

# ACORN USER

NOVEMBER 1987

BIGGEST AND BEST-SELLING BBC/ACORN MAGAZINE

**FREE**

**WIN AN ARC:**



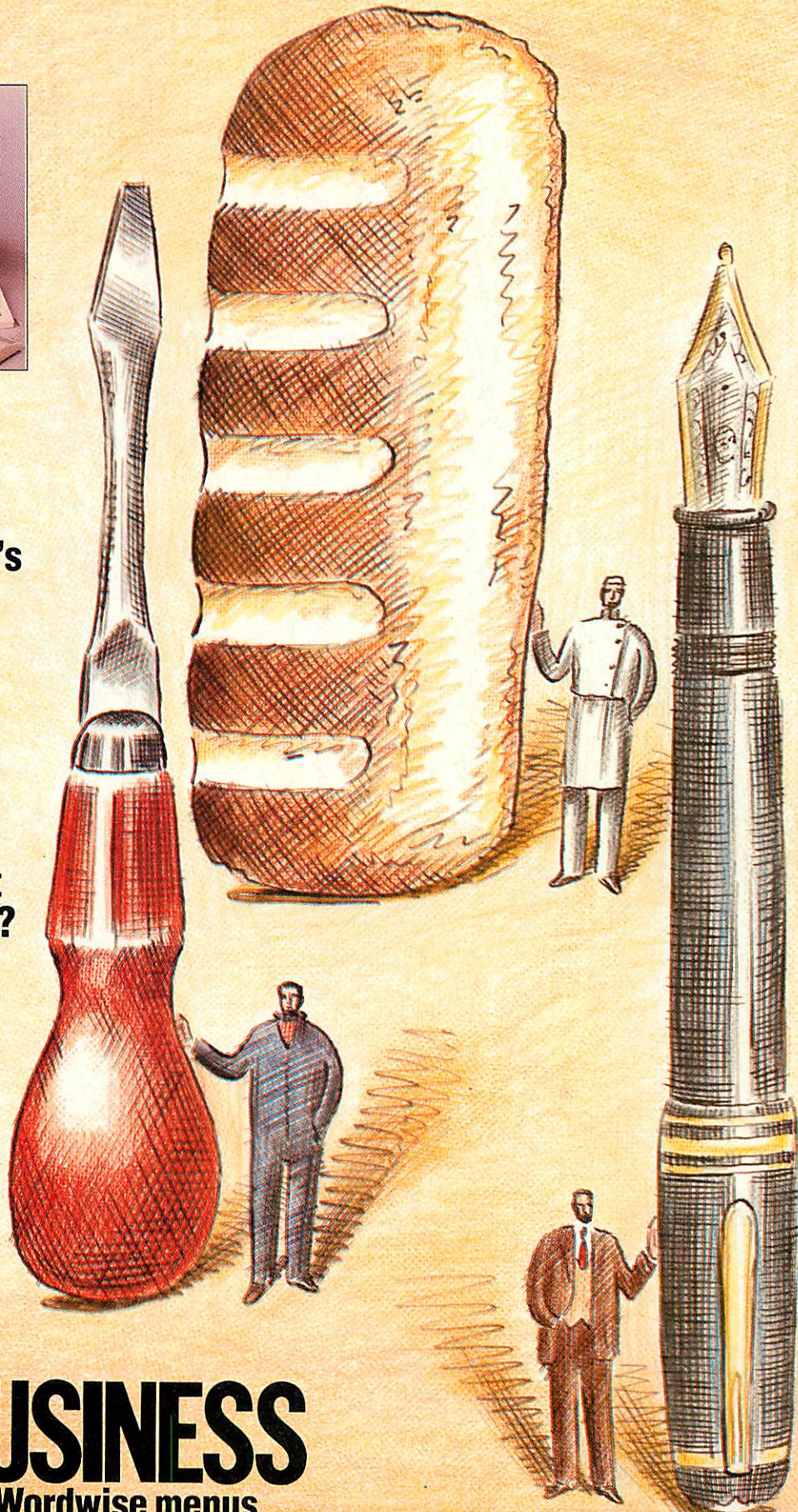
**Newspaper competition**

**TOOLKIT:**  
**Photographer's assistant**

**TYPESETTER:**  
**Publishing in the classroom**

**INTERBASE:**  
**Worth the wait or too weighty?**

**QUICKSORT:**  
**Mastering recursion**



## BIG BUSINESS

View macros, Wordwise menus

*Peter Tiller*

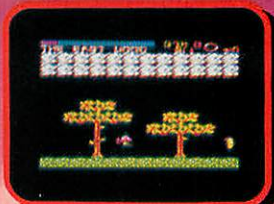
# PALACE of MAGIC



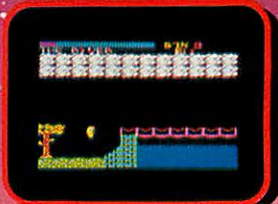
Leaping over deadly swords and spikes



Climbing up the East Tower



Wandering through a patch of woodland



Approaching the meandering river



At the top of the West Tower



Exploring the passages



Greeting the Guardian of the Guards



Down in the dungeons



## Over 100 Screens full of Challenging Puzzles and Awesome Foes

By practising acts of benevolence and goodwill, you have offended the evil wizard Caldeti. Summoning forth his satanic powers in order to extract retribution, he has cast two powerful spells upon you: (1) you have been reduced to the size of a dwarf; (2) Caldeti has banished you to one of his old homes, the "Palace of Magic".

The palace and its surrounding land is littered with magical objects and mysterious creatures. It is rumoured that there is also a hidden transporter — your only means of escape from this enchanted place.

After exploring the rooms of the palace, you should venture forth through the enclosing woodland: towards the ancient church and the eerie dungeons, or through the maze of secret passages, or over the river to the princess's house.

On your journeys, you will encounter many strange animals and people including rock monsters, gremlins, imps and guards. Some are good and some are evil. You will need to decide who you can trust to help you in this arduous quest.

### PRIZE COMPETITION

The first prize in our competition is a treasure chest containing over £200 worth of mystical and magical artefacts. 10 runners-up will each receive £5 and a signed certificate.

To enter the competition, you must complete the "Palace of Magic" adventure, and note down the congratulatory message you receive. Closing Date: 30th April, 1988.

BBC Micro Cassette.....**£9.95** Acorn Electron Cassette.....**£9.95**  
 BBC Micro 5¼" Disc.....**£11.95** Acorn Electron 5¼" Disc...**£11.95**  
 BBC Master Compact 3½" Disc...**£14.95** Acorn Electron 3½" Disc...**£14.95**

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

**SUPERIOR SOFTWARE**  
Limited

**ACORNSOFT**

Dept. PM2, 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).

# MICRO MEDIA Computer Supplies Ltd. Dept AU

0707 52698 or 0707 50913 Freepost, Rydal Mount, Baker Street Potters Bar, Herts EN6 3BR (NO STAMP REQUIRED)

## HEAD CLEANERS

	1	3+	6+
5¼	£3.95	£3.50	£3.15
3½	£5.00	£4.55	£4.10

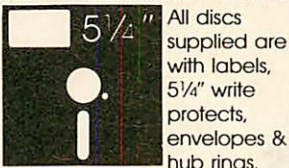
### 5¼ Micro Media Brand Discs

	10	20	30	50	100
SS/DD	6.99	13.10	18.70	29.50	55.80
DS/40T	8.50	16.00	22.75	35.90	67.60
DS/80T	9.99	18.70	26.35	41.05	76.35
DS/HD for PCAT	24.15	46.25	66.25	105.25	200.10

### 5¼ Reversible discs (Flippy's)

Have two write protect notches & index holes. Suitable for single sided drives.

	10.25	19.55	27.15	42.25	78.45
--	-------	-------	-------	-------	-------



All discs supplied are with labels, 5¼" write protects, envelopes & hub rings. Discs purchased direct from one major manufacturer. 100% certified error free - lifetime guarantee.

### 5¼ Rainbow Discs come in five colours

	20	50	100	250	500
SS/DD	13.20	30.75	57.10	134.50	252.45
DS/40T	14.35	33.10	60.70	141.45	262.20
DS/80T	15.20	35.20	64.85	148.75	276.00

### 5¼ Unbranded Discs

SS/DD	9.65	22.45	41.40	97.10	181.13
DS/40T	10.95	25.00	45.55	105.25	193.20
DS/80T	11.85	26.73	49.55	116.45	216.20

### 3½ Micro Media Brand

SS/DD	19.99	38.40	55.50	87.25	163.90
DS/DD	21.99	42.55	61.60	96.90	182.30

PRICES INCLUDE V.A.T.

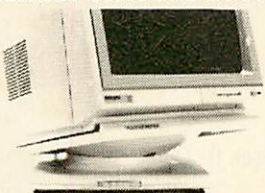


### 3½ Unbranded Discs

	10	30	50	100	150
SS/DD	14.95	42.95	61.50	111.65	164.50
DS/DD	16.70	48.30	78.20	147.20	212.20

## AUTUMN CATALOGUE OUT NOW CALL OR WRITE FOR YOUR COPY

### Monitor Swivel Bases



Pan tilt revolves around 360 degrees 12.5 degrees tilt up and down Adjustable by front mechanism.

55x280x260mm	55x355x320mm
for 12" Monitors	for 14" Monitors
1 12.10	1 16.70
3+ 10.99ea	3+ 15.15ea
6+ 10.35ea	6+ £14.30ea

### Adjustable Copy Holder

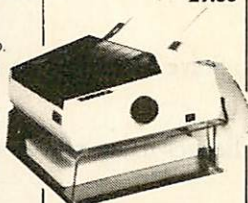
A4 adjustable desk clamping. Magnifying cursor line. Paper thickness adjustment. Paper height adjustable clip.

A4 Version	25.35
Desk Top Version	13.69
A3 Version	40.65

Holds up to 300g  
Holds up to 1000g  
Holds up to 1400g

### Printer Stand 5mm perspex

80 Column Version	400 x 310 x 100mm	21.65
132 Column Version	600 x 310 x 100mm	29.30



### Mobile Printer Stand

Rugged steel frame. Height adjustable adjustable basket for output paper & base shelf for input paper. Self assembly - includes castors.

80 column	£52.90
132 column	£65.40

### The Space Saver

Paper feed and refeed positioned one above the other. Dial controlled paper feed with adjustable deflectors ensures smooth flow and automatic refolding.

80 column	132 column
414x380x460mm	530x380x460mm
1 34.85	1 42.50
3+ 32.75 ea	3+ 40.00 ea
6+ 31.05 ea	6+ 38.30 ea

### Printer Ribbons

	3	6	12
<b>Acom</b> AP80	7.25	13.80	25.55
AP100	7.40	14.15	26.20
<b>Brother</b> M1009	8.10	15.50	28.95
Colours	12.30	24.60	49.20
HR15MS	10.70	20.70	39.35
Fabric	11.05	21.40	40.70
<b>Canon</b> PW1156/1080	7.95	15.20	28.30
<b>Centronics</b> GLP	8.10	15.50	28.95
Colours	12.30	24.60	49.20
<b>Epson</b> FX/MX/RX 80/85	7.25	13.80	25.55
Colours	13.20	26.40	52.80
LX/GX 80	6.90	13.10	24.15
Colours	12.60	25.20	50.40
MX/FX 105	8.80	16.90	31.75
LQ 800	10.00	19.30	36.60
<b>Juki</b> 6100MS	7.25	13.80	25.55
5510	7.25	13.80	25.55
Colours	13.20	26.40	52.80
<b>Kaga</b> KP810/910	7.95	15.20	28.30
Colours	13.20	26.40	52.80
<b>M/Tally</b> M180 MS	10.70	20.70	39.35
<b>NEC</b> PC8023	11.75	22.75	43.45
Colours	15.30	30.60	61.20
<b>Panasonic</b> KXP110/1080	10.70	20.70	39.35
Colours	19.35	38.70	77.40
<b>Saikosha</b> GP80	7.25	13.80	25.55
GP100	7.40	14.15	26.20
<b>Shinwa</b> CP80MS	10.70	20.70	39.35
<b>Star</b> NL10	18.60	36.60	71.10

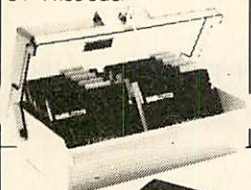
Colours available - Red/Brown/Blue/Green & Yellow

If the ribbon you require is not listed please let us quote

The above is a small selection of the 250 different ribbons we stock. We shall be pleased to find your ribbon, however old or obscure.

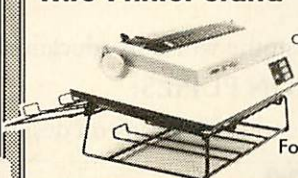
### MD 120

1	12.55	5¼" x 120
3+	11.90 each	
6+	11.35 each	



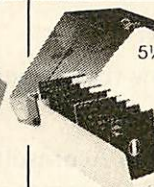
### Wire Printer Stand

stacks print-out in document tray automatically. Suitable for most standard printers. Made of safety coated steel wire. For 80 column £14.50 132 column £16.50



### MD 50

1	7.80	5¼" x 50
3+	7.40 each	
6+	7.10 each	



### MD 100

1	10.80	5¼" x 100
3+	10.30 each	
6+	9.80 each	

### MM 40

1	8.30	3½" x 40
3+	7.90 each	
6+	7.50 each	

### MM 80

1	10.95	3½" x 80
3+	10.40 each	
6+	9.90 each	

### Computer Labels

Continuous fanfold, sprocket fed		
Price per 1,000 3,000		
70x36	3.85	11.55
89x36	5.65	14.25
89x49	5.65	14.25
102x36	7.95	20.40

Please state no. of labels across the sheet (1, 2 or 3)

### Computer paper

Plain fanfold, micro perf edges		
Size	Weight 1000s gsm per box	Price per box 1 box 3 boxes
11x9½	60 2	16.50 43.80
	80 2	20.40 53.55
Exact A4		
11½x9½	70 2	27.60 58.50
	90 1	17.40 45.50

A4 Fixed tractor paper available

ALL PRICES INCLUSIVE OF POSTAGE & PACKING AND V.A.T.

## MICRO MEDIA

Computer Supplies  
Freepost, Rydal Mount, Baker Street, Potters Bar, Herts. EN6 3BR



Access & Visa



Out of Office Hours  
**0707 52698**

Orders despatched 24 hrs. Please allow 5 days for delivery. For next day delivery, please ring for details. Postage covers U.K. only.

A Catalogue is available with a more comprehensive range of products including - 3M & Verbatim discs - a wider choice of paper labels, ribbons and accessories.

Ring or write to obtain your copy now!

Educational and HMG orders accepted. For official orders/invoice/credit orders there is a minimum order value of £15.00 excluding V.A.T. Any order under £15.00 will be subject to £3.00 handling charge.

Personal callers welcome  
Weekdays 8.30am - 5.30pm  
Saturdays 10.00am - 4.00pm

# ACORNUSER

ISSUE No 64 NOVEMBER 1987

**EDITOR**  
Tony Quinn

**DEPUTY EDITOR**  
Steve Mansfield

**TECHNICAL EDITOR**  
Graham Bell

**SUB-EDITORS**  
Stuart Anderton  
Chris Jones

**EDITORIAL SECRETARY**  
Pauline McLernon

**TECHNICAL ASSISTANT**  
Robert Miller

**ART DIRECTOR**  
Mike Lackersteen

**ART EDITOR**  
Liz Thompson

**ASSISTANT ART EDITOR**  
Paul Holmes

**EDITORIAL MANAGER**  
Ellen Brush

**PRODUCTION ASSISTANT**  
Teri North

**GROUP ADVERTISEMENT  
DIRECTOR**  
Stefanie Blower

**ADVERTISEMENT MANAGER**  
Gary Lucas

**SALES EXECUTIVES**  
Shane Hussien  
Sara Hillen

**ADVERTISEMENT  
PRODUCTION**  
Jonathan Marsh

**ADVERTISEMENT  
ASSISTANT**  
Nicky Lewis

**PUBLISHING SERVICES  
MANAGER**  
Sarah Bullard

**MERCHANDISING  
ASSISTANT**  
Seran Anderson-Haddick

**PUBLISHING DIRECTOR**  
Michael Potter

**EDITORIAL DIRECTOR**  
Christopher Ward

## NEW USERS

<b>HINTS &amp; TIPS:</b>	41
Wordprocessing advice, using daisy-wheel printers and screen dumps	
<b>FIRST BYTE:</b>	47
Tessie Revivis continues her look at the CALL statement	

## REVIEWS

<b>GAMES:</b>	145
The Games Page with this month's arcade and adventure games news	
<b>GAMES:</b>	147
<i>Spy vs Spy</i> , <i>Crazee Rider</i> and <i>Palace of Magic</i> reviewed	
<b>SOFTWARE:</b>	149
Halcien is a new graphics oriented language. Marc de Weger assesses it	
<b>SOFTWARE:</b>	157
More new languages: Steve Mansfield on MicroCODIL	
<b>HARDWARE:</b>	159
Epson's LQ-800 challenges daisy-wheels for quality	

## EDUCATION

<b>NEWS:</b>	163
The latest from the world of education	
<b>PRESS BARON PUPILS:</b>	166
Chris Drage and Nick Evans on desktop publishing in the classroom	

## BUSINESS

<b>TAKING THE STRAIN:</b>	169
Roger Carus describes how readers put the BBC micro to work	
<b>FAMILY HISTORY:</b>	170
A look at the background to Acornsoft's <i>View Professional</i>	
<b>THE COMPATIBILITY QUESTION:</b>	173
Your experiences with the Master 512	

## REGULARS

News	7	Competition	109	Reader offers	131
Win an Arc	17	Subscription offer	111	Stop Press offer	163
Letters	33	Yellow pages	113	Free Ads	175
Acorn Forum	53	Order forms	129	Acorn Abuser's Diary	176

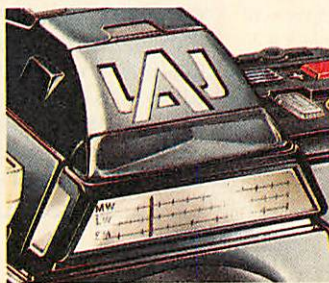
Published by Redwood Publishing Ltd, 20-26 Brunswick Place, London N1 6DJ. Tel: 01-490 1444. Subscriptions: Contact Gail Fairhall, Redwood Publishing Ltd, Lambourn Woodlands, Newbury, Berks. Tel: (0672) 40888. UK £17.50; Europe £25; Middle East £30; Americas, Africa £35; rest of the world £40; (price inc p&tp for 12 issues). Printed by Riverside Press, Gillingham, Kent. Typeset by Tabloid Fotoset, London. Colour reproduction by Clerkenwell Colour, London. Print production by Aquarius Print and Design, London. Distributed by Comag, Tavistock Road, West Drayton.



## FEATURES

LIGHT READING/Page 82

Joe Telford describes how to build a software toolkit, taking a set of photographer's utilities as an example



CHOOSE YOUR WORDS WISELY/Page 89

Philip Trinham has developed a menu system for *Wordwise Plus* that speeds setting up



THE RECURSION VERSION/Page 95

What is recursion? Nick Wetherby explains and shows how it can be used with the quicksort technique



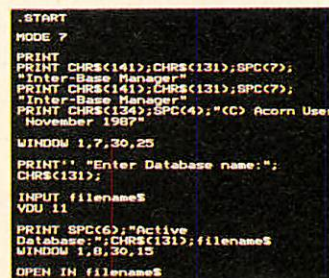
THE BIG MACRO/Page 103

View limits you to 132 characters in a macro. Graham Bell shows you how to get round this problem



INSIDE INTERBASE/Page 154

Bruce Smith has been looking forward to reviewing *Inter-Base* – was it worth the wait?



## COVER



Illustration by  
Peter Till

## NEXT MONTH

Graphics special:  
Successful computer artists  
tell us their secrets, Joe has  
written a CAD program,  
We look at monitors and  
the role of information tech-  
nology in schools

## ARCHIMEDES 300 SERIES

0190G BBC 305 Entry System	918.85
0191G BBC 305 Mono System	976.35
0192G BBC 305 Colour System	1148.85
0193G BBC 310 Entry System	1006.25
0194G BBC 310 Mono System	1063.75
0195G BBC 310 Colour System	1236.25

0240C M128 Manual 1 ADJ22	14.95	14.20
0241C M128 Manual 2 ADJ23	14.95	14.20
0242C M128 Adv. Ref Man.	19.00	18.05
0234B M128 Econet Module	48.88	46.43
0235B M128 Eprom Cartridge	15.18	14.42
0781B Care Elec. Cartridge	8.95	8.50
0782B Care 4 Way Cart.	14.95	14.20
0783B Peartree MR8000 Cart.	45.95	43.65
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 Accorn 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

## DISC DRIVES

0224G Master Disc Drive Unit	316.00	300.20
0600F Cumana CSX100 40	106.95	101.60
0610F Cumana CS100 40	126.50	120.18
0614F Cumana CS100E	118.45	112.53
0601G Cumana CDX200 40	215.00	204.25
0602F Cumana CSX400 40/80	142.60	135.47
0603F Cumana CS400 40/80	162.15	154.04
0615F Cumana CS400E	155.00	147.25
0604G Cumana CD800S 40/80	286.35	272.03

**Archimedes 300 Series  
Now available ex-stock**

**MEMBERS SPECIAL OFFER**

When buying a new Archimedes we will give you absolutely free:

"Zarch" the complete Lander game, Printer lead and Lockable 3.5" disc box with 10 discs all worth over £60.

## OTHER HARDWARE

0701B Aries B32 RAM Card	93.15	88.49
0740B Aries B12 ROM Board	46.00	43.70
0749B Aries B12C Adaptor	5.87	5.57
0704B ATPL ROM Board BBC	39.67	37.69
0746B Ditto for 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
0747B U.V. Tube For Eraser	10.35	9.83
0708A Eprom Extractor Tool	3.45	3.28
0713A Phone 2 in 1 Adaptor	6.30	5.99
0714A Bkey strip	2.09	1.99
0715A Dust Cover BBC B/B+	3.45	3.28
0734A Dust Cover Master	4.60	4.37
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

## ARCHIMEDES 400 SERIES

0260G Archimedes 410 Entry	1608.85
0261G Archimedes 410 Mono	1666.35
0262G Archimedes 410 Colour	1838.85
0263G Archimedes 440 Entry	2643.85
0264G Archimedes 440 Mono	2701.35
0265G Archimedes 440 Colour	2873.85

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

## ARCHIMEDES ACCESSORIES

0266C 0.5Mb RAM (305 only)	102.35	97.23
0267F Second 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	T.B.A.	T.B.A.
0271D I/O Podule	T.B.A.	T.B.A.
0272D MIDI add-on to I/O	T.B.A.	T.B.A.
0425B Archimedes Printer lead	10.47	9.95
0505G Multi-Sync Taxan Mon.	668.42	635.00

## 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

## COMPUTERS

When buying a new Master 128 or Compact we will give you absolutely free a Computer Concepts INTER-WORD worth £50

0200G Master 128	435.91	414.11
0199G Compact Entry System	375.00	356.25
0196G Compact Colour System	575.00	546.25
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

## MONITORS

0501G Taxan KX118 Green	100.00	95.00
0502G Taxan KX119 Amber	100.00	95.00
0503G Zenith 123 12" Green	83.00	78.85
0530G Microvitec 1431 Mon.	239.00	227.05
0531G Microvitec 1451 Mon.	289.00	274.55
0505G Multivision 770 Plus	668.42	635.00
0535G Supervision 625 RGB	379.50	360.53
0536G Supervision 620 RGB	318.55	302.62

**C**

The Language C is now available from Beebug for all users of the BBC Micro and Master. Beebug C conforms to, and extends beyond the Kernighan and Ritchie standard, producing fast, compact code and supporting full floating point maths.

**Code 0075B Price £59.00**  
**Members price £44.25**

Code	Qty	Description	Unit	Total

**Carriage**  
Carriage is denoted by the letter contained in the stock code. A-50p, B-£1, C-£2, D-£3, E-£3.75, 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 or 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.

Name: \_\_\_\_\_ Sub Total £ \_\_\_\_\_  
Address: \_\_\_\_\_ Postage £ \_\_\_\_\_  
Total £ \_\_\_\_\_  
Postcode: \_\_\_\_\_ Membership No: \_\_\_\_\_  
Access/Visa \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_ Expiry \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_

**(0727) 40303**

# TRADE-IN YOUR BBC MICRO FOR

## A New Master 128, Compact or Archimedes

Don't get behind the times with old equipment. We are offering an efficient trade-in service for people wishing to exchange their BBC Micro for a brand 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 £435.91 to £210.91.

### ARCHIMEDES PRICES Including VAT

0190G 305 Entry System	918.85
0192G 305 Colour System	1148.85
0193G 310 Entry System	1006.25
0195G 310 Colour System	1236.25

**Members special offer**  
When buying a new Archimedes we will give you absolutely free: "Zarch" the complete Lander game, Printer lead and Lockable 3.5" disc box with 10 discs all worth over £60.

U.K. carrier delivery £7

### DISCOUNT

BBC Micro issue 4 or older without DFS £125  
BBC Micro issue 7 or newer without DFS £175  
BBC Micro issue 4 or older with DFS £175  
BBC Micro issue 7 or newer with DFS £225

By DFS we mean an Acorn or Watford single density DFS. Computers must obviously be in good working condition to qualify for this offer.

BEEBUG members receive an additional 5% discount on all our products bringing the trade-in price of a Master 128 to as little as £189.11.

### MASTER & COMPACT PRICES Including VAT.

Code	Price	Mem Price
0196G		
Compact + Col. Monitor	575.00	546.25
0197G		
Compact + Mono Monitor	440.00	418.00
0198G		
Compact TV System	390.00	370.50
0199G		
Compact Entry System	375.00	356.25
0200G		
Master 128	435.91	414.11

U.K. carrier delivery £7.

If you wish to take advantage of this service please send your machine to us and enclose the order form attached. We recommend that you send your machine by courier (we suggest you check for insurance), and phone us to check availability on new machines. Alternatively, you are welcome to call personally at our showroom (address as below).

# BEEBUG

BEEBUG Ltd.,  
Dolphin Place, Holywell Hill,  
St Albans, Herts AL1 1EX.  
For More Information  
Telephone 0727-40303

I wish to trade in my BBC Micro Serial No. \_\_\_\_\_


Issue \_\_\_\_\_ with/without DFS for a Master 128/Compact Entry/TV/Mono/Colour system/Archimedes.

I enclose a cheque for £\_\_\_\_\_ Please debit my Access/Visa by £\_\_\_\_\_

My BEEBUG Membership No. is \_\_\_\_\_

Card No.

\_\_\_\_\_ and \_\_\_\_\_

Card expiry \_\_\_\_\_  

I wish to join BEEBUG and enclose £12.90 (UK only) and claim 5% discount.

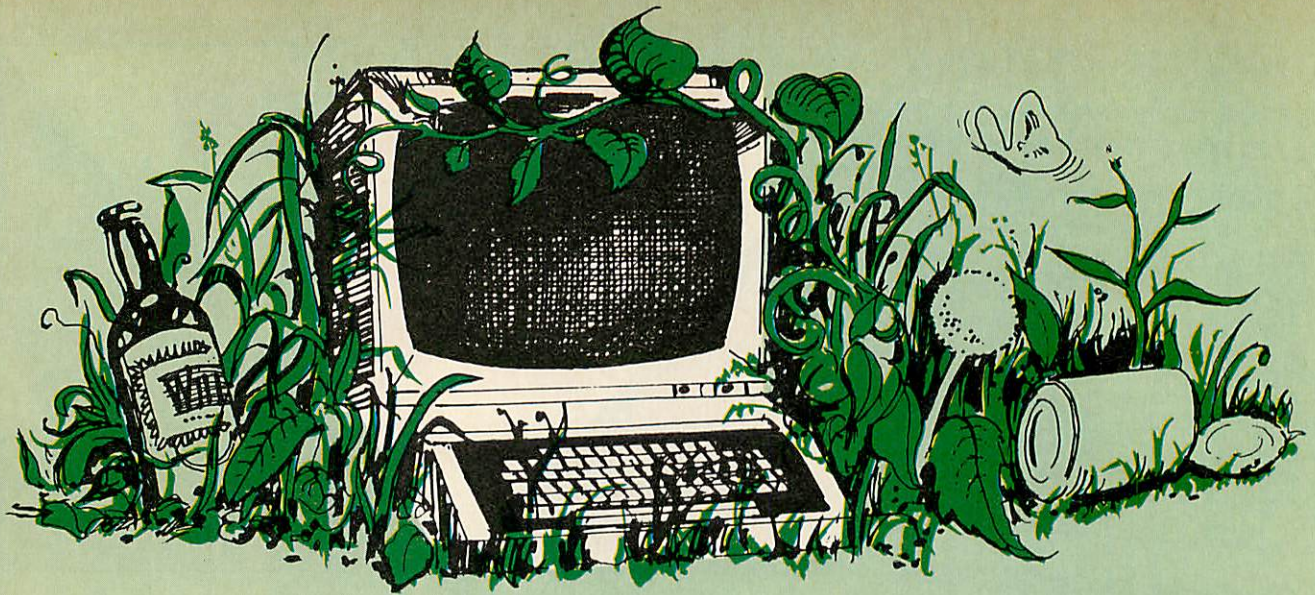
Name \_\_\_\_\_

Address \_\_\_\_\_

Post Code \_\_\_\_\_

Signature \_\_\_\_\_

Archimedes 300 Series Now Available Ex-stock



# Don't let your Computer ROT!

Your BBC Micro/Master Has So Much Potential – Don't Let It Go To Waste

At Beebug we are keen to help you get serious with your computer. Our magazine (currently sent out to 20,000 members) aims to stimulate you with new and interesting ideas and to keep you up to date with the latest developments and programs.

Whether you are a hardened computer buff or a complete beginner, Beebug has much to offer you.

#### As A Member Of Beebug You Would Benefit From:

- Free access to our technical support team, to obtain impartial advice and help on any computer hardware, or software problems.
- A swift mail-order service for all your hardware & software needs at competitive prices, with 5% members discount.
- A showroom with knowledgeable staff on hand, where you can try out the latest hardware, peripherals and software.
- Free personal adverts in the magazine to sell your unwanted kit.
- A Trade-In service to upgrade your BBC to a Master.

*A New Members Pack, including screen planning sheets, key strip, computer reference card, a 56 page introduction to your computer, membership card, mag. indexes & latest magazine.*

#### Recent issues of Beebug have included informative features and programs on the following subjects:

Business Graphics, Sideways Ram Construction Project, Home Banking, Sorting Data Files, Character Definitions, Storage Oscilloscope, Master Printer Buffer, File Security, Letter Headings, Virtual Arrays, View Printer Driver, Auto-Alarm, Chart Recorder, Help System.

As well as these we regularly include articles for beginners and experts, workshops, reviews, news, hints & tips and much, much more.

FOR A FREE BEEBUG INFORMATION PACK PHONE St. Albans (0727) 40303

I would like to subscribe to Beebug for 1 year and receive a new members pack and the next 10 issues of the magazine.  
My machine is a BBC/Master/Compact. Delete as appropriate.

Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Signature \_\_\_\_\_

I enclose a cheque for £ \_\_\_\_\_ / Please debit my Access/Visa account with £ \_\_\_\_\_ Card expiry \_\_\_\_\_

Card No.

Subscriptions may now also be placed on Micronet 800. Just type \*BEEBUG #

All payments must be in pounds sterling. Cheques must be drawn on a UK bank.

#### Subscription Rates

UK, BFPO, Ch Is	£12.90
Rest Of Europe	£19.00
Middle East	£23.50
America & Africa	£26.00
Elsewhere	£28.00



# BEEBUG

Send To Beebug, Dept. AU11, Dolphin Place, Holywell Hill, St. Albans, Herts. AL1 1EX.

Or Phone St. Albans (0727) 40303

Stop The Rot And Join Now



## Cub alteration 'unsatisfactory'

Microvitec has issued a stern warning to people who want to fiddle with its monitors' electronics to make them work with the Archimedes.

The statement follows an article 'published in the technical press' which suggested modifying some of the circuitry in Cub monitors to convert them to the linear RGB which the Arc uses. Cub monitors use standard TTL RGB signals.

In addition to the danger of frying yourself with the high voltages found inside monitors, Microvitec claims that 'the modification is in itself unsatisfactory and anyone using a monitor modified in this way will not obtain the usual high quality of display.'

The Acorn monitor supplied as standard with the Arc is a Philips model which accepts both linear and TTL RGB signals. And Microvitec itself produces the MS/1455 model which works with the Archimedes without any modification.

## Upbeat upgrade

A range of new sounds have been added to the Rice Digital Drum system. You can have hand claps and echo effects as well as the existing sounds, and the optional bass synthesiser now has four different sounds and variable picking strength.

The software has also been converted from Basic to machine code, making it faster and more reliable. The cost of the unit is £47.50, or £85 with the bass synthesiser and sequencer software.

# Arc obeys school rules

By Bill Penfold

Acorn's Archimedes could become the cost-effective answer to educationalists' dreams.

An exaggeration? Not according to recent guidelines from the Department of Education and Science on what to look for when buying classroom computers.

Whitehall's criteria match the specifications of the versatile Archimedes. In fact, says the DES, versatility is a requirement teachers and local education authorities should look for in future purchases.

Compatibility with existing school software and commercial systems, plus having the potential for software portability is stressed.

In addition the DES is emphasising the need for classroom computers to be upgradable to incorporate new standards as they are developed, have plenty of interfaces for use with peripheral devices, and be able to withstand wear and tear.

The 'buyers guide' is a chart contrasting the features of 19



Arc: best at the price

machines. Only the Nimbus VX range scores higher than the Archimedes – but at about three times the price.

The authors state that systems should be 'of an open design providing a path for future upgrading and the incorporation of new standards as they develop.' This includes expansion slots for second processors and the ability to emulate other computers.

New systems should offer access to much of a school's existing software, be able to use languages such as Logo and structured Basic while also

offering access to MS-DOS.

Though schools will probably not yet have pressing needs for C and ISO-Pascal compilers, the guidelines suggest they soon will and these languages should be available as, indeed, they are for the Arc.

The provision of a WIMP environment is seen as valuable. A dozen different interfaces are also suggested to make full use of existing and potential new peripheral devices. These include a separate printer port, a serial interface port to RS232C standard or compatible, and an analogue port for control.

The experts also suggest there should be interfaces for two floppy drives plus a hard disc and an interface capable of accepting a MIDI music system. Potential for networking and for interactive video applications are also necessities.

Finally, to get the gold star for classroom computing, the experts advise that plugs and sockets should be gold plated to withstand frequent connection and disconnection.

## Dragons descend on Surrey

Hideous hordes of babbling orcs and elves will be gathering in the dank dungeons of darkest Surrey this November.

Well, not quite dungeons. It will actually be Sutton Central Library, which is the venue for the second National Computer Adventurer's Convention. This takes place on Saturday

November 28, and features seminars on multi-user games, adventure creators and the future of adventuring. There will also be program demonstrations and advice available.

The price is £2.50 on the door. Contact David Wilkins on 01-642 3102 or Prestel mailbox 016423102.

## Free software with CAD pack

The latest CAD package from Bizzell Computers combines a Tandy plotter with digitising and CAD software. The *Micad* drawing package is included free of charge. The total cost of the system is £400. For more information contact Bizzell Computers on (095389) 592.

# JEFFREY ARCHER

**NOT A PENNY MORE,  
NOT A PENNY LESS**  
**THE COMPUTER GAME**



Atari ST  
CBM 64  
Amstrad CPC  
Spectrum 48  
Spectrum 128  
BBC B & Master

“We have had our money stolen by a very clever man. Gentlemen I therefore suggest we steal it back. Each of you must return with a plan of how we are to extract \$1,000,000 from him without his ever becoming aware of it.  
**NOT A PENNY MORE, NOT A PENNY LESS”**

Published by



DOMARK

## News in brief

■ *SIR*, the *Schools Information Retrieval* database published by the BP Educational Service, is now available on the BBC micro. The program is intended to teach secondary school students how to create and use a database system.

To promote the package, which costs £30, a workshop has been organised with Bedfordshire LEA. BP hopes that up to 40 users will attend and bring plenty of ideas for extending the use of *SIR*.

■ Acorn users in industry can improve their efficiency in programming and machine use with an off-line computer numerical control system from CyNCro Ltd. A full installation, including a dual-drive Master with mono monitor and printer, costs £3444.25. Training and software are provided and the package can be customised to include other peripherals such as plotters.

■ T K Boyd has come up with an answer to paranoia and insecurity among network users. For £13 he will send you a file encryption program to render *View*, *Wordwise* and *Basic* files illegible to everyone except the person with the decryption code. He is so confident about the security of the system that a prize awaits the first person to crack it.

■ Electron owners can now upgrade to a 3.5-inch disc for £99. Advanced Computer Products has launched the Advanced Plus 3, which includes a 1770 interface, ADFS, a 3.5-inch drive, a Welcome disc including utilities and a games disc, including the perennial favourite *Snapper*.

The Advanced Plus 3 differs from the original in being smaller – it consists of a cartridge to attach\* to the Plus 1 upgrade, and a cable to the disc drive – and in having a spare ROM socket. It is also easy to upgrade to the Advanced Plus 4.

# Acorn 'disappointed' by £1.4 million loss

Acorn managing director Brian Long described a £1.4 million loss in the first half of this year as 'disappointing'. The loss compares to a small profit in the same period last year.

The results reflect the costs of developing the Archimedes range, but this investment should begin to pay off in the second six months of the year.

Sales of existing products like the Master 128 and Compact were down slightly, in line with industry trends, but had held 'surprisingly well' in education.

However, showing the Archimedes to selected local education authorities in the spring affected Master series sales, as people waited to see the new machine. The uncertainty caused by the General



Long: Unix plans

Election was blamed for delaying educational purchases.

The future looks much rosier – growing Archimedes sales are expected to exceed Master series revenues early next year. As reported last month, Acorn

and Olivetti continue working on an upmarket ARM-based workstation to run the Unix operating system. This is aimed squarely at the university market currently dominated by Sun and Apollo workstations. The machine is planned for release in mid-1988, and will include a built-in arithmetic co-processor based on the Western Electric 32206 chip. This will vastly speed up floating-point, trigonometric and logarithmic calculations as they are performed by hardware rather than software routines.

The Unix software will also be available for the Archimedes 400 series, but will require some hardware upgrades, in particular a hard disc and extra memory capacity.

## Archimedes takes on the Minotaur

Minerva Systems has announced an Archimedes game, *Minotaur*. As the name suggests, it is a maze game. You have to rescue 10 fellow Cretans from the three-dimensional maze and its inhabitant the Minotaur. Littered around to help you are food, drink and segments of map.

Each time the game is loaded it will create a new random maze, increasing the long-term appeal of the game. You can also save a maze to disc, and complete it later by saving all your men, and then going in again to fight the beast himself.

'Maze games have been around a long time' said a Minerva spokesman. 'How different this one is is a matter

of opinion. It is certainly a good advertisement for the machine.' *Minotaur* costs £15.

■ Minerva has also announced the first of a range of add-ons for *InterBase* similar to their established *System Delta* range. *Interbase* is Computer Concepts' database manager and is reviewed in this issue.

*InterBase* has been criticised for being difficult to program, but the new applications should be simple enough for non-technical users. Minerva's Card Index application is more flexible than the one provided with *InterBase*, with much easier printout options.

Card Index will be available from Minerva or Computer Concepts themselves, price £30.

## Award for micro ideas

Is the spirit of innovation alive and well in Britain? *The Guardian* isn't sure, and so is hosting a competition for computer innovators ready to compete with technology from abroad.

You have until November 11 to submit entries to the Guardian Innovation Challenge. Any new method or device can be entered in five categories; data security, man/machine interfaces, connectivity, social benefits and 'any other'.

Individual and group entries will be accepted and there is an award for the best schools entry. The overall winner will receive £1,000, and see his/her entry commercially developed by one of the nine companies overseeing the competition. Details of the competition are available on (0895) 72617.

# DATATHORN SYSTEMS Ltd

GEORGE HOUSE, 50 SPRING GROVE, LOUGHTON ESSEX IG10 4QD

An advertisement cannot begin to do justice to this superb machine. Send an A4/foolscap s.a.e. for our **FREE FACT PACK** and sample prints.

with our introductory offer  
(strictly limited)

ACORN USERS  
**SAVE  
£450**

**YOU GET:**  
GQ-3500 printer + parallel cable  
+ form design program +  
+ LaserJet + Identity Card.

**PACKAGE VALUE: £1948.80**  
**OUR PRICE: £1498.80**  
(Free delivery)

FULL DEALER SUPPORT

†suitable for BBC B/B+/Master/Compact  
please add V.A.T. to all prices

PRESENT THE INCREDIBLE

# EPSON GQ-3500 LASER PRINTER

- ★ the ultimate for desk top publishing
- ★ compatible with Epson dot matrix print drivers
- ★ prints mixed text and graphics – print form 9 contents in one pass
- ★ fast – up to six A4 pages per minute
- ★ quiet – no impact noise
- ★ 640KB RAM – programmable – 192KB ROM
- ★ 22 character fonts available
- ★ identity cards available for: LaserJet+ and Diablo 630
- ★ new powerful Epson Vector Graphics codes are a superset of the Esc-P codes for dot matrix – destined to become the new industry standard
- ★ ideal for business, school or home use – start your own print business

Price List — Education

## Whittle Systems

For  
**YOUR NIMBUS PC**  
Expansion

APPROVED  
 **CUMANA** DISTRIBUTOR

### HARDWARE

<b>CSR200</b>	5.25" DSDD External floppy drive for Nimbus.....	<b>£124.00</b>
<b>CRM20</b>	20 Megabyte external winchester for Nimbus PC.....	<b>£575.00</b>
<b>CRM30</b>	30 Megabyte external winchester for Nimbus PC.....	<b>£599.00</b>
<b>CRM40H</b>	40 Megabyte, high speed external winchester.....	<b>£899.00</b>
<b>CRM60H</b>	60 Megabyte, high speed external winchester.....	<b>£1095.00</b>
<b>DTI MODEM CABLE</b>	to Nimbus AUX port.....	<b>£9.95</b>
<b>8 BIT PARALLEL PRINTER CABLE</b>	.....	<b>£19.95</b>

### SOFTWARE

<b>NIMBUS VIEWDATA</b>	Complete local Viewdata package <small>(includes NVD-EDITOR, NVD-DISPLAY, NVD-TUTOR, Modem cable)</small>	<b>£95.00</b>
<b>TRAPDOOR</b>	The ultimate debugging aid..... <small>(also available for IBM PC, APRICOT PC, XI, XENI)</small>	<b>£49.95</b>
<b>ZEM</b>	Z80 CP/M Emulator.....	<b>£49.95</b>
<b>CP/M 80 Programmer's Guide</b>	by Morrell & Whittle....	<b>£8.95</b>

Network prices of software

Up to 8 stations	@ 3 x standalone price
Up to 16 stations	@ 4 x standalone price
Up to 24 stations	@ 5 x standalone price
Up to 32 stations	@ 6 x standalone price

*All prices exclude P & P and Vat.*

**9, Herschel Crescent,  
Littlemore, Oxford OX4 3TS**

Tel 0865 711956

## IEEE488 INTERFACE PODULES FOR THE ACORN ARCHIMEDES AND SPRINGBOARD COMPUTER SYSTEMS

The combination of Acorn 32-bit RISC Technology and Intelligent Interfaces hardware and software design results in an extremely fast and powerful IEEE488 Interface Controller for ATE (Automatic Test Equipment) systems.

- Full implementation of IEEE Std 488.
- Enables the computer to communicate with up to 14 IEEE488 interface compatible instruments
- Extremely fast data transfer rate (around 250 Kbyte/s)
- Can be configured as the system controller or as a simple talker/listener
- As controller in charge can send all addressed and universal commands and conduct both serial and parallel polls
- Ultra high level software interface for ease of use BBC BASIC Procedures and Functions supplied on disc optional libraries of procedures for FORTRAN 77, ISO Pascal, C etc
- Comprehensive user guide

Intelligent Interfaces supply IEEE488 Interface Controllers based on the Acorn Archimedes or the Compaq Deskpro Computer Systems. They designed, developed, manufacture and support the Acorn IEEE488 Interface for the BBC Models B, B+ and Master 128 Microcomputers.

Officially appointed Acorn Scientific Dealer.



**Intelligent Interfaces Ltd**

43b Wood Street  
Stratford-upon-Avon  
Warwickshire  
CV37 6JQ

Tel: 0703 261514 or  
0789 415875 (Head Office)  
Telex: 312242 MIDTLX G

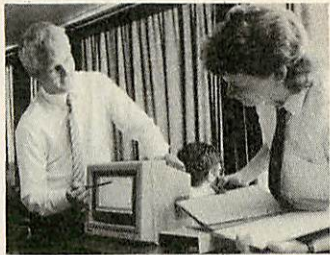


## Atoms, electrons and the BBC B

Helping students explore the heart of the atom is the aim of a new software package produced by the UK Atomic Energy Authority.

Developed with the cooperation of the Computers in the Curriculum Project at King's College London, the *Nucleides Database* covers most of the important concepts in nuclear physics.

The package, which has been field-tested in the North, is aimed mainly at sixth-form students, but should be useful in introductory courses at colleges



Teaching A-level physics

and universities. It covers topics such as half life, binding energy and mass defect. The information is available as either text or graphs.

Teacher's notes are included in the package, which sells for £12.50. It works with all versions of the BBC micro and is network compatible.

## Modem demo

Tandata has set up an on-line service just so people can see how good its modems are. The system is a database designed to show the speed and error handling of the company's Tm722 modem, which works at 1200 or 2400 baud and is fully Hayes compatible.

As well as being fast, the modem uses special protocols to detect and correct any transmission errors. The database is available on (0684) 892424, but you'll need a matching Tm722 modem to appreciate it.

# Wish you were here

Special report  
by Sam Greenbill

Grendon Hall, a Queen Anne house in a sleepy Northamptonshire village, is not the sort of place you would expect to find bristling with computers.

Yet behind the picturesque sandstone walls, there are dozens of youngsters hammering away excitedly at their micros.

For three weeks in the summer Grendon Hall plays host to Computer Park, a holiday designed for anyone interested in computers. It is run by a team of dedicated but somewhat unconventional enthusiasts.

An electronics workshop has been set up too, and a lot of people abandon their computers to try it out. About half a dozen of the participants worked in there full time, while others popped in and out.

Most people, including myself, spent their week learning as much as possible. Every day there are workshops on various aspects of computing, including machine code, graphics, and



Computer Park: even the computers make new friends

special applications.

There are demonstrations, which centre on using computers to control equipment. One used a BBC micro to control a polystyrene cutter producing letters of the alphabet.

But most activity is centred around the projects. For example, this year there was one 12-year-old boy building a weather station, with a computer to record the results. There was also an adult building a humanoid robot.

On the first day, everyone is assigned a supervisor. Each supervisor has about four people

in his group and spends equal time with each person during the week. This way you get one-to-one tuition.

Computer Park's main boast is that it has more computers than people. Although most of them are BBC micros, there are others, too, and next year there should even be a stock of Archimedes.

Computer Park serves beginners' needs extremely well.

The price, around £200, includes everything from accommodation and meals, to tuition and excursions.

## Dungeon design

If you like adventures but are bored with all the commercial games, you could always write your own.

*ALPS*, from Summit Software, is the latest adventure creation system for the BBC micro. The name stands for *Adventure Language and Programming System*. It's a chip-based program, with supporting disc or cassette, which provides routines for producing machine code adventures.

There's space for up to 255 locations and 180 objects. A

text compression routine squeezes the file down to a more manageable size – around 60 per cent of the original.

*ALPS* includes a text editor which boasts proper text formatting. Summit Software claims that this allows you to produce neater text than with other similar systems.

Extensions to the system are already being worked on. These include a utility to allow you to read in disc-based text.

The package costs £28.95 (disc) or £27.95 (cassette).

## Mice modified for the disabled

At the *Acorn User* show, representatives of the Spastics' Society managed to persuade a couple of manufacturers to modify mice and trackballs for people who can't manage to move and hold down a button at the same time.

The devices now use 'latching' so that the buttons don't have to be continuously pressed. The adapted trackball is available from Simnetts for £57, while the mouse by Challenge Research costs £30.



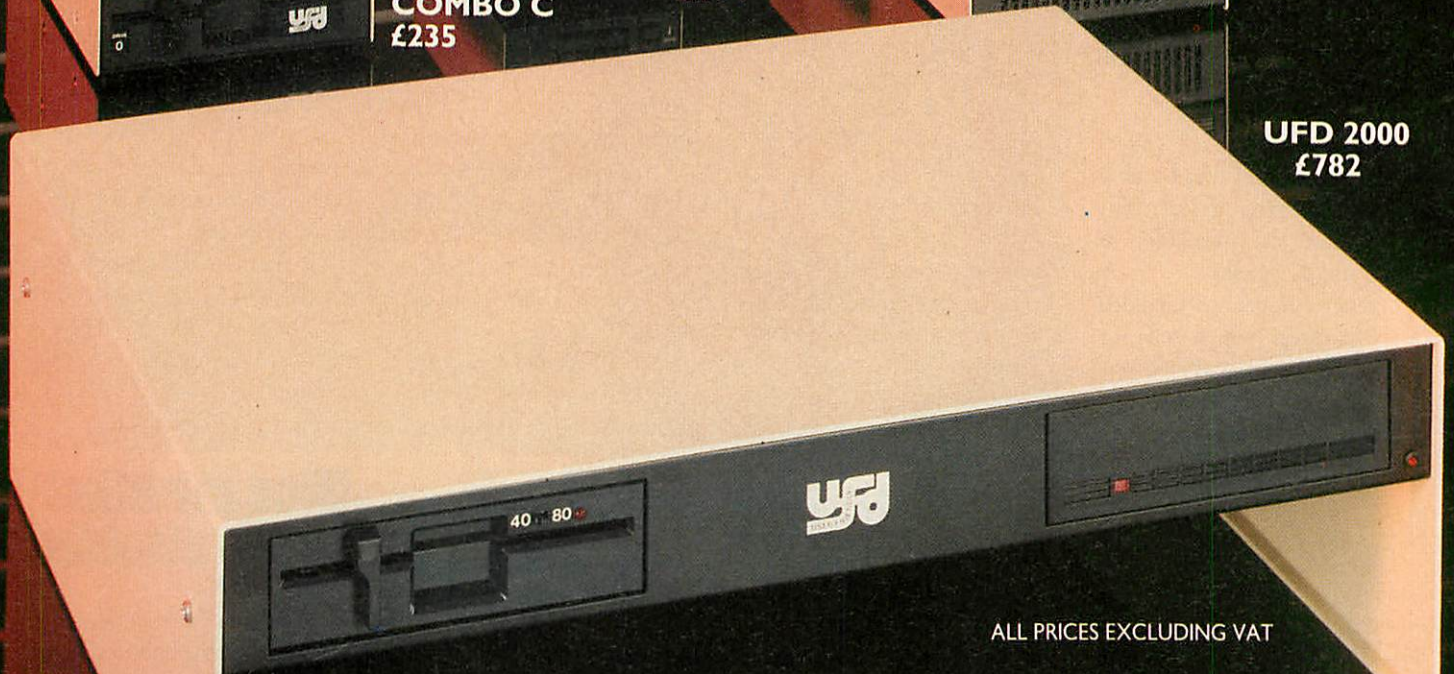
**COMBO C**  
£235



**MD802 F**  
£174



**HD 2000**  
£609



**UFD 2000**  
£782

ALL PRICES EXCLUDING VAT

## BBC Compatible Disc Drives

- COMBO C** – 3.1/2" plus 5.1/4" combination drive in 802C case without PSU
- MD802F** – Dual 800K drive 3.1/2" 40/80 track switchable
- HD2000** – 20MB Winchester built into MD802E case with independent PSU Using ADFS including Winchester controller card and BBC host adaptor card
- UFD2000** – 20MB Winchester and IBM floppy disk drive 40/80 track switchable housed in MD802DM case



**AKHTER**

**GROUP PLC.**  
TELEX 818894 AKHTER G

AKHTER HOUSE, PERRY ROAD,  
HARLOW, ESSEX CM18 7PN, UK  
TEL: HARLOW (0279) 443521

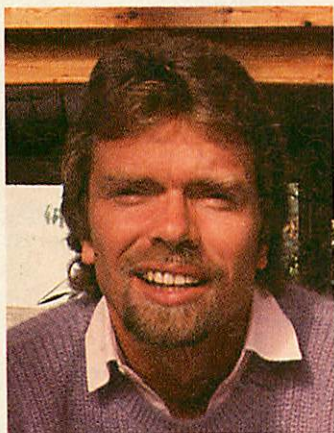
Dealer Enquiries  
Welcome

# Branson expands

The Branson empire continues to expand. Virgin Vision has announced the formation of a new subsidiary, Virgin Publishing, which will take on responsibility for software publishing and will be looking at other forms of electronic publishing as well.

In particular, Virgin is working on a number of interactive video projects, the first of which to be released is based on Sir Ranulf Fiennes' round the world expedition.

No doubt this subsidiary will be as successful as all the other companies Branson has launched – after all, Branson occa-



**Branson: into electronic publishing**

sionally gets his feet wet but somehow never seems to get his fingers burnt.

## Playing with profits

System Software, best known for its assembler package *Ade* and for the Island Logic *Music System* has moved into business simulations with the *Crisis Management* package.

Its latest software package, *Intervention*, is a decision making game in which teams of three to five set up and manage a manufacturing company.

The managers have to face all

the hazards of real business, like changes in the price of raw materials and natural disasters, while having to make all the crucial decisions in the running of the company.

It's interesting that, apart from the BBC micro and Master, the software is available only on business PCs. The price of the package on the Acorn machines is £115.

## News in Brief

■ Clwyd Technics has expanded its robotics and electronics range with a control card and printed circuit board designer for the Offboards system. The control card has eight input/output lines and is part of the Offboards approach of producing open-ended systems for education.

■ Yet another front end system for the Master has arrived. The new software goes by the tongue – twisting name of the *ADFS/SWR Management System*, or *ASMS* for short.

You can get *ASMS* for £16 as a ROM image on disc, or £19.50 if you want it on a chip.

is designed to work with *ADFS*, but can be supplied on a *DFS* disc too.

■ European printer manufacturers are rejecting the usual way of measuring printer speeds. The companies, which include Honeywell Bull, Philips and Olivetti, have abandoned the characters per second (cps) measurement in favour of pages per hour (pph).

The cps figures quoted for most printers are misleading in that they don't take into account paper and head movements. The new system will be more appropriate to new technology like laser printers.

## THE COMMS COLUMN

■ Early Archimedes micros including all those shipped to software houses, have a problem with hardware handshaking on the serial port. This is making the development of comms software for the machine difficult, as no-one is able to test their software on-line.

The problem arises only when the fast Archimedes tries to send data to a slow modem. The modem cannot cope with so much data and so toggles the CTS handshake line – causing problems at the Archimedes end. File transfers from other computers are unaffected.

Acorn is aware of the problem, and I assume that it will be put right when the final 512k operating system ROMs are released with volume production machines later this year. It is hard to see how any comms software can be released until the situation is resolved.

Jim Day of BBC Soft felt that its multi-function terminal, *ArcComm*, scheduled for release after Christmas should not be delayed by the difficulties, but other software producers we spoke to were not even aware of the problem. It makes you wonder how far they have progressed with development work.

■ Tandata, the Malvern-based modem company have set up a dial-up test system (see separate news story). The scheme is part of the company's promotion for the *TM722*, its new *V22/V22bis* (1200/2400 baud) modem, which at £499 + VAT is very competitive, provided you don't want the slower *V21* and *V23* speeds. Virtually every system (including *Prestel*, *Telecom Gold*, and *PSS*) now offers 1200 and 2400 baud.

Another inducement to buy this modem – for corporate users – is a free loan offer, a sort of 'on approval' system. Anyone thinking of buying at least six *TM722s* can borrow one for two weeks.

■ After escaping lightly from dissatisfied customers by restoring regular mailbox availability after months of patchiness, *Prestel* is once again upsetting its users.

Page \*92#, where your current bill is shown, has been altered to remove the cumulative quarterly totals. It now shows only the bill for your current call. Many people are complaining about this, saying that the cumulative totals were the only way to know if your account had been hacked, prior to receiving your quarterly bill.

*Prestel* says that the new system is a precursor to a more advanced billing information system to be introduced soon on printed bills, and in the future on-line. The *Prestel* chatlines are, full of mutterings about complaints to OFTEL and subscription cancellations.

■ This month our bulletin board spotlight falls on the *Gnome at Home*. This got a viewdata board has long been regarded as the premier private viewdata system. It was on special software written by the people who wrote the Acorn *Prestel* ROM and *Commsoft* software.

The board is hosted on an *Econet* with 20Mb hard disc, and contains lots of BBC articles, free telesoftware, and many separate message sections, including a private mail system for subscribers.

The *Gnome at Home* is on 01-888 8894 (two lines), with another four lines on a private number for subscribers.

David Atherton



**MD400 B**  
£135

**MD400 F**  
£87

**MD802 E**  
£261

**MD802 DM**  
£282

ALL PRICES EXCLUDING VAT

## BBC Compatible Disc Drives

**MD400B**

- Single 400K drive 40/80 track switchable, Double Sided, with PSU

**MD400F**

- 3.1/2" Single 400K drive, Double Sided

**MD802E**

- Dual 800K drive, 40/80 track switchable, vertically stacked, with PSU

**MD802DM**

- Dual 800K drive 40/80 track switchable, horizontally mounted in Monitor Stand, with PSU



**AKHTER**

**GROUP PLC.**  
TELEX 818894 AKHTER G

AKHTER HOUSE, PERRY ROAD,  
HARLOW, ESSEX CM18 7PN, UK  
TEL: HARLOW (0279) 443521

Dealer Enquiries  
Welcome



## Free gift!

If your programs use the user-definable function keys then you need a user-definable key strip! To use your free gift, use a water soluble felt tip – the sort used with overhead projectors – and simply write on your key definitions. You can wipe them off again when you have finished with them.

## Contacts

Big F Productions, 42 Brackyn Road, Cambridge CB1 3PQ. Tel: (0223) 210132.  
Bizzell Computers, Walnut Tree House, Fornsett St Peter, Norwich NR16 1HR. Tel: (095389) 592.

T K Boyd, Seaford College, Petworth, West Sussex.

Clwyd Technics, Antelope Industrial Estate, Rhydymwyn, Nr Mold, Clwyd CH7 5JH. Tel: (035283) 751.

Challenge Research, 218 High Street, Porters Bar, Herts EN6 5BJ. Tel: (0707) 44063.

Computer Concepts, Gaddesden Place, Hemel Hempstead. Tel: (0442) 63933.

Computer Park, 25 Bridge Street, Rothwell, Kettering, Northants NN14 2JW. Tel: (0536) 712627.

CyNCro 11-15 Oakland Road, Leicester. Tel: (0533) 709202.

Minerva, 69 Sidwell Street, Exeter EX4 6PH. Tel: (0392) 37756.

Rice Computers, PO Box 2, Morecambe, Lancashire LA4 4PP.

Simnett's, Unit 15, St George's Industrial Estate, Richmond Road, Kingston Upon Thames KT2 5BQ. Tel: 01-541 1495.

Spastics Society, 840 Brighton Road, Purley CR2 2BH. Tel: 01-660 8552.

Summit Software, 58 Oakdene Park, Craigavon BT63 5SB. Tel: (0762) 42510.

System 5th floor, Sheaf House, Sheaf Street, Sheffield S1 2BP. Tel: (0742) 768682.

Tandata, 50A Pall Mall, London SW1Y 5JQ. Tel: 01-839 3157.

UKAEA, 11 Charles II Street, London SW1Y 4QP. Tel: 01-930 5454.

Virgin Vision, 328 Kensal Road, London W10 5XJ. Tel: 01-968 8888.

# December graphics special

The December issue of *Acorn User* is a computer graphics special. Graphic artists Jonathan Inglis and Paul Bayley give the benefit of their experience with some advice on improving your drawing.

Brian Larkman examines the work of computer artist Karl Torok, whose distinctive style harks back to the Pointillist work of Seurat.

Joe's Jottings next month describes a program to design circuit boards.

Filing systems are Tessie Revis's subject in First Byte. Nick Evans and Chris Drage explore the potential of information technology in the classroom.

## Blunderbox

As many of you correctly pointed out, there is a misprint in October's competition. In question 1, '1542' should read '1642'. Sorry. And the checksum in Acorn Forum listing 5 applies only to the BBC model B. If you have a different computer, change line 1370 to say just '=TRUE'.



An example of Karl Torok's art, featured in next month's *Acorn User*.

## POST A PROBLEM

*Acorn User* has a guaranteed fast reply service for enquiries. Your answer will be returned within 10 working days for just £3 (includes VAT), or your money back.

Just write out your problem, fill in the coupon (right), and send both off to *Acorn User* with a stamped addressed envelope and cheque or postal order for £3. If you want recorded delivery add the cost of this on. Include as much detail as possible, and a disc or cassette if a program is involved, with enough space to record any corrected listing.

*Please note:* debugging readers' programs or those from other magazines is a complex task and we cannot guarantee to give a full solution. Unless the problem can be spotted quickly, the service will only be able to make general comments or suggest a strategy for the reader.

We will then answer the problem and return all material received – within a guaranteed 10 working days from receipt. If we fail to match this promise then your cheque or postal order will be returned with the answered question – you can't lose!

ACORN USER READER SERVICE  
20-26 Brunswick Place, London N1 6DJ.

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

POSTCODE \_\_\_\_\_

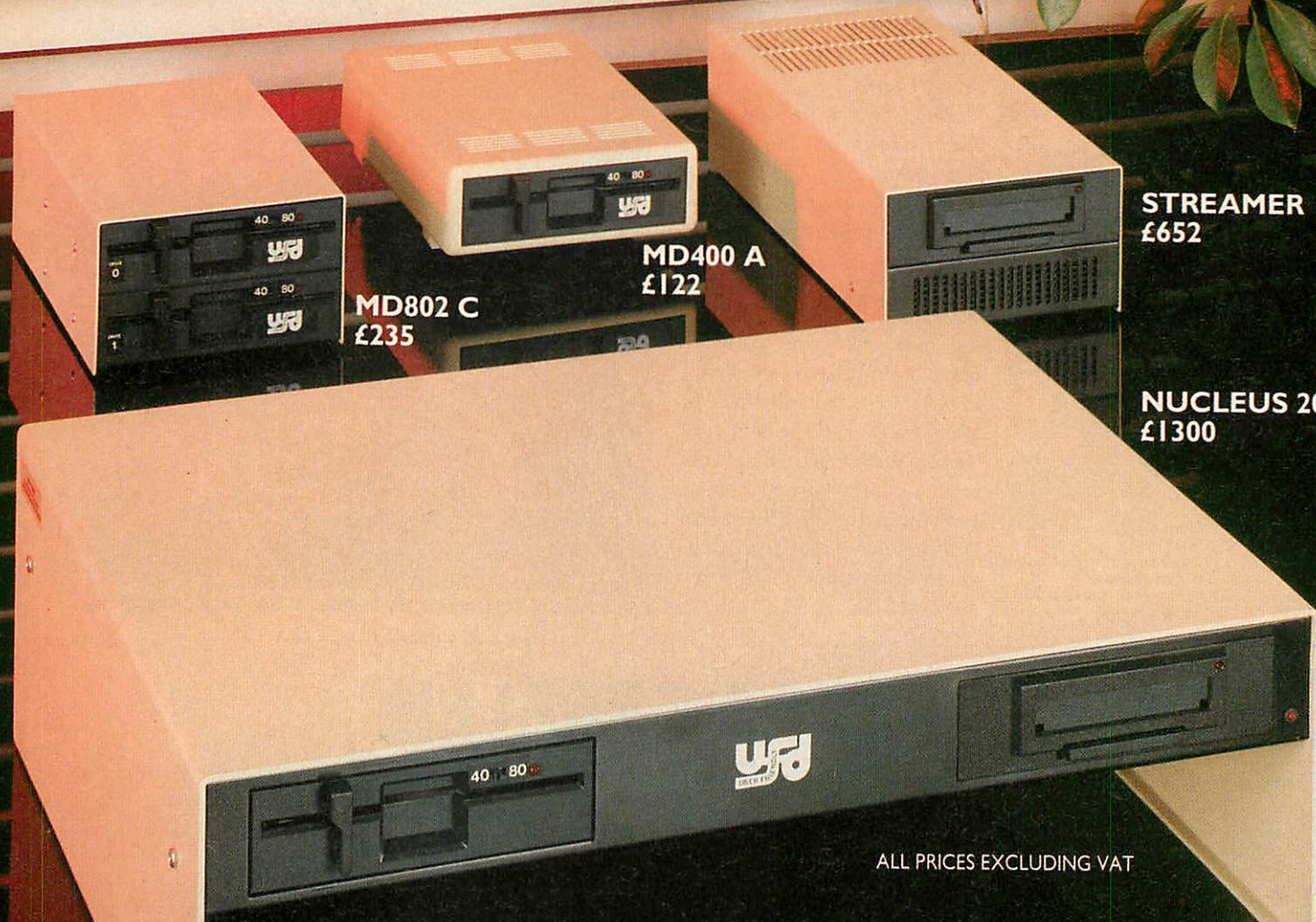
DAYTIME PHONE NUMBER \_\_\_\_\_

I enclose a cheque/postal order for £3 and an sae with my problem.

OFFICE USE ONLY Date in:

Date out:

Answered by:



**STREAMER 10**  
£652

**MD400 A**  
£122

**MD802 C**  
£235

**NUCLEUS 20**  
£1300

ALL PRICES EXCLUDING VAT

## BBC Compatible Disc Drives

- MD802C** – Dual 800K drive 40/80 track switchable, Double Sided
- MD400A** – Single 400K drive 40/80 track switchable, Double Sided
- STREAMER 10** – 10MB Stand alone Tape Streamer
- NUCLEUS 20** – 20MB Winchester, 10MB Tape Streamer and 1MB floppy disk drive 40/80 track switchable built into a Monitor Stand, with PSU



**AKHTER**

**GROUP PLC.**  
TELEX 818894 AKHTER G

AKHTER HOUSE, PERRY ROAD,  
HARLOW, ESSEX CM18 7PN, UK  
TEL: HARLOW (0279) 443521

Dealer Enquiries  
Welcome

# COMPETITION

## THE GREAT PAPER CONTEST

Design and write a newspaper and win an Archimedes. AMS Software and *Acorn User* are offering you the chance to own the world's fastest micro

Could you be a newspaper magnate? We want you to have a go, and perhaps win an exciting Archimedes micro in a competition run by *Acorn User* and leading software house AMS.

The aim of our competition is for you to produce a new national newspaper. In fact, you have to consider the whole process leading up to the launch of a paper, from planning to printing a 'dummy issue'.

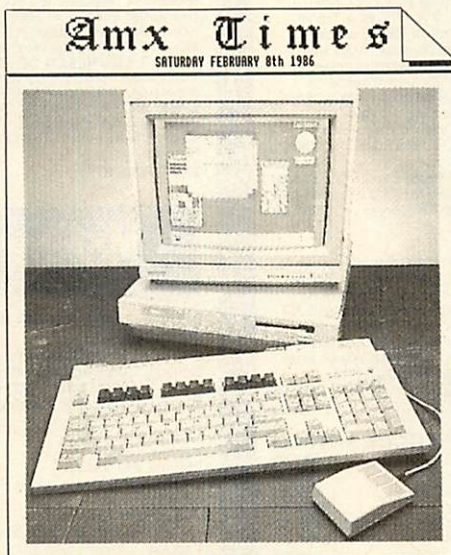
The competition will be judged in three age groups: under 14, 14 to 18, and over 18. Entries don't have to be from individuals: groups of people or even a school can enter. The judges will be Nick Pearson, managing director of AMS, *Acorn User's* Tony Quinn, and a senior journalist from the national press. They will be judging the entries on the technical merit of the newspaper and how well you have used the facilities of the software. But most important will be the journalistic quality and editorial content of the paper.

The prizes will be over £250 worth of AMS software for the best entry in each age group – *Super Art*, *Extra Extra*, *Max*, *Design* plus a new mark 3 AMX Mouse. The overall winner will receive an Archimedes 305, the acclaimed new BBC micro, complete with monitor.

### New newspaper

There's lots of advice available to help you with your newspaper. The June 1987 issue of *Acorn User* contained a number of articles on desktop publishing, and there were useful tips in the August issue too. The education section this month discusses how publishing software can be used in school.

The first thing to tackle is a synopsis defining your target readership. This is a list of the types of stories that you want to cover in your newspaper. Should it be hard-hitting and investigative? Entertaining? Report lots of gossip? Or just hard news? Work out who your readers should be and think about what makes your paper new and different. Try to work out what the contents of a typical issue should be to appeal to those readers. Remember this should be a national newspaper although it



The Arc could soon be yours



The Independent: Newspaper of the year

could aim at a major specialist group like schoolchildren, teenagers, sports enthusiasts or motorists, for example.

Now plan which parts of the paper should go where. Most of the quality national dailies stick to a strict formula and following a similar plan is a good idea.

We would like you to produce the front page, plus any one of the inside pages that you've planned. The front page should of

course include the title of your newspaper, the main news stories you wish to report, and an index to the rest of the paper. News stories should be original and topical. They should display balance and judgement, and have true journalistic value.

The inside page can be from any part of the paper. Again, take as much care over the editorial content as over the page layout.

You can use any of the desktop publishing packages for the BBC micro range – another way is to use a wordprocessor and a graphics package. The only stipulation is that all the software must be run on the BBC micro, Master or Compact with any printer, but a laserprinter isn't allowed.

The pages of your newspaper should be about A3 size, that's 42cm by 30cm – in other words like *Today* or the *Daily Mirror*, a 'tabloid'. It means you'll have to use more than one 'page' from a desktop publisher to make up each page of newspaper; probably four or five 'pages' stuck together will look best. You could even try a broadsheet like *The Independent*.

The pictures can be produced on a BBC micro, using an art package, or they can be real photographs, or you can cut them out from other magazines or newspapers. Of course, you should make sure they are relevant to the stories you have written.

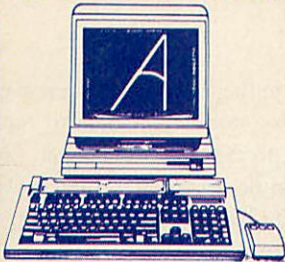
### How to enter

To enter, send us your synopsis (no longer than two pages of A4), the list of typical issue contents, and of course the two complete pages from your newspaper. Don't forget to include your name and age, or your school class, and an address and daytime telephone number. Entries should be sent to *Acorn User* at our new address, Redwood Publishing, 20-26 Brunswick Place, London N1 6DJ. Please include suitable packaging and postage if you want your entry returned. Closing date for the competition is February 29, 1988. Judging will take place in March, and the judges decision is final.

An *Acorn User* reader offer for AMX Stop Press and the AMX Mouse, offering a £10 saving, it on page 46.

# TWILLSTAR COMPUTERS LTD

## Computers



### ARCHIMEDES HIGH PERFORMANCE COMPUTER SYSTEMS

Archimedes systems use the Arthur operating system, a new version of the BBC Micro operating system. BBC BASIC is replaced by a new extended version, BBC BASIC V. The speed and power of Archimedes allows the programmer to exploit RISC architecture with a range of high level languages for scientific engineering and business uses. In addition to BBC BASIC V, Acornsoft's development languages include C, ISO-Pascal, FORTRAN, Lisp and Prolog. The Acornsoft Software Developers Toolbox provides utilities to simplify program development and debugging; while an extensive Software Developer's Debug Tool facilitates high level language development in C, Pascal or FORTRAN. All Archimedes Systems have a floating point emulator as standard. On the 400 series, complex mathematical calculations can be further enhanced by the addition of a floating point unit (FPU). All machines have feature: 32 bit RISC technology - BM enhanced style keyboard with 3 button mouse - BBC Micro style operating system (Arthur) - BBC BASIC V - interfaces; printer, serial, monitor, stereo sound - ECONET plug-in option - a variety of podules can be fitted. Archimedes is an open system and its flexibility is achieved by fitting any of the following podules (peripheral modules) via a back plane: hard disk controller (300 series only) - ROM extension board - MIDI music interface - MS-DOS co-processor - SCSI - hardware floating point unit - Ethernet podule.

**THE 300 SERIES** Consists of two models, Archimedes 305 0.5 Mbyte of RAM and Archimedes 310 with 1 Mbyte of RAM. Both machines have a 512 Kbyte ROM and a 1 Mbyte (unformatted) 3 1/2" disc drive.

**THE 400 SERIES** Offers increased expansion capabilities. The Archimedes 410 has 1 Mbyte of RAM, 1 Mbyte (unformatted) 3 1/2" disc drive, a hardware floating point unit option, a co-processor bus, a hard disk controller, a four socket back plane, 512 Kbytes of ROM. At the top of the range is Archimedes 440. This machine possesses all the features of the 410 as standard, with the adoption of 4 Mbytes of RAM and a 20 Mbyte hard disk.

305 BASE AKB10	918.85
305 & mono monitor	976.35
305 & colour monitor	1148.85
310 BASE AKB15	1006.25
310 & mono monitor	1063.75
310 & colour monitor	1236.25
410 BASE AKB26	1608.85
410 & mono monitor	1666.35
410 & colour monitor	1838.85
440 BASE AKB20	2643.85
440 & mono monitor	2701.35
440 & colour monitor	2873.85
Archimedes/Master Econet	49.99
0.5 MB RAM	102.35
Floppy disk	143.75
20 Mbyte hard disk & podule (300 only)	573.85
Podule Backplane	40.25
ROM Podule	TBA
I/O Podule	TBA
MIDI add-on to I/O	TBA
A series reference manual	£19.95

### MASTER 128

Complete With Internal Software	£399.00
Master Turbo Upgrade	£113.95
Master Econet Module	£46.00
Master ET	£349.00
Master 512 Upgrade	£217.35

The Master 512 upgrade board incorporates the Intel 80186 processor, plus 512K bytes of RAM. Digital Research DOS+, which is compatible with both MS/DOS version

2, and CP/M 86, allows you to run a large proportion of the most useful programs available. A dual 80 track disc drive is required to run programs on the 512. Provided free with 512 upgrade board are three GEM packages, GEM Desk Top, GEM Write, GEM Paint.

### UNIVERSAL SECOND PROCESSOR

This allows you to connect co-processor boards designed for the Master Series to your BBC Models B or B+. Fitting a Turbo board boosts the BBC's already rapid performance to twice the speed of the standard processor. Fitting the 512 co-processor converts the BBC micro into a 16 bit machine, opening up new possibilities within the world of MS-DOS and CP/M 86.

£86.25

Eprom Cartridge £14.95

Reference Manual Part 1 £14.95

Reference Manual Part 2 £14.95

Acorn Teletext Receiver £108.00

### FILESTORE

Filestore provides shared access to file and printer services on Econet.

The filestore consists of two units - a dual 3.5 inch floppy disc unit 1.2 Mbytes of storage (Filestore EO1) which can be expanded with a high performance 20 Mbyte Winchester disk drive unit (Filestore E20).

FILESTORE EO1 £952.00

FILESTORE E20 £829.00

### ECONET ACCESSORIES

100m Cable £89.00

Station Lead Set £29.00

Econet Starter Kit £99.00

Econet Bridge £199.00

Level 1 Fileserver 40 Track £99.00

Level 2 Fileserver 80 Track £235.00

Print Server Eprom £49.00

### BBC Upgrades

64K Upgrade Kit £39.95

1770 Upgrade Kit £49.94

ADFS ROM £29.95

Disc Upgrade Kit £65.00

Econet Upgrade Kit £49.00

DNFS ROM £20.00

### WORD PROCESSING SPECIAL PACKAGE

#### PACKAGE 1

Based on Master 128. The Twillstar All in One Word Processing Package contains a Master 128, View 3.0, Viewsheet, High Res Green Monitor, 800K Dual Drives with PSU, Quendata Daisy Wheel Printer together with a box of Discs, Paper, and all the Cables. £899.00

#### PACKAGE 2

Based on Master Compact 128. The Twillstar package includes Compact 128, latest version of the View Word processor, single 640K disk drive, monochrome monitor, correspondence quality printer. All connecting cables for above and also 5 disks and some paper. £635.00

### BBC Master Compact

Twillstar continues to offer the MASTER COMPACT for your Home Education and Business needs! Complete with bundled software and an integral 3.5" Disk Drive in the following Systems:-

**ENTRY SYSTEM** £360.00

\*128K \* Single 640K Drive \* bundled software\*

**TV SYSTEM** £375.00

\*128K \* Single 640K Drive \* UHF Modulator \* Bundled Software\*

**MONO SYSTEM** £412.00

\*128K \* Single 640K Drive \* Bundled Software \* 12" High Res Monochrome Monitor\*

### COLOUR SYSTEM £565.00

\*128K \* Single 640K Drive \* Bundled Software \* 14" Medium Res Colour Monitor\*

**SPECIFICATIONS:** \* Compatible with Master Series micro subset \* 128K RAM inc 64K sideways RAM \* 64K ROM inc 32K MOS, 16K BASIC \* Up to 4 internal ROM sockets \* 3.5" 640K formatted disk drive \* OUTPUTS: Video/RGB/Printer/Mouse or Joystick \* Disk drive \* (optional) Econet \* Serial \* 5V power from disk drive module \* Usual 8 BBC display modes inc. Mode 7 \* **BUNDLED SOFTWARE:** Pull down menus \* Desk top inc. note pad, calculator \* VIEW 3.0 \* CARD INDEX \* Full LOGO \* BBC BASIC 4.0 \* ADFS + Utils \* Welcome suite \* Tutorials \* (1770 DFS under licence)

2nd DRIVE KIT £113.00

£113.00

### Monitors

#### MONOCHROME MONITORS

Philips BM 7502 12" hi res. P31 Green Phosphor Screen. CVBS input. Audio input. Band width 20 MHz. 2000 CHRS Display. Adjustable viewing angle. £79.00

Philips BM 7522 Amber Screen £95.00

Philips BM 7542 Dedicated WD phosphor Screen monitor £95.00

Philips BM 7513 12" Green IBM compatible £120.00

**TAXAN** New Taxan Monochrome Screens Taxan KX117 12" Green Screen P31 £89.00

Taxan KX118 12" Green Screen P39 £99.00

Taxan KX119 12" PUL Amber Screen £99.00

£99.00

### COLOUR MONITORS

Microvitec 1431 Std Res £201.25

Microvitec 1451 Med Res £255.00

Microvitec 1441 Hi Res £391.00

Microvitec 2030 Cs 20 Std Res £425.50

Microvitec 1431 AP Std Res £224.25

Microvitec 1451 Ap Med Res £293.25

£293.25

### PHILIPS

New from Philips Philips CM8833 14" CVBS and RGB medium resolution colour monitor. IBM PC compatible. Fast blankup to enable superimposing. Stereo Audio. Ear phone socket. 600 dots x 285 lines vertical. £269.00

Philips CM8852 14" RGB professional med res colour. 700 dots x 285 £289.00

Philips CM8873 14" RGB high resolution colour monitor Res 850 x 480 £550.00

£550.00

### Taxan Super Vision 620

High Resolution colour monitor with several unique features, at an affordable price.

**SUPERVISION 620** 12" RGB High resolution colour monitor. Fully compatible with IBM, Apple, BBC and most other Personal Computers. 635 x 312 line resolution. Positive or negative sync input. Text colour switchable to green, amber, white or blue or inverse white. Super high contrast tube. Optional tilt-swivel base (with clock/calendar available). Special introductory offer. £299.00

£299.00

### NEW SUPERVISION 625

12" high resolution colour monitor. 661 dots x 312 lines £369.00

£369.00

### MONITOR TO TV CONVERTER

AV 7300 Colour tuner module Push button control. 12 preset channels. Built in aerial. Compact design. Composite video only £69.00

£69.00

### Mitsubishi 1404 Medium

Resolution Monitor with 640 X 200 Pixels RGB available with IBM or BBC Leads. £249.00

£249.00

## Disc Drives

### MITSUBISHI DISC DRIVES

User Friendly Disk Drives 100% BBC compatible slimline disc drives. All drives are supplied complete with formatting diskette, comprehensive users manual and all necessary cables. All drives are 40/80 Track switchable at the front and have two years warranty.

#### 5 1/4" Drives without P.S.U.

MD 400A Single 400K Double Sided £118.00

MD 802C Dual 400K Double Sided £219.00

£219.00

#### 5 1/4" Drives with P.S.U.

MD 400B Single 400K Double Sided £135.00

MD 802E Dual 400K Double Sided £249.00

£249.00

### SPECIAL

MD 802D Dual 400K Drives horizontally mounted in a monitor stand to fit both the BBC B and the Master series. £269.00

£269.00

### SOURCE DISK DRIVES

Source SD35 3 1/2" disk drive, single drive £85.00

£85.00

Source SD352 3 1/2" dual drive £149.00

£149.00

Supplied cased complete with cables, powered from computer. Extended two year warranty.

Source SD35S 3 1/2" single drive with P.S.U. £135.00

£135.00

Source 352S 3 1/2" dual drive with P.S.U. £199.00

£199.00

Source SD3545S Combo dual 5 1/4" and 3 1/2" drives with P.S.U. £249.00

£249.00

### Winchester Disk Drives

#### WINCHESTER DISK DRIVES

Source HD20 Twillstar's 20 Mbyte winchester drive including Acorn DFS ROM complete with P.S.U. £599.00

£599.00

Source HDP201 Twillstar's 20 Mbyte winchester drive and a 400k double sided floppy drive built in a plinth to accommodate monitor on the top and the computer underneath. Includes ADFS ROM and P.S.U. £869.00

£869.00

Source TS10 10 Mbyte tape streamer backup unit with utilities £695.00

£695.00

Other size hard disks are available, please call for our latest prices.

### Accessories

Taxan KIF 4308 buffer compatible with any Centronics interface printer £149.00

Further 64k upgrade available. Printer/Computer sharers. £39.00

2 - 1 £79.00

6 - 1 £67.82

£67.82

### Serial and Parallel T Switches

Parallel T switch £67.82

£67.82

Serial T switch £67.82

£67.82

### FLOPPY DISKS

Raven 5 1/4" pack of 10 in a clear library box £15.00

£15.00

Raven 5 1/4" rainbow colour pack of 10 in library box £17.00

£17.00

Raven 3 1/2" single sided pack of 10 in library box £18.00

£18.00

Raven 3 1/2" double sided pack of 10 in library box £25.00

£25.00

### LOCKABLE STORAGE BOXES

Trackmaster 5 1/4" 70 x 5 1/4" lockable £7.95

£7.95

Trackmaster 5 1/4" 100 x 5 1/4" lockable £9.95

£9.95

Trackmaster 3 1/2" 40 x 3 1/2" lockable £6.95

£6.95

Trackmaster 3 1/2" 100 x 3 1/2" lockable £9.95

£9.95

# YOUR ONE STOP MEGA-COMPUSTORE FOR HOME, EDUCATION & BUSINESS NEEDS!

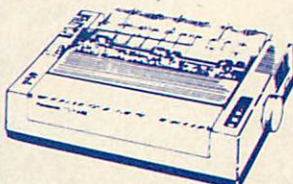
## Printers

### SPECIAL OFFER

SAVE **£29.00**

**FREE PRINTER STAND**  
**FREE BBC CABLE**  
**200 SHEETS OF PAPER**

When you buy a **Panasonic KX-P1081** The faster and enhanced KX-P1081. 120 cps in draft mode. 24 cps in NLQ mode. Fully Epson RX80 and IBM Matrix and Graphics Printers compatible. Standard friction and tractor feed. Operator accessible print mode switch. Standard 8 bit parallel interface. RS232 interface is optional **£179.00**



### EPSON PRINTERS

**LX-800** £228.85  
Draft print to 180cps. NLQ text to 25cps. Two correspondence fonts. Full-feed tractor supplied as standard. IBM character set. Integral 3K buffer. Graphics capability. Push-button controls. Standard centronics interface.

**FX-800** £368.00  
**FX-1000** £497.95  
Correspondence quality to 40cps. Draft speed to 240cps. Wide range of types. High resolution graphics. Powerful 8K buffer. IBM character set. Easy-reach control panel. Choice of wide or narrow carriage. Tractor feed now standard.

**EX-800** £458.85  
**EX-1000** £626.75  
Fast 300cps draft print. Correspondence quality to 50cps built in. High resolution graphics. Powerful 8K buffer. IBM character set. Advanced front control panel. Choice of wide or narrow carriage. Standard push-feed tractor. Short tear-off feature. Two-stage automatic paper loading. Reverse paper feed.

**LQ-800** £494.50  
**LQ-1000** £667.00  
Superb letter quality print at 60cps. One letter font built in. High resolution graphics. Powerful 7K buffer. Draft speed 180cps. Easy-use control panel. Choice of wide or narrow carriage. Serial and parallel interfaces built in.

**LQ-2500** £994.75  
Superb letter quality at 90cps. Draft speed to 270cps. Five fonts built in. High resolution graphics. Powerful 8K buffer. IBM character set. New select Type panel replacing DIP switch. Push-feed tractor built in. New LCD message screen. Serial and parallel interface built in.

**SO-2500** £1294.90  
Virtually silent print. Superb letter quality at 180cps. Draft speed of 540cps at 12cpi. Five fonts built in. High resolution graphics. Powerful 8K buffer. IBM character set. New select Type panel replacing DIP switch. New LCD message screen. Serial and parallel interface built in. £50dBa

### CREDIT FACILITIES

Full credit facilities now available nationwide  
\* **LOW DEPOSITS**  
\* **FAST FRIENDLY SERVICE**  
\* **UP TO 3 YEARS TO PAY**  
Call for further details

Typical APR 36.3%

### CANON PW1080A

80 column printer with 160 cps draft and 40 cps NLQ with built in friction and tractor feed. Fully compatible with Epson FX80. Standard parallel interface. **£249.00**

### CANON 55A

Wide version. Fully IBM compatible. **£399.00**

### STAR NL-10

Fine Near-Letter-Quality, 100% compatibility and total reliability all in one easy to use printer **£209.00**

### STAR NX-15

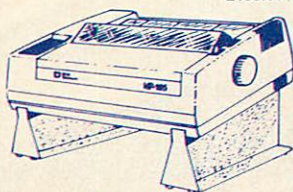
Same as Star NL-10 but with 136 column width. Both Epson and IBM compatible **£399.00**

### MP200

200 cps in draft. 40 cps in NLQ mode. 7K buffer as standard (128 downloadable characters in NLQ) optional 8K memory. IC font cards. **£274.85**

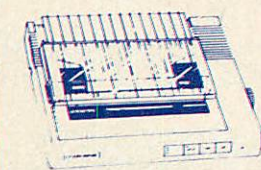
### MICRO P MP165

80 Columns. 165 cps in draft mode. 35 cps in NLQ mode. Ultra high resolution graphics. Friction and traction feed. 2 Year warranty. Epson or IBM compatible control codes. **£199.00**



### MP201

Same as MP200 with 136 columns **£318.55**



### MP135

#### Just released

135 cps, 80 column printer. Friction/tractor feed. NLQ. Epson & IBM Compatible **£145.00**

### MP480

#### New

Fast reliable 480 cps dot matrix printer. 74 cps, NLQ, 80 column, fully Epson & IBM compatible, Std parallel **£349.00**

### TAXAN KXP815

Taxan KXP 815 New enhanced KP 810 with 160 cps and fully Epson & IBM Compatible **£299.00**

### TAXAN KXP915

Taxan KXP 915 New enhanced KP 915 with 180 cps and fully Epson & IBM Compatible **£420.00**

### CITIZEN MSP10E

160 CPS Draft and 40 CPS NLQ. With two years warranty **£269.00**

### CITIZEN MSP-15E

17" wide carriage. 136 column operating at 160 CPS and at the flick of a switch will print near letter quality at 40 CPS. Fully Epson and IBM compatible. 8k of standard buffer built in. Standard Centronics are optional RS232 **£379.00**

### CITIZEN 120D

Bringing to the small business, educational and home user good quality and attention to detail. Its compact size, host of standard features and built in quality and reliability that supports Citizens unique full 2 year warranty make it a must for all computer users. Fast draft output: 120 cps. Built-in NLQ: 25 cps. IBM and Epson compatible. Plug-in interface cartridge. Tractor and friction feed as standard. Optional cut sheet feeder. **£172.50**

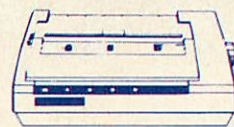
### CITIZEN LASER OVERTURE 110

Overture 110 Prints 10 pages per minute. Comes complete with print internal controller with print resolution of 300 x 300 dots per inch. Print capability of Standard Text, IBM & Epson bit-map graphics, IBM graphic character set, Epson graphic character set. Resident fonts are: Citizen Pica upright/italic, Citizen Elite upright/italic, Citizen Courier, Citizen Bookface (over 56 typefaces), downloadable one character set in Epson Mode. 11 international character sets. Standard Centronics Parallel and Serial RS232C. Standard 512K memory 384-byte user available. Fully compatible with Epson FX1000 IBM Proprietary & Diablo 630. **£1529.50**

## SOURCE

The Complete Solution

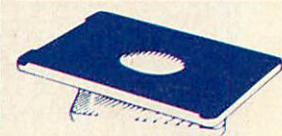
### TECO VP1814



Dot matrix printer. The VP1814 is fast highly reliable and easy to operate.

- ★ Standard 80 column
- ★ The high-speed, low energy consumption 9 wire dot head gives printing speed of 189 cps and NLQ speed 36 cps
- ★ Bi-directional, Logic seeking in text mode
- ★ Fan-fold, roll or cut-sheet paper is possible with adjustable sprocket pin feed and friction feed
- ★ Offers: emphasized, double print, super script, sub script
- ★ Justified print modes are also available including left, centre, right and full justification
- ★ 9 graphic modes are available
- ★ Both download and inprint buffer can exist simultaneously
- ★ 7K input buffer standard can be expanded to 15K
- ★ Printing modes selectable at front panel (NLQ/draft, Pica/Elite, enlarge, emphasize, condense, italic
- ★ 11 Language international character font is internalized
- ★ Both IBM and Epson compatible

MAIN UK DISTRIBUTOR **£199.00**



### SWIVEL BASE OFFER

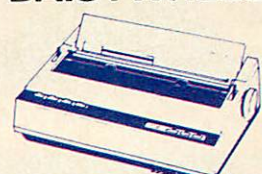
Special summer price Tilt and swivel base for 12" or 14" monitor or TV. "Looks very elegant" at an unbeatable price. **£9.95**



### PRINTER STAND

Fits nearly any width of printer. Allows paper storage and gives ideal viewing position. Can also be used for computers and monitors. Steel construction prevents bending or buckling **£18.00**

### DAISYWHEEL



### PANASONIC KX-P3131

A Fully Formed Serial Impact Daisywheel printer with print speed of 17cps. Diablo compatible print wheels. Print pitches available are: 10, 12, 15 and proportional spacing. Standard friction feed and optional tractor. Paper width 13.5 inches. Standard Centronics optional RS-232C. Built with 6K text buffer expandable to 32K buffer. **£289.00**

### BROTHER HR 20

The new Brother Daisywheel HR 20 8K standard buffer upgradable to 16k. Comes standard with serial and parallel port **£389.00**

### JUKI Daisywheel

Juki 6100 **£329.00**

### NEW MP26 Daisywheel

MP26 A feature rich very quiet printer. Universal compatibility with almost all personal computers at an unbeatable price. Speed: 26 cps. 132 columns Diablo 630 compatible **£249.00**

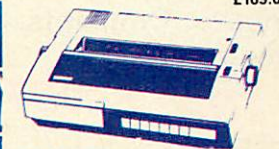
Optional Tractorfeed **£95.00**  
Optional Sheet feeder **£145.00**

### MP40

A very fast, quiet printer with features and compatible with virtually all computers at a fantastic price. 40 cps, 132 column, diablo 630 interface, parallel interface, built in standard RS232 optional **£355.00**

### GAKKEN GPR-2000

Print speed of 18 characters per second. Fully Qume compatible. Takes Qume exchangeable Daisywheel and ribbons. Selectable 10,12 & 15 pitch. Supports proportional spacing. Standard friction feed. Tractor/cut sheet feeder and serial interface optional. **£169.00**



## How to Order

You can purchase any of the items listed. All you have to do is write your requirements on a sheet of paper, and we will despatch your goods within 24 hours, subject to availability. Please add the following amounts for Postage and Packing.

Items below £10.00 add £1.50  
Items below £50.00 add £2.50  
Items below £100.00 add £3.50  
Items over £100.00 add £8.00 (UK Mainland only)

All prices include VAT at 15% 'No Hidden Extras'

Prices correct at time of going to press but subject to change without notice.

Please make cheques payable to:

**TWILLSTAR COMPUTERS LTD.**

Access/Visa Card Holders:

Welcome. Call now on:-

**01-571 5938 or 574 5271**

**TWILLSTAR COMPUTERS LTD**

**APEX HOUSE**  
**BLANDFORD ROAD**  
**NORWOOD GREEN**  
**SOUTHALL**  
**MIDD UB2 4HD**  
☎ **01-574 5271** or  
☎ **01-571 5938**  
Telex: 25247 Telex G.attn TIL  
Fax: 01-547 4326



Royal Horticultural Hall  
Westminster, London SW1



SEE the first software, hardware and books for the Archimedes from companies like Acornsoft, Clares, Minerva, Computer Concepts, and many others.

**BUT THAT'S NOT ALL!**

- ★ Hardware and software galore for BBC Micro and Electron owners
- ★ Lots of bargains for the BBC Micro and Electron at rock-bottom prices
- ★ Technical advice from the experts over the whole range of Acorn machines

10am-6pm, Friday November 13  
10am-6pm, Saturday November 14  
10am-4pm, Sunday November 15

## Here's your personal invitation to try out the revolutionary Archimedes for yourself

Be one of the first to play Zarch, the spectacular new game that is the first to make use of the Archimedes' incredible speed to magnificent effect – the four-directional scrolling really has to be seen to be believed!

Come along and meet the author, David Braben, creator of Elite. Try your hand at the game itself . . . and prepare to be amazed!

All this – and much, much more – at the 17th record-breaking Electron & BBC Micro User Show.

**Save £1 a head with this advance ticket order**

Please supply:

Adult tickets at £2 (save £1)..... £

Under-16s tickets at £1 (save £1)..... £

Total £ \_\_\_\_\_

Cheque enclosed made payable to Database Publications Ltd.

Please debit my credit card account

No.

Signed.....

Admission at door:

£3 adults, £2 under 16's

Post to: Show Tickets,  
Europa House, 68 Chester Road,  
Hazel Grove, Stockport SK7 5NY.

Name.....

Address.....

A069

PHONE ORDERS: Ring Show Hotline: 061-480 0171

PRESTEL ORDERS: KEY \*89, THEN 614568383

MICROLINK ORDERS: MAILBOX 72:MAG001

Please quote credit card number and full address



# THE NEW AMX MK. III MOUSE. TRAP ONE SOON.

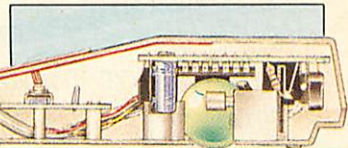


The MK III AMX Mouse is a product of Swiss precision and the result of a world-wide search to find a worthy successor to the AMX Mouse MK II.

The new Mouse has been specifically chosen to be the perfect partner to the ever expanding range of AMX software. The unique patented design includes high resolution D.P.I. and superior ball technology to ensure that contact between the Mouse and the surface is constant at all times.

There's a new shape too, that fits comfortably in the hand.

The AMX Mouse MK III costs only £34.99 or you can join the great "Mouse-Swap". Part exchange your old Mouse for the MK III for only £29.99.



## \*SUPERART

AMX MOUSE MK III PLUS SUPERART 16K ROM, PLUS DISC £79.99

Acknowledged as the most sophisticated, yet easy to use paint package available for the BBC Micro, it's no wonder over 20,000 have already been sold.

'Superart' features include cut, copy, paste, move, rotate, plus many, many more such as fantastic spray and zoom facilities.

Available for BBC B, B+; Master 128, and Master Compact. Please state which version is required when ordering.

**SUPERART (ONLY) £49.99**

**PICTURE GALLERY 2 x FLIPPY DISC £24.99**

Instant art! A collection of fine drawings produced by acclaimed artists using superart.

## \*STOP PRESS

AMX MOUSE PLUS STOP PRESS 2x16K ROM, 2xDISC £79.99

The most highly acclaimed desktop publishing software available for the BBC Micro. Already thousands of users are producing professional documents, newsletters, flyposters etc. in fact anything where text and graphics are required.

'Stop Press' comes complete with 16 variable typefaces.

Available for the BBC, B+ and Master 128. Please state which version is required when ordering.

**STOP PRESS (ONLY) £49.99**

**EXTRA! EXTRA! 2 x FLIPPY DISC £24.99**

300K fantastic clip art, over 25 fonts and utility software.

## \*MAX 16K ROM £19.99

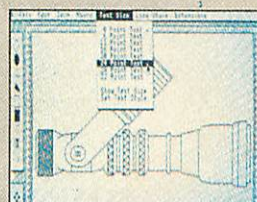
MAX provides an easy to use graphic based front end to your computer's disc filing system including a comprehensive set of disc management operations such as cataloging, copying, deleting and re-naming. You can also run programs from within MAX. Available for the BBC, B+, Master 128 and Master Compact. Please state which version is required.



## \*AMX DESIGN 32K ROM AND DISC £69.99

A highly sophisticated CAD package which allows the user drawings to be produced such as a simple PCB design up to the most intricate, architectural drawing.

Advanced features include full zoom and macro facilities, 58x58 screen canvas, full supported printer and plotter output. Available for the BBC, B+, Master 128 and Master Compact.



**FANTASTIC  
AMX  
SOFTWARE  
OFFER!**

The additional AMX Software range that requires the original AMX Art Rom or Super Art Rom including: 3D Zicon normal price £24.99 Database normal price £24.99 XAM normal price £24.99 MindGames normal price £14.99. Total price - £89.96 but now available as a complete package at only £69.99. These superb products are available from all good computer dealers or direct by Cheque, Access or Visa. All prices include VAT and post and packaging.



**FOR INSTANT ACCESS, VISA ORDERS TELEPHONE (0925) 413501/2/3**



\* ALL THESE PROGRAMS WORK WITH  
KEYBOARD, JOYSTICK OR MOUSE.

# AMX SOFTWARE

· IMAGINATION AT YOUR FINGERTIPS ·

ADVANCED MEMORY SYSTEMS LTD. 166/170 WILDERSPOOL CAUSEWAY, WARRINGTON, WA4 6QA. TELEX 628672 AMSG. FAX 0925 58039.  
TUBELINK ON PRESTEL PAGE 2582182 SUPPORTS THE AMX MOUSE, AND ALL AMS SOFTWARE.

## EDUCATION

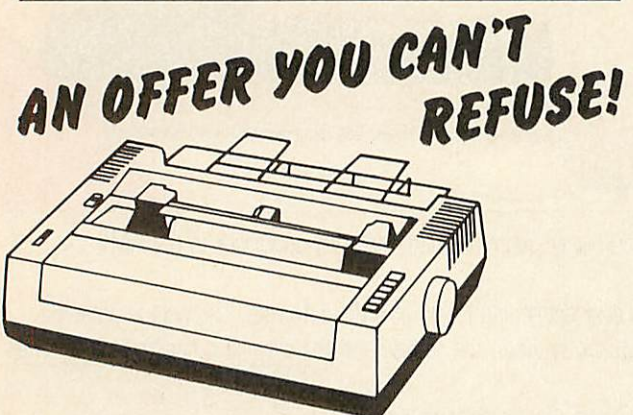
Superart and stop press are now available under licence for ECUNET levels 2 and 3. Please apply direct for Educational Discounts.



CARD DEVICES

## BBC PERIPHERAL SPECIALISTS

### PRINTERS



This Panasonic KXP 1081 is the very latest in impact dot matrix printers.

It's very user friendly, with operator accessible print mode switch.

- ★ 120 cps draft printing.
- ★ 24 cps near letter quality (NLQ).
- ★ Parallel interface as standard, with optional Serial interface.
- ★ Epson and IBM compatible through dip switch settings.
- ★ Epson compatible mode including elite, emphasised, double strike, condensed, superscript.
- ★ 10, 12, 15, 17 characters per inch (cpi), italics and proportional in NLQ.
- ★ Prints 80 columns on A4 cut sheets, continuous stationery or roll paper.

*We don't need to give away any freebees; from us you get peace of mind with 2 years no quibble warranty.*

For only **£165** + V.A.T. KXP 1081

Panasonic Daisy Wheel also with 2 years warranty.

For only **£250** + V.A.T. KXP 3131.

### DISC DRIVES SALES & SERVICE

Your complete answer to disc drive problems. We repair any repairable BBC disc drive. We have been repairing disc drives for nearly as long as they have been around.

Canon have appointed us to repair and service their disc drives in U.K.

Our experience speaks for itself.

Alignment, Repair and Test is **£25.00** + V.A.T. and parts when necessary

400K 40/80TK single with PSU, disc drive **£145.00** + V.A.T.

800K 40/80TK dual with PSU, disc drive **£265.00** + V.A.T.

Limited stock of the obsolete MDD 220 (40/80 400K) for any one who needs a second drive **£89.00** + V.A.T.

Winchester Hard Disc Systems, 20 MEG for only **£475** + V.A.T. while stock last

### CONSUMABLES

**PAPER** Plain white with micro-perf edges

11 × 9½	60 gsm	2000 sheets	£12.50
11 × 9½	70 gsm	2000 sheets	£15.50

**DISKETTES** Only quality labelled discs supplied all in plastic cases.

*per box ten*

Dysan 40 TK double sided/double density 104/2D	£12.00
Dysan 80 TK double sided/double density 204/2D	£18.00
Maxell 40 TK double sided/double density MD 2D	£11.00
Maxell 80 TK double sided/double density MD 2DD	£17.50

*Don't compromise on the quality of the discs you buy just to save a few pence.*

**PLASTIC PRINTER STANDS** **£19.95** + V.A.T.

**DELIVERY:** 3 day courier on printers, disc drives and repaired disc drives is **£6.00** inc. V.A.T.

P&P on consumables is free.

**TO ORDER:** Please remit by cheque/postal order Access/Visa to: Card Devices Ltd., Padmores Yard, St. Johns, Woking, Surrey GU21 1SE.

Please allow maximum 14 days for delivery.

**SALES HOTLINES:** ☎ (04862) 65634/66996, Telex: 858541 CARDD G



# Computers by Post

## LOWEST U.K. PRICES GUARANTEED



### PRINTER RIBBONS

		2+	5+	12+	
<b>ACORN</b>	AP80	£2.70	£2.20	£2.00	
	AP100	£2.70	£2.20	£2.00	
<b>AMSTRAD</b>	DMP1	£3.90	£3.30	£3.10	
	DMP2000/3000	£4.40	£4.10	£4.00	
	PCW8256/8512	£4.30	£4.00	£3.80	
<b>BROTHER</b>	HR5	£3.00	£2.80	£2.60	
	HR15 Corr	£2.90	£2.50	£2.30	
	HR15 FAB	£3.30	£2.90	£2.60	
	HR15 MS	£3.20	£2.80	£2.50	
	HR15 also for HR25/HR35				
	EP44	£2.90	£2.50	£2.30	
<b>CANON</b>	M1009	£3.40	£2.90	£2.70	
<b>CANON</b>	PW1080A Black	£3.10	£2.60	£2.40	
	PW1080A Red or Blue	£4.50	£4.10	£3.80	
	PJ1080 Ink Jet Colour, One Off			£10.90	
	PJ1080 Ink Jet Black, One Off			£8.90	
<b>CBM</b>	1515	£2.70	£2.20	£2.00	
	1525	£2.70	£2.20	£2.00	
	MPS801	£3.60	£3.00	£2.80	
	802/1526	£3.70	£2.90	£2.70	
	803	£3.40	£2.90	£2.70	
	MPS1000	£2.70	£2.30	£2.10	
<b>CENTRONICS</b>	4022	£2.70	£2.30	£2.10	
	MSC801 Colour, One Off			£18.50	
	DPS1101 SS	£2.40	£1.90	£1.75	
	DPS1101 MS	£2.90	£2.50	£2.30	
	DPS1101 Corr	£1.80	£1.50	£1.40	
	GLP 1/2	£3.40	£2.90	£2.70	
	<b>CITIZEN</b>	120D	£5.00	£4.60	£4.30
	<b>DAISYSTEP</b>	2000 MS	£3.10	£2.60	£2.40
		2000 FAB	£4.90	£4.20	£4.00
<b>EPSON</b>	MX/FX/RX80 Black	£2.70	£2.30	£2.10	
	MX/FX/RX80 Red or Blue	£3.90	£3.20	£3.00	
	100 Series	£3.70	£3.30	£3.00	
	LX80/LX86	£2.70	£2.30	£2.10	
	JX80 Colour, One Off			£18.50	
	LQ800	£3.70	£3.30	£3.10	
<b>JUKI</b>	LQ1000	£4.50	£3.90	£3.60	
	6000/2200 Corr	£3.10	£2.70	£2.50	
	6100 MS	£2.90	£2.50	£2.30	
	6100 SS	£2.40	£1.90	£1.75	
<b>KAGA</b>	6100 Corr	£1.80	£1.50	£1.40	
	KP810 Black	£3.10	£2.60	£2.40	
	KP810 Red or Blue	£4.50	£4.10	£3.80	
<b>M/TALLY OKI</b>	MT80	£3.70	£2.90	£2.70	
	80/82	£1.40	£1.10	£1.00	
	84	£3.90	£3.40	£3.20	
<b>PANASONIC</b>	Mate 20 Colour	£7.00	£6.50	£6.20	
	Mate 20 Black	£6.60	£6.20	£6.00	
	Dot Matrix	£5.00	£4.60	£4.30	

		£3.10	£2.60	£2.40
<b>QUENDATA</b>	DWP1120 MS	£4.90	£4.20	£4.00
	DWP1120 FAB	£2.80	£2.30	£2.10
<b>QUME</b>	Sprint 7/9 MS	£4.00	£3.70	£3.40
	Sprint 7/9 FAB	£6.00	£5.50	£5.20
<b>SEIKOSHA</b>	GP50	£2.70	£2.20	£2.00
	GP80	£2.60	£2.20	£2.00
	GP100/250	£3.90	£3.30	£3.10
	GP500/550			£18.50
	GP700 Colour, One Off			£6.00
	SP1000	£6.00	£5.50	£5.20
	CP80	£3.70	£2.90	£2.70
	Fastext 80 (Twinpack)	£11.70	£11.20	£10.90
	TPI M/S	£12.50	£10.70	£9.95
	TPI Fabric	£5.70	£5.25	£4.95
<b>SHINWA</b>	TPI Corr	£5.00	£4.70	£4.50
	D100/200	£4.80	£4.40	£3.90
	D300	£6.00	£5.50	£5.30
	DP/GEMINI/SG	£1.40	£1.10	£1.00
	SR15	£4.90	£4.50	£4.30
	NL10	£5.00	£4.40	£3.70

### DISK STORAGE

LOCKABLE DISK BOXES	MODEL	SIZE	CAPACITY	PRICE
	DD40L	3 3/4"	40	£8.50
	GS100	3.5"	100	£13.90
	DD50	5 1/2"	50	£8.90
	DD100	5 1/2"	100	£11.70
	LIBRARY CASE	5 1/2"	10	£1.50
NON-LOCKABLE DISK BOXES				
	MD12/30	3 3/4"	24	£7.20
	MF50	5 1/2"	50	£8.00

### COMPUTER STATIONERY

PLAIN WHITE WITH MICRO-PERF EDGES	SIZE	GSM	QUANTITY	1 BOX	2 BOXES
	11 x 9 1/2	60	2000	£12.50	£12.00
	11 x 9 1/2	70	2000	£15.50	£14.50
	EXACT A4	70	2000	£20.90	£18.75
	11 1/2 x 9 1/2	90	1000	£13.20	£11.25

### LASER PRINTER CONSUMABLES

TONER CARTRIDGES		£18.50	£18.50	£74.95	£74.95
Epson GQ3500	Canon A1/A2	£18.50	£18.50	£74.95	£74.95
Okilaserline 6	Canon A8 Mk II	£74.95	£74.95	£74.95	£74.95
HP Laserjets	QMS K8	£74.95	£74.95	£74.95	£74.95
HP Laserjet MkII	Citizen Overture	£84.95	£84.95	£22.95	£22.95

### FLOPPY DISKS

5 1/4" JVC inc Plastic Case	BOXES OF 10 DISKS		
	1-2	3-9	10+
MD-1D S/side D/dens 40TR	£9.99	£9.50	£9.25
MD-2D D/side D/dens 40TR	£11.99	£11.50	£11.25
MD-2DD D/side Q/dens 80TR	£15.99	£15.50	£15.25
MD-2HD D/side H/dens 1.6MB	£26.99	£25.99	£25.49
<b>MEMOREX</b>			
MD-2D D/side D/dens 40TR	£11.99	£11.50	£11.25
MD-2DD D/side Q/dens 80TR	£15.99	£15.50	£15.25
MD-2HD D/side H/dens 1.6MB	£26.99	£25.99	£25.49
<b>VERBATIM - DATALIFE</b>			
MD525 S/side D/dens 40TR	£11.60	£11.00	£10.60
MD550 D/side D/dens 40TR	£14.80	£14.00	£13.60
MD577 S/side Q/dens 80TR	£14.99	£14.75	£14.49
MD557 D/side Q/dens 80TR	£19.50	£19.00	£18.60
<b>FUJI</b>			
*S/side D/dens 40TR	£10.99	£10.50	£10.25
*D/side D/dens 40TR	£13.49	£12.99	£12.75
*Coloured Disks - red, green, blue, beige, grey £1.00 per box extra.			
D/side D/dens 80TR	£17.99	£17.50	£17.25
<b>3 1/2" JVC SONY/FUJI FUJI/MEMOREX SONY 3" DISKS</b>			
S/side D/dens	£17.99	£17.25	£16.99
S/side D/dens	£18.99	£18.25	£17.99
D/side D/dens	£26.99	£26.50	£25.99
D/side D/dens	£27.99	£27.50	£26.99
CF2 5 Disks	£2.89 each	£14.45 pack	
CF2 10 Disks	£2.49 each	£24.90 pack	

### SPECIAL OFFERS ON DISKS

	PRICES PER 10 DISKS		
	20 disks	50 disks	100 disks
TDK 5 1/4"SS/DD	£8.50	£8.00	£7.50
MAXELL 5 1/4"SS/DD	£8.75	£8.25	£7.75
BASF 5 1/4"SS/DD 40TR	£8.75	£8.25	£7.75
3M 5 1/4"DS/DD	£11.90	£11.50	£11.25
DYSAN 5 1/4"HD/1.6MB	£20.95	£19.95	£19.95
<b>Bulk Disks</b>			
5 1/4"SS/DD 40TR	£6.40	£5.90	£4.80
5 1/4"SS/DD 40TR	£7.40	£6.90	£5.80
5 1/4"DS/DD 80TR	£8.40	£7.90	£6.80
Life time guarantee. Disks include envelopes, labels, hub-rings and write protect.			
3 1/2"DS/DD	£18.80	£17.80	£16.80
Life time guarantee.			

