

THE MICRO USER

Volume 6
Number 6
August 1988
£1.50

Top-selling guide
to the BBC Micro, Master,
Archimedes and Z88

NEW SERIES

Make music: How to program in Ample

BODY BUILDING

First part of a DIY experimenter's board

FONT DESIGN

Tips on creating your own typefaces

Z88

- Graphics displays
- Questions answered

COMMS

Take your pick from 22 modems

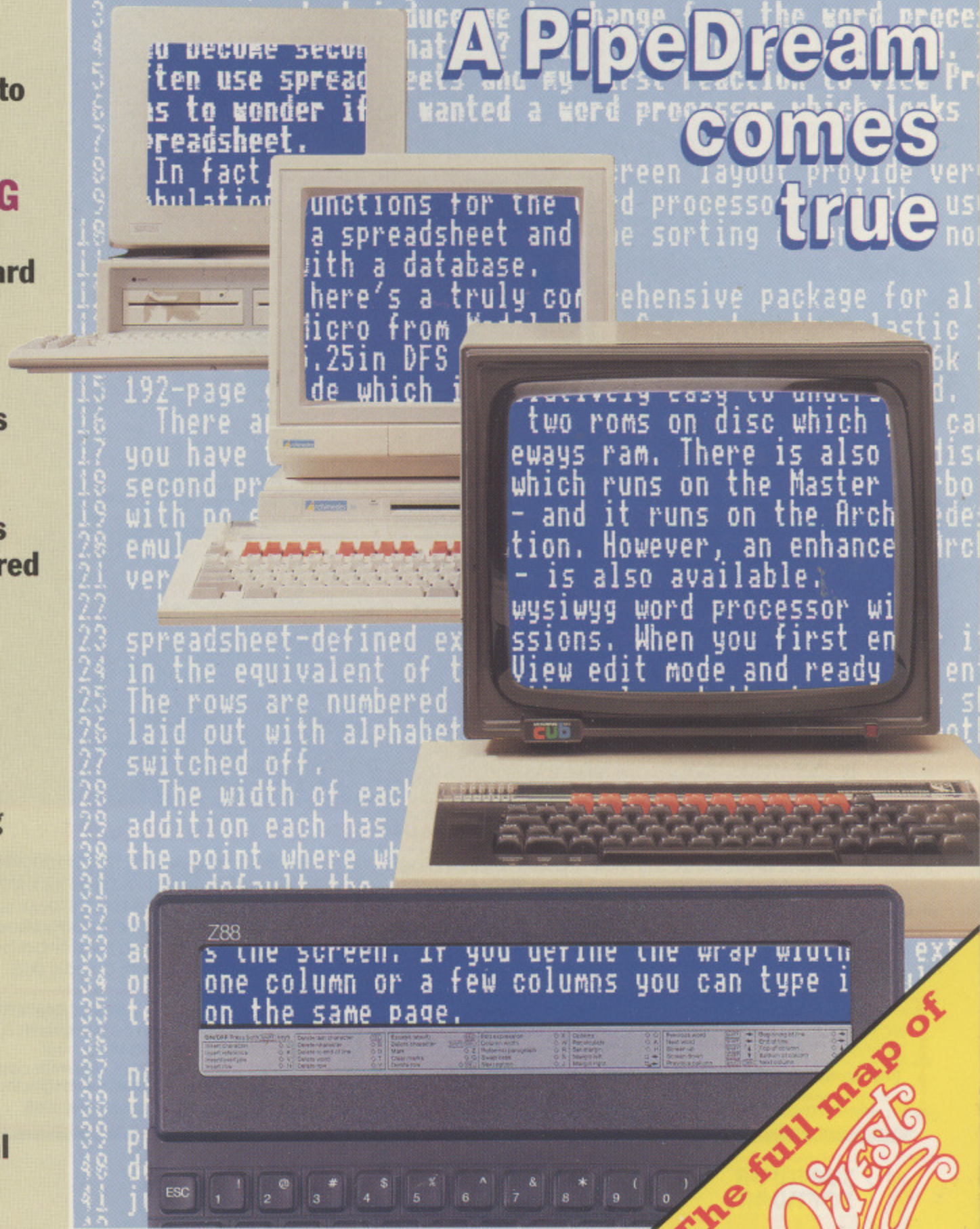
UTILITIES

- Safer disc saving
- Arc filter module

REVIEWS

- Aural
- Design 7
- NotePerfect
- Genie utilities
- Arc text editors
- View Professional
- ... plus all the latest software

A PipeDream comes true



The full map of
Quest

BARBARIAN

The Ultimate Warrior

NOW AVAILABLE FOR:
**BBC MICRO
ELECTRON**

BARBARIAN
The Ultimate Warrior
© Palace Software, 1987
MADE UNDER LICENCE



A bout of
Mortal Combat



The Victorious
Gladiator



Nearing the End of
a Feroocious Battle



Under the Gaze of
Drax and Mariana

THE ULTIMATE WARRIOR • THE ULTIMATE GAME

At last, BARBARIAN, the most realistic and exciting of sword-fighting games reaches the BBC Micro and Electron.

One or two players—fight against the computer or a friend.

The evil sorcerer Drax has abducted the beautiful Princess Mariana to satiate his nefarious desires. A powerful warrior is sought to vanquish against Drax's demonic guardians and free the princess? You are that warrior: a mighty barbarian wielding your broadsword with deadly skill.

BBC Micro Cassette\$9.95 Acorn Electron Cassette\$9.95
BBC Micro 5¼" Disc£11.95 BBC Master Compact 3½" Disc£14.95
(Compatible with the BBC B, B+ and Master Series computers)

Please make cheques payable to "Superior Software Ltd".

PRIZE COMPETITION

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

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

Closing Date: 30th September, 1988.

**SUPERIOR
SOFTWARE**
Limited

ACORNSOFT

Dept. B5, Regent House, Skinner Lane, Leeds LS7 1AX. Telephone: 0532 459453



24 HOUR TELEPHONE
ANSWERING SERVICE FOR ORDERS

MEGA BYTES FOR MINI BUCKS

**NEW
LOWER
PRICES**



Picture shows 20 and 28 megabyte units. 40 and 56 megabyte units may be slightly taller in size.

If you want to increase your storage capacity up to an incredible 112 MBytes you need a Winchester; but not just any Winchester ... the new Viglen System is 100% compatible with the Acorn Winchester; it's simplicity itself to install and it costs a lot less than you think.

The Viglen Winchester is ready to plug straight into your BBC Master or if you have a B or B plus you will simply have to fit an ADFS ROM. You can use up to two floppy disk drives in conjunction with the unit and, fitted to the B+ or Master, the floppies can double their capacity by running in double density mode.

The 112 MBytes Viglen Winchester System is equivalent in capacity to over 1000 100K floppies or 250 400K floppy disks. It takes under 2.5 seconds to save 200K bytes, making it at least ten times faster than the equivalent floppy disk options. The system is designed for virtually every application from education or business to home use.

WHAT DO I GET FOR MY MONEY

1. Winchester Unit - (winchester drive, controller boards, power supply and fan all fitted in one compact case). The fan is recommended in order to keep the winchester at the correct operating temperature.
2. Master Reference manual part 1 (for a BBC B or B plus you will require the Acorn ADFS ROM and utilities available at an extra cost).
3. Winchester user guide.
4. Additional utilities on the winchester including formatter, verifier, ADFS menu and backup program.

PLUG IN SECOND DRIVE

The Acorn ADFS can handle up to two winchester drives. These are accessed as drive 0 and 1 (the floppy disk drives being accessed as drives 4 and 5). Viglen winchesters are supplied as Drive 0 (single unit) and Drive 1 (Second drive for single unit). The Viglen drive 1 can be instantly plugged into drive 0 and used either as a backup for Drive 0 (and perhaps taken off and stored away) or for more online mass storage. This will enable you to back up 20 Megabytes in under 7 minutes.

STORAGE OPTIONS:-

Drive 0	Drive 1	Total Capacity
20 Meg	20 or 40 Meg	40 or 60 Meg
28 Meg	28 or 56 Meg	56 or 84 Meg
40 Meg	20 or 40 Meg	60 or 80 Meg
56 Meg	28 or 56 Meg	84 or 112 Meg

Plug in 20 to 112 MBytes of extra storage with the Viglen Winchester System

COMPATIBILITY!

Viglen winchesters are 100% compatible with the Acorn winchesters and the ADFS. Any program that will run on the Acorn winchester will also run on the Viglen winchester. The winchesters also run with the Acorn Master 512 board with DOS plus (CPM86 and MSDOS compatible operating system).

BACK OF UNIT



- 1 MHz IN:** This socket is used to connect the micro to the winchester.
- 1 MHz OUT:** This socket is used to connect any other device that is normally plugged into the 1 MHz bus on the micro.
- DRIVE 1 DATA:** This is a 20 way socket which is used to connect the data signals to a second winchester drive.
- DRIVE 1 CONTROL:** This is a 34 way socket which is used to connect the control signals to a second winchester drive.

HOW TO ORDER

Simply write off today to Viglen and remember to add £8.00 carriage, packing and insurance, and allow 7 days for delivery. Credit card holders may order by telephone. If you'd like to find out more why not come down to our West London showroom (see map for directions) or if you can't make it simply ask for our special datasheet.

Viglen

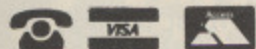
The Perfect Partners



OPENING TIMES
MONDAY - FRIDAY 9.00 - 5.30

Orders from Educational Establishments, Government Departments and Plc Companies accepted. Education discounts available, write or phone for details.

Prices correct at time of going to press and subject to availability.



Unit 7, Trumplers Way, Hanwell, London W7 2QA. Sales Hotline 01 843 9903.

THE MICRO USER

Managing Editor
Derek Meakin

Group Editor
Alan McLachlan

Features Editor
Peter Davidson

Production Editor
Peter Glover

Assistant Features Editor
Steve Turnbull

News Editor
Mike Cowley

Technical Editor
Mike Cook

Promotions Editor
Christopher Payne

Reviews Coordinator
Pam Turnbull

Advertisement Manager
John Snowden

Advertising Sales
Peter Babbage, Gail Blincow

Tel: 0625 878888 (All depts.)
0625 879940 (Subs.)

Telecom Gold: 72:MAG001

Telex: 265871 MONREF G

Quoting Ref. MAG001

Prestel Mailbox: 614568383

Fax: 0625 879966

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

Subscription rates for
12 issues, post free:

£18 - UK
£28 - Europe (incl. Eire)
£34 - Overseas Surface
£45 - Overseas Air

ABC 59,727
Jan-June 1988
ISSN 0265-4040

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


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


FEATURES

7 News
All the latest events in the ever-changing world of your BBC Micro.

24 Library 
High-quality routines which you can use in your own programs.

26 Micro Memos
Fascinating facts about the BBC Micro every user ought to know.

37 Fonts
Master the mystical art of designing your own distinctive typefaces.

41 Use It! 
More detailed information on the unplumbed depths of Dump Out 3.

53 Ample Music
We start a new series about using Hybrid's clever music software.

61 Problem Solved
A helping hand with some of those mind-testing hardware problems.

66 WeatherLink
Full details of recent upgrades and a colourful demonstration picture.

82 Body Building
The first part of a valuable new project: A DIY experiment board.

89 Modem Survey
Some of the most popular modems: An invaluable check-list.

90 Mad Hatter
Our monthly look at adventure games - old, new and revamped.

109 Leaky Listing
We reveal the solution to last month's programmer's poser.

114 Quest Map
Full colour map from the author of the mind-taxing arcade adventure.

118 Hac Man 
A wealth of useful hints and news from our resident games expert.

121 Challenge
Second part of the sticker album problem - we give some hints.


123 Ceefax Guide
What's coming this month on the telesoftware pages of BBC TV.

127 Letters
The chance to get your news, views, moans and name into print.


EDUCATION

69 Update
Up-to-the-minute news of the BBC Micro in the world of education.

70 Going for a Song
Two music practice software packages compared by our expert.


73 Game 
Follow the hidden Treasure Trail and practice compass points.




57 An LCD Plot 
All the information you need to get graphics on your Z88 screen.

59 Question & Answer
The solutions to several queries on Cambridge's portable micro.

UTILITIES

47 Archie Stripper  We show how to produce modules for the Acorn mega-machine.

106 Auto Archiving  Keep backup copies as you work on your programming masterpiece.

REVIEWS

30 View Professional Acorn's universal word processor/spreadsheet: An expert opinion.



33 Software Scene Our reviewers cast their eyes over the very latest games releases.

51 Design 7 A look at a powerful package for producing BBC teletext screens.

85 Archimedes Software An expert takes a quick look at some aids to easy programming.

111 New lamps for old Software to access the Genie's data files examined in detail.



Cover story

At last there is a word processing/spreadsheet that is file compatible across a whole range of micros – Z88, BBC Micro series, Archimedes and even PC and compatibles. In its BBC Micro form it is called View Professional and on Page 30 we take an in-depth look at this versatile package.

FontStyle

The presentation of your work can be greatly enhanced by the use of a good font. On Page 37 we tell you how to design them and on Page 45 there's a super offer for a designer so you can easily create documents like the one shown right.

We're Moving!

Dear John,

As you know we've been planning to move house and the time has come at last! So from 28th August 1988 we will be at:

The Vicarage
Coppice Green
Hatherage
West Yorks
E625 5BT

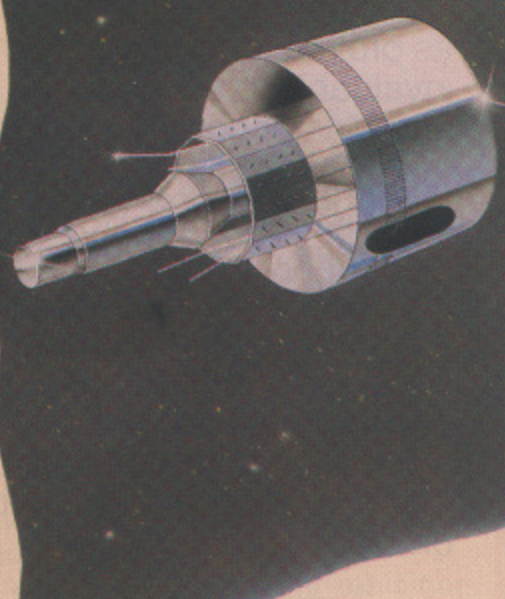
I hope to see you soon. We'll be having a party as soon as we've settled in.

All the best

Graham Bartholomew

PICTURES FROM SPACE

WeatherLink, the MicroLink-based satellite picture service, has been upgraded to provide high-resolution weather maps for BBC Micro and Archimedes users. On Page 66 we provide full details of what's available and an example photograph – which you can recreate on your own with the program supplied on this month's *Micro User* disc.



MICRO USER CLASSIFIEDS

The best bargains in the world of the BBC Micro come from fellow readers of *The Micro User*. Turn to **Page 124** find just what you're looking for – from cheap modems to complete computer systems.

NEXT MONTH

COMMUNICATIONS
How Email began


UTILITY
Half-size characters


CHALLENGE
The puzzle solved

REVIEW
Computerlock

THE MICRO USER

September 1988 issue on sale August 3

 For full details on how the checksums work, see the Get-it-Right article on Page 28 of the February 1988 issue of *The Micro User*.

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

BEEBUG

For users of the BBC Micro,
Master and Compact

RISC USER

For Archimedes
users

Subscribe to BEEBUG or RISC User and not only will you receive an informative magazine mailed directly to your own address for 1 year,

But you will also benefit from:

- Unlimited access to our technical support team to assist with any computing problems that you may have, and to provide impartial advice.
- A swift mail order service for all your hardware and software needs at competitive prices, and with 5% members' discount.
- A showroom with knowledgeable staff on hand, where you can try out the latest hardware, peripherals and software.
- Free members' adverts in BEEBUG to sell your unwanted kit.
- A trade-in service to upgrade your BBC/Master to a new Master/Archimedes.
- 25% members' discount on the entire Beebugsoft range of software.
- An Acorn appointed specialist support and service centre.

BEEBUG

The magazine is now in its sixth year of publication with 20,000 subscribers throughout the world. Its proven format has been invaluable to serious BBC Micro and Master computer users in the home, education and business.

Each issue of BEEBUG provides 72 pages of articles, programs (utilities, applications etc), tutorials, workshops, reviews, hints & tips, news and information for beginners and experts alike. All our programs are tested on all versions of the BBC Micro, and are also available monthly on disc or tape.

RISC USER

This is the magazine for everyone interested in Acorn's RISC computer, the Archimedes. Launched at the same time as Archimedes, RISC User provides lively and informed coverage of what's happening in the world of Archimedes.

Reviews, hints, programs and articles are all specifically written for Archimedes, showing how to exploit the many features of this sophisticated computer. RISC User is all about the Archimedes; it does not contain modified programs originally intended for the Model B or Master.

BEEBUG and RISC User are both published 10 times a year and are only available on subscription, not through the shops.

	Subscription rates for either magazine	Special rates for both magazines
1 Year UK, BFPO & Channel Islands	£14.50	£23.00
Europe & Eire	£20.00	£33.00
Middle East	£25.00	£40.00
America & Africa	£27.00	£44.00
Elsewhere	£29.00	£48.00

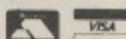
I would like to subscribe to BEEBUG/RISC User/Both Magazines

and enclose a cheque for £ _____
Official Orders Welcome

Please debit my Access/Visa/Connect account with £ _____

Card Number

Expiry _____/_____/_____



Name _____
Address _____

Access/Visa/Connect card holders may alternatively call our 24 hour hotline on 0727 40303.
All cheques must be in pounds sterling drawn on a UK bank.

Post To:
BEEBUG, Dolphin Place, Holywell Hill, St. Albans,
Herts. AL1 1EX

For a Free BEEBUG Information Pack Phone 0727 40303

MUB

NEWS *beat*

Acorn ups Arc prices

ACORN has increased its recommended retail prices for almost all the Archimedes range, along with a number of the machines' peripherals.

Only the Archimedes 305 emerged unscathed in what general sales manager Terry Shurwood described as a demonstration that "Acorn is not immune to the fluctuations affecting the computer industry".

Shurwood told *The Micro User*: "In the interests of market stability, it is our policy to minimise the frequency at which we make changes to our recommended prices".

He pointed out that "the previous alteration to Acorn prices was in the last quarter of 1987 and in the months since then there have been a number of changes in the commercial climate that Acorn has to operate in".

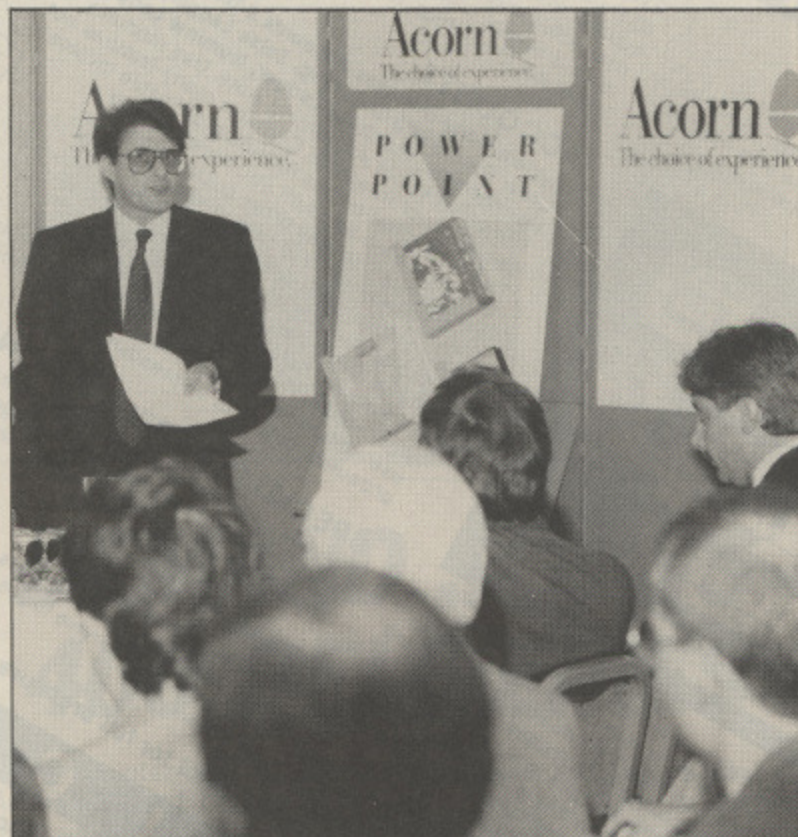
The Archimedes 310 will now sell for £835, with mono monitor £895 and with colour display £1,055.

The new price for the Archimedes 440 is £2,529, with mono monitor £2,589 and with colour display £2,749.

The 0.5Mb ram upgrade for the 300 series now costs £149, an additional floppy disc £125 and 20Mb high speed hard disc and controller card £499.

For both the 300 and 400 series, the I/O expansion card is £85 and the music Midi add-on £39. The recently released separate Midi expansion card is £69.

Prices of the Master 128 and Master Compact remain unchanged.



Acorn managing director Harvey Coleman addresses dealers and distributors

Coleman states his case

FOLLOWING recent criticism about poor communication with third party suppliers and the people who sell its products, Acorn has been extending a fraternal hand in a nationwide series of conferences.

Addressing more than 50 dealers and distributors in the company's home town of Cambridge, Acorn managing director Harvey Coleman outlined his marketing strategy.

Sales and marketing director Ian Laurence spoke about new target markets for the Archimedes.

MICROS AND MEDICINE GO ON SHOW

HOW Acorn technology is helping medical science was illustrated in depth during the UK's largest health care exhibition at Brighton.

Treatment for Aids, optical research, advanced interactive video training systems and patient rehabilitation were some of the medical applications of Acorn computers demonstrated at Healthcare Computing 88.

Acorn dealer and image processing specialist Wild Vision created much interest with its Hawk V8 video system running on a Master 128.

Video images are digitised and written in real time directly into the Master's video display memory for instant frame grabbing or moving picture analysis. The data capture and transfer is transparent to the microprocessor, leaving it free to run image processing software.

One of the applications of

the Hawk V8 seen at the exhibition is the animal activity monitor, developed by Wild Vision with the help of Dr Paul Flecknell of the Comparative Biology Centre at Newcastle University.

An animal is observed by a video camera, then the signals are digitised and fed to a Master 128 which calculates the centroid of the animal in order to analyse and record its movements.

Also based on the Hawk V8 system is the Pedobaroscope

PBS100 for scanning pressure distribution under feet, and an image analysis system for use in applications like medical scanning, quantitative microscopy and particle size analysis.

Also at the exhibition, an advanced interactive video system illustrated other programs used in knee and Aids treatments. Wild Vision is currently developing image

Turn to Page 9 ►

SKY WATCH SCRAPPED

ONE of the most popular features of Prestel has now been withdrawn.

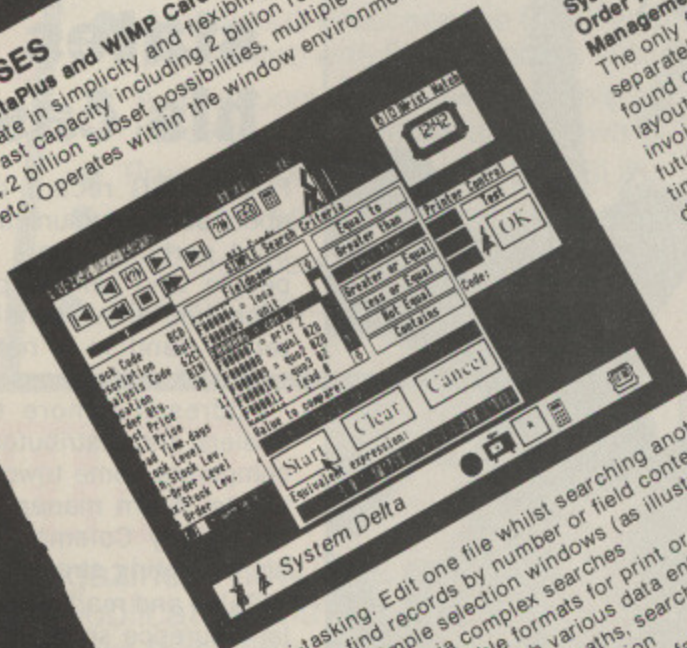
Sky Watch, which enabled people to see on their screens the departures and arrivals boards at all UK airports, has been discontinued indefinitely. This follows the decision by the British Airports Authority to withdraw their support for the service.

Build your own system...

with the Minerva **SYSTEMS DELTA, GAMMA and SIGMA** Individual programs designed to integrate; use separately or link together to form a powerful business system. Systems Delta, Gamma and Sigma... designed by highly acclaimed professional programmers with proven ability on the BBC, now providing definitive software for the Archimedes.

DATABASES

System DeltaPlus and WIMP Card Index £69.95
The ultimate in simplicity and flexibility. Unrivalled in power. Vast capacity including 2 billion records, 16 million fields. 4.2 billion subset possibilities, multiple files open at once, etc. Operates within the window environment.



- Multi-tasking. Edit one file whilst searching another
- Instantly find records by number or field content
- Search by simple selection windows (as illustration) or multiple criteria complex searches
- Multiple user-definable formats for print or display
- Simple card creation with various data entry types
- Unrivalled, comprehensive maths, searches and sort
- Mailing labels with line compaction
- Comprehensive, yet simple reporter facility
- Card copier to transfer records across files
- Imports data from dBase, Lotus, Viewstore, etc.
- Includes relational programming language, if required

System Delta with Card Index £64.95
Still the most comprehensive and flexible data management system on the BBC. 8160 records, 255 fields, 8000 characters per record in 3 seconds. Up to 5 files open at any time. Find any searches, sorts and maths facilities. Multiple print formats. Default card. Card copier for transfer between files. Fully programmable relational system with over 150 commands available.

Mailshot, Reporter and Inter/View Link £19.95 each
Three versatile support programs for use with all System Delta files. Mailshot produces up to 4 across labels and links with wordprocessors for mail-merged documents. Reporter produces simple lists as well as fully definable reports including negative or positive columns, averages, totals, headings, sub and sub-sub-totals. Inter/View Link transfers data directly or as a result of any calculation including sum, average, count, etc.

System Delta Personal Accountant £45.95 (Nominal £55.95)
Five comprehensive accounting modules for use separately or as integrated suite. Many advanced features as listed above. Total flexibility allows customisation if required.

Order Processing/Invoicing, Sales Ledger, Stock Management, Purchase Ledger, Nominal Ledger
School Administrator £69.95
Pupil and staff records allow extra fields to be added if desired. Entry reports for examination boards. Form 7 DES statistics, etc.

ACCOUNTS

DeltaBase £29.95 Affordable excellence
Extremely powerful yet simple to use general database. Over 8000 records, 255 fields and 16 subsets. Pull down help screens. Various search, sorts and maths facilities. Restructuring criteria searches, imports data from Viewstore, Betabase, InterBase, Mini-Office, etc.

System Delta Business Accounts £69.95 each module
Order Processing/Invoicing, Sales Ledger, Stock Management, Purchase Ledger, Nominal Ledger
The only flexible accounting suite. Use modules separately or integrate. Contains many features not found on other micros including definable invoice layouts, varied discount structures on one invoice, archive mail order customers for future mailshots, add new credit account at time of invoicing, selection of aged debtors/creditors or statements by various criteria, generates purchase orders, suggests stock levels, determines most profitable stock items, stock and sales graphs, numerous user-definable nominal accounts with unlimited bank accounts, output to a spreadsheet.

SPECIALIST APPLICATIONS
Flexible specialist software available for School Administrator, Video Rental, Newsagent, Hotelier (Genealogy, Timetabling coming early 1988)

GAMES
Minotaur Game £14.95
3D maze game. Fast reactions not needed. Create maze to your own size. Survive to rescue the men and kill the Minotaur.

Send for full brochure including other products

Specialist Applications from £54.95
Comprehensive management programs for Hotelier, Video Rental and Newsagent.

System Gamma £49.95
The first Graphics Management System. Anyone can produce stunning graphics and charts easily from the menu driven GammaPlot supplied. Multiple charts on screen at any one time and in any position desired. On screen text editorial. Several fonts provided for variable text. Statistical analysis. Macro facility. Entry by keyboard or System Delta files. Fully programmable to create your own graphics programs.



MINERVA SYSTEMS

69 SIDWELL STREET · EXETER · DEVON EX4 6PH · TELEPHONE EXETER 0392 37756

International Distributors in Africa, Australia, Belgium, Canada, Cyprus, Greece, Holland, Hong Kong, Iceland, New Zealand, Malta, Norway, Portugal, Sweden, U.A.E.

NEWS *beat*

Teletext for BBC Micro

A NEW advanced teletext receiver has been developed for use with the BBC Micro and Master by General Information Systems (0480 87464).

"The design incorporates many of the advances made possible by recent developments in teletext chip technology", commented a GIS spokesman.

It takes its power from the micro's auxiliary output. Tuning is carried out by an auto-scan system and the adapter is capable of keeping up to eight channel frequencies in non-volatile storage.

The director of GIS, Mr Ram Banerjee, said: "The potential for the imaginative enthusiast is almost endless since the program mode allows development of a countless number of applications."

"Once transmissions start the unit will be capable of producing higher definition – level three – teletext and some parts of level five". Price £149.



DEMAND SLOWS 400 DELIVERIES

ANYONE intending to buy an Archimedes 410 could have a long wait ahead of them. Acorn says it will probably be the end of the year before supplies of the expandable version of the 400 series are available.

The reason is that demand for the 440 has been much greater than anticipated.

Both enhanced machines share the same production line so something had to give – and as the 440 earns Acorn approximately £1,000 more than the 410, the less powerful

machine had to give way.

"Demand for the 440 has been very high indeed, and frankly we underestimated the strength of its popularity", said an Acorn spokeswoman.

"Demand is slightly less for the 410, and as both machines use the same production line we are concentrating on the 440 for obvious reasons".

The 440, costing £2,529 to £2,749, is a much more complete system than the 410 which is about £1,000 cheaper.

Although the 410 is expandable to 440 capability, it has not caught the imagination like its bigger brother.

As one buyer put it: "If you don't intend to expand you might as well get an Archimedes 310 for under £1,000. If you know you will expand you might as well buy the 440 in the first place and save yourself the bother of fiddling about with add-ons".

Another main reason why demand for the 410 has lagged behind is that the 440's big memory and hard disc are much more in tune with what the market wants.

And that market is increasingly the lucrative sectors of education, software development and large organisations.

Innovative entries are pouring in

ENTRIES already received for the 1988 Micro User Innovation Awards include an integrated package which manages all the administration associated with a continually assessed double option GCSE science course.

Also in the education field, another entrant uses the BBC Micro to help children with profound and multiple learning difficulties – children who cannot use the keyboard at all.

And in the commercial sector, a company has designed a program to cope safely and efficiently with the intricacies of high explosive storage.

The international competition is open to all BBC Micro users – individuals or groups, schools or businesses – and the project entered for consideration can be serious, commercial or just for fun.

In the BBC Micro category the winner will receive – among other prizes – an Archimedes, while the winner in the Archimedes section will take home a 24 pin Brother 1709 printer.

The closing date for entries is October 14 and the winners will be declared at the Electron & BBC Micro User Show in November.

DTP for ARC

ACORN Computers has signed a contract with British-based software house GST to develop a desktop publishing package for the Archimedes.

Scheduled for release towards the end of the year, the DTP software – based on GST's popular Timeworks package – will take full advantage of the machine's speed and graphics capability.

◀ From Page 7

analysis systems to exploit the power of the Archimedes' Risc-based environment.

Vital information for the treatment of glaucoma can be obtained by the use of Digit, a program designed by Dr Brian Hayes from the Institute of Ophthalmology in London.

To enable image analysis of the eye, a digitiser tablet is connected to an Archimedes to measure the area of the optic disc, located on the optic nerve at the back of the eye.

Also running on the Archimedes at the exhibition was a selection of rehabilitation programs for patients recovering from head injuries. These have

been developed at the Burden Neurological Institute, Bristol, for monitoring results and upgrading and adapting treatment.

Patients returning home are given a micro and modem so that exercise programs for regaining concentration can be undertaken and monitored remotely.

Ian Laurence, Acorn's sales and marketing director, presented a paper entitled Implications of Risc technology for the NHS.

The paper included a description of how Acorn's Risc developments can benefit the Health service.

CJEmicros

THE ACORN SPECIALISTS

The widest range of Archimedes Hardware & Software anywhere!

ARCHIMEDES

External Drive Interface

Fully buffered with link options. THE BEST. £30.00. N.B. not all drives are Archimedes compatible

Drive Swap Switch

For above makes external drive '0', internal drive '1'. Ideal for PC Emulator as 5.25" drive becomes A:Internal B: £8.00.

Drive Select Translation Cable

When used with above, interface links in external drive can stay set to '0', saves hassle when moving a drive from a Beeb. £9.00.

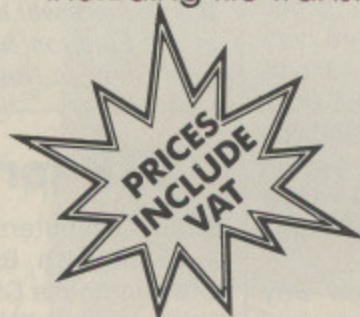
DFS Reader

This program will transfer the files on a DFS disk globally or selectively to an Archimedes disk quickly and simply. £15.00.

Monitor Switch Box

Archie/BBC. Plug both a BBC and an Archimedes into an Archimedes colour monitor. £10.00.

Archimedes <-> BBC RS423 link kit including file transfer software. £15.00.



P&P £1 or as quoted
TRADE & EXPORT
ORDERS WELCOME
please enquire for
delivery cost.
Phone/Credit Card
and Official
Orders welcome.

C.J.E. MICRO'S (Dept. MU), 78 Brighton Road, Worthing, W. Sussex BN11 2 EN
(0903) 213361 (3 lines)

FONTAID

'FONTAID' NLQ Font designer for CANON/TAXAN & STAR NL10/LC10 (Archie version available).
Ring for a leaflet

SOFTWARE

'Multi Font NLQ' for most printers (SWR workspace version now available)
'INFORM' Sideways Ram information system!
Ring for a leaflet

PRINTERS & MONITORS

PRINTERS

Star/Canon/Panasonic/Juki
MONITORS

Philips/Microvitec

Ring for best prices

Archimedes

Acorn
The choice of experience.

Special offers on
ARCHIMEDES & MASTERS.
Ring for details.
Officially approved ACORN/
ARCHIMEDES Dealer &
Service Centre.
Come to our shop for a
demonstration.

NEWS *beat*

Hospital wins in spreadsheet challenge

YOUNG patients at the Great Ormond Street Hospital in London have been given an Archimedes to mark an attempt at a new entry in the Guinness Book of Records.

Staged at the Electron & BBC Micro User Show the event involved an Archimedes and a brand new accounting software package from Minerva Systems called SigmaSheet.

The combination calculated a complete set of annual consolidated accounts for a company with 1,260 branches – covering nine financial categories including sales, costs, rents and expenses – in only 23.48 seconds.

Minerva (0392 37756) says SigmaSheet can calculate a 32-year cash flow in under 25 seconds and analyse figures for a period up to 333 years.

It all makes for a lot of paper – produced at the show was the longest spreadsheet in the world, all of 235ft long with up to



Minerva Systems team wrapped in its 235ft spreadsheet left to right: Roger Jane, programmer of SigmaSheet, Barry Stearn, technical director, and Nova Fisher, managing director.

1,000 columns by 16 rows of figures.

Leading international accountancy firm Touche Ross pulled out of a challenge to compete against SigmaSheet and the Archimedes at the last minute.

"Maybe they discovered how fast our spreadsheet really is and didn't feel they had a chance of winning", said Minerva managing director Nova Fisher.

Despite the lack of a challenge the day did provide a winner – in the shape of the Wishing Well appeal fund at Great Ormond Street Hospital.

Acorn donated an Archimedes which will be used by children in the hospital to continue their education while undergoing long-term treatment.

Arc aids athletes

AN Acorn-donated micro was the star attraction at a fund raising event for the British Olympic Appeal in Wales.

The Archimedes – fastest micro in the world – was a logical choice to raise money to speed British athletes to the Seoul Olympic Games.

Together with other prizes at a gala dinner and grand auction in the presence of the Princess Royal, it helped raise £56,000 for the appeal.

Alf Gooding, spokesman for the British Olympic Appeal, said: "It seemed entirely appropriate that a high performance British computer should help raise money for our athletes".

Mini modem for Z88

WEIGHING in at only 130 grammes, a miniature modem is the latest addition to the range of peripherals suitable for the Z88.

Available from Cambridge Computer (0223 312216) the battery-powered Z88 Pocket Modem is small – about the size of a cigarette packet – but offers a comprehensive range of features, including variable baud rates, choice of protocols and auto-dial and answer.

The modem is fully Hayes-compatible, with 300 and 1200 baud rates. It supports Bell 103/212A and CCITT V21/V22 communications protocols and can be switched between the two.

Price £172.45.

No hike in MicroLink charges

DESPITE this month's surprise Micronet/Prestel price rises, MicroLink has denied reports that it will be forced by BT into raising its own charges.

From July 1 Micronet/Prestel subscriptions go up 21 per cent from £66 to £79.95 a year for home users, with business users paying £119.95.

Peak time charges rise from 6p a minute to 7p, and free off-peak usage has been scrapped – users now have to pay 1p a minute. For the first time, full peak time rates also apply on Saturdays between 8am and 6pm.

However, although some communications industry observers are predicting that MicroLink will have to follow suit, the company says its annual subscription will remain at £36 for home and business users alike and it will continue to operate off-peak rates for the whole of Saturday and Sunday.

£1,000 competition winners

THE great £1,000 music competition sponsored by EMR in the April issue of *The Micro User* brought an absolutely massive response.

First correct entry out of the sack was from W.Stephens of Sudbury who wins the magnificent Farfisa TK80 digital keyboard. EMR's Scorewriter goes to S.Shaw from Stanmore, while the EMR Performer and Midi Interface were won by Ian Elson from London.

K.Milner from Knebworth; P.Sykes, Brighton; T.Pegg, Leeds and A.Highet, Granby

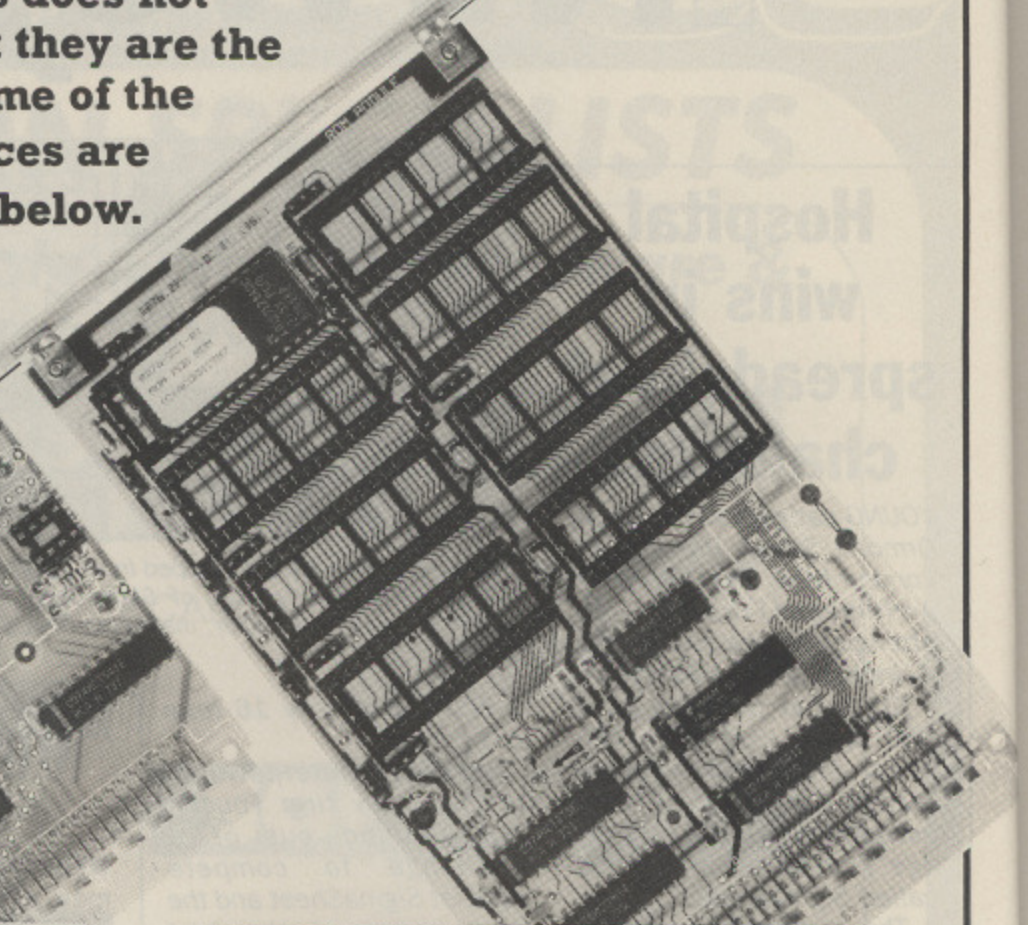
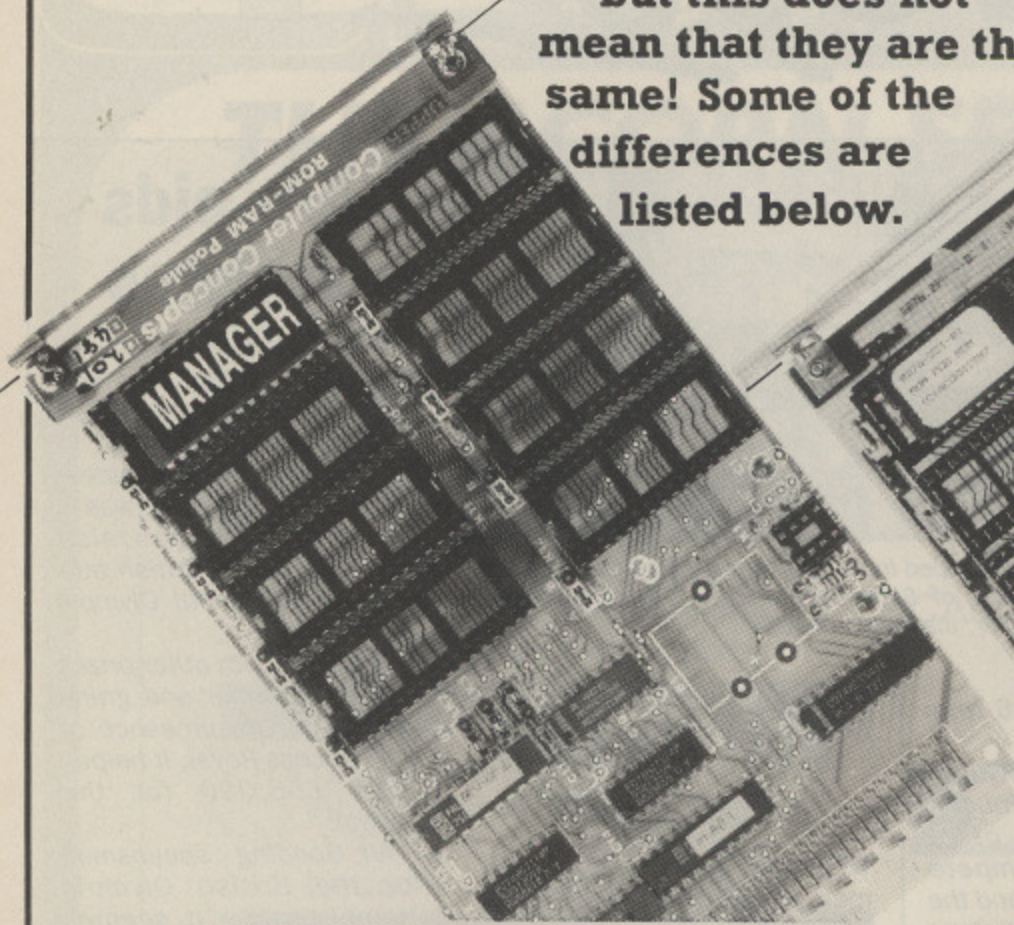
each won the new music package for the Archimedes – Soundsynth.

Copies of Mike Beecher's book – Midi, Micros and Music – go to each of the 50 runners-up: D.Lally, Bromsgrove; S.Smith, Ormskirk; M.Smith, Aughton; R.Billington, Warley; A.Mas, Lower Kingswood; C.Stops, Bridgwater; S.Hubbard, Basingstoke; R.Grant, Sheffield; J.Marshall, Tollerton; N.Kennedy, Northwood; M.Needham, Sheffield; A.Gray, Ruislip; D.Radford, Bolton; A.Launchbury, New Barnet; R.Escolme, Nuneaton; G.Heayes, Woodhurst; T.Lancaster, Haverhill; F.Chaplin, Chorley; M.Pegg, Derby; A.Rogers, Bracknell; P.O'Leary,

Worksop; T.Rowe, Welling; A.Barker, Watford; R.Masters, Gillingham; Q.Pak, Sevenoaks; P.Smart, Tunbridge Wells; N.Geeves, Wellingborough; J.Stone, Ivinghoe; A.Smith, London; J.Sawyer, High Wycombe; S.Crump, Chorley; K.Nelson, Patna; C.Williams, Coventry; R.Davenport, Iver Heath; W.Taylor, St Annes; R.Calvert, Newtownards; T.Lister, Salisbury; Z.Iqbal, Sheffield; A.Smith, Doncaster; S.Barber, Oxford; P.Robson, Lordswood; A.Smith, Long Eaton; M.Lancaster, Orpington; I.Braithwaite, Ruislip; H.Steel, Glasgow; S.Hardie, Amptill; J.Sampson, Weybridge; M.Street, Biggin Hill; V.Barnett, Soton.

The two ROM boards may look alike

but this does not mean that they are the same! Some of the differences are listed below.



Computer Concepts

- 7 ROMs maximum or
- 7 RAMs maximum
- Supports 8k, 32k, 128k RAMs
- Complete ROM filing system
- Automatic device type detection
- Automatic device configuration
- Fast file transfer (280k bytes/sec)
- 8 files open at once
- Complete RAM filing system
- Multiple boards extend RAM filing system
- 896k RAM maximum per board
- Price £49.00 + VAT

Acorn

- 5 ROMs maximum
- 2 RAMs maximum
- Supports 32k RAMs
- Limited ROM filing system
- Manual link device selection
- Manual command configuration
- Slow file load (30k bytes/sec)
- 1 file open at once
- NO RAM filing system
- Not possible
- 64k RAM possible per board
- Price £59.00 + VAT

The potential for Archimedes software without a ROM podule is severely limited. There will be many ROM based programs in future, in addition to INTER-WORD, SHEET, CHART and SPELL-MASTER, which are already available. Remember, ROM based programs on the Archimedes still have many of the same advantages over disc based programs that they had on the BBC; programs load faster, they are more reliable, they are permanently available and, most important, such programs can use overlay techniques to save a large proportion of the available memory. Consider running a document processor, spelling checker, drawing program and perhaps a thesaurus; the total program size could easily be over 600K—totally impractical, even on a 1 Meg machine.

In addition the Computer Concepts' board can be used as a very fast RAM filing system, and our experience is that many boards are used for this. A program that uses the floppy disc intensively will gain from the RAM filing system, which is about 10 times faster than floppy.

Our board is fast, cheap, flexible, expandable and easy to use. We also provide a no quibble money back guarantee. In a comparison, the facts speak for themselves.

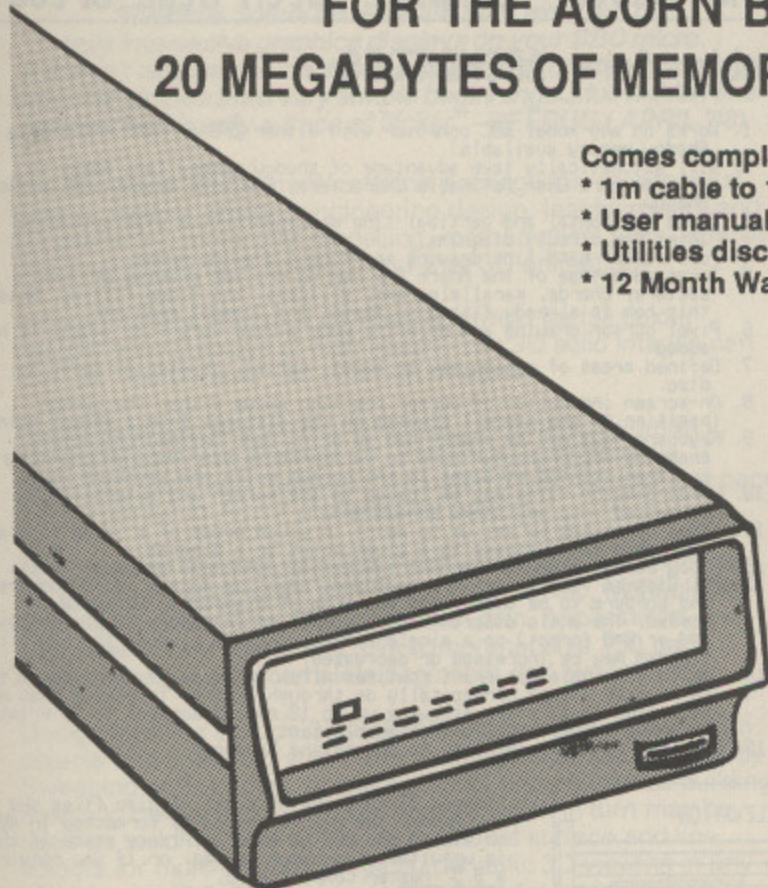
Please note: A backplane must be fitted in order to install any podule expansion card.



Computer Concepts Ltd

Gaddesden Place, Hemel Hempstead, Herts HP2 6EX Telephone 0442 63933

Another Sensational Offer from Copper Mill Computers
INTRODUCING OUR NEW 20MB WINCHESTER DISC DRIVE SYSTEM
FOR THE ACORN BBC B/B+ AND MASTER
20 MEGABYTES OF MEMORY FROM ONLY £299.95 inc VAT



- Comes complete with:**
- * 1m cable to 1MHz bus + through socket
 - * User manual
 - * Utilities disc (FORMAT, VERIFY, DIAGNOSTICS)
 - * 12 Month Warranty

OUR NEW WINCHESTER COMES AS A COMPLETE PACKAGE. NO HIDDEN EXTRAS!
 Attractively packaged our system is totally compatible with the Acorn ADFS and associated software. Our manual covers operation and use of the available high speed memory. This whole system is manufactured in our own factory where we have gained great experience in the service and repair of virtually all types of disc drive, thus you can be well assured should you require any service backup.

Please send cheque/P.O./Access or Visa to:
 Copper Mill Computers, Unit 13, 193 Garth Road, Morden, Surrey. SM4 4LZ.

Please write or call us on 01-330 4838, for further details.
 Official orders from Educational Government Dept's welcome.

NEW LINES FROM COPPER MILL COMPUTERS AT BARGAIN PRICES

**CASED-UP
 FLOPPY DISC DRIVES**
 (for BBC etc)

Single 40-Track without P.S.U.....	£86.25
Single 80-Track without P.S.U.....	£88.55
Single 40/80 Track Switchable without P.S.U. ..	£95.45
Single 40/80 Track switchable <u>with</u> P.S.U.	£109.25
Dual 40/80 Track switchable <u>with</u> P.S.U.....	£189.75

SPECIAL OFFERS

Twin Volume Export BBC 'B' manuals covering DFS, Speech and VIEW. A very comprehensive set of manuals.
 £20.00 (no VAT)
 Switch Mode P.S.U's - plus 5 and plus 12 volt. Ideal for disc drive etc
Special Offer £19.55

BARCO 26" COLOUR MONITORS

Ideal in situations where single or multiple screens are required for use as class/lecture theatre demonstration display units. Also may be used as screen only for television/video use. BNC type composite video in/out sockets. A quality PAL colour monitor for only . . .
£245.00 INC. CARRIAGE

HOBBYISTS CORNER

FLOPPY DISC DRIVE CHASSIS

Top quality units from Teac, Mitsubishi, etc. All drives are single/double density.

40 Track Double Sided (180K/360K)	£69.00
80 Track Double Sided (360k/720K)	£71.30
40/80 Track with face plate mounted switch	£78.20

(Ideal for BBC)

WINCHESTER ADAPTOR FOR BBC 1MHz

Bare Circuit Board	£17.25
Populated Circuit Board	£40.25
Populated Circuit Board c/w instructions and software to assemble BBC Winchester Subsystem	£57.50

CONTROLLER CARDS FOR WINCHESTERS

IM PC Bus Type:	
Western Digital WD1002	£74.75
Xebec 1210	£63.25
ST 506 to SASI Type:	
DTC 510A/510B	£86.25
XEBEC 1410/1410A	£143.75

WINCHESTER DISC DRIVES

10 Megabyte Half Height	£143.75
20 Megabyte Half Height	£201.25
40 Megabyte Half Height	£316.25
20 Megabyte Half Height with SASI Interface	£212.75
20 Megabyte Half Height with SCSI Interface	£258.75
20 Megabyte Full Height	£201.25
30 Megabyte Full Height	£287.50
40 Megabyte Full Height	£316.25

N.B. All drives have ST412/506 Interfaces except where specified

**WINCHESTER UPGRADE KITS FOR
 IBM PC & CLONES (inc. cables)**

20 Megabyte	£253.00
30 Megabyte	£356.50
40 Megabyte	£454.25

ALL OUR PRICES INCLUDE VAT AT 15%

Postage and Packing as follows: Disc Drives-£4.60; Cards and Manuals-£2.30; Winchesters/Subsystem-£9.20.
 Please ring for quote on quantity purchase
 All our goods are covered by a 12 month warranty (excluding P&P) except where specified

PINEAPPLE SOFTWARE

Programs for the BBC model B, B+, Master and Master Compact with disc drive

DIAGRAM II now also available for ARCHIMEDES

Diagram II represents a major breakthrough in the techniques used for drawing software on the BBC micro. It works on a completely different principle to other drawing software by storing the drawing information straight to disc as coded 8x8 pixel blocks.

This technique has three major advantages. First, the size of the diagram is only limited by the amount of space on disc. Second, there is no limit to the amount of information which can be stored on a given diagram as the information is stored on disc and not in computer memory. Third, the disc storage technique allows the smooth scrolling of the screen over the whole surface of the diagram.

For people not familiar with Diagram, the basic operation of the program is to first display any part of the diagram, either by quoting an index name or screen number. At this point you are free to scroll the diagram around the screen using either cursor keys, trackball or mouse. You may stop scrolling at any point and enter the edit mode which allows you to modify or add new information to the diagram. When you have finished making alterations, the new information is stored to disc and you are free to scroll elsewhere on the diagram stopping to edit at any time.

The edit features are now very comprehensive. Text may be typed straight from the keyboard, and if other fonts are stored as user defined characters then these fonts may be printed using the normal keyboard keys.

The print routines are now completely 'scaleable' with both the horizontal and vertical scales being totally variable in 1% steps between a size that will give 18 mode 0 screens on an A4 sheet and a size that would print just one pixel on a sheet! The routines are adaptable to most types of dot matrix printer and full advantage may be made of wide carriage printers. The printouts may be rotated through 90 deg. if required.

The new editing features make DIAGRAM II suitable for all types of serious drawing application including scale drawings, flow charts, architectural, family trees, and many other subjects as well as circuit and schematic diagrams. As an example of what Diagram II can do, this complete advertisement (with the exception of the PCB drawing) has been produced with the package.

1. Works on any model BBC computer with either DFS or ADFS. (ADFS only if Shadow memory available).
2. Will automatically take advantage of shadow memory (any make) to provide more User Definable Characters, 880 with Shadow, 381 without Shadow.
3. Rapid horizontal and vertical line drawing routine with automatic joins for circuit diagrams.
4. Full rubber band line drawing and circle drawing modes.
5. Takes advantage of the Acorn GXR rom to provide drawing of arcs, sectors, chords, parallelograms, ellipses, and flood filling. Note this rom is already fitted to Master and Compact machines.
6. Pixel cursor drawing and deleting mode allows very fine detail to be added.
7. Defined areas of screen may be moved, copied, deleted or saved to disc.
8. On-screen indication of cursor position shows either the cursor position on the overall diagram or the distance from a preset point.
9. Keyboard keys may be predefined to print User Defined Characters, enabling new character sets to be stored as user defined characters and then printed straight to the screen using the keyboard keys.
10. Wordprocessor files may be loaded to the screen and automatically formatted into any shape screen area.
11. Index names may be set up to point to given areas of a large diagram, to enable rapid access to a given point on a diagram.
12. Fully compatible with Marconi trackball and most makes of mouse.
13. All Diagram 'Utilities' are included, enabling screen ident numbers and borders to be added, and any area of diagram to be moved or copied. The whole diagram may be displayed in reduced scale (either 4x4 or 8x8 format) on a single screen, and the size of the overall diagram may be increased or decreased.
14. Completely scaleable print routines allow any area of the diagram to be printed either horizontally or through 90 deg. in scales that may be varied in 1% steps allowing up to 18 mode 0 screens to be printed on an A4 sheet (still with readable text).
15. Complete with 40 page easy to understand handbook.

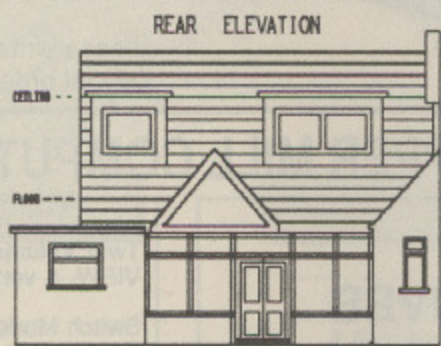
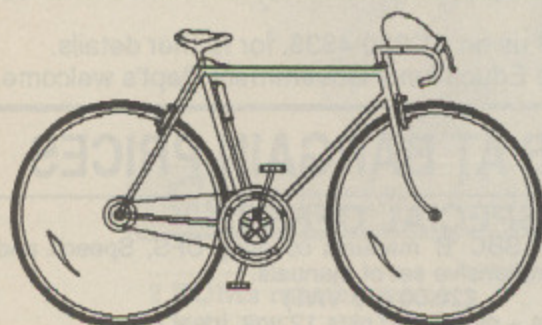


Diagram II consists of a set of disc files and a 16k Eprom. The disc supplied is formatted in 40T on side 0 and 80T on side 2. Please state if this is unsuitable for your system, or if you require a 3.5" Master Compact disc. ARCHIMEDES version on 800k 3.5" disc.

DIAGRAM II - £ 55.00 + vat

P & P free (except overseas)

N.B. Upgrades are available to existing Diagram owners. Please contact Pineapple if you have not received an upgrade letter.

PCB

Pineapple's now famous printed circuit board drafting aid produces complex double sided PCB's very rapidly using any model BBC micro and any FX compatible dot-matrix printer.

The program is supplied on Eprom and up to 500 component and 500 ASCII component descriptions may be stored for each PCB. There is no limit to the number of tracks that may be stored for a given PCB although the maximum board size is restricted to 8" x 5.6".

Using a mode 1 screen, tracks on the top side of the board are shown in red, while those on the underside are blue. Each side of the board may be shown individually or superimposed. A component placement screen allows component outlines to be drawn for silk screen purposes and component numbers and outlines entered on this screen may be displayed during track routing to aid identification of roundels.

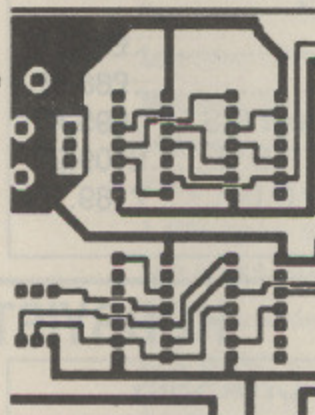
The print routines allow separate printouts of each side of the PCB in a very accurate expanded definition 1:1 or 2:1 scale enabling direct contact printing to be used on resist covered copper clad board. The print routines are very fast taking typically 5 minutes for a 1:1 print of a 7" x 5" board.

This program has too many superb features to describe adequately here, so please write or 'phone for more information and sample printouts.

PRICE £ 85.00 + vat

Plotter Driver to suit most plotters £ 35.00 + vat

PCB AUTO-ROUTING



This brand new addition to the PCB program greatly increases the power of the software and speeds the design of PCB's even more.

A connection list of up to 190 connections may be entered in the form of a 'rats nest' and then the computer does the rest!

You may specify which side of a board you wish the track to be on or leave the choice to the computer, and you may also say whether tracks should be allowed to pass between I.C. pins. Tracks may still be drawn manually at any time so boards may be produced by a combination of manual and auto techniques if required.

The program is in the form of a second Eprom and all the features are available even with an unexpanded model 'B' computer.

Please write or 'phone for full details.

COMPLETE AUTOROUTE PACKAGE £ 185.00 + VAT
(including manual eprom)

MARCONI TRACKERBALL

This high quality device comes in three versions. Version one is for the standard BBC micro and comes with the Icon Artmaster drawing package from Micro-Draw, and Trackerball Utilities which allow the trackerball to be used with other software.

Version two is for the Master 128 computer and this comes with the Pointer Rom. This is a Rom which allows the Master to be configured for use with the Trackerball and has commands to enable the Trackerball to intercept the cursor key or joystick routines of other software. Commands are also available to reverse the axes of the trackerball and set the sensitivity. The three buttons may also be set up to produce any ASCII code.

Version three is simply the bare Trackerball which comes without software but is suitable for use with specially written software such as Diagram or Diagram II.

Trackerball adapters are also available which plug onto the end of the cable and convert the connections of the trackerball to be the same as a mouse. This enables the trackerball to drive all types of 'mouse' software.

For Model 'B' and B+ (with Icon Artmaster)	£ 60.00 + vat
For Master 128 (with Pointer Rom)	£ 60.00 + vat
Bare Trackerball (no software)	£ 49.00 + vat
Pointer Rom - available separately	£ 12.50 + vat
Trackerball to mouse adapters	£ 8.00 + vat
Postage & packing on Trackerballs	£ 1.75

MITEYSPICE

Miteyspice is a very powerful AC & DC circuit analysis package with graphics suitable for use with any model BBC micro including those with 2nd processors.

As well as all the usual facilities available with this type of program, non-linear effects, small signal, noise measurements and sweeps may be performed. Component values may be swept, allowing component tolerances to be investigated as well as thermal performance etc. Comprehensive transistor modelling is incorporated using a 20 parameter Ebers Moll description. The program is supplied on disc with a very comprehensive 49 page manual.

PRICE £ 119.00 + vat

ADFS Utilities Rom - ADU

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. Copying of DFS discs onto ADFS discs can be made in one pass with automatic creation of the required directories on the ADFS disc. All functions are fully compatible with Winchester drives including *BACKUP which allows backing up of Winchester's onto multiple floppies.

Additional commands include:- *ADU, *BACKUP, *CATALL, *CHANGE, *DFSDFS, *DIRALL, *DIRCOPY, *DIRDESTROY, *DIRRENAME, *DISCEDIT, *DRIVE, *FILEFIND, *FORMAT, *KILLADU, *LOCK, *MENU, *PURGE, *PURBRK, *UNLOCK, *VERIFY, *VFORMAT, *WIPE



PRICE £ 29.00 + vat

All orders sent by return

VISA

39 Brownlea Gardens, Seven Kings, Ilford, Essex IG3 9NL Tel 01-599 1476

Access

REALTIME SOLIDS MODELLER

"Realtime Solids takes all the hard work out of truly impressive graphics displays on your BBC micro. It doesn't take much imagination or effort to create extremely complex shapes from very simple beginnings....full hidden line removal and hardly a trace of flicker" - BEEBUG (APRIL '88).

The complete 3D Solids/Wireframe package for architectural design, interior design, engineering design, teaching CDT and 3D geometry, molecular modelling, mathematical plots, scientific processing and high speed flicker-free 3D animation.

Hidden Surface Removal can be performed for full colour realistic solid displays at high speed. The 3D solid images can then be incorporated into other art designs.

Supports all plotters including HP-GL, Plotmate, Penman II, Hewlett Packard, Epson HI-80, Hitachi 672, Watanabe, Graphtec, Calcomp, Seckonic, Houston DMP, Roland and paper sizes from A0 to A4 for professional results.

The package consists of a 32k Realtime Graphics Language rom, Solids Design disc, Wireframe Design disc, Multi-plotter and printer driver disc, Demonstration disc, Applications disc, Database library disc and a fully comprehensive 150 page manual designed for complete beginners and experts alike.

Design facilities include 3D Solid/Wireframe Editors to design objects with lines and surfaces, create symmetrical objects by Sweeping or Extruding simple sections, use objects as building blocks to create more complex objects which in turn may be used as building blocks, specify individual surface and line colours for multi-coloured objects, dynamic 3D viewing in any graphics screen mode and a Data convertor for interfacing to other CAD systems and applications.

The Solids Realtime Graphics Language (RGL) rom provides 52 star commands to write your own 3D applications. The facilities include 3D Rotation, Scaling, Translation, Perspective and Isometric displays, Orbiting, 3D Turtlegraphics, Geometric processing, unique 35,000 pixels/sec line generator (faster than Acorn's 9000/sec) for high speed 3D animation and many more options.

The Solids RGL is compatible with all the BBC graphics screen, plotting and colour modes including Shadow screen and is up to 5 times faster than the original RGL. The 32k RGL rom board can be plugged into any 16k rom socket.

Minimum requirements: BBC B/keyboard/single drive. Also compatible with BBC B+, Master series, all versions of DFS & DDFS. The system will also take advantage of a 6502 2nd Processor/Turbo or AMX/QUEST Mouse. REALTIME SOLIDS MODELLER: £89.95.

Please send me further details.

I wish to order:

Realtime Solids Modeller (BBC).

3D CAD/Animation (Archimedes).

3D CAD/Animation (BBC).

Super-Dump (BBC).

Super-Plot (BBC).

I wish to pay by cheque/P.O./Access.

All prices are fully inclusive.

Card No:

Name:

Address:

.....

Signature:

3D CAD/ANIMATION SYSTEM

ARCHIMEDES & BBC VERSIONS

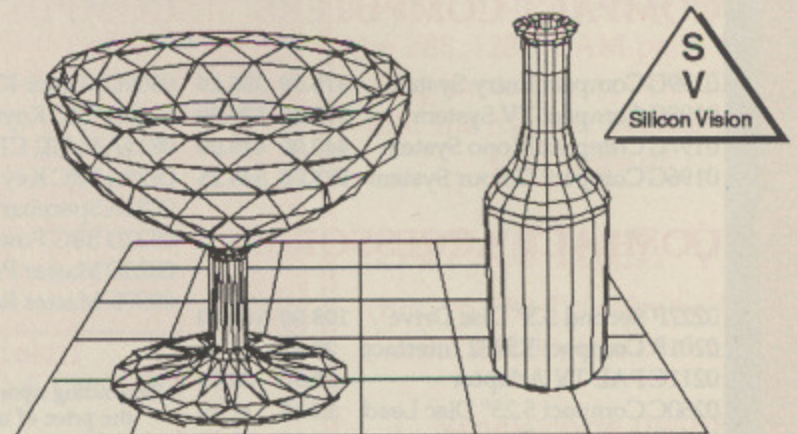
Once again Silicon Vision steals the lead with this incredible offer. It's true we're offering our international, best-selling wireframe 3D Graphics Development System (3D GDS) at an incredibly low price. No we haven't gone mad, it's simply our way of introducing you to our unbeatable 3D Solids Design & Animation Systems.

3D GDS is a full blown 3D CAD & Animation system that can handle wireframe models of any complexity. The package consists of a Design & Animation disc, a database disc to get you started, and a comprehensive 95 page manual. The standalone animation facilities for the BBC include a unique 30,000 pixels/sec line generator for high speed flicker-free 3D animation -ideal for games & simulations.

In the future, you may find that you need a 3D Solid Modelling system for more professional results or more powerful animation facilities for better effects.

Well, then you'll find no better company to do business with than Silicon Vision. As Europe's fastest growing CAD software house, there's no-one more capable of satisfying your future needs. In the meantime we offer you 3D GDS with our compliments. Worth over £25 it can now be yours for only £12.95 (BBC version) or £19.95 (Archimedes version). Super-Plot plotter driver: £15.95 (BBC).

Minimum requirements: BBC B/single drive. Also compatible with BBC B+, Master series, Archimedes 305 to 440, all versions of DFS, DDFS & ADFS(Archimedes 3.5" disc). Order one today and enter the dynamic world of high speed 3D computer graphics.



SUPER-DUMP

1920x1024 Resolution Breakthrough!
Near Plotter Quality hardcopy at a fraction of the cost.

At last a printer driver which takes advantage of the highest resolution capability of ordinary Epson compatible printers to provide 1920x1024 resolution as opposed to the 640x256 resolution limitation of most printer dumps.

Fully compatible with the Realtime Solids Modeller, 3D GDS and all other CAD packages and applications that can produce a VDU text file of a screen image. An example program is included in the package.

Unlike other printer drivers, Super-Dump does not use screen images directly but instead operates on text files of VDU codes that represent the image to be printed. These files can also be created by your own graphics programs with the addition of two simple *SPOOL statements.

The package consists of a Super-Dump disc complete with documentation and provides fully proportional dumps at resolutions of 1920x1024, 640x512 & 640x256. Images can also be scaled, positioned and previewed before printing.

Minimum requirements: BBC B/single drive. Also compatible with BBC B+, Master series, all versions of DFS & DDFS. SUPER-DUMP: £15.95. (Enquire for Archimedes version).

Contact your local dealer or order directly by cheque/P.O./Access/Mastercard/Eurocard from:

SILICON VISION LTD, SIGNAL HOUSE, LYON RD, HARROW, MIDDX, HA1 2AG.

Tel: 01-422 2274 or 01-861 2173. Fax: 01-427 5169. Telex: 918266 SIGNAL G.



BEEBUG

BEEBUG MAIL ORDER,
 Dolphin Place, Holywell Hill,
 St. Albans, Herts., AL1 1EX.
 Tel: 0727 40303 Multi-lines

5% DISCOUNT TO BEEBUG AND RISC USER MEMBERS ON HARDWARE/SOFTWARE
 Only if you quote your membership number.
BEEBUG Membership £14.50
RISC USER Membership £14.50

The products in this price list are available in our showroom in St. Albans and by mail order. Telephone your order on 0727 40303 or send us the order form.

Showroom open: Mon-Sat 9-5.30 and
 Thursday 9-8.00pm

ORDERS CAN NOW BE PLACED VIA MICRONET. SEE US ON PAGE 800909 OR SIMPLY TYPE "BEEBUG#"

PRICES INCLUDE VAT.

THERE ARE TWO PRICES LISTED BELOW FOR EACH ITEM. THE FIRST IS OUR NORMAL PRICE, THE SECOND OUR MEMBERS PRICE.

COMPACT COMPUTERS

0199G Compact Entry System	375.00	356.25
0198G Compact TV System	390.00	370.50
0197G Compact Mono System	440.00	418.00
0196G Compact Colour System	575.00	546.25

COMPACT ACCESSORIES

0227F Second 3.5" Disc Drive	108.00	102.60
0201B Compact RS232 Interface	29.90	28.41
0211C PAL TV Adaptor	29.90	28.41
0250C Compact 5.25" Disc Lead	12.32	11.70
0298B Compact Printer Lead	9.77	9.29

MASTER COMPUTER

0200G Master 128	435.91	414.11
------------------	--------	--------



Free Inter-word when buying a new Master Series Computer.

0234B M128 Econet Module	48.88	46.43
0781B Care Elec. Cartridge	8.95	8.50
0782B Care 4 Way Cart.	14.95	14.20
0230C 65C102 6502 "Turbo"	119.00	113.05
0231D 80186 Co-Processor	228.85	217.41
0233F Universal 2nd Proc.	83.00	78.85
0207A Basic II ROM	21.85	20.76
0208A 1.2 Operating System	10.06	9.56
0209B 1.2 DNFS ROM	19.78	18.79
0212B Acorn Speech Upgrade	46.00	43.70
0217B 1770 Disc Interface	50.24	47.73
0218A ADFS Upgrade 1770	29.33	27.86
0225B Econet Upgrade BBC	48.00	45.60
0226B 64K Upgrade Kit B+	39.00	37.05

COMPUTER SPARE PARTS

0809D Master Keyboard	64.00	60.80
0810D BBC Keyboard	52.90	50.25
0815A 65C02 CPU	13.80	13.11
0820A BBC Key Switches	1.73	1.64
0821A Spacebar Support	2.30	2.18
0822D BBC Power Supply	67.85	64.46
0823D Master Power Supply	69.49	66.02
0807B Master Battery Kit	3.68	3.50

1013B View Print Driver Cassette	8.62	8.19
1014B View Print Driver Disc	9.77	9.29
1002B Hi-View	44.28	42.06
1021A ViewIndex Disc	13.80	13.11
1043B ViewSpell ROM	34.02	32.32
1001B ViewSheet	44.28	42.06
1030B ViewPlot	25.30	24.04
1019B ViewStore ROM	44.28	42.06
1023C View Professional	99.95	94.95
1020D Overview (M128)	98.90	93.96

Trade-in your BBC Micro for a New Master 128, Compact or Archimedes

Depending upon the age of your computer we are able to offer a trade-in discount of up to £225 off the price of new equipment. This would bring the purchase price of a Master 128 down from £414.11 to just £189.11 for BEEBUG members. We have also extended this scheme to allow Master 128s and Compacts to be traded-in for Archimedes. Discounts are as follows:

• BBC Micro issue 3/4	£125	• BBC Micro issue 3/4 with DFS	£175
• BBC Micro issue 7	£175	• BBC Micro issue 7 with DFS	£225
• BBC Micro B+64K	£225	• BBC Micro B+128K	£230
• Master 128	£250	• Master Compact Entry	£215
• Master Compact Mono	£250	• Master Compact Colour	£330

Computers must obviously be in good condition to qualify for this offer. We also able to offer £40 for scrap for any BBC machine in any condition.

ACORN SOFTWARE LANGUAGES

0243B Master Lisp Cart.ROM	59.69	56.70	1010D Overview (Compact)	98.90	93.96
1003B Lisp ROM	48.00	45.60	1008B Basic Editor	28.00	26.60
0245B Master Logo Cart.ROM	67.85	64.46	1017B GXR B	28.00	26.60
1006B Logo	62.00	58.90	1018B GXR B+	28.00	26.60
1004B BCPL	53.00	50.35	1031B Termulator ROM	31.05	29.50
1026B BCPL Generator	43.57	41.39	1047B Master Termulator	34.50	32.78
1005B Comal	48.00	45.60	1035B 6502 Development	45.00	42.75
1007C ISO Pascal	62.00	58.90	1039B Creative Sound Disc	19.00	18.05
1028B Pascal Generator	32.78	31.14			
1027C Micro PROLOG	74.75	71.01			
1033B Microtext Disc	55.20	52.44			
1034C Microtext Plus ROM	240.01	228.00			
1041B Forth ROM	45.00	42.75			
1042B Forth Disc	19.00	18.05			

PRINTERS

0299G Panasonic KX-P1081	180.00	171.00
0304G Panasonic KX-P3131	290.53	276.00
0311G Taxan KP815	342.11	325.00
0316G Taxan KP915 15"	440.00	418.00
0322E Epson LX800	275.00	261.25
0327G Star NL-10	285.00	270.75
0328G Epson FX800	405.00	384.75

See separate advert for ARCHIMEDES

ACORN SOFTWARE APPLICATIONS

1000B View 2.1	44.28	42.06
1022C View 3.0 ROM	66.70	63.36

The products listed here are only a selection from our extensive range. Please telephone and ask for an information pack which includes a Catalogue and details of BEEBUG.

MONITORS & PLINTHS

0503G Zenith 123 12" Green	83.00	78.85
0504G Zenith 122 12" Amber	87.00	82.65
0530G Microvitec 1431 Mon.	239.00	227.05
0531G Microvitec 1451 Mon.	289.00	274.55
0535G Supervision 625 RGB	379.50	360.53
0536G Supervision 620 RGB	318.55	302.62
0551E Single Master Plinth	16.10	15.30
0559F Double Master Plinth	28.75	27.31
0552E Single BBC B Plinth	12.65	12.02
0553F Double BBC B Plinth	23.00	21.85

CUMANA DISC DRIVES

0600F CSX100 Single 40 Track	106.95	101.60
0610F CS100 as above with PSU	126.50	120.18
0614F CS100E additional drive	118.45	112.53
0602F CSX400 Single 40/80 switchable	142.60	135.47
0603F CS400 as above with PSU	162.15	154.04
0615F CS400E additional drive	155.00	147.25
0604G CD800S Double 40/80 track	286.35	272.03
0617G CS354 Single 3.5" with PSU	132.95	126.30
0618G CD358 Double 3.5" with PSU	229.42	217.95
0619G CCD2000S Dual 3.5" & 5.25"	308.27	292.86
0650B 10 x Memorex Discs SS 40	15.50	14.73
0651B 10 x Memorex Discs DS 80	25.50	24.22
0669B 10 x Memorex 3.5" Discs	25.00	23.75
0652B Disc Head Cleaner (5.25")	9.65	9.17
0648B Disc Head Cleaner (3.5")	9.65	9.17
0655C Lockable Disc Box (50)	13.80	13.11
0656C Lockable 3.5" Disc Box (40)	11.05	10.50

WATFORD HARDWARE

0214B Watford DDFS Kit	56.35	53.53
0216B Watford DFS Manual	6.95	6.60
0219B Watford 1.43 DFS Kit	62.10	59.00
0702B 32K RAM Card	67.28	63.91
0709D Watford Eprom Eraser	33.35	31.68
0717B Watford Sideways ZIF	17.83	16.93
0736B Solderless ROM Board	36.80	34.96

0737B Watford Battery	4.37	4.15
0752B Watford Diagnostic Disc	23.00	21.85
0755B Write Protect Mk12	2.76	2.62
0739C Watford Video Digitiser	113.00	107.35
0429B Watford NLQ Epson	28.75	27.31
0748F Co-Pro Adaptor	55.00	52.25
0785C Quest Mouse & Paint	67.85	64.46

OTHER HARDWARE

0701B Aries B32 RAM Card	93.15	88.49
0740B Aries B12 ROM Board	46.00	43.70
0704B ATPL ROM Board BBC	39.67	37.69
0746B ATPL ROM Board BBC B+	33.35	31.68
0735B ATPL Battery Backup	17.37	16.50
0705A 2764 8K EPROM	2.64	2.51
0706A 27128 16K EPROM	6.75	6.41
0707A 6264 8K RAM	3.68	3.50
0708A Eprom Extractor Tool	3.45	3.28
0714A BBkey strip	2.09	1.99
0715A Dust Cover BBC B/B+	3.45	3.28
0734A Dust Cover Master	4.60	4.37

VOLTMACE JOYSTICKS

0718B Delta 3B Single Joystick	9.99	9.49
0719B Delta 3B Twin Joysticks	17.00	16.15
0720B Delta 14B Joystick	12.50	11.88
0721B Delta 14B/1 Interface	13.00	12.35
0773B Delta 3S Compact Joystick	9.99	9.49

Join BEEBUG or RISC USER NOW for only £14.50 and claim your members 5% discount straight away. Just enter either 1400 as the stock code for BEEBUG membership, or 1421 for RISC USER, on the order form below.

COMPUTER CONCEPTS

1119C Mega 3 (BBC Version)	97.75	87.98
1117B Interword	50.03	47.52
1110B Intersheet	44.85	42.61
1114B Interchart	29.90	28.41
1116B Interbase	67.85	64.46
1118B Spellmaster	55.00	52.25
1100C Wordwise Plus	46.00	43.70
1102B Wordwise	28.75	27.31

GAMES

All Superior Software games are available on both 5.25" and 3.5" discs, telephone for prices.

1036B Elite Disc	14.95	14.20
1016B Acornsoft Aviator Disc	17.08	16.22
1125B White Knight Disc	18.63	17.70
1133B Trivial Pursuit Disc	19.95	18.95
1138B Revs incl 4 Tracks	14.95	14.20
1188B Imogen Disc	9.95	9.45

AMX MOUSE

1165C AMX Design	69.95	62.96
1164B AMX Extra Extra	19.00	18.05
0703C AMX Mouse	74.75	71.01
0757C AMX Mouse (Master)	74.75	71.01
1153B AMX XAM	19.00	18.05
1154C AMX Stop Press	40.00	38.00
1162C AMX Stop Press M128	40.00	38.00
1155B AMX Superart ROM	40.00	38.00
1163B AMX Sup'art ROM M128	40.00	38.00
1161B AMX MAX ROM	19.00	18.05
0786B New AMX Mouse	36.80	34.96

Z88

Cambridge Computer

(as reviewed in December 87 Beebug)
To introduce the new Z88, we are able to offer Beebug members the Z88, 128K RAM pack, Mains adaptor, and a special Z88 to BBC file transfer package for a total price of

£347.40 incl. VAT

(BBC to Z88 Transfer package, worth £24.95, free of charge.)

Stock code 0840F

PRICES INCLUDE VAT.

To claim members prices it is essential to quote your membership number.

Code	Qty	Description	Unit	Total

Name: _____ Sub Total £ _____

Address: _____ Postage £ _____

_____ Total £ _____

Postcode: _____ Membership No: _____

Access/Visa ____/____/____/____ Expiry ____/____

In accordance with our competitive pricing structure, prices are subject to alteration at any time.

Carriage

Carriage is denoted by the letter contained in the stock code. A-50p, B-£1, C-£2, D-£3, E-£4, F-£5.50, G-£7. When ordering several items, use the highest price code and half of each subsequent code. For courier delivery use code G.

Official Orders

Orders for £25 and over are welcome from education and government bodies. Alternatively pro-forma invoices are available on request.

Credit Cards



Access and Visa orders are welcome, and may be placed by letter or telephone.

BEEBUG LTD,
Dolphin Place, Holywell Hill,
St. Albans, Herts., AL1 1EX.

☎ (0727) 40303

TELETEXT ADAPTER

Would you like access to free high quality software and over a thousand pages of information, but Prestel access charges and phone bills too expensive? Then read on!

The answer is Teletext. Yes the same system everyone has seen incorporated into television sets, but with a difference. When Teletext is read by a computer you can actually use the data. The MORLEY TELETEXT ADAPTER introduces you to the world of Teletext at a price that won't break the bank. Inside it you will find the latest in second generation Teletext chip technology, which unlike our rivals who are still using chips designed more than ten years ago, will be fully compatible with any future advances in the Teletext system.

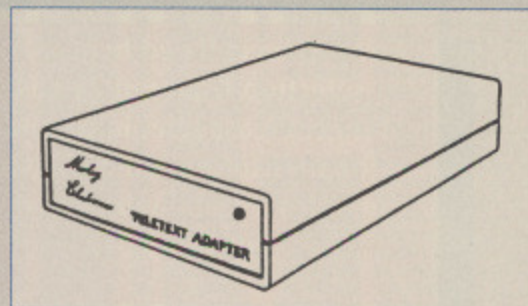
With the Morley adapter you will get a state of the art unit that automatically tunes itself into the required station (no more messing around with screwdrivers or twiddling little knobs in the back of the case), a user friendly menu driven program, easy to follow instructions and a 12 month warranty. Add to this the free downloadable telesoftware and we are sure that you will agree that we are offering you one of the best bargains on the market today.

FEATURES:

* Advanced design uses the latest technology, will handle ANY future enhancements to the Teletext

system e.g.: full field; 8 bit data transfer; 2k pages etc.

- * Simply plugs into the user port.
- * Low power consumption, less than 200ma. Optional power supply available.
- * User friendly menu driven software including extended OSCLI and OSWord commands for access from BASIC programs.
- * Supplied with 16k ATS (Advanced Teletext Software) and 16k support ROM software inc. printer dumps, page spoolers etc.
- * FREE Telesoftware, no access charges (updated weekly).
- * Save selected pages to disc/tape for later retrieval.
- * Full access to all Teletext services and channels e.g.: CEEFAX, ORACLE, 4-TEL.
- * Gives you a real-time clock at your disposal (*TIME).
- * Software upgrades to allow for any enhancements to the Teletext service, e.g.: extra channels, full field data on cable & satellite systems etc. (only the media charge).
- * Easy to follow comprehensive user guides.
- * No hardware limitations, it can for example receive virtually unlimited numbers of channels.
- * Utils disc available including printer drivers allows pages to be selected and dumped direct to a printer



(no more TV or Radio Times to buy).

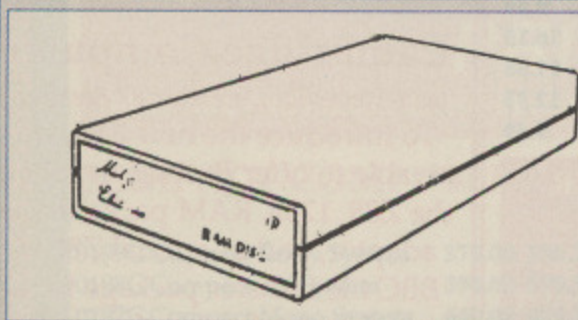
WHAT THE REVIEWERS SAID:

"... In terms of price, performance, future expansion possibilities and those little touches that show thought for the end user I would recommend the Morley unit."—(*Acorn User*, January, 1986).

"... The Morley unit has been designed to ensure that its operation is simple and smooth. It is the ideal Teletext adapter for school use."—(*A&B Computing*, June, 1986).

"... Using it over a number of months in different schools, it has proved utterly reliable, and may confidently be recommended."—(*The Times Educational Supplement*, September, 1986).

THIS IS THE BIGGEST SELLING TELETEXT ADAPTER CURRENTLY IN PRODUCTION WORLDWIDE, AND COMES WITH A FULL MONEY BACK SATISFACTION GUARANTEE.



Now available!
The first true MEGA capacity RAMdisc for the BBC, BBC B+ and MASTER computers. This fully compatible unit, currently available in either 1 or 2

megabyte versions comes complete with operating software on ROM, power supply, and a comprehensive user guide.

FEATURES:

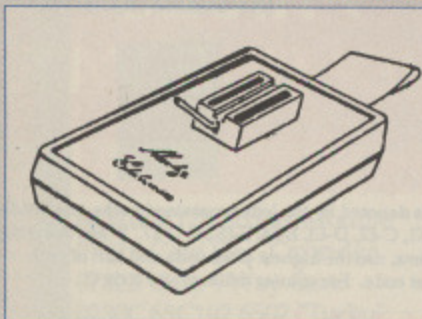
One megabyte of RAM connected to the 1mHz bus. Used with the supplied ROM software programs and files may be saved and loaded from the RAMdisc in the same manner as from a floppy disc with a large increase of speed, for example, a 20k mode 0 screen takes about 3-4 seconds to load from disc and about 0.2-0.3 seconds to load from the RAMdisc. The RAMdisc ROM operates as a utility ROM

RAMDISC

working with the current filing system rather than as a separate filing system. Therefore ensures compatibility with any Acorn compatible DFS (not ADFS). The RAMdisc can be selected by a * command to take the place of any drive number from 0 to 9. If the RAMdisc replaces a floppy drive as 0 for example, all commands addressed to drive 0 will be intercepted by the RAMdisc. The default drive number is 4. Any 'Dangerous' * commands such as *COMPACT, *COPY, *BACKUP etc can be intercepted and the BBC's RAM from page 2 to &7FFF saved to RAMdisc workspace, and may be recovered using a * command. This prevents accidental corruption of any programs/data in RAM you may have been using at the time. The filing system wedge ROM supplied supports load/save, byte file access, all relevant OSFSC commands, and contains a formatter verifier and 'sector' editor for use with the RAMdisc. Catalogue structure allows up to 2,688 files.

Well that's the spec., add to this our usual 12 month no quibble guarantee and we're sure you'll agree the Morley RAMdisc is the sensible alternative if increased storage capacity and speed is your requirement.

EPROM PROGRAMMER V2



The MORLEY EPROM PROGRAMMER V2 is a small self contained unit that plugs into the BBC or MASTER user port. It comes with a high quality ZIF (zero insertion force socket) and contrasting plastic case. Also included in the package is it's own user friendly menu driven software on ROM or disc. This state of the art unit, allows programming of 2764 (8k), 27128 (16k), and 27256 (32k) EPROMS. Not only does the hardware allow

programming of the usual NMOS devices, but will handle the new generation CMOS equally as well, and with the average time taken to program a 16k at less than 30 seconds we believe it to be one of the fastest programmers available today.

THE HARDWARE

The Unit is completely under software control, there are no knobs or switches to baffle the novice, and the extended features provided should excite the pro's.

THE SOFTWARE

The comprehensive user friendly software included in the package has two main parts, the first allows EPROMS to be read, programmed, verified and edited, also allowing a ROM image to be loaded or saved to disc. The second is a full ROM management system in its own right, which has a host of useful features and routines, such as KILL and RESURRECT ROM to disable or enable a sideways ROM, dump ROM image to buffer or disc, move ROM image in buffer to sideways RAM, and VIEW-SEARCH any sideways ROM.

The whole system is available now for less than the price of one WORDWISE chip. So get yourself the all new MORLEY EPROM PROGRAMMER V2 today and start using those expansion boards for what they were made for! ROMS. Immediate delivery no quibble 12 month guarantee.

