

ACORN USER

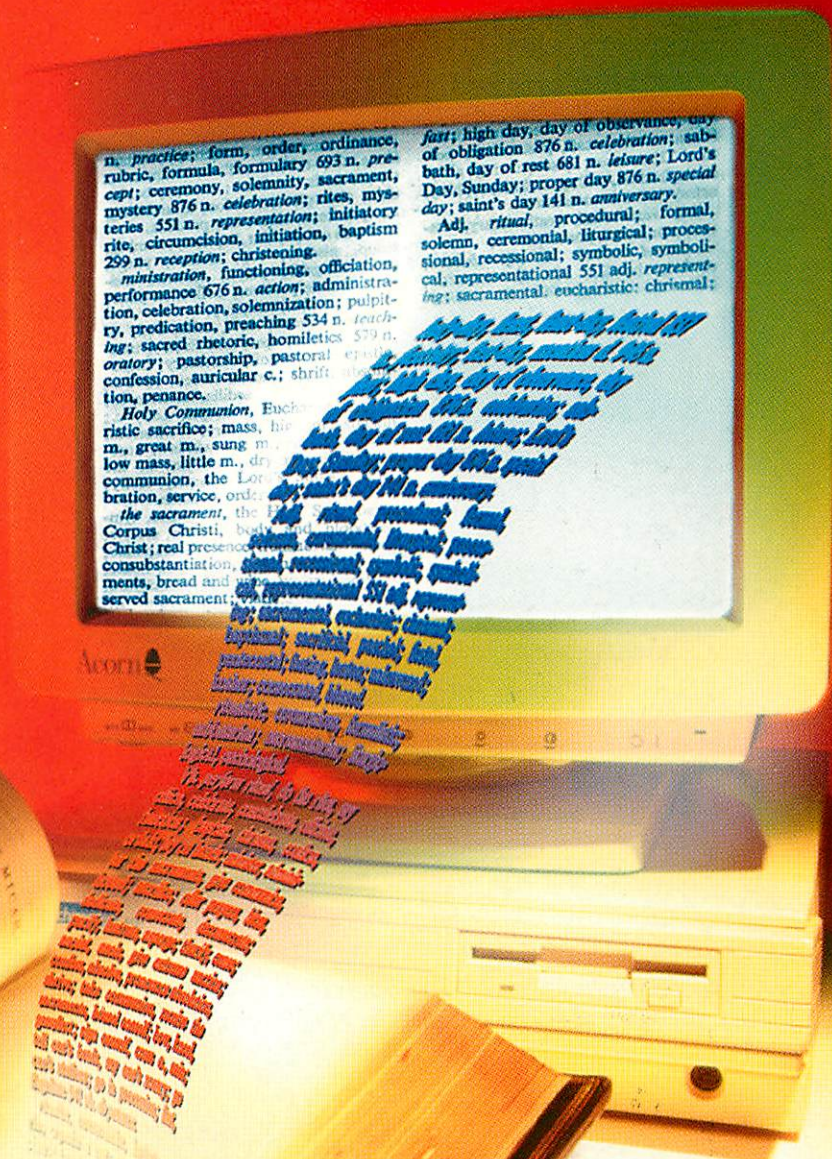
£1.80

MAY 1993

NO MORE TYPING

Optical character recognition for less than £60

A new hi-tech sequencer



FREE
A complete
game inside

ISSN 0263-7456



9 770263 745024

05>

EUREKA!

...FOR PEOPLE MEAN BUSINESS

Eureka - ads: IDEDED04 & Eureka Sheets NatBus																				
Greyed Total		1	2	3	4	5	6	7	8	NUM										
N21		-N14+N17+SUMN18 N20)																		
ads: IDEDED04 & Eureka Sheets NatBus																				
A	B	C	D	E	F	G	H	I	J	K	L	M								
National Business Group																				
Consolidated Balance Sheets																				
Fiscal Year End December 31					1990		1991		1992											
Assets																				
Current Assets :																				
Cash and Equivalents					€	15.5	E	22.9	E	34.4										
Accounts and Notes Receivable						554.9		664.3		600.4										
Inventories						660.5		767.0		809.0										
Other						165.0		212.3		312.8										
Total Current Assets						1,415.9		1,667.0		1,756.6										
Property, Plant & Equipment						2,699.3		3,655.1		4,088.7										
Accumulated Depreciation						-248.2		-877.2		-1,021.1										
Property, Plant & Equip. NET						2,651.1		2,777.9		3,067.6										
Land						89.1		103.9		222.5										
Goodwill						655.2		1,089.8		1,215.8										
Other						108.0		365.1		299.6										
Total Assets						4,919.3		6,253.7		6,552.1										
Liabilities																				
Current Liabilities :																				

Eureka's advanced DTP-like publishing capabilities encourage you to create the most impressive reports and budgets, making full use of the Acorn Outline Font Manager.

We Cycle Worldwide, Inc.
1990 Global Efforts
Consolidated Results in Thousands

	Q1	Q2	Q3	Q4	Total
North America	5.7	3.4	2.5	6.4	18.0
Europe	2.3	1.8	2.7	3.5	10.3
Asia	1.9	3.4	4.5	3.9	13.7
Australia	0.8	1.0	0.8	1.2	3.8
Total	10.7	9.6	10.5	15.0	45.7

Worldwide efforts up significantly over last year

Using the Eureka style editor, you can create and apply all types of on sheet formatting and effects with the click of a mouse button.

The Data Series command allows you to automatically create a wide variety of Time, Linear and Growth series.

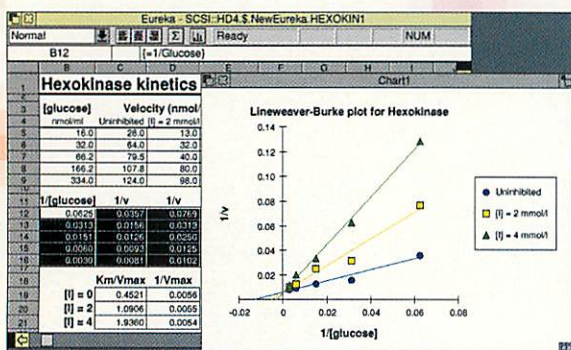


Multiple Regression Analysis

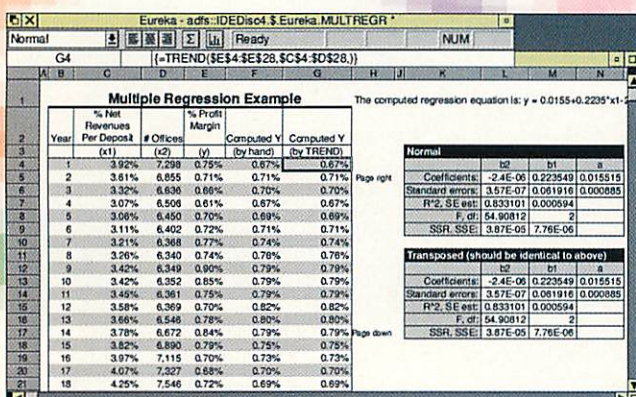
Variable Number	1	2	3
Constant	-48.448	0.764	0.713
Coefficients	6.471	0.131	0.158
Set Error of Coef.	0.025	0.002	0.002
Standard (p-hat)	0.747	0.002	0.002
Average Value	34.417	40.583	31.250
Standard Deviation	2.914	0.109	0.109

With over 155 built in functions, Eureka users have all the analytical mathematical power they will ever need, at their fingertips.

PEOPLE WHO USE BUSINESS



Eureka offers crisp, accurate business charting in a wide variety of formats.



Eureka's advanced statistical features make it the natural choice for scientific and engineering professionals, as well as financial analysts and business managers.

Category	Item	Qtr1	Qtr2	Qtr3	Qtr4	Total
Personnel	Total	£28,000.00	£29,000.00	£29,000.00	£29,000.00	£115,000.00
	Travel	£5,000.00	£5,000.00	£5,000.00	£5,000.00	£20,000.00
	Chemicals	£1,000.00	£1,400.00	£1,500.00	£1,500.00	£5,400.00
	Glassware	£1,000.00	£1,000.00	£1,000.00	£1,000.00	£4,000.00
	Supplies	£2,000.00	£1,000.00	£1,000.00	£1,000.00	£5,000.00
Large Equipment	Total	£158,500.00	£185,000.00	£180,000.00	£180,000.00	£703,500.00
	Plastics	£2,000.00	£1,000.00	£1,000.00	£1,000.00	£5,000.00
	Special Equipment	£500.00	£500.00	£500.00	£500.00	£2,000.00
	Office Supplies	£5,500.00	£4,500.00	£4,500.00	£4,500.00	£19,000.00
	Miscellaneous	£150,000.00	£174,000.00	£170,000.00	£170,000.00	£684,000.00
Miscellaneous	Total	£179,800.00	£190,000.00	£185,000.00	£185,000.00	£739,800.00
	Accelerator	£800.00	£800.00	£800.00	£800.00	£3,200.00
	Plastics	£2,000.00	£1,000.00	£1,000.00	£1,000.00	£5,000.00
	Special Equipment	£500.00	£500.00	£500.00	£500.00	£2,000.00
	Office Supplies	£5,500.00	£4,500.00	£4,500.00	£4,500.00	£19,000.00

Build and maintain budgets with speed and accuracy. Using Eureka's powerful range naming features ensures you can always remember what your formulae mean, even months later!

POWERFUL, RELIABLE AND FULLY-FEATURED

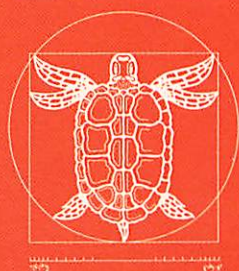
Eureka brings the power and innovative features of the very latest in easy-to-use spreadsheet technology to all RISC OS users.

- ▶ Fully integrated charting and graphing, including line, scatter, bar, stacked bar, pie and area.
- ▶ Powerful worksheet formatting with styles, including cell shading, cell borders with different colours and weights.
- ▶ Picture-style number and text formatting allows full customising of value display.
- ▶ Multiple worksheets with file linking.
- ▶ Import and export of CSV and Lotus 123 formats; export of Draw format.
- ▶ Point and click formula construction.
- ▶ Linear and multiple regression analysis.