### PRINTER CABLES

Amstrad CPC	Parallel	£8.90
BBC	Parallel	£6.50
IBM/Amstrad PC/Atari ST	Parallel	£14.50

### PRINTERS

Epson LX800	£186.95
Epson FX800	£294.95
Epson FX1000	£379.95
Epson EX800	£384.95
Epson EX1000	£509.95
Epson LQ800	£399.95
Epson LQ1000	£525.95
Epson LQ2500	£678.95
Epson GQ3500 Laser	£1259.95
Amstrad DMP3160	£174.95
Amstrad DMP4000	£299.95
Amstrad LQ3500	£299.95
Citizen 120D	£139.95
Citizen LSP10	£159.95
Juki 6100	£269.95
Panasonic KXP1081	£139.95
Star NL10 inc I/F	£179.95
Star NX15	£272.95

Star ND15	£342.95
Star ND15	£342.95
Star NR15	£412.95
Star NB24-10	£419.95
Star NB24-15	£531.95
Star NB15	£619.95

### LASER

Epson GQ3500 Laser	£1259.95
HP Laserjet Mk II Laser	£1989.95
Canon LBP8 Mk II Laser	£1599.95
Okilaserline 6 Laser	£1495.95
QMS K8 Laser	£1549.95
Citizen Overture Laser	£1495.95

### AMSTRAD 1512

SDMM	£379.95
DDMM	£479.95
Colour Extra	£139.95
20Meg Hard Card Extra	£249.95

### AMSTRAD 1640

SD Mono	£479.95
DD Mono	£579.95
20Mb Mono	£869.95
CGA Colour Extra	£139.95
EGA Colour Extra	£279.95

### DELIVERY

All consumables and software post free Hardware £5 + VAT 4 Day. £9 + VAT 24 Hour. Laser Printers £15 + VAT 24 Hour.

## EPSON PRINTERS UK'S LOWEST PRICES

Epson LX800	£186.95
Epson FX800	£294.95
Epson FX1000	£379.95
Epson EX800	£384.95
Epson EX1000	£509.95
Epson LQ800	£399.95
Epson LQ1000	£525.95
Epson LQ2500	£678.95
Epson GQ3500 Laser	£1259.95

**COMPUTERS BY POST GUARANTEE** If after buying any of the hardware or software in this advertisement, you find the same item offered at a lower price locally within one week, we will refund the difference.

All prices exclude VAT  
CREDIT CARD HOT-LINE



# 01-760 0014

Computers by Post (ACU), 14 Emmabrook Court, Sea Road, Rustington, West Sussex.

## Export Enquiries Welcome

To: Computers by Post, 14 Emmabrook Court, Sea Road, Rustington, West Sussex.  
I wish to order \_\_\_\_\_

My computer is \_\_\_\_\_  
I enclose cheque/PO for £ \_\_\_\_\_ inc VAT  
or charge my Access/Visa No: \_\_\_\_\_



Name \_\_\_\_\_  
Signature \_\_\_\_\_  
Address \_\_\_\_\_  
Postcode \_\_\_\_\_ Tel No: \_\_\_\_\_

# Winchester Users

## *-Discard the Soft Option!*

At last, a real solution to the problems of hard disc back up — the new Amcom Tapestreamers.

Amcom Tapestreamers provide a fast, reliable and economic means of backing-up the large amounts of data stored on Winchester hard disc systems. The speed and ease with which data is streamed onto magnetic tape makes backing-up faster, easier and more convenient with total Data Integrity. Multiple copies are easy to make, and data is quickly transferred back to the hard disc when required.

Amcom Tapestreamers provide:-

- Affordable Winchester Back-up
- Fast Operation (80k/sec).
- Reliable Data Transfer
- Easy Multiple copies.



Amcom Tapestreamers are available to run not only on Amcom's definitive E-Net Winchester based networks, but also on Amcom's new ADFS compatible Winchesters and standard Acorn hard disc systems.

**Amcom for the complete mass-storage solution**



For more information on Tapestreamers, Educational Networking Systems and stand alone Winchesters, contact:-

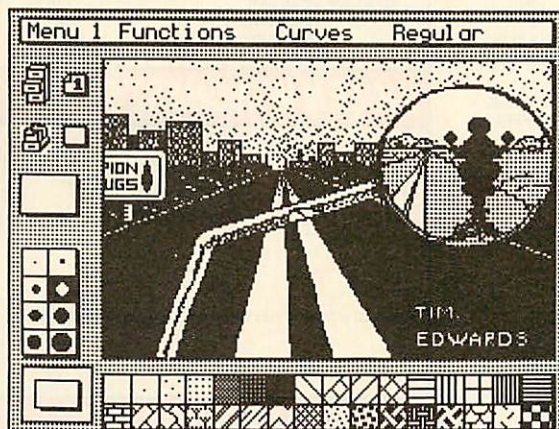
Amcom Software Ltd. 35, Carters Lane, Kiln Farm,  
Milton Keynes. MK11 3HL. Telephone (0908) 569212



# the NIDD VALLEY

## ILLUSTRATOR

A versatile graphics package designed to complement the high quality of the Nidd Valley Mouse. You can produce graphics and text like these using just ILLUSTRATOR and DIGIMOUSE.



### DESIGN YOUR OWN ICONS PATTERNS AND BRUSHES

The software not only has an extensive library of designs, but you can also create and edit your own to save and reload later.

### SPECIAL EFFECTS

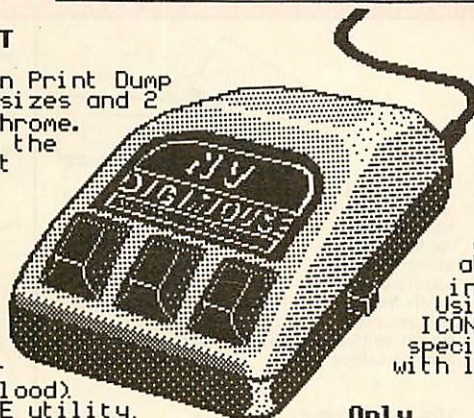
FLIP X or Y, ROTATE through 90, 180 or 270°, and using the HOLD option, shapes can be repeatedly drawn whilst rotating, creating hundreds of design possibilities.

### HIGH QUALITY PRINTOUT

The high resolution Epson Print Dump gives you a choice of 4 sizes and 2 densities in crisp monochrome. WYSIWYG! What you see on the screen is what you get at the printer - no loss of detail and no distortion. This very powerful print option is designed to allow illustrations to be incorporated with Word Processor text.

### AND THERE'S MORE!.....

SPRAY and FILL (line & flood). Easy to use CUT and PASTE utility, plus GRAB and CUT from saved screens redrawn at a size of your choosing. A GRIDLOCK option allows you to place designs on an invisible grid. And its DISC BASED !!! NO ROM's to fit.



Only  
**£49.90**  
complete with mouse

### PULL DOWN WINDOWS

Drawing functions and utilities are selected from 8 pull down and 4 popup windows. These are obtained from two main menu and two file ICONS.

### DRAWING OPTIONS

Every possible drawing option has been provided including LINE, MULTILINE, RAY, CIRCLE, ELLIPSE, SECTOR, CURVE, and POLYGONS. These can all be rubber banded or enlarged/reduced. Shapes may also be drawn inverse or filled, with or without outline. TEXT can be entered in a choice of 2 styles and 3 sizes, plus you can design your own FONTS with the powerful ICON designer utility.

### ZOOM and PIXEL EDITOR

Using the superb full screen zoom and scroll feature allows you to make fine detail corrections and designs one pixel at a time. The current pixel area is shown in an actual size, off screen window. Using this feature in conjunction with the ICON and GRIDLOCK enables icons, fonts and special shape designs to be generated quickly with little or no graphics experience.

ILLUSTRATOR is packaged with the  
**NIDD VALLEY DIGIMOUSE** for the  
**BBC MICRO**  
**A GREAT MATCH !**

**GRAPHIC SOFTWARE for CREATIVE DESIGNERS.**

### THE NIDD VALLEY MOUSE

This high quality, British mouse features a unique LINEAR LOCK which allows you to draw perfectly straight lines freehand, independently of the software.

The non-slip ball is held firmly in place and keeps in constant contact with your work surface. The mouse uses optical electronics, precision engineered to exacting standards.

Designed for comfort and long periods of effortless use, with an exceptionally smooth and accurate control.

### ARTROOM/ACE SOFTWARE

Well-reviewed graphics design package from Clares, supplied on disc, with DIGIMOUSE, for the MASTER or COMPACT. Includes an extensive library of symbols, borders and pictures, zoom for detailed editing, reserve screen, selection of proportional fonts, and the full range of drawing options.

High resolution graphics and excellent print out quality. Supplied complete with 'ACE' Artroom Colour Extension.

### ILLUSTRATOR & DIGIMOUSE

BBC 40 track DFS ..... **£49.90** incl. VAT

### ILLUSTRATOR software only

BBC 40 track DFS ..... **£19.90** incl. VAT

### ARTROOM/ACE & DIGIMOUSE

Master 128, 80 track ADFS ..... **£64.90** incl. VAT

Compact 3 1/2" disc ..... **£68.90** incl. VAT

### DIGIMOUSE only

BBC or Compact ..... **£34.90** incl. VAT

WHEN ORDERING PLEASE STATE WHICH MODEL COMPUTER

### HOW TO ORDER

By cheque, ACCESS or VISA, or official Educational order, direct from Nidd Valley. PLEASE STATE FOR WHICH MODEL COMPUTER.

All prices include VAT and P&P. 12 months guarantee, Allow 14 days for delivery.

Overseas - VAT element covers additional postage costs.

## NIDD VALLEY MICRO PRODUCTS LTD

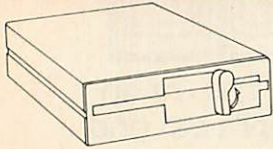
Dept AU1187

FREEPOST, Wetherby, West Yorkshire LS23 7YP, England.

Telephone: 0937 844661 Telex: 57453 MYSEC G

# The Perfect Partners.

## VIGLEN DISK DRIVES



Simply plug a Viglen disk drive into your BBC B (fitted with DFS), B+, or Master micro and immediately benefit from 400 or 800 KB of extra data storage capacity.

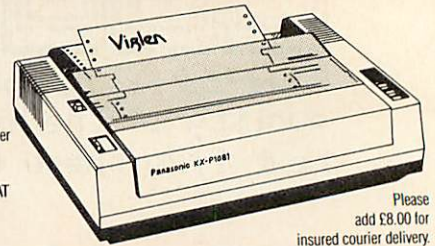
Stock Code	Description	Price inc. VAT	
VPD 0241	400K Single Drive, No PSU	£119.95	NOW WITH 3-YEAR WARRANTY
VPD 0246	400K Single Drive, + PSU	£134.95	
VPD 0243	800K Dual Drive, No PSU	£222.95	
VPD 0248	800K Dual Drive, + PSU	£249.95	
VPD 0249	800K Bridge Unit + PSU	£264.95	SPECIAL OFFER
VPD 0250	5.25" + 3.5" Combined + PSU	£249.95	
SPO 14	Single 400K 40/80T Drive	£ 99.95*	
SPO 19	Dual 800K 40/80T Drive	£189.95*	

\* These two models are offered with 12 months warranty. Please add £8.00 for insured courier delivery.

## PANASONIC PRINTER KIT

The Panasonic KX-P1081 comes complete with £45.00 worth of accessories FREE including tractor feed and roll feed units with paper, printer cable, and a specially designed metal printer stand. Features include:

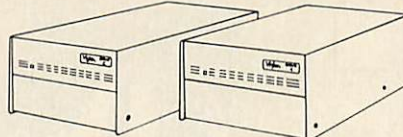
- \* 120 cps draft printing, 24 cps NLO
- \* IBM and Epson compatibility through dip switch settings
- \* Prints 80 columns on A4 cut sheets, continuous stationery or roll paper
- \* 9x9 draft and 18x23 NLO



Stock Code	Description	Price inc. VAT
SPO 79	Panasonic KX-P1081 plus accessories	£189.95

Please add £8.00 for insured courier delivery.

## VIGLEN WINCHESTER DISKS



Plug-in 20 to 112MB of extra storage with the Viglen Winchester system.

Please add £8.00 for insured courier delivery.

Stock Code	Description	Price inc. VAT
Drive 0 Single		
VO150	VB20 20MB Viglen Winchester	£ 649.00
VO152	VB28 28MB Viglen Winchester	£ 699.00
VO155	VB40 40MB Viglen Winchester	£1045.00
VO156	VB56 56MB Viglen Winchester	£1119.00
Drive 1 Second Drive		
VO160	VB120 20MB Drive 1 Winchester	£ 549.00
VO162	VB128 28MB Drive 1 Winchester	£ 599.00
VO165	VB140 40MB Drive 1 Winchester	£ 819.00
VO167	VB156 56MB Drive 1 Winchester	£ 899.00
VO157	20MB Tape Streamer Backup	£ 724.95

## PROFESSIONAL CONSOLE UNIT

Give your BBC or Master micro a professional PC-look by replacing the existing lid with this smartly styled package which can house two disk drives. Complete with separate keyboard case and connecting cables. A full range of accessories is also available.

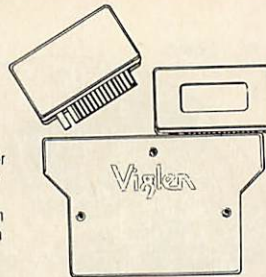


Stock Code	Description	Price inc. VAT
V0851	Viglen Professional Console Unit for the BBC micro	£49.95
V0861	Viglen Master Console Unit for the Master micro	£59.95

Please add £8.00 for insured courier delivery.

## ROM CARTRIDGE SYSTEM

Designed by Viglen for use with the BBC B or Master micros, the Rom Cartridge System allows a range of Rom software to be used and interchanged easily without fear of damage to the delicate pins. The system is simple to fit and requires no soldering.



Stock Code	Description	Price inc. VAT
V0560	Viglen Rom Cartridge System for BBC	£12.95
V0559	Viglen Rom Cartridge System for BBC (low profile)	£12.95
V0550	Viglen Rom Cartridge System for Master	£14.95
V0561	Single Viglen Cartridge	£ 3.99

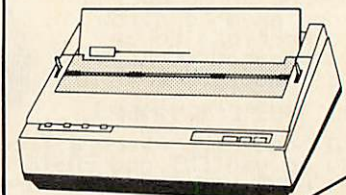
Please add £2.50 for postage and packing (£00.50 for single cartridge).

## DAISYWHEEL PRINTER

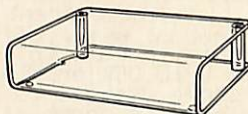
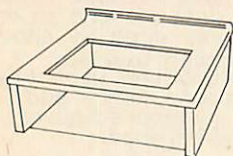
The Panasonic KX-P3131 daisywheel printer is Diablo-compatible and utilises bi-directional logic seeking techniques to produce letter quality print at a rate of 17 characters per second (cps). Friction speed provides really efficient paper handling, whilst tractors are available as an option.

Stock Code	Description	Price inc. VAT
V0400	Panasonic KX-P3131 Daisywheel Printer	£299.95

Please add £8.00 for courier delivery.



## PRINTER STANDS



Viglen's printer stands are available in	Price inc. VAT
clear perspex, 80 col.	£19.95
136 col.	£29.95
high-impact ABS plastic colour-matched to most printers.	
80 col.	£14.95
black metal finish	£ 9.95

Viglen's printer stands cater for 80 and 136 column printers and allow continuous stationery to be stored underneath.

Please add £3.00 postage and packaging.

SALES HOTLINE 01 843 9903

### HOW TO ORDER

Simply fill in the coupon or write to us with your requirements enclosing a cheque/postal order or your credit card no. for the total amount. Don't forget to add the cost of delivery. Allow 7 to 10 days for delivery. Credit card holders may order by telephone on our sales hotline 01-843 9903 (8 lines). Orders from overseas should be exclusive of VAT (Please deduct 15% from the total cost).

Prices correct at time of going to press and offers are subject to availability. Dealer, Trade & Education Enquiries Welcome.



# Viglen

Viglen Ltd., Unit 7, Trumplers Way, Hanwell, London. W7 2QA  
Telephone: 01-843 9903  
Telex: 919 304 VIGLEN G  
Fax: 01-574 5126

Send NOW for our special offers booklet

Fill in and post to Viglen Ltd., Unit 7, Trumplers Way, London W7 2QA. Tel. No. 01-843 9903. Please make cheques and postal orders payable to Viglen Ltd.

STOCK CODE	DESCRIPTION	QUANTITY	TOTAL PRICE

Please find enclosed a cheque/postal order  I prefer to pay by VISA  ACCESS  Tick one please. Carriage \_\_\_\_\_

Card No. \_\_\_\_\_ Signature \_\_\_\_\_ Expiry date \_\_\_\_\_ Total \_\_\_\_\_

Name \_\_\_\_\_ Address \_\_\_\_\_

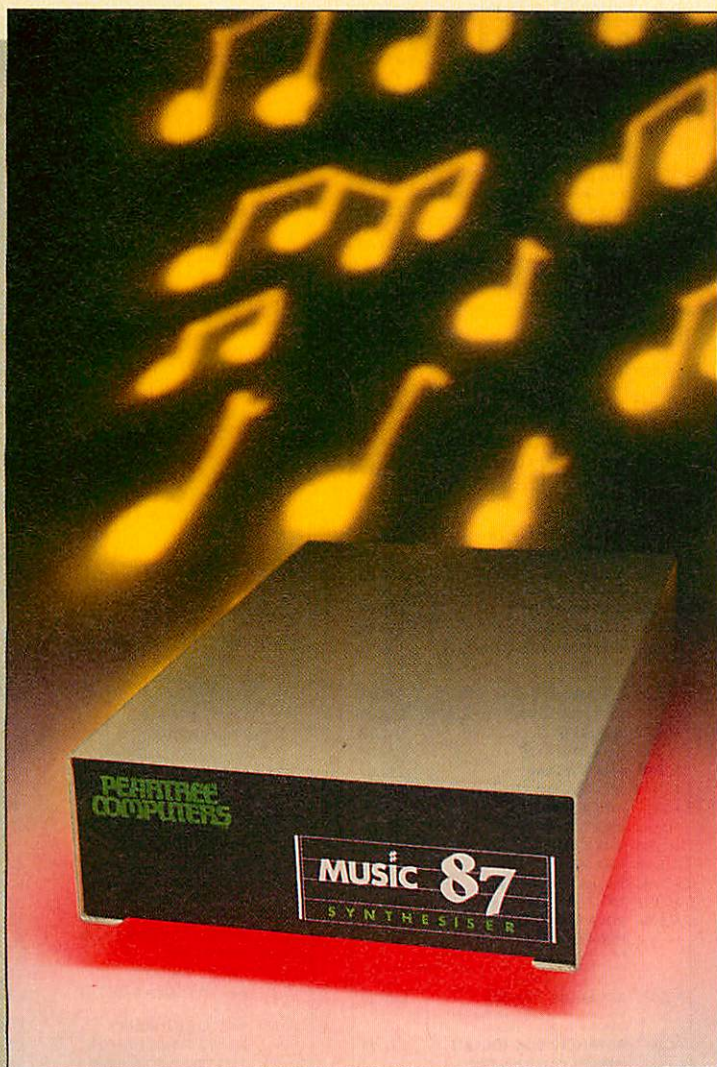
Postcode \_\_\_\_\_ Tel. no. \_\_\_\_\_

**Acorn**  
The choice of experience.

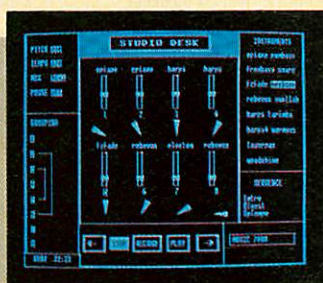
# PEARTREE COMPUTERS LTD

**Approved  
Acorn dealer**

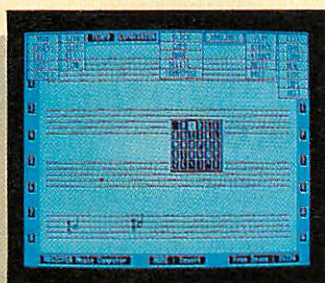
Peartree House, No 1 Blackstone Road, Stukeley Meadows Industrial Estate, Huntingdon, Cambs PE18 6EF. Telephone (0480) 50595



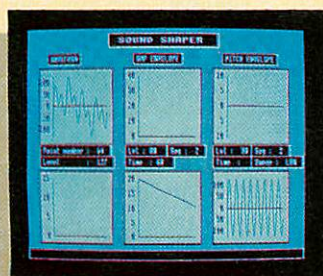
▶ PEP024



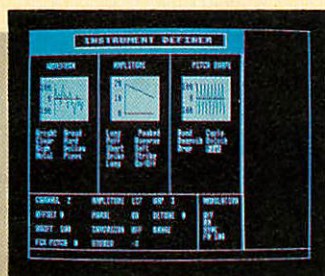
Studio Desk menu with mouse driven record, play, rewind options



Music Editor menu, light pen & mouse driven with complete menu options at top



Sound Shaper allowing you to create your own waveforms, envelopes, mouse, lightpen or keyboard driven



Instrument definer allows you to define your own instrument pitch, amplitude and wave forms

OVER

# 17000

visitors attended the 87 Acorn User Show. Most were amazed at the performance of the **MUSIC 87**. As a result we have been receiving hundreds of telephone calls from people wanting to know the differences and merits of the **MUSIC 87** synthesiser when compared to more expensive music synthesisers. Below is a table showing how the **MUSIC 87** compares to the Music 5000.\*

9 good reasons to buy the **MUSIC 87** rather than the Music 5000.\*

FUNCTION	Music 5000	MUSIC 87
Mouse driven	X	✓
2nd processor compatible	X	✓
Light pen driven	X	✓
Full 32k EPROM	X	✓
Waveform designer as standard	X	✓
Ability to bypass AMPLE	X	✓
Graphic representation of waveforms, envelopes and score	X	✓
Music printout as standard	✓	✓
Expensive	✓	X

Price Music 5000.\* **MUSIC 87**  
£161.00 **£79.95**

## # MUSIC 87 SYNTHESISER

**MUSIC 87** software to upgrade your Music 500 or 5000 only **£39.95**

\*Music 5000 is supplied by Hybrid Technology Limited



Approved service centre for all Acorn products.

Peartree House, No 1 Blackstone Road, Stukeley Meadows Industrial Estate, Huntingdon, Cambs PE 18 6EF. Telephone (0480) 50595

### HARDWARE

ACH001	<b>BBC MASTER 128</b>	£385.00
128K complete with View, Viewsheet, basic editor. ADS 5 1770 DFS		
*** special offer includes FREE MUSIC 500		
ACH002	<b>BBC MASTER COMPACT</b>	£375.00
128K computer 40K disc drive built in RGB comp video, joystick and printer port		
ACH003	<b>BBC MASTER COMPACT TV</b>	£395.00
As above with PAL TV modulator		
ACH004	<b>BBC MASTER COMPACT MONO</b>	£445.00
As above with high resolution green monitor		
ACH005	<b>BBC MASTER COMPACT COLOUR</b>	£545.00
As above with RGB medium res colour monitor with video composite		
ACH011	<b>TURBO UPGRADE for MASTER 128</b>	£99.00
85C102 co-processor 4MHz - 64K ram extra high Basic, high editor		
ACH012	<b>512K MSDOS for MASTER</b>	£189.00
IBM compatible DOS plus 8184 processor		
ACH041	<b>UNIVERSAL 2nd PROCESSOR</b>	£75.00
Allows both the turbo upgrade and the 512K upgrade to be run on the BBC Model B or B+		
ACH015	<b>1770 DFS KIT for BBC B</b>	£41.00
Allows BBC to access disc drives		
ACH016	<b>ADFS ROM for 1770 or BBC B+</b>	£24.00
Gives 720K per disc		
ACH020	<b>32016 CO-PROCESSOR</b>	£999.00
Allows BBC to access disc drives		
ACH021	<b>ACORN CAMBRIDGE WORK STATION</b>	£3400.00
4MB work station with 32016 co-processor		
ACP003	<b>MEGAMOUSE</b>	£49.00
High quality UK manufactured - Slip free rubber coated ball - Fully AMX compatible		
ACH034	<b>ACORN MUSIC 500</b>	£49.00

### MODEMS

ACS075	<b>COMMSTAR II</b>	£29.95
Now compatible with Master 128		
ACP014	<b>PACE NIGHTINGALE</b>	£99.00
1200/75 75/1200 300/300 baud rates - BT approved complete with cables - Includes Comstar II		
ACP015	<b>PACE NIGHTINGALE COMBO</b>	£129.00
As above with Comstar software		
ACP020	<b>WS3000V21/V23 MODEM</b>	£285.00
Hayes compatible		
ACP021	<b>WS4000 SCHOOLS MODEM</b>	£159.00
Autodial, autoanswer - Schools approved		
ACP029	<b>VOYAGER MODEM</b>	£59.00
ACP031	<b>BBC MICRO VIEWDATA</b>	£49.00

### COMPONENTS

ACP007	<b>EPROM 27256 32K</b>	£4.95
32K eprom		
ACP008	<b>EPROM 27128 16K</b>	£3.95
16K eprom		
ACP010	<b>8K RAM CHIP</b>	£3.50
Low power ram chips used in sideways rams		
ACP012	<b>EPROM ERASER WITH TIMER</b>	£29.95
ACP013	<b>EPROM BLOWER</b>	£69.00
Will program 2764, 27128, 27256 and 27513		
ACP023	<b>ACORN BBC B KEYBOARD</b>	£49.00
ACP027	<b>ACORN 8271 AND TTL</b>	£49.00
Complete DFS kit		
ACP028	<b>BBC B+ AND BBC B IBM LOOKALIKE CASE</b>	£99.00
ACP033	<b>BBC MASTER DUST COVER</b>	£4.50
ACP034	<b>BBC B DUST COVER</b>	£4.50

### SOFTWARE

ACS181	<b>OVERVIEW</b>	£86.00
Includes all View family software		
ACS181	<b>OVERVIEW</b>	£86.00
For the MASTER series only - Includes Viewplot, Viewstore, Viewspell, Viewindex and the View Printer Driver Generator		
ACS020	<b>ISO PASCAL</b>	£52.00
Full implementation of the ISO standard		
ACS053	<b>ISO PASCAL S.A.G. DISC</b>	£29.00
Generate stand alone code		
ACS021	<b>LOGO</b>	£52.00
Good intro. for children with total graphics support		
ACS022	<b>TERMINATOR</b>	£29.00
Terminal emulator enables the host computer to be sent directly to the BBC's output driver		
ACS023	<b>COMAL</b>	£39.00
Programming language standard in many European countries		
ACS024	<b>BASIC EDITOR</b>	£25.00
Powerful screen basic editor		
ACS025	<b>MICRO PROLOG</b>	£60.00
ACS026	<b>BCPL ROM</b>	£49.00
ACS027	<b>BCPL CALCULATION</b>	£29.00
ACS028	<b>BCPL STAND ALONE GENERATOR</b>	£39.00
ACS054	<b>FORTH ROM</b>	£39.00
ACS055	<b>FORTH DISC</b>	£14.95
ACS056	<b>MASTER LISP C-ROM</b>	£49.00
ACS058	<b>MASTER LOGO C-ROM</b>	£52.00
ACS059	<b>6502 DEVELOPMENT PACK DISC</b>	£39.00
ACS060	<b>GXR for MODEL B</b>	£23.00
ACS061	<b>GXR for MODEL B+</b>	£23.00
ACS031	<b>DOS COPY BBC/MS-DOS</b>	£14.95
BBC MSDOS copies to or from many IBM MSDOS disc formats - Requires 1770 based DFS		
ACS032	<b>CPMBEEB BBC/CPM</b>	£14.95
ACS038	<b>AMX MOUSE AND SUPERART</b>	£65.00
ACS039	<b>AMX DESK</b>	£19.00
ACS040	<b>AMX UTILITIES</b>	£11.50
ACS041	<b>AMX SUPERART</b>	£43.00
ACS042	<b>AMX PAGEMAKER</b>	£43.00
AG043	<b>AMX 3D ZICON</b>	£21.00
ACS044	<b>AMX DATABASE</b>	£21.00
ACS045	<b>AMX XAM</b>	£21.00
ACS046	<b>AMX MAX</b>	£17.00
ACS047	<b>THE ARTIST SOFTWARE</b>	£39.00
ACS048	<b>ARTIST AND MEGAMOUSE</b>	£79.00
ACS050	<b>ADVANCED DISC INVESTIGATOR</b>	£22.50
Powerful disc utility - Back up most protected discs - Check and repair faulty tracks - Compatible with the BBC B, B+ and the Master		
ACS075	<b>ADVANCED 1770 DFS</b>	£27.50
Turn our RAM cartridges into RAM disc - 62 file catalogue - 640K disc capacity		
AC051	<b>ADVANCED DISC TOOLKIT</b>	£27.50
Compatible with all Acorn products - 35 extra commands - ADFS formatter and back up plus many more powerful utilities		
ACS052	<b>MUSIC 500 SOFTWARE</b>	£9.95
Ample software with full manual		

### PRINTERS

PRT001	<b>EPSON LX86 PRINTER</b>	£199.00
120CPS - NLQ mode - Centronics Interface		
PRT002	<b>EPSON FX800</b>	£399.00
19 pin dot matrix - 180 CPS draft mode, 35 CPS NLQ mode - 8K buffer - Parallel interface standard - 80 column		
PRT003	<b>EPSON FX1000</b>	£499.00
19 pin dot matrix - 200 CPS draft mode, 35 CPS NLQ mode - 8K buffer - Parallel interface standard - 136 column		
PRT004	<b>EPSON LQ800 PRINTER</b>	£499.00
24 pin dot matrix - 180 CPS draft mode, 60 CPS NLQ mode - 7K buffer - Parallel interface standard - 80 column		
PRT005	<b>EPSON LQ1000 PRINTER</b>	£699.00
24 pin dot matrix - 180 CPS draft mode, 60 CPS NLQ mode - 7K buffer - Parallel interface standard - 136 column		
PRT008	<b>MP 165 PRINTER</b>	£199.00
165 CPS draft mode, 40 CPS NLQ mode - 2K buffer - Centronics interface - Built in tractor feed - Epson compatible		
PRT011	<b>JUKI 6100 PRINTER</b>	£299.00
18 CPS dot matrix printer - Standard ribbons - Centronics interface		
PRT021	<b>PANASONIC KX-P1081 DOT MATRIX PRINTER</b>	£147.00
Fast draft printing at 120 CPS - Excellent Near Letter Quality font at 24 CPS		
PRT014	<b>EPSON LX TRACTOR FEED</b>	£22.00
PRT016	<b>EPSON LX CUT SHEET FEEDER</b>	£59.95
PRT023	<b>EPSON LQ1000 TRACTOR FEEDER</b>	£50.00
PRT024	<b>EPSON LQ1000 CUT SHEET FEEDER</b>	£130.00
PRT025	<b>EPSON FX80+ CUT SHEET FEEDER</b>	£129.95

Please Note  
We have many other makes of printers in stock such as **brother**.  
Always call for availability.

### ECONET

ACH006	<b>ECONET BBC MASTER ET 128</b>	£300.00
No DFS Econet station with 128K memory		
ACH007	<b>ECONET KIT</b>	£55.00
Upgrades for BBC B or BBC B+		
ACH008	<b>ECONET STARTER KIT</b>	£79.00
ACH009	<b>ECONET SOCKET KIT</b>	£29.00
ACH010	<b>ECONET MODULE</b>	£43.00
Upgrade cartridge for Master 128		
ACH022	<b>ECONET 10 STATION LEAD SET</b>	£25.00
ACP006	<b>PRINTER SERVER EPROM</b>	£39.00
Allows BBC machine to be a printer server station		
ACH031	<b>WINCHESTER 30MB (ACORN) with LEVEL 3 FILE SERVER</b>	£1449.00
ACH039	<b>FILESTORE E01</b>	£819.00
Stand alone twin floppy file server unit - Contains clock box, terminator, etc.		
ACH040	<b>FILESTORE E20</b>	£709.00
20MB hard disk for use with Filestore E01		

## The Acorn Music 500 SYNTHESISER

Now available from Peartree the Acorn Music 500 for the BBC, BBCB+, Master 128

**£49.00** excluding VAT.

only from PEARTREE ▶ ACH034

### SOFTWARE

#### Computer Concepts

ACS002	<b>WORDWISE PLUS</b>	£45.00
Mode 7 editing, preview in mode 0 - Multi document editing		
ACS003	<b>INTER SHEET</b>	£42.00
40, 80 and 105 column mode multiple spreadsheet		
ACS004	<b>INTER CHART</b>	£30.00
Built in Epson screen dump - Supports pie, line & bar charts		
ACS005	<b>INTER WORD</b>	£42.00
80 or 105 column word processor - Continuous documents		
ACS006	<b>INTER BASE</b>	£50.00
Compatible with all filing systems - Card index mode, contains powerful Basic like programming language		
ACS033	<b>SPELLMASTER</b>	£50.95

#### ACORNSOFT

ACS012	<b>VIEW 3.0</b>	£53.00
Industry's standard word processor - For the BBC B, B+, 6502 compatible - Including printer driver generator		
ACS013	<b>VIEWSHEET</b>	£36.00
Acornsoft standard spreadsheet		
ACS014	<b>VIEWSTORE</b>	£37.00
Complete with report generator - Data can be imported from other view products		
ACS015	<b>VIEWSPELL</b>	£32.00
Spelling checker for View with 70,000 words		
ACS016	<b>VIEWPLOT</b>	£24.00
Enables you to draw lines, pie graphs		
ACS017	<b>VIEWINDEX</b>	£13.00
Automatically creates indexes, notes, page numbers		
ACS018	<b>VIEW PRINTER DRIVER GENERATOR</b>	£9.00
Used to personalise View documents with special features		

### MONITORS COLOUR

MON002	<b>MICROVITEC 1451 COLOUR MON MED</b>	£249.00
Medium res monitor - Metal or plastic case, please state when ordering - RGB interface		
MON003	<b>MICROVITEC 1451 A/P COL MON MED</b>	£279.00
As above with audio and composite video input		
MON004	<b>MICROVITEC 1441 MON COL HIGH</b>	£449.00
Very high resolution monitor - 895 pixels - RGB interface		
MON005	<b>TAXAN SUPER VISION 625 COL HIGH</b>	£349.00
12" super high resolution colour monitor - 4 unique text modes - Front monochrome test switch - 640 x 262 line resolution		
MON006	<b>PHILIPS CM8833 COLOUR MONITOR</b>	£273.86
14 inch medium resolution monitor - RGBI RGB TTL		
MON007	<b>PHILIPS CM8852 COLOUR MONITOR</b>	£299.00
14 inch medium/high resolution - RGBI RGB		

### MONOCHROME

MON009	<b>KAGA KX 117 GREEN MONITOR P31</b>	£89.00
MON010	<b>KAGA KX 118 GREEN MONITOR</b>	£99.00
Clearly exceptional on BBC text		
MON011	<b>KAGA KX 119 AMBER MONITOR (FLU)</b>	£99.00
MON012	<b>PHILIPS GREEN MONITOR</b>	£79.00

Many other monitors are in stock. We can supply, please call for prices and deliveries.

### LEADS

LDS001	<b>BBC TO TV LEAD</b>	£1.25
LDS002	<b>BBC TO GREEN MONITOR LEAD</b>	£2.95
LDS003	<b>BBC TO SONY/KAGA COLOUR MONITOR</b>	£5.95
LDS004	<b>BBC TO MICROVITEC LEAD</b>	£2.20
LDS005	<b>PHONO TO PHONO LEAD</b>	£1.25
LDS006	<b>BNC TO BNC</b>	£2.95
LDS007	<b>BBC TO CASSETTE</b>	£2.25
LDS008	<b>BBC TO ACORN CASSETTE LEAD</b>	£2.25
LDS009	<b>BBC TO CENTRONICS</b>	£9.95
LDS010	<b>BBC TO SERIAL PRINTER</b>	£9.95
LDS011	<b>4 WAY MAINS TRAILING SOCKET</b>	£9.50
LDS012	<b>CABLE FOR MODEM</b>	£4.95
LDS014	<b>MASTER COMPACT PRINTER LEAD</b>	£15.95

### BOOKS

MIS012	<b>BBC MASTER REFERENCE GUIDE PT1</b>	£14.95
MIS013	<b>BBC MASTER REFERENCE GUIDE PT2</b>	£14.95
MIS014	<b>VIEW MANUAL (BBC)</b>	£10.00
MIS015	<b>VIEWSHEET MANUAL</b>	£10.00
MIS019	<b>VIEWSTORE MANUAL</b>	£10.00
MIS016	<b>DFS OPERATING SYSTEM MANUAL</b>	£6.95
MIS017	<b>BBC USER GUIDE</b>	£14.95
MIS024	<b>BBC ADVANCED USER GUIDE</b>	£16.95
MIS018	<b>ADVANCED SIDWAYS RAM USER GUIDE</b>	£9.95

### PRINTER RIBBONS

MIS005	<b>RIBBON FOR MX FX80 &amp; JUKI 5510</b>	£4.50
MIS006	<b>RIBBON FOR LX80 LX86</b>	£4.50
MIS007	<b>RIBBON FOR MP165</b>	£5.00
MIS008	<b>RIBBON KAGA KP810/CANON PW1</b>	£5.95
MIS009	<b>RIBBON FOR EPSON FX RX/100</b>	£7.95
MIS034	<b>RIBBON FOR EPSON LQ800</b>	£11.95
MIS023	<b>RIBBON FOR CPA80</b>	£3.50

### DISC DRIVES

All Peartree Disc Drives have a two year warranty by Akhter Computers

ACH026	<b>SINGLE 40/80 DRIVE, NO PSU 400K MITSUBISHI</b>	£119.00
ACH027	<b>SINGLE 40/80 DRIVE inc. PSU 400K MITSUBISHI</b>	£135.00
ACH028	<b>DUAL 40/80 DRIVE, NO PSU 800K MITSUBISHI</b>	£229.00
ACH029	<b>DUAL 40/80 DRIVE, inc. PSU 800K MITSUBISHI</b>	£269.00
ACH030	<b>DUAL 40/80 DRIVE IN MASTER BRIDGE MITSUBISHI</b>	£289.00
ACH032	<b>WINCHESTER 20MB &amp; 400K DRIVE</b>	£766.00
In monitor bridge for Master - Built in fan and power supply - Other sizes for hard discs are available, please call		

PLEASE USE OUR CODES WHEN ORDERING

All prices are exclusive of VAT.

**Acorn**  
The choice of experience.

# PEARTREE COMPUTERS

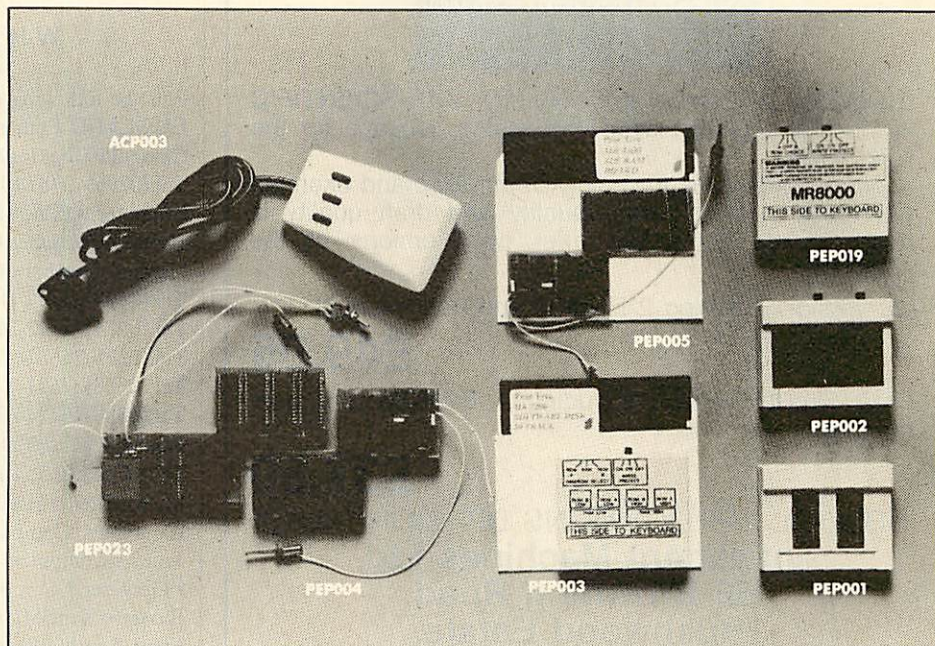
LTD

**BRITISH  
BROADCASTING  
CORPORATION  
MASTER SERIES  
MICROCOMPUTER**

Pear tree House, No 1 Blackstone Road, Stukeley Meadows Industrial Estate, Huntingdon, Cambs PE18 6EF

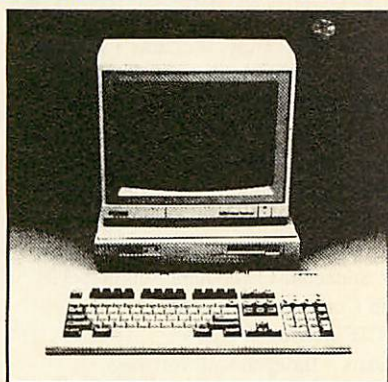
## PEARTREE PRODUCTS

PEP001	<b>PEAR 1 ROM CARTRIDGE</b> Add 32K rom to your Master	<b>£8.95</b>
PEP002	<b>MR6000 MASTER CARTRIDGE</b> Add 64K rom to your Master	<b>£11.95</b>
PEP003	<b>MR7200 MASTER RAM CARTRIDGE</b> Add 32K ram to your Master	<b>£29.95</b>
PEP019	<b>MR8000 MASTER RAM CARTRIDGE</b> Add 64K ram to your Master Battery backed up Battery life five years	<b>£39.95</b>
PEP023	<b>MR4800 RAM BOARD</b> RAM board for the BBC Model B 128K RAM Battery backed up Small, easy to fit, complete with utility software Includes write protect switch, battery included	<b>£59.95</b>
PEP004	<b>MR3000 ROM BOARD</b> Still going strong. This has proved to be a very popular mini rom board for the BBC Model B Add 4 extra rom sockets	<b>£15.95</b>
PEP005	<b>MR4200 RAM BOARD</b> Add 32K of sideways ram and 3 extra rom sockets. Includes write protect switch	<b>£29.95</b>



PEP010	<b>DISCS DS/DD 5.25 96 TPI</b> Life time guarantee Reinforced hub	<b>£13.50</b>
PEP011	<b>DISCS DS/DD 3.5</b> Double sided Suitable for the Master Compact	<b>£26.00</b>

## Archimedes



### The NEW High Performance 32 Bit Risc Processor from Acorn

consists of two models, ARCHIMEDES 305 with 0.5 Mbyte of RAM and ARCHIMEDES 310 with 1 Mbyte of RAM. These machines are the latest generation of British Broadcasting Corporation Micros. They offer, at low cost, all the basic features with expansion capabilities. Both machines have a 512 Kbyte ROM and a 1 Mbyte (unformatted) 3 1/2" disc drive.

#### THE 400 SERIES

The more powerful 400 Series offers considerably increased expansion capabilities. These machines are the new range of Acorn Computers.

The ARCHIMEDES 410 has 1 Mbyte of RAM; 1 Mbyte (unformatted) 3 1/2" disc drive; a hardware floating point unit option; a co-processor bus; a hard disc controller; a four socket back plane; 512 Kbytes of ROM.

At the top of the range is ARCHIMEDES 440. This machine possesses all the features of the 410 as standard, with the adoption of 4 Mbytes of RAM and a 20 Mbyte hard disc.

ARCHIMEDES is an open system and its flexibility is achieved by fitting any of the following podules (peripheral modules) via a back plane:

- hard disc controller (300 Series only);
- ROM extension board;
- MIDI music interface;
- MS-DOS co-processor;
- SCSI;
- hardware floating point unit;
- Ethernet podule.

Third party suppliers will be meeting other user requirements.

The ARCHIMEDES High Performance Computer Systems represent a considerable lead in performance, but how has this performance been put to use in the range of products?

The ARCHIMEDES range includes the 300 Series and the more sophisticated 400 Series.

All machines have features in common:

- 32 bit RISC technology;
- ergonomically styled in a 3 box presentation;
- 'IBM enhanced' style keyboard with 3 button mouse;
- British Broadcasting Corporation Micro style operating system (ARTHUR);
- BB BASIC V;
- interfaces; printer, serial, monitor, stereo sound;
- ECUNET plug-in option;
- a variety of podules can be fitted.

#### THE 300 SERIES

The 300 Series, identified by its red function keys,

### 300 SERIES

A305 SYSTEM	<b>BASIC</b>	<b>£799</b>
	<b>MONO</b>	<b>£849</b>
	<b>COLOUR</b>	<b>£999</b>
A310 SYSTEM	<b>BASIC</b>	<b>£875</b>
	<b>MONO</b>	<b>£925</b>
	<b>COLOUR</b>	<b>£1075</b>

### 400 SERIES

A410 SYSTEM	<b>BASIC</b>	<b>£1399</b>
	<b>MONO</b>	<b>£1449</b>
	<b>COLOUR</b>	<b>£1599</b>
A440 SYSTEM	<b>BASIC</b>	<b>£2299</b>
	<b>MONO</b>	<b>£2349</b>
	<b>COLOUR</b>	<b>£2499</b>

**We accept Barclaycard/Visa/Access/Mastercard/postal orders or cheques. We accept government and educational orders. Leasing available, please apply for written details.**

You may purchase any of the items listed, by cheque made payable to  
**PEARTREE COMPUTERS LTD.**

All you have to do is to list your requirements on a sheet of paper, post it to us quoting ref, and we will despatch your goods within 24 hours, whenever possible.

Please add the following amounts for postage and packing:

Items below <b>£10.00</b>	add <b>£1.50</b>
Items below <b>£50.00</b>	add <b>£2.50</b>
Items below <b>£100.00</b>	add <b>£3.50</b>
Items over <b>£100.00</b>	add <b>£10.00</b>

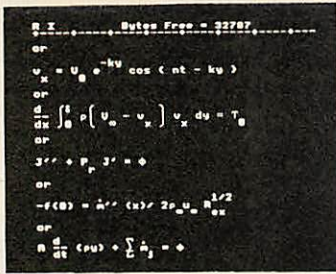
Independent courier for items over £100.00

**All prices exclude VAT.**

Access/Barclaycard holders—call us on our new special line: **(0480) 50595**

Prices are correct at time of going to press. Peartree Computers reserves the right to change prices without prior notice.

# SCIENTIFIC WORD PROCESSING



Developed at Edinburgh University, **VUE-SCIENTIFIC** is the first scientific word processing package for the BBC micro.

A promotional pack including Demo Disc and example print-outs of both Letter Quality and draft quality is available at £3.75. We offer two versions of the software.

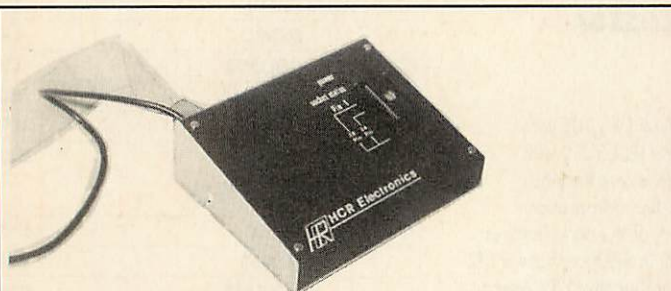
LQ version including 2 Eproms and user manual.

**£49.95**

Draft Quality version including 1 EPROM and user manual.

**£37.50**

SPECIAL APPLICATIONS DIVISION (AU10)  
**Intelligent Machines Ltd,**  
**66 Browning Road,**  
**Bushwood Estate,**  
**London E11 3AR**  
**Phone 01-989 5807**



## 128K EPROM PROGRAMMER

Again a quality-built product, cased in steel two tone case and comes complete with software in ROM, ZIF socket and all cables. This is the follower of the well proven 64K Micron Plus EPROM Programmer.

### THE SPECIFICATION

- \* Programme 2716, 2732, 2764, 27128, 27256, 2532, 2564, 27512, 27513, 2516, 27011, 2732A, 2764 etc.
- \* Programs all EPROMS up to 27512 (64K) in a single pass (master only).
- \* Programs all EPROMS up to 32K in a single pass (BBC B).
- \* Fully buffered
- \* Software selectable programming voltage 12.5/12/25 volt
- \* Normal or high speed algorithmic method of programming (software selectable).
- \* Continuous display of option selected.
- \* ZIF socket powered down when not in operation.
- \* Mains derived self contained power supply.
- \* VCC is raised to 6V during programming in line with manufacturers' recommendations.

### SOFTWARE ON ROM INCLUDES

- \* Fully menu driven
- \* Automatic verification on completion of programming and fault listing.
- \* Built in full screen memory editor (buffer is 32K long).
- \* Software allows blank check or EPROM and automatically lists faults.
- \* Will copy EPROMS to buffer or file.
- \* Will generate checksum.
- \* BBC format ROM images may be created using a number of images of basic or machine code programs.
- \* More than one image can be stored on one ROM.

This programmer has been designed and manufactured by H.C.R. Electronics to industry standard. Our engineers are on hand for queries relating to this product.

Price only £68.00 + £10.20 VAT + £3.00 P&P.

Orders to:  
**H.C.R. ELECTRONICS,**  
**H.C.R. House, Bakers Lane,**  
**Ingatstone, Essex CM4 0BZ.**  
**Telephone (0277) 355407/8.**



# banana

## DISKETTES

Available through selected

**W H SMITH & JOHN LEWIS stores**

Plus the following specialist computer shops:-

**ENGLAND** Enthusinet U.K. agents Tel:(04536)4310 J S Churchill Buckinghamshire Wordmongers Ltd Aylesbury Tel:(0296)437878 Henry Webster Cambridgeshire Wisbech computer services Ltd Tel:(0945)64146 Ian Duffy Cornwall Helston Computer Centre Helston Tel:(0326)563765 Mr C Harmer Cumbria Cumbria Software Systems Ltd Tel:(06977)3779 Devon Devitt Electronics Barnstaple Tel:(0271)75242 Mr J P Devitt • T A Computer Services Exmouth Tel:(0395)266814 Tony Ayling Dorset Tiger Software Bridport Tel:(0308)27691 Terry Gilbert Durham Desktop Durham Tel:(0388)767244 Duncan Routley Hampshire Timatic Systems Fareham Tel:(0329)239953 Mr. Young • WeServe Portchester Tel:(0705)325354 Kelvin Hertfordshire Melmark Microsystems Hertford Tel:(0992)554469 N J Tobin Kent Canterbury Computer Centre Canterbury Tel:(0227)462101 David Jones • Computers Plus Sittingbourne Tel:(0795)25677 A Francis • Gravesend Computer Centre Gravesend Tel:(0474)323871 Lynne Baxter • Kent Micro Computers Ltd Maidstone Tel:(0622)52784 Frank Smith • Romar Computers Ltd Ashford Tel:(0233)45119 • The Village House of Computers Bromley 01 460 7122 Mr C V Gee Lancashire Castle Computers Ltd Lancaster Tel:(0524)61133 Dave Smith • Computer Games Shop Blackpool Tel:(0253)48738 Jim McEvoy • Computer Systems Bolton Tel:(0204)794063 Frank Hunter • Elm Computing Cleveleys (0253)852882 Pete Wood • Time Computers Blackburn Tel:(0254)63414 Asif Sadiq London Electrosound Acton 01 740 8666 Phil Walsh • Micro Anvika W1 Tel:01 636 2547 A Gohil • Wida Software W5 Tel:01 567 6941 Tony Williams • Rensoft SW16 Tel:01 677 0569 Richard Butler Middlesex Instant Computer Supplies Hounslow Tel:01 897 1534 John Sims Midlands Mr Disk Warley Tel:021 420 1360 J Guest Norfolk Computer Plus (Kings Lynn) Tel:(0553)774550 D J Farrow Oxon Brookwood Computers Ltd Kidlington Tel:(08675)5468 • Oxford Computer Supplies Tel:(0865)716137 Terry Cummings Staffordshire Miles Better Software Cannock Tel: (05435) 3577 Robert Miles Surrey Stacom Computers Sutton Tel:01 661 2266 R Suri • Farnham Computers Farnham Tel:(0252)723107 Sussex CJE Micros Worthing Tel:(0903)213361 Chris Evans • Independent Software (0273)453568 Peter Worley Tyne & Wear Northern Business Centre Ltd Gateshead Tel:(091)4825421 Yorkshire Ashdown Computers Huddersfield Tel:(0484)510776 S Fisher • P C Electronics (Yorkshire) Ltd North Humberside Tel:(0405)768320 P Cliff • Wise Owl Software Wath-Upon-Deerne Tel:(0709)872703 Bob Lees **SCOTLAND** Almac Stirlingshire Tel:(0324)482435 Alistair McIntyre • Vics Perth Tel:(0738)36704 David Vicary • Microscot Computer Consultants Dundee Tel:(0382)200869 Tony Paterson **WALES** Posi-Tron Computing Dyfed Tel:(0554)759624 **NORTHERN IRELAND** Computerrall Ltd Belfast (0232)644927 David Weddell • TC Computing Services Co Londonderry Tel:(0265)53155 John Trott

WE ARE STILL LOOKING FOR MORE OUTLETS

## DISKING™

INTERNATIONAL

1 Royal Parade Hindhead Surrey GU26 6TD  
 Tel: (042 873) 4834 Retail • 4934 Wholesale  
 Fax: (042 873) 6676 • Twx: 858623 Telbur G



# Bananas keep trucking

and the truck's for FREE



## Bananas are growing

Last year saw the launch of our highly successful Banana reversible disks. Apart from the IBM PC-AT, these D/Sided disks suit ALL 5¼" drives. We know, because we have them ALL certified for both 48tpi & 96 tpi. What is more they have 2 w/p notches & index holes, so they are truly reversible if required.

### "What about microdisks"

you kept asking. Well here they are. The family is complete. The plantation's in full swing.

### FREE

We give a banana pen with every ten disks or microdisks, and should you buy 40 disks (4 ten-packs or 2 crates) OR 20 microdisks, you will receive a Mercedes banana truck.

Official orders from plcs & Government bodies are welcome.

DISKING  
FREEPOST Hindhead Surrey GU26 6BR  
Tel (042 873) 4834 • Fax (042 873) 6676  
Twx 858623 Telbur G

To: DISKING, FREEPOST, Hindhead, Surrey, GU26 6BR  
Telephone: (042 873) 4834 • Fax: (042 873) 6676 • Telex 858623 Telbur G

### ORDER FORM

BANANA Ten disks D/Sided 48/96 tpi Reversible disks	8.65	_____
BANANA-C Crates (twenty disks as above)	17.30	_____
BM2D Ten-packs D/Sided 135 tpi 3½" Microdisks	19.95	_____
SLIM 5B Banana Library box for ten disks	1.50	_____
SLIM 3B Banana Library box for ten microdisks (not shown)	1.00	_____
Mercedes Truck FREE with every 40 disks or 20 microdisks		_____

PRICE QUANTITY  
exc VAT

Goods Total exc VAT \_\_\_\_\_

U.K. Delivery (see below) exc VAT \_\_\_\_\_

Sub Total exc VAT \_\_\_\_\_

V A T @ 15% \_\_\_\_\_

Value of cheque payable to Disking \_\_\_\_\_

OR Please debit my ACCESS/VISA No: \_\_\_\_\_

Name/Company: \_\_\_\_\_

Address: \_\_\_\_\_

Tel. No: \_\_\_\_\_

U.K. P&P exc VAT (disks/microdisks)

10 - 20 disks 95p per ten • 30 - 50 disks 75p per ten • 60 - 90 disks 60p per ten  
100+ disks POST FREE

# Tubelink

## Advanced BASIC for BBC B/B+/Master

Tubelink is proud to offer the most powerful version of BASIC ever written for a 6502-based BBC micro. Advanced BASIC (formerly Archie BASIC) is a new version of BASIC, for the BBC micro models B/B+/Master with 6502 second processor or Turbo, and is compatible with Acorn's new Archimedes BASIC.

Just look at some of the features it has to offer ...

- Over 35 new keywords
- New program loop structures (CASE, WHILE, etc)
- Multi-line 'IF' statements
- New graphics commands (CIRCLE, ELLIPSE, etc)
- New error handling and TRACE debugging modes
- Instant on-screen help on keywords and status
- New statements and functions
- Mouse support (new MOUSE keyword)
- New string handling features
- INSTALL and LIBRARY commands for procedures
- Extended assembler
- Includes Acorn's very latest 1987 Hi-BASIC

Advanced BASIC can even be used to run Archimedes programs on your model B/B+/Master, or alternatively for writing programs which could be run on an Archimedes micro.

Advanced BASIC is supplied on disc for loading into a sideways RAM system, or on 16k EPROM, together with comprehensive user guide and 1987 Hi-BASIC on disc under license from Acorn. (To use extended graphics commands on B/B+ requires Acorn's GXR ROM. Mouse commands require suitable driver ROM, eg. Chauffeur or AMX Super ROM). State make and model of second processor in use. Full leaflet on request.

£29.95 on 40/80 track disc • £34.95 on 16k EPROM

**Unique offer:** Advanced BASIC and PMS B2P 65C02 second processor for just £115 - saving £15 on the normal RRP. Includes Advanced BASIC, second processor, instruction guides, and Tube Toolkit ROM. Add £5 if Advanced BASIC ROM version required. (B2P is only suitable for model B use.)

## EXROM: The Extension ROM for B/B+/Master

Tubelink's EXROM effectively doubles the BBC micro's operating system adding many useful utilities, and featuring unique facilities if used with a second processor...

- Extended Osbyte/Osword calls
- Filing system utilities
- Sideways ROM save/load • UNPLUG/INSERT ROMS
- Full 65C02 disassembler • Memory management tools
- Tube on/off commands • Extended Hi-BASIC system
- Memory transfer functions • Suitable for DFS/ADFS/Net

£14.95 on disc for sideways RAM • £18.95 on 16k EPROM

When ordering, please say which version of Hi-BASIC you have

## UTILRAM: The Utility RAM for BBC B/B+/B+128

At last a full emulation of the Master's configuration and Real-Time clock system is available for model B and B+ owners using Tubelink's Utility RAM. Supplied on 40/80 track disc for instant loading into a sideways RAM system. Excellent value at just £14.95 (includes comprehensive user-guide)

- Choose start-up mode, drive speed, default language etc
- Set-up screen interlace and DFS/ADFS preferences
- Extended Printer Buffer (upto 63k) and Epson screen dump
- Constantly updated Real-Time clock and calendar

## Acorn's 1987 Hi-BASIC for B/B+/Master

Available under license from Acorn, Tubelink are able to supply the very latest version of Hi-BASIC which offers considerable speed and accuracy improvements over the previous versions. Compatible with 6502 second processor and Turbo co-processor, and supplied on 40/80 track disc for just £9.95.

UK Postage FREE on all items (Overseas please add £3). FREE catalogue on request. Dealer enquiries welcome. Access/Visa accepted. Phone 01-205 9393 (24hrs) for more info

**Tubelink, PO Box 641 LONDON NW9 8TF**



# FREE FREE



Large (100 disc capacity) Lockable disc storage box worth £13.95

When you buy 25 disks (DS/DD) for only **£18.75** including VAT + postage



Large (100 disc capacity) Lockable disc storage box worth £13.95

When you buy 50 disks (DS/DD) for only **£28.95** including VAT + postage

Alternatively buy 100 5.25" ds/dd disks certified to 96tpi for an incredible £49.95 and get the box free!!

All disks supplied are

## JAPANESE HIGHGRADE

5.25 DS/DD Certified to 96tpi  
Subtract 51 for SS/DD. Add 107 for reversible DS/DD

with unique **5** year Guarantee

Please state Japanese Highgrade when ordering

# FREE

(worth £9.95)


90Capacity Lockable disk box for 3.5" disks when you buy 100 3.5" disks (or more) or only £2.50 when you buy 25 or £4.50 when you buy 10

QTY	SS 135TPI	DS 135TPI
10	£14.95	£16.95
25	£29.95	£35.95
50	£55.95	£62.95
100	£105.95	£119.95
150	£149.95	£169.95
250	£239.95	£269.95
500	£459.95	£519.95

All disks are supplied with full user labels

# FREE SOFTWARE

If you already have a disk box, you may like to choose a FREE (or cheap) program with your disks instead. If you are buying 25 disks (£18.75) or 50 disks (£28.95) or 100 disks (£49.95) then choose any one of the programs below, paying only the price in brackets (many free!!)



BBC DISC 5.25" GAMES		Our Special Price	Normal Price	Our Special Price	Normal Price
Firetrack	11.70	(3.00)	XOR Designer	11.65	(3.00)
Paycrafter	9.30	(FREE)	S. Fox Strip Poker	10.10	(1.00)
Sphere of Destiny	9.30	(FREE)	Hobbit	14.00	(6.00)
Thundercluck 2	9.30	(FREE)	Lord of the Rings	15.55	(8.00)
Durjuz	6.20	(FREE)	Imagan 40 Track	7.75	(FREE)
Computer Hits Vol 2	11.65	(3.00)	Imagan 80 Track	7.75	(FREE)
Starquake	9.30	(FREE)	Micropower Magic	27.75	(FREE)
Blue Ribbon II	7.75	(FREE)	Micropower Magic 2	6.20	(FREE)
Collarus Chess 4	11.65	(3.00)	Strike Force Harner	10.10	(1.00)
Living Daylights	11.65	(3.00)	Island of Xaan	10.10	(1.00)
Trivial Pursuit	15.55	(8.00)	Acornsoft Hits 1	9.30	(FREE)
Phantom	10.10	(1.00)	Acornsoft Hits 2	9.30	(FREE)
Airwolf	11.65	(3.00)	Around the World	9.30	(FREE)
Commando	11.65	(3.00)	In 40 Screens	6.20	(FREE)
Paperboy	11.65	(3.00)	Collection Vol 1	9.30	(FREE)
Chio	14.00	(6.00)	Collection Vol 2	9.30	(FREE)
Sentinel	11.65	(3.00)	Palace of Magic	9.30	(FREE)
The Kat Trilogy	9.30	(FREE)	Codename Droid	9.30	(FREE)
Apocalypse	11.65	(3.00)	Crazee Rider	9.30	(FREE)
Monopoly	11.65	(3.00)	Deathstas/Introspector	11.65	(3.00)
Scrabble	11.65	(3.00)	Elite	11.65	(3.00)
XOR	10.10	(1.00)	Grand Prix Cons. Set	9.30	(FREE)
			Revenstall	9.30	(FREE)
			Repton II	9.30	(FREE)

BBC DISC 5.25" UTILITIES		Our Special Price	Normal Price		
Miro Office II	13.20	(5.00)	Repton III	11.65	(3.00)
DFM Database + Labels	23.40	(18.00)	Revs + 4	11.65	(3.00)
Home Accounts	13.20	(5.00)	Strikers Run	9.30	(FREE)
Manager	13.20	(5.00)	Thrust!	9.30	(FREE)
Transact	23.40	(18.00)	Big K.O.	10.10	(1.00)
Admin Xtra 40	11.65	(3.00)	Phantom	10.10	(1.00)
Admin Xtra 80	11.65	(3.00)	Spy V Spy 40 Track	11.65	(3.00)
Fleet St. Editor 40	31.15	(25.00)	Impossible Mission	11.65	(3.00)
Fleet St. Editor 80	31.15	(25.00)	Font & Graphics	11.65	(3.00)
Font & Graphics	11.65	(3.00)	Wait Diary 40 (Graphics Library)	11.65	(3.00)
Wait Diary 40	11.65	(3.00)	Wait Diary 80	11.65	(3.00)
Wait Diary 80	11.65	(3.00)	Graphics Library	11.65	(3.00)
Graphics Library	11.65	(3.00)	MusSystem 1 & 2	18.50	(15.00)
MusSystem 1 & 2	18.50	(15.00)			

If you are not buying blank disks then you can buy any of the programs above by paying 'our normal price', (Much cheaper than retail).

### ALL PRICES ARE INCLUSIVE OF POST & VAT



Nebulae, Dept. M.I. FREEPOST, Kilroot Park Industrial Estate, Carrickfergus, Co. Antrim, BT387BR  
Telephone (09603) 65020 (Monday to Friday 9 to 5)  
7 Day delivery. (TEL. 09603) 51020  
& 14 day money back period

ORDER BY PHONE FOR SAME DAY DESPATCH

WE accept orders (09603) 51020 from all government bodies, schools, universities, PLC's etc. We despatch on receipt of an official purchase order.

FREEPOST YOUR ORDER TODAY - NO STAMP REQUIRED

# BEEBUG

## TECHNICAL ASSISTANT

BEEBUG has vacancies in St. Albans for young computer enthusiasts, who are familiar with the BBC Micro or Master. You will join a team providing technical advice on a wide range of software and hardware products for the BBC, Master and Archimedes.

Send details of yourself and your computer experience to:

**The Personnel Manager, Beebug Ltd, Dolphin Place, Holywell Hill, St Albans, Herts. AL1 1EX.**

# LETTERS

Write to Letters, Acorn User, 20-26 Brunswick Place, London N1 6DJ

## FINANCIAL DEVELOPMENTS

Sir, *Acorn User* readers and Micronet subscribers raised over £440 for the Centre World Development Education at the recent *Acorn User* Exhibition. I can't tell you how much we appreciate the contributions and your readers' generosity in taking part. I'd like to thank each and every one.

We have used part of the money to purchase a Beeb (secondhand) for the viewing area we are opening at over Resource Centre, so that visitors can look through our software while they are here. It is an idea I have had for a long time, and that is why I am so grateful to you for having enabled me to bring it to fruition.

E Segall  
Centre for World  
Development Education

Many thanks to all our readers who contributed. A review of *Sand Harvest*, an educational program by the Centre for World Development Education, appeared last month in *Acorn User*.

## ARC ADAPTATIONS

Sir, I am lucky enough to have a new Archimedes 305, for which there is little software available at the moment. I was itching to try out the new fast graphics, colours, number crunching and Basic commands. So what better than a graphics-oriented game such as

David Lawrence's *Maze* published in September '86. When running in Basic 5 the difference is unbelievable. Various minor changes have to be made as well as others that will enhance the game. For even better results the program should be run in RAM Basic 5.

The vital adaptations are to delete lines 60, 3080 and 3130, and change line 330 to:

```
330 done=FALSE:M
%=&10000
```

You can enhance the game by using a different screen mode, may be mode 9 or 12, and altering the colour statements, and by using the OFF and ORIGIN commands.

VDU23; 8202; 0;0;0; could simply be replaced by OFF and VDU 29, 640; 800; could be changed to ORIGIN 640, 800.

M Treagus  
Hampshire

## MANDELBROTS IN MINUTES

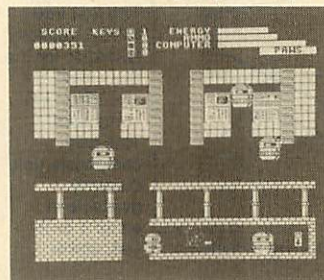
Sir, I tried many of the one-line graphics programs in the August issue. You might be interested to learn that on the Archimedes the Mandelbrot program ran in 5 minutes 53 seconds in mode 2; in mode 12 and mode 13, it ran in 6 minutes 27 seconds.

M Dunn  
Lancashire

On a BBC micro, J Greening's Mandelbrot design takes well over an hour to plot. We are still receiving new one-line programs, and will print a follow-up shortly.

## CONFIGURE CURES

Sir, I am sure that many other Master users have experienced the same problems as I have. Programs said to be Master-compatible hang up inexplicably.



Plan B: crashed inexplicably

ably. Bug Byte's *Plan-B* is one of several examples; after pressing space to start the game, the screen turns black.

After hours of frustration, I tried to run it on another Master. It turned out to work without problems. Then I copied all the \*CONFIGURE options from the other Master to my own, and it then worked.

It turned out to be the Scroll-No Scroll configuration that caused the difficulties.

So try typing \*CONFIGURE SCROLL followed by CTRL-Break before loading a program, and your problems may disappear.

H Sundt  
Norway

## COLOURED VIEW

Sir, I have a Master 128 which I use predominantly for writing worksheets in connection with my job as a teacher. I find *View*

quite adequate for this purpose.

However, one application is defeating me. I have set up my disc with a !BOOT file to take me directly into *View* and set up the stored commands and ruler length ready for immediate use. However, I like to work with white text on a black-lined blue background. I can get this by typing CTRL-S followed by 0 4 0 0 0. I have not found a way of building this into the !BOOT file successfully. Can you tell me how to do this?

M Roe  
Leicestershire

To put colour control codes into an exec file simply, you can include the following two lines:

```
*KEYO !S!@!D!@!@!@
```

```
*FX 138,0,128
```

## NEW PROBLEMS

Sir, In reply to Dr Sonywell (Letters, September), there are two reasons that using the command ':NEW' is unsatisfactory in *Wordwise Plus*.

First, there are risks involved since you cannot see what you are deleting - there are no safety checks.

Second, typing ':NEW' deletes everything, text and segments, in *Wordwise Plus*. If, like me, you like to use the segments to work on a number of documents at the same time, the outcome could be catastrophic indeed.

J Ducat  
Avon

# 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.

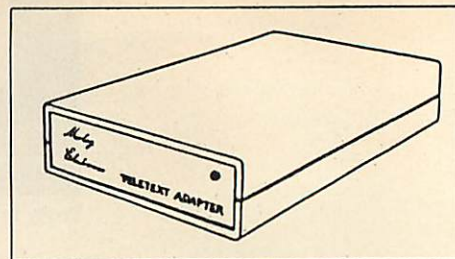
With the Morley adapter you will get a state of the art unit that automatically tunes itself into the required station (no more messing around with screwdrivers or twiddling little knobs in the back of the case), a user friendly menu driven program, easy to follow instructions and a 12 month warranty. 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.
- \* Utilis disc available including printer drivers allows pages to be selected and dumped direct to a printer



(no more TV or Radio Times to buy).

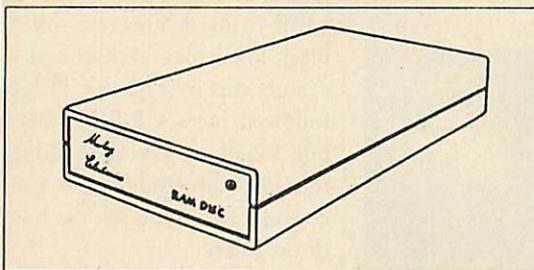
## WHAT THE REVIEWERS SAID:

"...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.**



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

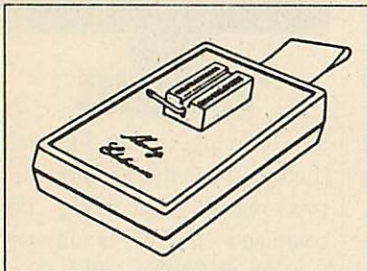
Now available! The first true MEGA capacity RAMdisc for the BBC, BBC B+ and MASTER computers. This fully compatible unit, currently available in either 1 or 2

# 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 be 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.

# 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.

**12 MONTH NO QUIBBLE WARRANTY  
ALL CARTRIDGES COME WITH A**

**NEW\***

# 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.

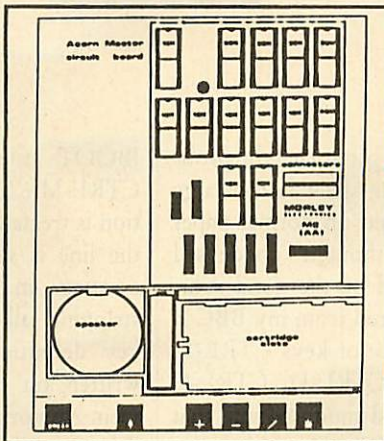
The new MORLEY MASTER BOARD "AA" allows you to have up to 8x16k and 4x32k extra Roms installed inside your MASTER and still leaves the cartridge slots free. This in effect allows your MASTER to support as many as 24, 16k ROMs installed permanently, whilst retaining the standard 4 x sideways ram banks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

**A staggering 32 ROM Images installed and accessible at any time**

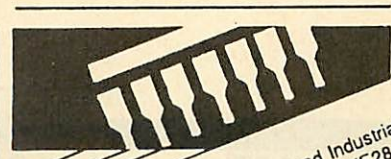
Included in the package is a utility ROM which has many useful features such as 'FICOPY', a clever file transfer program that transfers files between DFS and ADFS formats or vice versa.

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%

Qty.	Item	P&P Rate	Qty.	Item	P&P Rate
Qty. ____	Morley Teletext Adapters .....	119.95 (a)	Qty. ____	M/B Software Design 7+ .....	9.95 (c)
Qty. ____	Optional Power Supply .....	9.95 (b)	Qty. ____	M/B Software Desfax .....	19.95 (c)
Qty. ____	Teletext Utilities on disc .....	5.95 (c)	Qty. ____	M/B Software DesROM .....	12.95 (c)
Qty. ____	1 Megabyte RAMdisc .....	199.95 (a)	Qty. ____	M/B Software Mastercopy Disc .....	12.95 (c)
Qty. ____	2 Megabyte RAMdisc .....	349.95 (a)	Qty. ____	M/B Software Mastercopy ROM .....	14.95 (c)
Qty. ____	Eprom programmer V2 .....	34.50 (b)	Qty. ____	M/B Software Masterfax .....	29.95 (c)
Qty. ____	Master ROM boards "AA" .....	45.95 (b)	Qty. ____	M/B Software VU-Fax System inc RAMdisc .....	249.95 (a)
Qty. ____	Master RAMdisc/SWR cartridge .....	P.O.A.	Qty. ____	5.25" Floppy discs x 10 .....	7.95 (c)
Qty. ____	Care Master ROM cartridges .....	8.95 (b)	Qty. ____	27128 16k CMOS EPROM .....	3.65 (d)
Qty. ____	Master Smart cartridge .....	39.95 (b)	Qty. ____	Info Pack + Demo Disc of all Software .....	FREE (c)

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

AU11

# LETTERS

## FAST DRIVER

Sir, I read with interest the article on *View* printer drivers in the October issue of *Acorn User*. I own a Master 128 and a Panasonic KX-P1080 printer, and to date have accepted the normal printer output without the embellishments possible with a printer driver generator.

It was with delight therefore that I set about copying the appropriate listing to enable me to provide italics, bold print, underlining etc.

Having copied the listing and checked it twice for typing errors, I thought - here goes.

I encountered a problem which I hope you may be able to solve. On running the program and then trying to save it, I encountered 'Disc full at line 1540'. Is there some simple solution?

W Percival  
South Glamorgan

Several people who typed in this listing have had problems of this sort. It arises if a space is omitted from line 1300. The line should read:

```
1300 PROCoscli ("S
AVE "+name$+" 900
+FF 400")
```

As you can see, there is a space after '+FF'. Most listings on the yellow pages are printed using LISTO 1 and WIDTH 40. If you set your micro the same way before checking your typed-in programs, it can help to avoid problems such as these. Without the space, it reads '+FF4'.

## CONDENSED ADVICE

Sir, I read with interest in Hints & Tips, August 1987, the suggestion made for printing out *ViewSheet* in condensed

mode. As I often face the problem that the sheet is too large to be printed on normal paper width, I thought condensed mode could be the good solution. I entered from my BBC B the sequence of keys CTRL-B, CTRL-E, CTRL-D, CTRL-C in command mode hoping that my Taxan KP 810 would print the sheet in condensed mode, but this did not work. Does this only work on the Master and not on BBC B? Should the four keys be pressed on one line in the command mode or do I need to press Return?

D Clement  
Belgium

The correct key sequence for condensed mode is CTRL-B, CTRL-A, CTRL-O, CTRL-C. Don't put a Return between the four keypresses. One problem is that some types of printer driver reset the printer back to normal print, but if no printer driver is used then you should have no problems with your Kaga 810.

## KEY NOTES

Sir, I was very pleased to read Hints & Tips in the August issue. It answered several queries I have had regarding printing out from *ViewSheet*. Other codes I have found in my Taxan manual are CTRL-L for form feed eject, CTRL-R for cancel condensed mode and CTRL-N for enlarged print with self-cancellation.

Unfortunately I was unable to get the !BOOT to work properly. I am using a Master 128 and when attempting to !BOOT up *ViewSheet* using Martin Phillips' listing along with a couple of the codes listed above, the \*KEY definitions are acted on immediately as if they were not key definitions at all. Also, when the

!BOOT file is used, any CTRL-M (M) in a key definition is treated as a Return when the line is saved to disc, thus creating an empty line and stripping all CTRL-Ms from key definitions. !BOOT files written on my old model B seem to work OK and the disc drives are the same ones as used with the model B.

E Burke  
New Zealand

If you want to include a Return in a !BOOT file, using the Master or Compact you can use M. The M character means that the next character is a control code. \*BUILD decodes the M into a Return character, CTRL-M.

But what if you want to include M in the !BOOT file? You have to specify M in \*BUILD as, M is decoded to M, and the next character is M.

So in all the control codes for colour within \*KEY definitions you have to replace M with M. Martin Phillips' !BOOT file becomes:

```
*SHEET
*TV 0,1
MODE 131
*KEYO !S!@!;!4
!;!@!;!@!;!M*fx 12
S!M
*KEY1 !B!;!A!;!0
!;!C!;!G
*FX 138,0,128
```

## DIFFERENT CASES

Sir, I have often been infuriated while typing in programs which contain a mixture of upper and lower case letters. The BBC micro has the ability, like most typewriters, to print an upper case letter when Caps Lock mode is off simply by holding it down with Shift. But you can also do the reverse, print a lower case letter when Caps Lock is on. Hold down the Caps Lock key in conjunc-

tion with the Shift key. This makes the keyboard give capitals. Now when a lower case letter is required, press the key together with Shift.

Could you print a one-line memory downloader so that I can use long programs with DFS in the machine? Fitting the DFS 'took away' memory between &E00 and &1900.

C Webster  
Kent

When a disc system is fitted, it grabs some memory for itself, and the DFS normally uses the RAM between &E00 and &1900. Here's a downloader to add to your long programs, so they can be used from disc. However, it can't be used with programs that have to load in data files.

```
10 IF PAGE>&E00
THEN PROCrelocate
20 :
30 REM Your pro
gram here
40 :
10000 DEF PROCrelo
ate
10010 *TAPE
10020 *KEYO F.X%=0
TO (TOP-PA.)S.4:X%!
&E00=X%!PA.:N.:PA.
=&E00!MO.!MRUN!M
10030 *FX15
10040 *FX138,0,128
10050 END
```

## QUICK QUICK SLOW

Sir, I am surprised that in Joe's Jottings, October issue, you claim the Shell-Metzner sort to be a fast sort. I tried it, and was shocked to find that it took 137 seconds on average to sort 500 randomly selected integers. The quicksort typically takes only 47 seconds under similar circumstances.

The quicksort is the quickest method I know of.

J Robinson  
Edinburgh

The Shell-Metzner sort is indeed fast in most circum-

stances, though Joe's needs were better covered by the simpler exchange sort. You'll find an article on the quick-sort method on page 95.

## MASTER PROSPECTS?

Sir, I am a Master 128 owner living in New Zealand and what I would like to know is do Acorn Computers intend to discontinue the Master series now that the new RISC machine is available, or will they continue to support the Master for a few years yet?

R Johnstone  
New Zealand

An Acorn spokesperson replies that Acorn will continue to market and support the Master series as long as it is viable. Given the price difference between the Arc and the Master series, the market for the Master will not collapse overnight.

## RECLAIMING WORK SPACE

Sir, I own an issue 3 BBC B with an increasing number of essential ROMs in permanent sockets for the work I do. However, three of these claim their own work space and raise PAGE from &1900 to &1E00. The PMS NTQ ROM takes a page of memory, as does *Spell-Master*, and *Word Ex* takes two pages of memory.

I have the 6502 second processor but none of these ROMs will work across the Tube so my investment in it is negated. Is there any way I can claim back this memory?

I Crawford  
Oxfordshire

No, the memory taken by these ROM's can't be claimed

back. Each ROM needs some memory of its own to use as work space, and so PAGE is raised by the amount they take. PAGE can be lowered:

PAGE=&1900

but some of the ROMs probably won't work.

## PROFESSIONAL PROGRAMMING

Sir, First of all, congratulations: Peter Eggleton's article 'Better by Design' on structured programming (October 1987) is the first time I have ever seen an

language you are using. In providing WHILE... END-WHILE in BBC Basic 5 Acorn is making an improvement to the language. If the language hasn't got the construct you require, you often need to use GOTO. Jackson's view: 'No matter - so be it.'

I thought Mr Eggleton's comment about pseudo-code was misleading since the implication was that pseudo-code is an alternative methodology to Jackson's diagrams - far from it. Many people I know of use both: first a program structure is devised, then

standard textbooks all deal with the techniques for doing this and although it's clearly beyond the scope of a short introductory article such as Mr Eggleton's, I do think it should have been mentioned. The central point this method is that a program structure is derived from its data structures.

In conclusion, although I have my criticisms of Peter Eggleton's article, I think its emergence is a very healthy sign. Perhaps he could be encouraged to develop the theme - Jackson's method deserves far more than one short article and I'm sure there are many readers who would be interested to read further.

S Muir  
Berkshire

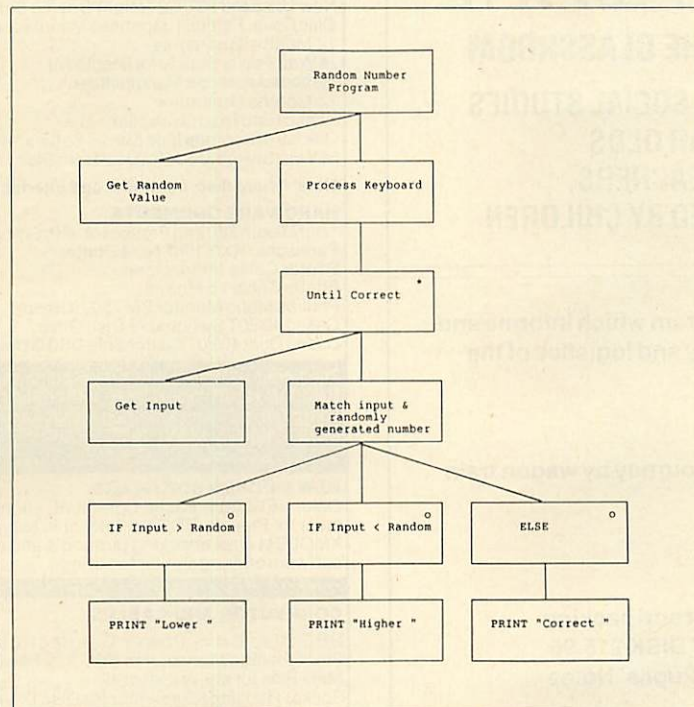
## NEW DIMENSION

Sir, I am writing a program for my BBC model B computer which uses the Basic word DIM. If I go back to the line number which holds the word DIM then I get a 'Bad DIM' error. The User Guide says that this error is produced when an array is made up of negative numbers, for example: DIM A(-3). However, I have not done this. Could you explain why this does not work?

O Astley  
Durham

One of the important points about DIM is that you can't *redimension* an array. So the first time you go through the line, it works; the error occurs when you branch back to that line again.

The cure is to either branch back to the line after DIM, or possibly use the CLEAR command. This gets rid of all the variables used by a program except A% to Z%, so you can redimension the array.



Jackson diagrams: using professional methods

article in an amateur's magazine on the sort of methodology which is now commonplace in commercial environments.

However, although this article was a large step in the right direction, to my mind it gave only half of the story.

Mr Eggleton was misleading in stating that GOTO cannot be used with Jackson's method. Jackson stated early in his book, *Principles of Program Designs* that you may be forced to use GOTO to overcome deficiencies in the programming

pseudo-code is written from this, finally the program is coded from the pseudo-code.

Now for the omissions from Mr Eggleton's article. Where do program structures actually come from? Having read Mr Eggleton's article you might be excused for thinking you devise them yourself. Not so, according to Jackson. In Jackson programming, program structures do not simply come out of the programmer's mind; they are determined by the data the program manipulates. The

SUBJECT  
TO  
AVAILABILITY

## S. P. ELECTRONICS

BBC  
SPECIALISTS

BBC Master 128 Computer.....	£425.00
BBC Master Compact from.....	£343.85
Acorn Electrons (When Available).....	£49.00
Opus 40/80 Single Drive (No PSU).....	£126.50
Opus 40/80 Single Drive (With PSU).....	£160.95
Cumana 40/80 Double Sided Dual Drive.....	£340.00
Acorn 1770 DFS Kit.....	£49.90
Acorn ADFS ROM (For use with above).....	£29.90
Citizen 120D Parallel Printer 120 CPS.....	£199.00
Canon PW1080A Parallel Printer 160 CPS.....	£299.00
BBC Parallel Printer Cable.....	£12.90
Computer Concepts Interword.....	£56.00
Computer Concepts Wordwise Plus.....	£56.00
Cassette Recorders from.....	£25.00
Wooden Plyths.....	£9.95

We are  
Acorn  
approved  
dealers  
& repair  
specialists

Wide selection of software, books, leads, plugs, etc.  
SAE for full list. All available Mail Order.

All prices only  
while stocks last!

48 Linby Road, Huncknall,  
Notts. NG15 7TS



Educational &  
institutional Carriage  
orders welcome extra

Tel: 0602 640377 (all prices include VAT)



### 2 NEW GAMES FOR THE CLASSROOM

A NOVEL APPROACH TO SOCIAL STUDIES  
FOR 11-14 YEAR OLDS  
DESIGNED BY TEACHERS,  
TESTED AND APPROVED BY CHILDREN

★ BECAUSE IT'S THERE – a program which informs and tests on the History, Geography and logistics of the ascent of Everest.

★ THE WAY WEST – a simulated journey by wagon train across America in 1840.

★ For BBC Model B or Master ★

EACH £10.95 inc. post and packing  
or BOTH on 1 FLIPPY DISK £15.95  
WITH Teachers' and Pupils' Notes

Further information and orders:

15 Allen Road PETERBOROUGH PE1 3BT

# SIGNWRITER!

instant display lettering  
from a dot-matrix printer

£29.95  
(BBC version)

- \* Signs printed across or down the page
- \* Sharp characters any size - the bigger the better
- \* Design logos, symbols on screen
- \* Extra fonts £5.75 each:

Rome Zoo:   
Hand Dawn   
Shop Fair   
Oldc etcetera

Available from the publisher:

WIGHT SCIENTIFIC  
44 Roan Street, London SE10 9JT  
(01) 858 2699

This advertisement printed A4-size with 16-bit SIGNWRITER

# OAK COMPUTERS SALE.

## NEW OAK MENTOR COMPUTER SYSTEM

Master 128 compatible, single 80T disc drive, Hi-Res Mono Monitor.....	£499.00 p&p £14.00
Master 128 compatible, dual 80T disc drive, Hi-Res Mono Monitor.....	£599.00 p&p £14.00
Master 128 compatible, single 80T disc drive, Hi-Res Colour Monitor (.37 dot pitch).....	£699.00 p&p £14.00
Master 128 compatible, dual 80T disc drive, Hi-Res Colour Monitor (.37 dot pitch).....	£899.00 p&p £14.00

Oak PMC range starts from..... £730.00

Oak offer a comprehensive consultancy service based around Acorn products. From straight forward advice to developing complete systems, please telephone for details.

Last remaining little used Master 128's  
(3 months old) 12 months guarantee..... £295.00 p&p £5.50

## DISC DRIVE ACCESSORIES

Single Disc Drive Case.....	£6.00 p&p £2.00
Dual Disc Drive Case.....	£12.00 p&p £2.75
Single Power Cable.....	£2.95 p&p £1.00
Dual Power Cable.....	£3.65 p&p £1.00
Single Data Cable.....	£3.95 p&p £1.00
Dual Data Cable.....	£5.95 p&p £1.00
New Uncased 80T 1/2 Height Double Sided, Disc Drive, Famous Japanese Manufacturer, 12 Months Guarantee.....	£67.00 p&p £5.00
24 Watt Power Supply for Disc Drive Famous Japanese Manufacturer, 12 Months Guarantee.....	£245.00 p&p £10.00
Xebec Hard Disc Controller.....	£135.00 p&p £2.50
Oak hard Disc Interface Card & Software (format etc).....	£55.00 p&p £2.50
35 Watt Switch Mode PSU for Hard Disc.....	£45.00 p&p £8.00

Note: If hard disc, controller and interface are purchased together delivery £10.00

## HARDWARE ODDMENTS

1 only Torch Z80 2nd Processor with Software.....	£75.00 p&p £5.00
Panasonic KXP 1081 NLQ Printer.....	£154.00 p&p £6.00
Printer Cable Metres long.....	£6.75 p&p £1.00
Printer Cable 1.5 Metres.....	£8.75 p&p £1.00
Phillips Mono Monitor BM 7502 (Green).....	£66.00 p&p £6.00
Cased 40/80T Switchable Disc Drive.....	£88.00 p&p £6.00
Cased Dual 40/80T Switchable DSDD Disc Drives.....	£165.00 p&p £8.00

The latest 1/2 height, low power consumption Japanese disc drives MONEY BACK IF YOU ARE NOT COMPLETELY SATISFIED. Disc Drives come complete in Colour Matched Metal Cases with Fitting Instructions, Formatting Disc, Manual & 12 Months Guarantee

## NEW MODERN SOFTWARE

Oaks NEW Rom Based Communications Software is easy to use, Menu Driven, ideal for Prestel, BT Gold, Micolink, Micronet etc. Terminal Mode which includes XMODEM error checking protocols and many more. Only a fraction of the cost of software offering similar facilities..... £10.95 p&p £1.75

## CONNECTOR AND CABLES

BBC Disc Drive Power Connectors	
Pin Housing (Connector to BBC Aux Power Outlet).....	£0.36 p&p £0.50
Male Pins for above (Set of 4).....	£0.45 p&p £0.50
Socket Housing (Connector for Disc Drives).....	£0.50 p&p £0.50
Female Pins for above (Set of 4).....	£0.35 p&p £0.50
4 Way Power Ribbon Cable Per Metre length.....	£0.55 p&p £0.50
20 Way IDC Connector.....	£1.35 p&p £0.50
26 Way IDC Connector.....	£1.65 p&p £0.50
34 Way IDC Connector.....	£1.65 p&p £0.50
50 Way IDC Connector.....	£2.85 p&p £0.50
20 Way IDC Card Edge Connector.....	£1.70 p&p £0.50
34 Way Card Edge Connector.....	£2.00 p&p £0.50
15 Way IDC "D" Plug.....	£3.85 p&p £0.50
25 Way IDC "D" Plug.....	£3.95 p&p £0.50
37 Way IDC "D" Plug.....	£4.55 p&p £0.50
15 Way IDC "D" Socket.....	£3.85 p&p £0.50
25 Way IDC "D" Socket.....	£3.95 p&p £0.50
37 Way IDC "D" Socket.....	£4.55 p&p £0.50
36 Way IDC Centronics/parallel Printer Plug.....	£2.95 p&p £0.50

## BBC/ACORN SPARES

BBC B + PCB.....	£235.00 p&p £2.50
BBC Power Supply.....	£56.00 p&p £2.50
BBC B&B + Keyboard.....	£54.00 p&p £2.50
BBC B&B + Plastic Cases.....	£10.00 p&p £2.50
BBC B&B + Keyboard Connector Cable (17 way).....	£1.00 p&p £0.50
Master 128 PCB.....	198.00 p&p £2.50
Master 128 PSU.....	£45.00 p&p £2.50
Master 128 Keyboard.....	£51.00 p&p £2.50

Prices Exclude V.A.T. United Kingdom customers please add 15% to total cost + p&p. Telephone for quantity discounts



Oak Computers, Cross Park House, Low Green, Rawdon, Leeds LS19 6HA. Tel: (0532) 502615  
Government and Education Authority Official Orders Accepted



# LETTERS

## TORN BETWEEN TWO MICROS

Sir, Reviews of the new Acorn Archimedes computer suggest that its market, apart from the educational field, is likely to be previous BBC micro owners who have sold their much loved BBC B and are considering upgrading to the Atari ST range. This is where the problem for Acorn begins: to get on the first rung of the Atari ladder will cost around £400, whereas to gain a foothold with the Archimedes is going to cost somewhere in the region of £1000 or more.

I realise the power and potential of Acorn's RISC chip, and the kind of money it took to develop, but I think it will be difficult for Acorn to sell it in a market where potential customers were considering paying only around £500 for their upgraded system. The Archimedes is clearly a brilliant machine, and I want one, but if Acorn target their prices wrongly, upgraders will commit themselves to the ST range and thus swamp the 'post eight bit' market. Acorn will find themselves with a superb machine, but a small user base.

I've just sold my BBC B, and am hovering with one eye on a 520/1040 ST and the other on my cheque book. The lure of the Archimedes for us 'veteran' BBCers is that the Archimedes technology will use BBC Basic, it's made in Britain, and it should be expandable, it promises to be as robust and reliable as most of us found our old Beeb's to be. History has shown Acorn not to be the kind of 'love 'em and leave 'em' company that other fast buck merchants have been.

If Acorn find it possible to give discounts to educational establishments, then they would be wise to aim 'entry

level' A305 machines at a price we mortal punters can afford.

If Acorn could establish a VAT inclusive price for the A305 that breathes down the neck of Atari's 1040 ST, the growth of the Archimedes user base would far outweigh the narrowing of its profit margin.

D Butler  
Lancashire

## ARC FILING

Sir, I have just attended a most impressive demonstration of the power of the new Acorn RISC machine, and like other home users would be very interested in upgrading from my model B. But the Acorn demonstrator, having heavily plugged the compatibility angle, was evasive about how you could transfer programs, and data files from 5.25-inch floppies to the new machine.

I gathered that there may well be a number of round-about ways to do this, involving networks, two machines back to back, *Kermit* chips and so on, but to the non-technical user these makeshift arrangements will require specialist help and seem likely to cause extra cost and delay.

Why is it that Acorn have not provided a straightforward means of just plugging in a 5.25-inch floppy drive to an Archimedes and reading the contents into RAM so that they can then be saved direct to the new 3.5-inch discs using the built-in drive?

It seems to me that a lot of people will be put off upgrading for want of compatibility with Acorn's original DFS!

R Smith  
Fife

Acorn appear to have adopted a policy of using DFS on 5.25-inch discs and, ADFS on 3.25-

inch discs. There are companies working on connecting 5.25-inch drives to the Archimedes, but products are unlikely to appear for a few months yet.

Acorn Forum this month describes how to transfer Basic programs from the BBC micro to the Archimedes, using the serial port. In this way all the time-consuming disc swapping can be avoided. Transfer of other files will be the subject of a future article.

## COMPACT DISCS

Sir, I have a BBC Master Compact and have found that games on 3.5-inch discs are more expensive than the same games on 5.25-inch disc. I would like to use a 5.25-inch disc as well as my 3.5-inch disc. If I buy a suitable drive, will I be able to load BBC B, B+ or Master games in 5.25-inch disc format?

S Peters  
West Glamorgan

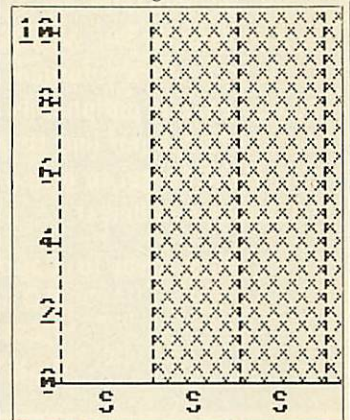
If you add an 5.25-inch disc drive to your Compact, then in principle you should be able to use a number of Master or BBC B games on disc. But you'll also need a 1770 DFS fitted, as Master and BBC B games don't use ADFS, the Compact's usual filing system. The 1770 DFS is on the latest editions of the Compact Welcome disc, and included as part of the Master Compact Companion. The Companion costs £39.95 and is available from Mertec Computer Products, 35-36 Singleton Street, Swansea SA1 3QN.

Copies of the Welcome disc containing the 1770 DFS as a ROM image are available for a nominal charge from Acorn themselves. The image can be easily loaded into sideways RAM.

## EXTRA SPACE

Sir, I am having difficulty using a printer dump with my Star SG-10 printer. The problem is that prints of a graph are broken up by a series of regular gaps, as you can see from the example below.

I suspect that an extra line feed is being issued at each



Mr Cox' gappy screen dump

carriage return and this seems to be confirmed by the fact that spreadsheet prints are produced with double spacing.

I am sure that in view of the popularity of Star printers some of your readers must have met the problem too. I would appreciate any help they can offer in overcoming it.

A Cox  
Lincolnshire

It looks like not double, but one-and-a-half line spacing. Graphics dumps need to adjust the line spacing so that the top dots of one line are adjacent to the bottom dots of the previous line. The control code for this is ESC "3"n, where n is the line spacing in 216ths of an inch. The Star is the same as the Epson printer in this respect, but it looks as though your dump isn't doing this correctly. Martin Phillips covered screen dumps in Hints & Tips in September 1986 and May 1987.

# PROGRAMMERS

If you can program in 6502 Assembler and/or 'C' then we want to hear from you!

We are a software consultancy in constant need of expert programmers for projects based on Acorn 6502 and RISC-based equipment as well as other manufacturers' machines (when our clients insist!).

If you are over 16, think you have genuine talent, write superb machine code, are conscientious, have some free time, are in need of excitement and could do with some well-paid part-time work then write to us now.

Please send us a PRINTED LISTING of some of your best work, accompanied by SUPERB DOCUMENTATION, and enclose an SAE with SUFFICIENT POSTAGE if you want your work returned. Also tell us what kind of equipment and peripherals you have and whether you have a telephone line that is available for MODEM use. Don't forget to give us your name, address and telephone number(s).

Write away to: Capricorn Consulting  
P.O. Box 72  
CAMBRIDGE  
CB5 9BX

# Archimedes

## NEW ACORN APPROVED LONDON DEALER

	Basic	Mono	Colour
Archimedes 305	799.00	849.00	999.00
Archimedes 310	875.00	925.00	1075.00
Compact	309.95	349.95	479.95
Master	349.95		
Master Turbo	99.95		
Master 512K	189.95		
Master ET	303.95		
Master Econet Mod	40.00		
Master Eprom Cart	13.00		
3.5 Disc Dr 400K	86.95		
3.5 Dri 400K P/S	113.95		
5.25 Dri 400K	119.00		
5.25 Dri 400K P/S	135.00		
512K Ram Archimedes	79.00		

SPECIAL OFFER!!

All prices subject to availability and VAT at 15%  
All prices subject to change without notice  
ACCESS/VISA accepted

Postage & Packing  
Below £10.00 add £1.50  
Below £50.00 add £2.50  
Below £100.00 add £3.50  
Above £100.00 add £10.00 per carton

**AUTOMATIC SERVICES,**  
217 WOOD STREET,  
WALTHAMSTOW, LONDON E17 3NT  
01-521 1784

# MEDUSA

Curriculum Material to meet REAL classroom needs

*Have you seen our Guides?*

**GETTING INTO PRINT - £10**

as described in this issue

**VIEW FAMILY GUIDES**

to View, Viewsheet, Viewstore and Viewplot - £10 each including Teachers' Guides, Worksheets, Examples

**CROSS CURRICULAR GUIDES**

to Spreadsheets - £7.50, and Graphics - £7.50 sample applications with templates on disk

*OTHER CURRICULUM SUPPORT MATERIALS ARE AVAILABLE FOR USE IN BOTH PRIMARY AND SECONDARY SCHOOLS*

LEA LICENCES AVAILABLE

For further details and free catalogue contact:

MEDU, BISHOP GROSSETESTE COLLEGE,  
NEWPORT, LINCOLN, LN1 3DY  
Telephone (0522) 44713

**MEDU - Leading the way in Educational I.T.**

## SQUIRREL SOFT

**PRESENT**

The new 'CARE' range of programs:  
For the Electron, BBC-B & B+, Compact, Master and Archimedes



**INVESTMENT CARE PLUS - £19.95**

Keeps track of all UNIT TRUSTS, SHARES etc. Produces displays & printouts of Capital Gains, Dividends, Current Holdings valuations showing Quantities, Bid/Offer prices, Values, Gains/Losses, APR, HiVal %, etc.

This new version has improved handling characteristics and a 3D BAR CHART program with a disc search procedure to collect past data.

**CASH CARE - £11.95**

Bank account AND Savings account. Full Analysis - 60 categories. Budget Forecasts. 3-D Bar Charts. Password Protection. Easy storage of data. Printouts of all accounts and Bar Charts.

**BUILDING SOCIETY CARE - £9.95**

Checks the complex interest calculations involved on a day to day basis. Shows interest earned to date. Spreadsheet display. Easy storage of data. Printout of account to date.

**VAT CARE - £14.95**

225 Sales AND 225 Purchases each month (BBC). Three month period. ALERT warning if VAT 2% or more incorrect. Easy storage of data. Printout with month & 3 monthly totals.

**The CARES DISK - £29.95 - comprising all four Cares utilities.**

**TV DIRECTOR:-**

Now popular in schools this program enables you to make your own video without cameras etc. on VHS or Betamax using this suite of purpose built software:-

'Picture maker' - 'Gallery' - 'Program review' 'Gallery' includes one TX and 8 P/V monitors. A&B bank vision mixer to provide cuts, fades, & dissolves, opening & closing credits. Sample picture datafile provided to get you going - choose your own soundtrack & record the result on to any suitable videorecorder - £14.95.

PLUS our range of QUALITY games:

**Supergolf - £7.50 Trafalgar - £8.00 Polar Perils - £7.95 Bunfun - £6.50**

**THE GAMES DISK £14.95 COMPILATION OF GAMES PROGRAMMES ELECTRON PROGRAMMES ON CASSETTE ONLY**

PLEASE FORWARD ME.....ON CASSETTE/DISC  
40TK  80TK  3.5"  5 1/4"   
I HAVE A BBC-B  MASTER  COMPACT  ELECTRON  ARCHIMEDES   
DEBIT MY ACCESS CARD NO.....  
OR ENCLOSED £..... NAME.....  
ADDRESS.....  
**Dept AU11, 4 Bindloss Avenue, Eccles, Manchester M30 0DU**  
Please phone 061-789 4120 for further information

# HINTS & TIPS

Martin Phillips explains some FX commands to new users, looks at differing daisy-wheels and even saves paper in *View*

## DAISY-WHEEL CHARACTERS

Daisy-wheel printers are much simpler to use than dot-matrix devices. There are fewer commands and no graphics to worry about. There is, however, one factor which can cause problems: the daisy-wheel itself. There are lots of different wheels available for most types of printer. Some wheels are simply different sizes or styles of print, but sometimes they have different characters as well. One daisy-wheel I came across recently substituted a comma for a full stop!

Imagine the problems when this wheel was used to print out a letter, or worse still, a program. There is a range of characters available by using ASCII codes higher than 127. ASCII stands for American Standard Code for Information Interchange, and normally printers use codes in the range 32 to 126 to represent all the normal characters. Most printers can accept all the codes in the range 0 to 255. Codes 0 to 31 are used to control features like line feed and form feed codes. The extra codes above 127 often represent extra characters that can't be obtained from the keyboard.

It is well worth finding out which codes give which character. A simple program which will do this is given in listing 1 on the yellow pages.

This will work with all printers, not just daisy-wheels. It will print out the character for each given ASCII code. The program skips over codes 0 to 31 and 127 to 157, as these are the control codes, and will do odd things to the printer (and the computer!). Codes 32 and 160 won't show up on the paper – they should always print a space. The program will then print out all the possible characters and their ASCII codes for a given daisy-wheel in a tabular form. The table will tend not to format properly when printing out codes greater than 126 because some of these ASCII codes are not recognised by the printer, and are simply ignored.

Some printers hide their extra characters – they may need a control code to print them, or even an 'escape sequence'. This is made up of two or more characters, the first of which is ASCII code 27. There is

no easy way to find these characters, except by reading the printer manuals.

There will usually be a '£' sign on the wheel. The pound sign on the keyboard has the ASCII value 96. Often on the printer this is shown as some other character. This can be allowed for in most wordprocessors. With *View*, it is altered by using the printer driver (see October *Acorn User*, Hints & Tips). With *Wordwise* and its related wordprocessors you use the define pound DP embedded command to say which code produces £.

Often beyond code 126 there are some other unusual characters. Some of these oddities can be quite useful. The codes greater than 126 can't be accessed easily from the keyboard. They are quite easy to access from *Wordwise*, but not from *View*. Using *Wordwise*, simply type:

```
<f1>OC172<f2>
```

to print code 172. *Wordwise* will ignore the character for formatting purposes, so a justified line with this code in it will be one character longer. To overcome this we need another trick. On the same line as the code type:

```
!<f1>OC8<f2>
```

This inserts a space using the pad character, but the printer then does a backspace (OC8), which then compensates for the previous character.

## WORDWISE REVISITED

In May 87's Hints & Tips I showed a way of setting up a !BOOT file to start up *Wordwise* and then load in a series of segment programs.

Essentially the routines consist of a complex !BOOT file together with a series of *Wordwise Plus* segment utilities. Obviously these utilities can be extended and adapted as required. The !BOOT file is shown in figure 1, just as it appears in *Wordwise Plus*. Do be careful not to put a Return after \*KEY, and not to insert any extra spaces or Returns – there are only two, at the end of the last two lines. Save it as normal using option 1 of the *Wordwise Plus* menu. It must be saved as !BOOT. When this !BOOT file is run, function key

```
Words-3 Characters free-28181 I
*KEYO
#WORD. 11#FX3, 1411#S.8E.011#LO.TE. "Z.0"11
.S. SE. 111#LO.TE. "Z.1"11#S. SE. 211#LO.TE.
Z.2"11#S. SE. 311#LO.TE. "Z.3"11#S. SE. 411#L
O.TE. "Z.4"11#S. SE. 511#LO.TE. "Z.5"11#S. SE
.611#LO.TE. "Z.6"11#S. SE. 711#LO.TE. "Z.7"11#
S. TE. 11#FX31111
#FX13, 0, 192
-End
```

Figure 1. *Wordwise Plus* !BOOT file

0 is defined and then called up. This then loads a series of segment programs from disc. The disc should contain all the files expected by the function key. In my case I have labelled them 0 to 7 and saved them in directory Z, thus they are saved as Z.0, Z.1, and so on. When the disc is catalogued, these files are tucked out of the way at the bottom of the list.

One segment I use a lot, but which was omitted from Hints & Tips in May is shown in listing 2 on the yellow pages. It is saved as segment 4.

Segment 4 sets up a standard heading for letters or reports. This is easy to alter for any particular purpose. Indeed you could include a selection option to call up any one of several standard headings, each in its own procedure, as an alternative to Philip Trinham's menu system on page 90.

You can use this segment in conjunction with segments 0 to 3 from May, or on its own. The !BOOT file requires files for eight segments: for any you aren't using, save a 'dummy file' consisting of only:

```
REM Segment 6
```

Using these segment programs is simplicity itself. Call up the segment by pressing Shift and the appropriate function key.

To install the whole thing on a disc, make sure that the !BOOT file has been saved, and so have the files for segments 0 to 7. These should have been saved as Z.0 to Z.7. Finally type:

```
*OPT 4,3
```

to enable the disc to auto-boot. Pressing Shift-Break will then enter *Wordwise Plus* and load the segments.

If there are problems and nothing appears to have loaded, then carefully

# HINTS & TIPS

check the !BOOT file – to do this, it can be loaded back into *Wordwise Plus*. A check through each segment will reveal which have loaded. Any mistakes made when entering the segments are highlighted when they are run, and so are easily cured.

£5

## TIPS FOR EDIT

D Aylott from Buckhurst Hill earns £5 for the following tips for the *Edit* screen editor on the BBC Master 128.

When writing !BOOT or \*EXEC files, the first line can be:

```
*!>filename
```

This then becomes the default filename. When saving, just press f3 then Return and the same after '>' at the top of the file gets used. This also serves as a reminder.

When writing Basic programs from within the editor do not use line numbers, but instead the first four lines you type should read:

```
*!>filename
*BASIC (or *HIBASIC)
NEW
AUTO
```

Using the editor makes such things as text and variable names easier to change. It is also easier to add procedures from libraries, as there are no line numbers needed. They can just be inserted using Shift-f2. Note that GOTOs cannot be used unless the line numbers are added once the program is complete.

Once a program has been completed and saved, it can be converted into a Basic program by typing:

```
*EXEC filename
```

or more simply:

```
*filename
```

If you use the AUTO technique, you'll have to press Escape once the program has been read in.

To strip REMs from existing programs and to delete line numbers from them, you can use the global replace function, f5. Some examples are shown:

```
* ^#REM^~$$/ remove REM lines
* ^#:$/ remove : lines
:REM^~$$/ remove REMs from
end of lines
^ $/$ remove trailing
spaces on line
** ^#/$ remove all line
numbers
$^ $/::$ puts : on blank
lines
```

The '^' symbol will find matches of single and multiple occurrences of the specified

character. Thus '^A' will find matches of a or A or AAA or AaaA etc. The '\$' symbol will find a Return character, so '^~\$\$' matches as many characters as possible up to the end of the line.

Within Edit, the SET MODE function key can also be used to show or hide the display at the top of the edit screen. Pressing function key 2, Shift-f5 then D shows the full help display, K shows the keypad and 0,1,3,4,6 or 7 show no help display at all. The editor will always start up in the mode it was last left in, as the mode last used is stored in the Masters' CMOS RAM.

Using function key 1 (COMMAND LINE) you can then change the editing screen colours. This is done using the CTRL-S command, which can also be used with *View*, *ViewSheet* and many other programs. Type CTRL-S, then 0 for background or 1 for the text colour. Follow this with a number, 0 to 7, which controls the colour, and then three zeros.

The colour numbers are:

0	Black
1	Red
2	Green
3	Yellow
4	Blue
5	Magenta
6	Cyan
7	White

£5

## SCREEN DUMPS WITHOUT A SCREEN DUMP

Impossible I hear you cry! Dr R G Steans from Camberley wins himself a fiver for a very nice tip which makes use of the \*SPOOL command. \*SPOOL will save any VDU calls made while the file is open, and this can even include characters sent to the printer. So if a \*SPOOL file is opened just before a screen is dumped to the printer, then all of the dump is stored on disc as well as being printed. This is useful if you regularly want to dump a particular screen or part of a screen – partial screen dumps were included in June 1987's Hints & Tips. It would be ideal if you wanted to include the family crest or some logo on a letter heading.