MASTER CARTRIDGE

Designed and manufactured by Care Electronics to Acorn specifications. These high quality Master expansion cartridges will take two 16k sideways ROM's, and will, unlike similar cartridges available from other manufacturers, accept the new second generation programs, such as Computer Concepts Interword and Spellmaster ROM's.

These Cartridges come in a high quality, robust, formed-plastic case, that fits neatly into either one of the Master's cartridge slots.

QUADS—also available quad cartridges, specifications as Duels but 4x16k ROM's.

MASTER SMART CARTRIDGE

This device was designed and manufactured jointly by Morley and Care Electronics.

The Smart cartridge will at the press of a button halt any program running in memory and execute any one of a host of useful built in, or user defined procedures, and once completed will return to the program and continue where it left off. The only limiting factor with this device is the programmers imagination. The Smart cartridge will prove useful to the novice, allowing him to do the simple things like dump any screen to printer, and make backups of protected tape or disc based software, but has an open ended specification for the advanced 'HACKER' allowing advanced programming techniques to be incorporated into almost any program at the touch of a button.

BUILT IN FEATURES (at the press of a button)

- Autosaves computer's entire memory.
- Freeze program at any point.
- Screen dump (any mode) to printer or disc.
- Allows any OSCLI command without disturbing memory.
- Copies 90% of protected software.
- Tape to disc, disc to tape.
- User friendly menu.
- Sound On/Off.

ALL CARTRIDGES COME WITH A 12 MONTH NO QUIBBLE WARRANTY

NEW PRODUCT

MORLEY MASTER BOARD 'AA'

At long last the add-on all MASTER users have been waiting for, an internal ROM board.

No more need to turn the computer off to insert the cartridge containing the ROM you need to debug the program in memory.

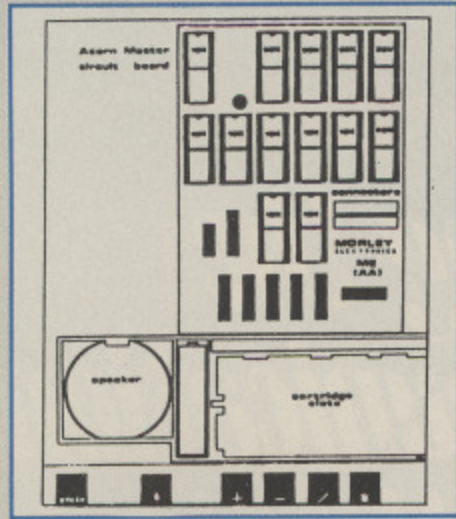
The new MORLEY MASTER BOARD "AA" allows you to have up to 8x16k and 4x32k extra Roms installed inside your MASTER and still leaves the cartridge slots free. This in effect allows your MASTER to support as many as 24, 16k ROMs installed permanently, whilst retaining the standard 4 x sideways ram banks and four banks by using cartridges

A staggering 32 ROM images installed and accessible at any time

Included in the package is a utility ROM which has many useful features such as 'FICOPY', a clever file transfer program that transfers files between DFS and ADFS formats or vice versa.

So for less than the price of four external cartridges you get a MASTER BOARD "AA" which with twice the capacity has got to be THE ROM expansion for the serious MASTER user.

The unit comes with the usual Morley, full no-quibble twelve months warranty, and our usual after sales service



MORLEY
ELECTRONICS



Unit 3, Maurice Road Industrial Estate,
Wallsend, Tyne & Wear NE28 6BY
Telephone: Tyneside (091) 2627507
Telex: 265871 A/B MONREF G
(Quoting Mag 70211)

THE COMPLETE RANGE OF TELETEXT SOFTWARE from M/B SOFTWARE

***NEW... DESIGN 7 PLUS** - now 'the best' is even better. Held in high regard by reviewers and hundreds of satisfied owners, DESIGN 7 has been further improved, with revised keystrip & even more features. Design/load/save and MODE 7 screen with ease, up to full CEEFAX/Oracle standard. Will convert ANY MODE 7 screen to a BASIC procedure, for inclusion in your own programs. ROM version includes a file copier, printer dumps useable from BASIC etc. B/MASTER/COMPACT.

TELETEXT EMULATORS/SCREEN DISPLAYS/INFORMATION SYSTEMS - A complete range of teletext programs to cater for all needs, with full teletext adapter interfacing.

***NEW... DESFAX** - totally new version - streets ahead of the competition - run your own information/display system. Stores hundreds of screens on dual 80 track drives (96 screens on single-sided 40 track), with access to any screen with a SINGLE KEYPRESS. Lots of special effects - screens can scroll, slide, overwrite etc. Animation, loops, subroutines - send for details - not enough space here to even begin to describe the advanced features!! B/MASTER/COMPACT

***NEW... MASTERFAX** - 84 MODE 7 screens in memory at once. 148 screens possible with cartridge RAM. An advanced teletext/carousel program featuring SINGLE KEYPRESS or 3-digit page selection. Runs entirely from memory - no disc accesses after pages are loaded. Superb animation and other effects. MASTER/COMPACT only.

***NEW... VU-FAX** - 1000 screens and no disc accesses! Screens stored on MORLEY 1MByte RAM DISC. SINGLE KEYPRESS gives instant access to any screen (or emulate teletext). This is the ultimate MODE 7 screen management system - there is nothing else like it. MODEL B/MASTER 128.

***ALSO... MASTERcopy** - DFS/DFS, DFS/ADFS, ADFS/DFS, ADFS/ADFS file copier. Uses the MASTER 128's memory to the full to permit fast disc copying. 31 DFS files to ADFS disc in less than 2 minutes. Creates directories automatically. You will wonder how you ever managed without this program. Described by reviewers as 'unexcelled'. MASTER 128 and COMPACT's fitted with DFS ROMS.

ORDER FORM

To order simply complete and return by post enclosing your cheque/P.O. made payable to Morley Electronics, or by phone during office hours, quoting your ACCESS or VISA number.

Morley Electronics, Unit 3 Maurice Road Industrial Estate, Wallsend, Tyne & Wear NE28 6BY Telephone Tyneside (091) 2627507.
Telex: 265871 A/B MONREF G (Quoting Mag 70211)

ALL PRICES INCLUDE VAT @ 15%

		P&P Rate			P&P Rate
Qty. _____	Morley Teletext Adapters	119.83 (a)	Qty. _____	M/B Software Design 7+	9.89 (c)
Qty. _____	Optional Power Supply	10.12 (b)	Qty. _____	M/B Software Desfax	20.01 (c)
Qty. _____	Teletext Utilities on disc	5.98 (c)	Qty. _____	M/B Software DesROM	12.88 (c)
Qty. _____	1 Megabyte RAMdisc	199.87 (a)	Qty. _____	M/B Software Mastercopy Disc	12.88 (c)
Qty. _____	2 Megabyte RAMisc	349.60 (a)	Qty. _____	M/B Software Mastercopy ROM	14.95 (c)
Qty. _____	Eprom programmer V2	34.50 (b)	Qty. _____	M/B Software Masterfax	29.90 (c)
Qty. _____	Master ROM boards "AA"	46.00 (b)	Qty. _____	M/B Software VU-Fax System inc RAMdisc	249.78 (a)
Qty. _____	Master Quad cartridge	14.95	Qty. _____	5.25" Floppy discs x 10	8.05 (c)
Qty. _____	Care Master ROM cartridges	8.97 (b)	Qty. _____	27128 16k CMOS EPROM	4.83 (c)
Qty. _____	Master Smart cartridge	39.79 (b)	Qty. _____	Info Pack + Demo Disc of all Software	FREE (c)
			Note Teletext Adapters for Master Compact 138.00 (a)		

Please delete: Adapter software on ROM/Sideways RAM format/Software on 40/80 track disc

Name _____ Phone no. _____
Address _____ Post Code _____



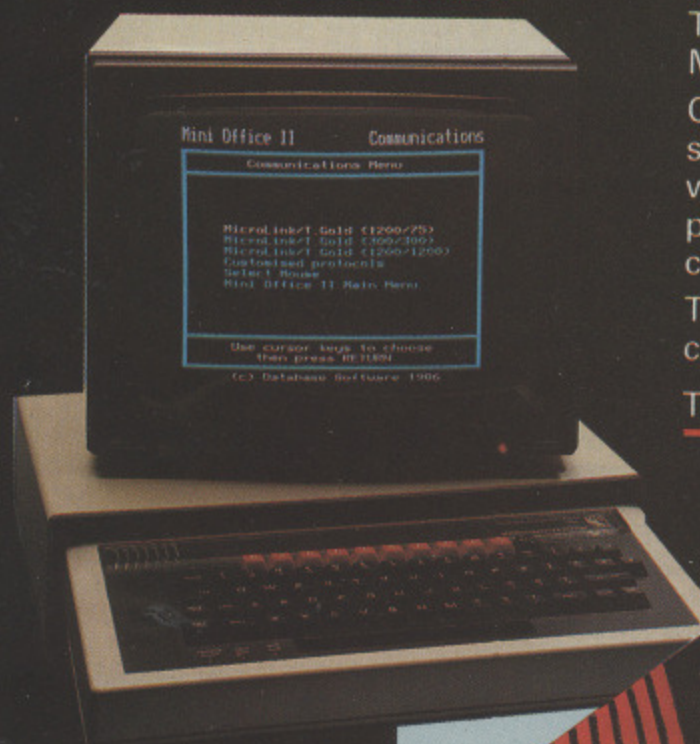
Cheque No _____ Access/Visa No _____ Amount £ _____

Please add Postage and Packing @ a=£3.00 b=£2.00 c=£1.00 d=£0.65 (when ordering more than one item, add P&P. on highest rate item only)
GOVERNMENT, LOCAL AUTHORITY, AND TRADE ORDERS WELCOME. Please allow 28 days for delivery

Use **TELECOM GOLD**
FREE* for a month!

Joining the communications revolution has never been easier...or cheaper

All you need to link your
BBC Micro to the exciting
world outside is a phone
— and the MicroLink
Communications Pack



* This exclusive offer relates to connect time only and does not include telephone, any possible PSS charges or surcharged services.

The MicroLink Communications Pack contains everything you require to go on line. There's a powerful modem that sits between your BBC Micro and your telephone, a lead to connect them together and easy-to-use communications software.

You'll also be given a unique invitation to join MicroLink, with FREE registration and telex validation (normally costing £15), and a month's FREE* connect-time to your MicroLink/Telecom Gold mailbox. So you can find out for yourself what MicroLink is all about without it costing you a penny.

Of course you can also use your MicroLink modem and software to access thousands of other services all over the world, from giant databases in the USA to innumerable privately-operated bulletin boards throughout Britain that cover a vast range of subjects.

To take advantage of this very special package deal simply complete and mail the coupon opposite.

There are two options you can choose from:

MicroLink dual-speed modem: This stylish modem works at two speeds — 1200/75 and 300/300. Fully BABT approved, it satisfies most users' requirements for a modest price.

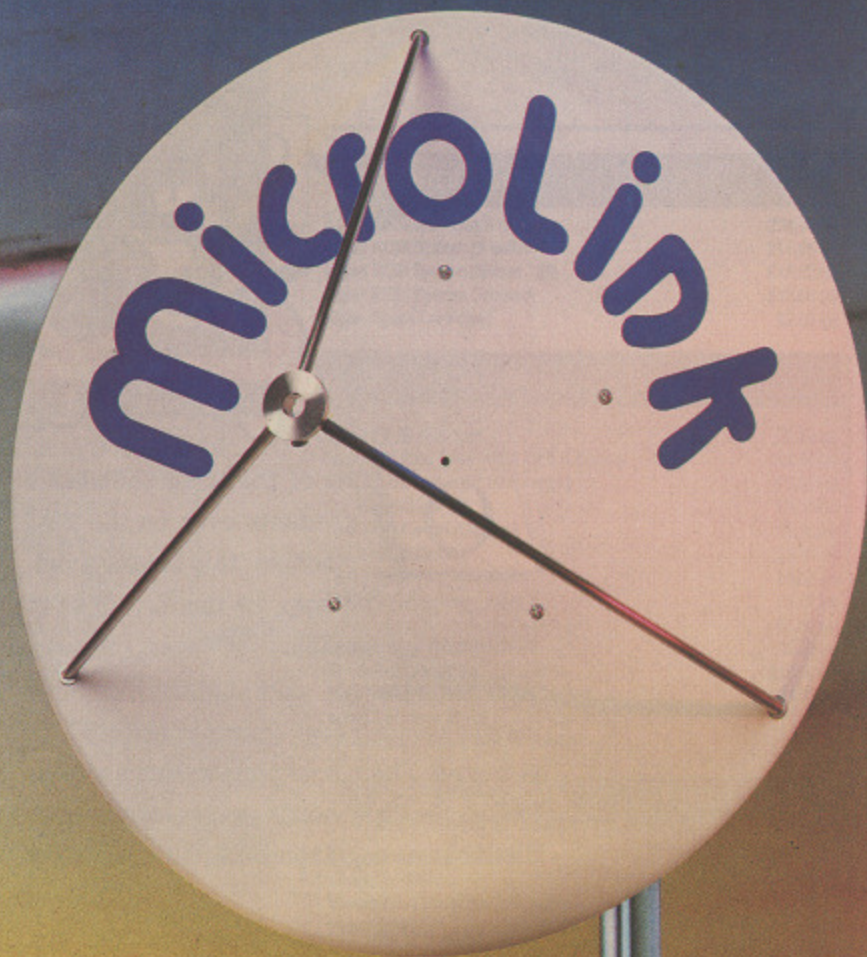
£99
incl. VAT

MicroLink multi-speed modem: This offers the additional speed of 1200/1200 full duplex for users who want super-fast two-way transmission. Plus many extra features, including powerful auto-dial and auto-answer facilities. A remarkable price breakthrough for a really exceptional product.

£179
incl. VAT

APPROVED for connection to telecommunication systems specified in the instructions for use subject to the conditions set out in them.





MicroLink is Britain's fastest-growing electronic mail service. It offers ALL the services of Telecom Gold – and a whole lot more besides.

With **MicroLink** you can link up with other users all over the world to send and receive electronic mail. It turns your BBC into a telex machine – without the need for expensive equipment or special phone line. It lets you send telemessages for next-morning delivery to ANY home or business in the UK or USA.

With **MicroLink** you can tap into a weather satellite and see pictures from space displayed in colour on your BBC monitor. You can use it to obtain legal and financial advice, to order flowers or book theatre and rail tickets.

With **MicroLink** you can receive free telesoftware programs over the phone to feed into your BBC. You can use it to turn text into typesetting or Braille. You can link in seconds to a database in New York, or key into the 400,000-word Great European Dictionary in Luxembourg. And it gives you direct access to up-to-the-minute financial information on every company in Britain.

The communications software that comes free with each modem is the complete Comms module from the acclaimed Mini Office II. To simplify preparing messages off line it also includes the COMPLETE Word Processor module of Mini Office II, which has many enhanced features not included in other word processors.

ORDER FORM

PLEASE SUPPLY:

- MicroLink dual-speed modem, software and BBC lead for £99
- MicroLink multi-speed modem, software and BBC lead for £179
- FREE registration and telex validation, plus FREE one month's connect time to MicroLink or
- I am already a subscriber to MicroLink

Software only available on disc for BBC B and Master

If you would like to join MicroLink and already have a modem and software simply tick the box alongside. You will then be sent full details of how to join.

- Cheque enclosed made payable to MicroLink Communications Ltd
- Please debit my Access/Visa card number:

--	--	--	--	--	--	--	--	--	--

Signature Expiry date /

Name

Address

..... Postcode

Daytime phone

Send to: MicroLink Communications Ltd, FREEPOST, Europa House, Adlington Park, Adlington, Macclesfield SK10.4NP.

Telephone orders: 0625 879940

Orders by Prestel: Key *89, then 614568383

Via MicroLink/Telecom Gold: 72:MAG001

Allow up to 28 days for delivery.
All prices include VAT & carriage (UK only)

Dealer enquiries welcome – contact Mike Hayes on 0625 878888

128k S I L I C O N Spelling Checker

One of the most successful products ever on the BBC machine, this is now available on a single chip, for the Archimedes and soon for the Z88.

All versions of SPELLMASTER offer instant spelling and typing checking - as you type. The single chip contains almost 60,000 English words and user created dictionaries can extend this number.

A range of dictionary search utilities are provided, in all versions, that rapidly search the entire dictionary and enable any of the following to be found;

- 1) Words that sound like the one specified.
- 2) Words that are spelt approximately like the one specified. This is ideal for correcting typing errors where words have a pair of letters transposed, one letter wrong, missing, or one too many.
- 3) Words where only a few characters are specified, (solves crosswords).
- 4) Words that have the correct letters, but are mixed up, (solves anagrams).

All these search facilities are accessible from any program that can issue star (*) commands.

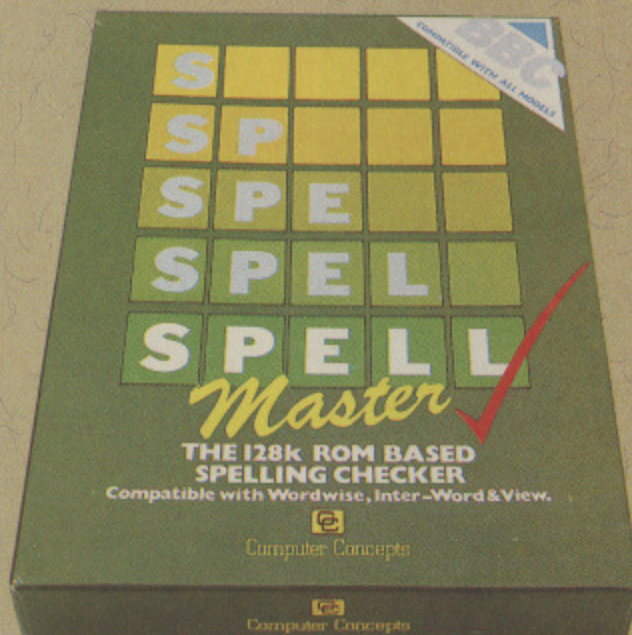
In addition there are facilities to check text directly within a variety of text editors or word processors, to check the word at the cursor, to check all text from a specified point, or to just browse through the dictionary.

The BBC SPELLMASTER can check-as-you-type in INTER-WORD, WORDWISE, and VIEW, in all versions of the BBC Micro. The Archimedes version can check-as-you-type in INTER-WORD, is compatible with ArcWriter files and requires a ROM expansion board.

SPELLMASTER for the Z88 is compatible with Pipedream files and contains its own powerful text editor.

Full details on request.

£51.30 + VAT (£59.00 incl.)



Available now for the
ARCHIMEDES

24 hour despatch service available.
Access & Barclaycard accepted.

AVAILABLE SOON FOR
Z88
ON
CARTRIDGE



Computer Concepts Ltd

Gaddesden Place, Hemel Hempstead, Herts. HP2 6EX.
Telephone 0442 63933

Computers and Upgrades

Archimedes 305	£669.00 (a)
Archimedes 305 Mono System	£759.00 (a)
Archimedes 305 Colour System	£919.00 (a)
Archimedes 310	£835.00 (a)
Archimedes 310 Mono System	£895.00 (a)
Archimedes 310 Colour System	£1055.00 (a)
Archimedes 310M	£895.00 (a)
Archimedes 310M Mono System	£955.00 (a)
Archimedes 310M Colour System	£1115.00 (a)
Archimedes 410	POA
Archimedes 410 Mono System	POA
Archimedes 410 Colour System	POA
Archimedes 440	£2529.00 (a)
Archimedes 440 Mono System	£2589.00 (a)
Archimedes 440 Colour System	£2749.00 (a)
Archimedes podule backplane	£39.00 (d)
Archimedes ROM podule	£85.00 (d)
Archimedes I/O podule	£79.00 (d)
Archimedes Midi add-on to I/O podule	£39.00 (e)
Archimedes Midi podule	£89.00 (d)
Master 128	£369.00 (a)
Master Compact	From £310.00 (a)
Master Turbo Upgrade	£99.00 (c)
Master 512 Upgrade	£189.00 (c)
Master 128 Eprom Cartridge	£11.00 (c)
Master 128 Dust Cover	£4.50 (e)
Compact RS 232 Interface	£26.00 (c)
Compact TV Modulator	£26.00 (e)
1770 Disc Interface	£41.00 (d)
ADFS ROM (B+ or B with 1770)	£25.00 (e)
B-64 64K Upgrade	£30.00 (d)
Trade in your old Model B against a new Master 128, Master Compact or Archimedes	
Cambridge Computers Z88	£244.00 (a)
Z88 PSU	£8.65 (d)
128K RAM	£43.00 (e)
128K Eprom	£43.00 (e)

Printers (Dot Matrix)

Epson LX800 80col/150cps + 22cps NLQ	£229.00 (a)
Citizen 120D 80col/120cps + 25cps NLQ	£150.00 (a)
Citizen MSP10E 80col/160cps + 40cps NLQ	£225.00 (a)
Citizen MSP15E 136col/160cps + 40cps NLQ	£259.00 (a)
Citizen MSP40 80col/200cps + 50cps NLQ	£300.00 (a)
Citizen MSP45 136col/200cps + 50cps NLQ	£400.00 (a)
Citizen MSP50 80col/250cps + 60cps NLQ	£400.00 (a)
Citizen MSP55 136col/250cps + 60cps NLQ	£520.00 (a)
Citizen HQP40 24pin 80col/200cps + 60cps LQ	£379.00 (a)
Citizen HQP45 24pin 136col/200cps + 60cps LQ	£454.00 (a)
MP 165 80col/165cps + 38cps NLQ	£179.00 (a)
MP 200 80col/200cps + 40cps NLQ	£264.00 (a)
MP 201 136col/200cps + 40cps NLQ	£289.00 (a)
Star LC10 120cps + 30cps NLQ	£174.00 (a)

Printers (Daisy Wheel)

Juki 610C 110col 20cps	£290.00 (a)
Citizen Premier 35 132col 35cps	£554.00 (a)
MP26 - 26cps Diablo 630 compatible	£234.00 (a)
MP40 - 40cps Diablo 630 compatible	£319.00 (a)
2 Year Warranty on Citizen, Juki and MP Printers	

Printers (Laser)

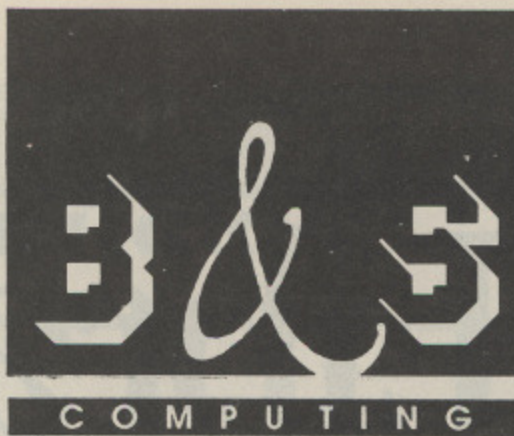
New Citizen Laser Overture 110 10 pages/min 250 sheet cassette dual interface	£1450.00 (a)
With one year on site maintenance	

AMX Mouse and Software

Amx Mouse + Super Art	£60.00 (d)
AMX Pagemaker	£37.00 (d)
Extra Extra	£21.00 (e)
Mouse Mat	£4.34 (e)

Disc Drives

Mitsubishi Drives	
Single DS 40/80T	£96.00 (a)
Single DS 40/80T inc PSU	£111.00 (a)
Dual DS 40/80T	£189.00 (a)
Dual DS 40/80T inc PSU	£209.00 (a)
Dual DS 40/80T inc PSU & Plinth	£214.00 (a)
20Mb Winchester	£449.00 (a)
Combination 3.5 5.25 Winchester available	Phone for details
2 year Warranty on all Drives	



**BUSINESS SYSTEMS • HARDWARE
SOFTWARE • VIDEO SYSTEMS
MEDIA SUPPLIES
OFFICIAL DOMESDAY DEALER**



The choice of experience.

ACORN APPROVED DEALER

Phone 0602 787923

Discs

Discs 5.25" (Boxed in 10's Lifetime guarantee)	
3M744 SS/DD 48TPI	£11.00 (d)
3M745 DS/DD 48TPI	£13.00 (d)
3M747 DS/DD 96TPI	£15.00 (d)

Add £1 for plastic library case

B & S Label 96TPI in see through LIB. Case DS/DD	£13.00 (d)
Disc Cleaning Kit (state 5.25" or 3.5")	£9.00 (d)
3.5"	
3M 35SS SS/DD (Box of 10)	£21.00 (d)
3M 35DS DS/DD (Box of 10)	£29.00 (d)
B & S Label DS/DD	£19.00 (d)

Lockable Anti-Static 5.25" Storage Cases

50 Disc Capacity	£8.00 (d)
100 Disc Capacity	£10.00 (d)

Monitors

All Monitors include BBC Lead

Philips Range of high resolution Mono Monitors with Audio Input Green, Amber or Paper White.	
BM 7502 (Green)	£69.00 (a)
BM 7522 (Amber)	£74.00 (a)
BM 7442 (Paper White)	£74.00 (a)

Philips Colour Monitor RGB, Composite Video, Audio in Linear RGB Green Screen SwitchableBBC/IBM Compatible CM8833	£220.00 (a)
---	-------------

High Screen ST88 Monitor Spec as Philips CM8833	£195.00 (a)
---	-------------

Philips Multisync CM8873	
CGA/EGA/PGA Compatible	£520.00 (a)
Ideal for use with Acorn Archimedes computers.	

Microfilm	
1431 (Metal or Plastic Case please specify) Std. Res.	£184.00 (a)
1451 (Metal or Plastic Case please specify) Med Res.	£229.00 (a)
1441 (Metal or Plastic Case please specify) High Res.	£379.00 (a)
1431 AP Metal Case RGB and CV/Audio Std. Res.	£209.00 (a)
1451 AP Metal Case only RGB and CB Audio Med. Res.	£259.00 (a)
TILT and SWIVEL Stands for Plastic Case Only	£19.00 (a)
Plinths	
BBC B Single	£11.00 (c)
BBC Master Single	£12.00 (c)
BBC Master with Shelf	£22.00 (b)

UK Customers: Please add 15% VAT to all prices (including carriage). Government and educational establishments official orders welcomed. When ordering please enclose a cheque or postal order for the appropriate amount, UK Carriage Rates (a) £8.00 - courier insured delivery (b) £3.50 (c) £2.50 (d) £1.50 (e) £1.00. All prices are correct at time of going to press. All offers are subject to availability, all prices are subject to change without prior notification and are available on request. Current price list is available on request. Goods normally despatched on receipt of order.

We are now Licenced Credit Brokers (Please call for written details)
£1000 instant credit available - No deposit required. APR 32%

**B & S COMPUTING (NOTT'M) LTD
THE LENTON BUSINESS CENTRE
LENTON BOULEVARD
NOTTINGHAM NG7 2BY
PHONE: 0602 787923**

ROM Boards

ATPL Sideways (state B or B+)	£34.00 (d)
Viglen ROM System (B series)	£11.25 (d)
Viglen ROM System (Master 128)	£12.00 (d)
Viglen ROM System Compact	£12.00 (d)
Viglen Spare Cartridges	£2.50 (e)

Printer Ribbons and Accessories

Epson LX 86 (Compat)	£2.89 (e)
Epson MX 80/RX 80/FX80/FX85 (Compat)	£2.50 (e)
Juki 5510/Citizen MSP 20 (Compat)	£2.50 (e)
Citizen 120D/LSP10	£3.75 (e)
Taxan 810/Canon (Compat)	£3.75 (e)
Juki 6100 Multifitrike	£2.30 (e)
Tally MT85 Fabric	£5.00 (e)
Tally MT86 Carbon	£7.00 (e)
Printer lead 1.5m B/B+/M128/ELK +1	£6.00 (e)
Printer lead 1.5m Compact	£8.00 (e)
Printer lead 2m IBM or Compatible	£10.00 (d)
80col Printer Stand	£11.00 (c)
Universal Printer Stand	£15.00 (d)
Printer Switch Box 2 Way "T" Switch	£39.00 (c)

Modems

All Modems inc BBC Lead	
Miracle WS2000	£95.00 (c)
Miracle WS4000 Hayes compatible	£144.00 (c)
Pace Nightingale + Commstar II	£94.00 (c)
Nightingale Auto Dial Auto Answer Board + SW	£52.00 (d)
Pace Commstar II ROM	£28.00 (e)
Pace Linnet	£124.00 (c)
NB BABT APPROVAL ON MODEMS ONLY	
50ft. Telephone Extn. Cable on Wind up Reel	£9.50 (d)

Software

Acorn Soft			
Micro Prolog	£50.00 (d)	ISO Pascal	£42.00 (d)
Logo	£44.00 (d)	BCPL	£39.00 (d)
Forth Basic	£14.00 (e)	Comal	£32.00 (d)
Lisp	£33.00 (e)	Hi View	£37.00 (d)
View Professional	£75.00 (c)	View 3.0	£39.00 (d)
Viewsheet	£37.00 (d)	View Store	£37.00 (d)
View Spell (80T only)	£29.00 (d)	View Plot	£21.00 (e)
View Index	£10.00 (e)	Overview	£69.00 (c)
View Printer Driver		Disc	£8.00 (e)
Gen. Tape	£7.00 (e)		
Computer Concepts			
Interword	£39.00 (d)	Inter Sheet	£39.00 (d)
Interchart	£26.00 (d)	Interbase	£49.00 (d)
Mega 3	£75.00 (c)	Spellmaster	£42.00 (d)
Wordwise	£30.00 (c)	Wordwise +	£37.00 (d)

Mirrorsoft			
Fleet Street Editor	£31.00 (d)	Fonts and Graphics	£11.75 (e)
Clares			
Fontwise +	£16.00 (e)	Replica III	£11.00 (e)

VINE MICRO REPLAY (State M/C and Disc Interface)	£30.00 (e)
NB It is essential to state machine and 40/80T when ordering software	

Books (No VAT on Books)

Master Ref. Manuals Pt1	£14.00 (d)	Pt2	£14.00 (d)
Advanced Master Ref. Manual (Bray & Dickens)			£19.95 (d)
Lisp	£8.00 (e)	Forth	£8.00 (e)
BCPL	£14.00 (d)	View Guide	£6.00 (e)
View 3	£9.00 (e)	View Sheet	£9.00 (e)
View Store			£9.00 (e)
Archimedes Ref. Manual			£29.95 (d)
Arm Assembly Language Manual			£12.95 (e)
Mastering View, Viewsheet and Viewstore			£12.95 (e)
Understanding Interword			£6.50 (e)
View A Dabhand Guide			£12.95 (e)
Z88 Computing			£9.95 (e)

Fanfold Paper and Labels

2000 x 1 Part 60gm 11 x 9.5" Micro Perf.	£12.00 (c)
1000 x 1 Part 85gm 11 x 9.5" Micro Perf.	£9.00 (c)
1000 x 1 Part 90gm "Perfect" A4 Micro Perf	£12.00 (b)
1000 89mm x 36mm Labels	£4.00 (d)
1000 89mm x 49mm Labels	£6.00 (d)
1000 102mm x 36mm Labels	£5.00 (d)
Please state Single or Twin Row, when ordering Labels	



PROGRAM

Library

No.18

Compiled by Steve Turnbull

WE get lots of Library routines and can't use them all, but we do hang on to the better ones until a space is available – so keep sending them in. This month we have a number of interesting routines including a little program to enter your favourite program editor when an error occurs – very useful as you develop your own routines.

On the 6502 front there is a complete 100-byte language for BBC B and B+ to combat the lack of No Language Environment of the Master. And finally there's a machine code routine to tidy up the format of input strings.

Title: String Tidy
Language: 6502
Author: Richard Owen

Getting someone to give your program input in a particular format is difficult. One solution is to write your own routines which force correct input, but even then a name could be entered like this:

RICHARD q Owen

or:

rIchard q. oWen

...the possibilities are endless. The

routine given here will take a string and convert it to standard upper/lower case format:

RQ. Owen

It works by scanning through the string and setting a flag, *caps*, each time it comes across one of the punctuation marks – *PUNC* – in its list.

Each letter encountered is first

forced to lower case and then, if the flag is set, is changed to a capital.

All you do is set up a buffer, put the string into it with:

\$buffer=s\$

then call the routine with the address of the routine in *X%* – low byte – and *Y%* – high byte. You can change the way the string is formatted by altering the contents of *punc\$*.

```

10 REM String Tidy
20 MODE7:PROCdeclare
30 PROCasm:PROCTest:END
40 DEFPROCdeclare
50 DIM code 256,buf 256
60 punc$ =',.-_+CHRS34
70 ptr=&70:caps=&72:ENDPROC
80 DEFPROCasm
90 FOR LX=0 TO 2 STEP 2
100 P%=code:[OPT LX
110 .stringTidy
120 STX ptr:STY ptr+1
130 LDY &FF:STY caps
140 .tidyLoop
150 INY:LDA (ptr),Y
160 CMP #13:BEQ endTidy
170 CMP #ASC'A:BCC notLetter
180 CMP #ASC'Z'+1:BCC isLetter
190 CMP #ASC'a":BCC notLetter
200 CMP #ASC'z'+1:BCS notLetter
210 .isLetter ORA #&20
220 BIT caps:BPL notCapital
230 AND #&5F
240 .notCapital STA (ptr),Y
250 LDA #0:STA caps:JMP tidyLoop
260 .notLetter LDX #LEN(punc$)
270 .scanLoop CMP scanStart,X
280 BNE notFound:LDA #&FF:STA caps
290 JMP tidyLoop
300 .notFound
310 DEX:BPL scanLoop:JMP tidyLoop
320 .endTidy RTS
330 .scanStart OPT FNs(punc$)
340 ]:NEXT:ENDPROC
350 DEFFNs(s$):$P%=s$:P%=P%+LENs$:=
LX
360 DEFPROCTest
370 REPEAT INPUTLINE"Line:"$buf
380 XX=buf:YX=XXDIV256:CALLstringTi
dy
390 PRINT$buf':UNTIL FALSE:ENDPROC

```

Get it right!

10 = 00	140 = EC08 D	270 = 4D5A 3
20 = A4E9 9	150 = 9A17 E	280 = 8EA0 E
30 = CEB3 A	160 = A87C 9	290 = D6A4 6
40 = 5EC5 9	170 = DEFB 3	300 = DBC2 9
50 = 3E42 0	180 = 734F 6	310 = 3391 9
60 = ADC9 F	190 = 98EF 6	320 = 102F E
70 = 3E93 7	200 = 951D 7	330 = BCF2 3
80 = DF1D 5	210 = C61F A	340 = 953B D
90 = AAB9 F	220 = 6228 6	350 = 1F5E 0
100 = 7CBB 7	230 = 9602 1	360 = A24 3
110 = 34D5 0	240 = 8F21 6	370 = 758 1
120 = A2F4 1	250 = ED8D D	380 = 1A56 A
130 = D8A4 F	260 = C601 0	390 = 8663 3

Title: No Language Environment
Language: 6502
Author: Michael Firth

In response to the letter by Ben Byram-Wigfield in the November 1987 issue of *The Micro User* about the lack of a No Language Environment mode on the BBC B and B+ here's a routine that provides one.

To work the code needs to input

lines and feed them to the command line interpreter. It also has to generate an *Escape* error if *Escape* is pressed while inputting text and handling errors generated by the rest of the system. In fact the utility represents the minimum requirements for

any language for the BBC Micro.

Although the routine is assembled at &900, it is quite logical for it to be located anywhere from &400-&6FF, or even in page zero, as it is only &64 bytes long. From here you can extend it as far as you like.

```

10 REM NLE Emulator
20 PROCinit:PROCassem
30 PROCsave:CALL NLE:END
40 DEF PROCinit
50 oscLi =&FFF7:osbyte=&FFF4
60 osword=&FFF1:oswrch=&FFEE
70 osnewl=&FFE7:code =&0900
80 data =&0700:brkv =&0202
90 errptr=&00FD:ENDPROC
100 DEF PROCassem
110 FOR LX=0 TO 2 STEP 2
120 PX=code:[OPT LX]:NLE
130 LDA #ASC"N":JSR oswrch
140 LDA #ASC"L":JSR oswrch
150 LDA #ASC"E":JSR oswrch
160 JSR osnewl:JSR osnewl
170 LDA #error MOD256:STA brkv
180 LDA #error DIV256:STA brkv+1
190 .main_loop LDX #&FF:TXS
200 LDA #ASC"*":JSR oswrch
210 LDX #parblk MOD256
220 LDY #parblk DIV256
230 LDA #0:JSR osword:BCC DoCLI
240 BRK:OPT FNb(17)
250 OPT FNb("Escape"):BRK
260 .DoCLI
270 LDX #data MOD256
280 LDY #data DIV256
290 JSR oscLi:JMP main_loop
300 .error
310 LDA #126:JSR osbyte
320 JSR osnewl:LDY #1
330 .errlp
340 LDA (errptr),Y:BEQ errend
350 JSR oswrch:INY:BNE errlp
360 .errend
370 JSR osnewl:JMP main_loop
380 .parblk
390 OPT FNw(data):OPT FNb(255)
400 OPT FNb(32):OPT FNb(126)
410 ]:NEXT:ENDPROC
420 DEF FNb(B%):?PX=B%:PX=PX+1:=LX
430 DEF FNw(W%):!PX=W%:PX=PX+2:=LX
440 DEF FNs(s$):$PX=s$:PX=PX+LENS$
:=LX
450 DEF PROCsave:PROCoscli("SAVE N
LE "+STR$code+" "+STR$PX):ENDPROC
460 DEF PROCoscli($&700):LOCAL X%,

```

Y%
470 Y%=7:CALL oscLi:ENDPROC



10 = 00	170 = 956E E	330 = A685 D
20 = 597F F	180 = DBC1 C	340 = 420C 8
30 = D604 A	190 = DFC2 B	350 = F147 0
40 = 4007 F	200 = 6464 2	360 = C2E3 7
50 = 665E B	210 = 2879 F	370 = A79 9
60 = 5215 7	220 = BE70 F	380 = 63F3 C
70 = 320D E	230 = CFE4 B	390 = 9FC4 9
80 = 9079 C	240 = 7426 D	400 = F697 7
90 = 8E8E 4	250 = 82B5 5	410 = 953B 5
100 = B623 B	260 = 7548 7	420 = 9BB4 1
110 = AAB9 8	270 = 9D2 A	430 = EAA2 F
120 = F05B B	280 = E7CF 2	440 = A3C2 3
130 = 1671 7	290 = 300F 1	450 = 1A8F 6
140 = 9CB7 7	300 = D394 B	460 = 1C6E 4
150 = D28E 5	310 = F227 D	470 = 7002 1
160 = 495D C	320 = 8E31 3	

Title: Error correction
Language: Basic
Author: Keith McDowell

After an error report you usually list the appropriate line. By adopting the technique shown in the accompanying program you can get your micro to automatically enter in the appropriate command for you.

It works by using the *FX138 command - via CALL &FFF4 - to insert the necessary key presses into the keyboard buffer. Then, for tidiness, it switches off the screen drivers - with VDU21 - while the line is processed, and switches them back on to list the line - using CHR\$6.

With:

```
??? PROCout("LIST "+STR$ERL+CHR$6)
```

or:

```
??? PROCout("EDIT "+STR$ERL+CHR$6)
```

or something similar, you can alter

the command string to invoke a built-in editor if you have one.

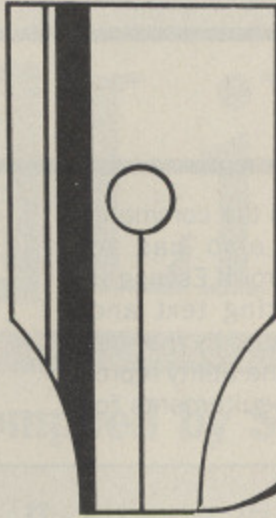
```

10 REM Error correction
20 REM by Keith McDowell
30 ON ERROR MODE 7:PROCerror
40 Silly mistake
50 END
60 DEF PROCerror:VDU7,4:*FX4
70 REPORT:PRINT" at line ";ERL
80 PROCout("L"+STR$ERL+CHR$6):END
90 DEFPROCout($&700)
100 LOCAL AX,LX,XX,Y%:AX=138
110 FOR LX=0 TO LENS&700:Y%=LX?&700
120 CALL&FFF4:NEXT:VDU21:ENDPROC

```



10 = 00	50 = FD2E 3	90 = BA9F A
20 = 00	60 = EFD0 0	100 = F5DF 2
30 = 868F F	70 = 6BDF E	110 = 5DA6 4
40 = F92E 7	80 = CEDF 5	120 = FF32 2



M · I · K · E · S M · I · C · R · O *Memos*

THIS series is devoted to explaining all the things about your BBC Micro that you never knew – or may have since forgotten! If there's something you want to know about getting the best out of your micro, or if you just want some of the more puzzling code explaining, write to: Mike's Micro Memos, The Micro User, Europa House, Adlington Park, Adlington, Macclesfield SK10 4NP.

It came as no surprise to learn that the so-called random number generator in my BBC Micro was anything but...

Random thoughts

IF there's one thing I've learned about life it's that it's definitely not random. Despite the best efforts of my maths teachers, I know for certain that buses arrive in pairs, bills come in threes, toast inevitably lands butter-side down and I'm always left with the Q and Z at Scrabble. So it came as no surprise whatsoever to learn that the so-called random number generator in my BBC Micro was anything but.

The idea of random numbers is simple enough. Every time we throw a die we're generating a random number between one and six. At least we assume it's random – that is, each number is equally likely to come up – though my seven-year-old cottons on quickly enough when I try to use my non-random die in Snakes and Ladders.

Of course a die doesn't have to have six sides – it could have four or even 20 giving you random distributions of the numbers one to four and one to 20 respectively. Wargamers and adventure role-players use dice like these all the time.

BBC Basic takes the idea several steps further, allowing you to generate random numbers over wide ranges of numbers, integer or decimal. This is very useful for introducing the chance element into games and simulations.

It uses the keyword RND, a function which returns an integer between -2147483648 and 2147483647. Try:

```
PRINT RND
```

repeatedly – you could put it in a loop or define a function key – and you'll see you get different

numbers each time, such as:

```
68153343
2.09662776E9
1.04851149E9
```

The E, by the way, means that the number before it should be multiplied by 10 to the power of the number after it. This notation is used for rather large values. As with other functions, you can assign the value of RND to a variable:

```
number=RND
```

Using RND like this, though, is rather cumbersome: There's not much call for a number like 68153343 in a game of Snakes and Ladders. Fortunately we can give RND a parameter in brackets. For instance:

```
PRINT RND(6)
```

will give you random whole numbers in the range 1 to 6 inclusively.

Generally RND(X) – where X is a whole number greater than one – will give you an integer in the range 1 to X. Notice that *greater than one*. If you were to use RND(1) you'd still get a random number, but this time it's any decimal in the range 0 to 0.999999.

In practice you'd use statements like:

```
number=10*RND(1)
```

to give a decimal range from 0 to nearly 10. RND(0) is also a special case: It repeats the number that RND(1) last gave you, so in a sense it isn't random at all. This comes in handy when you're trying to debug programs. You see, sometimes when you're using random numbers it's hard to tell whether you're constantly varying and erroneous output is due to the laws of probability or your own inept programming. By using RND(0) to repeat the last RND(1) you can weigh

TIP

When you're debugging a program that involves random numbers add a line with a negative seed at the beginning. That way you generate the same sequence of numbers each time you run it. With luck, this "predictable randomness" will show you where you're going wrong – or at least where you aren't!

the odds a bit more heavily on your side.

The trouble is, though, the numbers RND gives aren't random – they can't be. Think about it: A computer can only do as it's told, following a fixed sequence of instructions or program.

Somewhere inside the Basic rom there's a machine code program telling your BBC Micro how to generate your numbers. If you could decode that program you could work out the pattern and use it to predict the next number.

It's like telling a robot how to shuffle cards – if you know the sequence they're in at the beginning you'll know what they are at the end. Having said that, the shuffle the BBC Micro uses to generate its numbers is pretty clever so there's not much bias in the spread.

Unfortunately, the number it starts to shuffle at power-up – known as the seed – is always the same. This means that from switch on the sequence of random values is the same. The following program demonstrates this.

```
20 FOR Loop=1 TO 5
30 PRINT RND(6)
40 NEXT
```

Save it, then CHAIN it from power-up a few times. I always get 6,6,1,1,3. Not very random! We can

get round this, though, by altering the seed number. To do this we use the negative of our new seed in RND. For instance – picking a number *at random* – let's make 123456 our new seed by adding line:

```
10 dummy=RND(-123456)
```

Notice that now when you run it you still repeatedly get a fixed sequence – but at least it's different to the first. Change the seed and you change the sequence – *dummy* is just a waste variable to allow us to use RND.

And that gives us the idea for making our random numbers truly random ... nearly. We just use the *pseudo-variable* TIME to give us a seed that we're unlikely to be able to predict. This gives us the following program:

```
10 dummy=RND(-TIME)
20 FOR Loop=1 TO 5
30 PRINT RND(6)
40 NEXT
```

If you really wanted to make things random, you could set TIME using a keypress – on the grounds that there's no way you can be sure how a human will respond.

*INFO Info

ONE of the disc system's exotica is the *INFO command. Basically it's a super *CAT command telling you as usual the files on a disc, the directory they're in and whether they're locked or not. That's straightforward enough. It's those four numbers after all this that are problematical....

Well, first of all, they're in hexadecimal, so don't panic – we covered that last month. Here are their meanings one by one:

Load address: The first value shows the address in memory the file will be loaded to. For instance, &FF1900 means that – like most Basic files – this file will load on top of PAGE which is &1900 on my DFS. A machine code file might load to &900.

Execution address: Just because you've loaded a file at one address, it doesn't mean that the machine code routine that the operating system should use to run it shares that address. For a

Basic II file the execution address is &FF8023, the initialisation routine of the Basic rom.

Our putative machine code at &900 might have its first few bytes taken by data, so that its execution address could be &906. If, like a saved screen image, the file has no realistic execution address, the second number merely echoes the start address.

Length: Measured in bytes, this is exact – 000006 bytes means six bytes, not seven.

Start sector: Your disc drive is divided into rings, or tracks. These tracks are themselves divided into sectors, each holding 256 bytes. The DFS uses these sectors as minimum units, so a 257 byte file would use two sectors.

Files are saved in successive sectors, so all the DFS needs to know is which sector – beginning with sector zero – the file starts at.

Extra info

NOTICE the &FF in the &FF1900 start address of the Basic file. This is actually the DFS abbreviation of the full &FFFF1900. The &FFFF is to distinguish the I/O processor (your standard BBC Micro) from the equivalent second processor address – &00001900 or &1900 for short.

```
S.DEMO      L  FF1900 FF8023 00012B 030
S.CODE      000900 000900 000006 02F
S.SCREEN    007C00 007C00 000400 02B
```

The above figure shows the part of the output of a *INFO *.* on a disc after the accompanying demo program is run and saved as the locked file DEMO. It shows three types of file:

● DEMO: A Basic II program running in the I/O processor.

● CODE: A six byte machine code program poked into memory at &900. Enter CALL &900 to see what it does. Notice that, because the *SAVE

doesn't specify the &FFFF prefix for the I/O processor, this isn't shown.

```
10 REM Demo program
20 MODE 7
30 PRINTTAB(14)CHR$141CHR$129'Demo'
40 PRINTTAB(14)CHR$141CHR$132'Demo'
50 *SAVE screen 7C00 8000
60 !&900=&EE2007A9
70 !&904=&60FF
80 *SAVE 'CODE' 900 906
90 PRINTTAB(2,22)CHR$141CHR$129'Now
SAVE this program as DEMO'
100 PRINTTAB(2,23)CHR$141CHR$132'Now
SAVE this program as DEMO'
```

● SCREEN: Enter Mode 7 and you should be able to *LOAD SCREEN.

Note that the actual sector numbers will vary

Turn to Page 29 ►

TIP

The most usual form of the command *INFO is:

```
*INFO *.*
```

which displays all the files in all the directories. To display only those, say, in the route (\$) directory use:

```
*INFO $.*
```

and to display all the files on drive one the command is:

```
*INFO :1.*.*
```

3.5" TOP QUALITY BULK PACKED DISKS

	10	25	50	100	150	200
Single Sided 135T.P.I.	£9.49	£22.95	£41.95	£79.95	£116.95	£154.95
Double Sided 135T.P.I.	£9.95	£24.95	£43.95	£81.95	£119.95	£158.95

Rainbow Pack of five colours - **New Lower Prices**

	10	25	50	100	150	200
Single Sided 135T.P.I.	£12.49	£23.95	£46.95	£91.95	£129.95	£169.95
Double Sided 135T.P.I.	£14.49	£26.95	£52.95	£98.95	£145.95	£189.95

Rainbow disks are available in Blue, Red, Green, Yellow and Orange
 Packs of 10 3.5" Disks come with Free Plastic Library Case (worth £1.49!)
 All discs are supplied with labels and are certified 100% error free

BBC Printer Cable	£5.95
Archimedes Printer Cable	£6.95
Disk Notcher	£4.95
12" Monitor Stand	£9.95
14" Monitor Stand	£11.95
A3 Copy Holder	
(Arm + Clamp)	£19.95
5.25" Fluid based cleaning kit	£4.95
3.5" Fluid based cleaning kit	£4.95
Mini Vac for printers/ keyboards	£4.95
Economy printer stand (80 col)	£14.95
Mouse Mat	£4.95

SILLY SUMMER SALE

PC - AT HIGH DENSITY 5.25" DISKS

Made by one of the leading disk manufacturers, these disks are suitable for the PC - AT and other High Density Disk Drives. Packaged in plastic library cases, and with a lifetime warranty.

10	20	40	60	80	100
£17.95	£32.99	£62.99	£89.99	£119.99	£139.99

3.5" HIGH DENSITY DISKS

These disks are made by one of our leading disk manufacturers, and are packaged in 10 capacity storage boxes. Suitable for PS/2 High Capacity disk drives and other disk drives which use high capacity disks.

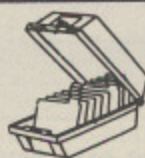
10	20	40	60	80	100
£39.95	£69.95	£129.95	£189.95	£249.95	£299.95



PROFESSIONAL PRINTER STAND

This new printer stand is very space efficient as it takes hardly any more room than your printer. Due to the unique positioning of the paper guide mechanism and refold compartments that is one above the other, the desk space is effectively halved. The space saving design allows easy access to the paper from both sides, the special dial controlled paper feed system with adjustable deflector plates ensures smooth paper flow and automatic refolding.

80 Col £19.95



STORAGE BOXES Anti-static, two keys, hinged + dividers

3.50" Lockable - Holds 40	£5.95
3.50" Lockable - Holds 80	£6.95
5.25" Lockable - Holds 50	£5.95
5.25" Lockable - Holds 100	£6.95

ANY TWO BOXES FOR £11.95 ANY THREE FOR £14.95

JUDGE FOR YOURSELVES

You'll be guilty of paying more & getting less if you go elsewhere



STORAGE BOXES NEW RANGE

3.5" 120 capacity lockable	£8.95
5.25" 140 capacity lockable	£8.95
any two for	£13.99
any three for	£19.99

ALL BOXES ARE ANTI-STATIC AND COME WITH LOCK, 2 KEYS AND HINGED LID

THE FAMOUS CENTEC DISK & BOX OFFER!

We can be copied on style but not on quality and Price!

3.5"	5.25"
3.5" DS/DD 80 Disks & 80 Capacity Box-£69.95	5.25" DS/DD 100 Disks & 100 Capacity Box-£29.95
3.5" DS/DD 40 Disks & 40 Capacity Box-£39.95	5.25" DS/DD 50 Disks & 50 Capacity Box-£19.95

TOP QUALITY DISKS AT ROCK BOTTOM PRICES

5.25" BULK PACKED-TOP QUALITY

	25	50	100	150	250
Single Sided 48T.P.I.	£9.97	£17.58	£30.88	£39.43	£58.43
Single Sided 96T.P.I.	£10.21	£18.05	£31.83	£40.85	£59.85
Double Sided 48T.P.I.	£10.45	£18.53	£32.78	£42.75	£62.70
Double Sided 96T.P.I.	£10.93	£19.48	£34.20	£44.18	£66.03
Double Sided Coloured 96T.P.I.	£13.06	£24.46	£46.08	£62.23	£94.76
Double Sided Reversible*	£14.25	£27.08	£47.98	£64.13	£97.38
Coloured & Reversible*	£16.39	£31.11	£60.08	£81.94	£123.26

Coloured Disks come in five colours (Red, Blue, White, Yellow, Green). Reversible disks have two index holes and two notches! Reversible disks work with 40T or 80T (48T.P.I./96T.P.I.) Coloured and reversible disks come in five colours and have two holes and notches. All Centec disks are packed with a protective jacket (envelope) and come with a full user set, including a label and a write protect tab. The disks are manufactured to top international standards and have a hub ring for added protection.

All disks carry our no quibble replacement guarantee and are certified 100% error free.

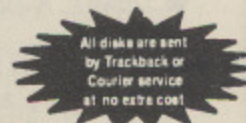


E. & O.E.

CENTEC DISK SUPPLIES

UNIT 3, THE METRO CENTRE, BRIDGE ROAD, ORPINGTON, KENT BR5 2BE
 TEL: (0689) 35353 (6 Lines) (24 Hours) Fax: 0689 77737

Please note we operate a call stacking system. Outside office hours a telephone answering machine will take your order.
 Remember - all prices include VAT and delivery! There are no hidden extras to pay! Personal callers welcome: Monday-Friday 9.30am-4.30pm



More than a pipedream

Rory McCloy finds something better than his beloved View

Product: View Professional
 Price: £99 incl. VAT
 Supplier: Acorn Computers Ltd, Fulbourn Rd, Cherry Hinton, Cambridge CB1 4JN.
 Tel: 0223-214411

FOR the past five years I have been a confirmed View user. Would any new product induce me to change from the word processor which had become second nature? Well, View Professional did. I do not often use spreadsheets and my first reaction to View Professional was to wonder if I wanted a word processor which looks like a spreadsheet.

In fact, the columns of the screen layout provide very powerful tabulation functions for the word processor, all the usual features of a spreadsheet and the sorting of entries normally associated with a database.

For once, here's a truly comprehensive package for all models of the BBC Micro from Model B to Compact – the plastic slipcase contains a 5.25in DFS disc, a 3.5in ADFS disc, two 16k roms and a 192-page guide which is relatively easy to understand.

There are images of the two roms on disc which you can use if you have two banks of sideways ram. There is also a disc-based second processor version which runs on the Master Turbo – but with no extra bytes free – and it runs on the Archimedes 6502 emulator without modification. However, an enhanced Archimedes version – PipeDream from Colton Software – is also available.

Yet other versions of the same program, also called PipeDream, is available for the PC and is built into the Z88.

View Professional is a wysiwyg word processor with spreadsheet-defined expressions. When you first enter it you are in the equivalent of the View edit mode and ready to enter text. The rows are numbered and the ruler at the top of the sheet is laid out with alphabetically headed columns, though both can be switched off.

The width of each column on screen can be altered and in addition each has its own definable wrap width which determines the point where whole words are carried on to the next line.

By default the wrap width of all the columns is set to the end of the row, allowing you to type in continuous lines of text across the screen. If you define the wrap width to extend for only one column or a few columns you can type in multi-column text on the same page.

Page layout – with top, bottom, header and footer margins – is not found on the edit sheet screen, pressing Escape puts you on the options page shown in Figure 11. The bytes free, filename

and printer driver currently loaded are all there, together with the definitions for page layouts, headers, footers, formatting, justification and many other powerful features.

This options page should not be confused with View command mode – it conveniently keeps all these features off the main screen and allows easy re-definition at any time. Page settings are saved with the text, enabling you to load in a personalised layout at the start of session.

The major disadvantage of the options page system is that definitions cannot be redefined in the middle of a page or file, so you can't change to double line spacing for a table halfway down a page. However, the option page settings are independent for each file and can differ for each part of a multifile document.

The 85 commands can be entered from the edit screen by prefixing a one, two or three character mnemonic with a backslash; the cursor then jumps to a command window at the top of the screen where the command is entered. A unique feature is that all commands can be assigned to any of the three tiers of function keys.

Many of the default definitions are identical to the fixed set of View and where the keys are different, a !BOOT file containing your choice can increase the coincidence with View keys. Preceding key definitions with *FX228,176 allows a fourth tier of definitions accessible by Control+Shift+function key.

Each file is formed from spreadsheet cells or slots formed by the intersection of rows and columns. These are normally text slots for word processing, but they can be expression slots – users of spreadsheets will be familiar with this concept.

Any mathematical expression can be placed in an expression slot and the screen display will show the result of evaluating the expression. All

Points for

- Powerful word processor
- Spreadsheet features
- Sort facility
- On screen highlights
- Comprehensive manual
- Pipedream compatibility

Against

- Expensive
- Whole file page layout only
- No macros

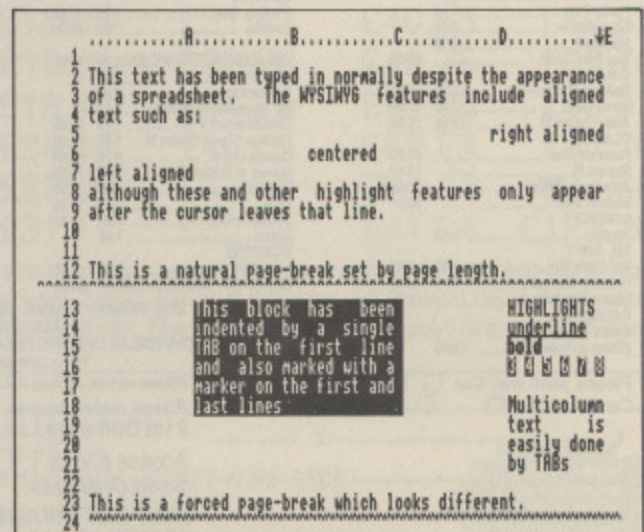


Figure 1: The main screen

the usual functions are available such as number format, left/centre/right alignment and decimal places.

The options page allows leading or trailing characters defined by the user to be added to an expression slot or block of slots. For example you can add pound or percentage signs – the defaults – or character strings such as *a.m.*, *pm* or *mins.* This facility is very useful for large tables or lists to which these prefixes or suffixes can be added by a single block command.

The database facilities are limited and amount to a sort routine that operates on any marked block of text, numbers or dates. All the entries on one row can be sorted into ascending or descending order. An example would be a table with columns of names, ages and birth dates separated by tabs. The name column can be sorted into ascending or descending alphabetical order and the corresponding entries in the other two columns on the same row would be carried with the name.

Blocks of text or numbers are delineated with markers set at the beginning and end of the chosen section by a single command. The marked block is highlighted by reversed video characters on the screen, which you can see in Figure 1. However, you can only highlight complete columns, which can be troublesome when copying, moving or deleting text, since most is written in the first column.

To mark a block which starts part way along a line it has to be split at the chosen place and the cursor moved down the next line, which now contains the split part of the line, which is then marked. This has to be repeated if the text at the end of the block also lies in the middle of a line. Finally, the revised paragraph has to be reformatted to remove the gaps caused by the split lines.

A major feature of View Professional is the power of the Tab key. Pressing it jumps the cursor to the next column of the sheet – Shift+Tab to jump back. The cursor then remains indented to that column. This is a much simpler way of indenting paragraphs than the setting of multiple rulers used by View.

One disconcerting feature is that if you have typed across the page in column A and then Tab to column B, all the column A text vanishes – although it re-appears when you Tab back. Another source of confusion to the novice is that inserting and deleting lines or rows only applies

MICRO COMPATIBILITY

PipeDream from Colton Software – 0945 211472 – is built into the Z88 and now also available for the Archimedes and PC. These versions are all very similar to View Professional but have more menu control, dialogue boxes and other enhanced features.

The Archimedes will run both View Professional and PC PipeDream on the appropriate emulator, but the Archimedes version is faster and has several extra features such as more spreadsheet functions.

One very important feature of the software is that the file structure is compatible on all versions; the Archimedes and PC versions even have built-in import and export facilities. So passing files between micros and using them in their new environment has never been easier.

View Professional and PipeDream are the ideal choices for anyone who uses more than one type of micro.

to the column the cursor is in.

In an otherwise excellent package, View Professional has one shortcoming which still sends me back to my old faithful View – it cannot perform macros. An example of a macro would be a standard letter which contains windows into which personalised details, such as name and address, can be fed automatically – different

Turn to Page 32 ►

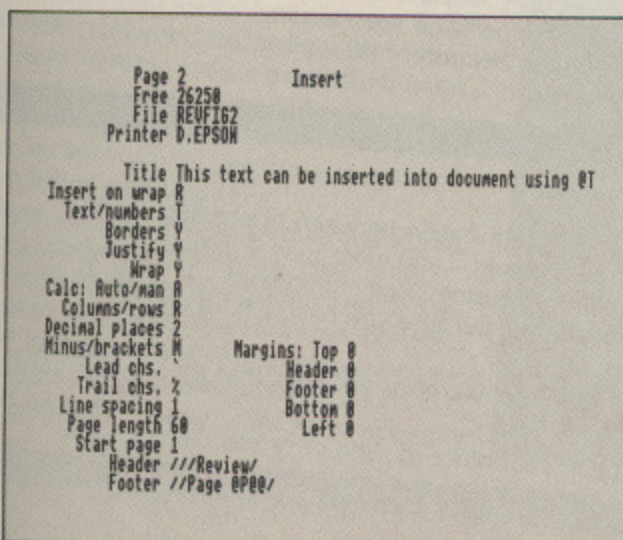
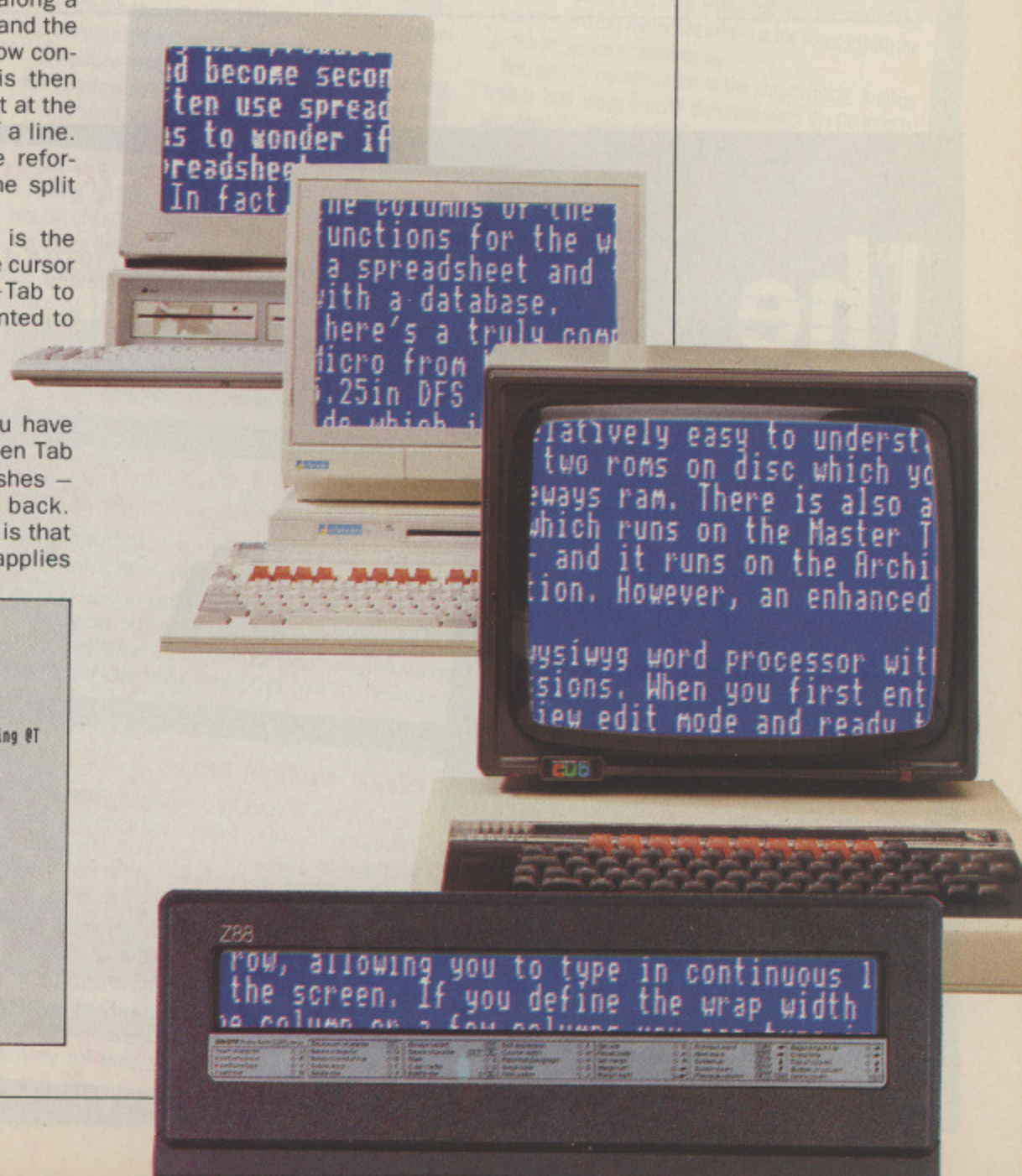


Figure 11 The options page

◀ From Page 31

details appearing in each copy of the letter.

The nearest that this package comes to performing a macro is the ability to transfer the details of a slot into the text of a document using an @-field. This can be done by entering a slot reference, such as column A/row 19 into the text with:

```
@ A19 @@@@@@
```

The trailing @s indicate the size of the field, six characters in this case, so that the text can be formatted and justified correctly following the insertion. The @-sign can also be followed by a P, D or T to insert the page number, day and date – on machines with a built-in clock – or title of the piece respectively.

In the final outcome any word processor is only as good as its printer driver – that software patch which interprets text highlights into codes the printer understands. The printer driver that comes with View Professional is limited to eight highlights, which are entered into the text with a highlight command followed by a number. It is possible to use View printer drivers with View Professional provided you stick to combinations of *h1* and *h2* which correspond to the View codes.

The disc supplied contains two ready-defined printer drivers, FX80 and JUKI610 for Epson and Juki-compatible printers and also a printer driver

editor so you can define your own. I successfully produced drivers for the Hewlett Packard Laserjet Plus and IBM Proprinter XL modes of my Brother HL-8 laser printer.

However, I continued to be frustrated by the limit of eight highlights until I acquired the latest printer driver rom, Hyperdriver, from Dabs Press. This allows any number of printer driver codes to be defined from View or View Professional.

Last year Acorn was developing an enhanced version of View Professional to run on the Arthur operating system of the Archimedes but I was very disappointed to hear that in January this project had been dropped. However, Colton Software, the original author of View Professional, has developed the fully-fledged Archimedes version which is available now. Not only that, the Archimedes also runs Colton's PC version on the PC Emulator.

Up to now View Professional has not been a big seller, probably due to its cost. But all that is now changing, as in its PipeDream guise it is being introduced to other micros. The full file compatibility between View Professional running on my Master or Archimedes with PipeDream on the Z88 was a major factor in my changing from View and buying a Z88. Buying a serial cable to connect the two micros has provided me with a truly portable word processor.

View Professional is an under-rated and under-promoted package which deserves more serious consideration and a far wider usage.

The bottom line...

Definitely for the serious user, but easy to use and better than View

The truth about TELEX

How much does it cost to go on Telex?

You could go the conventional way and buy a dedicated Telex machine. The cheapest will cost you £1,604 (the Whisper), the dearest £2,892 (the Cheetah). You will also need a separate telephone line, costing £101 to install, plus £404 a year rental. That's a total outlay over the first year of a minimum of £2,109. (All prices include VAT.)

Or you could do what more and more BBC Micro users are doing – use your BBC Micro to double as a Telex machine. And just use your ordinary telephone!

How do I turn my BBC Micro into a Telex machine?

All you need is a modem and appropriate communications software (see the advertisements in this issue), a telephone, and a subscription to *MicroLink*. Telex is just one of a growing number of services available to micro users on *MicroLink*. You can also read the news as it happens, go teleshopping, create your own closed user group, send telemessages and electronic mail right round the world, download free programs directly into your micro... and much more.

But why use Telex?

Because it's a standard means of instant communication between businesses. Today there are 150,000 Telex machines in use in Britain – and more than 2 million worldwide. It's used to dramatically speed up business communications – it's just as quick as using the phone but far more efficient, because you have a hard copy of every "conversation" for your records.

But there's a big bonus you get when you use *MicroLink* for Telex that the conventional way doesn't offer.

With *MicroLink* you don't HAVE to be in your office to send or receive Telex messages. You can just as easily use your computer at home (or even a portable). So now you can check whether there are any Telex messages waiting for you – anywhere, anytime. How's that for your business efficiency?

How to join:
Phone 0625 878888

SOFTWARE SCENE

DESKTOP GAMES ... bit of a puzzle

Price: £5.95 (3.5in disc, mail order only)
Supplier: Gem Electronics, 17 Tandragee Road, Portadown,
Craigavon, BT62 3BQ

WHEN the press release announcing this product arrived at *The Micro User* office, we couldn't believe the gall of anyone proposing to sell a sliding block puzzle, solitaire and a Mastermind game for the Archimedes – particularly when such things are so easy to write as short magazine listings. But we should always look before we leap.

The games run on any Archimedes except a 305 and running the program is simply a case of Shift+Break. There's a short delay marked only by a Desktop Games v2.1 message and finally the icon bar appears at the bottom of the screen. Except that instead of being a pleasant cream colour it's now dirty pink and there are three new icons – a star, a pair of headphones and a little space invader with the word Logic above him.

Clicking the star gives instant access to operating system star commands and the headphones bring up a volume control in the form of a slider – like the palette. Both are useful additions to the desktop.

Clicking the space invader produces a menu of three games: CrakCode, Slider and Leapfrog. Each appears in fixed-size windows which continue to work perfectly even if partially obscured. In addition, if you remove a game window and then restore it you get back to the position you were previously at. And if you're feeling really macho you can play all three at once.

CrakCode gives a very nice representation of the original Mastermind game board with 10 rows of four large holes in a row, with a square of four small holes at the side for the answer code – and seven colour blocks along the bottom.

The idea is that the micro selects four of the seven colours in some combination and you have 10 goes to figure out what that is. You play by clicking a colour and choosing the position you want to play; the selection also sounds a note so if you're bored you can play a tune.

When you successfully work out the choice and order of colours, a not entirely happy smiley face appears at the top with the corresponding code. Pressing the menu button over the board produces a list of options to allow colours to be repeated, leave gaps – effectively another colour, give the answer – which produces an unhappy face – or restart.

Slider is the sliding block puzzle. The picture occupies

about one quarter of the screen and is complete. Pressing the middle button on the mouse brings up the menu with options allowing different grid sizes, three levels of difficulty, the chance to load a different picture, give the solution, restart, or run the picture maker option.

Selecting any option apart from load and maker puts you straight into the game with the picture mixed up and one piece missing. Clicking on a block adjacent to the missing one slides that block very quickly into the space, allowing you eventually to put the picture back together. The moment you complete it the missing piece is also replaced.

The picture maker is the poorest part of the whole thing and it crashed the first time I used it – although this problem never recurred. It allows you to take any Mode 12 screen, or an ArmPaint picture, and convert it to the format required for the puzzle. It's then included in the load menu list.

Leapfrog isn't anything to do with Frogger, but is three versions of Solitaire: Standard, where one of the pegs on the board must finish in the middle; Blue Peg, where a specific peg – the blue one – has to end up in the middle; and

Surround, where four pegs have to finish one in each corner of the central nine hole block.

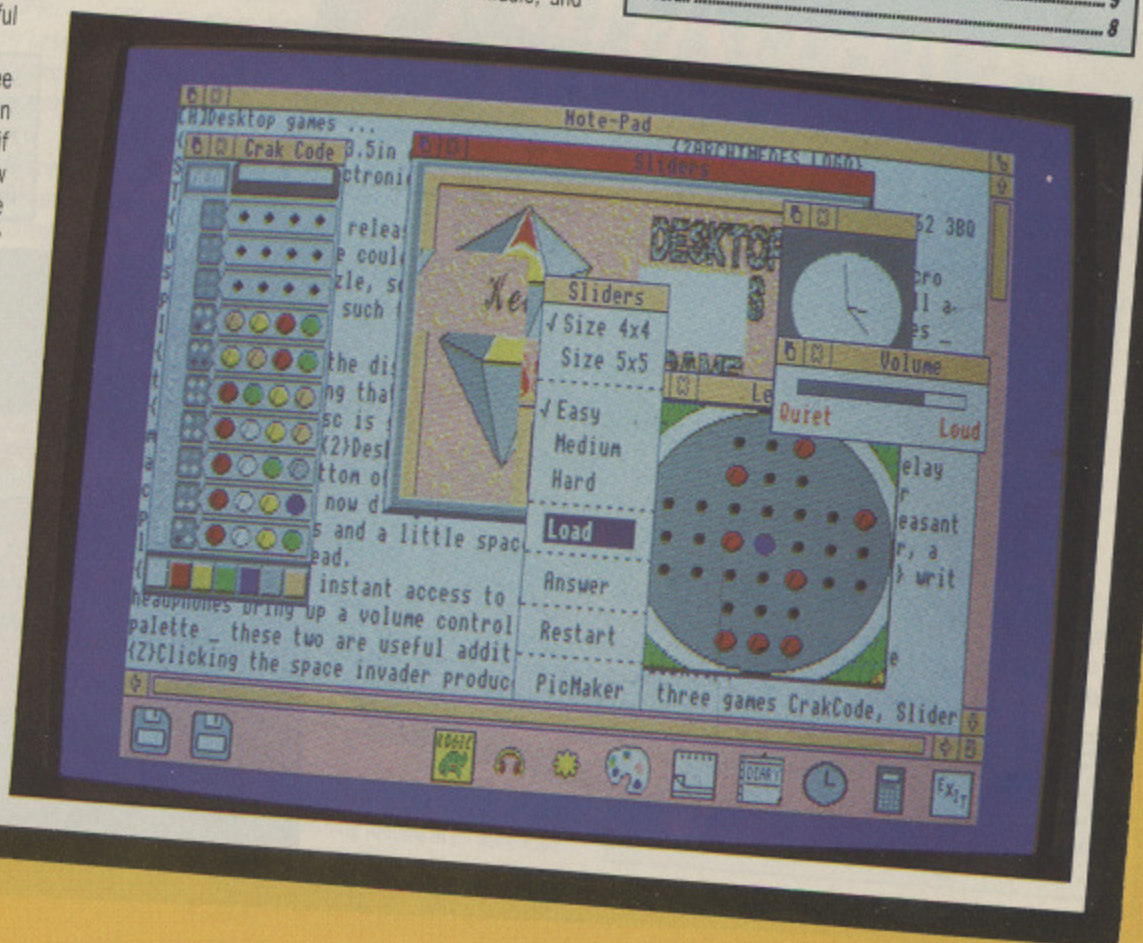
When a peg is clicked it turns yellow and you can move it to a legal position by clicking the appropriate hole – the one that has just been jumped will disappear.

While not spectacular the games are produced with a professional finish seldom seen on games two or three times the price. They are perfectly integrated with the rest of the Desktop – and this review was written in the notepad with the games on screen simultaneously.

But, despite my admiration of the programming, it takes time to load and is it worth the effort when the Desktop is supposed to provide fast entry to other programs?

Steve Turnbull

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



BARBARIAN ... could slay you

Price: £9.95 (cassette) £11.95 (disc)
Supplier: Superior Software, Regent House, Skinner Lane,
Leeds LS7 1AX.
Tel: 0532 459453

AFTER the blaze of publicity that preceded this game's release, with an expensive advertising campaign featuring two rather well-built and scantily clad models, I was really looking forward to a game full of excitement and action.

Sadly, I was disappointed. It seems that Superior Software is suffering from a shortage of new ideas. This game is almost identical to Yie-Ar Kung Fu, only this time the figure you control uses a sword instead of his hands to fight opponents.

In this one or two player game the scenario is a fight against the 10 evil minions of the sorcerer Drax – and finally the sorcerer himself – in order to free the beautiful Princess Mariana. At first the opposition is easy to despatch but as they get more proficient the task gets harder.

From boot up you can select your preferred keys for both players or you can play the game with a joystick. From there you are presented with the choice of combat practice or starting the game itself: The Fight to the Death.

The former gives you the choice of a demonstration which shows the 16 different fighting moves you can make, or you can practice against a passive opponent. This may seem pointless – it did to me – but it was while I was busy hacking away at some poor, helpless chap that I discovered that it's possible to decapitate an opponent, which in turn leads to

the most entertaining sequence in the whole game:

This involves a goblin-type creature which normally comes on at the left-hand side of the display once a combatant is dead, crosses the screen and exits at the right-hand side dragging the body behind him. If there's been a decapitation, the goblin collects the body as usual but casually punts the head off screen.

While still in combat practice mode you can opt for either one or two player modes. In the first you are pitted against a warrior who you must defeat in order to have the privilege of fighting another, slightly more proficient, one.

This goes on until either you defeat 10 of them or, as is more likely, one of them beats you. A fight ends when one of the combatants has taken 12 hits or is decapitated. In the two-player mode you each control a warrior and fight against each other. The same victory conditions apply, but you also have the added pressure of having to complete the duel in 90 seconds.

Of all the modes these two seemed the most pointless to me. If you're going to practice fighting 10 opponents, you might as well practice while playing the actual game. That way if you do, by some miracle, manage to defeat all of them, you can get to enter Superior's own Barbarian competition.

The Fight to the Death is almost exactly the same as the combat practice mode. Again you can watch a demonstration, fight a passive opponent or a second player. The only difference is that if you opt for the Fight to the Death in

one-player mode, you get to fight the evil sorcerer Drax after defeating the 10 Conan lookalikes.

Combat is punctuated by the sound of swords biting into flesh and the satisfying *thunk* as your warrior head-butts his opponent. These few sound effects can be turned off by pressing function key one. There is no signature tune, which some would say is a blessing, but I find Superior's tunes are better than most and it's unusual for them not to bother with one.

My biggest disappointment was with the graphics. I've no grumble with the quality – which is excellent – but I was disappointed with the quantity. There seem to be only four screens, and the two arena ones featured on the packaging are the only ones I've come across in Fight to the Death mode.

You begin fighting in front of someone sitting on a throne. In the second bout you face your opponent in front of Drax and the captive Mariana – who, by the way, bears no resemblance to the young lady featured on the packaging. Then it's back to the man on the throne again and so on.

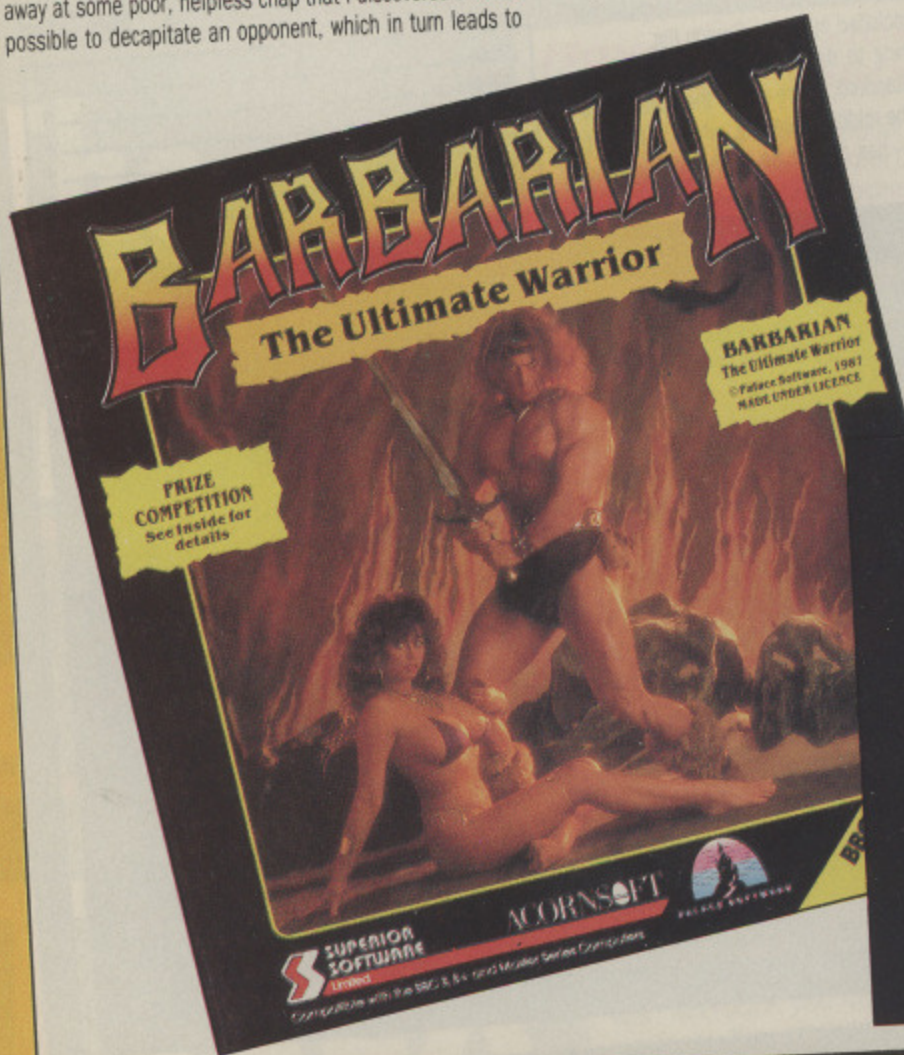
The other two screens only appear in the combat practice mode. Again they alternate, this time featuring two wilderness scenes, the first in daylight and the second at night.

Another point is that your adversaries are exact clones of your warrior except that yours is wearing a white vest. Even so, there have been a few times when I've smugly watched one of the warriors making mincemeat out of the other congratulating myself on some nifty swordwork, only to realise that it's the bad guy who was doing the hitting.

I don't want to give the wrong impression about this game: If you are a fan of games which simulate physical combat, martial arts and the like, you will find Barbarian an excellent addition to your collection. To its credit, Barbarian has little for me to criticise, except for the fact that I've seen it all before.

Desmond

Sound	6
Graphics	8
Playability	7
Value for money	8
Overall	7



SOFTWARE SCENE

WAY OF THE EXPLODING FIST ... still packs a punch

Price: £1.99
Supplier: Mastertronic, 8-10 Paul Street, London EC2A 4JH.
Tel: 01-377 8411

THIS is a re-issue of a piece of software which was so well received when it first came out that it won a number of awards. It is a karate simulation game in which your aim is to work your way through the various skill levels until you reach the 10th Dan.

Unlike other similar programs, the setting is very definitely sporting. The rules of karate are adhered to in a fairly strict manner and no weapons are used at all – just the hands and feet.

As is usual with this type of simulation, the main problem is getting to grips with the mind-boggling number of actions. There are 16 different functions which can be controlled either from the keyboard or joystick. They give you a full range of punches, kicks, somersaults and other movements

to be used against a micro-controlled opponent or another person.

The best way to practice moves is to select the two player option, without actually having a second player. Having coped with the keys required, you will be ready to tackle active opposition.

Your first opponent is remarkably unskilled in the art of karate. It should be no time at all before you have scored a victory over him. This will give you a chance to move on to the next competitor who is much more adept at dodging your moves and then felling you with a quick roundhouse kick.

With a lot of practice you will be able to beat a whole series of opponents, each a little more skilled than its predecessor. The graphics are very good with fast, flicker-free movement and the sound is adequate with nothing too spectacular.

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

Rog Frost



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

NOT A PENNY MORE, NOT A PENNY LESS ... no sale

Price: £14.95 (cassette) £19.95 (disc)
Supplier: Domark, 204 Worple Street, London SW20 8PN.
Tel: 01-947 5622

THE books of popular author Jeffrey Archer sell in their millions, and I enjoyed *Not a Penny More, Not a Penny Less* when I first read it some years ago: It is a light-hearted romp of the "Don't get mad, get even" genre, with an amusing twist in the tail.

Consequently, I was delighted when the adventure game was released. I booted the 40/80 track disc – to receive an error message. I managed to load the program by switching my disc drive to 40 track mode but, try as I might, I could not boot it in 80 track format. I have ordinary Cumana switchable drives and an Acom DFS.

The loading screen showed a cleverly-drawn picture and there was a prompt asking which of the game's three parts I wished to play. I loaded part one and discovered I was to be cast as Stephen Bradley, the American academic working at Magdalen College, Oxford. My task was to recover the money I had lost by investing in an oil company floated by that rogue Harvey Metcalfe who was now laughing all the way to his Swiss bank at my expense, and that of three other luckless punters.

I confess I liked neither the constant use of upper case letters nor the sloppy screen layout of the descriptions. They looked amateurish, as if the conversion for the BBC Micro had been delegated to the tea boy, but I persevered.

Starting in my room at Magdalen, I began to enter instructions, and rapidly discovered the limitations of the parser. I

began to suspect that the tea-boy's understudy must have had a hand in it, too.

Opening and examining various things I discovered a camera, three dossiers, Principia Mathematica, The Tatler and some phone numbers.

I dialled Scotland Yard and my stockbroker answered! He proceeded to give me details of my fellow victims and I began to suspect the tea boy of even darker designs. Tea boys don't know that an essential input from an adventurer is Inventory – or Inv or even I – so that we can keep track of what we are supposed to be carrying. Naturally, the parser of *Not a Penny More* does not acknowledge the existence of such a combination of letters.

Similarly, tea boys don't expect the present-day player to abbreviate direction input: There was no response to commands like N or S, and only GO NORTH and the like produced results.

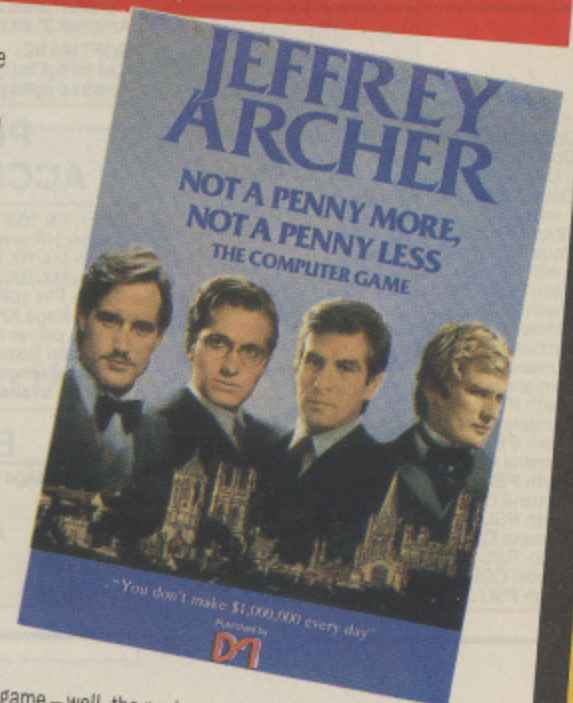
Opening a door and leaving my room proved impossible – was I to be trapped there forever? Never! Trust your old Hatter friend to try the daftest procedures known to mankind and deliver the goods:

EXAMINE ROBIN produced a door-knocking policeman, full of suspicion.

EXAMINE JEAN-PIERRE instantly transported me to Bond Street, and I then found my way to Pall Mall and did some shopping.

EXAMINE JAMES teleported me to the Bodleian, an attractive librarian and various tomes.

At this point my waning interest finally evaporated. Usually I try to find at least some redeeming feature in an adventure



game – well, the package includes the book which I enjoyed. As for the rest, there's a reversible disc with approximate value 50p – not a penny more, not a penny less.

Mad Hatter

Atmosphere	0
Complexity	0
Presentation	1
Value for Money	0
Overall	0



Computaccount (UK) Ltd
11 High Street, Harborne
Birmingham B17 9NT
Tel: 021 427 9898

We are major suppliers to the
educational and health sectors

Please telephone for our free extensive catalogue and price list. Hundreds of products listed at excellent prices.



THE NEW RISC COMPUTER FROM ACORN. A VERY FAST 32 BIT MACHINE, SPECIFICALLY AIMED AT THE EDUCATION MARKET COMPATIBLE WITH MOST EXISTING BBC SOFTWARE

	Base model	+ Mono monitor	+ Colour monitor
Archimedes 305 512k RAM, 512K ROM, 1Mbyte 3.5" drive	£699	£749	£899
Archimedes 310 As 305 but 1024k RAM	£775	£825	£975
Archimedes 410 As 310 but with hard disc controller floating point option, coprocessor bus.	£1399	£1449	£1599
Archimedes 440 As 410 but 4048k RAM 20Mbyte hard disc	£2399	£2479	£2629

ACORN

NEW MASTER COMPACT series.
Standard system is 128k, single 3.5 inch drive, bundled software.