Eureka is priced at £119 + VAT.
AVAILABLE NOW for any Acorn computer running RISC OS with 2Mb of RAM or more.

Eureka contains over 150 built-in functions:

Trigonometry	TYPE	VAR VARP	CEILING	DAYS360 DAY	MID REPLACE
PI SIN COS	ERROR.TYPE	GEOMEAN	FLOOR	HOUR MINUTE	SUBSTITUTE
TAN ASIN	ROW	HARMEAN	RANDBETWEEN	MONTH	
ACOS ATAN	COLUMN	RAND SLOPE	PRODUCT	SECOND	Financial
SINH COSH	ROWS	INTERCEPT	SUMSQ	WEEKDAY	PV FV PMT
TANH ASINH	COLUMNS	CORREL	SUMX2PY2	YEAR DAYS	NPV RATE
ACOSH		COVAR LINES	SUMX2MY2	DATE TIME	IPMT PPMT
ATANH		LOGEST	SUMXMY2		VDB DB DDB
RADIANS	PERMUT	TREND			SLN SYD NPV
DEGREES	COMBIN SUM	GROWTH	Matrix	CHAR FIXED	IRR MIRR
ATAN2	MAX MIN	AVERAGE	TRANSPOSE	DOLLAR	
			MDTERM	CLEAN CODE	Lookup
Information	COUNT	RAND ABS	MINVERSE	LEN LOWER	CHOOSE
NA ISNA	COUNTA	INT SIGN EXP	MMULT	TRIM UPPER	INDEX
ISBLANK	AVEDEV	LN LOG10		PROPER	HLOOKUP
ISLOGICAL	MEDIAN	SQRT FACT	Logical	DATEVALUE	VLOOKUP
ISREF ISERR	MODE RANGE	FRACTION	FALSE TRUE IF	TIMEVALUE	LOOKUP
ISERROR	IQRANGE	EVEN ODD	AND OR NOT	VALUE RIGHT	MATCH
ISNTEXT	QUARTILE	LOG MOD		EXACT LEFT	
ISNUMBER	LARGE SMALL	ROUND	Time	REPT TEXT	Miscellaneous
ISTEXT N T	STDEV STDEV	TRUNC	NOW TODAY	FIND SEARCH	REVERSE



LONGMAN LOGOTRON

124 Cambridge Science Park
Milton Road
Cambridge CB4 4ZS
Tel. (0223) 425558 ♦ Fax (0223) 425349

F20				=Profit/Revenue
scsi::H				
	A	B	C	
1	Garden World Mail O			
2	Break-even Analysis			
5	Fixed Expenses			
6	Administrative Personnel			
7	Publicity			
8	General Operating			
9	Interest			
10				Total
11				
12	Variable Expenses Ratio			0.5859
13	Contribution Margin			41.41%
14				
15				
16	Revenue	Fixed Expenses	Variable Expenses	
20	£265,000.00	£142,726.00	£155,274.00	
21	£295,000.00	£142,726.00	£172,853.00	
22	£325,000.00	£142,726.00	£190,431.00	
23	£355,000.00	£142,726.00	£208,009.00	
24	£395,000.00	£142,726.00	£235,597.00	

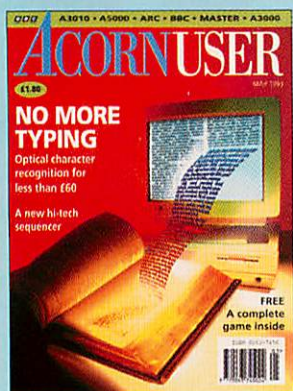
THE FIRST CHOICE...

£51,214.00
£49,276.00
£32,358.00
£9,878.00
£42,726.00

Cost Of Goods Sold
Shipping
Operating Personnel

Total

Total expenses	Profit or Loss	Profit Margin
98,000.00	(£33,000.00)	-12.45%
15,579.00	(£20,579.00)	-6.98%
33,157.00	(£8,157.00)	-2.51%
50,735.00	£4,265.00	1.20%
78,323.00	£16,677.00	4.22%



COVER: GEORGE SNOW

Editor Karen Donaghay
 Production Editor Fin Fahey
 Art Editor Tony Judge
 News Editor Ian Burley
 Games Editor Sam Greenhill
 Editorial Assistant Sarah Burns
 Group Advertisement Manager Duncan Pringle
 Advertisement Manager Richard Power
 Senior Sales Executive Areef Vohra
 Promotions Executive Jane McCann
 Ad Production Controller Fiona Senior
 Production Controller Fiona Andrews
 Production Manager Jennifer Jeffrey
 Ad Services Manager Ray Kelly
 Publisher Robert Marriott
 Publishing Director Michael Potter
 Editorial Director Christopher Ward
 Annual Subscription Rate £22.95



Published by Redwood Publishing, a BBC Enterprises Company, 101 Bayham Street, London NW1 0AG. Tel: 071-331 8000. Fax: 071-331 8001. Redwood Reader Services Executive: 071-331 8022.

Bureau setting and ad typesetting by Bold Gray Design, 52 Rosebery Avenue, London, EC1R 4RP. Colour by Trumps Studio, Ware, Herts. Printed by Cradley Print Ltd, West Midlands. Distributed by BBC Frontline, Park House, 117 Park Road, Peterborough. © Redwood Publishing 1993. UK Basic All rights reserved. Acorn is a registered trademark of Acorn Computers Ltd.



Redwood Publishing is a registered data user. ISSN 0263 7456.

PRODUCED ON THE ARCHIMEDES

All the editorial pages in BBC Acorn User are produced using Acorn computers, Computer Concepts' Impression 2, LaserDirect printers and Taxan monitors

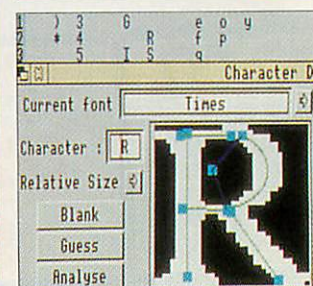
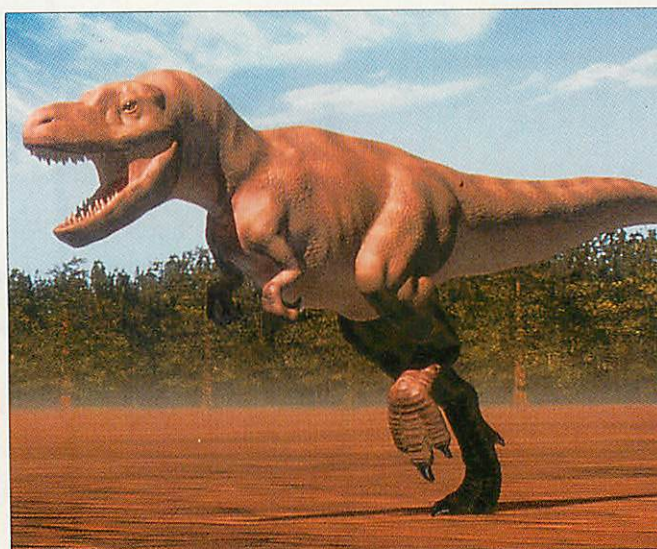
CONTENTS

REGULARS

News	7	The facts you need to know
Graphics	15	News from the visual zone
Comms	16	What's new on-line
Education	19	Acorn in the classroom
Absolute beginner	47	Give your machine a boot
Questions and answers	83	We resolve your perplexities
Letters	87	Make your views known
The subscriber's page	117	What's on your free disc this month?
The Moxon interview	128	Who's who in the Acorn world

FEATURES

Spring fever	29	Acorn User goes on the launch trail
Show competition	65	Win out at the Acorn User show
The exterminator	68	Recreate a Dalek onscreen



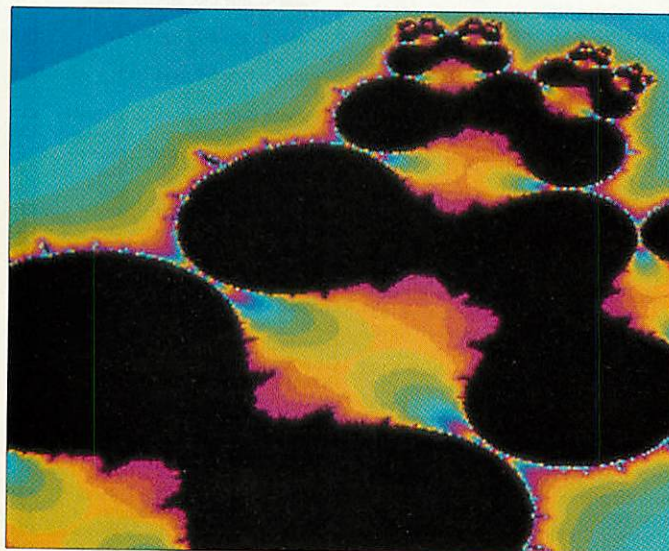
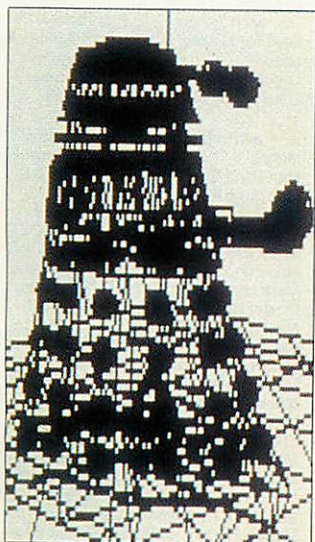
MAY 1993

REVIEWS

Judging characters	21	Forget typing: OCR is here
Old master	25	Masterfile 3: heir to a noble family
Adventure Playgrounds	31	Visiting other worlds in the classroom
Wordz made easy	49	Colton's new word processor
Fanfare for Serenade	51	Serenade: every musician's dream?
Modem times	56	The latest in comms boxes
In brief	59	Quick looks at new releases
Game show	73	Technodream, Sim City and more

PROGRAMMING

Bjorn again	93	Back to the '70s with Pong
Rocky trade	98	Designing a complete game
*INFO	103	A riot of programming ideas
Assembly line	113	Become an Arm expert



EDITOR'S LETTER

In the *Acorn User* office, we know when it's Spring by the size of our postbag. Just one morning in March brought us preview copies of *Knowledge Organiser 2*, *Serenade*, *ProArtisan 2* and the finished version of *Topographer* through the door, so we know that all must be well in the Clares camp. The battle for business supremacy is hotting up with the finished version of *Wordz* from Colton, to be followed soon by the spreadsheet *Resultz*.

