DDFS Board with its 1770 Disc Controller, has been adapted to allow the use of Acorn ADFS as well. It also has all the commands of the Acorn's 1770 DFS, plus the added features.

Added features include:

- Acorn ADFS compatible – Use ADFS on our DDFS board.
- Tube host Code – No longer any need to have the DNFS in your machine to use Co-Processors, even the CoPro and Master 512.
- Auto 40-80 Track sensing – no need to fuss with 40/80 track switches (even works with protected disks).
- An extremely powerful 8271 emulation – ensuring compatibility with almost all software.
- New low profile – small footprint board.
- Fits with all third party ROM boards.
- Option to double the speed of file handling operations – BPUT and BGET.
- Operates in both single and double density modes.
- OSGBPB has been recoded, increasing still further the speed of file handling.

Please note that not all DDFS's are capable of providing either the full 80% storage increase or of allowing a file the full size of the disk – Ours allows both of these!

If you already have a DDFS (any manufacturer), and wish to upgrade to our MkII version, then simply return your existing ROM and DDFS board and we will supply the new DDFS for only **£39.00**.

- SPECIAL PRICE **£44.00**
- DDFS Manual (No VAT) **£6.95**
- We will exchange your existing DFS Kit for our sophisticated DDFS for only **£30.00**

Please note, as the MkII DDFS is a hardware and software upgrade, it is not possible for existing Watford DDFS users to simply exchange the ROM for the new version.

3M – DISKETTES

3M – SCOTCH Diskettes with Lifetime warranty from Watford Electronics your 3M Appointed Distributor

- 10 x 5.25" S/S D/D 40T (744) **£5**
- 10 x 5.25" D/S D/D 40T (745) **£7**
- 10 x 5.25" S/S D/D 80 Track (746) **£8**
- 10 x 5.25" D/S D/D 80 Track (747) **£9**
- 10 x 5.25" 1.6M D/S D/D High Density for IBM XT and AT **£14**
- 10 x 3.25" S/S D/D 40/80 Track **£9**
- 10 x 3.25" D/S D/D 40/80 Track **£9**
- 10 x 3.5" Double Sided High Density **£22**

FREE – 3M World Desk Clock

(with special promoted boxes)

Buy 5 x 3.5" 3M special promoted Disc boxes, or 10 x 5.25" 3M Disc boxes and qualify for the specially commissioned 3M World Desk Clock. (Offer valid while stocks last).

TOP QUALITY 3.5" & 5.25" DISKETTES

To complement our range of Quality Discs and Disc Drives. WE are now supplying SPECIAL OFFER packs of 10 Lifetime guaranteed discs. Each disc has a reinforced hub ring. Supplied complete with selfstick labels and a Plastic Library Disc Box.

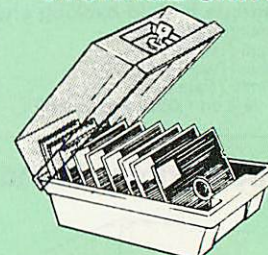
- 10 x M3 3.5" D/S D/D 80 Track **£9**
- 10 x M9 3.5" D/S High Density **£22**
- 10 x M4 5.25" S/S D/D 40 Track **£5**
- 10 x M5 5.25" D/S D/D 40 Track **£7**
- 10 x M7 5.25" D/S D/D 80 Track **£9**
- 10 x M8 5.25" D/S H/D Hi-Density **£13**
- M2 3" Double Sided **£3 each**

FLOPPY HEAD CLEANER KIT

The heads in floppy drives are precision made and very sensitive to dirt. The use of cleaner Kit is a sensible precaution against losing valuable data. It is recommended to clean the drive head once a week. It is very simple to use. Available in 3.5" & 5.25", please specify.

Price **£4**

ANTISTATIC LOCKABLE DISC STORAGE UNITS



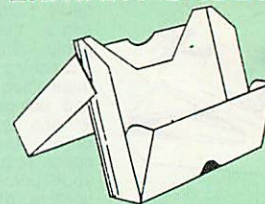
Gives double protection – Strong plastic case that affords real protection to your discs.

Antistatic helps avoid data corruption whilst in storage. The smoked top locks down.

Dividers and adhesive title strips are supplied for efficient filing of discs.

- M35 – holds up to 50 5.25" discs **£4.95**
- M85 – holds up to 95 5.25" discs **£6.95**
- M25* – holds up to 25 3.5" discs **£4.95**
- M50 – holds 50 3.5" discs **£6.50**
- M10 – holds 8 of No. 10 Data Cartridges **£15**
* Not lockable

PLASTIC LIBRARY CASES



Holds up to 10 5.25" Discs. Only **£2.00**

DUST COVERS (For our Disc Drives)

- Single CLS (without PSU) **£3.20**
- Single CS (with PSU) **£3.25**
- Twin CLD (without PSU) **£3.85**
- Twin CD (with PSU) **£3.90**

DISC ALBUMS

Attractively finished in black leather-look vinyl. Stores up to 20 discs. Each disc can be seen through the clear view pocket.

£4

Special BULK OFFER on 5.25" DISCS

(Supplied packed in Anti-Static Lockable Storage Units)
(Lifetime warranty on Discs)

**PRICES
SLASHED**

BULK PACK DISCS in lots of 100

Type	S-S 40T	D-S 40T	D-S 80T
● Without Sleeves	£30	£35	£40
● With Sleeves	£33	£38	£43

Quality Disc Drives from Watford

To help you decide which drive is the most suitable for your needs (and your pocket!), we have produced the table below. This 30 Megabyte hard disc is completely compatible with the Acorn ADFS – that's why we have bundled it with each Winchester drive, along with an Utilities Disc.

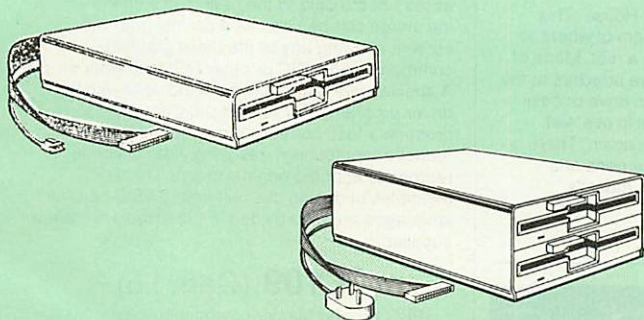
The tinting on some of the boxes is used to indicate which Drives are 40 track (non-tinted) and which are 80 track (tinted). All our 80 track drives are already fitted with a 40-80 select switch.

All our Disc Drives are Double Sided and will operate in both Single and Double Density modes. Extensive experience of the usage of disc drives suggests that the JAPANESE drives currently represent about the best in terms of speed, reliability and overall "elegance" available for the BBC Micro. Various UK "manufacturers" of disc drives for the BBC micro (more accurately, "packagers" label other manufacturers drives with their own name). We buy the high quality NEC and Mitsubishi drives in large quantities directly from the manufacturers, package them and sell them at "dealer" prices direct to the public. If you look around the popular BBC micro press, you will find that the prices we quote for the top quality, new slimline disc drives are, virtually without exception, some of the best around. These prices, coupled with the backup of one of the country's largest distributors of BBC peripherals provides a superb deal. Unless you anticipate using dual drives in a fully expanded BBC system for long periods of time with little ventilation, then we suggest that our range of "CL" disc drives without the PSU (Power Supply Unit) would be quite adequate (extensive tests within our workshops have confirmed this). All drives are supplied complete with a SPECIAL UTILITIES Disc, Cables and Plugs. The Drives with power supply have a mains moulded plug for safety purposes. **Ideal for Schools & Colleges.** We are now able to supply all single disc drives with Power Supply, in either single or dual case. (Dual case has a twin data cable and a power supply capable of driving two disc drives) allows easy expansion to a dual drive unit, at a later date. Prices stated in the pricing boxes below are for single drives in standard single cases. Single drives in a dual case cost an extra £18. (At Watford we anticipate your needs of tomorrow, not just today!)

When using a BBC Micro, most people find themselves short of desk space. The Watford's BBC Micro plinths form an ideal way of recovering some of this precious space) your BBC Disc Drive and Monitor can all occupy the same vertical footprint and still be comfortably situated. With the Watford Double plinth, your Disc Drive is mounted vertically at one side, leaving a very valuable area directly in front of you for such useful items as spare discs, pen, paper, reference manuals, etc. Follow the trend with a Watford plinth. (Turn to the 4th page of our advert for the Plinths).

P.S. All our 5.25" Disc Drives with PSU are compatible with the Compact Micro. All you require is the special Compact Disc Drive Cables designed by us.

Our Disc Drives conform to BS415



"Test Bureau Approved for Use in Education"

Capacity	Drives without P.S.U.		Drives with P.S.U.	
	Single	Twin	Single	Twin
400K (720K)	CLS400S £75	CLD400 £168	CS 400S £85	CD400 £188
800K (1,44M)		CLD 800S £153		CD 800S £163

● TWIN Disc Drive Case, complete with Power Supply & Cables £43
Securicor carriage on Disc Drives £6 to £7

Prefix C = Cased Drive L = Less PSU S = Single D = Double
Suffix S = 40-80 Switchable

e.g. CLS400S = Cased Disc Drive, Less power supply unit, single 5.25" 400K, (720K in double density); Double sided; 40/80 track switchable.

Cable to connect 5.25" Disc Drives to BBC Compact
Single £9 Twin £12

Special Cable to connect both 3.5" and 5.25" Disc
Drives simultaneously to the BBC Compact £13

Special 40/80 Disc Drive/DDFS Mk II Offer

● The popular 40/80 track 400K single Disc Drive, Double Sided, cased with Cables. Plugs directly to your Micro.

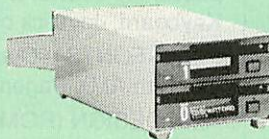


● Watford's extremely popular DDFS Disc Interface (allows 720K storage). Will run in both Single & Double Density modes.

● A comprehensive User Friendly Manual.

A Bargain at Only £119 (£7 carr) (Offer valid while stocks last)

3.5" DISC DRIVE OFFER



These top quality 3.5" Double sided, 80 track, 1 Megabyte (unformatted each Disc Drives), are attractively finished in BBC beige. They are supplied complete with all cables and a Utilities Disc.

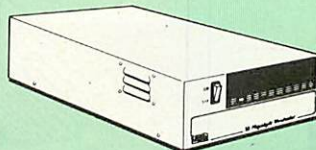
Drives to connect to BBC Micros own PSU

● CLS35 400K Unit £65 ● CLD35 Twin 800K £119

Drives with built-in Power Supply Unit

● CS35 Single 400K £85 ● CD35 Twin 800K £129

(P.S. CS35 Single is supplied in a twin case with a blanking plate to enable easy expansion to a dual drive at a later stage).



WATFORD'S WINCHESTER DRIVES

Undoubtedly the best value for money Winchester Hard disc available anywhere for the BBC Micro.

This 30 Megabyte hard disc is completely compatible with the Acorn ADFS – that's why we have bundled it with each Winchester drive, along with a Utilities Disc.

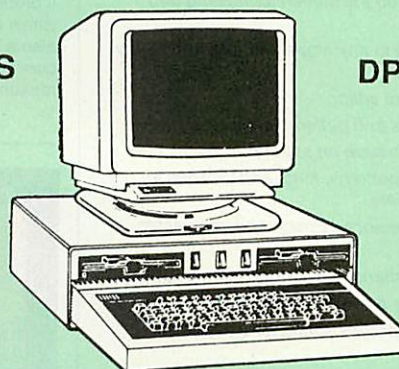
Finished in rugged metal and fetching BBC beige, the Winchester has an internal fan, so quiet you won't even hear it! A switched mode power supply and a neon-lit on/off switch are there along with a light on the hard disc to tell you when it is working – just compare the price with our competitors' 20 or 28 Mbyte discs!

Compatible with the Master, and the BBC B (with 17 X disc interface).

● 30 Megabyte BBC Hard Disc £395 (carr £7)

CDPM 800S

DP35-800S



Twin 800K Double sided 40-80 track switchable disc drives mounted in an attractively finished Beige colour plinth for the BBC Micro. Supplied complete with integral power supply, cables and Utilities disc. The mains switch with neon On/Off light indicator, and the two 40/80 track switches are mounted on the front panel for ease of use.

CDPM 800S for the BBC B & Master £175

A Double disc drive with a difference! Times are changing fast for the floppy disk, and whilst the current standard for the BBC B and Master series is the 5.25" disk, the standard of the future will most certainly be the smaller; faster and more reliable 3.5 inch disks – now a standard feature of both the Master Compact and the Archimedes Series.

To support the present disc drive users, and cope with the future, we have designed our own plinth-mounted disk system – called the DP35 800S. It contains both the 5.25 inch and the 3.5 inch drive formats as well as offer a firm and rigid support for a monitor on top. With the BBC Micro underneath, the plinth makes a surprisingly small footprint on the desk – leaving you more space to work with.

The 5.25" disc drive is 40/80 track switchable. DP35-800S has its own power supply, independent of the BBC Micro.

DP35-800S for BBC/Master £165

(Securicor Carr. £7)

(The above drive units are 2 Megabytes unformatted)

Continued → → → → → → → →

QUEST MOUSE Mk II



- Quest Mouse II & Quest Paint **£58**
- Quest Mouse II, Quest Paint, AMX Stop Press & Pagefont **£89**
- Quest Mouse II only **£29**
- Quest Paint Software only **£34**
- Quest Font Disc (22 Text Fonts) **£15**
- Quest Mouse Mat (Red or Blue or Green please specify) **£3**
- Part Exchange your unreliable AMX Mouse for a Quest Mouse for only **£22** (P.S. Quest Paint is not compatible with BBC Compact)



**Winner of the
BBC Acorn User
1990 Award for
the Best Art/
Graphics software**

ConQuest

Quest combined with ConQuest and Acornsoft GXR ROM make up THE MOST POWERFUL drawing packages available for the BBC range. Quest Paint is able to take advantage of almost any additions to your machine, such as Shadow or Sideways RAM. ConQuest takes this principle even further, by utilising the otherwise normally incompatible Sideways RAM facility by holding pictures in them. Some of the features are:

- Pick filenames off the screen for loading and saving.
- Rotate a cutout to any angle and Distort it to any four sided shape.
- Has Built in Font editor.
- Default brushes and patterns on startup.
- 16 x 16 font available on start up.
- Ability to reset patterns, fonts and brushes to default at any time.
- ROM based enhanced Epson and compatible printer dump.
- ROM based enhanced extended picture routine.
- Ability to create and abort extended pictures.
- Improved disk access speed for extended pictures.
- User definable sideways RAM driver for incompatible sideways RAM systems.
- Ellipses at any angle on Master 128 (or B with GXR ROM).

ConQuest ROM Package **£30**
(Price includes software in ROM and a comprehensive Manual).
(Not Compatible with BBC Compact)

NEW

ARCHI Mk II MOUSE

An extremely reliable replacement mouse for Archimedes Micro **£39**

RB2 Marconi TRACKER BALL

RB2 (AMX/Quest compatible) **£45**
RB2 including Quest Paint **£75**
RB2-A for Archimedes **£52**

THE NEW Mk III AMX MOUSE

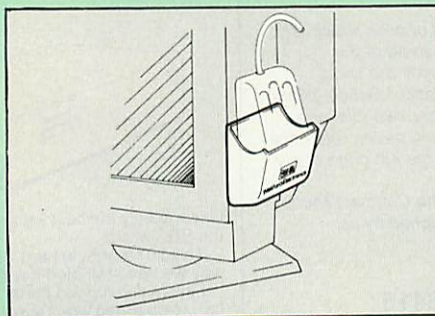
Inc. Super Art package

ONLY: £59 (carr £3)

(Please specify for BBC, Master or Compact)

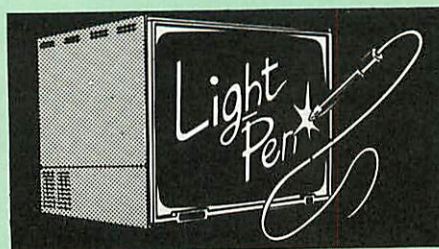
MOUSE MAT	£3
AMX MOUSE ONLY	£29
AMX SUPERART Package	£34
AMX STOP PRESS – A Desktop publishing software. Works with Keyboard, Joystick or a mouse	£32
PAGE-FONTS – Over 20 Fonts for use with AMX Pagemaker	£13
AMX DESIGN (ROM)	£55
AMX XAM Educational	£15
AMX EXTRA EXTRA	£16
AMX MAX A gem of desktop (ROM)	£20

WE MOUSE HOUSE



Treat your mouse to a cosy Mouse House. This handy little gadget solves the problem of where to store your mouse when it is having a rest. Made of sturdy plastic, the WE Mouse House attaches to the side of your computer, monitor, disc drive or desk. It protects it from damage when not in use, yet within easy reach when you need it again. There is also a second compartment for your pens and pencils – and at £4 it doesn't cost a rodent's ransom.

Price £4



Our Mark II Light Pen is the very latest in light pen technology. It is totally insensitive to local lighting conditions and works with many different monitors. The pen only responds to the High Frequency light produced by your monitor/TV. An LED indicates when valid video data is being produced. A conveniently located switch is also fitted. (Price includes FREE software Disc and Operating Manual)

Only £21

FLEET STREET EDITOR

Software pack for BBC Micro	£33
Software pack for the Master	£39
Admin Xtra Disc Utility	£13
Walt Disney Disc Utility	£13
Fonts N Graphics Disc Utility	£13

BEEB VIDEO DIGITISER



**"Test Bureau Approved for
Use in Education"**

Using any source of composite video (colour or monochrome) and the Watford Beeb Video Digitiser, you can convert an image from your camera into a graphics screen on the BBC Micro.

This uses the full graphics capacity of the BBC micro in modes 0, 1 or 2. The video source may be a camera, video recorder or television, and is connected via the video output socket. Images produced can be compressed, stored to disc, printed on an Epson compatible printer, directly used to generate graphics, analysed for scientific and educational use or converted to other formats e.g. Slow Scan TV or receiving a picture from a remote camera using a modem. The output from the digitiser exactly matches the graphics capability in each mode, with up to 8 levels of grey in mode 2. The unit connects into the User Port and automatically scans a complete picture in 1.6 seconds.

Both the black and white levels can be adjusted manually for the optimum picture, or switched to automatic for unattended use. The image produced can be reversed if necessary.

Full controlling software is supplied on a normal sideways ROM and this is easily accessed via additional ★ commands. The package is designed to allow easy input of complex screens and give full access of the data to the user. Once on the screen, the image can be used as a normal graphics screen, allowing any of the usual graphics commands in BASIC or other ROMs to work on it. A special print dump routine is included with the driver programs. This is specially designed to produce a fast, correctly proportioned picture, with reduced "contouring", resulting in an accurate reproduction of the original image. Detailed examples of driving this unit from BASIC or other languages are all provided in the extensive manual supplied.

£109 (Carr. £5)

(BBC B+ and Master compatible, except Master with Econet)

(Price includes) Digitiser Unit, Software in ROM & a Comprehensive Manual)

NEW

QUEST – Tracer ball

An attractively finished, extremely reliable, mouse replacement, input device. Requires very little desk space. Connects directly to your BBC B, BBC Master or Archimedes Micro.



QT-10 BBC/Master Version	£32
QT-20 Archimedes Version	£35



**Winner of the
BBC Acorn User
1990 Award for
the Best DTP/
Word Processor**

The WAPPING EDITOR

The Wapping Editor from Watford Electronics represents a breakthrough in Desktop Publishing for the Beeb. The package includes a 64K ROM containing ALL the software needed to get into print fast; a very sophisticated graphics module, professional quality typesetting software, a word processor, a comprehensive font editor for designing your own typefaces, and a variety of printer dumps. This mouse-driven system is designed for the BBC B, the B+ and Master computers and will take full advantage of any Sideways and Shadow RAM that may be fitted. It will run under DFS, ADFS and Network filing systems and requires as a minimum just a single 40 track drive.

Included with the system is a utility disc containing several high quality fonts, various utilities and a ROM image of a Support ROM. A comprehensive 100 page manual completes the package. The Support ROM contains routines to allow an area to be rotated to any angle or distorted to any four-sided shape. Also included are facilities to draw ellipses at any angle and sectors, segments and arcs (in Master or BBC B with Acorn GXR). Another of the features of the Support ROM is a 'Turbo DFS' which gives DFS access times comparable with those of ADFS.

PAGE LAYOUT SECTION

The Wapping Editor may be used to create pages of any size from an A6 to a full A3 page. If none of the eight default page types suit your purpose, the stand-alone page creation program may be used to create pages to your own requirements. By using proportionally spaced fonts and genuine microspacing it is possible to print over 150 characters across an A4 page. A unique feature of the Wapping Editor is the 'A5 x 2' page size allowing two A5 pages to be printed side by side onto a single A4 sheet.

The graphics module is a mode 0 version of the highly acclaimed Quest Paint package, and incorporates all the same drawing facilities, e.g. pencil, brush, airbrush, polygon, circle, ellipse, fill, cut-and-paste, etc., etc.

Text may be typeset, either justified or unjustified, in any font anywhere on the page. Simply select which font and text document you wish to use, and pull out a rectangle on the page where you want the text to be - it's as simple as that! Multiple columns may be printed just as easily and a special 'expand' feature may be used to expand the microspacing so that the document exactly fits the space defined.

WORD-PROCESSOR

The integral word processor is the ideal tool for producing your text documents, although text can of course be read in from any of the other popular word processors such as View, Wordwise etc.

cont./-

THE FONT EDITOR

The font editor module will allow you to design your own typefaces or to modify the ones provided on the utility disc. This sophisticated editor has numerous functions designed to take the tedium and frustration out of producing good looking, well balanced fonts. Each character may be individually proportionally spaced and characters of any size up to 16 x 16 pixels may be defined.

Upgrading to the Wapping Editor could not be easier since the font editor will convert fonts from other packages, such as Quest Paint or Stop Press (formerly Pagemaker), into Wapping Editor format and a mode conversion utility will convert any screen in modes 1, 2, 4 or 5 into a full grey-scale mode 0 screen. Pictures may also be 'grabbed' from a video source by using the Watford BEEB Video Digitiser, either independently or from within the Wapping Editor package.

Wapping Editor Software Pack £69
Wapping Editor plus Mouse £89

(Wapping Editor only works with Master Compact if a Mertec Expansion box is fitted)

Wapping Art Disc

Over 250K of clip art to cut and paste into your Wapping Editor pages. Pictures include maps, transport, people, media, sport, games etc. Two 'ratio' screens for use with hi-res and rotated A5 pages to ensure images are not distorted when printed out.

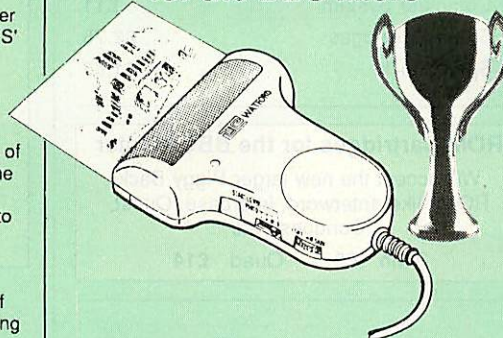
Music writing symbols in the form of pattern and brush for quick production of manuscripts are included together with staves.

There are two prepared hi-res pages laid out for printing labels, both single and double width. Ready made label designs are included but these can be easily replaced with your own designs.

A Mode 0 screen dump routine is also included. To pack such a large amount of data onto the discs the screens have been compressed and routines to compress and expand Mode 0 screens are included on both discs. Using the packing routine you can archive large numbers of screens onto a single disc.

£15

The Beeb HandScan Hand-held Scanner for the BBC Micro



Watford Electronics are pleased to announce the launch of the first hand held scanner for the BBC Micro. HandScan is a compact unit which will allow photographs, diagrams, or any other documents to be digitised quickly and easily, to then be used in a desk top publishing package, art program, or even in your own Basic programs! These useful devices have been available for faster and more expensive micros for some time, but only now is Watford Electronics able to offer the BBC Micro computer.

The HandScan plugs directly into the 1MHz bus on the BBC while a comprehensive set of utilities provided by the sophisticated ROM firmware. The scanner has a resolution of either 100 DPI or 200 DPI when accuracy is essential. Pictures as wide as 4" may be scanned in mode 0 and various types of dithering may be selected to simulate the grey levels of a scanned picture.

All necessary software has been included in the firmware to allow the scanner to read images directly into our Wapping Editor with little more than the click of the mouse. The digitised picture may then be incorporated into your magazine, newsletter, report or any other document.

Beeb HandScan & Firmware £135

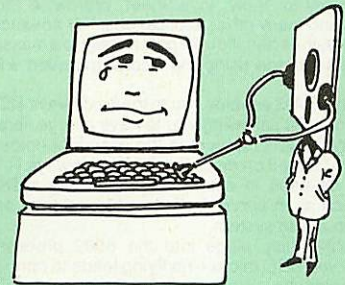
Wapping Font Disc

Sixteen Wapping Editor fonts including smaller versions of Oberon and Daisy and two new sizes of the standard font. Also included are three Mode 0 screens containing giant 'headline' fonts to cut and paste to create extra smooth headlines.

Supplied complete with instructions.

£12

DIAGNOSTICS DISC



The BBC Micro is a very complex machine and thus diagnosing a fault can be very difficult. At Watford Electronics, we realise how difficult it can be when faced with a problem, finding yourself a long way from your nearest dealer, or even just uncertain about your Beeb's health, but not wanting to waste time and money taking it to be looked at.

The solution to these problems is here now, in the form of the Watford's Diagnostics Disc. This excellent utility is specially designed to test out the following areas of your Beeb:

RAMs, ROMs, ULAs, Sound, Keyboard, Disc, RS423, ADC, User Port, Printer Port, Cassette, Joysticks, Speech, Disc Drives, 6502 and Z80 2nd Processors.

This utility is an invaluable aid for all those who take the reliability of their system seriously. A comprehensive manual provides full operating details and a list of possible causes and remedies for any faults that you may find along the way. The package also enables a permanent equipment and service record to be maintained.

Only £20.00

(Only suitable for BBC B with 8271 DFS)

Payment may be made by credit card, Connect card or cheque, but we also have available a range of finance terms see the feature in our advert.

NEW

Beeb DOS 2.2

The BBC and IBM PC's are the most popular micros in the UK. The BBC is firmly established in the education sector and the IBM is the industry standard in the business world. The pools of information and applications held on these computers are immense, yet the means of passing information between them are very limited. Beeb DOS provides a practical method of transferring information between these two micros.

Beeb DOS is a collection of utilities which run on the PC's and enable it to read and write information on BBC discs. You can transfer files between your PC's 360K floppy, high density floppy or hard disc and your BBC discs. In addition Beeb DOS allows you to catalogue, format and compact BBC discs and delete, re-name, lock and unlock BBC files, all on PC's. Each Beeb DOS utility is written in IBM assembler and is run directly from PC or MS-DOS. The Beeb DOS utility can be run from floppy disc, hard disc or RAM drive.

Beeb DOS is supplied on an IBM 5.25", 360K disc complete with a comprehensive operating manual. (Will only work on 360K Disk Drives)

Price: £39

(Please write in for technical literature)

Continued → → → → → → → → → →



ARIES CORNER

B-32 Shadow RAM Card

Like the BBC B+, the B32 provides 20k of shadow screen RAM and 12k of sideways RAM. Unlike the B+, the B32 has simple software commands which allow the user to reconfigure the RAM as 16k of shadow RAM and 16k of sideways RAM, or all 32k as sideways RAM.

With the B32, the programmer gets up to 28k of RAM available for Basic, Logo, Cobal, Forth, Lisp and BCPL programs in any screen mode. The business user gets extra memory for View, ViewSheet, Wordwise Plus, Interword and many other applications. For advanced applications, the scientific user gets access to a massive 47k of data storage using the Acorn approved ★FX call.

Sideways RAM enables you to load sideways ROM images from disc, allowing you to have a large library of sideways ROMs (subject to the copyright holder's permission) stored on disc. The B32's sideways RAM can also be used to extend any operating system buffer (such as the printer buffer) or to load tape programs into a disc system.

The B32 simply plugs into the 6502 processor socket on your BBC micro – no flying leads to connect and no soldering. Provision of the onboard ROM socket means that the Aries-B32 control ROM does not use up one of your existing ROM sockets.

● Recommended by Computer Concepts for use with their Inter series of ROMs.

Price: £59 (carr. £3)

Aries B-12 Sideways ROM Board

The B-12 provides a total of twelve sideways ROM sockets (the four in the original machine are replaced by the twelve on the board), all fully accessible by the MOS sideways ROM system. In addition, there are two sockets for sideways RAM, giving up to 16k of RAM using 6264 static RAM chips.

If you do not have a B32 or B20, a small adaptor module (the Aries-B12C) is available at a nominal cost

Price: Aries B-12 £36
Aries B-12C £5

ARIES B-488 IEEE-488 INTERFACE UNIT

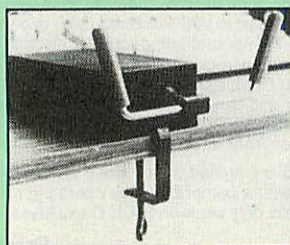
The Aries-B488 is an interface unit to enable the BBC micro to control and monitor IEEE-488 bus systems. The IEEE-488 bus (also known as the 'GPIB' or 'HP IB') is the standard method of interconnecting programmable laboratory instruments and control equipment. Using the B488, up to 15 devices may be connected in a single high-speed data network.

£238 (Carr £3)

VOLTMACE JOYSTICKS

Delta 3B Single Joystick	£10
Delta 3B Twin Joysticks	£15
Delta 3C Joystick for Compact	£10
Delta 14B Single Joystick	£11
Delta 14B/1 Adaptor Module	£12
Transfer Software Disc-Tape	£7
Delta-Cat A mouse eliminator Joystick for the Archimedes	£24

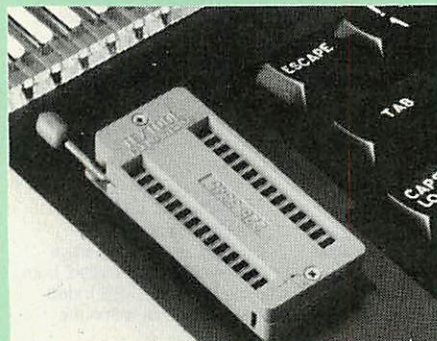
Delta Base B



Analogue aircraft style yoke Joystick to run in the analogue port of the BBC B & Master 128

£25

Sideways ROM ZIF Socket System



Allows you to change your ROMs quickly and efficiently, without opening the lid. The ZERO INSERTION FORCE (ZIF) socket is located into the ROM Cartridge's position.

● Very simple to install. NO SOLDERING required. The ZIF (Zero Insertion Force) eliminates the possibility of damage to your ROM pins when inserting & extracting.

● The low profile of the socket allows unrestricted access to the Keyboard.

● All data and address lines are correctly terminated to ensure correct operation of suitable ROMs with the BBC micro. We also supply a purpose designed see-through storage container with anti-static lining, allowing you to store up to 12 ROMs, protecting them from mechanical and static damage.

● This versatile hardware solves the problem of running out of socket space. Simply lift the ROM from the ZIF & insert a different one (No pulling or pushing of Cartridges. It is a must for professionals and Hobbyists alike.)

● BBC, B+ and Master compatible.

ONLY £18 (carr £3)

Low Profile CARTRIDGE SYSTEM

Complete System consists of: Low profile ROM Cartridge, Socket housing, Cable assembly, 5 labels and a library storage rack for the BBC B.

● Complete System	£11
● Spare Cartridges	£2.75
● Spare Rack	£1.65

ROM Cartridges for the BBC Master

Will accept the new larger Pluggy Back ROMs like: Interword, Interbase, Quest, Conquest, etc

Twin £9; Quad £14

16K Disc Ram Module

(16K Sideways RAM Module)

Complete with such features as read and write protection, these new modules from Watford Electronics are ideal for the hobbyist, software developer and ROM collector.

Key points to note about this new addition to the Watford range of products are:

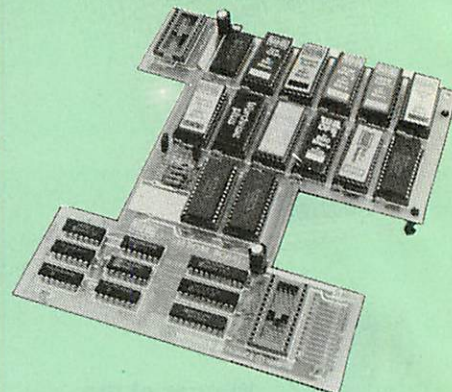
- Write protection (useful in a variety of circumstances)
- Compact construction
- No overheating or overloading problems.
- Free utilities disc supplied
- Can be used as a 16K PRINTER BUFFER.
- Ideal for professional software development.
- Supplied with utilities software disc.