Compact entry system	£349.00
Compact TV system	£359.00
Compact with mono monitor	£389.00
Compact with colour monitor	£529.00
RS 232 interface for compact	£26.00
Extra 3.5in drive for compact	£99.00
PAL TV adaptor for compact	£26.00
Master 128	£379.00
Master Econet module	£43.47
Turbo upgrade	£108.00
64K upgrade kit	£34.74
Master 512K upgrade	£199.00
Level 1 file service	£86.00
Level 2 file service	£199.00
File Store E01	£799.00
File Store E02 (20mb)	£600.95
Eprom cartridges	£11.95
Acorn DNFS kit	£82.60
1770 upgrade kit	£43.42
ADFS ROM	£26.04
ATPL Sideways RAM/ROM board	£39.00
CONCEPT Keyboard	£124.95
View manual	£10.00
Viewsheet manual	£10.00

DISC DRIVES

Opus 5802 400k DS 40/80 track ..	£109.00
Opus 5802DB dual 400k DS40/80 track	£205.00
Opus 5802D dual 400k DS 40/80 with PSU	£260.00
Opus DDOS kit	£59.95
Pace PSD3P 400k 40/80T with PSU	£144.00
Pace PDD3P dual 400k 40/80T with PSU	£260.00
Akhter MD802E dual 400k DS 40/80T mounted in monitor stand	£285.00
Cumana CSX100 100k SS 40T	£99.00
Cumana CS100 100k SS 40T with PSU	£129.00
Cumana CS400S 400k DS 40/80T with PSU	£152.00
Cumana CB800S dual 400k SS 40T with PSU	£295.00
Cumana CS354 SS 3.5" with PSU	£121.70
Cumana CD358 DS 3.5" with PSU	£210.00
Cumana CCD2000S 3.5" + 5.25" with PSU	£282.17

MONITORS

Mono	
Sanyo DM4112	£79.95
Sanyo DM9112	£126.00
Philips green Hi-res 7502	£85.00
Philips amber Hi-res 7522	£85.00
Zenith green Hi-res 1230	£85.00
Zenith amber Hi-res 1220	£85.00
Colour	
Microvitec std-res 1431	£191.00
Microvitec med-res 1451	£229.00
Microvitec hi-res 1441	£399.00
Philips 8833 RGB Med-res + composite video	£251.00
Monitor cables (state type required)	from £3.50
Master Monitor bridge single height	£25.00
double height	£28.00

AMSTRAD

* New 1640 now in stock *

Amstrad 1640	
Enhanced colour display	
Single 360k floppy drive	£799.00
Twin 360k floppy drives	£899.00
Single 360k floppy drive + 20Mbyte hard disc drive	£1199.00
Colour Twin floppies	£649.00
20Mb Hard Drive	£260.00
PCW 8256	£299.00
PCW 8512	£399.00
PCW 9512 with Daisywheel printer	£499.00
Amstrad 3" discs box of 10	£28.00

SOFTWARE:
Call for full list of IBM Compatible and Amstrad software

PRINTER ACCESSORIES

Epson FX 100/105 Sheet Feeder	£139.00
Brother HR sheet feeder	£209.00
Epson MX/RX/FX 80 Ribbons	£3.75
Epson MX/RX/FX 100 Ribbons	£4.50
Canon PW 1080/1156 Ribbons	£5.00
Taxan Kaga KP810 Ribbons	£5.00
Citizen printer ribbons	from £3.99
All Epson Spares available	£POA

Massive range of other compatible ribbons available

BOOKS

Wide range of computer books now in stock for:-

ARCHIMEDES	
MSDos	
ARM	
AMSTRAD	

PRINTERS

DOT MATRIX	
Epson LX800 150cps 80col NLQ	£229.00
Epson FX800	£324.75
Epson FX1000	£453.75
Epson EX800 (optional colour)	£457.88
Epson EX1000 (optional colour)	£614.63
Epson LQ 800 180cps 24 pin matrix NLQ	£479.00
Epson LQ 1000 180cps 24 pin 132 col NLQ	£659.00
Olivetti DM100 80col NLQ 120cps	£225.00
Olivetti DM280 80col NLQ 160cps	£349.00
Canon PW1080A NLQ 80col 160cps	£258.00
Brother 1109 Par + Ser 100cps + NLQ	£209.00
Brother 1409 Par + Ser	£349.00
Brother 1509 Par + Ser 180cps + NLQ	£449.00
Brother 2024 Par/Ser NLQ 24pin 160cps	£750.00
Star NL 10 NLQ 80 col 120cps	£239.00
Star NX 15 NLQ 132 col 120cps	£330.65
Star SD10 NLQ 80col 160cps	£330.65
Star SD15 NLQ 132col 160cps	£415.65
Star NB2415 NLQ 24 pin 216cps	£645.15
Star NB15 NLQ 24pin 300cps	£806.65
Citizen 120D 120cps NLQ 80col	£179.00
Citizen LSP100 120cps Eps/IBM comp NLQ	£225.00
Citizen MSP 10E 160cps Eps/IBM comp NLQ	£279.00
DMP 3160	£189.00
DMP 4000	£299.00
LQ 3500 24 pin	£299.00
MSP 1SE	£329.00
HQP 40 24 pin	£495.00
HQP 45 24 pin	£595.00
Panasonic KX-P 1081	£279.00
Panasonic KX-P 1090	£233.00
Panasonic KX-P 1092	£315.00
Panasonic KX-P 1592	£405.00
Micro-P MP165 NLQ	£208.70
Micro-P MP200 "NEW"	£299.00
Parallel printer cable BBC	£9.00
Parallel printer cable IBM etc from	£15.00

DAISY WHEELS	
Sanyo PR3000	£199.00
Sanyo PR5200	£299.00
Brother HR20	£399.00
Brother HR25	£480.00
Brother HR35	£825.00
Juki 6100	£299.00
Juki 6200	£454.00
Juki 6300	£694.00
Juki 2200 typewriter/printer	£238.00

LASER	
Epson GQ3500	£1595.00
Citizen Overture	£1750.00
Kyocera 1010	£2495.00
Kyocera 2010	£4595.00

OPUS PC

PC3 SF Mono 256k	£499.00
PC3 TF Mono 768k	£699.00
PC3 HD Mono 1024k	£995.00
PC5 (AD) HD Mono 1024k	£1295.00
EGA System available - please add	£300.00

BBC ROM SOFTWARE

InterWord	£48.00
Intersheet	£48.00
Interchart	£28.50
Interbase	£59.00
Acorn	
View 2.1	£45.00
View 3.0	£63.00
ViewPlot (Disc)	£25.75
ViewSpell	£33.50
Viewsheet	£45.00
Viewstore	£45.00
GXR (please state whether for B or B+)	£23.00
ISO Pascal	£52.00
LISP	£39.00
BCPL	£46.00
Logo	£52.00
ADFS	£26.04
Computer Concepts	
Wordwise Plus	£40.00
Printmaster	£25.00
Accelerator	£48.00
Speech ROM	£27.50
Spellmaster	£46.00
Beebugsoft	
Toolkit Plus	£33.00
Wordbase	£25.00
ICON Master	£29.00
ROMIT	£29.00
Help II ROM	£27.00
Sleuth ROM	£27.00
Exmon II	£28.00
Spellcheck III	£32.00
MUROM	£24.00
Pace	
Commstar	£29.57

AMX

Please state whether for BBC or Master

AMX mouse with Super Art ROM	£78.00
Stop Press	£43.43
Paintpot	£13.00
Desk	£21.70
Super Art ROM	£43.43
Database	£21.70
3D Zicon	£21.70
Utilities	£13.00

ARCHIMEDES SOFTWARE

System Delta Plus Database	£69.95
System Gamma Plus Graphics	£69.95
System Delta Account (per module)	£64.95
School Administrator	£79.95
Video Rental	£69.95
Newsagent	£69.95
Clares AlphaBase	£49.95
Clares Image Writer	£29.95
Archimedes Tool Kit Module	£39.95

SPECIAL SOFTWARE

Torch Turbo Library
functions and procedures for Turbo Pascal to access the power of Torch/BBC facilities

Newnet
Powerful friendly Torchnet management software with password protection etc.
dBase special
dBase helper program now available for those who want to access the powerful facilities in dBase, without having to learn how to program in dBase

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 021-427 9898 with your Access details



Quantity	Item	Price	£	£
.....	£	£
.....	£	£
.....	£	£
.....	£	£
			Total	£

Glasgow Font's face lift

Conrad H. Gempf tries his hand at producing a natty line in letters

A FEW days ago, I totally redesigned Glasgow. Despite the sentimental memories I had of it, the time had come for a total reconstruction. The Glasgow in question is not the city, however. As a new micro user a year and a half ago, I bought a font designer and produced a typeface I called Glasgow in honour of the Glaswegian architect who inspired it, Charles Rennie Mackintosh.

It was my first project, and my inexperience showed. Using experience gathered from more than a year in the "font biz", I herewith offer some tips and observations, some of which helped considerably in the Glasgow face-lift.

The first step in designing a typeface is to know what you want the alphabet to look like. Clarify in your own mind the features that define the font. An outsider looking at your typeface should be able to see at a glance that all the characters in your font belong together somehow.

If you don't have a copy on paper of every letter in the font, sketch one out with pencil and paper. Fine though the BBC Micro is, pencil and paper are much better tools with which to begin the process. Savour the effortlessness of constructing curves and diagonal lines. You are about to enter the less flexible world of the pixel.

There are certain key letters that, in most fonts, force decisions that will affect many of the other characters. Start by working on the lowercase letters n and h of your font. When they look right, notice their width and their relative heights.

The width will normally turn out to be the

average width for the rest of the letters, while the heights will be shared by most or all of the other characters.

In addition, you will find that many characters are variations on this basic shape. The m is an n with more, as the r is an n with less. The l, t, f, i and j are all related to the straight part of the h in

Turn to Page 39 ▶

hexa	gon
hexa	gon
hexa	gon
hexa	gon
hexa	gon
hexa	gon

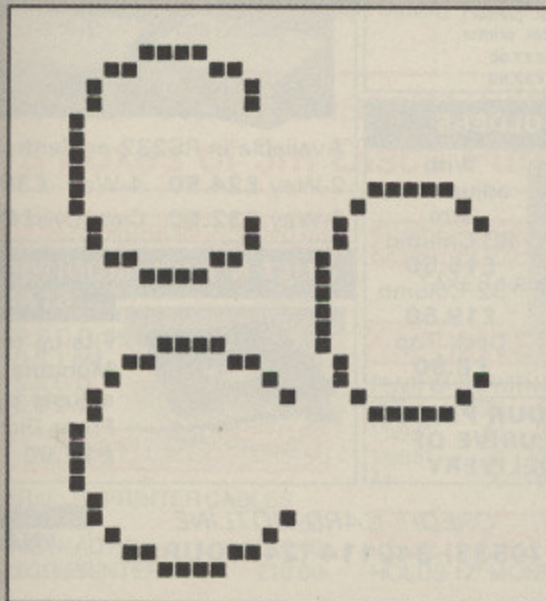
Despite the fact that these fonts are very similar you should be able to match the first to the second for each pair.

n h	n h
n h	n h
n h	n h

Just knowing what the letters n and h will look like is the key to the font.

c -- a g
c -- a g

In some fonts a and g are based on c -- but not in all.



Producing curves is tricky. Here are three strategies that look good on paper.

£48.00
£48.00
£28.50
£59.00

£45.00
£63.00
£25.75
£33.50
£45.00
£45.00

£23.00
£52.00
£39.00
£46.00
£52.00
£26.04

£40.00
£25.00
£48.00
£27.50
£46.00

£33.00
£25.00
£29.00

£29.00
£27.00
£27.00
£28.00
£32.00
£24.00

£29.57

aster
£78.00
£43.43
£13.00
£21.70
£43.43
£21.70
£21.70
£13.00

£69.95
£69.95

£64.95
£79.95
£69.95
£69.95
£49.95
£29.95
£39.95

ARE

Pascal
ilities

ment
etc.

ple for
verful
o learn

EPROMS, 8271

	Ex VAT	Inc VAT
1-9 27128 250nS 21V	3.57	4.10
10+ 27128 250nS 21V	3.26	3.75
1-9 27128 250nS 12.5V	3.04	3.50
10+27128 250nS 12.5V	2.75	3.16
1-9 2764 250nS	2.60	2.99
10+2764 250nS	2.39	2.75
1-9 27256 250nS	4.22	4.85
10+27256 250nS	3.83	4.40
1-9 TTL/Cmos set	3.91	4.50
1-9 8271 controller	39.13	45.00
1-9 6264 LP 150nS	5.00	5.75
Acorn 8271 DFS	43.48	50.00

ROMS

	Ex VAT	Inc VAT
Inter-Word	37.39	43.00
Inter-Sheet	36.52	42.00
Inter-Base	48.70	56.00
Wordwise Plus	37.39	43.00
MEGA 3	71.30	82.00
Spell Master	40.87	47.00
View Spell	27.83	32.00
View 3 Rom	55.65	64.00
View 2.1	38.26	44.00
ViewStore	38.26	44.00
OverView I & II	68.70	79.00
View Professional	68.70	79.00

DISKETTES

(lifetime warranty)	Ex VAT	Inc VAT
10 Banana Reversible	8.65	9.95
10 3.5" D/S 135tpi	9.57	11.00
10 48tpi D/S D/D in box	4.78	5.50
10 96tpi D/S D/D + case	7.39	8.50
10 96tpi D/S D/D in box	6.52	7.50
50 96tpi D/S D/D in boxes	21.70	24.95
100 96tpi D/S D/D in boxes	39.13	45.00
50 Disc Box hinged + lock	6.52	7.50
100 Disc Box hinged+ lock	7.83	9.00
Black Library case	1.21	1.39

5 1/4" DISC DRIVES

	ExVAT	InVAT
Cumana CSX100	91.30	105.00
Cumana CSX400	124.35	143.00
Cumana CD800S	260.00	299.00
MD100A 100k No PSU	84.35	97.00
MD100B 100k & PSU	99.13	114.00
MD400A 400k No PSU	88.70	102.00
MD400B 400k & PSU	103.48	119.00
MD802C 800k No PSU	173.91	200.00
MD802E 800k & PSU	191.30	220.00
MD802D 800k & stand	216.52	249.00

Phone for Viglen & Torch Winchester

MONITORS

	Ex VAT	Inc VAT
Philips CM8852	251.30	289.00
Philips BM7502 Green	65.22	75.00
Philips TV Tuner	56.52	65.00
Taxan KX P31 Green	68.70	79.00
Taxan KX Amber	82.61	95.00
Taxan KX1202 Green	68.70	79.00
Microvitec 1451	221.74	255.00
Microvitec 1451 AP	260.00	299.00

(Prices inc. BBC Cable)

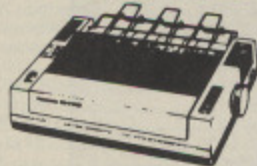
MASTER/COMPACT

	Ex VAT	Inc VAT
Master 128K Micro	346.96	399.00
Archimedes 305 from	699.00	803.35
512 Co-processor	185.00	212.75
Turbo Upgrade	98.78	113.50
Acorn Z80 2nd Pro	317.39	365.00
Acorn Cartridges	10.87	12.50
Pearlree Cartridges from	8.65	9.95
Care Cartridges from	7.65	8.80
ARM Assembler Book	12.00	12.00
Understanding Interword	6.50	6.50
Reference Manuals	14.00	14.00
View 3/View Sheet Guides	9.00	9.00
Master & B Dust Covers	3.00	3.45
Monochrome Compact	360.87	415.00
Second user BBC B's available		

Philips CM8833

with BBC cable
£249.00 (£216.52+VAT)

Panasonic KXP1081



with BBC cable & paper
£159.00 (£138.26+VAT)
above with Screen Dump & 2m cable
£165.00 (£143.48+VAT)

	Exc VAT	Inc VAT
KXP1080 Fabric ink ribbon	4.26	4.90
KXP1080 View Printer Driver	7.83	9.00
KXP1080 Control/Dump Rom	13.00	14.95

Panasonic KXP1082

(as 1081 but 160cps)
with BBC cable & paper
£189.00 (£164.35+VAT)

VOLTMAZE JOYSTICKS

Delta 14B single	11.26	12.95
Delta 3B single	9.52	10.95
Delta 3B twin	15.61	17.95

Canon PW1080A

with BBC cable & paper
£199.00 (£173.04+VAT)

Kaga/Taxan KP815

With BBC cable & paper
£179.00 (£155.65 + VAT)

STAR LC10 Colour

with BBC cable & paper
£229.00 (£199.13+VAT)

STAR LC10

with BBC cable & paper
£199.00 (£173.04+VAT)

CITIZEN 120D

with BBC cable & paper
£159.00 (£138.26+VAT)

EPSON LX 800

With BBC cable & paper
£229.00 (£199.13 + VAT)

JUKI 6100

with BBC cable & paper
£299.00 (£260.00+VAT)

MP165

With BBC cable & paper
£299.00 (£260.00 + VAT)

AMSTRAD LQ3500 (24)

with BBC cable & paper
£299.00 (£260.00+VAT)

MP480 (480cps)

with BBC cable & paper
£339.00 (£249.78+VAT)

PRINTER ADD ONS

	Ex VAT	Inc VAT
LX800 Sheet Feeder	62.61	72.00
LX/FX 800 Print Ribbon	3.00	3.45
NL-10 Sheet Feeder	47.83	55.00
NL-10 Print Ribbon	4.80	5.52
120D Print Ribbon	4.00	4.60
KP/PW Print Ribbon	3.39	3.90
Printer Dust Covers	4.00	4.60

PRINTERS/CABLES

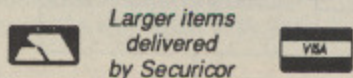
	Ex VAT	Inc VAT
Panasonic KXP3131 Daisy233.91	269.00	
Kaga/Taxan KP915	350.00	402.50
1.5m (4 foot) BBC cable	5.70	6.60
2.0m (6 foot) BBC cable	7.74	8.90
Compact printer cable	7.74	8.90
IBM/Archimedes cable	7.74	8.90

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

All products have a 12 month no quibble guarantee
Prices subject to variation without prior notification
We are closed some Saturday afternoons

Carriage 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



COMPUTER SUPPLIES AT WHOLESALE PRICES PRICES FULLY INCLUSIVE OF VAT & DELIVERY

BULK DISKS Certified & Guaranteed

	25	50	100	200
5 1/4" DSDD 40T	£10.20	£18.90	£33.90	£62.50
5 1/4" DSDD 80T	£11.90	£22.75	£42.90	£87.50
Supplied with Envelopes, Labels & Write Protects				
	10	25	50	100
3 1/2" DSDD 135T	£11.90	£22.50	£52.50	£99.00

Supplied with Labels

COMPUTER PAPER

PLAIN FANFOLD PERF. EDGES	
11 x 9 1/2" 60 gsm 1000	£ 9.50
11 x 9 1/2" 60 gsm 2000	£14.50
A4 11 1/2 x 9 1/4" 85 gsm 1000	£13.90

COMPUTER LABELS

SELF ADHESIVE, CONTINUOUS	
PACKED 2000 1, 2 or 3 across	
3 1/2 x 1 1/8"	£ 9.50
4 x 1 1/8"	£10.50

PRINTER RIBBONS

Amstrad 8256/8512	£3.95
Amstrad DMP 2000/3000	£2.75
Citizen 120D	£4.25
Epson FX/MX 80/FX 800	£2.90
Epson FX/MX 100/FM 1000	£3.75
Epson LX 80/86	£2.40
Juki 6100MS	£2.90
Panasonic KXP 1081	£3.90
Star NL10	£4.50
Star LC10	£4.50
Shinwa CP 80	£3.75

HEAD CLEANING KITS

5 1/4"	£2.90
3 1/2"	£3.75

DISK STORAGE BOXES

5 1/4"	50	£ 6.90
5 1/4"	100	£ 8.60
5 1/4"	120	£10.90
3 1/2"	40	£ 6.75
3 1/2"	80	£ 8.90

All Storage Boxes are with Lock and come with 2 Keys

PRINTER CABLES

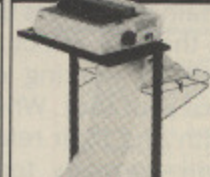
IBM, RS232 Centronics
£8.50

PRINTER STANDS



YU-S25 K/D PRINTER STAND
Made of molded plastic. Feeds and refolds paper underneath the printer, takes up hardly more space than the printer itself
YU-S25A: for 80 col. printer.
YU-S25B: for 132 col. printer.
80 Column £27.90
132 Column £32.50

MOBILE PRINTER STAND



Rugged steel frame.
Height adjustable basket for output paper & base shelf for input paper.
Self assembly - includes castors.
80 column £57.50
132 column £74.50

DATA SWITCHES



Available in RS232 or Centronics
2-Way £24.50 4-Way £39.50
3-Way £32.50 Cross Over £45.00

COPY HOLDERS



With adjustable arm
80 Column £15.50
132 Column £19.50
Desk Top £8.90

REMEMBER OUR PRICES ARE INCLUSIVE OF VAT & DELIVERY



TILT N TURN MONITOR STAND
Fits up to 14" Monitors adjusts by Front Dial £12.90



CREDIT CARD HOTLINE
(0533) 340114 (24 HOURS)



OVERSEAS MEDIA DISTRIBUTORS

30 GREAT MEADOW ROAD, BEAUMONT LEYS
LEICESTER LE4 0QA. TEL: 0533 340114

EDUCATIONAL, GOVERNMENT AND PLC ORDERS ACCEPTED. TRADE AND EXPORT ENQUIRIES WELCOME

◀ From Page 37

one way or another.

The next character to receive attention should be the c. The same height as and comparable in width with the n, your c will demonstrate how you plan to handle most of the curved letters. The lowercase o and e come from the c, and so do all the variations with "sticks": The b, d, p, q and sometimes g and a.

The more elaborate versions of the a and the g

will take some attention, as will the s in any alphabet.

Occasionally the letter y fits in with the abdpq lot, but more usually it belongs to the most awkward group of letters which are primarily diagonal. Along with y, there are v, w, x, z and k. Expect trouble when working with these, as the pixel is not very well-suited for representing diagonals.

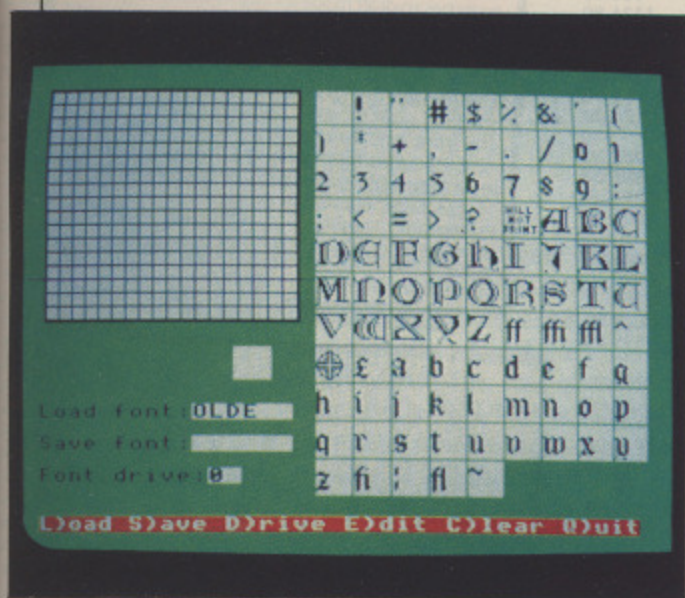
Capital letters may be similarly broken into three categories: The basically straight ones – IHLEFTJ, the round forms – OQCGDUBPRS, and the diagonals – AVWYMNKZ.

On the whole the caps are easier to make – at least partly because they are permitted so much more space. Our old friends W and S are usually the worst of the bunch.

When you have the main alphabet up and running, please take the time to put in the accented characters. Just copy the a and add the relevant accents. It will only take a few minutes, but it will greatly add to the usefulness and the professional quality of your font.

Finally comes the really difficult part – finding a city name that isn't already taken. Will Bourton-On-The-Water be accepted as a filename do you suppose?

Font designer screen from the font Style package. See offer on Page 45.



DISCOUNT COMPUTER SUPPLIES LTD

0494 711436-715696

National ■ High Wycombe

3M DISKETTES

	Code	Description	RRP	DCS
5.25"	744-0	Single Sided Double Density 48TPI	£1.58	£0.85
	746-0	Single Sided Double Density 96TPI	£2.30	£1.32
	745-0	Double Sided Double Density 48TPI	£1.95	£1.00
	747-0	Double Sided Double Density 96TPI	£2.48	£1.50
	1.6M	High Density 1.6MB (PC AT) 96TPI	£4.05	£1.85
3.5"	3.5SS	Single Sided Double Density 135TPI	£2.81	£1.32
	3.5DS	Double Sided Double Density 135TPI	£3.71	£1.82
	3.5HD	High Density	£7.20	£4.70

RIBBONS * HIGH QUALITY SUPPLIES FROM D.C.S.

THIS IS ONLY A SMALL EXTRACT FROM OUR RANGE OF RIBBONS, PLEASE PHONE US WITH YOUR RIBBON REQUIREMENT

		QTY	
		2-9	10+
AMSTRAD	DMP1	£3.36	£3.00
	DMP2000/3000	£2.30	£2.10
	DMP4000	£3.25	£2.90
	PCW 8512/8256	£4.75	£3.80
BROTHER	HR15/25/35 FAB	£3.25	£2.50
	HR15/25/35 M/S	£2.75	£2.30
	120D	£4.60	£4.10
CITIZEN	MPS15/25	£3.65	£3.15
	HYTYPE 2 FAB	£2.75	£2.50
DIABLO	1250 FAB	£3.50	£3.15
	LX80/86	£2.50	£1.90
EPSON	FX80, 85, 800, MX80, LX800	£3.05	£2.50
	MX100	£3.65	£3.30
	EX800	£4.00	£3.30
OKI	80/82	£1.20	£1.10
	84	£3.00	£2.70
QUME	SPRINT 7/9 M/S	£2.60	£2.35
	SPRINT 7/9 FAB	£3.10	£2.80
SHINWA	CP80	£3.35	£2.55
	M/TALLY	£3.35	£2.55

FREE! Video Cassette with every 3 boxes of 3m Discs Purchased

ZIDEX PRECISION BRAND PACKED IN BOXES OF 10

5.25"	S.S.D.D. 48TPI	£4.80
	D.S.D.D. 48TPI	£5.00
	D.S.D.D. 96 TPI	£5.85
	D.S. 1.6M	£12.00
3.5"	S.S.D.D.	£13.00
	D.S.D.D.	£14.85

LOCKABLE DISC BOX

TAKES 100x5.25 DISC £8.50

PRINTER PAPER

PLAIN WHITE WITH MICRO-PERF EDGES				
SIZE	GSM	QTY	1 BOX	2 BOXES
11x9.5"	60	2000	£11.45	£10.75
11x9.5"	70	2000	£12.65	£11.85
A4	70	2000	£15.50	£14.50

CABLES

PARALLEL PRINTER CABLES	
BBC 2MTR	£7.50
IBM/AMSTRAD PC	£10.00
D/SWITCH-PRINTER	£10.00

TILT 'N' SWIVEL

HOLDS 12" MONITOR £6.50

DATA SWITCHES

DON'T ORDER ANY MORE PRINTERS, MODEMS, OR PLOTTERS UNTIL YOU HAVE READ THIS – IT COULD SAVE YOU AT LEAST £1000!

Did you know that most computer peripherals—printers, plotters and modems—are under-used and standing idle? Now there's a way to get more out of these expensive peripherals... and support more devices than you or the manufacturer ever thought possible!

Our switches keep that costly equipment running as productively as possible, so you get more from your computer, whatever its size and whatever you use it for.

NOW YOU CAN SHARE ONE PRINTER BETWEEN TWO PC'S WITH OUR 'T-SWITCH'

RS232 1 IN 2 OUT	£17.00	PAR. 1 IN 2 OUT	£27.00
RS232 1 IN 4 OUT	£25.00	PAR. 1 IN 4 OUT	£36.00
RS232 "X" SWITCH	£40.00	PAR. "X" SWITCH	£45.00

DELIVERY CHARGES:

Orders for 1 Box of Paper or Printer Stands please add £4.00 + VAT
2+ Boxes of Paper please add £2.50 + VAT per Box
All other supplies: Orders under £25.00 ex VAT add £1.75 + VAT
Orders over £25.00 ex VAT add £2.50 + VAT
NEXT DAY SERVICE:
Please add £10.00 + VAT per order

ALL PRICES EXCLUDE VAT
ORDERS: Please allow 5-7 days to receive your order Please post your order and cheque to:

**Discount Computer Supplies Ltd.,
24 Chiltern Trading Estate, Earl Howe Road,
Holmer Green, High Wycombe, Bucks HP15 6QT**

Setting the scales

Peter Davidson continues his investigation into the features of Watford Electronics' Dump Out 3 rom

THIS month I want to investigate the commands that affect the size and position of the printout from Watford's Dump Out 3 rom. And I have a listing that lets you get the most out of the software easily. The size of dump is changed by adding two parameters to the *GIMAGE command – H and V followed by numbers – and they can be used either together or individually.

H changes the horizontal scale while V alters the vertical one and if you just use one of them, or you use them set to different values, the output will be elongated or squashed.

So H and V can be used to give, say, half-size dumps, or they can be used to adjust the proportions slightly if the default output looks distorted. Drawing a circle and dumping it is the best way to check the proportions – Listing 1 does just that.

But H and V are both followed by a number, so let's look at how to calculate that. First, decide by how much you want to scale your output – I'll show the calculations for half and double size, but the principles are the same for any size. Now divide 256 by the scale and convert the result to hexadecimal.

For a half-size printout you divide 256 by half – which is equivalent to multiplying it by two – and convert the result, 512, to hexadecimal – &200. So the command for a half-size dump is:

```
*GIMAGE EPS H&200 V&200
```

In a similar way, the parameters for a double-sized dump are calculated by dividing 256 by two and converting the answer to hexadecimal. The command is:

```
*GIMAGE EPS H&80 V&80
```

Let's move on to the position of the dump on the paper. The parameter I followed by a number determines the indent from the left-hand edge of the paper – useful if you want to centralise the output or print two small dumps side-by-side.

This time we're working in decimal, and the value is in tenths of an inch. So for a 1.5in indent the command is:

```
*GIMAGE EPS I15
```

Pictures can be printed on their side or even upside down. To rotate the output the parameter is R followed by a number representing the number of right angles it is rotated through. So R1 gives a dump on its side, R2 produces it

upside down and R3 gives one on the other side.

If you are dumping Mode 7 screens there are two useful parameters you can use. To make characters stand out more clearly from the background – for example if you have red on blue – use the parameter E – for expand contrast. To make separated graphics print as contiguous use C. In some cases the filled-in areas produced look better on the paper.

A parameter that can sometimes make dumps look better is L. Using it a whole number of dots on the paper represents pixels on the screen. Only certain values of H and V can be used with this – see the manual for details. The proportions of the dump may be distorted on some printers if L is used, so the best way to see if it improves your image is to try it.

Last month we looked at dumping part-screens using *GWINDOW to select the area. If you want to dump a fixed part of a screen – say from within a program to miss off icons down the side of a display – the parameters following the *GIMAGE command are X and Y together with the screen co-ordinates. The coordinates to be used can be found using *GWINDOW and pressing P as described last month.

The numbers are output in the order you need

Turn to Page 43 ▶

⚡ Pictures can be printed on their side or even upside down ⚡

Watford Electronics Dumpout Encoder

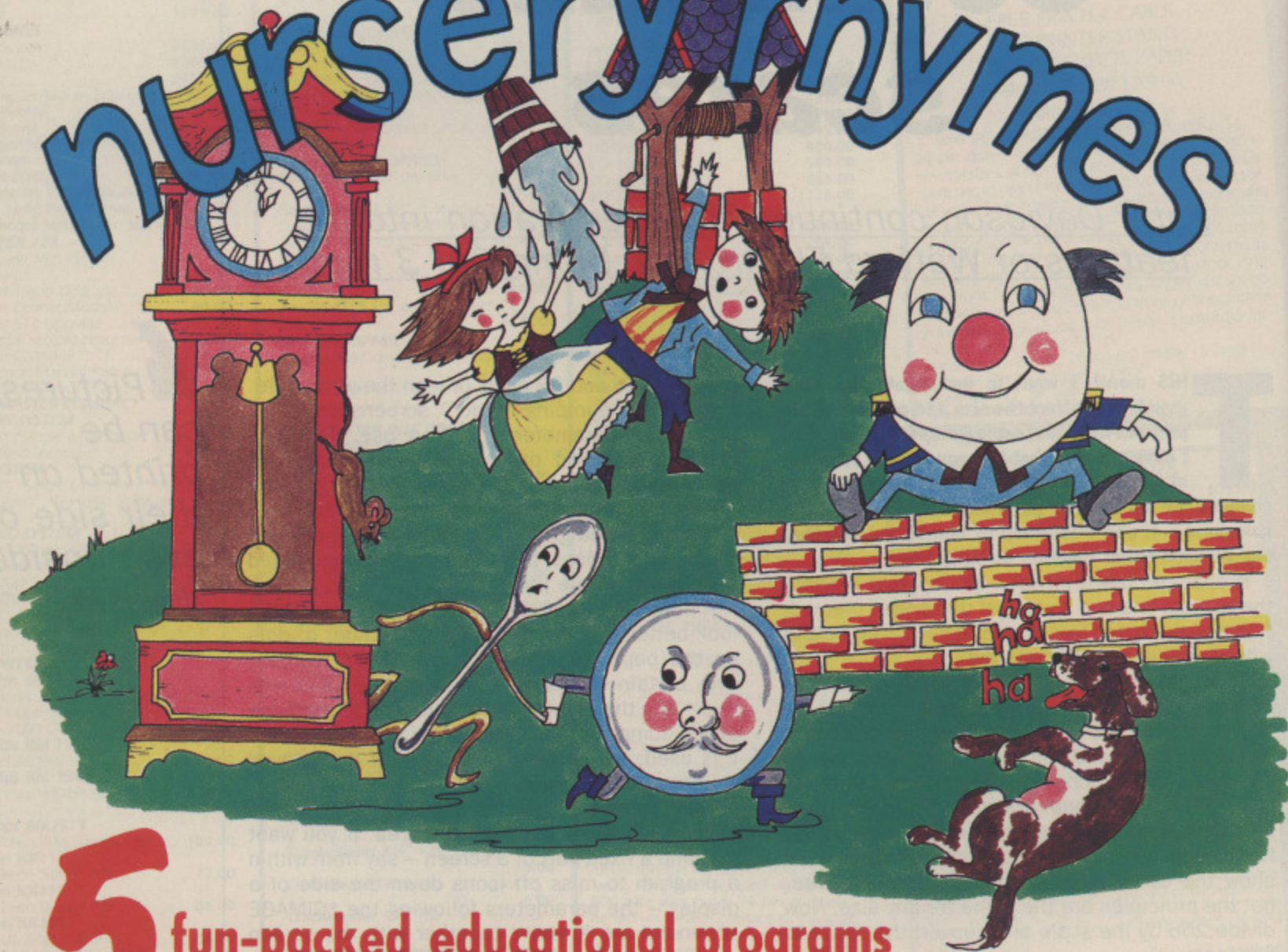
By Pete Davidson (c)The Micro User

Feature	Code	Effect
Contiguous (Mode 7)		
Expand contrast (Mode 7)		
Linear step size		
Fast	F	
Grey scale	H&200	50%
Horizontal scale	U&1EC	52%
Vertical scale	I25	2.5in
Indent		
Physical colours		
Rotation	R1	90°
Two tone		
Key triggered	K	
Switch triggered		
DUMP SCREEN		
QUIT		

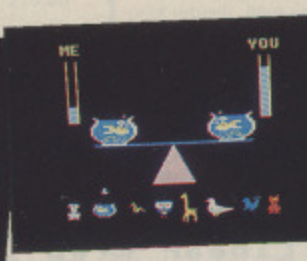
The command is:
*GIMAGE EPS F H&200 U&1EC I25 R1 K

Entering the parameters into the Encoder

nursery rhymes



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



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

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

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

ONLY **£5.95** (cassette)

£6.95 (5¼" disc)

£7.95 (3½" disc)

Suitable for BBC Micro, B+, Master and Master Compact

TO ORDER PLEASE USE THE FORM ON PAGE 135

◀ From Page 41

for a VDU command – xmin,ymin,xmax,ymax. It's a simple matter to put them in X<min><max> Y<min><max> form the Dump Out rom needs, so the command to print a top right-hand portion of the screen would be:

```
*GIMAGE EPS X508,1279 Y492,1023
```

The final command is M for Mask. To use this one you need a knowledge of technical things beyond the scope of this article – as it would take a full feature to explain the concepts of masking in simple terms.

So, let's move on to Listing II, a program to evaluate the Dump Out command for you and, if you wish, print a screen or define a function key ready for future use. Type in the listing, check it using Get it Right! and save it.

When you run it you are prompted for the code for your printer. If you're not sure, enter ? and, providing you have a Dump Out rom installed, you will be presented with a full list of the options. If you always use the same type of printer, say Epson, you can change line 140 to:

```
140 printer$="EPS "
```

to save having to enter EPS every time. Note that there is a space after EPS.

The next prompt you'll get is for the function key that will be defined as you exit from the program. You can then press the key to implement the command – especially useful for a key-triggered dump – or use it to insert the appropriate command into one of your own routines.

If you always want key 0 defining you can change line 150 so that fkey\$ is defined rather than input:

```
150 fkey$="0"
```

To prevent any key being defined set fkey\$ to the null string.

You are next presented with a menu of the options you can evaluate from the program. Features are selected by highlighting the one you want to change using the up and down arrow keys. You can also move straight to one by pressing its first letter, so to move to the fast option, press down-arrow six times or just hit F.

Options can be toggled on or off by pressing Return. The ones switched on are indicated by the appropriate code being printed alongside the feature and are also included as part of the command displayed at the bottom of the screen.

Rotations are selected by repeatedly pressing Return while the feature is selected: You will cycle between nothing, R0,R1 and R2. The angle of rotation will be displayed on the right of the screen.

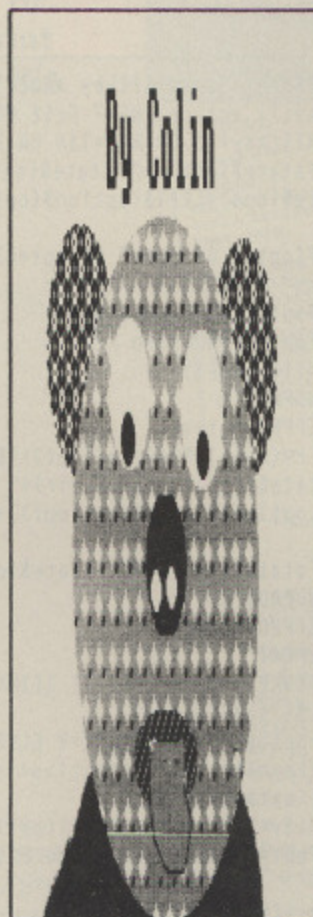
Indent, vertical and horizontal scales are selected by moving the highlight to the appropriate one and using the left and right cursor keys to change the values. Confirm your choice with Return. You can cycle through the values 10 at a time by holding Shift down as you press the arrow keys or you can step 100 at a time by using Control.

The effect is displayed on the right of the

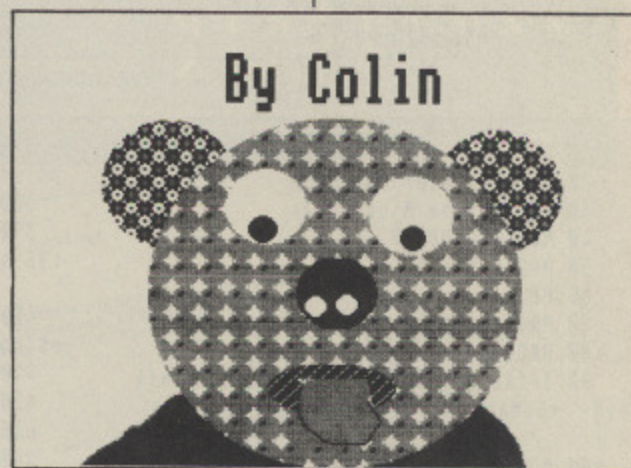
screen, and in the case of indent this is the distance in inches that the output will be moved over. The effect for vertical and horizontal scales is shown as a percentage so, for a half size dump you select 50 per cent while for a double size one select 200 per cent.

The final two options are Dump screen and Quit. The latter leaves the program, and if you requested it at the start, defines a function key for future use. The Dump option prints a screen previously saved to disc or tape using the parameters you've set up.

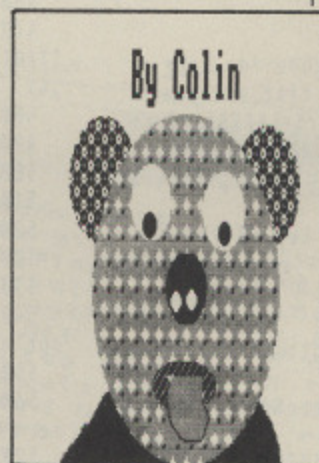
You'll be asked for the filename of the saved



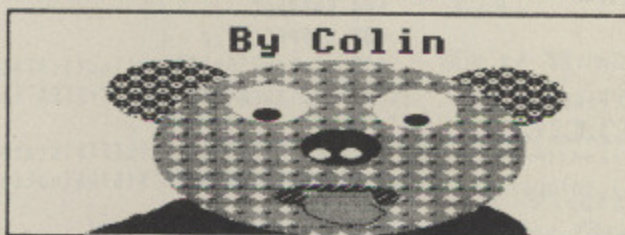
Gimage EPS H&200 V&80



Gimage EPS



Gimage EPS H&200



Gimage EPS V&200

These dumps illustrate the power of the H and V parameters. Usually they are set to the same value – or a similar one to compensate for differences between various printers – but here we've used the wider ranging ones shown.

screen and then the mode that it is in. The screen will then be dumped, but remember, that no account is taken of palette changes. Once the printing has finished you'll be asked if you want to dump another screen. You can keep outputting screens until you answer N when you'll exit the program – defining a function as if Quit had been chosen.

So there you have it. If you've got Dump Out 3 you can now make more use of its many features. Remember, to get the best dump you must experiment with the various parameters on your own printer.

Turn to Page 44 ▶

← From Page 43

✓ Get it right!

```

10 MODE 4
20 OX%=500:OY%=500:RX=200
30 XX=0:YX=RX:EX=3-2*YX
40 REPEAT PROCnext:UNTIL XX>YX
50 *GIMAGE EPS F
60 END
70 DEFPROCnext
80 PROCplot(X%,Y%):PROCplot(-X%,YX)
90 PROCplot(X%,-Y%):PROCplot(-X%,-YX)
100 IF EX<0 EX=EX+4*X%+6 ELSE EX=EX+4*
(X%-YX)+10:YX=YX-4
110 XX=XX+4:ENDPROC
120 DEF PROCplot(X%,YX)
130 PLOT 69,XX+OX%,YX+OY%
140 PLOT 69,YX+OX%,X%+OY%
150 ENDPROC
    
```

```

10 = 20F1 1
20 = 7650 7
30 = 2038 2
40 = 982D A
50 = C7C3 2
60 = FD2E F
70 = A5D2 8
80 = 3F5A 3
90 = 2800 A
100 = 2EF4 3
110 = C4D9 B
120 = 45F4 C
130 = C190 7
140 = C153 4
150 = ED0F P
    
```



A dump using the L option

Listing I: A circle dumping program

```

10 REM Dump Out 3 Encoder
20 REM By Peter Davidson
30 REM (c)The Micro User
40 MODE0:VDU22,7
50 PROCtitle
60 PROCinit
70 PROCscreen
80 PROCselect
90 IFkey$<>CHR$13 PROCoscli("KEY"+fk
ey$+" *GIMAGE "+printer$+pars$+CHR$124+"
M")
100 MODE7
110 END
120 DEFPROCinit
130 *FX4,1
140 PRINT"what is the code for your p
rinter?":INPUT"Enter ? to list all possi
bilities "printer$:printer$=LEFT$(printe
r$,3)+" ":IFprinter$=" " PROCoscli("HEL
P PRINTERS"):GOTO140 ELSE IFLEN(printer$
)<>4 GOTO140
150 PRINT"Define which key (0-9)? Ret
urn=none. ":fkey$=GET$:IFkey$<>CHR$(13
) AND (fkey$<"0" OR fkey$>"9") GOTO150
160 VDU23;8202;0;0;0;
170 noo=15:opt=1:old=opt:dir=0:sp$=STR
ING$(10," ")
180 DIMoption$(noo),state$(noo),val(no
o)
190 val(6)=100:val(7)=100
200 FORop=1TOnoo:READoption$(op):state
$(op)="":NEXT
210 ENDPROC
220 DEFPROCscreen
230 CLS:PRINT"CHR$133TAB(5)"Feature"TA
B(25)"Code"TAB(33)"Effect":VDU28,0,24,39
,5
240 FORop=1TOnoo:PRINTTAB(1,op)options
(op),state$(op):NEXT
250 ENDPROC
260 DEFPROCselect
270 REPEAT
280 REPEAT
290 PRINTTAB(0,old)CHR$135;TAB(0,opt)C
HR$130option$(opt)TAB(26,opt);:IFstate$(
opt)<>"PRINTstate$(opt)ELSEPRINTSPC(14)
300 pars$="":FORn=1TOnoo:pars$=pars$+
state$(n):NEXT
310 VDU28,0,24,39,22:CLS
320 PRINT CHR$129"The command is: ":PR
INTCHR$129*"GIMAGE "printer$ pars$;
330 VDU28,0,24,39,5
340 key=GET:old=opt
350 IFkey=138 AND opt<noo opt=opt+1
360 IFkey=139 AND opt>1 opt=opt-1
    
```

```

370 FORsel=1TOnoo:IF(key AND223)=ASC(o
ption$(sel)) opt=sel:NEXT ELSE NEXT
380 UNTILkey=13 OR key=136 OR key=137
390 IFstate$(opt)<>" state$(opt)=" E
LSE state$(opt)=LEFT$(option$(opt),1)+"
"
400 IF(opt=6 OR opt=7 OR opt=8)ANDstat
e$(opt)<>" PROCscale
410 IFopt=10 PROCrotate
420 IFopt=14PROCdump
430 UNTIL opt=15
440 ENDPROC
450 DEFPROCrotate
460 dir=(dir+1)MOD4:val(opt)=90*dir
470 state$(opt)="R"+STR$(dir)+" ":PRIN
TTAB(35,opt)LEFT$(STR$(val(opt))+" "+sp$
,4)
480 IFstate$(opt)="R" state$(opt)="
490 ENDPROC
500 DEFPROCscale
510 REPEAT
520 IFINKEY(-1)sc=10 ELSE IFINKEY(-2)s
c=100 ELSE sc=1
530 IFopt=6 OR opt=7 bit=9 ELSE bit=0
540 IFkey=136 AND val(opt)>sc+bit val(
opt)=val(opt)-1*sc
550 IFkey=137 val(opt)=val(opt)+1*sc
560 IFopt=6ORopt=7 PROCsize ELSE PROCl
in
570 key=INKEY(10)
580 UNTILkey=13
590 ENDPROC
600 DEFPROCsize
610 scale=256*100/val(opt):state$(opt)
=LEFT$(option$(opt),1)+"&"+STR$(scale)+
" "
620 PRINTTAB(26,opt)LEFT$(state$(opt)+
sp$,8)TAB(35,opt)LEFT$(STR$(val(opt))+"
"+sp$,5)
630 ENDPROC
640 DEFPROClin
650 state$(opt)=LEFT$(option$(opt),1)+
STR$(val(opt))+" "
660 PRINTTAB(26,opt)LEFT$(state$(opt)+
sp$,8)TAB(35,opt);:@%=&FF020109:PRINTLEF
T$(STR$(val(opt)/10)+"in"+sp$,5):@%=10
670 ENDPROC
680 DEFPROCtitle
690 FORIX=1TO2:PRINTCHR$131CHR$141"Wat
ford Electronics Dumpout Encoder":NEXT
700 PRINTCHR$134" By Pete Davidson (c
)The Micro User"
710 VDU28,0,24,39,3
720 ENDPROC
730 DEFPROCoscli($&700):LOCALX%,YX
740 YX=7:CALL&FFF7:ENDPROC
    
```

```

750 DEFPROCdump
760 REPEAT:CLS
770 INPUT"what is the name of the fil
e? "file$
780 IFLEFT$(file$,1)="/" PROCoscli(fil
e$):GOTO770
790 INPUT"what mode is it? "mode:IFmod
e<0 OR mode>7GOTO790
800 VDU22,mode:PROCoscli("LOAD "+file$
)
810 PROCoscli("GIMAGE "+printer$+pars$
)
820 CLS:PRINT"do you want to dump anot
her? ":ans$=GET$:IFans$="n" OR ans$="N"
opt=15
830 UNTIL opt=15
840 ENDPROC
850 DATAContiguous (Mode 7),Expand con
trast (Mode 7),Linear step size,Fast,Gre
y scale,Horizontal scale,Vertical scale,
Indent,Physical colours,Rotation,Two ton
e,Key triggered,Switch triggered,DUMP SC
REEN,QUIT
    
```

✓ Get it right!

10 = 00	300 = C6DE 9	590 = ED0F 9
20 = 00	310 = 584E B	600 = 96E0 1
30 = 00	320 = F85 F	610 = F167 7
40 = 671B B	330 = 1B97 5	620 = FE11 8
50 = 5255 9	340 = 3B7C 5	630 = ED0F 9
60 = DEBB 4	350 = E51B E	640 = B66D 7
70 = 9538 E	360 = A9A7 D	650 = C2E6 5
80 = F89D 5	370 = 6274 3	660 = 2D4F 4
90 = 2C7A E	380 = 47FF 3	670 = ED0F 6
100 = 8AFC 6	390 = 1272 E	680 = F931 0
110 = FD2E D	400 = 3474 D	690 = 6A53 6
120 = 344C B	410 = E65D 3	700 = 1BE2 E
130 = E383 D	420 = 9CB5 F	710 = 7B51 4
140 = 8EE1 E	430 = ADA0 0	720 = ED0F 2
150 = BF28 1	440 = ED0F A	730 = A6F3 8
160 = F716 3	450 = 4142 2	740 = 50E0 E
170 = 733A B	460 = 4E36 6	750 = 3218 F
180 = 8E7D 2	470 = B9E5 D	760 = 98EA 0
190 = EB64 D	480 = DBB9 C	770 = 9395 B
200 = F25D 0	490 = ED0F 5	780 = 7631 8
210 = ED0F 3	500 = 5EDD 9	790 = 9255 0
220 = F5B9 8	510 = BFBA F	800 = 5335 E
230 = 29B 9	520 = 6DD8 9	810 = B314 C
240 = F3 E	530 = 8781 0	820 = 5F4B 9
250 = ED0F 4	540 = 6EDE E	830 = ADA0 7
260 = 981C A	550 = 43EF 7	840 = ED0F D
270 = BFBA E	560 = CC38 3	850 = 4E4 E
280 = BFBA 0	570 = E0DD 9	
290 = 50D9 A	580 = 65C1 2	

Listing II: Automatic encoder for Dump Out 3

Print in style on your micro with

FontStyle

Now everyone can use the BBC Micro or Electron to design superb fonts and print them on an Epson-compatible printer. It's easy to use, and the results look so professional.

How? Just type in your text using your favourite word processor – Mini Office II, View, Wordwise and Wordwise Plus are all fully supported – put in the easy to remember formatting codes and save it. Then load up the FontStyle Print program and in minutes you have a professional, high quality output.

YOU CAN:

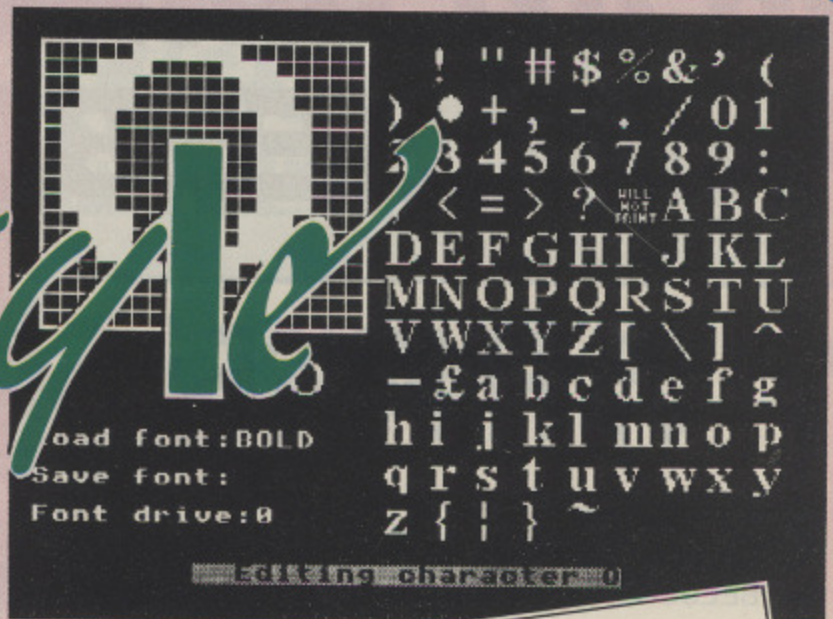
- Print in fast draft mode to check the display
- Use up to eight different fonts in any paragraph – (disc only)
- Print double height, double or quadruple width or condensed
- Use temporary or hanging indents

Two fonts are provided: **Bold** for classic output and **Olde** for the medieval touch. But, using the FontStyle Designer, you can produce *any* typeface you want. Not only can you design letters and numbers this versatile program lets you:

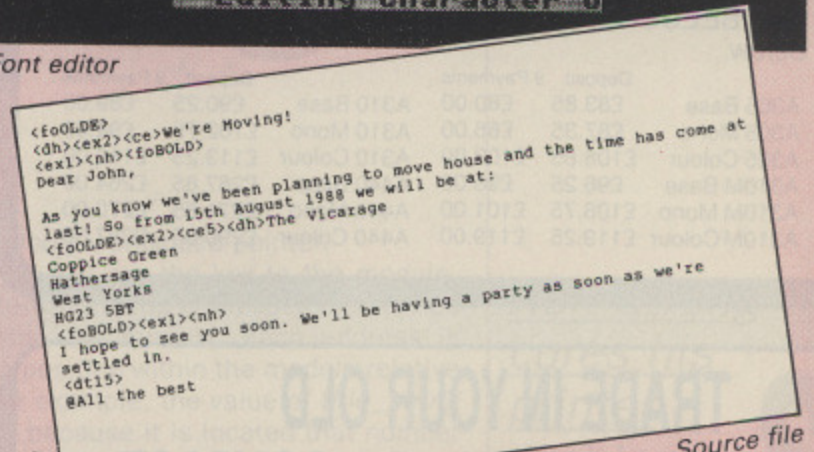
- Produce specialised characters, for circuit design or foreign languages
- Make border designs to brighten up your pages
- Design a special logo for your company
- Even print music

Say goodbye to boring dot-matrix printer fonts! With this package, the clearly written manual and your imagination you can produce perfect results every time.

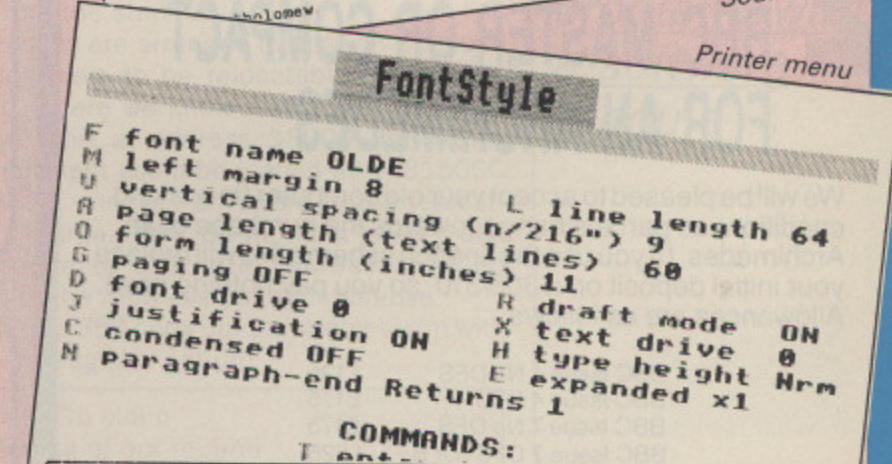
£8.95 Cassette
£9.95 5.25in disc
£10.95 3.5in disc



Font editor



Source file



Printer menu



Example output

To order, please turn to the form on Page 135

The Best Deals on Archimedes From BEEBUG



The **Archimedes**
Specialists

1 0% FINANCE

For a limited period we are able to offer 0% APR finance over 9 months on the purchase of any Archimedes. You pay no interest at all. This is a brand new scheme only available from BEEBUG. The deposit and repayments are shown below.

	Deposit	9 Payments		Deposit	9 Payments
A305 Base	£83.85	£80.00	A310 Base	£90.25	£89.00
A305 Mono	£87.35	£86.00	A310 Mono	£102.75	£94.00
A305 Colour	£106.85	£103.00	A310 Colour	£113.25	£112.00
A310M Base	£96.25	£96.00	A440 Base	£267.85	£264.00
A310M Mono	£108.75	£101.00	A440 Mono	£271.35	£270.00
A310M Colour	£119.25	£119.00	A440 Colour	£290.85	£287.00

2 TRADE IN YOUR OLD BBC, MASTER OR COMPACT FOR AN ARCHIMEDES

We will be pleased to accept your old computer (in working condition) as part exchange towards the purchase of an Archimedes. (If you use the finance scheme this will replace your initial deposit on a 305/310, so you pay nothing now). Allowances are as follows:

BBC Issue 4 No DFS	£125
BBC Issue 4 DFS	£175
BBC Issue 7 No DFS	£175
BBC Issue 7 DFS (Or B+)	£225
Master 128	£250
Compact Base System	£215

Please phone for allowances on other Compact and Master systems.

3 FREE PC EMULATOR OR ON-SITE MAINTENANCE

Join RISC USER, the Archimedes magazine and support group, and purchase your Archimedes by Cheque, Access, Visa, Official Order or 11.5% finance and we will supply you, absolutely free, 10 3.5" discs, a lockable disc storage box, printer lead and the latest version of The PC Emulator from Acorn. Alternatively we will provide 1 year on-site maintenance for your Archimedes absolutely free (8 hour call out guaranteed).

A305 Base	£803.85	Mono	£861.35	Colour	£1033.85
A310 Base	£891.25	Mono	£948.75	Colour	£1121.25
A440 Base	£2643.85	Mono	£2701.35	Colour	£2873.85

4 11.5% FINANCE OVER 12 TO 36 MONTHS

As a Licensed Credit Broker we are able to offer finance on the purchase of any equipment, including the Archimedes. You still benefit from the free PC Emulator, discs, disc box and printer lead. (Typical APR 23% on the purchase of a 310 Colour system over 36 months. Deposit £126.25 36 payments of £37.36).

5 DISCOUNTS FOR EDUCATION

We are able to offer attractive discounts to Education Authorities, Schools, Colleges and Health Authorities. Please write with your requirements for a quotation.

**TO FIND OUT MORE
PHONE OR WRITE NOW.
TEL: 0727 40303**

We offer a complete service, including Advice, Technical Support, Showroom, Mail Order and Repairs. Our showroom in St. Albans stocks everything available for the Archimedes. Call in for a demonstration.

Please indicate your requirements below.

Subscription to Risc User (£14.50 UK) Information Pack and Catalogue 0% Finance Form for 305/310/310M/440 Base/Mono/Colour 12-36 Months Finance Form for 305/310/310M/440 Base/Mono/Colour Trade In BBC/Master/Compact Purchase 305/310/440 Base/Mono/Colour UK Courier Delivery £7.00. Overseas please ask for a quotation.

I enclose a cheque value £.....

Please debit my Access/Visa/Connect Card No

Expiry...../..... with £.....

Name

Address

Signature

MUB

Beebug, Dolphin Place, Holywell Hill, St. Albans, Herts AL1 1EX Tel: 0727 40303

BEEBUG - The Archimedes Specialists



Stop Debugger upsetting things

DEBUGGING machine code on the Archimedes is fraught with difficulties, not the least of which is your printer going haywire when the Debugger module sends it unfiltered control codes. This problem can, however, be solved by writing a module that stays resident while you work, filtering characters as they go to the printer. If it finds control codes it converts them into something printable.

Software modules on the Archimedes are equivalent to sideways roms on the BBC Micro, but as they are ram resident they have to be loaded up each time you switch on.

Also, on the BBC Micro each rom has to perform its own command line decoding to check whether a particular star command is addressed to it. However the Archimedes operating system – Arthur – does this job itself, scanning each module in turn. So all you need to do is provide the commands and routines within your module. Arthur does the rest.

What we want to do is intercept the route that characters take on their way to the printer: check if they are printable and if not replace them with a full stop. The best place for this is the *Insert into buffer* vector, which Arthur allows us to legally intercept by using a software interrupt – SWI.

By calling the claim vector SWI with the number of the vector we want and the address of our routine, we arrange for Arthur to jump to our code when the vector is used. Then our routine makes sure that the printer buffer is being used: examines the output character and if it's not printable converts it to a full stop.

With three commands to turn the filter on, off and print the current setting, we're all set to design the module itself.

The listing is thoroughly annotated, so you should be able to work out what's going on. Remember that the ARM chip has 16 (0-15) registers to play with. Of these r15 is the program counter, r14 the link register containing the return address for a subroutine jump, and r13 is usually used as the stack pointer.

When Arthur enters a user routine r12 always

contains a memory workspace pointer.

Lines 110 to 210 are the key to the module. Each four byte word holds addresses of routines or tables within the module. Each address is actually just a position within the module relative to its start. For example, the value of *title_string* is 44 – &2C – because it is located that number of bytes from the start.

All addresses are arranged in this way because all modules have to be relocatable. Unlike the BBC Micro, where we know that a sideways rom will always start at address &8000, the Archimedes equivalent could be loaded at &181500C or &1816784 – in fact anywhere in the relocatable module area, RMA. So we must never make any reference to absolute addresses; when working with the ARM everything is relative.

Lines 320 to 350 carry out the vector claim with the following register set-up:

r0	Vector to claim
r1	Address of our routine
r2	Address of routine workspace

Sometimes Arthur moves things around in the RMA. To prevent the software becoming confused we need the *finalise_code* to allow the operating system to switch the module off before the move – it gets switched on again afterwards.

Moving on to the actual processing routine, the instruction at line 670 ensures that we are dealing with the printer buffer. Then the character – in r0 – has its top bit cleared, making its value less than 128, and any control codes are converted to a full stop.

Everything else should be quite clear from the listing. Pete Cockerell's book *ARM Assembly Language Programming* – reviewed in the September 1987 issue of *The Micro User* – explains the more obscure machine code instructions.

Well, that's it. Type it into your Archimedes and try it out. And if you're feeling adventurous why not try out some extensions – like converting all output to hexadecimal.

Turn to Page 49 ►

*Neil Strong
cures his
printer
problems with
a software
module*

Archimedes

BEEBUG the recognised Archimedes specialists.

RISC USER

We have launched a magazine and support group specifically for users of Archimedes. The magazine provides news, reviews, hints and programs, while the support group gives Technical Advice and 5% discount on our range of Archimedes products. UK subscription is £14.50 per annum.

New BEEBUG 0% Finance

We are now able to offer customers 0% finance on Archimedes Computers. Please contact us for written details. We also offer normal finance on all other equipment over £300.

ARCHIMEDES 300 SERIES

Always in stock

0190G BBC 305 Entry System *	803.85
0191G BBC 305 Mono System *	861.35
0192G BBC 305 Colour System *	1033.85
0193G BBC 310 Entry System *	891.25
0194G BBC 310 Mono System *	948.75
0195G BBC 310 Colour System *	1121.25
0257G BBC 310M Entry System *	960.25
0258G BBC 310M Mono System *	1017.75
0259G BBC 310M Colour System *	1190.25

* Free software See Special Offer box for details

MEMBERS SPECIAL OFFER

When buying a new Archimedes we will give you absolutely free: The PC Emulator software, Printer lead and Lockable 3.5" disc box with 10 discs all worth over £100.
Not available on 0% finance

ARCHIMEDES 400 SERIES

0263G Archimedes 440 Entry	2643.85
0265G Archimedes 440 Colour	2873.85

Beebug Mouse Mats

We are now able to offer high quality Mouse Mats for your Archimedes.

0789B Beebug Mouse Mat (Blue)	3.68	3.50
0788B Beebug Mouse Mat (Red)	3.68	3.50

ARCHIMEDES SOFTWARE

1089C Kermit	56.35	53.53
1080C Ansi C	113.85	108.16
1081C ISO Pascal	113.85	108.16
1082C Fortran 77	113.85	108.16
1083B Twin	33.35	31.68
1084C Logistix	113.85	108.16
1086C Prolog X	228.85	217.41
1087C Lisp	228.85	217.41
0900B PC Software Emulator	113.85	108.16
1088C 1st Word Plus	91.94	87.34
0901C Archimedes Termulator	79.35	75.38
0902C ARM Assembler Package	228.85	217.41
0903B EMR Sound Synthesiser	49.95	47.45
0904B EMR Creations Disc	19.95	18.95
0905B Logotron Logo (End-June)	69.00	65.55
0906B Pipedream	113.85	108.16

MINERVA

0931B Sigmashet	69.95	66.45
0920B Deltabase	29.95	28.45
0921B System Delta Plus	69.95	66.45
1233B Sys. Delta Plus Ref. Man.	29.95	28.45
0922B Order Processing*	64.95	61.70
0923B Sales Ledger*	64.95	61.70
0924B Stock Manager*	64.95	61.70
0925B Purchase Ledger*	64.95	61.70
0926B Nominal Ledger*	64.95	61.70
0927B School Administrator*	79.95	75.95
0928B Video Rental*	69.85	66.36
0929B Reporter*	24.95	23.70

* Requires System Delta Plus

OTHER HARDWARE

0805DCC ROM Podule	56.35	53.53
0806B Battery Backup for above	11.50	10.93
0803B Armadillo Sound Sampler	126.50	120.18
0825C IEEE488 Podule	326.50	310.17
0802C Chromalock Podule	339.25	322.29
0808C Watford Video Digitiser	286.35	272.03

ARCHIMEDES LEADS

0558B SKART Lead	9.42	8.95
0425B Archimedes Printer Lead	9.42	8.95
0795C 5.25" Disc Drive Interface	29.05	27.60
0796C Serial Link Kit & Disc	18.16	17.25
0797B Just Serial Link Cable	12.11	11.50
0826B Arch. to Magic Modem	7.32	6.95
0827B Arch. to Linnet Modem	7.32	6.95

ARCHIMEDES GAMES

1179B Zarch	19.95	18.95
1187B Conquerer	24.95	23.70
0930B Minotaur Game	14.95	14.20
0935B Dread Dragon Droom (ed.)	18.95	18.00

Trade-In your BBC or Master Series Computer for an Archimedes.

Sample Discounts available:

BBC B issue 7 with DFS	£225
Master 128	£250
Master Compact Entry	£215

Computers must obviously be in good working condition to qualify for this offer.

Please telephone for further details

PRICES INCLUDE VAT

Where two prices are shown, the first is our full price and the second our members price.

BOOKS

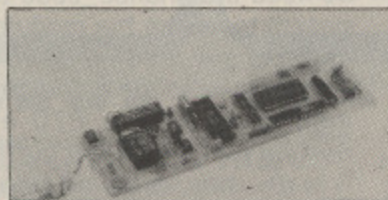
1242C Programmers Ref. Man.	29.95	28.45
1271B ARM Assembly Prog.	12.95	12.30

CLARES

1095B Artisan	39.95	35.96
1096B Image Writer	29.95	26.96
1097B Archimedes Toolkit	39.95	35.96
1098B Alpha Base	49.95	44.96
1099B Artisan Support Disc	19.95	18.95

ARCHIMEDES UPGRADES

0234B Econet Board (as M128)	48.88	46.43
0266C 0.5Mb RAM (305 only)	102.35	97.23
0267F Floppy Disc Drive	143.75	136.56
0268G 20Mb Hard Disc (300's)	573.85	545.16
0269C Podule Backplane	44.85	42.61
0270D ROM Podule	67.85	64.46
0271DI/O Podule	90.85	86.31
0272DMIDI add-on to I/O	33.35	31.68



5.25" DISC DRIVE INTERFACE FOR THE ARCHIMEDES

Connect up to four external disc drives to your Archimedes with our fully buffered disc drive interface. It fits neatly to the backplate of your machine and requires NO SOLDERING.

Stock code 0795C Members price £27.60

All Prices Include VAT.

Carriage

Carriage is denoted by the letter contained in the stock code. A-50p, B-£1, C-£2, D-£3, E-£4, F-£5.50, G-£7. When ordering several items, use the highest price code and half of each subsequent code. For courier delivery use code G.

Credit Cards



Access and Visa orders are welcome, and may be placed by letter or telephone (24 hours).

BEEBUG LTD,

Dolphin Place, Holywell Hill, St. Albans, Herts., AL1 1EX.

(0727) 40303

Please telephone for a Free Information pack and Archimedes brochure.

◀ From Page 47

```

10 REM > StripCtrl
20 REM by Neil Strong
30 REM (c) The Micro User
40 PROCinit:PROCsasem:PROCsasem:END
50 DEF PROCinit:DIM code% 1000
60 pc=15:link =14:sp=13:datap =12
70 InsertVector=&14:PrintBuffer =3
80 RMA_Claim =6:ENDPROC
90 DEF PROCasem
100 FOR LX=4 TO 6 STEP 2:P%=0:O%=code%:[OPTLX
110 EQU 0 ; no start code
120 EQU initialise_code ; initialisation code offset
130 EQU finalise_code ; termination code offset
140 EQU 0 ; no service calls
150 EQU title_string ; offset of module title
160 EQU help_string ; offset of help string text
170 EQU command_table ; command blocks offset
180 EQU 0 ; no SWI chunk base
190 EQU 0 ; no SWI handler
200 EQU 0 ; no SWI decoding table
210 EQU 0 ; no SWI decoding code
220 .title_string
230 EQU "PrintStrip":EQU 0:ALIGN
240 .help_string
250 EQU "Printer Utility":EQU 9:EQU "1.00 (27 Jan 88)"
260 EQU 0:ALIGN
270 .initialise_code
280 stmf (sp!),{link}
290 ldr r0,[r12] ; get workspace pointer
300 cmp r0,#0 ; if it < 0 then
310 ldmefd (sp!),{pc} ; continue else return
320 mov r2,r12 ; workspace
330 mov r0,#InsertVector
340 adr r1,excode ; code to redirect through
350 swi "OS_Claim" ; Claim Vector
360 mov r3,#16
370 mov r0,#RMA_Claim ; claim 16 bytes workspace
380 swi "OS_Module"
390 ldmvsfd (sp!),{pc} ; return if request failed
400 str r2,[r12] ; else store workspace area
410 mov r0,#0
420 str r0,[r2] ; set strip ON
430 LDMFD (sp!),{pc} ; and exit
440 ;-----
450 ; Finalise
460 ; This code is called when the module is killed or
470 ; the RMA area tidied. It releases the vectors
480 ; claimed earlier - otherwise the machine is subject
490 ; to rapid demise when char's are sent to the printer
500 ;-----
510 .finalise_code
520 stmf (sp!),{link}
530 mov r2,r12 ; point to my workspace
540 mov r0,#InsertVector ; vector to release
550 adr r1,excode ; code to release
560 swi "OS_Release" ; release vector again
570 ldmfd (sp!),{pc}
580 ;-----
590 ; Examine Character
600 ; This is the code through which the printer buffer
610 ; insert vector passes. If the strip is enabled, all
620 ; characters are checked to ensure that they are
630 ; printable. If not, it's converted to a '.'
640 ;-----
650 .excode
660 stmf (sp!),{r1-r4,link}
670 cmp r1,#PrintBuffer ; check dest buffer
680 ldmefd (sp!),{r1-r4,pc} ; return if not printer
690 ldr r12,[r12] ; get workspace pointer
700 ldr r3,[r12]
710 cmp r3,#0
720 ldmefd (sp!),{r1-r4,pc} ; return if no strip
730 and r0,r0,#&7F ; strip top bit
740 cmp r0,#13
750 beq ok ; don't touch returns
760 cmp r0,#10
770 beq ok ; or line feeds
780 cmp r0,#32
790 movlt r0,#ASC"." ; convert if < space
800 cmp r0,#&7F
810 moveq r0,#ASC"." ; or a Delete
820 .ok
830 ldmfd (sp!),{r1-r4,pc}
840 ;-----
850 ; Command blocks to define extra commands
860 ;-----
870 .command_table
880 EQU "Pstatus":EQU 0:ALIGN
890 EQU Pstatus_code
900 EQU 0:EQU 0
910 EQU Pstatus_help
920 ;
930 EQU "StripOn":EQU 0:ALIGN
940 EQU StripOn_code
950 EQU 0:EQU 0
960 EQU StripOn_help
970 ;
980 EQU "StripOff":EQU 0:ALIGN
990 EQU StripOff_code:EQU 0:EQU 0:EQU StripOff_help
1000 ;
1010 EQU 0
1020 ;-----
1030 ; Help text - printed when you *HELP <command>
1040 ;-----
1050 .Pstatus_help
1060 EQU "Shows whether the Strip function is enabled."
1070 EQU 0
1080 .StripOn_help
1090 EQU "Allows only ASCII characters to the printer."
1100 EQU 0
1110 .StripOff_help
1120 EQU "Allows all characters to printer unchanged."
1130 EQU 0
1140 ALIGN
1150 ;-----
1160 ; *PSTATUS code
1170 ; Displays whether the control code filter is in on.
1180 ;-----
1190 .Pstatus_code
1200 stmf (sp!),{link}
1210 ldr r12,[r12] ; get pointer to workspace
1220 ldr r0,[r12] ; get filter flag
1230 cmp r0,#0 ; true?
1240 adreq r0,on ; point to filter on message
1250 adrne r0,off ; else filter off
1260 swi "XOS_WriteS"
1270 equ "Control Character Filtering is "
1280 equ 0:ALIGN
1290 swi "XOS_Write0" ; write on/off
1300 swi "XOS_NewLine" ; next line
1310 ldmfd (sp!),{pc} ; return to caller
1320 .on
1330 equ "ON":equ 0
1340 .off
1350 equ "OFF":equ 0
1360 ALIGN
1370 ;-----
1380 ; *STRIPOFF code - switches off the filter
1390 ;-----
1400 .StripOff_code
1410 ldr r12,[r12] ; point to work area
1420 mov r0,#1 ; switch filtering flag off
1430 str r0,[r12]
1440 mov pc,link
1450 ;-----
1460 ; *STRIPON code - switches on the filter
1470 ;-----
1480 .StripOn_code
1490 ldr r12,[r12] ; point to work area
1500 mov r0,#0 ; switch filtering flag on
1510 str r0,[r12]
1520 mov pc,link
1530 ALIGN:] :NEXT:ENDPROC
1540 DEF PROCsave
1550 OSCLI "SAVE Pstrip "+STR$ "code%+" +STR$ "OX
1560 OSCLI "SETTYPE Pstrip FFA":ENDPROC

```

INTEGRA-B

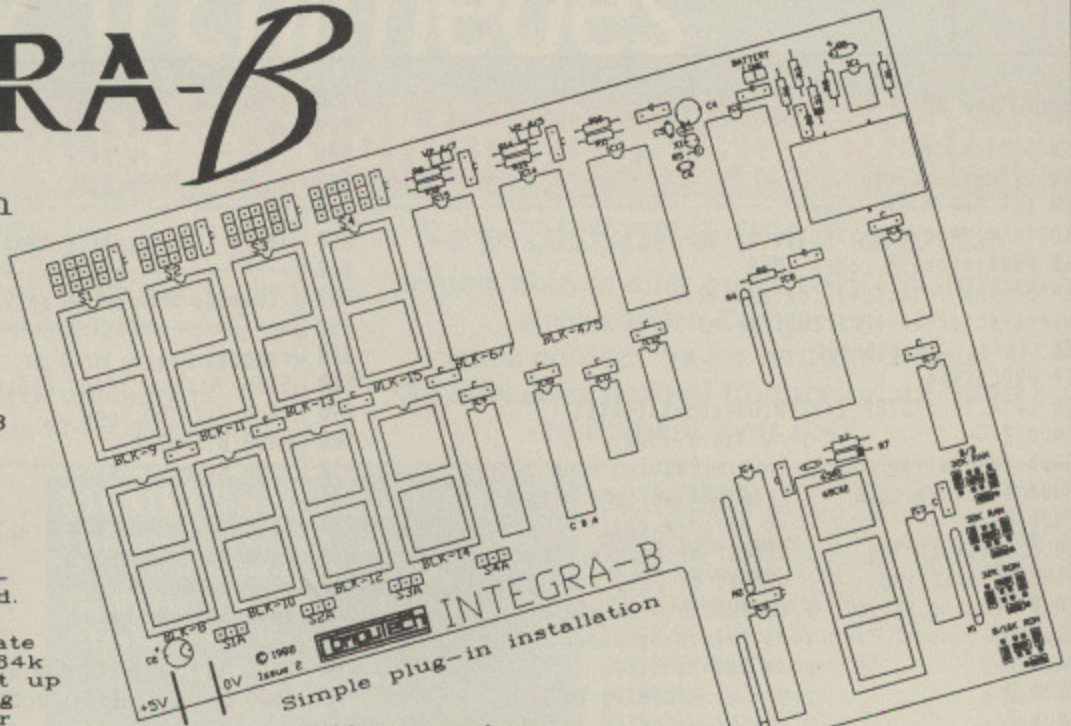
The Expansion
for the
BBC Model B

Four good reasons for
choosing the INTEGRA-B

1. All standard expansions included on one board.
2. 64k battery-backed Sideways RAM included.
3. Room for another 128k of battery-backed RAM.
4. Shadow RAM and a Real-Time Clock also provided.

Additionally, part of a Private RAM block (8k), or 16k to 64k of Sideways RAM can be set up as a printer buffer, allowing concurrent work on another application whilst printing proceeds.

Includes the INTEGRA-B OS ROM giving an extended set of commands and utilities handling all of the system management. Allows you to keep multiple startup configuration files on disc.



Offer prices
UK 130.00 (inc VAT p/p)
Europe 118.00 (inc p/p)
Others 118.00 plus p/p

Compatible with all disc filing systems and second processors conforming to Acorn protocols.

Computech

The Carth
Hampfell Road
Grange over Sands
Cumbria. LA11 6BC

Write or phone
for further details
Tel: 044 84 4604

LIGHTSPEED SOFTWARE

31A Broadweir, Bristol BS1. Telephone: (0272) 225604
24 Hour Answer Phone for all enquiries

BBC DISC		BBC DISC		BBC CASSETTE		BBC CASSETTE	
TITLE	OUR PRICE	TITLE	OUR PRICE	TITLE	OUR PRICE	TITLE	OUR PRICE
Acornsoft Hits 1	10.50	Quest	9.99	Acornsoft Hits 1	7.75	Power Pack	7.75
Acornsoft Hits 2	10.50	Quest (Compact)	12.50	Acornsoft Hits 2	7.75	Quest	7.50
Apocalypse	10.50	Repton 3	9.99	Apocalypse	7.50	Ravenskull	7.75
Battle of Britain	10.50	Repton 3 (Compact)	9.99	Arkanoid	7.25	Skirmish	7.50
Bonecruncher	9.90	Revs +4 Tracks	9.99	Bonecruncher	7.50	Round World 40 Screens	6.50
Code Name Droid	9.99	Revs +4 Tracks (Compact)	15.50	Boulderdash	7.75	Scrabble	9.99
Code Name Droid (Compact)	12.50	Round the World in 40 Screens	6.50	Code Name Droid	7.75	Sentinal	7.50
Colossus Chess 4.0	12.50	Scrabble	10.50	Colossus Chess 4.0	7.75	Spellbinder	7.50
Crazee Rider	9.99	Sentinal	10.50	Comp Hits 10 Vol 3	7.75	Spycat	7.50
Double Phantom	15.00	Spellbinder	9.99	Computer Hits 5	5.25	Spy v Spy	7.50
Elite	10.50	Spycat	9.99	Crazee Rider	7.75	Star Wars	7.50
Elite (Compact)	16.95	Starwars	10.50	Elite	9.99	Tetris	7.25
Elixir	9.99	Super Art (Compact only)	37.50	Elixir	7.50	The Hunt	7.75
Fleet Street Editor (40T)	29.95	Superior Coll Vol 1	9.99	Five Star Games 1	7.75	Trivial Pursuits	10.50
Fleet Street Editor (80T)	29.95	Superior Coll Vol 2	9.99	Five Star Games 2	7.75	Winter Olympiad '88	7.50
Grand Prix	9.99	The Hunt	9.99	Graphic Adventure Creator	16.50	Yes Prime Minister	10.50
Grand Prix (Compact)	10.50	Trivial Pursuits	15.50	Icarus	7.50	Ziggy	7.75
Graphic Adv Creator	21.50	Winter Olympics	10.50	Impact	17.50		
Icarus	9.99	Winter Olympiad '88	10.50	Indoor Sports	7.50		
Indoor Sports	9.99	Yes Prime Minister	15.50	Konam's coin ops	7.50		
Life of Repton	6.25			Life of Repton	5.75		
Mini Office 40/80	12.50			Mini Office II	10.50		
Mini Office 80T Master	15.50			Monopoly	9.99		
Mini Office Master Com	15.50			Palace of Magic	7.75		
Monopoly	10.50			Paperboy	7.50		
Palace of Magic	9.99			Phantom	5.99		
Palace of Magic (Compact)	10.50			Phantom Combat	7.75		
Paperboy	10.50			Play It Again Sam 1	7.75		
Play It Again Sam 1 or 2	9.99			Play It Again Sam 2	7.50		
Play It Again Sam (Compact)	10.50						

SPECIAL OFFERS

	Cass	Disc
Quest Probe (Human Torch & Thing)	1.99	-
Impossible Mission	2.99	-
Psycastris	3.50	5.99
Baby Boomer Trivial Pursuit	7.00	-
Repton 3	5.00	-
747	2.99	-
World War I	-	7.99
Rev + 4 Tracks	8.50	-
Graham Gooch Test Cricket	-	7.50

All prices are inclusive of VAT and delivery inside the UK. Please make cheques P.O.'s payable to 'LIGHTSPEED SOFTWARE'
Orders normally despatched within 24 hours, but allow 7 days. All titles subject to availability.

Screens by Design

Ian Waugh checks out a professional Mode 7 screen maker

HAVE you ever marvelled at the Mode 7 screens you've seen on Ceefax, Oracle and 4-TEL? Even information pages with their titles standing out in relief are very impressive – not to mention the graphic screens.

And if you've tried to produce anything but the simplest Mode 7 screen you'll know how difficult it can be, especially from Basic.

Typing in control codes and looking up the characters to produce a specific pixel arrangement is hardly conducive to creative programming. You need a Mode 7 screen editor – such as Design 7 Plus.

The program boots from disc and offers two choices: The Editor and a Basic Converter. In the former a status line at the bottom of the screen tells you the cursor's position and the character covered by it, plus its Ascii code. The teletext control codes are translated so, for example, 148 is shown as G.BLUE – Graphics Blue.

The control codes are accessed by pressing Shift or Control with a function key. You'd expect this from any Mode 7 editor but it's the extra features and automatic functions which make the program so interesting. So let's see what goodies are available.

You can change the colour of the screen from the cursor position across to the right and down to the bottom of the screen or a frame centred on the middle of the screen, even define a pixel-wide rectangle up to 37 by 22 characters in size.

Text can be entered normally, automatically in double height or selected from one of three big special fonts. The largest produces characters eight lines high by eight characters across and that's big. You can space text – and graphics – by inserting and deleting lines or characters and there's a line copy facility.

You can change a single character or code to any other code across the whole of the screen. This lets you easily change a colour, for example.

There are several aids to help you design graphic screens: In Sketch mode you can draw graphics using the cursor keys. Pixel mode allows you to use QW/AS/ZX to toggle the six graphics pixels in a character on and off, and pressing I in this mode inverts the pattern. Having defined a pixel pattern, the Paint option lets you put it anywhere on screen.

Particularly useful are the Cut and Paste options which allow you to define a section of the screen – a window – and save it to disc. It can then be pasted on to any position on the screen

so you can use a special design on many different pages.

A section of the screen can be marked and five operations performed: It can be copied, erased or recorded to change a specific character. All the graphics shapes can be inverted, while Mirror flips the whole marked area over – left to right – producing some fascinating results.

There's a word-wrap facility similar to that used by word processors. It saves you having to work out the length of your lines and words when entering a lot of text.

Using a Morley Teletext Adapter – see the special offer on Page 68 – you can drop a broadcast page on to the screen. And there's an Epson-compatible printer dump to give you hardcopy output.

The Basic Converter program, available from the main menu or as a direct command from the editor, turns the screen into a set of Basic statements which can be *EXECed into a program.

Finally, you have access to star commands – what program would be complete without that?

Design 7 Plus is a well thought out, carefully designed piece of software. It's extremely easy to use once you've mastered the keys. Text and information screens are an absolute doddle to produce – it can be almost as quick as entering text into a word processor.

If you have even a little artistic ability the special drawing routines will help you make the most of Mode 7. It doesn't have routines such as circle drawing or rubber banding standard in drawing packages using higher resolution graphic modes. Though possible in Mode 7, they are not very easy to implement.

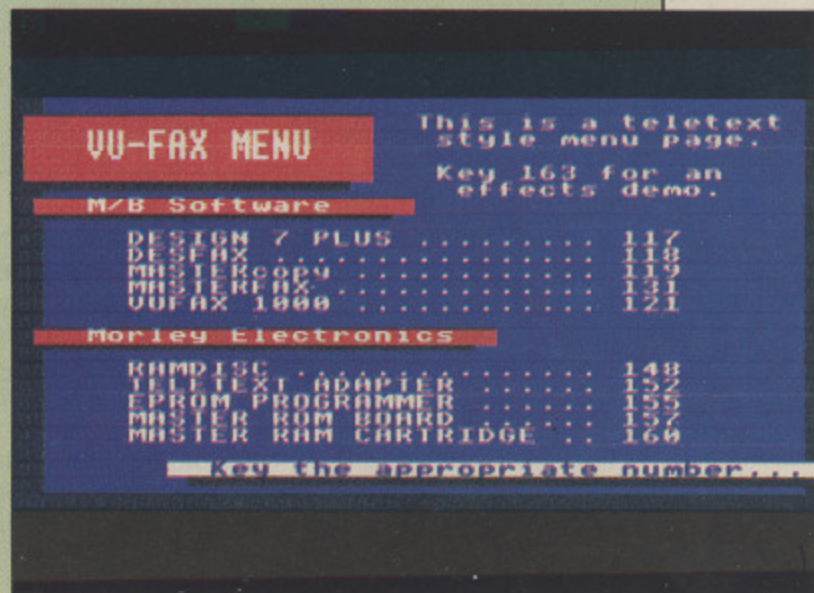
Nor does Design 7 Plus allow you to create carousels or customise the display of a series of pages but then it wasn't intended to. If you want these features then check out Ted, Desfax, Masterfax and Vu-Fax which let you do this – and more.

Design 7 Plus is a super program and I have no hesitation in recommending it to anyone requiring a good Mode 7 screen editor. And look at the price – value for money indeed.

Product: Design 7 Plus
 Price: £9.95
 Supplier: Morley Electronics, Unit 3 Maurice Road
 Industrial Estate, Wallsend, Tyne and Wear NE28 6BY.
 Tel: 091-262 7507

B B+ m

Similar packages reviewed in *The Micro User* are:
 Ted: December 1987
 Vu-Fax: February 1988



THE IMPACT GAMES CLUB

OUR GUARANTEE

1. Over 200 titles always in stock.
 2. Over 98% of all orders are sent out on the day they are received by 1st Class Post.
 3. We immediately replace any faulty games purchased from us.
 4. Prices are fully inclusive - nothing else to pay.
- Plus we'll send you a free copy of our comprehensive club magazine featuring over 200 games, reviews, 1/2 price offers, compilation titles breakdown, competitions and the latest up-to-the-minute news.

ARCHIMEDES GAMES

Terramex (Bug-Byte)	£15.95
Missile Control (Minerva)	£11.95
Hoverbod (Minerva)	£11.95
Conqueror (Superior)	£19.95
Zarch (Superior)	£15.95
Minotaur (Minerva)	£11.95

Terramex, from Bugbyte, is a classic conversion from the Atari ST and Amiga.
Missile Control is about as close to the original arcade version you can get.
Hoverbod is an arcade adventure with devious puzzles and excellent graphics.

FREE HELPSHEETS/MAPS

Spend over £4 on games and you may choose any ONE of the following helpsheets/solutions and maps absolutely FREE:- Spend over £10 and you may choose any TWO FREE:-

Spycat (Helpsheet + map)
Plan B2 (Solution + map)
Quest (Helpsheet + map)
Ravenskull (Solution + 4 maps)
Citadel (Solution + map)
Plan B (Solution + map)
Spy Vs Spy (Helpsheet)
Spellbinder (Solution + map)
Elixir (Solution + map)
Paperboy (Helpsheet)
Twin Kingdom Valley (Solution + map)
Omega Orb (Helpsheet + map)
Rick Hanson (Solution)
Tarzan (Solution + map)
Stranded (Solution)

Codename: Droid (Solution + map)
Thunderstruck (Solution + map)
Thunderstruck 2 (Solution + map)
The Lost Crystal (Solution)
Last of The Free (Solution + map)
Kourtyard (Helpsheet + maps)
Goburns Castle (Solution + map)
Palace of Magic (Solution + map)
Impact (Helpsheet + passwords)
Icarus (Helpsheet + maps)
Sphinx Adventure (Solution)
Rick Hanson 2 (Solution)
Philosopher's Quest (Solution + map)
Repton 2 (Helpsheet + map)

SHARK (ASL)

You are a lone fighter in this very good arcade adventure. There are 3 levels - the jungle, a refinery and a derelict town. Untold aliens attack you in this game - it's similar to Ghosts 'n' Goblins. Don't miss it!