And this is only the tip of the iceberg. There are countless other products vying for our attention, which we will be taking a closer look at over the following few months.

So what is the cause of all this springtime activity? Well, we like to think that the *Acorn User* Spring Show on 16 April has done its bit for the cause. There are plenty of new products planned for the show and we give you a last-minute run-down of the exhibitors on page 65.

Plus, on the back page there is a peer into the secret life of a product developer. Is planning and implementing a new release really fraught with tension and drama, or is it all one big yawn? Here is your chance to find out.

Finally, with a look at the latest development in OCR reviewed on page 21, we find copy typing for Acorn owners could become a thing of the past.

Hope you enjoy the issue and the merry month of May.

IC. Donaghay

ICS

051-625-1006

SOFTWARE

APRIL 1993

Beginner's Guide to Wimp Programming
on the Archimedes Sigma vo £13
Birthday Present Topologika £POA
Black Angel Fourth Dim £26
Blitz Arxe £17
BlowPipe Leading Edge £14
Bobby Blockhead vs The Dark Planet Atomic £15

Bookstore, age 7-16 ESM £37
Break 147 & Superpool Fourth Dim £25
Britain by Rail Fisher-Marriott £19
Budget DTP Dabs vo £13
Bug Hunter / MoonDash Minerva £10
Bug Hunter in Space Minerva £10
Business Accounts Minerva £298

C (new edition) Dabs vo £16
– with disc £24
CableNews Lingenuity £136
CADet Minerva £135
Cambridge Pascal Oak £79
Cartoon Collection Micro Studio £16
Casino Minerva £11
Castle of Dreams, age 9+ Storm £22
Cataclysm Fourth Dim £18
Caverns Minerva £10
C Development System RISC £77
Chameleon (new version) 4maton £33
Champions Compilation Krisalis £24
Charts & Graphs Computer Tutorial £17
ChartWell RISC £25
Chatter 4maton £34
Chequered Flag CIS £18
– Extra Circuits CIS £16
Chess 3D Micro Power £21
Children's Graphics Micro Studio £16
Chocks Away Compendium Fourth Dim £27
Chopper Force Fourth Dim £22
Christmas Adventure, age 5-8 Storm £19
Christmas Allsorts Sherston £15
Chuck Rock Krisalis £19
Clip Art Graphics Factory £19
– Vol 1 (General), sprites £19
– Vol 2 (General) / Vol 3 (Animals) / Vol 4 (Sport) / Vol 5 (Characters) each £25
Clip Art Set 1, drawfiles Midnight £28
Clip Art Set 2, drawfiles Midnight £28
CNC Designer V3 for Lathe TechSoft £343
CNC Designer V3 for Lathe and Miller TechSoft £493

CNC Designer V3 for Miller TechSoft £343
Coffee, age 9+ Storm £28
Colour Screen+Mac Human £90
– Arc/Mac Cable Human £24

ColourSep ICS £15
– site licence £45
ColourSep Starter Packs ICS £55
– DeskJet 500 (Mono) £85
– site licence £85
– BJ-10 with Cartridges £115
– site licence £40
– BJ without Cartridges £70
– site licence £34
Compression CC £17
Computer Basics Computer Tutorial £23
Concept Designer Longman £25
Control Logo Longman £25
Converta-Key Triple R £9
Cops Alpine £15
Countdown to Doom / Return to Doom /
Philosopher's Quest Topologika £25
Craftshop 1 4maton £19
Craftshop 2 4maton £19
Creator Alpine £31
Crisis CIS £15
Cross-32 Meta-Assembler Baildon £125
– manual for evaluation Baildon vo £15
Crystal Rain Forest, age 8-11 Sherston £37
Curves Topologika £37

Cyber Chess Fourth Dim £29
Cyborg Alpine £19
DataGraph Topologika £29
Datapower Iota £145
DataVision Silicon £79
DataWord Triple R £15
DBEdit 4maton £28
Decorated Alphabet, sprites Micro Studio £17
Designer V3 TechSoft £193
Designer Intro (not OS 3) TechSoft £75
Designer's Graphics, draw/sprites Micro Studio £16
DeskEdit2 RISC £27
Desktop Assembler Release 2 Acorn £119

Desktop C Release 4 Acorn £180
Desktop Database Iota £52
Desktop Folio ESM £60
– Themes: Christmas, Editors, Maths, Space, World War II each £22
Desktop Office v2 Minerva £95
Desktop Publishing on the Archimedes Sigma vo £13
RISC £18

Desktop Thesaurus Sigma RISC £18

Detect-a-Pet, age 5-11

DFS Reader

DrawBender ICS £10

– site licence £30
Draw_Help Sherston vo £16
Draw Print & Plot Oak £35
Dreamwave EMR £34
Droom Resource £24
Dust Resource £29
DTP Graphics 1 Mono, sprites Micro Studio £15
DTP Graphics 2 Colour Micro Studio £17
DTP Graphics combined Micro Studio £25
DTP Seeds 4maton vo £8
DTP Theme Packs, age 5-16 ESM £35
– Christmas each £29
– Editor's, Maths Fourth Dim £26

Easiword Plus Minerva £54

EasiWriter 2 Icon £115

– Dictionaries: Danish / Dutch / French / German / Italian / Norwegian / Spanish / Swedish / Swiss German / Welsh each £30

Ego: Repton 4 Superior £18

Einstein Ace £106
Elite Hybrid £32
Elucidata (OCR) Irlam £155
– bought with Irlam Scanner £79
Enter the Realm Fourth Dim £18
Equasor CC £37
Ethnic Borders 4maton £10
E-Type Compendium Fourth Dim £18
Euclid Ace £55
Eureka Longman £99
ExcellonDrill Silicon £63
Express Midnight £45
Eye for Spelling ESM £32

Family Favourites (not OS 3) Minerva £11

Farmer Giles Computer Tutorial £16

Farmer Giles II Computer Tutorial £17

Fervour Clares £19

Film-Maker Silicon £63

Fireball II Xtra CIS £9

First Impression Word Processing vo £28

First Logo Longman £24

First Words and Pictures Chalksoft £21

Flare Silica £22

Flexifile Minerva £84

Flight Path, age 9+ Storm £27

Flight Sim Toolkit Simis £31

Fontasy ICS £15

– site licence £45

Fontasy / DrawBender / Placard ICS £30

– site licence £80

FontFX Data Store £9

– site licence £70

Font Pack – Newhall, Starter, Symbol Acorn £35

– each pack RISC £47

Font Pack 1 – Paladin, Swiss B, Symbol B, Vogue CC £24

Font Pack – Avant Garde, Bookman CC £24

Pembroke – each pack CC £24

Food for Thought Sherston £15

Freddy's Folly (not OS 3) Minerva £8

Freddy Teddy Topologika £18

– Balloons & The Zoo Topologika £27

– The Playground Topologika £27

– The Puddle & The Wardrobe Topologika £27

Freddy Teddy's Adventure Topologika £18

Fun School 2 Europress £17

– age -6, age 6-8, age 8+ each £18

Fun School 3 Europress £18

– age -5, age 5-7, age 8+ each £18

Fun School 4 Europress £18

– age -5, age 5-7, age 7-11 each £18

Galactic Dan Fourth Dim £19

Gammplot Minerva £36

Gate Array Design System Silicon £114

Genesis II Oak £99

Genesis Plus Oak £68

Genesis Script Language Oak vo £15

GenIndex Oak £39

GerberPlot Silicon £63

Giant Killer, age 10+ Topologika £29

Giant Killer Support Disc Topologika £24

Glimpse Sherston £10

Gods Krisalis £19

Good Impression Word Processing vo £25

Granny's Garden 4maton £23

Granny's Garden Resource Pack 4maton £15

GraphBox Minerva £57

GraphBox Professional Minerva £104

Graphics on the ARM Machines Dabs vo £15

Graph_IT Sherston £19

Greetings Graphics, draw/sprites Micro Studio £16

Gribbly's Day Out Coin-Age £19

GridIT Widgit £30

Grievous Bodily 'ARM Fourth Dim £18

Guile Dream £24

ESM £49

RISC £9

ICS £10

£30

Sherston vo £16

Oak £35

EMR £34

Resource £24

Resource £29

Micro Studio £15

Micro Studio £17

Micro Studio £25

4maton vo £8

ESM £35

each £29

Fourth Dim £26

Minerva £54

Icon £115

each £30

Superior £18

Ace £106

Hybrid £32

Irlam £155

£79

Fourth Dim £18

CC £37

4maton £10

Fourth Dim £18

Ace £55

Longman £99

Silicon £63

Midnight £45

ESM £32

Minerva £11

Computer Tutorial £16

Computer Tutorial £17

Clares £19

Silicon £63

CIS £9

Word Processing vo £28

Longman £24

Chalksoft £21

Silica £22

Minerva £84

Storm £27

Simis £31

ICS £15

£45

ICS £30

£80

£9

£70

£35

£47

£24

£15

£8

£18

£27

£27

£18

£17

£18

£18

£19

£36

£114

£99

£68

vo £15

£39

£63

£29

£24

£10

£19

vo £25

£23

£15

£104

vo £15

£19

£16

£19

£30

£18

£24

Hard Disc Companion RISC £45

Hearsay II RISC £69

HelixBasic PDK £79

!Help 3 Sherston vo £11

Hero Quest Krisalis £24

Hilghter, age 7-16+ Sherston £42

History Costume, sprites Micro Studio £16

Holed Out Compendium Fourth Dim £18

Home Accounts Minerva £34

HotLink Presenter Lingenuity £19

House of Numbers Chalksoft £20

Hoverbod (not OS 3) Minerva £11

Ibix the Viking (not OS 3) Minerva £11

IC SWI Baildon £15

– bought with Oddule £5

Illusionist Clares £69

Illustrators' Graphics, draw/sprites Micro Studio £16

Image Animator Iota £68

Image OCR Iota £POA

Image Outliner Iota £72

Imagery Palette Studio £70

Imagine (Version 2) Topologika £44

Impact! Circle £47

Impact! Demo Circle £22

Impression CC £123

– network version £650

– site licence £545

– extra hardware key for sites only £15

– extra manual for sites only vo £8

Impression Dabs vo £14

– with disc £17

Impression Borders CC £19

Impression Business Supplement CC £39

Impression Junior CC £69

– site licence £435

– extra manual for sites only vo £7

Insight Longman £68

Instigator Dabs £39

Interdictor 2 Clares £26

Investigator 2 (not OS 3) Leading Edge £21

IronLord UBI Soft £14

Isle of Wight Computer Tutorial £20

Ixion Software 42 £21

James Pond Krisalis £19

Jet Fighter Minerva £10

Jiglet 4maton £19

Jigsaw Iota £45

Junior Database Longman £23

Junior PinPoint Longman £23

Karma Periscope £20

Keyboard Player Chalksoft £17

Keylink Prolog Keylink £69

KiddiCad Oak £59

Kid Pix ESM £35

Knowledge Organiser 2 Clares £84

Krisalis Collection Krisalis £21

Landmarks – Aztecs, Civil War, Columbus, Egypt, Elizabeth I, Rain Forest, Second World War / Victorians each £18