Only: £29 (carr £2)

Optional Battery back-up fitted

£3

SOLDERLESS SIDEWAYS ROM SOCKET BOARD



The key features of this new, no fuss, easy to install quality product from BBC leaders Watford Electronics are as follows:

- Increase your BBC's capacity for ROMs from 4 to 16.
- No soldering required.
- Very low power consumption.
- Minimal space required.
- Compatible with Torch, DDFS, RAM Card, 2nd Processor, etc.
- Socket 14 takes two 6264 RAM chips.
- Read protect to make RAM "Vanish" allows recovery from ROM crashes.
- Battery backup option for RAM chips.
- Supplied ready to fit with comprehensive instructions.

Price: Only £35

Battery Backup fitted £39

Battery Backup only £3

16K Sideways RAM £8.50
(carriage £3)

- Sideways RAM Utilities Disc for Solderless ROM Board. Includes the options to load and save ROM Images and the facility to use Sideways RAM as Printer Buffer.

Only: £8

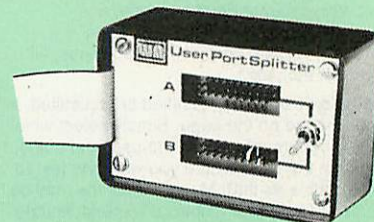
FINANCE AVAILABLE

In these days of expensive borrowing, we are pleased to have negotiated a special low rate finance deal for our customers, with flat interest rate of 12.25% per annum, typical APR 25.5%.

In addition to the above, we are able to offer all Archimedes and BBC Master computers as well as selected hardware on a 0% interest free finance deal.

For further details please telephone: 0923 37774 ext 223/203/201.

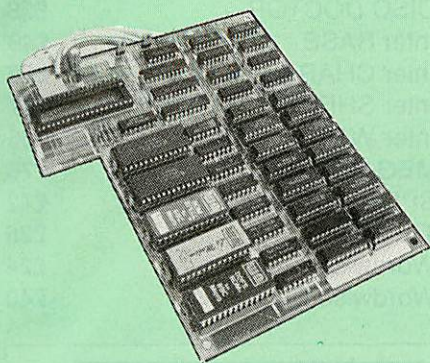
USER PORT SPLITTER UNIT



Gone are the days when you had to plug and unplug devices from the User Port. This extremely useful little device allows two units to be connected to the User Port simultaneously, and select between them simply by toggling a switch. This device is particularly useful for those people using Quest Mouse and the Watford Video Digitiser or any similar combination

Excellent Value at £22 (carr £2)

ROM/RAM CARD



Watford Electronics announced the first ever commercial ROM board for the BBC micro, the Watford Electronics 13 ROM Socket Board 7 years ago. Following the success of this board, we have designed what probably represents the ultimate in expansion boards, the new Watford Electronics ROM/RAM board. This highly versatile and sophisticated board represents the latest in "2nd generation" sideways ROM technology for the BBC micro, designed to satisfy the serious BBC user.

- NO SOLDERING required to fit the board.
- NO User Port corruption (avoids problems with the mouse, modems, Eprom Programmers, etc.)
- Fully buffered for peace of mind.
- Compatible with BBC micros (not BBC+ or Master).
- Total number of ROMs increased from 4 to 8.
- Up to 8 banks of sideways RAM (dynamic).
- Option for 16k of battery backed CMOS RAM (CMOS RAM needs one ROM socket).
- Software Write protect for ALL RAM.
- Read protect for CMOS RAM (ALLEVIATES crashes during ROM development).
- Separate RAM write register (&FF30 to &FF3F).
- Automatic write to currently selected RAM socket for convenience.
- FREE utilities disc packed with software.
- Compatible with our DDFS board, 32k RAM Card, Delta Card, sideways ZIF, etc.
- Large printer buffer.
- UNIQUE fully implemented RAM FILING SYSTEM (similar to the popular Watford DFS).
- ROM to RAM load and save facilities.

The SFS (Silicon Filing System) can utilise up to the full 128k of RAM (with the SFS in any paged RAM) as a SILICON DISC. This behaves as a disc drive, with all the normal Watford DFS features (including OSWORD &7F for ROMSPELL, etc.) to provide an environment that looks like a disc but loads and saves MUCH faster.

The ROM-RAM Board plugs into the 6502 CPU socket. This leaves free all the existing ROM sockets, which can still be used normally.

Any ROM that can be plugged into the BBC micro's own ROM sockets may be used in the ROM-RAM Board.

The ROM-RAM Board is supplied with all ordered options fitted as standard. Upgrade kits (with full instructions) are available for all of the options, for later.

INTRODUCTORY PRICES:

- ROM/RAM card with 32k dynamic RAM£48
- ROM/RAM card with 64k dynamic RAM£65
- ROM/RAM card with a massive 128k dynamic RAM£109
(carriage on ROM-RAM Card £3)

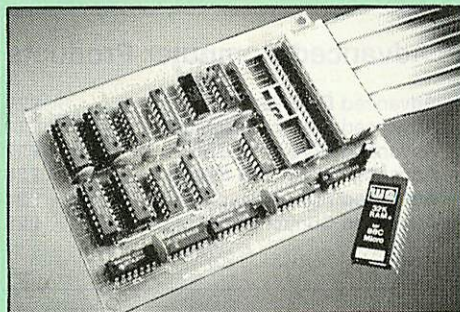
OPTIONAL EXTRAS:

- 16k plug-in Static RAM kit£9
- 16k Dynamic RAM for Upgrade£13
- Battery backup£3
- Read and Write protect switches£2 each
- Complete ROM-RAM board
All options installed£115

P.S.

IS your existing ROM Board overflowing with ROMs? Do you need more Sideways RAM? Is your Board unreliable? Then upgrade to Watford, ROM/RAM Board and pay £5 less.

32K SHADOW RAM- Printer Buffer Expansion Board



A MUST FOR WORD PROCESSING

Watford Electronics now brings you the latest state-of-the-art MEMORY EXPANSION BOARD for your BBC microcomputer. Don't throw away your BBC B for a BBC B Plus or BBC Master. Just plug the ribbon cable into the 6502 processor socket, and fit the compact board inside the computer. Immediately you will gain not 16k or even 20k, but a massive 32k of extra RAM!!!

- IMPROVE your WORD PROCESSING system, whether disc or cassette based. Don't wait for a slow printer - type in text while printing. TWO JOBS DONE SIMULTANEOUSLY and £100+ saved on a printer buffer.

- "VIEW" Wordprocessor users can now type in letters in 80 columns and have up to 28,000 bytes free - 5 times as much as normal.

- In WORDWISE (or WORDWISE-PLUS), preview in 80 columns with the full 24k of text in memory. This product is recommended as an ideal complement by Computer Concepts.

- Combine GOOD GRAPHICS and LONG PROGRAMS. Use the top 20k of the expansion RAM as the screen display memory, leaving all the standard BBC RAM free for programs. Benefit from MODE 0/1/2 graphics and 28k of program space.

- Use the FULL 32k or the bottom 12k of the expansion RAM as a PRINTER buffer for PARALLEL or SERIAL printers, sound channels, RS432 etc. Print large text files while running long graphics programs, and have all your buffer options available as well (*FX15,21,138, 145,ADVAL etc). Please note only a 12k printer buffer can be used with Wordwise or Wordwise-Plus, due to the way they are written.

- Unique facility to turn ROMs off and on again. Unlike all other ROM managers, this feature does not use 'unofficial' memory. Two bytes of normally user-inaccessible memory on the RAM card are used to ensure ROMs are disabled WHERE OTHER ROMS FAIL.

Only £59 (carr £3)

(Price includes a comprehensive manual and the ROM)

Acorn Speech Synthesizer
package complete, for the
BBC B Microcomputer
Special Offer £18

Watford Electronics are:

- Acorn Qualified Dealer & Econet Referral Centre
- ARIES PC Dealer/Distributor
- Cambridge Computer Dealer
- Epson Silver Centre
- EIZO Monitor Dealer
- Microvitec Appointed Dealer
- NEC Appointed Dealer
- Panasonic Premier Dealer
- Roland Plotter Official Dealer
- Star Printer Sub Distributor
- Taxan Monitor Distributor
- 3M Media Premier Distributor

BBC SOFTWARE'S Popular Educational Software

- Maths with a Story 1 (Disc). 4 primary level maths programs£11.25
- Maths with a Story 2 (Disc). 4 further level maths programs£11.25
- Picture Craft (Disc) 6-14 age group. Pack consists of flexible geometrical design & colouring programs.£17.00
- BONDING: Science (Disc) O-Level Chemistry program.£20.00
- ELECTROMAGNETIC SPECTRUM (8 Discs) O-Level program.£20.00
- ELECTRONICS IN ACTION (Disc) O-Level program.£19.95
- NEWTON & THE SPACE SHUTTLE (Disc) O-Level program.£20.00
- ECOLOGY (Disc) O-Level program.£20.00
- POLYMERS (Disc) O-Level program.£20.00
- Classification & Periodic Table O-Level. The suite is supplied with its own database of chemical elements which can be classified according to your own rule.£20.00
- FOOD & POPULATION (Disc) O-Level program.£20.00
- MICROTECHNOLOGY (Cassette) O-Level program.£11.25
- DEUTSCH DIREKT! (Disc & Audio Cassette)£19.95
- Modem Master (Disc)£11.25
- ADVANCED TELETXT SYSTEM£8.65
- PERIOD TABLE SOFTWARE£20.00
- Astronomy - Primary (Disc)£12.00
- Computers at Work - Primary£17.35
- Introducing Geography 11-17 years£17.50
- Electric Fields 6-14 years£11.25
- Black Queen Contract Bridge£13.00
- Espana Viva - 3 Discs£19.95

Educational Software

FUN SCHOOL 2 - Red:

Under 6 yrs - 8 programs on Discs, Shape Snap, Find the Mole, Teddy Count, Write a letter, Colour Train, Pick a Letter, Spell a Word & Teddy Bears Picnic.
£13.00

FUN SCHOOL 2 - Green:

6-8 yrs - Eight programs on Disc, Number Train, Shopping, Maths Maze, Treasure Hunt, Bounce, Packing Caterpillar, 3 Number jump
£13.25

FUN SCHOOL 2 - Blue:

Over 8 yrs - Eight programs on Disc, Build a Bridge, Passage of Guardians, Unicorn, Logic Doors, Souvenirs, Code Boxes, Mystery Machine & Escape.
£13.50

Versatile BEEB SPEECH SYNTHESIZER Unit



The Watford Speech Synthesiser is a very flexible speech synthesis unit based upon the powerful phonemes system. This system stores the building blocks of speech (called phonemes) and allows you to combine them quickly and easily to form virtually any word imaginable.

Supplied with an advanced ROM, you are provided with a 500 word dictionary to get you started. These can easily be added to by following the notes given in the comprehensive manual.

SPECIAL PRICE £32 (carr £3)

Continued → → → → → → → → → →

VIEW 3.0 ROM £45

VIEW PROFESSIONAL £50

VIEWSHEET (Acornsoft) £36

VIEWSTORE £36

VIEWSPELL with 80 track disc £25

VIEWPLOT Disc £20
(Please specify for Master 128 or Compact)

VIEW-INDEX £12

OVERVIEW packs 1 & 2 £65

HI-VIEW £38

Watford's own Sophisticated VIEW PRINTER DRIVERS

Epson FX80 & Kaga KP (Disc) £8

Juki & Brother HR15 (Disc) £8

OFFICE MASTER



CASHBOOK – A complete "Stand Alone" accounting software package for the cash based sole trader/partnership business. It is designed to replace your existing cashbook system and will provide you with a computerised system complete to trial balance.

FINAL ACCOUNTS – Will take data prepared by the Cashbook module and produce a complete set of accounts as follows: Trial Balance with inbuilt rounding routine; Notes to the accounts; VAT Summary; Profit & Loss A/C; Balance Sheet.

MAILIST – A very versatile program. Enables you to keep records of names and addresses and then print, examine, sort and find them, all with special selection techniques.

EASILEDGER – A management aid software tool designed to run alongside an existing accounting system. Essentially a Debit/Credit ledger system which can handle sales, purchase and nominal ledger routines to provide instant management information.

INVOICES & STATEMENTS – Greatly reduces the time and cost of preparing Invoices and Statements by storing essential information like customer names, addresses and account numbers. Has VAT routines and footer messages facility.

STOCK CONTROL – Allows you to enter stock received, stock out, summary of stock items and current holdings together with details of total cost, total stock to minimum level, units in stock ordering, quantity and supplier detail.

All this for only £21 (Disc)

OFFICE MATE



- DATABASE
- BEEBCALC SPREADSHEET
- BEEBPLOT GRAPHICS

DATABASE – Set up a computerised card index system with powerful search facilities.

SPREADSHEET – Offers many calculation and editing features

BEEBPLOT – Provides visual representation from Spreadsheet data.

OFFICE MATE Only £10 (Disc)

MINI OFFICE II

DISC Version for BBC B & B+ £14.00

DISC Version for BBC Master £16.00

DISC Version for the Compact £18.00

(When ordering please specify for which Micro & 40 or 80 track Disc)

Advanced Computer Products

Advanced Disc Toolkit £28

Advanced Disc Investigator £24

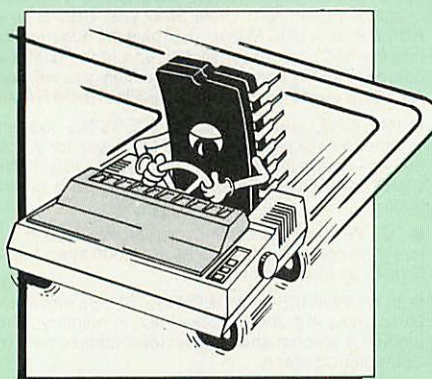
Advanced 1770 DFS BBC £27

Advanced 1770 DFS Master £28

Advanced File Manager £24

Advanced Control Panel £28

VIEW PRINTER DRIVER ROM



View is a powerful word processor, but until now has seriously lacked in terms of printer support. With the launch of our Printer Driver ROM, which includes an extremely powerful and easy to use Printer Driver Generator, View users can find themselves in the realms of advanced word processing at only a small outlay.

The VPD extends View's printer command with a series of mnemonic commands. All standard highlight sequences are also supported. A large range of printers are supported by drivers contained within the ROM (the drivers can be downloaded and customised). Printers supported include: Epson's MX, RX, FX, LX, JX80 range, Hi80, KP810/910, PW1080, JP101, HR15, M1009, GLP, Panasonic KX-P1081/2, JUKI 6100, etc.

Other printers are readily supported by defining a Printer Driver using the built-in Printer Driver Generator. The features mentioned below are available to both the built in Printer Drivers and user defined drivers (assuming the printer supports the features).

NLQ control, Underline, Bold, Proportional Spacing, Microspacing, Italic, Superscript, Subscript, Condensed, Enlarged, Double Strike, Set lines per inch numerically (e.g. LPI 6), Set characters per inch numerically (e.g. CPI 5), Select printer font, Select printer ribbon colour, Translation sequences, Emulation of BBC Character Set, Simple numeric expressions for certain operations, Full printer setup, Send control codes, Print prompt on screen, Redefinable Pad character, Pause for key press, Prompt to change daisywheel, and Execute * command when printing.

Other features include a very powerful on-screen preview, with bold, italic, underline, super/subscript, enlarged highlights, and a special printer driver to allow memory-based text to be previewed by View 1.4. Of course, View 1.4, 2.1 and 3.0 are all supported, as is Shadow RAM and 6502 Second Processors. The BBC B series and Master series of micros are supported. A comprehensive manual is supplied. All in all, a very professional product for the discerning user who wants power at their finger tips. (Write in for a detailed leaflet).

Price: Only £33

COMPUTER CONCEPT'S ROMS

COMMUNICATOR £49

DISC DOCTOR £28

Inter BASE £49

Inter CHART £25

Inter SHEET £37

Inter WORD £36

MEGA-3 ROM £76

SPELL MASTER £42

TERMI £25

Wordwise £24

Wordwise Plus £40

Wordwise plus £40

We are giving away absolutely **FREE**, the superb Word-Aid ROM worth £24, with every **WORDWISE PLUS** package bought from us.

Word-Aid

The most comprehensive utilities ROM for Wordwise-Plus

Extend the power of your Wordwise Plus word processor with this most advanced ROM from Watford. By utilising the powerful Wordwise Plus programming language, WordAid provides a whole host of extra features, all accessed via a special new menu option. This ROM has been personally approved by Mr Charles Moir, the author of **WORDWISE PLUS**.

- Alphabetical sorting of names and addresses.
- Text transfer options.
- Chapter marker.
- Epson printer codes function key option.
- Search and display in preview mode.
- Embedded command removal.
- Print Multiple copies of a document.
- Multiple file options for print and preview.
- Address finder.
- Label printer.
- Mail-merger.
- Number/delete/renumber.
- Clear test-segment area.
- BBC B, B+ and Master compatible.

Only £24

(N.B. Word Aid requires a Disc interface in your Micro)

BOOK

The Complete Mouse User Guide to BBC Micro

This manual has been written to reveal the secrets of the mouse. It explains all the principles required by the hardware and associated software, and also example listings for inclusion into custom programs. The manual first details the basic principles of the mouse and a simple program which uses these principles. This information should be adequate for most applications. However, it is possible to improve the performance of the mouse by expanding on the principles already used in the software. This is again fully explained and an example program given.

It is possible to gain a full understanding of the mouse from this manual. For those not interested in exactly how the mouse functions, complete example programs are also included. These may be typed directly into the micro, without the need for any understanding of the hardware or software involved, enabling the mouse to be used for custom applications.

Price £5.95 (No VAT)

Example programs on Disc £4.95

BOOKS (No VAT on Books)

15 Hr Wordprocessing BBC/View	£5.95
15 Hr Wordprocessing BBC/WW & WW+	£5.95
30 Hour BASIC (BBC Micro)	£12.95
Advanced User Guide for BBC	£10.95
Amiga Machine Lang. Guide	£19.95
Archimedes 1st Step - Beginners Guide	£9.95
Archimedes Assembly Language	£14.95
Archimedes BBC Basic Guide	£20
Archimedes Operating System	£14.95
Archimedes Risc-Os Programmers	
Reference Manual	£79.00
Arm Assembly Lang. Prog. Manual	£15
Assembly Language Prog. for the BBC	£10.95
Assembly Language Quick Ref.	£21.95
BASIC 2 - User Guide	£2
Basic V - A Dabhand Guide	£9.95
BBC Basic Guide (Archimedes)	£19.95
BBC Computer Handbook -	
The Complete	£14.95
BBC - Mastering Assembly Code	£8.95
BBC Micro & the small Business	£5.75
BBC Micro - Within the	£13.95
BCPL User Guide	£14
C Big Red Book of	£7.50
C - A Dabhand Guide to	£14.95
C Programming Lang. 2nd Edition	£24.95
COMAL - Introduction to	£9.50
Deutsch Direkt! (Book only)	£5.95
DISC FILING SYSTEM (DFS)	
Operating Manual for BBC	£6.95
File Handling on BBC Micro	£8.50
FORTH on the BBC Micro	£9.95
Hackers Handbook - New	£9.95
Introduction to COMAL	£9.50
Inside Information, Computers & Coms.	£9.95
ISO-PASCAL Reference Manual	£9.95
Mysteries of DISC DRIVES and DFS	
REVEALED	£5.95
Mastering Assembly Code	£8.95
Mastering Interpreters &	
Compilers	£14.95
Mastering Music	£6.95
Mastering the Disc Drive	£7.95
Master 512 Guide - Dabs Press	£9.95
Master Operating System	£12.95
Master Reference Manual Part 1	£14
Master Reference Manual Part 2	£14
Master Reference Manual - Advanced	£17
Mathematical Programs in BBC BASIC	£9.95
MINI OFFICE II - A Dabhand Guide	£9.95
PASCAL on the BBC Micro	£9.95
PASCAL Programming	£9.95
Practical Disc File Techniques	£5.95
The Epson FX-KAGA PRINTER	
Commands REVEALED	£5.95
The Software Business	£5.50
Understanding Interword -	
A Beginners Guide	£6.50
View 3.0 User Guide	£10
View Guide (View 2.1)	£5.00
Viewsheets & Viewstore Dabhand Guide	£12.95
VIEW Dabhand Guide	£12.95
Viewsheets User Guide	£10
Viewstore User Guide	£10
Wordwise + A User Guide	£10.95
Z88 - A Dabhand Guide	£14.95
Z88 Computing	£9.95
Z88 Magic	£14.95
Z88 Using Your	£9.95

Carriage on Books vary between £1 to £3.50, depending on their weight.

BOOKS for IBM PC & Compatibles

1-2-3 For Business 2nd Edition	£20.95
1-2-3 Command Language	£19.95
1-2-3 Mastering Release 3	£22.95
1-2-3 Mastering - 2nd Ed.	£20.95
1-2-3 Special Edition (QUE) - Using	£22.95
1-2-3 Using - Rel. 3	£22.95
8086/8088 Assembly Language Prog.	£13.50
8086/8088 Programming the	£17.95
Ability - Using	£12.95
Accountancy software in Business - Using	£12.95
Agenda - Using	£21.95
Aldus PageMaker - Using	£21.45
Amstrad Basic 2 Manuals	£9.95
Amstrad Technical Manual for 1640	£19.95
Amstrad PC Programmers Ref Guide	£7.50
Amstrad PC1512-1640 Step by Step -	
Using	£9.95
Amstrad PC 1512 PC User Guide - 2nd Ed	£9.95
Autocad - Mastering Through Rel. 10	£28.95
Autocad - Using Release 10	£26.95
Business companion on the 1640	£12.95
C Programming Library - The	£24.95
dBase III - Mastering	£21.95
dBase III Plus - Complete Reference	£19.95
dBase III Plus - Mastering	£21.95
dBase III Plus Handbook 2nd Edition	£20.95
dBase III Plus - tips, tricks and traps	
(QUE)	£20.45
dBase III Plus - Quick Ref. Guide	£4.95
dBase III Plus - Quick Prog. Guide	£8.95
dBase Instant Reference (III & III+)	£10.95
dBase IV - Handbook	£21.95
dBase IV - Understanding	£22.95
dBase IV - Using	£20.95
DBASE IV - Complete Ref	£27.95
Desk Top Publishing by Design	£18.95
DOS & BIOS Function - Quick Ref Guide	£6.95
DOS Instant Reference (up to 3.3)	£10.95
DOS, Mastering for Versions up to 3.3	£22.95
DOS Power Tools (includes a disk)	£39.95
DOS Plus Manual/Amstrad PC	£9.95
DOS - Programmers Ref. Manual 2nd Ed	£22.95
Excel IBM Version - Using the	£22.95
FAX - Managing with	£12.95
Framework III - Mastering	£22.95
Good Software Guide - for IBM PCs	£19.95
Hard Disc Instant Reference	£10.95
Hard Disc Manage IBM PC XT AT	£19.95
Hard Disc - Managing your 2nd Ed.	£20.95
Hard Disc management - Quick	
Reference Guide to	£4.95
IBM PS/2 Handbook	£19.95
Laserjet Handbook - The	£19.10
Local Area Networks 2nd Generation	£19.95
Lotus 1-2-3 Desktop Companion Soft/B	£24.95
Lotus 1-2-3 - Illustrated	£18.45
Microsoft 'C' Systems Prog. In	£23.95
Microsoft GW BASIC	£12.95
Microsoft Word 5 - Using	£20.45
MS-DOS - ABC's of 2nd Ed.	£17.95
MS-DOS Advanced Programming 2nd Ed.	£22.95
MS-DOS Bible 3rd Edition	£19.95
MS-DOS Handbook 3rd Edition	£18.95
MS-DOS Masters - Tricks of	£22.50
MS-DOS Quick Prog Ref Guide	£8.95
MS-DOS Commands - Quick Reference	
Guide	£4.95
MS-DOS - Running 4th edition	£19.95
MS-DOS - Supercharging 2nd Edition	£17.95
MS-DOS Users Guide 3rd Edition	£27.95
MS-DOS - Using	£19.95
Netware User Guide	£21.45
Networking Personal Computers 3rd Ed.	£20.95
Norton Programming Guide to IBM	£-
Norton Utilities - Inside the	£19.10
Norton Utilities Ver 4.0	£15.40
Novell Network - The ABC of	£21.95
Operating the IBM PC Network	£18.45
PageMaker IBM PC - Mastering	£21.95
PageMaker on IBM PC - Using	£22.95
PageMaker - Using Aldus	£19.95
Paradox - Mastering	£22.95
PC-DOS Using 3rd Ed	£21.95
Programming Guide to EGA & VGA Cards	£23.95
Prog. Guide to IBM - P. Norton's	£19.95
Quattro - Mastering	£21.95

Smart - Using	£21.45
Smart, tips, tricks and traps (QUE)	£22.45
SuperCalc 4 - Mastering	£19.95
Supercalc 4 - Using	£23.75
Supercalc 5 - Using	£20.95
Supercalc Professional	£17.95
Symphony 4th Edition - Mastering	£24.95
Turbo C Bible	£21.95
Turbo Pascal 5 - Using	£22.95
Turbo Pascal 5.5	£24.95
Turbo Pascal - Advance Techniques in	£20.45
Turbo Pascal - Complete Reference Ver 5	£24.95
Turbo Pascal Complete Ver. 4.0	£21.45
Turbo Pascal Disc Tutor	£36.25
Turbo Pascal Program Library	£22.95
UNIX - The Complete Reference	£26.95
Upgrading & Repairing PC's	£25.95
Ventura Mastering - 2nd Ed.	£22.95
Ventura Publisher - Using	£22.95
Ventura Publishing - Instant incl. DISC	£34.75
Wordperfect 5 - Desk Top Companion	£22.95
Wordperfect Desktop Companion	£22.95
Wordperfect - Illustrated	£18.45
Wordperfect Made Easy	£15.95
Wordperfect - Quick Reference V5	£7.95
Wordperfect 3rd Ed - Using	£20.45
WordStar 4.0 - Mastering	£20.45
WordStar Release 5.0 - Using	£19.95
WordStar - Quick program Ref. Guide	£8.95
Xerox Ventura Publishing - Inside	£27.95

THE COMPLETE BBC COMPUTER USER HANDBOOK

"Why has no-one written a book like this before? It's long overdue".

If you own a BBC-B, BBC B+, Electron, Master 128, Master Compact or Archimedes then this book is for you. It shows you how to get the most from your computer, and how to make the computer work for you. Although some sections are machine specific, most of the information, programs, hints and good solid experience are for the whole range of BBC machines. The general style and level means that both beginner and expert will feel satisfied with the quality and quantity of the material.

GENERAL - Uses and abuses of computers.

HARDWARE - How to design your own work station. Hardware additions (disc drives, ROMs, printers, 2nd processors, etc). DIY alterations.

HARDWARE RUNNING BBC-BASIC - All BBC machines are described with their differences. Compatibility between the various BBC machines. Networks. The Archimedes and its advantages.

GETTING ORGANISED - So that you keep track of your programs and control of your software. Setting up for easier programming sessions.

NEAT PROGRAMMING - Good style. Writing structured programs. Getting the best from BBC-BASIC, Graphics and screen displays. Speeding up programs. Saving space.

GENERAL PROGRAMMING TIPS AND HINTS - with a multitude of examples (eg input vetting, dealing with dates, blanking out function key messages, error trapping, disabling ESCAPE and BREAK, use of EOR with colour, etc).

DEBUGGING - Specific errors and how to handle them. How to test programs fully.

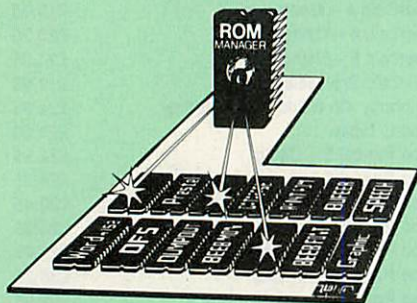
STANDARD PROGRAMS - Assessing word-processors, spread-sheets, databases, graphics packages, communications etc. How to customise them to your own requirements.

COMPUTERS AT HOME AND IN THE OFFICE - Introducing the computer to the office. Program protection. Computers and the law. Communications. Selling your own programs. 28 FULL CHAPTERS, elegantly written and extensively indexed. To dip into, consult, or read from cover to cover, again ... and again ... and again ...

Only: **£14.95** (Book No VAT)

Continued → → → → → → → → →

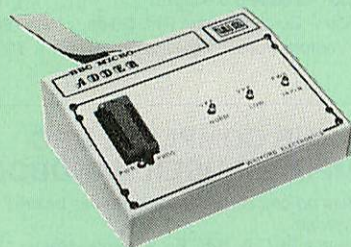
ROM MANAGER



Take control of your Sideways ROMs with ROM Manager. This powerful utility ROM gives you power over your sideways ROMs. Disable whole ROMs, send commands directly to named ROMs and many other powerful facilities.
"Provides comprehensive management of all your installed ROMs". (BEEBUG November '84.)

ONLY £20

ADDER



The only low cost EPROM Programmer for the BBC Micro that will program both the standard 21V and the new 12V5, 27128 EPROMs. The Adder unit connects to the User Port and draws its power from there too. The EPROM is mounted in a top quality ZIF socket. There are no switches or controls as Adder is entirely software controlled. The Adder software provides sophisticated facilities for programming EPROMs from a RAM image produced by loading disc files. The software is menu driven and designed for ease of use.

Features:

- Two ultra fast programming algorithms or standard slow algorithm.
- Supports standard 21V programming and newer 12.5 volt EPROMs. (Software switched).
- The RAM image to be programmed can be built up in many ways. Sections of image can be loaded separately. Part programming. Read EPROM. Edit data in memory.
- Automatic processing to handle a list of files to program into the EPROM.
- Automatic disc buffering to allow programming of 32K 27256 devices from a 32K file without extra effort.
- Verification gives detailed error list and checksums are maintained. There is also a blank check facility.
- Works with all standard filing systems. Generates header code for RFS ROMs to allow Basic programs etc. to be stored in EPROM. More than one file per ROM permitted.
- Programs the following EPROMs: 2516, 2716, 2532, 2732, 2764, 27128, & 27256.

£65 (£5 Carr)

TEX EPROM ERASERS

EPROMs need careful treatment if they are to survive their expected lifetime. Over erasure of EPROMs very rapidly turns them into ROMs! The TEX erasers operate following the manufacturers specifications to give the maximum possible working life by not erasing too fast. We use these erasers for all our own erasing work.

- **ERASER EB** - Standard version erases up to 16 chips. **£28 (carr £3)**
- **ERASER GT** - Deluxe version erases up to 18 chips. Has automatic safety cut-off to switch off the UV lamp when opened. **£30 (carr £3)**
- Spare UV tubes. **£12**

Servisol Foam Cleaner

This 415ML, king size multi-purpose foam cleaner spray is ideal for cleaning the Keyboard, Monitor, Disc Drive and your computer furniture surfaces. Simply spray on the surface to clean and wipe off with a clean cloth.

£2.50

Antistatic Aerosol Spray

Ideal for cleaning and preventing static build-up on TV/ Monitor Screens.

£2.50

Aerosol Dust Spray

This simple to use aerosol spray is ideal for removing Dust and Dirt deposits from the Keyboards and similar inaccessible places.

£3

SPARES for BBC Micro

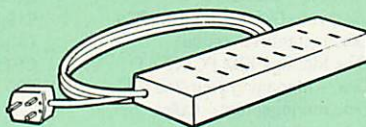
BBC Keyboard	£46	Speaker	£3
Master Keyboard	£62	Keypad	£1.50
UHF Modulator	£4	16MHz Crystal	£2
Speaker Grill	£1	17.734 MHz Xtal	£2
BBC Power Supply	£59	32.768MHz Xtal	£1
BBC B Refurbished		Master PSU	£59
Casing	£25	Master Casing	£39
Replacement Flexible 17 way Keyboard Connector			£4

Surge Protector Plug

Fitted in place of your normal mains plug, this device protects your equipment (and data from corruption), against mains high voltage transient spikes/surges caused by lightning or thermostats switching.

Protection for only **£8.50**

4 Way Mains Distribution Socket



4 way top quality mains trailing sockets. Supplied wired up with mains plug ready for use. Can be screwed to floor or wall if required. Very useful for tidying up all the mains leads from your peripherals.

£9.50 (carr £1.50)

Aries Spike Cleaner Unit

A 4 way mains distribution unit as above with a built-in Surge Arrester, providing protection for your complete Computer/Hi-Fi System

£13.50 (carr, £1.50)

ROM Extraction Tool

This extremely useful tool allows you trouble free chip insertion and removal from your computer by distributing the removal force over the whole body of any 24 or 28 pin chip.

Metal Chip Extractor

£2

£3

28pin DIL HEADER PLUG

SOLDER type **£1.50** IDC CRIMP type **£1.95**

8 WAY DIP SWITCH

Increase the speed of your Disc Drives by soldering this switch to your BBC B or B+ keyboard

Only £1.00

28 pin ZIF SOCKET (Textool) **£6.95**

CONNECTING LEADS

(All ready made and tested)

CASSETTE LEADS 7 pin DIN Plug	
to 3 pin DIN Plug + 1 Jack Plug	£2.50
to 7 pin DIN Plug	£3.00
to 3 Jack Plugs	£2.50
6 pin DIN to 6 pin DIN Plug (RGB)	£3.00

DISC DRIVE POWER LEADS

Supply from BBC power supply to standard Disc Drive Connection: Single **£3.00**; Dual **£3.75**

DISC DRIVE INTERFACE LEADS

BBC to Disc Drives Ribbon Cable
 Single **£4** Twin **£6**

Miscellaneous Connectors

	Plugs	Sockets
RGB (6 PIN DIN)	50p	75p
RS423 (5 pin Domino)	70p	80p
Cassette (7 pin DIN)	40p	95p
ECONET (5 pin DIN)	35p	50p
Paddles (15 pin 'D')	150p	250p
Disc Drive Plug 4 way	100p	-
6 way Power Connector	120p	150p

Watford DATA DUCK

Convert two single Disc Drives into one Dual Drive with this simple external unit (Suitable for Disc Drives with PSU. For Disc Drives without PSU, you will also require Watford Power Duck, see below).