The process is very simple. Assuming you have already got a file containing a mode 1 picture called, say, PIC, and that your screen dump program (on disc or on ROM) responds to a command like

\*SDUMP, you can create a file called ONESHOT, with a small Basic program like this:

```
MODE 1
*LOAD PIC
*SPOOL ONESHOT
*SDUMP
*SPOOL
```

Clearly any disc-based screen dump program must be on the same disc as the picture file. Then run the program. The picture should load, then a screen dump of it will be produced. While this is happening the disc drive will switch on and whirr away.

Once the program is finished, the same screen dump can be recalled from disc using \*TYPE ONESHOT or \*PRINT ONESHOT. The second screen dump will work much quicker, in fact as fast as the printer can operate, and it will work even without the screen dump program itself. \*TYPE and \*PRINT were discussed in last month's Hints & Tips. Briefly, use \*TYPE on BBC model B, or \*PRINT on a Master 128 or Compact.

For those who wish to try it out and have the June *Acorn User's* listings disc, or if you have entered listing 1 from June 1987's Hints & Tips, then add the following lines to the program:

```
225 *SPOOL ONESHOT
235 *SPOOL
```

Do ensure then that when this program is run there is a disc in the disc drive, and that there is plenty of space on the disc to save quite a long \*SPOOL file.

Clearly this procedure is only useful when the same screen needs to be dumped regularly. The advantages are that there's no need to be in the same mode as the picture was drawn in when you do the dump, it gives a faster printout. No memory space used for the program to produce the picture and no memory space is needed for the screen dump. The \*TYPE command to redump the picture can be used directly from the command page of *View*. It can be used with *Wordwise* too, but not from the menu page. Include the \*TYPE command within the text itself using an embedded command.

Finally, a further thought on this subject. The \*SPOOL idea could be a simple way of sending any piece of information to printer: it need not be a screen dump. This information could be text, printer commands, character definitions whatever. Although these could easily be included in a program, this method would certainly

# HINTS & TIPS

save program space and could be used with any language. If you do have any original applications, then do tell us about them.

£5

## USING TWO PRINTERS

D J Hyde wins himself £5 for this money-saving tip. Having recently acquired a daisy-wheel printer to complement his existing dot-matrix printer, he spent much time unplugging the lead from one printer and connecting it to the other. Having looked around for suitable printer sharers, he discovered that the cheapest cost about £27. The solution he discovered is very simple – buy another Centronics plug and clamp it half way along the old printer lead so that both printers could be connected via the same lead. So long as only one printer is switched on at any one time, the off-line printer does not interfere with the data being sent to the other one.

Clearly quite a long printer cable is needed for this. Did you know that printer leads up to two metres long work without problems, and sometimes an even larger lead works?

## \*FX SPECIAL EFFECTS

New users are often confused and put off by the large number of \*FX commands available on the BBC micros and Electron. There are 256 of these, and you can't remember them all. There are only a few of them that you would use regularly.

One of the most commonly used is \*FX6,10. This stops the printer printing everything in double line spacing. Alternatively, if your printer prints everything on the same line, then \*FX6,0 is what you need to type in. If you haven't got a printer, then you might want to type in \*FX5,0. This stops any program that assumes you do have a printer from causing any trouble.

Most useful in a crowded computer room, or late at night is \*FX210,1. This prevents the computer from making any noise. Conversely, \*FX210,0 switches the sound back on again. You can make the normal beep just a bit quieter by typing \*FX212,216.

The keys on the keyboard have a feature called 'auto-repeat'. If you hold down a

key for a few moments, then the micro acts as if you are tapping the key very quickly. The speed of this auto-repeat can be speeded up using \*FX12,3. This is mostly used for wordprocessing, because it allows you to move the cursor around the screen much more quickly. The normal repeat speed can be restored with the \*FX12,0 command, and auto-repeat can be switched off altogether using \*FX11,0.

Another really quite common command is \*FX200,1. This disables the Escape key altogether, and is very useful in your own programs to prevent them being halted. \*FX200,2 means that all the memory of the micro will be wiped clean if you press Break – the OLD won't get back a program after \*FX200,2. \*FX200,3 does both; it disables Escape and wipes memory when Break is pressed. \*FX200,0 switches off all these effects.

## VIEW PAPER SAVER

Mention *View*, and one question arises more often than all the rest put together: how do I stop the printer churning out a full page of paper each time something is printed? The answer is simple when you know. *View* is normally configured to print out a full page – this can be turned off using the stored command PB followed by OFF. Use Shift-f8 (Edit command) then enter PB in the stored command margin. Press return then enter OFF at the start of that line.

Now when the PRINT command is used *View* will not print out a full sheet. This PB command can only be used with *View* 3. Early versions of the *View* ROM can't be prevented from printing right to the end of the page.

## REJUVENATED MICROS

A few old BBC micros eventually become very unreliable when you switch them on. It may take several attempts to get them working correctly, switching off then on again. Once going, however, they seem to work fine.

If yours is one of these old micros, you may have followed last month's advice about rejuvenating your micro, swapping around the keyboard lead inside the case. If

you did, and your micro is still as reluctant to work as before, then the problem is very likely to lie in the power supply. The components used in power supplies like those fitted to the BBC micro do wear out in time, and they can't really be repaired.

If you suspect that this is the problem with your micro, then have it checked by a service centre. A new power supply should cost about £60 to buy and fit.

£5

## SUPER ART SUGGESTIONS

Jim Elsam writes in from Cheshire to say that the instructions to load *AMX Super Art* into the Master 128 requires you to press CTRL-Break. There are some instructions in the !BOOT file after that, but they aren't used because the CTRL-Break closes the file. You have to type \*POINTER ON by hand.

A quicker and more friendly method can be used, and it's particularly useful with small children. It is illegal, that is against Acorn's programming rules, but it works well enough. The last three lines of the !BOOT file should be replaced with:

```
FOR N=3 TO 7:N?&2A1=&C2:N.  
*POINTER ON  
*! now press CTRL-Break  
*! the type *ART
```

This makes life that bit simpler.

## WINDOWS IN VIEWSHEET

In *ViewSheet*, you can set up several 'windows' – separate areas of the screen that scroll independently. The key that moves the cursor from one window to another is f2, but in some other spreadsheets the Tab key is used. You can make the Tab key have the same effect as the f2 key using:

```
*FX 219,130
```

So Tab can now be used to switch between windows.

The Tab key can be made to emulate any other key on the keyboard in this way too, using \*FX192, <number> where the number is the ASCII number of the key to be emulated.

Send any hints and tips of your own to Martin Phillips care of Acorn User, Redwood Publishing Ltd, 20-26 Brunswick Place, London N1 6DJ.

# Advanced Computer Products

## THE ADVANCED PLUS FOUR

### The Advanced Plus Four (A.P.4.)

- A FULLY ACORN COMPATIBLE disc 1/face for the 'ELK' & Plus 1
- Accepts any standard 5 1/4" or 3 1/2" disc drive with PSU
- Supplied with 1770 DFS (as supplied on the B+ & Master series) (A.E.D. is still available for Plus 3 users at £24.15 inc.)
- Page stays at &E00, the same as Tape F.S. NO LOSS of RAM
- Will allow more tape software to be run from disc
- Access compatible BBC disc-based software. No conversion program needed
- Extra sideways ROM socket fitted as standard
- A self-contained, well finished and fully tested product
- No 'short cuts' in design, finish or components
- ROM s/ware includes format, verify, free space and utils.
- Achieve greater BBC compatibility

£69.55 (+VAT)

"I can recommend it to anyone contemplating upgrading to disc".

Electron User, June '86

"The AP4 should be considered the standard interface for the Electron".

Acorn User, July '86

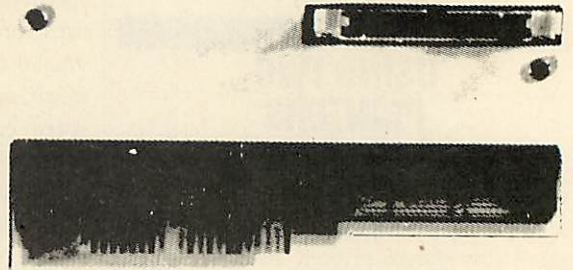
### AP4 SPECIAL PACKAGE PRICES

AP4 100 = AP4 + 5 1/4" 40 track S/S including PSU ..... £199.00

AP4 400 = AP4 + 5 1/4" track switchable D/S including PSU ..... £229.00

These prices include VAT and delivery

"Disc drive compatibility at long last".  
ELECTRON USER, JUNE '86



# AMX MOUSE

## POINTS THE WAY FOR THE ELECTRON USER

### AMX MOUSE

Catch an incredible AMX MOUSE! The advanced opto-mechanical device that brings to your ELECTRON facilities once only available on more expensive computers. Now you can use ICONS, WINDOWS, AND POINTERS in your own programs.

### AMX PACKAGE

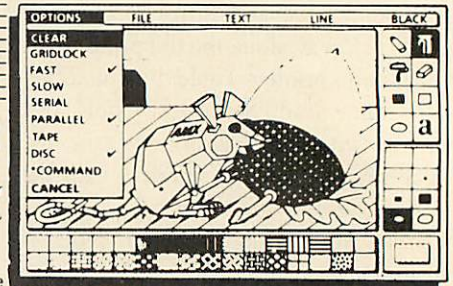
Plug the MOUSE into the user port, and the EPROM into your A.P.5. The latter contains fast machine code routines for creating on-screen windows, icons and pointers. And means that the MOUSE buttons can be programmed for use with commercial software such as Wordwise and View. There are two manuals included, explaining how to operate the MOUSE and the ROM routines, which are available in both basic and machine code programs.

Included in the package are two superb programs

AMX ART has to be seen to be believed! It's a computer-aided drawing program that's just as good for serious applications - such as the preparation of detailed architectural and engineering drawings or teachers' worksheets - as it is for having lots of family fun! And if you're artistically inclined, you'll be astonished at the quality of work you can produce and save. It makes full use of on-screen menus, pull-down menus and icons: the ideal, easy way for novices to learn and gain in confidence.

ICON DESIGNER is an invaluable program for creating and storing icons for use in your OWN programs.

The ACP/AMX mouse package may be used on an ELECTRON fitted with a PLUS 1 & AP5. The 'ART' software is supplied on cassette but can be transferred to DISC (DFS not ADFS)



£69.95 - MOUSE PACKAGE AND AP5 £125.00

Advanced Computer Products Ltd., 6 Ava House, High Street, Chobham, Surrey, GU24 8LZ Tel: 0276 76545

### THIS IS WHAT ELECTRON USER SAID ABOUT A.P.5:-

"Looking at the A.P.5. shows it to be constructed to a high standard, it looks solid and robust. The A.P.5. Interface opens up the new Electron for a whole new type of computing." E.U. Dec '86

# PRES

The company responsible for marketing and distribution of Advanced Computer Products.

## ANNOUNCE ADVANCED PLUS 3

A magic breakthrough in the price of disc upgrade for electron users. AP3 provides an Acorn standard 1770 interface which plugs into the Plus one providing Acorns ADFS 3.5" disc drive and spare ROM socket. (This unit may also be upgraded to an AP4 - please contact ACP for details).

Outstanding value at only £99.00 (+ VAT).

### INTRODUCTORY OFFER DISC VERSION OF SNAPPER, DRAUGHT AND REVERS; INCLUDED

All orders will be dealt with in strict rotation, cheques and credit cards to Pres Ltd., will only be cashed on despatch. Shipping on AP3 should commence end of September.

Also available

NEW VERSION OF ELECTRON ADFS 3 1/2" DISC DRIVE

Please call Pres for details on 0276 72046

PRES LTD, 6 AVA HOUSE, HIGH STREET CHOBHAM,  
SURREY. GU24 8LZ

# Advanced Computer Products

## ADVANCED CONTROL PANEL

(20)/M/B/E/C £34.50  
 ACP is a front end control panel language providing a sophisticated yet friendly interface between user and computer for access to Languages, MOSS functions and the users own file utility etc. Main features include pull down windows, simple to change MOSS configure, floating point calculator, file manager, SW ROM's facilities.  
 (16K EPROM & FULL MANUAL)

## ADVANCED DISC TOOLKIT

(01)/M/B/E/C £34.50  
 Any Acorn user including Master, BBC B+, Electron, DFS, 1770 DFS, ADFS, 2nd. & co-processors A.C.P.'s BEST SELLING product containing over 30 commands inc.: powerful memory & disc editor, search memory/disc/basic, catalogue/unplug ROMS, load/run programs below page, automatic menu, file transfer (inc. locked cassette files), ADFS utils etc. etc. ("it's superb" ... Database Pubs. - "A top-class toolkit - I have no hesitation in recommending it ... Acorn User Nov. 86)  
 (16K EPROM & FULL MANUAL)

## ADVANCED ELECTRON DFS

(05) /E/ £24.15  
 Electron & Plus 3 users gain BBC compatibility by adding the Advanced Electron DFS (1770 DFS) this is the same disc filing system supplied with the BBC B+ Now you can produce and access (compatible) BBC disc based software A.C.P. also supplies 5 1/4" disc drives to add to your Plus 3 (inc 2nd drive adaptor) "ACP has produced another superb ROM for the Electron" Electron User Feb '86  
 (supplied on 16K EPROM + DFS MANUAL)

## ADVANCED PLUS 4

(08) /E + 1/ £79.98  
 "DISC DRIVE COMPATIBILITY AT LONG LAST" (Electron User June '86) this sums up AP4 & ACP's approach to producing products AP4 is a fully ACORN compatible disc I/face & will accept any standard drive inc. PSU. runs 1770 DFS (as fitted in the B+ & Master), keeps page & E000 utils in ROM & provides a spare rom socket. ACP's PLUS 4 comes out on top. I can recommend it to anyone. (E.U. June 86)  
 AP4 should be considered the standard interface for the Electron (AU July '86)  
 AP4 100 £199.00 (inc VAT & Securicor delivery)  
 AP4 400 £299.00 (inc VAT & Securicor delivery)

## ADVANCED ELECTRON DFS E00

(14) /E+ASR/ £19.99  
 An alternative to our AED(05) for Plus 3 and ASR users. This optional alternative DFS is designed for use in Sideways RAM (ASR) and allows the user to operate a disc filing system & E000 when using the Plus 3 (in ADFS page would normally be & 1D00). The DFS is simply loaded using the software supplied with the ASR from disc. (optional upgrade for existing AED users £9.50 on return of original EPROM) (3 1/2" ADFS disc + manual)

## ADVANCED ROM ADAPTOR 2

(03) /M/E+1/ £14.95  
 An Acorn approved cartridge containing a card with special 'zero' profile sockets that allow you to fit compatible 8K or 16K EPROMS/ROMS The cartridge is fully enclosed providing complete protection for your ROMS Simple to use - no switching - complies fully to the Acorn (sideways) Rom Filing System A.R.A. 2 contains 2 sockets A single adaptor is also available. A.R.A.1 (02)/E/ £10.35 "The best ROM cartridge is by far the ACP ARA 2" ... A+B Dec 86

## ADVANCED DISC INVESTIGATOR

(06) /M/B/E/C £28.75  
 A very powerful Disc utility for standard & non-standard discs Backup most protected discs, edit any type of non-standard disc, check & repair faulty tracks, create new disc formats, copy 40track discs to 80track discs, verify two non-standard discs ("ADI features an extremely comprehensive sector editor, and one of the finest I've seen" Tubelink on Prestel)  
 (supplied on 16K EPROM + manual)

## ADVANCED PLUS 5

(09)/E + 1/ £66.70  
 A triple interface cartridge providing:  
 1) a TUBE I/face allowing a second processor to be connected, increasing BOTH speed & memory (PAGE & 8000 HIMEM & 8000 in all modes)  
 2) a 1 MHz BUS for control applications & prommers  
 3) the USER PORT for mouse and graphic devices  
 Also contains 2/3 ROM sockets and on board operating software for 2nd processor

## ADVANCED QUARTER MEG RAM

(19)M(ADM)/E+1 (ADE) £79.95  
 New hi-tech cartridge (normal size) containing an incredible 256k of S. ways RAM. Although it could be used to store many pages of ROM images its primary and best use is as a RAM disc supported by our advanced 1770 DFS (Master - ADM or Electron - ADE our now upgraded to access 256k in AQR. Now Database is Viewstore can perform at breathtaking speed (over twice as fast as some other 1 meg silicon discs) and animation with up to 25 screens becomes a reality. Price must reflect value for money and package prices for AQR and ADM/E are available at £99.95 (existing ROMs maybe upgraded when purchasing AQR for £5.00).

## ADVANCED BATTERY BACKED RAM

(18) M/E+1 £39.99  
 Advanced Battery-backed RAM for Master and Electron users. A battery backed 32K RAM cartridge A.B.R. is a self-contained cartridge containing two 16k pages of sideways RAM with a re-chargeable battery back up. Each 16k page can be individually locked by software. Supplied with full software support, to include loading software, ROM save, advanced print buffer and a disc utility MAKEROM.  
 "It's a superb Addon and a must for all serious Electron Users" EU June

## ADVANCED ROM MANAGER

(07)/M/B/E/C \*£14.95\*  
 A friendly utility for ROM & sideways RAM. Examine ROM/RAMs, load files into RAM, move memory to/from Sways ROM/RAM, catalogue/kill ROMS, offer commands to specific ROMS, save ROMs to disc/tape, AUTOROM a file (inc BASIC) to run from SWAYS ROM/RAM, execute specific machine code subroutine in a ROM, generate a ROM's checksum & CRC. "Represents amazing value for money. Go out and buy this real bargain" ... Dec 86 Database Publications. (supplied on EPROM + manual)

## ADVANCED 1770 DFS

3 versions ADM/C(11) - ADB(12) ADE (13) £34.50  
 ACP have totally re-written the Acorn 1770 DFS, enhancing existing features & adding new ones. The result is probably the fastest & most powerful disc filing system your computer could have. With the ability to operate in double density occupying both sides of a disc (640K). Automatic file relocation, improved file handling, 62 file catalogue and Sways RAM can be used as a fast RAM DISC.  
 (16K EPROM + comprehensive manual)

## NEW EXCLUSIVE PRODUCT ELECTRON ASSEMBLY LANGUAGE

Book by Bruce Smith £2.95 (144)  
 Software for above book on 3.5" A.D.F.S £3.50 (145) or 5.25" D.F.S. £2.50 (146)

## \*OTHER PRODUCTS & SPECIAL OFFERS\*

VIEW cartridge	(101) /E+1/ £ 14.95	3 1/2" discs in 1/box	(120) /M/B/E/ £24.00
Vsheet	(102) /E+1/ £ 14.95	5 1/4" discs ds/dd"	(121) /M/B/E/ £12.99
VIEW & SHEET	(119) /E+1/ £ 22.00	5 1/4" discs ss/sd	(122) /M/B/E/ £ 8.99
LISP cartridge	(103) /E+1/ £ 9.99	3 1/2" disc drives	£129.00
E/Adv User Guide	(104) /E/ £ 3.95	5 1/4" disc drives	£149.00
LOGO cartridge	(106) /E/ £ 29.95	2nd Drive Adaptor	(130) /E+3/ £ 7.95
PASCAL cartridge	(107) /E/ £ 29.95	Compact 2nd Drive Adaptor	(144)/C/ £14.95
VIEW pack BBC	(118) /B/ £ 49.00	3 1/2" library box 10	(124) £ 2.95
AP4 100	(140) /E+1/ £199.00	16K EPROMS	(131) £ 3.75
AP4 400	(141) /E+1/ £229.00	VIEWSTORE	(117) /M/B/(e) £57.95
AP5 + MOUSE Pckage	(143) /E+1/ £125.00	VIEWPLOT	(142) /M/B £26.95
		ACORN 1770 upgrade	£48.95

Equipment codes /M/= Master /B/=BBC /E/=Electron /E+1/=Electron + Plus 1 /C/=Compact

Please send order to:  
 Advanced Computer Products Ltd.  
 6 Ava House, High Street  
 CHOBHAM, Surrey, England  
 GU24 8LZ Tel 0276 76545  
 (mail order only)  
 All our prices include  
 UK delivery & VAT



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

NAME .....

ADDRESS .....

POSTCODE .....

TEL. ....

CREDIT CARD No. ....

PROD  
NO

PRODUCT

QTY

@

TOTAL

I enclose payment for £.....  
 Exp date ..... (A30)

# AMS STOP PRESS

## A C O R N U S E R O F F E R

# Desktop publishing at a snip



Stop Press, the most highly acclaimed desktop publishing package available for the BBC micro and Master 128, puts you in the editor's chair. This month we are offering AMS' Stop Press exclusively to Acorn User readers at a special Christmas price! Join the thousands of users who already produce professional looking reports, newsletters, and flyposters.

The AMS Stop Press package comes on two 16k ROMs and two discs for BBC micro owners, and three discs for Master users. The package includes:

- 16 typefaces are supplied as standard

- Keyboard, joystick and mouse control
- User definable fonts
- Text editing and formatting
- User defined text column window
- Cut and paste facilities
- Graphics drawing and painting
- Comprehensive dumping routines
- A mode 0 screen converter

The Stop Press software will run independently of the AMX Mouse for the BBC and Master series. This professional package can be yours for only £39.99, a saving of £10, or £69.99 for the software and the AMX Mouse, a saving of £10.

Please send me

\_\_\_\_\_ copies of Stop Press at £39.99 (Save £10.00)

\_\_\_\_\_ copies of Stop Press with the AMX Mouse at £69.99 (Save £10.00)

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

POSTCODE \_\_\_\_\_

I enclose my cheque/postal order payable to AMS Ltd for £\_\_\_\_\_

Please charge my Access/Barclaycard

A/c No

Expiry Date

\_\_\_\_\_

\_\_\_\_\_

SIGNED \_\_\_\_\_

DATE \_\_\_\_\_

Send this coupon with your remittance to Stop Press Offer Redwood Publishing Ltd, 20-26 Brunswick Place, London N1 6DJ.



# FIRST BYTE

## PASSING SENTENCES

We complete our look at the CALL statement by explaining how to pass variables to and from machine code

**Tessie Revivis**

We return this month to the last of our series of machine code tutorials, though we will be using machine code for graphics and file handling in the coming months.

In September we had a brief introduction to the very versatile CALL command. Let's now take a closer look at CALL's parameter blocks and types, and provide some more examples of its use.

### Parameter blocks

When CALL is used to execute a machine code program, the Basic interpreter counts up the number of parameters after the command and stores this value in location &600 – if there are none then a zero is placed there. Basic then uses the rest of this 'page' of memory, from &601 onwards, as a parameter block to store a three-byte identity for each parameter. The identity consists of a two-byte address which points to where the actual parameter is stored in memory, and a byte saying what type of parameter it is. We will come back to these later on in this article.

As each parameter takes up three bytes in the parameter block, and there are 255 bytes of page 6 left (the 256th being used to hold the number of parameters). It follows that the maximum number of parameters allowed is 255/3 or 85. Any program that has 85 parameters passed to it is likely to be very complex indeed! Figure 1 summarises the parameter block layout.

### Parameter types

As mentioned, there are various types of parameters. You should already be familiar with several: integer numbers (whole numbers such as 24 or 567), real numbers (ones with decimal points such as 1.234 or 567.9) and character strings. The CALL command can identify a total of five different types of parameters. These are as follows, with the type byte which is used in the block given in brackets:

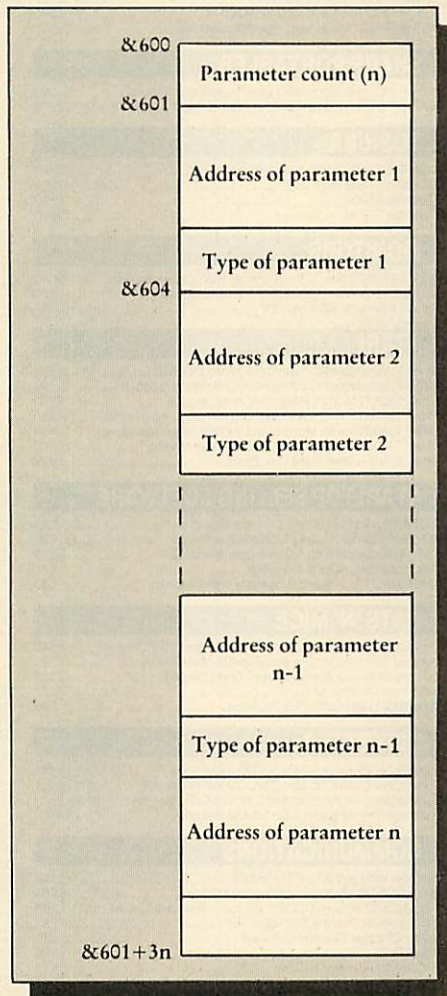


Figure 1. Format of a parameter block

**Single byte integer (&00)** This is a single-byte number between zero and 255 and must have been specified by using the ? operator – remember that the ? operator is used to read or write a one-byte number to or from memory. For example, ?&70=255 will write (or poke in computer jargon) 255 into memory location &70, while PRINT ?&70 will read (or peek) the value held in location &70. The address in the CALL block is the memory address pointed to by the ?. For example, CALL code, ?1234 will give the three-byte CALL block entry of

&34, &12, &00. &34 and &12 are the address specified in standard 6502 reverse format, and &00 is the type byte to tell you it's only a single byte at address &1234.

**Four-byte integer (&04)** These are similar to the previous category but four times the length. This type of parameter can either be specified as !<addr> or more commonly as an integer variable such as A%.

**Five-byte real (&05)** This is a 40-bit long floating point value specified by a real variable. The format of floating point numbers is rather too complex to cover here.

**Fixed string (&80)** These are the types of string that are accessed from Basic using the \$ indirection operator, as in \$&900="Hello World". The address given in the parameter block is the address of the first character of the string. The other characters are then stored in successive bytes until the end, which is marked by a carriage return character (ASCII &0D). Figure 2 shows how the string would be stored in memory. You must be very careful not to mix this type of string up with a true string variable which, as we will see next, is stored in a very different way.

**String variable (&81)** This is the type used when a fully fledged string variable is given as the parameter, for example, CALL search, name\$. Rather than the parameter block pointing straight to the text of the string, it points instead to a four-byte block called the string information block (SIB), the first two bytes of which in turn point to the string's actual text. The fourth byte of the SIB contains the current length of the string, and the third byte shows the number of bytes allocated for the string's text, that is, the maximum length of the string. Because the length of the string is given in the SIB, no terminator is needed for the actual text, which is just stored as a sequence of ASCII characters.

This is given the lofty description of 'double indirection' and is shown diagram-



matically in figure 3. Listing 1 on the yellow pages prints out the number of parameters passed, and their types. Try experimenting with this program to familiarise yourself with the types.

## Returning parameters

As well as using parameters to pass values to a machine code program, they can also be used to pass values back to the Basic program that issued the CALL statement. This is because the parameter block contains a pointer to the actual value of the variable stored in Basic's work space. Any changes made to the variable will directly affect the value read by the Basic program when it is returned to. This is illustrated in listing 2 which swaps two variables. If the variables are of the wrong type, a mismatch error is given and no swapping is done. Note that when two strings are swapped only the SIBs are moved, the text being left untouched. This is a much easier way of returning values from a machine code program. Unlike the single-byte values returned by USR, which has to have its components decoded the altered variables are instantly available.

An annoying side effect of this behaviour is that the parameters given in a CALL statement must be variables. A way round this is to assign any constants to variables, and then use the variables in the CALL. One example is:

```
CALL &900,23
```

is illegal, whereas:

```
temp=23:CALL &900,temp
```

is valid, as a variable is passed.

## Altering string variables

Because of the special way in which string variables are stored, extra care is needed when altering them. If the length of the new string is the same or less than that of the original string, there is no problem. The text can be altered as required and the length byte of the SIB changed to reflect the new length. If, however, the string is increased in length, care is needed in case it exceeds the memory allocated to it.

If the string was to get longer than the memory set aside for it, it would be necessary to allocate a new block of memory. This is possible, but very messy and generally it should be avoided.

If you are going to alter the lengths of strings via the CALL statement, it is best to make sure each string used can be increased to maximum length by putting in a line like:

```
A$=STRING$(255,""):A$=""
```

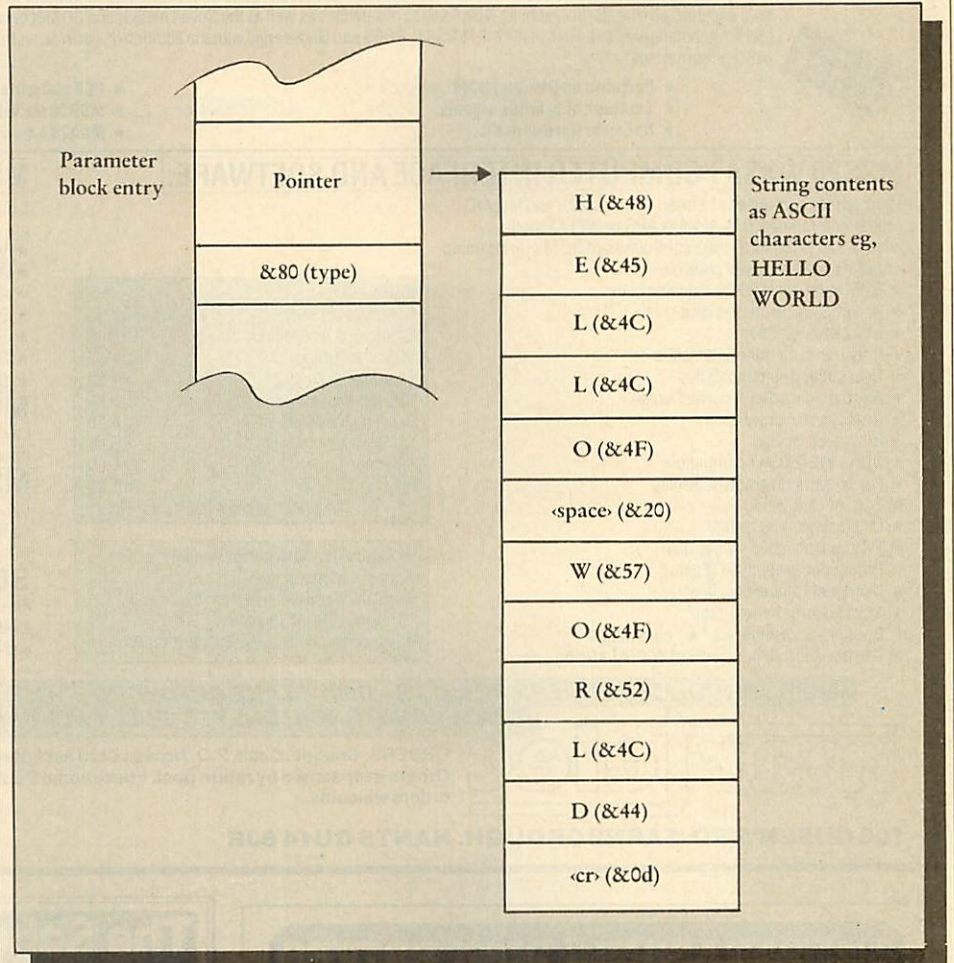


Figure 2. Format of fixed string in memory

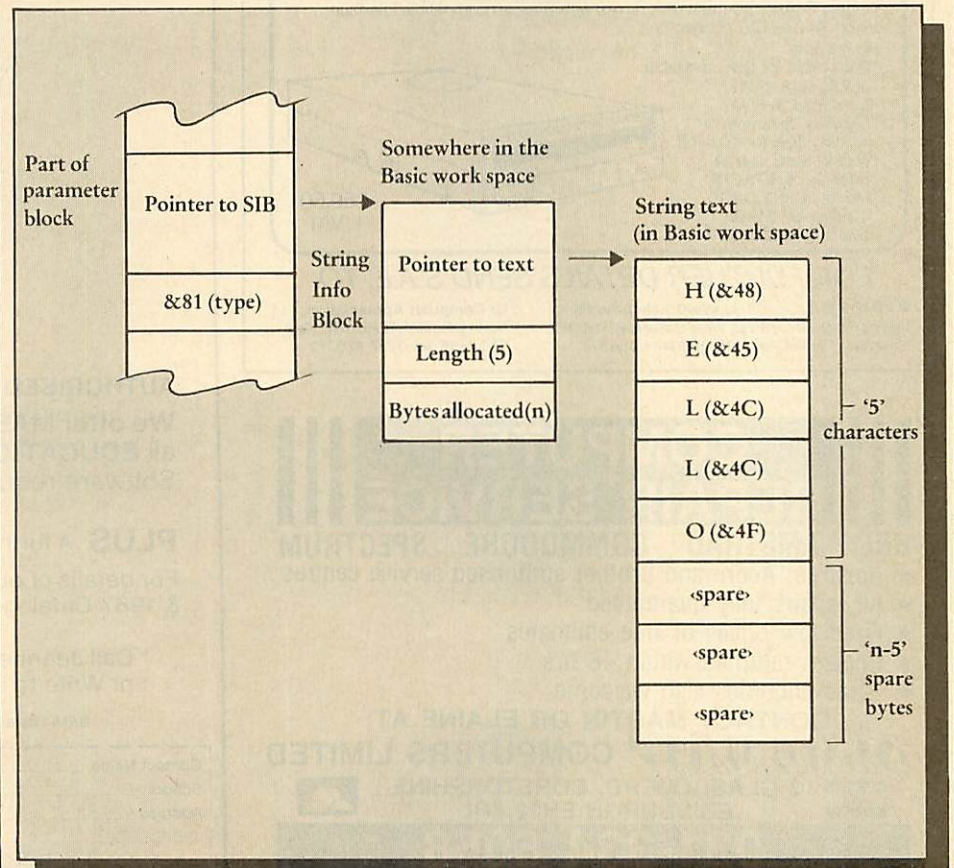


Figure 3. Format of string variable in memory

# WXSAT

## WEATHER SATELLITE STATION FOR THE BBC MICROCOMPUTER Model B, B+, Master 128, (Not Compact)

All you need for a high specification weather satellite receiving station based on the BBC microcomputer to receive, decode, display, print and save signals from the North American NOAA series of satellites as well as the Soviet meteor and COSMOS series. The system is upgradeable to receive geostationary satellites in the METEOSAT, GOES and GMS series with the addition of a downconverter and suitable antenna. The complete package comprises:

**NEW**

- ★ Software on Disc and ROM
- ★ Test tape of satellite signals
- ★ Receiver Hardware Kit

- ★ PCB and parts kit for interface
- ★ MSR20 Mk VHF satellite receiver kit
- ★ MSA20 Antenna kit

**SPECIAL INTRODUCTORY OFFER**  
**£139.95**

### MSS20 WXSAT COMPUTER INTERFACE AND SOFTWARE:

The interface comprises of a filter, demodulator and fast AID converter for the 2400 Hz satellite APR or WEFAX signal. Internal and external crystals controlled synch. Manual framing and white and black level controls.

- ★ ROM software is 100% machine code
- ★ Accompanying utilities disc
- ★ x1 x2 x4 & x8 'Zoom'
- ★ Infra red and Visible light scales
- ★ User defined colour palettes
- ★ Any pass decoded in correct sense
- ★ Instant picture inversion
- ★ Fast scroll facility
- ★ NOAA/METEOSAT compatible
- ★ Full conversion gradient display
- ★ Text, lines & windows
- ★ On screen tuning facility
- ★ Pictures, palettes save to disc
- ★ Printer dump supplied (Epson)
- ★ User print routine possible
- ★ Most features in 'real-time'
- ★ Routines accessible via "★" commands
- ★ Can be used independantly of WXSAT station

#### PRICE LIST

Complete package	£139.95
Software & Interface kit	£59.95
PCB + software	£33.95
Test tape	£4.95
VHF receiver kit	£56.95
Receiver Hardware kit	£14.30
'S' meter kit	£8.95
Antenna	£24.95
Preamp	£10.95

(All prices include VAT and P&P)

- ★ Available shortly. Please enquire ★
- ★ Hi-res tramestore
- ★ 'S' band converter, antenna, preamp for METEOSAT reception.
- ★ Fascimile transceive package for BBC

### MSR20 RECEIVER

A high performance, dual conversion, VHF receiver designed to provide coverage of the 136-138MHz satellite band. Featuring:

- ★ Very low noise
- ★ Automatic, adjustable noise mute
- ★ Automatic recorder switching
- ★ Electronic crystal switching
- ★ Scanner facility (optional)
- ★ Signal strength and signal deviation metering (optional)
- ★ Suitable I.F. for 1.7GHz band

### MSK20 137MHz PREAMP

Low noise for high definition pictures: Suitable for masthead operation. Kit includes necessary hardware.

### MSA20 AERIAL KIT

Circularly polarised, X dipole antenna with reflectors, ideally suited to reception of polar orbiting satellites - can be supplied with integral preamp.

### SERVICE BACK-UP

Although the equipment is quite complex it is presented in such a way as to be simple to construct. We will align, equipment and make good non-working units for nominal charge.

**WXSAT PRODUCES SUPERB RESULTS - DON'T TAKE OUR WORD FOR IT, SEND THE DEMONSTRATION DISC (STATE 40/80 TRACK) ONLY £3 (FULLY REFUNDABLE)**

**mar telec**

ORDERS: Cheque, Cash, P.O. Access Card accepted.  
Orders despatched by return post. Educational Dept orders welcome.



0252 515666



Telex: 859489

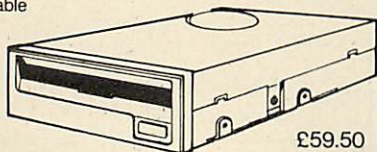
108 QUEEN'S RD. FARNBOROUGH. HANTS GU14 6JR

### 3 1/2" PANASONIC DISK DRIVES

1/2 height Model JU-363 1 megabyte low component Double Sided Double Density 80 track disk drives with Shugart compatible interface using 34 way IDC connector.

Please note:

- \*Data cable for BBC available at £7.50 plus VAT
- \*Carriage £3 + VAT
- \*Quantity discounts of at least 20% for 10 + off
- \*We still have a small quantity of HITACHI Model 305SX DSDD 40 track 3" drives available at £24.95 + VAT



£59.50 + VAT

FOR FURTHER DETAILS SEND S.A.E. TO:

MATMOS Ltd., Unit 11, Lindfield Enterprise Park,  
Lewes Road, LINDFIELD, West Sussex, RH16 2LX.  
Tel. 0444-73830/0444-414484/0444-454377

Or Computer Appreciation, 111  
Northgate, CANTERBURY, Kent  
CT1 1BH. Tel. 0227-470512

## COMPUTER REPAIR SERVICE

**BBC AMSTRAD COMMODORE SPECTRUM**

- ★ Amstrad, Acorn and Brother authorised service centres
- ★ All repairs fully guaranteed
- ★ Fixed low prices or free estimates
- ★ Repairs returned within 48 hrs
- ★ Trade enquiries also welcome

CONTACT MARTIN OR ELAINE AT:

**BLUE CHIP COMPUTERS LIMITED**



2 GLASGOW RD, CORSTORPHINE  
EDINBURGH EH12 8HL



**031-334 6058**

## The Schools Computer CLUB



**AUTHORISED SUPPLIERS TO MOST LEA'S**

We offer **MASSIVE DISCOUNTS** of up to 80% on all **EDUCATIONAL AND HOME** Computer Software requirements

**PLUS** A further 10% agency discount on all purchases!

For details of our current **SPECIAL OFFERS** & 1987 Catalogue

- ★ Call Jeanne Isbister on 0532 687789
- ★ or Write to us:-

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

Contact Name _____	TEL: _____
School _____	Best Time to Contact: _____
Address _____	_____
_____	No of Catalogues: _____
Post Code: _____	The Schools Computer Club

# FIRST BYTE

which will set A\$ to the null string, but also allocate a 255-byte chunk of memory to it.

Up until now we have only concerned ourselves with simple variables such as A\$, but we will end with a look at passing arrays using CALL.

If you just want to pass a single element using CALL, it is simple. You just list that element in the parameter list. For example:

```
num=5:CALL &900,num
```

and also:

```
DIM num2(5):num2(3)=5:
```

```
CALL&900,num2(3)
```

will both point to somewhere in the Basic work space that contains the floating point representation of the number five. The machine code routine called can't easily tell that the value is part of an array rather than just a simple variable.

Trying to pass a whole array to a routine using CALL can be difficult. Unfortunately there is no simple way to do it, but it is possible by a somewhat convoluted method as long as the number of dimensions in the array is known. For all arrays the first element stored is the one with all the subscripts zero, for example a%(0).

This first element is always preceded by a

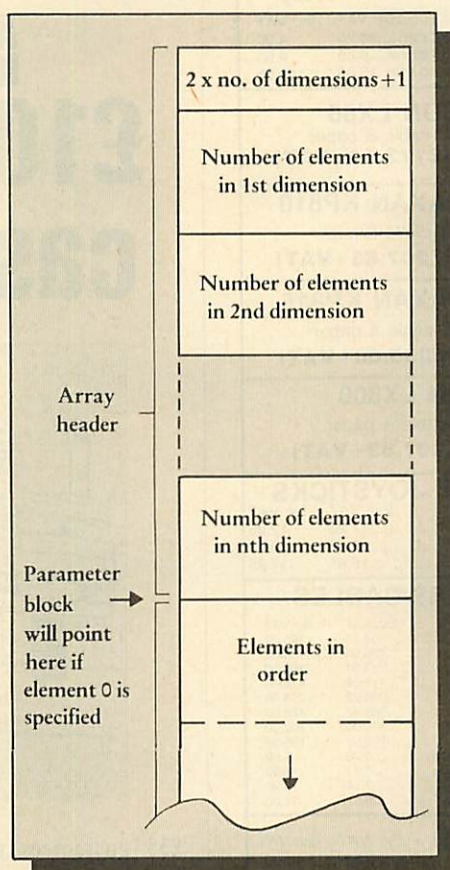


Figure 4. Format of array header

block of information giving details of the number of elements in each dimension. The format of an array is shown in figure 4. For a given number of dimensions the size of the element count block will be constant, eg, three for a single dimension and five for two dimensions. The block will always start at the address of the first element minus the block's length. Therefore, if we pass, via CALL, the first element of an array, it is possible to access the whole array. Don't worry if you can't understand this, it is quite complex and not often used. To make things clearer an example is given as listing 3 in the yellow pages, which prints, in hex, all the elements of an integer array.

Your machine code should now be able to use integer and string variables from Basic, but real variables still present a problem. The way they are stored in memory is complicated, but there are ways around this. You can round the real number to an integer before the CALL. Or you can use the STR\$ command to convert the variable to a string. After the CALL, use VAL to return it to a real number.

See the yellow pages index on page 113 for details of Tessie's listings.

## REALTIME GRAPHICS SYSTEM

### 32k GRAPHICS ROM

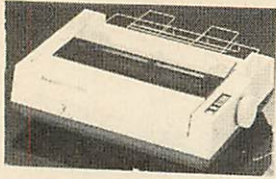
"there is no other software to rival it" - BEEBUG

"there isn't anything yet available for the Beeb capable of producing such impressive and powerful graphics" - A&B Computing

The *REALTIME GRAPHICS SYSTEM* provides a sophisticated design tool for creating 3D objects of any complexity. Colour hardcopy of the designs can then be produced on a range of popular pen-plotters or printers for professional results. Unlike other packages, this system also includes a unique *32k REALTIME GRAPHICS LANGUAGE (RGL)* rom allowing you to produce stunning 3D animation from your own Basic or Assembler programs. The package consists of a 32k Graphics Rom, five discs and a 115 page manual. The design system takes all the hard work out of designing complex 3D objects by providing *curves and surface generators* that can create any solid of revolution (not limited to circles and cylinders), *recursive macros* to allow a 'building block' design approach, *dynamic 3D viewing*, *Printer Driver*, *3D Multi-Plotter Driver* currently supporting Plotmate, Penman, Epson HI-80 and Sakata, *Library facilities* and a *Data convertor* for interfacing to other CAD systems and applications. The *RGL* provides 44 star commands for high speed flicker-free 3D animation. These include 3D rotation, scaling, translation, perspective/isometric projections, orbiting, 3D Turtlegraphic and Geometric calculation commands for mathematical and scientific plots. Also includes a unique 35,000 pixels/sec line generator (considerably faster than Acorn's 9000/sec) for high speed drawing. The *RGL* is compatible with all the BBC graphics screen, plotting and colour modes including Shadow screen. The Prisma 2/3, Cadsoft workstation, Pluto and CMS colour cards can also be driven for line generation in excess of 1,000,000 pixels/sec.

Compatible with the BBC B, B+, Master 128, Master Compact (3.5" disc), all versions of DFS, DDFS, ADFS (Master 128/Compact), 6502 2nd Processor/Turbo (optional), AMX Mouse (optional). Available from your local dealer or send cheque/P.O. for £49.95 (inclusive) to: SILICON VISION LTD, 47 DUDLEY GARDENS, HARROW, MIDDX, HA2 0DQ. Telephone: 01-422 2274

# PANASONIC KXP 1081



with BBC cable & paper  
**£169.00 (£146.96 + VAT)**  
 Above with Screen Dump & 2m cable  
**£175.00 (£152.17 + VAT)**

	Exc VAT	Inc VAT
KXP 1080 Fabric ink ribbon	4.26	4.90
KXP 1080 View Printer driver	8.65	9.95
KXP 1080 Control Dump rom	13.00	14.95

**PANASONIC KXP1082**  
 (as 1081 but 160cps)  
 with BBC cable & paper  
**£209.00 (£181.74+VAT)**

**EPSON LX86**  
 with BBC cable & paper  
**£199.00 (£173.04+VAT)**

**CANON PW1080A**  
 with BBC cable & paper  
**£239.00 (£207.83+VAT)**

**KAGA/TAXAN KP810**  
 with BBC cable & paper  
**£239.00 (£207.83+VAT)**

**STAR NL10**  
 with BBC cable & paper  
**£209.00 (£181.74+VAT)**

**KAGA/TAXAN KP815**  
 with BBC cable & paper  
**£299.00 (£260.00+VAT)**

**CITIZEN 120D & LSP10**  
 with BBC cable & paper  
**£169.00 (£146.96+VAT)**

**EPSON LX800**  
 with BBC cable & paper  
**£229.00 (£207.83+VAT)**

**JUKI 6100**  
 with BBC cable & paper  
**£299.00 (£260.00+VAT)**

**VOLTAGE JOYSTICKS**

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

## PRINTER ADDONS

	Exc VAT	Inc VAT
Universal Printer Stand	13.00	14.95
LX800 Sheet Feeder	68.70	79.00
LX Sheet Feeder	47.83	55.00
LX Print Ribbon	3.00	3.45
FX/LO Sheet Feeder	106.96	123.00
NL-10 Sheet Feeder	47.83	55.00
NL-10 Print Ribbon	4.80	5.52
120D Sheet Feeder	86.09	99.00
120D Print Ribbon	4.00	4.60
KP/PW Print Ribbon	3.39	3.90
Juki 6100 Dust Cover	5.60	6.44
Printer Dust Covers from	4.00	4.60

## PRINTERS/CABLES

	Exc VAT	Inc VAT
Epson EX800	404.35	465.00
Epson LQ800	426.00	490.00
Epson FX800	313.04	360.00
Epson FX1000	413.04	475.00
Juki 2200 Daisy	225.22	259.00
Juki 5520 Colour	369.57	425.00
Kaga/Taxan KP910/15	350.00	402.00
MP165	169.57	195.00
1.5m (4foot) BBC cable	5.70	6.60
2.0m (6foot) BBC cable	7.74	8.90
Compact printer cable	7.74	8.90
IBM PC printer cable	9.57	11.00

## EPROMS, 8271

	Exc VAT	Inc VAT
1-9 27128 250nS	3.74	4.30
10+ 27128 250nS	3.43	3.95
1-9 2764 250nS	3.00	3.45
10+ 2764 250nS	2.74	3.15
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	32.17	37.00
10+ 8271 controller	30.43	35.00
10+ 8271 controller	30.43	35.00
1-9 6264LP 150nS	2.56	2.95
Acorn 8271 DFS	41.74	48.00
Acorn 8271 DNFS Upgrade	51.30	59.00

## ROMS

	Exc VAT	Inc VAT
Inter-Word	37.39	43.00
Inter-Sheet	36.52	42.00
Inter-Base	48.70	56.00
Inter-Chart	24.35	28.00
Wordwise Plus	37.39	43.00
Spell Master	40.87	47.00
ACP Disc Investigator	22.61	26.00
ACP 1770 DFS ROM	26.96	31.00
ACP Disc Toolkit	26.96	31.00
View 2.1	33.91	39.00
ViewStore	38.26	44.00
ViewSpell	28.70	33.00
Overview	77.39	89.00
View Professional	77.39	89.00

## DISKETTES (lifetime warranty)

	Exc VAT	Inc VAT
10 Banana Reversible disks	8.65	9.95
10 96tpi D/S D/D case	13.90	15.99
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	31.13	45.00
50 Disc Box hinge lock	7.78	8.95
100 Disc Box hinge lock	8.65	9.95
Black Library case	1.21	1.39

## DISC DRIVES

	Ex VAT	Inc VAT
Toshiba 400k 80T chassis	65.22	75.00
Toshiba 400k + case etc	82.61	95.00
Cumana CSX100	91.30	105.00
Cumana CSX400	124.35	143.00
Cumana CD800S	260.00	299.00
MD400A 400k No PSU	101.74	117.00
MD400B 400k & PSU	116.52	134.00
MD802C 800k No PSU	190.43	219.00
MD802E 800k & PSU	216.52	249.00
MD802D 800k + Stand	225.21	259.00

Phone for Viglen & Torch Winchester

## MONITORS

	Exc VAT	Inc VAT
Philips CM8533	230.43	265.00
Philips CM8852	251.30	289.00
Philips BM7502 Green	68.70	79.00
Philips BM7522 Amber	73.91	85.00
Philips BM Tilt stand	7.78	8.95
Taxan KX P31 Green	77.39	89.00
Taxan KK P39 Green	86.09	99.00
Taxan KX Amber	86.09	99.00
Taxan Super Ver 625	317.39	365.00
Microvitec 1451	221.74	255.00
Microvitec 1451 Ap	260.00	299.00
14" Tilt/Swivel Stand	13.87	15.95

(Prices inc. BBC Cable)

## MASTER/COMPACT

	Ex VAT	Inc VAT
Master 128K Micro	365.22	420.00
Master ET 128K Micro	303.48	349.70
512 Co-processor	185.00	212.75
Turbo Upgrade	98.78	113.50
Universal 2nd Pro	72.00	82.80
Acorn Z80 2nd P	317.39	365.00
Acorn Cartridges	10.87	12.50
Reference Manuals	14.00	14.00
Peartree Cartridges from	8.65	9.95
Care Cartridges from	7.65	8.80
View 3/View Sheet guides	9.00	9.00
ARM Assembler book	12.00	12.00
Understanding Interword	6.50	6.50
Master & BBC Dust Covers	3.00	3.45
Monochrome Compact	373.04	429.00
Second user BBC Bs available		

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 all day Wednesday and Saturday afternoons  
 Carriage 92p (80p + VAT) Securicor £6.90 (£6.00 + VAT)

# WeServe



Larger items delivered by Securicor



**Acorn Dept.**  
**128 West Street,**  
**Portchester,**  
**Hants.**  
**PO16 9XE.**  
**Tel: 0705 325354**

# SUBSCRIPTION

## A U O F F E R

# £10 saving on cassette subs



£35 guarantees that you receive 12 *Acorn User* monthly listings cassettes – a saving of over £10. Whether you use a BBC or an Electron our monthly listings cassettes are a must.

By taking a subscription to *Acorn User's* monthly cassettes you will ensure delivery of 12 cassettes direct to your home. Each cassette contains the best programs, utilities, and graphics, which will entertain, inform and amuse you. Every cassette has a simple routine to transfer all programs to disc.

This unbeatable subscription offer is only available to UK subscribers, and we must receive your order before November 30 1987, so hurry and make sure you post your subscription today!

**YES!** I wish to subscribe to *Acorn User's* monthly listings cassette.

Please start my subscription with the \_\_\_\_\_ issue.

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

POSTCODE \_\_\_\_\_

I enclose my cheque/postal order for £35.00 made payable to Redwood Publishing Ltd.

Please charge my Access/Barclaycard

ACCOUNT NO: \_\_\_\_\_

EXPIRY DATE \_\_\_\_\_

SIGNED \_\_\_\_\_

DATE \_\_\_\_\_

Send this coupon with your remittance to Gail Fairhall, Subscriptions Manager, Redwood Publishing Limited, Lambourn Woodlands, Newbury, Berkshire RG16 7TW.

# ACORN FORUM

David Atherton presents a selection of readers' shortcuts and solutions along with some of his own

£5

## BBC TO ARC FILE TRANSFER

Michael Walls has taken the plunge and bought an Archimedes. He wants to transfer his BBC Basic programs across to run under the new Basic 5. Nowhere in the Welcome manuals does it tell you how to wire up the serial port plug, but Michael has worked it out. The Archimedes connector is shown in figure 1 together with the connector used to join it to the other BBC micros.

When a cable has been made up, nine-pin D-type to five-pin DIN, and plugged into the computers, the programs can be transferred. I first covered this for the Compact in the January 1987 issue.

At the Archimedes end, type:

```
*CONFIGURE BAUD 7
*CONFIGURE DATA 5
```

Then press CTRL-Break, and type:

```
*FX 2,1
```

Now at the BBC micro end, load your Basic program in, and type:

```
*FX 7,7
*FX 8,7
*FX 3,1
LIST
```

The program now lists, and is sent along the cable to the Archimedes too. To complete the process, type:

```
PRINT "*FX 2":*FX 3
```

and finish by pressing Escape on both machines. The Basic program should now be in Archimedes' memory. Michael has not yet managed to transfer machine code programs, as they need a proper system for file transfer. This will be covered in a forthcoming issue.

£5

## EDITING BASIC IN WORDWISE PLUS

When using a proper text editor to write Basic programs, line numbers just get in the way. Removing them makes programs easier to read, and forces you to use structures by making GOTO impossible.

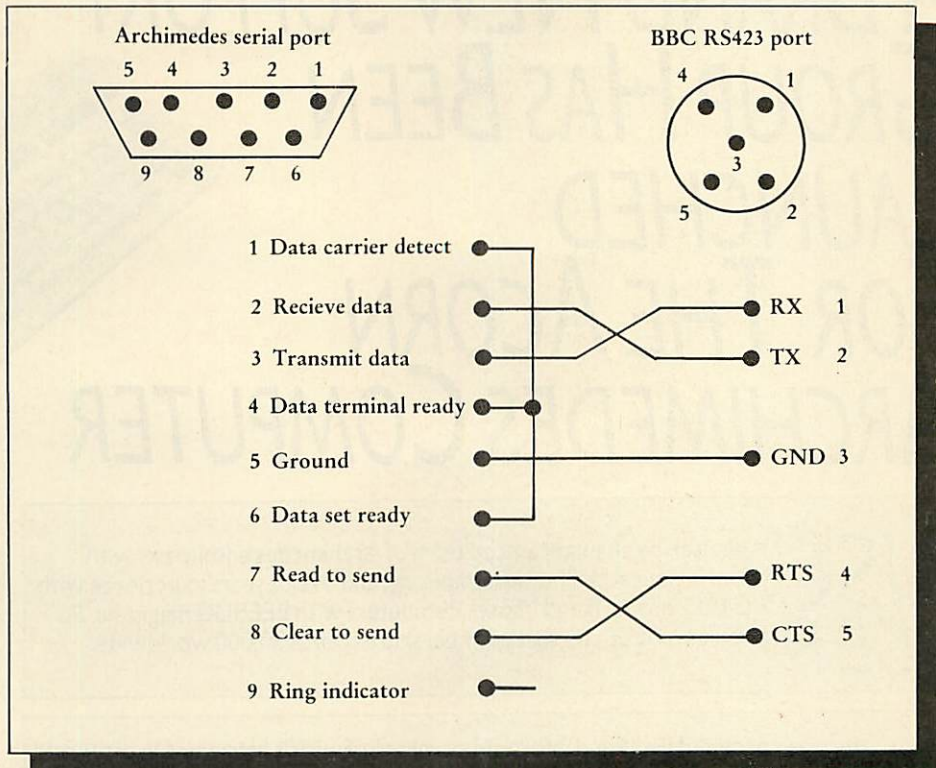


Figure 1. The Archimedes connector

Most important of all, editors other than the Acorn Basic Editor don't support re-numbering, and so by removing line numbers you can insert new lines of code at will, without tediously returning to Basic for renumbering.

*Wordwise Plus* makes an excellent editor for Basic programs. D Mortimer from Reading has submitted a segment program (listing 1 on the yellow pages) which will strip the line numbers from Basic. You must create an ASCII version of the program, and then load that into the *Wordwise* main text area. Then load the segment program into a spare segment. To make an ASCII version of a Basic program in a file called 'ASCVERS', simply type:

```
*SPOOL ASCVERS
LIST
*SPOOL
```

Once loaded into *Wordwise Plus*, the segment program will remove the line numbers. After editing the numberless program, put AUTO on a line of its own at the top of the file. Then save the file, enter Basic and \*EXEC the file back in again. The AUTO command will put a line number in front of each line as it is read in.

£10

## 64 TEXT ROWS ON MASTER SCREEN

Martin Hesketh from Ryton, Tyne and Wear has sent me an interesting program (listing 2 on the yellow pages) to generate 64 rows of text on a Master screen. It sets up code to double the resolution of the screen. It will work in any mode except teletext by changing the variable 'mode' at the beginning of the program.

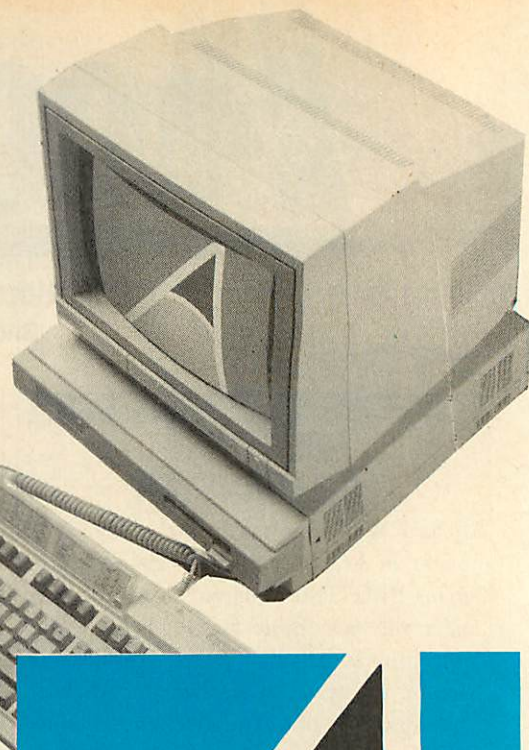
This works by switching between the screen in main memory, and the screen in shadow memory 50 times a second. When interlace is switched on this means that the two screens are displayed very slightly offset from each other, creating the effect of doubled resolution. A simple idea, but very novel and quite effective. Due to the switching of the screens the display does flicker a bit. However, on most monitors and some televisions the text displayed is still legible.

To generate text characters, Martin has split the rows of the characters, and assigned rows one, three, five and seven to one screen and rows zero, two, four and

# RISC USER

## THE ARCHIMEDES MAGAZINE AND SUPPORT GROUP

# A BRAND NEW SUPPORT GROUP HAS BEEN LAUNCHED FOR THE ACORN ARCHIMEDES COMPUTER



RISC  
USER

is written by an experienced team of Archimedes enthusiasts with roots in education, home computing, and over 5 years experience with the BBC Model B and Master computers with BEEBUG magazine. So popular is BEEBUG that membership exceeds 20,000 worldwide.

RISC  
USER

provides lively and informed coverage of what's happening in the world of the Archimedes. Reviews, hints, programs and articles are specifically written for the Archimedes, showing how to exploit the many features of this sophisticated computer. RISC USER has material of direct use to education, business, industry and home computing.

RISC  
USER

includes a well balanced selection of the latest news from Acorn and other major suppliers, pre-release reviews of the latest software and peripherals, as well as editorial features, ideas, hints and tips, readers letters and much more.

RISC  
USER

is all about the Archimedes, it does not contain modified programs originally intended for the BBC Model B or Master. It is published 10 times a year and is only available on subscription, not through the shops.

RISC  
USER

subscription also gives you free access to our technical support team who may be contacted by phone or letter. This team of experts will endeavour to resolve any software or hardware problems that you may have, and will also provide unbiased advice. RISC USER is also an Acorn appointed Archimedes Support & Service Centre should you need repairs etc.

Although the focal point of RISC USER is the Magazine, remember that you get far more than JUST a magazine when you subscribe. You become part of an organisation which has provided many years of support to micro computer users. Let us have the opportunity to help you make the most of your Archimedes. After all it is a sophisticated machine and you deserve the best to make the most of it.

### SPECIAL INTRODUCTORY OFFER FOR LIMITED PERIOD ONLY

6 months (UK only)	£6.90
1 year UK, BFPO & Channel Islands	£12.50
Europe & Eire	£18.00
Middle East	£22.50
America & Africa	£25.00
Elsewhere	£27.00

I would like to subscribe to RISC USER  
and enclose a cheque for: £\_\_\_\_\_

Official orders welcome

Please debit my Access/Visa/Connect account with  
£\_\_\_\_\_

Card number

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------

Expiry \_\_\_\_/\_\_\_\_  

Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Signature \_\_\_\_\_

Post to: RISC USER, Dolphin Place,  
Holywell Hill, St. Albans, Herts AL1 1EX.  
Or phone 0727 40303.

Official orders welcome.  
Phone 0727 40303 for more information.



# ACORN FORUM

six to the other. When placed 'on top' of each other the effect is of perfectly formed half-height characters.

When the program is run, black lines occasionally appear near the bottom of the characters. This is because the two screens being displayed do not synchronise with the program. You can usually solve the problem by re-running the program.

The program would theoretically generate graphics at 640x512 resolution when used in mode 0, but it is very difficult to get such results as the MOS cannot deal with the twin screens: poking the screen memory directly is the only way to produce such graphics.

## £10 SIDEWAYS RAM DFS BACKUP

Sheerness reader A Valentine has a Master 128 and single disc drive, and had the bright idea of using the four sideways RAM banks to buffer data during backup. This drastically reduces the number of disc swaps required. His program (listing 3 on the yellow pages) allows an 80-track disc to be copied in four swaps, and a 40-track disc in just two! It works by loading in 24 tracks at a time and storing them in sideways RAM, and then recalling them so they can be put back onto a disc.

To do this the program requires all 64k of the sideways RAM in the Master series. However, it can be altered to use less, by setting 'maxtrackread' to six, 12 or 18, in which case only one, two or three banks (always starting at bank W) will be used. But this will mean more swaps of the disc, defeating the object of the program.

To run the program, type in the listing, run it, and it generates a machine code file called SRCOPY. This should be \*RUN. The program will ask for source drive, destination drive, pause required between read/write and whether you want to copy an 80-track disc.

If you key 'Y' at the 'pause required' prompt, you will get a 'press a key' pause between reading and writing. Mr Valentine points out that by giving you the choice it happens anyway if source and destination discs are the same, you can copy between side 0 of one disc and side 2 of another, which you can't with the normal DFS backup commands. If you key 'N' to the '80-track' prompt, only 40 tracks of the disc will be copied.

## £10 ELECTRON HARDWARE SCROLLING

The electron display chips are different to their BBC micro counterparts, but Carl Bateman of Kidsgrove has found that this is no handicap to the implementation of hardware scrolling.

The main problem with Electron hardware scrolling is that, without a 6845 chip, the normal VDU 23,0 system used on BBC micros cannot be used. However, the Electron OS still needs to keep track of the screen start address, and this is done by the ULA. Page &FE (known as SHEILA) holds a number of ULA registers, interrupt status and control, cassette data shift register and so on. Locations &FE02 and &FE03 are used to store the screen start address. All locations in SHEILA can be written to by direct polling, or better still by using \*FX151,X,Y. X is the offset from &FE00; and Y is the value to be written.

Before being stored the screen start address is shifted to the right by one bit, and then stored in &FE02 and &FE03, low byte first. For example, the start of an unscrolled mode 4 screen is at &5800. Shifted right (or halved), that's &2C00, so &00 is stored at &FE02, and &2C at &FE03. By altering these registers it's possible to have limited hardware scrolling, and to show areas of memory on the screen other than &3000 to &7FFF.

Carl's listing (listing 4 on the yellow pages) shows how hardware scrolling can be set up. While vertical scrolling is fully available, the sideways scroll is a bit on the jerky side. This is because the Electron ULA will only take notice of a change of 64 bytes or more in the value of the screen start address.

As with the BBC micro, while screen start address is within the normal &3000 to &7FFF range, the circuitry ensures that information passing off the top of the screen reappears at the bottom, and vice versa. Similarly, as a character drops off the right of one line, it will reappear at the left at the start of the next line.

Entering \*FX151,3,4 allows you to look at memory from &800 upwards. To start looking at memory from a particular page, the last parameter should be the memory address DIV &200. For more precise control, use \*FX151,2,y to change the value of &FE02. The system doesn't seem to want to display RAM below &800 on screen,

even when the above formula is followed. This all goes to show that you can do a lot of fancy tricks on an Electron.

## £5 INSTANT KEYBOARD BEEP

Electron owner P A Bender has sent me a short, neat tip for adding a keyboard beep to your computer. This works on everything from an Electron to a Compact. Type in the following:

```
!&90=&EE4C07A9: ?&94=&  
FF: ?&220=&90: ?&221=0
```

The effect of the beep is not immediate, you have to turn it on with \*FX14,2, and turn it off again with \*FX13,2.

This will cause a beep with every key-press. Of course, the usual beep is far too long, so do an \*FX214,1 to shorten it. \*FX213 changes the pitch: \*FX213,180 is quite pleasant.

## UNDERUSED LOCATIONS

When writing small machine code utilities, you almost always need a few bytes of work space in zero-page. Page zero is special: some 6502 addressing modes and some operating system routines need it.

Many people use the area between &70 and &8F, because Basic sets this area aside for machine-code programs. But not all other languages do, and the whole point to machine code utilities is that they should be usable from any language.

So is there an area of zero page that all utilities can use? In fact, there is. The operating system reserves &AB to &AF for star commands.

That includes the sort of utilities you run from disc using a star command. One time when you would use this area is in calling Osargs. For example:

```
LDA #&01  
LDX #&AB  
LDY #&00  
JSR &FFDA \osargs
```

returns the address of the command line that called the utility, so that the rest of the text from the command line can be read. The address is put in the first four bytes of the zero page workspace at &AB-&AB.

Send your contributions for Acorn Forum to Acorn User, Redwood Publishing Ltd, 20-26 Brunswick Place, London N1 6DJ.

# SOFTWARE AT BARGAIN PRICES

## BBC VALUE PACKS

<b>ED1 SENIOR</b> £8 BBC & ELECTRON MATHS 1 MATHS 2 ENGLISH BIOLOGY LINKWORD ITALIAN	<b>GP2</b> £5 WALLABY SMASH & GRAB MR WIZ Q. BERT SPITFIRE COMMAND HUNCHBACK	<b>GP1</b> £6 FREE FALL JCB DIGGER CARAOUSEL TETRAPOD CRAZY TRACER METEORS OR MONSTERS	<b>ED2 JUNIOR</b> £9 CAESER THE CAT HI BOUNCER WORDS, WORDS NUMBER CHASER TURTLE GRAPHICS DROGNA	<b>INT 1</b> £7 KNOW YOUR PSI/Q KNOW YOUR PERSONALITY BLACK BOX & GAMBIT JOFFE PLAN (WEIGHT) ME & MY MICRO DO OR THEATRE QUIZ
--	--	---	--	--

## ELECTRON VALUE PACKS

<b>GP3</b> £7 CHESS BOXER HOPPER SNAPPER SPHINX DAY SWOOP STOCK CARS	<b>GP4</b> £7 ARCADIANS STARSHIP COMMAND BOXER TARZAN BRIAN JACKS CHALLENGE	<b>INT 2</b> £5 ME & MY MICRO BUSINESS GAMES COCKTAIL MAKER SPHINX MAKER BOXER WATCH YOUR WEIGHT	<b>INT 3</b> £6 TURTLE GRAPHICS COCKTAIL MAKER HOPPER ME & MY MICRO KNOW YOUR PERSONALITY KNOW YOUR PSI/Q
---	---	--	--

**BARGAIN TITLES £1.50**  
**ACORNSOFT — BBC**  
 FIREBUG  
 SUPER INVADERS  
 MONSTERS  
 TETRAPOD  
 METEORS  
 BOXER  
 CUBE MASTER  
 SLIDING BLOCK PUZZLE  
 FREE FALL  
 JCB DIGGER  
 DROGNA  
**COUNTDOWN TO DOOM**

**BARGAIN TITLES £1**  
**ACORNSOFT — Electron**  
 BOXER  
 SPHINX ADVENTURE  
 HOPPER  
 SNAPPER  
 CHESS  
 ARCADIANS  
 ME & MY MICRO  
 STARSHIP COMMAND  
 COCKTAIL MAKER  
 WATCH YOUR WEIGHT

**CURRENT TITLE BBC**

	CASS	DISC
PALACE of MAGIC	7.50	9.95
CRAZY RIDER	7.50	9.95
AROUND WORLD 40		
SCREENS	5.50	6.50
CODENAME		
DROID	7.50	9.95
STRYKERS RUN	7.50	9.95
REPTON 3	7.50	9.95
SUPERIOR COLLECTION		
VOL 1	7.50	9.95
VOL 2	7.50	9.95
REVS & 4 TRACKS	9.95	11.95
ELITE	9.95	11.95
GRAND PRIX		
CONSTRUCTION	7.50	9.95
CHOLO		14.95
SENTINEL	7.50	11.95
PAPERBOY	7.50	11.95
THE HUNT	7.50	9.95
COLOSSUS		
CHESS	7.50	11.95
LIVING		
DAYLIGHTS	7.50	11.95
PAPERBOY	7.50	11.95
OMEGA ORB	6.50	9.95
<b>WAR (MARTECH)</b>	<b>4.50</b>	
<b>SAM FOX STRIP POKER</b>	<b>4.50</b>	

**CURRENT TITLE ELECTRON**

COLOSSUS CHESS	7.50
5 STAR GAMES 2	7.50
SUPERIOR COLLECTION	
VOL 3	7.50
PALACE OF MAGIC	7.50
CRAZY RIDER	7.50
AROUND WORLD 40	
SCREENS	5.50
REPTON 3	7.50
STRYKERS RUN	7.50
CODENAME DROID	7.50
RAVENSKULL	7.50
ELITE	10.50
PAPERBOY	7.50
DUNJUNZ	2.99
FLIGHT PATH 737	2.99
<b>TARZAN</b>	<b>2.99</b>
<b>OMEGA ORB</b>	<b>6.50</b>

**PLUS 1 INTERFACE  
WITH  
VIEW WORDPROCS**

**£49.95**

# TOWERHILL COMPUTERS LTD



Unit 2 Wharfside  
 Fenny Stratford, Milton Keynes, MK2 2AZ  
 Telephone: Milton Keynes (0908) 74246



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

TECHNOLINE  
(24 hr viewdata system)  
Tel:01-450 9764

MAIL ORDER  
17 Burnley Road  
London NW10 1ED  
Telex:922800

RETAIL SHOPS  
15 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  
(near Edgware Road ⊕)

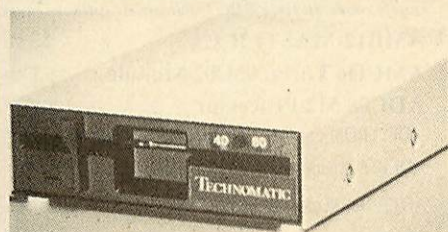
For fast delivery telephone  
your order on 01-208 1177  
using VISA/Access Card



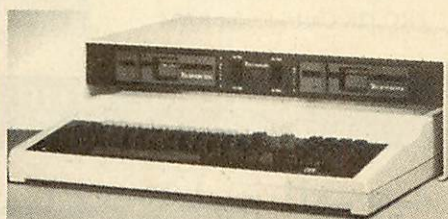
Orders welcome from  
government depts &  
educational establishments

All prices ex VAT.  
Prices are subject to  
change without notice  
Please add carriage  
(a) £8.00 (Datapost)  
(b) £2.50  
(c) £1.50  
(d) £1.00

## TECHNOMATIC DISC DRIVES



TS 400



PD 800P

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 Japanese 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 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 suitably fused 13A moulded plug.

5.25" Single Drives 40/80 switchable:

TS400 400K/640K £105 (b)

PS400 400K/640K with integral mains power supply £115 (b)

5.25" Dual Drives 40/80 switchable:

TD800 800K/1280K £185 (a)

PD800 800K/1280K with integral mains power supply £209 (a)

PD800P 800K/1280K with integral mainspower supply and monitor stand £229 (a)

3.5" 80T DS Drives:

TS351 single 400K/640K **OFFER** £75 (b)

PS351 single 400K/640K with integral mains power supply £99 (b)

TD352 Dual 800K/1280K £134 (b)

PD352 Dual 800K/1280K with integral mains power supply £169 (b)

PD853 Combo Dual 5.25"/3.5" drive with psu. £209 (a)

**DISC DRIVE MULTIPLEXER**  
(Suitable for DFS & ADFS)

TDM2 Dual Unit: 2 computers/one drive unit £69 (b)

TDM4 Quad Unit: 4 computers/one drive unit £119 (b)

## TECHNOMATIC WINCHESTERS

Technomatic offer the most popular range of Winchester Drives for BBC Micro Systems at competitive prices.

All Winchesters are supplied with:

- ADFS Roms
- Front End Utility for the Master. This utility enables the total contents of the drive displayed in icon format indicating the type of data in each file. Any file can be loaded by pointing the cursor at it.

**P20HD TECHNOMATIC 20 Mbyte Winchester Drive**

£499 (a)

**P40HD TECHNOMATIC 40 Mbyte Winchester Drive with Acorn ADFS ROM**

£749 (a)

**P204HP TECHNOMATIC 20 Mbyte Winchester and a 80T DS floppy Drive built in a monitor stand. Includes ADFS Rom.**

£769 (a)

**P2041HT** As P204HP but also with a 10 Mbyte tape streamer backup unit and backup utilities. Includes ADFS Rom.

£1295 (a)

**TS10 10 Mbyte Tape Streamer Backup unit with utilities.**

£599 (a)

**TFC10 10 Mbyte Pre-formatted Cartridge for use with P2041HT and TS10.**

£19 (d)

**Special adaptor for S.J. File Server**

£28 (d)

*Enquire for larger capacity Winchesters.*

*These Winchesters are compatible with the S.J. File Server.*

**WINCHESTER Drive Multiplexer**

TWM2 for two computers.  
TWM4 for four Computers.

£99 (b)  
£159 (b)

## 3M FLOPPY DISCS

### New low prices plus Winter Olympic Competition

Thousands of instant prizes to be won with 3M Discs. A draw for a trip to the Winter Olympics. Five 2nd prizes of £1,000 of recording equipment.

5.25" Discs in packs of 10  
744 40T SS DD £8.50 (d)  
745 40T DS DD £10.50 (d)  
746 80T SS DD £11.50 (d)  
747 80T DS DD £13.25 (d)

3.5" Discs in packs of 10  
80T SS-DD £15 (d)  
80T DS DD £19.50 (d)

(Add £1 for library case packing)



## 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. £36 (b)

50 3.5" 80 T double sided discs with sleeves in lockable box. £60 (b)

**FLOPPICLENE DRIVE HEAD CLEANING KIT**

5.25" Kit with 20 disposable discs £12.50 (d)

3.5" Kit with 20 disposable discs £14.00 (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)

# TECHNOMATIC

BBC COMPUTERS & ECONET CENTRE  
17 Burnley Road, London NW10 1ED Tel: 01-208 1177  
305 Edgware Road, London W2 Tel: 01-723 0233

## ARCHIMEDES

### 300 SERIES

Archimedes 305 Basic	£799 (a)
Archimedes 305 Mono	£849 (2×a)
Archimedes 305 Colour	£999 (2×a)
Archimedes 310 Basic	£875 (a)
Archimedes 310 Mono	£925 (2×a)
Archimedes 310 Colour	£1075 (2×a)

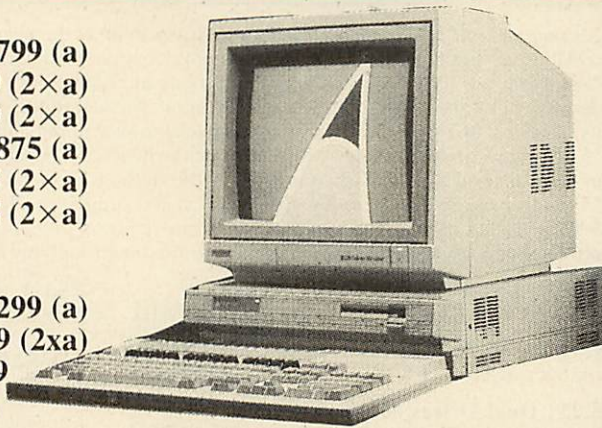
### 400 SERIES

Archimedes 440 Basic	£2299 (a)
Archimedes 440 Mono	£2349 (2xa)
Archimedes 440 Colour	£2499 (2xa)

### ADD-ONS

0.5Mb Ram upgrade kit for 305	£79 (c)
2nd Floppy Drive	£125 (b)
Podule Backplane	£39 (c)
20 Mb Hard Disc + Podule	£499 (a)

(Please enquire about the availability of some of the above packages)



### SOFTWARE

ANSI C	£99 (e)	Archimedes Ref Manual	£19.95 (b)
ISO Pascal	£99 (c)	ARM Ass Lang Prog	£12.95 (d)
Fortran 77	£99 (c)		
Logistix	£99 (c)		
View Professional	£99 (c)		

### BBC MASTER COMPACT

All Compact Systems include a FREE educational/fun software bundle made up from BBC Publications software range.

#### SYSTEM 1

128K, Single 640K Drive & bundled software. £309 (a)

#### SYSTEM 2

System 1 with a 12" Hi Res Monochrome Monitor. £359 (a)

#### SYSTEM 3

System 1 with a 14" Med Res RGB Monitor. £479 (a)

Second Drive Kit. £91 (c)

Serial Kit. £25 (c)

T.V. Modulator. £26 (d)

Extension cable for external 5.25" 80T Drive. £12.50 (d)

Mertec Adaptor (Upgrades to almost master level) £35 (c)

### FILE STORE

Acorn's new file server system. £828 (a)

Filestore E01. £710 (a)

Filestore E20. £710 (a)

Full details on request

Acorn 30Mb Winchester. £1530 (a)

(incl FS III Software)

### 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)

### UPGRADE KITS

1.2 OS ROM. £15 (d) ADFS ROM. £26 (d)

DNFS ROM. £19 (d) 1770 DFS Kit. £43.50 (d)

BASIC II ROM. £22.50 (d) Econet Kit. £55 (d)

### SECOND PROCESSORS

Universal 2nd Processor Adaptor. £75 (b)

Acorn 65C02 Turbo. £92 (b)

TORCH ZEP100. £229 (a)

MULTIFORM Z80

TECHNOMATIC'S multi format Z80 system includes a FREE Pocket Wordstar + MS/DOS Read/Write Utility. £249 (b)

### ACW/CO-PROCESSOR

For full specification see page 5

32016 Co-processor. £949 (a)

Cambridge Workstation. £3450 (a)

X25 Gateway. £2175 (a)

10 MHz upgrade for Co-Proc. £255 (a)

### ACORN IEEE INTERFACE

Allows BBC computer to control any scientific and technical equipment that conforms to the IEEE488 standard. The interface can link upto 14 compatible devices. Typical applications are in experimental work in academic and industrial labs. £265 (a)

### EPROMS/RAMS

2764-25. £2.80 (d)

27128-25. £3.60 (d)

6264LP-15. £2.60 (d)

27256. £5.00 (d)

27512. £9.90 (d)

### 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+. £31 (c)

### BBC MASTER SERIES

AMB15 MASTER. £346 (a)

Master AMB15 includes a free educational/fun software bundle made up from BBC Publications software range.

AMB12 MASTER ET. £315 (a)

AMCO6 Turbo 65C02 Module. £99 (b)

ADC08 512 Processor. £195 (b)

ADF14 ROM Cartridge. £13(d) ADJ22 Ref Manual I. £14(c)

ADF10 Econet Module. £41(c) ADJ24 Adv. £19.50(c)

ADJ23 Ref Manual II. £14(c) Ref Manual. £19.50(c)

BBC Master. View User Guide. £8.50(d)

Dust Cover. £4.75(d) Viewsheet User Guide. £8.50(d)

### MASTER ROM/RAM CARTRIDGES

TRC1 Two rom cartridge. £8.95 (d)

TRC4 Four rom cartridge. £11.95 (d)

TRC 32K Cartridge inc RAM. £29.95 (d)

### LEARN ARABIC WITH YOUR COMPUTER

### مساعد تعليم العربية

Convert your BBC or Master computer to bilingual operation with the BABEL Arabic Package.

Beautiful Arabic text. Software developed and tested in the classroom for 2 years to help the young read and understand Arabic.

The package comprises: an easy to install EPROM, a set of keycap labels, an instruction booklet and a disc with absorbing programs: Mastering the Arabic alphabet, Arabic grammar exercises, English to Arabic and Arabic to English translation exercises.

The BABEL Arabic Package. £70 (d)

Other Arabic educational software for the converted micro; each disc. £15 (d)

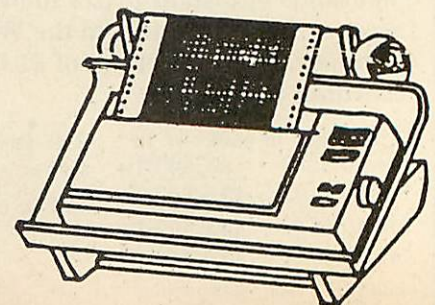
(Please specify 40 or 80 tracks). Send for more details.

### Master Operating System (book by David Atherton)

£12.95 (c)

### 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)



# TECHNOMATIC

BBC COMPUTERS & ECONET CENTRE  
 17 Burnley Road, London NW10 1ED Tel: 01-208 1177  
 305 Edgware Road, London W2 Tel: 01-723 0233

## PRINTERS

<b>EPSON LX800</b> 150 cps, variety of fonts, including NLQ, bit image graphics, IBM char/graphics compatible, centronics interface and tractor feed as standard	£189 (a)
<b>EPSON FX800</b> An enhanced version of FX85. Call for details.	£315 (a)
<b>EPSON FX1000</b> An enhanced version of FX105. Call for details.	£439 (a)
<b>EPSON EX800</b>	£409 (a)
<b>EPSON EX1000</b>	£595 (a)
Colour option for EX800/EX1000.	£59 (b)
<b>EPSON LQ800</b>	£399 (a)
<b>EPSON LQ1000</b> As LQ800 but wider carriage for 136 columns.	£609 (a)
<b>TAXAN KP815</b> Enhanced KP810 with 160cps and full IBM compatibility.	£269 (a)
<b>TAXAN KP915</b> Enhanced KP910 with 180cps and full IBM compatibility.	£369 (a)
<b>NATIONAL PANASONIC KX P1081</b>	£149 (a)
<b>STAR NL 10 (Parallel Interface)</b>	£190 (a)
<b>STAR NL 10 (Serial Interface)</b>	£219 (a)
<b>INTEGREX Multicolour Inkjet printer.</b> Ideally suited for high res colour VDU screen dumps. Quietness & consistent output are major characteristics. BBC Screen dump for Integrex.	£549 (a) £15 (d)
<b>BROTHER HR20</b> 8K buffer standard expandable to 16K. Parallel & Serial ports as standard.	£349 (a)
<b>NAT PANASONIC KX P3131</b> Daisy wheel printer with 38K buffer, 17 cps, bi-directional, parallel interface	£249 (a)
<b>JUKI 6100 Daisy wheel printer</b> 15 cps, 2K buffer, switchable 10/12/15 cpi proportional spacing, underlining. Parallel interface.	£295 (a)
Parallel Printer Lead (1.2m)	£6 (d)

## MODEMS

*All modems listed below will be supplied with BBC Publications ModemMaster comms package and a BBC data lead.*

<b>MIRACLE WS4000 V21/23</b>	£135 (b)
<b>MIRACLE WS3000 V21/23</b>	£244 (b)
<b>MIRACLE WS3000 V22</b>	£409 (b)
<b>MIRACLE WS3000 V22 bis</b> (All modems are BABT approved)	£537 (b)
BBC Data Cable for WS3000/4000	£7 (d)
<b>MIRACLE WS2000V21/23 &amp; BELL stds</b>	£92 (c)
WS2000 Auto Dial Card	£27 (d)
WS2000 Auto Answer Card	£27 (d)
WS2000 SK1 Kit	£5 (d)
WS2000 User Port Lead	£5 (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)

## PLOTTERS

<b>HITACHI 672</b>	£465 (a)
<b>LINEAR GRAPHICS</b>	
<b>A4S PLOTMATE</b>	£282 (a)
<b>A4SM PLOTMATE</b>	£342 (a)
<b>A3 PLOTMATE</b>	£299 (a)
<b>A3M PLOTMATE</b>	£431 (a)
Full range of accessories available for plotmate plotters	

## PRINTER SHARERS & BUFFERS

<b>BUFFALO PB Buffer</b> Parallel buffer for internal fitting to most Epson printers. Simple to instal. PB128 (128K)	£89 (c)
<b>PERIPHERAL &amp; COMPUTER SHARERS</b> High quality switches to allow the user to switch between computers, printers, modems etc. Fully shielded metal cases. all lines fully switched.	

	Parallel	Serial
2 Computers to 1 Printer 36v36-2	£25(c)	25v25-2 £25(c)
3 Computers to 1 Printer 36v36-3	£39(c)	25v25-3 £39(c)
4 Computers to 1 Printer 36v36-4	£45(c)	25v25-4 £45(c)
2 Computers 2 Printers X-over 36v36-x	£49(c)	25v25-x £49(c)
BBC Cable set 3 to 1 (1m ea)	£24(c)	
BBC Cable set 4 to 1 (1m ea)	£30(c)	

<b>BBC Computer Sharer: TCS26</b> 1 computer to 2 printers fitted with BBC cable	£17 (c)
---	---------

<b>Paper &amp; Labels</b> Plain fanfold paper with microperforation:	
2000 sheets 9 1/2" x 11"	£12 (£3.50)
2000 sheets 14 1/2" x 11"	£18.50 (£4.50)
1500 sheets A4 90gsm	£18.00 (£4.00)

<b>Labels/1000</b> Single Row 3 1/2" x 7/16"	£5 (d)
Triple Row 2 7/16" x 1 7/16"	£5 (d)

## PROGRAMMING ACCESSORIES/SOFTWARE

Compatible with B, B+ and Master

<b>EpromRyter (Epromer II)</b> Eprom Ryter is compatible with BBC Master only. See page 7. Upgrade of Epromer II to Eprom Ryter (Please return your Epromer II)	£119 (b) £49 (b)
<b>EPROMER II</b>	£89 (b)
<b>MPROMER</b>	£49 (c)
<b>META ASSEMBLER</b>	£145 (b)
<b>PORTAL EPROM EMULATOR 512K</b>	£245(b)
<b>TEAM Disassembler</b>	£145 (b)
<b>EPROM ERASERS</b>	
UV1B 6 eproms, safety cutout	£47 (b)
UV1T 6 eproms, timer, safety cutout	£59 (b)

## MONITORS

BBC lead incl with all monitors

<b>MICROVITEC 14" RGB Monitors</b> Please specify plastic or metal case.	
<b>Microvitec 1431</b> Standard Resolution 453 pixels	£179 (a)
<b>Microvitec 1431AP</b> As 1431 + composite video and sound input	£199 (a)
<b>Microvitec 1451</b> Medium Resolution 653 pixels	£225 (a)
<b>Microvitec 1451AP</b> As 1451 + composite video and sound input	£255 (a)
<b>Microvitec 1441</b> High Resolution 895 pixels	£359 (a)
<b>Philips 14" RGB</b> Med Res. high contrast screen, TTL/Linear Input, Mono/Colour Switch Sound Input. Separate controls for brilliance and contrast.	£195 (a)
<b>Microvitec 20" RGB/PAL/Audio Monitors</b>	
<b>Microvitec 2030CS</b> Standard Resolution RGB/Comp Video	£380 (a)
<b>Microvitec 2040CS</b> High Resolution RGB/Comp Video	£685 (a)
<b>TOUCHTEC-501</b> Brings genuine touch screen operation on metal cased Microvitec monitors, incl utilities disc with starter and development programs	£239 (b)
<b>TAXAN SUPER VISION 620</b> 12" Hi Res/Hi Contrast Option to switch to green/amber BBC/IBM Compatible	£269 (a)
<b>TAXAN SUPER VISION 625</b> 12" Super Hi Res and contrast RGB Monitor with option to switch to mono BBC/IBM compatible.	£319 (a)
<b>12" MONOCHROME MONITORS</b>	
<b>TAXAN KX 117</b> Hi Res green etched screen	£85 (a)
<b>TAXAN KX 118</b> Hi Res Long Persistence (P39)	£90 (a)
<b>TAXAN KX 119</b> Hi Res amber etched screen	£90 (a)
<b>PHILIPS BM 7502</b> Hi Res green screen.	£69 (a)
<b>PHILIPS BM7522</b> Hi Res amber screen.	£75 (a)
<b>PHILIPS BM 7542</b> Hi Res White screen.	£79 (a)
<b>MONITOR ACCESSORIES</b>	
Microvitec Swivel Base (14" plastic monitors)	£17 (c)
Philips Swivel Base	£10 (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	£5 (d)
Microvitec Lead	£3.50 (d)
Monochrome BNC/Phono Lead	£3.50 (d)

TECHNOLINE  
(24 hr viewdata system)  
Tel:01-450 9764

MAIL ORDER  
17 Burnley Road  
London NW10 1ED  
Telex:922800

RETAIL SHOPS  
15 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  
(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 (Datapost)  
(b) £2.50  
(c) £1.50  
(d) £1.00

### CAD/DRAWING PACKAGES

<b>NOVACAD</b> 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)
<b>MOUSE</b> AMX MOUSE with SUPER ART (pse specify B, B+ or Master)	£63 (d)
PAGEMAKER	£32 (d)
EXTRA/EXTRA (utility for the Pagemaker)	£19 (d)
MAX	£17 (d)
STAND ALONE MOUSE (includes horizontal scroll lock)	£34 (c)
<b>RB2 TRACKER BALL</b> 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)
<b>MIRRORSOFT FLEET STREET EDITOR</b>	£35 (d)

### CP/M SOFTWARE

Send for details on our full range of  
CP/M & PC DOS packages for  
Business, Communications & High  
Level Languages.

Please send for details on our range of CP/M  
software for Acorn/Torch Z80 2nd Processors

### BBC SOFT/FIRMWARE

All software supplied by us is known to  
operate with the appropriate Acorn Disc  
filing systems. We cannot comment on  
their use with other DFS systems.

### DATABASE MANAGEMENT SYSTEMS

VIEWSTORE	£37 (d)
STARdataBASE	£39 (d)
MASTERFILE II	£17 (d)
ACORN OVERVIEW PACKAGE Special Offer (RRP £86)	£57 (b)

### WORD PROCESSORS

ACORN VIEW PROFESSIONAL (BBC)	£85 (c)
VIEW 2.1	£35 (d)
VIEW 3.0	£48 (c)
VIEW INDEX	£12 (d)
VIEW PRINTER DRIVER GENERATOR	£7 (d)
VIEWSPELL	£29 (d)
DOT PRINT US	£28 (d)
WORDW	£24 (d)
WORDWISE PLUS	£38 (d)
WYSIWYG PLUS	£21 (d)
SPELLMASTER	£47 (d)

INTERWORD	£39 (d)
WORDEASE	£24 (d)
SPELLCHECK III	£31 (d)
EDWORD II	£43 (c)

### SPREADSHEETS

VIEWSHEET	£37 (d)
WINDOWMATIC	£15 (d)
VIEWPLOT	£22 (d)
INTER SHEET	£37 (d)
INTERCHART	£26 (d)
ULTRACALC	£26 (d)

MINI OFFICE II DISC Version For B & B+ 40T or 80T	£14.75 (d)
For Master 80T	£17.30 (d)
For Compact	£19 (d)

MINI OFFICE II ROM Version For Master, Compact, B+ & B	£48 (c)
---	---------

### LANGUAGES

META ASSEMBLER	£145 (b)
TEAM DISASSEMBLER	£145 (b)
MACROM	£33 (d)
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)
MICROTEXT	£52 (c)
MICROTEXT PLUS	£229 (b)

### COMMUNICATIONS

TERMULATOR	£25 (d)
COMMSTAR II	£28 (d)
COMMUNICATOR	£49 (d)
MODEM MASTER	£11 (d)
COMMAND	£34 (d)
MASTER TERMULATOR	£34.75 (d)

### UTILITIES

ACCELERATOR	£49 (d)
ACORN BASIC EDITOR	£24 (d)
MONITOR (BBC Pub)	£19 (d)
BROM PLUS	£26.50 (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)
HERSHEY FONT CHARACTER GENERATOR	£18 (d)
ICON MASTER	£29 (d)
MOVIE MAKER	£26 (d)
Two Roms + Cassette	£26 (d)
ADV TELETEXT UTILITIES ROM	£7.95 (d)

### COMPACT (all on 3½" disc)

ARTROOM	£27 (d)
FONTWISE+	£22 (d)
FONT EDITOR	£22 (d)
RAMROD	£37 (d)
BROM PLUS	£32 (d)
MACROM	£37 (d)
BETABASE	£27 (d)
WHITE KNIGHT MKII	£16 (d)
BBC PUBLICATIONS BUNDLED SOFTWARE	£18.50 (d)

### BBC PUBLICATIONS EDUCATIONAL SOFTWARE

A series of programs developed in many cases along-  
side 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)

#### SECONDARY LEARNING

TECHNOLOGY & DESIGN Pt1	£21.50 (c)
ELECTRIC FIELDS	£10.50 (d)
ADVANCED LEVEL	
STUDIES: STATISTICS	Disc £23 (d)
ADVANCED STUDIES: GEOGRAPHY	Cass £10 (d)
INSIDE INFORMATION	Prog Cass £10 (d)
	Book £8 (d) Audio Cass £5 (d)
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	Disc £14 (d)
S.T.: ELECTRONICS IN ACTION	Disc £14 (d)
S.T.: NEWTON & THE SHUTTLE	Disc £19 (d)
S.T.: ECOLOGY	Disc/EC £19 (d)
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)

#### GENERAL

VU-TYPE PROFESSIONAL	Disc £19 (d)
WHITE KNIGHT MK II (for compact)	Disc £16 (d)
BATTLEFIELDS	Cass £8.50 (d)
A VOUS LA FRANCE	Cass/EC £17 (d)
	Book £5.25 (d)
	Audio Cassettes (2) £7.50 (a)
	£9.00 (d)
DEUTSCH DIREKT	Disc/aud/EC £16 (c)
	Book £5.95 (d)
MODEM MASTER	£11 (d)

Additional charges for discs  
Cassette based programs listed above can be supplied  
on disc at an extra charge of £1.50 per disc and please  
specify the format required 40 or 80T.

# TECHNOMATIC

BBC COMPUTERS & ECONET CENTRE  
17 Burnley Road, London NW10 1ED Tel: 01-208 1177  
305 Edgware Road, London W2 Tel: 01-723 0233

## BOOKS

<b>No VAT Carriage Code (c)</b>	
<b>LANGUAGES</b>	
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
<b>BBC MICRO GUIDE BOOKS</b>	
Inside Information.....	£8.95
Maths Prog in BBC Basic.....	£7.95
The Friendly Computer Book.....	£4.50
Toolbox 2.....	£10.95
<b>PROGRAMMING/UTILITY</b>	
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
Mastering View, Viewsheet & Viewstore.....	£12.95
View by B. Smith.....	£12.95
View 3.0 User Guide.....	£9.00
Viewstore User Guide.....	£9.00
Viewsheet User Guide.....	£9.00
Wordwise Plus.....	£9.95
<b>SOUND &amp; GRAPHICS</b>	
Computer Graphics & CAD Fundamentals.....	£9.95
Mastering Music.....	£6.95
<b>DISC DRIVE SYSTEMS</b>	
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.....	£9.00
Practical Disc File Techniques.....	£5.95
Mastering the Disc Drive.....	£12.95
Mastering DOS plus.....	£12.95
<b>APPLICATIONS</b>	
Interfacing Proj for BBC.....	£6.95
BBC and Small Business.....	£5.75
The Software Business.....	£5.50

**Mastering Operating System**  
(David Atherton) .....£12.95

## PRINTER ACCESSORIES

### EPSON ACCESSORIES:

<b>Interfaces</b>	
143 RS232.....	£30 (d)
148 + RS232 + 8K.....	£65 (d)
177P NLQ for FX80 +/FX100 +.....	£99 (d)
Parallel & Serial Buffers of various size also available.	
Q800 Tractor Feed.....	£47 (b)
Q1000 Tractor Feed.....	£52 (b)
<b>HEET FEEDERS:</b>	
Q800.....	£135 (b)
Q1000.....	£179 (b)
X800.....	£135 (b)
X1000.....	£309 (b)
X800.....	£135 (b)

FX1000.....	£179 (b)
<b>Ribbons:</b>	
RX/FX100/100 +, FX105.....	£7 (d)
RX/FX80/80 +, FX85.....	£4 (d)
LX80/LX800.....	£4.50 (d)
LO800.....	£8.50 (d)
LQ1000.....	£10 (d)
EX800/1000.....	£7.50 (d)
H180 Pen Set (Aqueous/Ball point).....	£8.25 (d)
<b>HITACHI 672 Plotter</b>	
Aqueous Pen Set six pens.....	£18.50 (d)
Oil Based Pen Set six pens.....	£25.00 (d)
<b>TAXAN CANON Accessories:</b>	
Ribbon, KP810/815/910/915.....	£6 (d)
Star Printer	

NL10 Sheet Feeder.....	£52 (b)
NL10 Ribbon.....	£4.50 (d)
<b>National Panasonic KX P1080/81</b>	
Spare Ribbon.....	£4.50 (d)
KXP3131 Tractor.....	£90 (a)
KXP3131 Sheet Feeder.....	£189 (a)
<b>JUKI 6100</b>	
Tractor Feed.....	£149 (a)
Ribbon (Carbon).....	£2.00 (d)
Sheet Feeder.....	£219 (a)
<b>BROTHER HR20</b>	
Tractor Feed.....	£116 (a)
Spare Ribbon Nylon.....	£3.00 (d)
Spare Ribbon Carbon.....	£4.50 (d)
<b>INTEGREX INK JET COLOUR PRINTER</b>	

Spare Ink Cartridge Black.....	£9 (d)
Spare Ink Cartridge Colour.....	£15 (d)
Paper Roll.....	£7 (d)
<b>Printer Leads:</b>	
BBC Parallel Lead (1.2m).....	£6 (d)
<b>PAPER &amp; LABELS</b>	
Plain Fanfold paper with micro perforations:	
2000 sheets 9½" × 11" 60 gsm/sq m.....	£12 (£3.50)
2000 sheets 14½" × 11" 60 gsm/sq m.....	£18.50 (£4.50)
1500 sheets A4 90 gsm.....	£18 (£3.50)
<b>Labels/1000:</b>	
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

**WYSIWYG PLUS** is designed to work with the following systems:

BBC Model B	6502 Second processor,
BBC Model B+	Turbo coprocessor
BBC Master 128	All printers (Except lasers)
BBC Compact	

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** workspace is relocatable.

## WINDOWMATIC

All users of Acorn's VIEWSHEET spreadsheet program will be aware of its powerful windowing facility which allows the screen and/or printer to be configured in up to 10 separate windows taken from anywhere in the sheet. They will also be painfully aware of how difficult and time consuming it is to set up a required display. Although VIEWSHEET allows configurations to be saved to the media, it does not have provision for deciphering them.

**WINDOWMATIC** has been produced with the intention of rectifying these shortcomings and to bring out the very best from VIEWSHEET.

**WINDOWMATIC** provides a quick and easy

way to configure screen and printer allowing complicated documents and reports to be set up much more easily. It displays complete text information on all 20 windows and accurate graphic representation of the screen and printer output.

The package includes a screen dump routine for Epson printers and allows use of other printer dump packages.

**WINDOWMATIC** is compatible with BBC Master and BBC B+. A 6502 2nd processor must be fitted to a model B to run Windowmatic. Windowmatic is fully compatible with Turbo and 6502 2nd processor.

The program is supplied on disc with a comprehensive manual.

## 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

## EDUCATIONAL/FUN SOFTWARE BUNDLE

Wordmover	Pantry Antics	Drawstick
Wordplay		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.

<b>5.25" Disc</b>	<b>£17.50(d)</b>
<b>3.5" Disc</b>	<b>£18.50(d)</b>

(Normal RRP over £40)

TECHNOLINE  
(24 hr viewdata system)  
Tel:01-450 9764

MAIL ORDER  
17 Burnley Road  
London NW10 1ED  
Telex:922800

RETAIL SHOPS  
15 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  
(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 (Datapost)  
(b) £2.50  
(c) £1.50  
(d) £1.00

# NOVACAD

## Computer Aided Draughting for the BBC Micro

“ Novacad can drive a plotter to provide drawings of a high quality...  
Novacad is excellent. It is flexible, genuinely easy to operate  
without much practice, and a pleasure to use. ” Beebug December 1986

“ Novacad is a professional package, well worth the £90 for the  
ROM and disc and is expandable to suit your own particular  
requirements. I would have no reservations if I heard Novacad  
called, “the best on the market”. ” A&B Computing August 1986

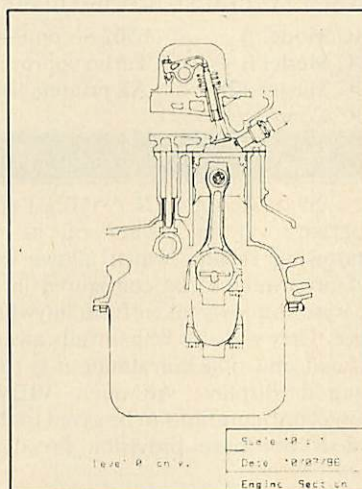
A sophisticated CAD package with unique facilities which are generally confined to the professional CAD packages costing thousands of pounds.

NOVACAD is being used in widely differing fields ranging from leading British 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 professional quality output are making extensive use of NOVACAD's unique features. NOVACAD is proving to be an invaluable teaching aid in technical schools and colleges simply because of the ease with which it can be used.

### NOVACAD'S MAJOR FEATURES

- \* Simple and easy to use with logical command sequence.
- \* A large drawing area (approx 15 screens).
- \* The ability to create complex icons (upto 500 lines instead of the usual 15 to 20 pixels), store them in a library and recall them at different scales and orientations.
- \* A zoom facility allowing magnification of up to 20 times to insert finer details.
- \* Block copy of shapes on the screen for repetitive use.
- \* Text entry at any 90° orientation at any position on the screen.
- \* Create multi layer drawing with 8 levels available.
- \* Full compatibility with the BBC range with minimal hardware requirements yet having the capability of exploiting the potential of the extra shadow memory or the second processor's memory and speed.
- \* Printer routine for Epson 80 and 136 column printers.
- \* A unique optional facility to output to any BBC compatible plotter.
- \* Cursor control from keyboard, tracker ball or mouse.



NOVACAD is compatible with all BBC models fitted with Acorn DFS. It has minimum hardware requirements of a single drive and an Epson compatible printer to get started though NOVACAD will utilise fully a dual drive system and 6502 2nd processor or the shadow ram on the B+ series. To obtain high quality drawings we recommend a BBC compatible plotter and our plotter driver generator.

With basic BBC B, NOVACAD operates in mode 4 allowing use of any 2 colours. With shadow memory of the BBC+ or the Master, it can also operate in mode 0 for higher resolution or mode 1 for allowing use of any 4 colours, and it will provide additional user memory for more complex drawings.

6502 second processor or the Turbo on the Master will also increase the drawing speed considerably.



**£49(d)**

**Plotter Driver  
Generator £15(d)**

### OPTIONAL EXTRAS

Plotter driver generator is available as an optional extra to configure a plotter routine for any BBC compatible plotter. Pre-configured programs for the popular plotters like Epson HI 80, Hitachi 672, Plotmate, Penman and HP GL. This program allows the drawing to be scaled to the maximum plotter size thus enabling drawing of A2 and A3 sizes to be produced with equal ease. The zoom facility will enable inaccuracies of drawing on the screen to be eliminated.

## BBC SPARE PARTS

<b>BBC B &amp; General</b>	16 MHz Xtal ..... <b>£12.50 (d)</b>	<b>BBC B +</b>	CF30049 ULA ..... <b>£15.25 (d)</b>
Power Supply ..... <b>£52.00 (b)</b>	8271 ..... <b>£40.00 (d)</b>	Keyswitch (state type) <b>£1.75 (d)</b>	CF30050 ULA ..... <b>£19.75 (d)</b>
Keyboard Connector <b>£5.00 (d)</b>	6522A ..... <b>£5.50 (d)</b>	Modulator UM1233... <b>£4.80 (d)</b>	CF30058 ULA ..... <b>£15.00 (d)</b>
Complete Keyboard.. <b>£52.00 (b)</b>	6845SP..... <b>£6.50 (d)</b>	B+ OS..... <b>£18.00 (d)</b>	6818 ..... <b>£4.00 (d)</b>
Keyswitch (state type) <b>£1.75 (d)</b>	DS3691..... <b>£4.50 (d)</b>	4864-12 ..... <b>£3.00 (d)</b>	65SC12 ..... <b>£15.66 (d)</b>
Modulator UM1233... <b>£4.80 (d)</b>	88LS120..... <b>£6.50 (d)</b>	PAL16RH ..... <b>£18.00 (d)</b>	50464..... <b>£3.50 (d)</b>
Video ULA ..... <b>£18.00 (d)</b>	LM324..... <b>£0.45 (d)</b>	1770 DFS ROM..... <b>£17.50 (d)</b>	74F00 ..... <b>£1.00 (d)</b>
Serial ULA ..... <b>£14.00 (d)</b>	SAA5050 ..... <b>£9.00 (d)</b>	<b>BBC MASTER</b>	74F74 ..... <b>£1.40 (d)</b>
1.2 OS ..... <b>£15.00 (d)</b>	UPD7002 ..... <b>£7.00 (d)</b>	Power Supply ..... <b>£65.00 (b)</b>	74HCT253 ..... <b>£3.50 (d)</b>
BASIC II ROM..... <b>£22.00 (d)</b>	NE555 ..... <b>£0.50 (d)</b>	Keyboard Connection <b>£3.75 (d)</b>	9637 ..... <b>£2.00 (d)</b>
DNFS ROM ..... <b>£17.50 (d)</b>	68B50 ..... <b>£2.50 (d)</b>	Keyboard ..... <b>£65.00 (b)</b>	32.768 MHz Xtal..... <b>£2.00 (d)</b>
ADFS ROM ..... <b>£26.00 (d)</b>	74ALS245 ..... <b>£5.00 (d)</b>	Keyswitch (state type) <b>£1.75 (d)</b>	
6502A..... <b>£5.50 (d)</b>	WD1770..... <b>£24.00 (d)</b>	1 Mb OS ROM ..... <b>£39.00 (d)</b>	<b>2nd PROCESSORS</b>
4816 RAM..... <b>£2.50 (d)</b>	68B54 ..... <b>£8.00 (d)</b>	CF30060 ULA ..... <b>£10.00 (d)</b>	ULA (512)..... <b>£34.00 (d)</b>
17.734 MHz Xtal..... <b>£2.50 (d)</b>	75159..... <b>£2.20 (d)</b>	CF30047 ULA ..... <b>£15.25 (d)</b>	ULA (6502 & Z80)... <b>£28.00 (d)</b>
	76489..... <b>£4.00 (d)</b>	CF30048 ULA ..... <b>£15.25 (d)</b>	Power Supply ..... <b>£42.00 (b)</b>



# TECHNOMATIC

BBC COMPUTERS & ECONET CENTRE

17 Burnley Road, London NW10 1ED Tel: 01-208 1177  
305 Edgware Road, London W2 Tel: 01-723 0233

## EpromRyter

- \*Highly sophisticated & Advanced Programmer
- \*Handles all current 1 rail Eproms
- \*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.

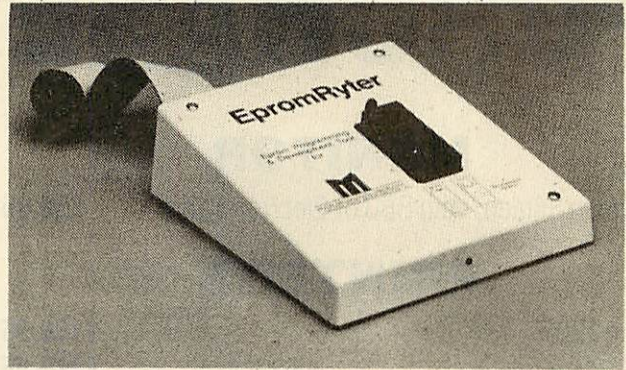
The EPROMRYTER interfaces with the Master through 1 MHz bus. It is mains powered with its own psu. 3M Textool zif socket has been fitted to ensure consistent and reliable service over long periods.

### 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

## 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.



### The main features of the programming software are:

- \* Device, function and voltage selection from the computer keyboard.
- \* Continuous display of the options selected.
- \* All eproms upto 27512 (64K) programmed in single pass.
- \* Automatic Intelligent identifier support for eproms able to respond.
- \* Selectable programming voltage 25/21/12.5V
- \* 3 programming methods: Normal, Intelligent & Pulse (30 sec for a 27128).
- \* Serial port protocols supported incl Intel Hex & Motorola S.
- \* DFS, NFS, ADFS and Rom Filing System Supported.
- \* BASIC/Machine Code programming using RFS.
- \* Powerful editor with input in HEX or ASCII. \* Full editable 64K file.
- \* Block move of data within the address range.
- \* User can select any section of the eprom from single byte to the full address range to blank check/burn/verify. Facility to program single bytes makes program development/amendment simpler.
- \* Multiple loading for ROM Filing System

*Some of the above features apply to Master Computers only*

## META Version III

*"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 AO, \$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 Disassemblers.
- 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-band manual, function-key strip.

## 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-post cable.
- Complete with all cables, manual and disc.

PORTAL 512 (2716, 2732, 2764, 27128, 27256, 27512).

## TEAM DISSASSEMBLER

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.