Last Days of Doom / Hezarin Topologika £17

Last Ninja Superior £19

Movaword	Chalksoft	£17
MultiFS	Axe	£27
Multistore version II	Minerva	£154
Myth of Moby Dick	Topologika	£27

Nature Graphics, draw/sprites

Naughty Stories (set of 6)	Micro Studio	£16
Navigators	Sherston	£48
Nebulus	Topologika	£39
Newton	Krisalis	£19
Night Sky	Longman	£20
Nominal Ledger	Clares	£67
Noot	Minerva	£78
Noot Art Disc	4maton	£41
Notate	4maton	£10
Note Invaders	Longman	£42
Number 62 HoneyPot Lane	Chalksoft	£20
Numbers and Pictures	Resource	£29
Numberscope	Chalksoft	£20
Number Zoo, age 3-6	Fisher-Marriott	£19
Numerator	Selective	£14
Numerator Chaos	Longman	£39
	Longman	£18

Oak Logic	Oak	£79
Oak PCB	Oak	£79
Oh No! More Lemmings		
(requires Lemmings)	Krisalis	£15
Ollie Octopus' Sketchpad, age 4+	Storm	£14
Omar Sharif's Bridge	Krisalis	£22
Order Processing/Invoicing	Minerva	£28
Orion	Minerva	£8
Orrery	Spaceteck	£93
Ovation	RISC	£85
Overload	Clares	£13

Paddock	ICS	£10
- site licence		£30
Pandora's Box	Fourth Dim	£18
Pappus	Computer Tutorial	£17
Paradroid 2000	Coin-Age	£22
PC Access	Minerva	£19
PC Emulator 1.8	Acorn	£89
PDT	Oak	£149
Pendown	Longman	£46
Pendown Etoules	Longman	£49
Pendown Outline Fonts	Longman	£19
Pendown Plus	Longman	£68
Personal Accounts	Apricote	£29
Perspectives	TechSoft	£44
Pesky Muskrats	Coin-Age	£19
Phonic Games	Fisher-Marriott	£28
Picture Book	Triple R	£15
Picture III	Applian	£29
- Topic discs	each	£9
PinPoint	Longman	£65
- site licence		£390
PipeDream 3	Colton	£72

PipeDream 4

PipeDriver Dot 1	ICS	£10
Pipe Mania	Empire	£18
Pirate, age 8-14	Chalksoft	£19
Placard	ICS	£10
- site licence		£30
Plague Planet	Alpine	£13
PlayBack	RISC	£19
Play It Again Sam 1	Superior	£20
Plot	Clares	£POA
Podd	ESM	£25
Polyminoes	Topologika	£29
Populous	Krisalis	£22
Poster	4maton	£75
PowerROUTER	Micro	£159
Prehistoric Animals, sprites	Silicon	£16
Premier	Circle	£71
- DataBase	Circle	£25
- WordProc	Circle	£25
Presentation Task Force	£POA	
Presenter GTI	Linguinity	£66
PrimeArt	Minerva	£69
PrimeMover	Minerva	£POA
PrimeWord	Minerva	£54

Printer Drivers, RISC OS:

BJ-10ex / BJ-200 TurboDriver + Cable	CC	£42
	CC	£89
BJC-800 TurboDriver + Cable	CC	£89
Canon BubbleJet, Canon LBP,		
Canon PJ1080, ColourCel, Epson JX,		
Epson ESC-P2, HP, Integrex 132		
- each	Ace	£19
Deskjet 500C, Epson / Star colour		
- each	RISC	£15
ProDrivers: Canon LBP8, Epson ESC-P2,		
HP Colourjet - each	Ace	£37
ProArtisan	Clares	£71
ProArtisan 2	Clares	£POA
ProCAD	Minerva	£394
Programming in ANSI Standard C		
on the Archimedes	Sigma	vo £15
Prophet (requires 2 Mb)	Apricote	£132
Prophet Demo	Apricote	£10
Protext	Amor	£117
Provocator	Computer Tutorial	£15
Puncman 1 and 2	Chalksoft	£16
Puncman 3 and 4	Chalksoft	£16

Puncman 5 to 7		
Punctuate		
Punctuate!		
Purchase Ledger		

Quest for Gold

QuickKey		
- site licence		

Real McCoy 2

Real McCoy 2	Fourth Dim	£25
Real McCoy 3	Fourth Dim	£25
Real McCoy 4	Fourth Dim	£25
Recall, age 8-13	Sherston	£39
Redshift	Minerva	£10
Render Bender 2	Clares	£78
Reporter	Minerva	£29
Repton 3	Superior	£14
Resultz	Colton	£POA
Revelation 1	Longman	£39
Revelation 2	Longman	£75
Revelation 2 CD Rom	Longman	£98
Revelation ImagePro	Longman	£127
Reversals	Chalksoft	£17
Rhapsody 2	Chalksoft	£45

Rhapsody 3

Rhythm-Bed	Clares	£79
RiscBASIC Compiler	Clares	£39
RiscForth Compiler	Silicon	£79
Risc OS Companion Vol 1	Silicon	£79
Risc OS Extras 1992	Oak	vo £49
Risc OS Programmer's	Acorn	£9
Reference Manual	Acorn	vo £79
Risc OS Style Guide	Acorn	vo £11
RoboLogo	Silicon	£39
Round the World Yacht Race, age 9+	Storm	£27

Sales Ledger

Saloon Cars Deluxe	Minerva	£78
- Deluxe Extra Courses	Fourth Dim	£25
S-Base Developer	Fourth Dim	£26
S-Base Developer Plus	Longman	£175
	Longman	£275

S-Base Personal

	Longman	£95
--	---------	-----

Schema	Clares	£95
Schema 2	Clares	£POA
Science, drawfiles	Micro Studio	£25
Score Draw	Clares	£44
Scorewriter	EMR	
- PMS Dot matrix, Version 1		£127
- PMS Dot matrix, Version 2		£147
- PMS PostScript		£422

ScreenPlay	Widgit	£35
ScreenTurtle	Topologika	£44
Search and Rescue, age 9+	Storm	£27
Seashore Guide, drawfiles	Micro Studio	£16

Serenade

	Clares	£109
--	--------	------

Sesame Street

- Letters for You	Electric Crayon	£16
- Numbers Count		£16

ShapeFX

ShareHolder	Data Store	£10
ShareHolder Professional	Silicon	£106
Shylock Gnomes, age 10-15	Silicon	£234
Sim City	Selective	£16
SkyHunter	Krisalis	£24
smArt	Longman	£22
	4maton	£50

smArt Aliens, Animals, Dinosaurs, Egypt,

Faces*, Fantasy, Fashion, Fiddles &		
Drums, Heraldry, Homes*, Leisure*, Look		
Smart, Smartoons, Trees and Gardens		
*Please specify English, French, German,		
Spanish or Welsh - each	4maton	£15

smArtFilter

smArt Modern Languages	4maton	£19
------------------------	--------	-----

Smudge the Spaniel, age 4-8

Snippet (new version)	Storm	£20
-----------------------	-------	-----

Soapbox

SolidCAD	4maton	£32
SolidsRender	Xavier	£34
SolidTools	Silicon	£79
Sound Engineer	Silicon	£79
Sound FX Maker	EMR	£69
Spark	CIS	£31
SparkFS	David Pilling	£5
Sparkle	David Pilling	£20
Special	Morley	£59
- site licence	ICS	£10
		£30

Speech!