£14

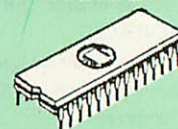
Watford POWER DUCK

£8

CHIP SHOP

1 Meg DIL D-RAM	£8.75
1 Meg ZIP D-RAM	£9.95
DS3691	£4.50
DS88LS120	£5.25
LM324	£0.45
SN76489	£5.50
SAAS050	£8.75
UPD7002	£6.00
2764-250nS	£2.80
27128A-250nS (12V5)	£3.00
27128-250nS (21V)	£4.50
27256-2	£3.50
27512-2	£4.95
27C101G (1 Meg)	£10.00
4013	60p
4020	£0.90
4164-15	£2.50
4464-12	£8.50
4464-15	£8.00
4816 RAM	£2.00
41256-15	£4.50
41256-12	£5.00
6264LP-8K	£4.25
6502A CPU	£5.00
65C02 3M	£9.75
65C12	£9.00
6512A	£10.00
6522	£3.40
6522A	£4.50
62256ALS-15	£10.00
62256P-12	£8.50
6818	£4.00
6845SP	£6.00
68B50	£2.95
68B54	£7.50
7438	40p
74LS00	25p
74LS04	25p
74LS10	25p
74LS123	80p
74LS163	70p
74LS244	80p
74LS245	£1.00
74ALS245	£2.75
74LS373	£1.00
74LS393	£1.00
75453	70p
75159	£3.00
9637	£2.00
ICL7673PA	£2.00

ASSORTED ROMS



ACORN ADFS	£25
ACORN BASIC 2 plus	
User Guide	£22
Acorn BCPL	£42
ACORN DNFS	£17
Acorn FORTH	£32
Acorn Graphics	£25
Acorn OS 1.2	£36
Acornsoft C Disc	£19
Acorn LISP	£25
Acorn OS B+	£14
Basic Editor	£24
BBC PCB Designer	£49
Beebmon	£22
Buffer & Backup	£20
Communicator	£49
Dump Out 3	£25
EPSON NLQ ROM	£25
Graphics Extension Rom	
GXR-B	£21
GXR-B+	£22
ICON Master	£28
Logotron LOGO	£43
MASTER OS ROM	£38
Master ULA (47)	£15
Master ULA (60)	£10
Micro Prolog	£25
Microtext Disc	£46
Microtext Rom	£199
NLQ DESIGNER	£25
Numerator - Archi	£69
Numerator - BBC	£39
Pendown ROM	£32
ROMIT	£29
SERIAL ULA	£13
TED	£35
Termulator B, B+	£28
Termulator Master	£32
Video ULA	£14
ULTRACALC II	£26
1Mb OS ROM	£39

Spring Hands-On Open Day

Sponsored by: The Micro User and Acorn Computers

EDUCATION

Of particular interest to Educational user will be a separate area reserved for discussing the needs and requirements of Schools, Colleges, LEAs' and Teachers alike. If your Educational Establishment is interested, come and talk to us about our SPECIAL Prices, Service and Support.

To be held at:
JESSA HOUSE
On Sunday
29th April 1990
10.00am to 4.00pm

SALES ADVICE

Watford Electronics Technical and Sales personnel will be on-hand to discuss all your technical queries and computer requirements. Come and see live demos of popular BBC/Archimedes Software and Hardware.

Also appearing:

ACORN — technical staff to answer your questions and advise on the whole Acorn range of computers.

THE MICRO USER — Contributors and editorial team will be at hand to answer all your questions.

MIKE COOK and GORDON TAYLOR — The BBC B/Master and Archimedes Gurus will be available to discuss your technical queries.

COLTON SOFTWARE — to present the world beating *Pipedream 3* package.

COMPUTER CONCEPTS — to demonstrate the sophisticated *Impression* DTP package.

HYBRID TECHNOLOGY — To demonstrate their famous *Music 5000 Synthesizer*.

MINERVA SOFTWARE — to show the power of the *System Delta Plus* and the *Atelier Art* packages.

CLARES — to demonstrate *Render Bender* and the popular *Inter Dictor* flight simulator.

SILICON VISION — to exhibit their *3D Solid modeller* and advance *CAD* packages.

PANASONIC — to demonstrate their full range of dot matrix and laser printers.

**** FREE REFRESHMENTS WILL BE SERVED ****

INSTANT CREDIT — Mercantile Credit will be at hand to arrange both 0% and Extended Credit on the day.

**ON PRESENTATION
OF THIS VOUCHER
ON THE OPEN DAY,**



**WE SHALL ALLOW
£10 OFF ANY PURCHASE
OVER £200 (ONE PER PERSON)**

Prices subject to change without notice and available on request. ALL OFFERS subject to availability.

Mail Order and RETAIL SHOP. Trade and Export inquiries welcome. Government and Educational Establishments' OFFICIAL ORDERS Accepted.

Shop Hours: 9.00am to 6.00pm. Monday to Saturday. Thursdays 9am to 8pm. (Free Customer's Car Park)

VAT: UK customers please add 15% VAT to cost incl. Carriage. CARRIAGE: Unless stated otherwise, minimum £1.50 on all orders. £3 on Larger items. On bulkier items, £7 Securicor charge applies (UK mainland only) Overseas orders, carriage is charged at cost

Specifications of all products are given in good faith but is subject to change without notice. Some items vary in their availability. Please ring for latest delivery situation.

Watford Electronics

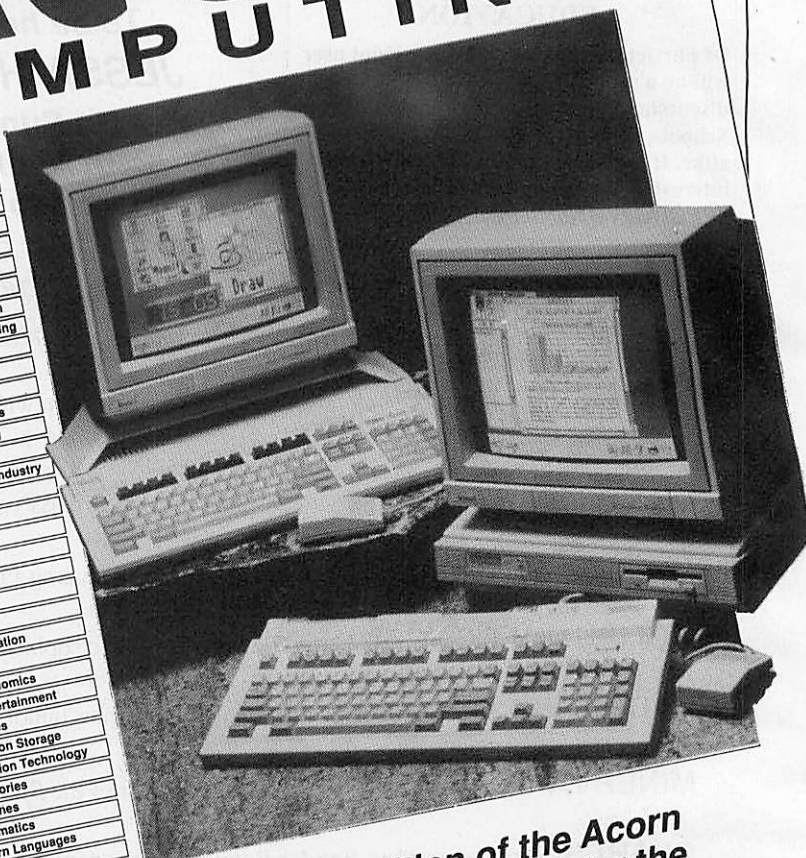
**JESSA HOUSE, 250 Lower High Street,
WATFORD WD1 2AN, ENGLAND**
Telephone: (0923) 37774; Telex: 8956095;
FAX: 0923 33642

£2.50
SPRING 1990

A Database Publication

Acorn COMPUTING

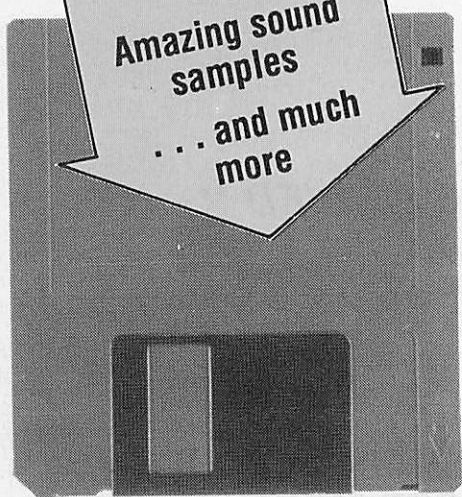
Accounting
Art
Books
Business
Business Studies
CDT, PE, HE
Communications
Complete Systems
Computer Aided Design
Computer Based Training
Computing
Control
Databases
Demonstration Discs
Desktop Publishing
Education
Engineering and Industry
English, Literacy
Equipment
Finance
Games
Graphics
Hardware
Healthcare
Health Education
Hobbies
Home Economics
Home Entertainment
Humanities
Information Storage
Information Technology
Laboratories
Magazines
Mathematics
Modern Languages
Music
Networking
Peripherals
Physical Education
Precision Drawing
Programming
Sciences
Simulations
Sound
Spelling Checkers
Spreadsheets
Statistics
Utilities
Video
Word Processing



Spring edition of the Acorn guide to software for the whole Archimedes range and BBC A3000. Includes all the latest hardware expansions and peripherals

What the disc contains:

- !FindFile disc utility
- Arcroids arcade game
- Superb graphic demos
- !LoadBasic utility
- Amazing sound samples
- ... and much more



The official and definitive guide to Archimedes/A3000 software

Acorn
COMPUTING
ONLY £2.50

3.5" utility disc
and magazine
ONLY £6.95

PLUS Features on basic Desk Top Publishing in schools
Hints and tips, Upgrading to the Archimedes series

PLEASE USE THE ORDER FORM ON PAGE 119

Random strokes

If you're writing a machine code game – educational or arcade – for either the BBC Micro or Archimedes one of the most useful routines is one to produce random numbers.

One way to get them is to peek the hardware clock location, but this isn't guaranteed to work on all machines and because it changes sequentially, accessing it too rapidly produces a predictable sequence.

What is needed is a routine for producing a sequence of unpredictable numbers the way Basic does. In fact, even these are not really random since each is derived from the previous one – but you'd be hard pressed to work out what comes next.

Listing I is the solution for the 8 bit BBC Micro, it's a very short routine and as the test routine shows, provides a very evenly distributed set of results. Simply type it in, check it against the checksums to ensure you've made no typing errors and save before running it.

You can extract the necessary code from the procedures *init* and *assemble*. The test routine shows how to call it from Basic but you might as well use the built-in RND command.

Its obvious use is from machine code, where you simply jump to the entry point. The A register is corrupted, Y is set to zero on exit and you can pull the four byte random number from *seed+0* to *seed+3*. If you only want two or one byte random numbers use the first or first and second bytes of the result.

The 32 bit Archimedes series and BBC A3000 are just as well catered for with Listing II.

Again it's a very short routine for you to type in. Use the checksums to ensure you've got it right and then save it. It provides a graphic display of the distribution of values attained. In this 32 bit version the random number is returned in register zero.

Both routines return a four byte integer value which will range between 2147483647 and -2147483648. You'll probably need to reduce this to a suitable range for your program and while you can use division this is very inefficient and slow.

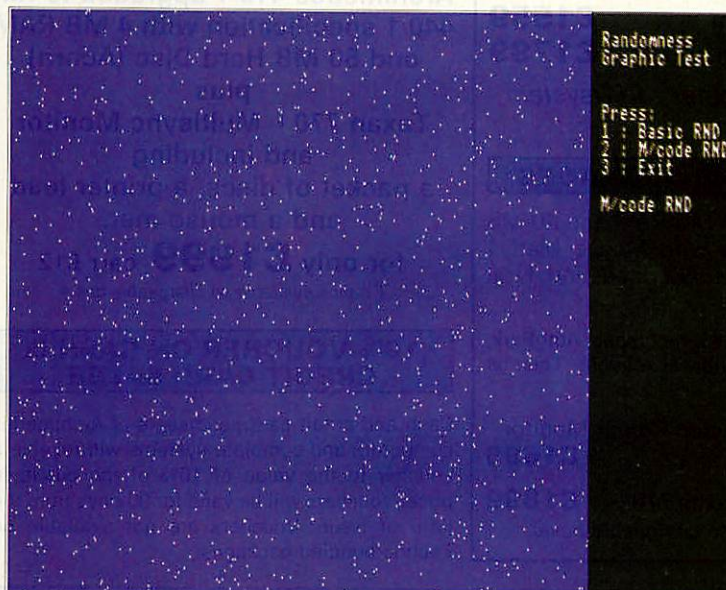
A better ploy is to use an AND operation with something close to the range you require and modify your needs to match the results. Using this you get:

```
n AND 1   0 or 1
n AND 3   0 to 3
n AND 7   0 to 7
```

and so on, where *n* is the value returned from the random number routine. But remember that:

```
n AND 5
```

Terry Blunt investigates two ways of producing unexpected events on either your 8 bit BBC Micro or 32 bit Archimedes series or BBC A3000



Smooth distribution of random numbers

will not yield all the numbers between 0 and 5 instead you get 0, 1, 4 or 5 (see the adjoining panel for an explanation). So if you want ranges which are not powers of two you will have to resort to division.

One feature of micro-generated random numbers is that any given set can be repeated as long as you start with the same *seed*.

This is very useful when you are testing a piece of software – like a simulation – and want to make changes to the program but repeat the sequence of events it's dealing with.

To ensure you get the same numbers set the value of *seed* before you start. In the listings *seed* is set to a random number from Basic at the time of assembly.

So there you have it two routines that provide an easy way to produce unpredictable events on your micro.

Limiting the numbers

The easiest way to limit the range of the random numbers generated is to use the AND operation. This works perfectly for any number which is a power of two less one – $2^n - 1$ – but using any other value causes problems.

We can draw a table, in binary, showing exactly what is happening if we try to get a range from zero to five:

n	AND 5	=
0000 (0)	0101	0000 (0)
0001 (1)	0101	0001 (1)
0010 (2)	0101	0000 (0)
0011 (3)	0101	0001 (1)
0100 (4)	0101	0100 (4)
0101 (5)	0101	0101 (5)
0110 (6)	0101	0100 (4)
0111 (7)	0101	0101 (5)

Any value of *n* greater than five will always give either 0, 1, 4 or 5.

Turn to Page 109

For fast delivery telephone
your order on 01-205 9558
using VISA/Access Card



Orders welcome from
government depts &
educational establishments

TECHNOMATIC

Techno House 468 Church Lane, London NW9 8UF.

Tel: 01-205 9558 Fax: 01-205 0190

All prices ex VAT.
Prices are subject to
change without notice.
Please add carriage
(a) £8.00 (Courier)
(b) £3.50
(c) £2.00
(d) £1.50

Archimedes COMPUTERS

A3000 (no monitor)	£649
A3000 (for TV use)	£698
A3000 Acorn Colour	£829
A410/1 (no monitor)	£1199
A410/1 Acorn Colour	£1340
A410/1 Taxan 770+	£1559
Acorn 420/1 systems	
420/1 (no monitor)	£1699
420/1 Acorn Colour	£1888
Acorn 440/1 systems	
440/1 Acorn Colour	£2579
440/1 Taxan 770+	2809

Techno 410/1 systems
upgraded to 420/1 spec.

Acorn Colour system	£1559
Taxan 770+ system	£1799

Carriage £8/computer £12/system

TECHNO 410/40 UPGRADES

A410/1 upgraded to 4 MB RAM and 40 MB
Hard Drive complete with Mouse Mat, 1
box of 3.5" discs, printer lead and First
Word Plus Release 2.

Our 40 MB Hard Drive is a high spec, AutoPark,
25ms, quality drive with a reliable Toshiba
mechanism.

techno 410/40 with Acorn Colour Monitor	£1699
---	--------------

techno 410/40 with Taxan 770+	£1899
-------------------------------	--------------

Finance available on chargeable basis.

GENIUS DIGITISING TABLET

The latest model of the Genius GT1212A PC tablet adapted for use with Archimedes computers offers a resolution of 1000 lines/in over a 12" x 12" working area and connects through the serial port of the computer.

The Tablet is operated by moving a four button puck controller over the special surface and a two button stylus with switched tip is also available:

The software to drive the tablet is supplied as a module to operate within the RISC OS desktop environment. Once loaded, several commands are available to control the tablet:

- turn the tablet on or off
- select relative or absolute coordinates etc.
- change puck movement sensitivity

Three of the puck buttons act as standard mouse buttons and the fourth allows special operations such as changing the size of the tablet work area.

The tablet can virtually take over all the functions of a mouse making the use of graphics packages much simpler. The puck has a set of cross-wires which allow simple and accurate transfer of technical drawings. The optional stylus will make tracings, line drawings etc much easier and more accurate.

The standard Archimedes mouse or a Tracker Ball can be left connected and can even be used as alternatives for some operations.

The package includes the tablet, puck, software and mains power supply.

GT1212A Tablet	£259(a)
Optional Stylus	£35(d)

What we offer in addition to efficient sales service and professional backup!

We not only offer professional advice when you are purchasing your system but we will also provide friendly assistance afterwards. All our products carry a 12 month full warranty for parts and labour.

SPECIAL FINANCIAL DEAL

Computers alone or complete systems can be purchased at NO EXTRA CHARGE over 9 months. The deposit will be payable with the order followed by 9 monthly payments. Please phone or write for full details and a personal quotation. Subject to status, we should be able to despatch your order within 7 days of receiving your order.

TECHNO 410/1 SPECIAL

Offer extended due to popular demand.
Archimedes 410/1 upgraded to full
440/1 specification with 4 MB RAM
and 50 MB Hard Disc (Acorn)

plus
Taxan 770+ Multisync Monitor
and including
a packet of discs, a printer lead
and a mouse mat.

for only **£1999** carr £12

Finance available on chargeable basis.

10% VOUCHER ON CASH & CREDIT CARD SALES

Cash and credit card purchasers of Archimedes computers and complete systems will receive a voucher to the value of 10% of the purchase price. Vouchers will be valid for 90 days from the date of issue. Vouchers are not available on Techno bundled packages.

TECHNO DTP PACKAGE

Archimedes 410/1 Colour
System upgraded to
full 420/1
spec with 2 Mb RAM and
20 Mb Hard disc
featuring our technoSCAN
package and either

Acorn DTP Package
First Word Plus Rel 2,
Logistix

or

Impression and Pipedream 3

and a free mouse mat
for only **£1777** carr £12

Finance available on chargeable basis.

Special Educational Subsidy on
the Techno DTP package.

R140 UNIX SYSTEM Limited Period Offer

R140 Base System
with
Taxan 770+ and PC Emulator
or
Viking II
plus
Ethernet Card and
Administrators Guide
for only
£3000

and it also includes on-site
maintenance contract.

This advertisement can only show an example of the range of products stocked by Technomatic. So send for our latest BBC catalogue providing detailed information and prices on BBC Computer Systems, Peripherals, Software and Books.

NAME.....

ADDRESS.....

.....Post Code

Return to Technomatic Ltd, Techno House,
468 Church Lane, London NW9 8UF. MU/5/90

TEL: 01 205 9558

Product: Archimedes Voice Generator
 Price: £59.95
 Supplier: MJD Software, 13 Burnham
 Way, West Ealing, London,
 W13 9YE.

Giving voice to the Arc

THE purpose of the Archimedes Voice Generator, AVG for short, is to help users create sounds. It can produce standard Archimedes relocatable voice modules which are accessible from all forms of program, including music packages such as Acorn's Maestro. It has been tested under Arthur 1.2 and Risc OS 2.0 – although it doesn't use windows or multi-task – and requires 1Mb of memory.

To begin you must set a suitable amount of sprite workspace using *CONFIGURE SpriteSize and check that SpriteExtend and the Sound Modules are not unplugged.

Operation is through a series of nested menus. The main one contains five icons which each lead to sub-menus containing up to eight levels, which in turn may lead to further sub-levels.

It's not as complicated as it may sound, as you can't skip from sub-level to sub-level without going back to the main menu – so you shouldn't get lost.

The five items on the main menu lead to the following screens, or modes as the manual calls them:

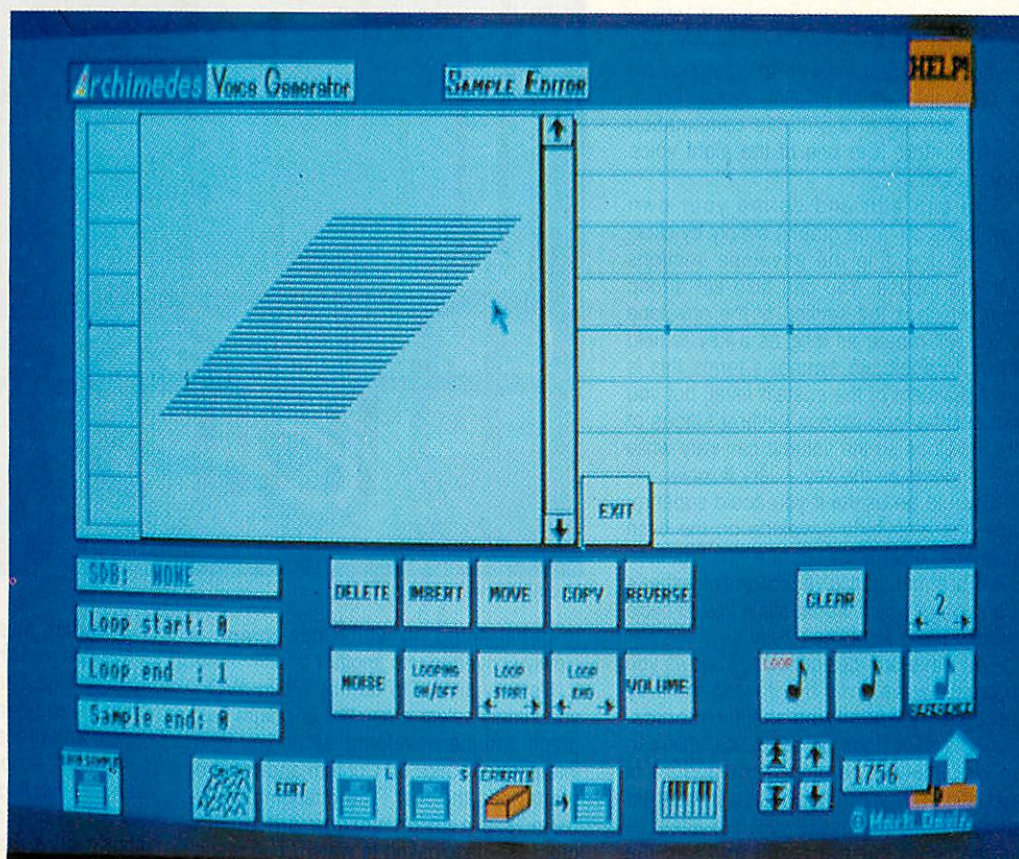
- The Realtime Synthesis Editor is used to create relocatable voice modules – up to eight voices – from a combination of waveforms, amplitude and pitch envelopes.

- The Interpolation Editor is used to create sound data blocks by combining a number of waveforms. SDBs are the common data structure of the package and are the equivalent to a sound sampled at 20.833KHz.

- The Harmonic Editor allows you to create SDBs by selecting up to eight harmonic partials, each with its own amplitude envelope.

- The Sample Editor lets you manipulate a loaded sample or SDB and edit it with a range of facilities. You can load and manipulate samples taken from program discs or created with a proprietary Archimedes sampler.

Ian Waugh tries out a sound creation tool for the Archimedes – and finds it strikes a reasonable balance between complexity and versatility



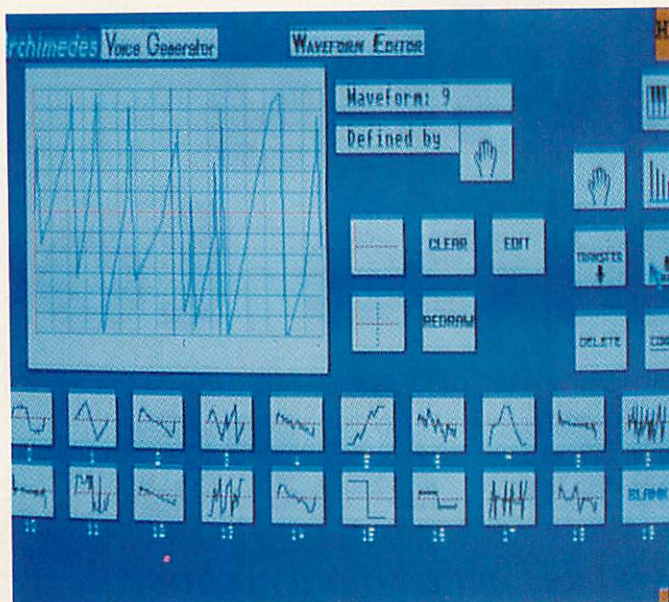
Making changes to a sound sample

- The Disc Utilities Page lets you Copy, Move, Rename and Delete files and there are also Compact and Format options.

Sounds created with realtime synthesis use less memory than sampled sounds. They are also precisely defined, so you can create the exact waveforms you want, although their tone will remain constant throughout their duration.

The default demo library contains 19

waveforms, 16 amplitude envelopes and 15 pitch envelopes. The waveform determines the tone or timbre of the sound, the amplitude envelope determines how the volume of the note varies with time – for example, does it die away slowly like a sustained note on a piano, or does it last for a very short time like a bass drum? And the pitch envelope adds modulation such



Changing the amplitude envelope of a sound

Altering a waveform by its envelope



as vibrato – usually a gentle variation in pitch.

In the create page you can select any combination of waveform and envelopes and hear them by clicking on a note icon or by playing the keyboard. You have to exit keyboard mode, however, to change wave or envelope, which is a nuisance. When you've arrived at a suitable combination you can store it in one of the eight voice module slots.

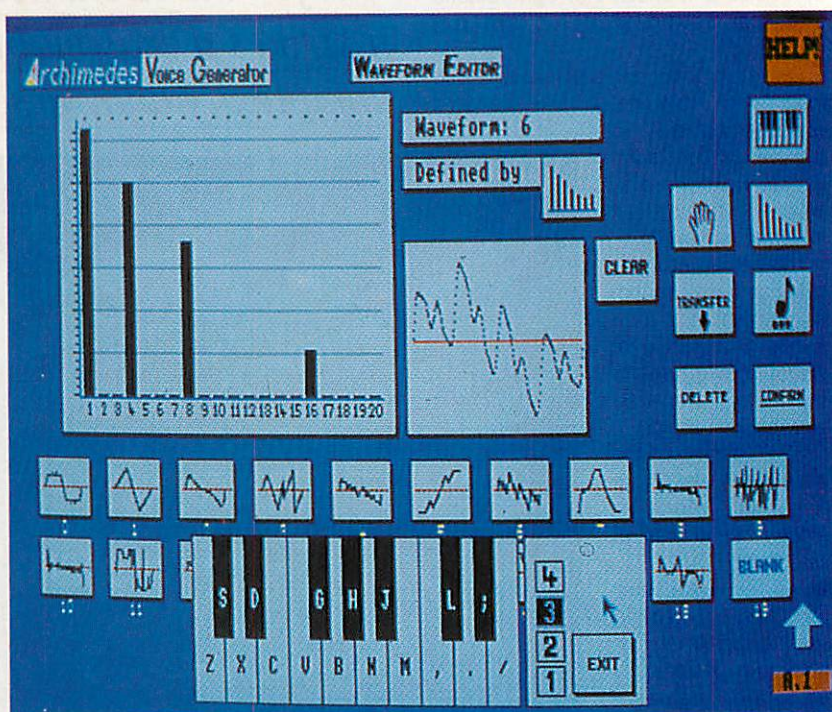
You can edit and define your own envelopes on large graphs simply by clicking and dragging the envelope sections with the mouse. You can also set a loop point which is the section of the envelope which will repeat as long as a key is held down. In analogue synthesis terms this is the equivalent of the sustain level, but you can set the loop across several stages of the envelope so the volume can vary while your finger is on the key – very flexible.

It would be useful if you could superimpose the amplitude envelope on the pitch envelope, or at least see the two together. Even a small icon of each on the other's graph page which would allow you to cycle through them would be useful.

The waveform designer page allows you to create waveforms by drawing them by hand or by specifying the harmonics. Armed with a book on acoustics, this can be extremely rewarding. Any student of acoustics or synthesis will find it ideal for studying waveforms as you can alter the harmonics, hear the result and see the waveform change before your eyes.

You can save and load your work, of course, and the library transfer function allows you to build a custom set of sounds from a variety of sources.

The waveforms created in the realtime editor are static, that is they produce the same tone colour or timbre throughout their duration. The wave interpolation editor is used to create waveforms which change timbre. The manual describes this as being similar to the cartoon process of



Modifying a waveform by harmonic

in-betweening, in which one image is slowly converted into another one.

It's very simple to do this within AVG – you simply select a number of points on a graph and the waveforms which you want interpolated. Click on Confirm and the program does the rest. The changing waveform is drawn on screen during the process – fascinating to watch. The resulting wave can be saved as an SDB and read into the Sample Editor. When experimenting with the envelopes it would save a little time if you could access the editors and various other areas of the program such as file handling from anywhere within the package. The window environment is very useful for this sort of thing and could have been used effectively.

The harmonic editor is slightly more complex to use. It allows you to build up a composite waveform by combining several

harmonics each with its own amplitude envelope. You have the first 32 harmonics to play with. The result can be saved as an SDB or you can go directly to the Sample Editor and process the wave there.

Anyone who has used a micro-based sampler will find similarities between it and AVG's Sample Editor. The sample is shown on a graph as a solid outline. You can also see it in 3D – although it cannot be edited in this form – and you can move a marker through it which will show, in a separate graph window, the actual waveform at each point it passes over.

There are several editing facilities such as delete, insert, move, copy and reverse – always good for a laugh, this. You can add white noise to produce a breath or cliff effect and you can set a looping point.

If you've used other samplers there are

Archimedes & A3000 Owners!

Quite a few Archimedes owners are apparently unaware of *Archive Magazine* and the various services that Norwich Computer Services provide.

- **Archive Magazine**, now in its third year, provides vast quantities of information about Archimedes computers. (£17 for 12 issues each approx 60 pages A5.)
- **ArchiveShareware / Careware discs**. We have a range of over 30 discs of public domain software from various sources. Many of the discs contain several quite substantial programs for as little as £3.50 per disc.
- **Members' Discounts** (up to 15% or more) are available on both software and hardware. A single purchase of £150's worth of software or hardware could save you the cost of a full year's subscription.

If you would like more details please let us know by letter, phone or fax.

Norwich Computer Services

18 Mile End Road, Norwich, NR4 7QY. (0603-507057 / Fax 250095)

Computer Holiday for young people!!