NEW

## THE TECHNOMATIC BBC CATALOGUE REVISED AUTUMN CATALOGUE

£10 Voucher Offer

This advertisement can only show an example of the range of products stocked by Technomatic. So send for our latest Autumn BBC catalogue providing detailed information and prices on BBC Computer Systems, Peripherals, Software and Books. **Inside you'll find a £10 voucher discount offer on orders worth over £200.** Technomatic is a BBC Computer and Econet Referral Centre providing a professional and reliable service to the BBC user. To obtain your free copy please complete and return the coupon below.

NAME.....

ADDRESS.....

.....Post Code.....

11/87

Return to Technomatic Ltd, 17 Burnley Road, London NW10 1ED

# SPECIAL PURCHASE

## MONITOR

12" Green Screen, with BBC or Electron Cable **£59.95**

## PRINTERS

Citizen 120D **£199.95**

Star NL10 **£219.95**

Panasonic 1081 **£189.95**

## MODEM

Telemod 2, with LMS rom and manual **£24.95**

THE COMPUTER DEPOT  
205 BUCHANAN STREET  
GLASGOW G1 2J2  
TEL: 041 332 3944



All prices include VAT + delivery

# AVON COMPUTER EXCHANGE

## TELEPHONE

## BRISTOL:

# (0272) 637981

**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

## DELTA COMPUTERS

### BBC MASTER SERIES

Archimedes Ring for price  
Master 128 £395.00  
Master Turbo Module £115.00  
Master Compact Entry System £415.00

### OPUS DISC DRIVES

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

### PRINTERS (inc lead)

Epson P-40 £49.95  
Citizen 120D £179.00  
Star NL-10 £237.00  
Panasonic KX-P1081 £169.00

### SPECIAL OFFER

Electron £49.99  
Electron+Plus 1+View+ Viewsheet £79.99

### 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

### UNBRANDED DISKS

5.25" DS DD 96tpi 25 off £14.99  
5.25" DS DD 96tpi 50 off £26.99  
5.25" DS DD 96tpi 100 off £48.99  
3.5" DS 135tpi 10 off £17.99  
3.5" DS 135tpi 25 off £39.99

All orders over £100 receive free Touchpad for BBC worth £49.95 (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



It is not what we tell you before – it is what we do for you later that counts

## LARGEST SELECTION OF BBC MODEL BD, COMPACT, MASTER, ELECTRON HARDWARE AND SOFTWARE

SPECIALIST BBC DEALER & SERVICE CENTRE

SALES:- 01-580 0181  
TECHNICAL:- 01-631 1098

MAIL ORDER –   – CHEQUES/P.O.

**COMPUFACE LTD** at Video City

233 TOTTENHAM COURT ROAD,  
LONDON W1P 9AE.

## ELECTRONS LIMITED OFFER

ONLY

# £59.95

## DISCS DISCS DISCS

INC 4 FREE  
GAMES

5 1/4" Packed in 10's

Please add  
£4.00 Carr  
& Pack.

SINGLE  
SIDED

DOUBLE  
SIDED

ONLY £8.99

ONLY £9.99

INC FREE LIBRARY CASE  
FREE DELIVERY *Prices Include V.A.T.*

# COMPSHOP

190 LISCARD ROAD  
WALLASEY MERSEYSIDE L44 5TN  
TEL: 051-639-3041

# VELOBYTE

## VELO-pack

Een produkt van VELOSOFT ROTTERDAM  
Communicatierom voor **BBC** en **MASTER** incl.

- een excellente editor (mode 7).
- editor *online* neemt funktie host over.
- rotor met instelbare tijden.
- conversie beelden naar ASCII filed (v.v.).
- conversie beeld naar BASIC procedures.
- muisdriver, ook voor andere programma's.
- exclusieve PLOT, DRAW & MOVE commando's.

Importeur/vertegenwoordiger voor Nederland van:

ACP  
Computer Concepts  
Morley  
Nidd Valley  
Pace  
Peartree  
PMS  
Slogger  
Towerhill  
Watford

Schiedamsedijk 5a-6a  
Tel. 010-4138197

3011 EB Rotterdam  
Databank 010-4332035

## A1 COMPUTER SERVICES

For your Computer Repairs and Supplies.

We are an Authorised Slogger Dealer.  
Used Equipment bought and sold.

9 PADDOCK MOUNT, DAWLEY,  
TELFORD, SHROPSHIRE. TF4 3PR  
TEL: 0952-502737

# MICROWAY

22 STATION ROAD RAINHAM KENT ME8 7PH  
TEL: (0634) 376702



AUTHORISED ACORN STOCKIST



LOCAL ORDERS  
ACCEPTED

5% DISCOUNT ON HARDWARE  
FOR EDUCATIONAL ORDERS

		ARCHIMEDES	
BBC MICRO	A305	BASIC MONO COLOUR	£799 £849 £999
	A310	BASIC MONO COLOUR	£875 £925 £1075

Many Books, Software and Peripherals also in stock.

# STARWORD – THE ELECTRON WORD PROCESSOR – NOW ONLY £19.95

## ACORN ELECTRON COMPUTERS

These computers are fully tested and guaranteed and can be purchased direct from SLOGGER or through certain dealers. The demand for this computer has prompted SLOGGER to offer both the TURBO ELECTRON and the 64k ELECTRON as well as the standard 32k ELECTRON.

	ONLY
52k Electron	64.00
TURBO Electron (switchable)	85.00
64k Electron (switchable)	99.00

## GREEN SCREEN MONITORS

SLOGGER has an offer a limited quantity of Green Screen monitors. These monitors are ideal for Word Processing in 80 column mode giving good clear consistant text.

A MUST for VIEW or STARWORD users.

Complete with all cables suitable for the Acorn Electron computer (or BBC)

Fully tested £79.00 inc carriage.

## MASTER RAM BOARD

Upgrade your Electron to a 64k Machine using 32k of SHADOW RAM

- ★ Fits inside the Acorn Electron, uses no cartridge ports
- ★ Compatible with ALL reliable Electron hardware (except TURBO DRIVER)
- ★ Compatible with ALL Electron software, switching between 64k mode, TURBO mode (yes . . . the TURBO DRIVER IS BUILT IN), and normal mode.
- ★ For correctly written software, HIMEM is ALWAYS AT 8000 in 64k mode so leaving 28000 bytes for BASIC or WORD PROCESSING in ALL screen modes
- ★ Doubles the speed of Word Processing
- ★ Up to 300% speed increase for games
- ★ Additional 12k for use as Printer Buffer with Expansion ROM 2.0
- ★ 64k Mode fully compatible with 98% of Level 9 BBC Adventure games
- ☆ NEW OS 2.1 – PLAY ACORNSOFT'S ELITE with SLOGGER'S JOYSTICK INTERFACE
- ★ Fits inside the Acorn Electron, requires no additional hardware
- ★ Compatible with ALL electron software (except TURBO DRIVER)
- ★ Installation Service for those not confident of soldering

"I can thoroughly recommend it," . . . Electron User 1987

**Master RAM Board kit –  
code MR2 – Now only £49.95**

Parcel Post  
Amount of  
postage to be  
paid by  
licensee

Postage Forward Parcel  
Service  
Licence no. GJC1

No postage  
stamp  
necessary  
unless posted in  
Channel Islands  
Isle of Man or  
Republic of  
Ireland

Date stamp

**SLOGGER LTD  
107 RICHMOND ROAD  
GILLINGHAM  
KENT  
ME7 1BR**

## SEDS

### THE COMPLETE DISK SYSTEM UPGRADE

Imagine . . . 400k of memory instantly available . . .  
Games loaded in seconds . . .  
Word Processing files loaded or saved in seconds . . .  
BASIC programs loaded or saved in seconds!!!  
This is the power of the disk system.

Requiring either the ROMBOX PLUS or the ACORN PLUS 1, SEDS is comprised of the following:

- High quality 40/80 switchable double sided 5¼ inch, BBC compatible drive with built in power supply unit.
- The Slogger Electron Disk Interface (SEDI)
- The Slogger Electron Disk Filing System (SEDFS)

**SEDS ONLY £199.95**

## SEDI

### SLOGGER ELECTRON DISK INTERFACE

This unit fits into the ROMBOX PLUS or ACORN PLUS 1 and provides the signals to control any standard 5¼ or 3½ inch drive. Supplied complete with SEDFS installed with appropriate documentation.

**SEDI ONLY £74.95**

## SEDFS

### SLOGGER ELECTRON DISK FILING SYSTEM

- ★ FULLY ACORN DFS compatible
- ★ OSWORD 7D, 7E and 7F implementation
- ★ FORMAT and VERIFY and other utilities built in
- ★ Page E00 . . . NO LOSS OF ELECTRON MEMORY
- ★ OPT commands for faster drives
- ★ FULLY compatible with BASIC Filing system commands
- ★ FULLY compatible with machine code programs
- ★ TAPE to DISK available (T2SEDFS)
- ★ Excellent comprehensive 90 page documentation.

"SEDFS is so good that I can't easily find fault with it, the manual is quite simply the best of the type I have seen, to suit everyone from the beginner to the professional."

"The SEDFS performed admirably throughout . . ."

"Anyone considering upgrading disks, SEDFS is the logical choice."

"I can recommend SEDFS unreservedly" . . . Electron User, June 1987

## THE ELK TURBO DRIVER

(Designed by Andyk Ltd)

**RUNS ELECTRON SOFTWARE AT SPEEDS  
COMPARABLE TO THE BBC**

- ★ Doubles the speed of Word Processing.
- ★ Up to 300% speed increase for games.
- ★ Fitted internally – occupies no cartridge ports.
- ★ Switchable "Normal/Turbo" speed.
- ★ Compatible with ALL existing hardware and software products (except the Master RAM board).
- ★ Installation service – for those not confident of soldering.

"This upgrade should be standard on all Electrons"  
Electron User, July 1986

**Turbo Driver Kit – code TD2 – only £29.95**

## Installation Service

- ★ Guaranteed to upgrade your Electron with either the Master RAM Board or Elk Turbo Driver AND RETURN IT WITHIN 7 DAYS OF RECEIPT.
- ★ Includes Postage paid BOTH WAYS (using FREEPOST) and 1 YEAR'S GUARANTEE.

PLEASE NOTE . . . if you own a PLUS 1, please send it with your Electron to be tested to ensure reliability at high speed.

## ACORN PLUS 1s

Slogger has on offer a limited number of Acorn PLUS 1s. These units are brand new but nonetheless fully tested in Slogger's factory.

**ONLY £44.95**  
(£50.00 with EXP ROM 2.0)

# NEWS FOR OPUS DDOS AND CHALLENGER OWNERS

## ROMBOX PLUS

SLOGGER's answer to PLUS 1

Q. Why not buy the ACORN PLUS?

A. Because, "excellent though the PLUS 1 is, I think there is still room for improvement" said the Electron User magazine.

The ROMBOX PLUS has this improved specification:

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

Still only £54.95

## 32K SIDEWAYS RAM CARTRIDGE

for ROMBOX PLUS or PLUS 1

- ★ Ever popular on the BBC.
- ★ Best used with EXP ROM 2.0
  - (1) Save ROM backups for loading into Sideways RAM
  - (2) Set up a 16K Print Buffer
- ★ Splits as 2 x 16K pages. VIEW and VIEWSHEET in one slot!!!
- ★ Write protect option . . . prevents corruption of software.

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

**ONLY £34.50**  
(£39.50 with EXP ROM 2.0)

## SLOGGER EPROM CARTRIDGE

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

**£10.00 FOR LIMITED PERIOD**

## JOYSTICK INTERFACE FOR ROMBOX PLUS or ACORN PLUS 1

- ★ Uses cheap ATARI-type joysticks.
- ★ Compatible with ALL Tape and Disk systems
- ★ Emulation of keys by Expansion ROM 2.0
- ★ Can be used with well written games either WITH OR WITHOUT A JOYSTICK OPTION. "The ultimate Joystick Interface" . . . A&B July 87

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

**ONLY £14.95**

- ★ Requires Electron Expansion 2.0 . . . only £5 with this unit

## JOYSTICKS

Switched Joysticks for the Slogger Joystick Interface.

Quickshot I .....£4.00  
Quickshot II .....£6.00

## EXPANSION ROM 2.0

for the ROMBOX PLUS and PLUS 1

- ★ Support Printer Buffer with 8K/16K sideways RAM or 12K with MASTER RAM BOARD.
  - ★ RSAVE command to save ROM images to Tape or Disk.
  - ★ RLOAD command to load Sideways RAM with a ROM image.
  - ★ ROMS command to displays ROM/RAM in system.
  - ★ JOYSTICK command for the SLOGGER Joystick Interface.
  - ★ Allows cassette loading in high resolution.
  - ★ Supports all standard functions (Printer, ADC, RS423).
  - ★ Simply fits into internal ROM socket.
- "There is room for improvement in the operating system. No doubt this was the idea behind Expansion 2." Electron User, July 87.

**ONLY £11.95**

## TAPE TO DISK ROMs VERSION 2

- ★ Transfer the majority of tape programs to disk.
- ★ Acornsoft, Superior and Micropower no problem.
- ★ Compatible with programs copied using Version 1.
- ★ More successful than ever before.

T2P3 for the Acorn Plus 3  
T2CU for the Cumana DFS  
T2P4 for AP4 and E00 DFS  
T2SD for the Solidisk DFS  
T2SEDFS for the SEDFS

**ONLY £24.95**

- ★ Upgrade 1-2 only £5 with original ROM

## UPGRADES FOR DDOS & CHALLENGER OWNERS

Purchase the latest releases from the authors direct

Order	DDOS 3.16	ONLY £7.95
	DDOS 3.36	(please return original ROM)
	DDOS 3.46	
	CHALLENGER 1.03	

Also available - DDOS REVEALED

The most comprehensive guide yet to OPUS DOUBLE DENSITY. 120 pages covering ALL aspects of DDOS and CHALLENGER.  
Release price - £7.95

## ROM SOFTWARE

STARSTORE 2	£29.95
SEDFS upgrade ROM for CUMANA owners	24.95

### \*\*\*BARGAIN CORNER\*\*\*

STARWORD	£34.50
STARSTORE	£9.95
STARMON	£9.95
STARGRAPH	£9.95
PRINTER ROM	£9.95
STAR TREK	£9.95
ELKMAN	£9.95
PDG	£9.95

## OTHER PRODUCTS

5.25" 40/80 Track D/s disk drive inc. PSU	£149.00
3.5" 40/80 Track D/S disk drive inc. PSU	£140.00
Printer lead (for ROMBOX PLUS/PLUS 1)	£9.95
Electron Advanced User Guide	£3.95
Vine Micros ADDCOM	£28.00
Vine Micros MATRIX ROM	£36.00

All prices include VAT P&P UK Mainland only

**SEND FOR THEM TODAY**

Cheques payable to SLOGGER LTD

<input type="checkbox"/> Access No	Expiry Date	PLEASE SUPPLY	Cost
<input type="checkbox"/> Visa		1	£
Name		2	£
Address		3	£
		4	£
		5	£
		<b>Total</b>	£

Please send orders to SLOGGER LTD, 107 RICHMOND ROAD, GILLINGHAM, KENT

## SLOGGER'S AUTHORISED DEALERS

<b>ABERDEEN</b> Micro Logic 0569 66233	<b>LEICESTER</b> DA Computers 0533 549407
<b>BIRMINGHAM</b> Allen James Computers 021 778 5737	<b>LONDON</b> Compuface 01 580 0181
<b>BRISTOL</b> Avon Computer Exchange 0272 637981	<b>LUTON</b> Hobbyte 0582 457195
<b>BROMLEY</b> Datastore 01 460 8991	<b>MARKET-HARBOROUGH</b> Harborough Computers 0585 635280
<b>BURNLEY</b> Atomic Computer Systems 0282 54299	<b>MERSEYSIDE</b> Compshop 051 639 3041
<b>BYFLEET</b> Calancraft 0932 342137	<b>NEWBURY</b> M&S Associates 0635 45774
<b>CARDIFF</b> Computer Exchange 0222 483069	<b>OLDHAM</b> Home & Business 061 633 1608
<b>CARDIGAN</b> Cardigan Electronics 0239 614463	<b>SHEERNESS</b> Swaletok Systems 0795 65530
<b>CESHAM</b> Reeds Photo & Computing 0494 783373	<b>STOCKPORT</b> Dram Electronics 061 429 0626
<b>CROYDON</b> Computer Centre 01 683 2546	<b>TELFORD</b> A1 Computer Supplies 0952 502737
<b>FAREHAM</b> Project Expansions 0329 221109	<b>TROWBRIDGE</b> West Wilts Micros 02214 62759
<b>FARNHAM</b> Farnham Computers 0252 723107	<b>ULVERSTON</b> Skand Computers 0229 56984
<b>GLASGOW</b> Computer Depot 041 332 3944	<b>WARRINGTON</b> Cheshire 0925 414109
	<b>NETHERLANDS</b> Velobyte Computers Rotterdam 010 413 8197

MAIL ORDER ONLY  
MILTON KEYNES Towerhill 09808 74246  
STOCKPORT 21st Software 0625 528885  
NETHERLANDS Compumasters 31 10 436 18 00



**SLOGGER**

Tel: 0634 52303

# Watford Electronics

Jessa House, 250 Lower High Street, Watford WD1 2AN, England

Tel: Watford (0923) 37774 Tlx: 8956095 Fax: 01 950 8989

BY POPULAR DEMAND OUR SHOP IS NOW OPEN UNTIL 8PM EVERY THURSDAY

All prices exclusive of VAT; subject to change without notice & available on request.

Credit Card Orders (ACCESS & VISA) Tel (0923) 33383 or 50234 (24 Hours)



The choice of Experience

The choice after the Experience

BBC MASTER 128K Micro incl. Acorn's: View, Viewsheet, ADFS, BASIC Editor & TERMULATOR £389

## 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 3 1/2", 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 £486

512K Processor Add on Board "inc. Mouse and GEM package" £195  
BBC AIV (Domesday) System £4479

## ADD-ONS & ACCESSORIES

Turbo 65C102 Add-on Module £99  
BBC MASTER ET (Econet Terminal) £315  
Econet Module for the Master £43  
Twin ROM Cartridge for Master £8  
Quad ROM Cartridge for Master £12  
Universal Processor Adaptor £75  
Reference Manual I (No VAT) £14  
Reference Manual II (No VAT) £14  
Advance Ref. Manual (No VAT) £19  
64K Upgrade Kit for B+ £32  
Acorn 1770 DFS Kit complete £42  
ECONET Upgrade Kit for BBC £42  
ALL ECONET UPGRADES Available  
Z80 Acorn 2nd Processor package £325  
ARIES' Professional IEEE Interface £238  
Acorn IEEE Interface Complete £265  
Morley Teletext Adaptor £104

## BBC MASTER COMPACT

All Master Compact Microcomputers are supplied complete with an integral 3 1/2" Disc Drive and various educational and professional bundled softwares.

System 1 Standard Package £295  
System 1A System 1 + TV Modulator £310  
System 2 System 1 + Green Hires Monitor £340  
System 3 System 1 + Medium Res Colour Monitor £475

RS232 Kit for BBC Compact £26  
Additional 3 1/2" Drive for BBC Compact £99  
(Securicor carriage £7)

## The 80186 Co-Processor

This package consists of the Master 512 board, Watford Co-Pro Adaptor, Acorn 1770 Disc Upgrade and Acorn ADFS. 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.

£275

## ARCHIMEDES Micros

### Model 305

● Basic System £799  
● with Green Monitor £849  
● with Colour Monitor £999

### Model 310

● Basic System £875  
● with Green Monitor £925  
● with Colour Monitor £1075

● Podule Backplane £39  
● Archimedes Ref Manual £20  
● ARM Assm. Lang. Prog Manual £12

## VARIOUS PRINTERS & ACCESSORIES

● Brother HR15 RS232 Daisy Wheel £275  
● Brother HR20 Daisy Wheel £349  
● Epson EX800 Printer £399  
● Epson EX1000 Printer £545  
● Epson FX800 Printer £315  
● Epson FX1000 Printer £439  
● Epson LQ800 Printer £429  
● Epson LQ1000 Printer £585  
● Epson LQ2500 Printer £790  
● Epson LX86 Printer £189  
● Epson LX800 Printer £199  
● Epson SQ2500 Printer £899  
● Epson Paper Roll Holder £17  
● EX800/1000 Colour Option £55  
● EX800/1000 Colour Ribbon £18  
● FX80/86 Tractor Feed Unit £35  
● FX/LQ/LX800 Single Sheet Feeder £135  
● FX/LQ1000 Single Sheet Feeder £149  
● Hi-80 Refills - Set of 4 Pens £7  
● LQ800 Tractor Feed Unit £39  
● LX80/86 Tractor Feed Unit £20  
● LX80/86 Single Sheet Feeder £49  
● Hitachi 672 Colour Plotter £495  
(Securicor Carriage on Printers £7)

## EPSON PRINTER INTERFACES

All these interfaces fit inside the printer.  
RS232 £27 RS232 + 2K Buffer £55  
IEEE 488 £65 RS232 + 8K Buffer £75

## PRINTER SHARERS

(Ideal for School environment)

Connects	Serial	Centronics
2 BBC Micros to 1 Printer	£25	£26
3 BBC Micros to 1 Printer	-	£58
6 BBC Micros to 1 Printer	-	£99

Connect 3 BBC Micros to 1 Printer £60  
Connect 6 BBC Micros to 1 Printer £99

## PRINTER CHANGER

3 Printers to 1 Micro (Centronics) £65  
(Cables extra, specify type required when ordering)

## 65C102 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.

£139

## KAGA/TAXAN PRINTERS

(IBM/Epson compatibles)

Kaga KP815 Printer £269 (carr £7)  
Kaga KP915 Printer £350 (carr £7)  
RS232 Interface £49  
RS232 Interface with 2K Buffer £69  
RS232 Interface with 16K Buffer £89

## PRINTER LEADS

Centronics lead to connect BBC micro to EPSON, KAGA, SEIKOSHA, NEC, STAR, JUKI, BROTHER, SHINWA, Panasonic etc. printers.

Standard length (4 feet long) £6  
Extra long (6 feet long) £8  
Compact's Special Centronics Lead £9  
RS232 Cable P.O.A.  
IBM Parallel 1 metre Cable £9

## PRINTER RIBBONS & VARIOUS DUST COVERS

Type	Ribbons	Dust Covers
BBC Micro	-	£3.50
BBC Master	-	£4.00
Brother HR15/20	£3.00	£5.00
EX/LQ800	£7.50	£4.50
EX/LQ1000	£8.00	£5.00
FX80/85/800/MX80	£4.50	£4.95
FX100/1000	£7.00	-
Kaga KP810/815	£5.25	£4.00
LQ2500	£9.00	£5.50
LX80/86/800	£4.00	£4.50
M1009/GLP	£4.00	£3.00
Panasonic KX1080/81	£4.50	£4.75
SQ2500	£25.00	£5.50
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  
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 (Econo paper) £4

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

## SPECIAL OFFER

EPROMs for BBC's Sideways ROMs.

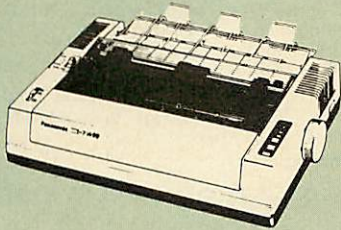
2764-250ns £3.00  
27128-250ns £3.50

RAMs (Low power) for ATPL, WATFORD, etc., Sideways ROM Boards

6264LP (8K) £2.50  
2 x 6264LP (16K) £4.80

## Panasonic KX-P1081

(Now IBM/Epson Compatible)



Available NOW at a superbly realistic price, the KX-P1081 perfectly balances features, quality of construction and Value for Money to produce the printer of tomorrow, here today, ready to sweep the current generation of machines away.

Ingenious innovation in terms of software control codes permits great flexibility when it comes to defining the print style. A nippy 120 cps of clear Draft text backs up the crisp 24 cps Near Letter Quality text mode, with upto 40 superbly useful downloadable characters. A delightful range of assorted character widths is efficiently supported, with sizes ranging from a broad 5 cpi to petite 17 cpi, EVEN in NLO mode. Some of the extensive support for serious use includes specialised functions to perform justification, centering and even left and right ranging. Proportional spacing permit even greater freedom when it comes to advanced use. Not only is the full Epson RX compatible control code set implemented, but extra codes have also been added to cater for the NLO options, etc.

A full 96 ASCII character set is supported, with an extended set of 32 international characters and IBM special characters as well as IBM block graphics characters. A 1K Print Buffer alleviates much of the wait time normally associated with printing, whilst the bi-directional logic seeking print head takes the quickest route to print as required.

(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: **£149** (carr. £7)

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 **£245** (carr. £7)

Single Sheet Feeder **£195**  
Tractor Feed **£90**  
Spare Ribbon **£3.00**

## Acorn-Olivetti JP101 Ink Jet Printer

One of the main problems with most printers is that they are hopelessly noisy. How often have you wanted to print something late at night but not done so for fear of waking the children?

Also ideal for those working in quiet environments such as libraries, etc. Silence the complaints with the serious solution from Watford at the amazing cost of only **£59** (Offer valid while present stocks last)

JP101 accepts 9½" standard fan fold paper or single A4 sheets. Tractor & Friction feed supplied as standard - print speed 50 cps.

Pack of 4 refills **£10**

Screen Dump ROM for JP101 **£10**

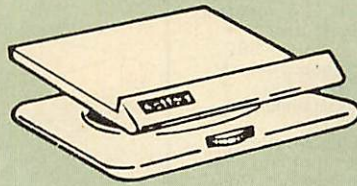
## Anti-Glare VDU Screen

This extremely effective, easy to install, 12" VDU screen eliminates harmful glare, improves contrast on colour monitors. Increases productivity in offices. A must for all wordprocessor users.

**£12**

## SWIVEL BASES

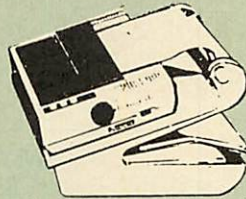
for Video Monitors



By placing your monitor on one of our superb swivel bases, you gain the freedom to adjust the monitor viewing angle to suit your needs. By doing this, you alleviate eye strain and reduce back stress. Front adjustable without lifting the monitor. (See drawing on left).

for 12" Monitors **£10** (carr. £2.50)  
for 14" Monitors **£14** (carr. £2.50)

## 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 i.e. 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.

**£26**



We stock a range of monitors to suit all needs. Choice of a monitor is a matter of personal taste so we recommend that whenever possible, you ask for a demonstration at our shop. All Monitors are supplied complete with connecting lead.

### MICROVITEC 14"

- 1431 - Medium resolution as used on the BBC television computer programme **£175**
- 1451 - High 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**
- Dust Cover for Microvitecs **£5.50**
- Touchtec 501 Touch Screen **£239**

### KAGA-TAXAN 12"

- TAXAN KX117 Hi-res Green Monitor **£75**
- TAXAN KX118 Long persistence Hi-Res Green Monitor **£85**
- TAXAN KX119 Ultra-Hi-Res Amber Monitor **£90**
- TAXAN Super Vision 2 Type 620 Hi-res RGB Colour monitor. Ideal for Wordprocessing **£269**
- 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 **£319**

### ZENITH

"Test Bureau Recommended for use in Education"

12" high resolution monochrome monitor. Ideal for word processing as its green or amber screen is very restful to read. (These are the same professional quality, stylishly finished monitors as used in the larger Zenith PC Systems.)

Green (New Design) Hi-res **£69**  
Amber (New Design) Hi-res **£74**

### LEADS

BNC Lead for Zenith or Philips **£3**  
Skart Monitor Lead **£5**  
RGB lead for KAGA **£3**

N.B. carriage on Monitors **£7** (securicor)

## 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 **£125** (carr. £3)

## 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 add-on 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:

**£50.00** (carr £5)

Continued



## THE EPSON RX-FX-KAGA PRINTER COMMANDS REVEALED (BOOK)

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)

## 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.

If you already have the Watford Electronics DFS and wish to incorporate these new facilities then simply return your existing DFS ROM to us together with £5 remittance for an upgrade. Please pack the ROM securely and address the package to our Upgrades Dept.

## WATFORD's & ACORN's SINGLE DENSITY DFS

Watford's popular and widely acclaimed DFS has now been available for four years, and has gained a large following amongst serious 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 £46
- Acorn's 0.90 DFS Kit complete £45
- DFS Manual (Comprehensive) (no VAT) £6.95
- (P.S. Our comprehensive DFS Manual 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
- Watford's DFS is exclusively available from Watford Electronics and their appointed dealers only. Every ROM carries a special label with LOGO and serial number.

## 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 DDFS board has been adapted to allow the use of Acorn ADFS.

Added features include:

- Acorn ADFS compatible – Use ADFS on our DDFS board.
- Tube host Code – No longer any need to have the DNFS in your machine to use Co-Processors, even the CoPro and Master 512.
- Auto 40-80 Track sensing – no need to fuss with 40/80 track switches (even works with protected disks).
- An extremely powerful 8271 emulation – ensuring compatibility with almost all software.
- New low profile – small footprint board.
- Fits with all third party ROM boards.
- Option to double the speed of file handling operations – BPUT and BGET.
- Operates in both single and double density modes.
- OSGBPB has been recoded, increasing still further the speed of file handling.

Please note that not all DDFS's are capable of providing either the full 80% storage increase or of allowing a file the full size of the disk – Ours allows both of these!

If you already have a DDFS (any manufacturer), and wish to upgrade to our MkII version, then simply return your existing ROM and DDFS board and we will supply the new DDFS for only £25.00.

- 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.

## SPECIAL DISC DRIVE/DDFS OFFER

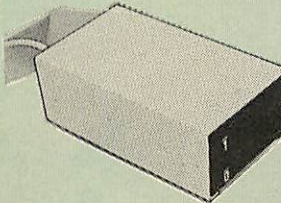
### Type CLS400



- 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 £125 (£6 carr)  
(Offer valid while stocks last)

### 3 1/2" DISC DRIVE OFFER



These top quality 3 1/2" Disc Drives are attractively finished in BBC beige and are supplied complete with Cables. They run directly from the BBC B/Master's own PSU.

- Single 400K Drive £69
- Twin 800K Drives £126

## MYSTERIES OF DISC DRIVES & DFS REVEALED (BOOK)

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

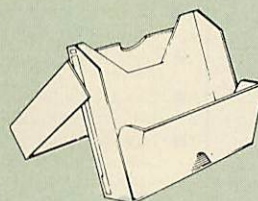
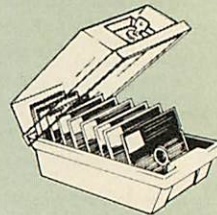
The heads in floppy drives are precision made and very sensitive to dirt. The use of a cleaner Kit is a sensible precaution against losing valuable data. It is recommended to clean the drive head once a week. It is very simple to use. Available in 3 1/2" & 5 1/4", please specify.

£7

## 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 £6.50
- 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



## PLASTIC LIBRARY CASES

Holds up to 10  
5 1/4" Discs.

Only £2.00

## PLONKER BOX

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 PLONKER BOX. It holds up to eight 5 1/4" Discs.

Protection at Only: £2



## 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



## 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.

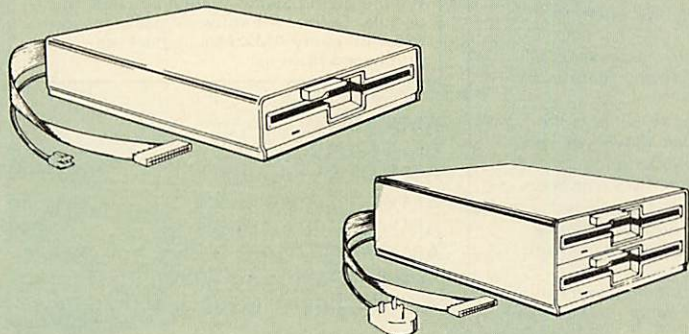
All our Disc Drives are Double Sided and will operate in both Single and Double Density modes. Extensive experience of the usage of disc drives suggests that the JAPANESE drives currently represent about the best in terms of speed, reliability and overall "elegance" available for the BBC Micro.

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 £90		CS 200 £102	
400K (720K)	CLS400S £92	CLD 400 £175	CS 400S £103	CD400 £196
800K (1.44M)		CLD 800S £179		CD 800S £198

● 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 **£8.50**
- 10 x 5 1/4" D/S D/D 40 Track Diskettes **£10.50**
- 10 x 5 1/4" S/S D/D 80 Track Diskettes **£13**
- 10 x 5 1/4" D/S D/D 80 Track Diskettes **£13**
- 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 **£15**
- 10 x 3 1/2" D/D D/D 40/80 track Discs **£19.50**

## 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 to protect them from damage. We strongly recommend these Discs.

DON'T SETTLE FOR LESS, BUY THE BEST

- 10 x M3 3 1/2" D/S D/D 80 Track Discs **£18**
- 10 x M4 5 1/4" S/S D/D 40 Track Discs **£7**
- 10 x M5 5 1/4" D/S D/D 40 Track Discs **£9**
- 10 x M7 5 1/4" D/S D/D 80 Track Discs **£11**
- 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)

### 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



## ACORN WINCHESTER DRIVES

Supplied complete with Level 3 Econet File Server software.

20 Megabytes £699; 30 Megabytes £1549

## WATFORD'S

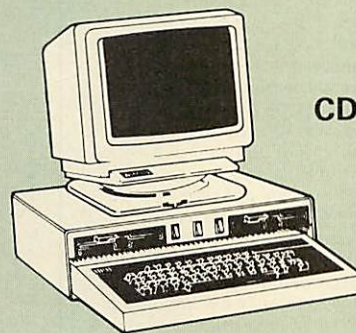
### WINCHESTER DRIVES

- 10 Megabyte Unit with ADFS **£399**
- 20 Megabyte Unit with ADFS **£499**
- 40 Megabyte Unit with ADFS **£749**



## CDP800S

## CDPM800S



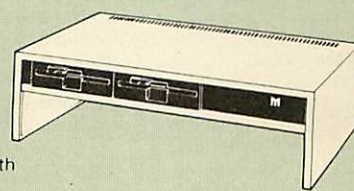
Twin 800K Double sided 40-80 track switchable disc drives mounted in an attractively finished Beige colour plinth for the BBC Micro. Supplied complete with integral power supply, cables and Utilities disc. The switches are mounted on the front panel for ease of use.

CDP 800S for BBC Micro **£199**

CDPM 800S for Master **£205**

(Securicor Carr. £7)

## ACORN'S Twin 800K Disc Drives



Specially mounted side by side in a Master Plinth. Supplied complete with Cables. Plugs directly to the Master Computer.

RRP £250 Our Price: Only **£189** (carr £7)

NOMINATED FOR



# 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 is smooth and easy to use on most work surfaces. The Quest Mouse is FULLY HARDWARE COMPATIBLE with the AMX MOUSE so that programs such as AMX Pagemaker etc. will work with it.

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 AMZ, 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".

<b>QUEST MOUSE &amp; QUEST PAINT</b>	<b>£59</b>
<b>QUEST MOUSE, QUEST PAINT, AMX PAGEMAKER &amp; PAGEFONT</b>	<b>£85</b>
<b>QUEST MOUSE ONLY</b>	<b>£29</b>
<b>QUEST PAINT SOFTWARE</b>	<b>£32</b>
<b>QUEST FONT DISC</b>	<b>£12</b>
<b>QUEST MAT</b>	<b>£3</b>
<b>Part-exchange your old Mouse for a New QUEST MOUSE for only</b>	<b>£23</b>

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 24 text FONTS for use within Quest Mouse.  
P.S. There is no need to worry about any of your existing AMX mouse software. The Quest Mouse is totally AMX compatible so it will work with any of the AMX range of software.

All prices in this advert are exclusive of VAT.

## MARK II LIGHT PEN + PENPAL 2

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.

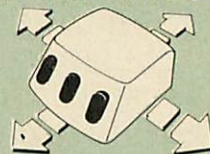
Penpal II, Watford Electronics' sophisticated light pen software is also supplied free on cassette or disc (please specify). This is a highly sophisticated drawing package enabling you to gain the maximum benefit from your Light Pen. The software is used to edit Mode 2 full colour screens using lines, patterns and you own designs. Screens may be saved to cassette or disc.

Price Only £15



**CREDIT CARD 24 HOUR**  
**Ansaphone Hot Lines**  
**(0923) 50234 or 33383**

## THE AMX MOUSE



Now supplied with the NEW SUPERART Software ROM & Disc at no extra cost.

**ONLY: £59** (carr £1.50)

(Please specify for BBC or Master Computer)

We are giving away, absolutely FREE, our popular Colour Art software package worth £15 with every AMX Mouse package purchased from us.

AMX MAT	£3
AMX MOUSE ONLY	£29
AMX DESK Package	£19.00
AMX UTILITY Package	£11.00
AMX SUPERART Package	£39
AMX PAGE-MAKER Pack - A desk-top publishing software. It Works with keyboard, joystick and a mouse	Only: £32

We are giving away, absolutely FREE, PAGE-FONTS, a disc containing over 20 fonts, with every purchase of AMX PAGE-MAKER from us.

PAGE-FONTS - Over 20 Fonts for use with AMX Pagemaker	£9.50
AMX DESIGN (ROM)	£59
AMX 3D ZICON Disc	£19
AMX Database Disc	£19
AMX Stop Press	£39
AMX XAM Educational	£19
AMX MAX A gem of desktop	

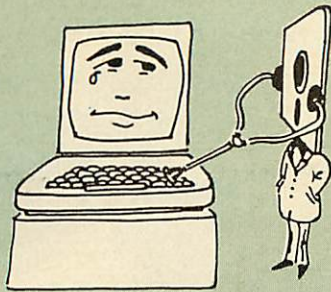
## RB2 Marconi Tracker Ball

Complete with Software Disc	£59
RB2 + Software Disc + Quest Paint	£85

## FLEET STREET EDITOR

Software pack for BBC/Master	£36
Software Pack for Compact	£40
Admin Xtra Disc Utility	£13
Walt Disney Disc Utility	£13
Fonts N Graphics Disc Utility	£13

## 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

## 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)

## TED

### THE ULTIMATE TELETXT SYSTEM

TED is one of a new generation of powerful 32K ROMs for the BBC B, B+ and Master computers and is compatible with disc, tape and network systems. It is in everyday use in schools, colleges and universities, Programmers, Prestel I.P.'s, Micronetters and exhibitors have also found it indispensable.

TED includes the most comprehensive teletxt (Mode 7) screen editor ever written for the BBC micro, combining flexibility with ease of use. Its sophisticated facilities include line, column and block copying within AND between frames; text, in a variety of styles and sizes, entered directly from the keyboard; graphics and line drawing modes; search and replace; margins; printer dump routines and a library of in-built icons and typefaces. TED will edit ANY mode 7 screen and can even convert high-res graphics screens to mode 7! Included within the ROM is a fully Epson compatible mode 7 graphics dump routine giving a grey scale printout of exactly what appears on the screen.

Using "SHOW" (a versatile carousel), collections of mode 7 screens may be 'routed' or displayed sequentially, making it ideal for creating and running 'Viewdata' information systems. Over 1200 frames may be stored on a twin 80 track drive. A unique feature of TED is "SCROLL", which lets you create pages of up to 600 lines which may be viewed 'Wordwise style', automatically or manually. SHOWs and SCROLLs may be freely mixed and even used from within a BASIC program.

The package comprises a 32K ROM, a 117 page manual, a function-key strip and a demonstration disc containing examples of real-time animation and a sample 55-frame database. A stand-alone machine code routine is provided allowing SHOWs and SCROLLs to be displayed on machines not fitted with TED.

Price: £35

## ROM-SPELL

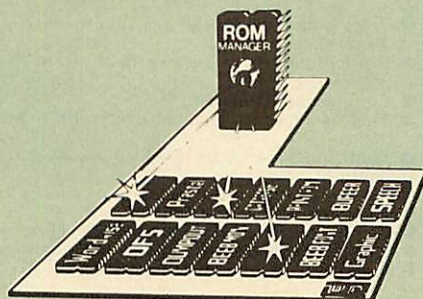


Probably the most advanced and fastest spelling checker available for the BBC Micro. Compatible with View, Wordwise and Wordwise Plus ROMSPELL is simple to use with easy editing of incorrect words. Full facilities for editing the user dictionary to allow customisation to your personal needs. Dictionary 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

## ROM MANAGER

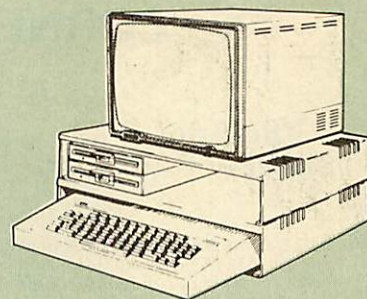


Take control of your Sideways ROMs with ROM Manager. This powerful utility ROM gives you power over your sideways ROMs. Disable whole ROMs, send commands directly to named ROMs and many other powerful facilities.

"Provides comprehensive management of all your installed ROMs". (BEEBUG November '84.)

ONLY £20

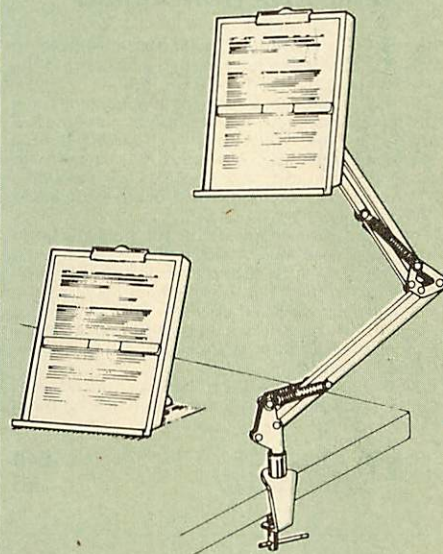
## PLINTHS FOR BBC MICRO, MASTER & PRINTERS



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.

Price: **£80** (carr. £2)

### 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)

### GRAPH PAD 2

Supplied complete with Software  
**£60** (Carr. £3)

### 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 £15** (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.

- Complete System **£11**
- Spare Cartridges **£2.50**
- Spare Rack **£1.50**

### 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.

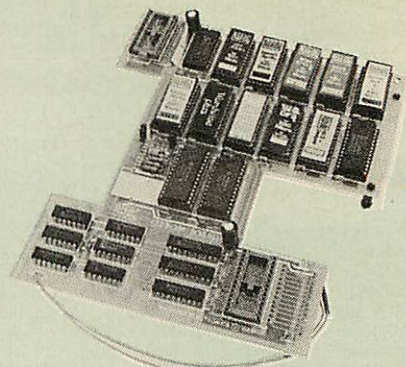
Only: **£24** (carr £2)

### Optional extras

READ and WRITE protect Switches **£2** each  
Battery for Battery Backup **£3**

**All prices in this advert are  
exclusive of VAT.**

### 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.

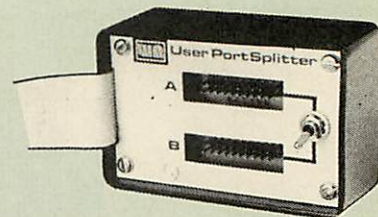
- Supplied ready to fit with comprehensive instructions.

Price: **Only £32**  
Battery backup fitted **£36**  
(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**

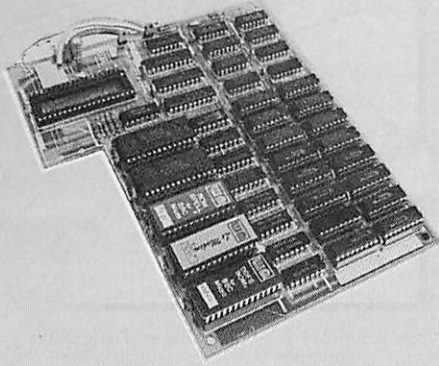
### USER PORT SPLITTER UNIT



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.

Excellent Value at **£19**

## 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 ..... £39
  - ROM/RAM card with 64k dynamic RAM ..... £52
  - ROM/RAM card with a massive 128k dynamic RAM ..... £80
- (carriage on ROM-RAM Card £3)

### OPTIONAL EXTRAS:

- 16k plug-in Static RAM kit ..... £6
  - 16k Dynamic RAM for Upgrade ..... £7.50
  - Battery backup ..... £3
  - Read and Write protect switches ..... £2 each
- Complete ROM-RAM board  
All options installed ..... £89

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 £10 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: **£84**  
(carr £3)

(Price includes, Le Modem, Software ROM, Cables & Comprehensive Manual)  
(Write in for further details)

## Nightingale Modem

SPECIAL PRICE to our Customers

**£82**

(Price includes: Nightingale Modem, Commstar ROM pack & Comprehensive manual)

Nightingale Modem without software Only £75  
COMMSTAR ROM package only £29  
(P&P on modem £3.00)

## 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 BABT 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: **£84** (Carr £3)  
(Write in for full specification)

### Minerva Systems Software

System Delta with Card Index	£55
System Programmers Ref. Guide	£19
System Gamma	£43
System Gamma Prog. Ref. Guide	£19
System Mailshot	£17
System Reporter	£17
System Intra/View Link	£17
System Sales Ledger	£39
System Purchase Ledger	£39
System Nominal Ledger	£48
System Stock Management	£39
Order Processing/Invoicing	£39

### 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	£48
CARETAKER Basic Utility	£25
DISC DOCTOR	£28
Graphics ROM	£23
TERMI	£25
COMMUNICATOR	£49
SPEECH ROM	£24
Printmaster	£24

## Wordwise

£24

## Wordwise plus

### 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 £47

Inter SHEET ONLY £37

## INTER-CHART

ONLY: £26

## Inter-WORD

Only: £39

INTERBASE £55

All Prices Exclusive of VAT

## VIEW

VIEW WORDPROCESSOR 2.1 £37

VIEW 3.0 ROM £54

VIEW PROFESSIONAL £79

HI-VIEW £36  
(for use with 6502 2nd Processor)

VIEW Printer Driver Generator £9  
Please specify Disc or Cassette)

VIEW SHEET (Acornsoft) £37

VIEWSTORE £37

VIEWSPELL with 80 track disc £29

VIEWPLOT Disc £22  
(Please specify for Master 128 or Compact)

VIEW-INDEX £12

OVERVIEW Packs 1 & 2 for the Master £75

### Watford's own Sophisticated VIEW PRINTER DRIVERS

Epson FX80 & Kaga KP (Disc) £8  
Juki & Brother HR15 (Disc) £8  
Silver Reed Printers (Disc) £8

### Micros in Business (Disc)

An introduction to Business software for the BBC Micro from Acorn £43

### ADVANCE COMPUTER PRODUCTS' ROMS

Adv. Disc Toolkit £29  
Adv 1770 DFS for Mast/Compact £29  
Adv 1770 DFS for BBC/BBC+ £29  
Adv Disc Investigator £24  
Adv. Control Panel £29  
Adv. Rom Manager £13

### MINI OFFICE II

Disc Version £14.50  
ROM Version £48.00

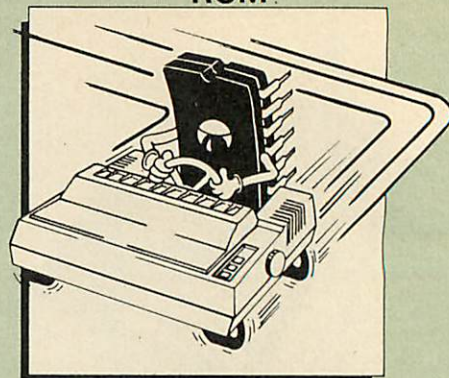
## REPLICA 3

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.

£13 (40 or 80 track)

Acorn's Speech Synthesiser package, complete  
Special Offer £18

## 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, 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

### EPSON NLQ ROM for the BBC Micro



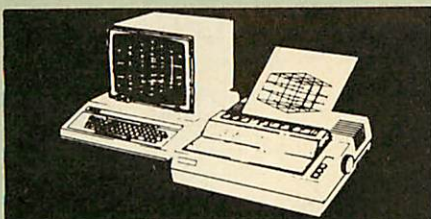
Harness the full potential of your Epson RX or FX printer. The NLQ ROM makes Epson printers produce Near Letter Quality output with optional proportional spacing, enlarged and underlined. Accessed by simple \* commands from Basic, Wordwise and View (with driver) or almost any other language.  
(Send an SAE for sample printout)

Only: £25

VIEW PRINTER DRIVER for NLQ ROM

£7

## 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 KX1080, Mannesman Tally and compatibles.

**Only: £25**

(Write in for further details on all above ROMS)

## THE EUREKA CARD

(The Unique RAM Expansion System)

The Eureka Card is Watford's latest and most sophisticated RAM expansion system. Using advanced PAL based technology this card is a breakthrough in RAM systems for the BBC micro. The Eureka Card provides the user with around 58K of free memory in Basic, VIEW and WORDWISE PLUS. You also get Shadow RAM from within the active language. No other RAM expansion system can match that!

Load up to 58K long Basic programs. Texts in VIEW and WORDWISE PLUS up to 58K as well. This with absolutely NO loss of speed in accessing your text or program. Eureka consists of a card containing 64K of program memory, two parallel banks of sideways RAM and some extremely complex switching circuitry. This is all controlled by Eureka's highly sophisticated software supplied in ROM. Designed to a very high specification, this board is fully buffered to give reliable operation under virtually any circumstances.

The Eureka board plugs into the 6502 socket and has NO messy flying leads. It is compatible with many other products from Watford, such as our Solderless ROM Board and our ROM/RAM Board. All in all, the Eureka Card is an amazing board. Jump into the age of serious data processing with a Eureka Card! Please write in for further details 'on advantages the Eureka can offer you'.

Introductory price: **Only £89** (carr £3)

(P.S. Eureka is only suitable for a standard model B; it normally replaces any Shadow RAM cards present. Some speed degradation does occur with filing system access. Eureka cannot be used at the same time as a second processor).

## BEEBMON

The most powerful machine code monitor for the BBC Micro **£24**.

## THE NLQ DESIGNER

(The First & still the Best)

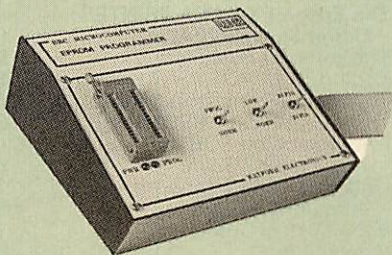
Supplied with over 25 Different fonts

A massively useful utility for users of the Taxan/Kaga KP810/910 or the Canon PW1080. This program allows you to define NLQ character sets to download into the printer's memory. Full on screen editing of the font. Requires 6264 RAM chip to be fitted in the printer.

Supplied with disc containing over 25 example fonts. Please specify 40 or 80 track. Fonts are: Italic, Courier, Courier Italic, Script, Copper Plate, Shadow, Bold, Double Print and Gothic etc. (P.S. This ROM is not suitable for Epson printers.)

● NLQ Designer ROM & FONT Disc **£25**

## ADDER



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).

**£65** (£3 Carr)

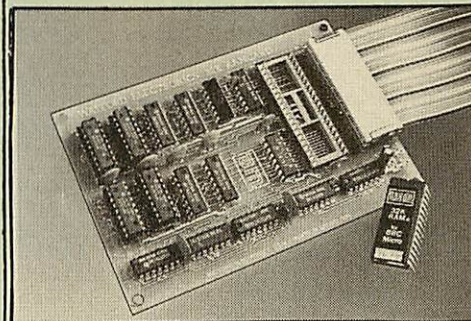
## TEX EPROM ERASERS

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 16chips. **£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.

See next page for SPECIAL OFFER

**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)

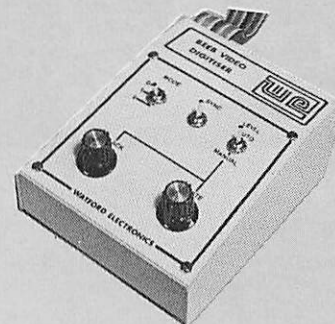
15 Hr Wordprocessing BBC/View	£3.95
15 Hr Wordprocessing BBC/WW & WW+	£3.95
30 Hour BASIC (BBC Micro)	£7.95
40 Best machine Code Routines	£7.95
50 Programs in BBC BASIC	£6.95
6502 Assembly Language Program	£19.95
6502 Application	£11.95
6502 Assembly Lang. Subroutines	£19.95
6502 Development Package	£7.50
6502 Reference Guide	£9.95
68000 Assembly Lang. Programming	£19.95
68000 Machine Code Programming	£13.00
68000 Microprocessor Handbook	£14.95
68000 Programming the	£22.95
68000 User Guide	£8.95
6809, Programming the	£16.95
6809 Machine Code Programming	£7.95
8086/8088 Assembly Language Prog.	£11.95
8086/8088 Programming the	£16.95
Advanced Disc User Guide	£16.95
Advanced BASIC ROM User Guide	£9.95
Advanced Programming Guide to BBC	£9.95
Advanced Sideways RAM User Guide	£10
<b>Advanced User Guide for BBC</b>	<b>£10.95</b>
Advanced FORTH	£9.95
Advanced Graphics with BBC	£9.95
Assembly Language Programming on BBC Micro	£11.50
Adventure into BBC BASIC	£6.95
Applied Assembly Lang. for BBC	£9.95
ARM Assem, Lang, Programming	£12.95
Art of Microcomputer Graphics	£14.95
Assembly Language Programming FOR the BBC Micro	£8.95
Assembly Language Programming on the BBC & Electron	£8.95
Basic ROM User Guide	£11.95
BBC B Compendium	£5.95
BBC BASIC for Beginners	£7.95
BBC Forth	£7.50
BBC Hardware Projects	£8.95
BBC Micro Programming Tips	£8.95
BBC Micro & the small Business	£5.75
BBC Micro Programming Tips	£8.95
BBC Micro ROM Book	£10.95
BBC Master 128 for High Flyer	£10.95
BBC Micro Disc Companion	£8.95
BBC Software Projects	£6.95
BCPL User Guide	£14
BCPL The Language & its Compiler	£7.95
C for Beginners	£10.95
C for Programmers	£9.95
Complete FORTH	£6.95
Computer Graphics & CAD fundamentals	£9.95
CP-M-86 User's Guide	£19.95
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
Creative graphics on BBC Micro	£7.50
Disc Drive Projects for Micros	£5.45
<b>DISC FILING SYSTEM (DFS)</b>	
<b>Operating Manual for BBC</b>	<b>£6.95</b>
DBASE Programming Language	£14.95
Disc Programming Techniques	£9.95
Exploring FORTH	£6.95
File Handling on BBC Micro	£7.50
FORTH on the BBC Micro	£7.50
Functional Forth for the BBC Micro	£5.95
Guide to BBC ROMs	£9.95
Graphics for Children	£6.95
Graphs & Charts on BBC Micro	£7.50
Hackers Handbook - New	£6.95
Inside Information (Computers, Interfacing & Control of BBC Micro Communications & People)	£9.95
Interfacing & Robotics on BBC	£15.95
Introduction to COMAL	£9.50
Introduction to LOGO	£6.95
Introducing 'C'	£9.95
Introducing LOGO	£5.95
Introduction to FORTH	£8.95
Introduction to PASCAL	£17.95
ISO - PASCAL Reference Manual	£9.95
LISP 2nd Edition	£14.95
LISP, A Beginners Guide to	£10.95
LISP on the BBC Micro	£7.95
LISP the Language of Artificial Intelligence	£9.95
Logo on the BBC Micro	£7.50

Logo Programming	£10.95
<b>Mysteries of DISC DRIVES and DFS REVEALED</b>	<b>£5.95</b>
Mastering Assembly Code	£8.95
Mastering CP-M	£17.95
Mastering Interpreters & Compilers	£14.95
Mastering Music	£6.95
Mastering View, Viewsheets & Viewstore	£12.95
Master Operating System	£12.95
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
Mastering View, Viewsheets & Mathematical Progress in BBC Basic	£7.95
Micro Prolog	£10.00
Microtext for the BBC	£10.00
MSDOS Quick Reference Guide	£9.95
Viewstore	£12.95
Points of View	£6.95
Practical Disc File Techniques	£5.95
Programming the 6502	£16.95
Programming the Z80	£19.95
Structured Basic	£7.95
<b>The Epson FX-KAGA PRINTER Commands REVEALED</b>	<b>£5.95</b>
The Software Business	£5.50
Toolbox 2	£10.95
Towers Int. Transistors Selectors	£12.95
Turtle Graphics on BBC Micro	£7.50
Understanding FORTH - A Beginner's Guide	£6.50
Understanding Interword - A Beginners Guide	£6.50
View 3.0 User Guide	£10
View Guide	£4.50
VIEW incl. ViewSpell & ViewIndex	£12.95
Viewsheets User Guide	£10
Viewstore User Guide	£10
Within the BBC Micro	£13.95
Writing Interactive Interpreters & Compilers	£8.45
Wordprocessing BBC Beginners Guide	£7.95
Wordstar & CP/M made easy	£7.45
Wordwise + A User Guide	£9.95
Z80 Applications	£15.95
Z80 Assembly Language Programming	£19.95
Z80 Reference Guide	£9.95

## BBC SOFTWARE'S Popular Educational Software

● Maths with a Story 1 (Cassette). 4 primary level maths programs	£9.95
● Maths with a Story 2 (Cassette) 4 further maths programs	£9.95
● Picture Craft (Disc) 6 - 14 age group. Pack consists of flexible geometrical design & colouring programs	£19.95
● WAVES: Science Topics (Disc) CSC O Level Physics program.	£14.95
● RELATIONSHIP: Science (Disc) O Level Biology program.	£14.95
● BONDING: Science (Disc) O Level Chemistry program.	£14.95
● ELECTROMAGNETIC SPECTRUM (8 Discs) O Level program.	£14.95
● ELECTRONICS IN ACTION (Disc) O Level program	£14.95
● 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.	£6.95
● A VOUS LA FRANCE (2 Cassettes) A French language homestudy aid.	£17
● DEUTSCH DIREKT! (Disc & Audio Cassette)	£20
● Modem Master (Disc)	£11.25
● ADVANCED TELETEXT SYSTEM	£8.55
● PERIOD TABLE SOFTWARE	£20
● USING YOUR COMPUTER (Cassette) 8-12 age	£24

## 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 ROM's 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 AMX 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 AMX 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 **£129.00 (carr. £3)**

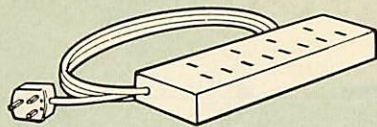


## SURGE PROTECTOR Plug

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 **£6.99**

## 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

**£12.50** (carr. £1.50)

## SPARES for BBC Micro

Keyboard	<b>£46</b>	Keystrip	<b>£2</b>
UHF Modulator	<b>£4</b>	Case	<b>£20</b>
Speaker Grill	<b>£1</b>	Speaker	<b>£2</b>
Power Supply	<b>£59</b>	Keyswitch	<b>£1.50</b>

## Replacement FLEXIBLE 17 way Keyboard Connector £3

## 8 WAY DIP SWITCHES

With these DIP switches soldered to their keyboard, any BBC B or B+ owner can take full advantage of the fast disc drives that we supply by configuring his BBC for fast disc drive operation.

Excellent value for money at **£1.00**

## CONNECTING LEADS

(All ready made and tested)

CASSETTE LEADS 7 pin DIN Plug to 5 pin DIN Plug + 1 Jack Plug	<b>£2.00</b>
to 3 pin DIN Plug + 1 Jack Plug	<b>£2.00</b>
to 7 pin DIN Plug	<b>£2.50</b>
to 3 Jack Plugs	<b>£2.00</b>
6 pin DIN to 6 pin DIN Plug (RGB)	<b>£2.50</b>
VIGLEN DATA DUCK	<b>£14</b>

## 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 (6PIN 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
BBC Power Plug 6 way	80p	-
Disc Drive Plug 4 way	75p	-
6 way Power Connector	-	95p

# Watford Dealers' List

## UNITED KINGDOM

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.

Cirkit 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.

Scientex P.V.B.A., Zilvermidstraat 2, B-2000 Antwerpen, Belgium, Tel: 03 233 59 06

Techno-matic Data, Holbergsgade 19, 1057 Kobenhavn 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 **£42**; Master **£51** (carr. £4)

## VOLTMACE JOYSTICKS

Delta 3B Single Joystick	<b>£12</b>
Delta 3B Twin Joysticks	<b>£17</b>
Delta 3C Joystick for Compact	<b>£10</b>
Delta 14B Single Joystick	<b>£12</b>
Delta 14B/1 Adaptor Module	<b>£12</b>
Transfer Software Disc-Tape	<b>£7</b>

## ROM EXTRACTION TOOL

This extremely useful tool allows you trouble free chip removal from your computer by distributing the removal force over the whole body of any 24 or 28 pin chip.

**£2**

## ATTACHE CARRYING CASE for BBC Micro

This attache carrying case is attractively finished in mottled antique brown leatherette. An ideal and safe way of carrying your BBC Micro around. Supplied with two Keys.

Price: **£13** (£2 carr.)

**28 pin ZIF SOCKET (Textool) £6.95**

## 28pin DIL HEADER PLUG

SOLDER type	<b>£1.50</b>
IDC CRIMP type	<b>£1.95</b>

## CHIP SHOP ASSORTED ROMS

8271	<b>£36.00</b>	ACORN ADFS	<b>£25</b>
DS3691	<b>£3.50</b>	ACORN BASIC 2	<b>£19</b>
DS88LS120	<b>£5.25</b>	Acorn BCPL	<b>£42</b>
LM324	<b>£0.45</b>	Acorn COMAL	<b>£38</b>
SN76489	<b>£5.50</b>	ACORN DNFS	<b>£17</b>
SAA5050	<b>£8.75</b>	Acorn FORTH	<b>£32</b>
UPD7002	<b>£4.40</b>	Acorn Graphics	<b>£25</b>
2764-250nS	<b>£3.00</b>	Acornsoft C	<b>£74</b>
27128-250nS	<b>£3.50</b>	Acorn LISP	<b>£35</b>
27256	<b>£4.20</b>	Acorn LOGO	<b>£49</b>
27512	<b>£9.50</b>	Acorn OS B+	<b>£25</b>
27C101G (1 Meg)	<b>£20.00</b>	Acorn OS 1.2	<b>£14</b>
4013	<b>60p</b>	Basic Editor	<b>£24</b>
4020	<b>£0.90</b>	Beebfont	<b>£25</b>
4464-12	<b>£4.45</b>	Beebmon	<b>£22</b>
4464-15	<b>£3.75</b>	BROM Plus	<b>£32</b>
4816 RAM	<b>£1.75</b>	Buffer & Backup	<b>£20</b>
41256	<b>£2.45</b>	Communicator	<b>£49</b>
6264LP-8K RAM	<b>£2.50</b>	Graphics Extension Rom	
6502A CPU	<b>£4.75</b>	GXR-B	<b>£21</b>
65C02 3M	<b>£9.75</b>	GXR-B+	<b>£22</b>
65C12	<b>£9.00</b>	Help II	<b>£27</b>
6512A	<b>£10.00</b>	ISO Pascal	<b>£54</b>
6522	<b>£3.40</b>	ISO-Pascal Stand	
6522A	<b>£5.00</b>	Alone Generator	<b>£30</b>
6845SP	<b>£6.00</b>	ICON Master	<b>£28</b>
68B50	<b>£2.95</b>	Logotron LOGO	<b>£45</b>
68B54	<b>£2.50</b>	Master Termulator	<b>£34</b>
7438	<b>40p</b>	Micro Prolog	<b>£62</b>
74LS00	<b>25p</b>	Microtext Disc	<b>£48</b>
74LS04	<b>25p</b>	Microtext Rom	<b>£199</b>
74LS10	<b>25p</b>	Mini Office ROM	<b>£47</b>
74LS123	<b>80p</b>	MUROM	<b>£21</b>
74LS163	<b>70p</b>	ROMAS	<b>£29</b>
74LS244	<b>80p</b>	ROMIT	<b>£29</b>
74LS245	<b>£1.00</b>	Serial ULA	<b>£13</b>
74ALS245	<b>£2.75</b>	TERMULATOR	<b>£28</b>
74LS373	<b>£1.00</b>	Toolkit Plus	<b>£31</b>
74LS393	<b>£1.00</b>	Video ULA	<b>£15</b>
75453	<b>70p</b>	ULTRACALC	<b>£26</b>
Acornsoft C	<b>£74</b>		

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. **£2** 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.

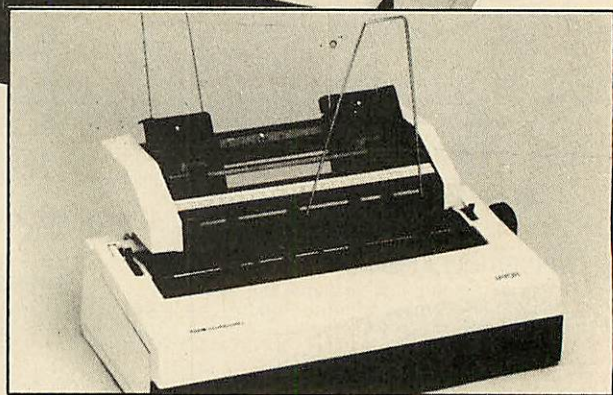
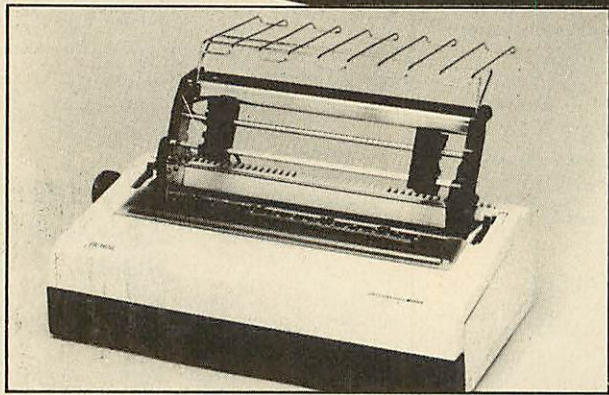
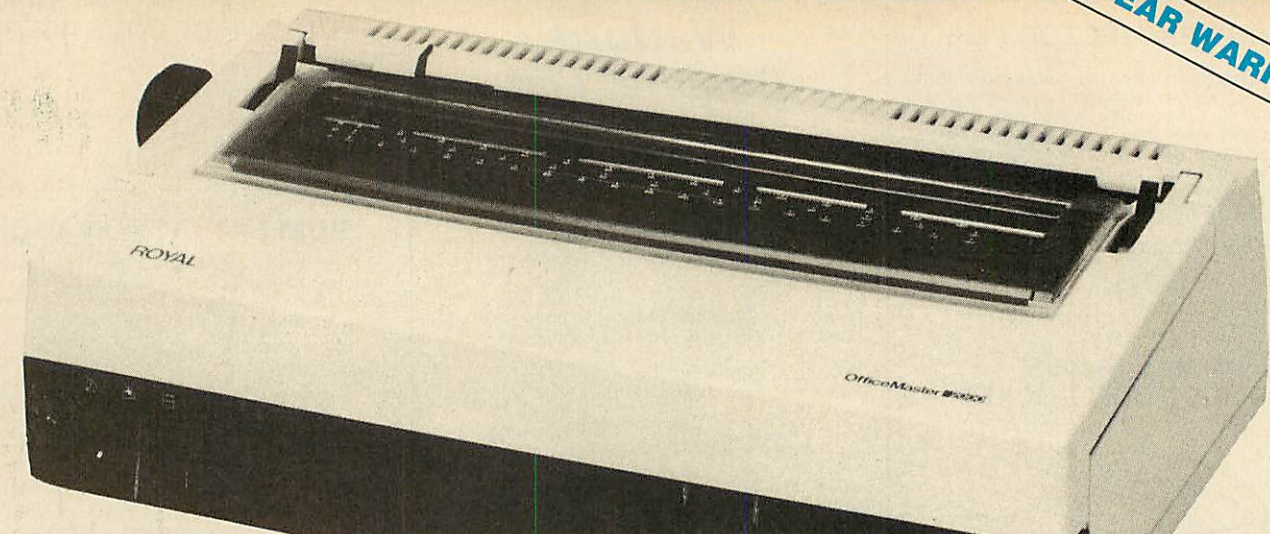
# Watford Electronics

JESSA HOUSE, 250, Lower High Street, WATFORD, ENGLAND  
Telephone: (0923) 37774; Telex: 8956095; FAX: 01 950 8989

ORDER VIA  
**MicroLink**  
72/MAR/0030

UNBEATABLE VALUE ★

★ 1 YEAR WARRANTY ★



# OFFICE MASTER 2000 *From TRIUMPH-ADLER*

★ BBC ★ COMPATIBLE

## Outline of Technical Data

**Type of Printer:** Character printer with 100 characters print wheel

**Print Speed:** 20 cps Shannon text

**Tab Speed:** 300 mm/sec.

**Columns per Line:** 120 characters/line at 1/10 in. (2.54 mm)  
144 characters/line at 1/12 in. (2.12 mm)  
180 characters/line at 1/15 in. (1.69 mm)  
Proportional spacing  
Horizontal step 1/120 in. (0.21 mm)

**Print Buffer:** 1500 characters (bytes)  
Option: 3500 characters

**Paper Passage:** 360 mm

**Print Width:** 302 mm

**Number of Copies:** 4 (1 original and 3 copies)

**Line Spacing:** Standard feed 1/6 in. (4.23 mm)  
programmable in basic steps of 1/48 in. (0.53 mm) or 1/96 in. (0.26 mm)

**Form Length:** Standard values adjustable by BCD-switch over software the multiple of line spacing

**Form Transport:** Friction roller with guide rolls  
Option: bidirectional endless form tractor single or double sheetfeeder

**Ribbons:** Carbon 60.000 characters  
Multicarbon 200.000 characters  
Fabric 1 mil. characters

**Keys for:** On/Off-line  
Line feed without form feed  
Top-set and paper insertion

**LED-Display for:** Power on and on-line

**Feedback:** End of ribbon  
Cover open  
Paper end in attachment (option)

**Interfaces:** Serial V.24 (RS 232 C)  
Parallel Centronics-interface  
Multifunction-interface with serial or parallel interface

**Selection:** Completely able for text processing (ESC-sequences)

**Country Versions:** Max. 10 in one design

**Environmental Conditions:** 10—40 °C at a humidity of 10—90%

**Noise:** ≤ 57 dB (A)

**Line Voltage:** 120/220/240 V 47—63 Hz

**Power Consumption:** Stand by approx. 15 W  
In operation approx. 40 W

**Sizes:** 145 mH x 500 mW x 310 mD

**Weight:** 10 kg

★ £240 + VAT ★

**S.C.E. (Business Products) Ltd.**

1 Armada Way  
Littlehampton  
West Sussex BN17 6QY  
☎ 0903 724654  
Telex: 878574 REPAIR G  
Fax: 0903 72698

# INTERSPAN, THE ELECTRONIC MAIL SERVICE THAT REALLY MAKES A NIGHT OF IT

Have you ever dreamed of an electronic mail system which doesn't cost a fortune to run, which runs totally automatically, and which integrates with your local network, allowing mail to be sent from any station or to any user? One which allows the system manager to vet and authorise mail before it is sent? A system which uses your existing hardware\*, but not when you want to use it too? A service which doesn't add a penny to your phone bills and which can be totally budgeted in advance?

Do you think this is just a pipe dream? While you're dreaming, Interspan could be making your dreams come true.

\*BBC microcomputer, Master or Compact with Disc or Network, and DTI or Communitel Modem.



# INTERSPAN

INTERSPAN OFFERS OVERNIGHT TRANSFER OF MAIL AND FILES. SENDING A SHORT MESSAGE COSTS ONLY 3P. THERE IS NO CHARGE FOR INCOMING MAIL AND NO CALL CHARGES (WE PHONE YOU). INTERSPAN WORKS ON ANY MODEL B OR MASTER WITH DISC OR NET AND A DTI OR COMMUNITELE MODEM (OTHER VERSIONS ARE UNDER DEVELOPMENT). JOINING COSTS £90.00; FOR EDUCATIONAL USERS THIS INCLUDES £40.00 OF FREE MAIL.

INTERSPAN ELECTRONIC MAIL LTD., 108 MILL ROAD, CAMBRIDGE CB1 2BD. TELEPHONE (0223) 316686.



INTERSPAN ELECTRONIC MAIL LTD., 108 MILL ROAD, CAMBRIDGE CB1 2BD. TELEPHONE (0223) 316686.

Please send me further information about Interspan

I AM INTERESTED IN CONNECTING FROM  A SINGLE SITE  MULTIPLE SITES  
 MY USE WOULD BE  PERSONAL  IN EDUCATION  OTHER.....

NAME \_\_\_\_\_ TITLE \_\_\_\_\_

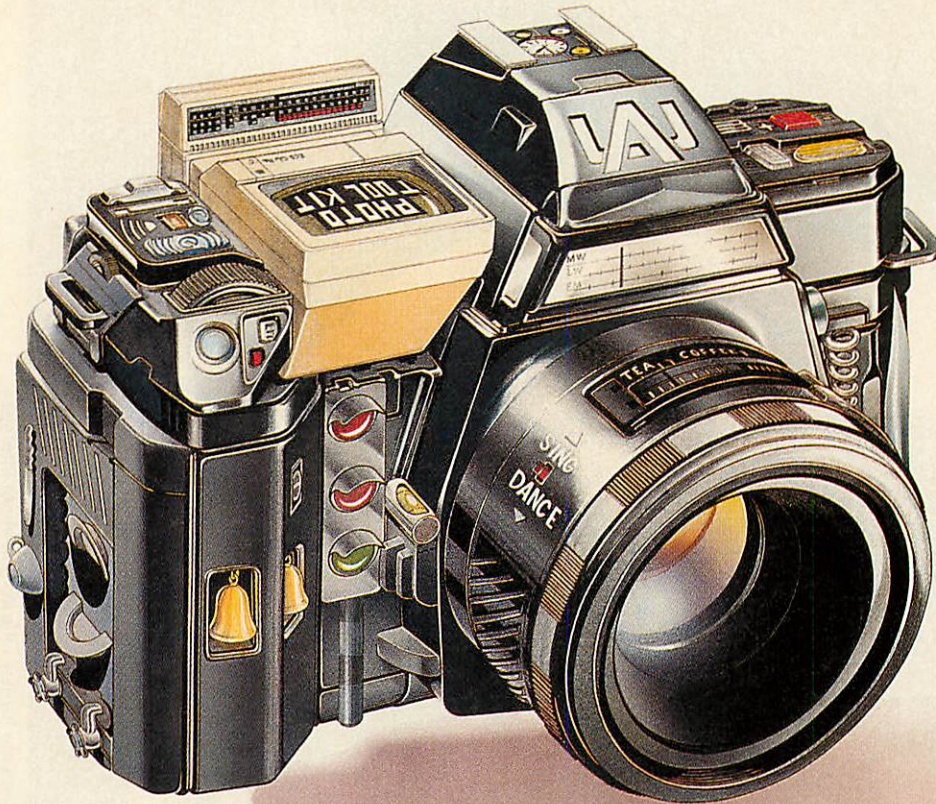
ORGANISATION \_\_\_\_\_

ADDRESS \_\_\_\_\_

POST CODE \_\_\_\_\_

TEL. NO.: \_\_\_\_\_

REF. NO. AJJI



# LIGHT READING

Put your micro in your camera bag alongside your flashgun and lenses with Joe's toolkit. Lights, camera, action!

**Joe Telford**

**A** toolkit is a little collection of utilities to do disc formatting, memory editing and program compacting. Originally most toolkits were written for boffins who spent their life assembling machine code, and wrecked their disc so often they had to learn how to rebuild disc sectors. Newer utility software has become less technical; the *Genie* system and *Acorn User's own Jottings Operating Environment* for example. Yet there still is a place for the toolkit, as a notepad, memory jogger and aid for specific applications.

Although most toolkits were written in machine code, Basic will function just as well, and it's much easier to write your own utilities.

Many toolkits operate on a command basis, so '\*WRECK 80 0 1' might be the command which would wreck both sides

of an 80-track disc. Most toolkits rely on the manual to explain how each command is used. By using Basic, we can make any toolkit much more friendly.

We will start with a core toolkit which we can use for any application. Once that's working, we can add specific features.

The approach taken in listing 1 on the yellow pages, the framework or core for the toolkits, is to use a command language. This way, the toolkit facilities are available on typing a word which the computer interprets into a command plus one or more parameters. The basic vocabulary used by listing 1 includes:

- COMMANDS (no parameters)
- EXPLAIN (one string parameter)
- EXIT (no parameters)
- TRACE (one string parameter)
- PRINTER (one string parameter)
- KEY (one number, one string)

Figure 1 shows the program outline, and how it processes a single command. The program prompts for a command with a ']' and then converts the string typed to capital letters with FNprocess. The end of the string is marked with the broken bar character '|'. The first whole word is extracted by FNextract and placed in the variable com\$. This is shortened so any command can be issued just by typing the first four letters, and PROCdecodecommand works out which command it is.

COMMANDS simply calls PROCcommands, which prints a list of the available key words. EXIT ends the program and returns to Basic. EXPLAIN can be typed by itself, but normally requires another command, eg, 'EXPLAIN COMMANDS'. Once EXPLAIN is decoded, PROCexplain is called. Now the rest of the entry line is considered and the next

whole word extracted and placed in para\$.

We use para\$ throughout when looking for parameters. This parameter is reduced to the first four letters, and decoded in a similar way to the command. The procedure called is identified by having 'ex' prefixed to it, so if the command 'EXPLAIN EXIT' is typed, the procedure called will be PROCexexit, while if the 'EXIT' command is entered, the procedure will be PROCexit. Maintaining the consistency of names is important when we begin to extend the program framework.

TRACE is a command which takes one parameter which must be either 'ON' or 'OFF'. TRACE allows the toolkit's command and parameter decoding to be shown on screen. This is useful when checking that new commands they are being decoded properly. PRINTER uses 'ON' and 'OFF' as parameters. The effect of 'PRINTER ON' is to copy everything that is displayed on the screen to a printer. 'PRINTER OFF' stops this. Because of the problems with colour control codes on some printers, the 'PRINTER ON' command removes the mode 7 colour display, while 'PRINT OFF' restores it.

The last command is KEY, and this takes two parameters, a number from zero to nine (though 10 can be added if necessary) plus a string. KEY acts like \*KEY, so 'KEY 0 EXPLAIN' and 'KEY 1 COMMANDS | M' are both legal. So too is 'KEY 2 TRACE ON | M'.

For the Electron try changing all MODE 7s into MODE 6s and then replace all references to PROCcolours with PROCblanks.

### The photographer's toolkit

The main program is listing 2 in the yellow pages. This is a toolkit for a photographer, but even if you are not photographically inclined, the program will serve to show how a toolkit can be expanded.

Once you have entered the program, then type RUN. The title 'Photographer's Toolkit V1.00' will appear at the top of the screen and the ']' prompt (which is an arrow in mode 7) appears. Now type COMMANDS and the list of commands in figure 2 will appear. EXPLAIN followed by a command will say what it does.

The new photographic commands fall into three groups; information handling commands, timing and control commands and data acquisition commands.

Information handling commands include SERIAL, ISO, DIN, EV, TABLE, QISO, and QDIN. Typing SERIAL gives a list of

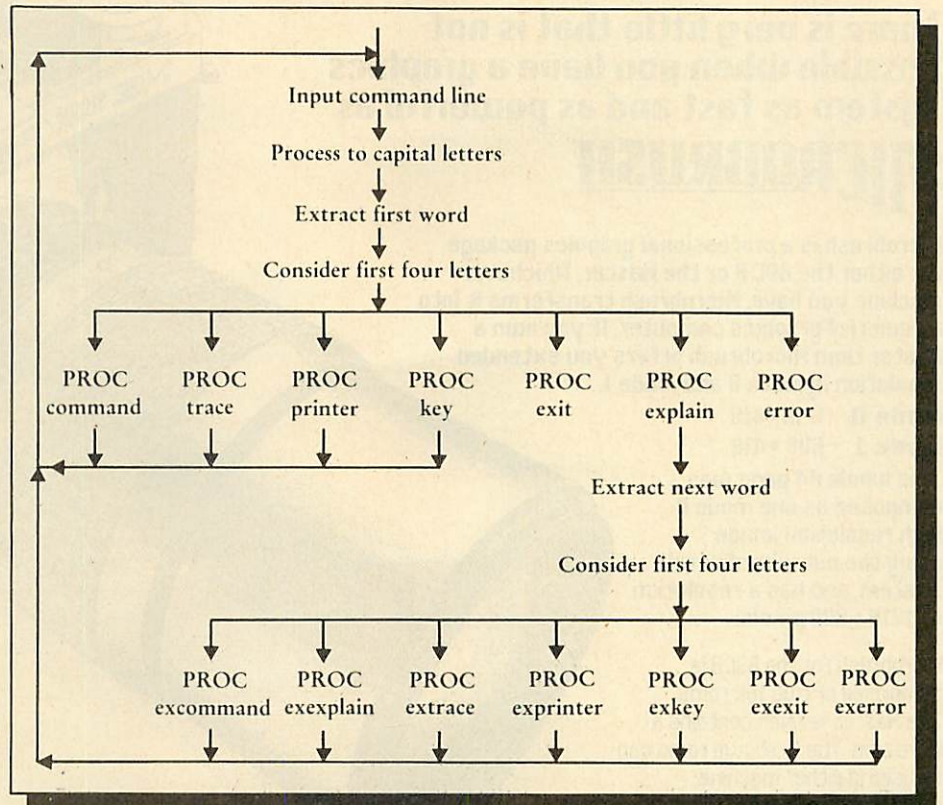


Figure 1. Framework of the toolkit program

```

Photographer's Toolkit V(1.00)
>
+COMMANDS
COMMANDS  EXPLAIN  EXIT      TRACE
KEY       SERIAL   ON        OFF
ISO       QISO    DIN       QDIN
TIME     DELAY   INTERVAL TRIGGER
METER    EV      TABLE   PRINTER
+EXPLAIN SERIAL
SERIAL
displays equipment serial numbers
SERI
+EXPLAIN TABLE
TABLE
lists all the possible
f-stops and shutter speeds
For each EV ... 0-20
TAGL
  
```

Figure 2. An introductory session

```

Photographer's Toolkit V(1.00)
+EXPLAIN EV
EV <exp val>
EV 10 lists all the possible
      f-stops and shutter speeds
      which will work with EV 10.
Use range 0 to 21 only
purple shutter speeds = seconds
yellow = fractions (camera shake)
green = fractions (safe holding)
cyan = fractions (1/1000sec)
red = out of shutter range
Use METER EV to read the light in
Exposure values (linked to film
speed set by ISO or DIN)
+EV 14
f-stop 2  2.0  4  5.6  8  11  16  22
EV 14    4  2  1  500 250 125 60  30
  
```

Figure 3. Running some complex commands

serial numbers of photographic equipment. These numbers won't match your equipment, so EXIT from the program and list it, until you find DEFPROCserial, then alter the PRINT statements to match your equipment.

The other commands should need no alteration. ISO followed by a number sets the ISO film speed rating. DIN does the same thing, using the other film speed standard. QISO and QDIN print out the currently set film speed rating as an ISO number or a DIN number respectively. ISO and DIN are linked together, so typing ISO 200 will automatically set DIN to 24, and vice versa. EV followed by a number from zero to 21 gives a list of matching shutter speeds and apertures (f-stops) which combine to make up the exposure value. So EV14 will give a 30th of a second at f22, a 60th at f16, a 125th at f11 and so on. The

TABLE command goes one step further and lists every shutter/f-stop combination from EV0 to EV20. This is shown in figure 7. Unfortunately, screen size in mode 7 means that speeds have to be colour coded, and while this is all right on the screen, it can't be printed out properly on paper. Note that below EV2 the numbers are all whole seconds. The 1, 2 and 4 of EV12 onward are actually 1000th, 2000th and 4000th of a second speeds. Other functions are shown in figures 2 and 3.

Timing and control commands include ON, OFF, TIME, DELAY, and INTERVAL. They all act on the cassette port relay, and so it is important to be able to connect whatever you are timing to that point. Figure 8 shows how this can be done simply using a small 2A terminal block (costing about 4p) and a nine-pin DIN cassette plug (45p). The terminal block can be used to

# Could you produce this advertisement on your Micro?

There is very little that is not possible when you have a graphics system as fast and as powerful as

## MICROBRUSH

Microbrush is a professional graphics package for either the BBC B or the Master. Whichever machine you have, Microbrush transforms it into a powerful graphics computer. If you own a Master then Microbrush offers you extended resolution in mode 0 and mode 1.

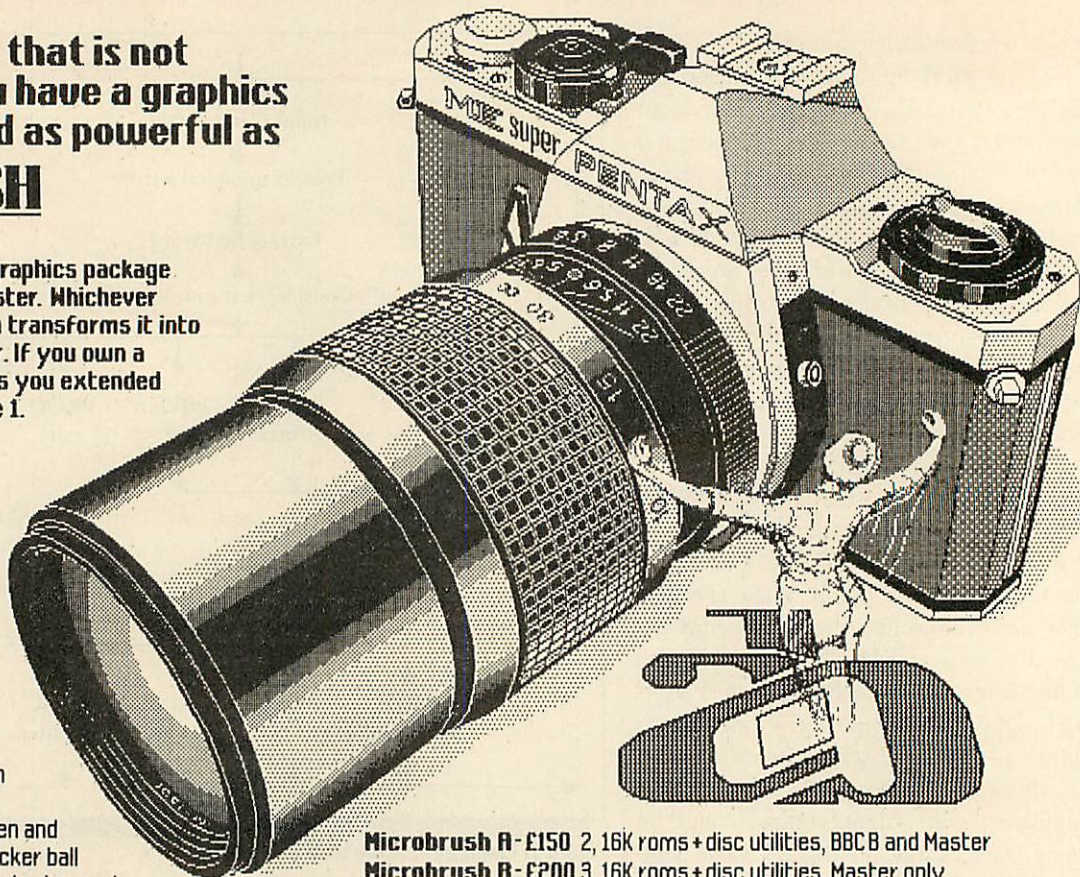
**Mode 0** - 1216 \* 416

**Mode 1** - 608 \* 416

This whole A4 page was composed as one mode 0 high resolution image using the out-board scroll system, and has a resolution of 1216 \* 900 pixels.

Microbrush for the BBC B is comprised of two 16K roms. The Master version contains a third rom. The first two roms can be used in either machine.

The whole system is menu driven and controlled by the Marconi RB2 tracker ball for speed and precision, but may also be used with either the AMX or the Whigmore mouse. Please note that the tracker ball is not included.

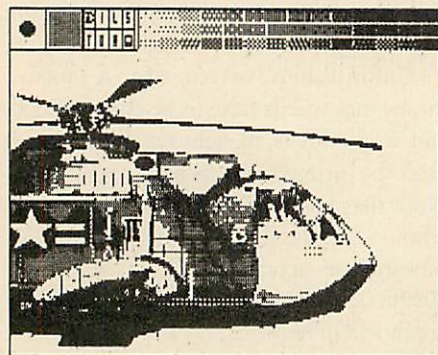


**Microbrush A** - £150 2, 16K roms + disc utilities, BBC B and Master  
**Microbrush B** - £200 3, 16K roms + disc utilities, Master only.

When ordering please remember to state which system you require, whether you need 40 or 80 track discs and a telephone no. if you have one. Orders and information requests should be sent to-AB Designs, 81 Sutton Common Road, Sutton, Surrey. Phone 01 644 6643

### The Painting system

This is just 1 of 33 major graphic systems contained within Microbrush and offers you 42 colours in mode 1 and 42 grey tones in mode 0. New colour palettes can be created with which you can draw lines, sketch, fill, paint in foreground, background, opaque, transparent and combined colour. Add this to a colour rubber which will selectively erase any actual colour and you have a very powerful painting system with more than 1,000,000 possible colours.



Above the painting system in mode 0.

### The Ikon Generator

The ikon generator is the main workhorse of the Microbrush system as it is used for both generating and positioning any ikon up to 6\*3 character blocks. This system is also used

by the typesetter and for creating colour palettes, rubbers, paint-brushes and type-faces. Up to 46 ikons can be stored in memory. The scope of the ikon facility is immense as it allows you to transform the Microbrush system into a purpose built design tool that suits your needs.

### The Type Setter

With the Microbrush system you will receive 50 proportionally spaced typefaces. The smallest allows you up to 170 characters to the line and if this is not enough then you can design your own typefaces.

The typesetter displays the current font as a scrollable menu allowing you to quickly produce professional typography.

### The Screen Editor and the Special Effects Generator

The screen editor is a powerful drag system that allows you to store up to a quarter of the screen in memory. Once stored, images can literally be dragged across the screen, repeated, copied, saved to disc or fed to the special effects generator.

#### The Special Effects Generator

This is a very versatile system which will automatically outline, inline, shadow, 3°, half-tone, etc. any image held within the screen editor's memory.

### The Injector rom

The Injector rom is the second rom in the Microbrush system. This rom contains the drawing functions such as lines, rectangles, circles, ellipses, arcs, rotate, squash, stretch, zoom, half and quarter screens, plus a whole host of other functions.

This is a very brief description of just 7 of the 33 graphics systems contained within Microbrush. All of the systems are both fast and easy to access. Microbrush also includes a 7\*7 character pixel editor and an Epson FX80 screen dump.

### The Master rom

The Master rom takes you into a completely different world of graphics with almost 4 times the resolution in modes 1 and 0, plus 2 on-board graphics screens, 10 rom based typefaces and a 3° generator which is linked to a 10 point perspective system. This allows you to deal with exceptionally complex perspective tasks such as the camera seen above. Also available for the Master rom is an out-board scroll system which allows you to build images with a resolution greater than 1216\*2000, plus there are high res. screen dumps for both Epson and Integrex printers.

Lastly flick through the pages of this magazine and see how many of the other graphic systems are capable of producing their own advertising.

Extensions to the Microbrush system include - The out-board scroll system - £40, an extended Master rom offering you 14 colours in mode 1 and 4 colours in mode 0 - £85, a typeface editor plus fifteen extra typefaces - £25, the Master rom - £65. No VAT if purchased before September 1.

connect a wide range of switchable devices to the computer including cameras, flash-guns and enlargers.

It is not possible to give precise construction details for the full range of photographic equipment. There are, however, some rules which you should follow:

- Only connect low voltage, low current devices to the cassette port relay, or you'll have a repair job on your hands.

- When connecting cameras, only connect to a camera with a remote electronic release. Buy a proper lead and connector for the camera. Cut the lead and find the two wires which trigger the camera when they are shorted. Connect them to the terminal block and the computer will be able to trigger the camera.

- When connecting anything else, use a second relay to protect the cassette relay. This is shown in figure 5. The best relays have a 185-ohm coil and will operate at less than 6V. Either use a battery or the BBC power supply to power them.

- When connecting a flash gun (figure 4) remember it might just have a voltage at the switch of 300V, though most modern units are only 6-9V. You don't want to get a shock or burn out the relay, so cover the relay terminals, or box the relay, and make sure its contacts can take mains voltage at a current of about 1A.

- Still with flash guns, buy a proper lead to fire the flash, and cut it to find the trigger wires. These connect to the relay (via another terminal block).

- For a mains enlarger remember the points above. The relay and connections *must* be boxed. All wires *must* be properly insulated, and the enlarger (if metal) *must* be properly earthed. If you have the slightest difficulty in building such an interface, or if you are at all unsure, have it done by a qualified electrician. Mains voltages are lethal and neither the author nor Redwood Publishing Ltd can accept any responsibility for damage to person or property resulting from construction work based on this article.

Once the interface is built then the controlling commands can be tried. ON and OFF are simple commands which replace switches with key presses. Try 'KEY 0 OFF | M' and 'KEY 1 ON | M' to give single keypress operation. TIME is another simple command. You can time your enlarger exposure by typing 'TIME 10', and a precise 10-second exposure takes place. DELAY is another command. Typing 'DELAY 30 S 1' will wait for 30 seconds then close the cassette relay for one second.

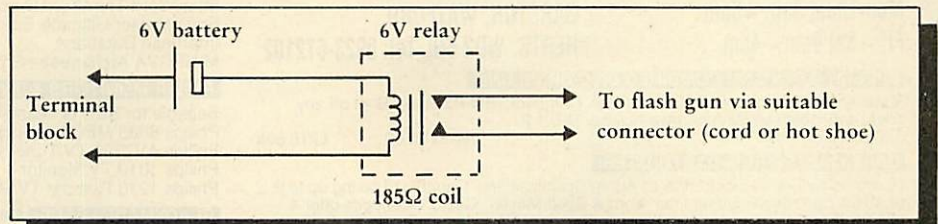


Figure 4. Connection to flash unit

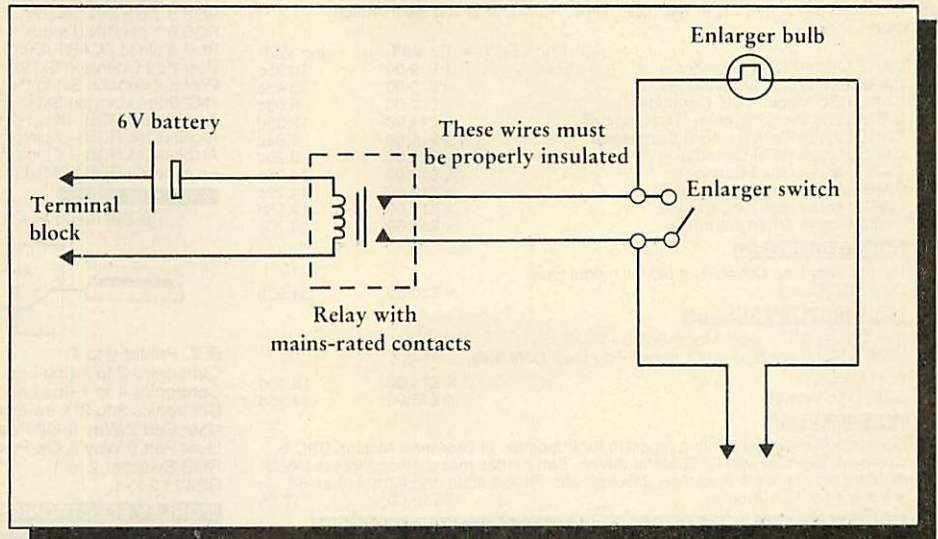


Figure 5. Connection to enlarger

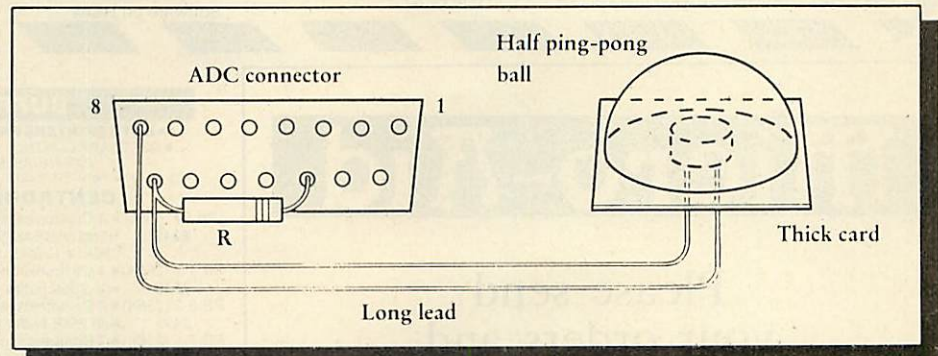


Figure 6. Hardware for a light meter for use with the QMETER command

The delay can be in seconds minutes (M) or hours (H). The last command is decoded in figure 4. The INTERVAL command acts like a delay command but can be repeated as many times as need be. To take pictures of a flower opening in your garden every half-hour for a day type 'INTERVAL 30 M 1 7' and a one second blip of the cassette port will occur every 30 minutes.

### Constructing a lightmeter

Of the data acquisition commands, the main command which we use is QMETER. Unfortunately Electron and Compact owners without analogue ports will not be able to make use of the QMETER command. QMETER is, of course, useless without a light cell to meter from.

Figure 6 shows the construction of a simple light meter. The components

needed are; a connector for the analogue port (£1.75), a 4.7kΩ resistor (1p), an ORP 12 light-dependent resistor (80p), half a ping-pong ball (14p) and some wire and solder. The total cost is about £2.70, and all should be available from a High Street electronic hobbyists shop.

The software acts as a low light (EV0 to EV11) light meter. The first version only worked using 'QMETER ABS' which returns a light reading from zero (bright) to 256 (dark). The half ping-pong ball was used to cover the light-dependent resistor to give an incident reading, so that the cell could be pointed divertly at a light source and the light from that source could be measured - this is a standard photographic technique for getting good exposures. Once the 'QMETER ABS' command was working I took simultaneous readings with

# CARE ELECTRONICS

Open  
Mon-Thurs 9am - 5pm  
Fri - Sat 9am - 4pm

800 ST ALBANS ROAD,  
GARSTON, WATFORD.  
HERTS. WD2 6NL Tel: 0923-672102

## SPECIAL 3.5" & 5.25" COMBINED DISC DRIVE UNIT

Suitable for Archimedes, BBC B, Master, Compact, IBM PS/2 etc. Boot off any drive, definable selection of drive number ie 0,1,2  
3.5/5.25 Disc Drive Unit @ £190.00 £218.50a

## CARE MASTER ROM CARTRIDGES:

Designed by CARE Electronics to Acorn Specifications. Capable of taking up to 2 or 4 16K Eproms. Including Inter-word & Spell-Master. CARE Cartridges offer 4 options for maximum user flexibility. 1: Standard Cartridge; 2: Single Zif; 3: Dual Zif; 4: Quad Sockets

## CARE MASTER SMART CARTRIDGE:

Freeze Prog at any point and dump Screen to Disc/Printer, Copies 99% of Protected programs. Tape-Disc, Disc-Tape, ASCII Dump and much, much more.

	Price Each =	Ex VAT:	Inc VAT:
CARE Master ROM Extender	@ £ 9.00		10.35c
CARE BBC Model B Cartridges	@ £ 3.00		3.45c
CARE BBC Model B ZIF Cartridge	@ £ 7.00		8.05c
CARE LOW Profile System (The Original)	@ £11.00		12.65d
CARE Library Rack (Holds 6 Cartridges)	@ £ 1.60		1.84c
CARE Master ROM Cartridge	@ £ 8.00		9.20c
CARE Master Quad Cartridge	@ £13.00		14.95c
CARE Master single Zif Cartridge	@ £12.80		14.72c
CARE Master dual Zif Cartridge	@ £17.00		19.55c
CARE Master Smart Cartridge	@ £34.60		39.79c

## POWER SUPPLIES:

For use with Disc Drives (Not old full height type)  
Dual BBC Outlets @ £30.00 34.50b

## CARE PRINTER BUFFER:

(For Master & Compact/Model B & B+)  
Uses S/RAM, any Spare I/O, completely User Definable.

Rom Version	@ £14.00	16.10d
5.25" Disc Version	@ £13.00	14.95d

## LABELMASTER

Comprehensive label printing program for Education or Business. Master, BBC B, Compact, Electron with DFS. Menu driven. Two modes message or address labels, different print styles & underline, italicised etc. Please state disc format required.  
\*\*\*\*\* Labelmaster @ £15.00 17.25

## GOVERNMENT & EDUCATION ORDERS WELCOME. HOW TO ORDER:

All prices inclusive of VAT. By post. Enclose your cheque/P.O. made payable to CARE Electronics. Or use your ACCESS/VISA.  
Please allow 7 days for delivery.  
Please add carriage. a = £10.35 b = £5.75 c = £1.15 d = £2.30

## SOFTWARE:

Inter-Word The Word Processor	@ £47.80	54.97c
Spell-Master Ultimate Spelling Checker	@ £50.00	57.50c
Interbase Database	£60.00	66.70c
MINERVA Archimedes Software Available		

## PHILIP MONITORS & TV/MONITORS inc lead:

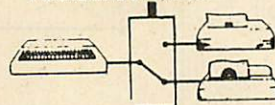
Suitable for BBC B, Master & Archimedes computers.		290.03a
Philips 8833 MEDIUM RES Colour	£252.20	74.75b
Philips AV7300 TV/Tuner for 8833	£65.00	262.20a
Philips 1010 TV/Monitor	£228.00	287.50a
Philips 1210 Remote TV/Monitor	£25.000	

## READYMADE LEADS: Many other cables available

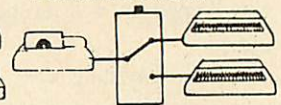
Centronics to Centronics	1.5mt @ £11.00	12.65c
Disc Drive Data (Single)	1.2mt @ £ 6.00	6.90c
Disc Drive Data (Dual)	1.5mt @ £ 8.00	9.20c
Printer (BBC to Centronic)	1.2mt @ £ 7.00	8.05c
RGB 6-7 pin DIN (Hitachi)	1.2mt @ £ 6.20	7.13c
RGB 6-7 pin DIN (Ferguson)	1.2mt @ £ 6.20	7.13c
RGB 6 pin to SCART (Euro)	1.2mt @ £ 8.20	9.43c
User Port Extension Skt to Plug	5mt @ £ 9.00	10.35c
Printer Extension Skt to Plug	1mt @ £ 10.20	11.73c
1MZ Bus Extension Skt to Plug	3mt @ £ 10.40	11.96c
Archimedes RGB - 6 pin din	@ £ 7.60	8.74c
Archimedes RGB - 7 pin din	@ £ 8.00	9.20c
Archimedes RGB - 7 pin din (ferguson)	@ £ 8.00	9.20c
Archimedes RGB - Scart (Euro)	@ £10.00	11.50c

## SWITCHING UNITS:

### 1 MICRO INTO 2 PRINTERS



### 1 PRINTER INTO 2 MICROS



BBC Printer 6 to 1	@ £ 71.00	81.65d
Centronics 2 to 1 (Inc Lead)	@ £ 33.00	37.95d
Centronics 4 to 1 (Inc Lead)	@ £ 70.00	80.50d
Centronics 2 to 2: x switches	@ £ 70.00	80.50d
User Port 2 Way & Off Posn (Inc Lead)	@ £ 33.00	37.95d
User Port 6 Way & Off Posn (Inc Lead)	@ £ 72.00	82.80d
RGB Switcher 2 to 1	@ £ 20.20	23.23d
RS423 2 to 1	@ £ 20.20	23.23d

## MORLEY ELECTRONICS PRODUCTS:

Teletex Adaptor ATS Software on ROM	@ £ 86.94	99.98d
Eprom Programmer Software on ROM	@ £ 30.00	34.50d
Care Deluxe Eprom Programmer capable of programming C/Mos & Standard Eproms 2716, 2732, 2764, 27138 & 27256		
Software on ROM	@ £ 33.00	37.95d

## BUFFERED SMART SWITCHES

- BOTH PRINTERS PRINTING DIFFERENT DOCUMENTS SIMULTANEOUSLY •
  - SOFTWARE CONTROL • OVERRIDE SWITCH • RESET & MULTIPLE COPY FUNCTION • EXPANDABLE • SIMULTANEOUS DATA INPUT • AUTO SELECT •
- ACS - AUTO COMPUTER SELECT • SI - SIMULTANEOUS INPUT • C - COPY • SPS - SOFTWARE PRINTER SELECT

### CENTRONICS

PB-DP (64K) • 1 Centronics input and 2 output soft select with 64K buffer expandable to 256K • C/SPS	£249	
PB-4-2 (256K) • 4 Centronics input and 2 output with 256K buffer. ACS/C/SPS	£345	
PB-6-2 (256K) • 6 Centronics input and 2 output with 256K buffer. ACS/SI	£495	
PB-7-1 (256K) • 7 Centronics input and 1 output with 256K buffer. ACS/SI	£445	
SB-4-2 (256K) • 4 Serial input and 2 serial output with 16K buffer at each input & a total of 256K memory. ACS/SI/C/SPS	£415	
SB-7-1 (256K) • 7 Serial input and 1 serial output with buffer at each input and a total of 256K memory expandable to 1MB. ACS/SI	£595	

### UNIVERSAL BUFFER

- SERIAL & PARALLEL INPUT AND OUTPUT • X ON AND X OFF SOFT AND DTR HARD HANDSHAKE • CENTRONICS • 2 FRONT PANEL T SWITCH INPUT AND OUTPUT • COPY • RESET • EXPANDABLE TO 256K •
- UB (64K) £220

## SMART AUTOMATIC SWITCHES

- AUTO COMPUTER SELECT • SERVICE • REQUEST LED INDICATION • MANUAL OVERRIDE SWITCH • UNSERVICED COMPUTER RECEIVES BUSY •

### CENTRONICS

MP-401 • 4 Centronics input and 1 Centronics output	£150	
MP-801 • 8 Centronics input and 1 Centronics output	£200	
MS-401 • 4 Serial input and 1 serial output	£180	
MS-801 • 8 Serial input and 1 serial output	£230	

## INTELLIGENT PRINTER BUFFERS

- SELF-TEST FUNCTION • BUFFER/PRINTER READY INDICATOR • BUFFER RAM STATUS INDICATOR • RESET AND MULTIPLE COPY FUNCTION • BUFFER BYPASS SWITCH •

PB (64) • 1 Centronics input and 1 Centronics output with 64K buffer	£140	
PB-2 (64) • Above with 2 way manual switch to connect 2 micros to 1 printer or vice versa	£185	
PB (256) • 1 Centronics input and 1 Centronics output	£190	
PB-2 (256) • Above with 2 way manual switch to connect 2 micros to 1 printer or vice versa	£235	

### ACCESSORIES

KSM 101 • Serial RS232 to parallel converter with PSU	£65	
KSM 104 • Parallel to serial RS232 converter with PSU	£70	
KSM 110 • Multi-link serial RS232 switch selectable cable	£24	
KPC 104R • Ribbon Cable 36pin-36pin		£12.00
KPC 104 F6 • Flex Cable 36pin-36pin		£16.00
KPC 105-6 • Flex IBM Parallel printer cable		£15.00
KPC-105-10 • Flex IBM Parallel printer cable		£17.00
KPC-106 • Flex (25 lines) 25pin-25pin		£14.00
KSC-101 • Flex (10 lines) 25pin-25pin		£12.00

CUSTOM CABLE-MAKING SERVICE AVAILABLE



Add postage Switches & Buffer £4.00 each, & cable £0.75 each + 15% VAT  
KEYZONE COMPUTER PRODUCTS LTD  
U14, Acton Business Centre,  
School Road, London NW10 6TD  
Telephone: 01-965 1684/1804 Telex 8813271 GECOMS G



# Micro-Aid

Please send  
your orders and  
enquiries in for

## PAYROLL, ACCOUNT

OR

## FAMILY HISTORY

TELEPHONE: 0209-831274

ASK FOR  
COLIN CHATFIELD

25 Fore St., Praze,  
Camborne, Cornwall.





a borrowed light meter and the light cell, and drew up a table of exposure values to calibrate the home-made meter, like so:

Light Meter	QMET ABS
EV0	210
EV1	188
EV2	167
EV3	135
EV4	110
EV5	96
EV6	60
EV7	43
EV8	30
EV9	20
EV10	12
EV11	7

Beyond EV0 and EV11, the light meter readings were not sufficiently stable. Every light dependent resistor is an individual, so look in DEFPROCsetup for this table of values in a DATA statement and alter them to suit your home-made meter.

Once calibrated, and the new DATA statements have been re-entered, you can use the command 'QMET EV' to generate an exposure value based on the light level. The EV parameter is linked to the film speed so if you QMET EV with ISO 100 film and get EV6 as the reading, changing to ISO 400 film will change the reading to EV8, because of the film speed.

It would be straightforward to design a further command, say QENLARGE, which would return a number of seconds based on the light read by the photocell when placed under an enlarger with a negative in place. The hardware would have to be altered by making the resistor larger (100kΩ), so the system was more sensitive to light. Removing the ping-pong ball cover would help too, but you would have to ensure the photocell reads the average density of the negative, perhaps by holding a thin sheet of greaseproof paper under the enlarger lens. The calibration technique would be to make test prints after each of four, six, eight, 12, 16, 24, 32, 48 and 64 seconds exposure, changing the aperture to get a good print. When a good print is achieved record the 'QMET ABS' reading and build up a table, eg.