Spelling week-by-week	Superior	£14
-----------------------	----------	-----

Spex

Spheres of Chaos	Chalksoft	£21
------------------	-----------	-----

Splash, age 7-11

Splice	ExplAN	£98
	Matt Black	£19
Split an Image	Sherston	£19
Spoken Word	Ace	£29
Spooler	Sherston	£15
Sporting Triangles	Wyddfa	£16
SportsDay	Computer Tutorial	£9
SportsPeople	CDS	£19
SpriteEd	Selective	£22
SpySnatcher	Selective	£22
Square Route	Computer Tutorial	£17
	Topologika	£12
	Computer Eyes	£16

Chalksoft	£18
Xavier	£31
Topologika	£25
Minerva	£78

Krisalis

ICS	£19
	£10
	£30

Fourth Dim

Fourth Dim	£25
------------	-----

Fourth Dim

Fourth Dim	£25
------------	-----

Superior

Superior	£14
----------	-----

Tabs

Tabs	£95
------	-----

Talking Pictures

Talking Pictures	£16
------------------	-----

Target Maths

Target Maths	£15
--------------	-----

Technodream (Nevryon 2)

Technodream (Nevryon 2)	£15
-------------------------	-----

TechWriter

TechWriter	£159
------------	------

ThinkLink

ThinkLink	£29
-----------	-----

ThinkSheet

ThinkSheet	£38
------------	-----

Thundermonk

Thundermonk	£11
-------------	-----

Tiles

Tiles	£16
-------	-----

TimeShare

TimeShare	£19
-----------	-----

Timetabler

Timetabler	£549
------------	------

Time Traveller

Time Traveller	£27
----------------	-----

TinyLogo/Draw

TinyLogo/Draw	£POA
---------------	------

TinyPuzzle

TinyPuzzle	£34
------------	-----

Titler

Titler	£119
--------	------

Toolkit Plus

Toolkit Plus	£36
--------------	-----

Tools Graphics, drawfiles

Tools Graphics, drawfiles	Micro Studio	£23
---------------------------	--------------	-----

Top Banana

Top Banana	Hex	£19
------------	-----	-----

Topographer

Topographer	Clares	£67
-------------	--------	-----

Touch Type

Touch Type	Iota	£39
------------	------	-----

Tower of Babel

Tower of Babel	Cygnus	£17
----------------	--------	-----

Trace

Trace	David Pilling	£5
-------	---------------	----

Tracer

Tracer	Midnight	£46
--------	----------	-----

Tracker

Tracker	Leading Edge	£37
---------	--------------	-----

Transport, drawfiles

Transport, drawfiles	Micro Studio	£25
----------------------	--------------	-----

Tween

Tween	CIS	£20
-------	-----	-----

Twin

Twin	Ace	£28
------	-----	-----

Twin World

Twin World	Acorn	£24
------------	-------	-----

TWO (Task and Window Organiser) ICS

TWO (Task and Window Organiser) ICS	UBI Soft	£14
-------------------------------------	----------	-----

- site licence

- site licence	ICS	£10
----------------	-----	-----

TypeStudio

TypeStudio	RISC	£39
------------	------	-----

Utility Disc 1

Utility Disc 1	Data Store	£8
----------------	------------	----

Utility Disc 2

Utility Disc 2	Data Store	£13
----------------	------------	-----

Utility Disc 3

Utility Disc 3	Data Store	£7
----------------	------------	----

Utility Collection

Utility Collection	Data Store	£21
--------------------	------------	-----

Vector

Vector	4maton	£75
--------	--------	-----

ViewMac 3

ViewMac 3	Human	£65
-----------	-------	-----

- Arc/Mac Cable

- Arc/Mac Cable	Human	£24
-----------------	-------	-----

Viewpoints, age 7-12

Viewpoints, age 7-12	Sherston	£37
----------------------	----------	-----

Vox Box

Vox Box	Clares	£46
---------	--------	-----

Waterloo (not OS 3.1)

Waterloo (not OS 3.1)	Turcan	£19
-----------------------	--------	-----

Whale Facts

Whale Facts	Topologika	£34
-------------	------------	-----

WindowEd

WindowEd	Armen	£27
----------	-------	-----

Word Bank

Word Bank	Topologika	£25
-----------	------------	-----

"You wonder how you ever managed without QuickKey."

NOW ONLY £10

"Congratulations on ColourSep! The results, compared with the drivers currently available, are bordering on the fantastic."

NOW ONLY £15



"TWO is the best thing I've ever bought."

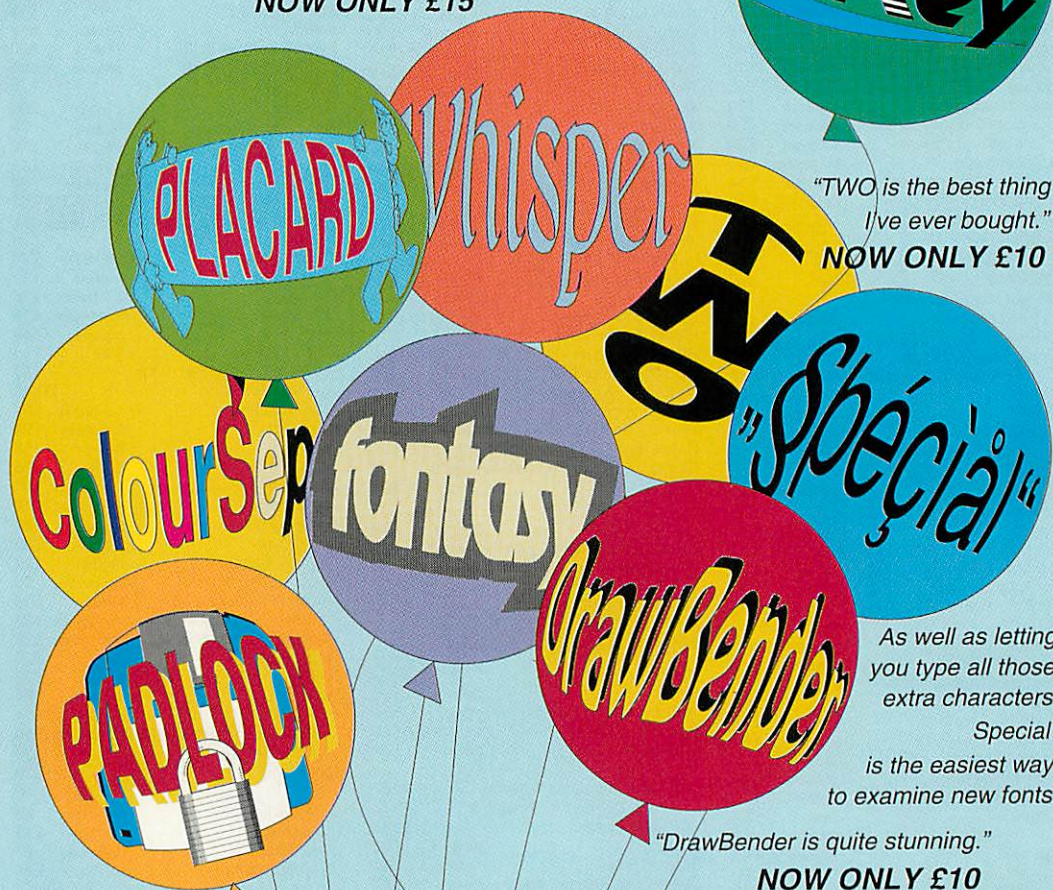
NOW ONLY £10

PRINTERS...

ArcLaser 300-6	Calligraph	£895
ArcServer 300-8	Calligraph	£985
Bubble Jet BJ-10ex	Canon	£187
Bubble Jet BJ-10ex + TurboDriver	Canon/CC	£219
Bubble Jet BJ-20	Canon	£255
Bubble Jet BJ-200	Canon	£282
Bubble Jet BJ-300	Canon	£325
Bubble Jet BJ-330	Canon	£405
Bubble Jet BJC-800 + TurboDriver	Canon/CC	£1499
DeskJet 500	Hewlett-Packard	£299
DeskJet 500C	Hewlett-Packard	£375
DeskJet 550	Hewlett-Packard	£475
Laser Direct HiRes4 with 50-sheet tray	CC	£899
- 250-sheet Paper Cassette	CC	£99
Laser Direct HiRes8	CC	£1275
Laser Direct LBP-4 Card	CC	£325
LBP-4	Canon	£659
Refill toner cartridge for Canon EPS		£50
New toner cartridge for Canon LBP-4		£59

SCANNERS, DIGITISERS...

ArcScanner including Epson GT-4000	Clares	£1660
Colour Converter	Lindis	£145
FaxScan	Spacetech	£94
Handipad	TechSoft	£173
Hawk V9	Wild Vision	£199
- A3000 version	Wild Vision	£278
Hawk V9 MkII	Wild Vision	£259
HiVision Digitiser Colour	HCCS	
- A3000 External		£137
- A3000 Series / A4000 Internal		£124
- A5000 / 300 / 400		£124
- Upgrade from Vision		£45
iImage (Sharp JX-100)	Iriam	
- for A5000		£490
- for other computers		£589
Image Scanner	Iota	£383
- Colour Upgrade Kit	Iota	£239
- Fast Parallel Card	Iota	£98
i-Scan 200	Iriam	£539
i-Scan 400	Iriam	£589
Pineapple Colour Video Digitiser	Pineapple	£195
- A3000 boxed	Pineapple	£230
ProImage (Epson GT6000)	Iriam	
- for A5000		£989
- for other computers		£1089
Scan-Light A4	CC	£277
- with Sheet Feeder	CC	£360
Scan-Light 256	CC	£190
- A3000 internal	CC	£190
Scan-Light Professional	CC	£565
- as above + SCSI interface	CC	£699
SnapShot Colour Video Digitiser	Lingenuity	£195
- A3000 version	Lingenuity	£275
Spectra	RISC	
- Archimedes / A5000		£545
- A3000 Series / A4000 Internal		£545
- A3000 External		£555
Vision Digitiser	HCCS	
- A5000 / 300 / 400 Mono		£48
- A5000 / 300 / 400 Colour		£76
- A3000 External Mono		£60
- A3000 External Colour		£89
- A3000 Series / A4000 Internal Mono		£48
- A3000 Series / A4000 Internal Colour		£76



Padlock is our top seller for simple disc security.

"Fantasy offers a wider range of effects than FontFX. It is a package for the perfectionist, whether professional or enthusiast."

NOW ONLY £15

"DrawBender is quite stunning."

NOW ONLY £10

As well as letting you type all those extra characters, Special is the easiest way to examine new fonts.

HOW TO ORDER

VAT: Zero-rated items are marked V0. UK customers please add 17.5% to all other prices. EC customers outside the UK (including BFPO) please do the same unless you are VAT registered, in which case quote your international VAT number. Ours is GB 595 7258 84.

CARRIAGE IS FREE WITHIN MAINLAND UK IF YOU PAY ON ORDERING.

Overseas carriage: If you are paying by credit card we will add airmail and insurance at cost. Otherwise please add £6 (Europe) or at least £12 (elsewhere) for each software item and send a pounds sterling bank draft payable at a London clearing bank, or Eurocheques for not more than £100 each.

Credit cards are welcome. We do not charge your account until your order is fulfilled. Your name and address must be as known to the credit card company. If you are leaving an order on our answering machine please include your telephone number, the expiry date of your card, and your calculation of the total payment due. We will make no charge for credit card commission unless we have informed you first.