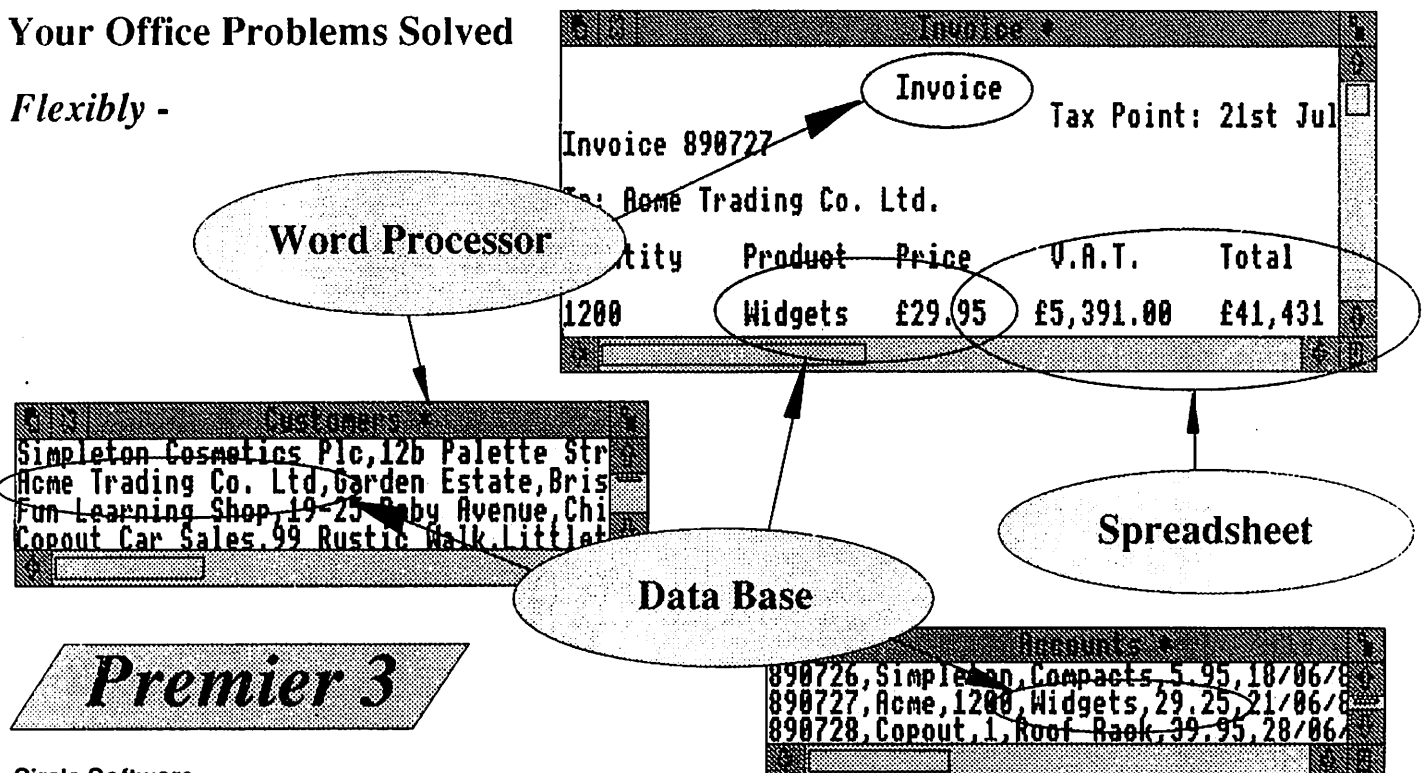
Scripture Union runs a computer holiday for 13 to 16 year olds at an attractive boarding school set in the Hertfordshire countryside.

July 31st - August 8th - £91 inclusive

For full details, write to Jim Maddox, Scripture Union Holidays, 69 Cloverdale Road, London, SW2 2DH or phone Jim on 01-671-8761.

Your Office Problems Solved

Flexibly -



Premier 3

Circle Software
33, Restrop View
Purton, Swindon
Wilts. SN5 9DG
Tel: 0793 770021

Premier combines Word Processing, Data Base, and Spreadsheet functions in one easy to use program

► a few facilities you may miss such as magnify, fade in and out, and echo and reverb. A facility to help produce glitch-free loops would have been helpful, too.

Whichever editor you use, the final sound needs to be saved as an SDB. One advantage of an SDB over a sample is that it has the same duration at whatever pitch it is played.

To increase the pitch of a sample you must play it back at a faster speed, resulting in a shorter duration. Eight SDBs, then, can be combined to form a voice module. These can be either multi-voice or multi-layer format: In the former, software will recognise eight separate samples, in the latter the samples are spread an octave apart and the software will select the one nearest to the pitch to be played, resulting in far more accurate representations of acoustic instruments. There are several samples, SDBs and voice modules on a data disc for you to study and experiment with.

The final manual should include programming examples on how to use the voice modules, although I found it fairly easy to use a voice module from within Maestro.

The final menu option is a set of disc-handling facilities including delete, move, copy, rename, format, compact and pre-

pare – to set up directories for use with AVG data. There is also an AVG info option which gives information about AVG-related files.

A niggle here concerns the number of options you have to select in order to format a disc – seven. Rather annoyingly, some require mouse clicks while others ask you to tap a key.

If the software had been written to be multi-tasking this part of the program wouldn't even have had to have been written.

AVG has 35 pages of on-screen help information and mini-helps for icons are available by clicking on them with the Right mouse button. Some of the menu screens are pretty sparse and it would have been helpful, especially for newcomers to the world of synthesis and sound creation, if the icons had contained their full names and a little more information. There's plenty of space to make them larger.

The manual supplied with the review copy was provisional and a new one is proposed containing both a tutorial and an introduction to the theory of sound.

Some knowledge of sound, waveforms, envelopes and acoustics is certainly required to get the best out of the package, although you can, as the review copy suggests, play it by ear.

As acoustics is such a potentially com-

plex subject I hope the release version of the manual explains it well and includes helpful diagrams. Some aspects of the, admittedly provisional, manual could be a little clearer.

I discovered a few bugs which occurred primarily when trying to create too many envelopes, but these should soon be sorted out by MJD.

Full Risc OS compatibility would be very nice, too.

AVG is an excellent package and does its best to strike a balance between complexity and versatility.

It could well become the sound creation tool for musicians and programmers wanting to produce music on the Archimedes.

It would be extremely useful in education, too, for the study of sound, waveforms and harmonics.

Summing up

A superb tool for anyone wishing to experiment with sound samples or waveform and envelope generation and creation.

Most of the minor niggles I found with the package were due to the fact that the program hadn't been written for the multi-tasking environment.

FREE support with all our systems

- *Expert advice! on system purchase
- *Expert help! on using your system
- *Expert backup! software support and hardware servicing
- *Leasing facilities now available

Consult the experts!

CSS Computer Centre

Unit 3A Townfoot Ind. Est. BRAMPTON
CUMBRIA CA8 1SW
☎ 06977 3779

Acorn Qualified dealers and Unix centre
Authorised SJ Networks, installer *Education specialists
Government plc and education orders welcome



Acorn
The choice of experience.



"FIRST" ADVANCED STATISTICAL SYSTEM

For Acorn Archimedes, BBC Models B, B+ and Master; "Industry Standard" machines. A powerful and practical tool for Research, Industry, Business Medicine and Teaching.

Integrated, interactive, robust, fast, accurate, modular. Designed to facilitate data critique. Many data entry options eg. CSVs. Full data transforms. Handles missing values and data subsets. Scatterplots, regression plots, function plots. Univariate statistics. Paired and unpaired tests. Chi-square tests. Nonparametric methods. Unrivalled REGRESSION facilities eg. weighted, through the origin, standardised, stepwise, full statistical information. Residuals, fitted and predicted values. Much more. Correlations. ANOVA. Contour plots of regressions. DIAGNOSTICS – VIFs, influential points etc. Automatic warnings ROBUST regression – many influence functions. Powerful NONLINEAR least squares. Time Series, eg. moving averages, exponential smoothing causal models. One-two and three-way ANOVA subsystems. Distributions generator. Histograms. Linear Calibration. Cluster analysis. Many other powerful analytical and descriptive features. Full utilities.

Price £120 – £180 (machine and version dependent). Special discounts available.

There's FAR too much to describe here. Get full information now from:

Serious Statistical Software, Lynwood, Benty Heath Lane, Willaston, South Wirral L64 1SD
Tel: 051 327 4268

Micro Studio

22 Churchgate Street, SOHAM, Ely, Cambs. CB7 5DS. Tel.(0353)720433

MAPS OF THE WORLD

GRAPHICS LIBRARY PACK FOR THE ARCHIMEDES

Includes

Austria, Belgium, Belize, Bulgaria, Denmark, France, Germany, Greece, Holland, Iceland, Ireland, Japan, Mexico,

Includes

New Zealand, Peru, Poland, Portugal, Scandinavia, Spain, Switzerland, USSR, Yugoslavia.

Over 100 in total



PRICE
£29.95
inc.vat & carriage

DTP GRAPHICS LIBRARY PACKS

MONO £17.25 COLOUR £19.95

DUAL PACK

MONO & COLOUR TOGETHER
£29.95

SPECIAL OFFER

IMPRESSION £149 inc

including MAPS or DUAL pack FREE please specify



FREE

with every computer
we sell . . .

. . . our expertise!

If you are buying a new Archimedes or Master Series computer, you don't expect to know all about it from day one. That's where we come in. We don't leave our customers high and dry with their problems – they know they can rely on us to get them out of trouble. Whether it's hardware or software, we're the people who know.

THE DATA STORE

6 Chatterton Road, Bromley, Kent
Tel: 01-460 8991. Fax 01-313 0400

(closed Wednesday)

An old-fashioned specialist computer
shop



BRITISH
BROADCASTING
CORPORATION
MASTER SERIES
MICRO COMPUTER

Acorn
R140
Unix
Work-
station

Cambridge
Z88
Portable



ADC Computer Supplies

84 High Street, Potters Bar, Herts EN6 5AB.
Tel: (0707) 47827. Fax: (0707) 52151

PRINTER RIBBONS

Price each ribbon	2	6	12
Cannon	2.99	2.85	2.60
Amstrad			
DMP 2000 248 RN	4.75	4.65	4.55
DMP 4000 2426	5.20	5.05	4.95
PCW 8256 LQ3500 2741FN ...	6.05	5.85	5.75
PCW 9512 2746 MS	4.95	4.85	4.75
Cannon 1080/1156	2.99	2.85	2.60
Centronics GLP	3.65	3.45	3.15
Citizen 20D/LSP10	3.60	3.40	3.25
Epson M, F PX80, F LX 800 ...	2.99	2.75	2.55
Epson LX80/86GX80	2.80	2.65	2.40
Juki 6100 MS	2.85	2.70	2.60
Kaga KP810/910	2.99	2.85	2.60
NEC P2200	4.95	4.60	4.25
Panasonic KXP1080/1/2/3	3.99	3.80	3.60
Shinwa CP80MS	3.99	3.80	3.60
Star NL10	4.95	4.60	4.25
Star LC10	3.50	3.10	2.85
Star LC24-10	3.99	3.80	3.60

COMPUTER PAPER

Plain fanfold, micro perf edges		Price per box		
Size	Weight gsm	1000s per box	1 Box	3 Boxes 5 Boxes
11 x 9 1/2	60	2000	14.95	14.45 13.65
11 x 9 1/2	70	2000	18.45	16.05 15.15
11 x 9 1/2	80	2000	20.25	18.55 16.45
A4 11 2/3 x 9 1/4 ..	70	2000	20.95	19.70 18.45
A4 11 2/3 x 9 1/4 ..	80	2000	24.55	23.05 20.15
A4 11 2/3 x 9 1/4 ..	90	1000	14.25	13.15 14.15

ADC BRANDED DISK

	10	20	50
3 1/2 DSDD	14.10	27.15	64.75
3 1/2 HD	36.90	70.50	167.75
5 1/4			
SSDD	6.75	12.74	29.85
96TP1	8.50	15.96	36.25
HD	14.50	27.90	66.50

HOW TO ORDER

By Phone: Potters Bar Tel: 01-998 6512/6513. 0707 47827.
By Post: ADC Computer Supplies, 84/84a High Street,
Potters Bar, Herts EN6 5AB. By Fax: 01-991-1451. 0707 52151.
Despatch within 24 hours. Delivery—Please allow 5 days. For
guaranteed next day delivery please phone. From £2.75
EXTRA. Postage covers UK only.
Minimum order value for payment with order value £8.90 or
£1.50 handling charge
Opening hours 9am to 5.30pm Monday to Saturday



COMPLEX

TEL: (061)-976-3763

SPECIAL OFFER
ARCHIMEDES 440/1 £2099.00

ACORN ARCHIMEDES

A3000	£579.00	A410/1	£1059.00
A420/1	£1495.00	A440/1	£2099.00
A3000 + Hyperpack			£659.00

Hyperpack-Minipack's 1,2,3 & 4. Not including Confusion	£89.90
Minipack 1 Repton 3, Pacmania, Jinxter	£22.60
Minipack 2 Quazar, Corruption, Conqueror	£22.60
Minipack 3 White Magic, Holed Out, Terramex	£22.60
Minipack 4 Orion, Word Up Word Down, Star Trader, Confusion	£24.35
Acorn Colour Monitor for above	£195.00
Tandata Colour Monitor for above	£159.00

AMIGA

Amiga 500 Batman Pack	£329.00
Amiga Class of the 90's	£499.00
Amiga Medium Res. Colour Monitor Mono Sound	£190.00

ATARI

Atari 520ST Power Pack	£320.00
Atari 520STFM Explorer Pack	£240.00
Atari 1040ST 1Mb of Ram	£399.00
Atari Medium Res. Colour Monitor	£231.00
Philips 14" RGB Composit Monitor	£220.00

SPECIAL PRINTER OFFERS

Citizen 120D	£115.00	Panasonic 1180	£179.00
Citizen Swift	£269.00	Panasonic 1124	£269.00
Epson LX80	£189.00	Star LC10	£159.00
Epson LQ550	£269.00	Star LC10 Colour	£199.00
Mannesmann Tally MT81	£115.00	Star 2410	£259.00
N.E.C. 2200	£229.00	Seikosha FT180	£125.00
Panasonic 1081	£159.00	Seikosha SP12A1	£149.00

For other printers not listed, including laser printers
PHONE FOR PRICES!

75 CROSS STREET, SALE, CHESHIRE M33 1HF

ALL PRICES ARE EXCLUSIVE OF VAT

If there is anything you require that is not on this list then please do not hesitate to
call us as we can probably supply the items you require.

MICRO USER CLASSIFIEDS

● Wanted: Intergra-B expansion board for BBC B. Tel: 0705 451886
● A3000 2Mb ram and floppy disc interface, £625 ono. Tel: 01-558 5698.

● Master 128, Microvitec colour monitor, Panasonic printer, dual DS40/80 disc drives, Morley Teletext, joysticks, many discs, much software, books, manuals, £650. Tel: 0372 842910 (Surrey).

● Archimedes 310, colour, includes backplane and Midi Podule, software and manuals. Cost about £1,500, sell for £800. All equipment as new. Tel: 0805 23862 evenings.

● Acorn Electron, Plus 1, several games and books, Desk Diary, £100. 02993 77937.

● Master 128, monitor, disc drive with Viewstore, £550. Winchester/floppy disc drive, plus books and software, £350. Tel: 0726 843487.

● Large quantity BBC hardware and software for sale. Telephone 01-789 2663.

● Sakata 9-pin printer, 180/36 cps, £100 or swap 3.5in drive with PSU. 0695 632563.

● Prestel adaptor boxed. Video digitiser complete with b & w camera. Telephone 041-649 5696.

● Master 128, Pace 40/80 drive, Toshiba printer, Microvitec 653 colour monitor, Plinth, Interword, Beebug C, Master manuals, many books numerous games, utilities, joystick, complete Beebug magazines and more, £600 ono. Tel: 0689 53045.

● Hard disc drive, Mini-Scribe 3212, 10Mb, new, £120. Tel: 0222 596351.

● BBC B, 40/80T drive, data recorder, 2 joysticks, manuals, lots of software, £200. Tel: Wellingborough (0933) 225495.

● Cumana 40/80 single disc drive (no PU), £50. AMX Pagemaker, £20. Both with manuals, both BBC. Tel: 0924 372493.

● Archimedes A440/1 with NEC multisync and Silicon Vision RiscBasic Compiler. Perfect condition, hardly used, £2,500 ono.

Archimedes A310 with Acorn backplane and Risc OS, perfect condition, £500. Telephone 0734 731093.

● BBC B Advanced DFNS, View chip, Spellcheck II, 40T disc drive, joystick, 24 discs, tape lead, £325 ono. Tel 0245 76592.

● Wanted. BBC B with disc drive and monitor if possible. 087 258 236, Cornwall (evenings).

● Wanted. Acorn Plus 3 disc drive, must be good condition. 098121 377 (evenings).

● Modem, Communicator, £65 ono. Fifty mags, £15 ono. 0285 810415 after 4pm.

● BBC B OS1.2, 1770 DDFS (2.2), Teac 40T DSDD disc drive, 32k sideways ram + roms, 50 discs, monitor, £350. Traker Ball, £30. 3D CAD (Silicon Vision), £40. The lot, £380. Phone 0705 575014 after 6pm.

● Wanted. To buy or swap any BBC games, details to: 25 Verity View, Leeds, W.Yorks, LS9 0EE.

● Tandata TD2516 Viewdata terminal with Microvitec monitor, thirteen-page memory, carousel, number memory, printer output, Suitable for accessing Prestel, Micronet etc, over £700 worth of equipment, £300 ono. Tel: 0602 636637.

● M512, 5.25in DSDD drive, Overview, Pascal rom, several games, Dos + guide, software, manuals, £700. Commodore C128 1571 drive, Datacorder, joystick, manuals, disc software, mags for both, £300. 0352 85416, Simon.

● BBC OS1.2 ADFS and DFS, PMS6502 second processor, Interword etc, £225 ono. 0933 6780253 (Wellingborough).

● BBC B with DDFS, ram/rom, Econet Wordwise+, Beebmon, Communicator, £150. Dual 800/400k disc drive, £100. Epson MX100 serial, parallel I/F, £80. Sanyo 14in colour monitor, £60. Tel: 0203 635918.

● BBC B, 1.2 OS, Opus 40/80T drive, Opus 3.45 DFS, Sanyo data recorder, Epson RX80FT printer,

Sleuth and Toolkit roms, lots of games including Elite, Revs, Repton(s), Trivia Pursuit, Chess, Flight Simulators etc, all leads and manuals, £350 ono. Tel: Uxbridge (0895) 631052.

● Electron, Plus 1, software, View, manuals, books, magazines, joystick, £170. Tel: 09938 9368 (evenings).

● Wanted. Rom cartridge system for BBC Compact. Phone 0294 64002.

● Master 512 board, mouse, discs, £100 ono. Morley Teletext Adaptor + PSU, £60 ono. Morley 1 meg ramdisc, £110 ono. Morley master romboard, £30 ono. Phone 0923 720528 evenings.

● BBC B, twin DSDD, 40/80 track drive, Wordwise, Pagemaker, mouse, joystick, speech synthesiser, many games, all for £275. Telephone 0278 787890.

● Master 128, single 40/80T disc drive, Panasonic 1080 printer, joystick, software, vgc, £455. 01-304 8726.

● BBC B, monitor, 40T disc drive, Epson AX-80F/T+ printer, Slave romchip, some software, open to realistic offers. 01-520 6855 daytime.

● Electron software. Over £200 worth latest titles, Plus 1, pair of joysticks, books, *Electron Users*, £65, the lot. 0903 762361.

● Master 512 co-processor and extras, £110. Reference manuals 1 & 2, £8 each, Advanced, £10. Iso-Pascal manual, £5. Master rom cartridge, £5. 0923 819206.

● Akhter 40 track single sided disc drive, £35 plus delivery. Swansea (0792) 290966.

● BBC Issue 7, colour monitor, 40/80 drive, DFS 1.41, AMX Superart, Max, mouse, sideways rom/ram, lots of roms, discs, tapes, manuals, £450. 0483 772750.

● BBC B, 6502 processor, colour monitor, twin disc drives, printer, modem and lots more goodies. A total package for £800. Excellent value, phone 01-311 5698.

● BBC plus data cassette recorder

plus over £450 games software. Will split, only £210 ono. Phone 0276 22282 after 6pm (Camberley).

● Wanted. The Micro User/Acorn User, issues Jan '87 to Jan '90, BBC 5.25in disc software including 80 track Elite. Exchange Wordwise+, Philips CD473. Tel: Haslemere (0428) 58489.

● BBC 6502 second processor, surplus to requirements, £95. Micronova PCB drafting and printing program, £40 plus postage. Sold together, £125. Phone 0271 88 2792.

● Archimedes 410/1 with colour monitor. Four months old, little used, boxed, £900. Telephone Brighton (0273) 697522.

● Master 128k plus 512k board, mouse, and Gem. Also twin 3.5in drives, plinth, overview, monitor, roms, books and discs. The lot for £600 or offers if split. 0400 61220 (Lincs).

● Software (Archimedes). PC Emulator, £60. DTP, £90. Soundsynth, £20. Zarch, £10. Conqueror, £10. Repton, £10. Artisan, £18. Old PRMs (+covers), £15. All ono. Phone 061-973 0529.

● BBC B, hardly used, Watford 40/80T DS/DD, View, Pascal, Basic 2, printer driver, £300 ono. Tel: 01-907 5540.

● BBC B Issue 7, Watford DFS, Cumana 40T ram/rom board, Wordwise Plus, CP-Rom, PMS, Genie Junior, joystick plus software and manuals, £400. Tel: 0254 35032.

● BBC DFS for sale, colour monitor, Opus double 40/80T drive, Z80 processor, manuals, games, Juki printer, good condition, £400 ono. 01-761 2560.

● BBC B Issue 7, VGC, 40/80T DS drive, 8056 dot matrix printer, GP-111 plotter, rom board, SWR, Wordwise+, Discdoctor, Enigma, Pascal, Replay, transfer and graphics roms, speech synthesiser, games, discs and more, £400 ono. Tel: 0453 545817.

● BBC B Issue 7 with Acorn DFS

PLEASE PRINT THIS AD IN THE NEXT MICRO USER

Name _____

Address _____

POST TO: Micro User Classifieds, Europa House, Adlington Park, Adlington, Macclesfield SK10 4NP

Cheque enclosed for £ _____
(minimum £2 for 10 words)

I certify that any software offered for sale is original and not a copy

Signed _____

Has upgrading your BBC Micro given you hardware you no longer need?

Or have changing interests left you with unwanted software?

This is THE place to advertise your surplus items. Our 179,000 readers are always on the lookout for a bargain and this is the first place they'll look!

and dual DSDD disc drives, ATPL rom board with 8k sideways ram, Acorn mono monitor, Watford eprom programmer, View, BCPL, Discdoctor, £350. Tel: 0734 731093.

● Archimedes A310, Risc OS with colour monitor, 8 games, Render Bender and Film Maker, £800. Tel: 0734 884348 after 6pm.

● BBC B fitted ATPL 16 slot expansion board, STL, ADFS/DFSS, Interword, Intersheet, Interbase, AMX Stoppress, Computer Concept's Accelerator, Spell Checker, 1.2 OS, numerous games, dual joysticks and 1 data keypad, £250 ono. Tel: 0443 402555.

● BBC Issue 7, DFS, 400k disc, rom/ram card, roms, mouse, monitor, Panasonic KX-P1081 printer, all manuals, £350 only, no offers, phone Gareth Jones, Sevenoaks (0732) 453828.

● BBC B Issue 7, 6502 second processor, Solidisk 4 meg, 256k board, 1770/8271 DFS/ADFS 40/80T drive, Wordwise Plus, Quest Mouse, Quest Paint, Pineapple PCB rom, boxed with all manuals, £450 ono. Tel: 0761 52356 (Andrew).

● LVL disc operating system, rom booted, with manuals, offers over £15. Tel: 061-427 2175, after 5pm on weekdays.

● Archimedes 310, colour, Risc OS, boxed as new, Interdictor, E-type, Pixel Perfect, all manuals, discs and leads. Many magazines, all for only £850. Ashford, Kent. Telephone 0233 633616.

● BBC B, 1770 DFS, 40/80T disc drive, cassette recorder, Ferguson RGB monitor/TV tapes, discs, books, magazines, all vgc, £350. Southampton (0703) 441172.

● Archimedes Pixel Perfect, DTP v1.05 with additional Artpack as new, bargain, £80. Telephone 0420 63543.

● Wanted urgently. Solidisk PC-Plus upgrade for Master 512 or complete with 80186 board, also Acorn or Watford co-pro adaptor. Good prices paid, 0993 705989 evenings.

● Electron games, perfect condition, worth £85. Includes Sam II, Predator, offers lot/single. 0483 67120 evenings.

● BBC B, 6502 second processor, 40T disc, Music 500, monitor, rom board, software, £250. 0622 672912, Maidstone.

● Wanted. Midi hardware and software for BBC B. Reasonable price. 051-608 7188 anytime.

● Microvitec 1451, boxed, £120. 6502 second processor, boxed, £50. 06285 29510.

● Immaculate condition BBC B, DFS, Seikosha GP700A colour printer, disc drive, magazines, games, £275 ono. 021-358 7271 evenings.

● Master 128, extras, £325. 40/80 drive, £70. Mono monitor, £50. Tel: 051-647 5367.

● BBC Model B with 40/80 dual disc drive, sideways ram, etc, 3250. BBC 2nd processor, £90. (0753) 868624

● Archimedes software, Risc basic, PC Emulator, Risc User, discs, games, books, BBC-ARC lead+, software, BBC B software, games, Wordwise, Viewsheet, Starbase, Fisheer Technik, computing kit (interface, construction kit, software, twin joystick.) Tel: 0633 681090.

● Exchange spectrum 48k, twin microdrives, printer, etc, for dual 40/80T double sided disc drive (Master). 0252 549932 evenings.

● Hybrid Technology Music 5000 synthesiser plus Music 4000 keyboard, as new, with Ample Nucleus manual and software, £210. 1451AP colour monitor, £160. Tel: 0745 583930 (N.Wales).

● Master 128, Opus 40/80 double disc drive, Morley Teletext Adaptor and Master Board AA, 3-way user port switch, Spellmaster, Printmaster, Bbug Master Roms, books etc, no monitor, £450. Tel: 0257 451213.

● BBC B double 40/80T drive, sideways rom/ram board, AMX mouse, Superart, Solidisk ADFS joystick, tape recorder, discs, games, £300. 04024 42575.

● Wanted. Viglen console unit or any larger console unit. For the BBC Micro. Also wanted is Watford disc drive. Phone David on Walton (0932) 244796 after 6pm.

● Archimedes original software, PC Emulator, £55. ABC Compiler, £50. Holed Out, £10. All as new. Tel: 0666 822731.

● BBC games, Predator, Barbarian, Pipeline, Repton Infinity, White Magic, Play it Again Sam 4 and 8, The Art Studio, AMX Design Rom, Speech, Light Pen plus software, lower prices the more you buy. Tel: 0772 742325 after 5pm, ask for Simon.

● Z80 second processor with software and manuals including WordStar, £100 including postage. Telephone John, 0302 538042 evenings.

● Spectrum 48k, Microdrives, joystick, Centronic Interface, utility programs, cartridges etc, £200. Tel: 0928 566682.

● BBC Master Compact, 3.5in drive, hi-res colour monitor, Mertec companion (analogue + user port), TV Modulator, games, discs, etc. £400. Tel: Oxford (0865) 54278 evenings.

● Archimedes A310, Risc OS, 4-slot backplane, 5.25in disc buffer, Memcia, Microvitec colour monitor, PC Emulator, £900. Add £160 for scsi card, £210 for 50Mb hard disc, Okimate 20 printer, colour, black ribbons, paper, £70. Call L. Brightman, 01-655 0399.

● High resolution monochrome 19in monitor, suitable for Archimedes with hi-res output (ie 400 series), £500 ono. Phone Adam on 0572 822499 work hours only please.

● BBC B, DFS 40/80T disc drive, Z80 2nd processor, software, mags, bargain £250. Mansfield 659889.

● BBC B Issue 7, cassette recorder, leads, manual, games, £200 ono. Tel: 0602 634892.

● BBC B, Watford DFS DSDD twin drive, £250 ono. 0332 705182 after 5pm.

● BBC B+, AMX mouse, joysticks, £250. Z80 second processor, £125. Torch graduate with IBM software, £250. Tel: 01-935 0640 (9-5), 01-431 2867 (evenings).

● Master 512/80186 coprocessor, mouse, Gem, Dos+, £85. ADE+ 65C02 assembler, in Master cartridge, £25. Wordwise+ and Spellmaster in care cartridge, £30. Solidisk eprom programmer Uvipro 1.0, £15. Solidisk 32k SWR for Beeb £5. South Essex 0375 858607.

● BBC B, twin 40/80T drives, sideways ram, joysticks, Forth, BCPL, Elite, Revs etc, 50+ discs, manuals, £350. Telephone 0256 764929 (Basingstoke).

● BBC B OS1.2 32k much software cassette recorder, £160. 021-454 6999.

● Master 128, dual disc drives, mono monitor, rom cartridge, manuals and magazines, excellent condition, £450. Phone Leamington Spa (0926) 311800 evenings.

● Master 128, £290. Viewsheet rom + manual, £20. Spellmaster rom + manual, £26. Interword rom, £25. Viewindex + manual, £12. Viewstore rom + manual, £29. Minerva Della Rom, Card Index, manual, £35. Genie rom + UT, £39. Watford Video Digitiser, £61. ADI rom, £15. Grafpad Draw 2 digitiser pad, £25. System Gamnia rom, £25. Modem WS2000+ Commstar rom, £50. Commstar B, £5. Dumpmaster rom, £16. Fontaid rom + discs, £10. Masterfile I, £11. Cassette Sanyo DR101, 310. 11 games BBC B cassettes incl Elite. 737, £10. Crawley (0293) 35229.

● Master 128k, twin DS40/80 disc drives + plinth, PW1080A printer, Philips CM8833 monitor, cassette recorder + all leads, books, magazines, manuals, 3 joysticks, 100+ discs and cassettes, £1,000s of software including AMX mouse + Stop Press, Mini Office II, other business software and 100s of games. As new, cost, £2,500+, sell £895 ono. Bargain! Might split - need car. Tel: Bedford (0234) 216215.

Ads will be accepted under the following conditions:

- This service is EXCLUSIVELY for the use of private readers. No trade ads will be allowed.
- To avoid encouraging software piracy, all ads will be carefully vetted before they are accepted.
- Ads can only be accepted on the form opposite (or a photocopy of it).
- There is no maximum to the number of words

you include in your ad. If there is insufficient room on the form, continue on a separate sheet of paper.

- The cost is 20p per word, with a minimum of 10 words.

- WE GUARANTEE your ad will appear in the next available issue of The Micro User.

Mijas Software

Bringing the new software world to YOUR BBC Micro

All software available for Archimedes as well as BBC B and Master series

Assembler, Linker, Debug, Shell and Small 'C' New Optimiser also available (see below) £50 +VAT

Professional-style assembler, modular, relocatable, disk to disk. Full Specification Linker giving compact run-files anywhere in memory. Source-Level Debug for rapid and effective testing of 'C' or assembler. Full Library facilities, 'C' and assembler Libraries provided (with sources).
★ Extended implementation of the original Small C including BBC graphics. Full Source Code provided for the 'C' compiler, add your own features! Many times faster than BASIC, 40K+ Program space in stand-alone mode. Post-sales support, low cost updates.
★ Original Small 'C' code supplied with the development system at the cost of distribution

New Code Optimiser

Revolutionary new Code Optimiser for Small C. Your programs use LESS memory and run up to THREE TIMES faster than before. Forget about assembler code and use Mijas Small C for high-speed graphics, text and word processors and many other programs. This new optimiser does not change your programs, has no restrictions, and makes them run up to 24 times faster than BBC BASIC. Upgrade from Small C (any issue) £25+vat. Complete system with Small C and optimiser £70+vat.

Other Microprocessors

Development system for the Mitsubishi 740 series as well as for the 6502 and 65C12. Supports all the new addressing modes. Mix C and Assembler. Write software for single board computers and other industrial applications using your BBC computer. Price including optimiser £150+VAT.

All software available in DFS or ADFS format on 5.25 or 3.5in. Discs.

Laser Typesetting Program

Professional printing you can afford today. Our new LASER TYPESETTING PROGRAM prints multi-window multi-column, multi-page Text & Graphics. Software £25+VAT. Requires one of the new low-cost Laser or desk-jet printers with proportional fonts. Written in Small C. Will run on Archimedes or BBC B or Master series computer. Full C Source provided.

Educational and departmental orders welcome. Please write for quantity and networking discounts. Full support on all software.

Mijas Software, Winchester Rd. Micheldever
Winchester Hants SO21 3DG

Telephone 0962-89-352 (24 Hr. Answering service)

Now at last you can achieve the speed of a true compiler without losing the program size advantages of BASIC.

Use it for games business or industrial software. Ideal for learning structured programming and compiler techniques



Ask for our
Archway 4GL
catalogue

V1.2
RISC OS
ONLY



ARCHWAY 4GL lets YOU unleash the huge program power of RISC OS and the ARM easily and quickly. Build powerful multi-window applications with pop-up menus, icons, mouse control, etc. of a professional quality. Programs are fully RISC OS multi-tasking and appear on the icon bar. All using BBC BASIC.

ARCHWAY 4GL provides a total environment for program creation including tools, shell program with run-time code, extensive examples and a library of functions and procedures.

An in-depth user guide takes you gently step-by-step through a progressive series of some 50 program building sessions from complete beginner to advanced level. All examples are on disc ready to run.

The complete system (V1.2) comes on 4*800k discs with a 500-page ring bound user guide. You need an Archimedes or A3000 with 1M or more of RAM and fitted with RISC OS. One disc drive is sufficient. There is no extra licence fee to distribute copies of the run-time in your programmes.

"You get an excellent piece of software which will make the mountain of programming needed to operate the WIMP environment into a molehill".
— Archive, July 1989

"Archway is one of the most impressive and best value-for-money products that I have yet seen for the Archimedes... anyone who wishes to write RISC applications in BASIC 5 would have to be quite insane NOT to enlist the aid of this remarkable package"
— A&B Computing, February 1990



SIMTRON
Programs to help you

£99.95

incl. VAT & p/p

4 CLARENCE DRIVE, EAST GRINSTEAD,
WEST SUSSEX RH19 4RZ Telephone (0342) 328188



Cheques/POs/official orders or Access/Visa number and expiry date. 24-hour* phone for Credit Card orders.