BBC/Electron Cassette £7.50
BBC 5 1/4" Disc £9.50

BREAKTHROUGH (ASL)

Another very good game from ASL. It is similar to Solomon's Key and features 100 different screens.

Set in a world of fire and mystery you must strive for your freedom. Highly recommended!
BBC/Electron Cassette £7.50
BBC 5 1/4" Disc £9.50

TITLE & PUBLISHER	BBC or Electron Cassette	BBC (or Electron) 5 1/4" Disc	Master Compact (or Electron) 3 1/2" Discs
* = Electron disc available			
M = Master compatible			
SUPERIOR			
Repton Thru Time M	5.50	6.35	7.50
Barbarian M	7.50	9.50	11.95
Spycat M	7.50	9.50	11.95
Quest M	7.50	9.50	11.95
Play It Again Sam 2 M	7.50	9.50	11.95
Bonecruncher M	7.50	9.50*	11.95
Spellbinder M	7.50	9.50*	11.95
Play It Again Sam M	7.50	9.50*	11.95
The Life of Repton M	5.50	6.35*	7.50
Elixir M	7.50	9.50*	11.95
Palace of Magic M	7.50	9.50*	11.95
Repton Around the World M	5.50	6.35	7.50
Crazee Rider M	7.50	9.50	11.95*
Codename: Droid (Stryker's 2) M	7.50	9.50	11.95*
Grand Prix Cons. Set M (BBC Only)	7.50	9.50	11.95
Repton 3 M	7.50	9.50	11.95
Revs & 4 Tracks (BBC Only) M	10.35	11.95	15.95
Elite M	10.35	11.95	15.95
Acorn Hits Vol 1 or 2 M	3.99	9.50	11.95
Sup. Coll. 1 or 2 (BBC Only) M	7.50	9.50	11.95
Superior Coll. 3 (Elec Only)	7.50	9.50	11.95
Speech (BBC Only) M	7.50	9.50	11.95
Citadel M	7.50	9.50	11.95
Ravenskull M	7.50	9.50	11.95
Thrust M	3.99	9.50	11.95
Galaforce M	7.50	9.50	11.95
TYNESOFT			
Saigon M	7.50	11.95	11.95
Winter Olympiad '88 M	7.50	11.95	11.95
Spy vs Spy M	7.50	11.95	11.95
The Big KO M	6.35	10.35	10.35
Boulderdash M	7.50	11.95	11.95
Indoor Sports M	7.50	11.95	11.95
Phantom M	6.35	10.35	10.35
Oxbridge M	6.35	-	-
Commonwealth Games M	6.35	10.35	10.35
Future Shock M	7.50	11.95	11.95
Microvalue (4 games)	3.99	-	-
Microvalue 2 (4 games)	3.99	-	-
Microvalue 3 (4 games)	3.99	-	-
Two Classic Games	3.99	-	-

TITLE & PUBLISHER	BBC or Electron Cassette	BBC 5 1/4" Disc
M = Master compatible		
ACORNSOFT		
Aviator (BBC Only)	4.95	-
Revs & Revs 4 Tracks (BBC Only)	2.99	4.99
ASL		
Shark M	7.50	9.50
Breakthrough M	7.50	9.50
Impact M	7.50	9.50
Powerpack 1 (7 games) } Elec	7.50	-
Powerpack 2 (7 games) } Only	7.50	-
Ziggy M	6.95	8.75
Ransack M	7.50	9.50
Despatch Rider M	7.50	9.50
Thunderstruck	2.99	-
Thunderstruck 2 M	6.35	9.50
Sphere of Destiny M	6.35	9.50
Omega Orb M	6.35	9.50
Graham Gooch Test Cricket M	7.50	9.50
BBC SOFT		
Bismark (BBC Only) M	-	11.95
Black Queen (BBC Only) M	-	11.95
White Knight Mk12 (BBC Only) M	-	11.95
BEAU JOLLY		
Five Star Games 1 (5 games)	4.95	-
Five Star Games 2 (5 games)	4.95	-
Five Star Games 3 (7 games)	7.50	-
Computer Hits 3 (10 games)	4.95	-
Computer Hits 4 (12 games)	7.50	-
Computer Hits 5 (5 games)	4.95	-
BUGBYTE		
Bugbyte Comp. 1 (4 games) M	-	4.99
Bugbyte Comp. 2 (4 games)	-	4.99
Dunjanz M	2.99	4.99
CDS		
Colossus Bridge (BBC Only) M	9.50	11.95
Colossus Chess (BBC Only) M	7.50	11.95
Steve Davis Snooker M	1.99	4.50
Brian Clough Football M	7.50	9.95
DOMARK		
Not a Penny More (BBC Only) M	11.95	15.95
Star Wars M	7.50	10.35
Living Daylights (BBC Only)	7.50	10.35
Trivial Pursuits (All BBC Only)	-	-
Genus Edition M	11.95	15.95
Young Players M	11.95	15.95
Baby Boomer M	11.95	15.95
ELITE		
Paperboy	7.50	11.95
FIREBIRD		
Sentinel (BBC Only) M	7.50	11.95
Cholo (BBC Only) M	-	14.35

TITLE & PUBLISHER	BBC or Electron Cassette	BBC 5 1/4" Disc
M = Master compatible		
GODAX		
Cybot M	7.50	9.50
Skirmish M	4.95	5.95
Kourtyard M	7.50	9.50
GREMLIN GRAPHICS		
Krakout (BBC Only)	7.50	11.95
Footballer of the Year	7.50	-
HEWSON		
Evening Star M	7.50	11.95
Uridium (BBC Only) M	7.50	11.95
INFOGRAMME		
Apocalypse (BBC Only)	7.50	11.95
LOGOTRON		
XOR M	7.50	10.35
LEISURE GENIUS		
Scrabble (BBC Only)	10.35	11.95
Monopoly (BBC Only)	10.35	11.95
MICROPOWER		
Imogen	5.95	7.50
(State 40 or 80 track disc)M	-	-
MANDARIN		
Icarus M	7.50	9.50
Time and Magic (BBC B+ and Master Computers only 80T)M	-	11.95
MARTECH		
War (BBC Only)	-	3.99
MIRRORSOFT		
Tetris M	6.95	10.35
Spitfire '40 M	7.50	10.35
Strike Force Harrier	7.50	10.35
ROBICO		
Village Of Lost Souls (BBC Only) M	7.50	10.35
TOPOLOGIKA		
(Text Adventures 5 1/4" state 40 or 80 tracks)	-	-
Return to Doom	-	10.35
Kingdom of Hamil	-	7.95
Countdown to Doom	-	7.95
Acheton	-	7.95
Philosopher's Quest	-	7.95

TITLE & PUBLISHER	BBC B or Electron
ACORNSOFT	
Magic Mushroom	1.99
Snooker	1.99
Revs & Revs 4 Tracks	2.99
Search Command (Elec Only)	2.99
ADDITIVE	
Football Manager	2.99
ALTERNATIVE SOFTWARE	
Pygmalion	1.99
Combat Lynx	1.99
Red Arrows (BBC Only)	1.99
Crazy Erbert	1.99
Rik the Roadie	1.99
Olympic Spectacular	1.99
Soccer Boss	1.99
License to Kill (Elec Only)	1.99
Video Pinball	1.99
Moan Crisis (BBC Only)	1.99
Dead or Alive	1.99
Conclusion	1.99
Traps Dealers 1 to 10 (each)	1.99
Raunobots	1.99
ATLANTIS	
Anarchy Zone	1.99
Pro Golf	2.99
League Challenge	2.99
Survivors	1.99
Cops and Robbers	1.99
Creepy Cave	1.99
Park	1.99
BLUE RUBBON	
Serve Oases Snooker	1.99
3D Dolly	1.99
Return of R2	1.99
Bar Billiards	1.99
Mongo	1.99
Trapper	1.99
Video Card Arcade	1.99
Nightmare Maze	1.99
Ravage	1.99
Dans	1.99
Golf	1.99
BUGBYTE	
Plan B2	2.99
Plan B	2.99
Hunley Dory	2.99
Uranians	2.99
Twin Kingdom Valley	2.99
Megarock (BBC Only)	2.99
Tennis	2.99
Croket	2.99
Ice Hockey	2.99
Sartoria 1	2.99
Squashkicker	2.99
Skyhawk	2.99
Dungeon	2.99
DOCTORSOFT	
Phantom Centur	2.99
FIREBIRD	
The Hacker	1.99
Star Order	1.99
RICOCHET	
Way of the Exploding Fist	1.99
Goburns Castle	1.99
Brain Jacks Super Challenge	1.99
Geoff Gapes Strongman	1.99
Diabolic Patrol	1.99
Kane	1.99
Vegas Jackpot	1.99
Jepac (BBC Only)	1.99
SUPERIOR	
Repton	1.99
Repton 2	1.99
Deathstar	1.99
Tempest	1.99
Kasale Combat	2.99
Thrust	2.99
SUPERSOFT	
Slyx	1.99
TOP TEN	
Warehouse	2.99
Peter Scott Trilogy (BBC Only)	1.99
Grid Iron	1.99

HOW TO ORDER

Simply fill in this coupon and send with a cheque or a postal order to Impact Posters.

- All games despatched by 1st class post
- FREE postage and packing (Overseas add £1)
- Despatch normally same days order (over 98%)



Impact Posters
Neepsend House
1 Percy St.
Sheffield S3 8AU
Tel. (0742) 769950

To: Impact Posters, Neepsend House, 1 Percy St., Sheffield, S3 8AU

Please send me the following games:

TITLE	FORMAT (Cassette etc.)	COMPUTER	PRICE

I enclose a cheque P/O (made payable to Impact Posters) for £

(BLOCK CAPITALS PLEASE)

Name

Address

Postcode

Please send me FREE helpsheets/solutions for the following games (from those above)

1.....(Orders over £

2.....(Orders over £

Music for pleasure



AMPLÉ is an acronym for Advanced Music Production Language and Environment. It can be used for a variety of programming applications but it was specifically designed for music production and this is what we will be concentrating on in this three-part series. Unlike virtually any other computer language you don't have to learn great chunks of Ample before you can do anything useful with it. This is, in part, owing to very user-friendly front-end editors, themselves written in Ample and each a self-contained application program.

Ample was designed to support the various parts of the Hybrid Music System, in particular the Music 5000, a stereo digital synthesiser which can generate up to eight different voices – the BBC Micro's internal sound chip is not used at all.

The software-based editors and modules to drive the hardware are loaded from disc when required. Ample Nucleus is the rom-based core of the language and it manages the whole environment quite cleverly so the loading of modules is virtually transparent.

An important feature of Ample is the total integration of all the modules allowing data to be passed freely between them. The more I use Ample, the more aware I become of just how flexible, versatile and fascinating a system of music creation it is.

The user guide supplied with the system is excellent but in case you're not one for reading manuals or you don't have a Hybrid Music System, this series will work through the construction of a piece of music using the three main editors. Suggestions will be given for altering and modifying the music and, at the end of part three, you will have a customised and individual performance – even if you can't read music.

Ample has two modes – Command and Edit – and Tab is used to toggle between them. In Command mode a % prompt appears and indicates the system is waiting for user input. The format of Edit mode varies but you always use the Tab key to return to Command mode.

One of the most important features of Ample is concurrency – the ability to do more than one thing at the same time. It handles the playing of several music parts in parallel and, most importantly, lets you control the music from the keyboard simultaneously.

In Basic, for example, when you type RUN the program shuts you out until it's finished its task. In Ample, RUN starts the program then returns to Command mode. It will continue to accept other instructions while program execution proceeds.

When the system is booted you are presented with a menu of 10 options – Figure 1. The cursor

keys are used to highlight and Return is used to select. Pressing f0 in Command mode will always bring you back here ready to select another option.

Select the Staff Editor. Here music can be entered using traditional notation. If you can't read music, don't worry – all you need do is to copy the score shown in Figures 11a and 11b.

Press Tab to enter Edit mode and you will see a block cursor above the staff on the right square bracket. The brackets mark the start and end of the music and at the moment there is nothing there.

Press c to enter a Clef, press the minus sign to enter a flat for the key signature then press k to place it correctly on the staves.

Press q to enter a 4/4 time signature: Both

*Ian Waugh
begins a
hands-on
series
exploring
programming
in Ample*

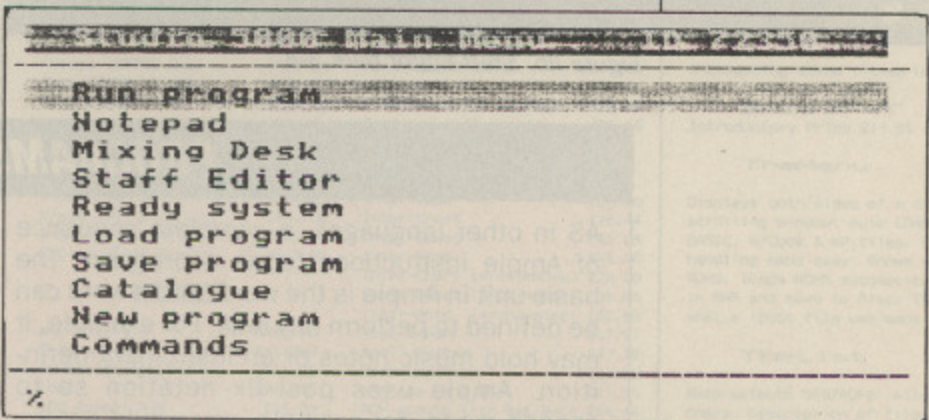


Figure 1: Main menu

values can be altered by using Shift and the cursor keys – see what range of time signatures it will accept then set it back to 4/4. If the block changes to a straight line you've pressed the up cursor without Shift. Press the down cursor to get the block back. Now we'll enter some notes.

Press Return and a note will appear on the staff and the block will step on ready for another note. Press the left cursor key to site the block over the note and use Shift and the cursor keys to

Turn to Page 54 ▶

PROGRAMMING

alter its pitch and duration. The higher the note sits on the staff, the higher the pitch; the shorter the duration, the more tails it acquires.

Set the pitch and duration to match the first note shown in Figure II. Press Return to get another and adjust it to match the second note.

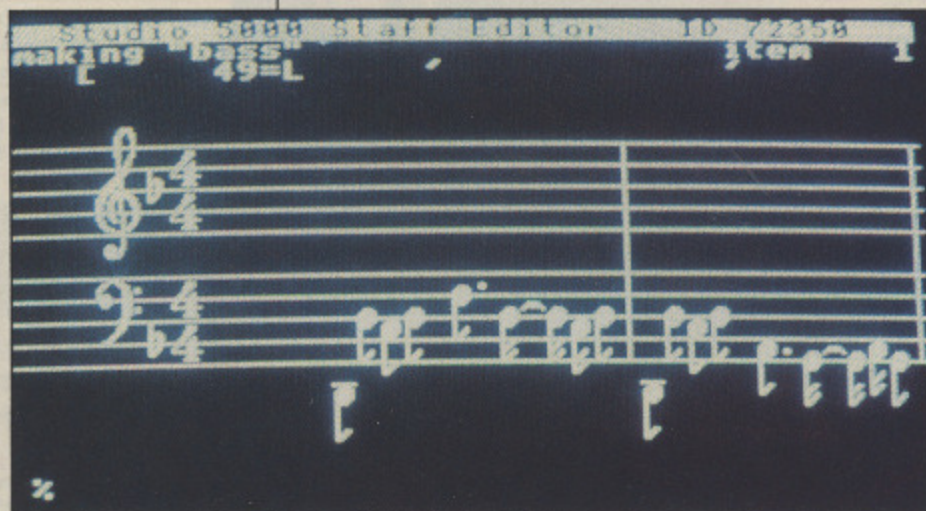


Figure IIa: Staff Editor bars 1-2

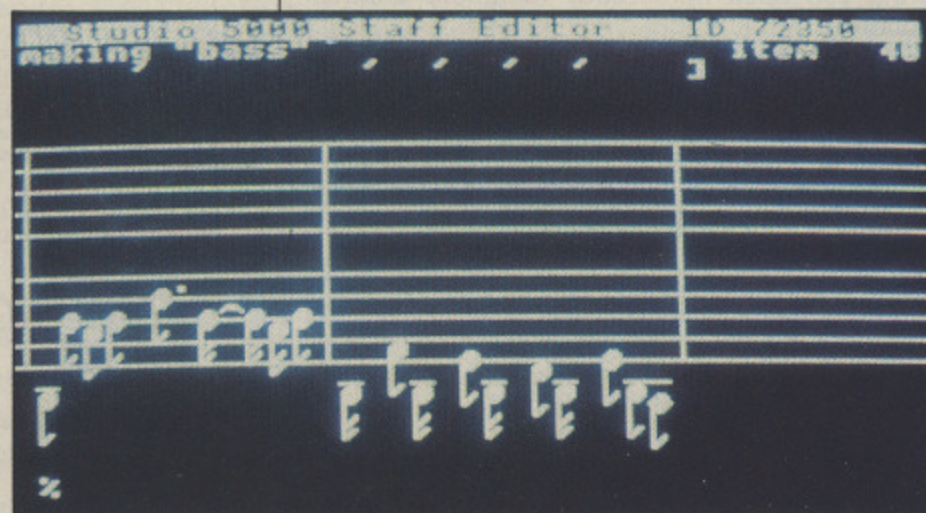


Figure IIb: Staff Editor bars 3-4

Carry on until you reach note five which has a dot after it. A dot extends its duration by a half and is entered by pressing the full stop after entering the note with Return.

The sixth and seventh notes are joined by a curved line – a tie which means the second is not played as such but its duration is added to the first note. Enter note six – it's of shorter duration than the others – press Return then press ` (the tilde just below Break) and a tie will appear. Enter the seventh note as normal and they will be tied. Enter the remaining two notes then press I to insert a bar line.

To hear this now, in Command mode enter:

```
1 VOICES Slapbass
```

followed by Return. This tells the system there is only one voice or music line and which instrument to play it on. A chord, for example, would require two or more VOICES. Press Tab then press f1 and the bar should play. The system automatically checks the length of the bars. If it is not correct a *Bad bar* error will appear leaving you in Command mode. Press Tab and the cursor will appear above where the error occurred. Enter the notes in all four bars as shown in Figure II, ignoring the symbols above the staff for the moment.

Now, having got this into the system, there are lots of ways we can modify it. Let's alter the tempo – the default is 125. In command mode enter:

```
250=T
```

then play the piece. Try different values. Then play it on different instruments. Enter:

```
'CHANS'FIND
```

to list the available instruments. The FIND command displays the names of all the words which use the specified string and CHANS is used

PROGRAMS AND WORDS

AS in other languages, a complete sequence of Ample instructions forms a program. The basic unit in Ample is the word, and a word can be defined to perform any task. For example, it may hold music notes or an instrument definition. Ample uses post-fix notation so to change mode, for example, you would enter:

```
7 MODE
```

The definition of a word is enclosed in square brackets – [] – the ones which look like left and right arrows in Mode 7. Type in the following word which will restore default windows and clear the text area:

```
"cls" [26 #OUT 12 #OUT]
```

This is Ample's equivalent of issuing a VDU26,12 command.

Ample editors will form words from their edit

screen almost automatically. The names of user-defined words are normally in lower case. Ample commands and instructions are also words but they are built into the system and to avoid confusion their names are in upper case.

User-defined word names can be 15 characters long but the screen displays will be clearer if you keep them down to nine characters or less.

SHOW produces a list of all user-defined words in a program. The tempo, articulation and instrument words aren't shown as they are built into the system. WRITE will list a complete program and individual words can be listed with the TYPE command:

```
"bass"TYPE
```

You can obtain a printout by pressing Control+B first.

◀ From Page 54

in all instrument definitions. Creating instruments, however, is beyond the scope of this series.

To alter the articulation of the piece – legato or staccato – use *Len* with a single number before it which sets the gate period – length of time a note is actually on – regardless of the actual duration of a note. A staccato note will be on for a shorter time than a legato note.

Position the block cursor above the first note and enter text mode by pressing the up cursor. The block will change to a straight line. Enter:

```
12 Len
```

and the notes will move along to make room for it. Leave Text mode by pressing unshifted down cursor then press f1 and you will hear the notes play staccato. Reposition the cursor and change it to:

```
Ø Len
```

Now the notes play smoothly, legato. Try different values – the effect of the *Len* command will depend upon the instrument being used. Try *Organ* and *Upright* to hear the difference.

Rather than having to write *Len* commands above the staff, you can define words to do the job. In Command mode enter:

```
"st" [12 Len]
"lg" [Ø Len]
```

Now you can use *st* and *lg* above the staff instead.

Enter Edit mode and Text mode again, move to the start of the notes and type:

```
49=L
```

The word =L sets the volume of the music – the default is 64 which is maximum.

A single quote mark above a note represents an accent. Insert it above the notes as shown in Figure II. An accent adds 15 to the volume level. You can define your own volume words:

```
"pp" [15=L]
"mp" [35=L]
"ff" [64=L]
```

Insert accents, volume settings and articulation words until you're happy with the way the music sounds. At any time during your experiments you can turn the piece of music into an Ample word. The editor will do this automatically, you only have two things to do. First, you must tell the program what you want to call the word. In Command mode enter:

```
"bass"NAME
```

You will see the top line change from:

```
making "newword"
```

to:

```
making "bass"
```

Next type in MAKE or press f3, and you will see

the Ample equivalent of staff notation scroll up the screen. You can change names and MAKE pieces as often as you like. To edit an existing music word use GET:

```
"bass"GET
```

but this will only work in the Staff Editor if the piece was written on it or designed to be displayed on it.

You can save the program with:

```
"prog"SAVE
```

● Next month we'll see how flexible the Notepad Editor is. Meanwhile, you may like to experiment further with the Staff Editor. If you NAME and MAKE pieces called part1, part2, part3, and so on, typing RUN will play them all together.

The Hybrid Music System is available from Hybrid Technology Ltd., Unit 3, Robert Davies Court, Cambridge, CB4 1TP. Tel: 0223 316910.

STAFF EDITOR CONTROLS

General use

Delete	Delete character before cursor
Copy	Delete character at cursor
Shift+Copy	Delete to bar line or end
Left, right	Move by one character
f1	Play music
f2	Copy to end of music
Escape	Stop music
Up	Text mode (line cursor)
Down	Symbol mode (block cursor)
Control+left/right	Move by one screenful
Control+up/down	Move to start/end

Symbol Mode (block cursor)

Shift up/down	Raise/lower pitch of note
Shift left/right	Shorten/length duration of note or rest
Return	Insert note
@	Insert chord note
c	Insert clef
^	Insert rest
-	Insert flat
+	Insert sharp
=	Insert natural
k	Make key signature
.	Insert dot
2	Insert duplet figure
3	Insert triplet
d	Insert 6/8 time signature
t	Insert 3/4 time signature
q	Insert 4/4 time signature
Spacebar	Insert space
e	Insert end line
-	Insert tie/slur
	Insert bar line

At any time during your experiments you can turn the piece of music into an Ample word



The plot thickens

Andrew Moore shows how to give your Z88 elementary graphics capabilities

THE Z88's clear, crisp supertwist LCD display is a joy to look at but there comes a time when you want to see more than just plain text. Graphical output, even in elementary form, can be extremely effective, be it bar charts for business, graphs for mathematics or pretty patterns for fun.

Most Basics come with a PLOT command – the basis of the high level interface to the graphics capabilities of the machine – but unfortunately, the Z88 doesn't. Or rather it does, but its action is simply to apologise for not being implemented.

In this article I will provide some Basic procedures to allowing plotting of chunky graphics, and demonstrate them with a program to display arbitrary mathematical formulae. Finally there's a routine to transfer pictures drawn using this system into Pipedream documents at an even lower, but nevertheless effective, resolution.

On the Z88 there seem to be two ways of creating graphics: Implement chunky graphics by means of User Defined Characters – UDCs – or use the Z88 map.

I've chosen the former, primarily because the map is so small on the unexpanded machine and even on an expanded one it can be no wider than about three inches. A second reason is that the map is inaccessible from Basic, and even if machine code is used, it requires meddling with some rather unsavoury parts of the operating system.

Let's look briefly at how the chunky graphics approach is implemented. It relies on using sixteen of the Z88's UDCs, labelled A to P – UDC's are fully described in the June issue of *The Micro User*. For our purposes each UDC is broken into

four rectangles arranged into a two by two square.

For each (which we'll label ASC"A"+i) i is a four bit value and the colouring of the character is determined from these bits according to this diagram:

Bit 3	Bit 2
Bit 1	Bit 0

For example, character 4 – 0100 binary – is white with the top left hand quarter black. As it is not possible for Basic to read from the Z88 display, we do this ourselves, storing which UDC is in which screen location in a virtual screen – SCR which must be updated whenever we do a plot.

To try it out, type in the routines in Listing I, save them, and enter the following program:

```

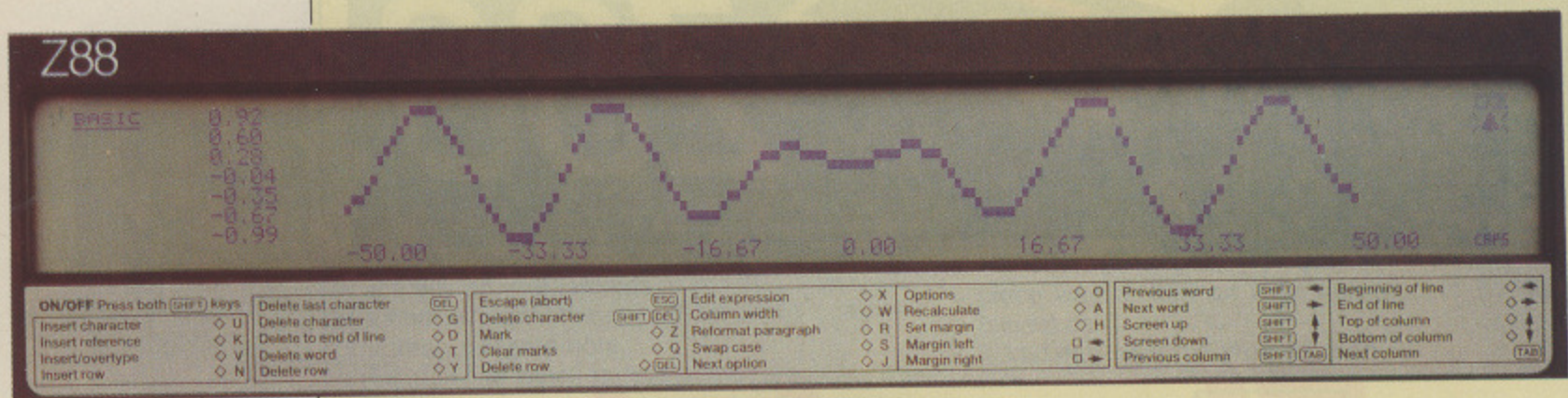
10 PROCINITG
20 PROCCLV
30 REPEAT
40 PROCPLT(RND(180)-1,
RND(16)-1,2)
50 UNTIL INKEY$(1)<>"
60 VDU 1,67
  
```

Alternatively, you can run Listing II to demonstrate and test the routine of Listing I. This is a utility to plot arbitrary mathematical functions of one variable – X – on the display.

You can supply the limits for the minimum and maximum values of X, and the program then chooses the optimal scaling for the X and Y axes. I recommend trigonometric functions – the long

There are two ways of creating graphics . . . User defined characters or the Z88 map

Turn to Page 58 ►



◀ From Page 57

thin Z88 display is certainly suitable for demonstrating their periodicity – repeating pattern.

The details of the main procedures are:
PROCINITG initialises the UDCs and the virtual screen.

PROCCLV clears both the Z88 display, and the virtual screen and also switches off the cursor. To get the cursor back you must enter VDU1,67.

PROCPLT(X,Y,C) plots at a position X chunky pixels from the left of the display and Y from the top. If X or Y are out of range nothing happens. If C is zero the pixel is plotted as white, if one the pixel is plotted black and it's inverted if C is two.

Finally, there is a short routine to copy a graphical display into Pipedream. This will not want anything to do with user defined characters, and so we have to go to the lower resolution of character sized pixels. The transferred image is converted to be 16 characters high, so at least we don't lose any vertical resolution.

After you have typed in Listing III, create a chunky graphics image to your liking – say by using the function grapher – and then go into Pipedream and place the cursor where you want the image to be drawn. It's necessary that there be only one Pipedream suspended activity.

Return to Basic, and enter PROCGRAPHTOPIPE – you needn't worry about writing over the graphics image on the display. Bizarre things will appear to happen for a while, but when the *FINISHED* message appears you can return to Pipedream and you'll find the graphics image has been transferred.

How is this done? As you may notice from the listing I've made use of the Z88's CLI. This is

almost a language in its own right, and has the combination of properties which can bring a gleam to the eye of any ardent micro enthusiast. It is arcane, dangerous, extremely powerful and very useful.

● Next month I will explain how the CLI can be used and explore some of its possibilities.

```

10 REM Graph Plotter by Andrew Moore
for Micro User.
20 PROCINITG
30 DIM Y(150):@%=800020203 : REM @% C
ontrols number format
40 CLS : PRINT "Please enter an expres-
sion with X as a free variable"
50 PRINT "For example: SIN(X/3) *
SIN(X/20)":INPUT XPRS
60 INPUT "What value of X should I st-
art from (e.g. -50.0):"MINX
70 INPUT "What value of X should I en-
d at (e.g. 50.0):"MAXX
80 MINY=1E20 : MAXY=-1E20
90 CLS : FOR I = 0 TO 150 : X = MINX
+ I * (MAXX - MINX) / 150
100 IF I MOD 30 = 0 THEN PRINT 2*I/3
"% Done"
110 Y(I) = EVAL(XPRS)
120 IF Y(I) < MINY THEN MINY = Y(I)
130 IF Y(I) > MAXY THEN MAXY = Y(I)
140 NEXT I
150 PROCCLV
160 FOR I = 0 TO 6 : PRINT TAB(0,I);MA
XY-I*(MAXY-MINY)/6;
170 PRINT TAB(10+I*12.5,7);MINX+I*(M
AXX-MINX)/6; : NEXT I
180 FOR I = 0 TO 150 : Y = Y(I)
190 PROCPLT(I+20,INT(13.99*(MAXY-Y)
/(MAXY-MINY)),1)
200 NEXT I
210 VDU 1,67 : @% = 890A : END
    
```

Listing II: A demonstration for the plotting routine

```

5000 DEF PROCBC(X)
5010 T = 128 + 56 * ( X AND 1 ) + 3.5 *
( X AND 2 )
5020 B = 128 + 14 * ( X AND 4 ) + .875
* ( X AND 8 )
5030 VDU 1,88A,83D,65+X,T,T,T,T,B,B,B,B
5040 ENDPROC
5050 DEF PROCINITG
5060 SCRFSIZE = 94*8-1 : DIM SCR SCRFSIZE
5070 FOR I = 0 TO 15 : PROCBC(I) : NEXT
I
5080 ENDPROC
5090 DEF PROCCLV
5100 PRINT "Clearing Virtual Screen.."
: VDU1,127,1,ASC"S"
5110 FOR I = 0 TO SCRFSIZE : SCR?I = 0 :
NEXT I
5120 CLS : ENDPROC
5130 DEF PROCPLT(X,Y,C)
5140 LOCAL U,V,P
5150 IF X < 0 OR Y < 0 OR X > 187 OR Y
> 15 THEN ENDPROC
5160 U = INT(X/2) : V = INT(Y/2)
5170 PRINT TAB(U,V); : U = V * 94 + U
5180 P = (X AND 1) + 2 * (Y AND 1) : P
= 2^P
5190 IF C = 0 THEN P = SCR?U AND (NOT P
)
5200 IF C = 1 THEN P = SCR?U OR P
5210 IF C = 2 THEN P = SCR?U EOR P
5220 VDU1,130,63,65+P : SCR?U = P : END
PROC
    
```

Listing I: The plotting routine

```

6000 DEF PROCGRAPHTOPIPE
6010 PRINT "Wait a moment..": OUTCH =
OPENOUT ":RAM.0/DELETE.ME"
6020 FOR Y = 0 TO 7 : FOR M = 3 TO 12 S
TEP 9 : AS = "" : FOR X = 10 TO 85
6030 IF (SCR?(Y+94+X) AND M) THEN
AS = AS+"*" ELSE AS = AS+" "
6040 NEXT X : PRINT #OUTCH,AS : NEXT
Y M : NEXT Y : CLOSE #OUTCH
6050 *CLI #PIFL:RAM.0/DELETE.ME"D"D"DY
"E#B
6060 I = INKEY(0) : *DELETE :RAM.0/DELE
TE.ME
6070 PRINT "Finished" : ENDPROC
    
```

Listing III: Graph to Pipedream routine



Inside story

John Allen reveals the Z88's intimate details

Q Why does the BAT LOW sign sometimes come on when you plug in the mains adapter?

A As the plug of an adapter is inserted into anything that is battery powered there is a short pause between the device taking its power from the batteries and it being supplied by the adapter. If that is not plugged into the mains, connecting it will usually disconnect the power to the device completely.

But the Z88 has to have power continuously to retain its memory. There's a capacitor inside that holds enough power to bridge the gap when the plug is inserted – it also powers the micro as you change the batteries – and there's also a diode which allows the supply to revert to the batteries if the adapter is connected but not plugged in to the mains. This diode has a voltage drop of nearly 1 volt.

A set of new batteries starts at approximately 6.5v and the BAT LOW warning comes on when this has fallen to 4.5v. But the first thing that happens as you plug in the mains adapter is that the direct battery power supply is cut and replaced by the one via the diode, so the BAT LOW indicator comes on if your batteries are down to 5.5v.

Although the mains adapter supplies 6v the indicator remains set. Turning the machine off and on again will clear it.

Q Your article on using the printer in the April 1988 issue of The Micro User showed how to print but how do I get effects such as bold in the output?

A You can send the codes to control your printer directly using VDU, PRINT# or BPUT#. But the easiest way is to use the Z88's printer driver which is already programmed with the codes. This only works if the printer is set up as a file by using:

```
X% = OPENOUT:"PRT.0"
```

and sending the text using BPUT#X% and PRINT#X%. The printer driver is operated by the ENQ character – Ascii code 5 – followed by a

character to say what should be done. The most useful of these are shown in the table.

ENQ,[Turn printer driver on
ENQ,]	Turn printer driver off
ENQ,U	Highlight 1 – Underline
ENQ,B	Highlight 2 – Bold
ENQ,X	Highlight 3 – Extended sequence
ENQ,I	Highlight 4 – Italics
ENQ,L	Highlight 5 – Subscript
ENQ,R	Highlight 6 – Superscript
ENQ,A	Highlight 7 – Alternate font
ENQ,E	Highlight 8 – User defined

You need to bear in mind that the printer driver will turn most of these effects off after a Return which is sent following each PRINT# statement.

To use an effect the printer driver first has to be turned on by:

```
BPUT#X%,5 : BPUT#X%,ASC"L"
```

Effects can then be sent either by using BPUT# in a similar way or by incorporating the characters into the PRINT# line. For example:

```
10 ENQ$ = CHR$(5)
20 PRINT#X%,"Normal "+
ENQ$+"B"+"Bold "
```

will print Normal and Bold on the same line.

Q Will all BBC Micro Basic programs run on the Z88 provided there's no graphics in them?

A Unfortunately no. Apart from graphics there are three other areas of difference between the two Basics. For a start, with the exception of the Ascii characters, the Z88 VDU drivers use totally different codes from the BBC Micro, for instance VDU2 does not turn the Z88's printer on – there are several different methods of printing from Basic on the Z88 and we'll cover them in future issues. Also, most Osci or star commands

Hint

When your Alkaline batteries are "flat" – the screen display won't work – the memory is retained for up to one month by the small amount of power left.

With re-chargable batteries this time can be as low as 12 hours, so while they work out cheaper you should use them with caution.

Turn to Page 60 ►

◀ From Page 59

are different which means, for example, that *FX commands cannot be used on the Z88.

The third area is a little more subtle: Basic on the BBC Micro uses separate stacks for the return addresses of different types of control structures – FOR...NEXT, REPEAT...UNTIL and so on – making it tolerant of poor program design. There is just one stack on the Z88 so some programs will run on the BBC Micro but not on the Z88. Take a look at the following:

```
10 PROCtest
20 PRINT "Main Program"
30 END
40 DEFPROCtest
50 FOR I = 1 TO 10
60 IF I = 6 THEN ENDPROC
70 NEXT
80 ENDPROC
```

Here the FOR loop inside the procedure never completes – the value of *I* never reaches 10. A BBC Micro will return from the procedure to the main program and execute line 20. However, the Z88, quite correctly, gives the error message:

No PROC at line 60

because ENDPROC cannot be executed before the FOR return address has been pulled off the stack.

Q The Z88 seems capable of handling vast amounts of memory. How is this organised?

A A combination of two techniques are used: There is bank switching, which is like the BBC Micro's sideways ram. The Z80 micro-processor at the heart of the Z88 – like the 6502 in the BBC Micro – can only handle 64k of memory directly. To allow more, different chunks of ram and rom are switched in and out of the main memory when they are required.

In addition, application workspace and files are located in fragmented ram. The fact a file is 995 bytes long it doesn't mean that a consecutive 995 bytes are used to store it – the file can be fragmented into a number of pieces anywhere in ram. Of course, a file won't be fragmented across a ram device – otherwise you could unplug a cartridge and lose half a file.

The exception to all of this is BBC Basic, which was written before the Z88 was designed and requires a continuous block of memory.

When you call Basic the operating system will find up to 40k of continuous memory for it and if necessary other activities are moved to a different part of memory. When you leave Basic everything is restored to its previous position and the Basic activity is collapsed into the smallest space it can occupy, plus about 2k for a copy of the screen.

AEON COMPUTER HOUSE

COMPUTER CONSULTANTS · COMPUTER SYSTEMS · SUPPLIES & TRAINING

EDUCATIONAL & PERIPHERAL SPECIALIST

Try our professional & friendly service for all your computing requirements!

- ★ Software & Peripherals
- ★ Computer Systems
- ★ Networked Systems
- ★ Supplies
- ★ Repair Service
- ★ Installation
- ★ Maintenance Contracts

(Sample prices ex VAT:)

Archimedes 310M Colour	969.00
Master Compact Professional Colour System with daisywheel Printer	769.00
Master 128	369.00
Colour Monitors	from 220.00
Disk Drives Single (400k) + PSU	from 115.00

Export, Educational & Official purchase orders welcome.
Open Monday-Saturday 9am-6pm. Telephone Orders Welcome.
All prices are subject to VAT and availability, and subject to change without notice

46 Christchurch Road,
Oxton, Wirral L43 5SF
Tel: 051 652 9196/7

Telex: 265871 MONREF G Quote Ref:72 MAG50053

DOUBLE VIEW

Two into one will go!

Tubelink is proud to introduce 'DoubleView', a sophisticated 32k extension system for the 'VIEW' wordprocessor and 'VIEWSHEET' spreadsheet.

DoubleView offers a professional style split screen display featuring variably sized document windows and a continual display of free memory, current position in the document being edited, current file and printer driver names and which (if any) markers are set for the two current documents.

With DoubleView you can work on **two** documents at the same time, with a 'cut and paste' clipboard for rapid transfer of text between documents.

DoubleView enables short document files to be 'linked' together and treated as one long document - far simpler than the 'continuous processing' system.

DoubleView makes it simple and quick to transfer data from ViewSheet to the View wordprocessor.

DoubleView has many more features including ...

- Improved screen handling by up to 35%
- Automatic security backups of documents
- 106 column screen included
- 'Pop Up' menus for View functions
- Recovers documents after 'soft' break
- 'Delete word' function added
- On-screen help information
- Compatible with SpellMaster

DoubleView comes in two versions, with a comprehensive 32pp manual
Pack 1: Either 40/80T 5.25" disc or 3.5" disc for sideways RAM £39.95

Pack 2: Supplied on two 16k EPROMs (32k) which can be inserted into the main board or a ROM cartridge £49.95

DoubleView is suitable for the Master 128 and Compact computers only. A version for the BBC model B/B+ micros will follow shortly.

UK Postage FREE on all items (Overseas please add £3). FREE DoubleView information sheet on request. Dealer enquiries welcome. Official Orders accepted. 24 hour order line: 01-205 9393

TubeLink

01-205 9393

Orders and enquiries to:
TUBELINK
PO BOX 641
LONDON NW9 8TF

Prop. B. Riatti Reg. Addr. 40 Old Church La. London NW9. Mail Order Only please

Your technical questions
answered by **MIKE COOK**

PROBLEM SOLVED

The missing line

MY Brother M1009 dot matrix printer prints out with a gap running along the middle of the letters. What would you advise me to do?

Also, my function keys are not working properly. When I use them in a program to display coloured letters they seem all right, but when I list the program, different statements come up instead.

— **H.R. Baijee, Forest Gate, London.**

● *The problem with your printer is that a needle is blocked or broken. This is most likely due to ink clogging up the hole it passes through, so carefully disassemble your print head and clean it in alcohol. If the problem persists it could be the solenoid or its driver at fault.*

As to the function keys, if the colour control characters are inserted directly in the program they are interpreted as Basic keywords when you list them. That, and the fact that we can't print them in The Micro User is why it is always best to use the CHR\$(X) statement for Mode 7 control characters.

Half-formatted discs

I RECENTLY updated my Model B with a Watford Mk2 DFS interface and a CS400S disc drive, but I am having some problems formatting discs with 80 tracks — single or double density. The head appears to come to the end of its travel just over halfway through the formatting procedure and reports back something like Sector 00/02 not found. — **P. Stonebridge, Ipswich.**

● *It sounds very much as if your disc drive is only a 40 track one. This would explain your problem.*

More micro colours

IS there any way of creating your own screen modes, such as an eight colour Mode 1? I understand that this would take up more memory, but could shadow ram be used? — **Antony King, Borstal, Kent.**

● *You can get a so-called Mode 8 which has all the colours but half the resolution of a Mode 2 screen. Full details of this are given in the Advanced User Guide. However you can't get more colours or more resolution simply in software.*

It is not just a question of having extra memory available but how that memory is wired up inside

the machine. Without completely replacing the video ULA, cutting tracks and adding a lot of extra logic, there is no way of improving the display.

Accessing telesoftware

I HAVE a BBC B fitted with the Acorn 0.9 DFS and an 80 track disc drive. As a monitor I use a TV which has teletext installed. What do I have to add to be able to access telesoftware? I am a novice and am bewildered by all the literature on teletext adapters. — **Anne Stuart, Sunbury-on-Thames, Middlesex.**

● *Unfortunately there is no way to connect the teletext circuitry inside your TV set to the Micro. Therefore if you want to download telesoftware you will have to get a teletext adapter like the Morley one advertised on Page 45. All the information you need to download telesoftware comes with the adapter.*

A bite at an Apple

I OWN a Master Compact but I have a lot of software on 5.25in discs. I also have an obsolete Apple II+ with two 5.25in drives. Would it be possible to connect one or both Apple drives to my Compact? — **Alistair English, Staveley, Nr. Kendal, Cumbria.**

● *Apple disc drives are unique in the field of computing as they do not contain the electronics used in conventional ones. The functions of the control board were performed by the software, making Apple drives cheap, very slow and, unfortunately, totally unusable on any other system.*

Picture break-up

I AM using a remote monitor as an information board in an entrance foyer. With a three metre lead I get a good display, but with a 10 metre one — which I would like to use — the picture breaks up. Can you help please? — **David M. Sims, Stockport College of Technology, Stockport, Cheshire.**

● *The problems with sending the four necessary signals over separate long leads is that they all arrive at different times and the signal suffers, due to the high capacitance of the lead. You*

On the agenda...

- Clogged print head
- Disc formatting trouble
- New multi-colour modes
- Breaking up display
- Trouble with joysticks
- Persistent noise and flicker
- Micro battery backup
- Using 80 track drives as 40
- Receiving telesoftware
- Using Apple disc drives

Turn to Page 62 ►

◀ From Page 61

could try replacing each signal lead with a low loss co-axial cable – not the type sold for TV aerials, as these are often only low loss at high frequencies.

The best solution might be the sort of cable that consists of four separate screened co-axial leads. They use this type of cable in professional TV studios but it might be that the BBC Micro will not have enough drive to push the signal that far even with good cable.

Perhaps the cheapest solution would be to use the modulated output of the micro to drive a TV set. In this way most of the problems are circumvented.

Battery operation

I WOULD like to construct a new power supply for my BBC B incorporating a standby 12v rechargeable battery. The disc drive – powered by the micro – requires only 36mA at 5v and a full board is fitted.

From experiments, I have found that the micro can be run off a non-switched mode power supply but can this cause any problems if continuously used for prolonged periods?

Also, should the supply be connected to all three positive and negative connections on the

motherboard, or would only one be sufficient? Finally, what current capacity should the power supply have? – **A. Clark, Sittingbourne, Kent.**

● A battery switch mode power supply was described in the April 1987 issue of *The Micro User*. I am surprised that you have a disc drive that takes so little current – are you really sure of this? The problem with a conventional series regulator design is that it dissipates too much power and so will run hot. The BBC Micro takes about 2.5 amps at 5 volts, so you will need to dissipate about 18 watts – the same amount of heat as a small soldering iron.

You have to connect the power to all three leads on the board to get the correct distribution impedance. Finally, if you want the sound, cassette and serial interface to work you have to supply a –5 volt supply at about 100mA.

80 into 40 will go

I HAVE recently bought an 80 track non-switchable disc drive for my BBC Micro. It works perfectly and I can use my old 40 track discs on the new drive by a software fix. My problem is that when I connect both drives to my micro using a two into one adapter I can only use either the 80 track or the old 40 track drive, but not both together.

I assume the software fix makes the 80 track



drive double step and this must alter the 40 track stepping so the discs on the 40 track drive become unreadable.

Can you suggest another software fix or, even better, a way to make my 80 track drive switchable? — **Alan M. George, Cockett, Swansea.**

● *There are two ways you can solve your problems. The first is to use the disc switcher board — Body Build pack 2 — described in the October 1985 issue of The Micro User. The second way is to use a DFS like the Watford one which allows individual drives to be switched; the latest versions will automatically adjust to the type of disc you have in the drive.*

Impending doom

I OWN an issue 3 BBC B and recently I have started to get a sort of rustling noise from the loudspeaker. I then noticed that when this happened the screen gave a slight shimmer.

Although not a serious fault — it does not affect the micro's performance — it does get annoying. I would be pleased if you could give me any help on this matter — **Andrew McIntyre, Tranent, East Lothian, Scotland.**

● *The persistent sound crackling and picture flickering are signs of impending doom: It sounds as though there are rapid fluctuations in the power supply. These are too fast to affect the*

operation of the micro, so it will still work.

A typical cause is a smoothing capacitor breaking down, and the short circuit current causes the electrolyte to reform so the capacitor continues to function a little longer.

Eventually it will break down permanently — when it will be easier to locate and replace. It is probably located in the switch mode power supply.

Analysing an analogue fault

I HAVE a joystick for my BBC Micro and after a year it seemed to fail, so I took it back and it was replaced with another of the same make. This one developed the same fault — or so I thought — as did the next few.

I realised that all these joysticks couldn't be faulty, so I tried a test program and got the reply that the joystick was not plugged in. If I waggle the plug I can get a positive reply, but it is almost impossible to keep it in that position. If I select joystick on Elite, I dive and spin to the right. Could you help me please? — **Chris Betterton, Dunstable, Beds.**

● *Clearly your micro is at fault and not the joysticks. It could be a fault on the socket of the analogue input port itself caused by a cracked track or bad solder joint nearby. From your description it sounds like a faulty earth connection.*

Have you any hardware problems with your BBC Micro? If so, write to Mike Cook, The Micro User, Europa House, Adlington Park, Adlington, Macclesfield SK10 4NP, giving full details of your system and the problem.

Unfortunately, Mike cannot send you personal replies, but as many questions as possible will be answered on the pages of The Micro User.

WATCHING YOUR BBC PROGRAMS ON TAXAN'S SUPERVISION 620 OR 625 IS A FEAST FOR THE EYES. BECAUSE THEY'RE PROFESSIONAL COLOUR MONITORS THEY GIVE YOU A BETTER QUALITY PICTURE THAN EITHER A TV OR MEDIUM RESOLUTION MONITOR. AND WITH THEIR SUPER HIGH CONTRAST TUBES (FOR SHARPER TEXT AND MORE VIVID COLOURS) AND FOUR SWITCHABLE COLOUR TEXT MODES, THEY MAKE EXCELLENT VIEWING. (HOWEVER IF YOU PREFER TO WATCH IN MONOCHROME ONLY, TAXAN HAVE A RANGE OF MONITORS - THE KX117, KX118 AND KX119). TAXAN ALSO OFFER TWO BBC COMPATIBLE DOT MATRIX PRINTERS, THE KP815 AND KP915. THEY'RE QUICK AND QUIET AND BOTH PROVIDE NEAR LETTER QUALITY. SO NOW YOU'VE SEEN OUR IMPROVEMENTS FOR THE BBC™, GIVE US A RING. WE'D LOVE TO HEAR YOUR POINTS OF VIEW.

TAXAN
A KAGA COMPANY
PERFECTING THE IMAGE



TO FIND OUT MORE ABOUT THE TAXAN RANGE OF PRODUCTS, CALL US ON 0344 484646.

EVEN MORE

RECENT RELEASES AT SPECIAL PRICES

	BBC or ELEC	BBC Disc	BBC Comp.
Barbarian	7.45	9.59	11.50
Bonecruncher	7.45	9.59	11.50
Codename Droid	7.45	9.59	11.50
Crazee Rider	7.45	9.59	11.50
Elixir	7.45	9.59	11.50
Icarus	7.45	9.59	-
Imogen*	7.45	8.45	10.95
Impact	7.95	9.95	-
Kourtyard	7.45	9.59	-
Life of Repton	5.50	6.50	7.95
Palace of Magic	7.45	9.59	11.50
Play it Again Sam	7.45	9.59	11.50
Quest	7.45	9.59	11.50
Skirmish	7.45	9.59	-
Spellbinder	7.45	9.59	11.50
Spy Cat	7.45	9.59	11.50
Spy vs Spy	7.45	9.59	11.50
Strykers Run	7.45	9.59	11.50

*BBC only - state 40 or 80t

JOYSTICKS at LOW PRICES

ELECTRON JOYSTICK INTERFACE & SOFTWARE £14.95

QUICKSHOT II TURBO JOYSTICK £13.95

BUY BOTH £24.95!

VOLTMACE DELTA 3B TWINS £19.95 £16.95

For use with Plus 1 or BBC

VOLTMACE 14B HANDSET £14.95
INTERFACE FOR 14B £14.95

BUY BOTH £24.95!!

VOLTMACE 31b SINGLE £11.95

VOLTMACE DELTA 35 £11.95
(for Master Compact)

BBC BUSINESS & UTILITIES

MEGA 3 (R) £97.75 £93.95

TERMULATOR £34.50 £27.95

M-CP TERMULATOR £39.95 £32.95

ADMIN EXTRA £14.95 £11.55

COMMUNICATOR £69.00 £65.95

GRAPHICS EXTENSION

ROM B or B+ £29.95 £22.45

DATABASE (D) £15.35 £11.95

SYSTEM DELTA £64.95 £49.95

MICROTEXT PLUS

(ROM) £199.00 £154.95!

MICRO POWER MAGIC !!

Compilation 1 or 2

BBC or ELEC Cass	£5.95
BBC 40 or 80t Disc	£5.95
Compact	£7.75

ELECTRON POWER SUPPLIES
£9.95

HOME INTEREST

* SNAPPER £6.00

DESK DIARY £6.00

WATCH YOUR WEIGHT £6.00

GRAPHS & CHARTS £6.00

* TURTLE GRAPHICS £6.00

ANY 5 £7.95

*BOXER £6.00

BUSINESS GAMES £6.00

THEATRE QUIZ £6.00

COMPLETE COCKTAIL MAKER

* ELECTRON ONLY

MORE GAMES AT SPECIAL PRICES

	BBC or ELEC Cass	BBC Disc	BBC Comp.
Citadel	7.45	9.59	11.50
Colossus 4 Chess	7.45	11.50	11.50
Commonwealth Games	5.95	9.95	9.95
Daley Thompsons S/T	-	11.50	-
Dunjunz	2.35	5.95	-
Elite	9.95	11.50	14.95
Ian Botham Test Cricket	5.95	9.95	-
Impossible Mission	7.45	11.50	-
Jet Set Willy II	5.95	9.95	9.95
Paper Boy	7.45	11.50	-
Psycastria	5.95	8.95	-
Ravenskull	7.45	8.95	-
Revs 4 Tracks	9.95	11.50	14.95
Scrabble	9.95	11.50	-
Speech	7.45	8.95	-
Spitire 40	7.45	9.95	11.50
Strike Force Harrier	7.45	9.95	-
Thunderstruck II	5.95	8.95	-
Village of Lost Souls	7.45	9.95	-

MICROPOWER AND OTHER GAMES

ELECTRON	BBC		
Gyroscope	£6.00	Gyroscope	£7.00
Bandits at 3 O'Clock	£6.00	European Knowledge	£7.00
Escape from Moon Base Alpha	£7.00	World Geography	£7.00
Ghouls	£7.00	Junior Maths	£7.00
Stock Car	£7.00	Killer Gorilla	£7.00
Killer Gorilla	£7.00	Bandits at 3 O'Clock	£7.00
Rubble Trouble	£7.00	Stock Car	£7.00
Swoop	£7.00	Cybertron Mission	£7.00
Croaker	£7.00	Positron	£7.00
Bumble Bee	£7.00	Fat Man Sam	£3.00
Positron	£7.00	Star Drifter	£3.00
Felix & the Fruit Monsters	£7.00	Microcosm	£3.00
Cybertron Mission	£7.00		
Moonraider	£7.00		
Felix and the Evil Weevils	£6.00		
Frenzy	£6.00		

ANY FIVE FOR ONLY £7.95! (Cass only)

*A MORE THAN SPECIAL DEAL! ANY 5 FOR £9.95!!

CRICKET	URANIANS	SKY HAWK
HUNKIDORY	JACK ATTAC	STAR FORCE SEVEN
ICE HOCKEY	PLAN B	TEMPLETON
SQUEAKALISER	ROBOTO	TENNIS
TWIN KINGDOM VALLEY		SAVAGE POND

* or £2.35 each

(NB: BBC/ELE Cass only)

COMPILATIONS

	BBC or ELEC Cass	BBC Disc	BBC Comp.
ACORNSOFT HITS 1	7.45	9.59	11.50
ACORNSOFT HITS 2	7.45	9.59	11.50
SUPERIOR COLLECTION 1	7.45	9.59	11.50
SUPERIOR COLLECTION 2	7.45	9.59	11.50
SUPERIOR COLLECTION 3 (Electron)	7.45	9.59	11.50
COMPUTER HITS 3	7.45	9.59	-
COMPUTER HITS 4	7.45	9.59	-
5 STAR GAMES 3	7.45	9.59	-
PLAY IT AGAIN SAM 2	7.45	9.59	11.50

SOFTWARE
Bargains

Dept MU8,
8/8A Regent Street,
Chapel Allerton,
Leeds LS7 4PE

AMAZING OFFERS

SCOOP PURCHASE

ELECTRON COMPUTERS

ONLY £59.95

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

Lloytron

DATA RECORDERS

Suitable for the Electron or BBC only **£19.95**

Electron Plus 1 Interface **£49.95!**
Plus 1, View & Viewsheets Roms **£69.95!**
Electron Computer, Plus 1 & View **£109.95!**

AUGUST SPECIAL

LOGO

on ROM Cartridge
For BBC Master 12.8
or EI Plus 1

£59.95- £24.95!

THE VIEW FAMILY



View 3.0 (Rom) £44.85
Viewsheets (Rom) ... £44.85
Viewspell (Rom) £44.85
Viewstore (Rom) £43.95
Viewplot (D) £22.95
View Index (D) £11.25
Printer D
Generator £8.95

Brand New

Brand New

Ferguson 12"
Green Screen (MM02)

MONITORS

only £59.95

(Ele or BBC lead supplied free!)

DESKTOP PUBLISHING (BBC)

Fleet St Editor (state 40 or 80t)	£39.95	£29.95
Fonts & Graphics (state 40 or 80t)	£14.95	£10.99
AMX Mouse & Superart B/B+/M	£79.95	£63.95
Pagemaker	£49.95	£39.95
Extra! Extra!	£24.95	£19.95
Fontwise+	£20.00	£15.95

VIEW PROFESSIONAL

Combines the functions of a word processor, spreadsheet and database in one program

BBC B/MASTER
£99.95 ONLY £79.45!

ARCHIMEDES!!

Hoverbod	£14.95	£11.95
Missile Control	£14.95	£11.95
Zarch	£19.95	£17.95
Conqueror	£24.95	£19.95
View 3.0	£59.95	£49.95
Artisan	£39.95	£34.95
Artisan Support Disc	£19.95	£17.95
Twin	£33.95	£29.95
Graphic Writer	£29.95	£21.95
Logistix	£113.85	£99.95
Ansi C	£113.85	£99.95
System Delta Plus	£69.95	£59.95

FOR THE ELECTRON

VIEW ROM £14.95
VIEWSHEET £14.95
BUY BOTH £21.95!!

OVERVIEW

A sophisticated combination of Viewstore, Viewspell, Viewplot, Viewindex & Printer Driver Gen Master 128 or Master Compact

£98.90 £78.45!

LANGUAGES (BBC)

"C" (Rom)	£84.70	£69.95
ISO Pascal	£59.60	£47.95
Lisp	£23.00	£16.95

Other Word Processors/Spreadsheets

MINI OFFICE II		
Master 128	£19.95	£15.95
B/B+ (state 40 or 80t)	£18.95	£13.95
Rom	£59.95	£55.95
WORDWISE +	£56.95	£43.95
SPELLMASTER	£59.50	£53.95
INTERWORD	£56.95	£49.95
INTERSHEET	£56.95	£49.95
INTERCHART	£36.80	£28.95

EDUCATIONAL SOFTWARE

	BBC/ELE CASS	40/80T DISC	COMP
Answerback Junior Q	7.95	8.75	9.95
Answerback Senior Q	7.95	8.75	9.95
Identify Europe	6.35	6.95	8.65
Answerback Sport	7.95	8.75	9.95
Happy Writing	-	8.75	13.45
Happy Letters	-	8.75	13.45
Word Hang	7.95	11.95	13.55
Spelling W. by Week	-	13.95	15.85
Words & Pictures	-	11.45	13.25
Happy Numbers	7.95	11.95	13.55
Decimals	-	11.45	13.25
Angles	-	11.45	13.25

BBC ONLY:

French Mistress
German Master
Italian Tutor
Spanish Tutor

Levels
A or B

£7.95

per
level

ASK SOFTWARE 7-11 YRS

The best four language Programs (set)
The best four maths Programs (set)

BBC/ELE CASS	£17.95
BBC DISC	£17.95
BBC COMPACT	£18.35

BELOW: ANY 2 £3.95

LINKWORD SPANISH
LINKWORD ITALIAN
MATHS 'V' LEVEL 2
BIOLOGY
ENGLISH
WORLD GEOGRAPHY (BBC only)
EUROPEAN KNOWLEDGE
GRAPHS & CHARTS
BUSINESS GAMES
TALKBACK
WORKSHOP

(CASS ONLY)

BARGAIN BOOKS

BBC Advanced User Guide	£19.35	£15.95
Basic Rom User Guide	£9.95	£7.95
Archimedes Ref. Manual ...	£29.95	£28.75
Lisp Manual	£7.50	£6.50
BBC Ref. Guide Vol. 1	£14.95	£12.95
BBC Ref. Guide Vol. 2	£14.95	£12.95
View 3.0 Manual	£10.00	£8.95
Viewsheets Manual	£10.00	£8.95
Viewstore Manual	£10.00	£8.95
BCPL User Guide	£15.00	£12.95
Ele Advanced User Guide ...	£9.95	£2.95



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

SOFTWARE
Bargains



Goods despatched within 48 hours subject to availability



0532-687735
0532-687789

All prices include VAT

Dept MU8, 8/8A Regent Street,
Chapel Allerton, Leeds LS7 4PE

Your BBC Micro's eye on the world's weather

Robin Nixon takes a look at new high resolution satellite maps

WEATHERLINK is a unique service for subscribers to MicroLink. Using state of the art technology it provides detailed maps of the world's weather taken directly from orbiting satellites. Recently the service has been enhanced to include very high resolution maps in up to 16 different colours or shades of grey on an Archimedes or eight on a BBC Micro.

It offers daily updates on the weather over Britain and Western Europe and brief summaries of each map.

There are also a number of demonstration maps covering the Mediterranean, North and South Africa, France and Spain. Shortly it is hoped that a regular weekly update of holiday spots will be made available, so you can see exactly what sort of weather to look forward to.

For anyone not familiar with MicroLink or the WeatherLink section, extensive help is available. Setting up your micro to receive the maps is a very easy process which you are guided through step by step, while downloading the maps themselves consists of merely typing the name of the day for the map you wish to receive.

There are two types of weather satellite: Polar orbital and geostationary. Examples of the polar satellites are the North American NOAA series and the Russian Meteor and Cosmos satellites. As the name suggests, they orbit the Earth passing over the North and South Poles with an orbital period of around 100 minutes, and are between 600 and 800 kilometers – 400 to 500 miles – above the Earth's surface.

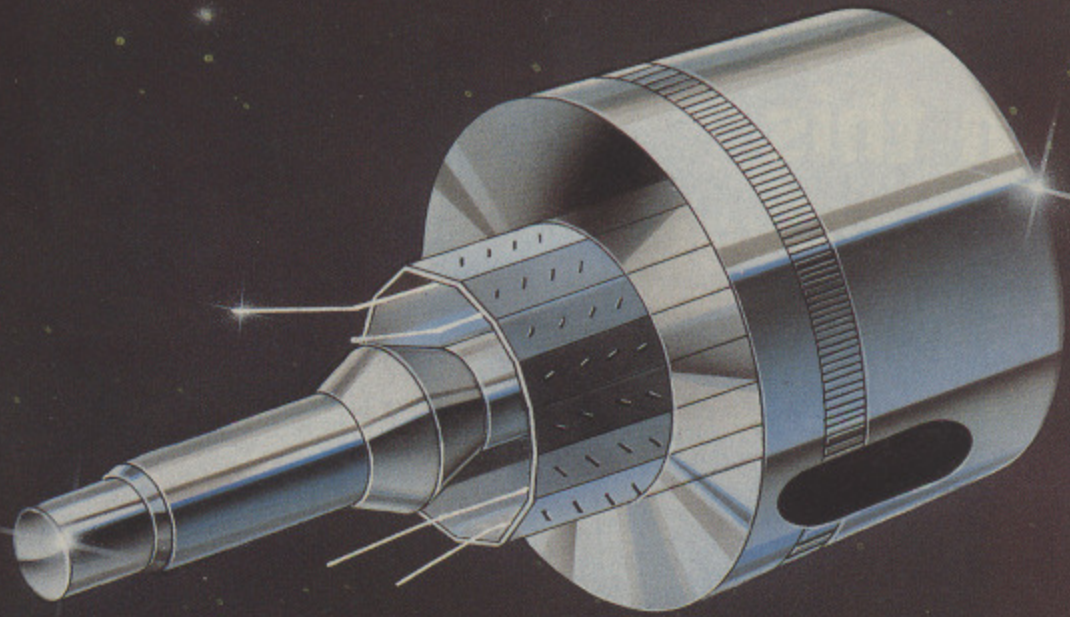
The European geostationary satellite, Meteosat, circles the globe around the equator. However, it has an orbital period of 24 hours and so appears to Earth observers to be stationary – over the Greenwich meridian. It is about 36,000 kilometers – 24,000 miles – above the equator.

The NOAA series of satellites transmits visible light and infra red images, while Meteosat has a timetable of four minute slots for visible light, infra red and water vapour images.

Normally to receive these pictures you need some very expensive equipment, including aerials, decoders, computers and display units. However, with the help of WeatherLink, all you need to view the maps is your BBC Micro, a modem and a subscription to MicroLink. At 1200/1200 baud each map only takes between four and five minutes to download – costing less than 20p at cheap rate for a satellite's view of earth.



NOAA Visible from DARTCOM (B/W)
***** SELECT for level, ADJUST to exit *****



's
e
er

or sub-
e of the
d maps
directly
tly the
a resol-
ades of
o.
Britain
h map.
i maps
Africa,
regular
ailable,
to look

Weath-
ting up
process
, while
merely
wish to

orbital
tes are
ussian
ggests,
South
inutes,
to 500

teosat,
it has
o Earth
enwich
0 miles

le light
able of
water

d some
coders,
help of
ur BBC
ink. At
n four
an 20p

Obtain
softwa
time v
e

work and
software to
You'll also
households
of pages on
program data
up-to-the-minute
The Money
popular unit
satisfied customer
Transport who
service stations
straight into
software and
required channel
You'll be able
the real time
automatically

**The WeatherLink
display program
and demonstration
maps are available
on this month's
Micro User disc
See order form
on Page 135**

TO ORD

Obtain FREE software at any time with this teletext receiver



COMPUTING AND TELESOFTWARE

TELESOFTWARE

NEXT	Micro-magazine.....	701
	Reviews.....	702
DATA	Forthcoming events.....	703
REPORT	Education special	
	- software reviews.....	704
*CAT	Programs available now.....	710
*INFO	Program information.....	711
LIST	Programs next week.....	712
	TELESOFTWARE The programs.....	720 to 731

With the Morley Teletext Adapter you can download software whenever you like at no charge whatsoever. Programs are updated every week and range from educational and utility software to exciting games.

You'll also be joining the 3.5 million households who regularly access the thousands of pages on Ceefax, Oracle and 4-Tel to check programme details, football results, share prices, up-to-the-minute news bulletins and much more.

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.

IMPORTANT: The BBC points out that a teletext adapter, like a TV set, will not work satisfactorily without a good outside aerial. Nor will it function correctly if you experience reception problems such as ghosting. They emphasise that



**SAVE
£27!**

Look what you get!

- Stylish beige teletext unit
- Official BBC Advanced Teletext rom
- 16k utility rom (plus printer dumps)
- Utilities disc packed with programs to help you make the most of your receiver

**NORMAL
PRICE**

£127

SPECIAL OFFER PRICE

£99.95

including VAT and p&p

FREE!

When you order a Morley Teletext Adapter you will also receive a FREE gift of Morley's Design 7 Plus Mode 7 editor, worth nearly £10.

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 provide for an additional £9.95.

these problems only affect a few areas of the country. However if you have any doubts as to the quality of signal available in your area you should contact the BBC Technical Support Service during office hours on 01-927 5040.

TO ORDER TURN TO THE FORM ON PAGE 135

U·P·D T·E

Compact prize

SUTTON comprehensive school in Ellesmere Port, Cheshire, has won a Master Compact donated by Acorn in the county's Career Countdown 88 competition. The Duke of Westminster handed over the micro, won in competition with 109 other secondary schools, during a visit to Sutton.

Organised by the Manpower Services Commission, the competition was launched last November to encourage school leavers to visit education and training exhibitions throughout Cheshire. Entrants had to produce a guide for future visitors, highlighting the uses, importance and aims of careers conventions.

Sutton comprehensive's winning entry was a video explaining how to benefit from the conventions, and a series of pocket-size guides. Both ideas are to be adopted by MSC.

Archimedes helps literacy project

A POWERFUL tutoring program with a difference is the latest project to be embarked upon by System Applied Technology (0742 768682). It will help adult literacy course participants learn a variety of language skills, as well as how to fill in forms and write CVs.

The Manpower Services Commission-funded project will be centred on a word processor tailor made for the needs of literacy students and will run on an Archimedes.

Linked to an extensive database, it will offer the student a wealth of learning material. Under the forms option, for example, a variety of areas will be available – including tax returns, passport and job applications. Other options contain sample letters, curriculum vitae and other reference text.

Artificial intelligence techniques will enable the micro to tell students what is wrong with their work. The system will then draw attention to the need for tutoring in comprehension, style, punctuation, spelling, layout, proof reading and vocabulary.

The training strategy within the system will not be fixed – the micro will collate information about the student's abilities and weaknesses and provide guidance through the learning tasks.

But the computer will not force students to take its advice – at all times it will judge when help is required and offer it.

The Archimedes-based system will be wysiwyg with high resolution graphics and a colourful and pictorial interface.



The Duke of Westminster (centre) presents children at Sutton Comprehensive School, Ellesmere Port, with their Acorn Master Compact prize.

Phonics package

TEACHERS of reading generally agree that children should learn whole words to build up a sight vocabulary of around 100 common words. One strategy is to provide systematic instruction in phonics, giving children of ages six to eight the skills to build up new words and extend their vocabulary.

Letters and Pictures, a new package from Chalksoft (0775 69518), is intended as a tool to start off this phonics work. Designed by experienced teachers in reading, the seven-program disc employs powerful graphics. The child uses only two keys to select a letter to match a picture – the initial letter, final consonant or middle vowel – building whole words in the final section.

When a child identifies the picture he is shown he presses the spacebar to move a pointer to the appropriate letter and then presses Return.

If correct, the child is rewarded by animation of the pointer and sound effects. If the answer is incorrect the micro beeps and the pointer disappears, returning a few seconds later for another try. When all the pictures in a program have been matched there is a colourful on-screen reward with sound effects.

Letters and Pictures on 5.25in disc for the BBC Micro and Master costs £13, on 3.5in disc for the Master Compact £15.

Ian Waugh
investigates
packages
aimed at
easing
music
practice

Product: NotePerfect I
Price: £9.95
Supplier: NotePerfect Software, 97 Valence Road,
Lewes, Sussex BN7 1SJ.
Tel: 0273 473135

MUSIC is a subject which lends itself to computer assisted learning, especially on a BBC Micro which has a built-in sound chip. NotePerfect aims to take advantage of the chip by providing a set of scale exercises the music student can follow and play.

The idea is a fairly simple one. The micro plays the scales and the student must follow them, thus helping develop his sense of pitch and articulation – an essential part of Associated Board music exams.

The program was designed specifically for flute, oboe and violin players but it could also be used for trumpets, piccolos, clarinets, cor anglais and viola players too.

When you boot it up, you are presented with a list of 10 options: Tune up, major scales, minor scales, major arpeggios, minor arpeggios, dominant 7ths, diminished 7ths, chromatic scales, major double stops and minor double stops, the last two being only relevant to string players.

Tune Up is used to tune your instrument to the BBC Micro's sound chip. This section is designed for the violin and offers A, D, G and E notes to tune against. Others could simply tune to the A.

The program, however, obediently uses a value of 89 in the SOUND command – as mentioned in the user guide – to produce the A pitch. This value produces a pitch of 449.3 Hz, not 440 Hz – the internationally accepted pitch of A. A value of 88 would be closer – 443.1 Hz – although even this is still not close enough for anyone with a half

decent musical ear. If you use this program you must be prepared to tune your instrument to the sound chip and then back to international A to play with other instruments. This is a nuisance to say the least, especially if it is difficult to tune or you would rather not to be constantly retuning it.

When you select one of the scale options the program asks you. What key, how loud, how fast, how many octaves and how many times? This is fine, but it asks you all these questions *every time* you select a new scale. You should be able to set all these options – except the key – at the start of a session. Also, it would be helpful if you could enter a number of scales at once. For instance all the major scales incrementing chromatically, so you could play through a complete series of exercises without stopping.

Although the sound chip only has a range of five octaves, the program lets you input any number in answer to the 'How many Octaves?' question. If it is outside the sound chip's range the pitch wraps around.

When in a sub-menu, Escape takes you back to its start and Break is supposed to take you back to the main menu. In some sub-menus, however, the Break key is configured as *RUN SCALES – which is the main menu program – but it's a Basic program so it crashes. The sub-programs are rather short anyway and all 10 could probably be fitted into memory at once.

This sort of thing sums up the programming side of NotePerfect extremely well – extremely sloppy. The presentation is functional – barely – and there are few, if any, checks made on user input. The key must be entered as a capital letter and if you enter c instead of C for example, it runs you through the speed, loudness, octaves procedure before realising the mistake and then simply plonks you back at the start of the questions again. Questions requiring a Y or N answer will scroll up the screen if you enter anything else.

The range of scales, however, is good and the minor selections give you the choice of harmonic or melodic minor – but yet another prompt to reply to. Practice Sheets are included with the program – you may photocopy them – and you can record your progress on them.

NotePerfect have Site Licence Options for both schools and LEAs. Costs range from £35 for schools up to 500 pupils up to £10 per school for LEAs with more than 25 schools.

To sum up, NotePerfect is a nice idea but badly implemented. The aim of a CAL program should be to help and encourage pupils to learn and practice. It certainly wouldn't encourage me if I had to enter all that information before *each* exercise.

If you – or any of your students – are finding scale practice a real problem the program could be a help and, as it doesn't cost an arm and a leg, it may be worth investigating. I had hoped, however, that educational software had improved beyond this backroom development stage.

Points for

- Value for money
- Good exercises

Against

- Poorly pitched
- Careless programming

MUSICIANS!

PRACTICE MAKES PERFECT

NOTE PERFECT I

THE ULTIMATE COMPUTER PROGRAM TO HELP MUSICIANS OF ANY STANDARD MASTER THEIR INTONATION, USING SCALES, ARPEGGIOS AND OTHER STUDIES VITAL FOR IMPROVING TECHNIQUE

Compatible with the BBC B, B+ & Master.

Product: Aural
Price: Grades 1 & 2 together £16.65 (cass), £18.45 (5.25in disc), £19.85 (3.5in disc). Grades 3, 4 & 5 individually £14.85 (cass), £16.65 (5.25in disc), £18.45 (3.5in disc)
Supplier: Perfect Fourth Software, 11 Hempstead Lane, Potten End, Berkhamsted, Herts HP4 2QJ.
 Tel: 04427 6311

THE aural part of any music examination is often the most unpopular with students. It can also be the most difficult to practise as another person is usually required to play some notes and ask questions. Aural sets out to ease the practice problem by using the computer to provide a series of exercises the student can do at home.

It was specifically designed for individual use and although Perfect Fourth says it could be used in a classroom, it is not, I think, so well suited to group use. The program boots from disc and, as a form of copy protection, asks you for a three-letter code which must be read from one of 676 on a Loading Card. The manual warns that if you lose the card you'll have to buy another program although the cards and codes for each of the programs are the same.

The program uses Mode 7 and all on-screen instructions are in upper case – I thought software had progressed beyond the big letters stage. It also addresses you as if the micro is talking and periodically throws out such comments as "Are you singing?" and "Nice and loud, I can't hear you". You can enter your name and if you do it will be tacked on to the end of some of these messages. OK for the under fives, I suppose.

We'll start with Grades 1 and 2: The first option plays the major scale to remind you what it sounds like. Next the program plays a note and you must sing it. The third option plays a key note and then one of the first five notes of the scale which you must name. The fourth option plays a short tune and you must clap the rhythm of it.

Grade 2 develops the exercises and adds Scale Singing in which you must sing a certain interval of the scale. It also adds Sing Three Notes which is a prelude to the other grades which ask you to sing a short melody.

Each exercise gives you four tests of its type after which you can try another four or go back to the main menu. The manual says the options are numbered 1, 2, 3 and so on, but the program uses letters. Also the Sing Three Notes exercise in Grade 2 appears as second choice in the manual but last choice on the program menu. Although admittedly minor points, the lack of agreement between software and manual never ceases to amaze me. Is it so difficult to get the two to match up?

When you reach Grade 3 there are exercises in which you must sing the upper or lower of two notes which are played together, sing notes of the scale, sing short melodies and clapping exercises.

Grades 4 and 5 introduce slightly more complex questions, longer melodies and larger intervals.

All grades have three beating time exercises. These play a short tune and you must beat time to it. The answer is supplied by an arrow which points in the direction you would move a baton if

you were conducting. The time signatures aren't given, though, which would have been helpful. As these are three-part tunes, you only get a few per exercise, unlike the scale and interval tests which can produce countless variations using the random number generator.

None of the exercises can accept feedback from the user – they are presented purely for you to practise on your own. The only way you can tell if your answers are correct or not is by using your own ears. As this is what the program is trying to develop it is, in a way, like marking your own examination paper. To get the best out of the exercises it will be important to get your progress checked by a teacher.

The presentation isn't particularly exciting – bland Mode 7 screens and inane comments – although the packaging is good. All the programs contain a "These Music Exams" leaflet included with the permission of the Associated Board and a Music Student's Practice Diary. The leaflet is excellent reading and the Diary can serve as an incentive to monitor and improve your progress.

The software provides practice rather than tui-

Points for

- Handy leaflet and diary
- Useful practice programs

Against

- Bland screen displays
- A bit pricey



tion – which is, after all, what it was designed to do – and is not a substitute for a good teacher. It also strikes me as being a touch pricey which may deter potential users from buying it. However it is aimed at a specialised market and that usually seems to justify a higher than average price tag.

There's no doubt these programs could help improve your aural ability but you'll need the will to work through them.

The bottom line...

Neither program really stands out but both work satisfactorily

Archimedes

HARNESS THE POWER

Alpha-Base

£49.95

Alpha-Base is the successor to **Beta-Base**, the top selling database for the BBC micro. Alpha-Base really does 'HARNESS THE POWER' of the Archimedes. As with all Clares products we have made **Alpha-Base** powerful but easy to use. You can be using a database within 5 minutes of receiving the program - that's easy. But don't be fooled, you do not lose any functions or power. Here are just some of the functions:



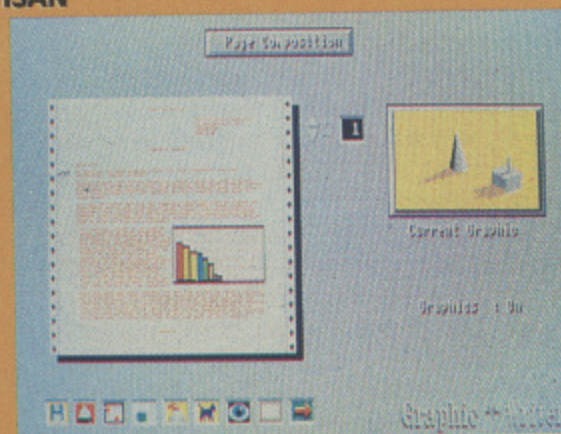
- * WIMP based using icons and mouse
- * Hard disc compatible - massive files
- * Free format screens with on line editing of field order
- * Upto 400 fields & 27600 chars per record
- * Upto 2.14 billion records per file !!!
- * Multiple display, entry and printer forms can be used with each file
- * Fast search by fields or record
- * Plain English entry of search & sort criteria with many inbuilt functions
- * Five data types including formulae
- * Calculation facilities with inbuilt min, max, average, age etc
- * Comprehensive print options inc labels
- * Validation on each field if required
- * Transfer fields from one file to another
- * Password security if required
- * Data stored on disc so computer failure will not result in loss of the data

If you want a powerful database that you can boot up and run within 5 minutes then buy **Alpha-Base** now. Absolutely no programming skills required.

Graphic Writer

£29.95

Graphic Writer, formerly Image Writer, is a sophisticated WIMP based word processor with an inbuilt graphics editor. It can be used as a standard word processor or graphics can be included to provide diagrams, graphs etc within your document. Graphics can even be imported from **ARTISAN**



- * Totally icon driven from menus
- * Multiple documents in memory, upto 512k
- * Super smooth scrolling
- * Fast search & replace
- * Justify centre etc
- * Text styles give plain, bold, italic, underlined, subscript, superscript or combinations of these eg bold italic underlined subscript.
- * Centered and Temporary text styles
- * Block operations - move, copy, delete and recall
- * Full WYSIWYG preview
- * Graphics editor
- * Page format controls page length, headers, footers, pad and pound characters.
- * Page Composition allows placing of graphics, mini preview etc
- * Multiple print out options
- * Auto page numbering even through multiple documents

To create a document with **Graphic Writer** you type in your text, using the many text styles available, leave room for the graphics and then place the graphics using Page Composition. It's simple and easy to use. You can have up to 14 documents in memory on a 310, that's equivalent to about 220 pages of A4 text.

See what the magazines say:

the scrolling is unbelievably smooth... I can highly recommend this excellent product as being **THE** word processor for the Archimedes

MICRO USER April 1988

excellent value... bowled over by its stunning use of graphics.

RISC USER December 1987



98 Middlewich Rd
Northwich
Cheshire CW9 7DA
Tel: 0606 48511

ALL PRICES INCLUDE
VAT and P+P
OVERSEAS ORDERS
ADD £4



DON'T FORGET, YOU CAN ORDER WITH ACCESS CARD TOO!

Riddle of the sands

Jon Perry presents *Treasure Trail*, an educational search for the Pharaoh's gold

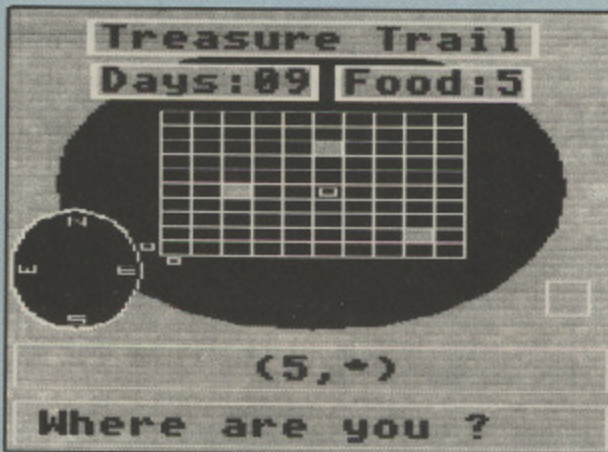
In the trackless wastes of the Sahara Desert you stand alone with your map. Hidden in the shifting sands is the Pharaoh's treasure, and you are determined to find it. But with a three month time limit and a limited supply of food and water can you survive?

This educational game not only encourages logical thinking but also gives lots of practice with compass directions and coordinates.

With 100 locations to search and only three opportunities to dig, you need as much help as you can get. Fortunately you have six clues giving an approximate direction to the treasure. But to get a clue you must answer a compass or coordinate question correctly. You can also re-stock with food and water by passing over an oasis, each marked as a blue square.

To enter instructions press the appropriate key and hit Return each time you want to send that command. When answering a compass question press the spacebar to move the pointer of the compass display. Coordinates are entered with the number keys - the squares in each direction are numbered zero to nine. The X coordinate should be entered first.

Happy hunting. May your oases be plentiful and your fortune good.