Official orders are welcome from UK government and educational institutions. Payment is due in 14 days. Invoices are subject to carriage and late payment charges.

Site licences are available for most products. Please check our prices.

All products, prices and specifications are offered in good faith and are subject to change without notice. We process all orders immediately, but suppliers do sometimes keep us waiting. Goods are guaranteed but we do not supply them on approval. Returns and cancellations can only be accepted by prior agreement and there may be a charge to cover the costs involved.



AUTHORISED ACORN DEALER

ICS (Ian Copestake Limited)

Dept B42, 1 Kington road, West Kirby, WIRRAL, Merseyside, L48 5ET

Tel: 051-625 1006

Fax: 051-625 1007



TESCO OFFERS SCHOOLS BARGAINS

ONCE again, schools are preparing to go to extraordinary lengths to cash in on this year's Tesco deal. As it did this time last year, Tesco will donate a voucher, exchangeable for Acorn software and hardware, for every £25 spent in one of its stores.

This year, the scheme promises to be even more successful than it was last time. 'Last year the scheme was a bit of an unknown quantity and people were wary of its value. This year, schools are well prepared to get out there and really motivate their local communities to collect as many vouchers as possible,' said a Tesco representative.

The 1993 scheme was launched by Sarah Green, the BBC presenter of *Going Live*. Schools have until May 23 to collect Tesco vouchers and vouchers can be donated to your chosen school; you don't have to be a parent or teacher to join in.

Acorn User will be doing its bit and collecting for a local London school, so if you have any spare vouchers out there, send them into us at Tesco Offer, *Acorn User*, Redwood Publishing, 101 Bayham Street, Camden Town, London NW1 0AG.



Tesco's voucher scheme covers even more products than last year

This year's Tesco scheme covers a much wider range of Acorn products. The A4 portable (5,800 vouchers), Pocket-Book (1,200 vouchers), A3020 2Mb HD60 (3,500 vouchers),

and CD-Roms are all included. For a full-colour brochure about the scheme, contact the Computers for Schools office at 59 Russell Square, London WC1B 4HJ.

BEEB HACKER ACQUITTED

IN A celebrated court case that has furnished the basis of a contemporary moral panic, Paul Bedworth, a hacker who used his BBC Model B to infiltrate computer systems all over the world, has been found not guilty on all counts.

Bedworth admitted to unauthorised use of computers and telecommunications services including systems at *The Financial Times*, European Community offices, universities and medical bodies.

While there is no doubt that Bedworth's activities caused many of these bodies considerable financial outlay – including £20,000 in phone bills by the *FT* – his successful defence case was based on the

idea that he was an obsessive and compulsive personality incapable of social skills; hence he related only to computers and people he communicated with via bulletin boards.

The result has been a spate of scare stories that may have brought a smile to the lips of many Beeb owners. Possibly the most lurid headline, 'Computers turned my son into a robot', was featured in the *Daily Mirror*, but most of the major dailies managed to work themselves up into a self-important frenzy.

So ask yourself: do you spend a little too much time with your model B? If so, isn't it time you upgraded to 32-bit?

COMPUTER LOGIC

RMD, a new software company producing programs for the Archimedes, has been set up by two electronics engineers, Roy McDermott and Mark Derbyshire, to produce logic training software for those studying electronics.

RMD's first release is *LogiSim*, a digital logic simulator. Two and three input AND, OR, NAND, NOR, EOR gates plus NOT, JK flip-flop, low frequency clock source, counters, LEDs and switches are emulated. *LogiSim* is priced at £10 including P&P, and is available from RMD at 12 Padstow Road, Greasby, Wirral, L49 3AQ.

IN BRIEF

● Acorn will again be exhibiting at this year's Ideal Homes Exhibition at Earls Court in London. The Acorn stand (312C) is on the first floor of the exhibition centre and features the usual array of Archimedes computers, plus Lotus Turbo Challenge and a special section dedicated to Midi music making. The exhibition runs until 12 April.

● Apricote Studios, which hails from Manea near Cambridge, has netted a prestigious deal in New Zealand. Apricote's *Prophet* accounting package is to be bundled by Acorn New Zealand in its A4000 Home Office promotion.

Prophet will complement Icon Technology's *EasiWriter 2*, which is also featured in the Home Office System. The two applications work together using a mail merge feature. Australian, New Zealand, Canadian and Dutch versions of *Prophet* now supplement the UK version. Apricote is on (0354) 78432.

● Two new software releases for the education market have been released by Selective Software. *Number Zoo*, aimed at children between ages 3 and 6, is a program for initial teaching of numbers. Graphical games help to maintain kids' attention.

Number Zoo is priced at £16.45 inclusive. *Sports People* is a management program for schools and clubs to plan and organise sports events around individual competitors. The package is designed to complement the earlier *Sports Day* package which managed team events. *Sports People* is priced at £26.44 inclusive and is compatible with Risc OS 3.1. Selective Software can be contacted on (0458) 43079.

● PDK Technologies has announced *HelixLogic*, an editing environment for designing electronic logic gate layouts. *HelixLogic* can also simulate a design and allow input states to be changed and so reveal any resulting changes. Layouts can be exported in *Draw* file format and truth tables are automatically generated. *HelixLogic* is priced £24.95. For further details call PDK on (0525) 403541.

NOW



DISC PARTITIONS

2 Mb/sec speed barrier broken
by ICS IDE filing system!
So fast, they're calling it

WIZZO (it's magic)

Now also available as a plug-in
filing system on rom -

WIZZO4 for the A4, and
WIZZO5 for the A5000

LAUNCH PRICE ONLY £29

MULTI-LEVEL
PASSWORD
PROTECTION

AFFORD

PRICE CUTS

on all ideA hard discs

e.g. Archimedes Internal 120 Mb £299
A3000 Series Internal 80 Mb £325
A3000 Series Internal 20 Mb £189
A3000 Series Internal 209 Mb £649
540 Mb IDE Hard Disc £825

'Phone us for latest prices!

RISC OS 3
COMPATIBILITY

BEST

ICS

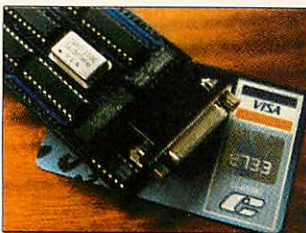
051-625 1006

LASER PRINTING FOR LESS OUTLAY

HCCS intend to reduce the price of their latest card by £100 when it is launched at the Acorn User Spring Show in Harrogate.

The new Laser Express direct-drive printer card allows the use of one of the least expensive laser printers around: the Canon LBP4 model called the Lite, which costs around £500.

Laser Express is compatible with low-priced Canon LBP4 Lite printers thanks to a new video interface. Laser Express are also the first direct drive laser printer controller card that can be fitted to practically any 32-bit Acorn machine, with the only notable exception being the Acorn A4 laptop. This flexibility is due



HCCS' card works with any Acorn



Canon LBP4 Lite can now be driven by HCCS' micropodule

to the fact that Laser Express is a micropodule that is compatible with the HCCS Ultimate Expansion System. MultiPodule adapters for MicroPodules cards are available for 'full-size' Acorn machines like the A300/400/540 and A5000, as well as the compact A3000/4000 ranges.

The normal price for a Laser Express card is £249+VAT. An Ultimate starter pack which

includes the MultiPodule adapter is priced at £269+VAT. For the show you will be able to purchase a starter pack for just £199+VAT, and this includes a Canon video interface worth £30.

The offer is strictly for show visitors. For more details contact HCCS on 091-487 0760. The Canon LBP4 Lite printer is available from several Acorn dealers.

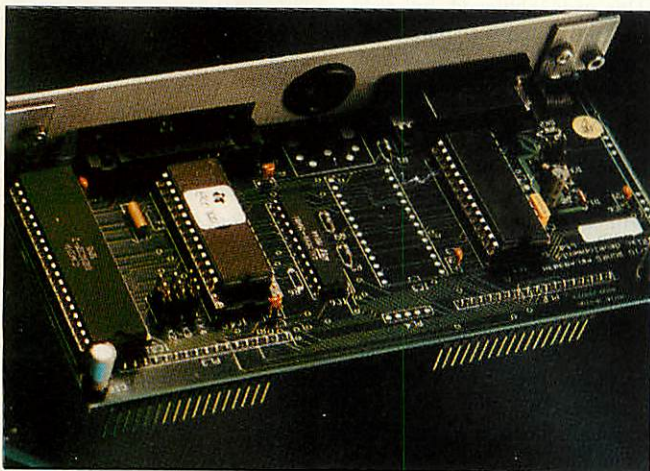
NET PRICES ANNOUNCED

RISC Developments has announced more details of its new networking cards.

The combined User Port, Analogue and Econet A3000/4000 minipodule costs £79.95+VAT. A boot Rom can be fitted to enable the card to boot from an AUN (Acorn Universal Network). The card is also available without the Econet interface for

£44.95+VAT. The full-size podule (A300/400/540/5000) as well as the A3000/4000 minipodule versions of the new Ethernet cards will cost £139+VAT.

Alternatively an internal A4000/3020 network card, which doesn't take up a minipodule slot, costs £159+VAT. Risc Developments is on (0727) 840303.



Risc Developments' net cards work with any kind of set up

THE STATE OF COLOUR

AN upgrade to State Machine's G8 Plus colour card allow it to be Replay-compatible, with full animation in true 16 bits per pixel 32K colour.

A TrueView application is supplied to display 24 bits per pixel colour clear files. TrueView also lets the user pan and scale images larger than the screen area. Along with TrueView also comes ARMovie, licensed from Acorn.

State Machine say that the card is the only solution offering 25 frames per second animation in true colour on the Arc. There is even a 50 frames per second option at a resolution of 384x288 pixels which offers flicker-free viewing. The upgrade cost is a £30+VAT option to new customers, while existing G8 users can upgrade for £20+VAT.

For more details, contact State Machine on (0582) 483377.

IN BRIEF

● Ayrshire-based software house Micro-Aid has released the latest version of its Payroll application just in time for the new tax year. Payroll is available for both eight-bit BBC micros and Risc OS machines.