Exposure time	QMET ABS
4 secs	10
6 secs	15
8 secs	20
12 secs	27
16 secs	40
24 secs	60
32 secs	92
48 secs	120
64 secs	180

**Photographer's Toolkit V(1.00)**

EV 0	4	8	15	30	60	120	240	480
EV 1	2	4	8	15	30	60	120	240
EV 2	1	2	4	8	15	30	60	120
EV 3	2	1	2	1	4	8	15	30
EV 4	4	2	1	2	1	4	8	15
EV 5	8	4	2	1	2	1	4	8
EV 6	15	8	4	2	1	2	1	4
EV 7	30	15	8	4	2	1	2	4
EV 8	60	30	15	8	4	2	1	2
EV 9	125	60	30	15	8	4	2	1
EV 10	250	125	60	30	15	8	4	2
EV 11	500	250	125	60	30	15	8	4
EV 12	1	500	250	125	60	30	15	8
EV 13	2	1	500	250	125	60	30	15
EV 14	4	2	1	500	250	125	60	30
EV 15	000	4	2	1	500	250	125	60
EV 16	000	000	4	2	1	500	250	125
EV 17	000	000	000	4	2	1	500	250
EV 18	000	000	000	000	4	2	1	500
EV 19	000	000	000	000	000	4	2	1
EV 20	000	000	000	000	000	000	4	2

Figure 7. The exposure value table

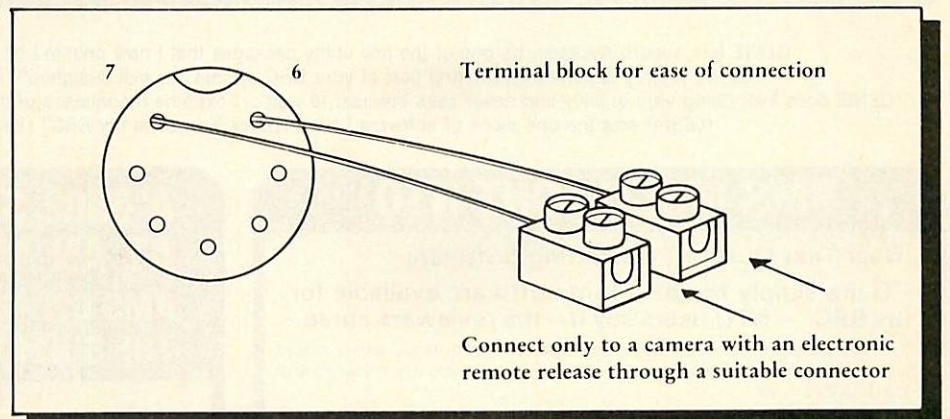


Figure 8. Connecting to the cassette relay

This can then be put into a DATA statement in PROCsetup, and read into a nine element list say DIMenlarger (9). Finally a PROCenlarge procedure can be added, almost exactly like PROCqmet but without parameters. PROCexenlarge can be added to explain how the command works. The points to be considered when adding a toolkit command are:

- Choose the name, eg, DEVELOP
- Add it to PROCcommands
- Check for 'DEVE' in PROCde-codecommand
- Check for 'DEVE' in PROCexplain
- Write DEFPROCexdevelop to explain what it does
- Write DEFPROCdevelop
- Extract the parameter with FNextract and convert it to a number
- Check for para\$="" or time=0 and call

PROCerror & ENDPROC

■ Continue writing to ENDPROC.

You can combine the metering facility with the control commands, by using TRIGGER. This command requires two parameters; one refers to the absolute light level at which triggering takes place and the second is the direction of the change of light level, (B)righter or (D)arker. If 'QMET ABS' returns 50, then that is the current light level. To trigger a flash or camera when the light drops we use 'TRIGGER 51 D'. The 51 is protection against slight dimming of the light, and the D says wait till it gets darker than 51, the cassette relay is blipped for half a second and the photo is taken.

The photographer's toolkit is just one application for the system - if you come up with any others let me know!

**NEW!**

# GENIE Your wish is my command...

**Address Book - Desk Diary - Calculator - Calendar - Phone Book - Notepad.  
Instantly - at any time - Magic??? No, just call GENIE!**

The Genie System only  
**£69.00 + VAT**  
(£79.35 inc. VAT plus £1 carriage)



GENIE can produce address labels, and pages of the diary notepad can be output to a printer.

In addition to these, stored in GENIE's memory are ASCII tables and lists of commonly used conversion factors eg metric to imperial units.

All the utilities in GENIE are MENU DRIVEN, making full use of cursor and function keys. There is an ON-SCREEN function key strip at the bottom of the display—NO need to change key strips to use GENIE!

If the information stored in GENIE is confidential, a password lock can be put on, barring access to all of the GENIE utilities.

How often do you interrupt important work on your computer to use a calculator, look up your address book, consult your diary or make a note of something?

Have you ever wished for an invisible helper, just waiting there in the shadows, behind whatever program you are using, ready to appear, as if by magic, whenever needed?

### GENIE - YOUR HELPER, HAS ARRIVED!

GENIE is a revolutionary new system which puts all your day-to-day information literally at your fingertips.

A single keystroke will call up GENIE, from WITHIN a wordprocessor, spreadsheet or other application software—no need to save your work—GENIE appears instantly on screen.

When finished, another keystroke makes GENIE vanish, immediately dropping you back to EXACTLY what you were doing, before you called GENIE.

GENIE is a totally self-contained system requiring no access to disk, it is present in your computer from the moment you switch on.

### THE SOFTWARE

The GENIE System software—32K of machine code—has an original screen display, using high resolution windows with up to 7 colours on screen, AND 80 column text display. The screen colours are user selectable to give optimum clarity on any monitor.

GENIE provides: a 10 digit calculator with memory, a 100 year calendar, address book, desk diary, notepad and phone book. Information can be accessed by browsing, or by fast search techniques. The notepad is a mini-wordprocessor with word-wrap, and full cursor editing.

### THE HARDWARE

GENIE 'lives' on a small circuit board only 3 inches square.

The GENIE System hardware uses a totally new memory paging technique, developed by PMS, which maps 32K of ROM and 64K of RAM into the address space of a single 16K sideways ROM.

The GENIE board is connected to the computer via a single header on 6 inches of ribbon cable. This header plugs into any ROM socket on the main BBC, MASTER or COMPACT board.

NO flying leads—NO soldering—NO modifications.

The GENIE board can be positioned almost anywhere inside the machine. The ribbon cable is long enough to prevent physical conflicts with other hardware.

The power requirement of GENIE is very low, only slightly more than standard EPROMS, so there are no overheating problems.

"GENIE is a superb package. Its one of the few utility packages that I now couldn't be without" (Acorn User, Aug 87)

"GENIE rapidly becomes an integral part of your BBC system... well designed" (Pop Comp Weekly, Jun 87)

"... GENIE does everything very quickly and never asks the user to wait... extreme friendliness of design... eminently practical" (A+B, June 87)

"GENIE was the one piece of software I have always wanted in my BBC" (Your Computer, July 87)

## PMS MULTI-FONT NTQ

Near Text Quality Typesetting Software

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

If you want to produce quality worksheets, newsletters, OHP slides, menus, leaflets, concert programmes and tickets, exam papers, reports, invoices or just add style to your personal letters—NTQ's for you.

Use NTQ with VIEW, WORDWISE, INTERWORD, WORDPOWER\* or BASIC on BBC, B, B+, MASTER, COMPACT and even ELECTRON with ANY EPSON compatible printer (MX and FX). FONT LIBRARY CONTAINS OVER 35 HIGH QUALITY FONTS—standard typefaces + foreign languages + maths/science symbols + fancy styles.

Write or phone for leaflet and full list of fonts.

MIX FONTS, HEIGHTS, WIDTHS AND PITCHES IN ONE LINE OF TEXT—just like this:

**MULTI-HEIGHT**  
**MULTI-FONT**

**MULTI-WIDTH**  
**MULTI-PITCH**

**BACKGROUNDS**

**INVERSE**

ÁÓÀÆÇÈáòòüöïe α±÷×√≡≠#~≈♪

### Other features:

MICRO-JUSTIFICATION—right and left justified proportionally spaced text.

DRAFT mode—for a fast, rough copy for proof reading, but showing ALL NTQ features.

The basic NTQ system consists of a 2 ROM set—one ROM containing the NTQ driver software, and 3 fonts, the other containing a further 4 fonts. Any number of FONT EXTENSION ROMS can be added to the system, each one containing any 4 fonts of the user's choice selected from the FONT LIBRARY. Users can create their own fonts using the FONT DEFINER program supplied on the utilities disk. These fonts can be loaded into sideways RAM or burnt into ROM.

**NTQ costs ONLY £34** (including VAT) plus £1 post and packing.

Please state disk size (5.25"/3.5") and printer type when ordering. For details of our Educational Site Licensing and Bulk Purchase agreements phone our Sales Office.

"Despite its power NTQ is a very easy package to use" (Educational Computing).

"The quality of text is quite outstanding" (TUBELINK).

\*Also available Power Font NTQ—a special version of NTQ for Ian Copestake's WORDPOWER word processor. This combines on-screen foreign/maths symbols with NTQ printout—a MUST for serious writers. (Phone 04867 4755 for info.)

## A 6502 SECOND PROCESSOR AT AN AFFORDABLE PRICE!

**PMS B2P-6502**

**THE SUB-£100 SECOND PROCESSOR**

### BANISH "Bad Mode" MESSAGES

- ★ 30K BASIC—all MODES
- ★ 44K in HiBASIC—from PMS

### WIDEN WORD PROCESSING STORAGE

- ★ 30K VIEW 2—80 column display
- ★ 47K VIEW 3 and HiVIEW
- ★ 42K HiWORDWISE PLUS—from PMS

### SWELL SPREAD SHEET SIZES

- ★ 30K VIEWSHEET—MODE 0
- ★ 44K ULTRACALC 2
- ★ 42K HiINTERSHEET

The B2P is fitted with a CMOS65C02 processor and works with both SINGLE and DOUBLE density DFS's. The "BOS" ROM, supplied with the B2P, contains the B2P Operating System + TUBE Toolkit — 65C02 disassembler, B2P memory editor, memory shifters, printer buffer.

The B2P runs software obeying the ACORN TUBE protocols, this includes BASIC, the whole VIEW family, PASCAL, COMAL, LISP, BITSTIK etc.

The B2P is only 5.5" x 4" — external to the BBC — can be fitted internally if desired.

"I have no hesitation in giving it a firm thumbs up — high power at low cost." Acorn User (March 87)

YOU CAN ADD SECOND PROCESSOR POWER FOR ONLY

**NEW PRICE**

**£99.95**

**£89.95** (including VAT) + £2 carriage.

HiBASIC (disk or ROM) **£5**, HiWORDWISE PLUS **£6**.

ALSO AVAILABLE the E2P-6502 — ELECTRON version of the 6502 Second Processor — only **£89** including VAT (Overseas orders no VAT required)



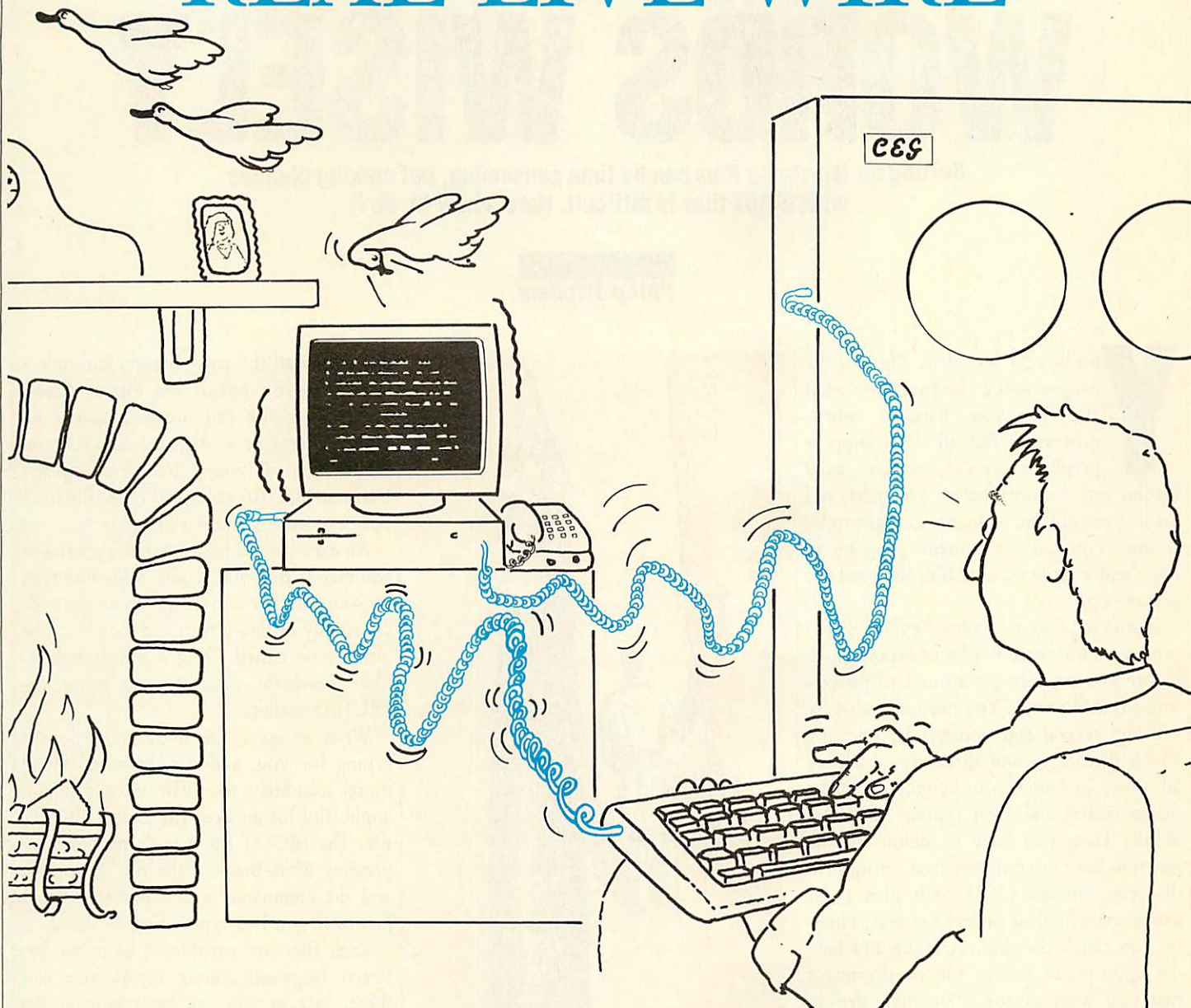
**Permanent Memory Systems**

38 MOUNT CAMERON DRIVE  
EAST KILBRIDE G74 2ES  
SCOTLAND



**03552-32796** (24 Hour)

# COME HOME TO A REAL LIVE WIRE



Inject the power of a mainframe into your micro. MICRONET is the only product that provides you with:-

- Real-time interactive chatlines
- Free and discounted telesoftware
- M.U.G.'s inc the UK's most popular SHADES™
- Daily computer news and reviews
- Free PRESTEL™ electronic mail
- Teleshopping – holidays, hotels etc.
- 70,000 PRESTEL users 56,000 Telecom Gold users
- National and International Telex
- Technical Support and Help Desk

**PLUS:** Access to PRESTEL and Telecom Gold, and there's much more – all for one low cost subscription. Modem owners call us now for an on-line demonstration.

With your first annual subscription MICRONET will give you a free modem. Complete and return the coupon for your MICRONET brochure.

## MICRONET

MICRONET, Durrant House, 8 Herbal Hill,  
London, EC1R 5EJ. Telephone 01-278 3143  
Please send me a free MICRONET brochure.

Name \_\_\_\_\_

Address \_\_\_\_\_

Tel. \_\_\_\_\_ Age \_\_\_\_\_

Micro \_\_\_\_\_

AU/11/87

# CHOOSE YOUR WORDS WISELY

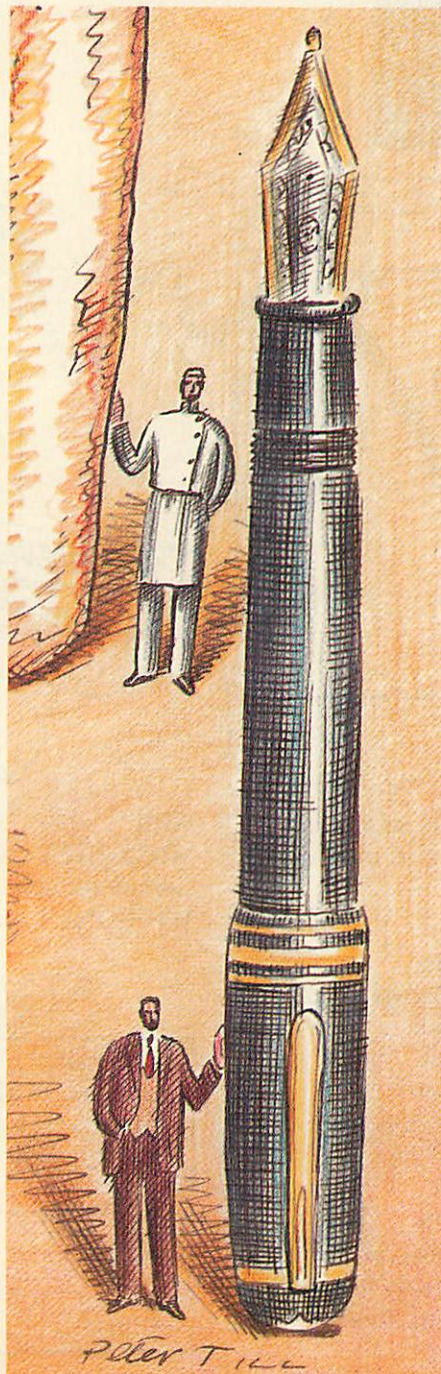
Setting up *Wordwise Plus* can be time consuming, but making choices with !BOOT files is difficult. Here's how to do it

**Philip Trinham**

**Y**ou bought *Wordwise Plus* for the programming language – what else do you with a word-processor? But all those support programs you've written need loading into memory before you start, and loading each of the segments can take quite a time. You can use a menu program in Basic and a series of exec files to speed the process up.

*Wordwise Plus* is a very flexible word-processor, but there is a lot of typing to do before you actually get around to processing any real words. You normally start by entering several star commands, selecting which disc drive and directory, disabling all those add-ons you bought to make things easier, and then typing \*WORDWISE. Then you have to define all the function keys to your preferred settings, so that you can use CTRL-Shift plus a red key to start bold or underlined text. Finally, you check the disc catalogue and load the appropriate header file or document that you want to edit. You may already have automated part of this process by using an exec file or !BOOT file to define the function keys.

The idea of using a header file is to have the outline or the start of a document on disc. Usually, you want all of your business letters to look the same, with a standard page layout to suit your stationery, and perhaps your address in a letter-head. All the *Wordwise* commands to define the layout and the letterhead could be put into a header file. You can then start typing a new letter by loading the header, and this gives you a ready made page layout. You can have several headers for different sorts of documents – one file could be a letter outline, another could be for memos, a third just blank. The outline



can define all the page, margin and indent sizes that you put at the top of almost every *Wordwise Plus* document, and by putting them in a standard file you can ensure that all your letters look equally business-like. An example header file for a business letter is shown in figure 1.

An exec file is a file containing a series of commands that you would otherwise type in yourself. The commands in an exec file are simply ordinary text, and the file can be written or edited using a wordprocessor like *Wordwise Plus*, or by using the \*BUILD command.

What an exec file does is to do the typing for you, and it does it faster and more accurately too. The most common application of an exec file is as a !BOOT file. The !BOOT file gets things going by pressing Shift-Break – the file is read in, and the commands it contains are treated just as if you had typed them by hand.

Exec files are capable of skipping between languages, doing things here and there, just as you can by typing at the keyboard. And they can even call other exec files into action.

The main limitation is that because the exec file is fixed, you can't decide that you want something slightly different today. An exec file can't be used to set up *Wordwise* and then load in one of six files chosen from a menu: there is no way to make the choice between menu items.

Listing 1 on the yellow pages is a program that lets you choose options from a menu. The option is stored in memory. When the exec file is used, the menu program tells the exec file where to look for the name of the chosen option. This way, the option chosen can be different every time, and the exec file can always find out which header file is needed. All

you have to do is boot the disc using Shift-Break, then choose your standard file from the menu. The procedure that the computer goes through is as follows:

- After Shift-Break the menu program is entered. This display the options and waits for further instructions

- It stores the number of the chosen option or places the name of the file into a known location in memory

- The first exec file is called, and defines the function keys. In turn, this calls a second exec file

- The second exec file finds the name of the option in memory, starts up *Wordwise Plus*, and then loads in the appropriate standard file

The menu routine is a Basic program. Type in listing 1 and save it – it's best to call this something like B.WWMENU. When run, it displays the list of standard headers that you have come to use, plus a no file option if you wish. You can also type in star commands, just as under the *Wordwise* menu, to change drives or directories. Lastly, the menu can call the exec files into action. This is where all the real work is done, as described above.

A selection of exec files can be used, one after the other, though only two are shown here. The first sequence, shown in figure 2, consists purely of \*KEY commands to set up the function key strings. This file must be called E.WWFKEYS. The last statement in this file is a \*EXEC command to call its companion into operation.

The second exec file in figure 3, called E.WWENTRY, is the one that automatically calls up *Wordwise Plus*, and loads in the appropriate header file. Note that at the end of E.WWENTRY there is a single blank line. It uses *Wordwise Plus* colon commands to load in whatever files it needs from the disc.

The exec file is passed parameters via the resident integer variables, A% and B%. Fortunately, these are the same in both Basic and *Wordwise Plus*, so if A% is set by the Basic menu program, it can be used later by *Wordwise Plus*. A% holds the option number from the menu, which controls which of the standard header files should be loaded. B% holds the address of a filename string stored in memory by the menu program. This is used when you wish to edit an existing document; press menu option 8, then type in the filename. At present, this filename is stored at memory address &O380. This is usually a fairly safe area of memory because it is used by the cassette filing system. You can change

```
<f1>*FX6
<f1>ES77
<f1>PL70
<f1>LL65
<f1>LNS
<f1>EP
<f1>EM
<f1>TS3
<f1>HP1
<f1>BS3
<f1>DF

<f1>DH<f1>FI<f2>Page <f1>PP<f2>
<f1>FI<f2>C. F. & D. TRINHAM.
<f1>FI<f2>Registered Builders

<f1>FI<f2>271 St Helena Road,
<f1>FI<f2>Greenborough.
<f1>FI<f2>Tel. Greenborough 2879

<f1>FI<f2>2nd September 1987
```

Figure 1. Example header file

PROCEDURES AND FUNCTIONS	
PROCinitialise	Set up routine
FNmenu	Get menu option
FNoptions	Show menu
PROCshow	Flash menu choice
FNfile	Get filename
PROCosci	Star command
PROCcursor	Flashing cursor control
FNget	Get single character
FNinput	Get string
PROCsysterror	Errors in PROCosci
PROCoserror	Other errors

MAIN CONSTANTS	
oscommand%	Oslci buffer
oscli%	Oslci call address
up%	ASCII code 11
return%	ASCII code 13
escape%	ASCII code 27
star%	ASCII code 42
delete%	ASCII code 127
yellow\$	Teletext code 131
cyan\$	Teletext code 134
flash\$	Teletext code 136
crkey%	INKEY code -74
esckey%	INKEY code -113
off	Set to zero
on	Set to one

EXPORT VARIABLES	
A%	Menu selection
B%	Address of filename

```
*! function key definitions
*! for Epson FX printer
*!
*! Underline on and off
*KEY 0 !!!OC27,45,1!!"
*KEY 1 !!!OC27,45,0!!"
*! Bold on and off
*KEY 2 !!!OC27,69!!"
*KEY 3 !!!OC27,70!!"
*! italics on and off
*KEY 4 !!!OC27,52!!"
*KEY 5 !!!OC27,53!!"
*! superscript
*KEY 6 !!!OC27,83,0!!"
*! subscript
*KEY 7 !!!OC27,83,1!!"
*! normal
*KEY 8 !!!OC27,84!!"
*KEY 9
*!
*EXEC E.WWENTER
```

Figure 2. Setting up function keys

this easily by altering the menu program – no change is necessary to the exec files. But reading the filename in *Wordwise Plus* programming language is difficult. As the filename string is stored in Basic using the equivalent of:

```
file$ = file$
```

the obvious way to read it is to use:

```
file$ = file$
```

*Wordwise Plus* doesn't use the \$ indirection operation like this to read a string from memory, so the filename has to be built up character by character, like this:

```
:F$=""
:F$=F$+CHR$(?(B%+0))
:F$=F$+CHR$(?(B%+1))
```

A maximum of 12 characters are allowed for in the E.WWENTRY exec file, enough for the DFS. If you have ADFS, then you may want to extend this, to allow you to use longer directory names.

The other file used is one of the many *Wordwise Plus* utilities – in this case one called W.WWUTILS – and it gets loaded into *Wordwise* segment 0. If you have more than one of these utilities, perhaps for mailmerging or label printing, then they can be loaded into other segments in a similar fashion.

These two separate exec sequences could be combined into a single exec file, but they have been separated so that the key definitions can be edited without the risk of ruining the main sequence contained in the second file. It also demonstrates that the parameters placed in memory are not destroyed or altered by the action of the first exec file.

Now for the !BOOT file to get the whole thing going automatically. To get this onto the disc, type the following command:

```
*BUILD :O.$.!BOOT
```



A series of line numbers are given; type in the commands necessary to start up the Basic menu program:

```
*BASIC
CHAIN " :O.B.WWMENU"
Escape
```

Pressing Escape finishes creating the file, and stores it on the disc. To complete the process, type:

```
*OPT 4,3
```

This makes sure that the !BOOT file is enabled: \*OPT 4,0 disables it. You should at this stage have at least four files on your disc – the Basic program, two exec files and the !BOOT file.

You might also have some of the standard header files like that shown in figure 1 – obviously the filenames used in the menu program and in the exec files should be altered to match the ones that you use. A second such standard header, suitable for a report or article, is shown in figure 4. This defines the page layout and defines some printer control codes. The menu system is aimed at allowing you to choose which of a number of such headers you want to start off with.

Using this program you should be able

```
WORDWISE-PLUS
(C) Computer Concepts 1984

1) Save entire text
2) Load new text
3) Save marked text
4) Load text to cursor
5) Search and Replace
6) Print text
7) Preview text
8) Spool text
9) Segment menu

ESC Edit Mode

Please enter choice
```

Start up menu for *Wordwise Plus*

```
*! Entry to Wordwise Plus
*! by Philip Trinham
*! for BBC B/B+/M/C
*! (C)Acorn User Nov 1987
*!
*WORDWISE
:F$=""
:F$=F$+CHR$(?(B%+0))
:F$=F$+CHR$(?(B%+1))
:F$=F$+CHR$(?(B%+2))
:F$=F$+CHR$(?(B%+3))
:F$=F$+CHR$(?(B%+4))
:F$=F$+CHR$(?(B%+5))
:F$=F$+CHR$(?(B%+6))
:F$=F$+CHR$(?(B%+7))
:F$=F$+CHR$(?(B%+8))
:F$=F$+CHR$(?(B%+9))
:F$=F$+CHR$(?(B%+10))
:F$=F$+CHR$(?(B%+11))
:SELECT SEGMENT 0
:LOAD TEXT "P.WWUTILS"
:SELECT TEXT
:IF A%1 THEN LOAD TEXT ":O.W.BUSLET"
:IF A%2 THEN LOAD TEXT ":O.W.BUSLET+"
:IF A%3 THEN LOAD TEXT ":O.W.STDLET"
:IF A%4 THEN LOAD TEXT ":O.W.MEMO"
:IF A%5 THEN LOAD TEXT ":O.W.AUART"
:IF A%8 THEN LOAD TEXT F$
:F$=""
:IF A%<8 THEN CURSOR BOTTOM
:PRINT CHR$(6)
```

Figure 3. Calls *Wordwise Plus*

```
<f1>ES76,32
<f1>ES50
<f1>RPS0,27,95
<f1>RPS1,27,82
<f1>RPS2
<f1>RPS3
<f1>RPS4
<f1>RPS5,27,78
<f1>RPS6,27,1,1,230,0,32
<f1>RPS7,27,1,1,230,0,48
<f1>RPS8,27,1,4,230,0,32
<f1>RPS9,27,1,4,230,0,48
<f1>PL66
<f1>LL50
<f1>LS2
<f1>EP
<f1>EM
<f1>LNS
<f1>PC"{"
<f1>TS3
<f1>HP1
<f1>DH<f1>CE<f2>Page <f1>PP<f2>
<f1>DF<f1>CE<f2>more...
```

Figure 4. Standard report header

to produce a customised menu to suit the utilities that you need. It should cut out a lot of the typing of setting-up commands that you have to go through every time you switch the computer on, before you can get down to work. The program should make the otherwise excellent *Wordwise Plus* considerably easier to use.

For details of Philip Trinham's menu listing please refer to the yellow pages index on page 113. They are also included on the monthly listings disc (see page 133).

# University Software

## UNISTAT-II

### MARK 2 STATISTICAL PACKAGE

\*FULLY INTEGRATED SUITE OF STATISTICAL PROGRAMS \*DEDICATED DATA PROCESSOR \*AUTOMATED MISSING DATA HANDLING \* USER DEFINED LABELS FOR VARIABLES \* READING DATA FROM ASCII FILES \* DIRECTION OF OUTPUT TO PRINTER OR ASCII FILES \* HIGH-RESOLUTION PLOTS \* COMPREHENSIVE USER MANUAL

**UNISTAT DATA PROCESSOR:** A spreadsheet designed exclusively for data handling. DATA ENTRY: Cursor editing, overwrite/insert modes, continuous entry, insertion and deletion of cells, cols and rows, go to, col labels. FILE HANDLING: Read, write and merge in internal and ASCII format. COLUMN TRANSFORMATIONS: Formulas using cols as variables. Any combination of +, -, \*, /, ^, LOG, EXP, SQ, ABS, SIN, etc. Operations with col numbers or labels. STATISTICAL COMMANDS: SIZE, MIS (no of missing values in a col), SUM, SSQ, MEAN (adjusted for missing values). Single or multi col sorting in asc or desc order. Ranks. CONDITIONAL FORMULAS: Selection of cases, creation of dummy and effect vars, recoding, breakdown, etc. Logical operators >, <, =, AND, OR, NOT.

**MULTIVARIATE REGRESSION:** Simple corr matrix, choice of dep var, selection of indep vars, nonconstant reg. Selection-specific missing data handling. No. of rows and cols omitted due to missing values and multicollinearity. Output includes estimated coeffs, t-stats, std errors, R<sup>2</sup>, adjusted R<sup>2</sup>, std error of reg, F-stat, D-W stat, ANOVA of reg, var-covar and multiple corr matrices, interpolation, plot of residuals, plot of actual and fitted y values. Addition of residuals and/or fitted y values to data matrix.

**STATISTICAL TESTS:** Significance levels for most test stats. Test-specific missing value handling. PARAMETRIC: One sample t, two sample t with equal and unequal vars, paired t, F, NON PARAMETRIC: Chi-sqr and Kolmogorov-Smirnov, (both with equal and unequal exp freq versions), chi-sqr Bartlett, Mann-Whitney U for small, medium and large samples, Wilcoxon signed rank, Walsh, Wald-Wolfowitz runs, Kruskal-Wallis one-way ANOVA, Friedman pseudo two-way ANOVA, Jonckheere trend, Page's L, Cochran Q, Goodman-Kruskal gamma, Sommer's d. CORRELATION COEFFICIENTS: Pearson, Spearman's rho, Kendall's tau, Point biserial,

Goodman-Kruskal gamma, Sommer's d, Yule's O, phi, tetrachoric, DISTRIBUTIONS: Chi-sqr, t, F, Normal (std, non std), log, inverse and bivariate normal, binomial, negative binomial, exponential, hypergeometric, gamma function, Khrgian-Mazin.

**DESCRIPTIVE STATISTICS:** Analysis of raw data or data with freq counts. Raw data sorted and grouped. Freq dist with choice of lower bounds and class intervals. Absolute, cumulative and relative freq. Histograms, scatter diagrams and time series plots. Output includes sum, mean, mean deviation, median, variance, std deviation, third and fourth moments, skewness, kurtosis, range, etc. ANALYSIS OF VARIANCE: One-way with and without repeated measures, two-way with no interaction, two-way and three-way with one, two and without repeated measures.

**TABULATIONS: CROSS-TABULATION:** Two-way tables with col and row totals and percentages. CHI-SQUARE CONTINGENCY TABLE: Observed freq, exp freq and chi-sqr for each cell. Col and row sums, overall chi-square stat and its significance level. Yates correction.

**HIGH RES PLOTS:** All plots can be dumped on the printer. PLOT OF BIVARIATE REGRESSION: Scatter diagrams with optional line of best fit, intercept, slope, R<sup>2</sup>, std error. CURVE FITTING: Fitting of polynomials on bivariate data. Fitted polynomial coeff, R<sup>2</sup> and std error. TIME SERIES PLOTS: Simultaneous plotting of up to 7 columns of data against time. PLOT OF FUNCTIONS: Simultaneous plotting of up to two functions, integrals, polynomials and roots of polynomials.

**DEFAULT SETTINGS (For BBC version):** Choice of screen and device control parameters, 40 or 80 column display, number of data drive 0/1/2/3, black & white or colour monitor width of printer, high-res screen dump command, maximum formula length, maximum number of columns and rows depending on free RAM.

### LINTPRO Linear/Integer Programming Package.

Written by Dr D. Sprevak

A professional package which can solve very large problems on a 32K BBC micro by means of revised simplex algorithm and efficient vectorisation. It can solve a problem with 82 variables, 60 constraints and 15 upper bounds in 24 minutes. Runs faster on second processor, Plus or Master series. LINTPRO requires minimal prior knowledge of linear programming techniques and is ideal for real applications as well as for teaching purposes. Data entry in Backus-Naur notation. Selection of optimality of solutions between 0% and 100%. Optional printing of intermediary steps and choice of branching strategies. Output includes optimal values of variables, value of objective function, slackness, shadow prices and it can be directed to screen or to a text file.

### CPA Critical Path Analysis

Written by Dr J. S. Dean

A comprehensive coverage of critical path analysis sufficient for most practical applications. Activities and durations are supplied as input and earliest and latest start and finish times for each activity, total float and critical path are obtained as output. Easy editing of inputs provides the possibility of analysing the sensitivity of solutions. A built-in calendar can give dates to any programme. Resources can be allocated to each activity. Suitable smoothing scheme is chosen and a resource bar chart is drawn. Results can be directed to printer or to text files. High-res plot of the node structure can be dumped on printer.

UNISTAT-II, LINTPRO AND CPA ARE AVAILABLE FOR: BBC B, PLUS AND MASTER SERIES, AMSTRAD PCW8256, PCW8512, IBM PC/XT/AT AND COMPATIBLES BBC versions: UNISTAT-II: £125+VAT, LINTPRO: £75+VAT, CPA: £50+VAT. AMSTRAD and IBM versions: UNISTAT-II: £150+VAT, LINTPRO: £100+VAT, CPA: £75+VAT.

Prices include post & packing within the UK. Official (government, university, local authority) orders are welcome. For orders from Europe add £5, from outside Europe £10. For BBC versions please indicate 40 or 80 track format. Cheques and correspondence to: UNISOFT LTD, P.O. Box 383, Highgate, London N6 5UP.





# THE RECURSION VERSION

Recursion is an alternative method to repetition and looping.  
The quicksort is just one application for it

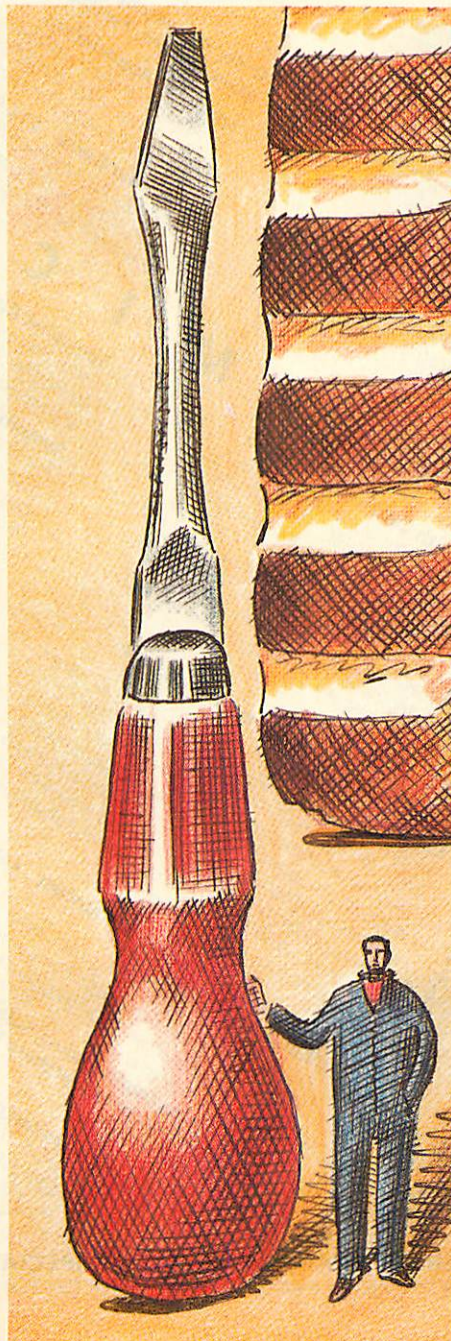
**Nick Wetherby**

**C**omputers are good at doing things repetitively, so much programming is about controlling repetition. BBC Basic has the FOR...NEXT and REPEAT...UNTIL structures to help you in this. Recursion is a programming technique that strikes terror into even experienced programmers, yet it is not really very different from these other two structures. Some computer languages, like Lisp, are built so strongly around the recursion concept that it almost replaces the other types of repetition.

Recursion is usually seen when a procedure or function refers to itself. So half way through doing a procedure, say, the computer goes back to the beginning of the procedure. And half way through the second time, it goes back to the beginning again... This illustrates a fundamental point about recursion – it must be controlled, otherwise it becomes the equivalent of an infinite loop.

One way to view the difference between repetition and recursion is that repetition is about building up the solution from something very small. Printing 10 dots is the same as printing one dot, but doing it 10 times. In contrast, recursion means breaking down the solution into something smaller and easier. Printing 10 dots is the same as printing one dot, then printing nine dots. And printing nine dots can be done in the same way, by printing a dot then eight dots.

What happens when we get to one dot? This is the same as printing a dot then no dots. But printing no dots can't be done recursively. So although recursion breaks down a problem into smaller and smaller parts, the very smallest part must not be



solved recursively. This places a limit on how much recursion occurs, and prevents it becoming an infinite loop. In general, there must always be two elements to a recursive procedure – the part that solves the complex bits by breaking them down recursively, and the part that solves the simple bits without recursion.

There is a function in mathematics called factorial – the factorial of, say, five is  $1*2*3*4*5$ , and it's often written as  $5!$ . The first listing in box 1 defines a function using a FOR...NEXT loop to work out the factorial of a number. Type in the program, then use the function by entering this:

**PRINT FNfactorial (5)**

This program first sets  $j\%$  to one, then uses a loop to multiply it by two, by three and so on, up to five. Experiment with other numbers too. You'll find that the number doesn't have to be very big for its factorial to be huge.

The other way of looking at the factorial function is to notice that  $4!$  is  $1*2*3*4$ . So  $5!$  is  $4!*5$ . This is the basis of the second, recursive, factorial function in box 2. Line 30 of this definition simply says that the factorial of a number is the number multiplied by the factorial of the next lower number. But the important bit is line 20. This controls the recursion, to ensure it doesn't become an infinite loop; it says, in effect, that the factorial of one is one.

These two programs show that recursion works, and in some cases it can even look simpler than repetition. The listing in box 3 is a recursive procedure that shows how any recursive program works. Type in the procedure, then type:

**PROClevel (5)**

The procedure prints the number five, then

# 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.

## ARCHIMEDES

**DeltaBase £29.95**  
Extremely powerful yet simple to use general Database. Over 8000 records, 255 fields and 16 subsets. Pull down Help Screens. Various screen modes. Extensive single or multiple criteria searches, sorts and maths facilities. Restructuring records is easy. Imports data from Viewstore, Betabase, InterBase, Mini-Office, etc.

**System DeltaPlus £69.95**  
Extensive Relational Database Management System. 2 billion records. 16 million fields. 24 million subsets. Infinite files open at once. Powerful WIMP database. Multiple user-definable print formats. Unrivalled, comprehensive maths, searches and sort. Mailing labels. Extensive Reporter. Card copier. Fully programmable or any Delta/Gamma File.

**GammaPlot £34.95**  
Versatile Graphics program. Multiple charts on screen at any time including pie, scatter, line, hist, 3D. On-Screen editor for text presentation. Macros. Entry by keyboard or any Delta/Gamma File.

**System GammaPlus £69.95**  
Graphics Management System. Multiple charts on screen at any time. Over 10 types available. Definable scaling and screen formats. Screen editor. Statistical analysis. Three dimensional charting. Macros. Fully programmable.

**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. 8 subjects. Up to 5 files open at any time. Find any record in 3 seconds. Extensive single or multiple criteria searches, sorts and maths facilities. Multiple print formats. Default 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 (Nominal £55.95)**  
Five comprehensive accounting modules for use separately or as integrated suite. Many advanced customisation if required. Total flexibility allows features as listed above. 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.

**System Sigma t.b.a.**  
Powerful Spreadsheet Management System containing the facility to design your own tailored system. To be released late 1987.

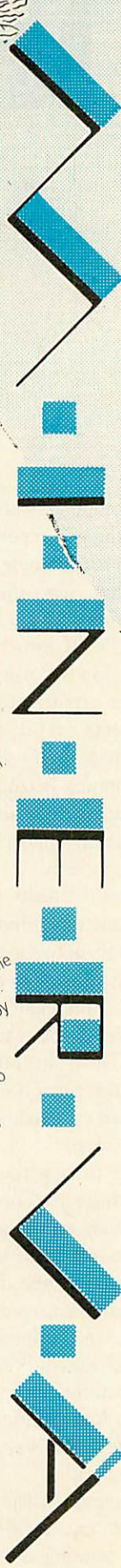
**System Delta Personal Accountant £69.95 each module**  
The only flexible accounting suite. Use modules separately or integrate. Contains many features not found on other micros including definable invoice layouts, varied discount structures on one invoice, archive mail order customers for future mailshots, 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.

**Order Processing/Invoicing, Sales Ledger, Stock Management, Purchase Ledger, Nominal Ledger.**  
**Specialist Applications**  
Flexible specialist software available for School Administrator, Video Rental, Newsagent, Hotelier, Genealogy (Timetabling coming early 1988)

**Minotaur Game £14.95**  
Full feature 3 dimensional animated maze type game. Unbelievable graphics. Use brains or force to kill the Minotaur.

**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.



**COMPUTER SOFTWARE AND SYSTEMS SPECIALISTS**

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

calls PROClevel again, this time using the number four. But the first PROClevel is left unfinished. The number four is printed, and PROClevel called again. The program continues to go down to a lower level, until it reaches level zero. In PROClevel(0), it doesn't call PROClevel(-1), but continues on to print the number zero a second time. Then the procedure finishes – but the program goes back up a level, and continues with the level one procedure it left unfinished earlier. Again, when this ends, it climbs back up through the levels until it finally finishes level five. Each different level can in many ways be thought of as a completely different copy of the PROClevel program. Whatever happens at the lower levels doesn't really affect the higher levels at all.

This shows that useful work can be done both on the way down through the levels of a recursive program, or later, on the way back up. The most complex programs can even do both.

So far the only variables we've used in these recursive procedures have been passed as parameters – given to the procedure in brackets. These parameters are special, but ordinary variables work slightly differently. Add these two lines to the listing in box 3:

```
15 a%=RND(100)
45 PRINT TAB(20); a%
```

Again, call the procedure by typing 'PROClevel(5)'. As before, you will see the program going down through five levels of PROClevel, then climbing back up to the top again. As it climbs down, the variable a% is set to a random number, and as it climbs up, the random number is printed. Yet all the numbers are the same. This is because although the program uses a new copy of the procedure each time, it doesn't automatically use a new copy of all the variables. It is the same a% that is used each time, so as the recursion climbs back up, the same random number is printed out. In fact, it is the number chosen last, at the very lowest level of the recursion.

Other languages like Pascal automatically use a new copy of all the variables in a recursive procedure. Basic has to be told to do so. Comal, the Pascal-like language widely used in schools in Scotland and in Europe lies somewhere in the middle. By defining a procedure as CLOSED, it means that all the variables in it are new copies, and also that they disappear when the procedure ends. In BBC Basic, a new copy of the variable a% can be created by adding the following line to PROClevel:

## 12 LOCAL a%

The idea is that the new copy of a% is solely for the use of this copy of the procedure. Each level has its own a%. So typing PROClevel(5) again will now display all the different random numbers. At, say, level three, the level three copy of a% holds the random number, and it isn't affected by level two. The level three a% is hidden from all the lower levels. When the recursion climbs back up to level three, the level three a% is revealed again, and can be printed out in the normal way. Local variables have to be used like this to preserve them from the effects of lower levels of a recursive procedure.

The space needed to store all these local copies is the major disadvantage of all recursive techniques – they require more

**TABLE 1. COMPARISON OF SORT SPEEDS**

Sort	Sort time (s)	
	100 items	10 items
Bubble	204.3	2.8
Shell-Metzner	53.1	1.8
Exchange	21.5	0.8

```
10 DEF FNfactorial (n%)
20 j%=1
30 FOR loop%=2 TO n%
40 j%=j%*loop%
50 NEXT
60 =j%
```

**Box 1. Factorial program using repetition**

```
10 DEF FNfactorial (n%)
20 IF n%=1 THEN =1
30 =n%*FNfactorial (n%-1)
```

**Box 2. Factorial program using recursion**

```
10 DEF PROClevel (n%)
20 PRINT SPC(n%); n%
30 IF n%>0 THEN PROClevel (n%-1)
40 PRINT SPC(n%); n%
50 ENDPROC
```

**Box 3. Procedure to illustrate recursion**

memory than ordinary repetition. If this is such a problem, then why use recursion? There are some problems ideally suited to recursive methods, where the recursive solution is much simpler to understand than a more conventional program. Fast sorting of lists using the quicksort method is one of these applications.

The basis of all the fastest sorting methods is that it takes less time to sort a short list than a long list. That is obvious,

but there is more to it. Halve the length of the list and you more than halve the time. Two short lists can be sorted in less than the time taken to sort one list double the length. Take a look at Joe Telford's results from last month. Table 1 shows the time taken by each of the three different methods of sorting Joe described, bubble sorting, exchange sorting and Shell-Metzner sorting. The exchange sort is also known as an insertion or selection sort. You might have different times depending which computer you have – the times in the table come from a second processor. There are times for two different sized lists, of 10 and 100 items.

With all the sorting techniques, dividing the length of the list by 10 makes an even greater difference to the number of swaps and the time taken. For random lists, this is true whatever method you use to sort them.

The fact that small lists can be sorted more quickly led to the development of the Shell-Metzner technique. Donald Shell, its inventor, also knew that the bubble sort, though very slow for long lists, works reasonably well for short lists, particularly if the list is already almost in the correct order. So the Shell sort works by splitting a long list into lots of small lists, then bubble sorting each of these separately. The short lists are then rejoined, and because each is already in order, final bubble sorting works much faster.

## Quicksort

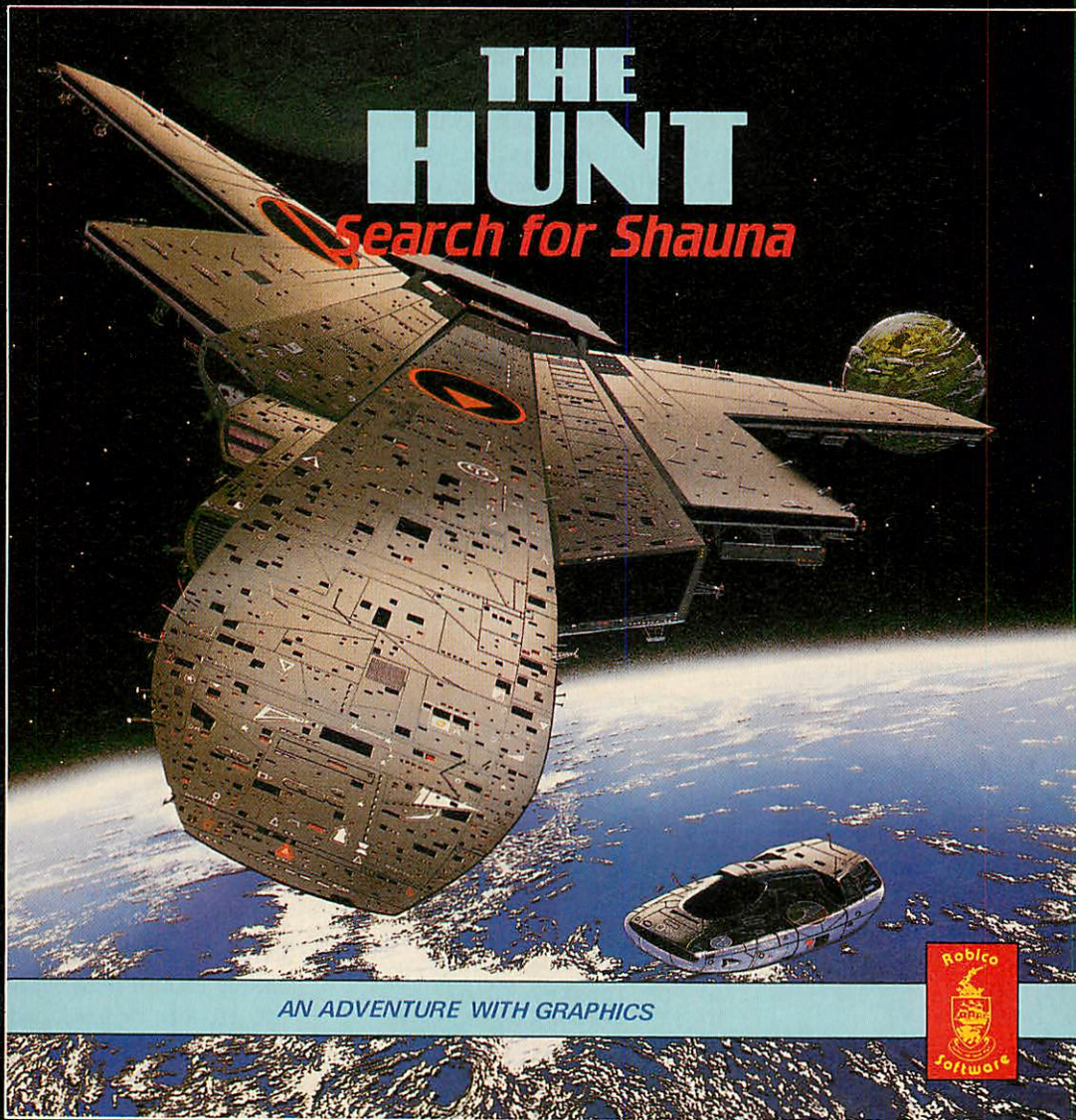
The quicksort uses the same idea. Starting with a long list, it takes the first item and calls this the key. It then scans through the list; all the items higher than the key are put to one side, all the lower ones on the other. When the whole list has been scanned, the key is in its correct place – between the higher and lower items. Usually, the key value is somewhere in the middle of the list. So scanning through the list just once gives you one item properly sorted, plus two separate lists. Of course, the two lists are on average nearly half the size of the original list, so they can now be sorted much quicker. Now, which method should be used to sort the two short lists? Why not just use quicksort again? This gives you four even shorter lists, which can all be sorted using the quicksort technique. So quicksorting is a natural application for recursion. The recursion stops, of course, as soon as the lists get so small they have only one item.

Listing 1 on the yellow pages shows how



**WE ENTHRALLED YOU WITH ENTHAR SEVEN.  
WE THRILLED YOU WITH THE RICK HANSON TRILOGY.  
NOW GET READY TO BE DAZZLED BY .....**

**FOR MASTER  
& ELECTRON  
AVAILABILITY**



**As the pilot of an intergalactic space craft, you have searched the galaxy for the kidnapper of your crew member Shauna. Your mission has led you to an enormous space station, devoted to scientific study and experimentation, where you have finally docked in berth 5820. Your space craft is battered and on the verge of collapse. Only the 'hull integrity system' is preventing loss of atmosphere and that, too, will fail in a few seconds time! Enter the exciting world of the Robico adventure of the year! THE HUNT Search for Shauna - It won't disappoint you.**



**BBC B, B + CASSETTE VERSION: £9.95  
5 1/4" DISK VERSION WITH SPECIAL DISK GRAPHICS: £12.95**

**ADVENTUROUS PEOPLE LOVE ROBICO**

**ROBICO, 3 Fairland Close, Llantrisant, Mid Glamorgan. CF7 8QH Tel (0443) 227354**

a list of random numbers can be quick-sorted. PROCchooselist first selects a list of random numbers; this list is printed by PROCprintlist. Then the list is sorted, and printed out again, together with the time taken to perform the sort. The length% variable can be used to experiment with different lengths of list, for example by typing the following:

```
60 length%=50
```

PROCquicksort does the sorting work. It divides the list into two, using two pointers lo% and hi%. These start at opposite ends of the list, and are moved alternately towards the middle; one is moved while the other points to the key item. When a swap occurs, the other pointer is moved. When they meet, everything above hi% is higher, and both hi% and lo% point to the key item. The two little lists can be sorted in the same way, using recursion. Notice that hi% and lo% need to be local variables, so they can be preserved while the recursion happens.

## Comparison

To compare the quicksort with some of the other methods, listing 2 on the yellow pages is a version that can be used in the same way as the programs from Joe's Jottings last month. Type in listing 2 and save it. Now you need to add Joe's listing 2. Load in his listing, then type:

```
RENUMBER 1000
*SPOOL MERGE
LIST
*SPOOL
```

This puts a text version of his program on disc (or tape), in a file called 'MERGE'. Now reload the quicksort program, and type this:

```
*EXEC MERGE
```

This adds the two programs together, and they can be saved or run. You can try to compare the times taken by the different sorting methods used last month with the quicksort. The quicksort entry in table 1 is 22.9 seconds for 100 items, and 1.15 seconds for 10 items, only slightly slower than the exchange sort.

It is more instructive to compare the sorts according to how many comparisons and how many swaps are made, since this is what takes up much of the time. Table 2 shows the results for the four methods, and reveals why they vary so much in speed. The bubble sort is the slowest, because it makes a large number of comparisons, and a large number of swaps. The Shell sort is quicker because it makes fewer comparisons and fewer swaps.

The speed rating is more confusing with

the exchange sort and quicksort. Notice that the quicksort makes many fewer comparisons, but more swaps. In this case, swaps take much longer than comparisons, and so the exchange sort comes out best overall. But this needn't always be the case. If comparisons took longer, or if swaps were quicker, then the quicksort would really be quickest, and the Shell sort would be speedier than the exchange method. Exchange sorts are best when swaps take much longer than comparisons, because exchange sorts minimise the number of swaps that need to be made. The time taken to do swaps depends on what type of data you are sorting.

Judging from this, there is clearly no one best sorting method. The best there is depends on the number of items there are to

change sort rather than calling the quick-sort again – because the exchange technique is best at short lists. To see how this works add the extra lines in box 4 and re-run the program.

## Calling process

The reasons for this increase in speed are twofold: first the elements in the list between 'bot%' and 'top%' are very nearly sorted already, and as previously mentioned quicksort isn't all that quick at sorting data that's already in order. Second, procedure calling in BBC Basic is quite slow, so when the quicksort gets down to the lowest level, it takes a long time simply calling itself! So the idea is to call the exchange sort when the sub-list gets small enough. The number 20 in line 305 controls how short the sub-list

**TABLE 2. COMPARISON OF SORT OPERATION**

Sort	Number of comparisons		Number of swaps	
	100 items	10 items	100 items	10 items
Bubble	4819	55	2106	29
Shell-Metzner	2444	68	452	15
Quicksort	760	31	218	11
Exchange	4950	45	92	7

sort, and the relative speed of comparing items and swapping items.

The final complication is that the speed of sorting depends on the order that the data is in to start with. If the list is already in the correct order, then the bubble sort turns out to be the quickest method, and the quicksort one of the slowest. In fact, the quicksort slows down if the data is sorted in any way! This can be shown by making a small change to PROCchooselist in listing 1:

```
190 list%(A%)=A%
```

This way, the list starts off already in order. Running the program shows that the sorting takes longer than when the list was random. It happens because the key value chosen is always the first in the sorted list. So instead of breaking the list into two much smaller ones, you are left with just one almost as large. This can be cured by selecting the key at random, rather than just taking the first in the list. Adding the following line speeds up the quicksort even more:

```
345 PROCswap(lo%,lo%-1+RND(hi%-1-lo%))
```

With this addition, the quicksort is equally good at sorting lists that are already in order and lists in random order.

One further speed increase can be gained by sorting the shorter lists with an ex-

```
305 IF top%-bot% < 20
PROCexchangesort(bot%,top%) :ENDPROC
480 :
490 DEF PROCexchangesort(bot%,top%)
500 FOR I%=bot% TO top%-1
510 L%=I%
520 FOR J%=I%+1 TO top%
530 IF list%(J%)<list%(L%) L%=J%
540 NEXT J%
550 PROCswap(I%,L%)
560 NEXT I%
570 ENDPROC
```

## Box 4. Speed increases for quicksort

must be before the exchange sort is called. Try varying it to come up with the best time. Lower values will only knock a couple of hundredths off the time because of the extra work needed, creating those local variables for example, in procedure calling. However, larger numbers will slow it down, as the actual quicksort routine is hardly ever used!

For any particular job, the sorting routine can be 'fine tuned' for the best possible performance, using a mixture of techniques, each doing what it is best at.

*Nick Wetherby's program listings appear in the yellow pages section.*

# 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 ALWAYS, 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.



Boxed, with detailed instruction booklet

**PRICE £15.00 (all inclusive)**

**NOW AVAILABLE**

## FIXGEN 87/8

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 1987/8. Simply type in the date, and the full fixture list is generated in seconds. Fully compatible with Poolswinner. Yearly updates available.

**POOLSWINNER with FIXGEN £16.50 (for both)**

## COURSEWINNER V3

**THE PUNTERS COMPUTER PROGRAM** 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 £15.00 (all inclusive) includes Flat AND National Hunt versions.**

ALL PROGRAMS AVAILABLE FOR: AMSTRAD CPCs, AMSTRAD PCWs, PC1512, All BBCs, All SPECTRUMS, COMMODORE 64/128.  
Supplied on tape (automatic conversion to disc) - except PCW and PC1512 (on disc - add £3.00).

Send Cheques/POs for return of post service to ...



phone 24 hrs



phone 24 hrs

37 COUNCILLOR LANE, CHEADLE, CHESHIRE SK8 2HX. ☎ 061-428 7425  
(Send for full list of our software)

# Klick

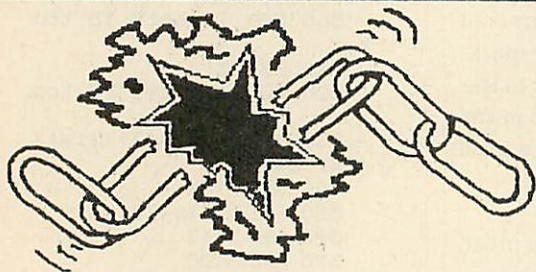
The flexible computer benching system



The Klick flexible benching system has been designed for constructing free standing benching which can be assembled quickly and easily. The Standard range is available in 3 heights and can be supplied with a selection of underbench storage units. The Flexi range provides the scope for any unusual size, height or configuration required. For product brochure and price list please contact:

**Store Stock Systems Ltd**, Claverton Road, off Floats Road, Wythenshawe, Manchester M23 9NE Telephone 061-998 9726

## ALPS - Adventure Language Programming System



Unshackle your imagination with the power of ALPS.

Because ALPS is a ROM it leaves you much more memory free for your games. You can have more evocative descriptions, a wider range of responses, better puzzles and so create more interesting adventures.

### Features:

- Compatible with B, B+ and Master 128
- 16K eprom ● user manual ● Utility disk or tape.
- Can create stand-alone games
- Sell your games and profit from your investment
- At least 27K free for data (using rom)
- Multiple commands ● synonyms ● abbreviations
- Auto exit reporting ● text editor
- Text compression ● over 80 commands
- Easy data entry/editing
- Puzzles ● mazes ● locked doors ● traps
- Secret passages ● vehicles ● and more. . .
- Includes a larger secret agent style adventure.
- Order now or send an SAE for further details. ●

To order ALPS, simply send details of your requirements with your name, address and cheque, postal order or Access/Visa card number to:

**Summit Software (Dept. AU)**  
PO Box 25, Portadown  
CRAIGAVON  
BT63 5UT

Or telephone 0762 42510

Prices (inc. P+P):

● Cassette £27.95 ● Disk £28.95

(Disk users, specify 40 or 80 tracks)

Watch out for further products in the Summit Software range.

● Trade Enquiries Welcome ●



# THE BIG MACRO

You can personalise letters using macros, but long addresses can be a problem. We solve it

**Graham Bell**

**Y**ou can use *View*'s macro facilities to produce lots of 'personalised' letters, mailshots and standard documents which differ only slightly from one to another.

This is doubly useful if *View* is teamed with a database such as *ViewStore*, because the parameter list for each letter can be taken from the database and inserted into the personalised letters.

All the macro parameters must fit on one line in *View*, and the line can only be 132 characters long. But what if the name, address and so on, add up to more than 132 characters? One way to overcome the limit is described here, together with a program to extract long macro parameter lists from *ViewStore* databases.

## Long macros

*View* is incapable of accepting more than 132 characters on a line. If more are typed in then the extra characters are ignored, and the machine beeps to signal an error. If a line of greater length is loaded from a file (for example a spooled Basic program), then the text is corrupted. Conversely, if the file is loaded in by *READING* it, or an attempt made to over-extend a line by using CTRL-f7, then the long line is split, and the excess characters appear on the next line down.

This affects the *ViewStore* MACRO utility, which is used to extract fields of information from a database and make up a series of *View* macro calls carrying the information from the database as parameters, one macro call for each database record. These macros are useful for standard letters, the names and addresses being taken from the database. Occasionally, the database fields selected for placing in a parameter list of a macro contain more than 132 characters for one or more records of

## USING MACROS

The way to personalise letters is to write one standard letter, but without any of the personal information, such as the address, filled in. Put parameters into the letter instead: the first parameter is @0, the second @1, and so on. So the beginning of a letter may look like this:

```
LJ @1
LJ @2
LJ @3
```

25th September 1987

Dear @0

When the letter is printed, the @0 gets replaced by a name, @1, @2 and @3 by the three lines of the address. To define the letter as a macro, put the edit command DM at the beginning of the letter, and EM at the end. The two-letter name of the macro goes after the DM.

To print the personalised letters, the macro must be called. This is done by putting the name of the macro in the *View* text after the EM, and supplying a list of parameters. If the macro is called AA, then the call may look like this:

```
AA Brian,Flat 3,Elm St.,Hull
```

and the eventual letter like this:

```
Flat 3
Elm St.
Hull
```

25th September 1987

Dear Brian

Clearly, it is easier to write a single letter and lots of parameter lists, than to write a new letter for each person.

the database. If this happens, the MACRO utility splits the line, and the excess characters are placed on one or more additional lines below the macro.

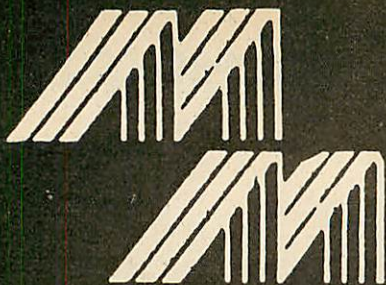
The *ViewStore* manual suggests that in this event, the list of parameters for the macro should be abbreviated in *View* so as to fit on a single line. Fine if only one or two macros overflow the limit, but what if one or two hundred do? If you keep a big database containing addresses of legal partnerships, or advertising agencies it will happen all the time, because their addresses are very long.

## Multi-macros

One solution to this is to split a standard letter into a series of two or more macros. For an example, see the macro definitions in figure 1. The two example macros AA and AB would, when used together, print out a letter, but each is incomplete on its own. This is a 'multi-macro'. Unlike a normal letter produced by passing parameters to a single macro definition, this multi-macro example would need two macro calls to complete it, and the two must be in the correct order. A set of calls to print one letter is also in figure 1. Of course, two macros isn't the limit; there can be several in each multi-macro.

All the parameters of a multi-macro can add up to more than 132 characters in total, providing that any one individual macro doesn't have more than this number of characters in its parameter list (so two macros with 100 characters-worth of parameters each is acceptable, but one macro with 200 is not). The other limit on macros, that there may be only 10 parameters, can also be solved this way.

For producing lots of standard 'personalised' letters it is easiest to produce a macro



# M & M COMPUTERS

Bon-Accord House

41 Albert Street, Aberdeen AB1 1XU

Tel: 0224-571735

Telex 739916

Incorporating MICROBANK LTD  
031 331 1716



ARCHIMEDES  
SOFTWARE  
NOW  
AVAILABLE

## BBC SOFTWARE

### COMPACT SOFTWARE

GAMES/ADVENTURES	R.R.P.
<b>BBC PUBLICATIONS</b>	
White Knight	£14.95
<b>CDS</b>	
Birdie Barrage Golf	£12.95
Steve Davis Snooker	£12.95
<b>MICRO POWER</b>	
Dr Who and the Mines of Terror	£9.95
Micro Power Magic	£9.95
<b>SQUIRREL</b>	
Games Disc	£14.95
<b>SUPERIOR</b>	
Revs/4 Tracks	£19.95
Elite	£19.95
Repton III	£14.95
Galaforce	£14.95
Karate Combat	£14.95
Repton 2	£14.95
Strykers Run	£14.95
Speech	£14.95
Citadel	£14.95
Acornsoft Hits Volume I	£14.95
Acornsoft Hits Volume II	£14.95
Codename Droid	£14.95
Around the world in 40 screens disc	£9.95
Superior Collection 1	£14.95
Superior Collection 2	£19.95
Grand Prix Construction Kit	£14.95
Crazy Rider Disc	£14.95
Palace of Magic Disc	£14.95
<b>TYNESOFT</b>	
Big K.O.	£12.95
Goal	£11.95
Jet Set Willy II	£12.95
Commonwealth Games	£11.95
Mousetrap	£11.95
US Drag Racing	£11.95
Vindaloo	£11.95
Winter Olympics	£11.95
<b>EDUCATIONAL</b>	
A.S.K.	£22.95
Best Four Maths	£22.95
Best Four Language	£22.95
<b>BBC PUBLICATIONS</b>	
Figures of Fun	£18.95
<b>HIGHLIGHT</b>	
Comp I	£19.95
Comp II	£19.95

### ELECTRON SOFTWARE

GAMES/ADVENTURES	
<b>MICRO POWER</b>	
Micro Power Magic	£7.95
Ghouls	S/O £7.95
Swag	S/O £6.95
Felix Meets Evil Weevils	S/O £6.95
Killer Gorilla	S/O £7.95
Felix in the Factory	S/O £7.95
Moonraider	S/O £7.95
Adventure	S/O £7.95
Galactic Commander	S/O £7.95
Bumble Bee	S/O £6.95
Chess	S/O £7.95
Croaker	S/O £7.95
Cybertron Mission	S/O £7.95
Danger UXB	S/O £7.95
Electron Invaders	S/O £7.95
Escape Moonbase Alpha	S/O £7.95
Frenzy	S/O £6.95
Felix & Fruit Monsters	S/O £7.95
Gauntlet	S/O £6.95
<b>SUPERIOR SOFTWARE</b>	
Elite	£12.95
Acornsoft Hits I	£9.95
Codename Droid Disc	£11.95
Codename Droid Cassette	£11.95
Acornsoft Hits II	£9.95
Ravenskull	£9.95
Repton III	£9.95
Thrust BBC/Electron	£7.95
Karate Combat BBC/Electron	£8.95
Citadel	£9.95
Repton II	£9.95
Repton II Disc	£11.95
Galaforce	£9.95
Galaforce Disc	£11.95
Codename Droid Disc	£11.95
Codename Droid Cass	£9.95
Crazy Rider Disc	£11.95
Crazy Rider Cass	£9.95
Palace of Magic Disc	£11.95
Palace of Magic Cass	£9.95
<b>TYNESOFT</b>	
Ian Botham Cricket BBC/Ele	£7.95
Jet Set Willy II BBC/Ele	£7.95
Future Shock BBC/Ele	£7.95
Goal BBC/Ele	£7.95
Winter Olympics BBC/Ele	£6.95
<b>U.S. GOLD</b>	
Impossible Mission BBC/Ele	£9.95
Questprobe	£7.95

### GAMES/ADVENTURES

Dr Who and the Mines of Terror Master B+	£9.95
Dr Who and the Mines of Terror (16K Rom + Cassette)	£8.95
Dr Who and the Mines of Terror (16K Rom + Disc)	£9.95
Castle Quest Disc	£7.95
Castle Quest Cassette	£6.95
Star Fleet Encounter	£9.95
<b>ACORNISOFT</b>	
4-Tracks	£9.95
Magic Mushrooms	£12.95
Boxer	£9.95
Bouncer	£9.95
Complete Cocktail Maker	£9.95
Snooker	£9.95
Terrapod	S/O £9.95
Drogna	S/O £9.95
Aviator	£14.95
<b>ACORNISOFT Disc</b>	
Snooker	£11.50
Magic Mushrooms	£14.95
4-Tracks Disc	£12.65
Aviator	£17.65
<b>ARCANA</b>	
View Professional	£113.95
Master Overview	£98.90
Powerplay Disc	£14.95
<b>AUDIOGENIC</b>	
Thunder Struck BBC/Ele	£7.95
Thunder Struck Disc	£11.95
Power pack	£9.95
The Last of Free BBC/Ele	£7.95
Pycastria Disc	£11.95
Pycastria BBC/Electron	£7.95
International Megasports/Genesis Project	£8.95
Complete	£19.95
<b>BBC PUBLICATIONS</b>	
White Knight MK12 Disc	£18.95
White Knight MK12	£29.95
Able to transfer to disc	
Maths with a Story I Disc	£10.95
Battlefields (Cassette)	£9.95
Picture Craft (Disc)	£17.34
Modem Master	£12.95
<b>SUPERIOR</b>	
Around the world in 40 screens disc	£7.95
Acornsoft Hits I	£9.95
Acornsoft Hits I Disc	£1.95
Acornsoft Hits II	£11.95
Acornsoft Hits II Disc	£11.95
Elite Disc	£14.95
Revs/4 Tracks	£12.95
Revs/4 Tracks	£14.95
Elite	£12.95
Ravenskull	£9.95
Ravenskull Disc	£11.95
Repton III	£9.95
Repton III Disc	£11.95
Strykers Run	£9.95
Strykers Run Disc	£11.95
Thrust Disc	£7.95
Thrust BBC/Electron	£11.95
Superior Collection Vol 1	£11.95
Superior Collection Vol 2	£11.95
Grand Prix Construction Kit	£11.95
Karate Combat Disc	£11.95
Karate Combat BBC/Electron	£8.95
Citadel	£9.95
Citadel Disc	£11.95
Repton II	£9.95
Repton II Disc	£11.95
Galaforce	£9.95
Galaforce Disc	£11.95
Codename Droid Disc	£11.95
Codename Droid Cass	£9.95
Crazy Rider Disc	£11.95
Crazy Rider Cass	£9.95
Palace of Magic Disc	£11.95
Palace of Magic Cass	£9.95
<b>TYNESOFT</b>	
Big K.O. BBC/Electron	£7.95
Big K.O. Disc	£12.95
Winter Olympics Disc	£12.95
Future Shock Disc	£12.95
Goal Disc	£12.95
Ian Botham Cricket Disc	£12.95
Commonwealth Games Disc	£12.95
Jet Set Willy II	£12.95
Jet Set Willy II BBC/Ele	£7.95
Future Shock BBC/Ele	£7.95
Goal BBC/Ele	£7.95
Ian Botham Cricket BBC/Ele	£7.95
Jet Set Willy BBC/Ele	£7.95
Winter Olympics BBC/Ele	£6.95
<b>U.S. GOLD</b>	
Impossible Mission Disc	£14.95
Impossible Mission	£9.95
Raid Over Moscow	£9.95

Rebel Planet	£9.95
Questprobe	£7.95
Bounty Bob	£9.95
Tapper	£9.95
<b>ULTIMATE</b>	
Cosmic Battlezones	£9.95
<b>BEAU JOLLY</b>	
Five Star Games 'B'	£9.95
Computer Hits III	£9.95
Computer Hits 2 Disc	£14.95
Computer Hits 2	£9.95
Computer Hits 10 games	£9.95
<b>BUG-BYTE</b>	
Plan B	£2.99
Dunjanz	£2.99
Skyhawk BBC/Ele	£2.99
Star Force Seven	£2.99
Roboto	£2.95
Twin Kingdom Valley	£2.95
Jack Attac	£2.95
Savage Pond	£2.95
<b>CDS</b>	
Brian Clough's Football Fortunes	£14.95
Brian Clough's Football Fortunes	£17.95
Colossus 4 Chess BBC/Ele	£9.95
Colossus 4 Chess Disc	£14.95
<b>DESIGN PEOPLE SOFTWARE</b>	
Tanks Disc	£12.95
Sink the Bismark Disc	£10.99
<b>DOCTOR SOFT</b>	
Double Phantom disc	£19.95
Phantom Combat Disc	£12.95
Phantom Combat	£9.95
<b>DOMARK</b>	
Young Players Full Edition	
Trivial Pursuit disc	£19.95
Young Players Question Pack (Trivial Pursuit)	£7.95
Trivial Pursuit	£14.95
<b>ELITE</b>	
Commando	£9.95
Air Wolf	£9.95
Air Wolf Disc	£14.95
<b>FIREBIRD</b>	
The Sentinel	£9.95
The Sentinel Disc	£14.95
<b>GREMLIN</b>	
Footballer of the Year	£9.95
Footballer of the Year Disc	£14.95
<b>IMAGINE</b>	
Yie Ar Kung Fu	£8.95
Yie Ar Kung Fu Disc	£12.95
<b>LEISURE GENIUS</b>	
Monopoly Disc	£14.95
Scrabble	£12.95
Scrabble Disc	£14.95
<b>MACSEN</b>	
Blockbusters BBC/Ele	£7.95
<b>MARTECH</b>	
W.A.R.	£8.95
W.A.R. Disc	£14.95
Samantha Fox Disc	£12.95
<b>MELBOURNE HOUSE</b>	
The Hobbit	£9.95
Lord of the Rings	£15.95
Way of the Exploding Fist	£9.95
Way of the Exploding Fist Disc	£14.95
<b>MIRRORSOFT</b>	
Strike Force Harrier	£9.95
Strike Force Harrier Disc	£12.95
Hi-Bouncer	S/O £6.95
<b>MOSAIC/LEVEL 9</b>	
The Secret Diary of Adrian Mole Disc	£12.95
<b>OCEAN</b>	
Daley Thompson Supertest D	£14.95
Yie Ar Kung Fu II	£8.95
<b>BUSINESS SOFTWARE (MASTER)</b>	
Guest Sense (Guest House & Hotel package)	£172.50
Fix Sense (Fixed Asset package)	£172.50
Per Sense (Personnel package)	£172.50
Also available for IBM, Amstrad & Apricot equipment.	

### H S SOFTWARE

<b>READ-RIGHT AWAY</b>	
Reading Pack 1. Age 5-8 years	
For the BBC Model B Disc	£11.95
<b>ADVENTUROUS ENGLISH</b>	
English Grammar & Language Skills	
Age 7-11 years Disc	£7.95
<b>CROSSWORDS</b>	
Range 8 years to adults	
For the BBC/Electron Disc	£7.95
<b>ENTERTAINING ENGLISH</b>	
English Language Skills	
Age 7-11 years for the BBC 'B' Disc	£11.95

### POSTAGE & PACKING ON SOFTWARE

All prices include VAT at 15%  
For Software add £1 for outside Scotland,  
and 50p within Scotland, for orders over  
6 games post & packing is FREE.

E.O.+E.

Mail Order

To: M & M COMPUTERS, Bon-Accord House, 41 Albert Street Aberdeen AB1 1XU  
Please send me

I enclose a cheque for £..... payable to M & M COMPUTERS.

Please debit my Access/Visa Account

No.

Name

Signed

Address





file automatically from a database; these multi-macros are no exception. *ViewStore* normally uses the MACRO utility, but this can only produce a series of calls to a single macro, one call for each record in the database (or one for each record in the SELECT file). VSMACRO, listing 1 on the yellow pages, can produce a macro file containing a series of calls to a multi-macro, which can be composed of several individual named macros.

There is an important consequence of the VSMACRO method. The macro parameters produced are of fixed format; the number of characters in each field (@0, @1, @2, etc) is controlled, and the parameter is truncated or padded out with spaces as necessary (but see below if space padding is not to your taste). The standard MACRO utility produces parameters that are of variable length, so a name could be five or 50 characters long – with VSMACRO the length will always be the same.

### How to use VSMACRO

Type in the Basic program in listing 1, save it using a name like 'MACROSC', then run it. The Basic program should assemble and save the machine code file 'VSMACRO'. If you are using ADFS, then the sub-directory 'V.' must be created first.

There are two steps in producing a file full of multi-macro calls from your database using VSMACRO. First, in *ViewStore*, a report definition is set up to describe the fields that should be taken from the database and put into the macros. The report definition has a special layout that is described below. Then, in *ViewStore* command mode, the VSMACRO program and the database are loaded, the REPORT utility is used to 'print' a report. VSMACRO creates the macro file from the report.

The macro file can be combined with the multi-macro definition in *View*, to print a whole set of 'personalised' letters – a process often known as mailmerging.

The first operation is to create a blank report definition file, using the SETUP utility in the normal way. Now you can enter the information that defines which fields to take from the database to use in the macro to load the new blank definition file called, say, 'ADDRS'

```
LOAD R.ADDRS REPORT
```

Now switch to the data screen, by pressing Escape, to see the blank definition file. You must enter one line of data for each macro you plan to use, so that means two or more lines for a multi-macro. Obviously, the macros in the report definition should be in

the definitions of the AA and AB macros:

```
DM AA
RJ Ball & Co. Lighting Services
RJ 14 Railway Cuttings
RJ Derby, DE1 9QQ
RJ @0
LJ @1
LJ @2
LJ @3
EM
DM AB

@0

CE New Improved Specification

We wish to bring to your attention our new
"Executive" range of wall-mounted lamps
light fittings...

Yours @1,
Edwin Ball

PE
EM
```

an example call to AA and AB:

```
AA 30.8.86,17 Whin Terrace,Thornthwaite,Durham
AB Attn: Joseph Addyman,sincerely
```

Figure 1. *View* multi-macro definition and example call

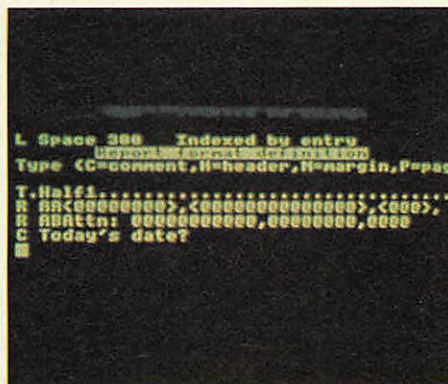


Figure 2. *ViewStore* report definition

the order they are required in the multi-macro. There are three types of information to be entered for each macro: type, format line and field list.

Type must be R for every macro. There must be no other line types except comments – no header lines, sub-totals or totals.

The format line (placed in the fields called Half1 and Half2 as normal) must start with a two-letter name for the macro, as used in the macro definitions. For example, the names used in figure 1 were AA and AB. The name must be different for each macro and must not clash with normal *View* edit commands like PL or LS. Immediately after the macro name, the patterns or formats may be listed. These are the @@@@ parts

of any normal report. Each format will be replaced by information from the database when the macro file is created. Separate the formats with commas, not spaces. If the format might be replaced by information that could include a comma, surround the format by angle brackets. These characters are necessary so *View* can interpret the macro parameters correctly. Finally, put an extra four characters format at the end. So a complete format line looks like this:

```
AC#####,@b.b,<#####>,####
```

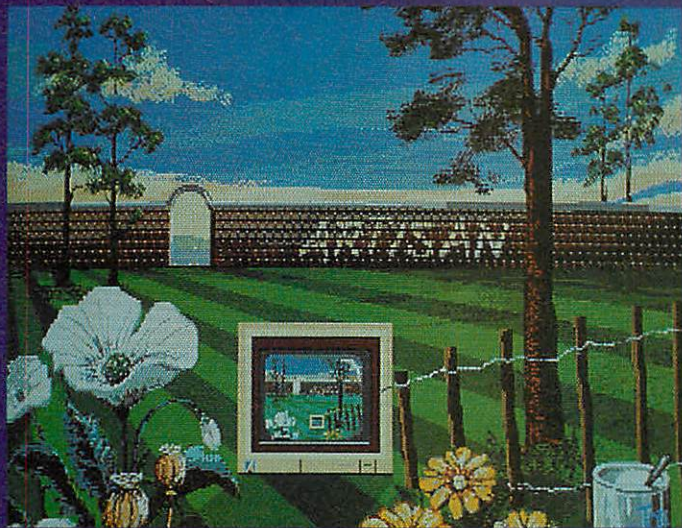
Here, the macro AC has four parameters; the second is a number with one decimal place, the third may include a comma. If the information from the database is too short for the format (a six-letter surname in a 15-letter field, for example), then the parameter will be padded with spaces. If the information is too long, then it is truncated.

Just as with a normal report, the field list must contain one item for each format in Half1 and Half2. The item may be a field name (the name of a field in the database), an arithmetic expression or a comment. Register operations may also be included, but they don't need a corresponding format in the format line. The item for the extra last format should be 'R'.

A complete example to define a multi-macro for the standard letter in figure 1 is

# rchimedes

## HARNESS THE POWER



A computer like ARCHIMEDES needs software that can match its outstanding capabilities. Our new products do just that and one of the first areas that you will want to explore is the graphics capability. ARTISAN, from the authors of ARTROOM, is the ultimate in graphics packages. Just take a look at the screen shot reproduced here, as they say 'a picture is worth a thousand words'. We can't describe all the features here but some major functions are:

- Full screen
- Fast multi level scrolling zoom
- Image distortion
- WIMP environment
- Magic brush
- ECF designer

Plus all the usual features and some very unusual ones too.

**£39.95**

### —COMPETITION—

PICTURE THIS

Can you do better than the picture shown here? If so you could win yourself a unique prize. If yours is judged to be the best picture then your masterpiece will be transferred to canvas by our artist Jon Warmisham (BA Hons Fine Art). The competition is open ended but the best picture each month will be featured in ACORN USER and a monthly prize will be awarded. Full details are contained in the ARTISAN pack.

## Alpha-Base

Alpha-Base is the successor to the hugely successful Beta-Base, the top selling database for the BBC micro. Beta-Base files can even be transferred to Alpha-Base.

Alpha-Base incorporates all the suggestions and requests that we have received over the last five years. All of the standard Beta-Base facilities are there but in a much improved form. In addition there are many new features that will make your life easier. Some of the features are:

- Free format screens
- Multiple pages per record
- 400 fields & 27,600 characters per record
- 2.14 billion records per file
- Multiple display & entry forms
- Fast search & sort options
- Plain English entry of search criteria
- Five data types including formula & date
- Winchester compatible

At Clares we try to give you usable programs. This results in some arbitrary limits on the size of files in Alpha-Base. The limits of 400 fields and 27,600 characters per record are unlikely to restrict you but they enable us to save memory and provide additional features. The only other limitations are due to the hardware. Alpha-Base can handle 2.14 billion records but the ADFS can't!

**£49.95**

## IMAGE WRITER

IMAGE WRITER is a sophisticated WIMP based wordprocessor with the ability to include graphics as well as to use various font combinations. Because Image Writer is document based you do not have to create page layouts for every page. You prepare your whole document in one go. Just type it, add the graphics and print it—simple. The graphics can be created with the built in graphics editor. Image Writer is designed as a first level DTP product and it uses the normal printer fonts to print both text and graphics in one pass. We will of course be producing a full feature DTP when ARCHIMEDES supports the fancy font printing. Image Writer will be available when you read this so please contact us for more information.

**£29.95**

## ARCHIMEDES TOOLKIT MODULE

ATM is the first toolkit available for this powerful new micro. Many of the features that made RAMROD a top seller have been incorporated into ATM and a whole host of new features have been added including:

- 10 Memory and disc editors
- 8 Memory and disc searches (inc. wildcards)
- A scrolling disassembler
- A one line assembler (accessed from the disassembler)
- Shift and compare functions
- Catall and Exall for discs
- Winchester compatible

If you want to explore your ARC then order the ARCHIMEDES TOOLKIT MODULE today. It has enabled us to disassemble modules, discover many undocumented SWI calls and has been an invaluable aid in debugging software. You can even search for mnemonics.

**£39.95**



ALL PRICES INCLUDE VAT and P+P  
OVERSEAS ORDERS ADD £4



DON'T FORGET, YOU CAN ORDER WITH ACCESS CARD TOO!

98 Middlewich Rd Northwich  
Cheshire CW9 7DA Tel: 0606 48511

given in figure 2. Notice how a comment is used to add the appropriate date to the letter. The 'Attn.' before the name field is added to the macro parameter, rather than being extracted from the database.

When you have set up the report definition file, press Escape to return to *ViewStore* command mode.

## Spooling multi-macro calls

VSMACRO is a custom printer driver. From *ViewStore* command mode, it is loaded using the command:

```
PRINTER VSMACRO
```

This printer driver should only be used to 'print' specially formatted reports as above.

The database from which information is to be taken must also be loaded. Then type:

```
UTILITY REPORT
```

to start the REPORT utility, and answer the questions as shown in figure 3.

The information is then extracted from the database by the REPORT utility, and the macro calls are put into a file. One macro or multi-macro call is produced for every record in the database, or one for every record in the SELECT file if the SELECT option was chosen. A completed multi-macro file loaded into *View* is shown in figure 4.

If an error occurs while this process continues, or Escape is pressed, then the files are closed and the program returns to *ViewStore* command mode.

The macro file can then be loaded into *View* for checking, or merged with the letter file – the file containing the text of the standard letter. The easiest way to print the set of letters is to enter *View* and type:

```
NEW
PRINTER FX80
```

to load the driver for your printer, then

```
PRINT LETTFIL MACRFIL
```

will print the set of personalised letters. Your own filenames should be used instead of LETTFIL and MACRFIL.

The letter file contains only the definitions of the multi-macro making up the standard letter – the macro file contains just the macro calls, with parameters extracted from *ViewStore*.

## Advanced use of VSMACRO

The padding spaces left at the end of the macro parameters can be removed if you don't like them. Load the macro file into *View* and type:

```
CHANGE/ ,/,/
```

```
CHANGE/ >,/>,/
```

then resave the file. The excess spaces are recognised by the fact that they precede a

```
Use select file (N,Y)? Y           or N if you want one
                                   letter for every
                                   record in the database

Screen or printer (S,P)? P         or S for just a quick
                                   preview of the macros

Use report format file (N,Y)? Y

Report filename? <report file>    enter the name of the
                                   special report defin-
                                   ition file

Send totals to linking file (N,Y)? N

Subtotal field? <RETURN>          no subtotals required

Single sheets (N,Y)? N

                                   the machine prompts
                                   for answers to any
                                   comment lines here

Macro filename? <macro file>     enter the name of the
                                   macro file
```

Figure 3. Using *ViewStore*'s REPORT utility to create a multi-macro file

```

01 .....*****
02 C015 Sup 1985, (Shoade Printers ) , (1 Latimer Rd. ) , (Gr
03 175.00, (0467 ) , (27.4.87 ) , 1
04 C015 Sup 1985, (Clerby Journal Publ. ) , (Print Works ) , (65-
05 225.07, (04491) ) , (25.4.87 ) , 2
06 C015 Sup 1985, (C1-Flu Pumps PLC. ) , (Slater House ) , (10a
07 21.32, (071103 ) , (28.4.87 ) , 3
08 C015 Sup 1985, (Helixmo Engineering Ltd. ) , (Unit 4, Daxler Rd. ) , (11a
09 203.15, (101114 ) , (15.4.87 ) , 4
10 C015 Sup 1985, (Systemic Pipework Ltd. ) , (24 Spring Lane ) , (Chh
11 46.00, (07303 ) , (17.4.87 ) , 5
12 C015 Sup 1985, (Systemic Pipework Ltd. ) , (24 Spring Lane ) , (Chh
13 32.81, (06097 ) , (27.4.87 ) , 6
14 C015 Sup 1985, (Thermax Heating ) , (61 Railway Cottings ) , (Lit
15 5.33, (0800002) ) , (19.4.87 ) , 7
16 C015 Sup 1985, (Thermax Heating ) , (61 Railway Cottings ) , (Lit
17 11.37, (0800001) ) , (17.4.87 ) , 8
18 C015 Sup 1985, (Thermax Heating ) , (61 Railway Cottings ) , (Lit
19 22.86, (0800003) ) , (22.4.87 ) , 9
*****

```

Figure 4. Multi-macro file in *View*

```

Feedback Hydraulic Services
307 Four Mile Lane
Hemel Hempstead
Herts.
HP3 7JH

20th Sep 1987

Accounts Department
Thermax Heating
61 Railway Cottings
Littleton
Herts.
HP3 7JH

Dear Sir,

I enclose a cheque for £ 22.86 in respect of your invoice
of 22.4.87, reference 0800003. I hope that you find
this to your satisfaction.

Yours faithfully,

Howard Jenkins,
Director.

```

Figure 5. Standard letter printed using *View*

comma, and are deleted. Neither the ordinary spaces adjacent to commas, nor the leading spaces appearing before numbers, are removed as these spaces occur in their usual place, after a comma. This is exactly what is required to keep everything neat.

The real function of the extra | R field at the end of the *ViewStore* field list is to

ensure this stripping works properly on all current versions of *View*. A comma and any single character would do, but using | R has the side effect of serial numbering all the multi-macros (up to 9999). The number isn't printed in the letter and has no effect on the macros. If you do want to number the letters, then you can use this extra field – if a *View* macro definition normally has four parameters, @0 to @3, then @4 is the serial number.

This method offers one more facility: the ability to join two or more pieces of information together, to produce a single macro parameter. The standard MACRO utility insists that one database field equals one macro parameter. But consider this format line:

```
AD<@@, @@@@@@@@@@@@@@@@@@>, @@@@
```

The macro AD has only one parameter, discounting the extra one at the end of | R, because *View* will treat the two formats enclosed by angle brackets as one single parameter. But the formats will be replaced by data from two database fields. So you could join, say, a job title field and a company name field. The macro call might eventually be:

```
AD <MD, Zinc Coating Ltd>, 1
```

The space and the comma after 'Sales executive' are derived explicitly from the format line, like the 'Attn.' in the figure 2. example. If you joined parameters like this, then it will almost certainly be necessary to remove the padding spaces from the fields, to keep the parameters neat.

# PINEAPPLE SOFTWARE

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

## DIAGRAM II

### SUMMARY of DIAGRAM II FEATURES

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 8\*8 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 1/2 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 4/4 or 8/8 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 1/2 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.

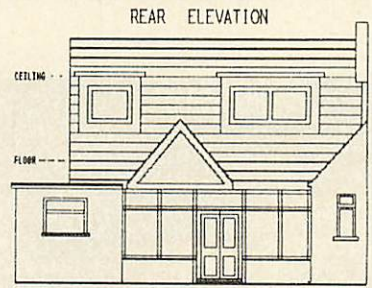
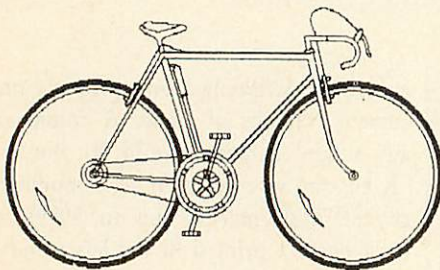


Diagram II consists of a set of disc files and a 16k Eeprom. The disc supplied is formatted in 40T on side 0 and 80T on side 2. Please state if this is unsuitable for your system, or if you require a 3.5" Master Compact disc.

**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 draughting 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 Eeprom 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".

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**

## 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

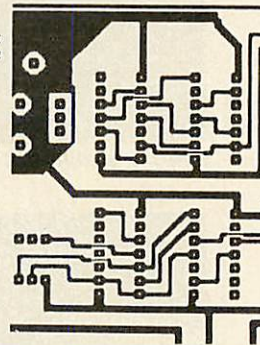
All orders sent by return

VISA

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

Access

## PCB PLOTTER DRIVER



A new addition to the PCB software is the PCB plotter driver program. This enables files produced by PCB to be used in conjunction with most types of plotter to produce plotted output rather than the normal dot-matrix printer output.

In this way plots may be produced directly onto film or even directly onto copper board with an etch resistant pen if a suitable plotter is available. The program is suitable for use with most makes of plotter including Hewlett Packard, Hitachi and Plotmate M. The program can also be configured to work with other plotters by entering suitable plotter instructions.

All the features of the printer driver are included, such as the automatic thinning down of tracks between roundels. Mirror image plots are also available.

**PRICE £35.00 + vat**

## 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 20 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 comparison, 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 onto multiple floppies.

Additional commands include: \*ADU, \*BACKUP, \*CATALL, \*CHANGE, \*DFSDFS, \*DIRALL, \*DIRCOPY, \*DIRDESTROY, \*DIRRENAME, \*DISCEDIT, \*DRIVE, \*FILEFIND, \*FORMAT, \*KILLADU, \*LOCK, \*MENU, \*PURGE, \*PURBK, \*UNLOCK, \*VERIFY, \*WFORMAT.

**PRICE £29.00 + vat**

# The System utility from KM Software Ltd

Due to the pending release of custom utility chips we are reducing price of system to clear stocks.

Extra commands for BBC B & Master users, Master features include CMOS editor, CHARSET to move the character set into private ram, PVIEW private ram editor.

For the BBC B user it implements the MASTER rom handlers (INSERT/UNPLUG etc), disabled roms stay off even over a CTRL+BREAK.

Plus commands which can be used by both BBC B & MASTER, GPACK (powerful screen packer), Very powerful disassembler (6502, 65C12, I/O, tube, labels etc.), memory editors, Down loader creator, Bad Program recover, Mode designer, Tube editors, Formatter, Verifier etc.

PRICE ~~£25.00~~ £17.50

Also available KM'S Sound to Light converter, This chip contains 10 different screens with an amazing 63 colours and responds instantly to sound input to the cassette port. Just play your favourite music and watch the colours and patterns flow.

PRICE ~~£12.50~~ £10.00

Send orders to: KM Software Ltd., 39 Clos des Ormes, Rue Verte, St. Lawrence, Jersey C.I.

# STACK COMPUTER PRODUCTS

## LIGHTPEN + DRAW SOFTWARE + 10 GAMES

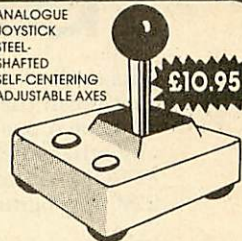
£28



- VERY ACCURATE
- TAPE & DISK
- B, B+, 128 MASTER
- ALL MODES

- ANALOGUE JOYSTICK
- STEEL-SHAFTED
- SELF-CENTERING
- ADJUSTABLE AXES

£10.95



- EAST TO USE
- SPECIAL TOUCH SWITCH
- FULL YEARS WARRANTY (SPECIFY 40/80T DISK)

## DIGIMOUSE & GRAFIK B, B+, MASTER etc.

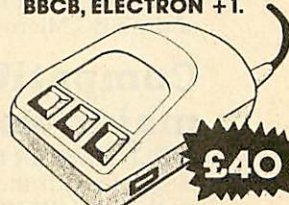
£34.95



- 100% AMX COMPATIBLE
- LINEAR LOCK FEATURE
- FREE SOFTWARE (40T DISK)
- BRITISH QUALITY PRODUCT
- COMPACT VERSION AVAILABLE

## ANAMOUSE & MOUSEPAINT BBCB, ELECTRON +1.

£40



- ANALOGUE MECHANISM
- COLOUR SOFTWARE (TAPE)
- PRINTER DUMP
- THUMBWHEEL
- FULL YEAR WARRANTY

FREE 40 PAGE CATALOGUE  
ON REQUEST PRICES  
INCLUDE VAT P & P £1.90  
(FREE OVER £20)

MEEDMORE LIMITED  
28 Farriers Way, Netherton  
Merseyside L30 4XL  
Tel: 051-521 2202

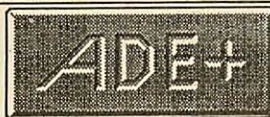


NEW TECHNICAL REFERENCE  
GUIDE NOW AVAILABLE!  
£12  
Please contact us for further details.

# At last a machine code development system that really does outperform ADE

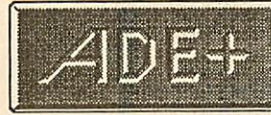
## SYSTEM Software

5th Floor  
Sheaf House  
Sheaf Street  
Sheffield  
S1 2BP  
Tel: (0742) 768682



### Features

- Runs on BBC B, B+, Master, Compact, ADFS, DFS, ANFS, NFS
- Full use of all available RAM
- Intelligent memory management unit (MMU)
- User switches on all main features
- Automatic search for macros on disc
- Assemble absolute or relocatable code
- Source program tokenised or full text
- REPEAT..UNTIL, WHILE..WEND etc. high level language constructs
- Macros nestable to any depth
- Excellent error diagnostics
- Linker
- Editor and symbolic disassembler provided



### Versions and prices

**Recommended for Master Compact...**  
ADE+ MMU and 65C00 series assembler on disc (3.5" ADFS). 32K sideways RAM required.  
**£42.00 + vat**

**Recommended for BBC B, B+ ...**  
ADE+ MMU and 65C00 series assembler on 2 16K EPROMS with DFS 5.25" utilities disc.  
**£46.00 + vat**

**Recommended for Master 128, turbo...**  
ADE+ MMU and 65C00 series assembler on EPROM cartridge with 5.25" DFS utility disc.  
**£49.00 + vat**

**Upgrade**  
ADE to ADE+ (upgrade to either disc, EPROM or cartridge, you must send in ADE ROM chip)  
**£27.00 + vat**

**Upgrade**  
ASM to ADE+ (upgrade to either disc, EPROM or cartridge, you must send in ASM ROM chip)  
**£35.00 + vat**

Please add £1.25 P&P per unit.



### The Ultimate Assembly Language Development Tool

ADE+ is a 65C00 series assembler system supporting all the mnemonics of the 65C12 used in the latest BBC microcomputers plus the additional 'Rockwell' instructions. ADE+ is fast, faster in fact than the in-built BASIC assembler and all rival products that we have tested. The assembler produces absolute code that can be \*RUN or linker modules that can be merged with the output from other programs using the ADE+ linker. ADE+ supports a powerful linker which drastically cuts assembly time; a feature normally only found on minis and mainframes. The linker will even link the output from compilers with your assembly language programs. Full library support for both the linker and the assembler is provided - fast searching for unknown instructions in a random access macro library. ADE+ is a modular system with many modules to add later; i.e. a mouse based editor & a Z80 cross assembler! A print spooling system uses sideways RAM as a print buffer to eliminate waiting time; your listing runs off as a background job! Use the print spooler from BASIC or your own programs. ADE+ uses ALL available memory. With a second processor attached the IO processor spare memory is used as a buffer to reduce the amount of disc access. All available memory is handled by ADE+'s intelligent memory management module. Use your own favourite editor or the one provided. Assemble from disc or memory. Full utilities including librarians, converter for BBC BASIC etc. ADE+ must be the bargain of 1986/7!

### A comparison of three 65C12 assemblers

Feature	ADE +	BBC Basic	MACROM
Number of pseudo-ops	64	4	36
Use of all available RAM	Yes	No	No
Macros	Yes	No	Yes
Relocatable output	Yes	No	No
Linker with libraries	Yes	No	No
High level constructs	Yes	Yes	No
Number of error reports	39+warnings	34-BASIC errs	20
65C00 extended opcodes	All	65C 12 only	65C1 2only
Switch off 65C 12 opcodes	Yes	No	No
ROM size	32K	16K	16K
Disassembler	Yes	No	Yes
Label restrictions	No	Yes	Yes

# SPELL-MASTER

This is the first completely ROM based spelling checker in the world. As a result it out-performs all known spelling checkers on this machine or any other micro-computer. The single 128K EPROM contains over 59,000 separate words and 22K of program.

## Compatible with all BBC Micros

Special switching techniques ensure that the 128K ROM appears to the machine as one single 16K ROM - this guarantees that it is completely compatible with the ROM sockets in all versions of the BBC Micro-computer.

## Compatible with all the major word processors

SPELL-MASTER has been designed to fully integrate with the most popular word processors on the BBC, WORDWISE and WORDWISE PLUS, VIEW and of course INTER-WORD. While editing in these word processors all that is necessary to control SPELL-MASTER is to press one CTRL key (Usually CTRL-J). This causes a menu to appear listing a variety of options such as 'Check entire text', 'Check word at cursor', 'Continuous check - on/off' etc. Text is checked directly in memory while in the word processor. There are even short-cuts to the menu, for example, pressing CTRL-V in any of the above word processors will start checking the text immediately from the current cursor position. Compare this with the process of checking text in the most highly rated competitive product - VIEWSPELL.

VIEWSPELL	SPELL-MASTER
<ul style="list-style-type: none"><li>•Save text from word processor.</li><li>•Enter spelling checker.</li><li>•Load text into spelling checker.</li><li>•Check the text.</li><li>•Go back to word processor.</li><li>•Load marked text.</li><li>•...finally, make corrections.</li></ul>	<ul style="list-style-type: none"><li>•Press CTRL-V</li><li>• make corrections.</li></ul>

## Check entire text

In a word processor, SPELL-MASTER can check at up to 10,000 words per minute. Whenever a word is indicated as misspelt the user is given three simple choices. Replace the word with another selected from the dictionary, ignore the word altogether or add it to a user dictionary.

## Check as you type

Because the dictionary is ROM based it is possible to check words as they are typed. This feature works with all the above named word processors and does not slow the operation of the word processor at all. Whenever an

incorrect word is entered the computer will beep; the word may then be corrected or simply ignored.

## User Dictionaries

SPELL-MASTER supports extensions to the main dictionary in sideways RAM or ROM. This has the advantage that there is no speed degradation when checking against user dictionaries, since there are no disc accesses required at all. Once a word is added to a user dictionary it is treated as if it is present in the main dictionary.

SPELL-MASTER can support a number of separate dictionaries at once, each sideways RAM or ROM holding up to 3000 additional words. Once a dictionary has been created it can be 'burned' into an EPROM to form a permanent extension to the main dictionary.

Provision is made for editing any dictionary extension, for adding or deleting words in bulk, and directly loading or saving user dictionaries from or to sideways RAM.

## Additional star commands

These can be issued from any language ROM such as spreadsheets or BASIC (they can even be included into BASIC programs). Some of the 8 commands are:

\***CROSSWORD** - Will search the entire dictionary for words that exactly fit the search pattern. For example \*CROSS. ##M#U#ER would list ARMOURER, COMMUTER, COMPUTER. It takes about 8 seconds to check against all 59,000 words.

\***ANAGRAM** - Will list all the words in the dictionary that contain the same letters as those specified.

\***FUZZY** - Will list all words that sound something like the one you are searching for. If you are not sure of the spelling of a word then entering the approximate spelling here will generally list the word you are looking for.

**Price: £59.00 incl.**

## Upgrades

Owners of the older two chip versions of SPELL-MASTER can upgrade to the single chip version for £25.00. However this new version is functionally equivalent and so it should not be necessary to upgrade.

## 2nd processors

Due to its unique design SPELL-MASTER will not work with word processors running on the 6502 2nd processor, although there are facilities provided for checking long text files.



Computer Concepts



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

# COMPETITION

## JOIN THE HUNT

Solve this logic puzzle and gain the chance to tackle a whole lot more in Robico's *The Hunt*

**Stuart Anderton**



Regular *Acorn User* readers Nigel, Sarah, David, Philip and Gary visited the *Acorn User* exhibition. They each now have a different Acorn computer – an Electron, a Compact, a Master, a BBC B, and one even managed to buy an Archimedes at the show.

On emerging from the Barbican they had with them a mouse, a joystick, a trackerball and a lightpen. One of them enjoyed a great time playing with the Domesday system, and had spent her hard-earned cash on the Marconi stall. David's computer is the oldest; he bought it almost exactly

five years ago! The Compact owner was tired of playing arcade games with the keyboard, and was itching to get home to try out his new purchase.

Philip's machine is the only one not to carry the BBC name. Nigel was very impressed by the RISC technology he saw at the show, and has since resolved to upgrade from his eight-bit machine as soon as possible.

Can you work out who has which computer and what input devices they have fitted? By the way, the lightpen isn't fitted to the Electron.

This month's competition is a logic problem based around the Acorn micros. The prize is the latest great adventure from Robico. We have 10 BBC B copies of *The Hunt: Search for Shauna* to give away to the winners who can work out the puzzle above, five on disc and five on cassette. State which version you would like.

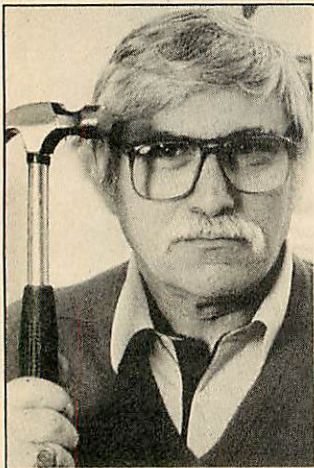
It's an adventure game set in a science-fiction future, with graphics for each loca-

tion. The aim is to rescue a former space shipmate Shauna from a kidnapper on a vast space station.

Put your answers to the problem on a postcard, or write them on the back of a sealed-down envelope. Send them to *Acorn User Hunt Competition*, Redwood Publishing, 20-26 Brunswick Place, London, N1 6DJ, to arrive by December 7. Don't forget to include the coupon on this page

with your entry – entries can't be accepted without it – and don't forget to include your own address too. The winners will be the first correct entries pulled out of the hat on December 7 and will be notified by post. The editor's decision is final.

ACORN USER  
COMPETITION  
NOVEMBER



# Snapper King turns nasty!

We advertised some months ago that our Harold had broken 2000 on Snapper and that he was going for 3000. Well he is still some 800 short of the target - and he's not very pleased about it. If you visit our shop to see our wide range of BBC hardware and software, just don't mention anything about Snapper. Look at our printers, keyboards and books by all means, but remember, Harold keeps the hammer behind the counter!

**NUMBER ONE IN BROMLEY**

## Data Store

6 Chatterton Road, Bromley, Kent. 460 8991

AA53

## BBC DUST COVERS

DIRECT FROM THE LEADING COVER MANUFACTURER

Tailored from the best quality ivory coloured nylon that has been coated with polyurathane to which an anti-static inhibitor has been added. These fabric covers are tastefully finished with brown piping and have the model name hot foil printed over the keyboard. They are washable and can be ironed with a cool iron.

BBC MASTER.....	£4.95
BBC B/B+.....	£4.95
BBC COMPACT SET.....	£8.50

(Please state colour or green shade)

### MATCHING COVERS FOR PRINTERS, MONITORS AND DISC DRIVERS

A large range of covers for printers, monitors and disc drives are available to match the computer covers.

PRINTER COVERS FROM.....	£4.50
MONITOR COVERS FROM.....	£4.95
DISC DRIVE COVERS FROM.....	£3.00

If you have a specific requirement please do not hesitate to contact us as we will be delighted to help. Prices include VAT and First Class Postage. All our covers are unconditionally guaranteed. Please make cheques out to:

**BBD Computer Dustcovers**  
The Standish Centre  
Cross Street  
Standish, Wigan

Trade inquiries welcome

TEL: 0257-422968 EX397

FAX: 0257 423909



# STAR DEVICES

**THE CONCEPT KEYBOARD SOFTWARE HOUSE**

have moved to

**MOORSIDE ROAD  
WINNALL INDUSTRIAL ESTATE  
WINCHESTER  
HAMPSHIRE**

**SO23 7RX**

**Tel: 0962 841141**

We are always interested in hearing about your projects using the Star Microterminals Limited Concept Keyboard and will consider publishing software on your behalf.

Please write to DAVID JUPP at the above address.

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.



Archimedes

PHONE TODAY FOR A FREE FACT SHEET

## MEADOW COMPUTERS

11, LONDON STREET, WHITCHURCH, HAMPSHIRE, RG28 7LH

Telephone: Whitchurch (0256) 892008





# ACORN USER

- Acorn User caters for all BBC/Acorn
- micro users from the
- learner to the advanced programmer.

## CHRISTMAS

- Stimulating, entertaining and informative
- features cover everything from business
- and education to the home

## SUBSCRIPTION

- Acorn User keeps you abreast of the
- developments that affect your BBC micro
- Every issue is packed with news and reviews

## OFFER

You probably don't need reminding that Christmas is just round the corner, but with the help of Acorn User magazine Christmas shopping won't be difficult. Treat a friend, or yourself, this Christmas to a 12-month subscription to Acorn User magazine for only £17.50 and we will send you a free monthly listings disc or cassette.

All you need to do to guarantee a Christmas gift that will be used and appreciated for 12 months is to fill in the coupon and choose your favourite Acorn User monthly listings programs. We will send a free gift card to the recipient.

Acorn User's monthly listings discs and cassettes contain all the major programs from the 15 yellow page listings in the magazine, and some bonus ones that don't ever appear in print. The monthly listings discs and cassettes preserve your fingers, save time, avoid typing errors and best of all the programs will work first time.

Choose your free disc from 39 discs or cassettes packed with the best programs, utilities and graphics.

Don't forget every disc or cassette contains a stunning Graphics Bonus. So do a friend a favour or treat yourself: subscribe now and receive the disc or cassette of your choice absolutely free. There are more Christmas gift ideas on pages 131-135.



Yes! Please start a year's subscription to Acorn User from the \_\_\_\_\_ issue and send it to:

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

POSTCODE \_\_\_\_\_

Please tick if you would like a gift card to be sent. I would like my free disc/cassette for the \_\_\_\_\_ issue to be sent to:

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

POSTCODE \_\_\_\_\_

I enclose my cheque/postal order for £17.50 made payable to Redwood Publishing Ltd.

Please debit my Access/Barclaycard

ACCOUNT NO: \_\_\_\_\_ EXPIRY DATE \_\_\_\_\_

SIGNED \_\_\_\_\_ DATE \_\_\_\_\_

Send this form with your remittance to Gail Fairhall, Acorn User Subscriptions, Redwood Publishing Ltd, Lambourn Woodlands, Newbury, Berks RG16 7TW.

# WHY

buy time switches,  
a burglar alarm,  
and enough wiring  
to make it all happen?



With Red Boxes home automation becomes a reality at last. Programmed simply and easily via your micro\*, Red Boxes use the mains wiring of your home to send signals which will control any appliance powered by a standard 13amp socket. That gives you control over your home environment – without wires trailing all over the place.

Home automation with Red Boxes also provides a sophisticated security system. At one level, it is an efficient burglar alarm which can detect and announce an intruder. At another level, you can make your house appear full of life when nobody's at home,

simply by programming lights, television and radio to operate in your absence.

And if you have two micros, with Red Boxes you've got a local area network as well. It's a system that expands with your needs – and your imagination in home automation applications.

Most remarkable of all, the Red Boxes starter system costs only £129. And additional Red Boxes cost just £34.95. Get yours now, by clipping the coupon. Credit card holders can call 0480 87464.

\*The Red Boxes system will work off an Amstrad, BBC Micro, Commodore 64, IBM PC or Spectrum 48k/128k.

To: Electronic Fulfilment Services, Chesterton Mill, French's Road, Cambridge CB4 3NP.

Please send me further details of the Red Boxes system.

Please send me a Red Box starter system at £133 (including £4 p&p).