MAIN PROCEDURES

init	Initialises variables, characters and trig tables	dig	Digs for treasure
game	Runs the game	clue	Gives a clue
screen	Draws initial screen	comp	Gives compass question
input	Accepts command	coord	Gives coordinates' question
action	Interprets command	direction	Finds and displays direction of treasure
move	Moves the player	end	End of game
		done	Draws a picture

COMMANDS

Cursor up or N	Go north
Cursor down or S	Go south
Cursor right or E	Go east
Cursor left or W	Go west
D	Dig for treasure
H	Help!
Spacebar	Rotate compass point

```

10 REM Treasure Trail
20 REM by J.Perry
30 REM (c) The Micro User
40 ON ERROR MODE7:REPORT:PRINT" at li
ne ";ERL:END
50 MODE 5:*FX4
60 ZX=RND(-TIME)
70 VDU23,1,0;0;0;0;
80 PROCinit:PROCGame
90 IF FNanother:RUN:ELSE:*FX4
100 END
110 DEFPROCinit
120 end=FALSE:VX=0:KX=0
130 di=0:da=0:f=9.5:X%=0:Y%=0
140 REPEAT Tx%=RND(10)-1:Ty%=RND(10)-1
150 UNTIL NOT FNpool(Tx%,Ty%)
160 VDU19,1,4;0;
170 REM Compass letters
180 VDU23,228,0,0,0,34,50,42,38,34
190 VDU23,229,0,0,0,62,32,62,2,62
200 VDU23,230,0,0,0,62,32,62,32,62
210 VDU23,231,0,0,0,34,34,42,42,62
220 REM North > South East
230 VDU23,232,0,8,28,62,28,28,28,0
240 VDU23,233,0,14,14,30,56,112,96,0
250 VDU23,234,0,8,124,126,124,8,0,0
260 VDU23,235,0,96,112,56,30,14,14,0
270 REM South > North West
280 VDU23,236,0,28,28,28,62,28,8,0
290 VDU23,237,0,6,14,28,120,112,112,0
300 VDU23,238,0,16,62,126,62,16,0,0
310 VDU23,239,0,112,112,120,28,14,6,0
320 REM 0 (coords)
330 VDU23,224,0,0,60,36,36,60,0,0
340 DIM S(24),C(24),VS(5),d%820
350 VS(0)="Go North"+STRING$(8," ")
360 VS(1)="Go East"+STRING$(9," ")
370 VS(2)="Go South"+STRING$(8," ")
380 VS(3)="Go West"+STRING$(9," ")
390 VS(4)="Dig for treasure"
400 VS(5)="Help!"+STRING$(11," ")
410 FOR IX=0 TO 24:J=RAD(IX*15)
420 S(IX)=SINJ:C(IX)=COSJ:NEXT
430 ENDPROC
440 DEFPROCGame
450 LOCAL UX:UX=-1:PROCScreen
460 VDU23,1,0;0;0;0;:PROCmove(0)
470 REPEAT:PROCPinput
480 PROCaction:UNTIL end:ENDPROC
490 DEFPROCScreen
500 GCOLOR,129:CLG
510 PROCcircle(2,640,632,532,320)
520 FOR IX=0 TO 1
530 PROCbox(0,172+IX*8,920+IX*4,1112-IX*8,1000-IX*4)
540 PROCbox(0,180+IX*8,824+IX*4,648-IX*8,900-IX*4)
550 PROCbox(0,688+IX*8,824+IX*4,1096-IX*8,900-IX*4):NEXT
560 COLOUR129:COLOUR3
570 PROCdb(3,1,"Treasure Trail")
580 PROCdb(3,4,"Days:00")
590 PROCdb(11,4,"Food:9")
600 FOR LX=0 TO 10:MOVE 320,476+LX*32
610 DRAW 960,476+LX*32
620 MOVE 320+LX*64,476
630 DRAW 320+LX*64,796:NEXT
640 PROCbox(0,16,48,1264,144)
650 PROCbox(0,16,176,1264,272)
660 PROCbox(0,1136,348,1224,424)
670 FOR IX=0 TO 4
680 PROCbox(1,648+IX*8,704+IX*4,700-IX*8,728-IX*4)
690 PROCbox(1,456+IX*8,608+IX*4,508-IX*8,632-IX*4)
700 PROCbox(1,840+IX*8,512+IX*4,892-IX*8,536-IX*4):NEXT
710 PROCcircle(0,144,440,136,136)
720 PROCcircle(3,144,440,128,128)
730 GCOLOR,0:GCOLOR,132
740 VDU5:MOVE8,460:VDU231
750 MOVE220,460:VDU230:MOVE112,568
760 VDU228:MOVE112,348:VDU229
770 MOVE324,476:VDU224:MOVE264,508
780 VDU224,4:ENDPROC
790 DEFPROCbox(CX,XX,YX,x%,y%)
800 GCOLOR,CX:MOVEXX,YX:DRAWx%,YX
810 DRAWx%,y%:DRAWXX,y%:DRAWXX,YX
820 ENDPROC
830 DEFPROCcircle(CX,XX,YX,rx%,ry%)
840 LOCAL TX:GCOLOR,CX:MOVE XX,YX
850 FOR TX=0 TO 24:MOVE XX,YX
860 x%=XX+S(TX)*rx%:y%=YX+C(TX)*ry%
870 PLOT85,x%,y%:NEXT:ENDPROC
880 DEFPROCinput
890 REPEAT:PROCW(.2):*FX15

```

Turn to Page 74 ▶

◀ From Page 73

```

900 IF INKEY-58 OR INKEY-86:V%=0:M%=0
910 IF INKEY-122 OR INKEY-35:V%=1:M%=1
920 IF INKEY-42 OR INKEY-82:V%=2:M%=2
930 IF INKEY-26 OR INKEY-34:V%=3:M%=3
940 IFV%<0:U%PROCdb(1,24,V$(V%)):U%=V%
950 IF INKEY-51:V%=4
960 IF INKEY-85:V%=5
970 UNTIL INKEY-74:ENDPROC
980 DEFPROCdb(X%,Y%,M%):VDU31XXY%
990 LOCALAX,LX:XX=d%:Y%=X%DIV256:AX=10
1000 FOR LX=1 TO LENMS
1010 ?d%=ASCIDS(M$,LX):CALL&FFF1
1020 VDU23,254,XX?1,XX?1,XX?2,XX?2,XX?3
,XX?3,XX?4,XX?4
1030 VDU23,255,XX?5,XX?5,XX?6,XX?6,XX?7
,XX?7,XX?8,XX?8
1040 VDU254,8,10,255,11:NEXT:ENDPROC
1050 DEFPROCaction
1060 IF V%>-1 IF V%<4:PROCmove(2+(FNpool
L(X%,Y%)=-1)):M%=V%
1070 IF V%=0:IF Y%<9:Y%=Y%+1:PROCgo
1080 IF V%=1:IF X%<9:X%=X%+1:PROCgo
1090 IF V%=2:IF Y%>0:Y%=Y%-1:PROCgo
1100 IF V%=3:IF X%>0:X%=X%-1:PROCgo
1110 IF V%>3 IF FNpool(X%,Y%):f=9.5:PRO
Cdet
1120 IF V%=4:PROCdig:V%=M%
1130 IF V%=5:PROCclue:V%=M%
1140 IF da>90:PROCend(2)
1150 ENDPROC
1160 DEFPROCgo:PROCmove(0)
1170 da=da+1:f=f-.5:PROCdet
1180 IF NOTFNpool(X%,Y%):IF f=0.5:PROCe
nd(1)
1190 ENDPROC
1200 DEFPROCw(t):LOCALTX:TX=TIME+t*100
1210 REPEAT UNTIL TIME>TX:ENDPROC
1220 DEFPROCclear
1230 PRINTTAB(1,24)SPC18TAB(1,25)SPC18
1240 PRINTTAB(1,28)SPC18TAB(1,29)SPC18
1250 ENDPROC
1260 DEFPROCmove(CX)
1270 PROCbox(CX,336+CX*64,486+Y%*32,368
+CX*64,502+Y%*32)
1280 IF CX=0:SOUND0,-15,6,1:SOUND0,-7,5
,1:SOUND0,-3,4,1
1290 ENDPROC
1300 DEFFNpool(X%,Y%):(CX=2 AND Y%=4) O
R (CX=5 AND Y%=7) OR (CX=8 AND Y%=1)
1310 DEFPROCdet:LOCAL AX
1320 IF da<10:AX=9 ELSE AX=8
1330 PROCdb(AX,4,STR$da)
1340 PROCdb(16,4,STR$INTf):ENDPROC
1350 DEFPROCdig:SOUND0,-10,4,1
1360 SOUND0,-12,5,1:SOUND0,-15,6,1
1370 IF X%=Tx% AND Y%=Ty%:PROCdb(1,28,"
You've found it!"):PROCw(2):PROCend(0):E
NDPROC
1380 PROCdb(1,28,"You find nothing.")
1390 di=di+1:IF di>2:PROCend(3)
1400 PROCw(2):ENDPROC
1410 DEFPROCclue:LOCAL H%:PROCclear
1420 IF K%>6:PROCdb(1,28,"No more clues
") ELSE PROCgive
1430 PROCw(2):PROCclear:ENDPROC
1440 DEF PROCgive:K%=K%+1
1450 IF K%AND1 H%=FNcord:ELSE:H%=FNcomp
1460 IF H%=1:PROCdir ELSE PROCdb(18,19,
"?)")
1470 ENDPROC
1480 DEFFNcomp
1490 LOCAL LX,P%,Q%,S%
1500 L$="":L%=RND(8)-1
1510 IF L%=7 OR L%<2 L$="north "
1520 IF L%>2 IF L%<6 L$="south "
1530 IF L%>0 IF L%<4 L$=L$+"east"
1540 IF L%>4 IF L%<8 L$=L$+"west"
1550 PROCdb(1,28,"Show "+L$)

```

```

1560 PROCw(.5):P%=0:Q%=1
1570 REPEAT:PROCw(.05):*FX15
1580 IF P%<Q%:PROCp(P%,0):PROCp(Q%,3):
Q%=P%
1590 IF INKEY-99:P%=P%+1:IF P%=8 P%=0
1600 UNTILINKEY-74:PROCp(P%,3)
1610 =FNresult(P%=L%)
1620 DEFPROCp(L%,CX)
1630 GCOLOR,CX:MOVE148,438
1640 DRAW148+S(LX*3)*64,438+C(LX*3)*64
1650 ENDPROC
1660 DEFPROCdir
1670 LOCAL D%,X%,Y%:X%=Tx%-X%:Y%=Ty%-Y%
1680 IF X%=0:IF Y%=0:PROCdb(1,28,"You a
re on it!"):PROCdb(18,19,"!"):ENDPROC
1690 a=DEGACS(X%/SQR(X%*X%+Y%*Y%))
1700 IF Y%>0 a=360-a
1710 D%=(a+90)MOD360)DIV45
1720 PROCdb(18,19,CHR$(232+D%))
1730 ENDPROC
1740 DEF FNresult(AX)
1750 LOCAL H%,S%,t$:PROCw(2):PROCclear
1760 IF AX t$="Well done!":H%=1:S%=100:
ELSE:t$="Hard Luck!":H%=0:S%=8
1770 PROCdb(1,28,t$):SOUND1,-9,S%,1:=H%
1780 DEFFNcord:PROCclear
1790 PROCdb(1,28,"Where are you ?")
1800 PROCdb(8,24,"( , )")
1810 LOCAL J%,N%,R%
1820 REPEAT J%=9+R%*2
1830 REPEAT PROCdb(J%,24,"*")
1840 PROCdb(J%,24,""):N%=INKEY0-48
1850 UNTIL N%>-1 AND N%<10
1860 IF R%=0 Gx%=N% ELSE Gy%=N%
1870 PROCdb(9+R%*2,24,CHR$(48+N%))
1880 R%=R%+1:UNTIL R%>1

```

```

1890 =FNresult((Gx%=X%)AND(Gy%=Y%))
1900 DEFPROCend(T%):LOCAL P$:end=TRUE
1910 IF T%=0:PROCdone:ENDPROC
1920 IF T%=1 P$="food."
1930 IF T%=2 P$="days."
1940 IF T%=3 P$="digs."
1950 PROCclear:SOUND1,-12,8,1
1960 PROCdb(1,24,"You failed to find")
1970 PROCdb(3,28,"the treasure.")
1980 PROCw(2):PROCclear:SOUND1,-12,8,1
1990 PROCdb(1,24,"You did not have")
2000 PROCdb(3,28,"enough "+P$)
2010 PROCw(2):PROCclear:ENDPROC
2020 DEFPROCdone:VDU19,1,1;0;
2030 GCOLOR,128:CLG:GCOLOR,1
2040 MOVE96,96:MOVE1184,96
2050 PLOT85,96,848:PLOT85,1184,848
2060 GCOLOR,0:MOVE128,544:MOVE1152,544
2070 PLOT85,128,816:PLOT85,1152,816
2080 GCOLOR,2
2090 FOR I%=112 TO 1136 STEP 128
2100 MOVE I%,160:MOVE I%+16,160
2110 PLOT85,I%,512:PLOT85,I%+16,512
2120 NEXT
2130 PROCcircle(0,640,448,16,48)
2140 PROCcircle(0,640,432,32,32)
2150 PROCw(2):GCOLOR,2
2160 FOR I%=256 TO 1024 STEP128
2170 J%=I%-(640-I%)DIV2
2180 MOVEI%,544:MOVEI%+16,544
2190 PLOT85,J%,960:PLOT85,J%+16,960
2200 NEXT:PROCw(2):ENDPROC
2210 DEFFNanother:CLS:LOCAL AX
2220 PROCdb(1,10,"Another game ?")
2230 REPEAT AX=INSTR("YnN",GET$)
2240 UNTIL AX>0:=AX<3

```



This listing is included in this month's tape & disc offer. See order form on Page 135.

10 = 00	390 = 293F 5	770 = 87CD 7	1150 = ED0F 2	1530 = C188 3	1910 = 34BF 8
20 = 00	400 = A428 5	780 = D7F9 C	1160 = F088 E	1540 = 3AD5 D	1920 = 6289 5
30 = 00	410 = A4E0 F	790 = 7AF3 8	1170 = 4377 4	1550 = A678 3	1930 = D933 6
40 = BC2B B	420 = B66C C	800 = F3FD F	1180 = AB89 5	1560 = 93DD 8	1940 = 6196 1
50 = EF84 7	430 = ED0F D	810 = 3198 F	1190 = ED0F B	1570 = B230 7	1950 = D250 9
60 = 4E1 9	440 = 74F3 5	820 = ED0F 4	1200 = 5436 C	1580 = F8A0 F	1960 = 41E6 1
70 = 1E64 7	450 = E98D 4	830 = 91AB 9	1210 = B6C9 7	1590 = 2C2C D	1970 = C661 5
80 = D15C 8	460 = 12CB 1	840 = 4CEC 8	1220 = 4623 F	1600 = 1D81 5	1980 = 35C4 3
90 = 2906 F	470 = EE93 4	850 = 167E 6	1230 = F13D A	1610 = 1B10 2	1990 = 2CD1 E
100 = FD2E 9	480 = B86B 2	860 = 3B5D 7	1240 = 6CD8 1	1620 = 2F13 9	2000 = 3AFB 6
110 = 344C F	490 = F5B9 0	870 = 344F 2	1250 = ED0F 9	1630 = 54A9 E	2010 = EC6 B
120 = 63AE 0	500 = 2BF7 D	880 = EA07 F	1260 = F27C 7	1640 = 8460 4	2020 = 90B5 0
130 = 8663 3	510 = 40F0 6	890 = 8388 3	1270 = 7F00 1	1650 = ED0F F	2030 = 2497 A
140 = BA97 0	520 = 2C3D 4	900 = 1B5B A	1280 = 9629 7	1660 = CC71 3	2040 = 35 F
150 = B6C8 9	530 = 1736 0	910 = 086 8	1290 = ED0F F	1670 = 5484 A	2050 = F327 D
160 = 7DA9 8	540 = 4DC3 6	920 = 3E2D B	1300 = BCBF A	1680 = 6842 D	2060 = 388C 2
170 = 0 8	550 = C2BD 7	930 = 90C8 D	1310 = 3925 8	1690 = 22C0 7	2070 = 24FF E
180 = 6B3F E	560 = 5207 5	940 = CB4E F	1320 = 9154 2	1700 = 521C 8	2080 = 334C 3
190 = B833 2	570 = 2BC0 0	950 = 22B3 7	1330 = 2E84 5	1710 = 8633 D	2090 = C9EC 0
200 = E78 4	580 = 9832 5	960 = DE39 0	1340 = 84C1 2	1720 = FE0F E	2100 = 8443 2
210 = F1C2 5	590 = 642B C	970 = 53E8 8	1350 = 9D77 9	1730 = ED0F 5	2110 = 3887 6
220 = 0 5	600 = 4890 3	980 = E0C2 5	1360 = 30F4 0	1740 = B109 8	2120 = 2C83 3
230 = DBCB 9	610 = 52D 0	990 = 9F12 D	1370 = 5AA9 8	1750 = 4443 E	2130 = 1078 F
240 = 1A8B E	620 = 9C36 1	1000 = 108A 5	1380 = C0F6 E	1760 = 4C04 2	2140 = 58B2 6
250 = 23C0 C	630 = 9263 E	1010 = 3F8A 1	1390 = 788A F	1770 = 24D0 6	2150 = A775 2
260 = 1FC5 F	640 = 2FD 5	1020 = C94C C	1400 = 16B8 8	1780 = 589B D	2160 = BD91 3
270 = 0 F	650 = A1E5 8	1030 = 21C9 7	1410 = 6610 8	1790 = A0D6 2	2170 = 1450 3
280 = DA67 5	660 = 7187 6	1040 = D7F0 3	1420 = 9F73 C	1800 = 07D 9	2180 = 830C D
290 = 77D9 0	670 = 7C98 2	1050 = D94E 6	1430 = EC6 7	1810 = 687E 6	2190 = 664C 3
300 = 10D4 D	680 = 17AC A	1060 = A894 D	1440 = 160E D	1820 = 3B57 5	2200 = D8BC 1
310 = A42 6	690 = 5B07 C	1070 = 30F2 4	1450 = 528F 9	1830 = CB73 3	2210 = AEED E
320 = 0 6	700 = C03F 1	1080 = 32FF 6	1460 = D065 2	1840 = AB24 5	2220 = B232 9
330 = 8B2B 0	710 = AD66 0	1090 = 6E8E A	1470 = ED0F 9	1850 = 9EEA D	2230 = AEE6 A
340 = 81F9 F	720 = 81E9 A	1100 = 6C83 A	1480 = 3F20 8	1860 = 6757 5	2240 = 6A81 B
350 = DEA7 8	730 = 39D 4	1110 = 9376 8	1490 = 7993 6	1870 = F5F5 4	
360 = 61E7 E	740 = 7D93 3	1120 = 7DCA D	1500 = 6FFD F	1880 = 5ABE D	
370 = C679 2	750 = 66F7 D	1130 = 8E84 8	1510 = 13FE E	1890 = 7AFD 4	
380 = 9B27 8	760 = EDA6 B	1140 = 80FB 8	1520 = 2F80 A	1900 = 766E 8	

TECHNOMATIC

17 Burnley Road, London NW10 1ED Tel: 01-208 1177 Fax: 01-452 1500
305 Edgware Road, London W2 Tel: 01-723 0233 Telex: 922800

ARCHIMEDES, BBC COMPUTERS & ECONET REFERRAL CENTRE

300 & 400 SERIES

Archimedes 305 Basic	£699(a)
Archimedes 310 Basic	£775(a)
Archimedes 440 Basic	£2,529(a)
Acorn Mono Monitor*	£60(a)
Acorn Colour Monitor*	£220(a)
Philips CM8833 Col Monitor*	£210(a)
PC Emulator Software*	£60(b)

Old prices
valid for
current stocks

*Prices applicable only when purchased with the computer

ADD-ONS

0.5Mb Ram upgrade kit (for 305)	£144(b)
2nd Floppy Drive (305, 310)	£118(b)
Backplane for 2 podules	£37(c)
I/O Podule	£80(c)
20Mb Hard disc + podule	£469(a)
Acorn ROM Podule	£55(c)
CCROM Podule	£45(c)
Midi Addon to I/O	£37(c)
Midi Expansion Card	£66(c)
Econet Network Module	£43(d)
Archimedes Printer Lead	£7(d)
Archimedes Colour Monitor Lead	£7.50(d)
IEEE Interface Podule	£283(b)

(Full implementation of IEEE 488 & 488A) Spec on request

Armadillo Sound Sampler	£105(b)
Fourier Transform Software	£40(d)
ARC/BBC Serial Link	£25(d)
ARC External Drive Adaptor	£30(d)
External 5.25 Drive	£104(b)

BOOKS: (no VAT)

Arc. Ref Manual	£29(b)
ARM Assy Lang Prog	£12(d)

SOFTWARE:

PC Emulator Version 1.20	£99(d)
--------------------------	--------

(includes MS-DOS 3.2)

LANGUAGES:

ANSI C	£95(c)	ISO PASCAL	£95(c)
Prolog X	£181(b)	FORTRAN 77	£95(c)
LISP	£181(b)	COMAL	POA

PROGRAMMERS TOOLS:

TWIN Editor	£29(d)
Toolkit Plus Module	£41(d)
Software Dev T/Box	POA
Software Dev Debug T/box	POA

WORDPROCESSORS

First Word Plus	£79(d)	View SKM31 (e)	£47(d)
Graphics Writer	£27(d)	Interword (e)	£35(d)
PipeDream	£99(d)	Wordwise +	£20(d)

SPREADSHEETS

Logistix	£95(d)
(Includes spreadsheet/database/timesheets/graphics)	
Matrix 3D	£159(c)

(3 Dimensional s/sheet with 19k col, 10k row & 100 pages)

Sigmashet	£59(d)	Viewsheets SKM7 (e)	£47(d)
Intersheet (e)	£35(d)		

GAMES:

Zarch	£17(d)	Minotaur	£11(d)
-------	--------	----------	--------

Software packages marked with (e) run under 6502 emulated mode.
Please check on availability of some of the above packages

ACCOUNTING SOFTWARE

Minerva's suite 5 Modules (ea)	£54(d)
Order Processing, SalesLedger, StockManager, Purchase Ledger & Nominal Ledger	

Special Offer

FREE £115 inc vat VOUCHER

with every Archimedes model 310 and 440 purchased from us.

The voucher can be redeemed against any future purchase from us (inc Arc monitor, PC Emulator (at £60), discs, cables, paper etc.)

Additionally we will offer discounts upto 10% on Archimedes software and 5% on Archimedes hardware stocked by us.

GRAPHICS/ART/CARD

Artisan	£30(d)	GammaPlot	£30(d)
Artisan Support	£17(d)	System GammaPlus	£59(d)
Autosketch	£69(d)	Interchart (e)	£25(d)
Presenter	£24(d)		

(Allows importing of text into First Word+)

DATABASES

Deltabase	£26(d)	ViewstoreSKM07(e)	£47(d)
System Delta+	£57(c)	Alphabase	£39(d)
Prog Ref Guide	£26(c)		
Support modules for System Delta Plus each	£35(d)		
CCMEGA 3			£82(c)

(incl. Interword/sheet/chart) (e)

FILE STORE

Acorn's new file server system	
Filestore E01	£825(a)
Filestore E02	£699(a)
Full details on request	

ECONET ACCESSORIES

Econet Starter Kit	£85(b)	Econet Bridge	£174(b)
Econet Socket Set	£29(c)	Printer Server Rom	£41(d)
File Server Level II	£75(b)	10 Station Lead Set	£26(d)
Master FS Utility Disc	£17.25(d)		

ECOLINK

Ecolink allows you to connect a PC/XT or AT to an econet network. Supplied complete with comprehensive manual, software and cable.
Full spec on request £299(b)

technoCAD

To be launched soon

The most comprehensive CAD system for the Master. Host of innovative features for creating complex drawings, pcb layouts, sketches etc. Virtually no restrictions on drawing sizes. On screen scaling for plotters, variety of screen dumps for compatible printers.

FREE

evaluation disc available to any educational establishment. A handling charge of £3 for others. The disc contains operating instructions and will perform as release version except for file functions.

MASTER SERIES

AMB15 Master 128K	£356(a)		
Includes free Educational/Fun software bundle from BBC Publications range (RRP £40) and a STARdataBASE package worth another £40.			
ADC06 Turbo 65C102 Module	£115(b)		
ADC08 512 processor	£99(b)		
includes MS-DOS and GEM Suite			
ADF10 Econet Module	£40(c)	Acorn Rom Cartridge	£13(d)
ADJ22 Ref Manual I	£14(c)	ADJ23 Ref Manual II	£14(c)
View User Guide	£8.50(d)	V/sheet User Guide	£8.50(d)
TRC2 ROM Cart	£7.50(d)	TRC44ROM Cartridge	£11(d)
TRC32 32K RAM Cart.	£21(d)	Master Dust Cover	£4.75(d)
Acorn 32016 Co Processor	£949(a)		
Acorn X25 Gateway	£2175(a)		
Acorn IEEE Interface (for B, B+ Master)	£265(b)		
Universal CoProc Adapter	£49(b)		
BBC Domesday System	£3,750(2x a)		

Send for detailed list of DOS software for 512

MASTER SUMMER SPECIAL

Master AMB15+512 Co-Processor for only £420(a)

(Allow £5 extra if you would like us to fit the card for you)
512 upgrade includes 80186 processor with 512K RAM, DOS+, GEM Suite (Desk Top, Paint & Write) and Mouse

This offer valid while stocks last.

Ask for our list of DOS software compatible with 512.

MASTER COMPACT

All Compact systems come complete with 128K of RAM, 640K 3.5" double sided drive and educational software. Additionally we include our Education/Fun software bundle to the package.

SYSTEM 1 Entry system	£310(a)
SYSTEM 2 with 12" Hi Res Mono Monitor	£365 (2xa)
SYSTEM 3 with 14" Med Res Col Monitor	£475 (2xa)

Compact 2nd Drive Kit	£90(c)
Serial Kit	£25(d)
TV Modulator	£26(c)
Mertec Adapter	£35(c)
(upgrades Compact to almost Master level)	
External Drive adapter Cable	£9(d)

UPGRADE KITS

1.20S ROM	£15(d)	ADFS ROM	£26(d)
DNFS ROM	£19(d)	1770 DFS Kit	£49(d)
BASIC II ROM	£22.50(d)	Econet Kit	£55(d)

EPROMS/RAMS

2764-25, 27128-25 (12.5V Vpp), 27128-25 (21.0V Vpp), 6264LP-15, 27256, 27512

All prices on application

RAM/ROM EXPANSION

ATPL Board for Model B. Simple to instal, no soldering. Allows expansion to 15 Roms + 2*8K RAMS	£37(c)
ATPL Battery backup kit	£18(d)
ATPL Board for BBC+ (10 Roms)	£31(c)

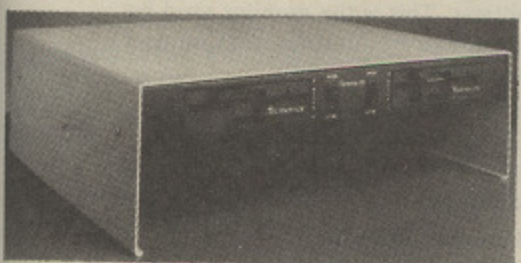
TECHNOMATIC DISC DRIVES



TS 400

A range of high quality high performance drives to meet the needs of all BBC Micro Users.

- All drives fitted with high quality, slim line Mitsubishi drive mechanism and necessary cables.
- *All drives are fitted with high quality slim line ultra low power mechanisms capable of single and double density operation and offering fast track access and head setting times. Our confidence in their quality enables us to offer a **two year parts and labour warranty** on these mechanisms without any extra charge.
- *5.25" floppy drives are fitted with 40/80 track switches as standard at no extra cost. The switches are located in the front and clearly marked to indicate the status at a glance.
- *The mechanisms are set inside attractively styled, sturdy metal casings painted in BBC beige colour.
- *All drives fitted with all necessary leads and are ready for operation on unpacking. The drives with the mains power supply are supplied with a mains lead fitted with a suitably fused 13A moulded plug.
- *TECHNOMATIC drives stand out from other drives because of the high quality of construction and use of reliable switchmode power supply units on dual drives.



PD 800P

5.25" Single Drives 40/80 switchable:

TS400 400K/640K **£90(b)**

PS400 400K/640K with integral mains power supply **£101(b)**

5.25" Dual Drives 40/80 switchable:

TD800 800K/1280K **£170(a)**

PD800 800K/1280K with integral mains power supply **£190(a)**

PD800P 800K/1280K with integral mainspower supply and monitor stand **£209(a)**

3.5" 80T DS Drives:

TS351 single 400K/640K **£69(b)**

PS351 single 400K/640K with integral mains power supply **£85(b)**

TD352 Dual 800K/1280K **£126(b)**

PD352 Dual 800K/1280K with integral mains power supply **£149(b)**

Combo Drives (5.25" & 3.5" drives)
PD853 with integral psu **£175(a)**
PD853P with integral psu **£195(a)**

DISC DRIVE MULTIPLEXER
see page 5 of this ad for details
For Master, B, B+ and any DFS/ADFS
TDM2 Two computers/one drive unit **£65(b)**
TDM4 Four computers/one drive unit **£115(b)**

TECHNOMATIC WINCHESTERS

Technomatic offer the most popular range of Winchester drives for BBC micro systems at competitive prices. The drives are fully compatible with Acorn ADFS system. Fan cooled switch mode power supply ensure efficient and reliable operation. Combination of floppy and winchester drives in our elegant plinth housing provides an ideal solution for need to have large storage and ease of transferring data to floppies.

Technomatic front end utility for the Master supplied with the winchesters at no extra cost provides an easy and efficient file management system. The entire contents of the drive are displayed on the screen on boot up, each file or directory appearing as an icon. The icon type indicates whether directory or file and type of data if latter.

Larger capacity drives available on request.

P20HD TECHNOMATIC 2 Mbyte Winchester Drive **£419(a)**

P30HD 30Mb Winchester Drive **£435(a)**

P40HD TECHNOMATIC 40 Mbyte Winchester Drive with Acorn ADFS ROM **£669(a)**

P204HP TECHNOMATIC 20 Mbyte Winchester and a 80T DS floppy Drive built in a monitor stand. Includes ADFS Rom. **£609(a)**

P2041HT As P204HP but also with a 10 Mbyte tape streamer backup unit and backup utilities. Includes ADFS Rom. **£1179(a)**

TS10 10 Mbyte Tape Streamer Backup unit with utilities. **£546(a)**

TFC10 10 Mbyte Pre-formatted Cartridge for use with P2041HT and TS10. **£21(d)**

Technomatic Winchesters can be adapted to operate with the SJ Research FileServer by internal modification. However this must be specified at the time of ordering otherwise the drive has to be returned to us for modification.

Adaptor for SJ FileServer **£28**

WINCHESTER Drive Multiplexer

These units let you share a Winchester drive between a number of computers. Full details on request.

TWM2 for two computers. **£99 (b)**

TWM4 for four Computers. **£149 (b)**

BULK DISCS

50 5.25" 40 T single sided discs with sleeves in lockable box. **£25(b)**

50 5.25" 80 T double sided discs with sleeves in lockable box. **£32(b)**

50 3.5" 80T double sided discs with sleeves in lockable box. **£60(b)**

FLOPPICLENE DRIVE HEAD CLEANING KIT

5.25" Kit with 20 disposable discs **£14.00(d)**

3.5" Kit with 20 disposable discs **£14.75(d)**

DISC STORAGE BOXES

DB340 Lockable 40 x 3.5" **£8.50(c)**

DB550 Lockable 50 x 5.25" **£6.50(c)**

DB570 Lockable 70 x 5.25" **£8.50(c)**

DB5100 Lockable 100 x 5.25" **£10.50(c)**

3M FLOPPY DISCS

5.25" Discs in packs of 10

744 40T SS DD **£6.75(d)**

745 40T DS DD **£9.75(d)**

746 80T SS DD **£12.00(d)**

747 80T DS DD **£12.75(d)**

3.5" Discs in packs of 10

80T SS DD **£13.50(d)**

80T DS DD **£15.00(d)**

(Add £1 for library case packing)



PRINTERS

EPSON		
LX800	£179(a)	LQ500 £279(a)
FX800	£309(a)	LQ850 £419(a)
FX1000	£405(a)	LQ1050 £589(a)
EX800	£409(a)	LQ2500+ £849(a)
EX1000	£549(a)	
GQ3500 Laser Printer £1249(a)		
Taxan KP815	£159(a)	Taxan KP915 £275(a)
Star LC10		£175(a)
Star LC10 Colour		£229(a)
NATIONAL PANASONIC		
KXP1081*	£145(a)	KXP1082* £172(a)
(*includes Wysiwyg ROM + Master Lead)		
KXP3131 with 38K buffer		£245(a)
Canon PW1080		£179(a)
Canon Laser LBP8-II		£1595(a)
Brother HR20 Daisy Wheel		£349(a)
Juki 6100 Daisy Wheel		£295(a)
Integrex Colour Inkjet		£515(a)

PLOTTERS

Hitachi 672XD A3 4 Colour HPGL	£499(a)
Plotmate A4S	£379(a)
Plotmate A3M	£549(a)
Roland 880 A3 Flat bed 8 col	£599(a)
Variety of Plotter pens and accessories in stock.	
Larger Plotters available. Please enquire.	

EPSON LQ500

Epson's budget 24pin letter quality printer provides unrivalled print quality with two built in letter quality fonts and widest repertoire of type styles at low cost. Sans Serif and Roman or draft font can be selected from the front panel. Maximum resolution of 360 x 180 dpi. Friction and tractor as standard. Parallel interface. Designed for low noise operation 55dB(A). Introductory price incl. master lead **£279(a)**

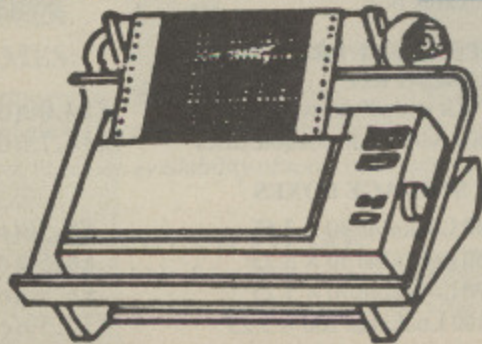
EPSON LX800

Epson's latest budget printer offers a host of new features all utilising Epson's unrivalled knowhow of printer technology and reliability.

- ★ 180 cps draft/25cps NLQ ★ two modern fonts as std: Sans Serif and ROMAN. NLQ font selection from front panel ★ Tractor and friction feed
- ★ Single sheet guide with auto load switch. Original + 2 copies.
- ★ 3K input buffer with character downloading facility
- ★ Fully compatible with BBC & IBM graphics
- ★ Centronics interface as standard
- ★ Price including BBC master lead **£179(a)**

PRINTER STAND

A new style printer stand with easy paper feed and paper separation, provides complete access to paper. Can be used with both top and bottom paper feed. Very space efficient. **£26 (b)**



PRINTER BUFFERS SHARER & CONVERTERS

TSB 256 Auto Sharer/Buffer

256K buffer with 3 input ports. Each port scanned automatically every 10 secs until data found. PAUSE, COPY and RESET Facilities. Full spec on request. **£169(a)**

Smart Printer Buffers

Facilities include: COPY upto 265 copies PAUSE, RESET, Self-Test.

For serial: X-on/X-off, ETX/ACK or DTR/DTS protocols independently selectable baud rate for each port

PP256 256K Parallel buffer **£169(b)**

SS256 256K Serial buffer **£189(b)**

Parallel Multi-Spoolers

Allows connecting 2 printers to 2 or 4 computers Butter allows quick dumping of data to free the computers

COPY allows upto 999 copies, SELF-TEST, PAUSE, CLEAR

MS422 4computers/2printers 512K buffer **£299(b)**

MS223 2computers/2 printers 512K buffer **£199(b)**

Auto switching Printer Sharers

Allows 2, 4 or 8 computers to share 1 printer

Auto Self Test, READY and BUSY indicators

	Parallel	Serial
2 input/1 output	£49	£49(c)
4 input/1 output	£59	£69(c)
8 input/1 output	£85	£85(c)

All units fitted with 25D Connectors

Serial/Parallel/Serial Converters

Compact economical converters which support X-on/X-off, ETX/ACK, DTR/DSR protocols

C-PS Parallel/Serial converter **£35(c)**

C-SP Serial Parallel converter **£35(c)**

Add £49 to above prices for units with 64K buffer

Manual Printer Sharers:

(All lines are switched).	Parallel	Serial
2 computers to one printer	£25(c)	£25(c)
3 computers to one printer	£39(c)	£39(c)
4 computers to one printer	£45(c)	£45(c)
2 computers to 1 or 2 printers	£49(c)	£49(c)

Cable sets for above sharers available for all popular computers

BBC Computer Sharer: TCS26

1 computer to 2 printers fitted with BBC cable **£21(c)**

Paper & Labels

Plain fanfold paper with microperforation:

2000 sheets 9½ x 11"	£12(£3.50)
2000 sheets 14½ x 11"	£18.50(£4.50)
1500 sheets A4 90gsm	£18.00(£4.00)

Labels/1000

Single Row 3½ x 17/16	£5(d)
Triple Row 27/16 x 7/16	£5(d)
OHP Transparencies A4	£55(b)

PRINTER LEADS

BBC/Master Parallel Lead (1.2M)	£5(d)
BBC/Master Parallel Lead (2.0M)	£7(d)
Compact Parallel Lead (1.2M)	£7(d)
Archimedes Parallel Lead (2M)	£7(d)

MODEMS

MIRACLE WS4000 V21/23	£129(b)
MIRACLE WS3000 V21/23	£244(b)
MIRACLE WS3000 V22	£379(b)
MIRACLE WS3000 V22 bis	£495(b)
Pace Linnet	£139(b)
(All modems are BAPT approved)	
BBC Data Cable for WS3000/4000	£10(d)
MIRACLE WS2000V21/23 & BELL stds	£92(c)

MONITORS

All Monitors supplied with a suitable lead.

12", 14" and 20" MONITORS

Microvitec 1431 Std Res, 14"	£179(a)
Microvitec 1431AP Std Res + PAL/Aud, 14"	£199(a)
Microvitec 1451 Med Res, 14"	£225(a)
Microvitec 1451AP Med Res + PAL/Aud, 14"	£255(a)
Microvitec 1441 Hi Res, 14"	£359(a)
Philips 8833 14" RGB Med Res, 14", high contrast screen, TTL/Linear Input, Mono/Colour Switch Sound Input. Separate controls for brilliance and contrast. This is the monitor used by Acorn with Archimedes and Compact Computers.	£219(a)
Sanyo CRT 70 14" High Resolution Colour Monitor Compatible with Master, B, Compact, and PC compatibles	£149(a)
Microvitec 2030CS 20" Standard Resolution RGB/Comp Video	£380(a)
Microvitec 2040CS 20" High Resolution RGB/Comp Video	£675(a)
TAXAN SUPER VISION 620 12" Hi Res/Hi Contrast Option to switch to green/amber BBC/IBM Compatible	£269(a)
TAXAN SUPER VISION 625 12" Super Hi Res and contrast RGB Monitor with option to switch to mono BBC/IBM compatible.	£319(a)
TAXAN 770+ MultiSysnc Autoscan 14", ideal for utilising the hi res modes on Archimedes. Our price includes a tilt & swivel stand	£495(a)
NEC MultiSync II 14" Enhanced version of the original NEC MultiSync complete with tilt & swivel base. Suitable for Archimedes and PC compatibles.	£489(a)

MONOCHROME MONITORS

PHILIPS 7552

14" green screen monitor. This is a new addition to the Philips' popular mono monitors. Features include Flat screen Reverse video switch, separate brilliance and contrast controls **£85(a)**

PHILIPS BM 7502

Hi Res green screen **£72(a)**

PHILIPS BM 7522

Hi Res amber screen **£79(a)**

Tilt & Swivel Stand for Philips Mono **£6(c)**

MONITOR ACCESSORIES

Microvitec Swivel Base (14" plastic monitors)	£17(c)
Monitor Stand Models B & B+	£10(c)
Monitor Stand Master	£13(c)
Double Tier Stand Models B, B+ or Master	£24(b)
Taxan RGB Lead	£7(d)
Microvitec Lead	£4(d)
Monochrome BNC/Phono Lead	£4(d)
Copy Holder Self Supporting A4	£15(c)

TECHNOMATIC

17 Burnley Road, London NW10 1ED Tel: 01-208 1177

CAD/DRAWING PACKAGES

NOVACAD Cad Package for B, B & MASTER. (See page 5 for specification)	
Tracker Ball/Mouse Version (TM)	£49 (d)
TM Version plus Tracker Ball	£94 (d)
TM Version plus Mouse	£79 (d)
Plotter Driver Generator	£15 (d)
<i>If purchased with Novacad</i>	£12 (d)
MOUSE	
AMX MOUSE with SUPER ART (pse specify B, B+ or Master)	£59 (d)
STOP PRESS (Pagemaker)	£32 (d)
EXTRA/EXTRA (utility for the Pagemaker)	£19 (d)
MAX	£17 (d)
STAND ALONE MOUSE	£34 (c)
RB2 TRACKER BALL	
RB2 Tracker Ball with Icon Master (for B, B+ & Master)	£59 (c)
RB2 Tracker Ball with Cursor Control Rom (for Master only)	£59 (c)
RB2 Tracker Ball 'Stand Alone' for use with NOVACAD & other software)	£47 (c)
Cursor Control Rom for Master	£12.50 (d)
MIRRORSOFT FLEET	
STREET EDITOR	£35 (d)

TIME WARP

Real Time Clock, Plugs into the user port, battery back up as standard, includes manual, demo software including a diary/planner application program

£29 (d)

BBC SOFT/FIRMWARE

DATABASE MANAGEMENT SYSTEMS

VIEWSTORE	£36 (d)
STARdataBASE	£39 (d)
MASTERFILE II	£17 (d)
ACORN OVERVIEW PACKAGE Special Offer (RRP £86)	£69 (b)
INTERBASE	£49 (d)

WORD PROCESSORS

ACORN VIEW PROFESSIONAL (BBC)	£69 (c)
VIEW 2.1	£35 (d)
VIEW 3.0	£45 (c)
Double View Rom Version	£42 (d)
Double View Disc Version (for Master & Compact)	£33 (d)
VIEW INDEX	£12 (d)
VIEW PRINTER DRIVER GENERATOR	£8 (d)
VIEWSPELL	£29 (d)
DOT PRINT PLUS	£28 (d)
WORDWISE	£24 (d)
WORDWISE PLUS	£38 (d)
WYSIWYG PLUS	£21 (d)
SPELLMASTER	£42 (d)
INTERWORD	£36 (d)
WORDEASE	£24 (d)
SPELLCHECK III	£31 (d)
EDWORD II	£43 (c)

SPREADSHEETS

VIEWSHEET	£36 (d)
WINDOMATIC (A Viewsheet Utility)	£15 (d)
VIEWPLOT	£22 (d)
INTERSHEET	£37 (d)
INTERCHART	£25 (d)
ULTRACALC	£26 (d)
MINI OFFICE II DISC Version For B & B+ 40T or 80T	£14 (d)
For Master 80T	£16 (d)
For Compact	£19 (d)
MINI OFFICE II ROM Version For Master, Compact, B+ & B	£43 (c)
MEGA 3Rom	£76 (b)
CC's integrated package offering Interword, Intersheet & Interchart on one 128K ROM. For Master, Compact, B+ & B	

LANGUAGES

META ASSEMBLER	£145 (b)
TEAM DISASSEMBLER	£145 (b)
MACROM	£33 (d)
ACORNSOFT 'C'	£40 (c)
ACORN MICRO PROLOG	£62 (d)
ISO-PASCAL	£51 (c)
ISO-PASCAL STAND ALONE GENERATOR	£30 (d)
OXFORD PASCAL (40 or 80T) Specify B or B+	£36 (d)
OXFORD PASCAL for Master	£52 (d)
ACORN LOGO	£46 (c)
LOGOTRON LOGO	£55 (c)
BBC PUBLICATIONS OPEN LOGO	£59 (c)
ACORN LISP ROM	£39 (d)
ACORN FORTH ROM	£39 (d)
ACORN COMAL ROM	£39 (d)
Advanced BASIC Disc (for B, B+ & Master + 6502 2nd Processor)	£26 (d)
MICROTEXT	£52 (c)
MICROTEXT PLUS	£229 (b)

COMMUNICATIONS

TERMULATOR	£25 (d)
COMMSTAR II	£28 (d)
MAYA Comms Package See next page for details	£49 (d)
MODEM MASTER	£11 (d)
COMMAND	£34 (d)
MASTER TERMULATOR	£34.75 (d)

UTILITIES

ACORN ADFS ROM	£26 (d)
ACORN BASIC EDITOR	£24 (d)
MONITOR (BBC Pub)	£19 (d)
SLEUTH	£23 (d)
TOOLKIT PLUS	£31 (d)
TOOLBOX 2 (BBC Pub) Manual Cassette	£9.50 (d) £9 (d)
ACORN GXR GRAPHICS ROM specify B or B+	£24 (d)
PRINTMASTER	£24 (d)
PRINTWISE	£24 (d)
DUMPMASER	£26 (d)
FONTWISE PLUS	£17 (d)
ADV TELETEXT UTILITIES ROM	£7.95 (d)

COMPACT (all on 3 1/2" disc)

ARTROOM	£27 (d)
FONTWISE +	£22 (d)
FONT EDITOR	£22 (d)
BETABASE	£27 (d)
WHITE KNIGHT MKII	£16 (d)

BBC PUBLICATIONS EDUCATIONAL SOFTWARE

A series of programs developed in many cases alongside Radio & TV programmes by BBC's Education Department which supplement the classroom studies by moving and colourful displays helping in clear understanding of a variety of subjects. Some packages also include audio cassettes.

PRIMARY EDUCATION

ASTRONOMY	£11 (d)
COMPUTERS AT WORK Aud/EC/disc	£16 (c)
PICTURE CRAFT	Disc £17 (d)
INTRODUCING GEOGRAPHY	Disc £16 (d)
MATHS WITH A STORY 1	Cass £8 (d)
MATHS WITH A STORY 2	Cass £8 (d)
NUMBER GAMES	Cass/EC £7.50 (d)
USING YOUR COMPUTER	Cass £24 (c)
THE HALL OF MIRRORS	Disc £13 (d)
MATHS	Disc + Aud Cass £17 (d)

SECONDARY LEARNING

TECHNOLOGY & DESIGN Pt1	£21.50 (c)
ELECTRIC FIELDS	£10.50 (d)
ADVANCED LEVEL	
STUDIES: STATISTICS	Disc £23 (d)
ADVANCED STUDIES:	
GEOGRAPHY	Disc £17 (d)
INSIDE INFORMATION	Prog Cass £10 (d)
	Book £8 (d) Audio Cass £5 (d)
OPEN LEARNING	
PACK	Disc/Aud Cass + book £36 (b)
SCIENCE TOPICS (ST)	
S.T.: WAVES	Disc £14 (d)
S.T.: RELATIONSHIPS	Disc £14 (d)
S.T.: BONDING	Disc £14 (d)
S.T.: ELECTROMAGNETIC SPECTRUM	
S.T.: ELECTRONICS IN ACTION	Disc £14
S.T.: NEWTON & THE SHUTTLE	Disc £19
S.T.: ECOLOGY	Disc/EC £19
S.T.: POLYMERS	Disc/EC £19 (d)
S.T.: CLASSIFICATION & PERIODIC TABLE	Disc £20 (d)
S.T.: FOOD & POPULATION	Disc £20 (d)
SEC. SCIENCE	
MICROTECHNOLOGY	Cass £7 (d)
SEC. SCIENCE: THE MOLE CONCEPT	Disc/Aud/EC £16 (c)
BIRD SPY	Disc £13 (d)
GEORDIE Racer	Disc £13 (d)

GENERAL

VU-TYPE PROFESSIONAL	Disc £19 (d)
WHITE KNIGHT MK II (for 1770 DFS)	Disc £16 (d)
BATTLEFIELDS	Cass £8.50 (d)
A VOUS LA FRANCE	Disc £20 (d)
	Book £5.25 (d) Aud Cass (2) £7 (d)
ESPANA VIVA	Disc £19 (d)
	Audio Cass (2) £8 (d) Book £6.95 (d) (2) £7.50 (a)
DEUTSCH DIREKT	Disc/aud/EC £16 (c)
	Book £5.95 (d)
BLACK QUEEN	
A long awaited bridge game. (1770DFS)	£13 (d)
BISMARCK	
History of the famous battleship. (1770DFS)	£13 (d)

All software in this advertisement has been tested to work with appropriate Acorn Disc Filing Systems only and we are unable to comment on compatibility with any other filing system. It will be the buyers responsibility to verify such compatibility.

BOOKS

No VAT Carriage Code (c)

LANGUAGES	
6502 Assy Lang Prog.....	£19.95
6502 Programming.....	£13.95
8086 Book.....	£23.95
Acorn BCPI User Guide.....	£15.00
Acorn FORTH.....	£7.50
Acorn LISP.....	£7.50
Acorn ISO Pascal Ref Manual.....	£10.00
Intro to COMAL.....	£10.00
Intro to LOGO.....	£7.50
Micro Prolog Ref Manual.....	£10.00
Introduction to Turbo Pascal.....	£14.95
Prog the Micro with Pascal.....	£8.50
The Supervisor's BBC Micro.....	£10.95

BBC MICRO GUIDE BOOKS

Inside Information.....	£8.95
Maths Prog in BBC Basic.....	£7.95
The Friendly Computer Book.....	£4.50
Toolbox 2.....	£10.95

ARCHIMEDES

Archimedes Reference Manual.....	£29.95(b)
ARM Assembly Language Prog.....	£12.95(b)

PROGRAMMING/UTILITY

Advanced Sideways Ram User Guide.....	£9.95
Advanced User Guide (BBC).....	£15.95
Applied Assembly Language on the BBC.....	£9.95
BBC Micro Advance Programming.....	£9.95
BBC Micro Ref Guide (B Smith).....	£10.95
BBC Micro Sideways ROM's RAM's.....	£9.95
Guide to the BBC Rom.....	£9.95
Beginners Guide to W.P.....	£7.95
Mastering Assembly Code.....	£8.95
Mastering Interpreters & Compilers.....	£14.95
Master Operating System.....	£6.95
Mastering View, Viewsheets & Viewstore.....	£12.95
View by B. Smith.....	£12.95
View 3.0 User Guide.....	£9.00
Viewstore User Guide.....	£9.00
Viewsheets User Guide.....	£9.00
Wordwise Plus.....	£9.95

SOUND & GRAPHICS

Computer Graphics & CAD Fundamentals.....	£9.95
Mastering Music.....	£6.95

DISC DRIVE SYSTEMS

Advanced Disc User Guide.....	£16.95
Disc Book.....	£3.50
Disc Programming Techniques.....	£7.95
Disc Systems.....	£6.95
File Handling on the BBC.....	£6.95
Discovering Disc Drives.....	£POA
Practical Disc File Techniques.....	£5.95
Mastering the Disc Drive.....	£12.95
Mastering DOS plus.....	£12.95

APPLICATIONS

Interfacing Proj for BBC.....	£6.95
BBC and Small Business.....	£5.75
The Software Business.....	£5.50

Mastering Operating System

(David Atherton).....	£6.95
-----------------------	-------

Check on new books in stock

PRINTER ACCESSORIES

EPSON ACCESSORIES:	
8143 RS232.....	£32 (d)
8148 + RS232 + 8k.....	£79 (d)
IEEE 488.....	£40 (d)
Apple II.....	£40 (d)
Colour option of EX800/1000.....	£55 (d)
TRACTOR FEEDERS	
LQ800.....	£44 (b)
LQ1000.....	£55 (b)
LQ850.....	£70 (b)
LQ1050.....	£85 (b)
LQ2500+.....	£90 (b)
EX800.....	£85 (b)
EX1000.....	£90 (b)
SHEET FEEDERS:	
LQ800/850.....	£159 (b)
LQ1000/1050.....	£189 (b)

EX800/FX800.....	£159 (b)
EX1000/LQ2500+.....	£225 (b)
FX1000.....	£189 (b)
Ribbons:	
FX/FX100/100+, FX105.....	£7 (d)
RX/FX80, FX85/800.....	£4 (d)
LX80/LX800.....	£4.50 (d)
LQ800/850.....	£6 (d)
LQ1000/1050.....	£7.75 (d)
EX800/1000 Black.....	£7.50 (d)
EX800/1000 Colour.....	£16.80 (d)
H180 Pen Set (Aqueous/Ball point).....	£8.25 (d)
HITACHI 672 Plotter	
Aqueous Pen Set six pens.....	£18.50 (d)
Oil Based Pen Set six pens.....	£25.00 (d)
TAXAN CANON Accessories:	
Ribbon, KP810/815/910/915.....	£6 (d)

Star Printer	
NL10/LC10 Sheet Feeder.....	£55 (b)
NL10/LC10 Ribbon.....	£4.50 (b)
National Panasonic KX P1080/81	
Spare Ribbon.....	£4.50 (d)
KXP3131 Tractor.....	£90 (a)
KXP3131 Sheet Feeder.....	£189 (a)
KXP3131 Ribbon.....	£4.50 (d)
JUKI 6100	
Tractor Feed.....	£149 (a)
Sheet Feeder.....	£219 (a)
Ribbon (Carbon).....	£2.00 (d)
BROTHER HR20	
Sheet Feeder.....	£229 (a)
Tractor Feed.....	£116 (a)
Spare Ribbon Nylon.....	£3.00 (d)
Spare Ribbon Carbon.....	£4.50 (d)

INTEGREX INK JET COLOUR PRINTER

Spare Ink Cartridge Black.....	£8 (d)
Spare Ink Cartridge Colour.....	£14 (d)
Paper Roll.....	£7 (d)
Printer Leads:	
BBC Parallel Lead (1.2m).....	£6 (d)
PAPER & LABELS	
Plain Fanfold paper with micro perforations:	
2000 sheets 9½" × 11" 60 gsm/sq m.....	£18.50 (£4.50)
2000 sheets 14½" × 11" 60 gsm/sq m.....	£18.50 (£4.50)
1500 sheets A4 90 gsm.....	£18 (£3.50)
Labels/1000:	
Single Row 3½ × 1½".....	£5.25 (d)
Triple Row 2½ × 1½".....	£5 (d)

WYSIWYG PLUS

WYSIWYG PLUS is a printer and screen utility for Wordwise Plus, View, Interword, and Basic users supplied on a 16K Eprom. To obtain a particular printer effect, such as enlarged text, it used to be necessary to discover the appropriate 'printer control code' from your manual and incorporate it into your text. Secondly, you had to print several trial copies in order to position the effect correctly in relation to the rest of your text.

WYSIWYG PLUS simplifies this trial and error approach using easily remembered *commands. For example, *ENLARGED not only selects enlarged text on your printer, but uniquely shows you double width characters on your screen, even from within Wordwise Plus!

WYSIWYG PLUS incorporates a logo editor. Just draw your design on screen using the arrow keys, and save the results. Use the *GRAPHICS command to incorporate your design anywhere in your text position and see your design in your text before faithfully reproducing a hard copy.

There is also special help for daisy wheel users. The *WHEEL command will prompt you to change daisy wheels whenever a change in type style is about to occur.

WYSIWYG PLUS is designed to work with the following systems:

BBC Model B	6502 Second Processor,	BBC Master 128
BBC Model B+	Turbo coprocessor	All printers (Except lasers)

WYSIWYG PLUS workspace is relocatable.

£21(d)

MAYA TERMINAL EMULATOR

A comms package for the professional user. MAYA emulates DEC VT52, VT100 and Tandberg TDV2215. Special BBC VDU mode allows full access to the BBC VDU driver.

Menu driven software allows the setting up of parameters and function key definitions which can be saved to disc for future use.

Flexible command parser provides a uniform user interface and allows full access to * commands and HELP facilities.

Xmodem and Kermit file transfer protocols are included as standard. Unique feature of MAYA is that Kermit can also be used in 'remote mode', which allows file transfers to be initiated by other computers connected to the BBC. File transfers can also be done with a 'dumb' ASCII protocol. Open architecture allows for expansion and addition of new features. Options currently under development are graphics drivers for Tektronix 4010/4014 emulation, TDGR driver for TDV2215 and a Viewdata patch (provisional version included in the current issue). Registered users will be provided with regular updates and customisation service will also be available to those interested.

The package comprises of a rom, utils disc and a comprehensive manual. It is compatible with Master Models B & B+. It supports DFS, ADFS, NFS and ANFS filing systems.

£49(d)

BLACK QUEEN

A contract bridge program from BBC Publications both for beginners and for club players. Features include rebid and/or reply of any deal just played. Deals can be saved to a disc. Unique feature of Black Queen is its ability to construct deals from standard or classic ones in newspapers etc.

Compatible with Master, B and B+ £13(d)

EDUCATIONAL/FUN SOFTWARE BUNDLE

Wordmover	Drawstick
Wordplay	Pantry Antics
	Locomotion

These programs are supplied from the BBC Publications Educational Software range and will be supplied on a 5.25" disc for BBC Master, B+ and B and on a 3.5" disc for the Compact.

5.25" Disc £17.50(d)

3.5" Disc £18.50(d)

(Normal RRP over £40)

See the previous page for comments on compatibility.

VU-TYPE

Do you have finger trouble when typing?

Do your letters look like this?

Dear Sor,

I wuold like to...

then you need:

VU-type, a complete touch typing program produced by BBC/Pitman.

It allows you to learn at your own pace and has a wide range of exercises. Screen displays show the keys you have pressed and it will report on your speed and accuracy.

Supplied on a 40T Disc with a manual.

Available at a special price of £7.50(d) instead of the usual £15. Offer valid while stocks last.

BISMARCK

An enthralling game of strategy involving the famous German battleship of the same name.

You can play the role of British Navy in its quest to find the Bismarck and sink it or take either British or German role against another player. It requires the highest qualities of judgement, observation and decision to plan strategy and tactics to plot the death of Bismarck.

£13(d)

TECHNOMATIC
MAILORDER & RETAIL
 17 Burnley Road
 London NW10 1ED
 Fax: 01-452 1500
 Telex: 922800

RETAIL SHOPS
 15/17 Burnley Road, London NW10 1ED
 Tel: 01-208 1177 Telex: 922800
 (close to Dollis Hill) Ⓢ
West End Branch
 305 Edgware Road, London W2
 Tel: 01-723 0233, 01-402 0444
 (near Edgware Road) Ⓢ

For fast delivery telephone
 your order on 01-208 1177
 using VISA/Access Card



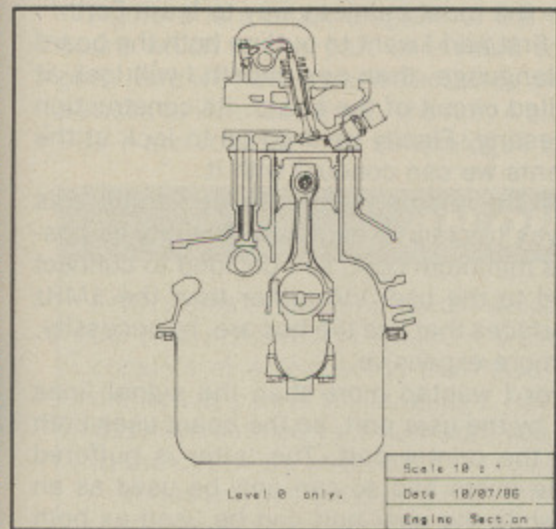
Orders welcome from
 government depts &
 educational establishments

All prices ex VAT.
 Prices are subject to
 change without notice
 Please add carriage
 (a) £8.00 (Courier)
 (b) £2.50
 (c) £1.50
 (d) £1.00

NOVACAD Computer Aided Draughting System

*Novacad can drive a plotter to produce drawings of highest quality...
 Novacad is excellent. It is flexible, genuinely easy to operate
 without much practice, and a pleasure to use.* Beebug Dec 86

A sophisticated CAD package with unique facilities. Thousands of Novacad packages are being used in widely differing fields ranging from industries for producing engineering drawings to accountants offices for producing flow charts. Architects, engineers, plumbers, kitchen planners and many other professions requiring easy to use facilities for producing high quality output are making extensive use of Novacad's unique features. Novacad is proving to be an invaluable teaching aid in technical schools simply because of the ease with which it can be used.



Novacad is compatible with all models fitted with Acorn DFS. Hardware requirements can be minimum; single drive and FX80 compatible printer are enough to get started, though its performance is enhanced considerably by use of 6502 2nd processor, dual drive and to a degree with B+ and Master's shadow ram.

The major features offered are:

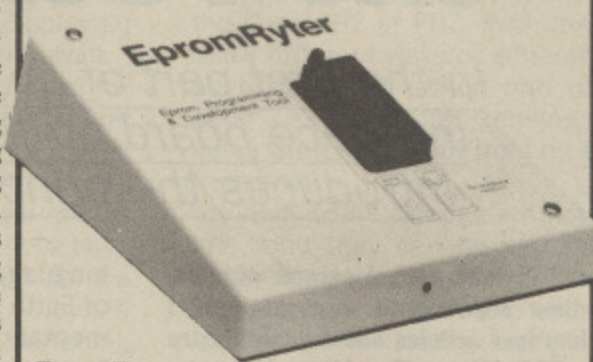
- ★ Simple and easy to use with logical command sequence.
- ★ A large drawing area (approx 15 screens)
- ★ Unique ability to create complex icons made up of upto 500 lines instead of the usual 15 to 20 pixels, store them in a library and recall them at different scales and orientations.
- ★ Zoom facility.
- ★ Create multi level drawings.
- ★ Text entry at any 90° orientation anywhere on the screen.
- ★ Grid scaling and locking, displacement measurements.
- ★ Printer routine for FX80/100 compatible printers
- ★ Cursor control from keyboard/tracker ball/mouse.

Plotter driver generator available as an optional utility, configures a routine for any BBC compatible plotter. Pre configured routines for popular plotters like Epson HI80, Hitachi, Plotmate are included. Drawings can be scaled to maximum plotter size.

NOVACAD T/M Version **£49(d)**
 NOVACAD T/M + Plotter DG **£61(c)**
 Plotter Driver Generator **£15(d)**

EpromRyter

- *Highly sophisticated & Advanced Programmer
- *All current single rail eproms handled
- *State of the Art Programming Algorithms



EpromRyter is a powerful eprom programmer designed for use with the BBC Master Computer. It takes full advantage of the latest developments in the eprom technology and the extra facilities on the Master to provide fast, simple and efficient programming and editing facilities.

The software is totally menu driven and on screen help messages make the programming simple for both specialists and novices alike.

The EPROMRYTER interfaces with the Master through 1MHz bus. It is mains powered with its own psu. 3M Textool zif socket has been fitted to ensure consistent and reliable service over long periods.

The single rail eproms handled by the EpromRyter are:

- 2716 2732 2764 27128 27256 27512 27513 27011 2516 2532 2564 (NMOS & CMOS)
- One time eproms P27XXX, 87CXXX etc.
- Also A suffix eproms such as 27XXXXA

£89(b) + VAT

META Ver III ASSEMBLER

"All the good features you would expect to find in a good source code editor are present ... Meta assembler lives in a different world. It is structured to work with any new processor ... as new instruction sets can be added ... as needed ... has a well featured editor with colour highlighting, a sound modular approach." Acorn User October 1986

- Assembles for over 30 popular processors, including Z80, 6800/01/02/04/05/09/11 etc - and 68000 - using native mnemonics for each processor, eg LD A, (HL) for Z80 and MOV A0, \$1000 for 68000 etc.
- Fully integrated Editor: four field, all search, search/replace, block copy, delete, move, marked save, load etc.
- Compatible with Portal Eprom Emulators and Team Disassembler.
- Send object code in Intel Hex, S-Record, straight binary etc. down to discs, RS232, parallel port, Eprom Emulators etc - all **during Assembly**.
- Over 50 directives included as standard: handling nestable macros, conditional assembly and twenty types of table definition directives.
- 32 bit labels; 31 character names. Arithmetic and Boolean arithmetic to 32 bits.
- Modular source code with numeric and string parameter passing.
- Serial communicator area with eight options lines: echo, control code trap, LF suppression/addition etc.
- Over 500 in use throughout the world in universities and many different industries.
- Two 16K Roms, two 80 track discs, A4 ring-bound manual, function-key strip. **£145(b)**

EPROMER II

A proven Eprom programmer for BBC Model B and B+ with thousands in use in industry, educational and R&D establishments. It offers many of the powerful features of the EpromRyter and can program all single rail eproms upto 27256. Full details on request. **£89(b)**

PORTAL EPROM EMULATORS

- Emulates 2716, 2732, 2764, 27128, 27256, 27512 eproms at 150ns Access time.
 - Load at 4Kbytes/second - No "erase" time.
 - 28 pin header plugs into Eprom socket on target system - status monitored on 13 Leds.
 - Fully software controlled from Meta Assembler.
 - 100 times faster than standard EPROM program/erase cycle.
 - Fully CMOS compatible; draws no power from target system.
 - Four portals may be independently programmed off same user-port cable.
 - Complete with all cables, manual and disc.
- PORTAL 512** (2716, 2732, 2764, 27128, 27256, 27512). **£245(b)**

TEAM DISASSEMBLER

The third part of the Universal Development System: a Meta labelling disassembler.

Supports 1802, 8080, 8085, #HD64180, Z80, 65XX (includes 65 col, 6511 etc), 68XX (includes 00, 01, 02, 03, 08 etc):

- Up to 64K of object code translated back into META compatible source code modules: labels automatically inserted on all jump targets, memory references etc.
- Pre-editing stage allows marking of object code areas as byte, string, word, long word etc, tables. These areas disassembled into appropriate directives instead of garbage mnemonics.
- Reconstituted source code ready for immediate re-assembly by META.
- Omniversal search/replace for re-naming arbitrary label names with meaningful ones. **£145(b)**

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. To obtain your free copy please complete and return the coupon below.

Technomatic is a BBC Computer and Econet Referral Centre providing a professional and reliable service to the BBC user.

NAME

ADDRESS

..... Post Code

Return to Technomatic Ltd, 17 Burnley Road, London NW10 1ED

THE BEEB BODY BUILDING COURSE

A board for all reasons

In the first part of an experimenters' interface board project, Mike Cook introduces the principles involved

In the dim and distant past, I agreed with the editor of a then unpublished magazine that I would write him four articles about adding extra parts to the BBC Micro. *The Micro User* was launched – and here I am at article 60 and to celebrate I am going to look at a bigger project than usual. Not that it will be complicated, but there will be so much to do with it that it will take several articles to cover its potential.

Many schools, colleges and individuals are taking an interest in micro control technology and most of my articles have covered some aspect of the subject. However our new project will attempt to include most areas of control by producing an experimenters' interface board.

I intend to cram as many devices as possible on to one board to enable many different experiments to be undertaken. The board will be totally re-usable and will be supplied in kit form or ready assembled. The latter will find favour with those of you who are not quite sure of your construction ability.

Finally, for the dedicated enthusiast, the printed circuit board will be available separately to allow you to add the components as time and pocket permit.

No project is ever complete without software, and again I want to break with tradition slightly. All the software so far in this series has been written either in Basic or machine code. There are better languages for control applications and to this end I will produce the software in the traditional Basic/machine code mix and also the equivalent routines written in Forth.

This is a language ideally suited for control, as it is extensible – code written becomes part of the

language itself. I shall be using the Acorn version of Forth which, despite not being the best implementation I have seen, will allow easy translation to other versions. So you will have an opportunity to look at a task written in two different languages – the most painless way to learn Forth!

In this first part I want to outline both the board and the language, then next month I will look at the detailed circuit of the board, its construction and its testing. Finally we'll go on to look at the experiments we can conduct with it.

One of the major factors in designing this project was to cram in as much usability as possible at a minimum cost, so I decided to connect the board to the user VIA rather than the 1MHz bus. Interfaces that use the bus are, by necessity, that bit more expensive.

However I wanted more than the signal lines provided by the user port, so the board uses both this and the printer port. The latter is buffered inside the micro and so can only be used as an output, while the user port can be used as both input and output. Therefore most of the output devices will connect to the printer port and the

Forth is a language ideally suited for control, as it is extensible

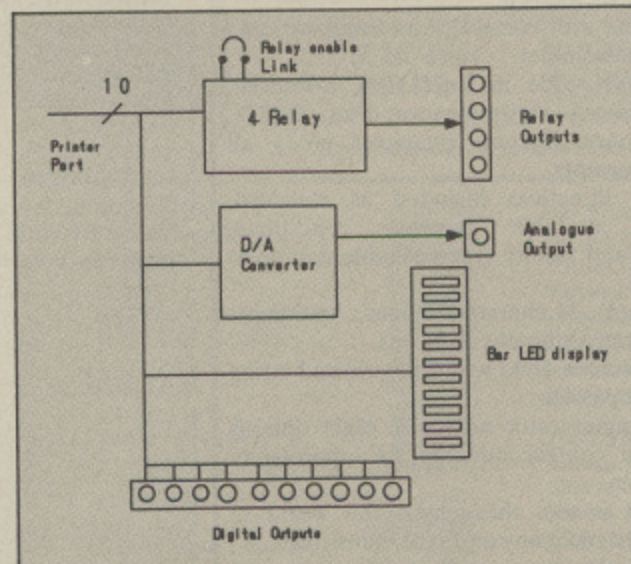


Figure 1: The output side of the board

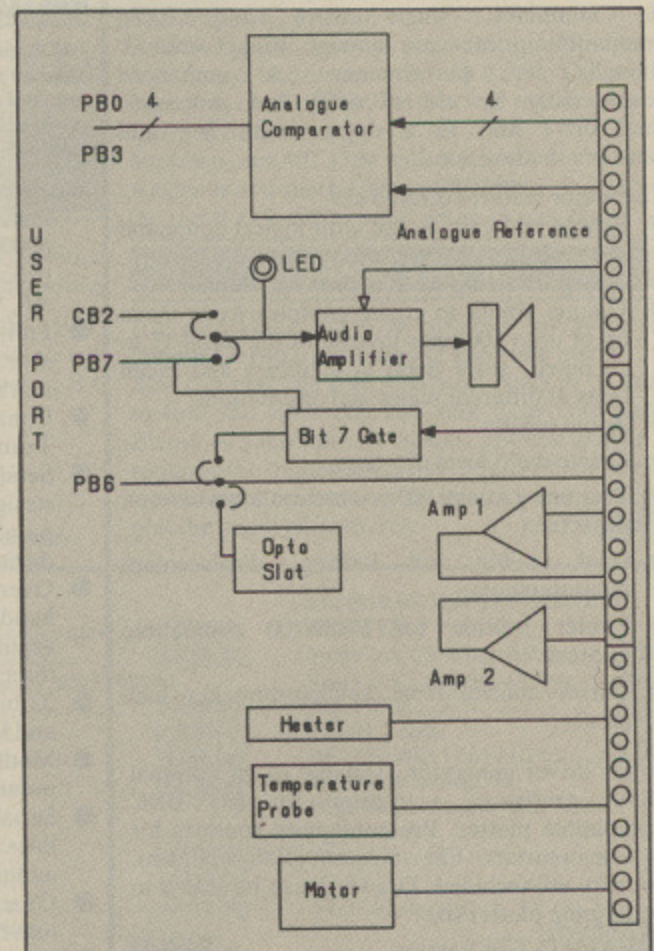


Figure 2: The user port connections to the board

inputs to the user port.

The hardware itself is chosen so that not only is it interesting to control in its own right but also interacts with the other pieces on the board. In addition, you can control external devices.

Figure I is a block diagram of the output section – the part that is connected to the printer port. First the signals are brought out to screw connectors to allow connection to any device. On the way they are also used to drive an LED bar display so you can monitor the logic state of each output.

The outputs are also fed to a digital to analogue converter so we can generate sound waveforms and construct an analogue to digital converter.

Finally four of the lines drive miniature relays, and as it might not always be convenient to have these connected, there is a link that can be broken when you want to disable them. They are double-pole change-over capable of switching one amp and can be used for controlling motors and lamps. Four are sufficient to control a buggy.

Figure II is a block diagram of the rest of the board which is the part connected to the user port. Here we have a more dedicated allocation of devices to interface lines. The first 4 bits – PBO to PB3 – are connected to an analogue comparator

which allows them to be used as simple digital inputs with signals that do not conform to the standard logic levels, as well as those that do. In addition it allows us to compare the level of two analogue voltages which, as we shall see later, allows us to construct several different types of analogue to digital converter.

There is an amplifier and loudspeaker which we can drive from an external signal or from one of the lines CB2 or PB7. With them we can look at many different ways of generating audio signals. An optical slot switch and photo-detector will allow us to perform sensing experiments and using the gated input from bit 6 we can measure frequency.

Finally some devices are not connected to any line, and they can be wired up via the screw terminals when required. We have a heater element and temperature sensor, along with an electric motor fitted with a fan. With them we can construct feedback control systems to regulate motor speed and temperature. Finally there are two amplifiers for general purpose use in boosting signal levels.

● Next month we will be looking at the board's detailed circuit diagram and there will be an order form if you wish to buy one.

AN OUTLINE OF FORTH

Forth works by defining words, which are similar to procedures in Basic. A word normally consists of a few words that have been pre-defined as part of the language. However once you have defined your new word you can use it in the definition of others.

In this way you build up a collection of words until the whole program is just represented by a single one. To execute a word, you simply type it on the keyboard. This means that it is simple to debug a program as you go, by testing each word as you define it. In this way you build up a set of words in the area of application you're interested in – control, in this case.

Forth is the only language I have used that allows the writing of non-trivial programs that work first time. You spend a lot more time thinking about what you are trying to do than clattering at a keyboard unsure of what you are doing.

The one thing that puts beginners to Forth off it is the way it handles the parameters to words – procedures. It uses a stack notation, and I must admit that I did not like this aspect of the language at first. However it is an extremely elegant way of handling numbers and one that you will soon appreciate as you become more proficient in code.

In stack notation, numbers are placed on a push down stack and all operations work on that. For example, take addition. Conventionally we may write:

5 + 4

If you scan that from left to right it says take the number five and perform an addition operation – but to what? We can't do the operation until we read the next number which is four. So what we need to do is to suspend the oper-

ation until all the numbers have been defined – a relatively simple task for us, but a messy and wasteful one for the micro.

With stack notation, operators are executed when they are encountered on parameters

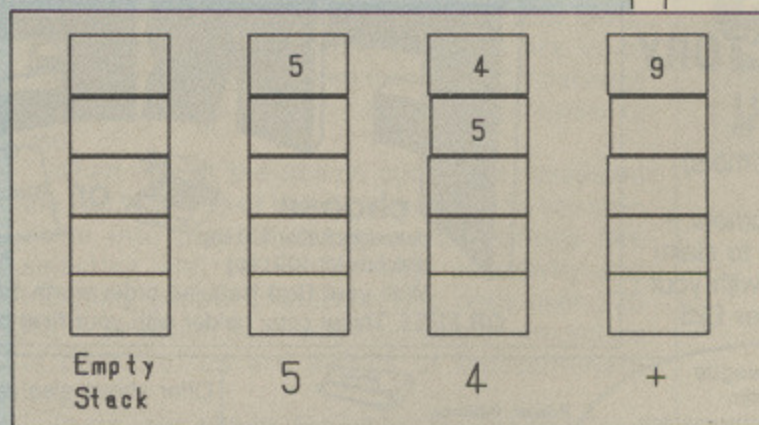


Figure III: Stack operation

already on the stack, so the same expression in Forth would be written:

5 4 +

Scan that from left to right and you will see it is in a much more sensible order. Take the number five, put it on a stack, take the number four, put it on the stack and add. Add what? The top two numbers on the stack. These are removed, added and the answer is placed back on the stack.

This operation is shown graphically in Figure III. You see there is no suspension of operation so the micro works quicker and more efficiently with less memory requirements. This allows Forth to run very quickly compared to a conventional high level language and speeds approaching that of machine code are not uncommon.

The Acorn Forth rom is available at a specially reduced price to readers of *The Micro User*. See the offer on Page 112 for full details.



Dave's been down-under!

Unfortunately, they sent him back. His father did all he could, but to no avail. Apparently David was beating the Aussies at "Hopper" (as well as cricket) and they didn't like it. Anyway, he's back, so if you come to see our full range of BBC software and hardware, disc drives, printers, monitors, cables etc, and you hear an Australian accent, it will only be David showing off. Actually, he sounds better than he used to!

NUMBER ONE IN BROMLEY

Data Store

6 Chatterton Road, Bromley, Kent. Tel.: 01-460 8991

DELTA COMPUTERS

BBC MASTER SERIES

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

DISC DRIVES

5802 400K DS DD	
40/80T	£104.95
5802DB Dual 800K	
40/80T	£204.95
5802D as 5802DB+PSU	£234.95
Acorn 7070 Disc Int.	£49.00
8271 Disc Interface	£75.00

PRINTERS (inc lead)

Citizen 120D	£169.00
Star NL-10	£237.00
Panasonic KX-P1081	£169.00
Amstrad DMP3160	£199.00

PRINTER RIBBONS

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

SPECIAL OFFERS

Tatung Std. Res. Col.	
Monitor	£169.00
Acorn Med. Col. Monitor	£239.00
Philips 8833 Col. Monitor	£259.00
Brother HR5 Printer	£69.99

* A Vu-File and Vu-Calc with every Master purchased *
All orders over £100 receive free Touchpad for BBC B (only).
(while stocks last).
MINIMUM ORDER £10.00

All prices include VAT

Please add £5 carriage on orders over £100
Mail Order only at this address
Trade and Educational enquiries welcome

85 Union Street Oldham Lancs
061-626 3841



INTRODUCTORY OFFER!

(to new customers)

Previous Customers - mention this ad to claim a FREE Thingi with your next order over £25

FREE

choose deluxe lockable 120 cap disk box (or 100 cap) or A4 copy holder
With your first Nebulae order worth over £25 in value
OR FREE Thingi copy holder with your first order over £15 in value

OR

Instead of the box or copy holder you may like to choose one of these games with your first order over £25.
Winter Olympiad
Play it Again Sam
Star Wars
Spycat
Quest
Life of Repton
Repton Thru Time
G. Prix Const Set
Barbarian
Superior Hits 1
Superior Hits 2



FREE Catalogue with order

Super offers on consumables, hardware games & peripherals + FREE individual customer card giving you even more discount!

DISKS

Japanese HiGrade 5.25 Disks				
25	50	100	250	
SS/DD	11.40	20.10	35.35	65.75
DS/40T	11.95	21.20	37.50	71.75
DS/80T	12.50	22.25	39.10	75.50
5.25 Coloured Disks				
25	50	100	250	
DS/DD	16.30	30.95	54.90	111.40
5.25 Reversible Disks				
10	20	50	100	
DS/80T	6.52	13.04	30.95	54.90
3.5 Japanese HiGrade				
DS	10	20	50	100
135tpi	14.49	26.95	52.95	98.95

Printer Ribbons

Acorn AP80	3+ 6+
Acorn AP100	3.50 3.30
Centronics GLP	2.85 2.65
R, BL, GR, BR, Y	4.50 4.30
Canon 1080/1156	4.65 4.40
R, BL, GR, BR, Y	2.99 2.85
Citizen 120D	3.99 3.85
R, BL, GR, BR, Y	3.80 3.60
Epson MX FX RX80 FX800	4.80 4.60
R, BL, GR, BR, Y	4.40 4.20
LX80/86	6.20 5.80
R, BL, BR, GR	3.50 3.30
Juki 6100 MS	5.90 5.60
Kaga KP810/910	4.10 3.90
R, BR, BL, GR	6.20 5.80
Panasonic KXP110/1080	6.80 6.50
R, BL, BR, GR	9.00 8.50
Seikosha GP80/100	3.50 3.30
Star NL10	6.90 6.50
R, BR, GR, BL, Y	9.10 8.60

Mixed types for quantity discount
R=Red, BL=Blue, BR=Brown, GR=Green, Y=Yellow
Small selection only. 200+ ribbons in stock, please phone for quote

Offer above also applies here!

Disk & Box Offer 1

120 capacity lockable



5 1/4

Box & 25 DS/DD disks	18.25
Box & 50 DS/DD disks	27.50
Box & 100 DS/DD disks	44.50

All Japanese HiGrade with hub rings, envelopes & labels

Disk & Box Offer 2

90 capacity lockable



3 1/2

Box & 10 disks DS 135tpi	19.95
Box & 20 disks DS 135tpi	28.95
Box & 50 disks DS 135tpi	62.95
Box & 100 disks DS 135tpi	106.95

Computer Paper

Size	Type	Qty.	1 box	3bx	5bx
11x9.5	1pt 60g P	2000	16.95	14.60	13.95
11x9.5	1pt 80g P	1000	10.55	-	-
11x9.5	1pt 80g P	2000	20.95	17.85	17.00
11x9.5	1pt 80g P	1000	12.60	-	-
True A4	1pt 70g P	2000	22.60	19.50	18.60
True A4	1pt 90g P	1000	16.90	15.05	13.90
11x14.5	1pt 60g P	2000	23.40	20.90	19.90

Computer Labels

*Please state 1, 2, or 3 labels across

Size	1000	2000	4000
70x36mm	5.50	10.45	20.25
89x36mm	6.30	11.95	23.15
89x49mm	8.85	16.80	32.60
102x36mm	7.05	13.40	26.00

Disk Storage Boxes (5.25 lockable)

Price each	1	2+	3+
50 Capacity	9.95	8.95	8.05
100 Capacity	10.95	9.85	8.85
120 Capacity	11.95	10.75	9.70

Printer Stands

Universal printer stand - holds any size of printer	16.25
Space Saver 80 col	27.75
Space Saver 120 col	31.65

Swivel Monitor Bases

Full 360 swivel & 25 tilt capability	
12" Monitors	12.95
14" Monitors	14.95
18" Monitors	16.50



Nebulae, Dept M1, FREEPOST, Kilroot Park
Industrial Estate, Carrickfergus, Co. Antrim BT38 7BR
7 Day Delivery, One year guarantee
& 14 day money back period
Tel: (09603) 51020
We accept orders from all government bodies, schools, universities, PLC's etc. We despatch on receipt of an official purchase order.

Tel: (09603) 51020
FREEPOST YOUR ORDER TODAY - NO STAMP REQUIRED

In the past few weeks *The Micro User* office has been deluged by word processors and text editors for the Archimedes. While choice of word processing software is a matter of preference selecting the right one for you is always difficult.

This review covers two text editors – Twin and ArchiText – which you would use for writing programs, not novels.

So, what distinguishes a text editor from a word processor? Primarily, output formatting. The latter gives you word wrap, control of print styles, indents, margins, centring of lines and so on. While useful for producing documents these things – particularly word wrap – are a liability when programming.

In addition, text editors always save files as pure Ascii, unlike most word processors which distort text into convoluted formats. But what a text editor must do is facilitate entering and correction of listings.

Product: Twin
Price: £29+vat
Supplier: Acorn Computer Ltd., Fulbourn Rd., Cherry Hinton, Cambridge CB1 4JN.
Tel: 0223 214411

TWIN comes in a large plastic box/folder containing the 3.5in disc, 64 page manual and a function key strip with six rows of options.

The software is designed to interface smoothly with any other interpreted language like Basic or compiler such as C. The name Twin covers several aspects of its operation: It can have two screen windows, one of which can have a task running in it. This means you can actually be running a program in one window and edit a copy in another.

Each window opens on to a buffer that all the output from a task and input from the keyboard go into. Since you can view different parts of it – just like any word processor – any text that has scrolled off the screen has not been lost, you can go back and look at it.

The concept being exploited here is that you write and edit your program in one window and use the copy facility to load it into the task in the other to run it. If any errors appear you can edit and run it again without the need to switch between applications.

Although this seems useful, I'm not sure how good it really is. For a start the majority of applications on the Archimedes will be graphical – Twin filters all screen output and any control codes just get converted to inverse characters. For example, the Basic command:

```
PRINTTAB(5,10)"Hello"
```

produces:

```
HELlo
```

For compiling C, Fortran, Pascal and so on it may speed up the debugging of syntax errors – all those errors which would be flagged during the compilation process itself. But again, it would be pretty useless for checking the application itself.

If a text editor can speed up the actual coding

A word from an editor

Steve Turnbull tests and compares two text editors

of a program it can't be bad and to aid this Twin has structures: All languages have particular groupings of control structures: IF...THEN...ELSE, REPEAT...UNTIL and so on. Twin has a facility to allow you to enter something like:

```
CASE OF
WHEN :
OTHERWISE
ENDCASE
```

with just two key presses – you can then fill in the details. Not only that, you can define your own.

The search and replace facilities are quite extensive, and are derived from the Edit package available on the Master – but it's a lot easier to use.

When one of the search options is requested the two top lines of the six level function key strip come into play. These give you options like selecting with or without case sensitivity and including control characters and ones over 126 Ascii. Selection from restricted sets of characters is possible, as are strings of indeterminate length.

There are clever facilities for loading and saving files via complex directory paths if you need them – for instance using a C compiler on a multi-user network.

The biggest surprise to me is that the product is completely keyboard-driven – no mouse use at all. I know some people will consider this a mercy, but when compared with ArchiText it's a failing.

Product: ArchiText
Price: £19
Supplier: Hopesoft, Hope Cottage, Winterbourne, Newbury, Berkshire RG16 8BB.
Tel: 0635 248472

THIS package has been produced by a new software house using Acorn's C compiler. The disc comes with an 18 page photocopied manual plus a two-level function key strip with several empty

Turn to Page 86 ►

Points for

- Good edit facilities
- Concurrent processing

Against

- Complex operation
- No display control

◀ From Page 85

spaces. The product is designed to replace Twin, so that from Basic you can enter the TWIN command and get ArchiText instead. Using TWINO8 you get an Ascii version of your program without line numbers.

The first thing that struck me about it was that, while the Twin screen display is utilitarian, the ArchiText one is colourful, but ugly. The last three lines of the screen are divided into a block of four scroll boxes, a scroll bar, line and screen number displays along with filenames and a message line at the very bottom. The rest of the display is devoted to the program text, and the edit position is marked by a thin red caret which sits between characters.

The mouse is used by ArchiText for all scrolling operations and the pointer is a light blue caret when in the text area, changing to a long, thin, very unaesthetic arrow in the lower area. Position control within the current text is very precise and fast and the line-by-line scrolling is smooth – using the rectangle move command.

ArchiText can handle five files at once, with two being displayed on screen at any time. Text can be block deleted just using the mouse and copied or moved between text areas – even if the block being duplicated is in an area not currently being displayed.

Search and replace is perfectly adequate – in

fact you can do block moves and copies to and from these areas as well. This feature allowed me to replace a piece of text I had accidentally deleted.

The only real problems I had were that it couldn't handle lines longer than 255 characters, and you have to press a number on the keypad to leave the star command section. These were annoying but hardly serious.

Conclusion

Twin is a far more complex product than ArchiText and essentially does the same task with a lot more frills. It's also half the size – Twin is 38k whereas ArchiText occupies a massive 86k – and this is due to the inefficiencies of the C compiler. ArchiText requires work on the display – I would have preferred the real Wimp environment, not this home-grown substitute.

With all the extreme cleverness and complexity of Twin – and I've hardly mentioned its extensive buffer options – I'm still left with the question: Do we really need such convoluted facilities, or is the software going the route of the messy inefficiency of recent microprocessors?

The ARM chip is a Reduced Instruction Set Computer. Don't we need reduced complexity software?

Points for

- Easy operation
- Uses the mouse

Against

- Tatty display
- Can't handle long lines

The bottom line...

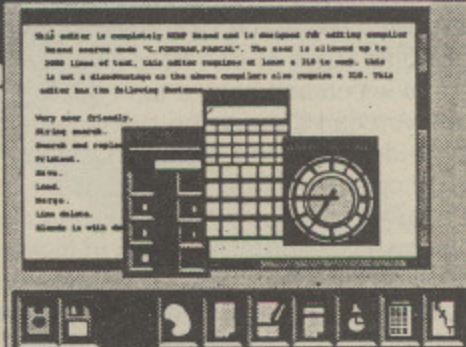
If you need to work while you compile buy Twin; if you want clean simplicity get ArchiText.

BRAINSOFT LTD FOR THE BBC SERIES AND ARC.

ARC DESKTOP + TRANSFER SOFTWARE.

This software is an enhanced desktop for the Archimedes (© Acorn Computer Ltd), and has the following functions:-
SCIENTIFIC CALCULATOR, A 30 function scientific calculator with a facility for number conversions.
CLOCK, A clock with a difference! . Big ben digitised and incorporated in the archimedes desktop.
DIARY, Same design and function as Acorns standard diary.
NOTEPAD, An improved version of Acorns notepad, with direct pointer driven input.
PALETTE, A Palette of the same design as the Acorn Palette.
BBC CONVERTOR, This program blends into the desktop, when a RS232 lead has been connected between the BBC and the Archimedes select the 5.25" disk icon and a window showing the files on the BBC B disk drive appears on the archimedes. To load files just select them with a mouse (as many as you want), and from the desktop menu select load to make the files transfer automatically from the BBC to the archimedes. The baud rate is set at 19200 baud although any speed can be used, the Convertor is intelligent and recognises automatically the file types contained on the BBC's disk drive.
EDITOR, This is an optional facility for editing source text files for compilers (FORTRAN, C, PASCAL etc), to work it must be used on at least a 310 (this is not a disadvantage as none of the compilers are able to work on a 305). This advanced program blends fully into the desktop environment, and is very user friendly and intuitive in its use, the maximum text size is 2000 lines. The files produced are compatible with twin, it is entirely WIMP driven and needs no control/function keys. The basic editor functions included are string search, search and replace, load, save, merge, print, clear.

"This kit from Brainsoft can be thoroughly recommended" from review in Archive magazine December 1987.



SIDEWAYS RAM

BRAINSOFT'S 32K STILL THE BEST VALUE SIDEWAYS RAM FOR THE BBC RANGE.



- *Uses latest technology.
- *32K of ram in a size no larger than a EPROM.
- *No soldering required the two leads clip on.
- *Takes up only one sideways ram socket.
- *Does not use user port but uses I/O register.
- *Low power consumption.

Incompatible with ram boards except Peartree MR3000.

BRAINSOFT'S 16K COMPATIBLE WITH MOST ROM MEMOS.

This module has been tested with the following boards:-
 ATP1, Matford, and Peartree MR3000.
 This module has the same construction of the 32K module but is minus the bank select line.
Write protect switch
 At little extra cost a write protect switch can be added to a module which allows "protected" software to be loaded.
NOTE: it is illegal to copy or pirate software.
 All the above are guaranteed for 1 yr. Please state computer.

SOFTWARE

SIDEWAYS RAM UTILITIES BBC B,B+,MASTER
 Now Version 3 with ARFS and APB !!

- MENU DRIVEN SOFTWARE this selects RAMLOAD, RAMSAVE, RAMLIST, PRINTER BUFFER, or PROGRAMMER'S UTILITIES.
 - ADVANCED PRINTER BUFFER provides the user with up to an extra 63K of buffer space, which allows the user to continue using WORDWISE-PLUS, VIEW or BASIC whilst the printer is printing.
 - PROGRAMMER'S UTILITIES are a collection of 25 utilities including a full-screen-memory editor, all variables clear, program relocation, program comparison, program repairer, rom list, rom enable, rom disable, rom status, speed control, computer status, string search, variable list, vector list, close all files, list of the currently active variables, keyload, keysave, program comparison with a file held on disk, rom save, and screen comparison/uncompression which can pack a mode 0 screen in less than 1K of disk space.
 - ADVANCED ROM FILING SYSTEM provides the user with fast access to programs and data, so fast that it can load a 20K program quicker than the BBC's CLS command takes to clear the memory. The ARFS is capable of storing files longer than 32K in length, the amount of file space is limited to the number of sideways ram the user has, the number of files, length of names being limited by only the ram size. The ARFS when enabled by "ARFS" acts like a disk interface allowing saves and deletions, as well as loading, many programs which use "legal" disk calls are compatible.
- Also provided on the disk are three BASIC programs which can be easily adapted to run on NETWORK systems, ramload, ramsave and ramlist.
 Provided with the sideways ram utilities is a 12 page instruction book, the software is supplied on a 40T disk with 80T conversion software.

PRICE LIST 1ST QTR 88	
16K MODULE	JUST £14
32K MODULE	£14.5
WRITE PROTECT SWITCH	£2
SIDEWAYS SOFTWARE	£6
SIDEWAYS SOFTWARE ORDERED WITH A MODULE	£3
62256LP-12 RAM CHIP	£11
2+OFF 62256LP-12	£10
ARCHIMEDES SOFTWARE	
LEAD ONLY	£8
SOFTWARE ONLY	£8
SOFTWARE + EDITOR	£13
LEAD + SOFTWARE	£14
LEAD + SOFTWARE+EDIT	£19

PRICES GIVEN FULLY INCLUSIVE NO EXTRA COSTS.
 EDUCATIONAL ORDERS ACCEPTED DISCOUNTS GIVEN FOR QUANTITY

BRAINSOFT LTD.
 22 BAKER ST.
 LONDON W1M 1DF
 TELEPHONE: 01-486 0321

DAISY WHEEL IMPACT PRINTERS
AT LESS THAN WHOLESALE PRICES!

£75-YES-£75

(Plus VAT and Post and Packing)*

AND THIS IS WHAT YOU GET . . .

**SANYO PR3000
DAISYWHEEL PRINTER**

Brand new in manufacturers original cartons

Centronics parallel interface, 8 CPS (Shannon text) Printing Speed, Elite 95 Character Daisy Wheel, 10/12 ch/inch Selectable Character Pitch, 1000ms/6.67 inches CR Speed, 8.5 inches Paper Width, 6.67 inches (80ch/12 pitch) 66 ch/10 pitch Print Width, Copy 1 sheet original Plus 3 copies copy capacity.

RWE has concluded an amazing bulk purchase of these brilliant printers—normal recommended price £199+VAT and is able to offer them at the bargain price of just £75 plus VAT, Postage and Packing. Immediate delivery whilst stocks last!!!

Send your cheque for £92.00* payable to:



RW Electronics

ROBERTS WARR ELECTRONICS LTD.

P.O. Box 2, Honiton, Devon, EX14 0NB

Tel: 040484 568. Telex: 42513 Sharet. Fax: 040484 575



The **note** Music System

- ♪ Features unparalleled create, edit, play and print tunes facilities
- ♪ Is sophisticated, yet simple to use
- ♪ Even the Instruction Manual has been applauded

DISC PACK: EDITOR · SYNTHESISER · KEYBOARD · LINKER · PRINTOUT-SONG AND SOUND LIBRARY · WAS £29.95 **SPECIAL OFFER £20.00 INC VAT.** PLEASE ADD £1.25 P&P PER ORDER.

ADDITIONAL SONG LIBRARY DISC: 2 TOCCATA AND CAROLS · 3 400 YEARS OF MUSIC · 4 MAINLY BACH · 5 IAN WAUGH ORIGINALS · 6 OLD FAVOURITES · £4 EACH INC VAT · POSTAGE FREE.

NOW WORKS ON BBC B, B+, MASTER AND MASTER COMPACT.

NEW UTILITIES DISC: KEYBOARD → MUSIC FILE CONVERTER · PLAY FROM BASIC UTILITY · TMS MUSIC FILE CONVERTER · MUSIC EDITOR FILE CONVERTER · £6 INC VAT · POSTAGE FREE.