The program can now handle the latest 'K' code specifications, in line with latest government legislation. Pre-printed payslip stationery produced by Micro-Aid is an option.

Payroll remains priced at £59.95 including VAT and there is an annual registration fee of £34. Micro-Aid can be contacted on (0465) 82288.

● John Reed, the editor of the amateur Illusions disc-based magazine for Archimedes users has contacted Acorn User with details of a new address and lower prices for the Illusions compilation discs, down from £6.95 to £4.95.

The second Illusions compilation disc is now available and contains around 40 articles from the first five issues of Illusions, plus some extras. John has also asked Acorn User readers not to phone the number that was published in our March issue. Instead, John can be contacted at 20 College Road, Wembley, Middlesex HA9 8RL.

● With the interest in Arm Risc chip technology currently soaring, what better time to publish a definitive guide to programming the Arm chip?

This is precisely what Alex van Someren and Carol Atack have done. The book even has the seal of approval from Arm Ltd, who advised the two authors during the book's creation.

The Arm Risc Chip - A Programmer's Guide, is an up to date reference work on how to program the Arm processor, and all the latest variants of the chip including the Arm250 and the very latest in the Arm6-series are covered. Co-author Alex is already well-known to many Acorn User readers via his products: the Aleph One Arm3 upgrades and Archimedes PC cards. The book will be published by Addison-Wesley in May, and has a provisional price of £24.95. The ISBN number is 0201 624 10-9. Addison-Wesley can be contacted on (0734) 794000.

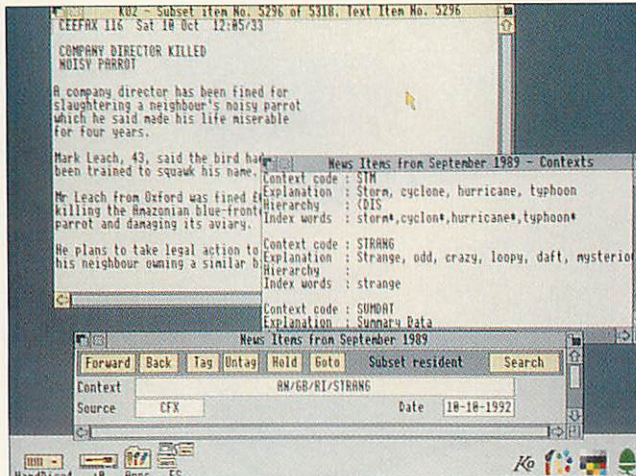
CLARES ORGANISES KNOWLEDGE

WITH a whole catalogue of new releases, Clares Micro Supplies looks set to be one of the central attractions at the *Acorn User Spring Show* in Harrogate. After the recent release of the 16-track *Serenade* sequencer as well as *Rhythm-Bed V1.27*, Clares is now putting the final touches to *Knowledge Organiser 2* and *Topographer*, with a selection of packages including *ProArtisan 2*, *NightSky*, *Rhapsody 3*, *Plot* and *Schema 2* to follow soon.

Knowledge Organiser 2 is a completely revised version of Clares' innovative textual information tracking application. Unlike its predecessor, *KO2* is fully Risc OS compliant. Information can be in a variety of formats, from Ascii text to viewdata, and can be searched in database fashion and arranged logically.

Also featured is data sharing and hypothesis testing. *Knowledge Organiser* is a fairly unique kind of application, so Clares has provided demonstration version for the uninitiated. *KO2* is priced £99.95 including VAT.

Now promised for release in the summer, the long-awaited Clares' *Schema 2* spreadsheet



Clares' Knowledge Organiser is a unique sort of application

will have the following new features: upwards compatibility with Acorn's *Advance* integrated spreadsheet application, economical use of memory and better performance, better spreadsheet publishing features and graphs hotlinked to spreadsheet data. It will be usable on 1Mb machines and the proposed price is £135.

Plot is scheduled to be released on May 1st priced £79.95. The program is a comprehensive charting application which features cartesian, cylindrical and spherical coordinates. A wide

selection of 2D and 3D plotting options are available.

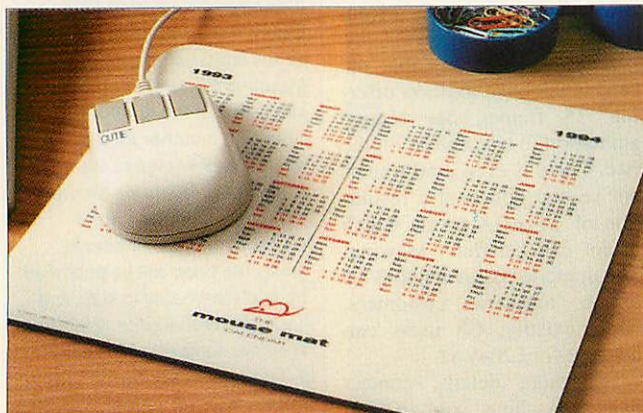
Clares' *Rhapsody 3* music notation package is described as a major enhancement over *Rhapsody 2*, though the latter will continue as a low-cost alternative alongside the newcomer.

Added goodies in *Rhapsody 3* include guitar chords, a quick edit panel, a wider range of note styles, automatic bar checking and instrument names. *Rhapsody 3* has a proposed price of £99.95. For more details, contact Clares Micro Supplies on (0606) 48511 or see them at the show.

MAKE THAT A DATE

SHIELING Technology has come up with one of those ideas which makes people wonder why they hadn't thought of it in the first place. This one is a mouse mat with a calendar on it. The mat in question covers two years and has a high-durability but non-

slip PVC surface. The mat is colour coded beige to match most desktop computers. At £7.95 including VAT and postage it isn't exactly cheap, but it's certainly a novel idea. For more information, contact Shieling Technology on (0252) 519224.



Shieling's mouse mat: an idea whose time has come?

NEW SPEED PC CARD

ALEPH One has managed to improve the communication performance between its range of PC cards and a host Archimedes by around 50 percent. This was achieved by redesigning some of the card's custom chips.

The benefits are mainly better graphics performance, an area in which the PC card had been least impressive. New Aleph One PC Card supplies will have the new chips as standard but unfortunately the upgrade for older cards is not a DIY job.

Instead, existing customers can opt for a special upgrade service. The £25+VAT deal includes the chip swap and courier collection and return of your card. Contact Aleph One on (0223) 811679.

IN BRIEF

- A combined audio/motion video capture and still-frame video digitiser card is being developed by Brain Software.

The card can sample sound to a resolution of 13 bits. The real time video capture function stores digitised video in a non-compressed format which can then be compressed into an Acorn Replay compatible file format.

In addition, the card can be used as a high-quality video digitiser with hardware dithering. An early prototype of an A3000 minipodule was shown at the Bett Show in January and a full-size podule version will also be produced. It's not yet certain who will market the new cards, though the prototype was spotted on the Technomatic stand at Bett.

- Micro Laser Designs in Bristol is now offering a high quality colour laser printing service to Archimedes users. Prints can be up to A3 in size and images can be supplied in *Impression 2*, *Art-Works*, *Draw* or *Paint* sprite formats. The firm also does imagesetting to film, bromide or Plazar Plate. Micro Laser Designs is on (0761) 453308

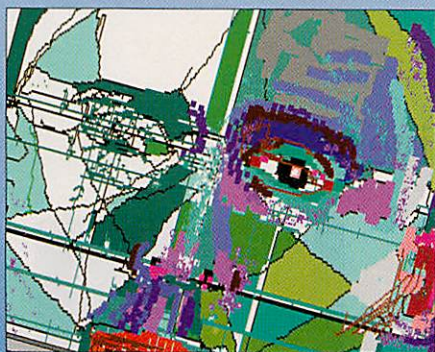
- Cambridge International Software (Amsterdam) has announced it is to be the sole distributor for Acorn software and upgrades in Holland. CIS Amsterdam will complement ECD Computers Delft, which has been Acorn's long-running official agent in Holland.

CIS Amsterdam has just released its new disc sector backup utility *BackMan*, soon to be available in the UK for £9.95. CIS Amsterdam can be contacted in Holland on (01031) 20 620 6858.

- Intelligent Interfaces Ltd, based in Eastleigh, Hampshire, has taken over the marketing and support for what used to be release 2 of Acorn's Fortran 77 compiler package.

The company is well known for its Fortran-based Gino graphics libraries for the Archimedes. One of their first tasks, they say, is to completely revise the manual. It's Fortran 77 package is priced £99+VAT. Intelligent Interfaces is on (0703) 261514.

REVELATION ImagePro



‘Revelation ImagePro contains just about every feature that you could imagine to aid in the preparation of pictures and enhancement of existing images.’

‘At an amateur or professional level, ImagePro suits the needs of both.’

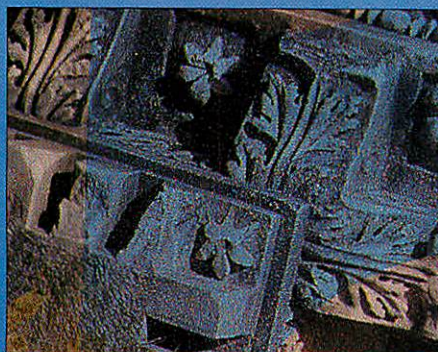
Peter Clements, Archimedes World

‘If you want this kind of package, then ImagePro is the one to buy... It's a superbly professional application.’

Richard Hallas, RISC User



STATE OF THE ART PAINT AND IMAGE PROCESSING



Create sprites in 2, 4, 16 or 256 colour modes (including new standard palette high-resolution modes now supported by third-party graphics cards).

Tools include user defined brushes, sprays, bristle and other painting effects.

Over 100,000 dithered colours under RISC OS 3.

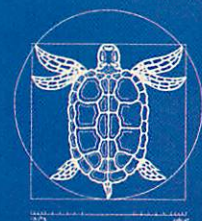
Fully editable graduated blends giving antialiased effects, directional graduations and image superimposition.

Variable sensitivity tracing, blurring, sharpening, dithering and mosaic effects.

Control over hue, saturation and contrast on whole images, selected colours or selected areas.

Internal colour processing at 24 bits per pixel (dithered onto standard 8 bit sprite).

Tint, RGB and CMYK colour models.