ONLY POOLS AND HORSES

FOOTBALL BOXFORM £14.95 (+ £2 for 3" disc)

The only genuine form program for British football now incorporates **SOCCEROO** a program specially written for **AUSTRALIAN POOLS**.

FOOTBALL BOXFORM is not a gimmicky play thing but a serious statistical analysis of football form. Its sole objective is to improve the chances of winning on the pools or fixed odds and the results speak for themselves. **THE PROGRAM HAS FORECAST 50% MORE DRAWS THAN WOULD BE EXPECTED BY PURE CHANCE.** Homes away and draws are shown in order of merit and true odds given for every match. Merit tables show at a glance the teams currently in form and those having a lean spell. Covers league and non-league clubs "Won £930 on the first week using **FOOTBALL BOXFORM**" — D.D. Devon
"The program is nicely presented and easily used and updated... will undoubtedly prove extremely useful and profitable" — Chic Computer Club

POOLS PLANNER £14.95 (+ £2 for 3" disc)

The term book on a computer. Gives full details of 369 entries ranging from 9 to 73,960 lines and covering from 12 to 56 selections. Enter the amount you wish to stake and several examples are listed. No problem with checking... simply enter the results of your selections and the best lines are given almost immediately. Based on Lit-Blocks they are easily entered on the coupon and all are accepted by the pools firms.

RACING BOXFORM & HANDICAP WINNER £14.95 (+ £2 for 3" disc)

Two programs for the price of one. Easy to use and they never go out of date. All you need is a few minutes with a daily paper. **BOXFORM** weighs up a race by considering the many facets of form. Easily amended to suit the user's ideas. **HANDICAP WINNER** shows the value for money bets. Over 1,000 winners in 1989 handicaps at 28/1, 25/1, 20/1, 16/1, 15/1... etc. etc. Hundreds of winners this year at prices up to 20/1.

"I received the tape last week and already it has paid for itself" — A.G. Manchester

SPECIAL OFFERS. Any 2 of the above £24.95 or all 3 £34.90 (+ £4 for 3" discs in either case). Both offers include **FREE** program to work out almost any bet. So good it's used by bookies.

RACING TOOL KIT (£49.95 tape or disc)

A package of 7 programs for the racing enthusiast. **BOXFORM** and **HANDICAP WINNER** plus programs to produce ratings and time figures, update private handicaps or form your own, keep records, work out almost any bet, etc.

"Bought your suite of programs — found them to be absolutely marvellous — quite superb" — R.E.W. Wolverhampton

Why pay inflated prices? **BOXoft CLEVER** and get the **BEST**

Available on tape or disc for **SPECTRUM**, **CMD 64/128**, **AMS CPC's**, **BBC B**

Prices for 5.25" disc same as tape

BOXoft (MU), 65 Allans Meadow
Neston, South Wirral, L64 9SQ

Credit card holders may phone 051-336 2668 (24 hrs)



FACT SYSTEMS (Barrow) LTD

19 Focus, 303 Business Centre

South Way, Walworth Industrial Estate, Andover, Hants SP10 5NY

Tel: (0264) 334811

ARCHIMEDES SPECIAL OFFER

System	Basic	Mono	Colour
A3000	£585	£655	£783
410/1	£1,079	£1,149	£1,275
420/1	£1,529	£1,599	£1,725
440/1	£2,249	£2,319	£2,445

ACCESSORIES

Acorn 1mb Ram Upgrade	£179
2nd Floppy Disk Upgrade	£113
Rom Exp Card	£53
I/O Exp Card	£78
Midi Add-on to I/O	£37
Midi Exp Card	£64
A3000 1mb Ram	£179
A3000 User Port/Midi	£46
A3000 Serial Upgrade	£19
A3000 Monitor Stand	£29

LANGUAGES

Assembler, Lisp, Prologx	£174
Fortran 77, ISO-Pascal	£87
Arc Basic Compiler	£87
Ansi-C	£129

UTILITIES

Acorn Toolbox	£174
Clares Toolkit	£44
Instigator	£44
PC-Emulator	£89
Beebug Hearsay	£55
Twin	£26

BUSINESS

Nominal Ledger, Purchase Ledger,	
Sales ledger, Stock management,	
Order Processing/Invoicing	£51
System Delta Plus	£59
Mailshot	£31
Home Accounts	£39

GAMES

Holed Out	£16
E-Type	£16
The Olympics	£16
U.I.M.	£25
Inter-dictor	£25
Arcade 3	£12
Overload	£12
Arcendium	£12
Alerion	£12
All in Boxing	£12
Jet Fighter	£12
Orion	£12
Missile Control	£12
Caverns	£15
Ibix the Viking	£15
Thunder Monk	£12
Hoverbod	£12
Freddy's Folly	£12
Casino	£18
Family Favourites	£18

MISCELLANEOUS

Tempest DTP	£101
Pipedream 3	£132
Alpha-Base	£39
Graphic Writer	£24
Artisan 2	£47
Render Bender	£63

BOOKS (no VAT)

Assembly Language	£13
Arc Operating System	£13
Basic V	£9
Prog Ref Manual	£27

Please Add VAT at 15%
FREE CARRIAGE ON ORDERS
OVER £100 ELSE £1.50
Open Mon-Sat 9am-5.30pm

From Page 99

Listing I

```

10 REM > RndArc
20 REM by Terry Blunt
30 REM (c) The Micro User
40 :
50 MODE 12:OFF
60 ON ERROR PROCerror:END
70 :
80 PROCinit
90 PROCassemble
100 PROCTest
110 PROCquit
120 END
130 :
140 DEF PROCerror
150 ON ERROR OFF:PROCquit
160 REPORT:PRINT" at line ";ERL
170 ENDPROC
180 :
190 DEF PROCquit
200 MODE MODE
210 ENDPROC
220 :
230 DEF PROCinit
240 DIM code 56
250 sp =13
260 link=14
270 pc =15
280 ENDPROC
290 :
300 DEF PROCassemble
310 FOR pass=0 TO 2 STEP 2
320 P%=code
330 [OPT pass
340 ; Random Number Generator
350 ; no entry parameters
360 ; on exit R0 contains a
random i
neger
370 ;
380 .random
390 STMTD (sp)!,{r1-r2,link}
400 LDR r0,seed
410 CMP r0,#0
420 MOVEQ r0,#255

```

```

430 MOV r2,#17
440 .random_loop
450 MOV r1,r0,asr #13
460 EOR r1,r1,r0,asr #24
470 MOVS r1,r1,ror #1
480 ADCS r0,r0,r0
490 SUBS r2,r2,#1
500 BNE random_loop
510 STR r0,seed
520 LDMFD (sp)!,{r1-r2,pc}
530 .seed
540 EQU D RND
550 J:NEXT
560 ENDPROC
570 :
580 DEF PROCTest
590 VDU 28,65,31,79,0
600 PRINT"Randomness""Graphic
Test"
610 PRINT'
620 PRINT"Press:"
630 PRINT"1 : Basic RND"
640 PRINT"2 : M/code RND"
650 PRINT"3 : Exit"
660 Q%=2
670 REPEAT
680 PRINTTAB(0,10);
690 IF Q%=1 THEN
700 PRINT"Basic RND"SPC6
710 ELSE
720 PRINT"M/code RND"SPC6
730 ENDIF
740 GCOL 4
750 RECTANGLEFILL 0,0,1023
760 GCOL 7
770 FOR Y%=0 TO 1023
780 IF Q%=1 THEN
790 A%=RND
800 ELSE
810 A%=USR(random)
820 ENDIF
830 PLOT 69,A%AND1023,Y%

```

```

840 NEXT
850 REPEAT
860 Q%=INSTR("123",GETS)
870 UNTIL Q%>0
880 UNTIL Q%=3
890 ENDPROC

```

Listing II

```

10 REM > RndBBC
20 REM by Terry Blunt
30 REM (c) The Micro User
40 :
50 MODE 0:VDU23;8202;0;0;0;
60 ON ERROR PROCerror:END
70 :
80 PROCinit
90 PROCassemble
100 PROCTest
110 PROCquit

```

Get it
right ✓

10 = 0 0	480 = 1A09 C
20 = 0 0	490 = 1A09 2
30 = 0 0	500 = 1A09 5
40 = 9719 9	510 = 1A09 8
50 = C501 B	520 = 1A09 C
60 = 917E 7	530 = D336 7
70 = 9719 F	540 = 856E 0
80 = DEBB 0	550 = B4F E
90 = 126A 9	560 = 99BF 8
100 = E0D3 2	570 = A9DC D
110 = F34D 4	580 = B9FD E
120 = FD2E 8	590 = F888 0
130 = 9719 2	600 = 7273 F
140 = 72B4 F	610 = 9843 A
150 = 561A 5	620 = B6D3 7
160 = 6BDF A	630 = C8B 5
170 = EDOF 9	640 = DA42 E
180 = 9719 E	650 = EDOF 5
190 = 6D21 5	660 = 9719 2
200 = DE34 D	670 = 5E97 E
210 = EDOF 0	680 = 7165 8
220 = 9719 6	690 = 9719 6
230 = 40D7 7	700 = 7EBF F
240 = 3667 4	710 = 8742 B
250 = EDOF A	720 = 78F7 6
260 = 9719 1	730 = 7475 9
270 = 98A5 2	740 = A3CB 6
280 = B43B 0	750 = E7F5 F
290 = 3FB3 0	760 = D7AC C
300 = 4E48 2	770 = DD D
310 = 0 2	780 = B61 D
320 = 0 2	790 = BFBA 9
330 = 0 2	800 = E64A 9
340 = 0 2	810 = 4496 3
350 = 0 2	820 = 619B F
360 = 3B13 7	830 = 7531 9
370 = AC92 B	840 = F300 6
380 = 8BA7 0	850 = AEF2 B
390 = 123B 9	860 = 2C83 D
400 = 3EBD 1	870 = BFBA F
410 = F888 8	880 = B44E 2
420 = 458E 7	890 = A93B D
430 = 694D 4	900 = C11F 5
440 = D752 4	910 = AA59 7
450 = C6B0 F	920 = 18AC 6
460 = D498 6	930 = CCOB E
470 = 6602 5	940 = EDOF A

SUBSCRIBE NOW!

If you prefer to save the wear and tear on your fingers you'll find this listing – together with all the others from this issue – on this month's disc, sent free if you subscribe to *The Micro User*.

Get it
right ✓

10 = 0 0	230 = 40D7 B	450 = 2DF E	680 = 5A44 F
20 = 0 0	240 = 1577 8	460 = 1FB3 8	690 = 7618 5
30 = 0 0	250 = 91E5 3	470 = 7812 A	700 = F7BC 0
40 = 9719 9	260 = A0B5 4	480 = 6CAE 0	710 = 18C0 1
50 = BA87 4	270 = FDC5 1	490 = 34FE 2	720 = DEF0 4
60 = 917E C	280 = EDOF 6	500 = E3B8 7	730 = 8E1 0
70 = 9719 1	290 = 9719 3	510 = 49F4 E	740 = 62A0 A
80 = DEBB C	300 = 98A5 1	520 = 1574 2	750 = E886 5
90 = 126A 9	310 = B43B E	530 = B6D3 2	760 = 52C3 3
100 = E0D3 4	320 = 3FB3 4	540 = 7341 A	770 = 7531 8
110 = F34D F	330 = 4E48 D	550 = DA42 5	780 = 7618 2
120 = FD2E 4	340 = 175C 3	560 = EDOF C	790 = 916F 2
130 = 9719 0	350 = 4F54 B	570 = 9719 B	800 = 18C0 4
140 = 72B4 E	360 = E868 C	580 = 7EBF 6	810 = DD71 9
150 = 561A 0	370 = 8738 3	590 = 8742 D	820 = 8E1 2
160 = 6BDF D	380 = 3B13 A	600 = 78F7 7	830 = AEF2 F
170 = EDOF 7	390 = 7DE1 B	610 = 7475 5	840 = 2C83 8
180 = 9719 8	400 = 9E5B A	620 = A3CB 9	850 = BFBA 6
190 = 6D21 8	410 = 111E 1	630 = E7F5 2	860 = B44E 4
200 = 1A63 D	420 = F055 2	640 = D7AC 5	870 = A93B 1
210 = EDOF A	430 = 4CE2 4	650 = DD F	880 = CCOB 2
220 = 9719 8	440 = D498 C	660 = B61 E	890 = EDOF 2
		670 = BFBA 0	


```

120 END
130 :
140 DEF PROCerror
150 ON ERROR OFF:PROCquit
160 REPORT:PRINT" at line ";ERL
170 ENDPROC
180 :
190 DEF PROCquit
200 VDU26,12
210 ENDPROC
220 :
230 DEF PROCinit
240 DIM code 47
250 ENDPROC
260 :
270 DEF PROCassemble
280 FOR pass=0 TO 2 STEP 2
290 P%=code
300 LOPT pass
310 \
320 \ no entry parameters
330 \ on exit A undefined Y=0
340 \ random integer in !seed
350 \
360 .random
370 LDY #3
380 .random_test
390 LDA seed,Y
400 BNE random_ok
410 DEY

420 BPL random_test
430 STY seed
440 .random_ok
450 LDY #17
460 .random_loop
470 LDA seed+1
480 LSR A
490 LSR A
500 LSR A
510 LSR A
520 LSR A
530 EOR seed+3
540 ROR A
550 ROL seed
560 ROL seed+1
570 ROL seed+2
580 ROL seed+3
590 DEY
600 BNE random_loop
610 RTS
620 .seed
630 OPT FNequd(RND)
640 J:NEXT
650 ENDPROC
660 :
670 DEF FNequd(D%)
680 !P%=D:P%=P%+4:=pass
690 :
700 DEF PROCtest
710 VDU 28,65,31,79,0
720 PRINT"Randomness""Graphic
Test"

730 PRINT'
740 PRINT"Press:"
750 PRINT"1 : Basic RND"
760 PRINT"2 : M/code RND"
770 PRINT"3 : Exit"
780 Q%=2
790 REPEAT
800 IF Q%=1 BS="Basic RND" ELSE
BS=
"M/code RND"
810 PRINTTAB(0,10)BS$PC6
820 GCOL 0,1
830 FOR Y%=0 TO 1023
840 IF Q%=1 A%=RND ELSE
CALLrando
m:A%!=seed
850 PLOT 69,A%AND1023,Y%
860 NEXT
870 REPEAT
880 Q%=INSTR("123",GET$)
890 UNTIL Q%>0
900 GCOLD,0:MOVE 0,0:MOVE 0,1023
910 PLOT 85,1023,0
920 PLOT 85,1023,1023
930 UNTIL Q%=3
940 ENDPROC

```

All program listings in this issue
can be downloaded FREE on...

MicroLink

New Outline Fonts for the Archimedes

ELECTRONIC

font
F.O.U.N.D.R.Y

- The new outline fonts are suitable for every Archimedes application incorporating the Font Manager: DTP packages, etc.
- Each font contains 215 letters and symbols: Latin 1 alphabet with DPT extensions
- All fonts are hinted
- A comprehensive manual supplied with each delivery
- Prices from £3.99 to £9.50 per font
- *Special discounts for schools*
- Site licences for business use

We also supply printers, computers and disc drives at extremely low prices. Probably the best printer at its price is Canon BJ-130 Bubble Jet used for this ad:

- It has a resolution of 360 by 360 dots per inch
- It takes paper up to A3 size
- And we sell it for only £529.00!

Latest: Aleph One ARM-3 available at £585.00

Prices are exclusive of VAT and delivery

Write for a **free 32 page Font Catalogue** to:

The Electronic Font Foundry
18 Brockenhurst Road • ASCOT SL5 9DL

ACCOUNTING PROGRAMS FROM APRICOTE STUDIOS

THE ACCOUNT BOOK V3 Comprehensive small business accounts to trial balance. VAT approved. Absolutely the EASIEST program to use, with neat final books AND full reports and audit trails. Unlimited entries. Automatic date order. Complete editing of all entries AT ANY TIME. Includes new VAT Return form (Jan. 1990). "The Account Book gets first prize for both price and performance" - Comparison of different accounts programs in Micro User, July '89. "A true user-friendly program. It succeeds admirably" - Beebug, October '88. "An easy to use system" - A&B Computing, August '89. "I am very impressed with these programs. These are programs for any small business." - Beebug, December '89. £27.95 inc.

THE INVOICE PROGRAM V2 Includes 700 customer database which keeps track of up to 2,500 unpaid invoices. VAT rates can be mixed (the VAT section can be turned off if you are not VAT registered) and there are almost no description length limits. Calculates quantities including fractions. 100 stock presets for regular items. Links directly to The Account Book's sales ledger or can be used independently. Automatically produced invoices and statements ready to be popped into window envelopes. Also prints labels for mail shots or even direct envelope addressing. Prints debtor lists including telephone numbers and instant database access to individual customers credit details. "If you buy these programs you will not be disappointed" Beebug, December '89. Judging by the letters of thanks we have received, our customers agree. £27.95 inc.

Special offer: The Account Book + Invoice Program £49.95 inc. Requires dot-matrix printer. State 40 or 80 tracks if using a BBC B or Master.

JUST RELEASED: PERSONAL ACCOUNTS A brand new program to keep track of all your personal income and expenditure. 48 user-defined income and payment headings with instant access to all the heading totals. 20 standing orders or direct debits. 10 bank/building society/credit card accounts with not only the opening balances but also the current balances and balance total. The easiest to use accounting system of all with the ultimate on screen editing facilities (even the previous cursor positions are remembered when you re-load a file). Bank reconciliation with look-a-like account statements to spot errors made by your bank etc. Full report printing and searching facilities including not only your entries but income/payment headings, bank accounts, standing orders and all their totals. Load, save and create new files from existing ones including the carrying forward of balances. Absolutely everything you need if you want to keep track of your finances. Runs on all disc drive and printer configurations. As above "You will not be disappointed", return within 10 days for a full refund if you don't agree. Just £14.95 inc.

All the above programs are available now by return of post for the BBC B, B+, Compact, Master, A3000 and Archimedes (inc. Risc OS). Please state computer/disc size when ordering. Thank you.



APRICOTE STUDIOS
2 Purls Bridge Farm
Manea, Cambs, PE15 0ND



Tel: 035 478 432 for information, help or to order

I HAVE noticed that lots of 6502 text printing routines have been published over the years since the first BBC Micro appeared.

Although very useful to machine code programmers, they can only handle up to 256 bytes of text at once.

The reason for this restriction is that the Y register is used as an index, along with the original address, to point to the location of the next character to be printed. However, as the Y register can only have values between 0 and 255 there is a 256 byte limit imposed upon us.

What we need is a piece of code which includes a routine to increment the original address index high byte every time Y returns to zero. The program following includes such a facility:

The new part of the coding is very short – in fact it only comprises lines 210, 230 and 240.

Because the program stores its original index at the addresses &70 and &71 the facility is easy to incorporate.

All that is needed is a check in the main printing loop to see if Y has reached zero and, if so, to branch to the extra code.

When called it increments the contents of &71 by one because of the way the pointer

Printing restriction removed

£10

Prize letter

is stored – most significant byte second.

Once this has been done the normal loop routine continues to execute until either a terminating byte – 255 (&FF) – is found or the incrementing routine is again required.

Note that EQUB and EQUUS are used in the routine so, as it stands, it can only be run on a Basic 2 or above micro – although the resulting 6502 code will work on any 8 bit BBC Micro.

In this, and any other program containing these commands, Basic 1 owners should replace all the EQUBs with OPT FNequb and a EQUUS becomes OPT FNequs as

shown in these example lines:

```
290 OPT FNequb(22):OPT F
Nequb(7):OPT FNequb(141)
300 OPT FNequs("The Micro
User"):OPT FNequb(13)
330 OPT FNequs(STRING$(1
4,""))
350 OPT FNequs(string$)
```

The functions should be defined as follows:

```
520 DEF FNequb(B%)
530 ?P%=B:P%=P%+1:=L%
540 DEF FNequs(S$)
550 $P%=$S:P%=P%+LEN$:=
L%
```

Using the text printing routine it is theoretically possible to have a text up to 64k – 65536 bytes – in length. However in practice this is not possible because of memory area restrictions.

This means that the routine should be sufficient for all your text printing needs. – **Pete H.N. Dawes, Manchester.**

Incorrect EVALuation

THE Countdown program printed in the letters column of the January issue of The Micro User does not seem to give the correct answer.

The EVAL statement works in the micro's own logical order – first evaluating any multiplication sign wherever it may be.

So if that is the last sign in the equation the last two figures are multiplied together before any other part of the sum is worked out.

This results in the micro giv-

Win a tenner

WANT to write to The Micro User? The address is: Letters, The Micro User, Europa House, Adlington Park, Adlington, Macclesfield, SK10 4NP.

Writers of the most interesting letters receive a £10 prize.

ing as an answer an equation the results of which are nothing like the number expected if you work out from left to right, as humans do.

So $4+2-5 \times 7$ will result in -29 using an EVAL statement, but only 7 if we do it in our heads. – **Jim Morrell, Kingston Upon Hull.**

● The EVAL function in the BBC Micro is designed to work as it does because it is mathematically the correct way. Any good calculator – and in fact most cheaper ones – also work in the same way. So, using the example $4+2-5 \times 7$ it should result in -29 whether done mentally, by using EVAL or on a calculator.

This correct method of evaluation is often referred to in maths as the BODMAS rule.

This means that expressions in Brackets are calculated first – starting at the innermost set – then Order – powers and so forth – then Division, Multiplication, Addition and Subtraction in that order.

So, if you want to obtain 7 from $4+2-5 \times 7$ you need to use brackets: $(4+2-5) \times 7$.

```
10 REM 16 Bit Text Printing Routine
20 REM by P.H.N.Dawes
30 REM (c) The Micro User
40 MODE7
50 string$=CHR$134+"This is a string of test text "+CHR$13
60 FOR L%=0 TO 3 STEP 3
70 P%=&900:COPT L%
80 .main
90 LDX #text MOD 256
100 LDY #text DIV 256
110 JSR print:RTS
120 .print
130 LDA &70:PHA
140 LDA &71:PHA
150 STX &70:STY &71
160 LDY #0
170 .print2
180 LDA (&70),Y
190 CMP #255:BEQ print4
200 JSR &FFE3:INY
210 CPY #0:BEQ print3
220 JMP print2
230 .print3
240 INC &71:JMP print2
250 .print4
260 PLA:STA &71
270 PLA:STA &70:RTS
280 .text
290 EQUB 22:EQUB 7:EQUB 141
300 EQUUS "The Micro User":EQUB 13
310 EQUB 141:EQUUS "The Micro User"
320 EQUB 13:EQUB 145
330 EQUUS STRING$(14,"")
340 EQUB 13:EQUB 13
350 EQUUS string$
360 EQUUS string$
370 EQUUS string$
380 EQUUS string$
390 EQUUS string$
400 EQUUS string$
410 EQUUS string$
420 EQUUS string$
430 EQUUS string$
440 EQUUS string$
450 EQUUS string$
460 EQUUS string$
470 EQUUS string$
480 EQUUS string$
490 EQUB 13:EQUB 255
500 J:NEXT
510 CALL &900
```


Compact rom boards

AS the owner of a Master Compact that is literally overflowing with roms I would like to know if there are any companies manufacturing a rom board – either internal or external – or considering doing so for the micro.

Since it is used mainly as an educational tool for children aged between four and eight, it is not feasible to be constantly leaving the micro case unbolted to enable frequent changing of roms.

I also understand that around 70,000 Compacts have been sold, making a rom board market quite a reasonable proposition. – Mrs. G. Clinch, Gatow.

● Until recently, we did not know of any rom boards for the Compact. However, Jafa Systems (0222 887203) has now released an adaptor to allow Master or Electron cartridges to fit the Compact.

They also supply a rom/ram board to fit into this so you can plug in up to eight roms or a combination of roms and ram.

Archimedes landscapes

AFTER playing Zarch on the Archimedes I attempted to write a program which produced random landscapes based on the same design as the game itself. The resulting program is just five lines long,

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

However, on the rare occasions when mistakes occur corrections are 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 cannot 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 letters pages.

including REM statements:

```
10 REM Zarch imitation
Landscapes
20 REM by Mark Holton
30 V=13:P=0:M=11:G=64:D
IM X(V,M),Y(V,M),S(360):D=
0:FOR S=0 TO 2*PI STEP PI/
180:S(D)=SIN(S):D=D+1:NEXT
:FOR B=1 TO M:FOR A=1 TO V
:X(A,B)=-109+107*(A-A*B/21
+B/3):NEXT:REPEAT:FA=0.15
*RND(100):FB=0.15*RND(100)
:F=FA/15:FOR Y=1 TO M
40 D=1:FOR X=1 TO V:D=D
+F:Y(X,Y)=27.7*Y+(S(D*FA M
OD 360)+S((P+D*FB)MOD 360)
)*G+50:NEXT:P=P+20:NEXT:M
DE 4:FOR Y=1 TO M:MVE X(1,
Y),Y(1,Y):FOR X=1 TO V:DRA
W X(X,Y),Y(X,Y):NEXT:FOR
X=1 TO V:MOVE X(X,1),Y(X,1
):FOR Y=1 TO M
50 DRAW X(X,Y),Y(X,Y):N
EXT:UNTIL 0
```

The routine can produce some quite amazing results, each taking just five seconds to both calculate and draw. – Mark Holton, Southminster, Essex.

● It just goes to show how easy it is to write a short listing

that is capable of producing graphics quite literally out of this world.

So what about a version for the 8 bit BBC Micro then. Any offers?

UIM ratings upheld

I HAVE been reading The Micro User letters column for nearly four years now, but have never seen a letter so far from the point as that of John Salt concerning the UIM game by the 4th Dimension.

The obvious reason why this product was given such high ratings by the reviewer was because of the myriad of different features it contained, such as commodity trading, share trading and currency as well as the vast number of ships, ports, networks and equipment you will find, to name but a few.

As for the missions, did Mr. Salt complete the undocumented voyages of the original Elite – without enlisting the

help of Hac Man or the Mad Hatter?

Has he even attempted to pass through the Anarchy Zone of Elite?

The comments Mr. Salt made were totally unjustified about an excellent game which is on a par with, if not greater than, the mighty Elite itself.

In time UIM will collect a great gathering of supporters as it deserves.

The reviewer was justified in giving the ratings he did – not biased as Mr. Salt suggested. – Robert Matthey (Elite), Billerkey, Essex.

RiscOS Dickie Brickie

RECENTLY received the March edition of The Micro User along with the Archimedes subscription disc.

To my dismay when I tried to run the Dickie Brickie game I was confronted by the error message File TAPE not found at line 3080.

After checking the listing I realised that the problem was with a *TAPE command, which the operating system was not recognising.

However, on removing this and trying again the computer simply froze.

Can you help? – M. Striblehill (age 10), Halesowen, West Midlands.

● Dickie Brickie is not designed to run straight from the RiscOS desktop, but it can be made to work under the

THERE is a simple, but not very well known, technique on both the BBC Micro and Archimedes series of micros which allows complex graphics to be stored on a disc without the need for saving the screen memory as a long data block.

At the start of the routine which produces the graphics – Basic or assembler – add a *SPOOL <filename> command, where filename is the name under which the file is to be saved. Then at the end of the routine simply add *SPOOL.

Using this method all VDU commands are sent to a file. Because instructions such as

Graphics file compressed

PLOT, MOVE and DRAW all use VDU sequences to create their effects, we can use this facility to store all the commands necessary to create the graphics screen in a short file.

If you want to create a sequence of screens that appear in order after each press of a key each single screen must be stored in a separate file.

The reason for this is that the time delay loops that you may be using will not be sent to the file that has been *SPOOLED, and instead any

MODE changes or CLS commands will be performed instantly.

Once you have created all the screens you just need a short program to take care of loading each in order, providing delay loops between each one. The delay loops need be nothing too elaborate, REPEAT UNTIL GET is sufficient. To reload your saved screen file, just type *EXEC <filename>: The screen will not be instantly there, but after a few seconds will have been fully redrawn. – Paul J. Mason

(age 13), Grantham, Lincolnshire.

● This method, as you mention, is not at all new but also not very well known. Its most common use is by software houses which produce long adventures.

As they only have a relatively small amount of disc space on which to store both text and graphics, the *SAVE approach was obviously not viable. Because the length is kept so short using this method it was the natural alternative.

BBC emulator. The process is as follows.

- Insert applications disc two.
- Double-click on l65Host.
- Remove the disc.
- Insert the March monthly
- CHAIN "Game1".

After doing this the game will run correctly, albeit slightly slowly and without any sound effects.

Screen Quest loading

ANYONE who has experienced the Watford Electronics Quest Paint package may have noticed that the program will load a Mode 1 screen correctly, but after saving one using the package it cannot be *LOADED back without strange effects occurring.

The fault, which sometimes results in only half the screen appearing, can be remedied with the program shown:

```
10 REM Quest screen con
vertor
20 REM by A.L.Smith
30 MODE1
40 INPUT "Name of Quest
file :"$
50 INPUT "Name of file
to save :"$
60 IF BS=AS THEN PRINT
"Names are the same. Conti
nue? (Y/N)" ELSE 80
70 DS=GET$:IF DS<>"Y" A
ND DS<>"N" THEN 70 ELSE IF
DS="N" THEN 50
80 CLS
90 OSCLI("LOAD "+AS+" 2
C00")
100 REPEAT UNTIL GET
110 OSCLI("SAVE "+BS+" 2
C00 +5000 3000 3000")
120 CLS:OSCLI("LOAD "+BS
):END
```

— A.L.Smith, Rainford, Merseyside.

● This is a useful routine, but will not work on Basic 1 because it contains the command OSCLI. As with all listings and letters submitted to us, we would be grateful if contributors could avoid Basic 2-specific commands.

To allow the routine to work on Basic 1 this should be replaced with PROCos and the following lines added to the program:

```
130 DEF PROCos($&700):L
OCAL X%,Y%
140 Y%=7:CALL&FFF7:ENDP
ROC
```

More lives than a cat

IN the Hac-Man articles all the cheats presented are for commercial games. But as all the listings published in The Micro User are good, I have written cheats for some of them to provide you with infinite lives.

To make each cheat work, load the original game and then make the specified changes. It is a good idea to copy the original games on to a blank work disc before making any alterations so that the original versions are not lost.

Here are my cheats.

5-Alive — June 1989

Load part two into memory.

Change liv%=liv%-1 on line 1450 to liv%=6.

Fred Drip — July 1989

Alter the li%=li%-1 in line 2330 to li%=3.

The Gate — August 1989

In line 1280 change LI%=LI%-1 to LI%=3.

Crystal Sea — September 1989

List line 1190 and change N%=N%-1 to N%=3.

Snowman's Revenge — January 1990

In line 180 alter sh%(l)=3 to sh%(l)=x where x is the number of shields required.

Dickie Brickie — March 1990

Load part two of the game.

Change lv%=lv%-1 to lv%=3 in line 2260.

Once the games have been altered, save them under their original filenames on your new work disc and then you are all set to play. Happy cheating. — James Page (age 12), High Wycombe, Buckinghamshire.

£10 Prize letter

Tree sorts sorted

I READ with great interest the feature about tree sorts by Anton Mans in the February issue.

I agree with Dr. Mans' method of sorting, but have written a faster version, presented here. In Dr. Mans' program the routine could sort 10,000 words in 108 seconds on an Archimedes. My version reaches the same objective in only 82 seconds.

The setup of the tree is accomplished by one procedure only — PROCdirection — with inputs of the node of the tree and the branch of the node.

I have attempted putting lines 280 to 330 inclusive in a separate procedure, but this only resulted in an increase of time by 15 per cent overall, thus defeating the object of the new program.

However, I do believe that it is still simple enough to follow the system in which the recursion is accomplished within this procedure. — E.D.Englehardt, The Netherlands.

```
10 REM ><Current$Dir>. e%,dir%)
3TreeSort 210 IF pointer%(node%,di
20 REM by E.D.Englehard r%)=0 THEN
t 220 pointer%(node%,dir%)
=30 REM For Basic V =num%
40 REM (c) The Micro Us 230 ELSE
er 240 IF name$(pointer%(no
50 DIM word$(word%),ind de%,dir%))>=name$(num%) TH
ex_sort$(word%) EN
60 PROCindex_sort_tree( 250 PROCdirection(pointe
word$()) r%(node%,dir%),0)
70 END 260 ELSE
80 DEFPROCindex_sort_tr 270 PROCdirection(pointe
ee(name$()) r%(node%,dir%),1)
90 LOCAL num%,inx%,poin 280 ENDIF
ter%( 290 ENDIF
100 DIM pointer%(DIM(nam 300 ENDPROC
e$(),1),1) 310 DEFPROCindex_sorted(
110 FOR num%=2 TO word% num%)
120 IF name$(num%)<=name 320 IF num%<>0 THEN
$(1) THEN 330 PROCindex_sorted(poi
130 PROCdirection(1,0) nter%(num%,0))
140 ELSE 340 inx%+=1:index_sort%(
150 PROCdirection(1,1) inx%)=num%
160 ENDIF 350 PROCindex_sorted(poi
170 NEXT nter%(num%,1))
180 PROCindex_sorted(1) 360 ENDIF
190 ENDPROC 370 ENDPROC
200 DEFPROCdirection(nod
```

Sounds fantastic

I USE my BBC Micro a lot with my Hybrid Music 5000, but I also run many programs that use the built-in sound, some of which are very good.