ECONET VERSION: £89.70 INC VAT PLUS £1.25 POSTAGE. AMSTRAD AND COMMODORE 64 VERSIONS ALSO AVAILABLE.

PLEASE NOTE: Cassette systems are no longer being supported. Upgrades to disc available.

ORDERS TO: SYSTEM APPLIED TECHNOLOGY LTD, DEPT B, FIFTH FLOOR, SHEAF HOUSE, SHEAF STREET, SHEFFIELD S1 2BP



(0742) 768682



DEALER ENQUIRIES WELCOME

ISLAND LOGIC

SYSTEM APPLIED TECHNOLOGY



Mijas Software

Bringing the new software world to YOUR BBC Micro

First with a Relocatable Assembler and Linker first with Source-Level Debug. Now bring you a New 'C' Compiler.

Updated! Exciting! Fast! 'C' Compiler

A NEW Software system

for real performance and productivity on YOUR BBC MICRO.

Use it for games *New version 1.5*
business or industrial software. *compiles faster, runs faster*
Ideal for learning structured *and even easier to use*
programming and compiler techniques. *on ANY BBC B or Master.*

Written in 'C' itself for speed and portability

FULL SOURCE-CODE of the 'C' Compiler and libraries with EVERY COPY. Can be modified and re-compiled on any BBC 'B' or MASTER.

Small 'C' v 1.5

A true compiler. Does not use p-code

Full Source-Level Debug

Full I/O and C libraries

Separately compilable source-files

Produces 'stand-alone' programs of minimum size

Full support of BBC Graphics

Screen Mode may be changed at any time.

40+K of Program space even without overlays

Shell ROM image provided giving a 'MAKE' facility. Use any editor, a simple line editor is included.

Write your own BASIC, PASCAL FORTRAN or Artificial Intelligence Compiler using this 'C' system

Complete System including Assembler Linker, Debug, Shell and utilities in ROM Image format on disk



ACCESS welcome

£50

Ready-blown EPROMS
£7.50 each, set of 4 £25

From:- Mijas Software, Mijas, Winchester Rd. Michedever, Hants SO21 3DG

Tel 0962 89 352

Official orders welcome from educational establishments

contex

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 80tk 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 Bank Manager £25.00

BANK MANAGER BUSINESS UTILITIES for disc systems only

For the 'professional' who also uses the BANK MANAGER for disc systems only 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
Disc for Archimedes (all models) £15.00

ALL PRICES FULLY INCLUSIVE FREE POSTAGE WITHIN UK
Enquiries and Access Credit card orders telephone 023 03 347
Please state: cassette, 3.5" disc, 5.25" 40tk disc, or 5.25" 80tk disc
and computer type (B. Compact, Master or Archimedes).



CONTEX COMPUTING

(REF. MU)

15 WOODLANDS CLOSE, COPLE, BEDFORD MK44 3UE

MIGHTY MICRO

Mighty Micro Manchester Ltd, Sherwood Centre
268 Wilmslow Road, Fallowfield, Manchester M14 6WL
Telephone 061-224 8117 (3 lines)



Telex: 295141 attn MBX 614860329



BBC Master and Compact with software
and peripherals, disk drive etc,
Acorn Archimedes on permanent
demonstration - full range of books
on all Acorn items of hardware

EXPORT SPECIALISTS

Exported to over 60 countries in 1986

EASY ACCESS

Close to M56, M6, M63 and M602

BULLETIN BOARD SYSTEM (FIDO and OPUS)

Ring (061) 224 8117 out of shop hours. Use for prices,
requests, general messages, P.D. software and so on.
Runs at V21 300/300 and V23 1200/75

Authorised Acorn Dealer



STEPPER MOTOR CONTROLLER

This ROM based software allows you to "talk" direct to two Stepper Motors and a Relay in BASIC via 20 new "star" commands. It is widely used for DIY plotters, turtles and computer control (CNC) of small machine tools. No machine code is now necessary for any of these projects.

ROM with handbook & fitting instructions £ 14.95 inc. P & P.

INTERFACING ?

We have Interfaces available ex-stock for many purposes including Stepper Motors, Lamps, Relays and small DC motors. 9 output lines so you can control two stepper motors and a relay from the User Port. Up to 9 relays can be added for controlling mains devices. Full user information included with each.

VERSION 1. Powered from BBC auxiliary power supply. £ 23.00 inc. P & P.
VERSIONS 2 & 3. With integral mains Power supply (optically isolated).
(2) 300mA per coil £ 49.00 (3) 800mA per coil £ 57.46 inc. P & P.
HI-POWER VERSIONS. High output for stepper motors or other uses.
Up to 3 or 5 Amps per line. Needs a separate power supply (See below).
3 Amp £ 42.50 P & P £ 3.00. 5 Amp £ 65.00 P & P £ 3.00.

POWER SUPPLIES for high current stepper motors etc. Custom voltages.
100 or 200 VA versions. £ 62.00 or £ 69.70 Post & packing £ 3.00.

SCRAPBOOK

A free-format storage & retrieval system for all types of information including colour and graphics. Incorporates screen designers and facilities to search, sort, browse, print, extract etc. Forget fields, records etc. Store information as you want to read it - on the screen. Store up to 320 Teletext screens on a disc. Do automatic "slide show" type presentations.

Disc and manual £ 12.95 inc. P & P.

Please indicate 40/80 track and whether SS/DS drive available.

SCRAPBOOK DEMONSTRATION disc £ 1.25 inc. P & P.

Instant On-Screen Help

All BBC models can have On-Screen help with our range of ROMs and Discs. Why thumb the handbook when you can have the important details on screen even when wordprocessing ?

WORDWISE COMPANION

For Computer Concepts Wordwise and Wordwise Plus wordprocessors.

BASIC COMPANION

Instant help for getting to grips with BASIC programming.

PROGRAMMERS COMPANION

Colours, Graphics, Sounds, VDU codes, ASCII codes, *FX commands etc.

MACHINE CODE COMPANION

Assembly language. OS routines, 6502 Instructions, Addressing, Vectors etc.

Each ROM gives you instant access to 15 screens of help via one simple command.

ROM with simple fitting instructions £ 19.95 inc. P & P.

Custom versions containing a mixture of our helpscreens or your own special data (E.g. Printer Codes) £ 5.00 extra.

All Companions are also available as ROM IMAGES on disc for loading into sideways RAM. £ 8.95 each or £ 19.95 for all four inc. P & P.

Disc versions of Basic, Programmers and Machine code Companions.

£ 9.95 each or all three £ 19.95 inc. P & P.

COMPANIONS DEMONSTRATION disc £ 1.25 inc. P & P.



MICRO HELP



5 Hill Terrace, LLANDUENO, Gwynedd. LL30 2LS. Telephone (0492) 76925

EBBS

Bulletin Board Software Version II

EBBS is a low-cost dial in host system which allows you to create your own Bulletin Board with no experience of communications required.

Minimum Hardware requirement is 400k Disk Drive and Auto Answer Modem

£10.00 discount on software until July 31st.

PRICES

BBC/Master SWR Version£35.00

BBC Rom Version£40.00

ADFS Compact Version£40.00

SPECIAL OFFER!

Dataphone Designer Modem & Cable

If bought with Software£110.00

Please specify modem type when ordering

For a demonstrator of EBBS dial:

0274-541156 1200/75 & 300/300

Features

- * Full colour
- * Scrolling ASCII in 40 and 80 columns and Viewdata modes
- * Four methods of transfer including X-Modem and CET
- * Chat Mode
- * Extensive message facilities
- * Mailwrap on messages
- * Private areas allowing for Closed User Groups
- * Use of external programs On-Line
- * Easy to use - no programming is required
- * May be used with files created on Wordwise, View and now Inter Word
- * Use of commands on-line

Upgrade service to Version 2 for existing EBBS users.

To upgrade your EBBS to the latest version please return your complete package, together with £8 for a replacement.

Trade & Dealer Enquiries Welcome

Cheque or Postal Order to:

Orion Computer Services,
Dept. 8MU, 17 Carlton Road,
Leyland, Lancs. PR5 1LP

All prices include VAT
and carriage
(UK only)

Telephone: 0772-436506

WHAT MODEM?

THE number of modems now available provides a would-be buyer with a near-impossible task when trying to compare the major features. So to remove some of the tedium involved in collating this information, here is our at-a-glance guide to the more popular makes.

The prices are current on going to press,

but because these are subject to fluctuation you are advised to check with the manufacturer for up to date details.

All models featured except the Beebug Master and Watford Le Modem are BABT approved.

Make							Price	Comments
	300/300	1200/75	1200/1200	2400/2400	Auto dial	Auto answer		
Micronet Datachat 1223		●					79.95	Price includes one year's free subscription to Micronet/Prestel.
Dataphone Demon II	●	●			●	●	91.95	Price includes free registration to MicroLink/Telecom Gold. Also available as a combined pack including Zrom software and lead. Total price: £114.95
Pace Nightingale	●	●					98.90	Also available as a combined pack including Commstar II software and free registration to MicroLink. Total price: £130.37.
MicroLink dual speed	●	●					99.00	Price includes Comms software and wordprocessor from Mini Office II, lead, free registration and telex validation to MicroLink/Telecom Gold plus one month's free connect time.
Watford Le Modem	●	●			●	●	108.10	Price includes software on rom, leads and free registration to MicroLink/Telecom Gold.
Watford Apollo	●	●			●	●	108.10	Price includes software on rom, leads and £6.50 off annual membership to Prestel/Micronet.
Dataphone Designer	●	●			●	●	114.95	Price includes free registration to MicroLink/Telecom Gold. Also available as a combined pack including Zrom software and lead. Total price: £137.95
Beebug Master Modem	●	●			●	●	119.00	Fits inside Master and comes complete with Beebug Command Rom.
Miracle WS2000	●	●				●	125.00	Price includes free registration to MicroLink/Telecom Gold.
Anglo Turbo I	●	●			●	●	160.95	
Pace Linnet	●	●			●	●	174.80	Also available as a combined pack including Commstar II software, lead and free registration to MicroLink/Telecom Gold. Total price: £226.05
MicroLink multi speed	●	●	●		●	●	179.00	Price includes Comms software and word processor from Mini Office II, lead, free registration and telex validation to MicroLink/Telecom Gold plus one month's free connect time.
Miracle WS4000	●	●			●	●	195.45	Also available as a combined pack including Dialup software, lead and free registration to MicroLink/Telecom Gold. Total price: £295.95. Upgrade to 1200/1200: £287.50; upgrade to 1200 and 2400/2400: £465.75
Telemap Propak	●	●			●	●	222.45	Price includes PMS Dial Up software and free subscription to Micronet/Prestel.
Anglo Turbo II	●	●	●		●	●	264.45	
Pace Linnet 1200	●	●	●		●	●	274.85	Also available as a combined pack including Commstar II software, lead and free registration to MicroLink/Telecom Gold. Total price: £338.10.
Pace Series 4 2123S	●	●			●	●	316.25	Price includes free registration to MicroLink/Telecom Gold.
Miracle WS3000	●	●			●	●	339.25	Price includes free registration to MicroLink/Telecom Gold.
Pace Series 4 1200S	●	●	●		●	●	470.35	Price includes free registration to MicroLink/Telecom Gold. Also available with error correction at £608.35.
Miracle WS3000	●	●	●		●	●	569.25	
Pace Series 4 22bis	●	●	●	●	●	●	585.35	Price includes free registration to MicroLink/Telecom Gold. Also available with error correction at £723.35.
Miracle WS3000	●	●	●	●	●	●	747.50	Price includes free registration to MicroLink/Telecom Gold.

- Anglo Computers, Unit 3, Cefn Llan Science Park, Aberystwyth, Dyfed, SY23 3AH. 0970 624321
- Beebug, Dolphin Place, Holywell Hill, St. Albans, Herts, AL1 1EX. 0727 40303
- Dataphone, 22 Alfric Square, Woodston, Peterborough, PE2 0JP. 0733 230240

- MicroLink Communications, Europa House, Adlington Park, Adlington, Macclesfield, SK10 4NP. 0625 878888
- Micronet, Durant House, 8 Herbal Hill, London EC1. 01-278 3143
- Miracle Technology, St Peters Street, Ipswich IP1 1XB. 0473 233888

- Telemap, Durant House, 8 Herbal Hill, London EC1. 01-278 3143
- Pace Micro Technology, Juniper View, Allerton Road, Bradford, BD15 7AG. 0274 488211
- Watford Electronics, Jessa House, 250 Lower High Street, Watford, WD1 2AN. 0923 37774



The ultimate hack

*Enter the world of fantasy
with the Mad Hatter*

FOR several months a couple of discs had been sitting in my desk drawer: At the Manchester Micro User Show, Howard Roberts of Heyley Software took me gently aside and reminded me of their existence. Much chastened, as soon as I got home I began exploring Heyley's first adventure, *The Ultimate Prize*.

The setting of the game is a type I enjoy from time to time – straightforward Dungeons and Dragons-style swashbuckling action. A mighty warrior already, you are invited to enter a contest which has as its prize the ultimate status of deity – hence the title.

It's a three-part adventure and each must be completed before you can progress to the next. First you wander through an underground labyrinth, part two finds you exploring a forest and finally you roam mountainous territory.

The beginning is straightforward enough. You find a knife in the opening location and, not too far away, is a rope that simply asks to be cut. From then on the puzzles escalate steadily in complexity. Fortunately it is possible to explore a good deal of the labyrinth without having to solve specific problems, and this is very useful.

As I always advise, you need to examine things, sit on things, dig, jump – in fact undertake just about every conceivable action if you are to

master this adventure.

Some things about the game I found very useful, others less so. The instructions are set out well. The screen layout is attractive too – Heyley uses multi-coloured text depending on whether the text describes your action, something that may be manipulated or your location.

There were, however, some very irritating aspects. The parser has a limited response at times. For example, you will come across an object described as *an empty silver flask*. A good parser would allow you to GET FLASK, GET SILVER or GET EMPTY. The Heyley parser only allows GET EMPTY.

I also felt at least one puzzle was too far-fetched, even for a Dungeons and Dragons environment. You have to leap 500 feet into a piranha-infested river. I'm not complaining about the piranhas – there's a way of dealing with them – but I think a 500 foot jump is a bit much, even for a fantastic warrior like me.

I had a further problem with the SAVE and RESTORE facilities. Whenever I restored a saved position I got the error message *Type mismatch*. The initial location description remained on screen, while the exits and any treasures shown were those belonging to the saved position.

Making several moves to get new data loaded in from the disc cured it, but this nonetheless remains a drawback. Howard tells me he is working on the parser and the protection to eliminate problems like this.

The Ultimate Prize is available from Heyley Software, 24 Ley Hey Road, Marple, Stockport SK6 6PQ on 40 or 80 track disc for BBC B, B+ and Master at £7.95 and for Master Compact at £9.95. A clue sheet is also available for an additional £1.

That's it for now, so until next month, happy adventuring.

Hatter's Helpline

Nine-year-old Stuart Quinn has a novel suggestion for dealing with Thorin in *The Hobbit*. Once you have got the ring in the goblins' dungeon, take Thorin back to the troll's cave and lock the old perisher in.

After that continue as usual until you meet Bard on the way to the mountain. Instruct him to go to the mountain and kill the dragon, walk in and collect the loot, free Thorin on the way home and Bob's your uncle.

However, I don't see how you can get maximum points this way, and I shall be offering readers assistance for the later stages of this adventure shortly.

Jonathan Lee can offer Anthony Graham some help with Micropower's *Adventure*. The runaway princess can be found in the magician's bedroom in the castle. If she bolts again, look for her in the bedroom up the beanstalk. You can kill the dragon with your bare hands, and treasures should be dropped in the left luggage office.

David Alexander has horticultural problems in the adventure *L*: He can't work out how to plant

Problem Corner

Jonathan Lee has problems. In *Escape from Pulsar 7* – how does he repair the lathe and the oven so as to bake the cake? What, if anything, can be found or done in the wrecked cabin? Jonathan would also like to know where to find the black and silver figurines in *Ten Little Indians* and how to open the gates.

Robin Keith has trouble with a few games I don't know. In *Golden Baton* how does he use the quartz to get the guard's knife? What does he do after finding the prism in *Time Machine*? Finally, how can he rescue Ant-man in *The Hulk*.

Tony Burton needs help with *Legionnaire*. Neither my colleague Pendragon nor I have it, so would someone like to qualify for a Hall of Fame rating by being the first to send in a solution?

the trees. I suspect others are in this predicament also, so here's the correct order:

```
T***T
**T**
T*T*T  * is a blank space and
**T**  T represents a tree
T***T
```

Adrian Jackson wants to know what to do with the sphere in the same game – the answer is nothing, it's purely a location marker.

Aidan Walsh has written with some **Elite** queries. Like others, he wonders if generation ships, space dredgers and transporters really exist. As I've said before, I've never come across the first two in all my roaming through the eight

galaxies, but transporters definitely exist.

They can often be encountered leaving the space station en route for the planetary surface as you prepare to dock. You can have a lot of fun by blasting them if you fancy a fugitive's life.

He also asks about swapping ships: You cannot swap your type of ship; you always have a Cobra MkIII. The only method of ship exchange permitted is by using the escape capsule, which I don't advise unless you are in extremis – you lose your cargo and no-claims bonus.

Finally, Aidan wonders how to get back from *Witch Space*, happy home of the Thargoids, to normal space. All you do is lock-on to a star and jump into hyperspace as normal, but you have to have enough fuel to get there.

Deeper into the labyrinths

According to Roger White's excellent solution to **Labyrinths of LaCoshe** the thief can be an ally and then killed once his usefulness is at an end.

When you receive the message *A furtive figure just brushed past you*, it indicates that the thief has struck. He steals any treasure you are holding and takes it to his lair above the Cyclops Room – see last month's column for details of how to get there.

His usefulness to the player concerns the porcelain egg which is found up the tree in the forest. The egg can't be opened safely by the player, but if the thief steals it, he opens it to reveal an additional treasure, a tiny jewelled bird.

Once the thief has stolen the egg, check his lair to see if both the egg and bird are there. If you can't get robbed conveniently, Roger suggests going to the lair yourself, dropping the egg and going away for a while.

This is not 100 per cent foolproof – there is a slight bug here. If the egg isn't opened, take it away and try again. Roger says this always works. The main thing to remember is never to try and open the egg yourself. The thief is a random element in the game, and your chances of meeting him are about 100 to 1 for any given move.

If you want to kill the thief, you need the sword or the knife and remember that, although the odds are in your favour, he has one chance in four of killing you, so SAVE before you try. If you are successful, you can also get the thief's silver chalice.

In Labyrinths, the weight of different objects is a factor that has to be taken into account before you can expect to solve the adventure in the minimum number of moves. I'll leave you to work out the details.

Another problem that should be solved fairly early on in the game is the Round Room, which is reminiscent of Bedquilt in Colossal Adventure. Leaving the Round Room deposits you in one of six random locations until the room has been stabilised.

Don't try pushing the buttons in the Machinery Room until you have the plastic pole, or you'll get a shock. The pole can be found at a Dead End in the twisty passage maze, N, S and D from the Troll Room. The Machinery Room can be found S and S from the Troll Room by solving the riddle –

no, I won't do it for you – and then doing things in a bucket.

You can push three buttons. Two of them reveal treasures as well as stabilising the Round Room, and the third provides an surprisingly attractive experience.

Once you have stabilised the Round Room, N always takes you to the room with the skin of wine, S to the Cold Room, E to the E-W path beside a ravine, W to the room with the spade, U leads to the Troll Room and D to the twisty passage maze.

Light can be a problem, too. The lamp has an inbuilt move-counter with a total life of 100. That makes the torch a necessary item, but it's vulnerable to the thief.

Roger suggests this strategy: Collect the egg, enter the caves through the Grotto and kill the Troll. Then stabilise the Round Room and set about collecting the torch, which is itself a valuable treasure.

To get the torch you first need the rope from the Very Chilly Chamber. From the Troll Room go E, N, N, E, E, D. To get back you must go S, N, N, S, S, S. Collecting the torch is a mini-adventure in its own right. There is a complex of 17 rooms in the region of the Torch Room contained a number of treasures.

Go to the Gallery, tie the rope to the rail and go D to the Torch Room. Go to the East side of the Lake via the Round Room and then into the Small Room to get the wrench and push Button V.

After that, you can go to the Control Room, using the wrench to turn the bolt in order to drain the lake. If you then throw the torch into the Cold Room you'll melt the snow and reveal another room containing a jade figure.

Whatever you do, don't enter the Small Cave while holding the torch – there's a gas leak! You can get the ruby by dropping the torch before going into the cave because you can survive in the dark just long enough. Getting the shield involves taking the spade from the Damp Cave, going to the Sandy Room and digging three times.

Well, that's all the help you're going to get on this adventure, but I hope it's enough to get you through the tougher areas.



HALL OF FAME

My thanks go to Mike and Neil Aldridge for the first full solution to Geoff Larsen's *Puppet Man*. Gray Robertson is the first person to send me a full solution and pictorial map of Robico's *The Hunt*, and Darren Higgs has provided the first pictorial map of *L*.

Watford Electronics

Jessa House, 250 Lower High Street, Watford WD1 2AN, England

Tel: Watford (0923) 37774 Tlx: 8956095 Fax: 01 950 8989



Acorn

The choice
of Experience

Shop Hours: 9am to 6pm (Mon.-Sat.) Thursdays 9am to 8pm

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
before and after
the experience

Archimedes *micro*

305 Series

- Entry System £699
- with Green Monitor £749
- with Colour Monitor £899

310 Series

- Entry System £799
- with Green Monitor £865
- with Colour Monitor £999

310M Series

- Entry System £859
- with Green Monitor £919
- with Colour Monitor £1085

440 Series

- Entry System £2499
- with Green Monitor £2539
- with Colour Monitor £2699

(Securicor carr. £10 on Micros)

Archimedes SPECIAL OFFER

FREE, £125.00 worth of Hardware

With every Archimedes Micro purchased from us, we are giving away absolutely FREE a 5¼", double sided disc drive with PSU, (1 Megabyte unformatted), plus the special Archimedes interface cable, worth £125. This package is absolutely essential if you want to run BBC software or IBM software with your Archimedes, in the emulation mode.

(P.S. This offer does not apply with 0% finance scheme mentioned in column two).

- 0.5 Mb RAM for 305 £149
- Podule Backplane £37
- ROM Podule (Computer Concepts) £46
- Archimedes Ref Manual £29
- ARM Assem. Lang Prog Manual £12
- 2nd 800K floppy disc drive (for 305, 310 & 410) £118
- Econet Network Board £40
- Backplane for 2 podules, with fan (305, 310) £39
- I/O Podule (with User port, Analogue port & 1MHz bus) £79
- MIDI add-on to I/O Podule £38
- MIDI Expansion Card £66
- ROM Podule (takes five 8 bit ROMs, of 16, 32, 64 or 128K) £56
- Real time Video Digitiser (Watford) £249
- Sound Sampler (Armadillo) £105
- 20 Mb Hard Disc & Controller Card £469

- Archimedes Printer Lead £7.00
- Archimedes Monitor Lead £7.50

WORDPROCESSORS

- Wordwise + £18 Pipedream £95
- Image Writer £25 View £49
- Interword ROM £35 Viewspell £32
- 1st Word Plus £79 ViewIndex £12

DATABASES

- System's Delta Plus £60
- AlphaBase £39 Delta Plus £57
- Viewstore £49

SPREADSHEETS

- Intersheet ROM £35 Viewsheet £49

BUSINESS GRAPHICS

- GammaPlot £30 Interchart ROM £22

INTEGRATED PACKAGES

- Logistix - Database, Spreadsheet, Time Management & Business Graphics £95

PC EMULATION Pack

- (for 310, 410 & 440), including MSDOS 3.21 £79

GRAPHICS, ART & DESIGN

- Interchart £25 Gamma Plot £30
- Artisan £31 Gamma Plus £60

- Zarch £16 Toolkit (Beebug) £32
- Toolkit (Clares) £31

LANGUAGES

- ANSI 'C'; ISO-PASCAL; FORTRAN 77; £95 each
- Cambridge LISP; PROLOG X £181 each
- TWIN EDITOR £27
- Archimedes Assembler £199

0% (APR) FINANCE

For a limited period, Watford Electronics are able to offer the Archimedes range of microcomputers at 0% (APR) finance. Credit facility available subject to status. Please inquire for further details.

(Watford Electronics are Licenced Credit Brokers)

CREDIT TERMS now available.
Please telephone or write in for further information.

Archimedes to BBC SERIAL LINK

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. Using this package it is possible to transfer any data from the BBC to Archimedes at upto 19200 baud.

By far the easiest way to transfer data to your new computer.

Only £25

Archimedes 5¼"/3½" Disc drive Interface

With this interface it is possible to connect almost any 5¼"/3½" disc drive with its own power supply to the Archimedes. NO SOLDERING is involved. Supplied complete with necessary lead.

Only £19

Note: This is not simply a lead. Attempting to connect an external disc drive by direct connection may result in damage to your Micro.

Watford Electronics are the
main Approved Stockist of
ACORN SPARES and ECONET
Referral Centre

The 80186 Co-Processor

This package consists of the Master 512 board, Watford Co-Pro Adaptor, 1770 Disc Upgrade and Acorn ADFS. This is a complete package, with its own power supply, ready to interface with your BBC Micro. The Master 512 board using the 80186 16 bit Processor at 10MHz and running Digital Research DOS Plus, gives a high degree of IBM compatibility at an extremely reasonable price. Included in the 512k package is a mouse and the amazing Digital Research GEM suite of software; GEM Paint, GEM draw and GEM desktop giving a complete Mouse Icons environment (All other GEM packages will work on the 512k). Famous packages that will work with the 512k board include Wordstar, Dbase II, Lotus 123 and many others. The only requirement to upgrade any BBC Model B to this system is you must have twin 80 track disc drives.

£259

BBC MASTER

BBC MASTER 128K Micro incl.
Acorn's: View, Viewsheet, ADFS,
BASIC Editor & TERMINAL plus £125
worth of FREE OFFER (see below)

£379

SPECIAL OFFER

FREE . . . £105 worth of Hardware
& Software

Gemini's OFFICE MATE & OFFICE MASTER packages on Disc consisting of: Database, Spreadsheet, Beebplot graphics. Accounts packs: Cashbook, Final Accounts, Mailist, Easyledger, Invoice & Statements, Stock Control and Watford's 3½", double sided 1 Megabyte (unformatted) single disc drive complete with cables, ready to connect to the micro - with every BBC Master purchased from us this month.

BBC MASTER with Turbo Board +
above SPECIAL OFFER £475

512K Processor Add on Board
"inc. Mouse and GEM package" £185

BBC AIV (Domesday) System £3999

ADD-ONS & ACCESSORIES

- Turbo 65C102 Add-on Module £95
- Econet Module for the Master £40
- Twin ROM Cartridge for Master £7.50
- Quad ROM Cartridge for Master £11
- Universal Processor Adaptor £75
- Master Reference Manual I (No VAT) £14
- Master Reference Manual II (No VAT) £14
- Master Advance Ref. Manual (No VAT) £19
- 64K Upgrade Kit for B+ £32
- Acorn 1770 DFS Kit complete £41
- ECONET Upgrade Kit for BBC £42
- ALL ECONET UPGRADES Available
- ARIES' Professional IEEE Interface £238
- Acorn IEEE Interface Complete £265
- Morley Teletext Adaptor with ATS Rom £99
- Filestore E01 £825
- Filestore E20 £699

BBC MASTER COMPACT

- System 1 Standard Package £310
 - System 1A System 1 + TV Modulator £322
 - System 2 System 1 + Green Hires Monitor £364
 - System 3 System 1 + Medium Res Colour Monitor £478
 - RS232 Kit for BBC Compact £25
 - Additional 3½" Drive for BBC Compact £90
- (Securicor carriage £7)

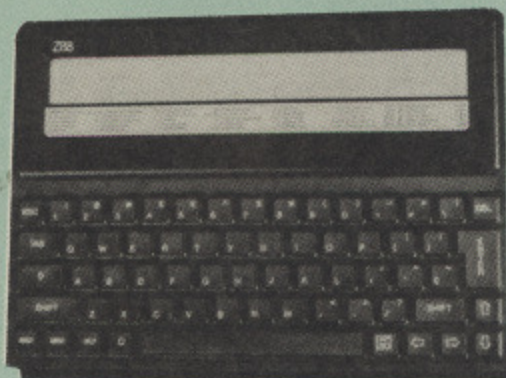
65C102 2nd PROCESSOR

(65C102 replaces the original
Acorn 6502 2nd Processor)

This amazing package consists of the Acorn 65C102 'Turbo' Board, the Watford Co-Pro Adaptor and Acorn 1.2 DNFS ROM. The 'Turbo' board, running at 4MHz with 64k of additional RAM will increase the speed by between 50 and 200% depending on the application running, and allow a BASIC program of upto 44k in any screen mode. Simply by plugging in the Co-Pro and the DNFS ROM with its special Tube host code and you massively increase the power of any Model B. This is a complete package, with its own power supply, ready to interface with your BBC Micro.

£135

Z88 Sinclair's Portable Micro



The worlds first, truly portable Micro. It is A4 size, only an inch thick and weighs under 2lbs. Ideal for use when travelling or as a personal organiser.

Only: **£239**

FREE

With every Z88 purchased from us this month, we are giving away absolutely FREE, a Z88 to BBC Interface Link, 4 rechargeable batteries and a compact Mains Battery Charger worth £38.

ACCESSORIES

Mains Adaptor	£8.65
32K RAM Pack or 32K EPROM Pack	£17.35
128K RAM Pack or 128K EPROM Pack	£43.40
512K RAM Pack	£169
Z88 to BBC Link	£21.70
Z88 to PC Link II	£30
Z88 EPROM ERASER	£34.75
Serial Printer Cable	£8.65
Parallel Printer Cable	£24.00
Z88 Modem	£86.90
Z88 Soft Carrying Case	£8.50
Sinclair Z88 Computing Book	£9.95
AA Nicad Rechargeable Battery	£1.50
Battery Charger, Compact & Fast (3 Hours)	£6

CO-PRO Adaptor



Now for the first time you can add the Master Co-processor boards, to your standard BBC model B, or B Plus. With this brand new launch from Watford Electronics you can attach any BBC Master co-processor to the original BBC Micro. Once again Watford strides ahead with a new concept in BBC B Micro add-ons. This unique external Co-Pro Adaptor, is protected by patent applications.

Use the super fast Turbo Board with your BBC B, it is much faster than the 6502 2nd processor superseding it.

With the 512K addon your standard BBC machine achieves IBM PC compatibility at a realistic price running GEM, Lotus 123 and many other programs. Included with the 512k package is a high precision mouse and the Digital Research GEM suite of software; GEM Desktop, GEM Write GEM Paint. This requires both the 1770 DFS and the ADFS to be fitted to your computer.

To use other co-processors you require a BBC B with DNFS 1.20 or higher, or BBC B+ fitted with 1770 DFS 2.20 or greater. Co-processors work exactly like a second processor.

Master owners may use Co-Pro to add a second Co-processor externally. Watford, brings power to your BBC at only:

£35 (carr £5)

Watford Electronics are Appointed & Authorised DEALERS / REPAIR CENTRE for Acorn Computers Ltd Microvitec Monitors Panasonic Printers

NEW

BBC PCB DESIGNER

At last! A PCB design package for the BBC Micro that eclipses some industry CAD software. Hard to believe, isn't it? Just look at some of the impressive package specification:

- Library Component Designer
- Component Library (over 200 parts)
- Component List Editor
- NetList Editor
- PCB Board Designer
- Plotter Driver
- Dot Matrix Printer Driver

This integrated suite of programs is packed full of sophisticated PCB related features making the design of a circuit board a dream instead of a nightmare.

Input for the design may be manual, taking components from the library and connecting them, or highly automatic starting from a netlist and list of components. In auto mode, PCB Designer will never allow you to forget a connection again! And of course, either in manual or auto mode, connectivity is maintained no matter how you later move the parts around and route the tracks. Connections snap together and angles are corrected. Through hole vias and track thickness are established automatically and many more features, far too numerous to mention here, are included in the system.

Some of the PCB Designer's features are:

- Over 120 library pad sizes/shapes
- Four colour adjustable palette
- Zoom range 2:1 to 1:4
- Highlighting of specific tracks
- Normal and surface mounted components
- Rapid screen review
- Menu driven
- Variable gridlock
- Switchable measurement grid
- Pre-select pan/scroll facility
- Large 24" x 24" Board size
- Copy route facility
- Connectivity held at all times
- Ratsnesting of part connections
- Auto-plaement of text references
- Text linked to parts
- Automatic placement of vias
- Printer and plotter outputs provided
- Comprehensive manual

TYPES OF PLOT OUTPUT

Top and bottom track artworks, top and bottom silkscreens, solder resist mask, drilling detail drawing and check plot. All these may be with pad holes on/off, scale of 2:1 or 1:1, board edge on/off, 90 degrees rotation, mirror image, width of pen, x & y offsets and batch plots to disc.

The above is only a taste of the superb features of this software, surely capturing previously unknown performance from the BBC Master computer. BBC B owners will need to fit at least one block of sideways RAM, Shadow screen memory and a disc drive. A trackerball or a mouse is also required.

BBC PCB Designer is supplied on a 32K PAL PROM and comes complete with two discs and a comprehensive manual containing examples and useful information on PCB design.

By the way, as a bonus, PCB Designer is also suitable for many other schematic drawing applications such as circuit diagram drawing.

Introductory Offer: £99

(Please write in for further technical details)

Archimedes Real-Time Digitiser

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.

Once captured, Video images can be stretched, squashed, rotated, stored on disk, printed, or used by applications software.

Applications include desktop publishing, graphics, animation, image analysis and recognition, medical imaging, automatic inspection and measurement, databases, interactive video, remote transmission of pictures via a modem, movement detection ... or anything else you can think of!

SPECIFICATION

SOFTWARE

All the driver software for the digitiser is contained in a ROM on the podule. Facilities provided include:

- Grabbing of images to the screen or dumping to memory.
- Continuous grabbing and display for previewing or camera alignment.
- 'Hot key' grabbing - pressing a (configurable) key combination grabs and displays an image on the screen while another program (e.g. paint software such as Artisan) is running.
- Scaling (zoom/shrink) any section of an image to any size in X and Y directions, with optional X/Y flip, window clip and logical (AND/OR/XOR) plotting.
- Rotation and scaling to any angle and size, rotating about any point, with optional window clip, and logical (AND/OR/XOR) plotting.
- Very versatile matrix printer screendump facility for Epson FX, LQ and EX compatible printers - pictures can be printed to ANY size (including multiple sheets) at any orientation, using any available printer density and one of six internal sets of dot patterns, or with user definable patterns (pattern editor supplied). The screen-dump can also be used for general purpose graphics screen printing.
- Pixel value lookup tables: pixel values can be passed through a user defined lookup table to allow contrast enhancement, thresholding pseudo-colouring etc.
- Smoothing and noise spot removal to enhance image quality.
- Creation of sprites from all or part of a digitised image.
- Saving and loading of digitised images in compressed format.
- Combination of pictures by adding, averaging, subtracting, multiplication etc.
- Much faster versions of the Arthur *ScreenLoad and *ScreenSave commands.

Software facilities are accessed via operating system star (*) commands and SWI calls. High resolution screen modes using MultiSync type monitors are supported.

UTILITY DISK

A disk is included, containing sample pictures, examples and utility programs including the following:

- Colour image grabbing using colour filters with monochrome or colour cameras, including colour balance adjustment and scaling facilities.
- Pattern editor for 2 colour display modes and printer screendumps.
- 512 line interlaced display for non MultiSync monitors.
- Thresholding to create two colour images.
- Capture and replay of animated sequences.
- Several example programs illustrating the use of digitiser software.

RESOLUTION

Images are digitised to 512 (h) x 256 (v) pixels, and then scaled to fit the Archimedes' screen. It is possible to digitise to 512 x 512 pixels if the picture is stationary for about 0.1 second. 512 x 512 images can either be displayed on a MultiSync monitor, or on a normal monitor using interlacing.

Pictures are digitised to 64 levels of grey (6 bits). Note, however, that it is only possible to display all 64 levels on a monochrome monitor, or a colour monitor which has a composite (CVBS) input. For this reason, the Philips CM8533 monitor is recommended instead of the standard Archimedes monitor. It is also possible to connect both a colour and a monochrome monitor at the same time.

Any 2,16 or 256 colour graphics mode can be used to display digitised pictures. In two colour modes, grey levels are represented using dot patterns, which may be redefined if required (a pattern editor is supplied).

SPEED

Video fields are captured in real time (1/50th sec.), and then transferred to Archimedes' memory or the screen. The grab/display rate is dependant on the screen mode and picture size, up to 25 fields per second for quarter screen images, or 12.5 per second for fullscreen (Mode 9).

HARDWARE

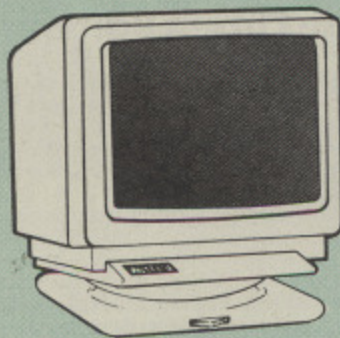
The digitiser is a single width podule, with a BNC socket on the rear panel for the video input, which may optionally be terminated via a link. There is 128K of on-board memory to store the digitised image, and a 32K ROM on the podule contains all the driver software.

Automatic video level control and black level clamping circuitry is used to ensure that the optimum contrast is obtained from a variety of video sources. A filter is included to avoid patterning effects when using colour sources.

Price £249

Continued





All Monitors are supplied complete with BBC connecting leads FREE.

MICROVITEC 14"

- 1431 - Standard resolution as used on the BBC television computer programme **£175**
- 1451 - Medium resolution, suitable for word processing in mode 0 **£225**
- 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**

TAXAN 12" & 14"

- TAXAN Super Vision 2 Type 620 Hi-res RGB Colour monitor. Ideal for Wordprocessing **£263**
- TAXAN Super 3, Type 625 Ultra Hi-res, RGB Colour) Text mode switch allows monochrome text display in Green, Amber, White reverse or White on Blue **£313**
- TAXAN 14" Multisync 770 Plus - An autoscanning Ultra high res, colour monitor. Ideal for Archimedes, IBM & Compatibles **£495**

- NEC JC-1401P3EE 14" Multisync Ultra Hi-res Intelligent Colour monitor. Auto scans frequencies between 15KHz to 35KHz. Text switch provides 7 colours for Database & wordprocessor. **£489**

PHILLIPS Monochrome 12"
BM7502 Hi-res Green **£69**

STAR BUY

- PHILLIPS 14" Hi-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.

ONLY £195

N.B. carriage on Monitors £7 (securicor)

SPARE LEADS

BNC Lead for Zenith or Philips **£3**
Skart Monitor Lead **£5**
RGB lead for TAXAN Monitors **£3**

SWIVEL BASES

for Video Monitors

By placing your monitor on one of our professional swivel bases (see monitors drawing above), you gain the freedom to adjust the monitor viewing angle to suit your needs and thus alleviate eye strain and reduce back stress. The front mounted adjustable control dial makes adjusting the monitor viewing angle very simple.

for 12" Monitors **£7** (carr. £2.50)
for 14" Monitors **£10** (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 all wordprocessor users. Hundreds of these screens are in daily use in various branches of one of the leading High Street banks.

£12

TAXAN KP-815 PRINTER

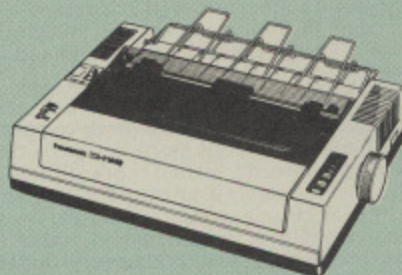
80 column, Bi-directional, 160 CPS, (NLQ 24cps); Friction & tractor feed + paper roll holder as standard; Epson FX compatible.

Offer Price £159

KAGA/TAXAN PRINTERS

Taxan KP915 132 Column Printerr **£275**
(carr £7)
RS232 Interface **£49**
RS232 Interface with 2K Buffer **£69**
RS232 Interface with 16K Buffer **£89**

Panasonic KX-P1081



Attractively finished in BBC beige. Bi-directional, logic seeking. Has IBM and Epson RX compatible command calls. Speed: 120CPS draft mode, 24 CPS NLQ mode. Character width range from 5 cpi to 17 cpi. Up to 40 downloadable characters. Functions include, Proportional spacing, Justification, centering and left & right ranging.

(Price includes, FREE a 4ft Printer Lead, and a Dump Out 3, Screen Dump ROM worth £35 with every printer purchased from us).

Special Price: **£145** (carr. £6)
Optional RS232 Interface: **£39**

Panasonic KX-P3131 Daisy-Wheel Printer

This low-cost high-performance Daisy Wheel printer is ideal for anyone wishing to produce clear, immaculate letters or reports. It delivers, flawless text at 10, 12 & 15 CPS. Supports proportional spacing. Is Bi-directional, logic seeking. Printing speed: 17CPS. Has 6k printer Buffer. A printer of similar spec could cost a lot more than our ridiculously low price of:

Only **£255** (carr. £7)

Single Sheet Feeder **£175**
Tractor Feed **£90**
Daisy Wheel (various) **£12**
Ribbons: Standard **£4.50**; Long Life **£7**
Extra 32K Printer Buffer (internally fitted) **£10**

Panasonic KX-P4450 LASER PRINTER

Now available from stock. Please write in for technical details

NEC P2200 PINWRITER

24 pin; 80 column; 168CPS - 56CPS LQ; Epson LQ compatible, 7K Buffer; 7 resident FONTS, Friction & Tractor feed, front load single sheet feed, etc.

Price: **£275**

Cut Sheet Feeder **£65**
Additional Font Cartridge **£25**
NEC P2200 Pinwriter Ribbon **£6**

VARIOUS PRINTERS & ACCESSORIES

- Brother HR20 Daisy Wheel **£349**
- HR20 Tractor Feed Attachment **£110**
- Epson EX800 Printer **£346**
- Epson EX1000 Printer **£589**
- Epson FX800 Printer **£295**
- Epson FX1000 Printer **£425**
- Epson GQ3500 Laser Printer **£1290**
- Star LC10 Printer **£175**
- Star LC10C Colour **£215**
- Epson LQ500 Printer **£285**
- Epson LQ800 Printer **£399**
- Epson LQ850 Printer **£469**
- Epson LQ1050 Printer **£599**
- Epson LQ2500+ Printer **£749**
- Epson LX800 Printer **£189**
- Epson SQ2500 Printer **£975**
- Epson Paper Roll Holder **£17**
- EX800/1000 Colour Option **£55**
- EX800/1000 Colour Ribbon **£18**
- HI80 Re-Fills - Set of 4 pens **£7**
- Hitachi 672 Colour Printer **475**

CUT SHEET FEEDERS for

EX800 **£130**; EX1000 **£195**; FX800 **£135**;
FX1000 **£169**; LQ/LX800 **£125**;
LQ850 **£135**; LQ1050 **£75**; LX1000 **£305**.

TRACTOR FEED for

EX800/1000 **£78**; LQ800 **£44**; LQ850 **£69**;
LQ1000 **£50**; LQ1050 **£75**; LQ2500 **£195**

(Securicor Carriage on Printers **£7**)

EPSON PRINTER INTERFACES

All these interfaces fit inside the printer.
RS232 **£27** RS232 + 2K Buffer **£52**
IEEE 488 **£65** RS232 + 8K Buffer **£62**

INTEGREX COLOUR JET PRINTER

- Colour Jet 132 Printer **£515**
- Paper Roll **£6**
- Screen Dump Software **£10**
- Colour Cartridge **£14**
- Black Cartridge **£8**
- 100 A4 OHP transparencies **£55**

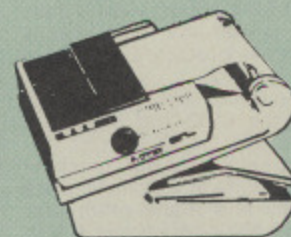
Printer Sharers/Changers

Connect upto 5 Micros to 1 printer or 5 printers to 1 Micro with our Printer Sharers/Changers. (Ideal for School environments.)

Connects	Serial	Centronics
2 to 1	£24	£25
3 to 1	£34	£35
5 to 1	£44	£45

(Cables extra at £6 each. Please specify type required when ordering)

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 **£23** (carr. £2.50)
132 Column version **£26** (carr. £2.50)

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 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 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)

PRINTER LEADS

Centronics lead for the BBC

Standard length (4 feet long)	£6
Extra long (6 feet long)	£8
Compact's Special Centronics Lead	£9
RS232 Cable	P.O.A.
IBM/Archimedes Parallel 1 metre lead	£7
Double ended 36 way Centronics Lead	£9

PRINTER RIBBONS & VARIOUS DUST COVERS

Type	Ribbons	Dust Covers
BBC Micro	-	£3.50
BBC Master	-	£4.00
Archimedes Micro pair	-	£9.00
Brother HR15/20	£3.00	£5.00
EX/LQ800	£7.50	£4.50
EX/LQ1000	£8.00	£5.00
RX/FX80/85/800/MX80	£4.00	£4.95
RX/FX100/1000	£6.00	-
Kaga/Texan KP810/815	£5.25	£4.00
LQ2500	£9.00	£5.50
LX80/86	£4.00	£4.50
LX800	£4.00	£4.75
M1009/GLP	£4.00	£3.75
Panasonic KX1080/81	£4.50	£4.75
SQ2500	£25.00	£5.50
Star NL10	£4.00	£4.50
Microvitec Metal	-	£5.50

Our attractive Dust Covers are manufactured from translucent PVC. The seams are stitched and edges are taped to prevent splitting due to continuous use.

Listing Paper (Perforated)

- 1,000 Sheets 9 1/2" x 11" Fanfold Paper **£7**
- 2,000 Sheets 9 1/2" x 11" Fanfold Paper **£12**
- 1000 Sheets 9 1/2" x 11" NCR 2 Part Fanfold **£19**
- 1,000 Sheets 15" x 11" Fanfold Paper **£9**
- 1000 Sheets true A4 Fanfold Paper **£11**
- 2000 Sheets true A4 Fanfold Paper **£20**
- Teleprinter Roll (Ecoho 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

MEGABUFFER 256



This new Megabuffer 256 from Watford is a full featured 256K Printer Buffer. It allows the computer to print 256,000 character in a short time thus freeing the computer very quickly. In short it makes light work of printing large documents, screen dumps, etc. It is extremely simple to connect. The features are:

- Low Cost, High performance.
- 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 test unit for both the buffer & your printer.

In conclusion it can safely be said that MEGABUFFER 256 is the ultimate printer Buffer for both the amateur and professional user.

Only £149 (carr £2)

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 trail balance.

FINAL ACCOUNTS - Will take data prepared by the Cashbook module and produce a complete set of accounts as following: 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.

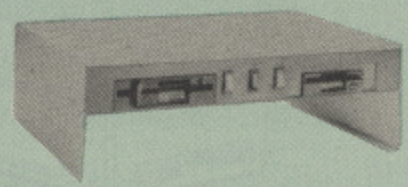
All this for only **£21 (Disc)**

OFFICE MATE



- DATABASE
 - BEEBCALC SPREADSHEET
 - BEEBLOT GRAPHICS
- DATABASE** - Set up a computerised card index system with powerful search facilities.
- SPREADSHEET** - Offers many calculation and editing features.
- BEEBLOT** - Provides visual representation from Spreadsheet data.
- OFFICE MATE Only £10 (Disc)**

New Launch Offers Disc Drives DP35-800S



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 inch disk, the standard for 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. For ease of access, the switches are front mounted. DP35-800S has its own power supply, independent of the BBC Micro.

Watford's new plinth enables users to read, write and format disks both in DFS and ADFS format - currently the accepted standard for the Master Compact and the Archimedes, it also enables the user to read disks written for the Archimedes. Ideal for both BBC & Master.

Launch Offer: £165 (carr. £7)

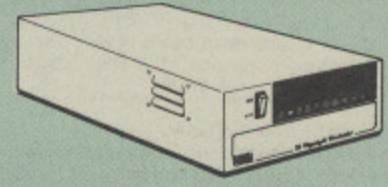
OKIMATE COLOUR PRINTER

The first ribbon transfer printer in its price range which offers fully versatile colour or black printing. A 24 element print head produces more than 100 shades with exceptional clarity. Ideal for use with Quest Paint or AMX Super Art.

Only: £119

BBC Screen Dump	£10
Colour Ribbon	£6
Black Ribbon	£6

30 Megabyte Winchester Drive



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 full user guide and full utilities including file copy, 1000K save routines, Format and Verify - in fact all you need and more.

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).

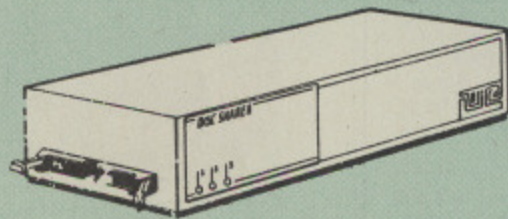
Launch Offer £425 (Carr. £12)

**CREDIT CARD 24 HOUR
Ansaphone Hot Lines
(0923) 50234 or 33383**

Continued

NEW

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

NOW WITH EXTRA FEATURES AT NO EXTRA COST – Watford's latest DFS 1.44

- Incorporates Acorn's Official Tube Host Code so that those with 2nd processors no longer need to waste a ROM socket on the DNFS.
- Option to DOUBLE the speed of BPUT and BGET.

WATFORD'S & ACORN'S SINGLE DENSITY DFS

Watford's popular and widely acclaimed DFS has now been available for five years and has gained a large following amongst serious and educational users of the BBC Micro. Owners of Acorn or any other standard DFS can upgrade to our "Ultimate" DFS merely by replacing their DFS ROM. See below for this upgrade. (P.S. Watford's highly sophisticated DFS is fully compatible with Acorn DFS). (not Acorn's 1770 DFS)

- Complete Disc Interface Kit including DFS ROM and fitting instructions **£58**
 - Acorn's 0.90 DFS Kit complete **£59**
 - DFS Manual (Comprehensive) (no VAT) **£6.95**
- (P.S. Our DFS manual is the only comprehensive Manual available for the BBC micro and covers both Acorn & Watford DFSs).
- Watford's sophisticated DFS ROM only **£16**
 - We will exchange your existing DFS ROM for Watford's Ultimate DFS ROM for only **£12**
 - DNFS ROM only **£17** ● ADFS ROM only **£25**

NEW

WATFORD'S Mk II Double Density DFS INTERFACE

Many of our customers have wanted to use our superior DDFS and Acorn ADFS together. Now our MkII DDFS board has been adapted to allow the use of Acorn ADFS as well.

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.
- OSGBP 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 **£30.00**.

- Special introductory offer **£39.00**
- DDFS Manual (No VAT) **£6.95**
- We will exchange your existing DFS Kit for our sophisticated DDFS for only **£25.00**

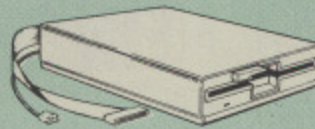
Please note, as the MkII DDFS is a hardware and software upgrade, it is not possible for existing Watford DDFS users to simply exchange their ROM for the new version.

DUST COVERS (For our Disc Drives)

Single CLS (without PSU) **£3.20** Twin CLD (without PSU) **£3.85**
Single CS (with PSU) **£3.95** Twin CD (with PSU) **£3.90**

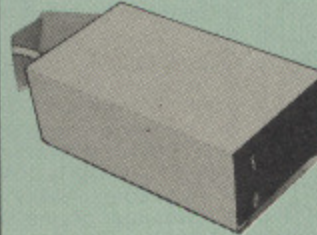
SPECIAL DISC DRIVE/DDFS OFFER

Type CLS400S



- The popular Mitsubishi 400k Single Disc Drive, Double Sided, cased with Cables. Plugs directly to your Micro.
 - Watford's popular DDFS Disc Interface (allows 720k storage). Will run in both Single and Double Density modes 40/80 track Software switchable.
 - A comprehensive User Friendly Manual.
- A Bargain at Only **£130** (£6 carr)
(Offer valid while stocks last)

3 1/2" DISC DRIVE OFFER



These top quality 3 1/2" 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. They run directly from the BBC B/Master's own PSU.

- CLS35 400K Unit **£69**
- CLD35 800K Uni **£126**

Mysteries of Disc Drives & DFS Revealed

Are you tired of faulty cassettes, and lengthy loading times? Do you want to upgrade your BBC micro to take discs but you get tied up in the plethora of jargon surrounding the choice and use of these systems.

Then The Mysteries of Disc Drives and DFS Revealed is the book for you. It explains in detail the different types of systems available, how they are installed and how to use them. Many examples are given including pre-written programs to call various functions of the DFS available only through Operating System calls. Different types of disc, 40/80 tracks etc. are all explained. This book is ideal for the beginner confused by the plethora of choice available in the marketplace.

£5.95 (Book No VAT)

DISC ALBUMS

Attractively finished in antique brown leather look vinyl. Stores upto 20 Discs. Each disc can be seen through the clear view pocket.

£4

FLOPPY HEAD CLEANER KIT

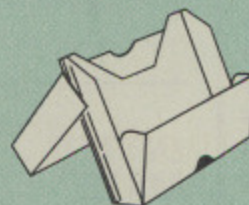
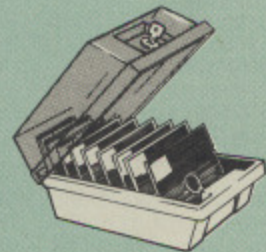
The heads in floppy drives are precision made and very sensitive to dirt. The use of a cleaner Kit is a sensible precaution against losing valuable data. It is recommended to clean the drive head once a week. It is very simple to use. Available in 3 1/2" & 5 1/4", please specify.

£6

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 upto 50 5 1/4" discs **£6.00**
 - M85 – holds upto 95 5 1/4" discs **£8.00**
 - M25* – holds upto 25 3 1/2" Discs **£5.50**
 - M50 – holds 50 3 1/2" Discs **£7.50**
 - M10 – holds upto 10 Data Cartridges **£15**
- * Not lockable



PLASTIC LIBRARY CASES

Holds up to 10 5 1/4" Discs. **Only £2.00**

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. It holds up to eight 5 1/4" Discs.



Protection at Only: **£2**

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.

The first capacity given in the first column indicates capacity in single density mode. That within the brackets is the capacity in double density mode. All disc drive type numbers start with the prefix "C".

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.

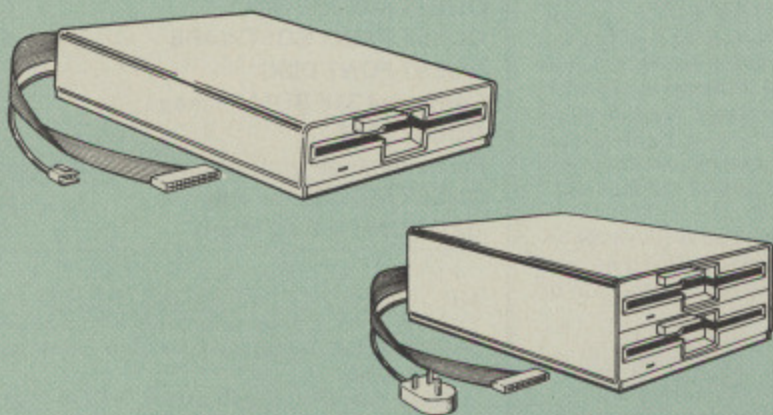
Various other "manufacturers" of disc drives for the BBC micro (more accurately, "packages" label other manufacturers drives with their own name). We buy the high quality JVC and Mitsubishi drives in large quantities directly from the manufacturers, package them and sell them at "dealer" prices direct 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 £5. (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 Watford plinth. (Turn to the 6th page of our advert for the Plinths).

P.S. All our 5 1/4" Disc Drives with PSU are compatible with the Compact Micro. All you require is the special Compact Disc Drive Cables designed by us.



Capacity	Drives without P.S.U.		Drives with P.S.U.	
	Single	Twin	Single	Twin
200K (360K)	CLS 200 £89		CS 200 £98	
400K (720K)	CLS400S £82	CLD 400 £168	CS 400S £92	CD400 £188
800K (1.44M)		CLD 800S £162		CD 800S £182

● TWIN Disc Drive Case, complete with Power Supply & Cables £43
Securicor carriage on Disc Drives £5 to £6

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 1/4" 400K, (720K in double density); Double sided; 40/80 track switchable.

Cable to connect 5 1/4" Disc Drives to BBC Compact
Single £9 Twin £12
Special Cable to connect both 3 1/2" and 5 1/4" Disc
Drives
simultaneously to the BBC Compact £13

3M - DISKETTES

3M - SCOTCH Diskettes with Lifetime warranty from Watford Electronics your 3M Appointed Distributor.

- 10 x 5 1/4" S/S D/D 40 Track Diskettes (744) £8.00
- 10 x 5 1/4" D/S D/D 40 Track Diskettes (745) £9.75
- 10 x 5 1/4" S/S D/D 80 Track Diskettes (746) £12.50
- 10 x 5 1/4" D/S D/D 80 Track Diskettes (747) £12.75
- 10 x 5 1/4" 1.6M D/S D/D High Density Discs for IBM XT and AT £28
- 10 x 3 1/2" S/S D/D 40/80 track Discs £13.50
- 10 x 3 1/2" D/S D/D 40/80 track Discs £15
- 10 x 3 1/2" High Density Diskettes £43



FREE

This extremely useful and attractive Personal Leather Organiser worth upto £50 is yours when you buy from us, 5 Boxes of any of the 3M range of Discs that we advertise above. Offer valid while stocks last.

TOP QUALITY 3 1/2" & 5 1/4" DISKETTES

To complement the range of quality discs and disc drives that WE already sell, WE are now supplying some special offer packs of 10 high quality discs. Each Disc has a reinforced hub ring and carries a lifetime guarantee. These are supplied complete with selfstick labels and packaged in an attractive plastic library disc box. We strongly recommend these Discs.

- 10 x M3 3 1/2" D/S D/D 80 Track Discs £13
- 10 x M4 5 1/4" S/S D/D 40 Track Discs £6.50
- 10 x M5 5 1/4" D/S D/D 40 Track Discs £8
- 10 x M7 5 1/4" D/S D/D 80 Track Discs £9
- 3" Double Sided Discs £3 each

Special BULK OFFER on 5 1/4" 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 | £35 | £39 | £45 |
| ● With Sleeves | £38 | £42 | £48 |

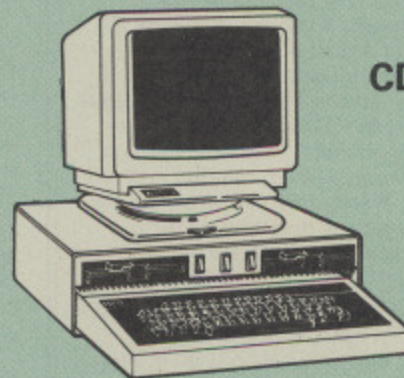
PRICES
SLASHED

WATFORD'S WINCHESTER DRIVES

- 10 Megabyte Unit with ADFS £375
- 30 Megabyte Unit with ADFS £425
(30 Meg Unit is supplied complete with utilities software. For full details see Page 6 of our advert)

CDP800S

CDPM800S



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.

CDP 800S for BBC Micro £192

CDPM 800S for Master £196

DP35-800 for BBC/Master £165

(For DP35-800S spec. see Page 4 of our advert)

(Securicor Carr. £7)

(The above drive units are 2 Megabytes unformatted)

Continued

NOMINATED
FOR

1987

QUEST MOUSE



QUEST MOUSE

The ultimate in Mouse technology, the Watford Electronics Quest Mouse must be the most powerful Mouse package yet produced for the BBC Micro. Featuring state of the art 32K ROM software the Quest Mouse package is filled with features essential to the budding artist. The Quest Mouse is a high precision, low profile and large footprint mouse. It has three large comfortable buttons and its RUBBER COATED STEEL BALL is smooth and easy to use on virtually any work surface. This also eliminates any directional bias that one encounters on the most well-known mouse for the BBC. The Quest Mouse is FULLY HARDWARE COMPATIBLE with the AMX MOUSE so that it will work with any of the AMX range of software.

The two parts of the Quest package are available separately so that existing Mouse owners can upgrade to the Watford's sophisticated Quest Paint software or replace their existing worn out mice for a minimum cost.

QUEST PAINT

The Quest Mouse software is supplied on a PALPROM unit to allow the sophisticated 32K program to be used from a single ROM socket. It is compatible with the BBC B, BBC B Plus and BBC Master Series machines.

The software is used to draw high resolution Mode 1 pictures in full colour. All menu selection and control of the drawing process is performed with the mouse so that you will hardly ever touch the keyboard.

SOFTWARE FEATURES

The software is far too powerful for us to describe it fully in such a small space. Below is a list of the various features. Please write to us for a fully descriptive leaflet.

Disk interface not required. Utilities disk has facility to create and print big screens. Colours applied can be solid, either pattern of user defined pattern. Drawing can use brush or airbrush. Brush shapes can be defined and stored. Airbrush sprays colour/pattern randomly with four jet sizes and even or center spread. Colour cycles. Colour protection to stop particular colours from being overwritten by selected drawing actions. All standard drawing facilities like: rubber, straight pencil lines, triangles, circles, ellipses, rectangles, parallelograms, polygons, etc are provided. All shapes can be solid or just a boundary line. Once a shape has been set up it can be repeated anywhere on the screen. Global colour replace in a rectangle. Powerful fill facility for areas and vertical/horizontal lines. Full cut and paste of rectangular areas with rotation and size with screens from Watford Beeb Video digitiser. Load and Save screens with colour pallet information, save brush and pattern definitions etc.

Take The Guesswork Out of Selecting a Mouse Package

With reviews like this how can you go wrong.

Popular Computing Weekly, 9-11 June '87

"What you actually get for your money is a well built, three button mouse (far superior to the AMX mouse)."

"Overall the combination of a quality mouse and decent art package gives Watford Electronics a real chance of supplanting AMX as mouse supremos."

Micro User June '87

"Quest Mouse and Quest Paint can hold their heads high in the market..."

A&B Computing June '87

"... Watford Electronics, a company famed for excellent hardware add ons and versatile software packages. Called Quest mouse, "this is a very special mouse driven drawing package..."

"... you will have one of the most comfortable and professionally built mice I have used in a long time. The buttons are responsive, the mouse movement is smooth and without directional bias - a pleasure to use."

"What we have here is probably the best art package there is for the BBC Micro..."

"Quest Paint is a major leap forward in BBC programming..."

"Quest Paint is an original piece of programming, it is friendly and well endowed with many useful facilities. I would comfortably say it is easier to draw good pictures with Quest Paint than it is with more expensive 'Professional' art packages for the Atari ST and the Commodore Amiga. A recommended buy if you are looking for the best in BBC micro based art packages"

Acorn User, September '87

"The mouse (Quest) performs well in the face of competition from AMX, Wigmore and the rest..."

"... this package represents excellent value for money. If you are interested in art then this program is for you to buy"

"Given time, I can see no reason why Quest Paint shouldn't take on the title of the definitive art package available for the BBC Micro to date"

"All in all, Quest Paint is a very professional package. It contains virtually every feature the budding artist could require"

"What makes Quest Paint so versatile is the addition of a sub-menu which allows you extensive control over each function"

"Until recently, Superart from AMS had been judged as the definitive mode 1 graphics package for the BBC micro. But now it has a serious rival in the form of Quest Paint, from Watford"

"As a measure of what is contained within Quest Paint, I would say it had all the features of Superart plus..."

"In most art packages, provision is given for drawing triangles and rectangles. Quest Mouse goes 14 better, allowing any regular polygon of upto 16 sides"

"One facility, not found on any other Art package to my knowledge, is the ability to access a digitiser from within the program". The reviewer concludes by saying, "The result is an extremely comprehensive and professional art package"

John Kilby, Head of Computer Science, Bishop Wulstan High School, Rugby, writes:

"Quest has been an excellent piece of equipment. The problem that seems to occur everyday is that at lunchtime the pupils rush to the computer room to make sure that they are first in the queue for the 'Quest' mouse"

Lt. Cln. C.G. Holton, G2 HQ 1 (BR) Corps, BFPO 39, writes:

"As ever your service is superb and the Quest Mouse proves every bit as good as the adverts claim"

Beeblet User Group, New Zealand Oct '87:

"One of its nicer features is that the top menu is done in Mode 0, the drawing itself is in Mode 1. Thus on screen together are two different Modes. A neat way around an old problem"

"PAN is used when a larger than one screen size image is required. The mind boggles at an A3 size drawing"

"I like it partly because of the mouse itself which is smooth and easy to handle but mainly I suppose because of the features I longed for and previously never got. Its easy to use with almost everything at your fingertips from the mouse. The software is simple where needed and complex where complexity is required"

ConQuest

Watford's Quest package is an extremely powerful and flexible drawing package, with very wide and unusual features. However, since its launch various suggestions for even more advanced & powerful facilities were received from the Quest users. ConQuest allows you these more advanced facilities, like, distortion of a cutout to any shape and a full font designer. If you also have a GXR ROM in your machine or you are using a BBC Master then ConQuest will take advantage of this to give ellipses at any angle, sectors and arcs, etc. 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 principal even further, by utilising the otherwise normally incompatible Sideways RAM facility by holding pictures in them.

Some of the features are:

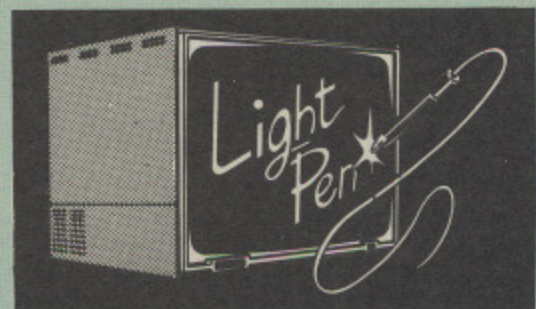
- Pick filenames off the screen for loading and saving.
- Rotate a cutout to any angle and Distort it to any four sided shape.
- Has Built in Font editor.
- Default brushes and patterns on startup.
- 16 x 16 font available on start up.
- Ability to reset patterns, fonts and brushes to default at any 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).

QUEST MOUSE & QUEST PAINT	£54
QUEST MOUSE, QUEST PAINT, AMX PAGERMAKER & PAGEFONT	£82
QUEST MOUSE ONLY	£25
QUEST PAINT SOFTWARE	£32
QUEST FONT DISC	£12
ConQuest 32K ROM Package	£29
QUEST MAT	£3
Part-exchange your old Mouse for a New QUEST MOUSE for only	£23
GXR ROM for BBC Micro	£22

N.B.

1. Quest Paint supplied complete with Software in a 32K ROM, Comprehensive User Guide and a Utility Disc.
2. Quest Font Disc has 22 text FONTS for use within Quest Mouse.

MARK II LIGHT PEN



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 Only £21

(Price includes FREE software Disc and Operating Manual)

RB2 Marconi Tracker Ball

RB2 (AMX/Quest compatible) £52
 RB2 including Quest Paint £78

FLEET STREET EDITOR

Software pack for BBC Micro £33
 Software pack for the Master £39
 Software Pack for Compact £40
 Admin Xtra Disc Utility £13
 Walt Disney Disc Utility £13
 Fonts N Graphics Disc Utility £13

**THE NEW Mk III
AMX MOUSE**

ONLY: £59 Inc. Super Art package
 (carr £1.50)
 (Please specify for BBC, Master or Compact)

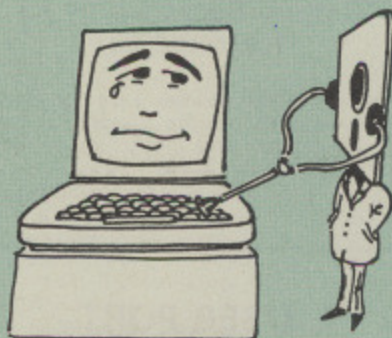
FREE our popular Colour Art software pack worth £15 with every AMX Mouse package purchased from us.

MOUSE MAT £3
 AMX MOUSE ONLY £29
 AMX UTILITY Package £11
 AMX SUPERART Package £34
 AMX STOP PRESS – A Desktop publishing software. Works with Keyboard, Joystick or a mouse £32

We are giving away absolutely FREE, our PAGE-FONT disc with every purchase of STOP PRESS from us.

PAGE-FONTS – Over 20 Fonts for use with AMX Pagemaker £12

AMX DESIGN (ROM) £55
 AMX 3D ZICON Disc £19
 AMX XAM Educational £15
 AMX EXTRA EXTRA £16
 AMX MAX A gem of desktop (ROM) £15

DIAGNOSTICS DISC

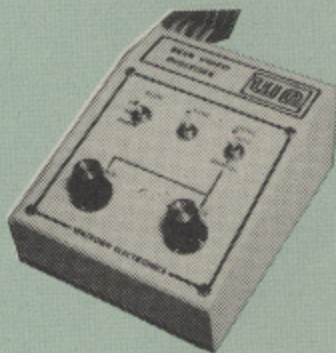
The BBC Micro is a very complex machine and thus diagnosing a fault can be very difficult. At Watford Electronics, we realise how difficult it can be when faced with a problem, finding yourself a long way from your nearest dealer, or even just uncertain about your Beeb's health, but not wanting to waste 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

**BEEB
VIDEO DIGITISER**

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. £3)

(Price includes) Digitiser Unit, Software in ROM & a Comprehensive Manual
 (BBC B+ and Master compatible, except Master with Econet)

Magazine Maker

(As seen on TV)

A combination of the Pagemaker and Watford's Beeb Video Digitiser.

Using any video that provides a composite signal and the digitiser, images from a camera or TV can be converted into a graphics screen on the BBC Micro.

They can then be used within Pagemaker to illustrate magazines or newsletters – in fact anything that needs to be created on A4 size paper.

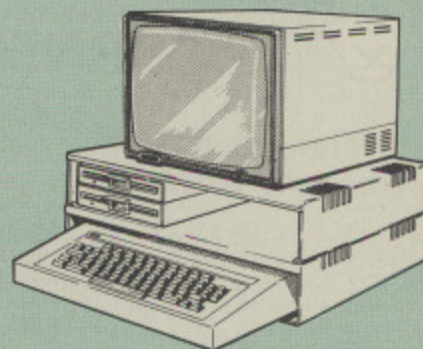
With Pagemaker's many features, a variety of pictures can be composed – the only limit being the imagination.

Pictures can be doctored using Pagemaker's graphics option to produce any number of effects.

Text can be formatted around the digitised photo on screen using the facilities available, which include 16 typefaces, character and pattern definer, text formatting and the ability to load in wordwise and viewfiles plus much more.

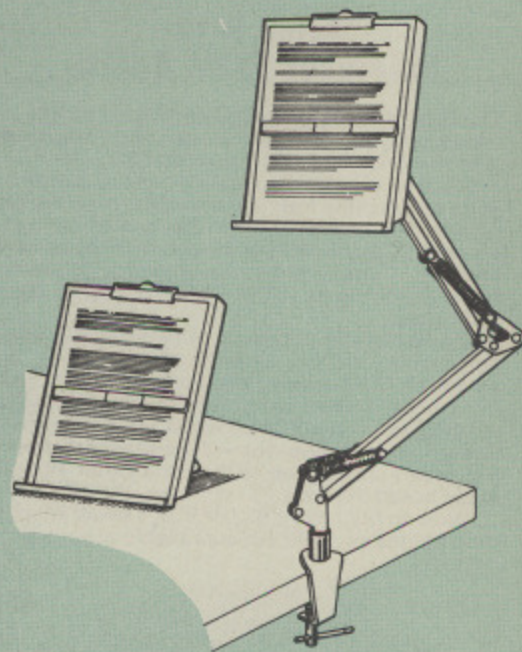
Once created the picture can be printed out. The Magazine Maker is suitable for any use that requires illustrated documents.

Complete Package **£135.00** (carr. £3)

**PLINTHS FOR BBC MICRO,
MASTER & PRINTERS**

Protect your computer from the weight and heat of your monitor. The BBC micro plinths have slots for maximum ventilation. The single plinth is suitable for a BBC and monitor, whilst the double height version provides enough room for our stacked or side-by-side dual disc drives or TORCH Disc pack, to be placed in the centre section. If you use our stacked drives, the remaining space can be used for further peripherals e.g. Speech Synthesizer, EPROM programmer or simply stationery. The computer slides neatly in to the lower section allowing easy access to remove the lid. The printer plinth is equally sturdy but without the cooling slots. It allows for access to the paper from the front as well as from the rear, (a facility not often thought of in similar products) if the paper is located beneath the plinth. This is a very convenient way to work especially if your work area is not deep enough to take the printer and paper separately.

SINGLE BBC PLINTH £11 (carr. £1.50)
 DOUBLE BBC PLINTH £19 (carr. £3.00)
 PRINTER PLINTH £10 (carr. £1.50)
 SINGLE MASTER PLINTH £14 (carr. £1.50)
 DOUBLE MASTER PLINTH £24 (carr. £3.00)

COPY HOLDERS

How often have you been about to type hand written notes into your computer when you find that there's nowhere to rest the paper or that your notes are resting at the wrong angle to read the type? Whether the notes be your latest program or the draft of a new trilogy, the new Manuscript Holders from Watford are superb for holding your paper at the ideal height and angle to allow you read and type in ease and comfort.

Available in 2 versions, desk resting and shelf clamping versions, these two units hold your paper firmly by means of a plastic retaining ruler and a clip grip. Both units are full A4 size.

Amazing value at only
 Desk Top **£10** (carr. £2)
 Angle poise **£14** (carr. £3)

Continued



ARIES CORNER

The Aries 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, Comal, 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 on-board 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: **£80** (carr. £2)



**CREDIT CARD 24 HOUR
Ansaphone Hot Lines
(0923) 50234 or 33383**

Aries B-12 Sideways ROM Board

This board is extremely well made, simple to install, reliable when fully loaded and compatible with the Aries-B20 and the Aries-B32.

The B12 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.

The B12 system consists of two parts: a large detachable "mother board" which carries the extension ROM sockets and a small "base board" on a short ribbon cable, which plugs into the existing sideways ROM sockets. This two-board design eliminates the reliability problems previously associated with some other ribbon-cable based systems.

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 **£40**
Aries B-12C **£5**

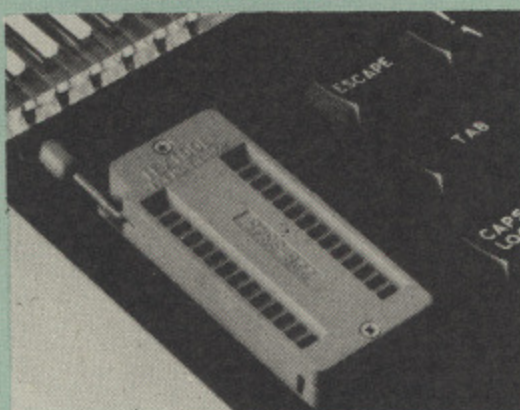
ARIES B-488 IEEE-488 INTERFACE UNIT

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)

All prices in this advert are
exclusive of VAT.

SIDEWAYS ZIF SOCKET



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 all professionals and Hobbyists alike.)

● BBC, B+ and Master compatible.
ONLY £16 (carr £2)

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 **£2.50**
- Spare Rack **£1.50**

ROM Cartridges for the BBC Master
Twin **£7.50**; Quad **£11**

16K Sideways RAM Modules

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:

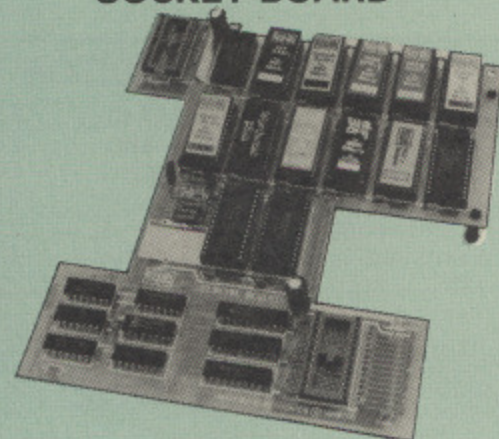
- Write protection (useful in a variety of circumstances).
- Read protection (allows recovery from ROM crashes).
- Compact construction.
- May be fitted in systems even with a ROM board.
- Multiple units may be fitted, even with a ROM board.
- No overheating or overloading problems.
- Free utilities disc supplied.
- Can be used as a 16K PRINTER BUFFER.
- Ideal for professional software development.
- Supplied with utilities software disc.

Only: **£24** (carr £2)

Optional extras

READ and WRITE protect Switches **£2** each
Battery for Battery Backup **£3**

SOLDERLESS SIDEWAYS ROM SOCKET BOARD



In the May 1986 Micro User's independent review, the writer concludes, "The board has been well laid out. Its position is much better than others - not over the HOT RAM chips and further away from the disc controller area". "I give the solderless ROM board the thumbs up and wish it success".

This brand new board from Watford Electronics is designed specifically for those wishing to add a ROM board to their own BBC without the need to perform any soldering.

This new board expands the total possible number of ROMs in a BBC from 4 to 16.

Unlike our competitors inferior boards, the ONLY upgrade required for fitting battery backup to the Watford Solderless ROM board (all Watford ROM boards, actually) is the fitting of the battery itself. (No other expensive components are required.)

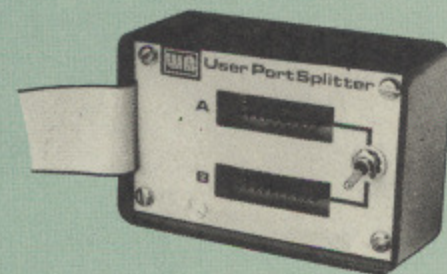
- The key features of this new, no fuss, easy to install quality product from BBC leaders Watford Electronics are as follows:
- Increase your BBCs capacity for ROMs from 4 to 16.
- No soldering required.
- Very low power consumption.
- Minimal space required.
- Compatible with Torch, DDFS, RAM Card, 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 £32**
Battery backup fitted **£36**
Battery Backup only **£3**
(carriage £2)

● 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.

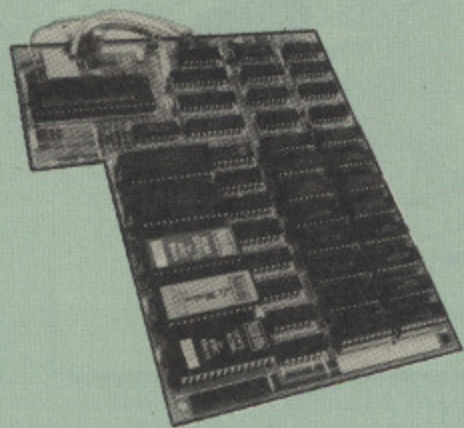
Only: **£8**

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.

ROM/RAM CARD



Watford Electronics announced the first ever commercial ROM board for the BBC micro, the Watford Electronics 13 ROM Socket Board 3 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 overheating problems.
- No User Port corruption (avoids problems with the mouse, modems, Eprom Programmers, etc.)
- Fully buffered for peace of mind.
- Firm mounting in BBC micro.
- Compatible with all 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.
- Accepts any ROM.
- 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 ROM-SPPELL, 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.

Please write in for further details.

INTRODUCTORY PRICES:

- ROM/RAM card with 32k dynamic RAM£45
- ROM/RAM card with 64k dynamic RAM£59
- ROM/RAM card with a massive 128k dynamic RAM£89

(carriage on ROM-RAM Card £3)

OPTIONAL EXTRAS:

- 16k plug-in Static RAM kit.....£9
- 16k Dynamic RAM for Upgrade.....£9.20
- Battery backup.....£3
- Read and Write protect switches.....£2 each
- Complete ROM-RAM board
- All options installed£106

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

Le Modem



The MODEM from Watford

At last a professional MODEM for the BBC Micro. Unlike other 'Modem packages' this is a complete package there are no extra software costs to get 'up and running'. Of course Le MODEM is multi-standard, i.e. 300/300, 1200/75 & 75/1200 UK and BELL (USA) are all supported.

The features that make Le MODEM such good value are:

- A complete communications terminal that transforms your BBC Micro into a very powerful World-wide data transfer system.
- Auto Dials, Auto answers, and is completely controlled by your micro. There are no external controls!
- Allows you to access PRESTEL, B.T. GOLD, THE SOURCE, MICROLINK, MICRONET, MICROWEB, THE TIMES NETWORK, MICRO LIVE (BBC TV database), CITY BB and more.
- Designed to be SIMPLE but SOPHISTICATED. To LOGON to a data base all you have to know is its TELEPHONE NUMBER, Le MODEM does the rest.
- Supplied with a comprehensive telecomms package in a 16K sideways ROM which includes a FULL PRESTEL terminal allowing TELE-SOFTWARE to be downloaded.
- A comprehensive 80 column terminal. This includes XMODEM error checked transfer protocol, to allow error free data transfer anywhere in the world!
- FULLY controlled by simple *COMMANDS allowing you to control it from your own BASIC programs. To get you started we supply a FREE disc of bundled software!
- Connects to the 1MHz bus. A *AUDIO ON-OFF command allows you to actually hear the telephone line through your BBC micro loudspeaker.
- Completely self contained with internal mains power supply. (Even a free mains plug is fitted!) A *TEST facility gives ON SCREEN indication that Le MODEM is working correctly.
- Packaged in such a way that you need nothing else except a BBC Micro to communicate with computers all over the world.
- FREE Registration to MicroLink.

SPECIAL OFFER

Price: **£82**
(carr £3)



(Price includes, Le Modem, Software ROM, Cables & Comprehensive Manual)
(Write in for further details)

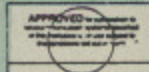
REPLICA 3

This new improved REPLICA 3 from Clares is a very powerful disc based TAPE to DISC Utility. It now transfers even more programs than ever before. Replica 3 will not work with all programs but then neither will anything else. 30,000 Replicas have been sold to date. It has to be good.

£15 (40 or 80 track)

Acorn's Speech Synthesiser package, complete
Special Offer £18

APOLLO



The NEW Modem from Watford

Following numerous requests from you, our discerning customers for an APPROVED, Low Cost & High Performance modem with Auto Dial & Auto Answer facilities as standard) we bring you the versatile APOLLO Modem. Just compare the features and look at the price (which incidentally includes the cost of the Software, manual and BBC connecting cable). We are sure you will agree that Watford Electronics in their traditional way are giving you a super 'value for money' deal.

Just look at these features:

- V21 for Bulletin boards, Microlink, Telecom Gold, etc.
- V23 for Prestel, Home Banking, and other Viewdata services.
- Reverse V23 allows User run Viewdata service.
- 1200-1200 half duplex for communications.
- XMODEM, HEX and ASCII file transmission.
- Auto Dial of given 'phone number.
- Auto Answer for User's Bulletin Board.
- 80 column terminal with split screen facility.
- Prestel text screen dump.
- Fully BAPT approved.
- FREE Registration to MicroLink.

The Apollo is attractively finished in matt black. It opens the doors to world communication to both, the Hobbyist and the Professionals alike. With baud rates varying from 300/300 Originate and Answer, 1200/75 and 75/1200 full duplex and 1200/1200 half duplex, virtually all the popular tele-services can be accessed. A comprehensive Comms ROM oversees the use of the APOLLO, providing simple commands for all the software controlled facilities. APOLLO is an ideal modem for both the first time buyer and the seasoned user. Join the Telecommunications Revolution - Buy a Watford APOLLO!

Only: **£82** (Carr £3)

Price includes, the Modem, Comm Software Cables & Operating Manual.
(Write in for full specification)

VOLTMACE JOYSTICKS

Delta 3B Single Joystick	£12
Delta 3B Twin Joysticks	£17
Delta 3C Joystick for Compact	£10
Delta 14B Single Joystick	£12
Delta 14B/1 Adaptor Module	£12
Transfer Software Disc-Tape	£7

ATTACHE CARRYING CASE

For the BBC Micro. Attractively finished in antique brown leatherette. Lockable.

Only **£10** (£2 carr.)

Versatile BEEB SPEECH SYNTHESISER 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 £2)

Continued



COMPUTER CONCEPT'S ROMS

ACCELERATOR	£46
CARETAKER Basic Utility	£23
DISC DOCTOR	£28
Graphics ROM	£29
TERMI	£25
COMMUNICATOR	£49
SPEECH ROM	£24
Printmaster	£25

Wordwise

£23

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 text-segment area.
- BBC B, B+ and Master compatible.

Only £24

(N.B. Word Aid requires a Disc Interface in your Micro)

HI-WORDWISE-PLUS DISC: £5

SPELL MASTER £42

Inter SHEET ONLY £37

INTER-CHART ONLY: £25

Inter-WORD £36

MEGA-3 ROM

Interword, Intersheet & Interchart - 3 in one ROM £76

INTERBASE £49

All Prices Exclusive of VAT

VIEW

VIEW WORDPROCESSOR 2.1 £35

VIEW 3.0 ROM £48

VIEW PROFESSIONAL £79

HI-VIEW £36
(for use with 6502 2nd Processor)

VIEWSHEET (Acornsoft) £36

VIEWSTORE £36

VIEWSPELL with 80 track disc £29

VIEWPLOT Disc £20
(Please specify for Master 128 or Compact)

VIEW-INDEX £12

OVERVIEW Packs 1 & 2 for the Master £72

Watford's own Sophisticated VIEW PRINTER DRIVERS

Epson FX80 & Kaga KP (Disc) £8
Juki & Brother HR15 (Disc) £8
Silver Reed Printers (Disc) £8

MINI OFFICE II

DISC Version for BBC B & B+ £14.00
DISC Version for BBC Master £16.50
ROM Version £43.00

(When ordering please specify for which Micro & 40 or 80 track Disc).

EPSON NLQ ROM for the BBC Micro



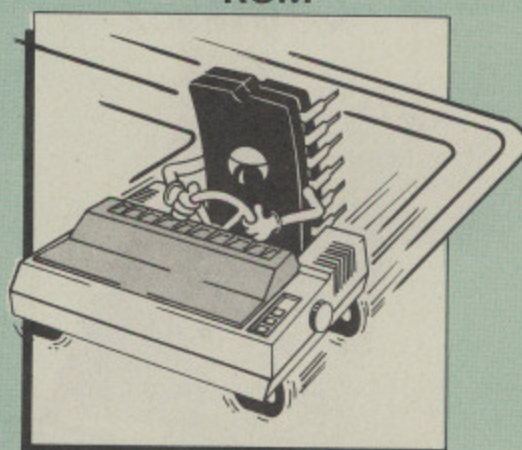
Harness the full potential of your Epson RX or FX printer. The NLQ ROM makes Epson printers produce Near Letter Quality output with optional proportional spacing, enlarged and underlined. Accessed by simple * commands from Basic, Wordwise and View (with driver) or almost any other language.

(Send an SAE for sample printout)

Only: £25

VIEW PRINTER DRIVER for NLQ ROM £7

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 only at 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

ROM-SPELL

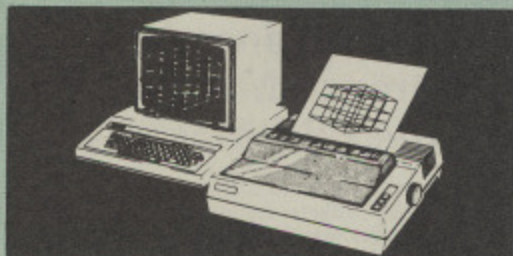


Probably the most advanced and fastest spelling checker available for the BBC Micro. Compatible with View, Wordwise and Wordwise Plus ROMSPELL is simple to use with easy editing of incorrect words. Full facilities for editing the user dictionary to allow customisation to your personal needs. Dictionary includes over 30,000 words and is supplied with a Comprehensive manual.

NOT compatible with 1770 DFS. (Please state 40 or 80 track disc)

Price still only: £25

DUMPOUT 3



A highly sophisticated screen dump ROM. This has to be the most flexible and powerful screen dump ROM yet produced for the BBC micro. It will put on paper anything you see on the screen, including full Mode 7 graphics. Also provided are window setting utilities and OSWORD calls to plot and read Mode 7 graphics pixels.

Facilities:

- Vertical and horizontal scaling in all graphics modes and mode 7
- Rotation of image by 90, 180 or 270 degrees
- Left hand margin setting
- Screen dump window setting
- Colours appear as grey scale
- Two tone fast dump
- Colour mask
- Mode 7 contrast expansion
- Mode 7 contiguous dump
- Key triggered and User Port triggered dumps

The Micro User Feb. 1985.

'Without reservation I wholeheartedly recommend the Dump Out 3 ROM as the ultimate screen dump facility for the BBC Micro ... it must represent excellent value for money and surely cannot be beaten'.

For use with the following printers:

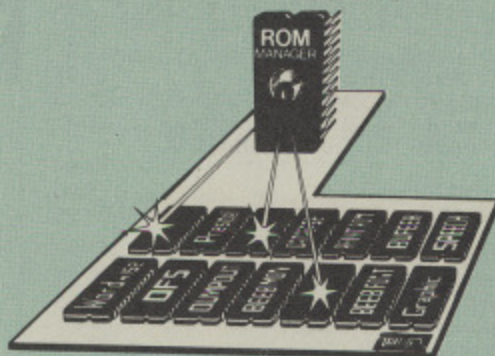
GLP, GP80/100/250, CANNON, STAR, KAGA/TAXAN, NEC, SHINWA CP80, GEMINI, EPSON MX/RX/FX, M1009, NEC PC8023, DMP100/200/400, Panasonic KX1081/82, Mannesman Tally and compatibles.