My computer is a:

- Amstrad
- BBC Micro
- Commodore 64
- IBM PC
- PC Compatible
- Spectrum 48k/128k

Name \_\_\_\_\_

Address \_\_\_\_\_

Postcode \_\_\_\_\_

Also include:

- ... project manuals at £9.95
- ... additional Red One control boxes at £36.95 each (including £2 p&p).
- ... additional Red Two infra red sensors at £36.95 each (including £2 p&p).

I enclose my cheque for a total of £..... made payable to General Information Systems Ltd., Readers' Account.

Please charge a total of £..... to my Access/American Express card.

Account number.....

Signature.....

For credit card orders or further information, call 0480 87464.

# WHEN

Red Boxes provide a home automation and security system that...

## WORKS OFF YOUR MICRO

*Announces an intruder*

*Starts the washing machine*

## NEEDS NO SPECIAL WIRING

*Discourages the would-be burglar*

*Tells you when the baby's crying*

## IS SIMPLE TO INSTALL AND USE

*Switches on the electric blanket*

*Wakes you for Breakfast Time*

## DOESN'T TIE UP YOUR COMPUTER

*Turns on the dishwasher*

*Controls your heating*

## IS EASY TO PROGRAM

*Turns on the light when you walk in*

*Puts the kettle on*

## GIVES YOU A NETWORKING FACILITY

*Switches on Crossroads*

*Switches off Crossroads*

## AND COSTS JUST £129

# YELLOW PAGES

## INDEX / COMPATIBILITY

### Entering listings

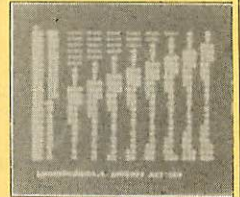
To make the task of entering listings easier, *Acorn User* has adopted several standards in the yellow pages. Programs are listed with line numbers in increments of 10, so type AUTO <Return> for automatic line numbering before you start. Before you list what you've entered, type LISTO 1 <Return> to provide spaces after the line numbers. Programs in the yellow pages are often listed to a width of 40 characters, so type MODE 6 <Return> before you start. Comparing the line-endings of your listing with the yellow pages will help you spot extra or missing characters.

To make sure that the program you want to enter will work on your particular machine, check the index below. All the listings work with Basic 1, 2 and 4 (unless stated otherwise) and with operating systems OS1.2 or above. If a program is accompanied by an article, please read the article first. If special care is needed when entering, we provide an easy-to-complete 'How To Enter' box.

Once you've typed in your program, save it to tape or disc then test it by running it. If you have a major problem with a listing, ask someone to check it. If you still have difficulties, you can also send off for a list of *Checksums* which help you find the errors. Send a large sae (26p stamp) to *AUChecksums*, PO Box 641, London NW9 8TF.

### LIGHT READING

119  
Get snappy with Joe Telford's toolkit program for a light meter



### CHOOSE YOUR WORDS WISELY

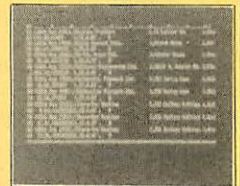
125  
A menu program for when you switch on *Wordwise Plus*

```

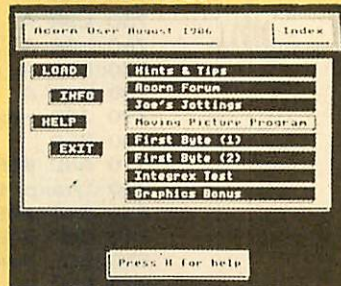
*: function key c
*: for Epson FX p
*:
*: Underline on e
*KEY 0 !!!0C27,45
*KEY 1 !!!0C27,45
*: Bold on and o
*KEY 2 !!!0C27,65
    
```

### THE BIG MACRO

127  
Give your letters and mailshots the personal touch by using macros



### DISCS AND TAPES



All the listings on these pages can be found on this month's listings disc or cassette. See page 129 for details of how to order.

### BACK ISSUES



For help with entering and debugging listings see the following back issues: April '86, June '85, Aug '84, Sept '83.

Program	Page	BBC B	B+/128	Master 128	Master Compact	Electron	6502SP/Turbo	ADFS	Econet	Shadow RAM	Monthly T/D
Hints & Tips	114										
Listing 1		■	■	■	■	■	■	■	■	■	■
Listing 2(A)		■	■	■			■	■	■	■	■
First Byte	114										
Listing 1-3		■	■	■	■	■	■	■	■	■	■
Acorn Forum	116										
Listing 1(A)		■	■	■	■	■	■	■	■	■	■
Listing 2&3			■(C)	■	■	■	■	■	■	■	■
Listing 4						■		■			■
Joe's Jottings	119										
Listing 1		■	■	■	■	■	■	■	■	■	■
Listing 2		■	■	■			■	■	■	■	■
Choose Your Words Wisely	125										■
Listing 1(A)		■	■	■	■	■	■	■	■	■	■
The Recursion Version	126										
Listing 1-2		■	■	■	■	■	■	■	■	■	■
The Big Macro	127										
Listing 1		■(B)	■(B)	■		■(B)	■	■	■	■	■

Notes: (A) Requires *Wordwise Plus*. (B) Requires *View/ViewStore*. (C) Listing 2 not compatible with B+/128

# YELLOW PAGES

## HINTS & TIPS

See Hints & Tips, page 41

### Listing 1. Daisy-wheel printer tester

```
10 REM Hints & Tips Listing 1
20 REM by Martin Phillips
30 REM for B/B+/M/C/E
40 REM (C) Acorn User Nov 1987
50 :
60 @%=7
70 VDU 2,13
80 FOR ▲=33 TO 255
90 IF N%=127 THEN N%=161:PRINT
100 PRINT N%;" "CHR$(N%);
110 IF N% MOD 8=0 THEN PRINT
120 NEXT N%
130 VDU 13,3
```

### Listing 2. Standard configuration settings

```
REM Segment 4
REM Standard configuration settings
CURSOR TOP
A$=CHR#13
TYPE"!G EP !G JO !G LS2 !G LM5 !W"
TYPE A$
TYPE"!G TS3 !G DP35 !W"
TYPE A$
DISPLAY
```

See First Byte, page 47

### Listing 1. Showing the parameters passed

```
10 REM First Byte Listing 1
20 REM by Tessie Revivis
30 REM For B/B+/M/C/E
40 REM (C) Acorn User November 1987
50 :
60 temp=&72
70 pblk=&600
80 osasci=&FFE3
90 osnewl=&FFE7
100 A$="HELLO WORLD"
110 PROCassemble
120 CALL &900,temp,%A00,A$,?&70
130 END
140 :
150 DEF PROCassemble
160 FOR F%=0 TO 3 STEP 3
170 P%=&900
180 !OPT F%
190 JSR txtprt
200 OPT FNequs("There are &")
210 LDA pblk
220 JSR hexprt
230 JSR txtprt
240 OPT FNequs(" parameters")
250 OPT FNequs(13)
260 LDX #0
270 LDY #0
280 .loop
290 CPX pblk
300 BNE loop2
310 RTS
320 .loop2
330 JSR txtprt
340 OPT FNequs("Parameter at &")
350 LDA pblk+2,Y
360 JSR hexprt
370 LDA pblk+1,Y
380 JSR hexprt
390 JSR txtprt
400 OPT FNequs(" of type &")
410 LDA pblk+3,Y
```

Continued ►

### ◀ First Byte listing 1 continued

```
420 JSR hexprt
430 JSR osnewl
440 TYA
450 CLC
460 ADC #3
470 TAY
480 INX
490 BNE loop
500 :
510 .txtprt
520 PLA
530 STA temp
540 PLA
550 STA temp+1
560 TYA
570 PHA
580 LDY #0
590 .ploop
600 INC temp
610 BNE ploop2
620 INC temp+1
630 .ploop2
640 LDA (temp),Y
650 BMI pdone
660 JSR osasci
670 JMP ploop
680 .pdone
690 PLA
700 TAY
710 JMP (temp)
720 :
730 .hexprt
740 PHA
750 LSR A
760 LSR A
770 LSR A
780 LSR A
790 JSR hexprt2
800 PLA
810 AND #&F
820 .hexprt2
830 ORA #ASC"0"
840 CMP #ASC"9"+1
850 BCC hexprt3
860 ADC #6
870 .hexprt3
880 JMP osasci
890 :
900 J
910 NEXT
920 ENDPROC
930 :
940 DEF FNequs(b%)
950 ?P%=b%
960 P%=P%+1
970 =F%
980 :
990 DEF FNequs(b$)
1000 *P%=b$
1010 P%=P%+LEN(b$)
1020 =F%
```

### Listing 2. Swapping variables

```
10 REM First Byte Listing 2
20 REM by Tessie Revivis
30 REM For B/B+/M/C/E
40 REM (C) Acorn User November 1987
50 :
60 source=&70
70 dest=&72
80 pblk=&600
```

Continued ►

# YELLOW PAGES

## FIRST BYTE

### ◀ First Byte listing 2 continued

```
90 PROCassemble
100 AX=300
110 BX=500
120 PRINT"AX=";AX;"BX=";BX
130 PRINT"Now call machine code"
140 CALL &900, AX, BX
150 PRINT"AX=";AX;"BX=";BX
160 END
170 :
180 DEF PROCassemble
190 FOR FX=0 TO 3 STEP 3
200 P%=&900
210 LOPT FX
220 LDA pblk
230 CMP #2
240 BEQ pok
250 BRK
260 OPT FNequb(128)
270 OPT FNequs("Wrong number of param
ters")
280 BRK
290 :
300 .pok
310 LDA pblk +3
320 CMP pblk +6
330 BEQ tok
340 BRK
350 OPT FNequb(4)
360 OPT FNequs("Type mismatch")
370 BRK
380 :
390 .tok
400 CMP #&80
410 BNE tok2
420 BRK
430 OPT FNequb(129)
440 OPT FNequs("Can't swap absolute st
rings")
450 BRK
460 :
470 .tok2
480 TAY
490 BEQ saveadr
500 LDY #3
510 CMP #5
520 BNE saveadr
530 INY
540 .saveadr
550 LDA pblk+1
560 STA source
570 LDA pblk+2
580 STA source+1
590 LDA pblk+4
600 STA dest
610 LDA pblk+5
620 STA dest+1
630 .swap
640 LDA (source),Y
650 PHA
660 LDA (dest),Y
670 STA (source),Y
680 PLA
690 STA (dest),Y
700 DEY
710 BPL swap
720 RTS
730 :
740 ]
750 NEXT
760 ENDPROC
770 :
780 DEF FNequb(b%)
790 ?P%=b%
```

Continued ▶

### ◀ First Byte listing 2 continued

```
800 P%=P%+1
810 =FX
820 :
830 DEF FNequs(b%)
840 $P%=b%
850 P%=P%+LEN(b%)
860 =FX
```

### Listing 3. Passing an array

```
10 REM First Byte Listing 3
20 REM by Tessie Revivis
30 REM For B/B+/M/C/E
40 REM (C) Acorn User November 1987
50 :
60 DIM AX(20)
70 base=&70
80 count=&72
90 limit=&74
100 pblk=&600
110 osnewl=&FFE7
120 oswrch=&FFEE
130 PROCassemble
140 FOR loop=0 TO 20
150 AX(loop)=loop
160 NEXT
170 CALL &900,AX(0)
180 END
190 :
200 DEF PROCassemble
210 FOR FX=0 TO 3 STEP 3
220 P%=&900
230 LOPT FX
240 LDA pblk
250 CMP #1
260 BEQ pok
270 BRK
280 OPT FNequb(128)
290 OPT FNequs("Too many parameters")
300 BRK
310 :
320 .pok
330 LDA pblk+3
340 CMP #4
350 BEQ tok
360 BRK
370 OPT FNequb(4)
380 OPT FNequs("Type mismatch")
390 BRK
400 :
410 .tok
420 LDA pblk+1
430 SEC
440 SBC #3
450 STA base
460 LDA pblk+2
470 SBC #0
480 STA base+1
490 LDY #0
500 LDA (base),Y
510 CMP #3
520 BEQ aok
530 OPT FNequb(15)
540 OPT FNequs("Subscript")
550 BRK
560 :
570 .aok
580 INY
590 LDA (base),Y
600 STA limit
610 INY
```

Continued ▶

# YELLOW PAGES

## A C O R N F O R U M

### First Byte listing 3 continued

<pre> 620 LDA (base),Y 630 STA limit+1 640 INY 650 LDA #0 660 STA count 670 STA count+1 680 .prtloop 690 LDA #ASC "(" 700 JSR oswrch 710 JSR ampprt 720 LDA count+1 730 JSR hexprt 740 LDA count 750 JSR hexprt 760 LDA #ASC ")" 770 JSR oswrch 780 JSR spaceprt 790 LDA #ASC "=" 800 JSR oswrch 810 JSR spaceprt 820 JSR ampprt 830 LDY #6 840 .prtval 850 LDA (base),Y 860 JSR hexprt 870 DEY 880 CPY #2 890 BNE prtval         </pre>	<pre> 900 JSR osnewl 910 LDA base 920 CLC 930 ADC #4 940 STA base 950 BCC incCnt 960 INC base+1 970 .incCnt 980 INC count 990 BNE chkLmt 1000 INC count+1 1010 .chkLmt 1020 LDA count 1030 CMP limit 1040 BNE prtloop 1050 LDA count+1 1060 CMP limit+1 1070 BNE prtloop 1080 RTS 1090 : 1100 .spaceprt 1110 LDA #ASC " " 1120 JMP oswrch 1130 : 1140 .ampprt 1150 LDA #ASC "&amp;" 1160 JMP oswrch 1170 : 1180 .hexprt         </pre>	<pre> 1190 PHA 1200 LSR A 1210 LSR A 1220 LSR A 1230 LSR A 1240 JSR hexprt2 1250 PLA 1260 AND #&amp;F 1270 .hexprt2 1280 ORA #ASC "0" 1290 CMP #ASC "9"+1 1300 BCC hexprt3 1310 ADC #6 1320 .hexprt3 1330 JMP oswrch 1340 : 1350 J 1360 NEXT 1370 ENDPROC 1380 : 1390 DEF FNequb(b%) 1400 ?P%=b% 1410 P%=P%+1 1420 =F% 1430 : 1440 DEF FNequs(b%) 1450 \$P%=b\$ 1460 P%=P%+LEN(b%) 1470 =F%         </pre>
--	--	--

See Acorn Forum, page 53

### Listing 1. Line number stripping in *Wordwise Plus*

```

SELECT TEXT
CURSOR TOP
REPEAT
REPEAT
A$=GCT$
A%=ASC A$
IF A%<33 OR (A%>47 AND A%<58) THEN DEL
ETE LEFT
UNTIL (A%>32 AND A%<48) OR A%>57
A%=GLT$
DISPLAY
UNTIL EOT
CURSOR TOP
REPEAT
REPLACE "!", ""
UNTIL EOT
CURSOR TOP
DISPLAY
        
```

### Listing 2. 64-row text screen display

```

10 REM 80x64 screen
20 REM by Martin Hesketh
30 REM for M/C only
40 REM (c) Acorn User November 87
50 :
60 *TV 0,0
70 mode=0
80 osword=&FFF1
90 osbyte=&FFF4
100 DIM buffer 10
110 IF mode=0 OR mode=3 nc=80 ELSE IF
mode=2 OR mode=5 nc=20 ELSE nc=40
120 PROCsetup
130 MODE 128+mode
140 MODE mode
150 VDU 23,1,0;0;0;0;
160 HIMEM=&1C00
        
```

### ◀ Acorn Forum listing 2 continued

```

170 start=&1C00
180 FOR I%=start TO start+5120 STEP 4
190 !I%=&20202020
200 NEXT
210 :
220 PROCprint(29,1,"Acorn Forum Nov 19
87")
230 PROCprint(20,3,"This is a demonstr
ation of 80 X 64 Text")
240 FOR line=10 TO 12
250 PROCprint(10,line,"ABCDEFGHIJKLMOP
QRSTUVWXYZabcdefghijklmnopqrstuvwxy
z1234567890")
260 NEXT line
270 PROCprint(0,15,"Now you have a go!
! . . .")
280 x=0
290 y=17
300 :
310 REPEAT
320 key$=GET$
330 IF ASC(key$)=13 THEN y=y+1:x=0:GOT
O 380
340 IF ASC(key$)=127 THEN PROCdelete:G
OTO 380
350 PROCprint(x,y,key$)
360 x=x+1
370 IF x=nc THEN x=0:y=y+1
380 UNTIL FALSE
390 :
400 DEF PROCdelete
410 x=x-1
420 IF x=-1 THEN x=nc:y=y-1
430 PROCprint(x,y," ")
440 ENDPROC
450 :
460 DEF PROCprint(x,y,A$)
470 FOR I=1 TO LEN A$
480 char=ASC(MID$(A$,I,1))
490 PROCdefine
        
```

Continued ▶

# YELLOW PAGES

## A C O R N F O R U M

### ◀ Acorn Forum listing 2 continued

```

500 PROCdisplay
510 ?FNscreen(x,y)=char
520 x=x+1
530 IF x=nc THEN x=0:y=y+1
540 NEXT I
550 ENDPROC
560 :
570 DEF PROCdefine
580 IF y MOD2=0 type=0 ELSE type=1
590 VDU 23,254
600 IF type=1 PROCcheck1
610 PROCrdchardef(char)
620 FOR def=buffer+1 TO buffer+7 STEP
2
630 VDU ?def
640 NEXT
650 VDU 0,0,0,0
660 VDU 23,255
670 IF type=1 PROCcheck2
680 PROCrdchardef(char)
690 FOR def=buffer+2 TO buffer+8 STEP
2
700 VDU ?def
710 NEXT
720 VDU 0,0,0,0
730 ENDPROC
740 :
750 DEF PROCdisplay
760 #FX 112,2
770 PRINT TAB(x,y DIV2);CHR#254
780 #FX 112,1
790 PRINT TAB(x,y DIV2);CHR#255
800 ENDPROC
810 :
820 DEF PROCrdchardef(character)
830 ?buffer=character
840 X%=buffer MOD 256
850 Y%=buffer DIV 256
860 AX=10
870 CALL osword
880 ENDPROC
890 :
900 DEF PROCcheck1
910 PROCrdchardef(?FNscreen(x,y-1))
920 FOR def=buffer+1 TO buffer+7 STEP
2
930 VDU ?def
940 NEXT
950 ENDPROC
960 :
970 DEF PROCcheck2
980 PROCrdchardef(?FNscreen(x,y-1))
990 FOR def=buffer+2 TO buffer+8 STEP
2
1000 VDU ?def
1010 NEXT
1020 ENDPROC
1030 :
1040 DEF FNscreen(x,y)
1050 =start+y*nc+x
1060 :
1070 DEF PROCsetup
1080 DIM M% 100
1090 FOR pass=0 TO 2 STEP 2
1100 P%=M%
1110 IOPT pass
1120 .event
1130 PHA
1140 PHX
1150 LDA store
1160 CMP #1
1170 BNE shadow
1180 JSR selectmem
1190 LDA #2

```

Continued ▶

### ◀ Acorn Forum listing 2 continued

```

1200 STA store
1210 PLX
1220 PLA
1230 RTS
1240 :
1250 .shadow
1260 JSR selectmem
1270 LDA #1
1280 STA store
1290 PLX
1300 PLA
1310 RTS
1320 :
1330 .selectmem
1340 TAX
1350 LDA #113
1360 JMP osbyte
1370 :
1380 .esetup
1390 LDA #event MOD 256
1400 STA &220
1410 LDA #event DIV 256
1420 STA &221
1430 LDA #1
1440 STA store
1450 LDA #14
1460 LDX #4
1470 JMP osbyte
1480 .store
1490 EQUB 0
1500 J
1510 NEXT pass
1520 CALL esetup
1530 ENDPROC

```

### Listing 3. Disc back-up with sideways RAM

```

10 REM Single Drive B
ackup
20 REM by A Valentine
30 REM for B+128k/M/C
40 REM (c) Acorn User
November 87
50 :
60 pauseflag=&81
70 trackflag=&82
80 maxtrackread=24
90 maxtrack=&80
100 osnewl=&FFE7
110 oswrch=&FFEE
120 oscli=&FFF7
130 osword=&FFF1
140 osrdch=&FFE0
150 PROCassem(&900)
160 PRINT "Press <SPAC
E> to save code."
170 REPEAT UNTIL GET=3
2
180 A$="*SAVE SRCOPY F
FFF0900+"+STR$~(end-&900
)
190 PRINT A$
200 OSCLI A$
210 END
220 :
230 DEF PROCassem(M%)
240 FOR pass=0 TO 3 ST
EP 3
250 P%=M%
260 IOPT pass

```

Continued ▶

# YELLOW PAGES

## A C O R N F O R U M

### ◀ Acorn Forum listing 3 continued

```

270 LDX #&FF
280 .loop
290 INX
300 LDA source,X
310 JSR oswrch
320 BNE loop
330 JSR readwrite
340 STA read
350 LDX #&FF
360 .loop1
370 INX
380 LDA destn,X
390 JSR oswrch
400 BNE loop1
410 JSR readwrite
420 STA save
430 LDX #&FF
440 .loop2
450 INX
460 LDA pause,X
470 JSR oswrch
480 BNE loop2
490 JSR osrdch
500 JSR oswrch
510 STA pauseflag
520 LDX #&FF
530 .loop3
540 INX
550 LDA tracks,X
560 JSR oswrch
570 BNE loop3
580 JSR osrdch
590 JSR oswrch
600 CMP #89
610 BNE tr40
620 LDA #80
630 STA trackflag
640 JMP start
650 .tr40
660 LDA #40
670 STA trackflag
680 .start
690 JSR osnewl
700 JSR osnewl
710 LDA #maxtrackread
720 STA maxtrack
730 .loop4
740 INC srdata+7
750 LDX #srdata MOD 25
6
760 LDY #srdata DIV 25
6
770 JSR oscli
780 LDA srdata+7
790 CMP #ASC"Z"
800 BNE loop4
810 .readgo
820 JSR rpause
830 .readdisc
840 INC read+7
850 LDA #&7F
860 LDX #read MOD 256
870 LDY #read DIV 256
880 JSR osword
890 .shiftup
900 LDA #&42
910 LDX #ramup MOD 256
920 LDY #ramup DIV 256
930 JSR osword
940 LDA maxtrack
950 CMP read+7
960 BEQ savedata
970 CLC
980 LDA #&A
990 ADC ramup+9
1000 STA ramup+9
1010 JMP readdisc
1020 .savedata
1030 JSR spause
1040 .savedisc
1050 LDA #&42
1060 LDX #ramdown MOD 2
56
1070 LDY #ramdown DIV 2
56
1080 JSR osword
1090 CLC
1100 LDA #&A
1110 ADC ramdown+9
1120 STA ramdown+9
1130 .savetodisc
1140 INC save+7
1150 LDA #&7F
1160 LDX #save MOD 256
1170 LDY #save DIV 256
1180 JSR osword
1190 LDA #80
1200 CMP save+7
1210 BNE savedisc
1220 LDA maxtrack
1230 CMP trackflag
1240 BEQ bye
1250 CLC
1260 LDA #maxtrackread
1270 ADC maxtrack
1280 CMP trackflag
1290 BCS adjust
1300 STA maxtrack
1310 JMP addrreset
1320 .adjust
1330 LDA trackflag
1340 STA maxtrack
1350 .addrreset
1360 LDA #0
1370 STA ramup+9
1380 STA ramdown+9
1390 JMP readgo
1400 .readwrite
1410 JSR osrdch
1420 JSR oswrch
1430 SEC
1440 SBC #48
1450 RTS
1460 .rpause
1470 LDX #&FF
1480 LDA pauseflag
1490 CMP #78
1500 BNE loop5
1510 RTS
1520 .loop5
1530 INX
1540 LDA source1,X
1550 JSR oswrch
1560 BNE loop5
1570 JSR osrdch
1580 RTS
1590 .spause
1600 LDX #&FF
1610 LDA pauseflag
1620 CMP #78
1630 BNE loop6
1640 RTS
1650 .loop6
1660 INX
1670 LDA destn1,X
1680 JSR oswrch
1690 BNE loop6
1700 JSR osrdch
1710 RTS
1720 .bye
1730 RTS
1740 .read
1750 EQU $00190000
1760 EQU $FF530300
1770 EQU 0
1780 EQU 42
1790 EQU 0
1800 .srdata
1810 EQU $SRDATA "
1820 EQU 86
1830 EQU 13
1840 .ramup
1850 EQU $001900C0
1860 EQU $000A0000
1870 EQU 00
1880 EQU 00
1890 .ramdown
1900 EQU $00190040
1910 EQU $000A0000
1920 EQU &0
1930 EQU &0
1940 .save
1950 EQU $00190000
1960 EQU $FF4B0300
1970 EQU 0
1980 EQU 42
1990 EQU 0
2000 .source
2010 EQU 12
2020 EQU 13
2030 EQU $Sideways Ram
Disc Copier by A.Valent
ine"
2040 EQU 13
2050 EQU 10
2060 EQU 10
2070 EQU $Enter source
drive : "
2080 EQU 0
2090 .destn
2100 EQU 13
2110 EQU 10
2120 EQU $Enter destin
ation drive : "
2130 EQU 0
2140 .pause
2150 EQU 13
2160 EQU 10
2170 EQU $Pause betwee
n read / write Y/N : "
2180 EQU 0
2190 .tracks
2200 EQU 13
2210 EQU 10
2220 EQU $Is it 80 tra
ck Y/N : "
2230 EQU 0
2240 .source1
2250 EQU 7
2260 EQU $Insert sourc
e disc and press a key.
"
2270 EQU 13
2280 EQU 0
2290 .destn1
2300 EQU 7
2310 EQU $Insert desti
nation disc and press a
key."
2320 EQU 13
2330 EQU 0
2340 .end
2350 J
2360 NEXT
2370 ENDPROC

```



# YELLOW PAGES

## JOE'S JOTTINGS

### Listing 4. Electron hardware scroller

```

10 REM Hardware scrolling on the Elec
tron
20 REM by Carl Bateman
30 REM for Electron only
40 REM (c) Acorn User November 87
50 :
60 MODE 6
70 INPUT TAB(10,10);"Which mode ";M%
80 MODE M%
90 S%=HIMEM
100 SL%=&8000-HIMEM
110 PROCintro
120 PROCgraph
130 REPEAT
140 A%=GET$
150 IF INSTR("Zz",A%)<>0 PROCscroll(64
)
160 IF INSTR("Xx",A%)<>0 PROCscroll(-6
4)
170 IF INSTR("?/",A%)<>0 PROCscroll(-6
40)
180 IF INSTR("*: ",A%)<>0 PROCscroll(64
0)
190 UNTIL 0
200 END
210 :
220 DEF PROCintro
230 PRINT "''''''This is an example of h
ardware scrolling on the Electron."
240 PRINT "''''
250 PRINT "To move this display use the
Z, X, ? and * keys."
260 ENDPROC
270 :
280 DEF PROCgraph
290 IF M%=3 OR M%=6 THEN PRINT "''Sorry
, no graphics in mode ";M%;"!":ENDPROC
300 MOVE 600,0
310 FOR D=0 TO 9
320 READ X%,Y%:DRAW X%,Y%
330 NEXT
340 DATA 300,0 ,300,300,600,300
350 DATA 600,0 ,750,150,750,450
360 DATA 450,450,300,300,600,300
370 DATA 750,450
380 ENDPROC
390 :
400 DEF PROCscroll(D%)
410 S%=S%+D%
420 IF S%>=&8000 S%=S%-SL%
430 IF S%<HIMEM S%=S%+SL%
440 R%=S% DIV 2:REM shift right
450 H%=R% DIV &100
460 L%=R% MOD &100
470 A%=151: X%=3: Y%=H%
480 CALL &FFF4
490 A%=151: X%=2: Y%=L%
500 CALL &FFF4
510 ENDPROC

```

See Joe's Jottings, page 82

### Listing 1. Framework toolkit

```

10 REM Framework Toolkit
20 REM by Joe Telford
30 REM For B/B+/M/C/A
40 REM (C) Acorn User November 1987
50 :
60 MODE 7
70 PROCsetup
80 ON ERROR PROCerr
90 REPEAT

```

Continued ►

### ◀ Joe's Jottings listing 1 continued

```

100 REPEAT
110 line$=FNinput
120 UNTIL line$>""
130 com$=LEFT$(FNextract,4)
140 PROCdecodecommand
150 UNTIL com$="EXIT"
160 MODE 7:*BASIC
170 END
180 :
190 DEF PROCsetup
200 LOCAL loop%
210 PROCcolours
220 trace%=FALSE
230 DIM oscar% 256
240 PRINT cy$"Framework Toolkit V(1.00
)"
250 PRINT gr$"Another one of Joe's Jot
tings"
260 PRINT ma$"Type COMMANDS or another
command!"
270 PRINT
280 VDU 28,0,24,39,3
290 ENDPROC
300 :
310 DEF PROCcolours
320 re$=CHR$129:gr$=CHR$130:ye$=CHR$13
1
330 ma$=CHR$133:cy$=CHR$134
340 ENDPROC
350 :
360 DEF PROCblanks
370 re$=" ":igr$=" ":ye$=" "
380 ma$=" ":cy$=" "
390 ENDPROC
400 :
410 DEF FNinput
420 LOCAL line$
430 INPUTLINE"|"line$
440 =FNprocess(line$)+"|"
450 :
460 DEF FNprocess(L%)
470 LOCAL a$,loop%
480 a$=""
490 IF L%<"@" THEN = ""
500 FOR loop%=1 TO LEN L%
510 char=ASC(MID$(L%,loop%,1))
520 IF char>95 AND char<122 THEN a$=a$
+CHR$(char AND 223) ELSE a$=a$+CHR$char
530 NEXT loop%
540 =a$
550 :
560 DEF FNextract
570 LOCAL b$,I%,J%
580 I%=0
590 REPEAT
600 I%=I%+1
610 b$=MID$(line$,I%,1)
620 UNTIL b$>"/" OR b$="|" OR b$=""
630 IF b$="|" OR b$="" THEN = ""
640 J%=I%
650 REPEAT
660 J%=J%+1
670 b$=MID$(line$,J%,1)
680 UNTIL b$<"0" OR b$="|"
690 b$=MID$(line$,I%,J%-I%)
700 line$=MID$(line$,J%,LENline$)
710 IF trace% PRINT ma$"trace|"cy$;b$,
gr$;line$
720 =b$
730 :
740 DEF PROCerror(ER%)
750 VDU 7
760 PRINT ye$;" "ER%
770 ENDPROC

```

Continued ►

# YELLOW PAGES

## JOE'S JOTTINGS

### ◀ Joe's Jottings listing 1 continued

```

780 :
790 DEF PROCerr
800 IF ERR=17 PROCerror("STOPPED!");EN
DPROC
810 REPORT
820 PRINT " at line ";ERL
830 END
840 :
850 DEF PROCdecodecommand
860 IF com$="" ENDPROC
870 IF com$="EXIT" ENDPROC
880 IF com$="EXPL" PROCexplain:ENDPROC
890 IF com$="COMM" PROCcommands:ENDPRO
C
900 IF com$="TRAC" PROCtrace:ENDPROC
910 IF com$="KEY" PROCkey:ENDPROC
920 IF com$="PRIN" PROCprinter:ENDPROC
930 PROCerror("I don't know how to "+c
om$+"...")
940 ENDPROC
950 :
960 DEF PROCexplain
970 PRINT cy$"EXPLAIN <command>"TAB(35
)"EXPL"
980 PRINT gr$"Explains the use of the
command typed;"
990 PRINT gr$"Eg "cy$"EXPL EXIT"gr$"Ex
plains what EXIT does."
1000 ENDPROC
1010 :
1020 DEF PROCexplain
1030 para$=LEFT$(FNextract,4)
1040 IF para$="EXIT" PROCexexit:ENDPROC
1050 IF para$="EXPL" OR para$="" PROCex
explain:ENDPROC
1060 IF para$="COMM" PROCexcommands:END
PROC
1070 IF para$="TRAC" PROCextrace:ENDPRO
C
1080 IF para$="KEY" PROCexkey:ENDPROC
1090 IF para$="PRIN" PROCexprinter:ENDP
ROC
1100 PROCerror("I can't explain "+para$
+"...")
1110 ENDPROC
1120 :
1130 DEF PROCexexit
1140 PRINT cy$"EXIT"TAB(35)"EXIT"
1150 PRINT gr$"Exits from the program,
back to BASIC."
1160 ENDPROC
1170 :
1180 DEF PROCexcommands
1190 PRINT cy$"COMMANDS"TAB(35)"COMM"
1200 PRINT gr$"Lists all the toolkit co
mmands."
1210 ENDPROC
1220 :
1230 DEF PROCcommands
1240 PRINT cy$"COMMANDS","EXPLAIN","EXI
T","TRACE"
1250 PRINT cy$"KEY","PRINTER"
1260 ENDPROC
1270 :
1280 DEF PROCextrace
1290 PRINT cy$"TRACE <ON/OFF>"TAB(35)"T
RAC"
1300 PRINT cy$"TRACE ON"gr$"shows comma
nd decoding."
1310 PRINT cy$"TRACE OFF"gr$"cancels TR
ACE ON"
1320 ENDPROC
1330 :
1340 DEF PROCtrace
1350 para$=FNextract

```

Continued ▶

### ◀ Joe's Jottings listing 1 continued

```

1360 IF para$="" THEN PROCerror("TRACE
<ON/OFF>"):ENDPROC
1370 trace%=FALSE
1380 IF para$="ON" THEN trace%=TRUE:PRI
NT cy$"Tracing.....":ENDPROC
1390 PRINT cy$".....no tracing."
1400 ENDPROC
1410 :
1420 DEF PROCexkey
1430 PRINT cy$"KEY <0...9> <string>"TAB
(35)"KEY"
1440 PRINT gr$"Performs the same functi
on as "
1450 PRINT gr$"*KEY in Basic."
1460 ENDPROC
1470 :
1480 DEF PROCkey
1490 para$=FNextract
1500 IF INSTR("1023456789",para$)<1 OR
para$="" THEN PROCerror("KEY <0..9> <str
ing>"):ENDPROC
1510 PROCoscli("KEY "+para$+" "+LEFT$(1
ine$,LENline$ -1))
1520 ENDPROC
1530 :
1540 DEF PROCoscli(%oscar%)
1550 X%=oscar%MOD 256:Y%=oscar% DIV 256
1560 CALL &FFF7
1570 ENDPROC
1580 :
1590 DEF PROCexprinter
1600 PRINT cy$"PRINTER <ON/OFF>"TAB(35)
"PRIN"
1610 PRINT cy$"PRINTER ON"gr$"sends eve
rything to"
1620 PRINT gr$"the printer until"
1630 PRINT cy$"PRINTER OFF"gr$"is typed
"
1640 PRINT gr$"The coloured display is"
1650 PRINT gr$"temporarily lost while t
his"
1660 PRINT gr$"command is functioning."
1670 ENDPROC
1680 :
1690 DEF PROCprinter
1700 para$=FNextract
1710 IF para$<>"ON" AND para$<>"OFF" TH
EN PROCerror("PRINTER <ON/OFF>"):ENDPROC
1720 IF para$="ON" PROCblanks:VDU 2:END
PROC
1730 VDU 3:PROCcolours:PROCbuildtable
1740 ENDPROC

```

### Listing 2. Photographer's toolkit

```

10 REM Photographers Toolkit
20 REM by Joe Telford
30 REM for B/B+/M
40 REM (c) Acorn User November 1987
50 :
60 MODE 7
70 PROCsetup
80 ON ERROR PROCerr
90 REPEAT
100 REPEAT
110 line$=FNinput
120 UNTIL line$=""
130 com$=LEFT$(FNextract,4)
140 PROCdecodecommand
150 UNTIL com$="EXIT"
160 MODE 7:*BASIC
170 END
180 :

```

Continued ▶

# YELLOW PAGES

## JOE'S JOTTINGS

### ◀ Joe's Jottings listing 2 continued

```

190 DEF PROCsetup
200 LOCAL loop%
210 PROCcolours
220 trace%=FALSE
230 ISO=100:DIN=21
240 DIM oscar% 256
250 DATA .8,1.1,2,1.6,2,2.5,3,4,5,6,8,
10,12,16,20,25
260 DATA 32,40,50,64,80,100,125,160,20
0,250,320
270 DATA 400,500,640,800,1000,1250,160
0,2000,2500
280 DATA 3200,4000,5000,6400,8000,1000
0,12800
290 DIM DIN(42)
300 RESTORE
310 FOR loop%= 1 TO 42
320 READ DIN(loop%)
330 NEXT
340 DATA 11
350 DATA 210,188,167,135,110,96,60,43,
30,20,12,7
360 READ maxev
370 DIM meter(maxev)
380 FOR loop%=0 TO maxev
390 READ meter(loop%)
400 NEXT
410 DIM EV$(28)
420 PROCbuildtable
430 PRINT cy$"Photographer's Toolkit V
(1.00)"
440 PRINT gr$"Another one of Joe's Jot
tings"
450 PRINT ma$"Type COMMANDS or another
command!"
460 PRINT
470 VDU 28,0,24,39,3
480 ENDPROC
490 :
500 DEF PROCcolours
510 re$=CHR$129:gr$=CHR$130:ye$=CHR$13
1
520 ma$=CHR$133:cy$=CHR$134
530 ENDPROC
540 :
550 DEF PROCblanks
560 re$=" ":gr$=" ":ye$=" "
570 ma$=" ":cy$=" "
580 ENDPROC
590 :
600 DEF PROCbuildtable
610 RESTORE 620
620 DATA "480","240","120","60 ","30 "
,"15 "," 8 "," 4 "," 2 "," 1 "
630 DATA " 2 "," 4 "," 8 ","15 ","30 "
,"60 ","125","250","500"
640 DATA " 1 "," 2 "," 4 ","ooo","ooo"
,"ooo","ooo","ooo","ooo","ooo"
650 FOR loop%=0 TO 9:READ EV$(loop%):E
V$(loop%)=ma$+EV$(loop%):NEXT
660 FOR loop%=10 TO 14:READ EV$(loop%)
:EV$(loop%)=ye$+EV$(loop%):NEXT
670 FOR loop%=15 TO 18:READ EV$(loop%)
:EV$(loop%)=gr$+EV$(loop%):NEXT
680 FOR loop%=19 TO 21:READ EV$(loop%)
:EV$(loop%)=cy$+EV$(loop%):NEXT
690 FOR loop%=22 TO 28:READ EV$(loop%)
:EV$(loop%)=re$+EV$(loop%):NEXT
700 ENDPROC
710 :
720 DEF FNinput
730 LOCAL line$
740 INPUTLINE"J"line$
750 =FNprocess(line$)+"!"

```

Continued ▶

### ◀ Joe's Jottings listing 2 continued

```

760 :
770 DEF FNprocess(L$)
780 LOCAL a$,loop%
790 a$=""
800 IF L$<"@" THEN = ""
810 FOR loop%=1 TO LENL$
820 char=ASC(MID$(L$,loop%,1))
830 IF char>95 AND char<122 THEN a$=a$
+CHR$(char AND 223) ELSE a$=a$+CHR$char
840 NEXT loop%
850 =a$
860 :
870 DEF FNextract
880 LOCAL b$,I%,J%
890 I%=0
900 REPEAT
910 I%=I%+1
920 b$=MID$(line$,I%,1)
930 UNTIL b$>"/" OR b$="|" OR b$=""
940 IF b$="|" OR b$="" THEN =""
950 J%=I%
960 REPEAT
970 J%=J%+1
980 b$=MID$(line$,J%,1)
990 UNTIL b$<"0" OR b$="!"
1000 b$=MID$(line$,I%,J%-I%)
1010 line$=MID$(line$,J%,LENline$)
1020 IF trace% PRINT ma$"trace]"cy$;b$,
gr$;line$
1030 =b$
1040 :
1050 DEF PROCerror(ER$)
1060 VDU 7
1070 PRINT ye$;" "ER$
1080 ENDPROC
1090 :
1100 DEF PROCerr
1110 IF ERR=17 PROCerror("STOPPED!"):EN
DPROC
1120 REPORT
1130 PRINT " at line ";ERL
1140 END
1150 :
1160 DEF PROCdecodecommand
1170 IF com$="" ENDPROC
1180 IF com$="EXIT" ENDPROC
1190 IF com$="EXPL" PROCexplain:ENDPROC
1200 IF com$="COMM" PROCcommands:ENDPRO
C
1210 IF com$="TRAC" PROCtrace:ENDPROC
1220 IF com$="KEY" PROCkey:ENDPROC
1230 IF com$="PRIN" PROCprinter:ENDPROC
1240 IF com$="ISO" PROCiso:ENDPROC
1250 IF com$="QISO" PROCqiso:ENDPROC
1260 IF com$="DIN" PROCdin:ENDPROC
1270 IF com$="QDIN" PROCqdin:ENDPROC
1280 IF com$="QMET" PROCqmeter:ENDPROC
1290 IF com$="SERI" PROCserial:ENDPROC
1300 IF com$="ON" PROCon:ENDPROC
1310 IF com$="OFF" PROCoff:ENDPROC
1320 IF com$="TIME" PROCtime:ENDPROC
1330 IF com$="DELA" PROCdelay:ENDPROC
1340 IF com$="INTE" PROCinterval:ENDPRO
C
1350 IF com$="TRIG" PROCtrigger:ENDPROC
1360 IF com$="EV" PROCev:ENDPROC
1370 IF com$="TABL" PROCtable:ENDPROC
1380 PROCerror("I don't know how to "+c
om$+"...")
1390 ENDPROC
1400 :
1410 DEF PROCexplain
1420 PRINT cy$"EXPLAIN <command>"TA$
)"EXPL"

```

Continued ▶

# YELLOW PAGES

## JOE'S JOTTINGS

### ◀ Joe's Jottings listing 2 continued

```

1430 PRINT gr$"Explains the use of the
command typed:"
1440 PRINT gr$"Eg "cy$"EXPL EXIT"gr$"Ex
plains what EXIT does."
1450 ENDPROC
1460 DEF PROCexplain
1470 para%=LEFT$(FNextract,4)
1480 IF para%="EXIT" PROCexexit:ENDPROC
1490 IF para%="EXPL" OR para%="" PROCex
explain:ENDPROC
1500 IF para%="COMM" PROCexcommands:END
PROC
1510 IF para%="TRAC" PROCextrace:ENDPRD
OC
1520 IF para%="KEY" PROCexkey:ENDPROC
1530 IF para%="PRIN" PROCexprinter:ENDP
ROC
1540 IF para%="ISO" PROCexiso:ENDPROC
1550 IF para%="QISO" PROCexqiso:ENDPROC
1560 IF para%="DIN" PROCexdin:ENDPROC
1570 IF para%="QDIN" PROCexqdin:ENDPROC
1580 IF para%="QMET" PROCexqmeter:ENDPR
OC
1590 IF para%="SERI" PROCexserial:ENDPR
OC
1600 IF para%="ON" PROCexon:ENDPROC
1610 IF para%="OFF" PROCexoff:ENDPROC
1620 IF para%="TIME" PROCexitime:ENDPROC
1630 IF para%="DELA" PROCexdelay:ENDPRD
OC
1640 IF para%="INTE" PROCexinterval:END
PROC
1650 IF para%="TRIG" PROCextrigger:ENDP
ROC
1660 IF para%="EV" PROCexev:ENDPROC
1670 IF para%="TABL" PROCextable:ENDPRD
OC
1680 PROCerror("I can't explain "+para%
+"...")
1690 ENDPROC
1700 :
1710 DEF PROCexexit
1720 PRINT cy$"EXIT"TAB(35)"EXIT"
1730 PRINT gr$"Exits from the program,
back to BASIC."
1740 ENDPROC
1750 :
1760 DEF PROCexcommands
1770 PRINT cy$"COMMANDS"TAB(35)"COMM"
1780 PRINT gr$"Lists all the toolkit co
mmands."
1790 ENDPROC
1800 :
1810 DEF PROCcommands
1820 PRINT cy$"COMMANDS","EXPLAIN","EXI
T","TRACE"
1830 PRINT cy$"KEY","SERIAL","ON","OFF"
1840 PRINT cy$"ISO","QISO","DIN","QDIN"
1850 PRINT cy$"TIME","DELAY","INTERVAL"
,"TRIGGER"
1860 PRINT cy$"QMETER","EV","TABLE","PR
INTER"
1870 ENDPROC
1880 :
1890 DEF PROCextrace
1900 PRINT cy$"TRACE <ON/OFF>"TAB(35)"T
RAC"
1910 PRINT cy$"TRACE ON"gr$"shows comma
nd decoding."
1920 PRINT cy$"TRACE OFF"gr$"cancels TR
ACE ON"
1930 ENDPROC
1940 :
1950 DEF PROCtrace

```

Continued ▶

### ◀ Joe's Jottings listing 2 continued

```

1960 para%=FNextract
1970 IF para%="" THEN PROCerror("TRACE
<ON/OFF>"):ENDPROC
1980 trace%=FALSE
1990 IF para%="ON" THEN trace%=TRUE:PRI
NT cy$"Tracing.....":ENDPROC
2000 PRINT cy$".....no tracing."
2010 ENDPROC
2020 :
2030 DEF PROCexkey
2040 PRINT cy$"KEY <0..9> <string>"TAB
(35)"KEY"
2050 PRINT gr$"Performs the same functi
on as "
2060 PRINT gr$"*KEY in Basic."
2070 ENDPROC
2080 :
2090 DEF PROCkey
2100 para%=FNextract
2110 IF INSTR("1023456789",para%)<1 OR
para%="" THEN PROCerror("KEY <0..9> <str
ing>"):ENDPROC
2120 PROCoscli("KEY "+para%+" "+LEFT$(1
ine$,LENline$ -1))
2130 ENDPROC
2140 :
2150 DEF PROCoscli(%oscar%)
2160 X%=oscar%MOD 256:Y%=oscar% DIV 256
2170 CALL &FFF7
2180 ENDPROC
2190 :
2200 DEF PROCexprinter
2210 PRINT cy$"PRINTER <ON/OFF>"TAB(35)
"PRIN"
2220 PRINT cy$"PRINTER ON"gr$"sends eve
rything to"
2230 PRINT gr$"the printer until"
2240 PRINT cy$"PRINTER OFF"gr$"is typed
."
2250 PRINT gr$"The coloured display is"
2260 PRINT gr$"temporarily lost while t
his"
2270 PRINT gr$"command is functioning."
2280 ENDPROC
2290 :
2300 DEF PROCprinter
2310 para%=FNextract
2320 IF para%<>"ON" AND para%<>"OFF" TH
EN PROCerror("PRINTER <ON/OFF>"):ENDPROC
2330 IF para%="ON" PROCblanks:PROCbuild
table:VDU 2:ENDPROC
2340 VDU 3:PROCcolours:PROCbuildtable
2350 ENDPROC
2360 :
2370 DEF PROCexiso
2380 PRINT cy$"ISO <no:>"TAB(35)"ISO"
2390 PRINT cy$"ISO 125"gr$"sets ISO and
DIN rating"
2400 PRINT gr$"to nearest value shown."
2410 ENDPROC
2420 :
2430 DEF PROCiso
2440 LOCAL loop%,gap%,flag%,value,val
2450 gap%=30000
2460 para%=FNextract
2470 IF para%="" OR para%>CHR$(58) PROC
error("ISO <number>"):ENDPROC
2480 value=VALpara%
2490 IF value <=0 OR value >12800 PROCe
rror("ISO number out of range."):ENDPROC
2500 FOR loop%=1 TO 42
2510 val=ABS(value-DIN(loop%))
2520 IF val<gap% THEN gap%=val:flag%=lo
op%

```

Continued ▶

# YELLOW PAGES

## JOE'S JOTTINGS

### ◀ Joe's Jottings listing 2 continued

```

2530 NEXT
2540 ISO=DIN(flag%)
2550 DIN=flag%
2560 ENDPROC
2570 :
2580 DEF PROCexQiso
2590 PRINT cy$"QISO"TAB(35)"QISO"
2600 PRINT gr$"displays current ISO val
ue"
2610 ENDPROC
2620 :
2630 DEF PROCQiso
2640 PRINT cy$ISO" ISO"
2650 ENDPROC
2660 :
2670 DEF PROCexdin
2680 PRINT cy$"DIN <no:>"TAB(35)"DIN"
2690 PRINT cy$"DIN 21"gr$"sets ISO and
DIN rating"
2700 PRINT gr$"to nearest value shown."
2710 ENDPROC
2720 :
2730 DEF PROCdin
2740 LOCAL value%
2750 para%=FNextract
2760 IF para%="" OR para%>CHR$(58) PROC
error("DIN <number>"):ENDPROC
2770 value%=VALpara%
2780 IF value% <=0 OR value%>42 PROCerr
or("DIN number out of range."):ENDPROC
2790 DIN=value%
2800 ISO=DIN(DIN)
2810 ENDPROC
2820 :
2830 DEF PROCexQdin
2840 PRINT cy$"QDIN"TAB(35)"QDIN"
2850 PRINT gr$"displays current DIN val
ue"
2860 ENDPROC
2870 :
2880 DEF PROCQdin
2890 PRINT cy$DIN;" DIN"
2900 ENDPROC
2910 :
2920 DEF PROCexQmeter
2930 PRINT cy$"QMETER <EV/ABS>"TAB(35)"
QMETER"
2940 PRINT cy$"QMETER EV"gr$"gives an E
V exposure"
2950 PRINT gr$"          reading based
on the ISO"
2960 PRINT gr$"          rating and the
light level."
2970 PRINT cy$"QMETER ABS"gr$"gives a r
aw"
2980 PRINT gr$"          ADC reading f
rom 0 to 256"
2990 PRINT gr$"          based on the
light level."
3000 ENDPROC
3010 :
3020 DEF PROCQmeter
3030 LOCAL value,val,gap%,flag%,loop%
3040 para%=FNextract
3050 IF para%<>"EV" AND para%<>"ABS" PR
OCerror("QMETER <EV/ABS>"):ENDPROC
3060 value=FNadc(1)
3070 IF para%="ABS" PRINT cy$,value":25
6":ENDPROC
3080 gap%=256
3090 FOR loop%=1 TO maxev
3100 val=ABS(value-meter(loop%))
3110 IF val<gap% THEN gap%=val:flag%=lo
op%

```

Continued ▶

### ◀ Joe's Jottings listing 2 continued

```

3120 NEXT
3130 EV=flag%+INT((DIN-21)*10/3+.5)/10
3140 PRINT cy$EV;" EV"
3150 ENDPROC
3160 :
3170 DEF FNadc(ch%)=(ADVAL(ch%)+ADVAL(c
h%)+ADVAL(ch%)+128) DIV 768
3180 :
3190 DEF PROCexserial
3200 PRINT cy$"SERIAL"TAB(35)"SERI"
3210 PRINT gr$"displays equipment seria
l numbers"
3220 ENDPROC
3230 :
3240 DEF PROCserial
3250 PRINT ma$"CAMERA"cy$"Canon T90
"gr$"1023016"
3260 PRINT ma$"CAMERA"cy$"Pentax ME Sup
er"gr$"5001959"
3270 PRINT ma$"LENS "cy$"50F1.8CFD
"gr$"8402414"
3280 PRINT ma$"LENS "cy$"80/210F3.8TA2
"gr$"4029223"
3290 PRINT ma$"LENS "cy$"35/70 F3.5TA2
"gr$"17A 343212"
3300 ENDPROC
3310 :
3320 DEF PROCexon
3330 PRINT cy$"ON"TAB(35)"ON"
3340 PRINT gr$"turns on the cassette re
lay"
3350 ENDPROC
3360 :
3370 DEF PROCOn
3380 VDU 11:PRINT re$:*MOTOR 1
3390 ENDPROC
3400 :
3410 DEF PROCexoff
3420 PRINT cy$"OFF"TAB(35)"OFF"
3430 PRINT gr$"turns off the cassette r
elay"
3440 ENDPROC
3450 :
3460 DEF PROCoff
3470 VDU 11:PRINT gr$:*MOTOR 0
3480 ENDPROC
3490 :
3500 DEF PROCextime
3510 PRINT cy$"TIME <secs>"TAB(35)"TIME
"
3520 PRINT cy$"TIME 10"gr$"turns the ca
ssette relay on"
3530 PRINT gr$"for 10 seconds"
3540 ENDPROC
3550 :
3560 DEF PROCtime
3570 LOCAL value
3580 para%=FNextract
3590 IF para%="" OR para%>CHR$(58) PROC
error("TIME <secs>"):ENDPROC
3600 value=VALpara%
3610 IF value <=0 PROCerror("Cannot tim
e "+para%+" seconds."):ENDPROC
3620 PRINT re$"Timing.....";
3630 *MOTOR 1
3640 PROCtiming(value,"S")
3650 *MOTOR 0
3660 PRINT gr$".....OFF"
3670 ENDPROC
3680 :
3690 DEF PROCtiming(d,u$)
3700 d=d*100
3710 IF u$="M" d=d*60
3720 IF u$="H" d=d*3600

```

Continued ▶

# YELLOW PAGES

## JOE'S JOTTINGS

◀ Joe's Jottings listing 2 continued

```

3730 TIME=0
3740 REPEAT UNTIL TIME>=d
3750 ENDPROC
3760 :
3770 DEF PROCexdelay
3780 PRINT cy$"DELAY <offwait> <H/M/S>
<onsecs>"TAB(35)"DELA"
3790 PRINT cy$"DELAY 1 M 2"gr$"delays f
or 1 Minute, then"
3800 PRINT gr$"           turns the ca
ssette relay on";
3810 PRINT gr$"           for two seco
nds"
3820 ENDPROC
3830 :
3840 DEF PROCdelay
3850 ER$="DELAY <offwait> <H/M/S> <onse
cs>"
3860 LOCAL wait,on,unit$
3870 para$=FNextract
3880 IF para$="" OR para$>CHR$(58) PROC
error(ER$):ENDPROC
3890 wait=VALpara$
3900 IF wait <=0 PROCerror("Cannot time
"+para$):ENDPROC
3910 para$=FNextract
3920 IF INSTR("HMS",para$)<1="" PROCer
ror(ER$):ENDPROC
3930 unit$=para$
3940 para$=FNextract
3950 IF para$="" OR para$>CHR$(58) PROC
error(para$+"... is not a number."):ENDP
ROC
3960 on=VALpara$
3970 IF on <=0 PROCerror("Cannot time "
+para$):ENDPROC
3980 PRINT cy$"Waiting....."
3990 PROCTiming(wait,unit$)
4000 *MOTOR 1
4010 PRINT re$"Timing....";
4020 PROCTiming(on,"S")
4030 *MOTOR 0
4040 PRINT gr$".....OFF"
4050 ENDPROC
4060 :
4070 DEF PROCexinterval
4080 PRINT cy$"INTERVAL <off> <H/M/S> <
on> <rep>"TAB(35)"INTE"
4090 PRINT
4100 PRINT cy$"INTERVAL 30 M 1 20"
4110 PRINT gr$"delays for 30 minutes, t
hen turns"
4120 PRINT gr$"on the cassette for one
second and"
4130 PRINT gr$"repeats this 20 times"
4140 ENDPROC
4150 :
4160 DEF PROCinterval
4170 ER$="INTERVAL <off> <H/M/S> <on> <
rep>"
4180 LOCAL wait,on,repeats,unit$
4190 para$=FNextract
4200 IF para$="" OR para$>CHR$(58) PROC
error(ER$):ENDPROC
4210 wait=VALpara$
4220 IF wait <=0 PROCerror("Cannot time
"+para$):ENDPROC
4230 para$=FNextract
4240 IF INSTR("HMS",para$)<1="" PROCer
ror(ER$):ENDPROC
4250 unit$=para$
4260 para$=FNextract

```

Continued ▶

◀ Joe's Jottings listing 2 continued

```

4270 IF para$="" OR para$>CHR$(58) PROC
error(para$+"... is not a number."):ENDP
ROC
4280 on=VALpara$
4290 IF on <=0 PROCerror("Cannot time "
+para$):ENDPROC
4300 para$=FNextract
4310 IF para$="" OR para$>CHR$(58) PROC
error(para$+"... is not a number."):ENDP
ROC
4320 repeats=VALpara$
4330 IF repeats <=0 PROCerror("Cannot t
ime "+para$):ENDPROC
4340 FOR loop%= 1 TO repeats
4350 PRINT cy$"Loop ";loop%;" Waiting..
...."
4360 PROCTiming(wait,unit$)
4370 *MOTOR 1
4380 PRINT re$"Timing....";
4390 PROCTiming(on,"S")
4400 *MOTOR 0
4410 PRINT gr$".....OFF"
4420 NEXT
4430 ENDPROC
4440 :
4450 DEF PROCextrigger
4460 PRINT cy$"TRIGGER <light> <B/D>"TA
B(35)"TRIG"
4470 PRINT cy$"TRIG 44 B"gr$"fires the
cassette relay"
4480 PRINT gr$"           whenever the 1
ight cell"
4490 PRINT gr$"           reads brighter
than 44"
4500 PRINT cy$"TRIG 10 D"gr$"fires the
cassette relay"
4510 PRINT gr$"           whenever the 1
ight cell"
4520 PRINT gr$"           reads darker t
han 10"
4530 PRINT 'cy$"Once triggered the ligh
t level must"
4540 PRINT cy$"return to its original s
etting"
4550 PRINT cy$"before triggering can re
occur, and"
4560 PRINT cy$"Escape exits this comman
d."
4570 PRINT 'cy$"QMETER ABS"gr$"should b
e used to"
4580 PRINT gr$"           check the lig
ht level."
4590 ENDPROC
4600 :
4610 DEF PROCtrigger
4620 LOCAL value,val
4630 para$=FNextract
4640 IF para$="" PROCerror("TRIGGER <li
ght> <B/D>"):ENDPROC
4650 value=VALpara$:IF value<=0 OR valu
e >255 PROCerror("Light level out of ran
ge!"):ENDPROC
4660 para$=FNextract
4670 IF para$<>"D" AND para$<>"B" PROCe
rror("TRIGGER <light> <B/D>"):ENDPROC
4680 count%=0
4690 REPEAT
4700 IF FNadc(1)>value AND para$="D" PR
OCblipcassette:REPEAT UNTIL FNadc(1)<val
ue
4710 IF FNadc(1)<value AND para$="B" PR
OCblipcassette:REPEAT UNTIL FNadc(1)>val
ue

```

Continued ▶

# YELLOW PAGES

## WORD PROCESSING

See Choose Your Words Wisely, page 90

### ◀ Joe's Jottings listing 2 continued

```

4720 UNTIL FALSE
4730 ENDPROC
4740 :
4750 DEF PROCblipcassette
4760 *MOTOR 1
4770 TIME=0:REPEAT UNTIL TIME>50
4780 *MOTOR 0
4790 count%=count%+1
4800 PRINT cy$"triggered...";count%
4810 ENDPROC
4820 :
4830 DEF PROCexev
4840 PRINT cy$"EV <exp val> "TAB(35)"EV
"
4850 PRINT cy$"EV 10"gr$"lists all the
possible"
4860 PRINT gr$"      f-stops and shutte
r speeds"
4870 PRINT gr$"      which will work wi
th EV10."
4880 PRINT cy$"Use range 0 to 21 only"
4890 PRINT ma$"purple shutter speeds =
seconds"
4900 PRINT ye$"yellow = fractions (came
ra shake)"
4910 PRINT gr$"green = fractions (safe
holding)"
4920 PRINT cy$"cyan = fractions (1/10
00sec)"
4930 PRINT re$"red = out of shutter
range"
4940 PRINT cy$"Use QMETER EV to read th
e light in"
4950 PRINT cy$"Exposure values (linked
to film"
4960 PRINT cy$"speed set by ISO or DIN"
4970 ENDPROC
4980 :
4990 DEF PROCev
5000 LOCAL ev
5010 para%=FNextract
5020 IF para$<>"0" AND VALpara%=0 PROCe
rror("EV <exp val> ...0-21");ENDPROC
5030 ev=VALpara%;IF ev<0 OR ev>21 PROCe
rror("Exposure value out of range 0-21")
:ENDPROC
5040 PRINT cy$"F-stop 2 2.8 4 5.6 8
11 16 22"
5050 PRINT "EV ";ev;TAB(6);
5060 FOR loop%=ev+7 TO ev STEP -1
5070 PRINT EV$(loop%);
5080 NEXT:PRINT
5090 ENDPROC
5100 :
5110 DEF PROCextable
5120 PRINT cy$"TABLE"TAB(35)"TABL"
5130 PRINT gr$"lists all the possible"
5140 PRINT gr$"f-stops and shutter spee
ds"
5150 PRINT gr$"For each EV ... 0-20"
5160 ENDPROC
5170 :
5180 DEF PROCtable
5190 LOCAL ev
5200 PRINT cy$"f-stop 2 2.8 4 5.6 8
11 16 22"
5210 FOR ev= 0 TO 20
5220 PRINT "EV ";ev;TAB(6);
5230 FOR loop%=ev+7 TO ev STEP -1
5240 PRINT EV$(loop%);
5250 NEXT:PRINT
5260 NEXT
5270 ENDPROC

```

### Listing 1. Wordwise Plus menu

```

10 REM Wordwise Plus menu
20 REM by Philip Trinham
30 REM for B,B+,M,C
40 REM (C) Acorn User November 1987
50 :
60 MODE 7
70 *FX 220,7
80 ON ERROR PROCsyserror
90 PROCinitialise
100 A%=FNmenu
110 IF A%=8 THEN $B%=FNfile
120 IF A%>0 THEN *EXEC WWfkeys
130 IF A%=0 THEN MODE 7
140 *FX 220,27
150 END
160 :
170 DEF PROCinitialise
180 VDU 26,15
190 options$="123456789*"+CHR$27
200 ascii%=STRING$(100," ")
210 ascii$=""
220 FOR code%=32 TO 126
230 ascii%=ascii%+CHR$(code%)
240 NEXT
250 A%=174
260 X%=0
270 Y%=255
280 B%=128+(USR(&FFF4) DIV 256) AND &F
FFF
290 A%=0
300 oscommand=B%
310 X%=oscommand MOD 256
320 Y%=oscommand DIV 256
330 Z%=0
340 oscli=&FFF7
350 up=11
360 return=13
370 escape=27
380 star=42
390 delete=127
400 yellow%=CHR$(131)
410 cyan%=CHR$(134)
420 flash%=CHR$(136)
430 double%=CHR$(141)
440 cr=-74
450 escape=-113
460 off=0
470 on=1
480 ENDPROC
490 :
500 DEF FNmenu
510 LOCAL choice
520 PROCcursor(on)
530 REPEAT
540 REPEAT UNTIL NOT INKEY escape
550 choice=FNoptions
560 IF choice>ASC "0" THEN PROCshow(ch
oice-ASC "0")
570 IF choice=star THEN PROCoscli
580 UNTIL choice=escape OR choice>ASC
"0"
590 PROCcursor(off)
600 =choice-ASC "0"
610 :
620 DEF FNoptions
630 CLS
640 PRINT 'SPC(11); double%; yellow%;
"WW-PLUS ENTRY"
650 PRINT SPC(11); double%; yellow%; "
WW-PLUS ENTRY"
660 PRINT cyan%; "      (C) Acorn User 1
987"

```

Continued ▶

# YELLOW PAGES

## PROGRAMMING

### ◀ Choose Your Words Wisely listing 1 continued

```

670 PRINT cyan%; "1) Business letter"
680 PRINT cyan%; "2) Business letter
+ letter head"
690 PRINT cyan%; "3) Standard letter"
700 PRINT cyan%; "4) "
710 PRINT cyan%; "5) "
720 PRINT cyan%; "6) "
730 PRINT cyan%; "7) "
740 PRINT cyan%; "8) Edit existing do
cument"
750 PRINT cyan%; "9) No document"
760 PRINT 'cyan%; "ESC Return to BASIC
"
770 PRINT "Please enter choice";
780 =FNget(options%)
790 :
800 DEF PROCshow(chosen)
810 PRINT TAB(0,5+chosen); flash$
820 PRINT TAB(0,18); "Loading ";
830 IF chosen=1 THEN PRINT "Business h
eader"
840 IF chosen=2 THEN PRINT "Business h
eader and letter head"
850 IF chosen=3 THEN PRINT "Standard h
eader"
860 IF chosen=4 THEN PRINT "NO file" S
PC(4)
870 IF chosen=5 THEN PRINT "NO file" S
PC(4)
880 IF chosen=6 THEN PRINT "NO file" S
PC(4)
890 IF chosen=7 THEN PRINT "NO file" S
PC(4)
900 IF chosen=8 THEN PRINT "Document s
election program"
910 IF chosen=9 THEN PRINT "NO file" S
PC(4)
920 ENDPROC
930 :
940 DEF PROCoscli
950 LOCAL choice
960 Z%=on
970 CLS
980 REPEAT
990 PRINT "*";
1000 VDU 14
1010 $oscommand=FNinput(ascii$,90)
1020 CALL oscli
1030 VDU 15
1040 PRINT 'cyan%; "* Star Command";'
cyan%; "ESC Main Menu";
1050 REPEAT choice=GET
1060 UNTIL choice=escape OR choice=star
1070 PRINT STRING$(14,CHR$(delete)); CH
R$(up); STRING$(17," "); CHR$(return);
1080 UNTIL choice=escape
1090 Z%=off
1100 ENDPROC
1110 :
1120 DEF PROCcursor(assign)
1130 VDU 23,1,assign;0;0;0;
1140 ENDPROC
1150 :
1160 DEF FNget(allowed%)
1170 LOCAL char
1180 *FX 15,1
1190 REPEAT
1200 char=GET
1210 UNTIL INSTR(allowed$,CHR$(char))>0
1220 =char
1230 :
1240 DEF FNinput(allowed$,maxlen)

```

Continued ▶

### ◀ Choose Your Words Wisely listing 1 continued

```

1250 LOCAL char,str$
1260 REPEAT
1270 char=FNget(allowed$+CHR$(delete)+C
HR$(return))
1280 IF char=delete AND LEN(str$)>0 THE
N str$=LEFT$(str$,LEN str$-1):VDU delete
1290 IF char<>return AND char<>delete A
ND LEN(str$)<maxlen THEN str$=str$+CHR$(
char):VDU char
1300 UNTIL char=return
1310 REPEAT UNTIL NOT INKEY cr
1320 =str$
1330 :
1340 DEF PROCsyserror
1350 PROCcursor(on)
1360 *FX 220,27
1370 VDU 14
1380 IF Z%=1 THEN PROCoserror
1390 IF Z%=0 THEN REPORT:PRINT" at line
";ERL:END
1400 ENDPROC
1410 :
1420 DEF PROCoserror
1430 LOCAL goon
1440 PROCcursor(off)
1450 PRINT ``:REPORT
1460 PRINT ``"Operating system error";
1470 goon=INKEY(400)
1480 PROCcursor(on)
1490 ENDPROC

```

### See The Recursion Version, page 95

#### Listing 1. Quicksorting a list of integers

```

10 REM Quick sort demonstration
20 REM By Nick Wetherby
30 REM For BBC B/B+/M/C/E/A
40 REM (C) Acorn User November 1987
50 :
60 length%=10
70 PROCchooselist
80 PROCprintlist
90 TIME=0
100 PROCsortlist(1,length%)
110 T%=TIME
120 PROCprintlist
130 PRINT T%/100; "seconds"
140 END
150 :
160 DEF PROCchooselist
170 DIM list%(length%)
180 FOR A%=1 TO length%
190 list%(A%)=RND(100)
200 NEXT
210 ENDPROC
220 :
230 DEF PROCprintlist
240 FOR A%=1 TO length%
250 PRINT list%(A%)
260 NEXT
270 PRINT
280 ENDPROC
290 :
300 DEF PROCsortlist(bot%,top%)
310 LOCAL lo%, hi%
320 lo%=bot%
330 hi%=top%
340 F%=TRUE
350 REPEAT
360 IF list%(lo%)>list%(hi%) THEN PROC
swap(lo%,hi%):F%=NOT F%

```

Continued ▶



# YELLOW PAGES

## WORD PROCESSING

### ◀ The Recursion Version listing 1 continued

```

370 IF F% THEN hi%=hi%-1 ELSE lo%=lo%+
1
380 UNTIL lo%=hi%
390 IF bot%<lo%-1 THEN PROCsortlist(bo
t%,lo%-1)
400 IF hi%+1<top% THEN PROCsortlist(hi
%+1,top%)
410 ENDPROC
420 :
430 DEF PROCswap(lo%,hi%)
440 temp%=list%(lo%)
450 list%(lo%)=list%(hi%)
460 list%(hi%)=temp%
470 ENDPROC

```

### Listing 2. Quicksorting addition to Joe's Jottings, October issue

```

10 REM File sort 4 - Quicksort
20 REM By Nick Wetherby
30 REM For BBC B/B+/M/C/E/A
40 REM (C) Acorn User November 1987
50 :
60 CLOSE# 0
70 PROCreadfile("Clubdat")
80 DIM spare$(fields%)
90 PROCquick(1)
100 PROCaddressdata
110 END
120 :
130 DEF PROCquick(f%)
140 PRINT"Quick sorting on field ";f%:
TIME=0
150 PROCrecurse(f%,1,recno%)
160 PROCtime
170 ENDPROC
180 :
190 DEF PROCrecurse(f%,bot%,top%)
200 LOCAL lo%, hi%
210 lo%=bot%
220 hi%=top%
230 F%=TRUE
240 REPEAT
250 IF file$(lo%,f%)>file$(hi%,f%) THE
N PROCswap(lo%,hi%):F%=NOT F%
260 IF F% THEN hi%=hi%-1 ELSE lo%=lo%+
1
270 UNTIL lo%=hi%
280 IF bot%<lo%-1 THEN PROCrecurse(1,b
ot%,lo%-1)
290 IF hi%+1<top% THEN PROCrecurse(1,h
i%+1,top%)
300 ENDPROC

```

See The Big Macro, page 101

### Listing 1. Multi-macro spooler

```

10 REM Viewstore macro spooler source
20 REM by Graham Bell
30 REM for B/B+/M/E + Viewstore/View
40 REM (C) Acorn User November 1987
50 :
60 brkv=&202
70 osfind=&FFCE
80 osbput=&FFD4
90 osasci=&FFE3
100 osword=&FFF1
110 osbyte=&FFF4
120 :
130 DIM store &FF

```

Continued ▶

### ◀ The Big Macro listing 1 continued

```

140 FOR I%=0 TO &FF
150 I%?store=0
160 NEXT
170 offset=store-&400
180 :
190 FOR pass=0 TO 2 STEP 2
200 P%=store
210 [
220 OPT pass
230 JMP output-offset
240 RTS
250 .last
260 BRK
270 .char
280 BRK
290 JMP close-offset
300 RTS
310 .nbrk
320 OPT FNequw(break-offset)
330 RTS
340 .handle
350 BRK
360 :
370 .text
380 OPT FNequs(" ? emanelif orcaM")
390 OPT FNequw(&OFOD)
400 :
410 .osblock
420 OPT FNequw(filename-offset)
430 OPT FNequw(&4FF-(filename-offset))
440 OPT FNequw(33)
450 OPT FNequw(126)
460 :
470 .openfile
480 LDY #&12
490 .message
500 LDA text-offset,Y
510 JSR osasci
520 DEY
530 BPL message
540 LDA #0
550 LDX #(osblock-offset)MOD256
560 LDY #(osblock-offset)DIV256
570 JSR osword
580 BCC noescape
590 LDA #&7C
600 JSR osbyte
610 BRK
620 OPT FNequw(&80)
630 OPT FNequs("Escape")
640 BRK
650 .noescape
660 LDA #&80
670 LDX #(filename-offset)MOD256
680 LDY #(filename-offset)DIV256
690 JSR osfind
700 TAY
710 BNE sethandle
720 BRK
730 OPT FNequw(&81)
740 OPT FNequs("Can't open file")
750 BRK
760 :
770 .close
780 LDY handle-offset
790 .closeall
800 LDA #0
810 JSR osfind
820 .sethandle
830 STA handle-offset
840 .vector
850 SEI
860 LDA brkv

```

Continued ▶

# YELLOW PAGES

## WORD PROCESSING

### ◀ The Big Macro listing 1 continued

```

870 LDX nbrk-offset
880 STA nbrk-offset
890 STX brkv
900 LDA brkv+1
910 LDX nbrk+1-offset
920 STA nbrk+1-offset
930 STX brkv+1
940 CLI
950 RTS
960 :
970 .break
980 PHA
990 TXA
1000 PHA
1010 TYA
1020 PHA
1030 LDY #0
1040 JSR closeall-offset
1050 PLA
1060 TAY
1070 PLA
1080 TAX
1090 PLA
1100 JMP (brkv)
1110 :
1120 .output
1130 STA char-offset
1140 TXA
1150 PHA
1160 TYA
1170 PHA
1180 LDY handle-offset
1190 BNE isopen
1200 LDA #&0D
1210 STA last-offset
1220 JSR openfile-offset
1230 .isopen
1240 LDA #&0D
1250 CMP last-offset
1260 BNE notend
1270 CMP char-offset
1280 BEQ return
1290 LDA #&80
1300 JSR osbput
1310 .notend
1320 LDA char-offset
1330 STA last-offset
1340 BPL print
1350 AND #&7F
1360 BEQ htone
1370 LDA #&01
1380 .htone
1390 ORA #&1C
1400 .print
1410 JSR osbput
1420 BIT char-offset
1430 BMI return
1440 JSR osasci
1450 .return
1460 PLA
1470 TAY
1480 PLA
1490 TAX
1500 LDA char-offset
1510 RTS
1520 :
1530 .filename
1540 J
1550 NEXT pass
1560 :
1570 sum=0
1580 FOR I%=0 TO &FF

```

Continued ▶

### ◀ The Big Macro listing 1 continued

```

1590 sum=sum+I%?store
1600 NEXT
1610 IF sum<>&500B PRINT "Checksum err
or - please check listing":END
1620 :
1630 PRINT "Press <SPACE> to save code.
"
1640 REPEAT UNTIL GET=32
1650 PROCoscli("SAVE VSMACRO " + STR$~s
tore + " +100 40C 400")
1660 END
1670 :
1680 DEF FNequb(byte)
1690 ?P%=byte
1700 P%=P%+1
1710 =pass
1720 :
1730 DEF FNequw(word)
1740 ?P%=word MOD 256
1750 P%?1=word DIV 256
1760 P%=P%+2
1770 =pass
1780 :
1790 DEF FNequs(string$)
1800 $P%=string$
1810 P%=P%+LENstring$
1820 =pass
1830 :
1840 DEF PROCoscli(string$)
1850 DIM X% &FF
1860 Y%=X% DIV 256
1870 $X%=string$
1880 CALL &FFF7
1890 ENDPROC

```

### Monthly program listings

MICRONET 800 (C)	60061Ja	Op
------------------	---------	----

### ACORN USER PROGRAMS

- 1 ACORN USER SEPTEMBER LISTINGS A.U. £5  
More from the magazine...
- 2 SEPTEMBER ABUSERS GAME A.U. FREE  
Another one-liner from the back page.  
21/8
- 3 ACORN USER OCTOBER LISTINGS A.U.  
£4.35 Helpful routines, a catalogue  
program, a printer driver generator  
plus more...
- 4 CODE KEY A.U. FREE Gives your model B  
or master the Compact's CODE key 11/9

Key 9 - Telesoftware menu.

To save time and mistakes, the yellow pages listings are available on disc or cassette, and they can also be downloaded from Micronet. The disc costs £5.95 and is fully menu driven. It is in 40-track DFS format, easily convertible to 80-track. The cassette costs £3.95 and contains a tape-to-disc transfer program. Both tape and disc contain a free graphics bonus. To order your disc or cassette, see the order form opposite.

You can also download the listings from Micronet at a cost of only £5.00. The programs can be reached by typing Acorn User's own special keyword \*AUPROGS#. This takes you to a menu from which you can choose our monthly listings

# ACORN USER ORDER FORM

## ACORN USER OFFERS

### DISC SUBSCRIPTIONS

Yes! Please send me my free copy of *Viewchart* and start my disc subscription from the \_\_\_\_\_ issue

- |                       |                          |        |
|-----------------------|--------------------------|--------|
| 01 UK                 | <input type="checkbox"/> | £69.00 |
| 02 EUROPE (Airmail)   | <input type="checkbox"/> | £76.00 |
| 02 OVERSEAS (Surface) | <input type="checkbox"/> | £76.00 |
| 03 OVERSEAS (Airmail) | <input type="checkbox"/> | £84.00 |

TOTAL VALUE £ \_\_\_\_\_

### CASSETTE SUBSCRIPTIONS

Yes! Please start my cassette subscription from the \_\_\_\_\_ issue

- |                       |                          |        |
|-----------------------|--------------------------|--------|
| 01 UK                 | <input type="checkbox"/> | £35.00 |
| 02 EUROPE (Airmail)   | <input type="checkbox"/> | £52.00 |
| 02 OVERSEAS (Surface) | <input type="checkbox"/> | £52.00 |
| 03 OVERSEAS (Airmail) | <input type="checkbox"/> | £62.00 |

TOTAL VALUE £ \_\_\_\_\_

### MAGAZINE SUBSCRIPTIONS

Yes! Please start my subscription to *Acorn User* magazine from the \_\_\_\_\_ Issue (UK Subscribers see page 111 before completing)

- |                          | 12 Issues                       | 27 Issues                       |
|--------------------------|---------------------------------|---------------------------------|
| 01 UK                    | <input type="checkbox"/> £17.50 | <input type="checkbox"/> £35.00 |
| 02 EUROPE                | <input type="checkbox"/> £25.00 | <input type="checkbox"/> £50.00 |
| 03 MIDDLE EAST           | <input type="checkbox"/> £30.00 | <input type="checkbox"/> £60.00 |
| 04 THE AMERICAS & AFRICA | <input type="checkbox"/> £35.00 | <input type="checkbox"/> £70.00 |
| 05 REST OF THE WORLD     | <input type="checkbox"/> £40.00 | <input type="checkbox"/> £80.00 |

TOTAL VALUE £ \_\_\_\_\_

### ACORN USER MONTHLY DISCS

- 1986
- |                                     |                                     |                                     |
|-------------------------------------|-------------------------------------|-------------------------------------|
| <input type="checkbox"/> JAN 0204-6 | <input type="checkbox"/> AUG 0211-9 | <input type="checkbox"/> MAY 0220-8 |
| <input type="checkbox"/> FEB 0205-4 | <input type="checkbox"/> SEP 0212-7 | <input type="checkbox"/> JUN 0221-6 |
| <input type="checkbox"/> MAR 0206-2 | <input type="checkbox"/> OCT 0213-5 | <input type="checkbox"/> JUL 0222-4 |
| <input type="checkbox"/> APR 0207-0 | <input type="checkbox"/> NOV 0214-3 | <input type="checkbox"/> AUG 0223-2 |
| <input type="checkbox"/> MAY 0208-9 | <input type="checkbox"/> DEC 0215-1 | <input type="checkbox"/> SEP 0224-0 |
| <input type="checkbox"/> JUN 0209-7 | 1987                                | <input type="checkbox"/> OCT 0225-9 |
| <input type="checkbox"/> JUL 0210-0 | <input type="checkbox"/> JAN 0216-X | <input type="checkbox"/> NOV 0226-7 |
- UK=£5.95       FEB 0217-8  
 Europe=£6.95       MAR 0218-6  
 Overseas=£7.95       APR 0219-4

All AU discs are in DFS format for the 1770 and 8271 systems. Monthly discs are 5.25-inch (40-track with 80-track transfer program supplied)

TOTAL VALUE £ \_\_\_\_\_

### ACORN USER MONTHLY CASSETTES

- | 1985                                | 1986                                | 1987                                |
|-------------------------------------|-------------------------------------|-------------------------------------|
| <input type="checkbox"/> JAN 0409-X | <input type="checkbox"/> JAN 0421-9 | <input type="checkbox"/> JAN 0433-2 |
| <input type="checkbox"/> FEB 0410-3 | <input type="checkbox"/> FEB 0422-7 | <input type="checkbox"/> FEB 0434-0 |
| <input type="checkbox"/> MAR 0411-1 | <input type="checkbox"/> MAR 0423-5 | <input type="checkbox"/> MAR 0435-9 |
| <input type="checkbox"/> APR 0412-X | <input type="checkbox"/> APR 0424-3 | <input type="checkbox"/> APR 0436-7 |
| <input type="checkbox"/> MAY 0413-8 | <input type="checkbox"/> MAY 0425-1 | <input type="checkbox"/> MAY 0437-5 |
| <input type="checkbox"/> JUN 0414-6 | <input type="checkbox"/> JUN 0426-X | <input type="checkbox"/> JUN 0438-3 |
| <input type="checkbox"/> JUL 0415-4 | <input type="checkbox"/> JUL 0427-8 | <input type="checkbox"/> JUL 0439-1 |
| <input type="checkbox"/> AUG 0416-2 | <input type="checkbox"/> AUG 0428-6 | <input type="checkbox"/> AUG 0440-5 |
| <input type="checkbox"/> SEP 0417-0 | <input type="checkbox"/> SEP 0429-4 | <input type="checkbox"/> SEP 0441-3 |
| <input type="checkbox"/> OCT 0418-9 | <input type="checkbox"/> OCT 0430-8 | <input type="checkbox"/> OCT 0442-1 |
| <input type="checkbox"/> NOV 0419-7 | <input type="checkbox"/> NOV 0431-6 | <input type="checkbox"/> NOV 0443-X |
| <input type="checkbox"/> DEC 0420-0 | <input type="checkbox"/> DEC 0432-4 |                                     |

Monthly cassettes are suitable for BBC micro and Electron users

UK= £3.95  
 Europe= £4.95  
 Overseas= £5.95

TOTAL VALUE £ \_\_\_\_\_

### ACORN USER MAGAZINE BACK ISSUES

- | 1985                                | 1986                                | 1987                                |
|-------------------------------------|-------------------------------------|-------------------------------------|
| <input type="checkbox"/> JAN 0021-3 | <input type="checkbox"/> JAN 0032-9 | <input type="checkbox"/> JAN 0044-2 |
| <input type="checkbox"/> MAR 0022-1 | <input type="checkbox"/> FEB 0033-7 | <input type="checkbox"/> MAR 0046-9 |
| <input type="checkbox"/> APR 0023-X | <input type="checkbox"/> MAR 0034-5 | <input type="checkbox"/> APR 0047-7 |
| <input type="checkbox"/> MAY 0024-8 | <input type="checkbox"/> APR 0035-3 | <input type="checkbox"/> MAY 0048-5 |
| <input type="checkbox"/> JUN 0025-6 | <input type="checkbox"/> MAY 0036-1 | <input type="checkbox"/> JUN 0049-3 |
| <input type="checkbox"/> JUL 0026-4 | <input type="checkbox"/> JUN 0037-X | <input type="checkbox"/> JUL 0050-7 |
| <input type="checkbox"/> AUG 0027-2 | <input type="checkbox"/> JUL 0038-8 | <input type="checkbox"/> AUG 0051-5 |
| <input type="checkbox"/> SEP 0028-0 | <input type="checkbox"/> AUG 0039-6 | <input type="checkbox"/> SEP 0052-3 |
| <input type="checkbox"/> OCT 0029-9 | <input type="checkbox"/> SEP 0040-X | <input type="checkbox"/> OCT 0053-1 |
| <input type="checkbox"/> NOV 0030-2 | <input type="checkbox"/> OCT 0041-8 | <input type="checkbox"/> NOV 0054-X |
| <input type="checkbox"/> DEC 0031-0 | <input type="checkbox"/> NOV 0042-6 |                                     |
|                                     | <input type="checkbox"/> DEC 0043-4 |                                     |

UK= £1.75  
 Europe= £2.25  
 Overseas= £3.75

TOTAL VALUE £ \_\_\_\_\_

### BINDERS

TOTAL VALUE £ \_\_\_\_\_

- |                        | UK                             | EUROPE                         | OVERSEAS                        |
|------------------------|--------------------------------|--------------------------------|---------------------------------|
| MAGAZINE BINDER 1201-7 | <input type="checkbox"/> £4.95 | <input type="checkbox"/> £7.95 | <input type="checkbox"/> £14.95 |
| DISC BINDER 1302-1     | <input type="checkbox"/> £6.95 | <input type="checkbox"/> £9.95 | <input type="checkbox"/> £16.95 |

24 hour telephone service (0672) 40825

# ACORN USER ORDER FORM

## ACORN USER OFFERS

### ACORN USER ROMS

- USERDUMP 1001-4 UK = £19.95  
 USERROM 1002-2 Europe = £20.95  
 AXRRROM 1003-0 Overseas = £21.95

TOTAL VALUE £ \_\_\_\_\_

### ACORN USER SPECIAL CASSETTES

- ACORN USER GRAPHICS 0601-7 UK = £3.95  
 BEST OF ACORN USER 0602-5 Europe = £4.95  
 GAMES COMPENDIUM 0603-3 Overseas = £5.95  
 FINEST FAVOURITES 0604-1

TOTAL VALUE £ \_\_\_\_\_

### ACORN USER SPECIAL DISCS

- |  |                                    |  |  |
|--|------------------------------------|--|--|
| GALLERY DISC<br>40-track 0801-X <input type="checkbox"/> 80-track 0802-8 <input type="checkbox"/> 3.5in 0803-6 <input type="checkbox"/>            | UK = £3.95                         | SIDEWAYS RAM<br>UTILITIES DISC<br>40-track 0825-7 <input type="checkbox"/> | UK = £9.95<br>Europe = £10.95 Overseas = £11.95  |
| GALLERY COLLECTION DISC<br>40-track 0840-0 <input type="checkbox"/> 80-track 0841-9 <input type="checkbox"/> 3.5in 0842-7 <input type="checkbox"/> | UK = £3.95                         | NETWORK UTILITIES<br>DISC<br>80-track 0809-5 <input type="checkbox"/>      | UK = £19.95<br>Europe = £20.95 Overseas = £21.95 |
| DISC HELP DISC<br>80-track 0804-4 <input type="checkbox"/> Europe = £7.95  | UK = £6.95<br>Overseas = £8.95     | CALLIGRAPHY<br>40/80-track 0950-4 <input type="checkbox"/>                 | UK = £9.95<br>Europe = £10.95 Overseas = £11.95  |
| PRINTER HELP DISC<br>40-track 0820-6 <input type="checkbox"/> 80-track 0821-4 <input type="checkbox"/>   |                                    | VIEWCHART DISC<br>40-track 0920-2 <input type="checkbox"/>                 | UK = £12.95 Europe = £13.95 Overseas = £14.95    |
| GRAPHICS UTILITIES DISC<br>40-track 0830-3 <input type="checkbox"/>  | UK = £7.95                         |  |  |
| EDUCATION DISC<br>40-track 0815-X <input type="checkbox"/>   | Europe = £8.95<br>Overseas = £9.95 |  |  |

TOTAL VALUE £ \_\_\_\_\_

I enclose a sterling cheque/postal order for a total of £ \_\_\_\_\_ made payable to Redwood Publishing

Please debit my  Visa (Barclaycard)  Access (Mastercard)

Credit card number             Expiry date

SIGNED \_\_\_\_\_ DATE \_\_\_\_\_

MR/MRS/MISS/MS \_\_\_\_\_ INITIALS \_\_\_\_\_ SURNAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

POSTCODE \_\_\_\_\_ TELEPHONE \_\_\_\_\_

Please return your order to: Redwood Publishing Ltd, Acorn User Mail Order, Lambourn Woodlands, Newbury, Berkshire RG16 7TW

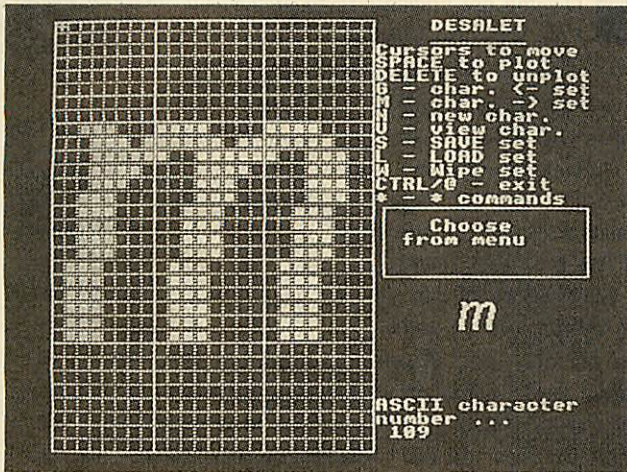
For Office Use Only

B41

24 hour telephone service (0672) 40825

# OFFERS

C A L L I G R A P H Y



**BBC/B/  
B+/M** This is your chance to produce your own letterheads and posters to a professional standard, with the minimum of fuss and effort. *Acorn User's Calligraphy* disc has been compiled due to popular demand and contains all the programs needed to produce letter designs that will impress your friends and colleagues.

The *Desalet* program is a simple font creator which produces customised letters, to your personal design. It will save you from using repetitive data statements and error prone calculations. You can save your font set on disc and then call it up as needed. All previously saved sets can be modified or added to, and each set covers up to 94 characters.

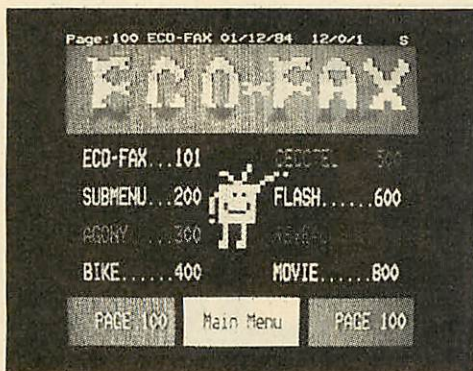
*Modical*, a modification of the original *Calligraphy* program (September 1986 *Acorn User*) is also included on the disc. *Modical* allows the use of disc-based font sets created with *Desalet*. *Modical* also incorporates a modified file creation program, which permits files to be printed out immediately or saved for later printing.

An enhanced font ROM in the form of a sideways RAM image, is also on the disc. This allows you to design your own fonts for use on-screen. Any output to the printer will be in the new font – thus giving true WYSIWYG capabilities. There is a selection of new fonts to help you get started.

This superb disc comes in 5.25-inch, 40/80-track format and is great value at only £9.95.

## A new dimension in letter designing

L I S T I N G S

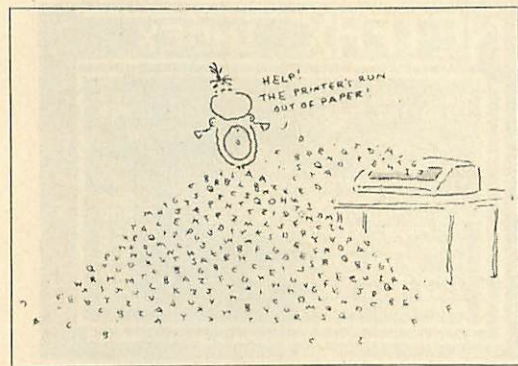


## Easy learning with Education disc

**BBC/B/  
B+/M/  
C** The *Acorn User Education* disc makes learning easy and enjoyable. The disc is packed with useful programs, including the *Eco-fax* database for Econets.

Graphics are a strong feature, and included on the disc are *Turtle Logo*, *Easyplot* and *Bulletin*, and you can then show off your creations with *Vufoil* and *Noticeboard* or make music with *Tunemaker*. Also included are an all-mode dumping routine for Epson compatibles and a teletext dumping routine for mode 7 dumping to Epson FX80 compatibles. All this for only £7.95.

D I S C S



## Printer advice with Printer Help disc

**BBC/B/  
B+/M/  
C** Often printer manuals don't fully cover the Master and BBC micro – our disc will help you to understand your printer's facilities for just £7.95.

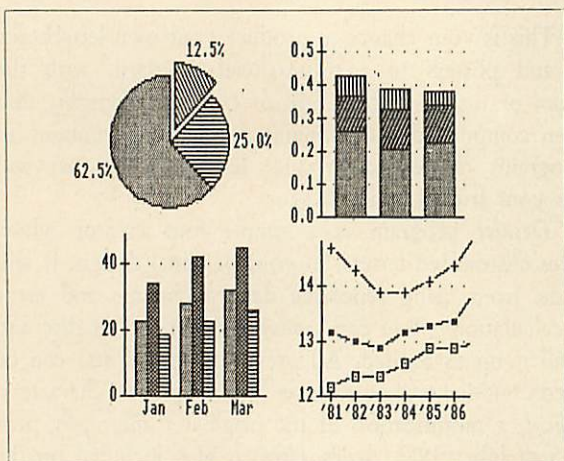
The 5.25-inch *Printer Help* disc illustrates various print type styles, use of *Wordwise* and *View*, screen images and printer care. There is an ASCII standard codes table and clear diagrams illustrating stages of printer use including advice on what to do if things go wrong.

For compatibility details write to Seran, Redwood Publishing Ltd, 20-26 Brunswick Place, London N1 6DJ.

Acorn User order form on page 130 – 24 hour telephone service (0672) 40825

# OFFERS

C H A R T S O F T W A R E



## Improve your presentation with ViewChart

**BBC/B/  
B+/M/  
C** Do you use your micro to prepare figures? Perhaps in *ViewSheet* or *ViewStore*? Do you make printed reports? This business graphics program from *Acorn User* contributor Peter Sandford is aimed at anyone who uses figures, and wishes to improve the quality of their work.

*ViewChart* takes your numeric data from a *ViewSheet* or *ViewStore* file, or manual input, and plots various chart formats to screen. In one plot you can produce between one and five piecharts, stacked bar charts up to 25 bars, grouped bar charts up to 24 bars and line graphs with up to five lines each of 40 plotted points.

In practice, most business presentation data such as sales figures, departmental breakdowns, cost analyses and so on can be presented in a form even the boss will understand!

You can even add extra text and graphics to the completed chart prior to saving or printing. A screen dump program is provided, for Epson and compatible printers, which is specifically designed to fit the width of an A4 page. Instructions are provided on interfacing to other printers. *ViewChart* works in screen mode 0, using full shading effects, so what you see on screen is what you get on paper, and includes some tips on final presentation of graphics in documents.

*ViewChart* is supplied on 40-track 5.25-inch disc and works on the BBC models B and B+ and Master 128.

And the price of this professional software? Just £12.95.

D I S C S



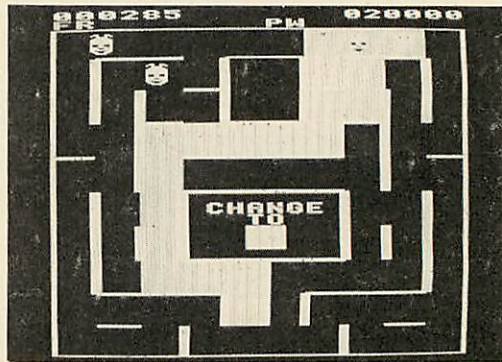
## Network utilities for better communication

**BBC/B/  
B+/M/  
C** The *Network Utilities* 80-track disc is the logical addition to your network, combining invaluable routines with a sophisticated yet easy-to-use noticeboard.

Included is *Netfax*, our own hybrid information system providing access to thousands of pages of information. Other special features are: a file locator and directory size finder; network manager utilities including a bridge compatible screen viewer and a 'notify all' facility.

Plus there are 150 *Netfax* pages covering instructions, help and indexes, all on a 5.25-inch disc for £19.95.

C A S S E T T E S



## Games galore in our compendium cassette

**BBC/B/  
B+/M/  
E** You can guide Shuggy around his garden; puzzle over *Puzzle*, and be 3-D amazed. Or destroy submarines with *Run Silent, Run Deep*. And for the really adventurous, go round the *Acorn User* office.

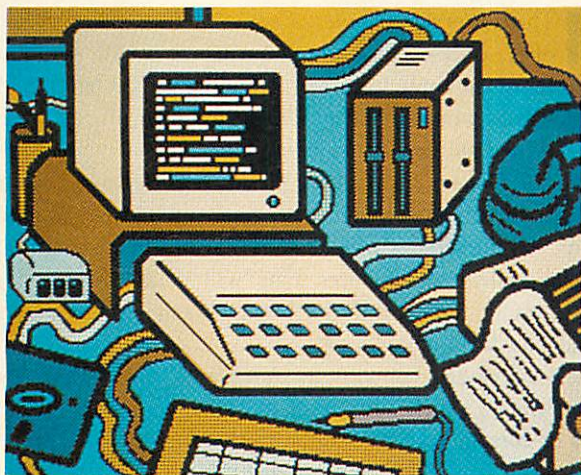
Best of all, try the truly different *Adventure* game written especially for the *Games Compendium* cassette by Rob Anderson. It's excellent value at £3.95.

You will also find David Acton's *Spectramania* and *Quadline* on this cassette: beat your micro, get four in a row. All are easily transferred to disc.

Acorn User order form on page 130 - 24 hour telephone service (0672) 40825

# OFFERS

P R O G R A M L I S T I N G S



## Perfect photos with this month's listings

Joe Telford's photographic toolkit is a must for all your future photographic assignments. Joe has put together a suite of programs that will allow you to correctly expose all of your photographs. There is also a program to enable you to control an enlarger – use this program to enlarge your snaps.

Does your business often do mailings or send out press releases? If the answer is yes we can help you develop your macro format. When using *View* you have probably discovered that you are limited to 10 items and a mere 132 characters, which just isn't enough for some long addresses. Using our program you can get a multi-macro from *View-Store* using your database for mailouts.

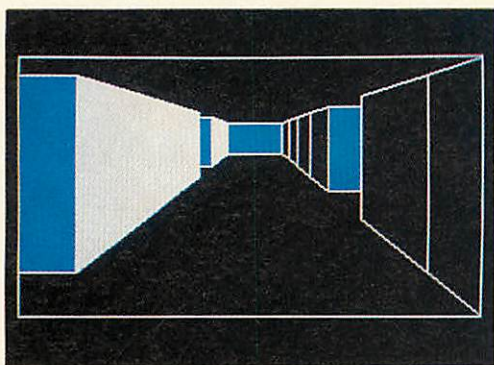
Find out how to use daisy-wheels, with Martin Phillips. There are many daisy-wheel printers, with different characters, typefaces and commands, now you can use them all.

From Forum there is a program which doubles the screen resolution of the Master to 64 lines of text. To save time when making backup discs use our program that enables you to backup all discs via sideways RAM. Carl Bateman explains four-directional hardware scrolling on the Electron.

Philip Trinham has put together a menu program for using *Wordwise Plus* including standard letter files. And there is an update to Joe's sorting programs from October 1987 issue.

November's listings are available in 5.25-inch 40/80-track format at only £5.95 or on cassette for £3.95.

L I S T I N G S

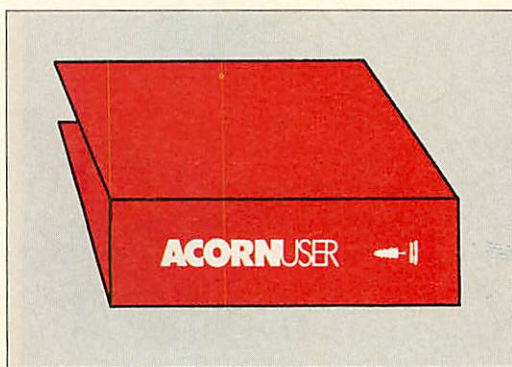


## Monthly listings subscription special

Subscribing to the *Acorn User's* monthly listings discs and cassettes will save you hours of typing and debugging the listings. For this issue only we are offering a subscription to our cassette listings for an unbeatable £35.00 – a saving of £10.00. Subscribers to the monthly listings discs will receive a free copy of *ViewChart* – worth £12.95 when they subscribe for the year.

The *Acorn User* monthly listings are great value, so be sure you receive the best programs, utilities and graphics and post your subscription today!

B I N D E R S



## Vastly reduced prices for disc binders

Our grey cloth disc binder is supplied with its own protective slip case and is filled with six transparent inserts, which will hold a year's supply of 5.25-inch monthly discs, and it is currently available at the special price of just £6.95.

An *Acorn User* magazine binder is the best way to keep your precious copies in pristine condition. Our smart red binder features a wide spine with the capacity to hold a whole year's issues. For only £4.95 your magazines can last a lifetime.

*Acorn User* order form on page 129 – 24 hour telephone service (0672) 40825

# OFFERS

G A L L E R Y D I S C S



## Special money-off Christmas offer

BBC/B/  
B-/M/  
C

The *Gallery* and *Gallery Collection* discs are on special offer, only £3.95 each, a saving of £3.00 per disc, whichever of the three formats you choose. These two superb graphics discs would make an ideal Christmas gift for family or friends and an excellent stocking filler for the graphics fan.

Both the *Gallery* and *Gallery Collection* discs contain over 20 digitised, colourful, and stunningly produced graphics screens. All the screens will scroll automatically creating your personal gallery of pictures that will rival the best art institutions in the world!! Each screen can also be loaded individually for a closer look.

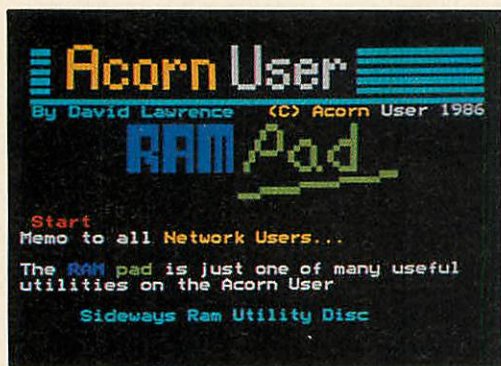
The *Gallery* disc contains two programs, *Pixel Editor* and *Super Painter*, which allow you to create your own masterpieces or edit the screens already on the disc. Included on the *Gallery* disc are old favourites including Thomas the Tank Engine and Malcolm Banthorpe's Coke Can.

The rich and famous, or sometimes infamous, put in an appearance on the *Gallery Collection* disc – Spitting Image, the Dallas crowd, Henry the VIII and Bugs Bunny are on the disc to entertain you.

All the screens on the *Gallery Collection* disc some in compressed format, with a program to help you compress and expand your own graphics screens.

This money-saving offer is only available while stocks last, so send in your orders now and beat the Christmas rush.

D I S C S



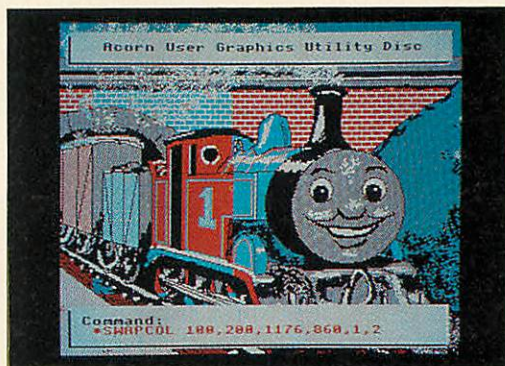
## Disc for all sideways RAM users

BBC/B/  
B-/M/  
C

The *Sideways RAM Utilities* disc includes: *Ram-Pad* – your computer's answer to the pad and pen. *On-Screen Fonts* – a variety of print styles available in all graphics modes. \* *HLP ROM* – add your own help text to call up when you're stuck. Standard ROM header for use when writing your own ROMs. \* *RLOOK* to examine the contents of your ROMs and sideways RAM images.

There are many more utilities on this 40-track 5.25-inch disc with a transfer program for 80-track users, and it's competitively priced at £9.95.

D I S C S



## Graphics utilities for your screens

BBC/B/  
B-/M/  
C

The 40-track 5.25-inch *Graphics Utilities* disc, keenly priced at £7.95, features 16 routines to manipulate blocks of graphics: rotation and reflection, a screen compressor/expander, a colour flood-fill routine and three mode conversion commands.

With the Basic procedure library are multi-height, proportional and justified text and 'drop shadow' boxes. A teletext screen editor gives point plotting, line drawing, rubber banding and flood fill, along with all mode 7 control codes. All can be used in your own programs.

Acorn User order form on page 130 – 24 hour telephone service (0672) 40825



# OFFERS

D U M P R O M S



## Printer control with the UserDump ROM

**BBC/B/  
B-/M/  
C/E** This pack includes the easy-to-fit *UserDump* ROM chip and a practical 22-page guide to the screen dump and printer control facilities offered – for just £19.95.

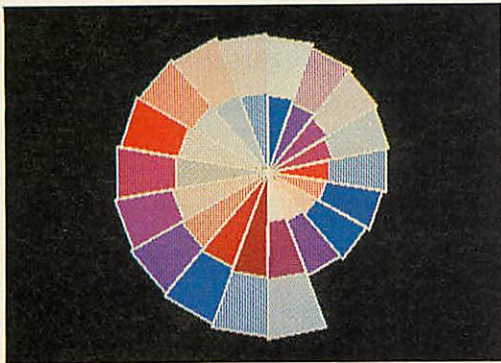
Once installed, *UserDump* will allow you to dump any screen image in any display mode by entering a single command – either as a line of your program or by typing in direct from the keyboard. A perfect dump can also be obtained while a machine code program is running.

*UserDump* features the following extra commands: \*WDUMP – dump of graphics window only in any mode; \*ZDUMP – a distortion-free dump of the mode 0 screen using plotter graphics; \*TRANSIT – translate teletext screen into mode 1; \*SHIFT <argument> – shift any area of memory; \*IBM – select IBM printer; \*CP80 – select CP80 printer.

*UserDump* is compatible with the BBC micro (model B or B+) fitted with operating system 1.2. Any earlier version will cause problems. *UserDump* is fully compatible with the Acorn 6502 second processor. It works with any printer which has single density and double density bit image graphics, including all Epson (LX, RX and FX) printers, Star Gemini and Delta, SG, SD and SR, Canon and Kaga NLQ. Also usable are the Shinwa and other CP80 printers.

There are many more commands available with *UserDump*, and details are available from Seran, Redwood Publishing Ltd., 20-26 Brunswick Place, London N1 6DJ.

R O M S

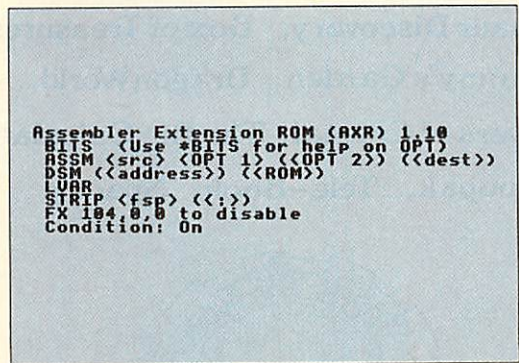


## Your favourite Acorn User routines

**BBC/B/  
B-/M/  
C/E** Get *UserROM* for your favourite *Acorn User* routines. Plug in the ROM chip and 19 routines are instantly accessible via star commands, including colfill with 27 colourful fills; dotfill providing 23 new black and white shades; bad program recovery; variable lister; function key lister; a graphics compiler; a circle drawing routine and a sound compiler. There are many demonstration programs and a 22 page manual. All for £19.95.

Full details are available from Seran, Redwood Publishing Ltd., 20-26 Brunswick Place, London N1 6DJ.

R O M S



## Acorn User Assembler Extension ROM

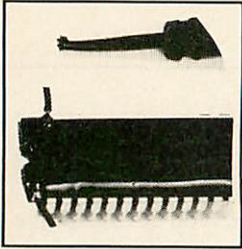
**BBC/B/  
B-/M/  
C/E** The AXR ROM, competitively priced at £19.95, is especially designed for use by machine code programmers. AXR adds a variety of options and commands to the Basic assembler, along with several new pseudo op codes, full Basic expression evaluation, and even the use of binary numbers. A disassembler is included in the software, and all 65C02 instructions can be used. AXR is compatible with Basic 1, 2 and Master.

Further details from Seran, Redwood Publishing Ltd., 20-26 Brunswick Place, London N1 6DJ.

Acorn User order form on page 130 – 24 hour telephone service (0672) 40825

# SIDEWAYS RAM

**BRAINSOFTS 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 &FE30 register.
- \*Low power consumption.

Incompatible with rom boards except Peartree MR3000.

**BRAINSOFTS 16K COMPATIBLE WITH MOST ROM BOARDS.**

This module has been tested with the following boards:- ATPL, Watford, and Peartree MR3000.

### BRAINSOFTS BATTERY BACKUP UNIT.

A 28pin 0.6inch wide socket with a built in CMOS controller and a embedded lithium battery. It monitors the supply for disruption when such occurs the battery is switched on.

All the above are guaranteed for 1 yr. Please state computer.

# SOFTWARE

## SIDEWAYS RAM UTILITIES

### Now Version 3 with ARFS and APB !!

- MENU DRIVEN SOFTWARE this selects RAMLOAD, RAMSAVE, RAMLIST, PRINTER BUFFER, or PROGRAMMERS 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.
  - PROGRAMMERS UTILITIES are a collection of 25 utilities including a full-screen-memory editor, all variables clear, program relocation, program compaction, 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 compaction/uncompaction 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 \*RFS 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.

**BBC TO ARCHIMEDES DISK CONVERSION KIT** Comprising of 3.5 and a 5.25 inch disk with a connection lead for connecting the BBC and ARCHIMEDES together. Requires a BBC series computer and a Archimedes, menu driven software. Available Sep 87.

Send order form to: BRAINSOFT, 22 BAKER ST, LONDON W1M 1DF. TELEPHONE 01-486 0321 ( 10 lines)

SIDEWAYS RAM	COST	No	TOTAL
16K SLIMLINE MODULE	£14		
32K SLIMLINE MODULE	£14.5		
WRITE PROTECT SWITCH	£2		
BATTERY BACKUP FOR ABOVE MODULES.	£14		

SOFTWARE & BITS	COST	No	TOTAL
HM62256LP-12	£11		
HM62256LP-12 2+off	£10		
LEAD KIT	£14		
SOFTWARE W/O MODULE	£6		
SOFTWARE WITH MODULE	£3		

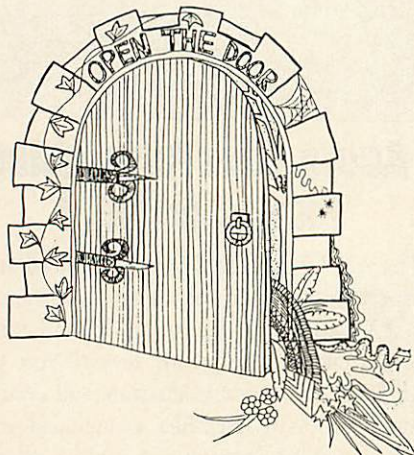
**MAIL ORDER ONLY.**  
P & P £1 ON ORDERS BELOW £4.  
**EDUCATIONAL DISCOUNTS.**

NAME \_\_\_\_\_ PHONE No \_\_\_\_\_ CHEQUE No \_\_\_\_\_  
ADDRESS \_\_\_\_\_

**SAME DAY DESPATCH**

## ENTER THE EXCITING WORLDS OF

**Dinosaur Discovery, Box of Treasures  
Granny's Garden, DragonWorld,  
Flowers of Crystal, The Big Calculator  
Zoopak, Tele-Book, Spacex**



TTNS MAILBOX 01:YNK045  
"SEND LARGE 20p SAE FOR BROCHURE"

# OXFORD PASCAL

**BBC B  
MASTER  
ECONET**

Oxford Pascal is the most popular full extended implementation of PASCAL for Acorn machines.