When I saw the Sound Blaster advertised I immediately bought it but found that although the sound quality improved mains hum became more noticeable. I have been forced to

move my system away from the family stereo unit, which means that my Music 5000 became useless as it doesn't have its own loud-speaker.

But a quick bit of work with the soldering iron and a DIN plug soon had my Sound Blaster plugged straight into the Music 5000 — and it worked perfectly.

Now I get full volume and

good quality without the need for a hi-fi system and it's a lot more portable. — Peter Stevenson, Wirral.

● We've contacted the Sound Blaster manufacturers and with our special offer — see Page 114 — you can buy it with connectors for the Archimedes and A3000, 8 bit BBC Micro or the Music 5000 or Music 500.

TITLE	RRP	SALE	TITLE	RRP	SALE	TITLE	RRP	SALE	TITLE	RRP	SALE
1st Word Plus	91.94	£84.95	COPS .. NEW	19.95	£15.95	Inter-word (Disc)	33.35	£29.95	Risc Basic Compiler	99.95	89.95
Acheton	19.95	£17.95	DataVision	99.95	£89.95	INTER-DICTOR	34.95	29.95	RiscForth	99.95	£89.95
Alerion	14.95	£11.95	Delta Cat (JOYSTICK)	29.95	£26.95	ISO Pascal (Release 2)	113.85	£99.95	RISC-OS Prog Ref Manual		79.00
All in Boxing	14.95	£11.95	Deltabase	29.95	£24.95	Jet Fighter	14.95	£11.95	RISC OS	33.35	
Alpha Base	49.95	£44.95	Desktop Publisher	171.35	£139.95	Keyword	29.95	£25.95	(Customer responsible for installation)		
Alps System	32.00	£27.95	Disc Tree V. 2	49.95	£44.95	Knowledge Organiser	59.95	54.95	Rise in Crime	29.95	£24.95
Ancestry	79.95	£69.95	Dust Cover Archimedes	14.95	£9.95	Logistix .. (Includes manuals)			RoboLOGO	69.95	£59.95
Ansi C (Release 3)	171.35	£154.95	Dust Cover A.3000 K'b'd	5.95	£3.95	Logistix Manual Part 1	113.85	£99.95	Rotor... NEW	24.99	£19.95
ARC-COMM	29.95	£26.95	Erithar seven	29.95	£24.95	Logistix Manual Part 2	10.00	£8.95	Scan-Light Senior	516.35	£479.95
ARC-PCB	195.00	£175.95	Euclid (RISC-OS)	70.00	£59.95	Mailshot	39.95	£34.95	School Administrator	79.95	£69.95
Arche 3 Compilation	14.95	£11.95	Family Favourites	19.95	£15.95	Minotaur	14.95	£11.95	Sigma Sheet	69.95	£59.95
Arceidum	14.95	£11.95	Film Maker	79.95	£69.95	Missile Control	14.95	£11.95	Software Dev. Toolbox	228.85	£199.95
Arch. Reference Manual	29.95		Financial Accountant	175.00	£154.95	Mogul	20.00	£17.95	Solid CAD	49.95	£44.95
Arch Operating System	21.95		FIREBALL 2... NEW	24.95	19.95	Multistore	299.00	£244.95	Spellmaster	44.85	£39.95
Arch. Assembly Lang.	21.95	£18.95	Flying Start 2	99.95	£89.95	Newhall Font Start. Pack	51.75	£46.95	Spellmaster - ROM	58.99	£49.95
Arch. Basic Compiler	99.95	£89.95	Font Starter Pack	51.75	£46.95	Orion	14.95	£11.95	Star Trader	17.95	£15.95
Arctivia	24.95	£19.95	Fortran 77 (Release 2)	113.85	£99.95	Overload	14.95	£11.95	Stock Management	64.95	£54.95
Armadeus	79.95	£69.95	Freddy's Folly	14.95	£11.95	Pac Mania	19.95	£17.95	Stranded	9.95	£24.95
Armadeus Sound-			Fugitives Quest	29.95	£24.95	PC Emulator	113.85	£113.85	Super Dump	24.95	£21.95
Samp. Board	149.95	£139.95	Fun School 2 (0-6 yrs)	19.95	£15.95	Pipedream Spellcheck	49.95	£44.95	System Delta Plus	79.95	£69.95
ARTISAN 2	59.95	£54.95	Fun School 2 (6-8yrs)	19.95	£15.95	Pipedream 3	171.35	£149.95	System Delta Plus Ref Guide		£29.95
Artisan 2 H.P. Driver	14.95	£11.95	Fun School 2 (8+ yrs)	19.95	£15.95	Plague Planet... NEW	11.95	£9.95	Terramex	19.95	£17.95
Artisan 2 Star LC10 Div.	14.95	£11.95	Gamma Plot	69.95	£59.95	Presenter 2 (RISC-OS)	45.94	£39.95	Things to do with Words	24.95	£19.95
Assembler	228.85	£199.95	GENESIS... NEW	99.99	£89.95	Presenter Story	228.85	£199.95	Thundermonk	14.95	£11.95
Atelier	99.95	£89.95	Gerber Plot	125.00	£109.95	(phone for release)			Timewatch	34.44	£29.95
Autosketch	90.85	79.95	Giant Killer	17.50	£15.95	Presentation System	49.95	£44.95	Toolkit Module	39.95	£34.95
Avon	19.95	£17.95	Graph Box	79.95	£69.95	Pro Artisan	169.95	£89.95	Toolkit Plus	49.95	£44.95
BASIC V -			Graphic Writer	29.95	£24.95	Prolog	228.85	£215.95	Trivial Pursuit	29.99	26.95
(A dabhand mini guide)	9.95	£8.95	Hearsay	69.00	£59.95	Realtime Solids Modeller	89.95	£79.95	Twin	33.35	£29.95
Bumper Disc 1 (Educ)	19.95	£15.95	Home Accounts	49.95	£44.95	Render Bender	79.95	£69.95	U-Connect	59.95	£49.95
Bumper Disc 2 (Educ)	19.95	£15.95	Hoverbod	14.95	£11.95	Render Bender -			View 3.0	59.80	£49.95
Cambridge Pascal	79.95	69.95	IBIX THE VIKING	19.95	£17.95	Animated Discs	14.95		Word Up Word Down	17.95	£15.95
Casino	24.95	£19.95	IMPRESSION... NEW	171.35	£154.95	Reporter	39.95	£24.95	Wordwise +	23.00	£19.95
Cavems	19.95	£17.95	Instigator	49.95	£44.95	Repton 3	19.95	£17.95	World Class Lderboard	29.95	£21.95
Conqueror	24.95	£19.95	Inter-chart (Disc)	21.85	£18.95	Return to Doom	19.95	£17.95	Zarch	19.95	£15.95
Control Panel	17.20	£13.95	Inter-sheet (Disc)	33.35	£29.95						

Fun School 2

BBC/ELE CASS RRP £9.95
OFFER PRICE £7.95
 BBC 5.25" DISC RRP £12.95
OFFER PRICE £9.95
 ARC DISC RRP £19.95
OFFER PRICE £15.95
 (All prices are per age-range)

UNDER 6 YEARS Includes:-

- SHAPE SNAP:- Colourful shape recognition
- FIND THE MOLE:- Experiment with number sizes
- TEDDY COUNT:- Ideal introduction to numbers
- WRITE A LETTER:- Creative fun at the keyboard
- COLOUR TRAIN:- Play at spotting colours
- PICK A LETTER:- Word building made easy
- SPELL A WORD:- Enjoy naming the pictures
- TEDDY BEARS PICNIC:- Move around a maze

6 - 8 YEARS Includes:-

- NUMBER TRAIN:- Calculations made enjoyable
- SHOPPING:- Which shops for which products?
- MATHS MAZE:- Fun improving arithmetical skills
- TREASURE HUNT:- Introduction to co-ordinates
- BOUNCE:- Get to grips with angles
- PACKING:- Discover tessellating shapes
- CATERPILLAR:- Word building challenge
- NUMBER 1 JUMP:- Have fun practising tables

OVER 8 YEARS Includes:-

- BUILD A BRIDGE:- Shape-fitting challenge
- PASSAGE OF GUARDIANS:- Enjoy anagrams
- UNICORN:- First steps in problem solving
- LOGIC DOORS:- Mapping made easy
- SOUVENIRS:- An introduction to travel
- CODE BOXES:- Discover binary arithmetic
- MYSTERY MACHINE:- Have fun breaking codes
- ESCAPE:- A final check on progress

JOYSTICKS

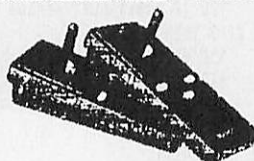
JOYSTICKS FOR THE BBC B/B+ / MASTER 128

Potentiometer:-

- VOLTMACE 3B SINGLE - * Can be used as either left or right handed * Light spring action **£13.95**
 VOLTMACE 3B TWINS - * 2 joysticks wired to one plug * Light spring action * L or R handed **£19.95**

Digital:-

- HARRIER - * 1 Fire button on control handle * Firing push bar * Suction cups **£4.95**
 ELITE SUPERPRO AUTO - * 8 Directional control * Autofire * 2 fire buttons on base * Strong **£13.95**
 COMPETITION PRO - * Arcade quality micro switches * 2 fire buttons on base * Strong **£19.95**



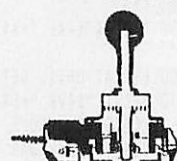
3B TWINS



HARRIER



SUPERPRO



COMPETITION PRO

RECENT RELEASES at special prices!

TITLE	BBC or ELE CASS	BBC DISC	C.P.C.T DISC	TITLE	BBC or ELE CASS	BBC DISC	C.P.C.T DISC
A QUEST. OF SPORT	9.95	10.95	14.95	TANK ATTACK	9.50	10.95	-
BARBARIAN 2	6.95	8.95	10.95	RICOCHET	7.95	9.95	11.95
BLAST	7.95	9.95	-	STAR WARS TRILOGY	-	15.95	-
BALLSTIX	7.95	9.95	11.95	PLAY IT AGAIN SAM Compilations 1 to 10 (Each):-			
ELITE	9.95	11.95	14.95	6.95	8.95	10.95
EXILE	9.95	10.95	14.95	PLAY IT... SAM 11 & 12 (ea)	7.95	9.95	11.95
FAB 4 VOL 1	7.95	-	-	Superior Col 1 (BBC only)	6.95	8.95	10.95
LAST NINJA 2	7.95	9.95	11.95	Superior Col 2 (BBC only)	6.95	8.95	10.95
PERPLEXITY... NEW	7.95	9.95	11.95	Superior Col 3 (ELE only)	6.95	-	-
PREDATOR	6.95	8.95	10.95				
REPTON INFINITY	9.95	10.95	14.95				
SUPERIOR SOCCER	7.95	9.95	11.95				

FOR FULL RANGE SEND FOR OUR CATALOGUE

* Please add 95p P&P (Europe £2.50, Outside Europe £4.50)
 * All prices include VAT
 * Goods despatched within 48hrs (subject to availability)
 * Out of hours answerphone... 0532 436300
 * 20% Discount for schools & colleges, when spending in excess of £150.00 on Archimedes software - phone for details



520ST-FM SUPER PACK

**1Mb DISK DRIVE
£450 OF SOFTWARE**

ARCADE GAMES

Arkanoid II	Imagine	£19.95
Beyond The Ice Palace	Elite	£19.95
Black Lamp	Firebird	£19.95
Buggy Boy	Elite	£19.95
Chopper X	Mastertronic	£9.99
Ikari Warriors	Elite	£14.95
Marble Madness	Electronic Arts	£24.95
Quadrailen	Logotron	£19.95
Ranarama	Hewson Consultants	£19.95
Return To Genesis	Firebird	£19.95
Roadwars	Melbourne House	£19.95
Starquake	Mandarin	£19.95
Test Drive	Electronic Arts	£24.95
Thrust	Firebird	£9.95
Thundercats	Elite	£19.95
Wizball	Ocean	£19.95
Xenon	Melbourne House	£19.95
Zynaps	Hewson Consultants	£19.99

SPORTS SIMULATIONS

Eddie Edwards Super Ski	Elite	£19.95
Seconds Out	Tynesoft	£19.95
Summer Olympiad '88	Tynesoft	£19.95

PRODUCTIVITY SOFTWARE

Organiser	Triangle Publishing	£49.95
-----------	---------------------	--------

JOYSTICK

Atari CX40 Joystick	Atari Corp	£4.99
---------------------	------------	-------

FREE ATARI BUNDLE VALUE: £458.97



The Atari Super Pack is ideal for you if you want to get off to a flying start with the best in entertainment software. The Pack includes a 520ST-FM with 1Mb RAM, a built-in 1Mb disk drive, over £450 of top games and a joystick. If you buy the Super Pack at Silica Shop, we will add our own ST Starter Kit (worth over £200), Free Of Charge. Return the coupon for details.

£399
INCLUDING VAT

With SM124 mono monitor: £498 INC VAT

With SC1224 colour monitor: £698 INC VAT

ATARI ST

The range of Atari ST computers offers something for everyone. From the games enthusiast who wants the challenge of the very best in arcade action, to the businessman who wants to make financial forecasts or faultless presentations. The ST offers high quality graphics, sound and speed for the gamer, whilst providing a fast, user friendly and affordable solution to business. The ST is now firmly established in the home environment and boasts a wealth of users in education, local government, television, and a variety of different businesses. Software for the range stretches to cover applications as diverse as ENTERTAINMENT, ACCOUNTS, ART, COMMUNICATIONS, COMPUTER AIDED DESIGN, DATABASES, DESKTOP PUBLISHING, EDUCATION, MUSIC, PROGRAMMING, SPREADSHEETS, WORD PROCESSING and more. For a full list of the software available, as well as details of the ST range, complete and return the coupon below.

All prices correct at the time of going to press. E&OE

520ST-FM EXPLORER PACK WITH BUILT-IN 1Mb DISK DRIVE



The value for money offered by the Atari ST range is reflected in the Explorer Pack featuring the 520ST-FM computer with 512K RAM. The 520ST-FM computer now comes with a built-in 1 Mb double sided disk drive as well as a free mouse controller and a built-in TV modulator. The new 520ST-FM Explorer Pack includes the 520ST-FM computer, the arcade game Ranarama, a tutorial program and some useful desktop accessories. In addition, if you buy the Explorer Pack from Silica, we will give you the Silica ST Starter Kit worth over £200, FREE OF CHARGE. Return the coupon for details of our Starter Kit and of the full ST range.

£260
ONLY £2.51 PER WEEK
RETURN COUPON FOR DETAILS
+VAT= **£299**

+ SM124 mono monitor: £398 INC VAT

+ SC1224 colour monitor: £598 INC VAT

1040ST-FM PROFESSIONAL PACK

NOW WITH TV MODULATOR

For the serious home user and the small business, we are pleased to announce a new package based around the 1040ST-FM. The 1040ST-FM has 1Mbyte RAM and a 1Mbyte built-in disk drive. In addition, the 1040ST-FM now comes with a TV modulator built-in. (The previously available 1040ST-F was designed for use with a monitor only and did not come with a modulator.) This modulator allows the 1040ST-F to be plugged directly into any domestic TV set, and comes complete with a lead to allow you to do so. The new 'Professional Pack' from Silica includes the new 1040ST-FM with modulator plus four high quality software packages including a spreadsheet, database, word processor and programming language. This 'Professional Pack' software will enable you to get straight down to business with your new computer. In addition to this software (worth £384.84), if you buy the Professional Pack from Silica Shop, you will also receive the Silica ST Starter Kit (worth over £200), Free Of Charge. Return the coupon for further information.



ATARI 1040ST-FM	(Computer)	£499.99
VIP PROFESSIONAL	(Spreadsheet)	£149.95
MICROSOFT WRITE	(Word Processor)	£149.95
SUPERBASE PERSONAL	(Database)	£59.95
BASIC DISK & MANUAL	(Language)	£24.98

NORMAL RRP: £884.82

LESS DISCOUNT: -£385.82

PROFESSIONAL PACK PRICE: £499.00

£499
INCLUDING VAT

With SM124 mono monitor: £598 INC VAT

With SC1224 colour monitor: £798 INC VAT

2Mb & 4Mb MEGA ST

The MEGA ST computers are styled as lightweight keyboard with a separate CPU, connected by a coiled telephone style cable. There are two versions of the MEGA ST, one with 2Mbytes of RAM and the other with 4Mbytes. Each version has a 1Mbyte double sided disk drive built-in to the CPU unit. The MEGA STs do not come with modulator built-in and must therefore be used with a monitor. With every MEGA ST purchased, we will add the 'Professional Pack' software (worth £384.83) detailed above, plus the Silica ST Starter Kit (worth over £200) both Free Of Charge. Return the coupon for further details.

2Mb MEGA ST

£899 INC VAT

+ mono monitor=£998

+ colour monitor=£1198

4Mb MEGA ST

£1199 INC VAT

+ mono monitor=£1298

+ colour monitor=£1498



DTP PageStream £149 +VAT =£171.35

Desktop Publishing (DTP) is one of the fastest growing applications for personal computers. We are pleased to announce a powerful low cost package for the Atari ST called PageStream. PageStream costs only £149 (+VAT=£171.35) and, because it works with an Atari 1040ST and a Seikosha SP-180AI printer, you can be up and running with a complete system for less than £1000. Some of the features of PageStream are listed to the right. If you would like further information on this program, complete and return the coupon below, ticking the 'DTP' box in the corner.

- TEXT-FLOW AROUND GRAPHICS
- ROTATION OF TEXT & GRAPHICS
- SLANT OR TWIST ANY OBJECT
- POSTSCRIPT COMPATIBLE
- TAG FUNCTION
- AUTO/MANUAL KERNING & HYPHENATION
- GROUPING OF OBJECTS

DO YOU OWN AN ATARI ST?

If you already own an Atari ST computer and would like to be registered on our mailing list as an ST user, let us know. We will be pleased to send you copies of our price lists and newsletters FREE OF CHARGE as they become available. Complete the coupon and return it to our Sidcup branch and begin experiencing a specialist ST service that is second to none.

SILICA SHOP:

SIDCUP (& Mail Order) 01-309 1111

1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX

OPEN: MON-SAT 9am - 5.30pm LATE NIGHT: FRIDAY 9am - 7pm

LONDON 01-580 4000

52 Tottenham Court Road, London, W1P 0BA

OPEN: MON-SAT 9.30am - 6.00pm LATE NIGHT: NONE

LONDON 01-629 1234 ext 3914

Selfridges (1st floor), Oxford Street, London, W1A 1AB

OPEN: MON-SAT 9am - 6.00pm LATE NIGHT: THURSDAY 9am - 8pm

WHY SILICA SHOP?

Before you decide when to buy your new Atari ST computer, we suggest you consider very carefully WHERE you buy it. There are MANY companies who can offer you a computer, a few peripherals and the top ten selling titles. There are FEWER companies who can offer a wide range of products for your computer and expert advice and help when you need it. There is ONLY ONE company who can provide the largest range of Atari ST related products in the UK, a full time Atari ST specialist technical helpline and in-depth after sales support, including free newsletters and brochures delivered to your door for as long as you require after you purchase your computer. That one company is Silica Shop. We have been established in the home computer field for ten years with an annual turnover in excess of £8 million and can now claim to meet our customers requirements with an accuracy and understanding which is second to none. But don't just take our word for it. Complete and return the coupon below for our latest literature and begin to experience the Silica Shop specialist Atari service.

SILICA STARTER KIT: Worth over £200. FREE with every Atari ST computer bought from Silica.

PROFESSIONAL PACK: Free business software with 1040ST-FM and MEGA STs bought from Silica.

DEDICATED SERVICING: 7 full-time Atari trained staff with years of experience on Atari servicing.

THE FULL STOCK RANGE: All of your Atari requirements from one place.

AFTER SALES SUPPORT: The staff at Silica are dedicated to help you get the best from your ST.

FREE CATALOGUES: Mailed direct to your home as soon as we print them, featuring offers as well as all of the new releases.

FREE OVERNIGHT DELIVERY: On all hardware orders shipped within the UK mainland.

PRICE MATCH PROMISE: We will match competitors on a 'same product same price' basis.

FREE TECHNICAL HELPLINE: Full time team of Atari technical experts always at your service.

FREE SILICA STARTER KIT WORTH OVER £200

WITH EVERY ST - RETURN COUPON FOR DETAILS
ALL PRICES QUOTED INCLUDE FREE UK DELIVERY

o Silica Shop Ltd, Dept 23-MUSER-05/90, 1-4 The Mews, Hatherley Road, Sidcup, Kent DA14 4DX
PLEASE SEND FREE LITERATURE ON THE ATARI ST

Mr/Mrs/Ms: Initials: Surname:

Address:

Postcode:

Do you already own a computer
If so, which one do you own?

DTP ☐

Take a step into the world of professional publishing with

DATABASE PUBLICATIONS

DTP

Database Publications' DTP is an easy-to-use and flexible page design system for producing high-quality printouts through your Epson-compatible printer. It comes with four of its own fonts to get you started plus a Font Designer to keep you going.

Some of the features of Database Publications' DTP

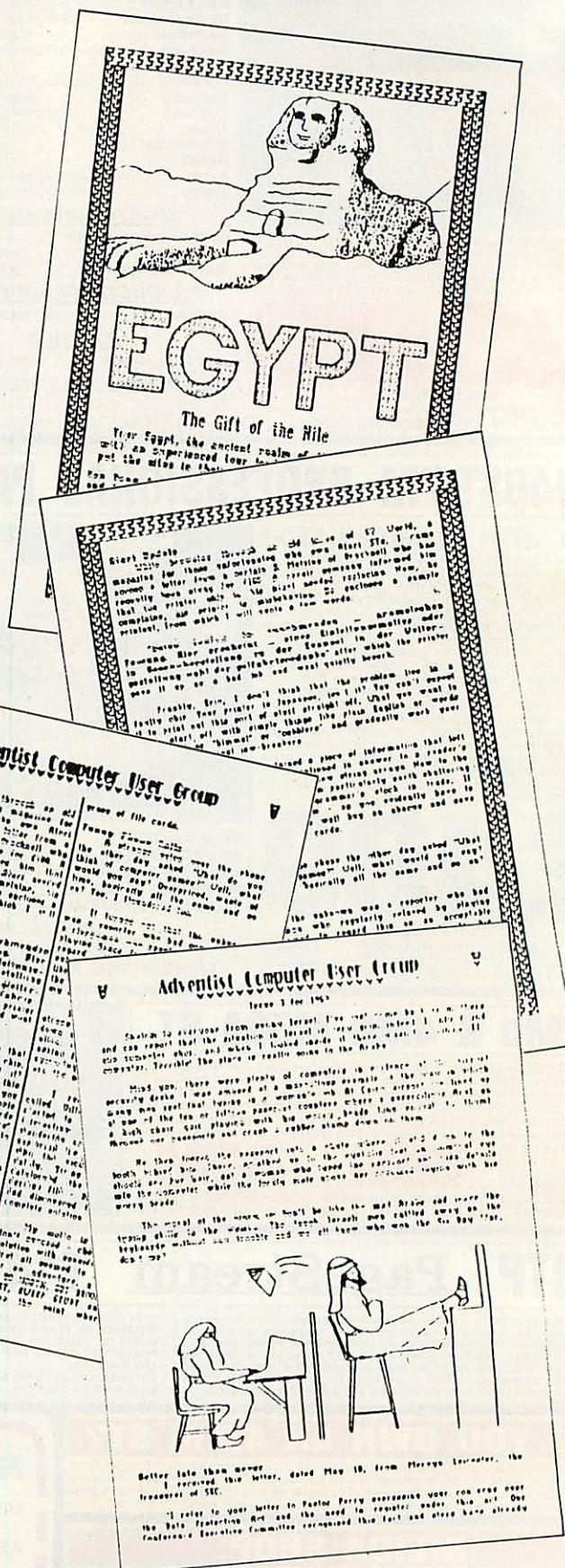
- Independent control of bold, italic, 'thin' and underline characteristics of any font
- Proportional spacing of both external and system fonts
- Stretching and compressing of any area
- Pixel editing via zoom facility
- Up to A4 page design
- No special disc format
- Four fonts provided
- Font Designer supplied
- Built-in Graphic Designer
- Import text or type direct
- Can import cut-outs
- Built-in Mode converter

Database Publications' DTP

5.25in DFS 40/80 track disc (only)

£14.95

Due to the complexity of the program the fill routines will not function correctly with the B+, Master or Compact – all other features are compatible.



Place your order today, using the form on Page 119

Create the right impression with

FontStyle

Fontstyle is a versatile system for creating professional looking printouts. It comes with two ready-made fonts and a designer so you can create your own.

Plus you can now get a set of four discs containing an extra 64 fonts!

FontStyle is so easy to use. You just type in your text using your favourite word processor – enter the easy-to-remember formatting codes and save it. Then just load in the Fontstyle program and you'll have superb results within minutes.

Some of Fontstyle's features

- Professional-looking results from 9 pin printers
- Can print characters, borders, music, patterns and much more
- Simple to use
- Fast draft mode
- 64 fonts
- Up to 8 fonts in any paragraph
- Print any font in different dimensions
- Temporary or hanging indents
- Dynamic control over page layout
- Flexible and easy-to-use font designer
- Ideal for letterheads, invoices, newsletters, memos and so on
- All popular word processors supported

Fontstyle

5.25in disc	£9.95
3.5in disc (BBC ADFS)	£10.95
Archimedes (Using emulator)	£11.95

Set of 64 Fonts (4 discs)

5.25in discs	£14.95
3.5in discs (BBC/Archimedes)	£19.95

MEMO

To: ... Arthur ...
Date: 15 June 1989 ...
From: ...
We need to meet some time in the next few days to discuss the new projects. In particular we shall have to decide how best to tackle Malcolm's proposal about the new office. It should be given encouragement at this time to benefit from closer monitoring.
Could we also have a word about Philip's resignation?
Please arrange a suitable meeting time about 4 hours should be enough.

Jabberwocky

'Twas brillig, and the slithy toves
Did gyre and gimble in the wabe:
All ~~missy~~ were the borogoves,
And the mome raths outgrabe.

"Beware the Jabberwock, my son!
The jaws that bite, the claws that catch
Beware the Jubjub bird, and shun
The frumious Bandersnatch!"

(and so on, inter)

The mouse's tale

"Fury said to
a mouse, That
he met in the
house, 'Let
us both go
to law: I
will prose-
cute you.
Come, I'll
take no de-
nial; We
must have
a trial:
For really
this morn-
ing I've
nothing
to do.'
Said the
mouse to
the cur,
'Such a
trial, dear
Sir, with
no jury
or judge,
would
be wast-
ing our
breath.'
'I'll be
Jury.'
Said
the
cur,
'I'll
be
Judge.'
Fury
said
'I'll
try
the
whole
cause,
and
con-
demn
you to
death.'

FIN~II CAR SURGERY

10 Hamilton Square
BIRKENHEAD
Merseyside
L41 6RU

INVOICE

To replacing worn flange-grobbles:

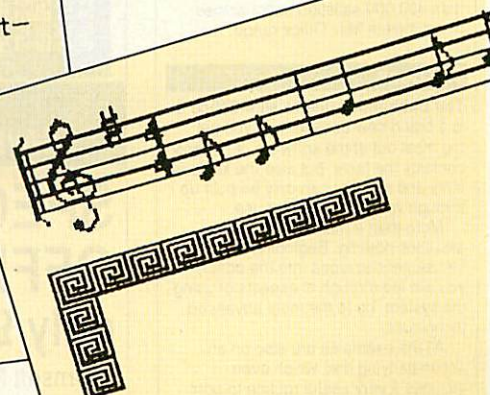
Parts
labour

TOTAL

+15% VAT

GRAND TOTAL

Payment terms: 4 days or we send the boys round



Place your order today, using the form on Page 119

FUN SCHOOL

TAPE 5.25" DISC
£9.95 £12.95

Educational Bundle

Ages 2-5

Alphabet
Colours
Counting
House
Magic Garden
Matchmaker
Numbers
Pelican
Seaside
Snap

Ages 5-8

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

Ages 8-12

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

- Use your BBC Micro 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

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.

TELETEXT ADAPTER

With the Morley Teletext Adaptor you'll be joining the 3.5 million households who regularly access the thousands of pages of Ceefax, Oracle and 4-Tel to check programme details, holiday information, weather, up-to-the-minute news bulletins and much more. AND you'll have far more flexibility than if you use a normal TV set – you can store or print pages and program your BBC Micro to evaluate the data for you. While you're watching your favourite TV programme your micro can be printing a review of a film to be screened later, checking your personal share portfolio or even checking whether you've won the pools.

The Morley Teletext Adapter is the most popular unit on the market with more than 10,000 satisfied customers – including the Department of Transport who use it to display weather maps at service stations throughout the country. It plugs straight into the user port, includes menu-driven software and automatically tunes itself to the required channel. You'll be able to store pages in memory, use the real-time clock in your programs and automatically load associated pages each time you select a page from the menu – considerably speeding up access time.

The Morley Teletext Adapter is an ideal companion for your BBC Micro system

Note: If you use your BBC Micro's auxiliary power socket for your disc drive, or any other external device, you will need a power supply which we can supply for an additional £9.95

Normal price £122.60 Special Offer Price £99.95 including VAT and p&p



SAVE £23!

10,000 customers can't be wrong!

Look what you get!

- Stylish beige teletext unit
- Official BBC Advanced Teletext rom
- Utilities disc packed with programs to help you make the most of your receiver

THE PERFECT PAIR

The best-selling, award-winning BBC software is now joined by THE definitive guide



The Program

Mini Office II is the highly-acclaimed suite of integrated programs which turn your computer into a versatile business machine.

It's the perfect package to increase your personal productivity – with more than 400,000 satisfied users across the complete Mini Office range.

The Book

The Dabhand Guide to Mini Office II is a brand new book to help you get the most out of the software. It not only contains the facts, but also the kinds of hints and tips that can only be built up through years of computer use.

More than a manual, the guide assumes nothing. Beginning with the first sentences typed into the editor, you are led through all aspects of using the system, up to the most advanced techniques.

All the examples are also on an accompanying disc which even includes a very useful routine to print out large spreadsheets sideways.



Packed full of some of the best educational games available for the BBC Micro, the new Ten of the Best Educational Games is the ideal way for your children to learn about maths, spelling, anagrams, telling the time, general knowledge, and even the rudiments of running a business!

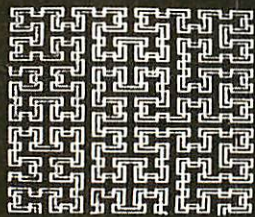
Specially compiled by the *Electron* and *Micro User*, teams to give a good ground in all aspects of learning, and at the very special price of only £5.95 on tape, or £6.95 on disc, this collection is a treat you and your children cannot afford to miss!

Give your children hours of fun, and help them to learn the easy way by ordering your copy today.

ACORN SOFTWARE LANGUAGES

FORTH

for the BBC Microcomputer



SAVE £30

SPECIAL OFFER only £19.95

Acornsoft Forth Rom £19.95

SAVE on batteries

Four your personal stereo, radio or TV

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

We have solved the problem with the unique superfast powerful battery and charger kit.

This amazing device will completely charge four standard AA size rechargeable batteries in under 2 hours and each battery can be recharged at least 1,000 times.

Further, for a limited period we can sell the charger and four rechargeable batteries at the staggeringly low cost of £19.95 (plus £1 p&p).



It will pay for itself within weeks!

TANK ATTACK

Tank Attack is a computerised board game for two, three or four players, where each one takes the role of a General commanding a country's Tank Corps of one or more armoured divisions.

Your objective is to capture the enemy headquarters, which will require the planned strategic deployment of your forces and regular fire duels between your own and enemy units. Weather, morale, skill, judgement, planning foresight, careful management of rebuild and repair facilities and luck all play a part in deciding the result of each game.

Tank attack is one of those games you keep coming back to, and at the special offer price it is guaranteed to give you and your friends hours of action-packed excitement.