Only: £25

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 maths programs **£11.25**
- Picture Craft (Disc) 6 - 14 age group. Pack consists of flexible geometrical design & colouring programs **£17**
- WAVES: Science Topics (Disc) CSC O Level Physics program. **£14.95**
- RELATIONSHIP: Science (Disc) O Level Biology program. **£20.00**
- 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**
- ECOLOGY (Disc) O Level program. **£20**
- POLYMERS (Disc) O Level program. **£20**
- 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**
- FOOD & POPULATION (Disc) O Level program. **£20**
- MICROTECHNOLOGY (Cassette) O Level program. **£11.25**
- A VOUS LA FRANCE (2 Cassettes) A French language home study aid. **£21.70**
- DEUTSCH DIREKT! (Disc & Audio Cassette) **£19.95**
- Modem Master (Disc) **£11.25**
- ADVANCED TELETXT SYSTEM **£8.65**
- PERIOD TABLE SOFTWARE **£20**
- Astronomy - Primary (Disc) **£12**
- Computers at Work - Primary **£17.35**
- Introducing Geography - Primary **£17**
- Introducing Geography 11-17yrs **£17.50**
- Electric Fields 6-14 years **£11.25**
- BlackQueen Contract Bridge **£13**
- Espana Viva - 3 Discs **£19.95**
- A Vous La France Disc **£21.50**

ROM MANAGER

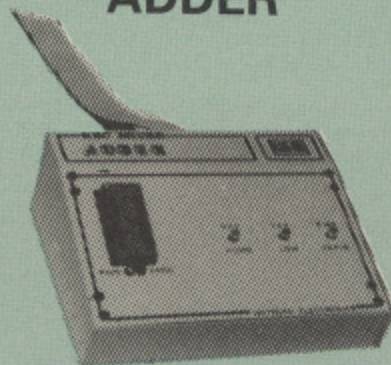


Take control of your Sideways ROMs with ROM Manager. This powerful utility ROM gives you power over your sideways ROMs. Disable whole ROMs, send commands directly to named ROMs and many other powerful facilities.

"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.

Adder is the ultimate EPROM programmer for the BBC Micro. It will program many different EPROMs up to the very latest 27256 32K devices.

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: From 2K to 32K: 2516, 2716, 2532, 2732, 2764, 2764A, 27128, 27128A, 27256 (Both 12.5V and 21V).

£75 (£3 Carr)

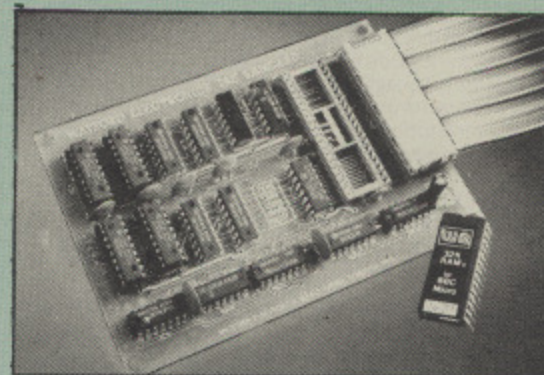
TEX EPROM ERASERS

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 £2)**
- ERASER GT - Deluxe version erases up to 18 chips. Has automatic safety cut-off to switch off the UV lamp when opened. **£30 (carr £2)**
- Spare UV tubes. **£9**

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, RS423 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.

● Recommended by Computer Concepts for use with their Inter series of ROMs.

Only £59 (carr £2)

(Price includes a comprehensive manual and the ROM)

INCREDIBLE WORDPROCESSING DEAL

Watford's 32K SHADOW RAM CARD and Computer Concept's INTERWORD Wordprocessor package.

at Only **£89 (carr £2)**

Continued

BOOKS (No VAT on Books)

15 Hr Wordprocessing BBC/View	£4.95
15 Hr Wordprocessing BBC/WW & WW+	£4.95
30 Hour BASIC (BBC Micro)	£9.95
6502 Assembly Language Program	£19.95
6502 Application	£13.95
6502 Development Package	£7.50
6502 Programming the	£16.95
6502 Reference Guide	£10.95
68000 Assembly Language	£15.95
68000 Assembly Language Prog.	£19.95
68000 Assembly Language Techniques	£24.95
68000 Machine Code Programming	£13.00
68000 Microprocessor Handbook	£14.95
68000 Programming the	£22.95
68000 User Guide	£8.95
6809, Programming the	£18.95
8086/8088 Assembly Language Prog.	£11.95
8086/8088 Programming the	£17.95
Advanced Disc User Guide	£16.95
Advanced Prog. Guide to BBC	£9.95
Adv. Sideways RAM User Guide	£9.95
Advanced User Guide for BBC	£10.95
Amiga Hardware Ref Manual	£23.70
ARM Assem, Lang, Programming	£12.95
Art of Microcomputer Graphics	£15.95
Assembly Language Prog. for the BBC	£9.95
Basic ROM User Guide	£11.95
BBC - Advanced Graphics with the	£10.95
BBC - Advanced Programming	£8.95
Techniques for	£8.95
BBC Micro & the small Business	£5.75
BBC Micro Basic Sound & Graphics	£7.95
BBC Micro Programming Tips	£9.95
BBC Micro ROM Book	£10.95
BBC Master 128 for High Flyer	£10.95
BCPL User Guide	£14
BCPL The Language & its Compiler	£7.95
C Big Red Book of	£7.50
C for Beginners	£10.95
'C' Introducing	£9.95
C for Programmers	£9.95
C Programming Lang.	£23.95
COMAL - Introduction to	£9.50
Complete FORTH	£6.95
Computer Graphics & CAD fundamentals	£9.95
CP-M Bible	£16.50
CP-M Handbook with MPM	£9.95
CP-M Plus Handbook	£13.95
CP-M Soul of	£16.50
CP-M The software BUS	£8.95
DOS Instant Reference (up to 3.3)	£10.95
DOS, Mastering for Versions up to 3.3	£19.95
Disc Drive Projects for Micros	£5.45
DISC FILING SYSTEM (DFS)	
Operating Manual for BBC	£6.95
dBase III Plus	£12.95
dBASE III Plus, Quick Ref. Guide	£4.95
dBase III Tips & Tricks	£14.25
File Handling on BBC Micro	£7.95
FORTH - Advanced	£9.95
FORTH - A Text Reference	£19.10
FORTH - Introduction to	£8.95
FORTH on the BBC Micro	£9.95
FORTH - Starting	£19.10
Hackers Handbook - New	£6.95
Hitch-Hikers Guide to A.I.	£8.95
Interfacing and Robotics	£15.95
Introduction to COMAL	£9.50
Introduction to FORTH	£8.95
Introduction to LOGO	£6.95
Introduction to PASCAL	£17.95
Inside Information, Computers & Coms.	£9.95
ISO - PASCAL Reference Manual	£9.95
LISP 2nd Edition	£15.95
LISP Looking At	£11.95
LISP on the BBC Micro	£7.95
LISP the Language of	
Artificial Intelligence	£13.95
Logo on the BBC Micro	£7.50
LOGO - Introduction to	£6.95
Mysteries of DISC DRIVES and DFS	
REVEALED	£5.95
Mastering Assembly Code	£8.95
Mastering CP-M	£17.95
Mastering Interpreters &	
Compilers	£14.95
Mastering Music	£6.95
Mastering the Disc Drive	£7.95
Master Operating System	£12.95
Master Reference Manual Part 1	£14.00
Master Reference Manual Part 2	£14.00
Master Reference Manual - Advanced	£19
Mathematical Prog. in BBC Basic	£7.95
Micro Prolog	£10.00
Microtext for the BBC	£10.00
MS-DOS Illustrated	£18.45
MS-DOS Instant Reference Guide	£10.95
MS-DOS Performance Programming MS-DOS	
Supercharging	£17.95
Under	£19.95
MS-DOS Advanced Programming	£19.95
MS-DOS Running (2nd Ed.)	£19.95

MS DOS Commands Quick Ref. Guide	£3.95
PASCAL - Introduction to	£17.95
PASCAL Programming	£9.45
Pick Operating Sys. Practical Guide	£14.95
Practical Disc File Techniques	£5.95
Quick Program Ref. Guide - MS-DOS	£8.95
Quick Program Ref. Guide - Wordstar	£8.95
Quick Program Ref. Guide - dBASE III	
PLUS	£8.95
Sinclair Z88 Computing	£9.95
Structured Basic	£7.95

The Epson FX-KAGA PRINTER

Commands REVEALED	£5.95
The Software Business	£5.50
Understanding Interword -	
A Beginners Guide	£6.50
Using DOS+ on the 1512	
(95% Ok for 512 Bd)	£9.95
View 3.0 User Guide	£10
View Guide (View 2.1)	£4.50
Viewsheet & Viewstore Dabhand Guide	£12.95
Mastering View, Viewsheet &	
Viewstore	£12.95
VIEW Dabhand Guide	£12.95
Viewsheet User Guide	£10
Viewstore User Guide	£10
Within the BBC Micro	£13.95
Wordprocessing On The BBC Micro	£6.25
Writing Interactive Interpreters	
& Compilers	£8.45
Wordstar & CP/M made easy	£9.95
Wordwise + A User Guide	£10.95
Z80 Applications	£15.95
Z80 Assembly Language Prog.	£20.95
Z80 Programming the	£19.95
Z80 Reference Guide	£9.95

NEW

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**

NEW

The Advanced Reference Manual for the BBC Master

At last Acorn's long awaited Advance Reference Manual for the BBC Master Series of Microcomputers has now been published. Watford Electronics' own authors have edited and added missing sections to the original script and produced a very high quality publication.

It features information about:

- Memory Organisation
- Slow data bus
- Detailed circuit description
- Keyboard controller
- Screen display
- User port
- Serial Processor
- Peripheral bus controller
- 1 Mhz Bus
- Machine operating System
- Second processors - Internal, Z80 and 80186
- Disc Filing Systems
- ANFS
- Terminal Emulator & Editor
- View internal format
- Detailed differences between Model B, B+, Master 128K and Compact
- Comprehensive appendix on 65C12 instruction set

At the rear of the manual there are pull out circuit diagrams for the Master 128K. A worth-while addition to any Master owner's library.

All this for just £19 (NO VAT)

THE WAPPING EDITOR

Watford Electronics bring professional quality Desktop Publishing to the Beeb. The Wapping Editor is a totally self contained mouse-driven desktop publishing package designed to run on the BBC B, B+ and Master computers. The massive 64K ROM contains ALL the software you need to do your own publishing. It 'Brings the Freedom of Press' to your fingertips. Its salient features are:

Graphics Package

This section is a fully functional word processor specially tailored to suit the Desktop Publishing environment. Gone are all the unnecessary and cumbersome text formatting commands - these are dealt with in the 'Page-Layout' section. Text input can of course be taken from existing word processor files like Wordwise, View, etc.

Page-Layout Section

Page Layout becomes easy using these mouse-driven routines. The user simply 'pulls' a rectangle onto the page and states which text document or graphic is required to fill the space - it's as simple as that! Text can be automatically printed in a pre-set number of columns, left justified and/or right justified, or centered. Several different typefaces can be held in memory at one time. Graphics may be stretched, squashed or cropped to fit any size rectangle. Graphics input can be from the software provided in the package or, using the 'mode convert', from any graphics mode screen.

The Font Editor

Allows editing of ALL 95 characters. As well as being able to design your own typefaces, fonts from other DTP packages or from Quest Paint may be loaded into the editor and converted for use with the Wapping Editor. Some of the numerous functions including slide, flip, invert and rotate individual characters or the whole font. Individual characters can be mirrored or copied and a mask feature allows you to superimpose two characters. Lines and columns can be inserted or deleted allowing the character to be stretched or squashed.

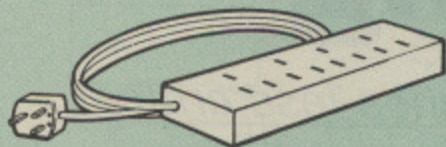
This package is the latest in the line of integrated professional quality mouse-driven software from Watford.

P.S. For details on Quest Paint and ConQuest, please refer to Page 7 of our advert.

SURGE PROTECTOR Plug

Fitted in place of your normal mains plug, this device protects your equipment against mains surges. Nearby lightning strikes, thermostats switching and many other sources which put high voltage transient spikes on to the mains. This can lead to data corruption in memory and on disc and can result in spuriously crashing machines. A must for every computer user.

Protection for only **£7.50**

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.

£7.95 (carr £1.50)

SPIKES CLEANER UNIT

A 4 way mains distribution unit as above with a built-in Surge Arrester, providing protection for your complete computer system

£13.00 (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.

£2

Replacement FLEXIBLE 17 way Keyboard Connector £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**Watford DATA DUCK**

Convert two single Disc Drives into one Dual Drive with this simple external unit (suitable for disc drives with PSU).

£14

Watford POWER DUCK £8**CONNECTING LEADS**

(All ready made and tested)

CASSETTE LEADS 7 pin DIN Plug	
to 5 pin DIN Plug + 1 Jack Plug	£2.00
to 3 pin DIN Plug + 1 Jack Plug	£2.00
to 7 pin DIN Plug	£2.50
to 3 Jack Plugs	£2.00
6 pin DIN to 6 pin DIN Plug (RGB)	£2.50

DISC DRIVE POWER LEADS

Supply from BBC power supply to standard Disc Drive connector.

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)	30p	45p
RS423 (5 pin Domino)	40p	50p
Cassette (7 pin DIN)	25p	65p
ECONET (5 pin DIN)	20p	30p
Paddles (15 pin 'D')	80p	200p
Disc Drive Plug 4 way	75p	-
6 way Power Connector	80p	95p

Watford Electronics are the main Approved Stockist of ACORN SPARES and Acorn ECONET Referral Centre

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

Keyboard	£43	Speaker	£2
UHF Modulator	£4	Keypad	£1.50
Speaker Grill	£1	16MHz Crystal	£4
Power Supply	£56	32.768MHz Xtal	£1.00
BBC Casing	£20	Keypad	£3

CHIP SHOP

8271	£49		
DS3691	£4.50		
DS88LS120	£5.25		
LM324	£0.45		
SN76489	£5.50		
SAA5050	£8.75		
UPD7002	£6.00		
WD1770	£12.00		
2764-250nS	£3.00	ACORN ADFS	£25
27128-250nS (12V5)	£3.25	ACORN BASIC 2	£19
27128-250nS (21V)	£5.25	Acorn BCPL	£42
27256-15	£5.00	Acorn COMAL	£38
27512	£10.50	ACORN DNFS	£17
27C101G (1 Meg)	£17.50	Acorn FORTH	£32
4013	60p	Acorn Graphics	£25
4020	£0.90	Acornsoft C	£74
4164-15	£2.75	Acorn LISP	£19
4464-12	£8.95	Acorn LOGO	£49
4464-15	£8.25	Acorn OS B+	£25
4816 RAM	£2.00	Acorn OS 1.2	£14
41256-15	£6.25	Basic Editor	£24
41256-12	£9.75	Beebfont	£25
6264LP-8K	£8.00	Beebmon	£22
6502A CPU	£4.50	BROM Plus	£32
65C02 3M	£9.75	Buffer & Backup	£20
65C12	£9.00	Communicator	£49
6512A	£10.00	Commstar	£29
6522	£3.40	Graphics Extension Rom	
6522A	£4.50	GXR-B	£21
65256ALS-15	£12.50	GXR-B+	£22
6818	£4.00	Help II	£27
6845SP	£6.00	ISO Pascal	£51
68B50	£2.95	ISO-Pascal Stand	
68B54	£7.50	Alone Generator	£30
7438	40p	ICON Master	£28
74LS00	25p	Logotron LOGO	£45
74LS04	25p	Master Termulator	£32
74LS10	25p	Micro Prolog	£62
74LS123	80p	Microtext Disc	£46
74LS163	70p	Microtext Rom	£199
74LS244	80p	Mini Office ROM	£47
74LS245	£1.00	MUROM	£21
74ALS245	£2.75	ROMIT	£29
74LS373	£1.00	Serial ULA	£13
74LS393	£1.00	TED	£35
75453	70p	TERMULATOR	£25
75159	£2.00	Toolkit Plus	£31
9637	£2.00	Video ULA	£14
ICL7673PA	£2.00	ULTRACALC	£26
		1Mb OS ROM	£39
		ADE	£20

ASSORTED ROMS**Watford Dealers' List****UNITED KINGDOM**

Alpha Microtec Ltd, 321 Stratford Road, Shirley, Solihull, West Midlands. Tel: 021-745 8998.

Badger Micros (Devon), Badger's Hill, Southerton, Ottery-St. Mary, Devon EX11 1SE. Tel: 0395 68516.

Beebug Retail, Dolphin Place, Holywell Hill, St. Albans.

Cambridge Computer Store, 4 Emmanuel St., Cambridge CB1 1NE. Tel: 0223 358264.

Circuit Distribution Ltd, Park Lane, Broxbourne, Herts.

C.J.E. Micros, 78 Brighton Road, Worthing, West Sussex. Tel: 0903 213361.

HCCS, 575-583 Durham Road, Low Fell, Gateshead, Nr. Newcastle Upon Tyne. Tel. 091 4870760.

Mancomp Ltd, Printworks Lane, Levenshulme, Manchester. Tel: 061-224 1888-9888.

Microman Computers, Pasture Lane Farm, Pasture Lane, Rainford, St. Helens, Merseyside WA11 8PU. Tel: 074488 3667.

The Computer Depot, 205 Buchanan Street, Glasgow G1 2JZ. Tel: 041-332 3944.

Verospeed Ltd, Boyatt Wood, Eastleigh, Hants.

OVERSEAS DEALERS

*Absolute Electronics, Rewal House, 208-210 La Trobe Street, Melbourne, 3000, Victoria, Australia. Tel: (03) 663 2411.

Alpha Computer Co, Shop 314 Chi Fu Commercial Centre, Chi Fu Fa Yuen, Hong Kong, Tel: 5-506592.

Computer Distribution Company, Parklaan, 47, 8-9300 Aalst, Belgium.

E.B.N., Elisenstrasse 13, 1000 Berlin 41. Tel: (030) 7952057

Lendac Data Systems, Unit 31, IDA Enterprise Centre, Pearce Street, Dublin 12. Tel: 710796.

Lindis International Ltd, Wood Farm, Linstead Magna, Halesworth, Suffolk. Tel: 098 685 476.

Scientex P.V.B.A., Zilvermidstraat 2, B-2000 Antwerpen, Belgium, Tel: 03 233 59 06

Techno-matic Data, Holbergsgade 19, 1057 København K, Denmark

*Velobyte, Scheaedyksadyk 5a-6a, 3011 EB Rotterdam, Holland, Tel: (010) 413 8197/414 5171.

Viking Tecno, Vestergade 12.1, 9620 Aalestrup, Denmark, Tel: 08 642522

*Acorn/Watford Referral Centres.

Viglen Console Unit

Enhance the appearance and convenience of your BBC Micro & Master with the Viglen console unit.

BBC **£45**; Master **£55** (carr. £4)

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 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, ENGLAND
Telephone: (0923) 37774; Telex: 8956095; FAX: 01 950 8989

ORDER VIA
MicroLink
72-MAG030

Automatic archiving

John Tissandier helps keep crashes less critical

PROGRAM development can be a risky business — you make a couple of changes to your masterpiece and suddenly it doesn't work. So you go back but can't quite remember what you did — and you are left tracing a bug that you put in yourself. The Automatic Archiver can help you by keeping one earlier generation of any file that is **SAVED** or ***SAVED**. So when you save a version of your program the archiver keeps the previous copy.

When a **SAVE** or ***SAVE** is issued the utility checks to see if a file of the same name already exists on the disc. If it doesn't the disc operation continues as normal. But if it does, the original file is renamed as *b.filename* before the new one

is saved — producing two versions of the program on the disc. If we save the file with the same name a third time the following happens:

- *b.filename* is deleted.
- The existing *filename* becomes *b.filename*.
- The new one is saved as *filename*.

So the two latest versions of a file will always be on disc and it works with any software that uses the standard *osfile* routine. The utility can be overridden by specifying a directory in the filename. In addition, by providing a drive number multi-drive systems can be incorporated.

Type in the source program, check it with Get it

```

10 REM Automatic Archiver
20 REM by John Tissandier
30 REM (c) The Micro User
40 MODE 7:PROCuser:PROCinit
50 PROCtitle_page:PROCassemble
60 PROCsave:PRINT"Utility enabled"
70 PRINT CHR$148STRINGS(38,CHR$172)
80 END
90 DEF PROCuser
100 zero=&70:code=&900
110 bdir$="b":mc$="ARC"
120 c1$="Model B":c2$="Master"
130 computer$=c1$
140 b1$="No action"
150 b2$="Reset vector"
160 b3$="*RUN utility"
170 break$=b2$:ENDPROC
180 DEF PROCinit
190 filev =&212:osgbpb=&FFD1
200 osbyte=&FFF4:oscli =&FFF7
210 bufptr=zero:filenm=zero+2
220 ENDPROC
230 DEF PROCtitle_page:PRINT
240 PRINTCHR$148STRINGS(38,CHR$172)
250 FOR XX=0 TO 1:PRINTTAB(10)CHR$141"
Automatic Archiver":NEXT
260 PRINTCHR$148STRINGS(38,CHR$172)'
270 PRINT" For single_sided single dri
ve"
280 PRINT" Computer"TAB(19)=""CHR$129c
omputer$
290 PRINT" Archive directory ="CHR$129
bdir$
300 PRINT" Break key action ="CHR$129
break$
310 PRINT" Zero page usage ="CHR$129
"&";"zero"&";"zero+3
320 PRINT" Machine code"TAB(19)=""CHR$
129"&";"code"&";
330 ENDPROC
340 DEF PROCassemble
350 FOR LX=0 TO 2 STEP 2
360 PX=code:[OPT LX
370 .init
380 LDA filev:CMP #start MOD256
390 BNE ok:LDA filev+1
400 CMP #start DIV256:BEQ i_exit
410 .ok
420 LDA filev:STA oldvec
430 LDA filev+1:STA oldvec+1
440 LDA #start MOD 256:STA filev
450 LDA #start DIV 256:STA filev+1
460 ]:PROCbreak:[OPT LX
470 .i_exit RTS
480 .start:CMP #0:BNE exit
490 STA found:STX bufptr
500 STY bufptr+1:LDX #1:LDY #1
510 .loop1:LDA (zero),Y
520 STA zero+2,X:DEX:DEY:BPL loop1
530 \ Check if directory specified
540 .loop2
550 INY:INY:LDA (filenm),Y
560 CMP #ASC".":BEQ restore
570 INY:CPY #5:BNE loop2
580 ]:PROCstore_master:[OPT LX
590 \ Store current drive/directory
600 LDA #data6 MOD 256
610 STA osgbpb_block+1
620 LDA #data6 DIV 256
630 STA osgbpb_block+2
640 LDX #osgbpb_block MOD 256
650 LDY #osgbpb_block DIV 256
660 LDA #6:JSR osgbpb
670 \ Check if current directory
680 \ same as backup directory
690 LDA current_dir:AND #&DF
700 CMP #(ASCbdir$ AND &DF)
710 BNE dir_ok
720 \ Restore registers
730 .restore:LDX bufptr
740 LDY bufptr+1:LDA #0
750 .exit
760 JMP (oldvec)
770 \ Check if drive specified
780 .dir_ok:LDY #0:LDA (filenm),Y
790 CMP #&3A:BNE no_drive
800 \ Change drive
810 INY:LDA (zero+2),Y
820 STA command+4:LDA #0:JSR cli
830 \ Copy filename to command line
840 LDY #3
850 .no_drive:DEY:LDX #&FF
860 .loop3:INX:INY:LDA (zero+2),Y
870 STA command+6,X
880 STA command+16,X
890 CMP #&21:BCS loop3
900 LDA #&0D:STA command+16,X
910 LDA #&20
920 .loop4:STA command+6,X
930 INX:CPX #8:BNE loop4
940 \ Change directory to backup
950 LDA #ASCbdir$:STA dir
960 STA command+4:LDA #1:JSR cli
970 \ Set values in osgbpb block
980 .next_dir:LDA #0:LDX #4
990 .loop5:STA osgbpb_block+8,X
1000 DEX:BNE loop5
1010 .next_file
1020 LDA #data8 MOD 256
1030 STA osgbpb_block+1
1040 LDA #data8 DIV 256
1050 STA osgbpb_block+2
1060 LDA #1:STA osgbpb_block+5
1070 LDA #0:LDX #3
1080 .loop6:STA osgbpb_block+5,X
1090 DEX:BNE loop6
1100 \ Read filename on disc
1110 LDX #osgbpb_block MOD 256
1120 LDY #osgbpb_block DIV 256
1130 LDA #8:JSR osgbpb
1140 BCS no_more_files
1150 \ Compare filenames
1160 LDY #0
1170 .next_char:LDA command+6,Y
1180 CMP #&20:BEQ end_filename
1190 INY:CMP data8,Y:BEQ next_char
1200 BNE next_file
1210 .end_filename
1220 INY:LDA data8,Y:CMP #&20
1230 BNE next_file

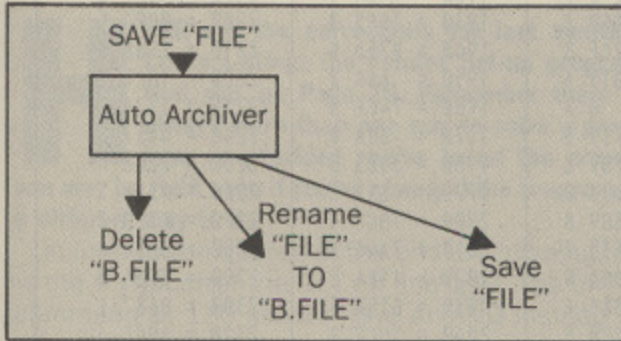
```

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

MicroLink

Right! and save it as ARC/SRC. When run, the routine is installed and the code is saved as ARC. From then on you can run it from disc by typing *ARC.

The program can create two versions – for the



The Auto Archiver's operation when a save command is issued.

BBC B and the Master. For the latter change line 130 to:

```
computer$=C2$
```

You can also modify some of the program variables to configure it to your requirements. The backup directory name is held in *bdir\$*, zero is the

start address of the zero page bytes required, and *code* is the start address of the machine code.

The final user parameter *break\$* controls the action of the Break key: ARC works by changing the address in the vector *filev*. Pressing Break normally resets all vectors, therefore although the code will still be in place *filev* will no longer point to it.

To get round this you can either arrange for the utility to be simply disabled, have it automatically re-initialise itself or set the Break key to perform *ARC which will re-run the routine.

FILE SAVE PROBLEMS

If a file is saved but no backup is produced check the following points:

- The current directory has been set to the directory selected for backups. The routine will be exited if this is detected, though the normal SAVE operation will proceed.
- A directory is specified in the filename. This is the method for overriding the backup operation. Use *DIR instead to select a different directory.

```

1240 \ Filename found on disc
1250 LDA dir:CLC:ADC found:STA found
1260 .no_more_files
1270 LDA current_dir:CMR dir
1280 BEQ disc_checked
1290 \ Reset original directory
1300 STA dir:STA command+4:LDA #1
1310 JSR cli:LDA #0:BEQ next_dir
1320 .disc_checked
1330 LDA #ASC".":STA command+5
1340 LDA current_dir:CLC
1350 ADC #ASCbdir$:CMP found
1360 BNE skip
1370 \ Delete old backup
1380 LDA #ASCbdir$:STA command+4
1390 LDA #&0D:STA command+13
1400 LDA #2:JSR cli
1410 LDA current_dir:STA found
1420 .skip
1430 \ Rename last version to backup
1440 LDA current_dir:CMR found
1450 BNE reset_drive:STA command+4
1460 LDA #&20:STA command+13
1470 LDA #3:JSR cli
1480 .reset_drive
1490 LDA current_drive:STA command+4
1500 LDA #&0D:STA command+5
1510 LDA #0:JSR cli
1520 ]:PROCrestore_master:[OPT LX
1530 \ Restore registers
1540 LDX bufptr:LDY bufptr+1
1550 LDA #0:JMP (oldvec)
1560 \ Assemble command line
1570 .cli
1580 ASL A:ASL A:TAX:LDY #0
1590 .loop7
1600 LDA commands,X:STA command,Y
1610 INX:INY:CPY #4:BNE loop7
1620 LDX #command MOD256
1630 LDY #command DIV256
1640 JMP oscli
1650 \
1660 .oldvec OPT FNds(2)
1670 ]:PROCbrcak_data:[OPT LX
1680 .found OPT FNds(1)
1690 ]:PROCmaster_data:[OPT LX
1700 .osgbpb_block OPT FNds(13)
1710 .data6 OPT FNds(1)
1720 .current_drive OPT FNds(2)
1730 .current_dir OPT FNds(1)
1740 .command
1750 OPT FNds(STRING$(5,"")+CHR$13+STR
ING$(8,"")+bdir$+ "."+STRING$(8,""))
1760 .dir OPT FNds(1)
1770 .data8 OPT FNds(8)
1780 \ End of filename marker
1790 OPT FNb(&20)
1800 .commands
1810 OPT FNds("DR. ")
1820 OPT FNds("DIR ")
1830 OPT FNds("DEL.")
1840 OPT FNds("REN.")
1850 ]:NEXT:PRINT;"PX
1860 CALL init:ENDPROC
1870 DEF PROCbreak
1880 IF break$=b1$ REM Do nothing
1890 IF break$=b2$ PROCreset_break
1900 IF break$=b3$ PROCrun_utility
1910 ENDPROC
1920 DEF PROCreset_break
1930 [OPT LX
1940 LDA #247:LDX #&4C
1950 LDY #0:JSR osbyte
1960 LDA #248:LDX #init MOD256
1970 LDY #0:JSR osbyte
1980 LDA #249:LDX #init DIV256
1990 LDY #0:JSR osbyte
2000 ]:ENDPROC
2010 DEF PROCrun_utility
2020 [OPT LX:LDX #break MOD 256
2030 LDY #break DIV 256:JSR oscli
2040 ]:ENDPROC
2050 DEF PROCstore_master
2060 [OPT LX:LDY #0
2070 .loop8:LDA (bufptr),Y
2080 STA osfile_block,Y
2090 INY:CPY #18:BNE loop8
2100 LDY #0:.loop9
2110 LDA (filnm),Y:STA filename,Y
2120 INY:CPY #24:BNE loop9
2130 ]:ENDPROC
2140 DEF PROCrestore_master
2150 [OPT LX:LDY #0
2160 .loop10:LDA osfile_block,Y
2170 STA (bufptr),Y:INY
2180 CPY #18:BNE loop10
2190 LDY #0:.loop11
2200 LDA filename,Y:STA (filnm),Y
2210 INY:CPY #24:BNE loop11
2220 ]:ENDPROC
2230 DEF PROCbreak_data
2240 IF break$<>b3$ ENDPROC
2250 [OPT LX:.break
2260 OPT FNds("KEY10*"+mc$+"IM")
2270 OPT FNb(&0D):]:ENDPROC
2280 DEF PROCmaster_data:[OPT LX
2290 .osfile_block OPT FNds(18)
2300 .filename OPT FNds(24)
2310 ]:ENDPROC
2320 DEFFNB(BX):?PX=BX:PX=PX+1:=LX
2330 DEFFNs(s$):$PX=s$:PX=PX+LENs$:=LX
2340 DEFFNd(NX):LOCAL BX
2350 FOR BX=1 TO NX:?PX=0
2360 PX=PX+1:NEXT:=LX
2370 DEF PROCsave
2380 $&700="SAVE $. "+mc$+" "+STR$code+
"+STR$PX
2390 XX=0:YX=7:CALL oscli
2400 PRINT" Saved as"CHR$129mc$
2410 ENDPROC

```



10 = 00	130 = 6103 A	250 = 764B B
20 = 00	140 = DB66 E	260 = BEAE 9
30 = 00	150 = 77BC F	270 = CF20 0
40 = 5092 2	160 = 9516 2	280 = B91E C
50 = CCE1 4	170 = 602B 2	290 = 58B2 1
60 = 2E4C 9	180 = 40D7 2	300 = C719 F
70 = FD7B 7	190 = EB5D 7	310 = C4DE 3
80 = FD2E 9	200 = E042 E	320 = 7B5A F
90 = 30DB 6	210 = 2222 E	330 = ED0F 5
100 = 1232 E	220 = ED0F B	340 = 98A5 C
110 = 8DB1 6	230 = FDDF B	
120 = 4AE3 A	240 = 4F53 4	

Turn to Page 108

◀ From Page 107

350 = AAB9 C	640 = F1A 2	950 = F920 7	1260 = 7092 0	1570 = E4E7 2	1880 = 2242 8	2150 = 6C9D 2
360 = 7CBB 7	650 = 9E6F 3	960 = D46E 1	1270 = 43B5 7	1580 = F6EA 4	1890 = 112 7	2160 = E052 6
370 = 6272 C	660 = D9AF 0	970 = 0 1	1280 = 99B2 2	1590 = 53D7 0	1900 = 4148 2	2170 = B8F6 F
380 = 3750 0	670 = 0 0	980 = 816 A	1290 = 0 2	1600 = 168 1	1910 = ED0F 8	2180 = EA35 E
390 = 3664 0	680 = 0 0	990 = 2F1B 4	1300 = 911B 7	1610 = FEF0 5	1920 = 94EA 4	2190 = A099 6
400 = 306A 1	690 = 9605 0	1000 = A0A2 1	1310 = 41C8 5	1620 = 615B F	1930 = 1EF3 0	2200 = 8B96 D
410 = 5B1E 9	700 = F431 8	1010 = 6362 A	1320 = 58AC 5	1630 = 22CF 8	1940 = B75D E	2210 = FF68 5
420 = F8C3 1	710 = A384 4	1020 = DFFC 7	1330 = 676C 4	1640 = 1B15 A	1950 = 8AA 2	2220 = 1BCE 3
430 = ACCE F	720 = 0 4	1030 = BE3C 5	1340 = CB3E B	1650 = 0 A	1960 = 74CF 3	2230 = 1334 C
440 = E490 C	730 = D13E 9	1040 = 9B7F E	1350 = 6CB 7	1660 = 47E9 5	1970 = 8AA D	2240 = 4D57 1
450 = 8265 C	740 = 34AA A	1050 = 8E5F 9	1360 = CAA1 3	1670 = 2FB9 C	1980 = 3183 5	2250 = 22C8 A
460 = F772 5	750 = DC83 E	1060 = 1EA4 5	1370 = 0 3	1680 = 3D53 2	1990 = 8AA 2	2260 = 45A5 F
470 = FDD7 6	760 = 8802 F	1070 = 9DA3 6	1380 = EF26 E	1690 = F8B9 8	2000 = 1BCE 4	2270 = E728 0
480 = 5391 E	770 = 0 F	1080 = DB22 E	1390 = 1BED 9	1700 = CA33 7	2010 = 7A4C F	2280 = B85A A
490 = 8FC 4	780 = 7B98 A	1090 = 90C1 C	1400 = FC9E 9	1710 = 4D1D 9	2020 = A1E4 2	2290 = E065 6
500 = 8B2C 3	790 = 2321 4	1100 = 0 C	1410 = F535 A	1720 = C386 F	2030 = E15B 5	2300 = B687 E
510 = 54AC A	800 = 0 4	1110 = F1A 6	1420 = BA0A F	1730 = 6420 5	2040 = 1BCE 9	2310 = 1BCE 6
520 = 10E4 C	810 = E70B 4	1120 = 9E6F 8	1430 = 0 F	1740 = E454 3	2050 = 8A1A E	2320 = D4A 2
530 = 0 C	820 = 3F4D 4	1130 = C939 A	1440 = 4D6C 8	1750 = 300B B	2060 = 6C9D 5	2330 = 1F5E 8
540 = 372 6	830 = 0 4	1140 = 279D D	1450 = 76DE A	1760 = B64F 9	2070 = D245 9	2340 = 19F4 2
550 = DCEC 6	840 = AC92 9	1150 = 0 D	1460 = 53CD F	1770 = E713 3	2080 = D147 7	2350 = 79D6 A
560 = 3C8B 6	850 = 4704 1	1160 = 9CF1 6	1470 = 17BD 8	1780 = 0 3	2090 = 380D 5	2360 = CE1D C
570 = AEC1 9	860 = CDB5 1	1170 = 19A6 B	1480 = FB18 F	1790 = 130E D	2100 = 22F C	2370 = EB7 C
580 = CA5F 0	870 = 9259 7	1180 = E8E6 5	1490 = 7D0A A	1800 = A75E 6	2110 = 8B55 7	2380 = 733D 1
590 = 0 0	880 = 3014 9	1190 = 78F D	1500 = 3A46 7	1810 = D721 D	2120 = DE7A E	2390 = C836 8
600 = ED74 F	890 = 907A 2	1200 = 8A8D 4	1510 = 3AF9 6	1820 = 32C3 B	2130 = 1BCE 0	2400 = 6ABA 4
610 = BE3C F	900 = 808C 2	1210 = 36EF 1	1520 = CE8 8	1830 = 1B14 A	2140 = 3E29 8	2410 = ED0F 6
620 = A9F7 1	910 = 1119 1	1220 = 4EEC B	1530 = 0 8	1840 = 6119 D		
630 = 8E5F 0	920 = 98E4 5	1230 = 8A8D F	1540 = 8BCF 5	1850 = C053 F		
	930 = 6ED7 D	1240 = 0 F	1550 = 2BD4 1	1860 = B06A C		
	940 = 0 D	1250 = EBF E	1560 = 0 1	1870 = 7384 E		

This listing is included in this month's tape & disc offer. See order form on Page 135.

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

WHOLESALE PRICES - DIRECT FROM THE WAREHOUSE!

Importers . . . Manufacturers . . . Distributors . . .
Telephone: 0664 410666

STORAGE BOXES



3.50" Lockable - Holds 40	£4.95
3.50" Lockable - Holds 80	£6.95
3.50" Lockable - Holds 120	£8.95
5.25" Lockable - Holds 50	£4.95
5.25" Lockable - Holds 100	£6.97
5.25" Lockable - Holds 140	£8.97

ALL WITH LOCK & TWO KEYS
DIVIDERS & ANTISTATIC!

ACCESSORIES

Mouse Mat	£4.95
BBC Printer Cable	£5.95
Atari etc Printer Cable	£6.95
3.5" Cleaning Kit (fluid)	£4.95
5.25" Cleaning Kit (fluid)	£3.95
Disk Notcher (doubler)	£4.95



Space Saver Printer Stand (80 col) £24.95

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

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

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

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

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

REVERSIBLE DISKS HAVE TWO INDEX HOLES AND
TWO NOTCHES!

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

BULK PACKED OFFERS - BEST VALUE IN TOWN

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

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

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

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

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

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

MELTON COMPUTER SUPPLIES

PO Box 2, Melton Mowbray, Leics. LE13 1YG

☎ 0664 410666 (24 hrs)

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



Please ask for
FREE
catalogue

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

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

E&OE

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

Check your Leaky Listing corrections

HERE are the corrections for last month's Leaky Listing, the Printer Set-up program that was on Page 26. Remember there is always more than one way to solve a problem, so provided you've found the errors, you may be right even if you've changed the program in a different way to us.

In line 40 the quotes at the end are missing, as is the \$ sign after the GET on line 120. The UNTIL command at 130 should have an AND instead of OR to give:

```
130 UNTIL AS>"0" AND AS<"5"
```

since, as it stands, anything typed at the prompt has to be either be above 0 or below 5 – that's all numbers – and what we want is to allow past only values that are between, not including, 0 and 5.

Line 180 gives a Type mismatch error because we're trying to compare a string with a number: The 4 should be in quotes.

A common error when writing short routines with procedures is missing the END from the main routine. In this utility if you select option 4 to quit,

PROCrestart will be executed – thereby cancelling all the effects implemented – and the error No PROC will be generated when Basic hits ENDPROC. So an extra line is needed:

```
185 END
```

In line 200 "@" needs to be preceded by ASC to give the Ascii value rather than the string. The final error won't be noticed until you request condensed type, when you'll get:

```
No such PROC/FN at Line 160
```

But, as we cannot say often enough, just because the error is given at line 160, the actual mistake may be somewhere else. In this case line 210 where we have PROCCondense, instead of PROCCondense. The upper/lower case discrepancy generates the error.

As for the poor display, by adding a CLS after the REPEAT in line 30 and a semi-colon – ; – at the end of line 110, the whole screen becomes much tidier.

MONITORS – DRIVES PRINTERS – 8271/1770 & COMPONENTS

VIGLEN CONSOLES – PC STYLE

BBC B Console £41.30 (d)
Master Console (Professional) ... £48.25 (d)
Supports Monitor, can enclose two drives

WINCHESTER – Lower Prices

Fully compatible
Well known make–Phone, SAE Leaflet
(Master–Plug–n–Go–B requires 1770 DFS
and ADFS)
20MB Drive £433.50 (d)
28MB Drive £451.20 (d)

5.25" 40/80 TRACK D/SIDED DRIVES

–new switched cased drives with leads
(Famous Japanese mechanisms)
SINGLE (400k) Prices £82.50 (c)
DOUBLE (800k) Slashed! £165.00 (c)
Master Bridge–Twin (800k) Drives
with PSU £185.00 (d)
5.25"×3.5" Combo with PSU £208.85 (c)
Single 3.5" (400k) with PSU £111.25 (c)
Double 3.5" (800k) with PSU £197.35 (c)

DFS KITS with fitting instructions

8271 DNFS Kit inc Rom (new stock
secured) £51.00 (a)
1770 Kit (inc Acorn Rom) £39.00 (a)
Package Price
Acorn ADFS with utilities £26.00 (a)

THIS MONTH'S SPECIAL

UFD 2000 20MB Hard Drive +SW (400K)
Floppy+PSU & Monitor Bridge. £659.00 (d)
Single (400K) Drive+ 1770 DFS £121.00 (c)
Double (800K) Drive+ 1770 DFS £199.50 (c)
NOW CHEAPER THAN EVER!

ADVANCED COMPUTER PRODUCTS

Adv 1770 DFS or Adv Disc T'kit. £28.50 (b)
Advanced Disc Investigator £23.50 (b)

UNIVERSAL DISCS

Up to 80T DSDD Clear plastic case inc.
Box of 10. Reduced £5.95 (a)

MEMORIES

4416-15NL (TMS or NEC) £2.30 (a)
41464-12 (Solidisk 41254-12) £4.50 (a)
41416-15 (Watford 48415) £2.30 (a)
EPROMS VPP 12.5V (21V as available)
27128-250ns £3.30 (a)
27256-250ns £4.20 (a)
27512-250ns £9.45 (a)

TTL-DFS CHIPS ETC – Prices on Request

PRINTERS

MP 135 137CPS, NLQ £147.00 (d)
Epson LX800 Printer £235.00 (d)
Epson FX800 160CPS, NLQ £360 (d)
Canon PW1088 160CPS, NLQ £230 (d)
BBC Printer Lead £8.00 (a)

MONITORS

Philips BM7502 12" Green £68.55 (d)
Philips BM7522 12" Amber £73.85 (d)
Microvitec 1431 Standard
Res Colour £189.00 (d)
Microvitec 1451 Medium
Res Colour £235.00 (d)
Microvitec 1441 Hi Res Colour. £369.00 (d)

ALL PRICES EXCLUDE V.A.T.

Mail order only to:

Cp microsystems

32-34, Surbiton Road,
Kingston upon Thames,
Surrey KT1 2HX.

☎ 01-394 1452

(Answerphone – we're despatching orders, we'll ring back).

Carriage & ins.:- (a) £0.58, (b) £1.10,
(c) £4.00, (d) £6.96.

More than one item? All sent in one parcel.
Choose rate for your dearest item.

Add 15% VAT to goods &
carriage total price

ALL GOODS NORMALLY IN STOCK
Local Authority Orders accepted

DISCOUNT MAIL ORDER

FUTUREPLACE LIMITED,
12, Loanpit Hill, London. SE13
Telephone enquiries (01) 692 8700
All prices include V.A.T. C.W.O.
P&P (A) £16 (B) £8 (C) £6

ARCHIMEDES (A)

A305 Base £750.00
A305 Mono £800.00
A305 Colour £950.00
A310 Base £830.00
A310 Mono £880.00
A310 Colour £1035.00
A310M Base £896.00
A310M Mono £946.00
A310M Colour £1101.00

MASTER COMPACT (B)

Entry System £350.00
TV System £370.00
Mono System £400.00
Colour System £550.00
RS232 Interface £28.99
Extra 3.5 Drive £105.99
Pal TV Adaptor £27.60

PRINTERS (C)

Citizen 120D £165.00
Citizen LSP100 £200.00
Citizen MSP 10E £245.00
Sheet Feeder £142.99
Citizen MSP 15E £270.25

Sheet Feeder £172.50
Citizen MSP 40 £327.99

MASTER SERIES (B)

128k £415.00
Turbo Upgrade £118.00
512k Upgrade £209.00
Master Et £339.99
Econet Module £46.00
Eprom Cartridge £13.95
Z80 2nd Processor £368.00
IEEE Interface £299.00
100M Econet Cable £93.99
10 Station Lead Set £27.60
File Server LVL 2 80T £224.99
Printer Server Eprom £44.85
File Server LVL 1 80T £94.30

Z88 LAPTOP COMPUTER (C)

Z88 £270.00
Mains Adaptor £9.50
32k Ram or Eprom Pack £17.50
128k Ram or Eprom Pack £46.00
PC or BBC Link £23.00
Serial Printer Cable £9.50
Parallel Cable £27.00
Modem £93.00

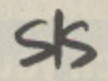
*** SPECIAL OFFER ***

The 21st order received will be given to the purchaser totally
FREE OF CHARGE

Why not visit our shop – Now open!

LOADSAMONEE!!

IS WHAT YOU WILL SAVE WHEN YOU BUY YOUR COMPUTER DISCS AND STORAGE BOXES FROM YOUR FAVOURITE SUPPLIER



OFFER 1
100 D/S D/D 96tpi
+ 100 capacity
lockable box only
£34.99

OFFER 2
25 D/S D/D 96tpi
5.25" Discs plus
50 capacity box
£16.99

OFFER 3
50 D/S D/D 96tpi
5.25" discs plus
50 capacity box
£24.95

3.5" DISCS	10	25	50	100	150	250
SS DD 135 TPI	12.49	23.95	45.95	84.95	124.95	188.95
DS DD 135 TPI	14.99	26.95	52.95	89.95	135.95	199.95

Certified 100% error free

Bulk discs are in no way inferior to the branded product. A bulk disc is what software houses, duplicators, corporate companies etc would buy instead of the higher priced boxed product. Each disc is tested to top international standards and is offered with our NO QUIBBLE LIFETIME WARRANTY.

5.25" Bulk Packed-Top Quality	10	25	50	100	150	250
Single sided 48 T.P.I.	5.49	10.50	18.50	32.50	41.50	61.50
Single sided 96 T.P.I.	5.95	10.75	19.00	33.50	43.00	63.00
Double sided 48 T.P.I.	5.95	11.00	19.50	34.50	45.00	66.00
Double sided 96 T.P.I.	6.95	11.50	20.50	36.00	46.50	69.50

All discs supplied with envelope labels etc.

OFFER 4
25 D/S 135tpi 3.5"
Disc plus
40 capacity box
only £29.99

OFFER 5
50 Single sided
3.5" Disc plus
80 capacity box
only £49.99

OFFER 6
80 D/S 135tpi
plus 80
capacity box
£69.99

Storage Boxes

5.25" Lockable - Holds 50	6.49	3.5" Lockable - Holds 40	6.49
5.25" Lockable - Holds 100	8.49	3.5" Lockable - Holds 80	7.49
5.25" Lockable - Holds 140	9.99	3.5" Lockable - Holds 120	9.99

Computer Care Kits
Regular cleaning and periodic maintenance will keep your computer in tip top condition, our range of cleaning kits will help you to do just that.
3.5" DISC DRIVE CLEANER £2.99
5.25" DISC DRIVE CLEANER £2.99

REMEMBER ALL PRICES INCLUDE V.A.T. AND DELIVERY!!



Cheques P/O to: M. D. OFFICE SUPPLIES, 18 Cresnet Way, Farnborough, Kent BR6 9LS
CREDIT CARD HOTLINE: 0689 61400
ALL GOODS ARE SUPPLIED SUBJECT TO AVAILABILITY



C & F ASSOCIATES

Quality Service at Competitive Prices

Cass	Disc	Comp	Cass	Disc	Comp	Cass	Disc	Comp	Cass	Disc	Comp		
ADDICTIVE			IMAGINE			Spycat	7.95	10.95	12.95	Revs	10.95	12.95	17.50
Football Manager	2.99	-	Arkanoid	7.20	-	Quest	7.95	10.95	12.95	TYNESOFT			
ALTERNATIVE			Pedro	1.99	-	Repton Thru Time	5.95	6.95	7.75	Saigon	7.95	12.95	-
All Titles	1.99	-	INCENTIVE			Play It Again Sam 2	7.95	10.95	12.95	Indoor Sports	7.95	11.95	-
ASL			Graphic Adventure Creator	19.95	22.95	Play It Again Sam	7.75	10.95	12.95	Boulder Dash	7.95	11.95	-
Impact	7.95	11.95	Ket Trilogy	7.75	10.95	Spellbinder	7.75	10.95	12.95	Winter Olympiad 88	7.75	12.95	-
Ransack	7.75	10.95	LARSOFT			Elixir	7.75	10.95	12.95	Spy Vs. Spy	7.75	12.95	-
Despatch Rider	7.20	9.95	Puppet Man	3.95	-	Bone Cruncher	7.75	10.95	12.95	The Big KO	6.75	-	-
Ziggy	7.20	9.95	Nine Dancers	3.95	-	Life of Repton	5.95	6.95	7.75				
BEAU JOLLY			Wychwood	3.95	-	Palace of Magic	7.75	10.95	12.95				
Computer Hits 4	7.95	-	Rising of Salandra	4.95	-	Crazy Rider	7.75	10.95	12.95				
5 Star Games 3	7.95	-	Hex	3.95	-	Around the World 40 Screens	5.95	6.95	7.75				
CDS			LEISURE GENIUS			Superior Collection 1	7.75	10.95	12.95				
Colossus Chess 4	7.75	12.95	Scrabble	10.95	12.95	Superior Collection 2	7.75	10.95	12.95				
DATABASE			Monopoly	10.95	12.95	Grand Prix Construction	7.75	10.95	12.95				
Mini Office 2	12.45	14.95	MANDARIN			Speech	7.50	10.95	12.95				
Mini Office 2 (Master 80T)	-	17.50	Icarus	7.95	10.95	Acornsoft Hits 1	7.75	10.95	12.95				
French on the Run	7.75	-	Time and Magic	-	12.95	Acornsoft Hits 2	7.75	10.95	12.95				
DESIGN PEOPLE			MIRRORSOFT			Elite	10.95	12.95	17.50				
Sink the Bismark	-	9.95	Strike Force Harrier	3.95	-								
Tanks!	-	10.95	Spitfire 40	7.75	10.95								
Battle of Britain	7.75	10.95	MOSAIC										
Midway	-	11.95	Yes Prime Minister	12.95	17.50								
DOMARK			ROBICO										
Star Wars	7.75	11.95	The Hunt	7.95	10.95								
DR. SOFT			Rick Hanson Trilogy	-	19.95								
Phantom Combat	2.99	4.99	Village of Lost Souls	7.95	10.95								
GODAX			Beeline	2.95	4.95								
Kourtyard	7.95	10.95	SUPERIOR										
Skirmish	7.95	10.95	Barbarian	7.95	10.95	12.95							

ALL PRICES INCLUDE VAT AND POSTAGE & PACKING
(Overseas Orders add £1.00 per order or Airmail £2.00 per item)

Cheques/PO payable to:



C & F ASSOCIATES



and send to
C & F ASSOCIATES, 1 MOOREND,
WEMBORTHY, DEVON EX18 7SE
Telephone: 0392 413418

Orders normally despatched within 24 hours of receipt but allow maximum of 7 days
For our comprehensive range of BBC and Electron Programs Please send for list

Pop-up perfection

Product: Genie Utilities
Price: £9.95 (disc)
Supplier: Permanent Memory Systems, 38 Mount
Cameron Drive North, East Kilbride, Scotland
G74 2ES.
Tel: 03552 32796

SINCE becoming the proud possessor of Genie, the electronic organiser for the BBC Micro and Master, I've become an addict. My complete address book has been computerised and I now have dozens of quick programming tips available at a keystroke in Genie's notepad. The only problem is that it's hard to use a BBC Micro on a train.

I certainly hadn't found anything to be lacking from Genie's comprehensive collection of goodies, so when the existence of the Genie utility disc came to my attention, I was eager to investigate its possibilities.

Created as a direct result of customer suggestions, the new utilities allow you to make hard copies of the information or produce files suitable for transfer to other packages or even other micros such as the Z88.

Available in all possible disc sizes and formats, the disc contents are identical. Booting up presents you with a short menu containing four options: Address Book, Notepad, Desk Diary and Phone Book. The stylish Genie banner, complete with lantern and Genie, is displayed at the top of the screen.

Selecting Address Book produces another menu, this time containing five choices. First is the Print by keyword option which allows you to make hard copies of all addresses matching a given name, occupation, street or postal area.

You can also print all addresses that fall between two given limits. This means that you can furnish two surnames, and any addresses whose surname fields fall alphabetically between these names will be printed.

The next two options are similar, except that the output is to a spooled file, using a filename of your choice. So you can now export data from different sections of Genie into Mini Office II, View or Wordwise.

The final option in this section imports data into Genie's address book from tape or disc. Your data must match the format expected by Genie exactly, however.

Failure to ensure this could fill up huge areas of the address book with garbage which could take ages to delete, item by item. Still, this is a very valuable option for those who already have a computerised address book, but would like it

transferred into Genie's much more accessible environment.

Going back to the main menu, Notepad comes next. Offering four choices similar in function to the address book utilities: You can print items in page number range and keyword, and send both to a named spooled file.

The Desk Diary option contains some of the most interesting utilities. The first two allow you to output diary entries, which fall between and include two dates, either as hardcopy or a spooled file.

Next come two very useful facilities: You can print a planner for a particular week containing all the diary entries and including a neat little calendar for the month in which that week falls.

Alternatively, you can print out a calendar for any month this century. As you can imagine, a couple of minutes would see a full year's calendar printed – which, by the way, is just the right size for a wallet, or for pinning to your in tray.

The final item on the main menu, Phone Book, contains two options. You can choose either to print or spool the whole phone book, the result being a very neatly formatted list with a gap of one line between each letter of the alphabet.

Having thought that my personal organisation was complete thanks to Genie, I find that whereas before I had to manually copy information now I am free to manipulate the data as I please. And at last I can print the data I'll need while travelling on that train.

The Genie Utilities Disc completes what was already an incredibly useful package, and transforms it into what must surely be the ultimate personal filing system for the BBC Micro.

*Chris Nixon
adds a
utilities
package to
his Genie
Organiser
and waxes
lyrical over
its data
handling
capacity*

GENIE
GENIE UTILITIES

- 1 Address book
- 2 Notepad
- 3 Desk diary
- 4 Phone book
- 5 Exit

Please Select

(C) 1987 Permanent Memory Systems

Choosing an address range

Amazing Acornsoft bargains

GAMES

THREE tapes for the price of ONE!

Revs and Aviator are two of the best simulations ever produced for the BBC Micro. And with Revs Four Tracks you will be able to experience the excitement of driving around some of Britain's most renowned racing circuits.

Games Galore
Normally £39.85
Offer Price £9.95

Save £30!



LANGUAGES

Powerful roms pack a punch

- BCPL is the most flexible of modern structured languages and is the easiest to learn. It is particularly good at handling Input and Output, and is perfect for writing utilities, screen editors, control systems – even games software. The package includes a language rom, a disc containing compiler, screen editor, 6502 Assembler, utilities – and a 450 page User Guide.

BCPL Bundle
Normally £109.70
Offer Price £29.95

Save £80!

- Forth is a complete implementation of the 1979 standard specification. It is a compiled language which typically runs five times faster than Basic, and this rom version gives full error messages, making it ideal for beginners and enthusiasts alike.

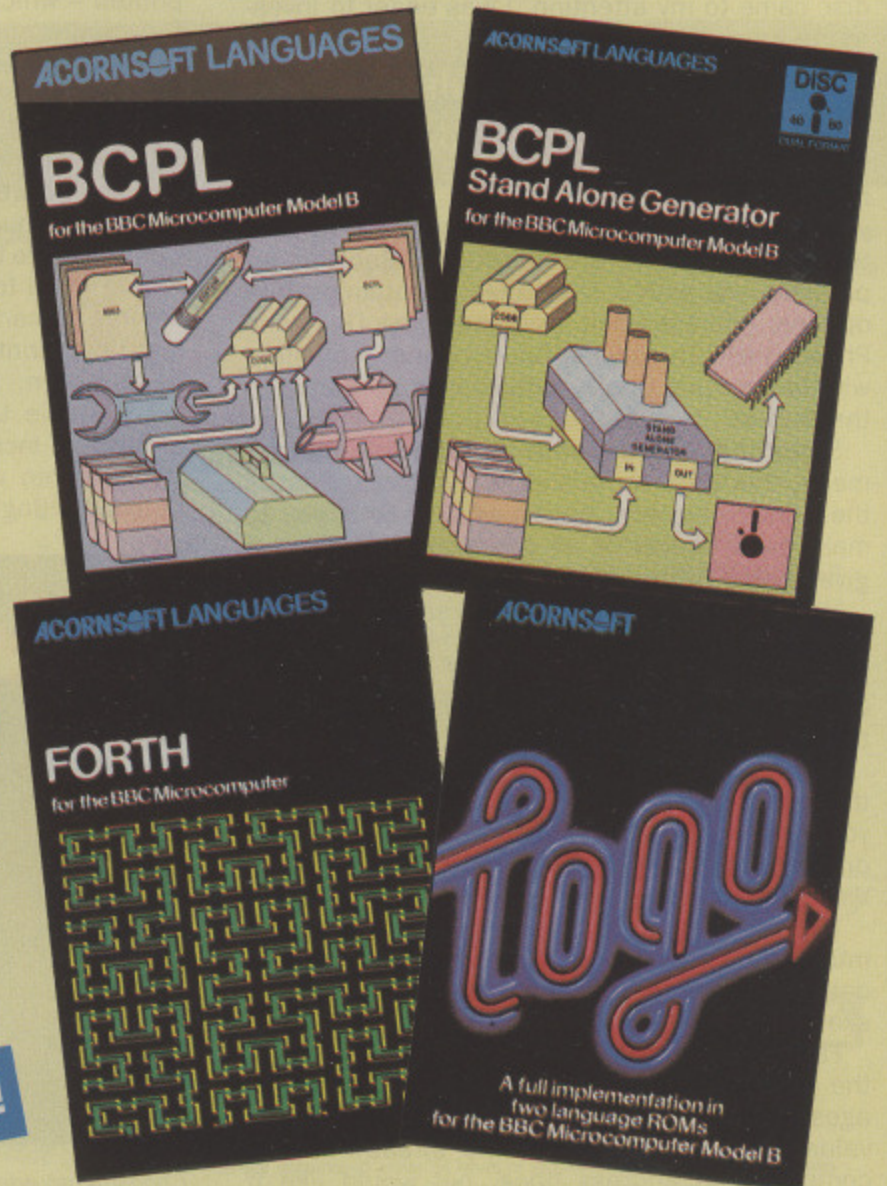
Normally £49.85
Offer Price £19.95

Save £30!

- Acornsoft Logo is a full implementation of the Logo language widely used in schools. Special features include multiple screen turtles, extensive sound and graphics commands, and list processing facilities. The package includes two roms, three manuals, a reference card, one disc and a cassette.

Normally £69.00
Special offer £29.95

Save £39!



MUSIC

Make your micro sound sensational!

Creative Sound is a beautifully presented 320 page book, packed with everything you need to know about music on the BBC Micro.

The authors are musician, composer and programmer David Ellis, and Chris Jordan, who designed the BBC Micro's sound system as well as the Acorn Music 500 and 5000.

There are more than 30 program listings, including programmable synthesisers, sequencer, music compiler, example tunes, Mozart's Musical Dice Game, composition aids, pitch trainer, scales program – and sound effects galore.

Creative Sound

Normally £9.95

Offer Price £4.95

Save £5!



EDUCATION

For the younger micro user . . .

- ABC is a unique writing tool for seven year olds and upwards, designed to be easily operated and quickly understood.
- Spooky Manor is an adventure game for up to four players that encourages planning and logical thinking.
- In Talkback you can hold conversations with the computer by typing in sentences – and even create your own computer characters.
- Drill, cut, squash and paint your creations using the machines in the Workshop. Suitable for children from the age of three upwards.

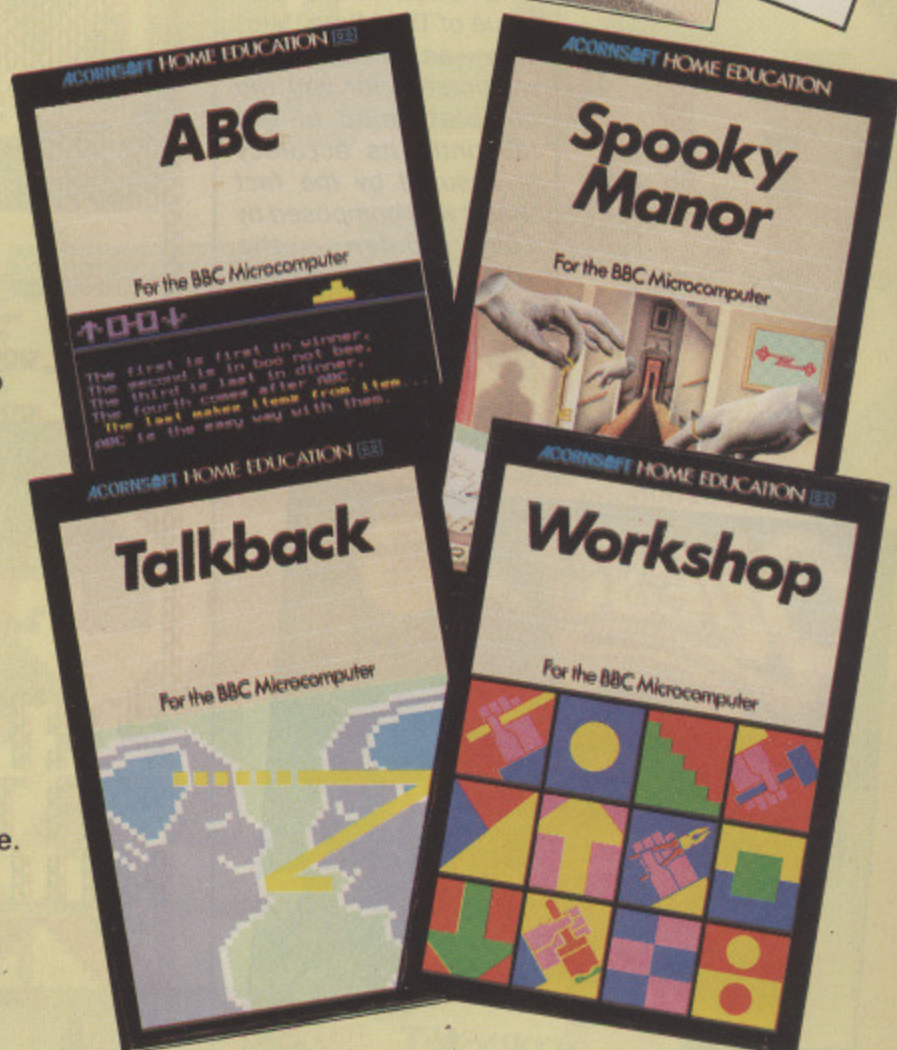
Previously each package cost £9.95 – now you can buy all four tapes together for the same price.

Educational extravaganza

Normally £39.80

Offer price £9.95

Save £30!



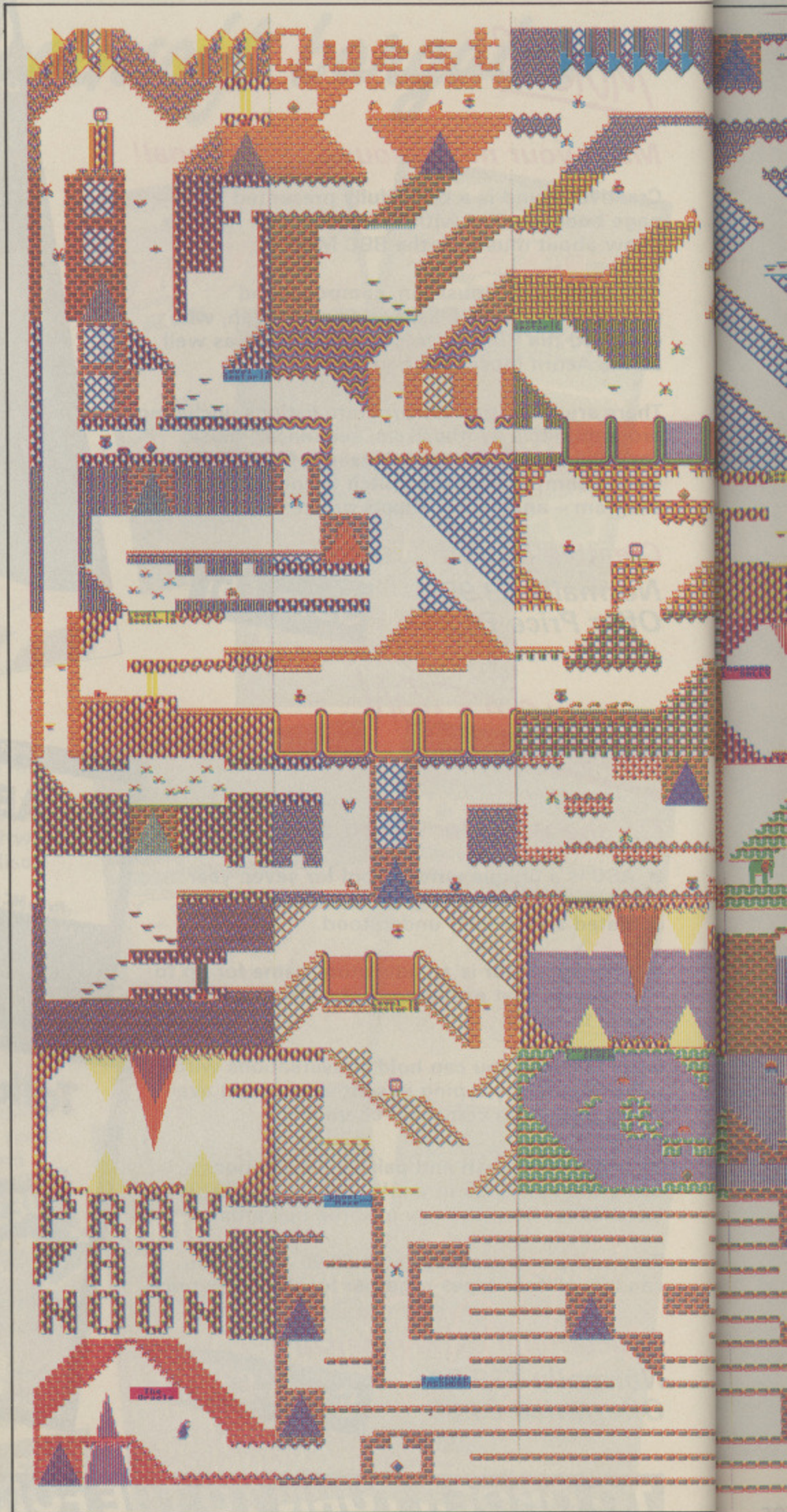
TO ORDER TURN TO THE FORM ON PAGE 135

THE MICRO USER

map of

Quest

We've received lots of requests for assistance with Superior Software's arcade adventure Quest — reviewed in the May issue of The Micro User. Now — as an exclusive — we present for you the complete map of the labyrinth. Its accuracy is assured by the fact that it was composed by Tony Oakden — the author of this superb package — and produced by him on an Integrex 132 colour jet printer.





- OBJECTS**
- KEY 1
 - KEY 2
 - KEY 3
 - CARD
 - CHEESE
 - MOUSE
 - NORM
 - HERRING
 - BOTTLE
 - EYE
 - CROSS

SUPERIOR SOFTWARE

To make sure the Atari 520 STFM
only plays games that are worthy of it,



Offer excludes monitor.

Only the Atari Summer Pack gives you the world's best home computer plus the world's best games. Twenty-two software titles that most people would give their right arms for, are yours absolutely free.

gam

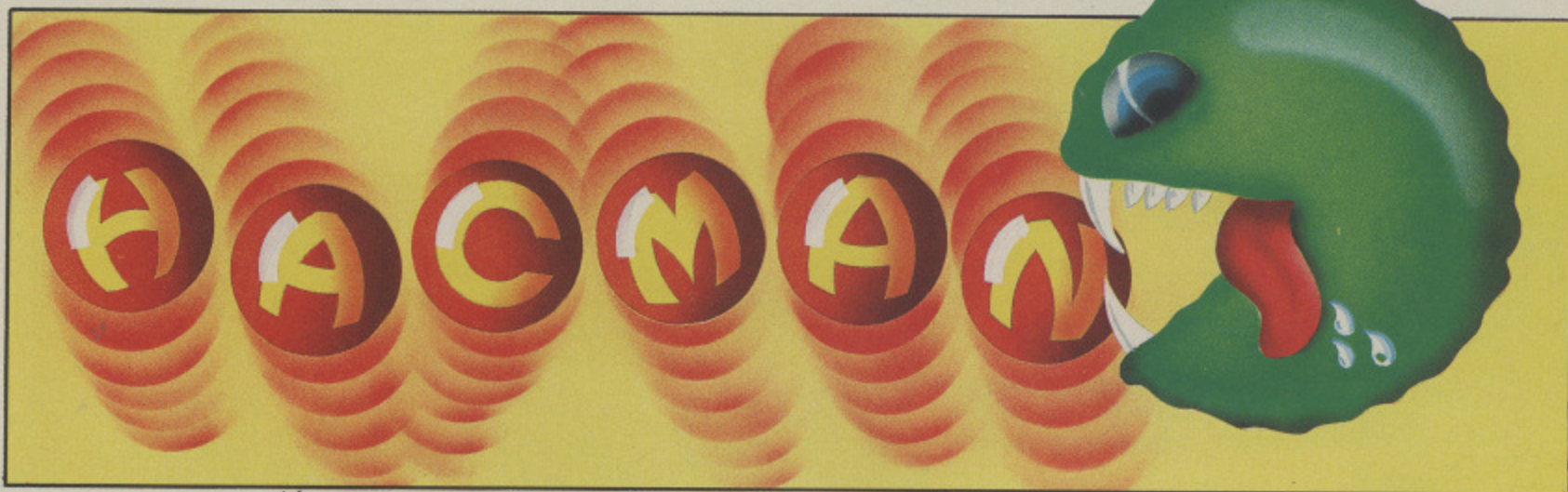


we're giving you
£400 worth free.

There's no catch. You really do get a 520 STFM and £414 worth of great games for just £399.99! But only until September 1st. What are you waiting for?



ames.
y free.



Featuring

The Living Daylights
 Sphere of Destiny
 Codename:Droid
 Life of Repton
 Strykers Run
 Crazee Rider
 Omega Orb
 Psycastria
 Arkanoid
 Ransack
 Impact

Re-living past glories

While making a plea for help with *Repton 2* in our February 1988 issue, I also mentioned that I had been devoting a lot of time to *Life of Repton*. Among the many readers who very kindly sent me the complete set of *Life of Repton* passwords is John Hughes of Bridgend, Mid Glamorgan, who suggested that they would help me cut my time down.

I am very grateful to John and everyone else, but you may be surprised to learn that in fact I rarely use my own – or anyone else's – cheat routines, especially when I am trying to achieve a new high score. I have still not even quite finished *Around The World In Forty Screens* but I'm sure that, given time, I'll get there.

Since I started this column I seem to have spent a lot of time discussing the many aspects of compatibility between the various models of the BBC Micro family caused, unfortunately, by illegal programming techniques.

This general subject is not a particular hobby-horse of mine but I just can't agree that once a game has reached the end of its effective selling life it is virtually worthless. I regularly play games that date from the earliest days of the BBC Micro – I'm sure I can't be the only one – and if I've upgraded to a Master why should I have to give up playing my favourites?

When I receive letters saying that older games do not work on newer machines I try to help. But in a hard world business sense must prevail if a software house is to survive. Previous columns have shown that many software houses do their best to help all their customers – but this should

Hac Man discusses playing old favourites on updated machines

be counted an exceptional bonus, rather than a consumer right.

Since I first discussed software – particularly games – clashing with certain sideways roms, I have received letters from John Terry from Ruislip, Middlesex, and Andrew Thacker from Croydon, Surrey, with further examples of such clashes. Both problems concern our old friend Commander Stryker – John's with *Stryker's Run* and Andrew's with *Codename:Droid*.

John points out that *Stryker's Run* will not work on a machine fitted with the AMX Pagemaker roms. And Andrew has found – as I have – that *Spellmaster* corrupts the ropes in *Codename:Droid*, making it impossible to climb them. He has also found that if the machine has the Acorn TFS (teletext) rom fitted, with the Teletext Adapter switched on the game locks up with a blank screen instead of displaying the first title page.

The Acorn Teletext Adapter also interferes with both the cassette and disc versions of the Gary Partis' games *Psycastria*, *Sphere of Destiny* and *Impact* – all published by Audiogenic. If the adapter is plugged into the machine these games will crash, resetting to the power-up state.

This time, moreover, it makes no difference whether the unit is switched on or off, or even if there is no TFS rom: If the adapter is connected these games crash. The problem is that the

Help Corner

Kevin Sinclair of Luncarty, near Perth, has an answer to Carl Dimelow's problem – April 1988 – with *The Living Daylights*. Carl could not get past the man with the balloons on level five. Kevin says that you must shoot the balloons with the bazooka.

Life of Repton passwords

A	BABY	15890	SCHOOL	36216	TEENS	61268	WORK	21012	OAP	20910
B	KEYHOLE	44287	ADVANCE	14562	TURBINE	32854	INCLINE	7014	UNAWARE	18760
C	FAILURE	58847	BAPTISE	49514	WEAKEN	51857	HOSTAGE	60159	SOAKING	57020
D	GADGETS	24882	LESSONS	39008	CHEAPLY	53452	TWISTED	9677	EVOLVES	21489
E	REACTOR	61197	ZIPPER	21622	OVERLAP	22068	TAXABLE	14439	QUIBBLE	52892
F	REUNION	19047	BLEAKLY	27442	PADLOCK	43672	WARTIME	21383	NATIVES	30995
G	OBSERVE	5067	CORPSES	4831	DIALLED	13517	ALGEBRA	57802	JUMPING	21164
H	DIVERGE	36440	ZYGOTES	21882	CIRCLES	4405	BETTING	996	SHALLOW	35064

games' protection runs through a number of checks before loading the main part and if the adapter is present one of these checks crashes the program.

The protection is too sophisticated to allow this routine to be modified to make it ignore the presence of an adapter – the only answer is to unplug it physically.

Now on with the hints, and until next month – happy hac-ing.

Crazee about Opus

Owners of the Opus DDOS disc system may remember a conversion routine published in the October issue to allow the Codename: Droid disc to run on their system. Mrs Eileen Powney of Bristol, author of that routine, has now come up with another, this time for **Crazee Rider**. Put the disc into the drive and enter the following lines:

```
PAGE=&1900
LOAD'MENU'
*LOAD LOADER 1B1E
!&1B46=&41472E4C
!&1B4A=&D454D
!&1B4E=&26D60929
!&1B52=&D363134
?&1904=&F4
RUN
```

Although this routine refers to the original Crazee Rider disc, it should work for the version of the game featured on **Play It Again Sam II** – but I haven't been able to try it yet.

Getting bug-eyed

Roger Griffiths of St. Davids, Dyfed has sent in a very useful conversion routine to allow Audio-Genic's **Bug Eyes II** to work on the B+ and Master. Master owners should enter Listing I, and type:

```
RUN
```

Owners of both machines should then type:

```
LOAD'STARMAN'
41 REM
RUN
```

and the game will load and run perfectly. This routine works with both the original stand-alone game and the version of Computer Hits 10 Volume 4.

Chocka with cheats

Arkanoid, one of Peter Johnson's best-ever games, seems to be full of surprises. Jamie Pearce has brought me news of yet another built-in cheat facility. If you press Delete to pause the game, followed by pressing D, H and J simultaneously, you will advance to the next level.

Also, if you hold down P, A and J while on the high score screen, you will start a new game on the level on which you lost your last life.

Ransacking

I recently received a letter from Peter Scott, the first I had heard from him since he went off to university last year. Peter will be well known to many readers for his great arcade adventures, such as **Omega Orb** and the **Thunderstruck** series. Towards the latter part of last year he sent me a copy of his then new game, **Ransack**.

He described the two built-in cheat facilities, on the understanding that I would not publish them until the game had been out for a while, to give everyone a chance to play the normal game.

For the first one, play the game until you are invited to enter your name for inclusion in the high-score table. Type in:

```
WAMALAMADINGDONG
```

exactly as shown, without any mistakes. The next time you play the game, the counter will be corrupted but you now have about 230 lives.

The second one is a level jump: When the high-score table is being displayed press Control+f4. You will hear a quiet beep amid the music – which is, incidentally, a superb rendition of Kraftwerk's *The Model*. When you now press the spacebar, you will find yourself on Level 2.

Repeat this procedure to tackle any of the eight levels. However, the game will crash if you try to jump to a ninth, so be careful. Also, you'll always restart on the selected level and to return to a lower one you must reload the game, so exercise a little restraint.

On the general subject of Mr Scott, his previous offering, **Omega Orb**, also features a cheat facility. When you are accessing a computer terminal, type GROVEL and you'll be awarded an extra life, which you can sell if you are a bit hard up. You can use this feature repeatedly, so it can be quite useful for building up stocks of both lives and credits.

```
10 REM Bug Eyes II VDU character definitions (for Master)
20 REM by Roger Griffiths
30 REM (C) The Micro User
40 :
50 VDU23,128,124,254,198,246,246,6,6,0
60 VDU23,129,252,254,198,220,198,62,60,0
70 VDU23,130,126,254,192,192,254,126,0,0
80 VDU23,131,252,254,198,198,222,220,0,0
90 VDU23,132,126,254,192,248,192,254,126,0
100 VDU23,133,126,254,192,240,192,192,192,0
110 VDU23,134,126,254,192,198,198,254,124,0
120 VDU23,135,198,198,254,254,198,198,6,0
130 VDU23,136,56,56,56,56,56,56,56,0
140 VDU23,137,12,12,12,12,12,124,120,0
150 VDU23,138,204,204,248,248,204,204,204,12
160 VDU23,139,192,192,192,192,192,254,254,0
170 VDU23,140,252,254,214,214,214,214,214,0
180 VDU23,141,252,254,198,198,198,198,198,0
190 VDU23,142,124,254,198,198,198,254,124,0
200 VDU23,143,252,254,198,222,220,192,192,0
210 VDU23,144,124,254,198,198,254,124,24,0
220 VDU23,145,252,254,198,220,222,198,6,0
230 VDU23,146,56,56,28,14,6,126,124,0
240 VDU23,147,254,254,24,24,24,24,24,0
250 VDU23,148,198,198,198,198,198,254,126,0
260 VDU23,149,220,222,198,110,108,124,56,0
270 VDU23,150,108,238,198,214,214,254,124,0
280 VDU23,151,0,238,254,24,254,238,0,0
290 VDU23,152,220,222,236,108,88,24,48,48
300 VDU23,153,254,254,28,56,112,254,254,0
```

Listing I: Bug Eyes II VDU character definitions

Riding high

Robert Miley from Snaith, North Humberside has sent me a useful tip for Kevin Edwards' **Crazee Rider**. If you press Tab when the lights are changing you will immediately be promoted to the next circuit.

SOFTWARE AT BARGAIN PRICES



ACORN TELETEXT ADAPTORS

complete with manual +
TFS ROM for all BBC/Master

RRP £229 OUR PRICE £89.95



CURRENT TITLES	Cass	Disk
Spycat	7.50	9.95
Icarus	7.50	9.95
Tetris	6.95	9.95
Boulderdash	7.50	11.95
Indoor Sports	7.50	11.95
Quest	7.50	9.95
Play It Again Sam II	7.50	9.95
Kourtyard	7.50	9.95
Skirmish	7.50	9.95
The Lost Crystal	9.95	11.95
Spellbinder	7.50	9.95
Life of Repton	5.50	6.50
Elixir	7.50	9.95
Bonecruncher	7.50	9.95
Despatch Rider	6.00	8.95
Impact	7.50	9.95
Ransack	7.50	9.95
Ziggy	6.00	8.95
Graham Gooch Cricket	6.50	9.95
Thunderstruck II	6.50	9.95
Spy v Spy	7.50	9.95
Phantom (Tynesoft)	6.50	9.95
Winter Olympiad	7.50	12.50
Village of Lost Souls	7.50	10.50
Project Thesius	7.50	10.50
Rick Hanson Trilogy	18.00	21.00
Play It Again Sam	7.50	9.95
Spitfire 40	7.50	10.95
Palace of Magic	7.50	9.95
Crazy Rider	7.50	9.95
Codename Droid	7.50	9.95
Repton 40 Screens	5.50	6.75
Revs + 4 Tracks	10.50	12.95
Grand Prix Construction	7.50	9.95
Superior Collection Vol1	7.50	9.95
Superior Collection Vol2	7.50	9.95
Colossus Chess	7.50	12.95
The Hunt	7.50	10.95
Paperboy	7.50	12.95
Elite	10.50	10.95
Star Wars	7.50	10.95
Evening Star	7.50	9.95

NEW TITLES FOR THIS MONTH

	Tape	Disc
Repton through Time	5.50	6.50
Saigon	7.50	11.95
Barbarian	7.50	9.95
Steve Davis Snooker	1.99	4.99

BARGAINS OF THE MONTH (Tapes)

Power Pack (7 games)	4.99
Last of the Free	2.99
Genesis Project & International Mega Sport	3.99
(Twin Tape)	

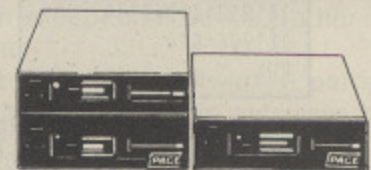
SPECIALS ON DISC

DUNJUNZ (Argus)	4.50
BUGBYTE COMPILATION 1 ...	4.50
BUGBYTE COMPILATION 2 ...	4.50
ROUNDHEAD (Argus)	4.50
WORLD WAR I	4.50
WAR (Martech)	4.50
FOOTBALLER OF THE YEAR	4.50
PSYCASTRIA	4.50

ACORN DISC DRIVE

40 track/100k
£39.95

PACE Disc Drives



400K Single 800K Dual
£99.00 £189.00

800K Dual with PSU
£209.00

All disc drives fitted with 40/80T switch.
Prices include VAT, but please add
£3.00 P&P

10 DS/DD DISCS
5.25" DS/DD 96TPI
Reinforced hub rings
in library case

£6.50

TOWERHILL COMPUTERS LTD

Unit 5, Acacia Close,
Cherry Court Way Ind Est, Leighton Buzzard, Bedfordshire
Telephone: Leighton Buzzard (0525) 385329



ALL PRICES INCLUDE V.A.T. AND P&P. OVERSEAS ORDERS ADD £2.00

Stick at it!



It's a challenge!

Mike Cook gives some hints and algorithms for his devious programming problem

In our July issue we set a challenge to see if you could simulate the process of sticker collection – the sort where you buy a pack of five stickers at a time and put them in an album. This month we'll see how you can tackle such a problem by translating it into plain English. You can refer to the July issue to compare the techniques here with the original problem.

In the next issue of *The Micro User* we'll give you a no-frills program that will do the job along with suggestions for further improvements. You'll be able to check this against your own efforts and perhaps sort out any points you had difficulty with.

Remember, as far as a program is concerned, there are as many right answers as there are wrong ones, but the solutions I prefer are simple and readable. I will avoid, as much as possible, using fancy tricks or so-called clever programming techniques, as most of the time they are not necessary. So, without further ado, let's move on to a sticky problem...

We can represent each sticker with a unique number ranging from one to the total number in the collection. As we have five stickers per packet we can represent each as an element of an array and the number of sticker it is by the value in that array.

For example the first sticker in the packet could be called *PACK(1)* and this variable would contain a number identifying the picture on it. To generate a packet of stickers we need to assign each element of *PACK* a random number between one and the maximum number of stickers.

Next we need a computer representation for the album. This has to indicate if we have a sticker corresponding to that number. Again we can use an array: *ALBUM(T)* where *T* is the sticker number. In this we only need to indicate if we have that sticker or not and we can do this by assigning each array element to be either true or false. Initially, of course, we have no stickers so each space – array element – is assigned to false.

Now we have to stick the stickers in the album. With a little thought this is easily done: The value of the sticker becomes the index number of the album array. Simply assign those array elements

to *TRUE* to indicate we have the sticker. If it is already assigned as true then we have a duplicate so it can be ignored.

Next we have to count how many stickers we have in our album to see if we have to buy another pack or can order the remaining stickers from the publisher who will usually sell you the last few.

Having completed the album we need to display the results and add them to the grand total. Then we can work out and display the average packets, cost and number of duplicates. In order to make the program interesting to watch it is a good idea to print out the number of stickers we have and how many we have to collect to complete the current album.

Finally, rather than build constants into your program arrange it so that all the parameters of the simulation are stored in variables so you can easily change them to simulate different collection schemes.

For example the number of stickers to collect and the number of stickers you can buy to complete your collection should be declared in a line near the start rather than being hard coded in the program. Get the inner routine working first, the one to fill up one album, and then extend it to calculate the average of many tries.

● *So there it is: All the help you could want short of me doing it for you – which I will next month. So, before then, see if you can write the simulation yourself.*



REAL TIME CONTROL APPLICATIONS

From Paul Fray Ltd

For School, Business, Home or Laboratory



SPIDER The Software

Fifty additional keywords expanding BASIC's control over the User Port, Serial Port and keyboard by invoking BASIC procedures from external events.

- Foreground/Background processing
- ROM/RAM combination takes no memory
- Leaves BASIC programs unaffected
- Easy to install with no soldering

— FROM £65 —

TERMITE The Hardware



- Eight configurable input/output lines
- Status indicators for each line
- Outputs rated at 2A, 5 to 30V DC
- Opto-isolated and fused for safety
- Fully compatible with SPIDER
- Comprehensive manual including driver utilities
- Ideal for driving motors, lamps, sensors etc.

— ONLY £79 —

Prices inclusive of VAT. Please add £3 for p&p

We also supply a full range of industrial digital, analogue and serial cards for use with SPIDER. For more information on any Paul Fray product please telephone (0223) 66529

(Trade Enquiries Welcome)

Paul Fray Ltd, Willowcroft, Histon Road, Cambridge CB4 3JD

INTRODUCING

MEGAPRINT-NLQ

For too long BBC micro users could only print large text using unsightly, chunky characters. Now Megaprint-NLQ offers an alternative, allowing your printer to produce high resolution characters of any size. Its uses are endless as it is capable of producing advertisements, labels, titles and notices of any kind.

Megaprint-NLQ is a self-contained publishing package for the B/B+/Master with 5.25" disk drive(s) and DFS, and may be used with any Epson FX80 compatible printer.

WHAT YOU GET WITH MEGAPRINT-NLQ

- A font editor to create your own fonts and for editing the 12 complete fonts provided free on disk (over 320K of data). Each font consists of all 95 characters available from the BBC keyboard, with each character designed on an incredible 48 by 48 matrix.

- A document editor on 16K ROM to design your notices. The features supported by Megaprint-NLQ include any page format, text of any height or width, full justification, proportional spacing, underlining and inverse text. This ad was produced on A4 paper using Megaprint-NLQ.

All for just £29.95 inc.

When ordering please state which disk format you require: 40 or 80 track / single or double sided

Please make cheques / P.O.s payable to Sabre Software. For further details, send a large SAE.

SABRE SOFTWARE

Sabre Software,
23 Sispara Gdns.,
London,
SW18 1LG

POOLSWINNER II

THE ULTIMATE POOLS PREDICTION PROGRAM

- **MASSIVE DATABASE** Poolswinner is a sophisticated Pools prediction aid. It comes complete with the largest database available - 22000 matches over 10 years.
- **PREDICTS** Not just SCOREDRAWS, but AWAYS, HOMES and NO SCORES.
- **SUCCESSFUL** SELEC guarantee that Poolswinner performs significantly better than chance.
- **ADAPTABLE** Probabilities are given on every fixture - choose as many selections as you need for your bet. The precise prediction formula can be set by the user - you can develop and test your own unique method.
- **SIMPLE DATA ENTRY** All team names are in the program. Simply type in the reference numbers from the screen. Or use FIXGEN to produce fixture list automatically (see below).
- **LEAGUE AND NON-LEAGUE** All English and Scottish League teams are supported, and also the non-league sides often used on pools coupons.
- **PRINTER SUPPORT** Full hard copy printout of data if you have a printer.