*"The code produced is very compact"* Acorn User  
*"I can wholeheartedly recommend it to Pascal novices and experts alike"* Computer Weekly.

The Oxford Pascal package contains

- 1) A Resident compiler. This compiler runs entirely in RAM and provides a very fast and convenient way to learn the language and debug programs. Using the resident compiler is like using a BASIC interpreter in that programs are ready to run in seconds.
- 2) A full disk to disk compiler producing relocatable object files. This compiler is capable of compiling very large programs (e.g. the compiler itself!)
- 3) The LINKER. This extension to standard Pascal allows you to break up programming tasks into small separately compilable files and then link them together into a single object module. Whenever you make a change to a file you need only compile that file and relink. Because you can work with short files you can use the resident compiler even for developing large programs. The LINKER also allows the building of libraries.
- 4) The LOCATOR. This utility allows you to produce stand alone programs which run on any machine without the Pascal system.

Oxford Pascal allows many extensions to standard Pascal including:

- \* program chaining
- \* sound extensions
- \* Bit manipulation
- \* Random numbers
- \* Machine code calls with parameters
- \* Graphics (Move, draw, plot etc)
- \* Hexadecimal numbers and I/O
- \* Run time error trapping
- \* String input
- \* Clock access
- \* Peek, Poke etc
- \* AND MORE

### ECONET USERS

Oxford Pascal is now available for the ECONET with BBC B or MASTER stations and is installed in numerous educational sites in the UK and Europe. Call us for details.

### This month's special offer.

Oxford disk Pascal for the Master £59.95 £49.95

S.S.O.L. 16B WORCESTER PLACE, OXFORD OX1 2JW Tel: (0865) 54195

Please rush me: - OXFORD PASCAL FOR THE BBC B (DISK) 40T  80T  £39.95  
OXFORD PASCAL FOR THE MASTER (DISK) £59.95   
OXFORD PASCAL ECONET INFO PACK FREE

I enclose cheque/postal order for \_\_\_\_\_  
(prices include VAT, please add £1.00 pp UK, £3.00 overseas).

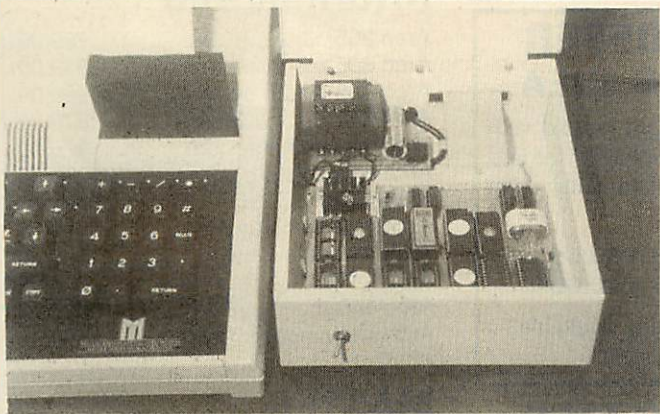
NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

PHONE \_\_\_\_\_

MAKE ALL CHEQUES PAYABLE TO S.S.O.L.

Allow 14 days for delivery.



## EXTERNAL EPROM EXPANSION FOR BBC MODEL B + MASTER

### 'Master' EPROM Expansion

The expansion unit will hold up to 12 ROM's. The ROM's may be 8K, 16K or 64K. The unit is plugged into the 'Master' cartridge socket via a cable and adaptor. The ROM's are selected as 3 banks of 4 ROM's. Each bank can contain up to 16, 16K ROM images, if 27512 EPROM's are used. In addition, 16K bytes of battery backed up RAM can be fitted, this RAM can be read and write protected.

**1 CARD SYSTEM £68 + £3 p&p + VAT**  
**ADDITIONAL CARD SYSTEM £20 + £1 p&p + VAT**  
**BBC Model 'B' EPROM Expansion**

The expansion box will hold 12 ROM's as standard and 24 in total with the addition of the second board. The ROM's may be 8K or 16K. The unit is connected via one of the internal ROM sockets and a buffer board, no soldering is required to fit the unit. When a box with expansion board is fitted each card of 12 ROM's exist in the sideways ROM area, and are addressable at any time. Switching between the cards is software controlled. Up to 64K of battery backed RAM (32K per card) can be fitted. This memory can be read and write protected. Both units are mains powered.

**1 CARD SYSTEM £75 + £3 p&p + VAT**  
**ADDITIONAL CARD SYSTEM £29 + £1 p&p + VAT**

### ORDERS TO:

**H.C.R. ELECTRONICS,**  
**H.C.R. HOUSE, BAKERS LANE, INGATESTONE**  
**ESSEX CM4 0BZ. Tel (0277) 355407/8**



## COMPUTECK

### Some Points of Interest

A business has to make a profit to survive and you, the customer provide that profit to keep that business trading. Out of that profit comes lots of costs and usually a large one is advertising. We at Computeck keep our advertisements small and running costs to a minimum, then we can pass these savings on to you by way of discounts, as much as 20% on some items.

At present we have 800 plus items on our lists of new and used hardware and software. We trade in software and hardware for new items. So send a SAE today for our up to the minute prices from an Archimedes to a Ram Chip we have it all - Minerva Systems, Pace, Computer Concepts, AMS, Beebug, ACP, Taxan, Vine Micros, etc. etc. We are also registered Acorn Dealers.

So if the above makes sense to you, buy from us and we will be able to pass on bigger and bigger savings to you.

Due to large stocks - 10 tape based games £12.95 + £1.50 p&p.

Telephone 04574 65953 ACCESS and VISA accepted.

Computeck (Dept AU) : 2 Werneth Road : Glossop : Derbyshire : SK13 9LZ

WARNING! Anyone sending "pirated" software on any media will be reported to the software house or author for legal action by them!

## ROOM 7 SOFTWARE

**INVESTMENT ANALYSER**

VERSION 1 £18.95

VERSION 2 £25.00

**SOCCER BOSS**  
£11.95

Fully bound software catalogue  
50p P & P  
Refundable with order

**POOLS CHEQUE**  
£12.50

LOOK

IDEAS FOR XMAS GIFTS

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: H.L. Computer Services, Dept. 2, First Floor, H.S.L. Building, 437 Warrington Road, Rainhill, Merseyside, L35 4LL. Tel. 051-426 9660.

VISA

# Electronequip

## LEADS SUPPLIED WITH EVERYTHING

### Archimedes 310 now in stock

### Computers & Accessories:

Master 128 .....	435.91
Turbo Co-processor .....	119.46
512 Co-processor .....	217.41
Universal Co-processor .....	79.95
Master Compact (UHF) .....	343.85
Master Compact (Mono) .....	425.95
Compact Companion .....	39.95
Master ROM Cartridges .....	14.95
Compact TV Adaptor .....	29.95

### Monitors:

Colour:	
Philips 8833 Med Res BBC/IBM compatible .....	287.50
Microvitec 1451 Med Res BBC RGB TTL .....	249.95
Mono: Zenith ZVM1230 (Green) and ZVM1220 (Amber) .....	79.95

### Disc Drives:

(Two year warranty)	
MD400A (No PSU) .....	132.96
MD400B (With PSU) .....	149.95
MD802C (No PSU) .....	259.90
MD802E (With PSU) .....	289.95
MD802D/M (in Plynth) .....	309.95
MDCOMBO (5.25&3.5) .....	259.00
MD20M 20Mbyte Wini .....	659.96

### Printers:

Dot Matrix:	
Citizen 120D (80col) .....	179.00
Star NL10 (80col) .....	209.95
Star NX15 (132col) .....	389.00
Epson FX800 (80col) .....	399.00
Epson FX1000 (132col) .....	549.00
Star NB24-10 (24pin) .....	599.00
Epson LQ800 (24pin) .....	599.00
Daisywheel:	
Juki 6100 (18cps) .....	343.56
Gakken GPR2000 (18cps) .....	199.95

### Discs:

Box 96Tpi D.S. in plastic Library Case (5.25") .....	12.95
Box 30 96Tpi D.S. in Plastic Storage Box (5.25") .....	39.90
Box 10 135Tpi D.S. (3.5") .....	24.95
Box 10 96Tpi D.S. Unlabeled discs .....	6.90
Coloured Disc 5 1/4" 96Tpi (each) .....	1.99

Large Selection of Disc Storage Boxes

£6.90 to 19.90

### BBC & Master Spares:

BBC Power Supply .....	56.35
BBC Keyboard .....	49.95
BBC O.S. 12 .....	12.58
BBC Basic II .....	19.95
BBC Cases (complete) .....	17.95
Master Power Supply .....	59.95
Master Keyboard .....	54.95
Master Batteries .....	4.95
Acorn 8271 Disc I/F .....	69.00
Acorn 1770 Disc I/F .....	49.95

### Electronequip:

New for Master & Compact View Printer Driver generator and menu .....

12.95/13.95

### Dust Covers:

We stock dust covers for most popular items. Here's a selection:

Master 128 .....	4.49
Star NL10 .....	5.41
Citizen 120D .....	5.50
Microvitec .....	6.46

### ROM Software:

A selection from our large range:

#### Acornsoft

View .....	44.95
Viewsheet .....	44.95
Viewstore .....	44.95
Overview .....	89.95

#### AMX

Mouse Super Art .....	79.95
Pagemaker .....	45.94
Max (Desktop) .....	18.95

#### Computer Concepts

Inter-word .....	49.00
Inter-chart .....	32.00
Inter-sheet .....	49.00
Wordwise Plus .....	49.00
Inter-base .....	60.00

### A.T.P.L. Sidewise ROM

Board. The most popular and original Special Offer .... 39.33

2 AK Ram Chips.....9.20

### Merlin

Datascribe .....	59.95
Titan .....	89.00

### LARGE SELECTION OF JOYSTOCKS

Prices subject to variation without prior notification. Trade, Government and Education orders Welcome. Barclaycard & Access, orders accepted. All prices include 15% V.A.T. P&P

Please add 92 pence per item. Securicor £6.90 per parcel.

Please send for our extensive Mail Order catalogue.

59 West Street Fareham Hants PO16 0AT

Tel: 0329-230670/1



# HCCS ASSOCIATES

Telephone: (091) 487 0760

## HCCS PRODUCTS

### VIDEO DIGITISER

£99.00

Coming with ROM & DISC s'ware. Facilities include image grab, outlining, smoothing, window manipulation, distance & area measurement, charting of relative eight grey scale quantities. Accept most video signals. Pull down menu system.

### VOICE RECOGNITION SYSTEM

£299.00

Utilising state of the art NEC chip set. Teaching mode, 128 word capacity. Down load from disc any number of 128 word sets. Can be used instead of keyboard after teaching. Almost 100% recognition rate. The up and coming input method

FORTH ROM	£15.00
LOGO FORTH ROM	£18.00
XCAL (programmed learning tool)	£18.00
PASCAL-T	£18.00



## SPECIAL OFFER CHRISTMAS IDEA

11 x 94½ White 80GSM fanfold with micro perfs. Printed one colour for letterheads, invoices, statements etc. Copy to be supplied.

1000 SHEETS £30.00  
2000 SHEETS £40.00

2, 3 + 4 colour printing available.  
Prices on request

## HCCS DISKETTES

Supplied in plastic library boxes in tens.

5¼ DS/DD 96TPI	10 @ £16.00
3½ DS/DD	10 @ £16.00

## RIBBONS

Acorn AP80	4.50
Acorn AP100	4.50
Epson Fx, Mx, Rx 80/85	4.80
Epson Fx, Mx, Rx, 100/105	6.00
Epson Lx80/86	4.50
Juki 5510	4.80
Juki 6100	5.00

Printer ribbons available for any known printer. Prices on request.

## ARCHIMEDES

Arch 305 .....	799.00
Arch 305 mono .....	849.00
Arch 305 colour system .....	999.00
Arch 310 .....	875.00
Arch 310 mono system .....	925.00
Arch 310 colour system .....	1075.00
Arch 410 .....	1399.00
Arch 410 mono system .....	1499.00
Arch 410 colour system .....	1599.00
Arch 440 .....	2299.00
Arch 440 mono system .....	2349.00
Arch 440 colour system .....	2499.00

## MASTER

Master 128 .....	395.00
Master 128 turbo .....	493.00
512 upgrade .....	195.00

## COMPACT

TV entry system .....	363.00
Monochrome system .....	399.00
Colour system .....	549.00

## SCIENTIFIC

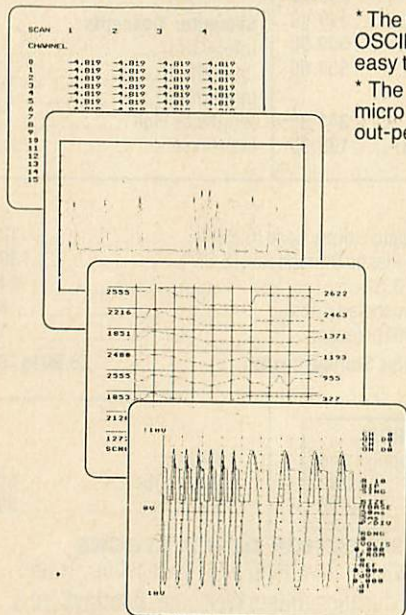
Cambridge Workstation .....	3450.00
32016 second processor .....	999.00
X-25 Galaxy .....	2175.00

Enquire for Quality Discounts

All prices are exclusive of V.A.T. All items are subject to availability. All prices are subject to change without notice. Price and stock status available on request. Official orders welcome. Carriage free.

## Oasis Products

# OASIS VIRTUAL INSTRUMENT SYSTEM



\* The OASIS Virtual Instrument System (VIS) emulates conventional DVM, OSCILLOSCOPE, CHART RECORDER, X/Y PLOTTER and DATA LOGGER in one easy to use package and also provides sophisticated data analysis tools.

\* The VIS data acquisition module and instrument emulation software turns the BBC micro directly into a versatile and flexible laboratory measurement system which can out-perform and is easier to implement than IEEE 488 linked systems.

\* VIS professional, ready-to-use instrument emulations include: Multi-channel DVM with real time numeric and graphic displays, storage SCOPE with on-screen measurement and waveform zoom, DATA LOGGER with logged data compression algorithm and X/Y PLOTTER with programmable integration periods.

### HARDWARE

VIS is based on a precision computer controlled 16 channel A-D converter, with six programmable ranges and read rates of 50k samples per second at 8 bit resolution, 25k at 12 bit.

This simply installed unit has proven long term stability and reliability.

### SOFTWARE

The menu-driven acquisition, analysis and display programs combine on screen set up of measurement parameters, SPREADSHEET data manipulation and a range of data display formats, including 8 trace CHART RECORDER and oscillogram.

Total data mobility from measured information to memory, disk, screen and HARD COPY output.

The OASIS VIS carries full documentation to allow the beginner or professional programmer to create new interface applications or personalised instrument emulations.

**PRICE** (Education orders welcome - Discounts available)

At £399 (ex VAT), the price of the complete VIS system is less than any one of the instruments it replaces. Performance enhanced versions also available, e.g. higher acquisition speeds.

For fast delivery, phone your order on 0603 747887. Technical queries answered and requests for further data on this number.

## Computers and Upgrades

The new Archimedes computer system available now. Prices start at £799.00. Phone now for more information.

Trade in your old Model B against a new Master 128 or Master Compact.

Master 128	£339.00 (a)
Master E.T. (Econet Filing System only)	£320.00 (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)

Special Prices on upgrades if ordered with Master 128. Phone for details.

**BBC Master Compact from £349.00 (a)**

All Compacts with Package Offers of Software etc. a value of £35 to £50 software etc. to your choice.

Compact RS 232 Interface	£26.00 (c)
Compact TV Modulator	£26.00 (e)
Compact Second Disc Drive	£99.00 (a)
Compact 5.25" Second Drive Cable	£11.00 (e)
1770 Disc Interface	£41.00 (d)
ADFS ROM (B+ or B with 1770)	£25.00 (e)
B+64 64K Upgrade	£30.00 (d)

## Printers (Dot Matrix)

Tally MT 85 80col/180cps + 45cps NLQ	£344.00 (a)
Epson LX800 80col/150cps + 22cps NLQ	£229.00 (a)
Citizen 120 D 80col/120cps + 25cps NLQ	£164.00 (a)

## Printers (Daisy Wheel)

Juki 6000 80col 12cps	£182.00 (a)
Juki 6100 110col 20cps	£280.00 (a)
Citizen Premier 35 132col 35cps	£554.00 (a)

## Printers (Laser)

New Citizen Laser Overture 110 10 pages/min 250 Sheet cassette dual interface. **£1650.00 (a)**

All printers include Free BBC cable or plus £5.00 for IBM lead.

## AMX Mouse and Software

AMX Mouse + Super Art	£60.00 (d)
AMX Pagemaker	£37.00 (d)

### SPECIAL OFFERS

#### Printers - Dot Matrix

MP 135 80col/135cps + 27cps NLQ	£135.00 (a)
MP 165 80col/165cps + 38cps NLQ	£166.00 (a)
MP 200 80col/200cps + 40cps NLQ	£249.00 (a)
MP 201 136col/200cps + 40cps NLQ	£274.00 (a)

#### Printers - Daisy Wheel

MP 26 - 26cps Diablo 630 compatible	£234.00 (a)
MP 40 - 40 cps Diablo 630 compatible	£319.00 (a)
2 Year Warranty on MP Printers	

#### Gaken 16cps

**£189.00**

## Disc Drives

Direct Drives all with full 3 yr. Warranty

0241 40/80T DS 400K	£99.00 (a)
0243 Dual 40/80T 800K (Horizontal)	£194.00 (a)
0246 40/80T DS 400K Inc PSU	£114.00 (a)
0248 Dual 40/80T 800K (Horizontal) Inc PSU	£214.00 (a)
0249 As 0248 in Master Bridge/Monitor Plinth	£229.00 (a)
0250 As 0248 with 1 x 3.5" & 1 x 5.25"	£239.00 (a)

#### UFD Drives (2 yr. Warranty)

MD 802 C Dual 40/80T DS 800K (Vertical)	£214.00 (a)
MD 802 E Dual 40/80T DS 800K Inc PSU	£244.00 (a)
MD 802 DM As above in Master Bridge/Monitor Plinth	£284.00 (a)

#### Winchester Drives

20 mb incl PSU and ADFS	£549.00 (a)
40 mb incl PSU and ADFS	£869.00 (a)

# B & S

## COMPUTING

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

**Acorn**  
The choice of experience.

ACORN APPROVED DEALER

**Phone 0602 787923**

## Disc Drives

<b>Misc</b>	
Viglen SS 40T 100K	£79.00 (a)
<b>Discs 5.25" (Boxed in 10's Lifetime guarantee)</b>	
3M 744 SS/DD 48TPI	£11.00 (d)
3M 745 DS/DD 48TPI	£13.00 (d)
3M 747 DS/DD 96TPI	£17.00 (d)
Add £1 for plastic library case	
<b>B &amp; S Label 96TPI in see through LIB. Case DS/DD</b>	£13.00 (d)
<b>Disc Cleaning Kit (state 5 1/4" or 3 1/2")</b>	£9.00 (d)
<b>3.5"</b>	
3M 355S 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  
Phillips 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)
BM7442 (Paper White)	£77.00 (a)

Phillips Colour Monitor RGB, Composite Video, Audio in Linear RGB Green Screen Switchable BBC/IBM Compatible CM8833 **£239.00 (a)**

#### Microvitec

1431 (Metal or Plastic Case please specify) Std. Res.	£179.00 (a)
1451 (Metal or Plastic Case please specify) Med. Res.	£224.00 (a)
1441 (Metal or Plastic Case please specify) High Res.	£375.00 (a)
1431 AP Metal Case RGB and CV/Audio Std. Res.	£209.00 (a)
1451 AP Metal Case only RGB and CV/Audio Med. Res.	£259.00 (a)
TILT and SWIVEL Stands for Plastic Case Only	£19.00 (d)

#### 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) £8.50 - 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

**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+)	£36.00 (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	£2.00 (e)

## Printer Ribbons and Accessories

Epson 8302 LX 86 Tractor Unit	£19.00 (c)
Epson 8338 LX 86 SSF	£48.00 (b)
Epson LX 86 (Compat)	£2.89 (e)
Epson MX 80/RX 80/FX 80/FX 85/(Compat)	£2.50 (e)
Juki 5510/Citizen MSP 20 (Compat)	£2.50 (e)
Citizen 120D/LSP10	£3.75 (e)
Taxan 810/Canon (Compat)	£3.74 (e)
Juki 6100 Multistrike	£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 SStand	£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 Compat	£144.00 (a)
Pace Nightingale + Commstar II	£94.00 (c)
Nightingale Auto Dial Auto Answer Board + SW	£52.00 (d)
Pace Commstar II ROM	£28.00 (e)

NB BABT APPROVAL ON MODEMS ONLY

50ft. Telephone Extn. Cable bin/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 (c)
Forth Disc	£14.00 (e)	Comal	£32.00 (d)
Lisp	£33.00 (e)	Hi View	£37.00 (d)
View 2.1	£37.00 (d)	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	£84.00 (d)
View Printer Driver Gen. Tape	£7.00 (e)	Disc	£8.00 (e)

### Computer Concepts

Interword	£39.00 (d)	Inter Sheet	£39.00 (d)
Interchart	£26.00 (d)	Interbase	£55.00 (d)

### The Newly Released Spellmaster

Wordwise	£30.00 (d)	Wordwise +	£47.00 (d)
			£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)	Pt 2	£14.00 (d)
Advanced Master Ref Manual		EPOA	
Lisp	£7.00 (e)	Forth	£7.00 (e)
BCPL	£14.00 (d)	View Guide	£6.00 (e)
View 3	£9.00 (e)	View Sheet	£9.00 (e)
		View Store	£9.90 (e)

## Fanfold Paper and Labels

2000 x 1 Part 60gm 11 x 9.5" Std. Perf.	£11.00 (c)
2000 x 1 Part 60gm 11 x 9.5" Micro Perf	£12.50 (c)
1000 x 1 Part 85gm 11 x 9.5" Micro Perf	£9.00 (c)
1500 x 1 Part 90gm "Perfect" A4 Micro Perf.	£17.00 (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



## BBC MASTER

Master 128	359.00
Master Econet Terminal	309.00
Master Turbo upgrade	99.00
Master 512 upgrade	192.00
Master Econet Module	37.60

## BBC MASTER COMPACT (3 1/2" DRIVE)

Master Compact Entry System	299.00
Master Compact Mono System	349.00
Master Compact Colour System	499.00
RS232 Upgrade Kit	25.15
3 1/2 to 5 1/2 Ext Drive Lead	12.50
Compact Printer Lead	10.00

## DISC DRIVES

5 1/2" Akhter 2 Year Warranty	
MD400A D/S 40/80 no PSU	109.00
MD400B D/S 40/80 with PSU	121.00
MD802C Dual D/S 40/80 no PSU	209.00
MD802DM Dual D/S 40/80 with PSU in Plinth	254.00
3 1/2" Akhter 2 Year Warranty	
MD400F Single 400K no PSU	98.00
MD400G Single 400K with PSU	108.00
5 1/2" Cumana 1 Year Warranty	
CSX 100 S/S 40 no PSU	89.00
CSX400s D/S 40/80 no PSU	119.00
CS400 D/S 40/80 with PSU	134.00
CDX800 Dual D/S 40/80 no PSU	219.00
CD800a Dual D/S 40/80 with PSU	259.00

## MONITORS

1431 Microvitec Std Res Colour	164.00
1451 Microvitec Med Res Colour	199.00
7502 Phillips High Res Green	67.00
7522 Phillips High Res Amber	74.00
Zenith High Res Green Screen	69.00

## PRINTERS (incl. Master Compact Lead)

Matrix	
Citizen 120D 120cps 25NLQ 80Col	159.00
Star NLQ 100cps 25NLQ 80Col	209.00
Epson LX800 inc Tractor Unit	229.00
Citizen MSP 160cps 40NLQ 136Col	329.00
Star MX 15 120cps 30NLQ 136Col	329.00
Epson FX1000 inc Tractor 136Col	455.00
Daisywheel	
Panasonic Kx P3131 17cps	299.00
Brother HR20 22cps	439.00
Laser	
Citizen C110 Overture	1799.00
HP Laserjet RS232	2664.00

ALL PRICES EXCLUDING VAT  
BEFORE YOU PLACE YOUR  
NEXT ORDER, TALK TO US!

**Rotherham  
Computer  
Centre**

135 Wellgate Rotherham S60 2NN  
Tel: 0709 369912

## MAD CHRISTMAS SALE BUY WHILE STOCKS LAST

### 5.25" COMPUTER DISKS - BULK PACKED - TOP QUALITY

QTY	SS 48TPI	SS 96TPI	DS 48TPI	DS 96TPI	DS 48 C/R	DS 96 C/R
10 (in a box)	£5.95	£6.95	£6.95	£7.95	£8.95	£9.95
25	£10.99	£11.99	£11.99	£12.99	£14.99	£17.99
50	£19.99	£20.99	£20.99	£21.99	£27.99	£32.99
100	£36.99	£37.99	£37.99	£41.99	£45.99	£57.99
150	£52.99	£55.99	£55.99	£57.99	£63.99	£80.99
250	£85.99	£87.99	£87.99	£91.99	£103.99	£126.99

C/R - Coloured or Reversible disks - reversible disks have two holes and two notches! These 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.

### 3.5" COMPUTER DISKS

BULK PACKED with labels etc.

QTY	SS 135TPI	DS 135TPI	Lockable Storage Boxes from Centec
10 (in a box)	£14.95	£16.95	3.00" Lockable-Holds 25 £7.99
25	£29.95	£36.95	3.00" Lockable-Holds 60 £9.95
50	£55.95	£62.95	3.50" Lockable-Holds 40 £7.99
100	£105.95	£119.95	3.50" Lockable-Holds 90 £9.95
150	£149.95	£169.95	6.25" Lockable-Holds 50 £7.99
250	£239.95	£269.95	6.25" Lockable-Holds 100 £9.95

50 5.25" DSDD 96TPI Disks with lockable storage box	£24.95
50 3.50" DSDD 135TPI Disks with lockable storage box	£64.95
10 3.00" CF2 Disks for Amstrad etc.	£19.49

Please inquire for the best prices of listing paper

### COMPUTER MONITORS - FULL RANGE STOCKED - BEST PRICES

Philips CM8833-Colour Monitor IRGB for Nimbus/BBC/Atari etc*	£269.95
Philips CM8862-Colour RGB/TTL/Linear Input*	£299.95
Philips BM7602-High Res Green Screen Monitor - Composite	£79.95
Philips BM7622-High Res Amber Screen Monitor - Composite	£89.95
Microvitec 1431-Standard Resolution Colour Monitor*	£179.95
Microvitec 1451-Medium Resolution Colour Monitor*	£229.95

\* Comes With Free Cable

REMEMBER - All monitors are delivered free by Securicor! No extra to pay!



**CENTEC ELECTRONIC SYSTEMS LTD**  
UNIT 3, THE METRO CENTRE  
BRIDGE ROAD, ORPINGTON, KENT BR5 2BE

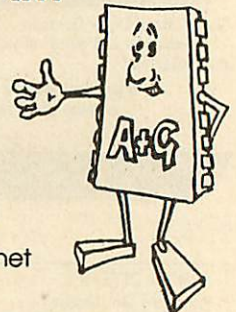
TEL: (0689) 35353 (6 Lines) (24 hours)

Remember - all prices include VAT and delivery!  
There are no hidden extras to pay!



## BBC B Sideways RAM

32K Unit £16.00  
16K Unit £13.00



- Fool proof fitting - No soldering
- 16K Unit Rom Board Compatible
- RW Protect switch as standard
- Each unit requires one rom socket
- Compatible with tape, disc & econet
- Low power slimline units

### Sideways RAM & Utility Software Pack v3.0

SWR software (requires 1x16K SWR) Includes:

- Intelligent menu-driven s/w for load/save/test/clearing SWRam
- Wordwise mem extension -160preview -Toolkit -Printer Buffer
- Utility software (no SWR req'd) Includes 25+ useful programs:
- Damaged disc recovery -Flood-fill -Disc Imager -Char definer
- Graph plotter -Screen enlarger/flip/compacter plus much more.

Please state 40/80 track, sold with SWR £3.00, separate £8.00

### Switching Boxes

User Port	Printer	RS423
1 to 2	£24.00	£14.00
1 to 3	£28.00	£17.00
1 to 4	£37.00	£22.00
1 to 5	£43.00	£27.00
1 to 6	£48.00	£32.00

Prices apply to changers and sharers. Lead length 1 metre

Special prices: AMX compatible mouse ONLY £25 ARCHIMEDES POA

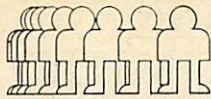
Please send for free catalogue

A&G ELECTRONICS (AU)  
14 HURSTWOOD AVE,  
BEXLEY,  
KENT, DA5 3PH  
(MAIL ORDER ONLY)

BT GOLD:72MAG90461  
PRESTEL 32252315  
TRADE & SCHOOL  
DISCOUNTS AVAILABLE

ALL PRICES INCLUSIVE

Tel: 0322 521949



# MICROMAN Computers

PASTURE LANE FARM,  
PASTURE LANE, RAINFORD,  
ST. HELENS, MERSEYSIDE, WA11 8PU

PHONE 074488 3667

## SHOWROOM

**SHOWROOM OPENING**  
9-6 MONDAY TO FRIDAY  
9-1 SATURDAY

## MAIL ORDER

**PHONE 074488 5242**

We accept both Access and Visa credit cards. Simply telephone your order, giving card number, expiry date, name and address, or send your order with cheque or postal order to the address opposite.

**DELIVERY CHARGES INCLUDING VAT**

Computers/Printers/Drives:  
Next day £8.00, Trackback £4.00  
Small Items: £1.00

## ACORN DEALER : ECONET : SERVICE CENTRE

# Archimedes

**ARCHIMEDES 300 SERIES:**

	Ex VAT	Inc VAT
Archimedes 305 Base	799.00	918.85
Archimedes 305 Monochrome	849.00	976.35
Archimedes 305 Colour	999.00	1148.85
Archimedes 310 Base	875.00	1006.25
Archimedes 310 Monochrome	925.00	1063.75
Archimedes 310 Colour	1075.00	1236.25

Phone for prices and details of Archimedes 400 Series.

**BBC MASTER SERIES:**

Master 128	379.00	435.85
Master Turbo Module	108.70	125.00

## MASTER 512 UPGRADE SPECIAL OFFER

**£199.00**

Price includes VAT.

This offer includes: **FREE MICROMAN 512 DISC UTILITIES SOFTWARE WORTH £12.95.**

**MASTER 512 SOFTWARE:**

Microman 512 Disc Utilities	11.26	12.95
Words & Figures	99.00	113.85
Ability (Integrated Package)	99.00	113.85
VP Info	86.09	99.00
Volkswriter	39.09	44.95

**BBC MASTER COMPACT SERIES:**

Master Compact	349.00	401.35
Master Compact + TV Modulator	363.00	417.45
Master Compact + Green Monitor	399.00	458.85
Master Compact + Colour Monitor	549.00	631.35
RS232 Kit	26.00	29.90
Additional Floppy Disc Drive	99.00	113.85
Pal TV Adaptor	26.00	29.90

**ECONET NETWORKS:**

Master Econet Terminal	329.00	378.35
Archimedes/Master Econet Module	43.47	49.99
Filestore E01	828.00	952.20
Filestore E20	721.00	829.15

## OPUS DISC DRIVES

Opus 5802 400K 40/80T

**£109.95**

Opus 5802DB 800K 40/80T

**£209.95**

Opus 5802D 800K 40/80T

+ Power Supply

**£239.95**

Prices include VAT.

**BBC MONITORS:**

Microvitec 1431 Std/Metal	199.13	229.00
Microvitec 1451 Med/Metal	240.00	276.00
Philips CM8833 Med/RGB/CV	250.00	287.50
Philips TV Tuner (Composite Video)	69.52	79.95
Philips Green 7502	73.91	85.00
Philips Amber 7522	77.39	89.00
Philips White 7542	77.39	89.00

**BBC DISC INTERFACES/UPGRADES:**

Acorn 1770 Disc Interface	43.44	49.95
Acorn ADFS ROM	26.08	29.99
Watford 8271 Disc Interface	60.00	69.00

**BBC B CO-PROCESSOR ADAPTERS:**

Acorn Co-Pro Adapter	75.00	86.25
Watford Co-Pro Adapter	50.00	57.50

	Ex VAT	Inc VAT
<b>BBC B ROM BOARDS:</b>		
Watford Solderless ROM Board	32.00	36.80
Watford Battery Backup	3.00	3.45
Aries B12 Sideways ROM Board	40.00	46.00
Aries B12c Adapter	5.00	5.75
ATPL Sideways ROM Board	38.00	43.70
<b>BBC B SIDEWAYS ROM/RAM EXPANSION:</b>		
Watford 16K Sideways RAM Module	29.00	33.35
Watford ROM/RAM Card + 32K DRAM	39.00	44.85
Watford ROM/RAM Card 64K DRAM	52.00	59.80
Watford ROM/RAM Card + 128K DRAM	80.00	92.00
Watford Sideways ZIF Socket	15.00	17.25
<b>BBC B SHADOW BOARDS:</b>		
Watford 32K Shadow RAM Board	59.00	67.85
Aries B32 RAM Extension Board	80.00	92.00
<b>BBC EPROM PROGRAMMERS/ERASERS</b>		
Control Telemetry EPROM Prog	95.00	109.25
Uviprogram EPROM Prog	18.22	20.95
Uviprogram EPROM Prog + ZIF	22.57	25.95
Multiprom Programmer	39.09	44.95
Uviprogram & Multiprom programmers require either SWR or ROM software listed below.		
Uviprogram ROM Software	4.35	5.00
Uviprogram SWR Disc Software	1.74	2.00
Watford EPROM Eraser GT	30.00	34.50
Uviprogram EPROM Eraser	18.22	20.95
Uviprogram EPROM Eraser + Timer	22.57	25.95
<b>EPROMS/RAM CHIPS:</b>		
Eproms 2764 8K	POA	POA
Eproms 27128 16K	POA	POA
Eproms 27256 (12.5v)	POA	POA
Eproms 27512	POA	POA
RAM 6264LP-15 8K	POA	POA
<b>BBC MODEMS:</b>		
Pace Linnet + Commstar II	139.00	159.85
Pace Nightingale + Commstar II	86.09	99.00
Watford Apollo Modem	75.00	86.25
<b>BBC SPECIAL KEYBOARDS:</b>		
Concept Keyboard A4	109.50	125.93
Concept Keyboard A3	139.50	160.43
<b>BBC DIGITISERS:</b>		
Graphpad II (BBC)	65.65	75.50
<b>BBC VIDEO DIGITISERS:</b>		
Watford BEEB Video Digitiser	109.00	125.35
Watford Magazine Maker	129.00	148.35
<b>BBC MOUSE/TRACKERBALL PRODUCTS:</b>		
Watford Quest Mouse	35.00	40.25
Watford Quest Mouse + Paint	59.00	67.85
AMX Mouse + Super Art Mark II	69.52	79.95
AMX Mouse Mat	5.00	5.75
AMX Pagemaker	43.44	49.95
AMX Extra Extra (Pagemaker)	21.70	24.95
AMX Super Art ROM: BBC B	43.44	49.95
AMX Super Art: Master	43.44	49.95
AMX MAX	17.35	19.95
Fleet Street Editor	34.74	39.95
Fleet Street Editor Fonts/Graphics	13.00	14.95
Fleet Street Editor Admin Xtra	13.00	14.95
Fleet Street Editor Disney	13.00	14.95
Trackerball RB2 + ICON Soft	59.00	67.85
Trackerball + Pointer (Master)	59.00	67.85
<b>BBC MASTER CONSOLE UNITS:</b>		
Viglen Console	43.44	49.95
Viglen Master Console	52.13	59.95
Pineapple II	55.00	63.25
<b>BBC CAD SYSTEMS:</b>		
Bitstik 2 (Master Compatible)	694.78	799.00
Bitstik 2 Upgrade	400.00	460.00
Pineapple Diagram	25.00	28.75
Pineapple Diagram Utilities	10.00	11.50
Pineapple PCB Designer	85.00	97.75
AMX DESIGN	60.83	69.95

	Ex VAT	Inc VAT
Novacad Plotter Utilities	21.00	24.15
Microman Plotter ROM	26.04	29.95
<b>PRINTERS:</b>		
Star NL10 + BBC Cent Interface	209.00	240.35
Star NX15 Wide Carriage	339.00	389.85

## PANASONIC KXP1081

Printer + Free BBC Lead

**£179.00**

Price includes VAT.

Epson LX800	239.00	274.85
NEC Pinwriter P660 (80) Parallel	449.00	516.35
NEC Pinwriter CP660 (80) Parallel	519.00	596.85
NEC Pinwriter P760 (136) Parallel	529.00	608.35
NEC Pinwriter CP760 (136) Parallel	619.00	711.85
Juki 6100 Daisywheel	299.00	343.85
Panasonic Serial Interface	41.00	47.15
Star NL10 Sheet Feeder	55.00	63.25
Star NX15 Sheet Feeder	140.00	161.00
LX800 Sheet Feeder	TBA	
Print Sharer 2 Way Switch	39.00	44.85

**PLOTTERS:**

Roland DXY880A A3 Plotter	694.78	799.00
Roland DXY980A A3 Plotter	999.00	1148.85

We are a Roland Main Dealer and stock the complete range of plotter, pens and paper.

**BBC WORDPROCESSING SOFTWARE:**

View Professional	86.91	99.95
Interword ROM	42.61	49.00
Wordswise Plus ROM	42.61	49.00
View 3.0 ROM	45.22	52.00
Spellmaster	51.31	59.00
Viewspell	34.74	39.95
View Index	13.00	14.95
View Printer Driver Generator	10.00	11.50

**BBC DATABASE & SPREADSHEET SOFTWARE:**

Master Overview	86.00	98.90
Interbase ROM	60.00	69.00
Viewstore ROM	45.22	52.00
Intersheet ROM	43.44	49.95
Interchart ROM	29.52	33.95
Viewsheet ROM	45.22	52.00
Viewplot Disc	26.04	29.95

**BBC LANGUAGES:**

Master C	78.00	89.70
BCPL ROM	52.00	59.80
BCPL Calculations	30.00	34.50
BPCL Stand Alone Generator	43.39	49.90
ISO Pascal ROM	52.13	59.95
ISO Pascal Stand Alone Gen	30.00	34.50
Comal ROM	43.35	49.85
Acorn LOGO ROM	60.00	69.00
Logoton LOGO ROM	60.00	69.00
Micro-Prolog ROM	69.52	79.95
Microtext	52.00	59.80

**BBC UTILITIES:**

Master Termulator	34.74	39.95
System ADE + BBC Version	46.00	52.90
System ADE + Master Version	49.00	56.35
Advanced Disc Investigator	25.00	28.75
Advanced Disc Toolkit	30.00	34.50
Vine Replay ROM's	30.44	35.00
Vine Master Replay	36.48	41.95

We stock a large range of utility software by ACORN, CLARES, COMPUTER CONCEPTS, WATFORD etc.

## PC COMPUTERS & SOFTWARE:

We stock the OPUS PCII & AMSTRAD PC1512 range of PC Computers along with a large selection of add-ons and books. Full Price List available.

# GOVERNMENT, NHS AND EDUCATIONAL ORDERS ACCEPTED

**ALL OUR PRICES INCLUDE CARRIAGE & VAT**

**HSV COMPUTER SERVICES LIMITED (AU)**

23, Hampstead House, Town Centre, Basingstoke, RG21 1LG.

**NEW LOWER PRICES**

DISKETTES	QUANTITY	10	20	30	40	50	100
3½ SS/DD	135TPI	13.95	26.50	37.50	49.00	60.00	110.00
DS/DD	135TPI	15.95	30.50	43.50	57.00	70.00	130.00
5¼ SS/DD	48TPI	5.95	8.95	12.75	16.00	18.75	36.95
DS/DD	48TPI	6.95	9.95	13.95	16.95	19.95	37.95
DS/QD	96TPI	7.95	10.95	14.95	17.95	21.95	39.95
★COL DS/QD	96TPI	8.95	14.95	21.95	28.95	35.95	63.95
**UNIVERSAL	96TPI	8.95	14.95	21.95	28.95	35.95	63.95

\* COLOURS AVAILABLE: Red, Blue, Green, Yellow, White, either in boxes of ten or mixed, two of each. Please state when ordering.

★★ Universal disks are suitable for 40/80 track drives and have 2 notches and 2 holes. All 5¼ disks supplied in cardboard boxes with write protect tabs labels and envelopes and come with our no quibble money back or replacement guarantee.

**DISKETTE STORAGE BOXES**

10×5¼" Library Case	1.25
50×5¼" Hinged Lid	6.50
50×5¼" Hinged Lid Lockable	7.50
100×5¼" Hinged Lid Lockable	10.50
120×5¼" Hinged Lid Lockable	12.50
10×3½" Library Case	1.25
40×3½" Hinged Lid Lockable	7.95
80×3½" Hinged Lid Lockable	10.95

**PRINTER STANDS 80 COLUMN**

Nylon coated wire for rear or centre feed printers £12.95

**TILT 'N' TURN MONITOR STANDS**

12" Monitor £12.95  
14" Monitor £14.95

**NEW LOWER PRICES**

**Continuous Stationery** (micro perf all edges)

	250	500	1000	2000
9.5" × 11" 60 GSM - White	£2.95	£4.95	£8.95	£14.95
True A490 GSM - White	5.25	8.75	14.95	-
True A4 100 GSM - cream, blue, grey, white.	7.25	13.50	25.50	-
Labels 3.5" × 1.5" (1 across)	-	2.95	4.95	9.50
Labels 4.0" × 1.5" (1 across)	-	3.25	5.50	10.50
Labels 4.0" × 1.5" (2 across)	-	3.75	6.50	11.95
Labels 2.75" × 1.5" (3 across)	-	2.75	4.50	8.50

**PRINTER RIBBONS**

	COL	BLACK
Canon PW1080/1186★★★	3.95	2.95
Centronics GLP	3.95	2.95
Citizen 120D	N/A	2.95
Epson FX/MX/RX80	N/A	4.95
Epson LX80/86	3.95	2.95
Epson MX100	3.95	2.95
Juki 6100 S/S	3.95	2.95
Juki 6100 M/S	3.95	2.95
Mannesmann Tally MT80/80	N/A	2.95
Okidata Microline 80/82/83	N/A	1.50
Panasonic KXP1090, 1080	N/A	2.50
Seikosha GP80	N/A	3.95
Seikosha GP100	2.50	1.50
Shinwa CP80	N/A	3.95
Star SG10/SG15	N/A	2.75
Taxan Kaga ★★★	N/A	2.75
	N/A	3.95
	2.50	1.50
	3.95	2.95

COLOURS AVAILABLE: Red, Blue, Green, Brown, Purple, Orange, ★★ Red or Blue only. Please state when ordering.

**NO EXTRAS TO PAY**



Credit Card Hotline (0256) 463507 Faxline (0256) 841018





# AMAZING OFFERS

## ELECTRON BONANZA

**FOR THE ELECTRON VIEW ROM** ~~£29.95~~  
 Word Processor £14.95  
**VIEW SHEET ROM** ~~£29.95~~  
 (Spreadsheet) £14.95  
**ACORN PLUS 1** ~~£59.95~~  
 Now in stock! £49.95

**SCOOP PURCHASE ELECTRON COMPUTERS IN STOCK NOW**  
 3 months warranty  
**£59.95**  
 \*Includes user guides, power supply and introductory cassette

### SAVE £££'s ELECTRON PACKS

**PACKAGE 1**  
 PLUS 1 £49.95  
 VIEW £14.95  
 VIEWSHEET £14.95  
~~£79.85~~  
**OFFER PRICE £69.95**

**PACKAGE 2**  
 ELECTRON COMPUTER £59.95  
 PLUS 1 £49.95  
 VIEW ROM £14.95  
~~£124.85~~  
**OFFER PRICE £99.95**

### ELECTRON AND BBC

**CUMANA DISC DRIVE INTERFACE FOR ELECTRON** £69.95  
 ENABLES YOU TO USE MOST BBC DISCS AND CARTRIDGES UP TO 32K

**NEW ACORNSOFT OVERVIEW**  
 A sophisticated combination of Viewspell & Viewstore on Rom Cartridge and Viewplot, View index and Printer Driver Generator on Disc  
**BBC Disc & Rom R.R.P. £98.90**  
**OFFER PRICE £78.45**

**ACORNSOFT VIEW PROFESSIONAL**  
 Combines the functions of a wordprocessor spreadsheet and database in one program.  
**BBC B, & all Master Series Micros R.R.P. £99.95**  
**OFFER PRICE ONLY £79.45**

**PRIMARY EDUCATION**  
 \*Sentence sequence  
 \*Word sequence  
 \*Talkback **£1.50 each**  
 \*Workshop (CASSETTE)

**SPECIAL OFFER — ACORNSOFT**  
 BBC Cassette and Disc  
**EDUCATION COMPENDIUM**  
 Workshop (3+ years)  
 ABC (7+ years)  
 SPOOKY MANOR (7+ years)  
 TALKBACK (10+ years) SET **£11.96**

Magic Mushrooms Electron £12.95 £2.95  
 Me and My Micro (Book Only) £2.95 £1.00

**MORE 3.5" COMPACT DISCS**  
 Bug Eyes III ~~£9.95~~ £7.95  
 Elite ~~£19.95~~ £15.95  
 Repton III ~~£9.95~~ £7.95  
 Grand Prix Construction ~~£14.95~~ £11.95  
 Strykers Run ~~£14.95~~ £11.95  
 Acornsoft Hits Vol I ~~£14.95~~ £11.95  
 Acornsoft Hits Vol II ~~£14.95~~ £11.95  
 Superior Collect Vol I ~~£14.95~~ £11.95

### HOME INTEREST

Snapper ~~£6.99~~ \*Desk Diary ~~£6.99~~  
 Boxer ~~£6.99~~ \*Business Games ~~£6.99~~  
 \*Watch your Weight ~~£6.99~~ \*Graphs and Theatre Quiz ~~£6.99~~ Charts ~~£6.99~~  
 Complete Cocktail Maker ~~£6.95~~  
**SELECT ANY FIVE FOR ONLY £7.95**  
 (or £1.65 each)

### VOLTMACE TWIN JOYSTICKS

for use with Plus 1 or BBC  
 Normally ~~£19.95~~  
 Now Only **£14.95**

### EDUCATION SPECIALS

\*Linkword Spanish £14.95 \*Maths 'O' Level I £12.65  
 \*Maths 'O' Level II £12.65  
 \*Linkword Italian £14.95 \*Biology £12.65  
 \*ID0 £12.65 \*English £12.65  
**ANY TWO FOR £3.95**

### RECENT RELEASES AT SPECIAL PRICES

Superior Collection 1 or 2 BBC only  
 Superior Collection 3 Electron only  
 Codename Droid  
 Strykers Run  
 Crazee Rider  
 Palace of Magic  
 BBC/Electron Cass ~~£9.95~~ £7.99  
 BBC Disk ~~£11.95~~ £9.59  
 BBC Compact ~~£14.95~~ £11.99  
 Electron 3.5" Disc ~~£14.95~~ £11.99  
 Beau Jolly 5 Comp. Hits  
 BBC or Electron ~~£6.95~~ £5.55  
 Five Star II Repton III  
 BBC or Electron Cass ~~£9.95~~ £9.59  
 Cholo (Disk) Firetrack or Grand Prix Cons.  
 BBC Cass £7.95  
 Disk £9.95

### MICROPOWER AND OTHER GAMES

Dennis Through the Drinking Glass <del>£6.95</del>	Rubble Trouble <del>£7.95</del>	Felix & the Evil Weevils <del>£6.95</del>
Classic Adventures <del>£6.95</del>	Swoop <del>£7.95</del>	Frenzy <del>£6.95</del>
Giroscope <del>£6.95</del>	Croaker <del>£7.95</del>	Plutonian Plunder <del>£6.95</del>
Bumble Bee <del>£6.95</del>	Mr. Ee! <del>£7.95</del>	Blockbuster <del>£6.95</del>
Bandits at 3 O'Clock <del>£6.95</del>	Positron <del>£7.95</del>	Microcosm <del>£3.95</del>
Escape from Moon Base Alpha <del>£7.95</del>	Felix & the Fruit Monsters <del>£7.95</del>	Fatman Sam <del>£3.95</del>
Ghouls <del>£7.95</del>	Cybertron Mission <del>£7.95</del>	Star Drifter <del>£3.95</del>
Stock Car <del>£7.95</del>	Moonraider <del>£7.95</del>	
Killer Gorilla <del>£7.95</del>		

**BBC & ELECTRON ANY FIVE FOR ONLY £7.95** (or £1.65 each)

### MICROPOWER MAGIC COMPILATIONS I & II

IN THE CHARTS NOW! 10 ORIGINAL HITS ON EACH FANTASTIC VALUE

BBC B/B + MASTER CASSETTE ~~£7.95~~ £5.95  
 BBC B/B + MASTER 80T DISC ~~£7.95~~ £5.95  
 BBC B/B + MASTER 40T DISC ~~£7.95~~ £5.95  
 BBC COMPACT DISC ~~£9.95~~ £7.75  
 ELECTRON CASSETTE ~~£7.95~~ £5.75

### imogen

A totally NEW Graphic Adventure for the Discerning Games Player. Your power of logic & resourcefulness will be stretched to capacity...

BBC CASSETTE £7.95  
 BBC 5.25" Disc (40 or 80T) £8.95  
 BBC Master Compact 3.5" Disc £10.95

### SCOOP PURCHASE POWERPACK

7 Great Games by Audiogenic  
 BBC Cassette  
**£9.95 £4.95**

Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 Tel. \_\_\_\_\_ AN

### SOFTWARE BARGAINS

(a division of the micropower group)  
 Dept AN, 8/8A Regent St., Chapel Allerton, Leeds LS7 4PE  
 Tel: (0532) 687735  
 Out of Hours Answer Phone

PLEASE ADD 95p P&P and make cheques or P.O. payable to Software Bargains  
 Goods despatched within 48 Hours  
 Subject to availability

\*BBC COMPATIBLE



SAE for comprehensive price lists  
 Please state for which machine

## New! SCRAPBOOK

A new free-format system for storage & retrieval of all types of information including colour and graphics. Incorporating two screen designers and facilities to search, sort, browse, print, extract etc. Forget fields, records etc. you store it how you want it.  
Disc. (40 or 80 Track) £12.95 incl. P & P.

### Instant On-Screen Help

All BBC models can now have On-Screen help with our range of ROMs and Discs. Switch to and from any COMPANION with only one command from Basic or Wordprocessor.

### 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, VIDU codes, ASCII codes, \*FX commands etc.

### MACHINE CODE COMPANION

Assembly language help, OS routines, £502 Instructions, Addressing Modes, Vectors etc.

All the above ROMs come with easy to follow fitting instructions £19.95 incl. P & P.  
**SPECIAL OFFER!** Buy any TWO and get one FREE!

### STEPPER MOTOR CONTROLLER

Control two stepper motors and a relay direct from BASIC with 20 new 'star' commands.

Ideal for plotters, turtles etc. With full instructions and program examples.

Combines the ease of use of Basic and the speed of machine code.

ROM with easy fitting instructions £14.95 incl. P & P.

### STEPPER MOTOR INTERFACE

Boxed unit which plugs into the User Port to control two 12V stepper motors and a relay.

With an information leaflet on driving stepper motors.

VERSION 1. Powered from BBC auxiliary power supply. £23.00 inc. P & P.

VERSION 2. With mains Power supply (optically isolated) £46.00 inc. P & P.

### Master and Compact Owners

Avoid the problem of limited ROM sockets. The above ROMs are also available in

ROM IMAGE form on disc ready for loading into sideways RAM.

40 or 80 track disc. (Please state) £8.95 incl. P & P.

### Disc Versions

Disc versions of Basic, Programmers and Machine code Companions. £9.95 incl. P & P.  
All three Disc Companions on one disc. 40 or 80 Track £19.95 incl. P & P.

### Demonstration Disc

With interactive demonstration and samples from all four Companions. £1.00 inc. P & P.



Telephone (0686) 27549 For Details. (Anytime)

## MICRO HELP

P.O. Box 17, NEWTOWN, POWYS, SY16 1ZZ.

# G-TEN LIMITED

## THE MAIL ORDER SOFTWARE HOUSE

BBC MICRO	TAPE	DISC	3.5"	BBC MICRO	TAPE	DISC	3.5"
	£	£	£		£	£	£
Commando.....	7.25	11.25	N/A	Code Name Droid.....	8.25	9.75	12.25
Airwolf.....	7.25	11.25	N/A	Living Daylights.....	8.25	12.25	N/A
Repton 3.....	7.25	9.75	11.25	Spy VS Spy.....	8.25	12.25	12.25
Strykers Run.....	7.25	10.50	11.25	Crazee Rider.....	8.25	10.25	12.25
Crystal Castles.....	7.25	9.50	N/A	<b>ELECTRON</b>			
Ravenskull.....	7.25	9.50	N/A		RRP	OUR	PRICE
Thrust.....	6.50	9.50	N/A		£	£	£
B.C. Football Fortunes.....	7.25	11.25	N/A	Xor	9.95	7.25	
Acornsoft X.....	7.25	9.75	N/A	Five Star Games 2	9.95	7.25	
Questrobo.....	4.25	N/A	N/A	Micro Power Magic	7.95	6.50	
Rebel Planet.....	4.25	N/A	N/A	Superior Col. V3	9.95	7.25	
Yie Ar Kung Fu 2.....	7.25	11.25	N/A	Ravenskull	9.95	7.25	
Citedal.....	7.25	9.75	11.25	Repton 3	9.95	7.25	
Strike Force Harrier.....	7.25	10.50	N/A	Commando	9.95	7.25	
Speech.....	7.25	9.75	N/A	Football Manager	8.95	6.50	
Starquake.....	7.25	11.25	N/A	Crystal Castles	8.99	6.50	
Elite.....	10.50	11.25	15.25	Paperboy	9.95	7.25	
Trivial Pursuits.....	11.25	16.25	N/A	Code Name Droid	9.95	8.25	
Revs.....	9.75	10.50	11.25	Strykers Run	9.95	8.25	
Sentinel.....	7.25	11.25	N/A	Crazee Rider	9.95	8.25	
Five Star Games.....	7.25	N/A	N/A	<b>PERIPHERALS (P&amp;P £1.50 p/item) OUR</b>			
Firetrack.....	7.25	11.25	N/A			PRICE	
Superior Collection 1.....	7.25	9.75	11.25	Amx Mouse.....		£	
Superior Collection 2.....	7.25	9.75	11.25	ATPL Sidewise.....		41.50	
Paperboy.....	7.25	11.25	N/A	ATPL Sidewise +.....		30.00	
Konami Coin-op.....	7.25	11.25	N/A	Quickshot II.....		6.50	
Temple of Terror.....	6.50	10.75	N/A	Quickshot II Turbo.....		11.50	
Round Heads.....	N/A	11.25	N/A	BBC Quickshot.....		3.50	
The Hunt.....	8.50	10.50	N/A	Competition Pro 9000.....		12.50	
Arkanoid.....	6.75	N/A	N/A	BBC Joystick Interface.....		7.50	
S. Fox Strip Poker.....	N/A	10.50	N/A				

Please add 75p P&P per item (Inland/BFPO only) -  
European orders add £1.50 P&P per item (inc. N.I./Eire).  
Elsewhere add £2.50 P&P per item. Please make cheques or postal orders  
(Sterling only) made payable to: G-TEN LIMITED

Send orders to:

G-TEN LIMITED  
DEPT AU11  
FREEPOST (no stamp needed INLAND/BFPO)  
146/150 COMMERCIAL STREET  
LONDON E1 6BR  
CREDIT HOTLINE Tel: 377 2630 24hr answer phone

## BEST QUALITY UNBRANDED DISKS

Supplied complete with white protect, labels, sleeves and hub rings  
(Boxed in tens price per box of 10 discs)

	1+	3+	5
5 1/4" DS/DD 40T	£5.50	£16.00	£26.50
DS/DD 80T	6.00	17.50	29.00
3 1/2" SS/DD 40T	12.50	36.00	
DS/DD 80T	16.00	46.50	
3 1/2" SS/DD 40T	12.50	36.00	60.00
DS/DD 80T	16.00	46.50	77.00

**DISC DRIVES** (Mitsubishi Disc Drives by UFD 2 yrs guarantee)  
MD 400A Single without PSU £125.00 MD 400B Single without PSU £135.00

**CHIPS**

27128-25ons 21vpp	£4.00	65C02 4MHz	£16.00
27512-25ons	£10.00	8271 CPU FDC	£37.50

### MAIL ORDER ONLY

All prices inclusive of P&P and VAT  
**DIAL - A - DISK**  
258 Wilbraham Road  
Manchester M16 8QL  
Tel: 061-881 7712

## SPIDER 2 REAL-TIME CONTROL FOR THE BBC MICRO

### Watch the SPIDER!

- Powerful new BASIC commands for invoking PROCs from the User Port, Serial Port or the Keyboard.
- 8 independent countdown timers.
- Easy to install with no soldering.
- Comprehensive manual supplied.

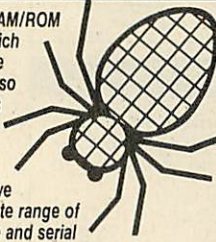
### New SPIDER 2 features

- Special keywords for controlling the Serial Port.
- Professional implementation of Foreground/Background processing.
- Reaction timing and pulse trains accurate to 0.1 milliseconds!

from £65 including VAT

SPIDER 2 is a RAM/ROM combination which uses none of the BBC's memory, so BASIC programs are unaffected. The BBC B+ is fully supported and we supply a complete range of digital, analogue and serial interfaces for use with SPIDER using the 1MHz bus.

Ask now for details.  
**Paul Fray Ltd**  
Willowcroft, Histon Road, Cambridge CB4 3JD  
Telephone: (0223) 66529

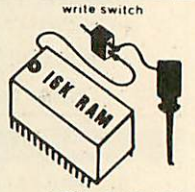


SPIDER - stamps out I/O bugs

NOW AVAILABLE FOR BBC MASTER

## RAM MODULES TAPE, DISC & NETWORK systems

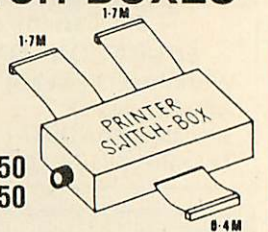
- Plugs into any ROM socket, no soldering
- 32k occupies two sockets (2x16k banks ideal for ROM boards. Single Socket 32k also available.)
- Easy-fit small size 35x18x14mm fully encased
- ATPL versions available - adds extra 16/32k
- Software includes full Load/Save/List ROMs 15k Printer buffer, Network easy-loader, view drive generator. Full documentation.



16K £16.95  
32K £25.95

## PRINTER SWITCH BOXES

- Complete with all cables & connectors
- Robust plastic case, 100x50x20mm
- Selection by colour indicator button
- Printed circuit board construction
- Ready to use just plug in



PS12 BBC'S TO 1 PRINTER £31.50  
PS21 BBC TO 2 PRINTERS £31.50

- Quality modern style plastic case in beige/brown, size 205x145x40mm
- Selection by push switches fitted with colour change indicator buttons
- Data buffers fitted to the 3.7m cables for reliable data transfer. The cables on the PS3 box are 1x3.7m+2x1.7m
- Complete and ready to use - just plug in

PS3 3 BBC'S TO 1 PRINTER £59.50  
PS4 4 BBC'S TO 1 PRINTER £69.50  
(Please add £2 for each BBC Compact)

Please add 15% VAT Free P&P Send Cheques/PO/Official Orders to:  
**TERRELL ELECTRONICS**, 7B Essex Gardens,  
Hornchurch, Essex RM11 3EH. Tel: (04024) 71426

EDUCATIONAL DISCOUNTS

# REVIEWS

## GAMES

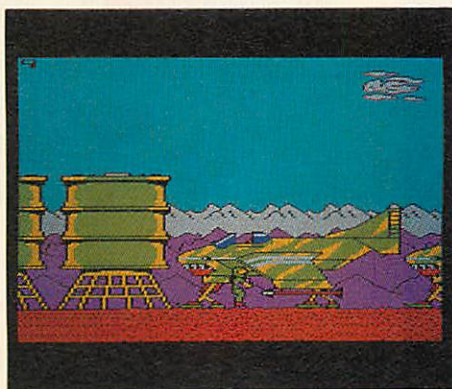
### THE GAMES PAGE

David Lawrence surveys the latest releases, collections, hints and high scores

All quiet on the games front. I think the major companies are saving their best for Christmas, or maybe they're working on Archimedes games. The latest news from Superior is as follows: *Palace of Magic* is now out and from what I've seen of it, it looks very similar to *Citadel*. But I think there are just enough differences to make it a new game; it's reviewed in this issue. By the time you read this, *Play it again, Sam* – the next compilation – should be available. This sounds the best collection so far from Superior, and features *Citadel*, *Thrust*, *Ravenskull* and both the ordinary and enhanced versions of *Stryker's Run 1*. Unlike the previous two Superior collections there is no new game included.

From what I've heard, *Elixir* should be out sometime in November. Two other releases are also planned for then. The first is *Spellbinder*, said to be still under development. The second, *The Life of Repton*, is not some mythical *Repton 4*; instead it's yet more extra screens for *Repton 3*. As before there are five sets of eight screens featuring Repton. In the first, as a baby, he wears a nappy and must collect bottles of milk. Then it's off to school in a new uniform, and he must avoid the teachers. Set three reveals that, as a teenager, Repton was a punk – complete with spiky hair. After this he becomes a pencil pusher in an office. Finally, as an old man, he must fight off fearsome grannies in their rocking chairs! The screens are of a similar standard to *Around the World*.

*Zarch* is finished! All Archimedes owners can now rush out and buy a copy of the complete *Lander* game. There have been quite a few changes since the version we saw at the *Acorn User Show*; sound has now been added, crashing into enemy ships takes away less fuel, and you can now fire homing missiles and smart bombs. There is even an intelligent demo mode that plays itself and notches up a respectable score!



*Stryker's Run* from Superior's latest collection

All in all, an impressive first game for the Arc, let's hope that other companies can match (or exceed) this standard.

Audiogenic's duo Peter Scott and Gary Partis have been bashing the buttons extra hard. They've now finished *Ransack* and *Impact* respectively. *Ransack* is a thinking person's shoot-em-up; you bounce along shooting anything that moves, collecting weapons and 'random bombs'.

I have yet to see Gary's *Impact*, so you'll have to wait until next month for more information. Peter has started work on an Atari ST game, and Gary is now working on the Arc, so maybe these will be the last Beeb games from these two.

Audiogenic has also signed up a game called *Dispatch Rider* – this is meant to be a cross between *Paperboy* and *Zaxxon*.

I've had a letter concerning Imagine's *Arkanoid* from someone who has signed themselves as 'ZZKJ'. It says, 'To skip a level, pause the game with Delete then press down the keys 'J', 'D' and 'H'

together. You can also quit the game by pausing and pressing Tab. On the high score table, if you press 'P', 'A' and 'J' instead of Space, you carry on from the current screen, rather than restarting. Finally, if the ball is going far too fast, hold down Delete and Copy. This slows the game down and at least gives you a chance to hit the ball!

Christopher Briscoe has some hints for *Sink the Bismark*. He writes 'Attack with the big guns first like King George V and Rodney, then bring in the carriers.' He goes on to describe a small cheat. 'Take the plane about halfway, drop the torpedo then tap the space bar every six or seven seconds and you won't lose a single plane!'

Here is the latest update to the highscore table. The last full table was published in the June issue so refer to that before submitting new high scores. Linus Sarguy's times on *Revs* still hold although I've received some times very close to his:

Silverstone 1:24.3 N Gibbs  
Snetterton 1:01.2 E Richardson

Can anyone break the one minute lap on Snetterton? Of course, anyone can cheat, but that misses the point, doesn't it? I now have a map of Tynesoft's *Futureshock*, thanks to Jonathan Leamouth. If you would like a copy, send a cheque for £1.50 and a large s.a.e marked *Futureshock* to the *Acorn User* address below and mark your envelope 'Futureshock'.

Finally, we would like to increase our coverage of Electron games. For this, we need a couple more people to join our team of reviewers. If you would like to do this, please send your name, address, daytime and evening telephone numbers and a list of what equipment you have (Plus 1, Plus 4 etc) to me here at *Acorn User*. You must also tell me why you think you'd be a good reviewer.

Acorn User, Redwood Publishing Ltd.,  
20-26 Brunswick Place, London N1 6DJ.

#### HIGH SCORE TABLE UPDATE

Game	Score	Name
Eagle's Wing	460,400	S Greenwood
Firetrack	375,900	S Gibson
Joust	19,950	S Brown
Repton 2	24,018	M Young

Spy Vs. Spy 1 is probably the most innovative program yet, with features never seen before on the BBC / Electron. A. & B. Review - "An excellent package, colourful and imaginative that BEEB owners rarely see. Give this one a try" !

Electron User "Overall 10/10. I have to say I have never had so much fun trying to outwit a computer at it's own game."

The program features Split Screen Action \* Real Time Animation \* You control your Spy's every action \* One-on-One combat \* Booby-Trap Calculator \* Superb Graphics and Sound Effects \* One or Two Players \* Simulvision™ Both Players Active at the same time.

Cassette BBC B / Master / Electron - £ 9.95

BBC Disk 40 / 80 Track - £14.95

BBC Master Compact 3 1/2" Disk - £14.95

ADDISON INDUSTRIAL ESTATE,  
BLAYDON, TYNE & WEAR NE21 4TE  
TEL: (091) 414 4611

# A Unique Aid for Science Students

The Nuclides Data Base, a new computer package available from the U.K. Atomic Energy Authority, enables science students to explore some of the concepts at the heart of nuclear physics.

This unique educational aid has a large and rapidly accessible store of invaluable information on such topics as half life, binding energy and nuclear radius.

Designed by science teachers primarily for use by students in the 16-18 age group, the program should also be helpful in nuclear physics introductory courses at tertiary level.

Disk versions of the program are available for the BBC (including BBC Master 128), RM 480Z and RM Nimbus microcomputers. All versions are network compatible.

The package, which includes booklets for teacher and student, costs £12.50 inclusive of VAT and postage.

To obtain further information and an order form please use the coupon below.

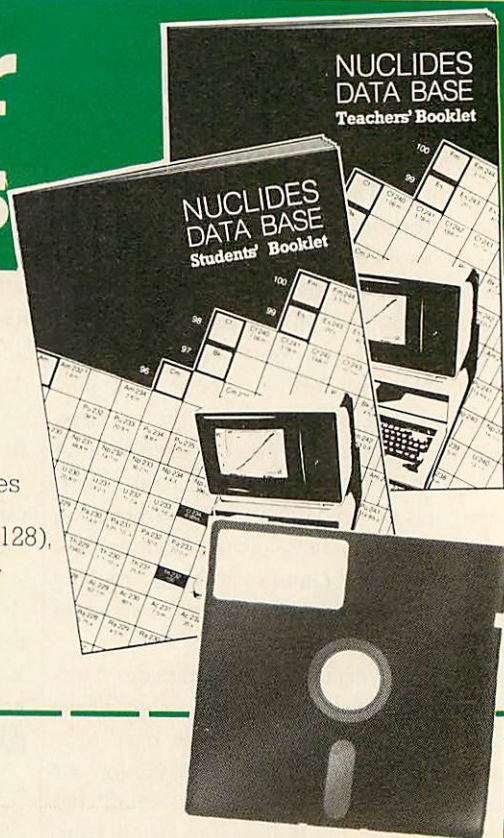
Purchasers will receive a **FREE** copy of an A0 size (841 x 1189mm) chart of the nuclides.

To: U.K. Atomic Energy Authority, Room 119, 11 Charles II Street, London SW1Y 4QP  
Please send me information and an order form for the Nuclides Data Base.

Name .....

Institution .....

Address .....

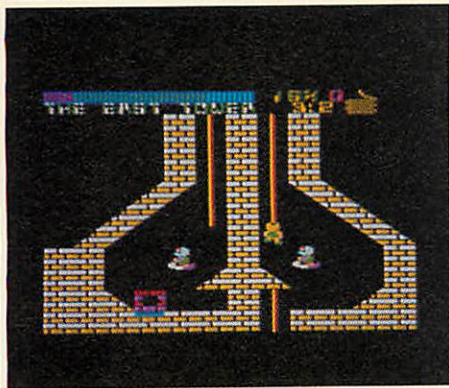


UNITED KINGDOM  
ATOMIC ENERGY AUTHORITY  
EDUCATION SERVICE

# REVIEWS

## GAMES

### PALACE IS MAGIC



Palace of Magic; Superior Software; £9.95 (cassette), £11.95 (5.25-inch disc), £14.95 (3.5-inch disc).

To be perfectly honest, Superior should have subtitled this game *Citadel 2*. The similarity between this and the original *Citadel* is uncanny! There is even an evil wizard. Nothing wrong with that, of course, except his name is Caldeti!

In *Palace of Magic*, you must search for a transporter to escape to freedom. An assortment of creatures inhabit the palace and its surrounding land, including space-men, white rabbits and a vicar. Some will help you in your quest, while others try their hardest to shorten your life-span.

For those of you who never saw the original game, locations – the palace for example – consist of several levels, connected with ropes and ladders. Colour-coded doors block the corridors at places throughout the game. In order to progress, the relevant key has to be found. Other barriers can block your path; the most annoying of which is when a wall is just that little bit too high to jump. You can see a passage off to the left just waiting to be explored, but you can't reach it!

The game is in mode 2 with creative use of colours to give shades and textures. There are some nice graphic touches with flickering candles and 'sparkling' magic top hats. The sound isn't much cop, with the odd ping or blip as you jump about. To be fair, there isn't really much scope for sound effects in games like this. For those of you who prefer to explore in perfect silence, there are sound on/off keys.

Having enjoyed *Citadel* the chance to relive my days of exploring and questing is

very welcome. The usual Superior price of £9.95 is a small amount to pay for such a great game. I really enjoyed playing *Palace of Magic* and will keep playing until I complete it.

Robert Miller

### ELECTRON TURNS THE CORNER



Crazee Rider; Superior Software; Electron BBC; £9.95 (cassette), £11.95 (5.25-inch disc), £14.95 (3.5-inch disc).

*Crazee Rider* is the best motorcycling game Electron racers have seen yet.

While BBC micro owners have been treated to several racing simulations, programming problems have prevented the translation of highly successful games such as *Revs* from BBC micro to Electron. This, however, is a genuine Electron game that fills in a real gap in the serious game player's collection.

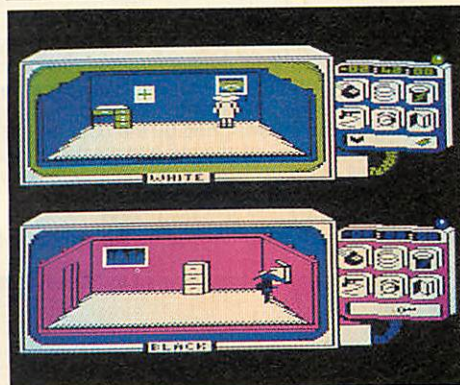
*Crazee Rider* puts you behind the controls of a 150mph motorcycle in a series of races which starts at Le Mans, and features six international race-tracks, with access to each subsequent race limited to those who qualify by finishing in the first six of the previous race, though there is a Jump option which allows players to jump between tracks they've qualified for.

The wide range of options includes the use of digital (First Byte) or Plus One joysticks, (though I found the keyboard easier to use), a choice of colour combinations, sound on/off, and a pause option.

Plus 3 owners will be pleased to see another worthwhile game on disc, though cassette owners will question the value of a full screen title page which takes a long time to load.

Bernard Emblem

### SPYCATCHER ON DISC



Spy vs Spy; Tynesoft; BBC/Compact; £9.95 (cassette), £14.95 (3.5-inch and 5.25-inch discs).

Set in an embassy, *Spy vs Spy* is a one or two-player game with the aim of collecting various items in a briefcase before fleeing the country. The required objects – secret plan, passport, etc – are hidden at random behind pictures, hatstands and numerous other pieces of diplomatic furniture. As there is only one of each, the spies compete to find them first.

If you are too late, you can always try and steal the briefcase from your opponent before he makes it to the airport.

Perhaps the most innovative feature of the game is Simulvision – Tynesoft's tradename for the simultaneous display of the two rooms where the spies are rummaging. The graphics are three-dimensional and have been well designed.

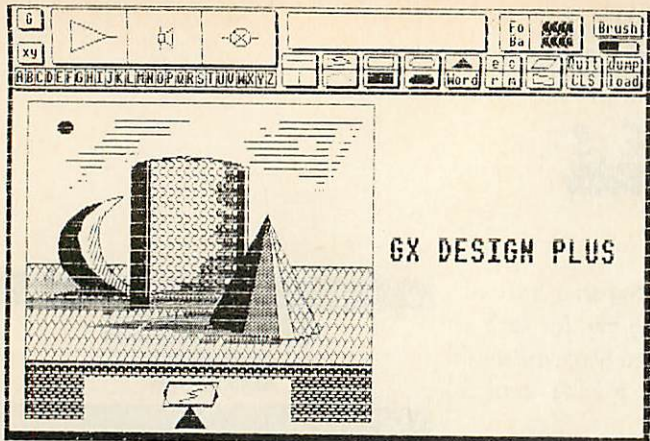
Each spy may set traps for the other. Bombs may be placed behind pictures and guns may be tied to doors with pieces of string. However, Simulvision permits the clever spy to note where traps await them.

There are traps with varying effects. After a few seconds, however, you return to rummage on. Well, it is only a game!

As a one-player game, *Spy vs Spy* could become dull quite quickly. The computer-controlled spy, lacking any intelligence at all, is surely in the wrong business. The spy invariably sets traps only to trigger them off seconds later.

However, as a two-player it really is a well-written and durable piece of programming. Fitting four hands on the keyboard takes a bit of practice, though.

David Acton



# GX DESIGN PLUS

## An all-purpose draughting system

The software is driven by an analogue joystick, a tracker ball or from the keyboard and offers a competitively priced entry to a high resolution design application.

Driven by an analogue joystick, tracker ball or from the keyboard GX Design PLUS offers a competitively priced entry to a high resolution design applications.

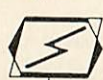
- \*78 icons can be designed by the user on a 27x27 matrix and used as brushes or images and rotated through 90 degrees..
- \*Any part of the screen can be enlarged, reduced, copied, moved, reflected or isometrically altered.
- \*64 patterns for infill or background.
- \*Definition can be enhanced by the erasure of the individual pixels.
- \*2D images can be transformed to 3D using the isometric

- functions.
  - \*Mode 0 text can be enlarged to any size.
  - \*Accurate measurements available using the x & y coordinates and a definable grid.
  - \*Display is black on white or the inverse allowing easy hidden line removal for solid or see-through objects.
  - \*7 selectable screen colours.
  - \*Built in Epson screen dump allows any parts of or any number of screens to be successively printed out without breaks. Other dump routine may be used.
- Suitable for a single sided disc drive.

£24.95 fully inclusive

TO ORDER  
AFTER SALES  
OTHER TITLES  
PROGRAMMERS

Please send cheque/PO payable to PAEAN Systems. Specify 40 or 80 despatched by return of post at 1st Class rates. We provide an efficient help and advisory service to our customers. Please ask for our full list. We are always interested to market original quality software for the BBC model B, B+, Master 128 and 512 on specialist subjects.



*PAEAN systems*

Hollesley House, Hollesley,  
Woodbridge, Suffolk IP12 3RH.  
Telephone: (0394) 411 250

# NEW BATTLE OF BRITAIN

FROM DESIGN PEOPLE SOFTWARE!  
Battle of Britain is available on  
cassette or 5 1/4" disc.

DISC £12.95 + £1.00 p&p  
CASSETTE £9.95 + £1.00 p&p

COMING FOR CHRISTMAS  
**MIDWAY**  
in the BATTLEGAME SERIES

11th August 1940 . . .

Britain stands alone against the German war machine.

BATTLE OF BRITAIN simulates the conflict that ensued. The player takes the place of the commander of the Royal Air Force, whilst the computer takes charge of the German forces. Under your command are the seven sector stations of Fighter Command. You receive reports from your radar stations on the coast, or if these have been bombed out of action, from the Observer Corps. Your forces are replenished from your fighter reserve and by production from aircraft factories -- but you will lose both if the factories are bombed.

As if that were enough, bombing raids which penetrate your defences and reach your airfields will wreak havoc. All these and a host of other details are simulated by the Battle of Britain program. Unlike 'Sink The Bismarck' and 'Tanks', 'Battle of Britain' does not include 'combat sheets' as the numbers of planes involved are so large, though it does use disc overlay techniques to allow a larger program.

### Reviews:

"Full marks for simulations like this -- an intelligent use of the computer that is never boring and doesn't require you to be a wargaming fanatic to enjoy playing . . . I do believe that many more of you would enjoy playing Battle of Britain than you might suspect . . . I'm eager to see the next in the series!" *A&B Computing, October 1987*

All games are compatible with the BBC B,B+ and MASTER series. All orders will be despatched by return of post.

**Design People Software, 77 Grimwade Street, Ipswich, Suffolk, IP4 1LN**

# REVIEWS

## SOFTWARE

### HALCIEN DAYS

Yet another programming language for the BBC micro has been released by High-level Algorithms. Mark de Weger assesses it

With almost a dozen programming languages available for the BBC micro, you'd think there would be enough. Apparently not; a twelfth one, with the exotic name of Halcien, has shown up.

Halcien stands for High-level Algorithmic Computer Instruction Encoding Language, and was originally written to combine the best features of Forth and Algol '68, with some extensions. However, these two languages have been the basis of other programming languages, so Halcien has elements of many languages in it.

The software comes on a 16k EPROM and utilities disc, accompanied by a 250-page manual, a reference card and a function-key strip. It runs on the model B, B+ and the Master series.

Halcien is a general purpose language with extensions into graphics and text editing. One of its main features is its modular approach to programming; just like in Forth and Logo it is possible to define words (comparable to procedures in Basic) which then form an integral part of the language. The beauty of a modular approach is that a program can be divided into smaller modules, which can be individually written and tested.

Another major feature of Halcien is its use of stacks. A stack is like a pile on which data is pushed and later retrieved. The main one is the data stack, on which variables like integers and strings are stored. The problem in Forth of having to use Reverse Polish notation (1 2+ instead of 1 + 2) has been solved by adding an operator stack. However, if you need a language for number-crunching, you shouldn't use Halcien.

Many of the features from Pascal are also available, including all of the important data types such as records (called structures in Halcien) and pointers. But Halcien offers better string handling and a simple form of random access filing – a flexible way to store and access data on disc.

There are also omissions. The most remarkable one is the complete lack of trigonometric and logarithmic functions. A utility file on the disc offers these functions

```
>ROTN 30,50  
>PYR  
>SIZE 2500  
>PYR
```

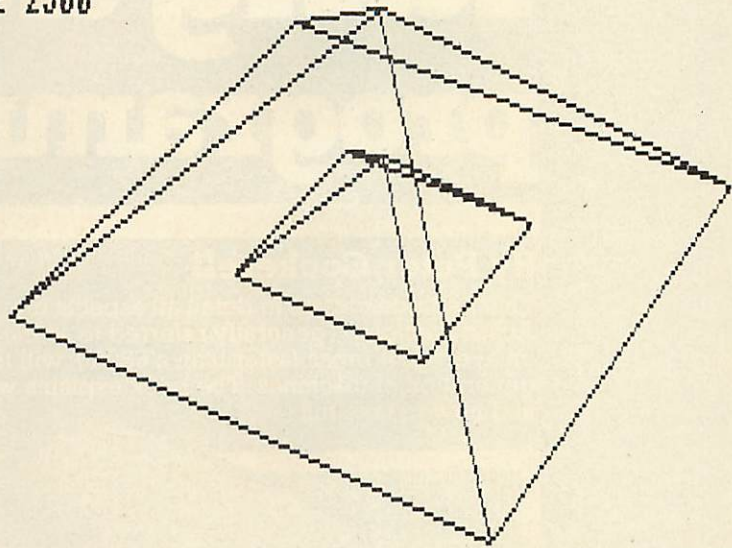


Figure 1. Halcien's powerful graphics facilities

written in Halcien, but these are not suitable for serious use. Halcien also doesn't offer sets and enumeration types. Something else that is quite restrictive is that it is not possible to pass data of more than 255 bytes in length to a procedure. There are ways round this, but these don't encourage elegant programming.

Halcien performs conversions between variable types automatically. So if S is a string variable with the value '123' and I has been defined as an integer, a statement like I%=S is perfectly legal. Of course, this also has disadvantages, the main ones being that it can lead to untidy programming and errors that are not reported.

The language has an unusual approach to direct memory access. To read a part of the memory it is necessary to move this block into variables known by Halcien. This is quite a clumsy method and together with the slow speed at which Halcien programs run, it makes the language unsuitable for most interfacing applications. Machine code programs can be called from Halcien, but there is no built-in assembler.

One of the most striking characteristics of a program written in Halcien is the

number of spaces it contains. Every word or number has to be separated from others by a space or a comma. When you have just started learning the language this leads to a disastrous number of errors, though you soon get used to it.

#### Text and graphics commands

Apart from being a general purpose language, Halcien is specialised in two fields: graphics and text manipulation.

Let us look at the text processing commands first. To be able to use these, a piece of text (called the ED file) should be present in the micro's memory. This file is then manipulated using commands similar to those of *Wordwise Plus*, but they are a lot more powerful.

The ease with which graphics can be programmed also forms a major feature of Halcien. At the simplest level it is possible to draw lines, boxes, arcs and so on. The SIZE and ROTN commands make it possible to change the scale and rotate drawings. This compensates for the lack of trigonometric functions.

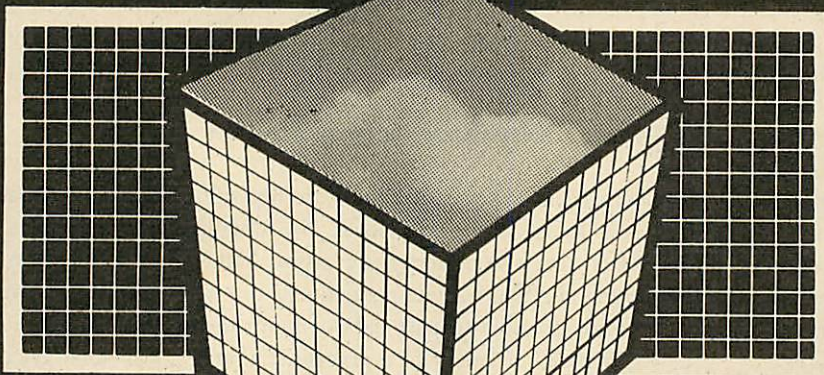
However, the commands only work to full advantage in the definition of icons. An

# ARM

## Assembly language programming

By Peter Cockerell

This book describes in detail all aspects of programming the new Acorn Risc chip (generally referred to as the ARM). This 32-bit chip, on average 4 times faster than a 68000, will form the basis of a new generation of machines. The book explains why the chip is so fast and how to take full advantage of its power.



Topics covered  
include;

- ▶ First concepts.
- ▶ Inside the ARM.
- ▶ The ALU and barrel shifter.
- ▶ The instruction set.
- ▶ Instruction timings.
- ▶ The BBC BASIC assembler.
- ▶ Assembly programming principles.
- ▶ Data structures.
- ▶ Non-user modes.
- ▶ Undefined instructions.
- ▶ Interrupts and vectors.

The book is completely up-to-date covering only the new 2 micron ARM, with appendices on the floating point and co-processor instructions and with numerous example programs. A truly comprehensive reference manual for anyone who intends to program in ARM assembly language, or for those who just want to find out why the Acorn RISC chip is so special.

Price £12.95



Computer Concepts

Gaddesden Place, Hemel Hempstead, Herts HP2 6EX. Tel: (0442) 63933

Access/Barclaycard accepted. All orders despatched within 24 hours.

**AVAILABLE  
NOW!**



# REVIEWS

## SOFTWARE

icon is a sequence of graphics commands which is treated by the language as if it were a single unit.

All this is possible not only in two dimensions, but also in 3-D. The utilities disc contains a very impressive program in which an image of the earth as seen from space is displayed and rotated. The co-ordinates of the 900 points are calculated in less than 10 seconds. Perhaps the most impressive part is that the main section of the program listing fits easily on to just one A4 sheet of paper.

Listing 1 shows how a three-dimensional drawing can be partly built up from two-dimensional shapes. In this case the base of a 3-D pyramid is drawn in 2-D. The FIX POINT commands move the graphics cursor to the different corners of the base. Once the procedure has been defined, the pyramid can be viewed from all sides. It is worth noting that variables have to be declared before they are used, like in Pascal. The command:

```
ROTN 0,70,0 pyramid
```

for example, will produce a side view.

### Performance

Just like ISO-Pascal programs, Halcien programs have to be compiled to some intermediate code, called H-code, before they are executed. This compilation is very fast (even the longest programs take only a few seconds to be processed) and results in very compact code.

Compiled Halcien programs take about half the space of Basic programs. However, my benchmarks showed they run about 25 per cent slower.

I composed Halcien with other languages using the Tak function, published in the November 1986 *Acorn User*. This measures the efficiency of recursion. The compiled code takes 64 bytes and the Tak (18,12,6) benchmark runs in 291 seconds. If we compare this to the results of other languages, the code is almost as compact as its Forth equivalent, but not very fast.

Error checking during program compilation is only very basic, which means that most errors will show up when running programs. Unfortunately you are given only the error number if a run-time error occurs. There is no message and no indication of where abouts in the program it occurred. The latter can make it very diffi-

```
PROC 'pyramid'  
  2D BOX 200,200  
  3D 100,100,-100  
  FIX POINT 2  
  GAP FIX POINT 3  
  -100,100,-100  
  FIX POINT 1  
END_P  
  
PROC 'pyr'  
  ICON GAP -100,100  
  pyramid  
  END_IC  
END_P
```

Figure 2. The procedure that produced figure 1

cult to debug Halcien programs properly.

### The editor

Built into the language is a full-screen editor to enable you to write programs directly. It's better than Basic's line editor, but I think it is the worst screen editor I have ever been forced to use.

You cannot move freely around with the cursor; if it is moved up or down, it jumps back to the start of the next line. There is a ruler on the line below the cursor which splits the text in a very irritating way, making it difficult to read.

Furthermore, scrolling is very slow. Scrolling down a mode 3 screen without making use of the 'jump' option takes about 15 seconds! And there is an awful tendency to overscroll.

The editor does offer some basic word-processing facilities, like search and replace and block move/delete, but it is incomprehensible to find such an editor in a language that is specially suited to text processing.

It is possible to use another word-processor for the preparation of program material, but that means you lose several advantages of the built-in editor, like easier debugging when the program is compiled.

### The manual

The user-guide is a loose-leaf ring binder containing almost 250 pages. It's intended as a reference guide, and in that respect is quite good. But with a completely new language, a tutorial guide is an absolute must, and for that the manual is totally unsuitable. What's needed is a clear explanation of Halcien in the context of a course in structured programming.

The part of the user-guide covering the general purpose commands concentrates

too much on how the language interpreter executes a program. It is technical, rather dry and contains too few examples.

With a new language like Halcien everything depends on the support that is given by the publisher. Fortunately this is very good. During this review, I made use of telephone assistance from the author. Some useful utilities have been developed and, according to the publisher, these will be made available to the users.

### Conclusions

Unlike the publisher of Halcien, who claims the language is suited to many applications in every field of computer use, I feel it is useful in only a limited number of areas. Halcien is certainly not a language for beginners. The lack of teaching material and the bad error handling are the main reasons.

Although the modular approach of Halcien and its expression power make it potentially useful in education, the same disadvantages that make it unsuitable for beginners speak against its use in this field. Another important disadvantage in this respect is the fact that Halcien is a new and quite idiosyncratic language.

Basic programmers who just wish to learn a new programming language that gives more expression power and eases program development should consider Halcien. Halcien does have important advantages over a language like Pascal. However, I think that the disadvantages mentioned above will turn the scale in favour of Pascal most of the time.

The real market for Halcien lies with experienced programmers who want a language that is specially suited to graphics and text handling, or a flexible stack-based language. A program like *Gus* (*Acorn User*, March 1987), which is based on stack manipulation, could have been written in Halcien with much less effort.

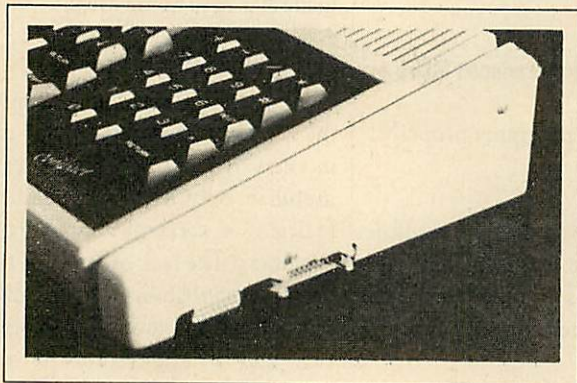
It is good to see that people have so much trust in the BBC micro market that a new language is first written for it. An MS-DOS version of Halcien is under way. I think that Halcien's features fully justify its existence and that it is a useful addition to the programming languages already available.

*Halcien*. £49.95. Details from: High-level Algorithms Ltd., 12 Den Brook Close, Lydwell Park, Wellswood, Torquay, Devon TQ1 3TP. Tel: (0803) 22092.

# MASTER THE COMPACT WITH THE COMPACT COMPANION

YOU COULD SAVE AS MUCH AS £200 ON THE  
PURCHASE OF AN EQUIVALENT MASTER 128 COLOUR SYSTEM!

THE COMPREHENSIVE INTERFACE  
TO UPGRADE THE MASTER COMPACT



If you need more from your ACORN COMPACT COMPUTER or you are a decision maker considering the purchase of the ACORN MASTER 128 for your organisation, then look at the ECONOMIC advantages of using the ACORN COMPACT COMPUTER with the COMPACT COMPANION.

The COMPANION INTERFACE provides a COMPACT COMPUTER with most of the extra facilities normally found on the MASTER 128

- ★ User Port
- ★ Analogue (Joystick) Port
- ★ MH2 Bus
- ★ ACORN 1770 DFS in ROM
- ★ All connections Standard MASTER 128
- ★ Full user control of the Interface Software

The interface bolts directly onto the end of the keyboard and simply adds one inch to the keyboard length. Fitting takes two minutes.

PRICE £39.95 inc. VAT  
Educational discounts available  
Dealer enquiries welcome.

**MERTEC COMPUTER PRODUCTS,  
35/36 SINGLETON STREET,  
SWANSEA SA1 3QN.  
Tel: (0792) 467980.**

ARCHIMEDES  
NOW IN STOCK  
AS AT 9.9.87

*Class Utility Software & Printers  
from the Professionals.*

# CJE Micro's

# Unbeatable in print.

CJE Micro's are an official ACORN approved dealer.

A wide range of accessories and software for ACORN, Amstrad and Atari computers are on display in the CJE Micro's retail showrooms.

## Multi-Font NLQ

**("Very good package . . .  
Saved me over £100")**

V. BUNCE, OXFORD. DEC 86.

Upgrade your printer to NLQ with a choice of many fonts. Up to 49 predefined fonts are available on 4 discs, or you can design your own. Multi-font is easy to use and compatible with nearly all software. For prices see below or ring for further details on 0903-213361.

Some of the fonts available are shown here:

This is STANDARD  
This is COURIER  
This is ITALIC  
This is ~~BOBAC~~  
This is COMPTS  
This is BOLD  
This is SHADOW  
This is OUTLINE  
This is BROWAYE  
This is THEATRE

CJE Welcome EXPORT and TRADE ORDERS - inquire for delivery costs.

Phone/Credit Card and Official Orders are accepted. Please ring for all the latest information and prices on 0903-213361.

## FONTAID

**("Good value . . . Useful buy")**

BEEBUG MAY 87.

Fontaid is a must for any Canon or Kaga Taxan owner. 60 predefined fonts are available or you can design your own. A Star NL10/NX15 version is also now available, so inquire for further details.

## **"Impressed... Delightful Simplicity... Easy to use"**

(MICRO USER JUNE 87)

INFORM from CJE Micro's.

This unique sideways RAM information system is quick, versatile and simple.

NOW - Solidisk 256K version is also available.

## *Master Writeprotect/ROM select switch.*

**"I cannot praise it enough . . . Worth  
buying!!"** MICRONET 800116575

This switch system selects RAM protected, RAM unprotected or ROM. Each bank is separately switchable. This is the MOST POWERFUL switch unit available at only £15.00 inc VAT. (p & p £1.00 extra).

# CJEmicro's

CJE Micro's (Dept AU11), 78 Brighton Road, Worthing,  
W. Sussex BN11 2EN. Tel: 0903-213361.

## SOFTWARE PRICE LIST

All prices include VAT, but please add £1.00 for postage/packing and state 40, 80 track or 3½" ADFS when ordering.

MFNLQ £30.00  
Font Discs B, C & D each £15.00

Fontaid £30.00  
Fontaid with 6264 RAM £36.00  
Font Discs A, B, C, D,  
EA & Lang each £15.00

Inform £20.00

## PRINTERS

Delivery on all printers is free. Ring for a sample printout, specification and the latest prices.

The following Near Letter Quality printers all come with centronics interface, friction and tractor feed.

Panasonic KXP1081 £180.00  
Canon PW1080A £260.00  
Star NL10 £230.00  
Star NX15 £410.00  
Star NB24/10 (216cps) £599.00

Juki Daisywheel £330.00  
Free delivery on printers

CJE Printer packs

The CJE packs include; Cable, delivery, paper, plug, utility software and booklet. Please ask for further details.

The Printer packs cost £15.00 with printer: e.g. NL10 + pack = £260 + £15 = £275 inc. VAT.

BBC Cable if purchased separately is £8.00. Software on its own: £11.00 + £1 p&p.

# REVIEWS

## SOFTWARE

# INSIDE INTERBASE

Bruce Smith has been waiting for the final part of Computer Concepts' *Inter range* – *InterBase*. This is his verdict

*InterBase* is the last of the *Inter* series of applications from Computer Concepts. As with its predecessors – *Chart*, *Sheet* and *Word* – it has been a long time coming and concludes what has to be the most integrated set of ROM software available for the BBC micro, based around the excellent ROM link concept.

Regular readers will know that I am not an *InterWord* convert, preferring *View 3*, although *InterSheet* and *Chart* have always been my first choice for spreadsheets and business graphics. I have always thought *ViewStore* to be the best all round database available for the BBC micro so, needless to say, I have been itching to see what *InterBase* can do.

*InterBase* is not a traditional database in the *ViewStore* mould which is devoted to the direct management and sorting of data. Like Minerva's *System Delta*, *InterBase* is used to write databases tailored to suit your own needs.

Unlike *System Delta*, *Inter-Base* is a complete language in its own right, not just an extension to Basic. However, it is very closely modelled on BBC Basic and reproduces just about every keyword – even ENVELOPE, whatever use that is in a database. As one would expect, there is a vast array of extra and extended file and string handling commands, which are needed to enable direct creation and manipulation of databases.

Implementing a full version of Basic is fine because most BBC micro users are now well versed in this language. But if Basic was a good enough environment in which to write sophisticated databases we wouldn't need *InterBase*. It all hinges on the extra string and file handling commands, yet after a day or two of *InterBase* programming I was still flummoxed by many of them.

The manual is dreadful. At first sight its 120 pages would seem to be cram packed with the stuff programmers love. In fact, the descriptions are short and terse, and the few examples are not documented and are taken out of context. No doubt the author knows what each command does – but he

```
          DATABASE : BOOKS
          (C) Computer Concepts 1987

          1) Close database
          2) Disable Index (AUTHOR)
          3) Set condition
          4) Edit fields
          5) Option menu
          6) Print records
          7) Build index
          8) Create new database
          9) Program menu

          ESC Edit current record

          Enter choice
```

*InterBase* uses *Wordwise*-style menus to handle data files

doesn't share the information clearly with the reader.

From the start *InterBase* appears like any other Computer Concepts product, presenting a reassuring mode 7 screen. Being a 64k ROM it will not work with a second processor, so serious work will probably need shadow RAM.

### Starting up

The start-up screen places you in what can best be described as card-index mode. The card index is an application program which is always on tap and from which you can build most of your databases.

An example of its use is the address book on the disc of programs supplied with the product. The example is completely useless – a name, address and serial number database is hardly the sort of application you would pay £70 for.

Much better things are within the capabilities of the card-index program. Creating and building a database is a relatively simple task providing you have had some experience in this kind of thing. If not you, may have a struggle. The manual recommends editing the address book example on the

disc but I would suggest you leave this well alone – in fact delete it from the disc – and start from scratch.

Once you have created a database you can manipulate it in a variety of ways, and in this area *InterBase* comes out very well.

Indexes are a vital part of any database, as they can make searching the data – a time-consuming task – a faster process. For example, the card index is quite capable of handling home and office records, perhaps a proper address book, clients' names, addresses and products or perhaps for stock control in a small business.

Taking the last example, a company may wish to keep strict control on the number of boxes of various products in store. In this case an index can be created which is built up from a field assigned to product quantity. The stock level can be monitored by searching on the 'quantity' index.

Using another option from the menu it is also possible to set search conditions – and these can be quite complex. For example, we could print out all products of which there are less than 10 in stock by setting the condition:  
quantity<10

This can be made even more specific. For example:

```
quantity<10 AND
Product="Archimedes"
```

would search for all products called Archimedes of which there are less than 10.

Search strings are not limited to indexes alone – they can be applied directly to the database itself and the string being sorted can be ambiguous using the now standard \* and # wild card characters.

## Options menu

A further sub-menu is available from the main menu – the options menu – from which printer control code sequences are set (an excellent idea) and databases rebuilt.

The last option is a very important one. When a record is deleted from the database it is not actually wiped from the database. Instead the pointer that links it to the last record is altered. This means that no space in the database is saved by deleting records. If space is tight then the database can be rebuilt so that the deleted records are physically erased – similar to the way in which \*COMPACT is used to close up unused space on a disc.

There is another reason why this should be done regularly, especially if you are planning to use the programming language to access a database created in the card index. Many of the commands which access records don't know which have been deleted. So if you have a database of 24 records, delete 6 and then write a program to access the records, then 24 will be looked for, not 18! If you do rebuild the database you must specify a destination filename, contrary to what the manual says.

The card-index application will suit most common needs. It is capable of handling data in either string, integer number, real number, date or multi formats. What it isn't particularly good at is sorting data (programs are needed for this) so if you are going to need alphabetical lists of names, towns and so forth, you're going to have to do some difficult programming work.

Having set up a small database of books, I decided to set about writing a program that would provide some basic information about the database, namely the number of records, the number of fields in each record and which would then allow me to print out a field from each record.

The resulting program eventually worked but it took me an hour to get to this stage! I consider myself a competent Basic programmer but had to spend much of my time trying to work out from the manual the

exact syntax of the various commands, and how they could be made to interact.

The programming menu is accessed from the main menu. The Escape key can then be used to toggle between the program area and the menu – just like *Wordwise*. Programs when written or loaded are stored in a string, by default P\$.

Once written, and this is easy to do as the editor is in fact a mini text editor. The

```
STATUS
Database - BOOKS
21 records
65440 bytes free
410 info size
614 info free

Current index - AUTHOR
With condition :
TRUE
Indexed on :
Author
21 entries

Updatable indexes:
AUTHOR

Press any key
```

Status display shows what's on file

program is 'run' by typing its letter from the menu screen. Unlike Basic, *InterBase* strings are not limited to 255 characters and so quite long programs can be written.

There are two major features that need to be fixed for the next version. First, when a program ends or aborts due to an error, you are presented with a '>' prompt. Press Return and you get the prompt again – this is disconcerting as it appears you have gone back into Basic – you haven't. You must press Escape to get to the 'Press any key' prompt. Second, if you press Escape during a disc access the program crashes, the screen goes blank and that's it. You press Break to start again.

For expert programmers, the language offers some exciting possibilities, particularly in the scientific fields. The incorporation of an ADVAL command means that a program could be written to capture incoming sampled data and log it into a database, sort it and display it, which opens up intriguing possibilities. Similarly, by using the serial port, data can be read from elsewhere. Linking my BBC to a Macintosh I was able to transfer ASCII data from it straight into *InterBase* – but only after I had managed to write the program.

Owing to the limited memory of the BBC micro, *InterBase*, like many other databases, relies heavily on the disc to move information in and out of memory – and as such there is a physical limit on how quickly files can be accessed. The language is obviously an interpreted one, and this imposes a further time restriction, so

long and complicated programs can prove cumbersome. Speed is improved by using a TOKENISE command which converts the program into a more compact form. But this makes it impossible to edit, so always keep an ASCII version.

*InterBase* also seems to have a RAM filing system incorporated into it for use with sideways RAM. Unfortunately the single page used to describe it in the manual doesn't say how you use it.

The utilities disc contains several applications programs including a label printer which worked well, and two file converters – *Masterfile* and *ViewStore* to *InterBase*. I tried the *ViewStore* converter on about half a dozen files of various sizes – but it didn't work reliably, often giving a 'string too long' error.

## Data transfer

The ROM link system allows data and information to be passed readily between any of the *Inter* packages. Using data created in *InterBase*, it is a simple matter to perform quite complex mail-emerging tasks. Addresses can be read from the database and imported into *InterWord* during printing by using an embedded command – ideal for anybody in the business of sending out mail-shots.

The process could go further – standard paragraphs could be held on file and called into *InterWord* as required. *InterChart* could extract data compiled in *InterBase* and plot it graphically, and of course databases could be built up using information from *InterSheet*.

*InterBase* is rather like my favourite Chinese meal – sweet and sour. There are some excellent facilities available – once you understand them. On the other hand, several facilities give the impression of having been rushed. What it desperately needs to make it a product worthy of the Computer Concepts name is a disc of applications – like those offered by Minerva for their *System Delta* – and a much better manual.

*ViewStore* is still the best all rounder, while I would recommend *System Delta* to readers who can program or whose requirements are covered by Minerva in their application software packages. *InterBase* is only for the more advanced user, particularly those who are already writing their own database or data logging programs in Basic. Computer Concepts can do better.

*InterBase* is available from Computer Concepts, Gaddesden Place, Hemel Hempstead, Herts HP2 6EX. Tel: (0442) 63933. Price £69 including VAT.

## RBRC SOFTWARE

- ◆ Hands on Experience in Business Dynamics.
- ◆ Live Business Simulations.
- ◆ The teams (as boards of directors) have to cope with all aspects of managing the business.



### Crisis Management

Fothergale Co Ltd, makers of the 'Castaway' disposable shirts.

For sixth formers (16-19)  
£60 + VAT p&p

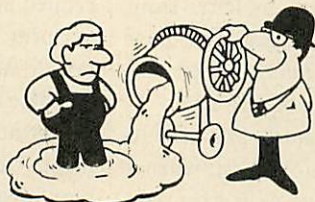
### The Cement Business Game

The Goliath Cement Co Ltd, a small independent cement maker coping with all its problems.

For fifth and sixth formers (15-18)

(Sponsored by Blue Circle Industries PLC)

£30 + VAT p&p



### "Beat the BOSS"

An introduction to business dynamics, and to "Crisis Management". For fourth to sixth formers (14-17)

£30 + VAT p&p

All 80 track DFS for BBC/B, Master, Compact, 'Nimbus'.

"Crisis Management" has comprehensive tutor's manual that covers all three simulations. "Beat The BOSS" has a special tutor's guide. All three have players' guides

## SPECIAL OFFER

All three simulations for £98.50p plus VAT and p&p

Normal retail price for all three £120 plus VAT and p&p

Offer valid for all orders received by 7th December 1987

**From: RBRC Software  
Guild House  
32 Worples Road  
Wimbledon SW19 4EF**

Telephone: 01-946 8641



## DISCOUNT OFFERS!!

**ALL PRICES INCLUDE VAT**

**BBC MASTER 128 COMPUTER £395**  
**ACORN ARCHIMEDES - PLEASE TELEPHONE!**

**COMPUTER CONCEPTS  
INTERBASE ROM  
ONLY £58.65...**

**GENUINE MAXELL 5 1/4" DISKS IN PLASTIC  
LIBRARY/STORAGE BOX ONLY £10.95!!**

**VIGLEN DISK DRIVES + 3 YEAR WARRANTY**

★ SINGLE 400K ONLY £119.95 ★

★ DUAL 800K ONLY £222.95 ★

☆ **PRINTER SPECIALS** ☆

**STAR NL-10 £204.70**

**CITIZEN 120D £155.25**

**GPR2000 18cps DAISYWHEEL**

**ONLY £172**

24HR. DELIVERY FOR HARDWARE £8 INC.

**TIGER SOFTWARE**  
**66 ST. MICHAELS LANE**  
**BRIDPORT, DORSET, DT6 3RB**  
**TEL: 0308 27691**



## RAYCOMP DATABASE

### NEW PRODUCTS

- Features: 80 column display, up to 64 fields per record and 254 characters per field
- merge records with other files
- produce VIEW compatible files
- updated file information in header
- file size limited only by disc
- versions for Shadow RAM/6502 second processors (+ turbo), Sideways RAM
- alphabetical, numerical sort on any field
- repetitive search (not basic versions)
- full edit/search + edit facility
- print records/selected fields (or via VIEW)

COMPATIBLE versions for ALL Acorn microcomputers. This is the completely upgradeable database. DFS & ADFS versions. DFS-ADFS file transfer service. Shadow RAM/6502 sec. proc. & Sideways RAM versions-£8.50. Basic ELK & BBC versions-£8.00. Additional versions (not Archimedes) - £4.50. Archimedes version 1 (RISC) - £14.40.

### RAYCOMP GRAPHICS UTILITY

Plot line or scatter graphs, pie or bar charts with data from RAYCOMP DATABASE files or from keyboard. With screen dump printout. Price £7.50

### EDUCATIONAL - CHROMOTOGRAPHY SIMULATION

Input sample size and number, number of theoretical plates, fraction size & number. Visual simulation, tabulation & graphical output. Suitable HNC/D, Degree courses in Chemistry, Biology & related subjects. Price £14.50

Orders/Enquiries: State full details of computer system, 40/80 track, DFS/ADFS to:  
**RAYCOMP, 46 Frenchs Avenue, Dunstable, Bed's LU6 1BH**

Just upgraded from BBC to Archimedes?

## Beeb-to-Ark

**transfers ANY BBC Micro file  
to an Archimedes computer!**

Beeb-to-Ark comprises a data cable, BBC Micro and Archimedes software (supplied on top-quality Verbatim diskettes) and an easy-to-follow manual. We operate a hotline support service for registered purchasers, to help you over any problems. Beeb-to-Ark will run on any BBC B, B+ or Master micro with a disk drive. Acorn DFS or ADFS, and OS 1.0 or greater. Please specify DFS or ADFS and 40 or 80 track when ordering. Send £29.95 (inc. P&P) to:

**ZAPHOD SOFTWARE, Floor 1, 17 Howe Street,  
Edinburgh, EH3 6TE. Cheques only, please.**

# REVIEWS

## SOFTWARE

# THE MEANING OF MICROCODIL

Twenty years in the pipeline, MicroCODIL is a language for building expert systems.

Steve Mansfield assesses its usefulness

Expert systems have finally made it out of the artificial intelligence labs – they've even suffered the indignity of becoming trendy.

This is a result of two converging factors – the increasing power of micros and the increasing elegance of software systems. This latter point is shown most clearly in MicroCODIL, a language which allows you to build useful expert systems and knowledge bases, and it succeeds in doing this even on a BBC.

True expert systems take a simple knowledge base further by adding structures which tie up the facts in meaningful ways, allowing, for example, a medical program to diagnose an illness even if the symptoms are incomplete and contradictory.

Expert systems work by defining rules, and this approach is also at the heart of MicroCODIL. You provide a framework – a set of rules and linking structures – and then feed in the information.

MicroCODIL owes something to languages newer than Lisp, particularly Prolog, in that rules are more explicitly stated. Yet there are several advantages to MicroCODIL over the Acornsoft MicroProlog package. Prolog is very greedy with memory. It is difficult to write meaningful programs in the limited space left after you've loaded in one of the friendly front-end systems, and the core syntax of Prolog is difficult to understand.

MicroCODIL, on the other hand, is a fairly simple language, and as such leaves plenty for space of data, which can be easily manipulated. The other great advantage is that the program doesn't expect the data you feed in to conform rigidly with the program's data structure. It can handle 'fuzzy' logic and data.

The fact that MicroCODIL uses the BBC micro's memory so economically is surprising. Like many languages, this one has found its way down from larger computers – in this case mainframes at Brunel University, where its author, Dr Chris Reynolds, is in the computer science department. He began developing the language 20 years ago. More recently, funding from the Micro Electronics Programme

```
Micro          Copyright Chris Reynolds
CODIL         1985
1.21         Overall VIEW
C SEARCHNUMBER = 1 .
C STATEMENT = 3 .
C FOUND = 1 .
C NAME = Carborundum .
C CHEMICALNAME = Silicon carbide .
C USE = grinding .
C COLOUR = black .
C COLOUR = grey .
C HARDNESS >= 9 .
C HARDNESS <= 10 .
C MELTINGPOINT = 2600 .

Type % when input complete

hardness > 3 .
%

Space 216
```

Searching the example chemical solids database with MicroCODIL

helped MicroCODIL find its way on to the BBC. The name stands for COntext Dependent Information Language.

The transplant has been successful, with none of the feeling of being a cut-down system that you get with some other languages. The system can seem strange to those raised on Basic, but it doesn't take long to get into it.

You can try out one of the many sample databases supplied with the package. These include a rather intriguing music database which highlights one of the systems most unusual features – you can have sound in your expert system as well as text. With one eye on the memory space, MicroCODIL works in mode 7. This is adequate, if unexciting, and Reynolds has made a good job of designing the screen layout. However, I'd like to see an option – or separate version – for machines with shadow memory to let you work in any mode. You could then use mode 0 or 3 for large amounts of text.

The language is targetted mainly at schools, and several additional knowledge

bases have been produced to make the most of it. For example, the first to appear was *The History Project*, an educational system based on a group of Hertfordshire farms in the 19th century.

The documentation is excellent, providing both a tutorial and a reference source for the language.