- Control a full division of tanks and armoured cars
- See all the fighting 'live' on your computer
- Superb board and fully detailed playing pieces
- Real time graphics
- Play as allies or enemies
- Suitable for all ages

TAPE 5.25" DISC
£9.95 £12.95

Place your order today, using the form opposite

Please allow up to 28 days for delivery

Valid until May 31, 1990

Back issues

Nov 1989	£1.75	2532		Feb 1990	£1.75	2535	
Dec 1989	£1.75	2533		Mar 1990	£1.75	2536	
Jan 1990	£1.75	2534		Apr 1990	£1.75	2537	

November-April 1990 bundle (6 issues) £8.95 2730

Add £3 for Europe & £12 Overseas

Fontstyle

(see page 117)

Fontstyle	5.25" (40/80T)	£9.95	2108
Fontstyle	3.5" (BBC ADFS)	£10.95	2109
Fontstyle	(Archimedes)	£11.95	2110
64 Fonts	5.25" (40T)	£14.95	2115
64 Fonts	5.25" (80T)	£14.95	2116
64 Fonts	3.5" (BBC/Archimedes)	£19.95	2117

Arcade Game Creator (DFS only)

(see page 115)

Cassette & Manual	£9.95	2268
5.25" disc (40T) & Manual	£11.95	2269
5.25" (80T) & Manual	£11.95	2270

Keyword

Archimedes	3.5" disc	£19.95	2352
BBC/Electron	3.5" ADFS disc	£14.95	2351
BBC/Electron	5.25" 80T DFS disc	£14.95	2353
BBC/Electron	5.25" 40T DFS disc	£9.95	2354

Acorn Computing

Acorn Computing Magazine	£2.50	2356
Magazine + Disc	£6.95	2357

Fun School + Nursery Rhymes

Cassette	£9.25	2090
5.25" Disc BBC B, B+ (40T)	£12.95	2091
5.25" Disc BBC B, B+ (80T)	£19.95	2092

Tank Attack

(see page 32)

Tape	£9.99	2102
5.25" Disc (40T)	£12.95	2100
5.25" Disc (JT)	£12.95	2101

Ten of the Best Educational Programs

(DFS only)

Cassette	£5.95	2189
5.25" Disc (40T)	£6.95	2190
5.25" Disc (80T)	£6.95	2191

Pocket colour TV

NEW

£94.95	2122
Plus post and packing £1.50	

Battery charger

£19.95	2123
Plus post and packing £1.50	

Perfect Pair

Available For:	MO2	Book	Disc	Price	Code	Please Tick
Tape users	•	•	-	£19.95	2271	
Model B, B+ (40T disc)	•	•	-	£21.95	2272	
Model B, B+ (80T disc)	•	•	-	£21.95	2273	
Master (5.25" 40T disc)	•	•	-	£24.95	2281	
Master (5.25" 80T disc)	•	•	-	£24.95	2276	
Model B, B+ (40T disc)	•	•	•	£29.95	2274	
Model B, B+ (80T disc)	•	•	•	£29.95	2275	
Master (5.25" 40T disc)	•	•	•	£32.95	2282	
Master (5.25" 80T disc)	•	•	•	£32.95	2277	

Binder

£4.95 2221

Disc storage box

5.25" discs only £4.95 2052

Soundblaster

(see page 52)

NEW

£34.99 2360

Dust covers

BBC B & B+	£3.95	2220
BBC Master	£3.95	2222
BBC Master Compact	£3.95	2224

Database Publications DTP

(See page 116)

5.25" DFS 40 Track	£14.95	2145
5.25" DFS 80 Track	£14.95	2146

Morley Teletext Adapter

(See page 36)

Teletext Adapter (40T utilities disc) + Design 7 Plus	£99.95	2157
Teletext Adapter (80T utilities disc) + Design 7 Plus	£99.95	2158
Power Supply	£9.95	2054

DTP Yearbook 1990

£14.95 2125

Forth Rom

£19.95 2046

Add £4 per Rom for Europe & £15 Overseas

Transparent calculator



£7.95 2118

Addition for postage: Europe & £ire add £3
Overseas add £5
(Unless otherwise indicated)

Send to: Database Direct, FREEPOST, Ellesmere Port, South Wirral L65 3EB

(No stamp needed if posted in UK)

Products are normally despatched within 48 hours of receipt but delivery of certain items could take up to 28 days

Order at any time of the day or night

Orders by phone: 051-357 1275

Orders by Fax: 051-357 2813

Orders by MicroLink: MAG001

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

General Enquiries: 051-357 2961

Payment: please indicate method (✓)

☐ Cheque/Eurocheque made payable to Database Direct

☐ Access/Mastercard/Eurocard/Barclaycard/Visa/Connect

No.

Expiry Date

Name _____ Signed _____

Address _____

Post Code _____

Daytime telephone number in case of queries _____

MU5

The Micro User gui

WEST MIDLANDS



MAUDEN SALES



We talk both COMPUTER LANGUAGE & ENGLISH.

Ring and talk to us in either!

Computers picked up at your premises.

Repairs carried out on ours..

We consider ourselves the best in the West Midlands.

Why not find out for yourselves.

We are also stockists of Educational Software.

MAUDEN SALES
P. O. BOX 23
0384 371362

HAMPSHIRE

Acorn Service Centre

ALSYSTEMS

- 0% Finance available
- Training Courses
- Network Installation
- Technical Support
- Teacher's Scheme
- FREE Hyperpack with ALL A300's sold

ALTON (0420) 87213

65 SALISBURY CLOSE, ALTON,
HANTS GU34 2TF.
EDUCATION AND BFPO
ORDERS ACCEPTED



REPAIRS
computers
disc drives
monitors

GET REAL SUPPORT
CALL US

SJ research
networks

ISLE OF WIGHT



COMPUTER TUTORIAL SERVICES

ACORN DEALERS Sales & Business Consultancy
Individual Tuition
PC's & ARCHIMEDES Bespoke Software
Micro Computer Supplies

TEL: (0983) 294333 FAX: 298439
17 Market Hill, Cowes, Isle of Wight PO31 7TR

NOTTINGHAMSHIRE

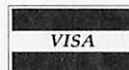
G. A. COMPUTERS LTD

Acorn  AUTHORIZED
ACORN DEALER

SUPPLIERS TO EDUCATION

STOCKISTS OF AMSTRAD, COMMODORE, ATARI

LARGE RANGE OF PERIPHERALS & MEDIA
AMSTRAD ADVANCED SYSTEMS CENTRE &
CAMBRIDGE Z88 AUTHORIZED DEALER
SAGE MAIN AGENT



1 WILFORD ROAD, RUDDINGTON,
NOTTINGHAM. PHONE (0602) 211225
FAX (0602) 456289



TYNE & WEAR

CURRIE + MAUGHAN Microcomputers

SALES – SERVICE – SUPPORT

For most popular makes of hardware
Authorised Commodore, Amstrad, Star dealers.
Software – Accounts, W/Processing, Database,
Spreadsheets.

Training available.

Service on most makes of hardware, maintenance
contracts available if required.

TEL: (091) 4558111
Charles Newton Building
Commercial Rd, South Shields,
Tyne & Wear NE33 5SH

BEDFORDSHIRE & NORTHAMPTONSHIRE

VECTOR SERVICES LIMITED

Please contact us for all your
Acorn Computers – hardware
and software and associated
peripherals

Peter Goater
Vector Services Limited, 13 Denington Road,
Wellingborough, Northants NN8 2RL

0933 79300

Contact Martin Bailey on 0625 878888 now to

de to local dealers

SOUTH YORKSHIRE

SMART COMPUTERS
253 BROOMHALL STREET
SHEFFIELD 10
Telephone 0742 766655

**IBM COMPATIBLE &
 ACORN SPECIALISTS**

**CALL FOR A
 DEMONSTRATION!!!**

WEST YORKSHIRE

Resource Facilities

THE BUSINESS AND EDUCATION SUPPORT SERVICE

**Spruce House, Washer Lane,
 HALIFAX HX2 7DR**

**For all sales and service of ACORN
 hardware, software upgrades and peripherals.**

Special educational prices

EPSON printers & PC's

**Tel: 0422 365935
 Fax (0422) 346 388**

Acorn
 The choice of experience.

NORTHAMPTONSHIRE



CCS



SYSTEM ONE

Acorn 410/1 Archimedes £1,199
 Acorn Colour Monitor£220
 1 Meg ram Upgrade£95
 20 Meg Hard Disc£195
 Total System Cost£1,709
 Special Offer Price£1,540

SYSTEM TWO

Acorn 410/1 Archimedes £1199
 Eizo Multisync Monitor£390
 3 Meg Ram Upgrade£265
 40 Meg Hard Disc£430
 Total System Price£2,284
 Special Offer Price£2,050

SYSTEM THREE

As system 2 but with ARM3
 Total System Price£2,879
 Special Offer Price£2,589

Please phone for a special price on the specific equipment that you are interested in.
 Offer Closes April 30th 1990

Phone Today For Details Northampton (0604 760991)

Fax: (0604) 761800

All Prices Are Exclusive of V.A.T.

We have re-located to new, larger premises:-

Craddock Computer Systems

20 Osyth Close, Brackmills Industrial Estate, Northampton NN4 0DY

KENT

COMPUTEREYES

16 Starnes Court, Union St., Maidstone, Kent.

**Archimedes specialist for
 the Kent area.**



(0622) 751096



MIDDLESEX

JR Letronics Co

- * Archimedes/A3000/BBC
- * Computer Peripherals
- * Educational & Business Software
- * Documentation
- * Discs & Paper
- * Maintenance of all BBC machines

Proprietor:

J.H.JARLETT

Acorn

01-977-8053

The choice of experience

The Annexe 2 Broad Street Teddington Middlesex TW11 8RF

This advert has been produced by Acorn's Desktop Publishing

SCOTLAND

**Best display in Scotland of
 BBC and Archimedes**

FREE installation of all upgrades

Scottish dealer for WATFORD ELECTRONICS

Excellent prices on printers, monitors, drives etc . . .

REPAIRS to BBC machines



THE COMPUTER DEPOT

205 Buchanan Street
 GLASGOW G1 2JZ

Tel: 041-332 3944

CREDIT TERMS AVAILABLE

55 Clerk Street,
 EDINBURGH EH8 9JQ

Tel: 031-6684146

MAIL ORDER SERVICE

have YOUR company included in this section

From Page 63

Listing I

```

10 REM>$KeySRC
20 REM The Hot Key system
30 REM by Gareth S. Long
40 REM (c) The Micro User
50 CLS:PROCinit:PROCCasm:PROCsav:END
60 DEFPROCinit
70 Module$="S.Modules.HotKey"
80 Version$="1.00"
90 Date$="(27 Oct 1989)"
100 buff%=84000
110 DIM code% buff%
120 FORI%=code% TO (code%+buff%) STEP
4: !I%=0:NEXT
130 keystatus=0
140 inuse=4
150 key=8
160 ENDPROC
170 DEFPROCcasm
180 FORI%=4TO6STEP2
190 P%=0:0%=code%
200 [ OPT I%
220 EQU0 0
230 EQU0 initialise
240 EQU0 finalise
250 EQU0 service
260 EQU0 titlemess
270 EQU0 helpmess
280 EQU0 commandtable
290 .titlemess
300 EQU0 "HotKey"+CHRS0
310 ALIGN
320 .helpmess

```

SUBSCRIBE NOW!

If you prefer to save the wear and tear on your fingers you'll find this listing - together with all the others from this issue - on this month's disc, sent free if you subscribe to *The Micro User*.

```

330 EQU0 "Hot Keys"+CHRS9+Versio
n$+" "+Date$+CHRS0
340 ALIGN
350 .initialise
360 STMFDR13!,{r0-r6,r14}
370 LDR r0,[r12]
380 CMP r0,#800
390 LDRNE r12,[r12]
400 BNE restart
410 MOV r0,#806
420 MOV r1,#820
430 MOV r3,#8100
440 ADD r3,r3,#80C
450 SWI "XOS_Module"
460 LDMVSD r13!,{r0-r6,r14}
470 ADRVS r0,initerror
480 ORRVSS pc,r14,#810000000
490 STR r2,[r12]
500 LDR r12,[r12]
510 MOV r0,#800
; Change to &FF to start active
520 STR r0,[r12,#keystatus]
530 STR r0,[r12,#inuse]
540 MOV r0,#880
; Default 'print' key
550 STR r0,[r12,#key]
560 ADR r0,default
570 SWI "XOS_CLI"
580 ADR r0,grabscreen
590 SWI "XOS_CLI"

```

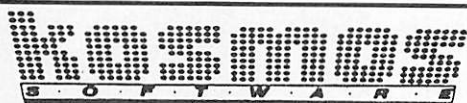
```

600 ADR r0,grabscreen2
610 SWI "XOS_CLI"
620 LDMFDR13!,{r0-r6,pc}
630 .restart
640 LDR r0,[r12,#keystatus]
650 CMP r0,#800
660 MOVNE r0,#814
670 ADRNE r1,keypress
680 MOVNE r2,r12
690 SWINE "OS_Claim"
700 LDMFDR13!,{r0-r6,pc}
710 .finalise
720 STMFDR13!,{r0-r6,r14}
730 LDR r12,[r12]
740 LDR r0,[r12,#keystatus]
750 CMP r0,#800
760 MOVNE r0,#814
770 ADRNE r1,keypress
780 MOVNE r2,r12
790 SWINE "OS_Release"
800 LDMFDR13!,{r0-r6,pc}
810 .service
820 STMFDR13!,{r0-r6,r14}
830 LDR r12,[r12]
840 CMP r1,#827
850 BEQ restart
860 LDMFDR13!,{r0-r6,pc}
870 .keypress
880 STMFDR13!,{r0-r6,r14}
890 CMP r1,#800
900 LDMNEFDR13!,{r0-r6,pc}
910 LDR r1,[r12,#inuse]
920 CMP r1,#800
930 LDMNEFDR13!,{r0-r6,pc}
940 LDR r1,[r12,#key]
950 CMP r0,r1
960 LDMNEFDR13!,{r0-r6,pc}

```

Get it
right ✓

10 = 0 0	350 = 5B39 4	680 = 410B 9	1030 = 61BC 1	1380 = 9176 2	1730 = 3050 0	2080 = 1971 C
20 = 0 0	360 = 6C3F 0	690 = 9176 6	1040 = 49A5 F	1390 = 9C78 F	1740 = E46 E	2090 = 24FA 6
30 = 0 0	370 = D42B 6	700 = CECC 3	1050 = CD0D 5	1400 = B053 F	1750 = 9392 5	2100 = 387 C
40 = 0 0	380 = 188 8	710 = 5F0B 4	1060 = CADC 7	1410 = AC1B E	1760 = 2D46 D	2110 = 50B 3
50 = 78FA A	390 = 929A 8	720 = 6C3F A	1070 = 8540 4	1420 = 37B5 A	1770 = 332F 6	2120 = 24FA E
60 = 344C A	400 = E806 7	730 = F390 A	1080 = 893F C	1430 = 79AE B	1780 = 9087 B	2130 = BBB E
70 = 9652 7	410 = E9F9 F	740 = 49CB 5	1090 = 6BC1 8	1440 = 1766 5	1790 = 5C7F 3	2140 = 7030 0
80 = 6454 5	420 = AAFD A	750 = 188 1	1100 = 48D3 D	1450 = 1AF2 0	1800 = 24FA 4	2150 = 24FA F
90 = 9E19 B	430 = E640 2	760 = 3E5D C	1110 = 584D 4	1460 = 51D5 C	1810 = 80 3	2160 = 8FA2 9
100 = 5FE7 4	440 = 494 8	770 = 49FD 1	1120 = 7B47 B	1470 = 5AA2 6	1820 = EA12 F	2170 = 38B0 F
110 = 44DC B	450 = FF19 5	780 = 410B C	1130 = E86B 1	1480 = 61BC 2	1830 = 24FA F	2180 = 24FA C
120 = 30F C	460 = E784 5	790 = 777B 3	1140 = F390 C	1490 = 2E60 3	1840 = 9611 A	2190 = 8A7E C
130 = 5DAF 4	470 = A1E9 0	800 = CECC 4	1150 = 4418 A	1500 = 1403 D	1850 = 8BEC 1	2200 = 6592 1
140 = D590 5	480 = 4FA9 3	810 = FEEA 2	1160 = DB05 8	1510 = 52F D	1860 = 24FA E	2210 = 5B46 B
150 = 92BF C	490 = A052 2	820 = 6C3F 4	1170 = 6A2B F	1520 = 2D46 1	1870 = 947D 2	2220 = C4A3 E
160 = ED0F 7	500 = F390 3	830 = F390 5	1180 = 93EA 5	1530 = C7F 4	1880 = CB73 B	2230 = 236E 2
170 = DF1D F	510 = 2B05 4	840 = 529D C	1190 = E3FA 6	1540 = 179E B	1890 = 9F32 2	2240 = 24FA 2
180 = B14B 5	520 = A9D2 2	850 = 9DD7 E	1200 = 6807 4	1550 = F8CF E	1900 = 24FA 8	2250 = 28F5 E
190 = AAEE 7	530 = 48D3 4	860 = CECC F	1210 = B96C 9	1560 = 49CB B	1910 = 3169 5	2260 = 82B1 4
200 = 5DBA 2	540 = 7AA8 4	870 = 99A1 0	1220 = A9A0 A	1570 = 1B8 A	1920 = E53A 4	2270 = AD57 4
220 = D2AA A	550 = 5C48 4	880 = 6C3F D	1230 = CF58 5	1580 = B5D1 A	1930 = 24FA F	2280 = EDDC 6
230 = 6DC5 F	560 = 7F80 6	890 = 4418 F	1240 = 3E57 A	1590 = 2D26 0	1940 = D2AA C	2290 = 1971 D
240 = 8BF8 7	570 = 7D39 1	900 = A440 5	1250 = BD53 F	1600 = F8CF E	1950 = D2AA 7	2300 = 24FA D
250 = 120 9	580 = 650C 2	910 = 8DA9 D	1260 = CF58 A	1610 = 61BC 1	1960 = D2AA E	2310 = 902A 0
260 = B063 3	590 = 7D39 D	920 = 4418 A	1270 = 272D 5	1620 = D9D8 C	1970 = 49F2 5	2320 = 24FA 0
270 = 13E8 1	600 = 2612 3	930 = A440 2	1280 = B313 3	1630 = FFOA 5	1980 = BF8D 5	2330 = 8B58 8
280 = B0C9 D	610 = 7D39 1	940 = 7C55 6	1290 = 65D0 F	1640 = A86 9	1990 = 24FA B	2340 = 2C83 7
290 = CB9A 0	620 = CECC 3	950 = 3CB1 F	1300 = C777 9	1650 = 7EE3 8	2000 = BE A	2350 = EDDF 7
300 = BF8D 5	630 = 9A41 2	960 = A440 B	1310 = 6295 B	1660 = FEF7 C	2010 = 244E A	2360 = 7A2C B
310 = 24FA B	640 = 49CB F	970 = 3591 0	1320 = BD53 8	1670 = FFOA 9	2020 = EB77 0	2370 = 6255 1
320 = C718 D	650 = 188 E	980 = 48D3 3	1330 = F7C8 5	1680 = A86 6	2030 = D73F 9	2380 = A1ED C
330 = 13CF F	660 = 3E5D B	990 = 7326 D	1340 = 626A A	1690 = 4DD2 8	2040 = D2AA 8	2390 = 7B73 7
340 = 24FA 9	670 = 49FD 3	1000 = FD18 2	1350 = 3E5D 7	1700 = 1E67 F	2050 = 18A7 7	2400 = EDDF B
		1010 = 2CA0 5	1360 = 49FD 1	1710 = 9392 D	2060 = DB52 6	
		1020 = 9B8C C	1370 = 410B C	1720 = C47B F	2070 = 908E 5	



Whatever your subject

French, First Aid, Football, Spelling, Science, Spanish, Sport, Scotland, England, English Words, German, General Knowledge, Geography, Italian, Arithmetic, Natural History and Welsh

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



ADVENTURES



Includes free game – HEZARIN!

BBC, Compact DFS, Elk DFS, A3000
and Arc £19.95 (inc. VAT) + 50p p&p

Previous encounters with Doom saw you too busy saving your own skin to worry about the future of the planet. In THE LAST DAYS OF DOOM you'll do just that! The final part of the Doom trilogy will keep you & your Robot Dog busy for days!

PO Box 39, Stilton, Peterborough PE7 3RL. Tel: 0733 244682



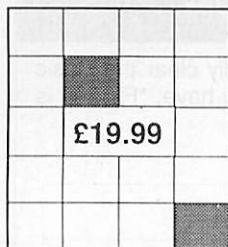
P.O. Box 432
Hemel Hempstead
Herts. HP2 5UP

Archimedes Software

WORDALL

WORDALL is a wordplay software package, ideal for crossword enthusiasts, English students, and education (helps to make spelling fun). Some of its many features include:

- ☐ Crossword compiler/solver
- ☐ Anagrams/Anagram solver
- ☐ Sentence anagrams
- ☐ Spelling checker
- ☐ Build your own dictionaries
- ☐ Add to dictionary



This package which took over a year to develop is not just another dictionary. It can actually compile full crosswords in less than 3 minutes giving you the grids, and automatically inserting the words from a selection of over 160,000. It will also print out your crosswords to a dot matrix printer in two forms – one with answers inserted and one without.

The price, just £19.99. Cheques, Postal Orders should be made payable to "Switch" and sent with your order to the above address. (Wordall requires at least 1 meg of RAM).

Learning has never been such fun!

Fun School 2 has been a tremendous success with more than 60,000 copies sold to date – even reaching Number 3 in the Gallup full-price software chart!

Each pack contains eight colourful and exciting programs designed by a team of educationalists, a colourful button badge and detailed instructions giving educational help.

The computer itself monitors the child's progress. The skill level – initially set by you – is automatically adjusted to suit your child's ability.

Now children can enjoy using your computer while they learn at their own pace.

Give your children an unfair advantage with Fun School 2!

"The number one choice in our school"

– The Micro User

"Fantastic!"

– New Atari User

"It is fun, and your child will almost certainly learn too."

– Amstrad Action

"Full marks to Database"

– Amstrad User

On sale at top dealers nationwide and selected branches of WH Smith and Boots subject to availability

Order by telephone on 051-357 2961, or send your name, address, postcode and product code number together with a cheque payable to Database Software or your Access/Visa number and its expiry date. Postage free in the UK. Add £2 per program for Europe & Eire (£5 Overseas).

Send to:

Database Direct, FREEPOST, Ellesmere Port, South Wirral L65 3EB.



Under-6s



6-8 years



Over-8s

Prices from
£9.95

Format	Under 6s		6-8 years		Over 8s	
	Tape	Disc	Tape	Disc	Tape	Disc
Spectrum	9094	9095	9096	9097	9098	9099
Commodore 64	9064	9065	9066	9067	9068	9069
Amstrad CPC	9179	9180	9181	9182	9183	9184
BBC Micro/Electron	2239		2242		2245	
BBC B+/Master 40 Track		2240		2243		2249
BBC B+/Master 80 Track		2241		2244		2250
Atari ST		9192		9193		9194
Amiga		9842		9843		9844
PC 5.25"		5764		5765		5766
PC 3.5"		5767		5768		5769
Archimedes		2900		2901		2902

8-bit formats: £9.95 (cassette) £12.95 (disc)

16/32-bit formats (ST, Amiga, PC, Archimedes): £19.95

Please quote the product code number
(as shown above) when you order.

DATABASE EDUCATIONAL SOFTWARE


```

970 MOV r0,#8FF
980 STR r0,[r12,#inuse]
990 ADR r0,code
1000 ADD r1,r12,#80C
1010 SWI "XOS_AddCallBack"
1020 LDMFD r13!,{r0-r6,r12}
1030 LDMFD r13!,{pc}
1040 .code
1050 STMFD r13!,{r0-r12,r14}
1060 ADR r0,hotkey
; Place your alternative code
1070 SWI "XOS_CLI"
; instead of these two lines
1080 MOV r0,#800
1090 SUB r12,r12,#80C
1100 STR r0,[r12,#inuse]
1110 LDMFD r13!,{r0-r12,pc}
1120 .keydecode
1130 STMFD r13!,{r14}
1140 LDR r12,[r12]
1150 CMP r1,#800
1160 BEQ keys
1170 BL checkon
1180 BVS keyerror
1190 MOV r5,r0
1200 MOV r6,r1
1210 LDR r4,[r12,#keystatus]
1220 STR r3,[r12,#keystatus]
1230 CMP r3,#800
1240 CMPEQ r3,r4
1250 LDMEQFD r13!,{pc}
1260 CMP r3,#800
1270 STREQ r3,[r12,#keystatus]
1280 MOVEQ r0,#814
1290 ADREQ r1,keypress
1300 MOVEQ r2,r12
1310 SWIEQ "OS_Release"
1320 LDMEQFD r13!,{pc}
1330 CMP r3,r4
1340 STRNE r3,[r12,#keystatus]
1350 MOVNE r0,#814
1360 ADRNE r1,keypress
1370 MOVNE r2,r12
1380 SWINE "OS_Claim"
1390 CMP r6,#801
1400 LDMEQFD r13!,{pc}
1410 CMP r6,#802
1420 BNE keyerror
1430 MOV r1,r5
1440 ADD r1,r1,#801
1450 MOV r0,#8C000000A
1460 SWI "OS_ReadUnsigned"
1470 STR r2,[r12,#key]
1480 LDMFD r13!,{pc}
1490 .keyerror
1500 ADR r0,keyerrorm
1510 LDMFD r13!,{r14}
1520 ORRS pc,r14,#810000000
1530 .keys
1540 ADR r0,keysm
1550 SWI "OS_Write0"
1560 LDR r0,[r12,#keystatus]
1570 CMP r0,#800
1580 ADREQ r0,off
1590 ADRNE r0,on
1600 SWI "OS_Write0"
1610 LDMFD r13!,{pc}
1620 .checkon
1630 LDRB r2,[r0],#801
1640 AND r2,r2,#8DF
1650 CMP r2,#ASC"o"
1660 ORRNES pc,r14,#810000000
1670 LDRB r2,[r0],#801
1680 AND r2,r2,#8DF
1690 CMP r2,#ASC"N"
1700 MOVEQ r3,#801
1710 MOVEQ pc,r14
1720 CMP r2,#ASC"F"
1730 ADDEQ r0,r0,#801
1740 MOVEQ r3,#800
1750 MOVEQ pc,r14
1760 ORRS pc,r14,#810000000
1770 .default
1780 EQU "Set Alias$PressKey Gra
bscreen|M"+CHRS13
1790 ; Change the last line to execute
a different '*' command by default
1800 ALIGN
1810 .grabscreen
1820 EQU "Set Alias$GrabScreen S
etEval GrabScreen%Number GrabScreen%Numb
er+1|M$ScreenSave :0.$Screen|<GrabScreen
%Number>"+CHRS13
1830 ALIGN
1840 .grabscreen2
1850 EQU "SetEval GrabScreen%Num
ber 0"+CHRS13
1860 ALIGN
1870 .initerror
1880 EQU 827200
1890 EQU "HotKey system unable t
o claim required workspace"+CHRS0
1900 ALIGN
1910 .commandtable
1920 EQU "Key"+CHRS0
1930 ALIGN
1940 EQU 0
1950 EQU 0
1960 EQU 0
1970 EQU help
1980 EQU "HotKey"+CHRS0
1990 ALIGN
2000 EQU keydecode
2010 EQU 800020000
2020 EQU keysyntax
2030 EQU keyhelp
2040 EQU 0
2050 .keyerrorm
2060 EQU 827201
2070 .keysyntax
2080 EQU "Syntax: *HotKey [<ON
|OFF> [<key>]]"+CHRS0
2090 ALIGN
2100 .keysm
2110 EQU "The Hot Key system is
currently "+CHRS0
2120 ALIGN
2130 .on
2140 EQU "on."+CHRS10+CHRS13+CHR
S0
2150 ALIGN
2160 .off
2170 EQU "off."+CHRS10+CHRS13+CH
RS0
2180 ALIGN
2190 .hotkey
2200 EQU "PressKey"+CHRS13
2210 .help
2220 EQU "The Hot Key system act
ivates the user-defined command 'PressKe
y' upon the depression of a configurable
key."+CHRS10+CHRS13
2230 EQU "The system may be swit
ched on or off using a star command and
optionally, the hot key may be changed t
o suit the application."+CHRS0
2240 ALIGN
2250 .keyhelp
2260 EQU "*HotKey switches the H
ot Key system on or off."+CHRS10+CHRS13
2270 EQU "*HotKey can take an AS
CII keycode to allow a key to be program
med from the default to activate the uti
lity. The default is the 'print' key."+C
HRS10+CHRS13
2280 EQU "*HotKey without a para
meter reflects the current state."+CHRS1
0+CHRS13
2290 EQU "Syntax: *HotKey [<ON
|OFF> [<key>]]"+CHRS0
2300 ALIGN
2310 EQU "HotKey by Gareth S. Lo
ng."+CHRS13
2320 ALIGN
2330 J
2340 NEXT
2350 ENDPROC
2360 DEFPROCsave
2370 OSCLI"Save "+Module$+" "+STR$code
%+" "+STR$(code%+P%)
2380 OSCLI"SetType "+Module$+" Module"
2390 OSCLI"Key 1 *RMLoad "+Module$+"|M"
2400 ENDPROC

```

MICRO MEMORIES

Facts and tips you may have forgotten... or never known

HAVE you ever wanted to disable Escape, or totally clear the Basic program in memory if Break is pressed? Well if you have, *FX 200 is just what you've been looking for.

There are four variations of the command:

Command	Action
*FX 200,0	Enable Escape. Leave memory intact if Break is pressed
*FX 200,1	Disable Escape
*FX 200,2	Clear memory on Break
*FX 200,3	Combine the effects of *FX 200,1 and *FX 200,2

You should be careful when using this command because you may lose vital data once your program is running as there could be no way out, so always save your work before running it.

When debugging a program you may need to use Break or Escape to leave it, so to avoid any unwanted action taking place, don't insert the *FX 200 command until you are sure the program works.

All program listings in this issue can be downloaded FREE on...

MicroLink

Take a touch of textual intercourse...

*The
lighthearted
saga of two
micro addicts
continues*

Dear Trev

If you managed to decipher my last letter – I've still to get the hang of Maxi Warehouse's word processor – you'll know about GUIs (Gormless User Interfaces) and OSCLIs (Only Slow Clots Like Icons) and how I ended up at the university's microcomputer laboratory.

I felt really sorry for all those poor little BBCs and Amigas pushing pathetically against their chicken wire pens, or Faraday cages as Bill said they were called. Apparently they're doing research into computer viruses as well as GUIs.

And they've made a breakthrough! It seems Bill left some discs lying around without their wallets on and when he star dotted them he found what he thought was rubbish but when he ran the program his Amiga was cured of its virus!

He says that it's the computer equivalent of penicillin and he's going to call it an unclebiotic (as he says calling it an antibiotic is female chauvinism).

Doreen thinks he's got a flaming cheek. And I'm not sure about these viruses being all that new. We've always had bugs going round our beebes.

Anyway, I knew it was going to be a bad day when Doreen turned up wearing a "Wimp users do it with mice" badge. She claimed this was in response to Bill's usual "I've a likin' for an icon" badge.

Things looked up when Bill introduced us to Helen, his research assistant. She was wearing a "Cat lovers are pretty kinky" tee shirt and looked the part.

"Oh" she purred, logic probe in hand, as I said I liked the sentiment, "are you an animal lover?"

"I could be", I replied before D. could stop me.

"Helen will introduce you to Wimps," said Bill.

"We've already met you", snarled Doreen. Which just about set the tone for what followed.

"I'm told you use OSCLIs to communicate with your micro", Helen remarked as she showed me her equipment, which was pretty impressive.

"Yes, I like a bit of textual intercourse now and then".

"Well in this experiment we'll be using icons. We're revolutionising human-computer interaction by using icons or pictures instead of words".

"Like fruit machines and the signs on loos," D. murmured.

Helen ignored her (I wonder if she could teach me how to do that?) and proceeded to show us how it all worked.

"We'll be using a workstation," she said pointing to what looked like a micro to me.

"What's the difference between that and a micro?" I asked.

"The price", she replied. "And it's attached to an IBM main-frame".

"What's IBM stand for?" D. asked.

"Instead Buy a Micro".

The day went on like that. Helen introduced me to the Wimps I was to use. Apparently it was all supposed to be intuitive, but at first I found using the mouse a bit difficult. Then it clicked.

"Where are the curtains?" Doreen asked when shown the windows. And when I was taught how to drag boxes she said that that was more in Bill's line than mine.

The desktop was dismissed as too tidy. And where were the chains of paperclips and half-empty coffee cups? When Helen told her that it was a metaphor D. asked what did bullfighting have to do with anything?

Apparently the whole point of this new GUI was that users would create their own icons – which Andrea promptly condemned as blasphemous.

It didn't help when she kept yelling "open the box" in my ear, though I must admit that I wasn't happy that the GUI was called Pandora.

Needless to say, the whole thing was a disaster. Pandora was fun but slow. At least OSCLIs are prompt. And I'm used to them. In fact at the Rogues I'm now known as the Wizard of OSCLI. Guess who's the Wicked Witch of the West?

Yours

Bob

PS Doreen's got a new badge for me to wear at the next meeting. It says "OSCLI users do it with two fingers".



BADGER MICROS (DEVON)

- Archimedes, BBC Master ●
- Disc Drives, Printers, Monitors, etc. ●

APPOINTED WATFORD DEALER

- Rom Boards, Ram cards, etc. ●

STOCKISTS OF COMPUTER CONCEPTS RANGE

- Interword, Spellmaster, Intersheet, etc. ●
- Discs, Disc boxes, Paper, Labels ●

Badgers Hill, Southerton,
Nr Newton Poppleford, Devon

- PLEASE PHONE FOR BEST PRICES ●

Colaton Raleigh (0395) 68516

LEARNING MUSIC? YOU NEED MY SOFTWARE

You probably practise your instrument every day: the computer gives you the chance to practise other musical skills every day as well.