PRICE £18.00 (all inclusive)

NOW AVAILABLE

FIXGEN 88/9

AT LAST! No more struggling for hours to get the fixture list into the computer. FIXGEN has been programmed with all English and Scottish League fixtures for 1988/89. Simply type in the date, and the full fixture list is generated in seconds. Fully compatible with Poolswinner. Yearly updates available.

POOLSWINNER with FIXGEN £19.50 (for both)

COURSEWINNER v3

NOT JUST A TIPSTER PROGRAM, Coursewinner V3 can be used by experts and occasional punters alike. You can develop and test your own unique winning system by adjusting the analysis formula, or use the program in simple mode. Coursewinner V3 uses statistical analysis of major factors including past form, speed ratings, course statistics, prize money, weight, going, trainer and jockey form etc, etc. It outputs most likely winners, good long odds bets, forecasts, tricast etc. The database includes vital course statistics for all British courses. You can update the database - never goes out of date. **FULL PRINTER SUPPORT.**

PRICE £18.00 (all inclusive) includes Flat AND National Hunt versions.

AVAILABLE FOR

All supplied on tape ...
(Automatic Conversion to disc)

AMSTRAD CPCs
BBCs
COMMODORE 64/128
SPECTRUM

DISCS ...

(Add £3.00)

AMSTRAD PCW
IBM Format
COMMODORE AMIGA
ATARI ST

Send Cheques/POs for return of post service to ...

selec
SOFTWARE

VISA
phone 24 hrs

62 ALTRINCHAM RD, GATLEY, CHEADLE, CHESHIRE SK8 4DP. ☎ 061-428 7425

(Send for full list of our software)

ENTER THE EXCITING WORLDS OF

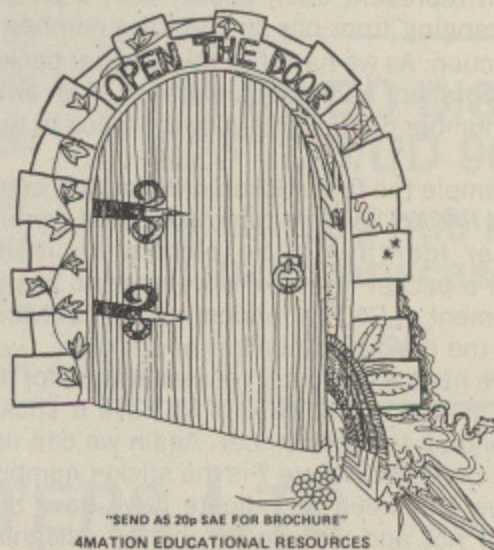
Worlds without Words

Dinosaur Discovery, Box of Treasures

Granny's Garden, DragonWorld,

Flowers of Crystal, The Big Calculator

Zoopak, Tele-Book, Bush Rescue



"SEND AS 20p SAE FOR BROCHURE"

4MATION EDUCATIONAL RESOURCES
LINDEN LEA, ROCK PARK, BARNSTAPLE, DEVON EX32 9AQ
TELEPHONE: 0271 45566

4MATION Educational Resources

ELECTRONIC MAILBOX TTNS 01:YNK045

June 1 to 7

Morse

Teach yourself Morse code with this easy to follow tutorial guide. Practice reading code generated by the micro or enter your own words for translation. The program can also monitor the user port to detect any Morse code being sent, storing it in memory until you are ready to listen. Alternatively, code can be sent to any suitable device connected to transmit the signals.

Globe Globe2

A very clever piece of animation, showing the BBC globe rotating. A superb demonstration of the display characteristics of the BBC Micro.

Timer Tmr/Inf

A routine to keep track of your recordings – on video, cassette or

sideways roms are constructed and in particular the structure of the rom header which identifies it to the operating system. Service calls are also discussed.

Strangers

Parents will already know of the dangers of children being lured away by strangers – but it is very difficult to impress upon youngsters the need to be continuously alert to this type of peril. Even the most attentive child may find it difficult to remember the frequently quoted phrase *don't go with strangers* if such a situation were to arise. The program helps to impress children with this vital message.

Lister Instruc File

Make your printed listings of programs neat, tidy and very readable. Routines are highlighted and many other useful features employed to ensure debugging,

held on the disc in the specified drive. Suitable for both DFS and ADFS.

ClkSet SetClk

A very simple to use utility to correct the internal clock of the BBC Master computer using the Ceefax information via your teletext adapter.

Flip

A unique and interesting game to keep your mind active and your fingers nimble.

T/SWR03 NewCom Trace

Continuing with the sideways ram programmers series, T/SWR03 shows how a simple one-command interpreter can be constructed so an additional star command can be implemented.

Archive

An automatic way to safeguard

message in the wordbox before your opponent does? This two-player game will keep you thinking.

Recover

An easy-to-use utility to help you rescue lost disc files. It was first published in the February issue of *The Micro User*.

July 29 to Aug 4

T/DFS00 IDSDump Verify

Beginning a major new series for programmers wishing to know more about a variety of aspects of the BBC Micro. The first eight modules of the new opcodes series looks at the Acorn DFS and how to utilise its various facilities and functions at any of the three available levels – via OS commands such as BGET and *SAVE, using osword calls or by directly accessing the floppy disc controller chip itself.

In studying the principles of storing information on disc, producing non-standard format discs for copy protection is also discussed. Opcodes tells you everything you ever needed to know about the DFS.

T/SWR05 Cursor

More from the series explaining the intricacies of using sideways ram areas of memory. This module explains how to incorporate arguments typed in after a star command into your own software.

Alginon

A set of useful routines to incorporate in your own Basic programs, all concerned with producing graphical representations of data.

T/Strip M/Strip M/Spool

Routines to save text from the View word processor in a form that can be used by any other word processor – even on a different type of micro. The programs operate as printer drivers, but send the output to disc rather than paper, overcoming the problems of using the inflexible SAVE and SPOOL commands.

Gloop Gulp

In this super game from the November 1985 issue of *The Micro User* you must take charge of the Gulper before the Green Gloop gets out of hand and covers everything.

SOFTWARE

Guide

B B+ M

Software is currently transmitted for a period of one week. The files are updated on Fridays and there will be periods during the update day when they are unavailable. The program details given are provisional.

reel-to-reel. Timer calculates the duration of recordings from the tape counter, and vice-versa.

T/SWR01 ReadROM

Part one of a series to help BBC Micro owners get more use from sideways ram and rom facilities. Sideways ram is available as standard on all Masters and as an add-on option for the BBC B. T/SWR01 describes how banks of rom or ram are switched in and out of the micro's memory map, and how to read the contents of a rom that is currently switched out.

Pinball

A superb arcade simulation of a pinball machine from the February issue of *The Micro User*.

July 8 to 14

T/SWR02 Trace Readrom

Part two of our series looks at how

modifying or just studying a program is made as simple as possible.

Data Words Leader

Produce wordsearch puzzles automatically. Just give the micro your selection of words to be included and wait as the completed puzzle is produced.

Avengence

An excellent graphical version of the hidden-code strategy game from the January issue of *The Micro User*.

July 15 to 21

CatDisc CDInfo

Obtaining details of the contents of any disc is a useful facility for a wide range of programs. CatDisc can be appended to your own Basic programs, returning in a string array the name of every file

your disc files by copying them to tape. Published in the January issue of *The Micro User*.

July 22 to 28

T/SWR04 Enable EnabTst

T/SWR04 looks at the *ENABLE command and shows how to use it from your own software.

Backup IBack

A rapid disc backup utility for use with a Master 128. Large time savings can be achieved for owners of single disc drives, with an 80 track disc being copied in under two minutes involving just four disc swaps.

Wordbox Intro WBdata

Can you work out the hidden

MICRO USER CLASSIFIEDS

Has upgrading your BBC Micro given you hardware you no longer need? Or have changing interests left you with unwanted software? Then 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!

An added bonus!
Your advert will be automatically displayed on MicroLink, the electronic mail service operated in association with Telecom Gold. This means it will be seen by thousands of computer enthusiasts who can send an instant response.

- Amx Mouse with Super Art, Olivetti JP101 inkjet printer with dump rom each £40 o.n.o. As new. Tel: Winchester 0962 66291.
- Master 128 40/80T drive, Master Replay + OS 1.20 convertor, joysticks, blank discs + box Master-Rom, Cumana Touchpad, books, software, many magazines £499. Tel: 0793 813189.
- BBC B - 7, 40/80Tk drive, Microvitec colour monitor, external rom box, Zif, Mouse, Apollo modem, roms, discs, games, leads, books, mags, cost £1500 sell for £650. Tel: 0403 752085.
- Metamorphose your Beeb into IBM - Compatible with Torch Graduate. 256K d/drives x 2. Integrated Psion xchange software. Runs Wordstar, Dbasell, Lotus 123, bargain at £250 o.n.o. Tel: 01 530 4807 evenings.
- Teletext Receiver for BBC/B Advanced TFS boxed, hardly used £60. Tel: 01 317 1836 (Mike) after 6pm.
- JP101 printer £30. Unused Taxan 12" monitor £30. Tel: 01 861 0774 evenings.
- BBC 400K disc drive, 256k board, Viglen case, lots of books, mags, software, joysticks, T/ball etc £450 o.n.o. Tel: Steve 0634 404473.
- BBC tape software for sale. Please Tel: 0656 724778 for details.
- BBC B 1.2 Watford Electronics 32k shadow ram, sideways ram, rom board, W.E. DDFS, user guides and manuals £250 o.n.o. Dr Pace Tel: Stamford (0780) 64501 ext 3296 (days), ext 339 (eves).
- Master 128, 400k drive, Trackball, control Rom, Rom cartridge, Elite, manuals one, two, advanced. Bargain £375. Tel: (Bradford) 0274 590021 evenings.
- Portable Tandy model 102 for files business or home £175 o.n.o. Tel: Nottingham 581065 evenings.
- Master 128 £290. Morley Eprom Programmer £22. Tel: 04243 4500.
- BBC B 32k 16 socket Ram/Rom board. Double 40T Teac D/D. Wordwise, Exmon, Beebmon, Beebcalc, Disc Doctor, Acorn DFS, games, magazines £450. Tel: 0277 352525.
- Wanted Wordwise Plus, Word-Aid, Spell Master and View chips. Tel: 0242 584753.
- Electron software - mostly games. S.a.e. E.J. Byne, 32 Harfield Road, Sunbury, Middx, TW16 5PT.
- BBC B, OS 1.2, DFS, 40T S.S. drive, Microvitec colour monitor, 128k SWR, 12 Roms inc Wordwise+, Toolkit, Discdoctor, Printmaster, Star 15" printer, Morley Teletext, lots of other software on over 50 discs (Masterfile, Elite, Revs, Paintbox, etc.) Computer desk. BBC tapeunit with software. Full set of Beebug and some other mags £695

- could split. Tel: 0494 816326 (evenings).
- BBC B OS 1.2 DFS/Basic 40T DDSS twin P.s.u. Philips monitor, Amx/Mouse, Superart III, Epsom LX800 128k Rom/Ram board, manuals, extra Eproms £550. Will split. Tel: 0234 45207.
- BBC B, dual 80/40 DS drives, printer, Pc-consult, Rom cartridge system, Teletext, Sideways Rom, Mouse, lots of books, magazines, games & utility software. Only £600. Tel: (eve) Tobias 01 482 3609.
- BBC B, Epson RX-80F/T+ printer, Cumana 40/80 disc drive, 20" colour monitor, Teletext Adapter. £150+ software, cassette recorder, joysticks, desk, leads, manuals £550 o.n.o. Tel: 0908 78841 buyer collects (Bletchley).
- BBC B+ 128k (64k sideways Ram, 20+ shadow screen), dual disc drives, modem, mouse, joystick, Wordwise+ (including Wordaid), Acornsoft logo + many games, mags and all manuals (£375). Philips CM8833 colour monitor (£200). Taxan KP810 NLQ printer (£150). All in excellent condition, boxed. Tel: 01 670 7520 or Trent Gray-Donald, 9 Hitherwood Drive, London, SE19 1XA.
- BBC B Issue 4 DFS 9 OS 1.2. Challenger 256k recorder, discs, games, tapes, books, mags, joysticks, Philips monitor, hardly used £400. Tel: 01 300 0627.
- Teletext Adaptor £50. Music 500 £10. B+ Romboard £15. Interword £20. Toolkit + 1 Conmaster and loads of games software, Mouse. Call for details. Tel: 0276 29962.
- Master 128 40/80 ds/dd dual drives. Microvitec colour monitor, Acorn teletext adapter, Eprom blower, Turbo coprocessor, books, discs etc £450. Tel: 0932 786758 (Sunbury, Middx).
- Microvitec 1451 monitor £175. 100k 40 track drive £25. Watford twin 400k 3.50 in drive £95. Watford 32k shadow ram £30. ATPL board with all inter roms £85, manuals. Tel: 0234 857945 evenings.
- Acorn Z80 second processor. All software and manuals, excellent condition £165 including Datapost delivery. Tel: Luton (0582) 412368.
- Morley Teitex + PS £60, Graphpad II £50, Discdoc £10, Cumana Touchpad £10. Tel: 0272 838916.
- Sendata series 700, Acoustic coupler 300 BPS £25. Tel: Thomas 01 249 7440.
- Master 128 and books worth £50. Bargain at £295. Tel: 0524 54388.
- Dowty Steebek SB123 Hayes compatible modem. Autodial and autoanswer. V21.22.23, as new. Tel: 01 554 4335.
- BBC B 128k ram (sideways/shadow) dual 80/40 drive with Psu, many roms/games,

- mouse, joysticks, 40 discs. Tel: Reigate 243864.
- BBC B Issue 7, Acorn DFS, software, Advanced user guide £225. Tel: Sunbury 788322.
- PC Emulator £60. Zarch £10. Tel: Simon (0829) 260476 evenings.
- BBC B, Wordwise+, Opus disc drive, Philips portable colour Tv £350 o.n.o. Juki 6100 £200. All vgc. Tel: 0302 770414 evenings.
- New word programme £30. Centronics Interface £20. Amstrad PCW 8256 £150. Tel: 01 299 3784.
- BBC Beebug Spell-Check II Rom + disc £6.50. Penfriend 2 Rom (Wordwise utility rom) £6.50. Tel: 01 368 1773 eves.
- Three years of Micro User magazines from number one volume one in official binders. Offers invited. Tel: 0959 73007.
- Acorn Electron, Plus 1, Plus 3, View, Viewsheets, manuals, boxed, excellent condition £180. Tel: 0272 61655 (Herts) evenings.
- BBC Roms, Interword, Intersheet, Interchart, Interbase, Wordwise, Logo, ADFS and Advanced user guide. All as new value £350 for £199 or will split. Also computer paper. Tel: 031 664 3765 or write for list to John Bibby, 29 Liberton Brae, Edinburgh, EH16 6AG.
- BBC B with Challenger 3 512k plus roms and games £360. Tel: 051 737 1243.
- Wanted BBC B Issue 7 DFS 1770, disc drive, printer. Tel: (0785) 58344 evenings.
- ATPL Sidewise Rom board £15. Stardat-base Rom/disc £15. Watford Rom Manager £12. 6502 second processor £60. Tel: 0233 32787 (after 5pm).
- BBC B, Opus dual 80/40 discs, Z80 second processor, colour monitor, teletext adapter. Interword, software, manuals, books £675. Tel: 0784 34639.
- Master 128 plus single 40/80 drive, various manuals and dust covers £300. Tel: 04203 89445 evenings.
- BBC £1800 worth of equipment offers around £900. Tel: 0724 842953 includes disc, printer, second processor, modem, roms etc.
- BBC B issue 7 in PC style case, Acorn and Watford DFS, SS40T disc with dualing cables, Microvitec monitor, Amx mouse and Superart, Acorn data recorder, analogue joysticks, speech synth, Replay, extra Roms, disc box with blank discs, much software including Mini Office II, Arkanoid etc. Manuals including advanced user guide, tons of magazines and all connecting leads £640 o.n.o. Tel: Brighton (0273) 735743 after 6.15pm.
- Juki 2200 combined daisywheel printer,

- typewriter, Centronics Interface, superb quality, mint condition £185. Tel: 0782 627290.
- Music 500 any offers. Disc Games: Star Wars, Spy vs Spy, Spycat etc. Tel: Simon 01 508 3010 after 6pm for prices.
- BBC B games & Peartree sideways ram worth £114. Selling for £55. Tel: 01 801 9770.
- AMX Mouse with Rom and user guide plus utilities and paintpot discs £40. Beebug Toolkit plus rom £15. Graphics Rom from Computer Concepts £15. Floppywise Rom from Software Services £15. Tel: 0925 811420 evenings.
- BBC OS 1.2 Watford DFS 16k battery sideways ram, 16 rom sockets, inter word, print-master, mega rom, £200 software, joystick £235 o.n.o. Tel: 01 531 3880 anytime.
- BBC Master 128 + 80186 Co-processor and mouse + Toshiba 40/80T DS DD front switchable with own power supply + Sanyo CRT70 high res monitor + Star Gemini 10x printer + software. All you need for IBM setup for £950 o.n.o. Tel: 0252 549217.
- Archimedes 310M backplane, I/O podule, system Delta+, twin, diagram, PCB, toolkit, reference guides, 5.25" drive cable, DFS reader etc etc. £899 o.n.o. Tel: 0903 65900.
- BBC Cumana touchpad with software instr. £35. SM-Corona serial interface to parallel printer £35. 3.5 disc drives. Discovery - £30. Brother 1.5 MB - £50. Taxan printer buffer 6Y-256K £45. Everything new. Tel: Tom 01 249 7440.

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 this form (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.

PLEASE PRINT THIS AD IN THE NEXT MICRO USER

Name _____
Address _____

Cheque enclosed for £ _____
(minimum £2 for 10 words)

I certify that any software offered for sale is original and not a copy

Signed _____

POST TO: Micro User Classifieds, FREEPOST, Macclesfield, Cheshire SK10 4YB.

**DABS
PRESS**

Archimedes Dabhand Guides

Serious Books for the Serious Archimedes User

Archimedes Assembly Language

At last the first book specifically written to provide a complete guide to programming the Archimedes in machine code. Whether you are an Archimedes owner, a user, or just interested in the ARM chip this book is truly the definitive guide.

In a massive 368 pages, author Mike Ginns provides a clear, step by step account of using the assembler. Many simple, useful, documented programs provide the practice to illustrate the theory making it ideal for the beginner.

But this book goes much, much further. For instance it explains how to use the Debugger and there is a large section on implementing BASIC equivalents in machine code plus coverage of Arthur and use of SWIs, WIMPs, the Font Manager, graphics and sound.

The book is applicable to all Archimedes computers and includes a full reference section. A programs disc is also available.

Price: £14.95 for book, £9.95 for disc, £21.95 ordered together.

C: A Dabhand Guide for Archimedes, Master, BBC

In an amazing 512 pages this thoroughly readable Dabhand Guide is a must for Archimedes, Master and Beeb owners. It describes in detail from first principles how to program in the language that is fast becoming the world standard and the natural successor to BBC BASIC. Littered with example programs at just £14.95 it's incredible value! Programs disc: Archie £9.95, BBC/Master £7.95. Book and disc together: Archie £21.95, BBC/Master £19.95 (£21.95 3.5").

Send or phone for our FREE 32 page catalogue NOW!

Prices inc. VAT and p&p in UK. ACCESS/VISA accepted by post/phone/mailbox. Products available from most dealers. Free catalogue on request. Add £2 (£10 air) if outside UK. Official and trade orders welcomed. See us at Micro User and PCW shows.

DABS PRESS (MU) 76 Gardner Road Prestwich Manchester M25 7HU
Tel: 061-773 2413 • Prestel 942876210 • Microlink 72:MAG11596

WITH PAYROLL

A LOW COST DISC BASED
PROFESSIONAL ACCOUNTING PROGRAM
For the BBC Computer

"Micro-Trader"
INTEGRATED SALES PURCHASE AND NOMINAL LEDGERS
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 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.

"MICRO-MAILER"
A Mailmerge program, fully integrated with "Micro-Trader". With a user Database.
£30.00 + V.A.T.

ONLY £200 + V.A.T.

Compact
BRITISH BROADCASTING CORPORATION
MASTER SERIES MICROCOMPUTER

Archimedes

PHONE TODAY FOR A FREE FACT SHEET

MEADOW COMPUTERS
11, LONDON STREET, WHITCHURCH, HAMPSHIRE, RG28 7LH
Telephone: Whitchurch (0256) 892008

DRAM ELECTRONICS LTD.

OFFICIAL ACORN SPARES DISTRIBUTOR

Please phone for prices
Dealer Enquiries Welcome

DRAM ELECTRONICS LTD.
Unit 12, Kingston Mill, Chestergate,
Stockport SK3 0AL.
Tel: 061-429 0626. Tlx: 312242

COMPUTERS
Amstrad, Epson & Opus authorised dealers.
Amstrad PPC Portable Ex-stock

DOT MATRIX PRINTERS

BROTHER	
M1409	£345
M1509	£399
CANON	
A-55	£395
A-65P	£475
EPSON	
LX800	£225
FX1000	£465
LQ500	£325
PANASONIC	
1540	£575
STAR	
ND10	£255
NX15	£275
MANNESMANN TALLY	
MT80	£175
MT85	£286

DAISY WHEEL PRINTERS

QUME	
12/20	£295
12/45	£595
JUKI	
6100	£275
6200	£399
PANASONIC	
3131P	£245
3151P	£395
MICRO-P	
M26P	£215
BROTHER	
HR20	£365
HR25XL	£565

LASER PRINTERS

BROTHER	
HL8	£1825
CANON	
LPB-811	£1750
EPSON	
GQ3500	£1395
HEWLETT PACKARD	
HPLJ+	£2995
HPLJ2	£1850
OKI	
L/L6	£1450
PANASONIC	
4450	£1995
STAR	
LASERP 8	£1699
TEXAS INSTRUMENTS	
TI 2015	£3775
TI 2108	£3595
TI 2115	£4950
MANNESMANN TALLY	
MT910	£2495

SPECIAL OFFERS

Star LC 10	£175
Star LC 10Col	£195
Panasonic 1081	£139
Panasonic 1082	£159
Panasonic 1592	£325
Panasonic 1595	£395

Sony Branded Diskettes
3.5 S/S £12.50
3.5 D/S £17.00

PRICES ARE CASH WITH ORDER and Exclude Delivery and VAT
All Goods Covered by Manufacturers Warranty

MICROSOL Ltd
01-739 5607
1-4 Christina Street London. EC2A 4PA.

BYTEMAIL

Software

TITLE	PUBLISHER	RRP	TAPE	DISC 5.25	ELECTRON
BARBARIAN	SUPERIOR	11.95 D 9.95 T	7.50	9.00*	7.50
ICARUS	MANDARIN	11.95 D 9.95 T	7.50	9.00*	7.50
CHOLO TETRIS	FIREBIRD MIRRORSOFT	17.95 10.99 D	-	15.50 9.50*	-
URIDIUM	HEWSON	8.99 T 14.95 D	7.50	12.95	-
COMPUTER HITS 4 SKIRMISH	BEAU JOLLY GODAX	9.95 T 11.99 D	8.50	9.99	8.50
YES PRIME MINISTER	MOSAIC	19.95 D 14.95 T	12.95	16.95	-
SPITFIRE 40	MIRRORSOFT	12.95 D 9.95 T	8.50	11.50	-
SCRABBLE	LEISURE GENIUS	14.95 D 12.95 T	10.95	12.95	-
LIVING DAYLIGHTS	DOMARK	12.95 D 9.95 T	7.50	11.50	-
MONOPOLY	LEISURE GENIUS	14.95 D 12.95 T	10.95	12.95	-
APOCALYPSE	INFOGRAMMES	14.95 D 9.95 T	8.50	12.95	-
ARKANOID STAR WARS	IMAGINE DOMARK	8.95 T 12.95 D	6.95	10.95	-
WORLD WAR 1 EVENING STAR	GRANDSLAM HEWSON	12.95 D 14.95 D	8.50	12.95	-
STAR GAMES 3 GRAHAM GOOCH	BEAU JOLLY AUDIOGENIC	9.95 T 11.95 D	8.50	10.50	8.50
ELITE	SUPERIOR	14.95 D 12.95 T	10.95	12.95*	10.95
FOOTBALLER OF YEAR KRAKOUT	GREMLIN GREMLIN	9.95 T 14.99 D	8.50	12.99	-
KOURTYARD	GODAX	9.99 T 11.95 D	7.95	10.50	-
SPYCAT	SUPERIOR	9.95 T 11.95 D	7.00	9.00*	7.00
BONE CRUNCHER	SUPERIOR	11.95 D 9.95 T	7.00	9.00*	7.00
QUEST	SUPERIOR	11.95 D 9.95 T	7.00	9.00*	7.00
PLAY IT AGAIN SAM 2	SUPERIOR	11.95 D 9.95 T	7.00	9.00*	7.00
SPELL BINDER	SUPERIOR	11.95 D 9.95 T	7.00	9.00*	7.00

AT THESE PRICES WHY GO ELSEWHERE FOR ACORN SOFTWARE?

GRAND PRIX	SUPERIOR	11.95 D 9.95 T	7.00	9.00*	7.00
REVS	SUPERIOR	14.95 D 12.95 T	10.95	12.95*	-
WINTER OLYMPICS	TYNESOFT	14.95 D 9.95 T	8.50	12.95	-
PHANTOM	TYNESOFT	12.95 D 7.95 T	6.50	10.95	-
PAPERBOY	ELITE	14.95 D 9.95 T	7.50	12.95	7.50

UTILITY SOFTWARE

FLEET STREET EDITOR	MIRRORSOFT	39.95 D (STATE 40 OR 80 TRACK)	34.95		
MINI OFFICE 2	DATABASE	16.95 D (STATE 40 OR 80 TRACK. MASTER VERSION ADD 3 POUNDS)	14.95		
SPELL MASTER ROM		59.00	53.00		
WORDWISE PLUS ROM		56.35	51.35		
INTERWORD ROM		56.35	51.35		
INTERSHEET ROM		56.35	51.35		
INTERBASE ROM		56.35	51.35		

EDUCATION

ANSWER BACK JUNIOR	KOSMOS	10.95 D 9.95 T	8.95		
ANSWER BACK SENIOR	KOSMOS	10.95 D 9.95 T	8.95		
IDENTIFY EUROPE	KOSMOS	8.95 D 7.95 T	7.95		
ANIMAL/VEG/MIN	BOURNE	14.95 D 9.95 T	12.95		
HAPPY LETTERS	BOURNE	14.95 D 9.95 T	12.95*		
HAPPY NUMBERS	BOURNE	14.95 D 9.95 T	12.95*		
HAPPY WRITING	BOURNE	14.95 D 9.95 T	12.95*		
WORLDWIDE	BOURNE	14.95 D 9.95 T	12.95*		

ORDERING DETAILS

All prices include VAT & P&P
(please add £1.50 for overseas orders)
* Add £2 to 5 1/4" disc price for 3.5"
Cheques and POs made payable to - Telemap Ltd
Bytemail (Dept mu)
Durrant House
8, Herbal Hill
London EC1R 5EJ
Tel: 01-278 3143

TELEMAP GROUP LTD



Access and Visa welcomed



CARE ELECTRONICS

800 St. Albans Road, Garston, Watford,
Herts. WD2 6NL. Tel: 0923 672102

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 32K BATTERY BACKED RAM CARTRIDGE

For use as a 32K Sideways Ram or Plug Spellmaster in and have User Dictionary 16K (Battery Backed) all on the same cartridge. With Write Protect Switch and a battery life of approx 10 years £33.00 £37.95c

CARE MASTER ROM CARTRIDGES

ALSO SUITABLE FOR INTERWORD & SPELL MASTER

Standard Cart takes two Roms	£9.00	£10.35c
Standard Cart with Single Zif	£13.40	£15.41c
Standard Cart with Two Zifs	£17.60	£20.24c
Quad Cart takes Four Roms	£14.00	£16.10c
Cartridge for Two 32K Roms	£12.00	£13.80c
Master Rom Extender for using BBC B Cartridges on the Master-Ideal for schools	£13.00	£14.95c
Morley AA (Internal) Rom Board	£40.00	£46.00d

BBC B ROM CARTRIDGE SYSTEM

BBC B Low Profile Rom System	£12.00	£13.80c
BBC B Spare Cartridges	£3.00	£3.45c

BBC B Cartridges can be used on the Master with the Master Rom Extender-See above

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

SPECIAL OFFER

MORLEY TELETXT ADAPTOR

Comes with 16K ATS Rom, 16K Utilities Rom, Two Manuals and utilities Disc at the unbeatable price of £84.80 £97.52d

LABELMASTER

Uses a variety of print styles and sizes. All formatting is done for you and can accept different label sizes. A comprehensive label printing program that is easy to use for BBC B, Master, Compact and Electron-Please state model when ordering £15.00 £17.25c

CARE PRINTER BUFFER

User definable for BBC B, Master on Rom or Disc £14.00 £16.10c

MASTERCOPY

If you need to copy between DFS and ADFS and DFS. MCOPY is it £11.26 £12.95c

PRINTER SWITCHERS

Two Printers to one computer	£30.00	£34.50d
Four computers to one printer	£50.00	£57.50d
Please note that the above units switch all lines, are suitable for all types of printers and computers using Centronics Parallel and INCLUDE LEAD		
Six computers to one printer	£71.00	£81.65d
Four to one automatic switcher	£102.00	£117.30d
Eight to one automatic switcher	£128.00	£147.00d
For advice or a quote on your installation please phone		
User port switcher 2 to 1 & off	£33.00	£37.95d
User port switcher 6 to 1 & off	£72.00	£82.80d
RS423 Serial Switcher 2 to 1	£20.20	£23.23d

CARE READY MADE LEADS RANGE

BBC/Master RGB-7 Pin Hitachi	£6.20	£7.13c
BBC/Master RGB-7 Pin Ferguson	£6.20	£7.13c
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=£10.35; b=£5.75; c=£1.15; d=£2.30



ACCESSING A BUG LEADS TO DISASTER

I HAVE encountered a disaster which can happen when using random access filing techniques with the disc system. The file I was using contained records of length 514 bytes and was accessed like this:

```
3820 X=OPENUP'SENTS*
3830 PTR#X=5+(NX-1)*514
```

Line 3820 sets the file pointer to the beginning of the N%th record.

As a result of some careless coding earlier in the program it was possible for the value of N% to be zero, causing PTR#X to be assigned a negative value.

I would have expected the program to stop with some sort of error message. What actually happened was that the DFS replaced the whole file SENTS with a series of

null characters right to the end of the disc.

I have tidied up the earlier coding to make sure the N% cannot take a value of zero. However as a precaution there is also a trap in lines such as 3830 to guard against possible file destruction:

```
3830 IF NX>0 THEN PTR#X
      =5+(NX-1)*514 ELSE CLOSE
      #X:STOP
```

Can you explain this strange DFS behaviour? — Peter Davy, Wakefield, West Yorkshire.

● It appears you have come

across a combination of a feature and a bug. The former relies on the fact that no matter how many bytes the disc can store the DFS will accept any pointer value — so that your programs don't need to be altered to take advantage of bigger storage devices when they appear.

Pointer values can range from 0 to 4,294,967,295 — what would be negative to Basic is treated as an even bigger positive number.

The bug is that if the DFS thought it had a big pointer value it should have just extended the file and not overwritten the original data.

Z88 control codes

IN the June edition of The Micro User, D.H. Griffin wrote describing a problem with transferring programs to his Z88 from a BBC Micro: He was finding that all his % signs were changed to %PC%.

This is due to the fact that the file was edited with Pipedream and saved directly. It should have been saved with the Plain Text option set to Yes on the Save menu.

Pipedream uses the % character in its internal format to introduce special markers. The sequence %PC% means this is not one of these markers — it really is a percentage sign. — Paul M. Fellows, Software Manager, Cambridge Computer.

£10 Prize letter

Dangerous RUN

MACHINE code programs which make use of routines in

the Basic rom will only work if the rom is paged in to &8000 to &BFFF. Basic will be paged in if the program is activated by CALL, but if *RUN is accidentally used — perhaps from force of habit — disaster could strike.

For example, if a DFS is in use it will be paged in and the disc could be corrupted when the program is executed if it is not write protected. In any event the program will not work.

Such hazards can be avoided by starting the assembler code with the

routine listed below.

It works by first checking if the Basic rom is paged in. If it is, control goes directly to the program proper, which is then executed.

If it is not paged in, a message is displayed instructing you to CALL the start of the program and control goes to command mode. After the CALL the program executes normally.

The routine has been written so that it can be run as a demonstration and when executed simply prints S. Type it in, save it as ROMCALL

and then run it. The object code will automatically be saved as ROMCAL#. Now try:

```
*LOAD ROMCAL#
```

followed by:

```
CALL &5000
```

Then switch the micro off and back on and try:

```
*RUN ROMCAL#
```

For inclusion in your own programs the following alter-

Turn to Page 128 ►

```
10 REM Basic rom calls
20 REM By H.R.Hall
30 FORpass%=0TO3 STEP3
40 PX=&5000
50 [OPT pass%
60 .checkrom
70 LDA #&BB:LDY #&FF
\Is Basic rom
80 LDX #0:JSR &FFF4
\paged in?
90 CPX &F4
100 BNE abort
\no
110 JMP begin
\yes
120 .abort
130 LDA &202:STA &70
\save BRK
140 LDA &203:STA &71
\vector
150 LDA #abort3 MOD &100
\re-address
160 STA &202
\BRK vector
170 LDA #abort3 DIV &100
\to point
180 STA &203
\to abort3
190 BRK
\go to abort3
200 .abort3
\print message
210 JSR &FFE7:LDX #0
220 .abort2
230 LDA text,X:CMP #13
240 BEQ finish:JSR &FFEE
250 INX:JMP abort2
260 .finish
270 LDA &70:STA &202
\restore
280 LDA &71:STA &203
\BRK vector
290 RTS
\jump to command mode
300 .begin
\start of program
310 LDA #83:JSR &FFEE
320 RTS
330 .text EQU"CALL&5000"
\message
340 EQUB 13
350 ]
360 NEXT
370 *SAVE ROMCAL# 5000 50
53
380 END
```

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.

◀ From Page 127

ations should be made:

- Delete lines 10 to 50
- Delete lines 310 to 320
- Delete lines 350 to 380
- Alter address in line 330 to start of your program
- Insert your program starting at line 310
- Move lines 330 and 340 to a suitable place near the end of the your program. — **H. R. Wall, Broomhall, Worcester.**

Breaking from software

BEFORE getting my Master 128 I used a standard BBC B and with certain hardware/firmware I was able to simulate the Break which was necessary to enable the firmware to grab workspace. This was done by using either CALL !-4 or sometimes *BREAK — available on the AMX rom.

Both these methods proved very useful from time to time as they could be incorporated into appropriate Boot files — particularly when trying to make software user-friendly or idiot-proof.

However it seems that the Master series requires a Control+Break to initialise certain roms and my previous method no longer works.

Is there a neat software solution to the problem, or is it mandatory to physically press the keys? — **H.L. Smith, Little Bealings, Woodbridge.**

● Put *FX151,78,127 in your software before the CALL !-4 command. This works on all versions of the 8 bit BBC Micro without second processor, but note that the FX call disables the keyboard so it can't be used directly from Command mode. Do any of our readers know a second processor compatible method?

Overheating micro chips

SOME of the ICs in the BBC B tend to get rather hot, particularly if an internal rom extension board is fitted.

IC14 — an 74LS245 dual bus transceiver — is a common victim and I have replaced this twice so far.

It plugs into a 20 way DIL socket and everything works until the micro gets hot when all sorts of strange things start to happen.

Basic programs behave abnormally or crash and odd letters and bits of text appear or disappear from word processor output. The effects get worse with time, but spray freezing the chip usually brings things back to normal.

One odd thing is that the defective chips from my BBC Micro behaved quite normally under load on an IC tester when cold.

You can get clip-on heatsinks, but there usually isn't room to fit one under an extension rom board. I chopped a T0220 heatsink in two, bent the fins nearly flat and stuck it to the top of the chip with epoxy. This fitted under my extension board and seems to have cured the problem.

A top hat of 18 gauge aluminium sheet should also work. You must check that the heatsink is clear of the extension board and of the other chips — you don't want to turn a problem into a catastrophe.

The chip costs about £1.50 and is a good first guess for the DIY repairer with a load of roms, a sick BBC Micro and a can of freezer. I would like to thank Watford Electronics for this tip. — **C.J. Chapman, Nuneaton, Warwickshire.**

Archimedes OS bug

THERE is a bug in the Archimedes operating system with the *FX220 command.

Normally it allows selection of an alternate Escape key. For instance Space has the Ascii code of 32 therefore *FX220,32 will cause the spacebar to act as the Escape key in the place of the real key.

Similarly Control+A, which generates Ascii code 1, can be set to act as Escape with *FX220,1.

However *FX220,0 which

should turn Control+@ into Escape also makes pound, accent and some other keys generate Escape too.

The Contex Computing Archimedes Bank Manager used *FX220,0, and as a consequence a user can inadvertently Escape from a module.

This has now been fixed by a different command and if you have version 3.0 or 3.1 you can return the original disc to Contex with an SAE for a free upgrade. — **Ian Whiting, Contex Computing, Cople, Bedford.**

Servicing the MOT

I HAVE a problem with the Disc MOT program from the October 1987 issue of The Micro User. I have typed it in and, thanks to the checksum, eliminated all my errors except one.

The problem occurs in line

1800, for which I have typed:

```
OPT,FNequs("Fixing Track:..
"):OPT FNequs(131):OPT FN
equs("Sector:..00"):OPT FNe
qub(42)
```

This generates a checksum of D686 D and not the one published — CF25 5.

I have checked it many times and still can't find an error, but when the assembled program is *RUN it works fine until it formats the disc and then reports Fatal disk error.

This happens with all discs, including healthy ones.

Could you please tell me what is causing the checksum difference? — **David Key, Heanor, Derbyshire.**

● The program unfortunately contained embedded teletext colour codes — namely character 135 — which we didn't spot, and our typesetting

Turn to Page 130 ▶

Plugging the leaks

HERE'S a corrected and improved version of the Leaky Listing program published in the May 1988 issue of The Micro User.

It includes procedures and functions making the program structured and easy to follow. It does not jump out of a loop, as the original routine did in line 90.

Keep up the great work: These Leaky Listings are excellent — try to make them even harder.

More assembler programs too please. The one in the April issue was great but taxing to me as I'm quite a novice in machine code. And I like the idea of printing the answers in the next issue — it stops me from peeping at the answers.

The series is brill — and so is the whole magazine. I buy both The Micro User and Electron User and I haven't found a fault with them yet. — **Paul A. Clarke, Golborne, Warrington, Cheshire.**

£10 Prize letter

```
10 REM Guess a number
20 REM re-written
25 REM by Paul A. Clarke
30 MODE 7
40 PROCinit
50 REPEAT
60 correct%=FNguess(num
er%)
70 UNTIL turns%=0 OR cor
rect%
80 IF correct% PRINT"Ye
s, that was correct." ELSE
PRINT"The number was ";num
ber%
90 END
100 DEF PROCinit
110 PRINT"Guess a number"
120 INPUT"Guess a number
from 1 to :high%
130 INPUT"Number of turn
s allowed",turns%
140 number%=RND(high%)
150 ENDPROC
160 DEF FNguess(number%)
170 REPEAT
180 INPUT"Enter guess:"g
uess%
190 UNTIL guess%>0 AND gu
ess%<=high%
200 turns%=turns%-1
210 IF guess%>number% PRI
NT"Too large"
220 IF guess%<number% PRI
NT"Too small"
230 =(guess%=number%)
```


Take part in our nationwide search for innovation in action



Last year's Innovation Award was an outstanding success with more than 500 users of the BBC Micro competing for the prestigious accolade.

Entries came from all over the world, from health researchers, engineers, teachers and students – all with remarkable applications which pushed the BBC Micro to its limits and beyond. The press response was enormous with top coverage in hundreds of newspapers throughout the country.

Now you can join our search for the innovations of 1988. And this year the competition is twice the size, with a special section for Archimedes users.

HOW TO ENTER

Tell us what your BBC Micro or Acorn Archimedes is doing that is out of the ordinary. It may be a project with exciting commercial potential, with significant social benefit – or even just for fun. Whether you're an individual, group, school or business, this contest is open to you – there's no restriction.

Your typed entry should not exceed 500 words, and you can also include any supporting illustrative material such as black and white photographs, colour transparencies, diagrams or screen dumps.

Complete the coupon below, attach it to your entry and send it to arrive no later than October 14, 1988.

The two winners will be announced at the Electron & BBC Micro User Show at the New Horticultural Hall, Westminster, from November 11 to 13.

THE PRIZES

The winner in the BBC Micro category will receive a magnificent Archimedes, courtesy of Acorn. This 32-bit workhorse is the fastest micro in the world with 512k ram, 512k rom, 800k 3.5in disc drive, mouse and colour monitor. It comes with a Welcome disc containing an excellent painting package, a music editor and much more. Value: £1,034.

In the Archimedes category the prize will be a powerful Brother 1709 printer, supplied by Kelator, Acorn's distributor to the trade. The 1709 can output text in three different modes – draft, near letter quality and letter quality – at speeds of up to 240 cps. The package will also come with unique software to make the most of the Archimedes' special features. Value: £685.

And both winners will receive an impressive plaque in recognition of their achievements.



ENTRY COUPON

Name _____

Address _____

Postcode _____

Daytime tel. no. _____

Occupation _____

Send to: *The Micro User Innovation Awards 1988*,
Europa House, Adlington Park, Adlington,
Macclesfield SK10 4NP.

◀ From Page 128

machine converted this into the underline character.

However the program should work. There were some amendments to cater for all DFSs in our December 1987 Letters section.

Also anyone using Basic I will find that the colons within strings in the assembly language cause errors and need to be replaced by another character, say =.

Doctoring databases

I HAVE built up many files on Acornsoft's disc-based Database, and now need to merge files to carry out a sort on the combined file. Can you suggest a simple routine to merge two files of an identical format?

Of lesser priority, but nevertheless useful, would be a routine to delete fields and to rearrange the order of fields to bring files into the same format. — **Allan Swift, Dorking, Surrey.**

● Combining database data without a utility is very unlikely to succeed — even when they are of the same format — because the file pointers which keep track of where the data is within the file, will not be set up correctly.

Perhaps one of our readers has a utility that can merge these files?

£10 Prize letter

HERE is a useful tip for any users of Acorn's PC Emulator on the Archimedes. Initially when you re-configure the machine as suggested by Acorn, you have little over 300k to use.

This is not much good for most programs, so by using my method, you can increase the usable memory under MSdos to about 580k. It works as follows:

- Note current configuration on piece of paper or spool it to a disc file.
- Type *MODULES
- Most of the resident modules claim workspace on power-up, so you can unplug them as they will not be

MORE MEMORY ON PC EMULATOR

required under MSdos. All but the top four modules may be unplugged. This is achieved by using:

```
*UNPLUG <Module name>
```

For example:

```
*UNPLUG WaveSynth
```

Repeat for modules 5 to 20.
 Finally press Control+Break and type *MODULES — only modules 1,2,3,4 should remain.

When you boot up the emulator you will see that approximately 576k of

memory is registered.

To reset the modules, the handiest method is to switch off, hold down R and switch on twice to reset the cmos ram as detailed in the Welcome guide.

Also, I've got Inter-Chart to run to the Archimedes — proving it is legally written software. It is very simple: All you need is a rom image of ICHART and the 6502 Emulator.

Run the emulator, type *ICHART and it will work as normal except that function key f0 is now the Print key. — **Richard Charles, Londonderry.**

Checking up on a checksum

AFTER I bought the February 1988 issue of The Micro User for the first time in months I was instantly impressed by the new format. Write on lads! Definitely worth the money and a subscription.

I think your Library section and Checksums are a brilliant idea, but after typing in the Vertical labeller program I found a small mistake. The problem I had was in line 100 where I kept on getting a

Missing) message.

So I checked the program with the Checksums program and found that my checksum didn't correspond with what was in the magazine.

I'm not exactly excellent in Basic so after a bit of mathematical genius (if I may say so myself) I bunged in a minus sign (-) and lo and behold it worked. The correct line corresponds to the given checksums and should be:

```
100 MOVE XX,Y%-32*(LEN(L$)-NX):VDU255
```

After that I tried other math-

ematical, symbols and combinations of other symbols and thought your readers may be interested in a few suggestions to brighten up their displays:

```
100 MOVE XX,Y%-32*(LEN(L$)+NX):VDU255
```

really spreads out the text.

```
100 MOVE XX,Y%-32*(LEN(L$)+NX):VDU255
```

reverses the text down the screen. — **Andrew Leong, Eccles, Manchester.**

ZERO IN ON THE STARS

QUITE a long time has elapsed since I learned to navigate my way around the night sky with a bubble sextant and a copy of the Air Almanac, but I still maintain some interest in star recognition.

I was very interested, therefore, in Mike Cook's Body Building Course in April's issue, and intend typing in his listing soon.

However, when reading the

comments about setting up the theodolite I was rather puzzled by one fact.

Mr Cook suggests using a compass to see the azimuth to 0 degrees when pointing North, but does not mention that an allowance should be made for magnetic variation — the angular difference between Magnetic and True North — when doing this.

At the moment I believe that the variation for this part

of the world is eight degrees East of North as indicated by the compass.

This is quite a substantial amount, and I feel it might be sufficient to cause problems for a newcomer. — **W.H. Foggan, Newcastle upon Tyne.**

● Good point, but we think that using a home-made theodolite the few degrees of error are likely to be outweighed by the inaccuracies of the device itself.

Laser printing

I HAVE recently bought a Hewlett Packard Laserjet series 2 printer and it works wonders on my Apricot Xen. But it does not work on my BBC B — it keeps on repeating on one line and does not go on to the next. Please could you tell me how to correct this? — **Nicholas Longfield, Thirsk, N. Yorks.**

● Unfortunately nobody in the office has any experience with this printer which — don't be fooled by the name — is not a laser printer but is actually a high quality inkjet. So we can't help; can any reader?

4 exciting compilations of the very best programs from the pages of *The Micro User*

TEN of the BEST!

We've brought together the most popular listings which have been published over the last year and created four packages each devoted to a particular subject area. There's entertaining games, handy utilities, clever graphics utilities and powerful ram and disc utilities – all ready for you to put to use without the need for any typing in! You can also list and adapt nearly all the programs – an excellent way to improve your programming skills.

Ten of the Best Ram and Disc Utilities

- Ram Arrays** – Extend the memory available for your arrays in Basic.
- Printer Buffer** – No more waiting for your printer to finish printing with this great utility.
- Prommer** – Put your own Basic programs in rom for instant access.
- Disabler** – Having problems with duplicate rom commands? Cancel out roms with this utility.
- MOT** – Keep your discs in top magnetic condition and rescue corrupted programs.
- Disc Copy** – No more single file copies - this utility makes use of the whole memory.
- Disc Catalog** – Keep track of your disc files with this excellent cataloguing program.
- Disc Protect** – Professional disc protection is yours using this excellent utility.
- Dual Catalog** – Get 56 files on one disc surface with this utility.
- Safe Save** – Prevent overwriting a backup file with this clever checking routine.

Disc price: £4.95

Buy all four discs for **£17.80** and save **£2!**

Ten of the Best Graphics Utilities

- MicroWorks** – Create impressive Mode 4 screens with this superb graphics program.
- Pixel Editor** – Fine-tune screen pictures in any mode with this excellent editor.
- Flood Fill** – Fill screen areas with solid colour at remarkable speed.
- Mode 7 Dump** – Print out your Mode 7 screens onto any Epson-compatible printer.
- Slim Characters** – Get 40 characters per line in Modes 2 and 5.
- Special Fonts** – Display 192 fonts on screen with this easy-to-use utility.
- Printer Control** – Modify your printer styles easily from your wordprocessor.
- Dual Screens** – Give your programs the professional look with this double-screen display.
- Characters** – Create your own character sets with this useful utility.
- Charprint** – Use this clever routine to print your own character sets to Epson printers.

Disc price: £4.95

Ten of the Best Games

- Dino** – Ride the gobbosaurus past all the perils in this magnificent fast-action game.
- Hunkie Egg** – Clamber up the ladders and run along the levels to gather up the eggs.
- Diamond Quest** – Collect all the diamonds in this superb arcade adventure.
- Stellar Rescue** – Defeat the powerful gravity to land your spacecraft in one piece.
- Fruit Machine** – Test your skill and luck on the one-armed bandit with this addictive simulation.
- Karate Warrior** – Delve into the mysteries of the martial arts as you aim to get a black belt.
- Maltese Cross** – Try your hand against the computer in this classic domino game.
- Othello** – Entertain yourself for hours with this very popular oriental board game on your micro.
- Witch Hunt** – Help Olive search the maze to find the 42 keys of Transportal.
- Soccer Manager** – Take on the soccer club's top job in this gripping game of skill.

Disc price: £4.95

(Also available on tape for only £3.95)

Ten of the Best Utilities

- Text Compressor** – Use this excellent utility to reduce the space held by your strings.
- Variable Compressor** – Reduce the size of your variables automatically to save space and improve speed.
- Line Compressor** – Save space in your programs by creating multi-statement lines.
- BOS Editor** – Make editing your Basic program easy with this on-screen editor.
- Basdat** – Convert disc files into Basic data statements and add the resultant lines automatically.
- Basic Repairer** – Rescue your programs after the Bad program error with this useful little utility.
- Line Editor** – Use a single-line word processor in your INPUT statements without changing your programs.
- Circles** – Use this fast and powerful routine to quickly draw filled and unfilled circles.
- Events** – Make your programs respond to real-time events with interrupt-driven Basic routines.
- Stripper** – Remove the line numbers from your Basic programs to allow editing within a word processor.

Disc price: £4.95

PLUS

Every package comes with an easy-to-use machine code version of the Get It Right checksum to enable you to check listings you've typed in.

At only **£4.95** each the Ten of the Best compilations represent superb value for money. But you can obtain all four for **£17.80** and save **£2!**

Don't delay – turn to the order form on page 135 to take advantage of this excellent offer.

All this in just

```
Time 0.17 54 Words 5544 Free
Insert Characters
START
July 23, 1986
Dear Douglas,
Further to our telephone conversation
yesterday, I have pleasure in enclosing
a pie chart showing the breakdown of our
fixed costs for the year.
As previously discussed with yourself, I
will be travelling down by train next
Thursday morning.
I look forward to meeting you then.
Yours sincerely,
Jeremy Brood
```

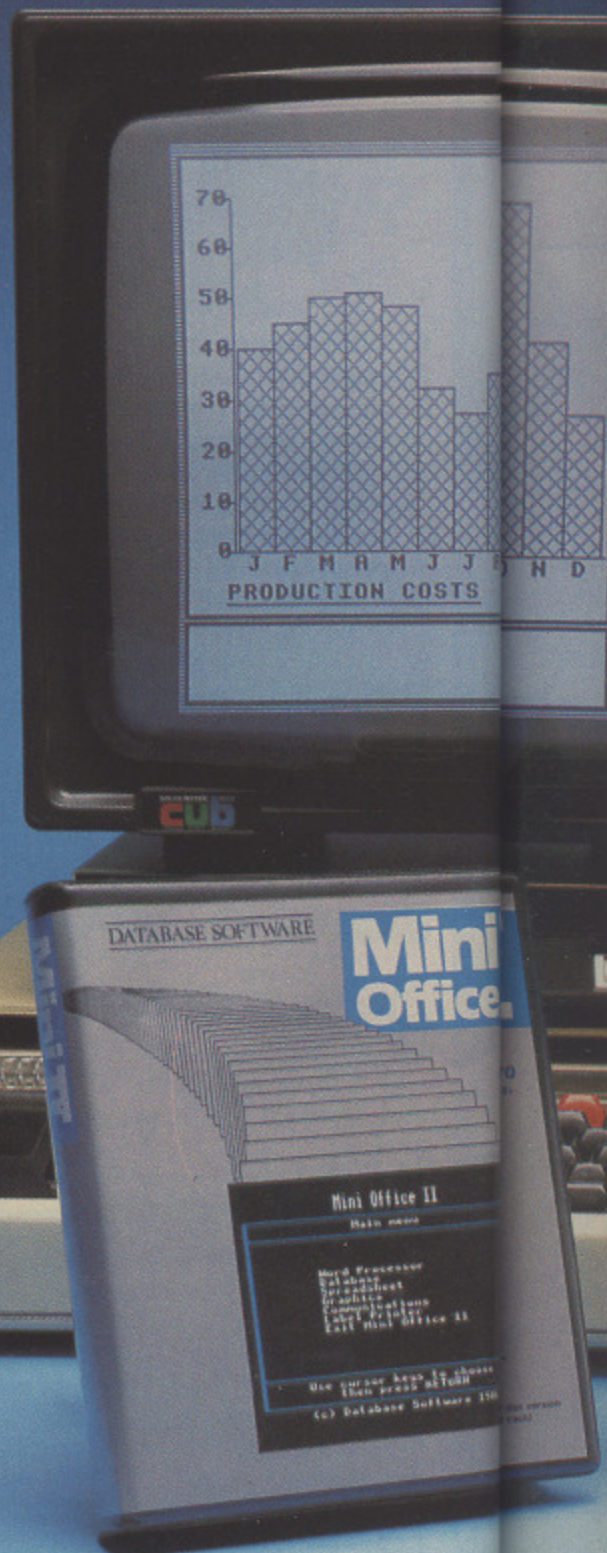
WORD PROCESSOR
Compose a letter, set the print-out options using embedded commands or menus, use the mail merge facility to produce personalised circulars – and more!

```
Used 11 Free 32 Len 127 Rec 1
Surname Wooller
First name Douglas
Address1 Hallwood House
Address2 Hallwood Road
Town Stockport
Post code SK5 4GP
Credit lim 10000
Discount 30
Use +, +, +, v, ESCAPE, (N)ew, (E)dit,
(D)elete, (M)arker, (P)rint
```

DATABASE
Build up a versatile card index, use the flexible print out routine, do powerful multi-field sorting, perform all arithmetic functions, link with the word processor – and more!

```
Mini Office II Label Printer
#####
# Douglas Wooller #
# Hallwood House #
# Hallwood Road #
# Stockport #
# SK5 4GP #
#####
Use Cursor Keys To Move
# Followed By A Number For Field
ESCAPE To Exit TAB To List Fields
```

LABEL PRINTER
Design the layout of a label with the easy-to-use editor, select label size and sheet format, read in database files, print out in any quantity – and more!



...and at a price th

Mini Office II is a comprehensive integrated suite of programs setting a new standard in home and business software. These sample screenshots illustrate just a few of the wide range of features, many of which are usually only available on software costing hundreds of pounds. Most are easily accessed by using cursor keys to move up and down a list of options and pressing Return to select. Mini Office II takes over where the original, highly successful Mini Office left off, with numerous extra features, two additional modules, a program to convert existing Mini Office files to Mini Office II format, and a 60 page, easy to follow manual. *And it's at a price everyone can afford!*

DATABASE SOFTWARE Europa House, Adlington Park, Adlington, Macclesfield SK10 4NP.

- Now available on a power-packed rom board!**
- Four 32k roms on one board packed with 128k of super fast machine code.
 - Easy to install – no soldering needed.
 - Split second application selection.
 - Frees valuable ram space for much more data.
 - Fully compatible with the whole BBC|Micro range, Aries or Watford shadow ram board, and tape, DFS, ADFS and ECONET filing systems.

ONE package!



SPREADSHEET
Prepare budgets or tables, total columns or rows with ease, copy formulae absolutely or relatively, view in either 40 or 80 column modes, recalculate automatically – and more!

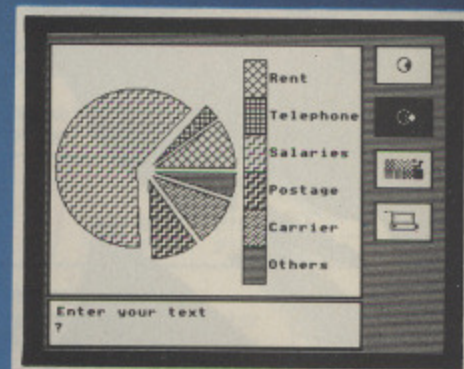
```

Freespace= 3750      Auto
Cell=A1             Text
Contents=           Fixed
    
```

	A	B	C	D
1)	Fixed Costs for 1986			
2)		Jan	Feb	Mar
3)	Rent	400	400	400
4)	Electric	60	50	45
5)	Telephone	130	125	115
6)	Salaries	2450	2400	2400
7)	Cleaning	80	80	80
8)	Stationary	55	50	50
9)	Postage	375	360	355
10)	Carrier	420	380	330
11)				
12)				
13)	TOTALS	3970	3845	3775
14)				
15)				
16)				
17)				
18)				

MASTER DISC NOW AVAILABLE!

GRAPHICS
Enter data directly or load data from the spreadsheet, produce pie charts, display bar charts side by side or stacked, overlay line graphs – and more!



COMMS MODULE
Using a modem you can access services such as MicroLink and book rail or theatre tickets, send electronic mail, telex and telemessages in a flash – and more!

```

>br
*****
British Rail Service
Tickets / Fares / Timetable
*****
(c) Database Publications

1  * Ticket Bookings
2  * Pullman/Steam Bookings
3  * Seat Reservations
4  * Sleeper Reservations
5  * Pullman Rail
6  * Steam Excursions
7  * Electric Express - Newsletter
8  * Timetable and Fares from May 12th

* Mn for HELP
i-B R edisplay Quit
Select 1
>
    
```

ce that can't be matched!

INSTANT Mini Office II



£39.95 NOW ONLY £49.95

Mini Office II

- BBC B, B+
- Cassette..... £14.95
- 5 1/4" disc..... £16.95
- MASTER**
- 5 1/4" disc..... £19.95
- COMPACT**
- 3 1/2" disc..... £21.95
- INSTANT MINI OFFICE II**
- On rom for full BBC range £49.95

Turn to order form on Page 135

MANDARIN
SOFTWARE

FREE
when you subscribe
to The Micro User



In this delightful game you control BLOB, the Biologically-Operated Being, navigating him through 500 action-packed screens to rebuild the unstable planet's core.

Bubble Bus' Starquake is one of the biggest-selling games for home micros, due to its incredibly-addictive gameplay and cleverly-animated graphics. It has received

such accolades as Game of the Month in *Computer and Video Games*, and was awarded a *Crash Smash*.

● *What Hac-Man said about the BBC Micro version:*

'I am now firmly hooked and every spare scrap of paper is being turned into a map of the game. Buy it - it's great.'

Don't miss out on this tremendous offer - fill in the coupon without delay

Suitable for	Product	Format	RRP	Special reader offer	YOU SAVE	Offer with subscription
BBC Micro	Starquake	Tape	£9.95	£4.95	£5	FREE
		5¼" Disc	£11.95	£5.95	£6	

N.B. Current subscribers can re-subscribe early to take advantage of this very special opportunity.

FREE
Subscribe
to User

★ Special price if accompanied by subscription or renewal

Valid to August 31, 1988
Overseas orders sent Airmail
Orders subject to availability
Please tick items in box below

Annual magazine subscription £ p

	New	Renewal
UK £18 2001	<input type="checkbox"/>	<input type="checkbox"/>
2002	<input type="checkbox"/>	<input type="checkbox"/>
Europe (incl Eire) : Surface £28 2365	<input type="checkbox"/>	<input type="checkbox"/>
2114	<input type="checkbox"/>	<input type="checkbox"/>
Overseas Surface £34 2366	<input type="checkbox"/>	<input type="checkbox"/>
2367	<input type="checkbox"/>	<input type="checkbox"/>
Overseas Air £45 2004	<input type="checkbox"/>	<input type="checkbox"/>
2113	<input type="checkbox"/>	<input type="checkbox"/>

Commence with _____ issue

FREE

with subscription
(tick one box only)

Starquake cassette	2149	<input type="checkbox"/>
Starquake 5.25" disc	2154	<input type="checkbox"/>

Annual subscription for cassettes and discs

	New	Renewal
BBC 'B' cassette £35 2005	<input type="checkbox"/>	<input type="checkbox"/>
2009	<input type="checkbox"/>	<input type="checkbox"/>
5.25" disc 40T £50 2006	<input type="checkbox"/>	<input type="checkbox"/>
2010	<input type="checkbox"/>	<input type="checkbox"/>
5.25" disc 80T £50 2007	<input type="checkbox"/>	<input type="checkbox"/>
2111	<input type="checkbox"/>	<input type="checkbox"/>

Commence with _____ (state month)

Add £10 for Europe (incl Eire)/Overseas

Fontstyle (see page 45)

NEW

Cassette	£8.95	2107	<input type="checkbox"/>
5.25" disc	£9.95	2108	<input type="checkbox"/>
3.5" disc	£10.95	2109	<input type="checkbox"/>

Computer Hits 4

Cassette	★ £3.95	£6.95	2096/7	<input type="checkbox"/>
----------	---------	-------	--------	--------------------------

Ransack

Cassette	★ £3.95	£6.95	2098/9	<input type="checkbox"/>
5.25" disc	★ £5.95	£8.95	2100/1	<input type="checkbox"/>
3.5" disc	★ £7.95	£11.95	2102/3	<input type="checkbox"/>

Books

BBC Basic	★ £1.25	£5.95	2084/5	<input type="checkbox"/>
Sound and Graphics	★ £1.25	£5.95	2086/7	<input type="checkbox"/>
Both	★ £1.90	£11.90	2088/9	<input type="checkbox"/>

Add £1 for Europe (incl Eire). Add £2 Overseas per book

The Life Of Repton

Cassette	★ £2.95	£5.45	2090/1	<input type="checkbox"/>
5.25" disc	★ £3.95	£5.95	2092/3	<input type="checkbox"/>
3.5" disc	★ £5.95	£7.95	2094/5	<input type="checkbox"/>

Acornsoft Specials

Language Roms (see page 112)

BCPL Bundle	£29.95	2045	<input type="checkbox"/>
* Not ADFS			

Add £5 for Europe (incl Eire), £19 Overseas

Forth	£19.95	2046	<input type="checkbox"/>
-------	--------	------	--------------------------

Add £2 for Europe (incl Eire), Overseas

Logo	£29.95	2047	<input type="checkbox"/>
------	--------	------	--------------------------

Add £4 for Europe (incl Eire), £15 Overseas

Education (see page 113)

ABC, Workshop, Talkback and Spooky Manor (four cassettes)	£9.95	2048	<input type="checkbox"/>
---	-------	------	--------------------------

Music (see page 113)

Creative Sound Book	£4.95	2049	<input type="checkbox"/>
Two 5.25" discs 40T	£3.95	2056	<input type="checkbox"/>
Two 5.25" discs 80T	£3.95	2057	<input type="checkbox"/>

Games (see page 112)

Revs, Revs 4 Track and Aviator (3 cassettes)	£9.95	2050	<input type="checkbox"/>
--	-------	------	--------------------------

Add £4 for Europe (incl Eire), £7 Overseas

Micro User back issues £ p

UK £1.75	January 1988	2510	<input type="checkbox"/>	May 1988	2514	<input type="checkbox"/>
Europe inc. Eire £2.25	February 1988	2511	<input type="checkbox"/>	June 1988	2515	<input type="checkbox"/>
Overseas £3.75	March 1988	2512	<input type="checkbox"/>	July 1988	2516	<input type="checkbox"/>
	April 1988	2513	<input type="checkbox"/>			

Monthly cassettes/discs

	BBC B Tape	40 track	80 track	5.25" disc	3.5" disc
	£3.95	£4.95	£4.95	£4.95	£7.75
Barny Bee	Jan	2608/11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pinball	Feb	2612/15	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pipeline	Mar	2616/19	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Darts	Apr	2620/23	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chinese Chess	May	2624/27	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Beastroids	June	2628/31	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Halma	July	2632/35	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Treasure Trail	Aug	2636/39	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Ten of the Best (see page 31)

Games				
Cassette	£3.95	2131	<input type="checkbox"/>	
5.25" Disc 40T	£4.95	2132	<input type="checkbox"/>	
5.25" Disc 80T	£4.95	2133	<input type="checkbox"/>	
Basic Utilities				
5.25" Disc 40T	£4.95	2134	<input type="checkbox"/>	
5.25" Disc 80T	£4.95	2135	<input type="checkbox"/>	
Graphic Utilities				
5.25" Disc 40T	£4.95	2136	<input type="checkbox"/>	
5.25" Disc 80T	£4.95	2137	<input type="checkbox"/>	
Ram and Disc Utilities				
5.25" Disc 40T	£4.95	2138	<input type="checkbox"/>	
5.25" Disc 80T	£4.95	2139	<input type="checkbox"/>	
All Four Discs				
5.25" Disc 40T	£17.80	2104	<input type="checkbox"/>	
5.25" Disc 80T	£17.80	2105	<input type="checkbox"/>	

Starquake (see page 134)

Cassette	£4.95	2155	<input type="checkbox"/>
5.25" disc	£5.95	2156	<input type="checkbox"/>

Morley Teletext Adapter (see page 68)

Teletext Adapter (40T utilities disc) + Design 7 Plus	£99.95	2157	<input type="checkbox"/>
Teletext Adapter (80T utilities disc) + Design 7 Plus	£99.95	2158	<input type="checkbox"/>
Power Supply	£9.95	2054	<input type="checkbox"/>

Add £4 for Europe (incl Eire). Add £7 for Overseas

The Sound Master

	£14.99	2083	<input type="checkbox"/>
--	--------	------	--------------------------

Add £2 for Europe (incl Eire). Add £7 for Overseas

Knitwear Designer

BBC 'B' Cassette	£8.95	2031	<input type="checkbox"/>
5.25" Disc	£9.95	2032	<input type="checkbox"/>
3.5" Disc	£10.95	2051	<input type="checkbox"/>

Add £2 for Europe (incl Eire). Add £5 for Overseas

Nursery Rhymes (see page 42)

BBC 'B' cassette	£5.95	2070	<input type="checkbox"/>
5.25" disc 40T	£6.95	2071	<input type="checkbox"/>
5.25" disc 80T	£6.95	2072	<input type="checkbox"/>
3.5" disc	£7.95	2073	<input type="checkbox"/>

Mini Office II

BBC B, B+	Cassette	£14.95*	2368	<input type="checkbox"/>
	5.25" disc 40T	£16.95*	2369	<input type="checkbox"/>
	5.25" disc 80T	£16.95*	2370	<input type="checkbox"/>
BBC Master	5.25" disc 80T	£19.95*	2028	<input type="checkbox"/>
BBC Master Compact	3.5" disc	£21.95*	2029	<input type="checkbox"/>

* Add £2 for Europe (incl. Eire). Add £5 for Overseas

Instant Mini Office II

4x32k Rom Board	£49.95†	2372	<input type="checkbox"/>
-----------------	---------	------	--------------------------

† Add £3 for Europe (incl. Eire). Add £8 for Overseas

Save £10

Fun School

	BBC B Tape	40 track	80 track	5.25" disc	3.5" disc	5.25" disc Master
	£3.95	£4.95	£4.95	£6.95		£4.95
Age 2-5	2338/41	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2076
Age 5-8	2342/45	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2077
Age 8-12	2346/49	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2078

Disc Storage Box

(holds up to 60 5.25" discs)	£4.95	2052	<input type="checkbox"/>
------------------------------	-------	------	--------------------------

Micro User Binders

UK £4.95, Europe (incl Eire) £8.25, Overseas £10.25	2221	<input type="checkbox"/>
---	------	--------------------------

Dust Covers

BBC B & B+	£3.95	2220	<input type="checkbox"/>
BBC Master	£3.95	2222	<input type="checkbox"/>
BBC Master Compact	£3.95	2224	<input type="checkbox"/>

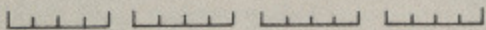
Readers in Europe (incl Eire) add £2. Overseas add £4 per item unless otherwise indicated

Don't forget to fill in your name and address overleaf.

TOTAL

Payment: please indicate method (✓)

Access/Mastercharge/Eurocard/Barclaycard/Visa



Cheque made payable
to Database Publications Ltd.

Expiry Date

BLOCK CAPITALS PLEASE

Name

Address

Post Code

Tel:

Signed

Please allow 28 days for delivery

You can also order by phone, Prestel or MicroLink/Telecom Gold

- Any of the goods listed here can be ordered by telephone.
- Micronet subscribers and other users of Prestel can also use the Prestel mailbox.
- MicroLink subscribers and other users of Telecom Gold can also use the MicroLink mailbox.

Orders: **0625 879920**

24 hours

Enquiries: **0625 879940**

9am-5pm.

Prestel

Key Page 89, then send your order to:

614568383

24 hours

MicroLink/Telecom Gold

72:MAG001

24 hours

Fax Orders

0625 879966

24 hours

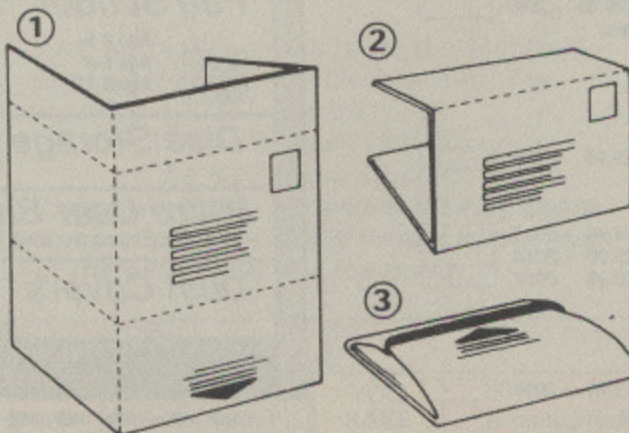
Don't forget to quote your credit card
number AND your full address.

TUCK INTO FLAP

Don't forget to provide: Your address, your cheque/credit card No.
If you've ordered discs have you indicated which format?

The Micro User
FREEPOST
Macclesfield
Cheshire
SK10 4YB

NO
POSTAGE
NEEDED
(IF POSTED IN UK)

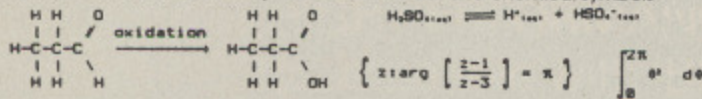


Sciways for Scientists

- 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
Α Β 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 Telematics,
376a Ringwood Road,
Poole, Dorset BH12 3LT
Tel: (0202) 747695

MICROLEDGER

A high quality general ledger package designed by a Chartered Accountant for maximum versatility and ease of use. Ideal for small businesses, clubs, schools etc., as well as for home accounts. Runs on all BBC micros with 32k RAM or more. Features include:

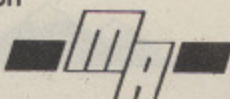
- ☆ "Double-entry" accounting.
- ☆ Up to 99 general ledger accounts: all account names user-specified - can include VAT and sales/purchase ledger accounts.
- ☆ Up to 500 transactions per accounting period.
- ☆ Excellent budgeting facility.
- ☆ Reports include Income & Expenditure Account, Balance Sheet, Funds Flow Statement. Current period and year-to-date reporting with actual/budget comparisons. Full audit trail.
- ☆ Consolidation of two or more separate ledgers.
- ☆ Menu-driven with full prompt messages.
- ☆ Comprehensive, 30 page manual.

MicroLedger is supplied on 40 track 5.25" disk or on tape cassette for conversion to other disk media. Unrivalled value at £16.50 (incl. p&p) for disk or tape - specify which is required. Send cheque with order to Ixchel Software, 16 Meredith Road, London SW13 0DY; or 'phone 01-878 9732 for a free fact sheet.

FREE SOFTWARE!?

Still struggling with an unfriendly IEEE-488 controller?
Simply plug the **MA INSTRUMENTS IEEE-488.2 PROM** into your BBC Micro and see how easy the bus can be to use.
All it costs is £28.00 to cover media, including a full manual.
Upgrade to an **MA INSTRUMENTS IEEE-488 controller** and we'll deduct £28 from the normal list price of £280.00.
Access and Visa are welcome.

Contact: **MA INSTRUMENTS LTD.,**
Freepost, Yelverton, Devon
PL20 6BR
Tel: (0822) 853585
Tlx: 45441 IMAGE(MAI)



A very special and limited offer

SANYO PR3000 DAISY WHEEL PRINTERS at only £99.00 + VAT (+carriage)

Standard Centronics Parallel Interface
Takes normal A4 paper so you can print on your headed paper
Bi-directional printing at 8 CPS
Size 355 (W) x 104 (H) x 247 (D) mm

HEMYOCK ELECTRONICS
27 Station Road, Hemyock, Near Cullompton, Devon
EX15 3SE
Tel: 0823 680926
We also repair computers. Estimates free

ADD-ONS:

TELETEXT (AND TV) ADAPTER: OUR PRICE: £89.99 INC. VAT

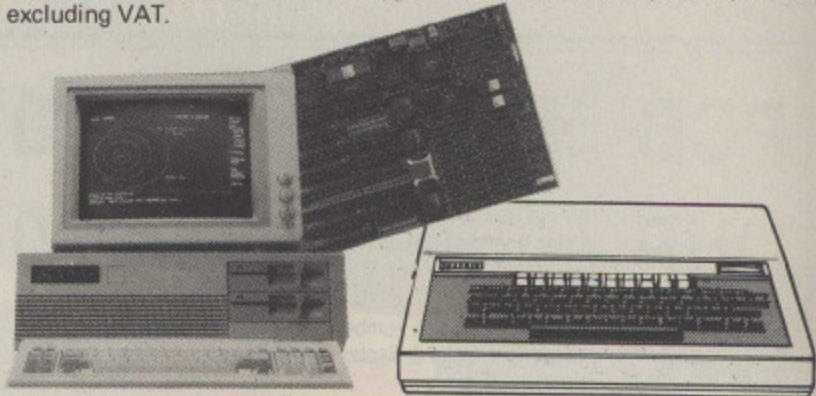
Compatible with Archimedes, BBC, Master and Compact. Professionally built and tested, mains powered, on/off switch, TV picture and sound outputs for Philips monitors. Connects to the user port on BBC or Master, joystick port on Compact and printer port on Archimedes. Downloads free software and preselected pages manual or automatic. Stylish 2-tone brown and beige case. Supplied with lead, software disc and manual.

PC 500 and PC PLUS:

They can be left plugging into the TUBE connector and switched on when required. The PC 500 is basically an Acorn 80186 co-processor in a case. 512K RAM, 10MHz 16-bit CPU, mouse, GEM and DOSPLUS. Runs most PC software. OUR PRICE: £239 INC. VAT. The PC PLUS comes with 1024K of RAM, OUR PRICE: £339.00 INC.

SOLIDISK SUPER AT SYSTEM:

Our fully IBM compatible PC At (12MHz 80286) offers realistic computing power at much lower price than the Archimedes. Please ring for catalogue. Example of prices: System unit, keyboard, PSU, serial parallel, Real time Clock: £399. WD's HDD/FDD controller + 40MB, 40ms hard disc: £265. RAM chips: £6 each. Display options: mono, Super EGA and VGA multisync. All prices are excluding VAT.



THE MULTIFUNCTION TWOMEG 128K:

4 extra ROM sockets (plus 4 already on the BBC), 128K of Shadow RAM and Sideways RAM will massively improve your BBC computer. Ring us for full specs. OUR PRICE: £60 INC. VAT.

1772 DOUBLE DENSITY DISC INTERFACE:

The new Acorn DNFS and ADFS require the WD1772 to run. Our 1772 is inexpensive and totally hardware compatible with these ROMs and the 80186 co-processor. Full specs available. OUR PRICE £35.00 INC. VAT.

1772 + 8271 DFDC:

Our DFDC will add the 1772 Double Density while retaining your 8271 chip on the same circuit board. Some DFS ROMs cannot switch, please check with us before you buy. OUR PRICE: £40.00 INC VAT.

DOUBLE DENSITY DFS 2.2 ROM:

This will work with both 1772 and 8271 (single density only). Overcome DFS 31 file limit, 60% increase of storage on DD, disc format, verify, edit, recover and restore. 16K ROM, truly superior code. OUR PRICE: £15 (£10 if purchased with our 1772 or DFDC).

ADVANCED ADFS 2.1 ROM SET:

This works only with the 1772 chip. It has all the features of 2.2 DFS plus a more powerful ADFS than the Compact or Master. Two 16K ROMs the best disc operating system for the BBC. OUR PRICE: £30 (£20 if purchased with our 1772 or DFDC).

SUMMER SALE!

MASTER PACK:

Acorn Master 128K computer plus 3.5" double sided disc drive. RRP: £549, OUR PRICE: £449 inc. VAT.

ARC MEGA PACK:

Acorn Archimedes 310, 20MB Winchester, 14" Multisync Colour Monitor, full specs available. RRP £2199.00. OUR PRICE: £1999.00

ATARI SUMMER PACK:

New model Atari 520 STFM 512K RAM but with 1 MB double sided disc drive, £400 worth of free software, mouse and joystick, full specs available. A sure winner. RRP £399, OUR PRICE: £359 including £20 discount vouchers.

PHONE 0702 354 674

TO PLACE AN ACCESS/VISA ORDER.
Second Hand BBC's Bought, Sold and PX.

Solidisk Technology
17 Sweyne
Avenue
Southend-on-Sea
Essex
SS2 6JQ

QUICK REPAIR
SERVICE
£20 + PARTS

ROOM 7 SOFTWARE

Investment
Analyser 2
£25.00

SUPER ! BOOT
DISC AUTOMENU/MANAGER
£6.90

Fully bound
software catalogue
50p P&P
Refundable with order
or free with each
purchase

**Electrical Cable
Selector £17.25**

Central Heating Calculator £23.00

Most of our programs are available for the Electron/B/B+/
Master and Compact. 3.5" & 5.25" disc, and in DFS or ADFS
Also covered by our catalogue - Soccer Boss, Pools cheque, Investment
Analyser 2, Matrix, Central Heating calculator, Electrical cable selector,
Structural Beam Calculator, Introduction to Statistics, Easy Banker

Letters/cheques to: W.L. Computer Services, Dept. 4, First floor,
H.S.L. Building, 437 Warrington Road, Rainhill, Merseyside,
L35 4LL. Tel. 051-426 9660

VISA

ADVERTISERS' INDEX

4mation	122	Meadow Computers	124
21st Software	29	Melton	108
Aeon Computer House	60	Micro-Aid	138
Alpine Software	138	Microhelp	88
Apex Software	138	MicroLink	20,21
Atari Corp UK	116,117	Microman Computers	75
B&S Computing	23	Micromedia	55
Beebug	6,16,17,46,48	Microsol	124
Brainsoft	86	Mighty Micro	88
Bytemail	126	Mijas Software	87
C&F Associates	110	Minerva Systems	8
Care Electronics	126	Moordene Associates	137
Centec	28	Morley Electronics	18,19
CJE Micros	10	Nebulae	84
Clares	72	Orion Computer Services	88
Commonside Hardware	13	Overseas Media	38
Computaccount	36	Paul Fray	122
Computech	50	Pineapple Software	14
Computeck	55	R W Electronics	87
Computer Concepts	12,22	Sabre Software	122
Contex Computing	87	Selec Software	122
C.P. Microsystems	109	Silicon Vision	129
Dabs Press	124	Software Bargains	64,65
Database Software	132,133	Solidisk	137
Datastore	84	System Applied Technology	87
Delta Computers	84	Superior Software	2,140
Desktop Publishing Show	15	Taxan	62,63
Discount Computer Supplies	39	Technomatic	76-81
Dram Electronics	124	Towerhill Computers	120
Future Place	109	Tubelink	60
Hemyock Electronics	137	Twilstar	40
Impact Electronics	52	Video Electronics	138
Integrex	139	Viglen	3
Ixchel Software	137	Vinderen Associates	138
Lightspeed Software	50	Watford Electronics	92-105
Mandarin Software	134	W.L. Computers	138
Mayhew Telonics	137	Weserve	38
M.D. Office Supplies	110		

PCB Design on BBC, store on disc, plot on HI-80 or HPGL compatible, print on Epson compatible dot matrix **£20**

OHP Lay out view foils on screen, store on disc, mix design from disc plot on HI-80 or HPGL compatible **£20**

CALC 30 function complex number calculator programme. Enter & display (x+jy) or (z<0) format **£10**

VINDEREN ASSOCIATES
PO BOX 130, Belfast BT9 6NB.
Tel: 0232 660203/667885
MicroLink Mailbox MAG 11652

FAMILY HISTORY SYSTEM

Health Warning: Genealogy is Addictive

PAYROLL (Wages) ACCOUNT-PLUS

Prices: £20.52, £57.44 & £57.44 inc VAT
Micro Trader £230



Micro Aid

25 Fore St., Praze, Camborne, Cornwall TR14 0JX
Telephone: 0209-831274 and ask for Colin



Fly into danger
with
PLAGUE PLANET

A Disk-based adventure with 82k of text, 250 locations,
many objects and puzzles and over 1000 messages.

Prices (including P&P)

BBC Micro/Master: 5.25" disk £10.95

(Specify 40 or 80 track)

Master Compact: 3.5" disk £11.95

Acorn Archimedes: 3.5" disk £11.95



Alpine Software

PO Box 25, Portadown

☎ 0762 42510



CRAIGAVON, BT63 5UT

Put your Micro in the picture!

ARVis BEEB-LOCK

We design and manufacture the most comprehensive range available of genlock and vision mixing systems for all models of Acorn/BBC micros including the ArVis audio/video interface for the Archimedes. Use our products to combine video pictures with captions, sub-titles, data and graphic images generated by your micro. Our systems are already in world-wide use by professional TV studios, educational, industrial, government and scientific establishments

VIDEO ELECTRONICS LIMITED
Wigan Rd., Atherton, Manchester M29 0RH
Tel: 0942-882332

Reach For The Sky

with GLIDER PILOT 2, our comprehensive flight simulator. Features cable launch, thermals, cross country with map and practice option. Extensively machine coded for quick response. Instruction booklet.

With full instrumentation and "solid" colour perspective graphics, this is not a game but an accurate and challenging simulation. Keys or potentiometer joystick. Find the thermals and soar!!

FREE to disc users - "NOTEBOOK" - an easy to use memopad utility. Use it as a flight log for Glider Pilot 2!

B, B+ and MASTER.

Cassette £7.95, 5.25" Disc £8.95, 3.5" Disc £9.95.

**APEX Software, Station Road, Penshaw, Tyne & Wear
DH4 7PE. Tel: Durham 091-385 3091.**

COLOURJET 132

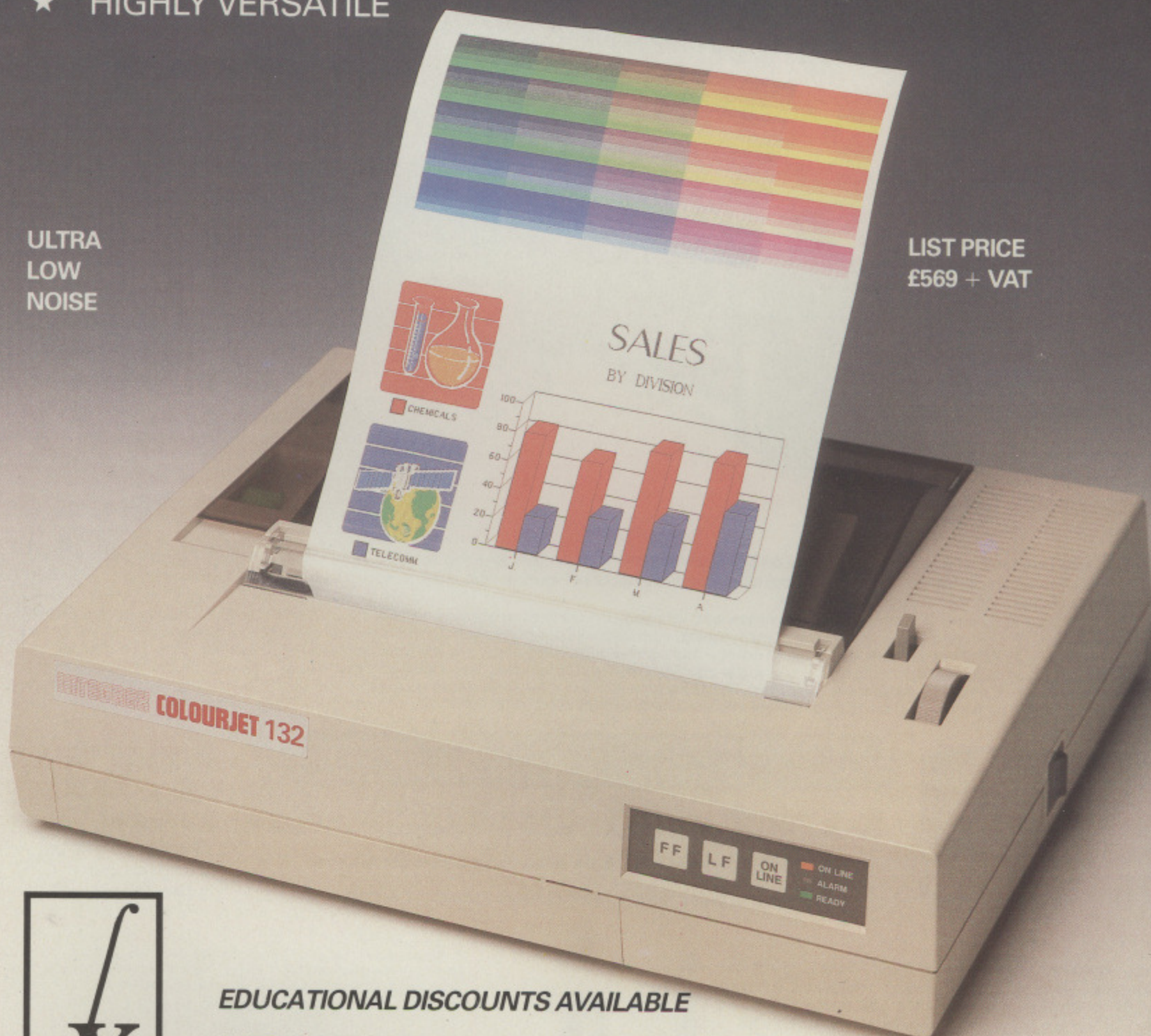
HIGH PERFORMANCE COLOUR INK JET PRINTER

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

- ★ PRINTS ALL 64 SCREEN COLOURS FROM CGA AND EGA USING OPTIONAL INTEGRIX SOFTWARE
- ★ EMULATES OTHER PRINTERS (A1210, 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

LIST PRICE
£569 + VAT



EDUCATIONAL DISCOUNTS AVAILABLE

INTEGREX LTD CHURCH GRESLEY, BURTON ON TRENT
STAFFS DE11 9PT
Tel (0283) 215432
Telex 341727 INTEG X

REPTON

THRU TIME



PREHISTORIC REPTON



EGYPTIAN REPTON



VICTORIAN REPTON



PRESENT DAY REPTON



FUTURE REPTON



REPTON — THE TIME TRAVELLER

Where did Repton come from? Does he have an Egyptian mummy? Is he the real Jack the Repper? Where is he now? Where is he going to? We have been inundated with these and many other questions about our lovable hero. Now all is revealed in 40 new screens that vividly reveal Repton's evolution from prehistory to the future. The PREHISTORIC screens with their caves, mountains and volcanoes, have Repton battling against pterodactyls and dinosaurs to collect edible berries. In EGYPTIAN times, Repton chases around pyramids and sphinxes collecting scrolls and meeting a mummy or two! Amidst the smog and grime of VICTORIAN times, Repton collects gold coins — but can he avoid the police and the gallows? PRESENT DAY Repton has even greater dangers to face as he rushes around the city's jungle of parking meters and skyscrapers, looking for cans of cola. If the gangster's machine gun doesn't get him, the traffic wardens will. Amazingly Repton may make it to the FUTURE. As he zooms through space collecting crystals, the Martians give chase. Will he succeed or disappear forever into the infinite depths of a black hole? Only you can help Repton Thru Time!



THE SCREEN EDITOR

Each copy of Repton Thru Time includes:

- the Repton 3 main program
- the Repton 3 editor and
- the 40 new game screens.

BBC Micro Cassette.....£6.95 Acorn Electron Cassette.....£6.95
 BBC Micro 5 1/4" Disc.....£7.95 BBC Master Compact 3 1/2" Disc..£9.95

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

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



THE CHARACTER EDITOR

PRIZE COMPETITION

If you complete all 40 screens of Repton Thru Time without using passwords, you can enter our competition. A draw will be made from all the correct entries received to select 25 prize winners. Each will receive an EGYPTIAN REPTON Cuddly Toy and a signed certificate. Closing date: 30th September, 1988.



REPTON ORIGINAL Cuddly Toy

SPECIAL OFFER — NEW!

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

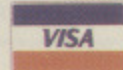
REPTON ORIGINAL £9.95
 ARCTIC REPTON £9.95
 TEENAGE REPTON £9.95
 Postage and packing free.



Dept. RT2, Regent House, Skinner Lane, Leeds LS7 1AX. Telephone: 0532 459453.



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



24 HOUR TELEPHONE ANSWERING SERVICE FOR ORDERS

OUR GUARANTEE

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