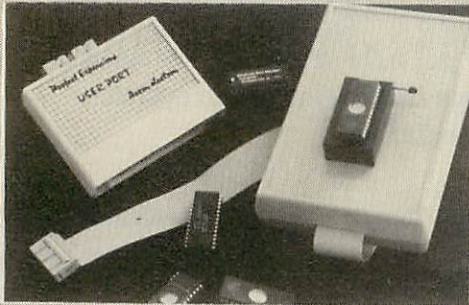
Apart from the language's great potential in teaching, there is a lot to recommend it to home users. If you are interested in expert systems, but haven't got as far with Micro Prolog as you want to, then MicroCODIL is worth trying out.

Serious applications are possible too. The language could prove useful to scientists wanting to create intelligent databases or hobbyists needing to make sense of their obsession – amateur genealogists are one possible customer suggested by Reynolds.

The cost varies depending on the disc format you want, but starts at £50. Extra manuals and network licences are available. Extra project packs cost about a tenner.

Codil Language Systems, 33 Buckingham Road, Tring, Hertfordshire HP23 4HG.

PROJECT EXPANSIONS  
USER PORT & EPROM PROGRAMMER  
for the  
ELECTRON



User Port cartridge for the Electron

With ROM socket. PRICE ONLY: £29.95  
EPROM Programmer inc ROM software

For 8, 16, 32K EPROMS  
All Menu Driven, PRICE ONLY: £34.95

COMING SOON FOUR CHANNEL SOUND CARTRIDGE  
AVAILABLE END OF OCTOBER  
ALL THE ABOVE PRICES ARE INCLUSIVE OF P. O. & VAT.  
PLEASE SEND CHEQUES/P. O. TO

PROJECT EXPANSION  
5 TEAL CLOSE, FAREHAM HANTS PO16 8HG  
0329 221109

# CommuniTel

CommuniTel is an exciting professional viewdata system for the BBC B, Master & Compact Micros (DFS, ADFS or Network).

IT'S USES IN EDUCATION INCLUDE

- Learning Information Technology
- Structuring Creative Learning
- Cross-Curricular Development
- Administration / Publicity

The system includes a comprehensive suite of programs which enables the creation of a database with message facilities. This can then be made available to callers using a telephone line and any viewdata terminal. The package includes comprehensive tutorial and reference manuals and a sample database.

Available in TWO LEVELS FOR USE WITH THE DTI (DaCom or Tandata)  
SCHOOLS MODEM

LEVEL 1+	FRAME EDITOR SEARCH CAROUSEL DISPLAY FRAME PRINTER VIEWDATA - TERMINAL	LEVEL 2	FRAME EDITOR SEARCH CAROUSEL DISPLAY FRAME PRINTER VIEWDATA - TERMINAL DIAL IN HOST SYSTEM TELESOFTWARE FORMATTER
----------	--	---------	---

LEVEL 1+ £55      LEVEL 2 £95

Upgrade from LEVEL 1+ TO LEVEL 2 £45  
LEVEL 2 TO ADFS LEVEL 2 £45

LEVEL 2 with Auto-answer / Auto-dial MODEM from £375  
(all prices exclude p.p. & VAT)

**Educational Discounts Available**

The ADFS version includes response frames and gives up to 600 pages with a single 80 track D.S. disk or thousands of pages using a Winchester disc drive  
FOR A DEMONSTRATION of LEVEL 2 dial:

Viewdata No 01-968 7402 or Telephone 01-960 7998  
189 FRESTON ROAD, LONDON W10 6TH

REFLECT ON IT...

# !eTInumm0J

# Arraymate

from  
**FOSSE SYSTEMS**

for total control of your arrays!

Arrays are the fundamental data structure in BBC Basic – but they have their limitations. Now **Arraymate** is here to help you to realise their full potential.

With **Arraymate's** powerful 'star' commands at your fingertips, you can ...

- ★ Sort an array into ascending or descending order – any array type, any number of dimensions.
- ★ Select the key elements to be used in sorting.
- ★ 'Rotate' the contents of an array, up or down.
- ★ List dimensions and program references of current arrays.
- ★ Selectively erase an array.
- ★ Simulate passing array parameters to a procedure.
- ★ Safeguard all your variables while you edit your program, or even chain in a new one!
- ★ ... and more!

**Arraymate** is supplied on Eprom, and is compatible with BBC Model B, B+ and Master.

Only **£15.75** inc. p&p. 30-day money-back guarantee  
Trade enquiries welcome.

Order now for immediate dispatch, from  
FOSSE SYSTEMS, 3 The Chipping, Tetbury, Glos. GL8 8EU.  
Tel (0666) 54477.



Please send me        **Arraymate** Eproms @ £15.75 each

I enclose a cheque/postal order for £

Name \_\_\_\_\_ Address \_\_\_\_\_

IS YOUR COMPUTER SICK? - try  
**RIVERSIDE SYSTEMS Ltd**

THE \_\_\_\_\_  
NAME \_\_\_\_\_  
IN \_\_\_\_\_  
COMPUTER \_\_\_\_\_  
REPAIRS \_\_\_\_\_  
ACORN APPROVED SERVICE CENTRE

ELECTRON

BBC MASTER

BCONET

MONITORS D. DRIVES

PRINTERS

WORKSHOP : ON-SITE : 6 MONTHS  
REPAIR : SERVICE : GUARANTEE

CONTRACT MAINTENANCE AVAILABLE TO  
COMMERCIAL AND EDUCATIONAL DEPTS'

RIVERSIDE SYSTEMS LTD  
UNIT 15 . RIVERSIDE WORKSHOPS  
28 PARK ST . LONDON SE1 9AB

Phone 01-407-2486



# REVIEWS

## H A R D W A R E

# ON THE DOTS

The latest dot-matrix printer from Epson rivals daisy-wheels for quality and surpasses them for flexibility. David Atherton tests it out

Computers are not the only things that are getting faster and better. Printers now offer print quality, speed and versatility that was undreamt of a few years ago – particularly the fashionable and highly expensive laser printers. Yet while lasers hog the limelight, dot-matrix printers have improved to offer similar quality at a much lower price.

Of course, the top line models are still not exactly cheap. However, if you're looking to upgrade from a standard FX-type printer, it may be worth spending the extra to get a machine which will give you everything you're ever likely to need.

Ask any computer user to name a manufacturer of dot-matrix printers, and the name you will hear most often is Epson. The Japanese giant has always dominated the market, so much so that, like IBM in micros, being 'Epson-compatible' is a great boost to success for any other company.

The Epson MX, RX, FX and LX series have been nine-pin printers – the characters are formed from a matrix consisting of several columns of nine needles arranged vertically. I have been looking at one of the new breed of dot-matrix printers, the 24-pin range. With 24 needles occupying the same amount of space, the image has three times the resolution, giving a vast improvement in quality. Epson's base model in the 24-pin range is the LQ-800.

The Epson LQ-800 is an 80-column printer not dissimilar in styling to the earlier FX80. There are three panel switches, friction and tractor feed, and dip switches to control linefeeds, international variants and so on. The tractor feed, or 'pin feed', is a primitive unit, and Epson recommends that for regular tractor paper usage, an optional add-on unit is bought. The dip switches are conveniently accessible on the back panel.

An addition to the standard interfaces is the identity and font module socket. A standard parallel interface connector is present and, as with most printers, a serial interface is offered as an option.

The LQ in the title stands for letter quality printing. This is the main selling point of the machine. Look at the sample

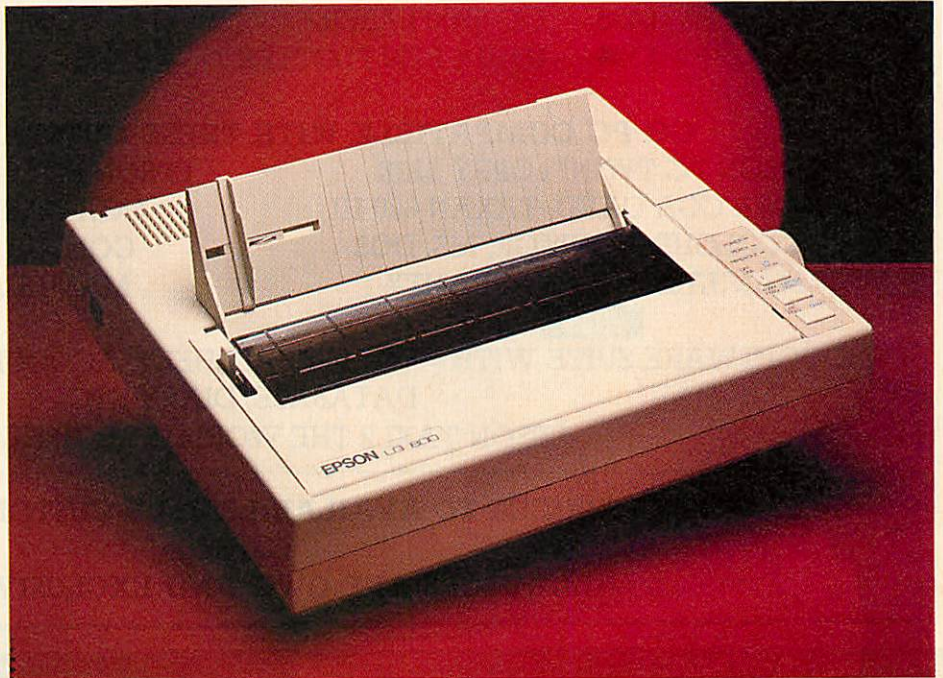


Figure 1. Epson's LQ-800 24-pin dot-matrix printer – a step up from conventional printers

### ADDING ADDITIONAL FONTS

The LQ-800 accepts identity modules, which make the printer behave like another machine, and font modules which provide additional typefaces. Available identity modules are IBM, Diable 630 (a popular daisy-wheel) and Epson. The latter is provided because the font modules plug into identity modules, so you must have an identity module in to use a new font.

Fonts available are SansSerif, Courier (a typewriter face), Prestige Elite, Script and OCR-B. The fonts are quite expensive at £44 each and, as you have to have an identity module at £60, the first one effectively costs £104. This is rather pricey and I'd recommend that you use one of the software downloadable font programs such as those produced by CJE Micros and Watford.

Epson is not working on a direct font interface for this machine. As the Epson identity module is the same price you might as well get one of the others, to get an extra feature.

in figure 2 – the LQ printing is superb. If you do a lot of text printing, it is probably worth buying the printer for this alone. Also it's fast. Epson claims 60 characters per second (cps) for LQ printing, and 180 cps for draft mode. As usual, these figures represent the optimum situation, but the printer was about twice as fast as the FX in draft mode, and three times as fast as some software-based NLQ systems.

The letter quality type can be printed in pitches of 10, 12 or 15 characters per inch, or proportionally spaced. These settings are the same as most daisy-wheel typewriters and printers, so you'll be able to use the Epson with software intended for daisy-wheel layout. The codes for emphasised, double-strike, underline, italics, superscripts and so on are the same as on previous Epsons, so highlighting codes which are currently set for Epson FX machines will all work correctly.

The proportional spaced LQ text, which has the best appearance of all, suffers from the problem that you can't get the layout right on screen, but this is a function of the software, not the printer. Someone ought to sit down and measure the width of the

**eren Computer Systems**  
 520 Reading Rd, Winnersh,  
 Berks RG11 5EX

**0734 785467/771455**  
 Answerphone service  
**THE EPSON SPECIALISTS**

**EPSON PRINTERS**

LX 800	£225	LQ 800	£435
FX 800	£325	LQ 1000	£580
FX 1000	£445	LQ 2500	£849
EX 800	£435	QQ 3500 LASER	£1,635
EX 1000	£599	H180 4 PEN PLOTTER	£285

**PRINTER ACCESSORIES**

LQ 800 TRACTOR	£39
LQ 1000 TRACTOR	£49
FX/LQ 800 CSF SB	£115
FX/LQ 1000 CSF SB	£135
EX 800 CSF SB	£120

**GO PC COMPATIBLE WITH THESE OUTSTANDING OFFERS**

EPSON PC TWINFLOPPY 512K  
 COLOUR CGA CARD, TAXAN 620 HI  
 RES COLOUR MONITOR, MS. DOS.  
 MANUALS 1 YR WARRANTY

**£949**

EPSON PC 20 MB HDD, 512K, COLOUR  
 CGA CARD, TAXAN 620 HI RES  
 COLOUR MONITOR, MS, DOS,  
 MANUALS, 1 YR WARRANTY

**£1,249**

ABC SOFTWARE SUITE WITH - WP, SPREADSHEET, ACCOUNTS, STOCK CONTROL, VAT,  
 DATABASE, DIARY ETC **£148**

EPSON TAXI 2 THE WORLD'S MIGHTIEST WIMP **£195**

**ALL OFFERS SUBJECT TO AVAILABILITY, UK CUSTOMERS ADD £8 per Carton  
 Carriage**

**ALL PRICES ARE CWO AND EXCLUSIVE OF VAT**



**The Principal Supplier and Maintainer of Micro  
 Computer Systems to the**

**CORPORATE AND EDUCATIONAL MARKET IN SCOTLAND**

**Computer Services Scotland Ltd**

**WHITEHILL INDUSTRIAL ESTATE  
 GLENROTHES, FIFE KY6 2RZ**

**Tel: 0592-773710 Telex: 727706 Fax: 0592-774094**

**COMPLETE SYSTEM - MICRO COMPUTERS - PRINTERS - VISUAL DISPLAY UNIT - SOFTWARE**

# REVIEWS

## H A R D W A R E

proportional characters on an Epson, and write a program which correctly justifies proportional text!

In draft mode, the printer behaves almost identically to earlier models. The typeface used is somewhat different, but control codes all work in the same way. There are many new control codes such as cut-sheet feeder control, microspacing (at last!), and extra international character sets. The speed improvement mentioned above is a real bonus when printing listings, but otherwise it's not very different from the nine-pin printers.

One area that is not quite the same on the LQ-800 is bit-image graphics, as used in screen dumps. The line spacing codes now work in 60ths or 180ths of an inch as opposed to 72ths and 216ths. This means that standard dump software will generate a picture which is 20 per cent taller.

There are ways round this. You can alter the aspect ratios of dumps without altering the main screen dump program.

There are also five graphics modes using all 24 pins of the print head. These will obviously offer improved graphics, but the coding of graphics printing is totally different for 24 pins. Unless you have an LQ-800 dump program, you will be stuck with only nine-pin graphics images. Such a program should soon appear.

The LQ-800 sports three separate manuals, a setup guide, an 'everyday user' manual and a reference guide containing all the Escape sequences. The guides are well written, in real English, with indexes. For once Epson acknowledges the existence of Acorn machines, even mentioning *Word-wise!* Epson has obviously recognised that it was weak in this area, and taken steps to improve. Nevertheless, a single-page summary of all the control codes would have been a useful addition.

The LQ-800 is a clear cut above all the nine-pin dot-matrix printers and, if you do masses of wordprocessing, and you can afford double what a nine-pin machine costs, I'd say buy it. You can get them with over £150 off the recommended price of £720. Heavy graphics users should check that their software can support the LQ's 24-pin graphics, or they'll be no better off than with a nine-pin machine.

*Epson UK, Dorland House, 388 High Road, Wembley, Middlesex HA9 6UH. Tel: 01-902 8892.*

The Epson LQ-800 is an vast improvement on previous Epson models. Its 24-pin head gives a much smoother printout and effectively makes a daisywheel printer redundant. The printer fully supports Epson control codes from earlier models, but also has a host of new codes to allow you to control the extra features of the machine.

The Epson LQ-800 is an vast improvement on previous models. Its 24-pin head gives a much smoother printout effectively makes a daisywheel printer redundant. The printer fully supports Epson control codes from earlier models, but also has a host of new codes to allow you control the extra features of the machine.

The Epson LQ-800 is an vast improvement on previous Ep models. Its 24-pin head gives a much smoother printout effectively makes a daisywheel printer redundant. The printer fully supports Epson control codes from earlie models, but also has a host of new codes to allow you control the extra features of the machine.

**Figure 2. The print quality comes close to daisy-wheel standards, but the typeface is flexible**

### DOT-MATRIX, DAISY-WHEEL OR LASER?

Traditionally, microcomputer printers have been nine-pin dot-matrix (including ink jet and thermal), or daisy-wheel. Dot-matrix printers are flexible and can print graphics, but have always suffered from an inability to produce professional correspondence-quality text. The daisy-wheel printer produces output indistinguishable from a typewriter, and so has been the standard office letter-printing workhorse. However, daisy-wheels are slow, and cannot produce even simple graphics such as straight lines.

The new 24-pin printers, such as the LQ-800, produce correspondence-quality text. With the other advantages of speed and graphics, they effectively make the daisy-wheel redundant, and there is unlikely to be much further development of this type of printer, except perhaps in the intelligent typewriter market.

A new type of printer just beginning to appear is the laser printer. This behaves in a similar manner to a photocopier, accepting cut paper in a tray, and printing

using toner cartridges. Laser printers have high resolution output (but only about the same as the top density on 24-pin matrixes) and are quiet and fast. They are still fairly expensive, costing upwards of £2000, although, like all new products, prices will fall in due course. Laser printers tend to offer much more in the way of special fonts and graphics, provided you have suitable software, but unfortunately there isn't much of this available for the BBC micro.

If you are buying a serious general purpose printer for business and professional use, you should really only consider 24-pin dot-matrixes and lasers. If your requirement is for quality wordprocessing and not full-blown desktop publishing (DTP), the laser printer, at three or four times the price of printers like the LQ-800, is an expensive luxury. Even with DTP, more and more packages are supporting the LQ as an output option, particularly the PC packages usable by 512 owners.

# WORD PUZZLES

WORD PUZZLES is a suite of popular word puzzle programs including CROSSWORD, ANAGRAM CROSSWORD, CROSS REFERENCE, and CROSS-FIT. (You can buy any or all of them.) You can design and solve these puzzles quickly and easily.

The satisfaction and educational value of solving word puzzles cannot be under-estimated and designing your own puzzles may be something completely new - but with ABLE-SOFT's WORD PUZZLES this challenging and rewarding task comes easily within your reach.

The display on your computer is exactly like the real thing as are the print-outs. All the WORD PUZZLES operate in a similar way so once you have learnt to use one (and they are very easy to use) you should be able to use the rest almost straight away (if you buy them!).

## \*\* WORD PUZZLE FEATURES \*\*

- up to 24 puzzles on the disc ready for you to solve
- design and write your own puzzles for others to solve
- save anything that is unfinished and continue at any time
- making changes is extremely easy for both solving and designing
- a unique optional scoring facility
- print-outs and displays to professional standards
- keyboard operation (or keyboard emulator)
- four levels of difficulty to choose from 1-very easy to 4-advanced

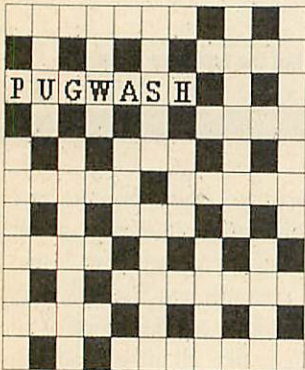
## \*\* THE SUITE OF FOUR \*\*

**CROSSWORD** is the standard and very popular word puzzle which needs no explanation

**CROSSGRAM** is very similar to CROSSWORD. The only difference is that instead of being given clues you are given ANAGRAMS of the answers. An ANAGRAM is a word with all its letters jumbled up and you need a certain amount of skill to be able to unjumble it and find the correct word. If you enjoy anagrams you will thoroughly enjoy this new type of puzzle.

**CROSS REFERENCE** is similar to a CROSSWORD in that you have to guess where words are supposed to fit in a grid of boxes. But unlike a CROSSWORD there are no clues in the form of questions. Infact the answers are given to you but in the form of a number code.

The grid is full of squares with numbers in with a range of 1 to 26 (with the exception of the black squares). Each number corresponds to a particular letter of the alphabet, e.g. every number 8 could be the letter "R". You are usually given three letters to begin with and it is then up to you to find the corresponding letters to all the other numbers. All the letters of the alphabet are always used.



### CROSSFIT

Place these words on the grid opposite. You must use all the words and they should interlock without spelling mistakes.

**3 LETTERS**  
ART, ASS, SPY, TAY

**4 LETTERS**  
BANG, CAIN, COWL, EMUS,  
EXAM, PIER, ROLL, SPOT

**5 LETTERS**  
AROMA, CASES, CHAIR, PEARL

**7 LETTERS**

ANATOLE, CASPIAN, HAGGARD, HORATIO,  
PEACOCK, PUGWASH, SCARLET RAILWAY

## \*\* ORDER FORM \*\*

\*\* CROSSWORD CROSSGRAM CROSSREF CROSSFIT \*\*

### PRICES

Any one.....	£10.00
Any two.....	£18.00
Any three.....	£25.00
Any four.....	£32.00
P&P.....	£2.00

WORD PUZZLE	QTY	COST
CROSSWORD.....	.....	£.....
CROSSGRAM.....	.....	£.....
CROSSREF.....	.....	£.....
CROSSFIT.....	.....	£.....
POSTAGE & PACKING.....	.....	£ 2:00
TOTAL.....	.....	£.....

Please supply me with the following:

### YOUR DETAILS

NAME .....

ADDRESS .....

POSTCODE .....

PLEASE MAKE CHEQUES PAYABLE TO:  
"ABLESOFT"

I enclose cheque for £.....

Signed .....

HOMEWORK ● REVISION ● TUTORIALS

# MATHS EXAM?

DIFFERENTIATION &  
INDEFINITE INTEGRALS:-

# SOLUTIONS ON SCREEN!

Watch your problems transformed  
into worked examples with  
'SYMBOLIC CALCULUS'  
for PAST PAPERS ● TEXT BOOKS

In a radical departure from conventional software we offer:-

- STEP BY STEP solutions
- EXPLANATIONS at every step
- Take problems from ANY book or paper
- Superb colour highlighting for clarity

FOR

- Product, Quotient & Chain rules
- Integration by parts
- Integration by substitutions
- e, Logs, SIN, ARCSIN, SINH, ARCSINH etc.

Learn the BEST way — by example.

# Maths Workshop

DEPT. AU,  
45 Carson Road,  
London E16 4BD  
Tel: 01-511 5244

BBC model B only

Please send me SYMBOLIC CALCULUS on cassette (£15.95)/ 40T disk (£16.95). I have BASIC 1/BASIC 2 I enclose a cheque/PO payable to

MATHS WORKSHOP

Name .....

Address .....

.....

.....

AU1

ABLE-SOFT FREEPOST TUNBRIDGE WELLS KENT TN2 5BR

# EDUCATION

NEWS

## ILEA to use Plotmate

The Inner London Education Authority has decided to endorse Linear Graphics' Plotmate plotter.

Dave Doyle of ILEA's Design and Technology Centre cites value for money as the reason for its choice, as well as its software support and its wide compatibility.

There is an increasing number of software vendors supporting Plotmate, for example, AMS with *AMX Stop Press* and Logotron with 3-D Logo.

## Help with reading

Help is available for remedial reading teachers to get the child started. Prisma Software provides the motivation with its *Play and Read* series, which aims to make learning to read fun. The reading content is chosen from the McNally and Murray word list - the basis of many reading schemes.

Each package comprises an audio cassette featuring Patricia Hayes and Nik Cookson, two discs, four reading books, a coloured story book, six colour-coded word cards and an instruction book. Author Trude Salisbury originally conceived the package to help her son with his reading. Case studies of the course are available.

*Play and Read* costs £29.95 per pack and a detailed report on its development and method in practice is available at £1.50.

## Baker's £19m boost to new technology

Education Secretary Kenneth Baker's new £19 million Government cash injection, revealed in the July issue of *Acorn User*, will boost the use of new technology across the curriculum. It will involve over 700 advisory teachers on two-year secondments. They will be drawn from a variety of subjects in a five-year IT program.

The scheme is being administered by the Microelectronics Education Support Unit (MESU) who have two weeks next summer to whip the advisory teachers into shape. The teachers will concentrate on their own subject area and its strengths in IT, rather than the



Baker: buying guidelines

broader application of IT. Groups of authorities forming

consortia are likely to gain a larger slice of the advisory cake than those which stand alone. So the authorities who stuck with the old MEP regional structure are likely to benefit from their persistence.

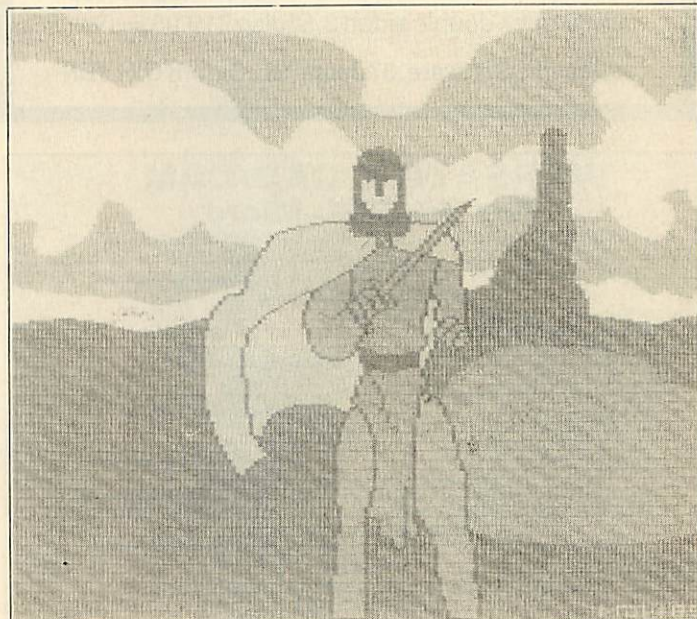
£8.5 million is destined for new computer provision. The strict DES buying guidelines do not exclude either the Archimedes or the RML Nimbus VX machines.

Initially many schools will lose imaginative and resourceful teachers to the advisory group. But the scheme should produce widely spread benefits and help to improve the status of new technology.

## Printing program

ESM's *Screenprint* ROM helps those teachers who despair of programs that will not print their pictures, graphics or text. With a simple CTRL-P keystroke the program is frozen and the printer begins work. Once finished, the program resumes where it left off.

It was only possible to print out if the program specified it or if it could be modified to include a dump command. That might have been impossible because of copy protection. *Screenprint* costs £28.75.

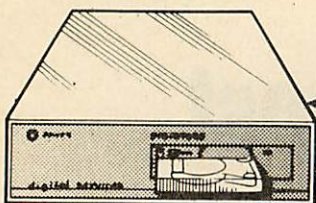


Output from *Screenprint* from ESM

**ECONET ENHANCEMENT HARDWARE FROM DSL**



**ECONET TAPE STREAMER**



**£1,299 plus VAT**

Back up your entire Econet Level 3 Winchester in 2 minutes!

The Digistore 600 is the latest addition to our range of Econet enhancement products. It provides Acorn hard disc users with the first professional tapestreamer for Econet and ADFS, and at 5.2 megabytes per minute, a security backup can be made several times a day with almost no effort.

The Digistore uses industry standard data cartridges giving exceptional reliability and data security.

159 HAVANT ROAD, DRAYTON, PORTSMOUTH, HANTS PO6 2AA  
TELEPHONE (0705) 324934

**digital services**

**£££ SAVE TIME £££**



**USE OUR READY MADE GRAPHICS AS A BASIS FOR YOUR ARTWORK STOP PRESS/PAGEMAKER USERS**



**PAGEMAKER GRAPHICS LIBRARY**

- 150 Cutouts (Pack 1) **£10.00**
- Utilities Disc **£6.95**
- 30 New Fonts **£4.95**
- Cutout Previewer **£7.95**
- Font Previewer **£7.95**
- FSE to AMX Converter **£7.95**



**FLEET STREET EDITOR USERS**

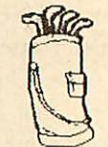
- FLEET STREET GRAPHICS LIBRARY**
- 200k (Disc 1) **£10.00**



Also at **£10.00**

**QUEST PAINT GRAPHICS LIBRARY**

VIDEPAK 150 screen pictureshow  
All prices fully inclusive of p&p  
Europe add £3 outside Europe £5  
State DFS format (40/80)  
Educational orders welcome



**£££ SAVE MONEY £££**

Don't buy an ARCHIMEDES until you've checked our price e.g. 305 upgraded to 1 MEG free  
Send SAE for catalogue & prices



Dept 2, MICRO STUDIO, 83 CLAY STREET  
SOHAM, CAMBS. CB7 5HL. (0353) 721736

Danté's

**INFERNO**

*a graphic adventure for the BBC computer*

2 x 40 track reversible 5.25" discs £14.95 incl. p&p  
1 x 80 track double sided 3.5" disc £19.95 and VAT

to Vanadis Software, 37 Jeune St., Oxford OX4 1BN

**VERSATILE CAD/CAM For the BBC Micro**

A sophisticated, menu driven, user friendly CAD/CAM package with many facilities for very accurate drawing construction and data extraction for Numeric Control (NC) post processing. As used in Education and Industry.

**CAD System (EDUCAD) - £80 (ex. vat)**

- \* geometric/schematic drawings
- \* zoom, scale and units control
- \* text/symbols, any size and angle
- \* mirror and duplicate
- \* generalised x-y plotter output
- \* area properties
- \* construction/modification
- \* text/symbol font editor
- \* Intersects and tangents
- \* rubber banding
- \* graphics screen dump
- \* revision/material info. editor

**CAM System (EDUCNC) - £35 (ex. vat)**

- \* part geometry from EDUCAD
- \* tool path animation
- \* part profile definition
- \* generalised NC post processor

Econet Network versions available.

Both packages have explicit input prompts and error messages. This together with over 80 pages of online HELP data makes these systems easy to use and easy to learn - an ideal way of introducing this new technology.

TO ORDER simply specify disk format requirements or to obtain further details contact:

**EDUSOFT,**  
Lodge Hill, Sevens Road, Cannock Wood, Rugeley,  
Staffs WS15 4RX  
☎ 05436 76939

**Succeed with LCL Educational Software**

**COMPLETE SELF-TUITION COURSES** (age 4 to - GCSE - A level)



**THE BEST** awarded the highest ever marks for ed. soft. in recent mag. review..  
Hons. graduate/teacher authors.  
World leaders (distributors in 24 countries).

**FOR YOU** for beginners (from ages 4 to adult), exam candidates

or teachers with any BBC Micro (B, B+, Master or Compact or Electron.

**NOW** immediate dispatch

Each course consists of 24 programs on up to 105 topics held on 2 - 4 discs/tapes and usually with 2 books and a voice tape and costs only £24.

**£5 off total for 2 courses, £10 off for 3, £17/4, £24/5**

- PRIMARY MATHS COURSE** All animated, colour graphics (4 discs)
- MICRO FRENCH (8-GCSE)** With real speech & graphics adventure game
- MICRO MATHS (11-GCSE)** Best seller, highly acclaimed
- MICRO ENGLISH (8-GCSE)** Eng. Language or EFL with real speech
- MEGA MATHS** A-level course with all Calculus by graphics
- SEND COUPON, PHONE ORDERS OR REQUESTS FOR FREE COLOUR CATALOGUE TO:
- LCL (Dept A) Melody House, 13 Deanfield Road, Henley, Oxon RG9 1UG.



or ring 0491 579345 (10am-10pm)



NAME \_\_\_\_\_ ADDRESS \_\_\_\_\_

TITLE \_\_\_\_\_ COMPUTER \_\_\_\_\_ 40/80Disc/Tape/Compact

### Sign software

*Signwriter* is a package for producing high-quality signs from a dot-matrix printer. This software makes labelling work and posting notices much easier, especially if your calligraphy skills are lacking! The utility generates impressive output from most dot-matrix printers.

Several fonts are available. The makers demonstrated the utility at the *Acorn User Show*, printing on plastics and fabric as well as the more conventional paper and sticky labels.

### Mail order by micro

GSN Educational Software have released the fourth in their 'Micro at Work' series. *Mail Order* is a simulation of the data processing required in a mail order warehouse. Pupils from the age of nine upwards build their own catalogues, sell their wares and compete with other groups to make a profit – or a loss.

It comes with a Key system disc, *Mail Order* data disc, worksheets and a teacher's guide and costs £19.90.

### Contacts

**Acorn Computers:** Cambridge Technopark, 645 Newmarket Road, Cambridge CB5 8PD. Tel: (80223) 21441

**ESM:** 32 Bridge Street, Cambridge CB2 1UJ. Tel: (0223) 65445

**Linear Graphics:** 28 Purdeys Way, Rochford, Essex SS4 1NE. Tel: (0702) 541663/4/5

**Mercury Educational Products:** PO Box 194, Sevenoaks, TN15 8TZ

**Prisma:** PO Box 211, Chester CH1 3NJ. Tel: (0244) 26244

**Wight Scientific:** 44 Roan Street, London SE10 9JT.

# Doubts over Arc image

by Carol Atack

Local education authorities and university computing departments are still unsure about the Archimedes. Despite the Acorn 'road show' presentations, and the DES circular reported on page seven this month, they remain confused about the relevance of its capabilities to their needs. It may take some time to dispel the view that such powerful machines just aren't needed yet.

The Archimedes' image means that it is viewed by many in the educational establishment as a machine most suitable for specialist use in science and engineering departments, and for large-scale number-crunching. At the University of East Anglia, Laurie Benfield in the Computer Centre said, 'We will not be buying the Archimedes until more software is available. Even then, we will not be recommending it to other departments, as it's really a scientific number cruncher and not what the average user needs.'

At Reading University, the Computer Centre is awaiting



Archimedes: more software needed

the arrival of a Unix-like operating system before the Archimedes will merit consideration. Even then, it is expected to be used initially only by departments who can make full use of its power and speed.

Software availability is the main concern of potential buyers. Although much has been promised, including advanced word processing and data management software, the first programs to be released have been language and toolkit programs of specialist appeal.

Grafox' spreadsheet and time management package *Logistix*, and the educational programming environment Logo are the

most interesting software to be announced so far, and neither is on the shelves yet, but are expected very shortly.

Schools seem more likely to buy the Archimedes as advisers search for a replacement for ageing BBC Bs. Many local education authorities are busy evaluating the Archimedes machines in the light of the DES circular and its recommendations on such matters as MS-DOS compatibility and WIMP environments. Here the Archimedes is competing with the Research Machines Nimbus, and in particular the new VX286 and 386 models. The Archimedes is considerably cheaper, but the Nimbus has some advantage in its readily available and proven software. However, as predicted by Research Machines itself, the BBC name will help the Archimedes find acceptability.

It would seem that either a refocusing of the image or the release of a convincing amount of software with wide appeal is necessary for the Archimedes to achieve its hoped-for success in the education market.

# Compact sales revive after price cut

Acorn has reversed its policy against modifications to the basic specification of the Master Compact. And following the recent price cut, there have been more educational sales.

The Compact has been criticised by educationalists over its lack of a DFS and of interface ports found on a BBC model B. The adoption of ADFS and a 3.5-inch disc drive caused many to hesitate. No 5.25-inch disc option is available, and Acorn provides no simple

means of transferring files. Only West Glamorgan LEA bought large numbers.

First Acorn added a 1770 DFS ROM image to the Welcome disc. Now it is bundling in the Merteck Compact Companion with educational orders. The bolt-on unit provides user port, analogue port, 2MHz bus and 1770 DFS ROM, and brings the machine more into line with the market's wishes.

An Acorn spokesman told *Acorn User* that the Compact's

performance in the UK was now improving. He added that, with Eltec likely to produce a wordprocessing package comprising Compact, mono monitor and a good printer to compete directly with the Amstrad 8256, there seems every reason to feel the Compact still has a future in schools. With educational discount the Compact plus Companion but without monitor is now available at £344 inc VAT. The Merteck Companion alone costs £39.95.

# EDUCATION

## PRESS BARON PUPILS

DTP has come to the classroom. What are its applications and advantages?

Chris Drage and Nick Evans

'I claim that if every child in the country had routine access to wordprocessing for about half an hour a day, we could throw away most of our remedial reading and spelling exercises and get on with the curriculum.' So says Derek Maxted in *Getting into Print*, available from MEDU.

Teachers now are realising that the wordprocessing power of the micro has been harnessed into something even more powerful, something which many see as an even more important educational tool — desktop publishing, or DTP. This allows text and also graphics to be handled on-screen, providing an environment in which children can present the outcome of their work. Skills of presentation gain importance, as well as the usual linguistic considerations, and the end result is something of which children of all age ranges and abilities can be proud.

This article will examine the possibilities of DTP in the school, look at some of the software packages available, and concentrate on the package called *Typesetter!* from Sherston. It will also draw on the excellent work of Derek Maxted in *Getting into Print*, the book which no teachers' resource room should be without.

### What is available?

The sophistication of on-screen composition offered by *Stop Press*, *Fleet Street Editor* and *Typesetter!* is all very well — but where do you start? How can you ensure the development of associated skills is a fluid one? It has been found that a good starting point is provided by cut-and-paste work, using packages which offer a number of typefaces or fonts. It is important that children understand the objectives and are clear about who the target audience is for their printed work. Suitable tasks are headings and titles for topic work, posters, 'maxi' books, charts, signs and wall displays for the classroom.

There are at least four wordprocessors for children which offer a variety of fonts ideal for this broad introduction to DTP. *Folio* and *Pendown* have been discussed in past issues of *Acorn User* and each seems to have

**ALLERTON NEWS**  
SECOND EDITION

**MAKE YOUR OWN NEWSPAPER**  
you are going to create a new sheet of your own. You can make your own headlines using the different size prints offered. This is normal print. THIS IS NORMAL PRINT TOO, BUT USING ONLY CAPITAL LETTERS.

**make a box**  
Use key F4 to make a box. The arrow keys will make your box as big as you wish it to be. You can wipe away a box by using F5. You can join boxes together to make them bigger or to create irregular shapes. This all goes to make the appearance of your news sheet more interesting. Remember, if you make a mistake, or wish to change anything, it is always possible. DON'T PANIC!

**THIS IS SMALL BUT IN CAPITALS**  
To get this press F1  
small with no caps looks like this

**MEDIUM CAPS**  
medium no caps  
For medium you press F2.

**LARGE**  
large  
For this press F3

**LOOK!**  
If you want pictures on your page, you have to leave a space and draw them in later, or use a sketch on picture. You can photocopy the end result.

**help? ask.**

**SAVE ON DISC**  
Do this often so that your work is kept safe on disc.

A teacher's instructions to her pupils

been designed with cut and paste in mind. *Folio* scores with its micro-justification of the text and the varied densities of print. *Pendown* prints in single density, so a new printer ribbon is required for really dark headlines. However, combined with the excellent *Pendown Toolbox* disc, *Pendown* offers numerous fonts in a full range of sizes — almost to the width of the printer paper!

*Concept Writer* with Printer Fonts and Speech is the latest version of the free (public domain) *Writer*, and offers a wide range of print height and width. An old favourite, *Prompt-3* now also offers these facilities; its excellent manual is packed with suggestions for use.

It may be worth considering typesetting software to provide not only a full range of fonts but also near letter quality (NLQ) text, even if your printer does not support it. An incredible variety of typefaces is possible and generally they are simpler and more convenient than the on-screen composition packages currently available.

For *Wordwise Plus* owners, *Fontwise Plus* will satisfy almost all requirements (12 fonts + 10 additional fonts). For beginners, *Multifont NLQ* from CJE Micros offers simplicity and ease of use without any frills (10 fonts + 27 additional fonts). For overall

power *Multi-Font NTQ* from PMS excels (seven fonts + 15 patterns and 24 additional fonts). In addition to a large range of fonts and sizes, backgrounds may also be printed to give borders and lines. However, it takes skill to get the best from this package.

*Typesetter!* is a recently released package aimed at bridging the gap between simple DTP packages like *Front Page Extra* from MAPE and the more sophisticated AMS *Stop Press* and Mirrorsoft's *Fleet Street Editor*. All these packages have their virtues and each has its supporters and detractors. *Typesetter!*, however, seems to be taking the country by storm because of a couple of main features.

The first is that it is simple and obvious in use — you don't need to train for a couple of hours to get the best from it. The second is that it does not try to be too clever. Many of the more sophisticated packages have so many bells and whistles that it is difficult ever to have an overall understanding of them. *Typesetter!* provides a simple environment in which children — and teachers — can create pages of text in a combination of four print sizes (three headline and one main text).

Up to 64 text boxes may be defined on screen. Each box is an individual word-processing environment in which the text may be edited and formatted. There is no attempt in *Typesetter!* as yet to provide graphics and users are encouraged to cut and paste their graphics into the final printout. This facility may be provided at a later stage with an extension disc.

When producing the output to printer, Sherston has thought about the users. Most schools have printers with worn ribbons, and it is possible to instruct the printer to make up to five passes for each line of text. This increases the blackness of print, and probably finishes the ribbon off altogether. Another useful feature is that if your printer supports NLQ print it is possible for the standard text to be printed using this font simply by switching it on at the printer before starting printing. The headline font comes in three different sizes which are sufficient to supply most classroom needs.



Further fonts are being developed and should be released in the near future.

### Getting to grips with the package

As with any software, the children will have to get used to the way in which it operates. *Typesetter!* is relatively simple in this respect but it will still be important for children to have a working knowledge of all its facilities so that the use of the computer mechanism does not interfere with the main objective – producing a piece of paper. In order to familiarise the class with the package there are many routine tasks which can be undertaken on a rota basis, to provide experience for everyone. A 'cascade' model for this type of exercise works well; that is, the teacher prepares one small group of two or three, who will be present in the first two or three groups using the software. From each group a member will be chosen who will help people in the next session. In this way the training process helps to enhance learning.

Many schools produce a regular menu for the day or for the week, to be displayed at the canteen or posted around the school. This is an ideal regular topic to be tackled using the DTP package. The only disadvantage is that the users are likely to be lumbered with the task for life! The class calendar of events can be provided on a weekly basis and notices of club meetings and events are very easily produced by the pupils concerned. A rota of children who put together a cumulative class diary will produce a fine corpus of work which is a record not only of the class's activities but also of their experience in DTP. This type of work encourages innovation with even the simplest package, and children working in groups will be keen to present their individual offerings in an original format.

### The project

Once the children are familiar with the software it is up to the teacher to direct its use as an integrated part of the general class work. By now, pupils should not be treating the package as something special but rather as a normal part of the class resources. It is not the intention of this article to provide a specific topic for development with DTP, but rather to show some of the possible directions in which output from topic work may be steered. The golden rule, as with any computer application, is that if the computer is not appropriate here – don't use it.

Derek Maxted's book explains in detail the arrangements for a school newspaper

day in which a school turns over its entire resources to the production to a deadline of as many sheets of copy as possible. This exciting exercise is one which Derek has undertaken on an increasing scale across the country. The rewards for this daring type of enterprise are immense and as an 'in at the deep end' method of learning it takes some beating. The logical successor to this is the

production of the entire school magazine using DTP.

The broadsheet is also a very useful medium for presenting a child's work. A broadsheet aims to convey its message in as rapid and concise a method as possible, rather like the single sheet advertising which arrives through the letter box. A child's skill in presenting a message is greatly enhanced by being constrained by a page, or even by a box within a page.

The beauty of this type of presentation is that the professionalism of the output means that its content gains authority. Thus resource-based learning becomes more effective when the material produced is very readable. The research of each child contributes to the overall school resource for use by future classes. This idea of corporate presentation of aspects of a topic in hand can be developed in the displays used in the classroom. Teachers often use the 'topic web' as a means to explore the routes into different areas of the curriculum from the main theme. This can be turned to advantage by presenting the topic as interlinked pages of display on a noticeboard. Each group's contribution is summed up in the broadsheet summary which is central to their area of the board and is surrounded by their work.

Work that ties in to school events is always motivating. The school trip is an obvious source of work, but don't neglect such ideas as sports day, school play, parents' evening and so on. Each of these is usually accompanied by a handout of some sort. That work is better undertaken by the pupils if it can be tied in with the curriculum generally.

### Conclusion

The concepts and skills developed using DTP in the classroom include presentation, aesthetic appreciation, conciseness in writing, as well as keyboard and communication-related skills. This is particularly relevant when the DTP package is used by a group who together present their corporate ideas. DTP is here to stay. New machines will make this activity even simpler and children will be encouraged to use the computer as a normal classroom resource.

*Typesetter!* (£25.00) is available from *Sherston Software*, 8 Court Street, Sherston, Malmesbury, Wiltshire SN16 0LL. Tel: (0666) 840433.

Getting into Print (£10.00) by Derek Maxted is available from *MEDU*, Bishop Grosseteste College, Newport, Lincoln LN1 3DY. Tel: (0522) 44713.

## NEWS 18p

### GALORE

#### TRAIN CRASH: SIX KILLED.

... (text) ...

### TANKER CRASHES INTO HOUSE.

... (text) ...

#### TRAIN CRASH VICTIMS

... (text) ...

#### STRIKE AT COAL MINE

... (text) ...

#### SALE! SALE!

... (text) ...

#### MISSING CHILD FOUND DEAD.

... (text) ...

### CARPET KINGDOM

... (text) ...

## GRANGE GAZETTE 18p

### GRANGE SCHOOL SET ON FIRE.

... (text) ...

### WORD SEARCH

... (text) ...

#### BBC1

... (text) ...

#### BBC2

... (text) ...

#### REAGAN DECLARES WAR!

... (text) ...

#### SALE! SALE! LAST NIGHTS BOXING.

... (text) ...

#### PUSH BIKE T.V. VIDEO CAMERA

... (text) ...

#### WOMAN FOUND DEAD

... (text) ...

#### LAST NIGHTS FOOTBALL RESULTS.

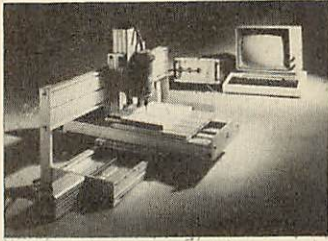
... (text) ...

### ABC

... (text) ...

The untutored efforts of children from Grange Middle School, Grimsby. The children were presented with *Typesetter!*. Four of them were given a brief introductory 'tour'. They then helped the rest of the class to achieve the end results above. Although the pages are full of errors of various sorts, the children have made efforts to present their ideas readably.

## LOW COST XYZ TABLES



N.C. Work Station for Drilling, Routing, Engraving etc.  
200 mm x 300 mm x 100 mm XYZ table and controller from £2400.  
Outputs from 'STARCAD', 'LINTRACK PCB' or any other  
software using MOVE, DRAW or PLOT commands can be sent  
to the machine via RS.232 link

**LEEWOOD DEVELOPMENTS LTD**  
UPTON, CAMBS.  
TEL (0480) 890860 (24 Hr)

## LABELMASTER

### THE MOST VERSATILE LABEL-PRINTING PROGRAM

All your label-printing requirements available in one easy-to-use program.

Message labels – hundreds of uses for home and business, e.g. labelling samples, products, packaging, books, discs etc., using a variety of print styles and sizes.

Address labels – create mailing lists and print them onto labels.

All formatting is done for you. Accepts wide variety of label sizes.

Too many features to list – telephone us for details.

Requires 80-column screen and Epson-compatible printer (address labels can also be printed on daisywheel).

**Single colour version £18 Multi-colour version (for colour printer) £23**

Available on 40- or 80-track disc for all models of BBC (OS 1.2 onwards) including Master & Compact and also Electron (DFS only). Please state model when ordering. Please add £1 for 3.5" discs.

### 15k BUFFER KIT FOR JUKI 5510

Fitted in minutes (no soldering required) – full easy-to-follow instructions provided  
Only £18

All prices include VAT and p&p   
Calderdata, High Lee, Luddenden Foot, Halifax HX2 6LB. Tel: 0422 885202

## Minimum of £150.00 trade in for any working BBC Model B against any of the products listed below. (With Acorn DFS add £40.00)

Archimedes 300 series from	£799.00
Acorn Master 128	£395.00
Amstrad PC 1512 full range from	£449.00
Amstrad PC 1640 full range from	£799.00
Atari 520 STFM	£260.00
Atari 520 STFM + Mono Monitor	£346.96
Atari 140 STF	£433.91
Atari 1040 STF	£520.87

Full range of peripherals and software available for all the above micros.

All the above prices exclude VAT but include carriage.

Retail shop open 9.30am to 5.30pm Monday – Saturday.

**Portobello Trading Company** Phone 031 657 2988  
300-302 Portobello High Street, Edinburgh EH15 2AS 

## ★ GRAPHICS ★ Software & Peripherals

### EXHIBITION PRICES – PACKAGE DEALS

**MEGAMOUSE** – Top quality British precision mouse. 100 ppi resolution. User Port. AMX Compatible. £59.00

**DIGIMOUSE** – Competitively priced, user-port mouse. AMX Compatible. £34.50

**ANAMOUSE** – Joystick compatible mouse. Plugs into Analogue port on BBC or Joystick Port on Electron. £34.50

**TRACKBALL** – Mouse-like control. Joystick compatible. Very competitively priced. Normally £17.90 NOW £14.90

### NEW ★ WIGMORE MOUSEMATE ★

for Electron with Plus 1 or Rombox. Allows use of MEGAMOUSE or DIGIMOUSE (or AMX) on ELECTRON. Comes with FREE Mouseport S.W. worth £10.00

Introductory Price £29.90

Package price with MEGAMOUSE £83.50 with DIGIMOUSE £62.50

Now Electron users have the choice of Mice BBC owners take for granted!!

**MOUSEPAINT** – Friendly icon driven 4 colour graphics for BBC (40 or 80 Disc or Cassette) or ELECTRON (cassette only). 514 & 312 Disc versions available soon! For use with user port or joystick port peripherals. £10.00

**CADMOUSE** – CAD Drawing package for BBC B & B+. Works in Mode 1 for 4 colours of Mode 0 for high res. 40 or 80T disc. User port peripherals. £29.90

**CADTRACK** – Similar to CADMOUSE, this package is joystick compatible. BBC B & B+. 40T or 80T disc. £23.00

### ★ ARTIST ★

Highly sophisticated & powerful pure art package for BBC B, B+ & Master. STUNNING! Rom & Disc (40 or 80T). £49.90

WITH MEGAMOUSE **£95.00**

All prices include VAT. P&P inland £2.00 overseas £4.00

**WIGMORE HOUSE LTD** 32 Savile Row London W1X 1AG  **Access, Cheques, P.O., Cash.**  
01-734-8826  
01-555 3751

## A MAJOR BREAKTHROUGH IN SOFTWARE PUBLISHING

# THE TIMES COMPUTER CROSSWORDS

Author: David Akenhead

Enjoy your computer and challenge your brain with *The Times Computer Crosswords* available in either disc or cassette, for use on BBC Micro, Master Compact, Electron and Model B machines with between 56 and 60 crosswords.

Although experienced crossword solvers will find a pleasing familiarity in the format, clues and conventions employed, *The Times Computer Crosswords* have three levels of help built into the program:

- The computer can mark the clue so you can return to it
  - The convention employed in the clue can be indicated (whether it is an anagram, acronym, proverb etc)
  - The first letter of each answer can be supplied
- Accompanying the program is a booklet giving full, clear instructions, lists of abbreviations and conventions used, and an introduction.



Please send me *The Times Computer Crosswords* on:

System	Price	Product code	Quantity
ADFS for BBC Micro on 5¼ disc	£14.95	CT5A1	<input type="text"/>
Master Compact and Electron 3.5 disc	£14.95	CT3A1	<input type="text"/>
DFS for BBC Micro on 5¼ disc 80 track	£12.95	CT5D1	<input type="text"/>
Cassette for Master, Model B and Electron	£9.95	CTCBI	<input type="text"/>

Name ..... (please use capitals)

Address .....

I enclose a cheque for £ ..... (made payable to Vector Services Ltd)

Please complete and return this form to: Vector Services,  
13 Denington Road, Wellingborough, Northants NN8 2RL

# contex computing

### 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' (bank, credit cards, savings, cash) accounts online simultaneously, inter-account transfers. 9999 standing orders. 99 analysis categories. 12 actual and 12 budgets per category, over 4,000 postings on an 80k disc. Reports to screen or printer. Graphics. Foreign currency support. Password. File recovery. Auto exec file. Field editing. Itemised look ahead. Programmable report writer.

Standard Bank Manager for the BBC B, B+ £17.50

### BANK MANAGER MASTER for disc systems only

Version 2 now available. 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  
Upgrade from standard, return original disc and £6.00

### BANK MANAGER BUSINESS UTILITIES for disc systems only

For the 'professional' who also use the BANK MANAGER to control the business accounts the BUSINESS UTILITIES add double entry trial balance and programmable spreadsheet analysis reports. Generated from cheque and cash transactions keyed into BANK MANAGER. Just pass the reports to your accountant! Use with either standard or master/compact version.

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. You may 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. Recommended.

for BBC B, B+, Master and Compact; Cassette £9.50, Disc £12.50

ALL PRICES FULLY INCLUSIVE FREE POSTAGE WITHIN UK  
Enquiries and Access Credit card orders telephone 023 03 347

**CONTEX COMPUTING 15 Woodlands Close, Cople, Bedford MK44 3UE**

Please rush me ..... on cassette/disc

40k  80k  3.5"  5¼"

I have a BBC:  B  B+  Master  Compact.

Enclosed £ ..... or debit my Access card no .....

Name .....

Address .....

FAST DELIVERY

# BUSINESS

## TAKING THE STRAIN

Still your uses for BBC micros in business come flooding in.  
Roger Carus surveys the latest set

Your ideas keep coming, six months after the first article in this series appeared (*Acorn User*, April 1987). Letters are still arriving in from home and abroad to join the many we have already received.

I will gladly pass on letters sent via the *Acorn User* office by anyone interested in any items discussed, and I equally welcome any more ideas you may have.

One recurring theme is that many people have good working ideas, but there's no easy way of marketing them. It's difficult to get in touch with those who might have use for a new technique.

A good example of this came from Christopher Hogg in Bodmin, who combines his interest in computing with one in pottery and has developed a suite of programs to help him in his studio. The main routine is designed to work out a glaze recipe from a chemical analysis, handling oxidising and reducing firing conditions in the kiln. And he has another for plotting graphs showing how the temperature of his kiln varies over time.

Christopher has wondered about the program's market potential, but doubts many combine his interests. But it is just the kind of 'real life' software which might be of value to schools and colleges.

A quite different approach is to start with an established market need, and to design products or services to meet the demand. This was the approach taken by Alan and Margaret Wrigley in founding Calderdata of Halifax. Their firm sells *Labelmaster*, which is a program designed to produce high quality printed labels in a range of different formats and colours. They also have a special wordprocessing program to produce a personalised curriculum vitae. This could be of great value to job applicants, and Alan and Margaret believe it is better for the purpose than any standard software. Their sample looks very good. I handle job applications at work, and anything which improves their quality is a boon.

A third common approach is to use the micro to help you solve a problem at work.



The Foyle Bridge – analysed by BBC micro

Many letters have come from readers who've done this successfully.

Dr John Leitch, a civil engineer from Queen's University, Belfast, is involved with a project to monitor bending in a box girder bridge. He needed a system to measure the girder deflection. The technical aspects are complex, but the solution was to link four BBC micros in a network to monitor a laser scanning device. Simple and relatively inexpensive technology to solve an important problem!

At a much lower level of technology, N A Tilston of Warley, and his brother, are concerned with manufacturing small white metal castings. They use *InterSheet* to estimate job prices. A spreadsheet template can be filled in with the job's specifications, and the price is calculated automati-

### IDEAS WANTED

If you make use of your micro for business or pleasure, and would like to share your knowledge and experience, write to Roger Carus, c/o *Acorn User*, Redwood Publishing Ltd, 20-26 Brunswick Place, London N1 6DJ. Or use British Telecom Gold: 81:RED001.

cally. The template can easily be updated when costs change. The brothers have also written a simple program to produce a payment slip for credit business.

Much the same sort of approach has been taken by Tim Everard of Lincoln, who showed the firm he works for how it could keep its stock records on *Mini Office II*. This led to using the micro for costings, and then on to wordprocessing, using more sophisticated software. But it has retained its BBC micros, as they are still adequate for the firm's needs.

Not all businesses flourish, and a few end up with debts. Even this situation can be turned to profit as it was shown by Tom Hervey of Acculaw who has developed a program called *Accudebt System* for solicitors wishing to computerise their debt-collection system.

This is a fully professional system which produces the extensive legal documentation quickly and easily. It is already used by four firms of solicitors – it is impressive and an obvious source of big savings.

*Calderdata, High Lee, Ludden Foot, Halifax HX2 6LB.*

*Acculaw Ltd, 13 St Mark's Road, Leamington Spa, Warwickshire CV32 6DL.*

## FAMILY HISTORY

Rob Macmillan outlines the capabilities of *View Professional* and looks at the background to its development

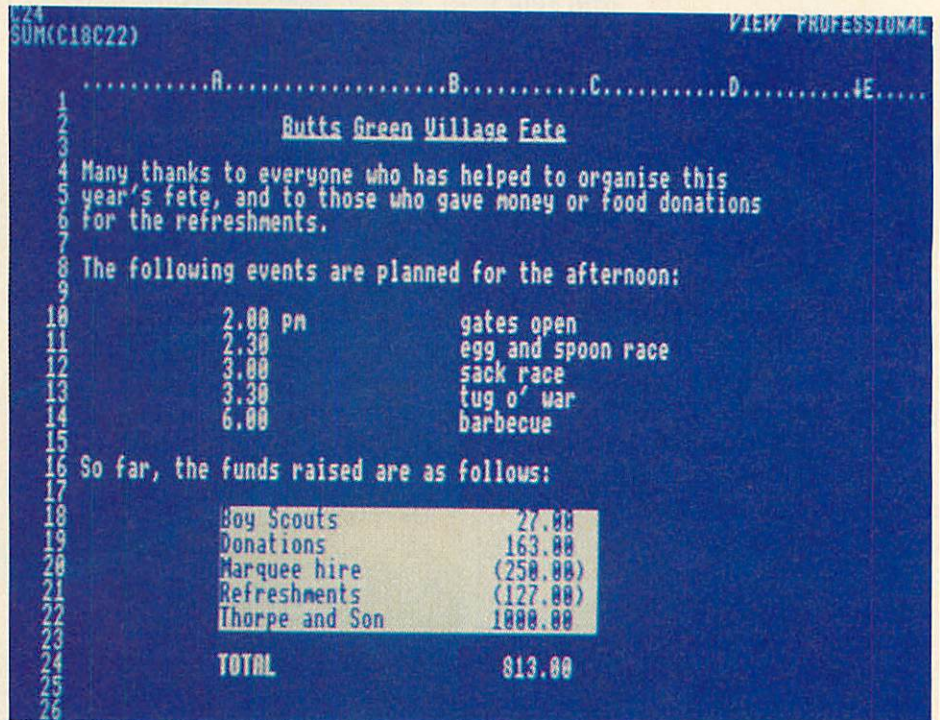
Acornsoft's recently-launched *View Professional* is promoted as a wordprocessor which also includes spreadsheet and database facilities. It could just as easily be regarded as a spreadsheet program with wordprocessing facilities, or even a flexible manager of small databases. In fact, regarded purely as a wordprocessor, it is probably more powerful than *View*, and regarded purely as a spreadsheet program it is at least as powerful as *ViewSheet*. But its distinguishing feature from the many other wordprocessors and spreadsheet programs around is its unique combination of the two. It is a single program with which you can create and edit a document containing both text and 'live' numbers. It has slots, formulae and recalculation of the spreadsheet, it has paragraph formatting, page layouts and mailmerge of the wordprocessor. It is neither one nor the other, and yet it is both at the same time.

But why is Acornsoft producing a new member of the *View* family which competes so much with the two most established and best-selling family members?

Early in the life of the BBC micro, Acorn understood that the BBC could appeal to many different types of user, if only a wide range of software were available for it. Perhaps the most important type of software was what we now call 'personal productivity' software - wordprocessors, spreadsheet programs and database management systems. With this in mind, Acornsoft started the *View* project in 1982, to provide these applications on the Beeb.

### In the old days

It is worth recalling how the world looked at that time. Sales of the BBC micro were taking off as its potential for home, scientific and educational usage was being realised by the public. In the business area, at that time there were no IBM PCs in Britain; Commodore computers, CP/M machines and the Apple II, all based on eight-bit microprocessors and 48-64k RAM, were the standard. *WordStar*, *VisiCalc* (the original spreadsheet) and *dBase II* were the market leaders in the software world. Meanwhile, the BBC micro was only just starting to acquire disc drives. Of



*View Professional*: the highlighted area is sorted into alphabetical order

course, nowadays many of us take floppy discs for granted, but back then 800k dual drives were hard to get, slow, noisy and about £800, twice the cost of the computer!

Serious personal productivity software first arrived in the autumn of 1982 in the form of *Wordwise* from Computer Concepts. Acornsoft countered this with *View* version 1.4 in the spring of 1983, and the rivalry between the two companies and groups of supporters started. In early 1984 BBC Soft launched *UltraCalc*, the first acceptable spreadsheet program for the BBC micro, and this was followed in the summer of 1984 by Acornsoft's *ViewSheet*. These were some of the first application programs to appear in sideways ROM form, giving greater speed and ease of operation but also causing a few supply difficulties for the manufacturers!

In May 1985, it became clear which companies were running in the race to provide the 'integrated systems' the market was by now demanding. Computer Concepts announced the ROM-link series and started to sell *InterSheet*. But neither *Wordwise* nor *Wordwise Plus* were part of ROM-link and the market had to wait some time for the other three applications. Acornsoft was able to counter this with the

launch of *ViewStore*, and so had all three main applications of wordprocessor, spreadsheet and database on sale first, with spelling checker and graphics to come.

### The race was over

By mid-1986 the race was just about over with *View* and *ViewSheet* as standard in the Master 128, the rest of the *View* family available and all of the ROM-link except for *InterBase* available. In a sense both companies won since both had firmly established their ranges of software and both had many devoted users in the market. Both companies claim that their software is unique there are far more similarities than differences. Meanwhile at Acornsoft, there were more developments behind the scenes.

It became clear that the first major new developments should be families of applications which could pass data between members. But with products which could do this already in the pipeline, what could be done next? There seemed to be three possibilities:

- Retain the family concept, and develop each member to make it more powerful or easier to use.
- Strengthen the bridges between applica-

tions, making it easier to pass data from one type of application to another.

■ Develop a new type of program, making the old families obsolete.

The first two options were already being followed by a number of software suppliers. In the IBM PC world similar families were springing up before giving way to the immovable giants *WordStar*, *Lotus 1-2-3* and *dBASE*. It seemed that both Lotus and Ashton-Tate had taken the first two options to their conclusion when they released *Symphony* and *Framework*; each is a single package covering wordprocessing, spreadsheet, database and charts. You can call up new windows or frames when a new application is needed. A complete document say, a business report, is built by stringing the windows or frames together. However, you have to keep switching between application, no matter how invisibly they are joined. And you must divide the document into several sub-documents of different types.

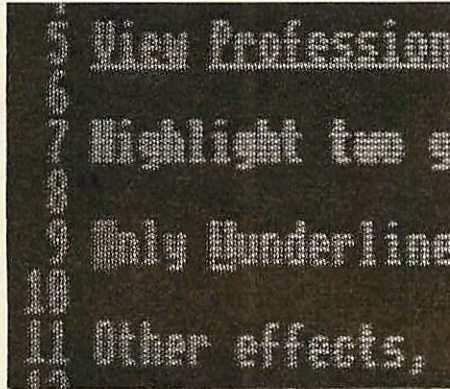
### A single program

*View*, *ViewSheet* and *ViewStore* had all been written for Acornsoft by Mark Colton who worked for Protechnic Computers, a Cambridge software house. In early 1985 Colton left Protechnic to start his own company, and to work on the third option. His idea was to create a single program which could replace wordprocessors and spreadsheets and perhaps combine some database elements too. With backing from Acornsoft, he developed the program that became *View Professional*, and ultimately *PipeDream* for Clive Sinclair's Z88 portable computer.

The original idea was that the traditional (it was at least six years old by now!) distinction between textual document and numerical spreadsheet was artificial. Wordprocessors could create only text and spreadsheets were for numbers, but many everyday applications required both. The family solution was that you write your text in your wordprocessor, you perform your calculations in your spreadsheet, and then you 'cut' out a piece of spreadsheet and 'paste' it into the text. But this approach has two problems. First, it is fiddly. Second, and worse, the spreadsheet fragment that is pasted into the text is no longer 'live', meaning that it cannot be recalculated. When the spreadsheet needs updating the numbers pasted into the text don't change automatically.

So the first requirement for the new super program would be the ability to

perform both text and spreadsheet operations on a document without the need for cut and paste. A second requirement would be that compared to existing wordprocessors and spreadsheet programs, neither wordprocessing nor spreadsheet power should be compromised so that



Special effects of *View Professional*

users would feel they were losing any facilities. Judged purely as a wordprocessor or a spreadsheet it should compete with the best. It should have sort and search operations so that it could replace dedicated database programs for small database applications. A high degree of on-screen formatting was necessary to keep to a minimum the time required to create the final document. On top of all this, compatibility with existing software was desirable, wherever possible, so that documents could be transferred from existing *View* applications. Finally, the user interface should be easy to learn for existing *View* users, but configurable for other users.

The solution Colton came up with has an underlying spreadsheet structure, on top of which text can be written and edited. The usual spreadsheet columns and rows are available at all times. Page breaks are visible on screen, unless explicitly switched off, and respond immediately to changes caused by editing the document. Simple highlights – bold characters and underlining – are also visible whilst editing. Documents can be larger than the available RAM, by creating disc-based multi-file documents, and many global operations such as printing and searching can treat all the linked files together. In addition all the editing operations and commands, from simple cursor movements to complex sort operations, can be configured to any combination of keyboard strokes, enabling you to build your own command interface or foreign character sets.

This model satisfies many goals. If you wish, you can think of *View Professional* as a pure spreadsheet program or as a pure

wordprocessor. Indeed this article was written on *View Professional* purely as a wordprocessor. Spreadsheet fragments can be alternated with paragraphs to produce 'live' reports where the totals change if you alter a number. But the merging of the two concepts opened new horizons. Since a flow of text exists within a single column (although it can overlap onto other columns) multi-column text is available almost as a by-product. In fact up to 42 columns of text can be maintained – each independently formatted. And since slot references can be included inside text, paragraphs can suddenly handle 'live' dates, sales totals and portfolio profits within the text. Complex financial models can be created with explanatory text typed in as an integral part of the model, rather than tacked on as an afterthought. Smaller calculations can be turned into memos or letters at the drop of a paragraph.

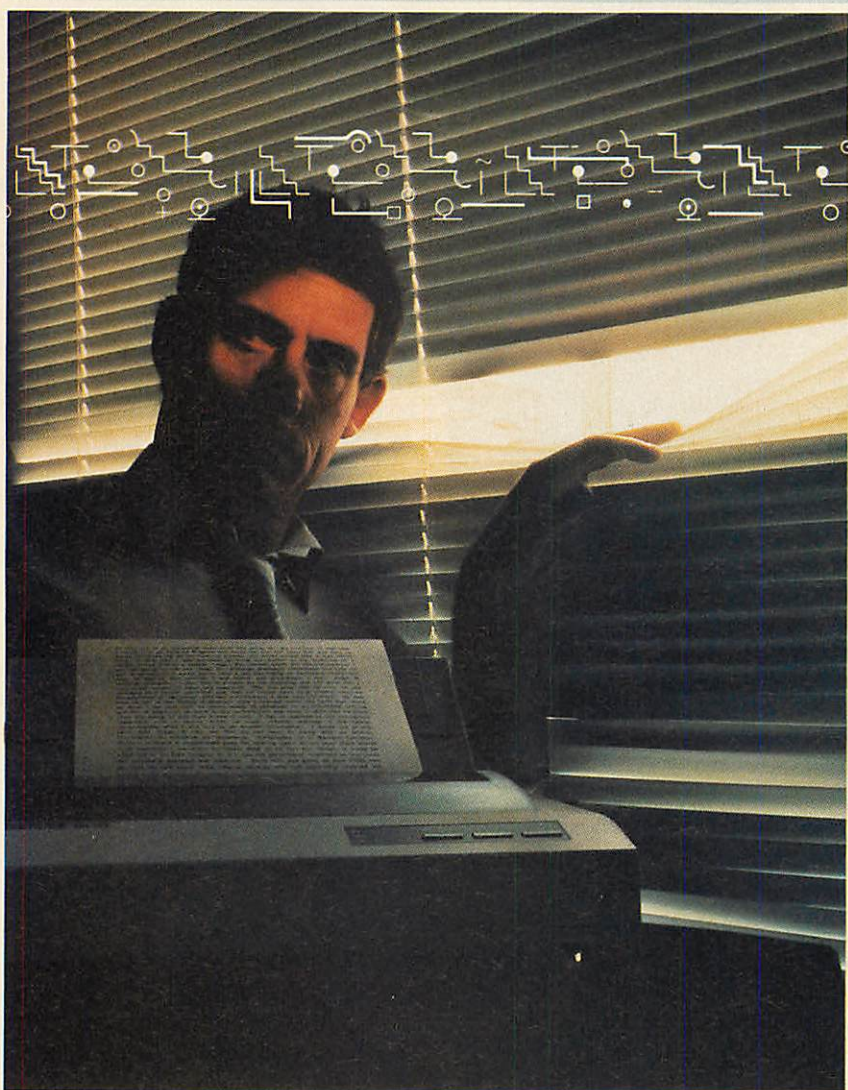
### A 'word sheet'

Colton has managed to incorporate the bulk of editing facilities from both *View* and *ViewSheet* to create the full-blown 'word sheet'. Extra spreadsheet operations not available in *ViewSheet* have added, including date manipulation and a powerful indexing function. The result is a program which seems to do away with the need for separate wordprocessors and spreadsheets – it is a single entity and there's no need to cut and paste.

To all intents and purposes *PipeDream*, supplied with Clive Sinclair's Cambridge Computer Z88, is a direct translation of *View Professional*. Cambridge Computer advertises connecting cables and software to transfer data files from *PipeDream* to the IBM PC in both *Lotus 1-2-3* and *WordStar* formats. There is also a connecting cable and software to connect with the BBC micro. *PipeDream* and *View Professional* share exactly the same data file format, and so text or financial models created on one can be immediately loaded into the other to be edited or printed.

In this way the BBC micro and the new Z88 complement each other, rather than compete, particularly since a version of BBC Basic is also bundled with the Z88. The BBC is a more suitable machine for use in the office, school or home with large screen display, disc drives and printers. But you can't get your BBC micro in your briefcase or use it on the train.

*View Professional* is available from Acornsoft, 645 Newmarket Road, Cambridge CB5 8PD, and costs £100 including VAT.



WHO BETTER TO EXTOL  
THE VIRTUES OF THE  
CITIZEN 120D THAN  
MR DAVID LARKIN,  
PRIVATE DETECTIVE.

**CITIZEN**  
COMPUTER PRINTERS

*"By and large the public have the wrong impression of Private Eyes, all these TV shows mean that most people can't see the paperwork for the glamour.*

*I needed a printer compatible with most PC's but that's not the only reason why I chose the Citizen. Naturally I looked at a couple of other printers. Apart from not feeling as sturdy as the 120D, all the switches controlling the basic printer functions seemed to be tucked away in the guts of the machine: the dip switches on the 120D are easily accessible and easy to operate.*

*These days clients need more than just a verbal report. So the printer's ability to handle different type styles helps a lot, especially when I'm reminding people they owe me money. It also has a big internal memory so it doesn't slow me down when I find the time to do the paperwork. I know these are small points but I find it's these little extras that really tip the balance. It's also pretty quick.*

*If you could only see some of the stories it's had to tell. I look at it this way. Who better to extol the virtues of a private detective than the 120D printer."*

For further information call Citizen free of charge on Linkline 0800 282692.

## THE COMPATIBILITY QUESTION

Graham Bell has been monitoring readers' experiences with the Master 512

For Master 128 owners, the 512 co-processor looks an attractive way of running IBM PC software. However, as this and the Master 512 use not MS-DOS but the rival DOS Plus, and the hardware is very different to the PC's, doubts hang over exactly how compatible they are. In August we asked readers to tell us how they were getting on with the Master 512.

Wordprocessors are among the least demanding of programs. The large selection of PC wordprocessors mostly work well with the 512 co-processor. No reader reported any problems with *WordStar* or *SpellStar*, although the Amstrad version, *WordStar 1512*, won't run.

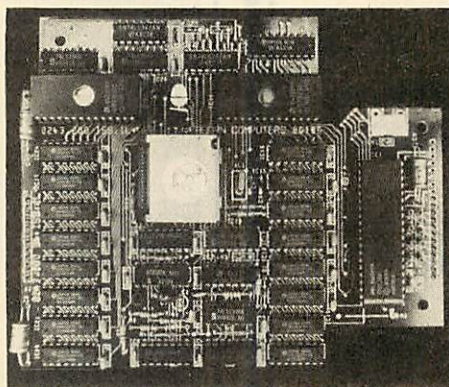
Similarly, *Multimate*, versions of *Volks-writer* and *GEM Write* all worked without problems. There were varied responses concerning *PC-Write*; some copies clearly worked, but Alan Edmondson of County Antrim reported that versions 2.55 and 2.7 work only in insert mode.

Readers fared badly with Microsoft *Word* and with *1st Word Plus*. Philip Hill of Ipswich also confirmed the unsuitability of *PC-Outline*; he had trouble with the scroll key, macros and the disc utilities.

The most widely used PC applications in business include the *Lotus 1-2-3* spreadsheet and versions of *dBase*, the database system. Whether these work on the Master 512 is not really dependent on the software – disc protection is the problem.

Several readers agree that protected versions of *Lotus 1-2-3* do not work, but unprotected copies of version 2 are available and these are compatible with the Master 512. Even the graphs and charts produced by *1-2-3* can be used. Other spreadsheets that can be used include *Supercalc*, *PC-Calc* and Grafox' *Logistix*.

Unprotected copies of *dBase II, III* and *III+* are all compatible with DOS-Plus and the 512 co-processor. Ian Whiting of Bedford has used *dBase III+* extensively, and he reports a minor limitation. The Master 512 can hold fewer files open than MS-DOS and the IBM PC, which may be important for particularly complex databases. The Borland *Turbo Reflex* database also seems to be compatible. Neither *Lotus Symphony* nor Ashton-Tate's *Framework* will run on the Master 512. The only



The 512 co-processor board

similar package which readers reported to run is *Migent Ability*.

### Programming languages

Although bundled with a selection of *GEM* software, the Master 512 is supplied without any 16-bit programming language. Of course, you can switch off the co-processor and use the Basic of the BBC micro.

A version of BBC Basic is available to run on the PC and on 512 co-processors. BBC Basic (86) by M-Tec is widely reported to run well. But as it was written for the PC, it lacks the graphics and sound features of the Acorn versions. This is true of almost all the programming languages here. An enhanced version of BBC Basic specially for the 512 is being developed by M-Tec.

Other versions of Basic fare less well. Readers have had some success with the Microsoft Quick Basic compiler, but others report problems. Borland Turbo Basic works for just a few minutes, allowing the nimble-fingered to type in and compile small programs. But it invariably soon crashes the machine. Alan Edmondson claims that various versions of Microsoft GW Basic run, but he has some problems with loading and saving data.

The other popular languages among those who wrote in are C and Pascal. Readers report no problems with Aztec C Prime, and several say that the good value Zorland C works well, in both its original and version 2 forms. As Dr Ronald Alpair of Dorset pointed out, some versions will compile only from within the Zorland editor, but this problem is not limited to the Master 512. Borland Turbo C also works well, the only limitations being that of the

512 screen. For example, there is no facility for multiple coloured windows.

Pascal programmers use Borland Turbo Pascal almost exclusively, and many report that this is compatible with the 512. Graphics are well supported with this language, through the separate Borland *Graphics Toolbox*. R Shruballs sent in times for the new PCW benchmarks showing Turbo Pascal on the 512 to be about four times faster in calculation than on an IBM PC, but text display was slower.

Fortran compilers are also available for the 512. Lawson Wakefield of Stafford has tested three, and reports that both Prospero Fortran and Fortransoft F77 are compatible, but Ryan McFarland Fortran 77 is not.

One point to watch when buying a compiled programming language is that you may also need a linker program. Many compilers don't produce a runnable program; the linker modifies programs so they can be run. MS-DOS comes with its own linker, but DOS Plus does not.

Among those who replied, there is a fair degree of agreement about what runs and what doesn't. But it is clear that even a seemingly simple package may have hidden problems. The Microsoft *Flight Simulator* version 2.12 runs on the 512, but Ian Whiting points out that the later version 2.13 stops after displaying the title page. You should still see the program running before you buy, or make it clear to the dealer which machine it is to be used on.

One vital point is that the 512 system uses several different disc formats. PC discs are usually formatted to store 360k of data, but DOS Plus also uses its own format. But beware, some PC disc utilities are designed only for 360k discs, and can corrupt discs using other formats, and destroy your files.

It is also important to get the latest DOS Plus system discs for your Master 512. A number of packages are 'more compatible' with the new versions, among them *Ability*, *Volks-writer*, *Lotus 1-2-3* and *Supercalc*. The new discs are available from Acorn if you return your original system discs, price £10.

Many thanks to all those who have written in detailing their experiences with DOS-Plus. If you have anything to add, then do write in – we hope to publish a further 512 update in the future.

Acorn user is on the move!  
This space can be used to move  
your business forward!

To find out why Acorn User is  
the  
most successful advertising  
vehicle  
for BBC/Acorn products

RING GARY LUCAS ON:  
01-490 1444

Acorn Users new address is:  
20-26, BRUNSWICK PLACE  
LONDON N1 6DJ

## ACORN USER ADVERTISEMENT PAGES NOVEMBER 1987

4Mation	136	Meadow Computers	110
A&G Electronics	140	Medu	40
AB Designs	84	Meedmore	108
Ablesoft	162	Mertec	152
ACP	42, 44	Micro-Media	1
Allan Data	52	Microaid	86
Akhter Computer Group	12, 14, 16	Microhelp	144
Amcom	24	Microman Computers	141
AMS	21	Micronet	89
Autoservices Ltd	40	Micropower	143
B & S Computing	139	Microstudio	164
BBD Computer Dust Covers	110	Minerva Systems	96
Beebug	4, 5, 6, 32	Nebulae	32
Blue Chip	36	Nidd Valley Micro Products	25
Brainsoft	136	Oak Computers	38
C & F Associates	92	Paeon Systems	148
Calerdata	168	Paul Fray Ltd	144
Capricorn	40	Peartree	27, 28, 29
Card Devices	22	Pineapple Software	106
Care Electronics	86	PMS	88
Centec	140	Portabello Trading	168
Citizen	172	Project Expansions	158
CJE Microcomputers	153	Raycomp	156
Clares Micro Supplies	104	RBRC Ltd	156
Communitel	158	Riverside	158
Comp-Shop	92	Robico	98
Computech	137	Rotherham Computer Centre	140
Computer Appreciation	36	Saxon	38
Computer Concepts	108, 150	SCE Computer Equipment	80
Computer Services	160	Schools Computer Club	30
Computers By Post	23	Selec Software	100
Conlex Computing	168	SJ Research	81
Croydon Computer Centre	174	Slogger	63-67
Database Publications	20	SP Electronics	38
Datatore	110	Star Devices	110
Datathorn Systems	10	Store Stock Systems	100
Design Consultancy	138	Summit	10
Design People Software	148	Superior Software	IFC, IBC, OBC
Dial-A-Disc	144	System	107
Digital Services Ltd	164	Systems Software	136
Disking	30, 31	Technomatic	56-62
Domark Ltd	8	Techno Information Services	174
Edusoft	164	Terrel Electronics	144
Electronequip	137	Tiger Software	156
Fosse Systems	158	Times Books	168
G-Ten	144	Tubelink	32
General Information Systems	112	Twillstar Computers	18, 19
HCCS	138	Tyne-Soft	146
HCR	137	UK Atomic Energy Authority	146
Home Based Business	174	Unisoft	93
HSV Computers	142	Vanadis	164
Intelligent Machines	30	Voron	160
Intelligent Interfaces	10	Viglen Computer Supplies	26
Keyzone	86	Watford Electronics	68, 79
KM Software	107	We-Serve	52
LCL	164	Whittle Systems	10
Leewood	168	Wight Scientific	38
M&M Trading	102	Wigmore House	168
Manor Court Supplies	94	WL Computer Services	137
Maths Workshop	162	Zaphod	156



**COMPUTER SERVICING**

(established since 1979)



WE REPAIR - ON THE PREMISES - QUICK TURNROUND

- ☆ AMSTRAD PC AND OPUS PC
- ☆ BBC & ELECTRON (APPROVED SERVICE CENTRE)
- ☆ COMMODORE & SPECTRUM
- ☆ DISC DRIVES, PRINTERS, MONITORS
- ☆ HARDWARE HIRE - MINIMUM 10 DAYS

MAIL ORDERS by phone Access and Visa Accepted

A Range of Hardware, Software, Joysticks, Leads, Interfaces  
Chips etc, and Computer Paper always in stock

**CROYDON COMPUTER CENTRE**  
29 BRIGSTOCK ROAD, THORNTON HEATH,  
SURREY CR4 7JJ. Tel 01-683 2646

**THIS NOTICE WORTH £5**  
AGAINST ANY PURCHASE OF HARDWARE OR SOFTWARE OVER £50

AA90

### MAKE YOUR MICRO EARN!

Yes, making money becomes incidental when you know how.  
Your micro is, if only you knew it, a gold mine, the size and make  
is irrelevant.

Make the initial effort **NOW** by starting your own

### HOME BASE BUSINESS

Remember: You'll never get rich digging someone else's "ditch".  
It's more rewarding than playing games.

The benefits are many and varied. Full or part time, for **FREE**  
details S.A.E. to,



## HOME BASED BUSINESS

97 Pilton Place (AU9)  
King and Queen Street  
Walworth, London SE17 1DR

# FREELANCE WRITING OPPORTUNITIES BBC MICRO

A new user advice service on the BBC Micro needs writers with expertise in all aspects relating to the use of the BBC Micro hardware and all types of accessories and software. The aim is to help people get the very most out of their BBC Micro.

The service will cover all types of business, domestic, hobby and scientific uses of the BBC Micro. We therefore need several writers for the different parts of this service.

You must have proven writing ability and be able to write with clarity, precision and expertise. It cannot be overstressed that this is to be a practical information service to assist the average user.

In addition, we are also interested in people who can either prepare their own programs for us to publish and/or have the ability to check out programs supplied to us for inclusion in our service.

The work will offer an average 8-10 hours work a week. This can be from your home and will be on a regular basis. It will be preferable, but not essential, to submit text and programs on disk prepared on a BBC Micro.

Please write with details of your specialist areas of knowledge and past writing experience/software development abilities to:-

**Techno Information Services, Owens House, Lamer Lane, Lower Gustard Wood,  
Wheathampstead, Hertfordshire, AL4 8RU.**



# FREE ADS

**Penpal** wanted with Electron and disc drive. Write to 5 St James Road, West End, Southampton, Hants SO3 3FX. Tel: (0703) 476321.

**Penfriend** wanted to swap information etc. Also anyone interested in Pascal. Write to Ian, 57 Northside Terrace, Bradford BD7 2QU.

**Penpal** wanted to swap ideas, preferably with disc drive. A Walker, 2 Arnold Lane, Gedling, Nottingham NG4 4BE.

**BBC penpal** wanted to exchange information, hints, tips, etc. Write to Amit Jalan, 47 Gulmohur Colony, Indore, Madhya Pradesh, India.

**BBC B** disc users wanted as penpals to swap ideas, info and tips. All letters answered. P Vickery, 24 Stockton Close, Whitchurch, Bristol.

**Help** from exclusive new computer club. Send SAE to M Brierton, 32 Studley Road, Wallasey Village, Merseyside L45 6TW.

**Racing** forecasting using the BBC B. Interested in joining? Send sae & details to Paul Green, 10 Willow Rd, Killamarsh, Sheffield S31 8FL.

**Teletext** adapter, latest ROM, includes manual. £55. Tel: Brian, (0258) 53742 evenings.

**OPUS** 14-inch monitor. £110. Solidisk two-meg 32k board. £30. Kenda DDFS. £30. Mouse £20. Tel: 01-968 3454.

**Cumana** CS200 80-track drive with PSU cables, comprehensive manual, formatter disc. Boxed, as new. £50 ono. Tel: 01-778 6290 evenings.

**Electron** Plus 1, Viglen joystick, Epson P-40 thermal printer with lead and paper. Hardly ever used. £70 ono. Tel: (0493) 667388.

**Music 500** plus Music 5000 software (nucleus ROM, disc & manual). Functions as Music 5000. As new, boxed. £100. Tel: (04747) 3835.

**Archimedes** wanted, so must sell BBC B issue seven with DFS, Solidisk 128k sideways RAM. Only £195. Tel: 051-928 7299 anytime. Ask for Jim.

**Acorn** Electron with over £300 worth of games. Manuals, advanced user guide. £150 the lot. Tel: John, (051630) 6603. 'Digit'-digitiser for BBC, only £27.50. Send sae for details. D. C. Hollick, 5 Montserrat Road, Lee-on-Solent, Hants PO13 9LT.

**Wanted:** Printer (preferably colour). Must be able to change fonts and take A4 paper. Will pay well. All printers considered. Tel: Justin, (0672) 20920.

**64k** Electron/software. £75. Plus 3, 10 discs TLP3 (V2). £100. Plus 1 user port. £50. Tel: K. Kirk, (0734) 665180.

**Acorn** Electron, Plus One, Cumana disc interface. Vgc. £110 ono. Changing computers and must sell. Tel: (0705) 471421. **BBC B**, Solidisk casing, DFS, ATPL Bat/bkd RAM/ROM board, shadow RAM (Watford), dual drives, second processor, ROMs, software. £550. Tel: (0832) 74169.

**BBC B**, disc drive, printer, mouse, ROMs, sideways RAM, plus £1500 games, £90 books. Will sell separately. £650 ono. Tel: 01-698 0216 evenings.

**Acorn** Electron computer plus data recorder, games (worth £35), manual, magazines, leads and power supply. Quick sale, therefore only £99. Tel: Mr Hussain, (0753) 72431.

**Exchange** my old 40-T drive for 32k shadow RAM (BBC B) W Warriner, 4 Langdale Drive, Keyingham, Humberside HU12 9TG. Tel: (0964) 622274.

**BBC B** S-ROM board, plus ROMs, soft-

ware disc drive, Cub colour monitor. £450. Tel: 01-550 8382.

**OPUS** 5401SD 40-track single-sided disc drive, unused. With manual and utilities disc. £60. Tel: 01-863 8117.

**Torch** twin 80-track disc drives with Z80 second processor. BBC B/Master compatible, software, manuals etc. £295. Tel: (0255) 429852/433595.

**Electron** Bud joystick interface, Quickshot II, new and boxed. £20. Tel: (0734) 882649 after 4.30pm weekdays and weekends, ask for Chris.

**Compact** colour system, complete. £450. Epson LX86 printer. £180. Both under guarantee. Good reason for sale. Tel: (0604) 870465.

**Silver** Reed EXP400 daisy-wheel printer. 10 hours use. £130. Tel: (0443) 205365.

**SWAP** Sinclair Spectrum 128k for BBC B 1.2 OS. Mint, boxed, some adventures/utilities. £100+ balance available. Tel: Howard, (0734) 792566, 9am-5pm.

**BBC B** seven, Watford DFS, Torch dual 40/80-track drives. *Sleuth*, graphics ROMs. Advanced 6502 manuals. Data-corder, software. £430, could split. Tel: (0775) 60005.

**Replay** ROM + games. £25. WE/sideways ROM/RAM with 112k of RAM. £40. Tel: Steve (0844) 51570.

**Microvitec** 3.5-inch monitor Cub. £100. *Wordwise* plus. £25. Disc drive. £25. Printer sharer 3-1. £40. Logotron £30. Tel: (0532) 779050.

**ATPL** ROM board with 16k RAM. £28. *TEAC* 40/80-track disc drive with PSU. £80. Codal SCI1000 printer. £75. (0223) 833203.

**BBC B** 1.2 OS Opus-DDOS, second processor (6502), two drives, Microvitec 1431, Viglen keyboard, 16k SRAM, joystick. £750 ono. Tel: (0457) 73637.

**Disc** drive Opus-type, 100k 40-track S/S plus Acorn DFS ROM. £60. Tel: (0246) 810978.

**BBC B** issue seven, 1170 and ADFS, light pen, speech, manuals, data recorder, new drive, much software. £380. Tel: (0226) 203221.

**ATPL** ROM board with RAM. £20. *Beebug Toolkit plus*, and *Romit*, both boxed as new. £15 each. Tel: (0522) 720713.

**Acorn Users** for sale. July '82, Sept '82, Dec '82, Jan '83, complete set to Jan '84. Offers? Daly, 35 Scafell Drive, Kendal, Cumbria. Tel: (0539) 26129.

**AMX Superart** ROM and manual. £20. Mouse. £25. Hardly used. P&P £1.50.

Tel: (0389) 30007 after 6pm.

**Z80** second processor with software and manuals. £150, no offers. Tel: (928) 543.

**50** BBC games including *Elite*, *Exploding Fist*, *Repton 2*, *Tapper*, *Knight Lore*. £150 the lot. Packs of 5, £16. Tel: (0580) 241306.

**Acorn** Z80 second processor including manuals and software, ie. Cobol, *Nucleus* Memo Plan, MBasic, *Fileplan* etc. £150. Tel: (0532) 779050.

**Seikoshu** GP-250 graphics printer with user manual, ribbon cable and spare printer ribbons. £110 ono. Tel: (05827) 3697.

**Acorn** Electron with Plus 3 disc drive, blank discs, slogger ROM box plus, *View*, advanced disc toolkit, second processor kit, database, games discs, manuals for everything, books, magazines. Only £200. Tel: 01-843 0012 after 6pm.

**BBC B**, dual 40/80-track 800k disc drives, Watford 32k ROM/RAM board, over 700 programs. Only £400. Tel: (05827) 69152.

**BBC B** Solidisk DFS ADFS side-shadow RAM RTC DS80T disc, mono monitor. £475 ono. Tel: 01-579 0607.

**BBC B**, Watford DDFS, DS40/80-track drive, 30 discs, many games, ROMs, books, mags. £400. Tel: 01-421 0367, evenings.

**BBC B** seven board, dual 100k disc drive, 128k sideways RAM, Prism 1000 modem, cassette player. Only £500, Tel: 021-544 4595.

**BBC B**, Acorn DFS, Basic 2, Basic Editor, *Disc Doctor*, Cumana SS 40-track drive, leads, manuals, cassette tapes, discs, joystick. £300. Tel: (0274) 607449.

**Master** 128W/Z80 Co-processor, LX80 printer, Cub monitor 653, OPUS DO/DS/twin drives, AMX Mouse, W/Super Art. £1800. W/£3000. Free software. Tel: (0423) 870875.

**Acorn** 6502 second processor complete £60. Tel: John (0642) 219006 after 5pm.

**BBC B** with Acorn DFS, *Wordwise*, Cub colour monitor, BT modem, Sanyo DR201 d-recorder, Quickshot II joystick and interface, software, books including complete set of *Input*. All in mint condition. Bargain £520 ono. Tel: (0834) 861244.

**Double-density** board with manual and utilities (LVL). £18. Wanted: BBC B printer. Tel: (0902) 338089.

**BBC** Master 400k D/S 40/80-track disc including software and books, six months old. Under guarantee. £475 ono. Tel: (0296) 85325.

**BBC B OS 1.2 DFS 1.2** Cumana twin 40/80-track *View*2.1, Watford RAM/ROM with 80k, joysticks, Viglen PCU. Tel: (0252) 712873 (weekends). £520.

**Robocom** Bitstick II CAD system. £400. Hitachi 672 plotter. £350. Both as new. Tel: (0892) 33434.

**BBC B OS 1.2 DFS1.2** *View* 2.1, two DS80-track drives, green monitor, Juki 6100, manuals, leads, etc. £595. Tel: (024541) 3392.

**BBC B OS 1.2** series seven, Watford DDFS, interface and ROM. Dust cover, cassette. Immaculate condition. £230. Tel: (0375) 380369.

**BBC B+**, double disc drive, LX-80 printer, colour monitor, Nightingale modem. All leads and manuals. £825. Tel: Mike, (04023) 73263.

**Dual** disc drives, 80-track (40/80 switchable), Mitsubishi, self-powered. £175. Grundig RGB monitor/receiver. £175. Epson printer MX80II. £150. Epson printer MX80II. £150. All perfect and with cables. Tel: (0932) 43664 evenings. Close offers considered.

**BBC B**, Acorn DFS, 40/80 twin DS disc drives, Solidisk 64k sideways RAM. Philips green HR monitor. £500. Tel: (0235) 835391.

**Master** 128k, dual 40/80-track d/s bridged drives, medium resolution cub, mouse, *Interword*, *WordwisePlus*, Music 500, max, offers. Tel: (0389) 57881. Ask for A. James.

**Seikoshu** GP-100A MkII printer, complete with leads, manual, ribbons, original box. £60 ono. Tel: (0366) 501001.

**BBC B OS 1.2**, excellent condition, two joysticks, Cheetah speech chip, ROM, well over 100 games (*Elite* etc), mags, cass. rec. Tel: 01-953 8999.

**16k & 32k** sideways RAM for sale. Ring Adam on (0295) 65857 after 6pm only.

**Solidisk** EPROM programmer & eraser. £25 (for use with sideways RAM). Acorn Music 500 with studio 5000 upgrade. £40. Tel: (0344) 423649.

**Pace** disc drive, never used. £80 ono. Plus other BBC B bargains. Send sae to A. Javaid, 18 Chapman Street, London E1 2NN.

**Electron** plus one, *View* ROM. £130 of software, *Starship Command* ROM, books, everything. Only £200. Tel: 061 2818572 (6pm-10pm), ask for Jeremy.

**BBC B**, DFS, 400k drive, *Wordwise*, replay, datacorder, joysticks. £250 of software etc. Cost: £1000. Sell: £400. Tel: (07372) 47438 after 5pm.

## FREE PERSONAL AD SERVICE

Fill in the form below to a maximum of 20 words (one in each box) and send it to *Acorn User Free Ads*, 20-26 Brunswick Place, London N1 6DJ. Please use capital letters, write clearly, and remember your name, address and telephone number. Without this full information, supplied on a separate sheet of paper, we regret we cannot carry your Free Ad. We cannot accept entries selling or swapping software. This is a service to readers—no companies please. One entry per form only. Free Ads are carried in the magazine as space permits, and any Free Ads not used within a month of receipt will be disposed of.


# ACORN USER'S

## DIARY

### One man and his laptop

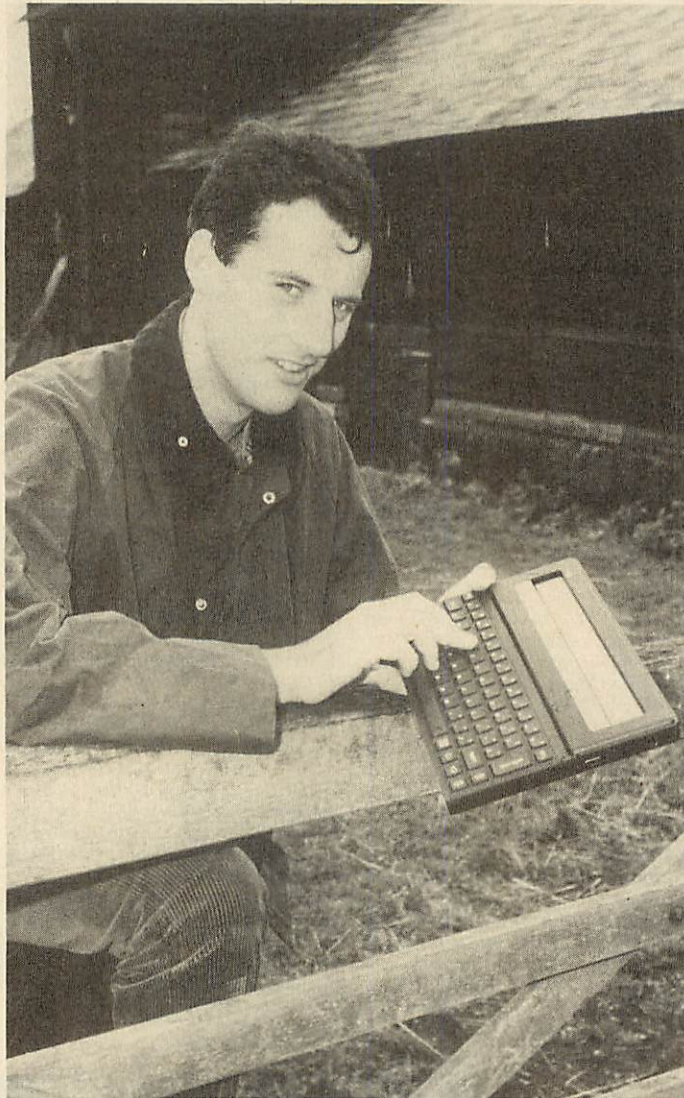
Who should you choose to endorse your nice new laptop computer? This is one of many problems that faced Sir Clive Sinclair as he prepared to launch the long-awaited Z88 and relaunch his own career.

Evidently a great deal of lateral thinking went into the choice. Acé reporter Orson Fact and the assembled hacks were locked (yes, really locked) into a darkened room in London's Waldorf Hotel and treated to a gushing exposition by actress and one-time Dr Who sidekick, Lalla Ward.

Despite her evident profound ignorance of all computing matters, she confided she just knew the Z88 was 'absolutely wonderful' and that it made her proud to be British. Presumably chasing low-budget aliens across time and space qualifies you for this kind of thing.

Lalla went on to liken the Z88 to her former home, the Tardis. Not, one hopes, as an indicator of its reliability and ease of use.

When the last hack had given in, and admitted that with the Z88 no other computer was necessary and compatibility was an irrelevance, Orson was shown lots of pictures of PR people finding uses for Z88's in unlikely situations. Should sales



For the well-dressed farmer and inter-galactic traveller

fall off, it will apparently be supplied free with all Barbour jackets. But unlike the ill-fated

C5 it is the wrong shape to become a flowerpot in trendy wine bars.

### Zander is here at last

The October issue's scheduled on-line game was hit by legal wrangles. After an acrimonious court drama, charges of piracy and software theft have eventually been dropped, but Abuser has been forced to agree 'to substantially alter the look and feel' of its game.

The object is to fly your \$-shaped craft over a tundra landscape dotted with stunted pine trees. The game was originally to be called *Arctic* but Acorn is claiming rights to all words beginning with 'A'. Renamed *Zander*, release had to be put off for a month to allow time for new cassette inlays to be printed. Here it is.

```
10 MD:7:F:1=0TO
10:V:31,10-I,9+I,4
7,31,29+I,9+I,92,3
1,9-I+RND(19+I),9+
I,94:N.:X=20:Y=5:H
=2:REP.V=&7D6B+X+4
0*Y:s=?V: ?V=-1:V=V
-40*INTH:f=?V: ?V=3
6:K=?&EC:X=X-(K=19
4)+(K=225):Y=Y-(K=
232)+(K=200):?(V+4
0*INTH)=s:A=A-.01-
(K=201)/20:H=H+A: ?
V=f:U.H<0
```

To run the program, type AUTO, then enter it carefully, pressing Return only at the very end. Then save it, and type RUN. Return is thrust, Z and X are east and west, and / north and south. The craft's shadow and the effects of gravity are fully depicted.

In fact, this is only a demonstration of part of the full game, *Lurch*, to be released early next year.

### Return of Mad Alex

Our own Mad Alex, ex-denzin of the Redwood dungeon, featured in a recent *Sunday Telegraph* exposé of computer hacking. 'There is a problem with many programmers,' he says. 'A lot of them

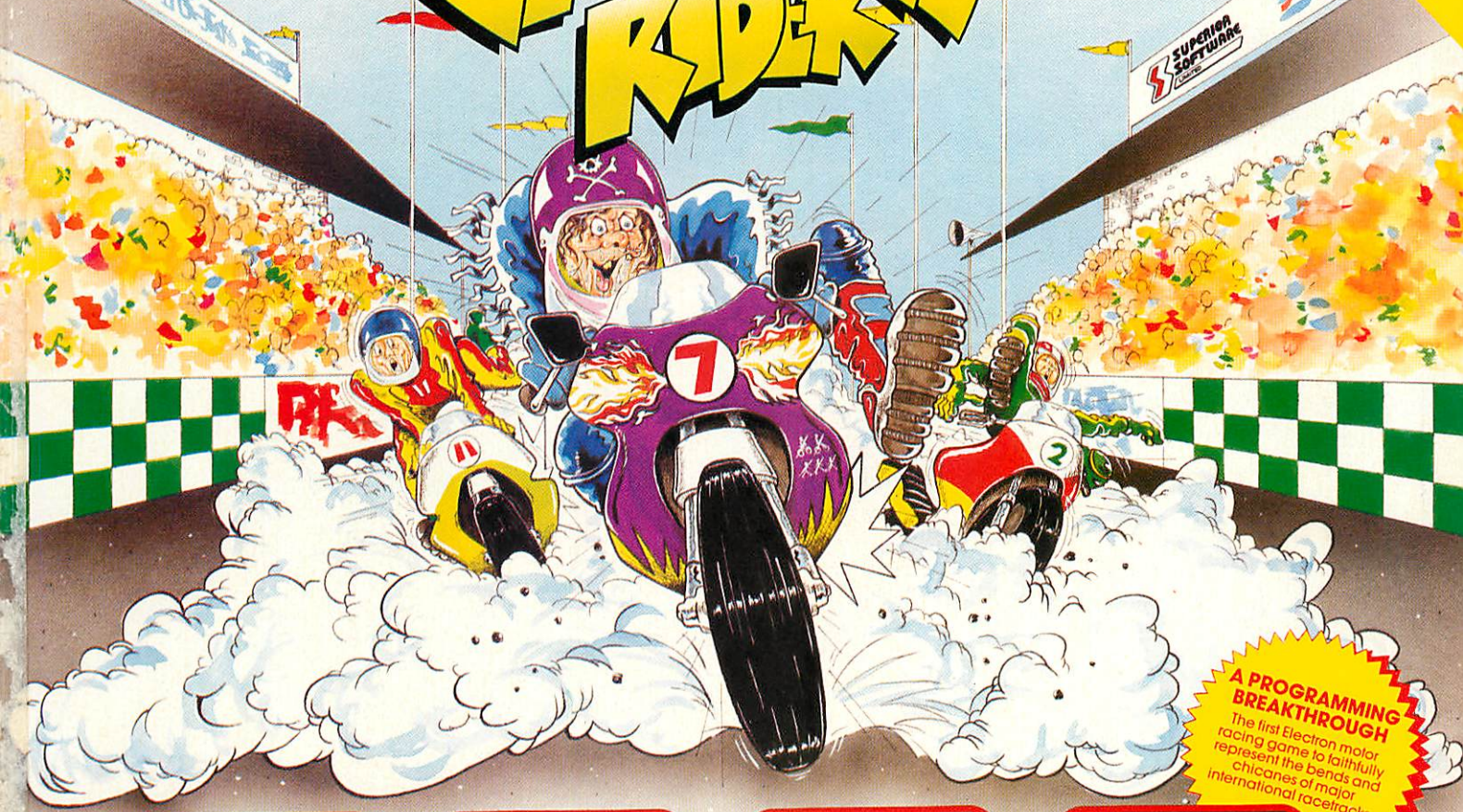
are very weird indeed, and they can barely talk to other people.' But Alex has his own eccentricities, reported in the *Telegraph*. These centre around his nine-inch ponytail and 'vigorously striped' trousers.

### On the move

*Acorn User* has moved from its cramped Covent Garden offices to different cramped offices. Our new address is *Acorn User*, Redwood Publishing Ltd, 20-26 Brunswick Place, London, N1 6DJ.

# CRAZY RIDER

**FREE:**  
 ENHANCED BBC  
 MASTER VERSION  
 • Extra Race Circuits  
 • Haunting Music  
 • Extra Graphics  
 • Auto-Demo Mode  
 • Extra Game Features



**A PROGRAMMING BREAKTHROUGH**  
 The first Electron motor racing game to faithfully represent the bends and chicanes of major international racetracks.



Setting the Scene



Going round the bend at Misano (BBC MICRO VERSION)



Knocking off an opposing rider (BBC MICRO VERSION)



Clever Electron programming techniques (ACORN ELECTRON VERSION)

## If you can't beat them, knock them off!

Howling round the bends at Le Mans at 150 m.p.h. is a daunting experience. You'll need nerves of steel and slick reflexes to finish in the Top 6 and qualify for the next race. If, at first, you can't make the grade you can always let off steam (and gain bonus points) by bumping into the other riders and knocking them off their bikes; listen for the terrified wail as the rider is sent flying to the ground.

Each race has 60 participants — and the further you get, the tougher the competition becomes. Bonus points are awarded for a good finishing position, and your "hit-count" shown at the top of the screen records the number of other riders you have sent tumbling from their steeds.

Seven top international racetracks are featured:-

- Le Mans (France)
- Anderstorp (Sweden)
- Paul Ricard (France)
- Brands Hatch (U.K.)
- Misano (Italy)
- Silverstone (U.K.)
- Nurburgring (W. Germany)



An enhanced version has been specially produced for owners of the BBC Master Series computers. Included free with all BBC Micro cassettes and discs, this version features several extra race circuits, a beautiful 6-minute musical soundtrack, and a host of extra game features — making full use of the Master's extra memory and capabilities.

BBC Micro Cassette ..... **£9.95** Acorn Electron Cassette... **£9.95**  
 BBC Micro 5/4" Disc ..... **£11.95** Acorn Electron 3 1/2" Disc. **£14.95**  
 BBC Master Compact 3 1/2" Disc ..... **£14.95**

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

### PRIZE COMPETITION

A superb MZ Simson sports moped (illustrated above) worth £500 is the first prize in our competition.

To enter the competition, you must finish in qualifying position on the first 21 racetracks, and note down the congratulatory messages you receive. Closing Date: 31st March, 1988.



ACORNSOFT

Dept. CR1, Regent House, Skinner Lane, Leeds LS7 1AX. Telephone: 0532 459453

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



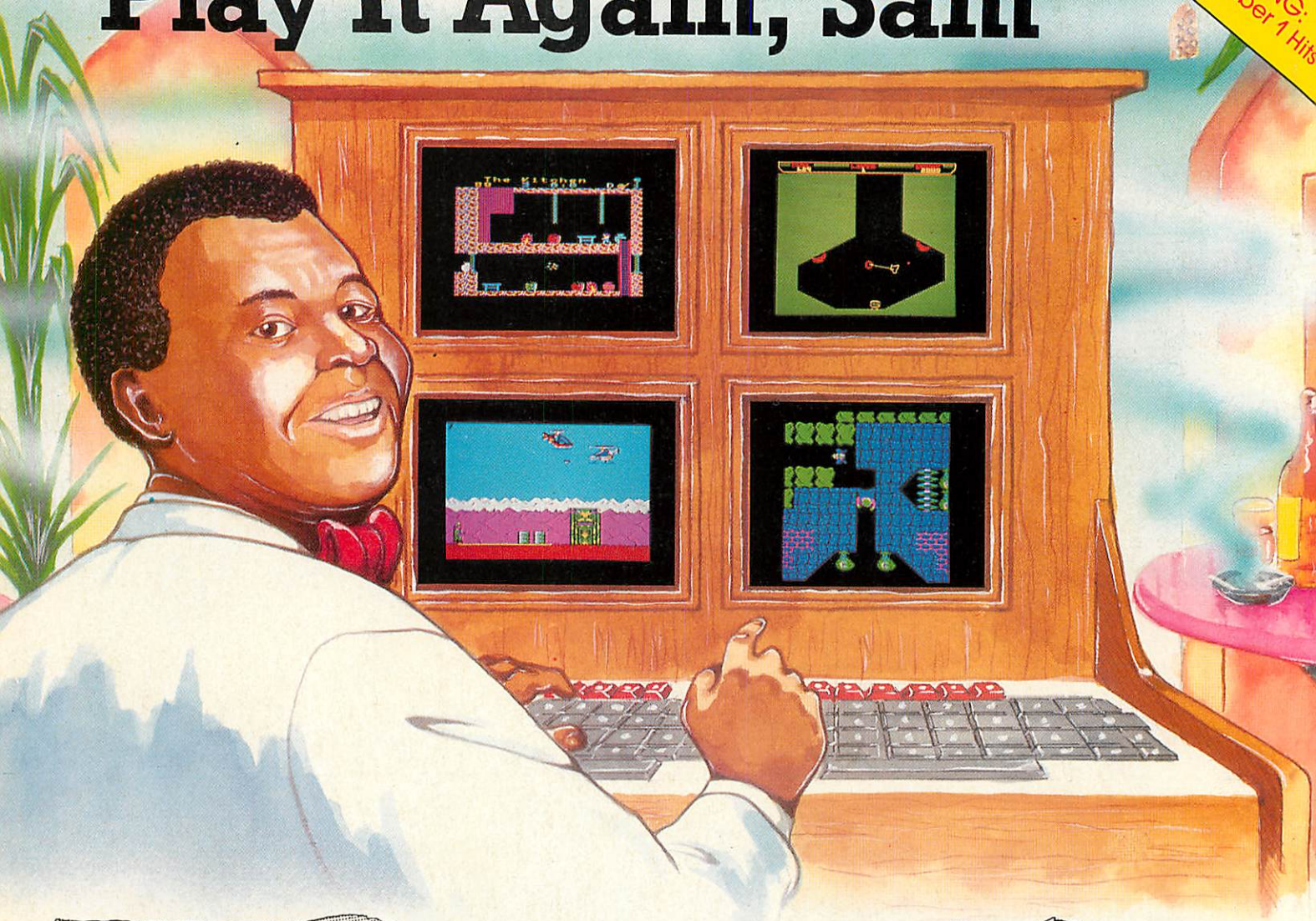
24 HOUR TELEPHONE ANSWERING SERVICE FOR ORDERS

#### 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).

# "Play It Again, Sam"

FEATURING:  
Four Number 1 Hits



## THE BEST COMPILATION EVER for the BBC Micro and Acorn Electron

**Sam**, an ardent fan of Superior Software's games, is always ready for a challenge... and the tougher the better! Here's four games that, as time goes by, he returns to again and again.

**Citadel**, a fascinating arcade-adventure, features over 100 beautifully detailed screens of action. Computer Gamer reported: "The game is extremely good. Well worth the cash!"

**Thrust** is simple and fun-to-play, yet incredibly realistic and highly addictive.

"This game has class... try it!" urged Computer & Video Games.

**Stryker's Run** is a challenging action-packed combat game.

"This game will impress you... the graphics are stunning... this should be in every collection," A & B Computing remarked.

**Ravenskull** is a massive arcade-adventure game, full of puzzles and problems to be solved.

Acorn User commented: "Ravenskull is a very good game and is destined to become another Superior classic!"

BBC Micro Dual Cassette .....	£9.95	Acorn Electron Dual Cassette .....	£9.95
BBC Micro 5¼" Disc .....	£11.95	Acorn Electron 5¼" Disc .....	£11.95
BBC Master Compact 3½" Disc .....	£14.95	Acorn Electron 3½" Disc .....	£14.95

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



ACORNSOFT

Dept. P55, 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)