PLAY WHAT I PLAY - (Improved and extended version)
(The COMPLETE pitch ear-trainer - beginner to advanced. Answer by playback or notation, or use it to practise sing-back tests)

THEORY OF MUSIC GRADE 1 - from the beginning
(This is a teaching program with exercises)

THEORY OF MUSIC Questions and Exercises - Grades 2 to 5
(A practise program - helpful hints but no teaching sections)

All programs: 5.25" disk £13.50, 3.5" disk £14.50

Schools - add £5 for network/site licence to copy (covers all purchases)
When ordering PLEASE SPECIFY B/MASTER/COMPACT/ARC.80/40,
DS/SS, DFS/ADFS, colour/mono.

Orders and inquiries (leaflet free) to TED KIRK (MU)
33 Humber Crescent, ST. HELENS, Merseyside, WA9 4HD
(0744 818761)

Universal Computer Support!

Are you a newcomer confused by manuals or just looking for a good reference source on disk. If so our compact step by step basic course is just for you. The full 16 lesson elementary course contains 62 programs with many useful tips not often found in books. Suitable for schools, colleges and the home user, with full back up facility and program library. NOW available in ADFS. See news column in June issue.

Full 16 lessons £20.95 (40 track DFS on two disks £21.95)

Lessons 1-8 £10.95, Lessons 1-4 £5.95.

3.5" disks £1.00 extra.

Please state 40 or 80T and DFS - ADFS

Payment by cheque only and post to:

Universal Computers Support

168, Hough Road, Walsall, West Midlands WS2 9BG

Tel (0922) 30038

Mid week up to 7pm or Saturday til 11pm

FIELD ELECTRIC LTD

3 SHENLEY ROAD, BOREHAMWOOD, HERTS WD6 1AA

Tel: 01-953 6009 Fax: 01-207 6375

SPECIAL OFFER

Philips BM7502 High Resolution (920 pixel),
Wide Bandwidth (20Mhz), Monochrome monitor (green screen)
with dark etched anti-glare screens.

240V AC and are fitted with adjustable feet.

Composite video input & audio

£26.95 c/p £6

Philips pedestal full monitor. New and Boxed, Type AU7202

£6.50 (Carriage & Packing £2.00)

Computer Hardware, Electric Test Equipment,

Audio & Telephone equipment stocked.

Telephone credit card orders accepted

Official orders, Overseas enquiries welcome

All price include VAT at 15%



SIGNWRITER

Quality posters & banners any size

£29.95 (BBC etc. PCW) £39.95 (Archimedes)

£92 (PCs etc)

Many extra fonts (£5.75 each), e.g. :

Chal i Cril

Also: PAPERBASE for bibliographies COLOURED RIBBONS
LABELWRITER for multiple labels QUESTION MARK for testing

WIGHT SCIENTIFIC (01) 858 2699

Dept. MU, 44 Roan Street, London SE10 9JT

ARCHIMEDES VOICE GENERATOR

See Review in this
months educational
section

Teaching Music

Voices for Music

Teaching Sound

Sound for Games/Demo

Unlimited creation of VOICE banks, held in
re-locatable Module accessible from Music
Packages, Programs etc. (including full sample
editor) £59.95 (inc. P&P)

Education + Bulk Discounts, Site licences negotiable

MJD SOFTWARE

13 Burnham Way, London W13 9YE. Tel: 01-567 4284

Carswell Computers

24 Elm Road, Faringdon, Oxon SN7 7EJ
Telephone (0367) 21153

TYPEEASY Version 4

- Touch typing course for the BBC B, B+, Master & Electron
- Mistakes displayed with flashing letters
- Teaches correct finger movement
- 139 progressive exercises plus routines for writing more yourself
- Displays errors, speed and performance
- Disc (40 or 80 track) £15, Econet disc (80 track) £30, cassette £7.50

TYPE INVADERS

- Increases your speed - we guarantee!
- Letters and words rain down faster and faster - type correct letters to stop them
- 10 levels with 4 speeds plus colour and sound
- See review in Acorn User, July '86

Disc (40 or 80 track) £12.50, Econet (80 track) £25, cassette £7.50
Prices include P&P, please add 15% VAT

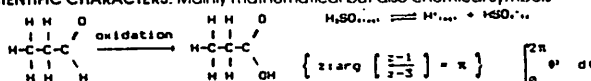
Sciways for Scientists

- Over 350 defined characters accessible with simple 2-key codes
- All characters printable on both screen and printer
- User defined characters can be stored on disc
- All facilities can be used with word processors or with BASIC
- Tested with BASIC I & II, Wordwise, Wordwise Plus, View 2.1, View 3.0, on the Master 128, B+ & Model B, and with Epson/compatible printers

GREEK ALPHABET: Upper and Lower case, upright and italic

A B Γ Δ Ε Ζ Η Θ Ι Κ Λ Μ Ν Ξ Ο Π Ρ Σ Τ Υ Φ Χ Ψ Ω

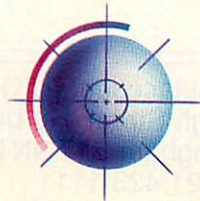
SCIENTIFIC CHARACTERS: Mainly mathematical but also chemical symbols



Orders accepted from schools, colleges, establishments, etc.
Private orders - cheque with order, please

PRICE £39.95 inc VAT, p&p
16k ROM, 40/80 disc & manual
(not compatible with Inter-Word)

Mayhew Telonics,
376a Ringwood Road,
Poole, Dorset BH12 3LT
Tel: (0202) 747695



Clares Micro Supplies welcome you to their world of computer software for the Archimedes, where your imagination is the *only* limitation.



PRO-ARTISAN

Pro-Artisan enhances all the advantages of the Archimedes, providing an immensely powerful graphics package that is so easy to operate. Allowing *Pro-Artisan* to successfully integrate into every environment. From schools, colleges and universities to the world of television and Graphic studios.

£99.95

SAVE £70

NEW PRICE

RENDER

BENDER

Render Bender is a powerful 3D animation package that allows the construction of scenes using 3D objects with advanced ray tracing algorithms. After which it is easy to compile ray traced

screens into super smooth and visually stunning animated sequences.

£79.95



Armadeus Sound Sampler, "the biggest break for ears in years" can take any stored sound and create unbelievable effects and sound tracks for use in your own programs, videos, etc. Add on the 8 bit A to D, *Armadeus* Sound Sampler Board at £149.95 and you can plug in your own tape/record player, even C.D. The output quality could put you on Top of the Pops.

£79.95



INTER DICTOR

This is not just a game but a realistic flight simulator. You are in control of a high performance jet whose handling characteristics have been programmed by professionals from the aerospace industry. Everything is simulated so there are no canned scenarios, the action depends on how you play. But watch out... it's almost too real.

£34.95

Knowledge Organisation. It sounds so easy doesn't it, but it's surprising how difficult it is. Now, however, thanks to Clare's new program *Knowledge Organiser*, it can all be very simple—Lawyers, Writers, Researchers, Lecturers, Students, Z88 users. Everyone who needs to organise, collect, collate and create will benefit from this revolutionary new program.

£59.95

The all new *Artisan 2* is now fully RISC OS compatible and makes full use of Windows, Icons and the Mouse in Mode 12. *Artisan 2* uses the full power of the Archimedes and the new Help Window makes this program a joy to use. *Artisan 2* has been hailed as the best of its kind and comes highly recommended. Remember the possibilities are endless.

£59.95



CLARE'S
MICRO SUPPLIES

98 Middlewich Road, Rudheath, Northwich, CHESHIRE CW9 7DA.
Telephone: 0606 48511 Fax No: 0606 48512

Designed for your imagination



Computaccount (UK) Ltd
11 High Street, Harborne
Birmingham B17 9NT
Tel: 021 428 1111
Fax: 021 428 2028

We are major suppliers to the
educational and health sectors

FULL
SUPPORT
&
BACKUP
FOR EDUC.
USERS

Archimedes

Acorn A3000 1mb Ram 3.5" Disc Drive	£649.00
A410/1 1mb Ram 3.5 Drive + Hard Disc Controller	£1199.00
A420/1 2mb Ram 3.5" Disc Drive + 20mb Hard Disc	£1699.00
A440/1 4mb Ram 3.5" Disc Drive + 50mb Hard Disc	£2499.00
Colour Monitor for A3000 & A400 Range	£220.00

Acorn Archimedes Accessories

A3000 Monitor Stand (Acorn)	£29.00
A3000 Serial Upgrade	£19.00
A3000 1Mb Ram Upgrade	£199.00
A3000 User Port/Midi Podule	£49.00
Prog. Ref. Manual (Risc Os)	£72.00
Risc Os Operating System	£29.00
Podule Backplane for A310	£39.00
Rom Expansion Card	£59.00
I/O Expansion Card	£85.00
Midi add on to I/O	£39.00
Midi Podule	£69.00
Econet Module	£43.00
PC Emulator	£99.00
1mb Ram A400/1 series	£199.00
2nd Floppy A440/1 series	£125.00
2nd Floppy A300 series	£115.00
20mb Hard Disc A300 series	£499.00

PRES Archimedes Accessories

A3000 monitor Plinth	£24.95
A3000 System Housing	£69.50
A3000 External Podule Case	£14.95
A3000 Disc Buffer Board	£48.95**
A3000 20mb Hard Disc	£429.00**
A3000 3.5" Floppy	£75.00**
A3000 5.25" Floppy	£99.00**

Computerware Archimedes Accessories

A3000 1mb Ram Upgrade	£150.00
A3000 2mb Ram Upgrade	£275.00
A3000 3mb Ram Upgrade	£415.00
A3000 External 20mb H/D	£399.00
A3000 External 45mb H/D	£499.00*
A3000 External 75mb H/D	£659.00*
A400/1 Internal 20mb H/D	£199.00
A400/1 Internal 40mb H/D	£379.00
A400/1 Internal 50mb H/D	£499.00
A400/1 Internal 45mb H/D	£449.00*
A400 Internal 75mb H/D	£549.00*

Items marked ***** require SCSI card

Acorn Master & BBC Accessories

Master 128K Computer	£409.00
Master Econet Module	£49.00
Master Turbo Upgrade	£120.00
Master ROM/RAM Cartridges	£11.95
Master Battery Pack	£4.95
Master Welcome Disc	£10.00
Master Welcome Guide	£10.00
Master Reference Manual 1	£14.95
Master Reference Manual 2	£14.95
Econet Upgrade Kit	£59.00
1772 DFS Upgrade Kit	£49.00
ADFS Rom	£26.08
DNFS Rom	£17.91
64k Upgrade Kit (B+ only)	£34.74
ATPL Rom/Ram Expansion	£38.00

DISC DRIVES

Cumana CSX400 40/80T	£112.00
Cumana CS400S 40/80T	£129.00
Cumana CDX800	£216.00
Cumana CD800S Dual 40/80T	£242.00

BBC B & Master Software

Interbase	£59.00
Interchart	£32.50
Intersheet	£49.00
Interword	£49.00
Printmaster	£29.00
Spellmaster	£51.30
View 3.0	£52.00
Viewindex Disc	£13.00
Viewplot Disc	£26.04
Viewsheel	£52.00
Viewspell	£34.74
Viewstore	£52.00
Printer Driver Disc	£10.00
Wordwise Plus	£49.00
System Delta	£56.48
System Delta Ref. Guide	£17.35
System Gamma	£43.43
Sys. Delta Order/Invoice	£39.96
Sys. Delta Sales Ledger	£39.96
Sys. Delta Stock Man	£39.96
Sys. Delta Purchase Led	£39.96
Sys. Delta Nominal Ledger	£48.65

Printers

DOT MATRIX	
Amstrad DMP3250di	£149.00
Amstrad DMP4000	£229.00
Amstrad LQ3500 (24 pin)	£229.00
Amstrad LQ5000di (24 pin)	£379.00
Brother M1109	£175.00
Brother M1209	£229.00
Brother M1709	£445.00
Brother M1224 (24 pin)	£339.00
Brother M1724 (24 pin)	£629.00
Brother M1824 (24 pin)	£525.00
Brother M2524 (24 pinn)	£889.00
Citizen 120D	£145.00
Citizen 180E	£199.00
Citizen MSP55	£649.00
Citizen HOP45 (24 pin)	£499.00
Citizen Pro-Dot9	£365.00
Citizen Pro-Dot9X	£465.00
Citizen Pro-Dot24 (24 pin)	£499.00
Citizen Swift24 (24 pin)	£359.00
Colour Kit Pro-Dot	£60.00
Colour Kit Swift24	£39.00
Epson LX400	£189.00
Epson LX850	£239.00
Epson FX850	£429.00
Epson FX1050	£499.00
Epson LQ400 (24 pin)	£229.00
Epson LQ550 (24 pin)	£329.00
Epson LQ850 (24 pin)	£579.00
Epson LQ1050 (24 pin)	£709.00
NEC P2200 (24 pin)	£335.00
NEC P6plus (24 pin)	£579.00
NEC P7plus (24 pin)	£749.00
Star FR10	£391.00
Star FR15	£509.00
Star LC10	£169.00
Star LC10II	£195.00
Star LC10 Colour	£220.00
Star LC15	£339.00
Star LC24-10 (24 pin)	£254.00
Star LC24-15 (24 pin)	£424.00
Star XB24-10 (24 pin)	£509.00
Star XB24-15 (24 pin)	£671.00

DAISY WHEEL

Brother HR20 D/I	£469.00
Brother HR40 inc. Sheetfeeder	£895.00
Brother Twinwriter	£895.00
Juki 6300	£399.00
Juki 6500	£799.00
Olympia ESW1000C	£359.00
Olympia ESW2500i	£629.00
Panasonic KXP3151	£479.00

Books

Archimedes Assem. lang Bk+DI	£21.04
Archimedes Operating Sys Disc	£8.65
Archimedes Operating Sys Book	£14.95
Basic V for Acorn Archimedes	£9.95
RISC OS Prog Ref man. Vol. 1-4	£72.00
15 Hr WP BBC/Wordwise & +	£5.59
15 Hr Word Proc VIEW	£5.95
30 Hr Basic Standard Ed	£12.95
Adv Ref Man BBC Master	£19.00
Assem lang Prog BBC	£11.50
BBC Master Ref Part 1	£14.95
BBC Master Ref Part 2	£16.28
BBC User Guide	£10.90
Complete BBC Computer User	£14.95
Master 512 User Guide	£9.95
Master 512 User Guide Disc	£6.91
Master Operating System - Dabs	£12.95
Mastering Assembly Code	£8.95
Mastering Interpreter Compiler	£14.95
Mastering The Disc Drive	£7.95
Mini Office II A Dabhand Guide	£9.95
New Adv User Guide Master B, B+	£19.95
Understanding Interword	£6.50
View 3 Man. BBC	£10.00
Viewsheel User Guide	£10.00
View A Dabhand Guide	£12.95
Viewsheel Viewstore	£12.95
Within the BBC Assem Lang	£11.95
Wordwise Plus	£12.95

Please telephone for our
FREE extensive catalogue
and price lists

★ ★ ★

Hundreds of products listed
at excellent prices

HOW TO ORDER

Payment by cheque to:
COMPUTACCOUNT (UK) LTD

Carriage: Items less than
£50: £2.50, £50-£100: £4.50
Carriage and insurance on
items more than £100: £9.50

Please add VAT at 15% to Total,
including Carriage

Send to Computaccount (UK) Ltd., 11 High Street, Harborne, Birmingham B17 9NT
or Telephone 021-428 1111 with your Access details

Items subject to availability. Prices subject to change without notice. Please phone to confirm current price and availability before placing order.



NAME

ADDRESS

Quantity

Item

Tel:

Price

£

£

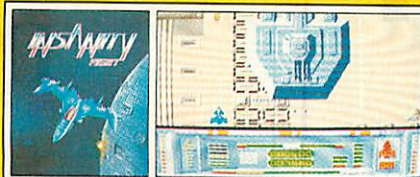
£

Total £

FREE! TENSTAR PACK WORTH OVER £229!



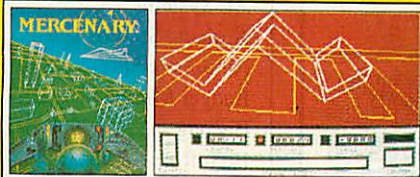
FREE! - AMEGAS - by Players



FREE! - INSANITY FIGHT - by Microdeal



FREE! - ART OF CHESS - by SPA



FREE! - MERCENARY COMP - by Novagen



FREE! - BARBARIAN, ULT WARRIOR - by Palace



FREE! - TERRORPODS - by Psygnosis



FREE! - BUGGY BOY - by Elite



FREE! - THUNDERCATS - by Elite



FREE! - IKARI WARRIORS - by Elite



FREE! - WIZBALL - by Ocean

Commodore AMIGA



ONLY £346.95
+VAT= **£399**
INCLUDES FREE UK DELIVERY

The Amiga 500 is one of a new breed of technologically advanced computers, which are now emerging as the new standard for home computing, based around the new Motorola 68000 chip. The A500 has 512K RAM and a 1Mbyte double sided disk drive built-in. It can be connected directly to a wide range of monitors, or to a domestic TV set through a TV modulator. Designed with the user in mind, the A500 features a user friendly WIMP environment and comes supplied with a free mouse. And, when you buy your Amiga from Silica Shop, the UK's No1 Amiga specialists, you will experience an after sales service that is second to none, including a technical support helpline and free newsletters and price lists. Return the coupon below for our current information pack, which will give details of the Silica service and the very latest Silica Amiga offers. E&OE.

WHY SILICA SHOP?

Before you decide when to buy your new Commodore Amiga computer, we suggest you consider very carefully WHERE you buy it. There are MANY companies who can offer you a computer, a few peripherals and the top ten selling titles. There are FEWER companies who can offer a wide range of products for your computer as well as expert advice and help when you need it. There is ONLY ONE company who can provide the largest range of Amiga related products in the UK, a full time Amiga specialist technical helpline and in-depth after sales support, including free newsletters and brochures delivered to your door for as long as you require after you purchase your computer. That one company is Silica Shop. We have been established in the home computer field for ten years and can now claim to meet our customers requirements with an accuracy and understanding which is second to none. Here are just some of the things we can offer you:

THE FULL STOCK RANGE: The largest range of Amiga related peripherals, accessories, books and software in the UK

AFTER SALES SUPPORT: The staff at Silica Shop are dedicated to help you to get the best from your Amiga.

FREE NEWSLETTERS: Mailed direct to your home as soon as we print them, featuring offers and latest releases.

FREE OVERNIGHT DELIVERY: On all hardware orders shipped to Silica Shop customers within the UK mainland.

PRICE MATCH PROMISE: We will normally match our competitors offers on a 'same product same price' basis.

FREE TECHNICAL HELPLINE: Full time team of Amiga technical experts to help you with your technical queries.

But don't just take our word for it. Complete and return the coupon below for our latest Amiga literature and begin to experience the Silica Shop specialist Amiga service.

PHOTON PAINT PACK

A500 Computer	£399.99
TV Modulator	£24.99
Photon Paint	£69.95
TenStar Pack	£229.50
TOTAL RRP:	£724.43
LESS DISCOUNT:	£325.43
PACK PRICE INC VAT:	£399

1084S MONITOR PACK

A500 Computer	£399.99
1084S Colour Monitor	£299.99
Photon Paint	£69.95
TenStar Pack	£229.50
TOTAL RRP:	£999.43
LESS DISCOUNT:	£350.43
PACK PRICE INC VAT:	£649

FREE FROM SILICA

When you buy the Amiga 500 from Silica Shop, you will not only get a high power, value for money computer, we will also give you some spectacular free gifts. First of all, we are now including a TV modulator with every A500 stand alone keyboard, so you can plug your Amiga straight into your TV at home (the modulator is not included with the A500+A1084S pack as it is not required for use with monitors). Secondly, we have added a free copy of Photon Paint, an advanced graphics package with an RRP of £69.95. Last (and by no means least!), so that you can be up and running straight away, we are giving away the sensational TENSTAR GAMES PACK with every A500 purchased at Silica Shop. This pack features ten top Amiga titles which have a combined RRP of nearly £230! Return the coupon for details.

FREE TENSTAR PACK

Amegas	£14.95
Art Of Chess	£24.95
Barbarian, Ult Warrior	£19.95
Buggy Boy	£24.95
Ikari Warriors	£24.95
Insanity Fight	£24.95
Mercenary Comp	£19.95
Terrorpods	£24.95
Thundercats	£24.95
Wizball	£24.95
TOTAL RRP:	£229.50

INC VAT

DO YOU OWN AN AMIGA?

If you already own an Amiga computer and would like to be registered on our mailing list as an Amiga user, let us know. We will be pleased to send you copies of our price lists and newsletters FREE OF CHARGE as they become available. Complete the coupon and return it to our Sidcup branch and begin experiencing a specialist Amiga service that is second to none.

SILICA SHOP:

SIDCUP (& Mail Order) 01-309 1111
1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX
OPEN: MON-SAT 9am - 5.30pm LATE NIGHT: FRIDAY 9am - 7pm

LONDON 01-580 4000
52 Tottenham Court Road, London, W1P 0BA
OPEN: MON-SAT 9.30am - 6.00pm LATE NIGHT: NONE

LONDON 01-629 1234 ext 3914
Selfridges (1st floor), Oxford Street, London, W1A 1AB
OPEN: MON-SAT 9am - 6.00pm LATE NIGHT: THURSDAY 9am - 8pm

To: Silica Shop Ltd, Dept 22-MUSER-05/90, 1-4 The Mews, Hatherley Road, Sidcup, Kent DA14 4DX

PLEASE SEND ME FREE LITERATURE ON THE AMIGA

Mr/Mrs/Ms: Initials: Surname:

Address:

Postcode:

Do you already own a computer
If so, which one do you own?

ACCOUNT PLUS

Price £58.13 inc VAT



Micro Aid

Kildonan Courtyard, Barrhill, S. Ayrshire, KA26 0PS
Telephone: 0465-82288 and speak to Colin



ACORN APPROVED LONDON DEALER

*Wide range of software and
hardware stocked*
Good prices

Easy to get to

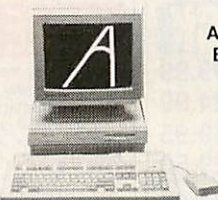
Train: WOOD ST Station
(British Rail)
Road: Bottom of M11,
just off North Circular
Tel No: 01-521 1784



AUTOMATIC SERVICES
217 WOOD STREET
WALTHAMSTOW
LONDON E17 3NT

CANNON COMPUTING

THE ONLY CHOICE FOR FAST
PERSONAL SERVICE



**ARCHIMEDES:
EASY TO USE
NO LIMIT TO
CAPABILITY.**

Acorn COMPUTER'S
PREMIER DEALER - ONE OF
THE TOP 25 UK DEALERS.

The ONE computer for all walks of life and all ages:
Business (including IBM), Educational, Graphics,
Health, Music, Art, CAD, DTP, WP and Games.

Archimedes features: 32 bit RISC Architecture for high speed, enhanced RISC-OS
window environment, low cost, multitasking, MS-DOS and UNIX compatibility.

Cannon Computing is one of Acorn's top dealers. All your required computer products and queries can be solved
by us as your stockist, repairer and Econet Network approved supplier and installer.

Unlike most dealers Cannon Computing are available 9am till 11pm, 7 days per week to offer instant assistance
to any of our customers - during evenings and weekends when most dealers are closed you can rely on us. We
have also found that these are the most convenient times for many people to have demonstrations, we spend
time discussing individual needs. We can also personally deliver any equipment purchased and set it up on your
premises - evening and weekend service available if required.

For urgent orders we offer **SAME DAY DELIVERY** - most orders delivered within 24 hours - subject to stock
availability.

We stock the complete range of Acorn machines: BBC Masters, Archimedes 310, 410/1, 420/1 and 440/1s and
the new BBC micro, the A3000 and we can part exchange. Monitors, disc drives, printers, upgrades and
accessories are always in stock together with consumables and all types of software.

Phone now for brochures and prices - QUANTITY AND EDUCATIONAL DISCOUNTS available.
FOR THE BEST BEFORE SALES GUIDANCE AND AFTER SALES CARE CONTACT:

CANNON COMPUTING

DEPT MU, 35 RUSHLEIGH GREEN, THORLEY PARK,
BISHOP'S STORTFORD, HERTS, CM23 4JH

TEL: 0279-507727/0831-407652

★ Please quote Micro User ★

Call now for details of our new integrated accounts and stock keeping software
packages for the Archimedes

FINANCE ON ARCHIMEDES - CANNON COMPUTING ARE LICENSED CREDIT BROKERS



Better solutions.

ADVERTISERS' INDEX

4mation	24	JR Letronics	121
ADC Comp Supplies	105	Kosmos	123
AL Systems	120	Logic Computer Stores	62
Apricote Studios	110	Mauden Sales	120
Automatic Services	130	Mayhew Telonics	126
Badger Micros	126	MD Office Supplies	39
Beebug	6, 8, 10, 13, 20	Meadow Computers	123
Boxoft	108	Micro Aid	130
B&S Computing	45	Microfix	71
Calderglan Computers	42	Microstudio	104
Cannon Computing	130	Mijas Software	108
Care Electronics	72	Minerva Software	35, 66
Carswell Computers	126	MJD Software	126
CCS	121	Morley Electronics	14, 15
Circle Software	103	Norwich Computer Services	103
Clares Micro Supplies	21, 127	Orion Computer Services	70
Computaccount	128	Pineapple Software	71
Comlex Computers	105	RBRC	79
Compuceek	57	Resource Facilities	121
Computer Depot	121	Sabre Computers	75
Computereyes	121	Serious Statistical Software	104
Computer Tutorial Service	120	Silica Shop	115, 129
Contex Computing	123	Silicon Vision	22
Cumbria Software	104	Simtron	108
Currie & Maughan	120	Smart Computers	121
Dabhand Computing	46, 69	Software Bargains	114
Dabs Press	58	Software Solutions	64
Datastore	105	Superior Microcomputing	132
Denham Computer Products	24	Swift Software	60
Diamond Computer Systems	18	Switch Computer Services	123
Dises Direct	30	Technomatic	100
Electro Music Research	71	Ted Kirk	126
Electronic Font Foundry	110	Topologika	123
Fact Systems	108	Universal Computer Support	126
Field Electric	126	Vector Services	120
G.A. Computers	120	Watford Electronics	84-97
HSV	75	Weserve	72
Impact Posters	131	Wight Scientific	126
Integrex	3	Willow Software	56
Irlam Instruments	2		

512 USERS!

THE 512 MOUSE DRIVER makes the 512's mouse WORK with standard
MS-DOS software - like TurboCAD, MS WORD, AUTOSKETCH, GEM
3.0 etc. Excellent manual including a programmers section is included.
Price: £30.00 inc VAT

TCS Utility disc #1 - Full PrtSc's are possible - fast text screen dumps,
graphics screen dumps (mono & shaded) all at the press of a key! Also
included on the disc are a suite of menu facility programs for your own
batch files (needs the above MOUSE.COM), Equipment lister etc.
Price £15.00 inc VAT

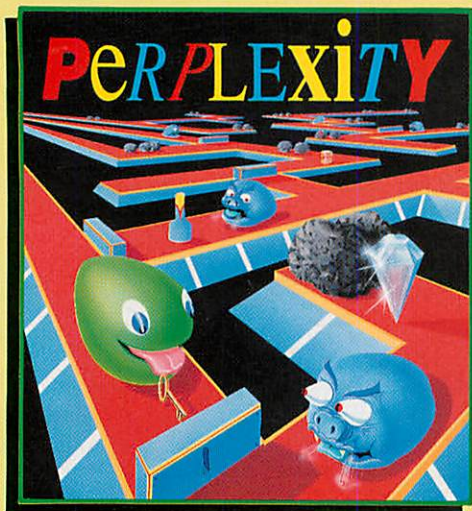
For further details phone Cliff on (0923) 662240 or write to



Tull Computer Services

115 Gammons Lane, North Watford, Hertfordshire. WD2 5JD

THREE GREAT NEW TITLES FROM SUPERIOR SOFTWARE



PERPLEXITY

3-Dimensional Strategy Game with Brilliant Graphics

PERPLEXITY consists of 16 increasingly difficult levels, each a puzzling maze with one of four different 3D background themes. Collect the diamonds by pushing together the boulders scattered about the maze and push the keys to the correct doors to open them.

But watch out for the monsters who will chase you around the maze. And watch out also for the 'mystery boulders', which may give you a bonus score or a magic potion, but may also reverse some or all of the movement controls...then you've really got problems!

On-screen information includes a constantly up-dating scanner/map, which allows you to plan your route, a score-line and timer/status icons. Passwords allow you to skip completed levels.

PERPLEXITY combines the best puzzling features of REPTON games with superb 3D graphics, to give a highly addictive and visually brilliant game. Are you ready to face the challenge?

(The Electron version has the same graphics as the BBC Micro version.)

PLAY IT AGAIN SAM 13 A New Top-Hit Four-Game Compilation

BARBARIAN II

Have you the skill and strategy to reach the Dungeon of Drax? Twenty gruesome monsters to defeat in an 80 screen maze.

"The monsters are spectacular in size and design. A most impressive and playable game"....Acom User

PERCY PENGUIN

The classic and highly addictive game by Superior. Percy must kill the Snobees in the frozen maze by hurling ice cubes at them, but deadlier breeds then appear!

"Enjoyable to play with good graphics and sound"....A & B Computing

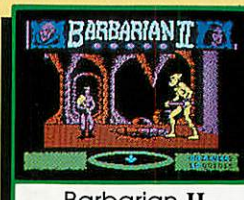
HYPERBALL

A brand-new release by Superior. The best version ever of the classic 'bat-and-ball' game, with 6 levels and a massive total of 120 screens. Special features include: Infra-red scanners, 8-ball splitters, aliens, cannons, weapons' purchase, bonus rounds and screen-jump options.

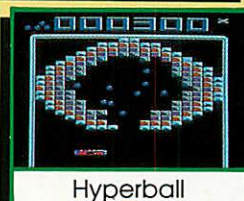
PANDEMONIUM

A brilliant 'Top Ten' game by Peter Scott, featuring teleporters, lifts, springs, weird aliens to shoot, and lots, lots more, as you attempt to construct the core.

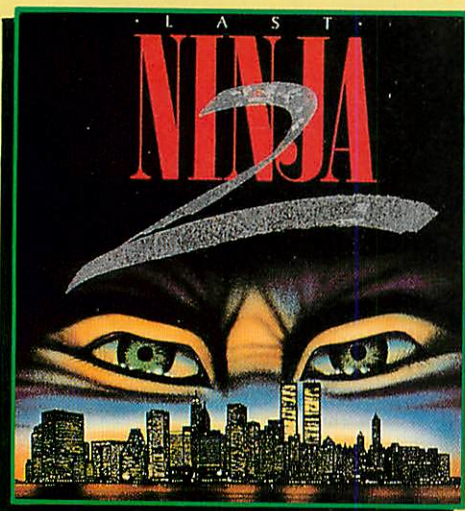
"Eighty screens of fun make this game my favourite"....Micro User



Barbarian II



Hyperball



A Thug in the Cellar



Mugged on the Street

LAST NINJA 2 - Back with a Vengeance!

Born in a time of peace, lived in a time of war; the shadow warrior returns. Leaping the abyss of time he comes to fulfil his destiny!

DATELINE: 1990 THE PLACE: Downtown New York

THE QUEST: To destroy the eternal evil.....Kunitoki!

Lots more fiendish adversaries, more colourful screens with superb graphics, a score-line, a timer... and lots and lots more exciting Ninja action. Are you ready for the thrills and skills of the Ninja in crime-filled Manhattan? Can you survive the six action-packed levels?

You start in the notorious CENTRAL PARK, with thugs, police and bees to get past, and shuriken stars and hamburgers to collect. Now to THE STREET, littered with down-and-outs and meths bottles. Take care in THE SEWERS to avoid the darkness and the crocodile. On to the forbidding opium factory in THE CELLAR and then to THE OFFICE and a secret computer code. Finally to KUNITOKI CASTLE with its immortal adversaries and the trickiest puzzle of all!

BBC Micro Cassette.....\$9.95 each BBC Micro 5 1/4" Disc.....\$11.95 each

(Compatible with the BBC B, B+ and Master 128 computers.)

BBC Master Compact 3 1/2" Disc.....\$14.95 each Electron Cassette.....\$9.95 each

(The screen pictures show the BBC Micro versions of the games.)



ACORNSOFT

(Superior Software is a trading name of Superior Microcomputing Ltd.)
Dept. Z1, P.O. Box 6, Brigg, S. Humberside DN20 9NH. Tel: (0652) 58585

Available from
WHSMITH
and all major dealers

PLEASE MAKE CHEQUES
PAYABLE TO 'SUPERIOR SOFTWARE.'



24 HOUR TELEPHONE
ANSWERING SERVICE FOR ORDERS

OUR GUARANTEE

- All mail orders are despatched by first-class post
 - Postage and packing is free
 - Cassettes and discs that are faulty on receipt will be replaced immediately
- (This does not affect your statutory rights)