LONGMAN
LOGOTRON

Revelation ImagePro — £139 Single User pack
£400 Educational Site Licence
£600 Business Site Licence (per 16 users).

124 Cambridge Science Park, Milton Road, Cambridge CB4 4ZS
Tel: (0223) 425558 Fax: (0223) 425349

Instructional Videos at amazing savings

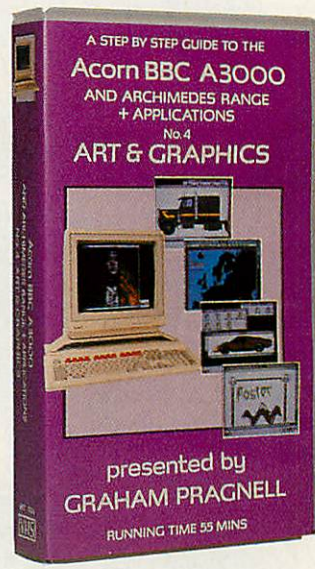
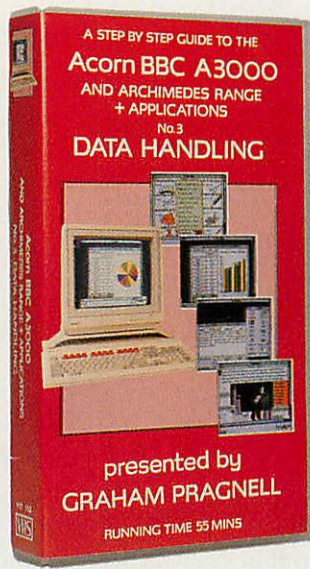
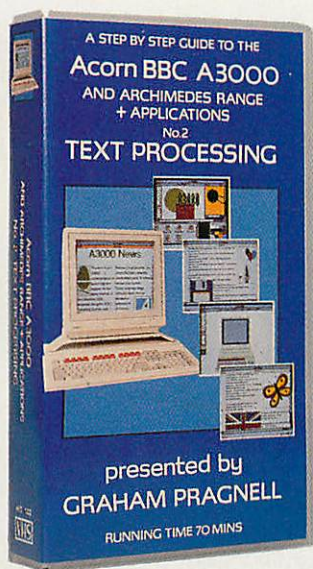
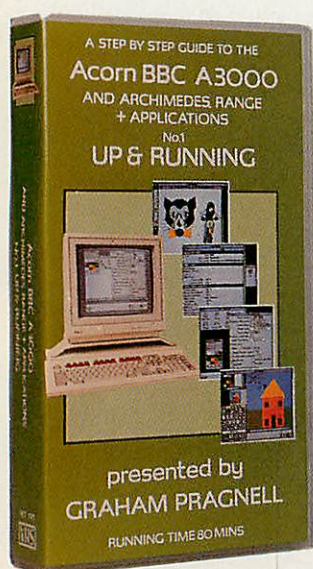
For the
BBC A3000 /
Acorn Archimedes

Normal price £14.99 available exclusively to readers of

Save
£5 per video

BBC
ACORNUSER

at only £9.99 each including delivery



1. Up & Running

An introduction to your easy to use, powerful multitasking BBC A3000 / Acorn Archimedes.

This video features:

- How to load and run software
- How to save to disc
- How to print
- How to edit text through *Edit*
- How to handle graphics through *Paint and Draw*

2. Text Processing

Word processing offers easy text manipulation for highly polished results, while Desktop Publishing offers a variety of page formats and the use of diagrams and pictures

This video features:

- *First Word Plus*
- *Phase#2*
- *Ovation Professional DTP*
- *Technoscan II*

3. Data Handling

Your BBC A3000 / Acorn Archimedes offers powerful data processing coupled with professional graphic display

This video features:

- *Data Sweet*
- *Squirrel*
- *Schema*
- *Genesis*
- *Magpie*

4. Art & Graphics

Speed and ease of use makes the multitasking BBC A3000 / Acorn Archimedes computer superb for art and graphics. Effects can be created and undone at the touch of a button. Make full use of the 256 - colour palette that the machines put at your fingertips.

This video features:

- *Paint*
- *Revelation*
- *Poster*
- *Technoscan II*

Order Form

FREE DELIVERY

	PRICE	QTY	TOTAL
1. UP AND RUNNING	£9.99		
2. TEXT PROCESSING	£9.99		
3. DATA HANDLING	£9.99		
4. ART & GRAPHICS	£9.99		
TOTAL VALUE			

AU/5/93

ORDER HOTLINE - CALL 0937 842489

Please debit my Access/Visa Card No.

To the value of £

Signature

Expiry Date

Name on card



Name.....

Address.....

Postcode.....

Tel:

or I enclose a cheque/postal order for £

Made payable to: Redwood Publishing Ltd.

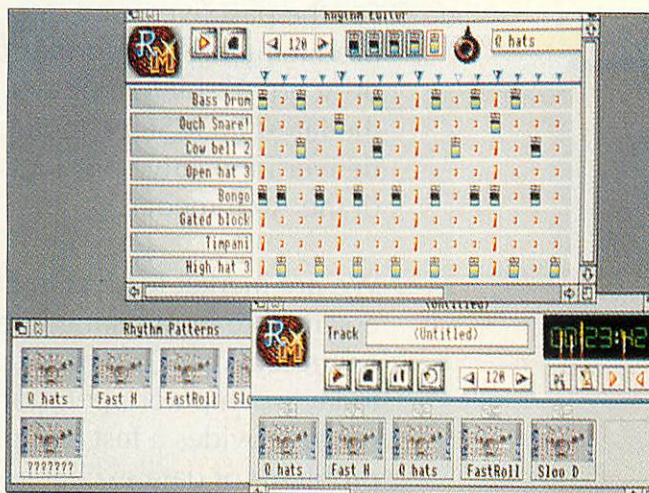
PO Box 66, Wetherby, West Yorkshire, LS23 7HL

Please allow 10 days for delivery

ECS RECOMPOSES MIDI PACKAGE

EXPRESS Software Projects in Nottingham has released a new version of its *Compose World* Midi package with faster graphics, better icons and the more Midi instrument sounds. Upgrades are available for £5 to existing users who return their original disc. *Compose World* is priced at £48+VAT.

ESP has also announced *Rhythm Maker*, a grid-based pattern sequencer for Midi. It is compatible with both internal Archimedes sounds and external Midi instruments. *Rhythm Maker* costs £34+VAT. ESP can be contacted on (0602) 295019.



ECS's Rhythm Maker: the new grid-based sequencer

SPEEDING UP THE ARM

THE A3010, A3020 and A4000 can now run up to 40 percent faster, courtesy of a Turbo Ram enhancement from Simtec Electronics. This means smoother desktop operations and faster redrawing and printing, and should allow Replay movies to be played back at full speed in mode 28.

Rather than replace the standard Arm chip with a faster Arm3, Simtec's solution leaves the original Arm250 *in situ* and replaces the Ram with a faster type of memory chip, enabling the processor to be driven faster. Simtec says the performance jumps from 7

mips (million instructions per second) to 10mips. A 25Mhz Arm3 produces almost 13mips.

As a motherboard modification accompanies the plug-in Ram upgrade, the whole computer must be sent in for the work to be carried out. The upgrade cost is £129 and fitting costs £15 plus carriage. Call Simtec for more details.

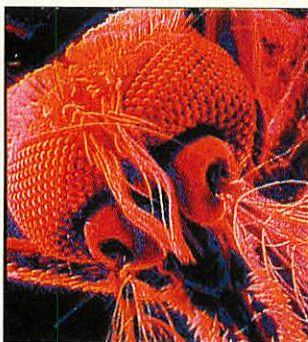
● Simtec has reduced the price of its Arm3 upgrade which features a socket for the soon-to-be released Arm FPA10 floating point accelerator. The new price is £165+VAT. Contact Simtec on (0772) 812863.

MORE CREEPY CRAWLIES

CUMANA has announced two more CD-Rom software bundles. The first pack consists of four CD-Roms; *Dictionary of the Living World*, *Creepy Crawlies*, *Image Warehouse* and *Grooves*.

Creepy Crawlies takes the user on a voyage of discovery through the world of bugs, beetles and spiders, etc. *Grooves* contains 90 tracks of royalty-free music ranging from classical to modern jazz.

Image Warehouse is a library of hundreds of full illustrations, smaller clip art pictures and scanned photographs suitable for all sorts of applications from decorating your desktop to brightening up a DTP document.



The price is £299+VAT each, but education customers can have a £50 discount.

The second pack is a subset of the first and £50 cheaper because it doesn't include *Dictionary of the Living World*. Cumana can be contacted on 081-547 3418.

SHARP DEAL

SHARP, has been signed up as the third manufacturer of Arm chips. The deal gives Sharp the right to produce and market Arm chips like Risc, and video processor chips.

Arm Ltd's managing director, Robin Saxby, said: 'We are very pleased to make this announcement since it extends the technologies associated with Arm architecture.' Saxby added that his company's goal of licensing Arm technology in the three key areas, the USA, Europe and Japan, had now been realised.

Sharp's executive director, Hiroshi Inoue, said: 'The licensed Arm products allows Sharp to open up the 32-bit microprocessor market. By using an Arm product as a core part, system-on-chip devices from Sharp will be enhanced to make many kinds of small-sized, yet high-performance, products become reality.'

This is probably a hint at Sharp's plans to build its own range of personal digital assistants or PDAs, the pocket sized computers that use artificial intelligence and handwriting recognition.

Sharp has already secured a deal with Apple to manufacture the Newton PDA, which is also Arm-based.

The other manufacturers that are already involved in Arm production are VLSI Technology in the USA and GEC Plessey Semiconductors in the UK.

IN BRIEF

● The Arm Club user group now has a Freepost address. If you would like further information about Arm Club activities, they can be contacted at The Arm Club, FREEPOST (ND6573), London, N12 0BR.

● Dudley College is celebrating the installation of a new, larger and more reliable hard disc system on its educational view-data online host system by making its entire library of *Ample* music files available for anyone to download. *Ample* music files work with the Hybrid Technology music synthesizer system which has been running on eight-bit BBC micros for many years now.

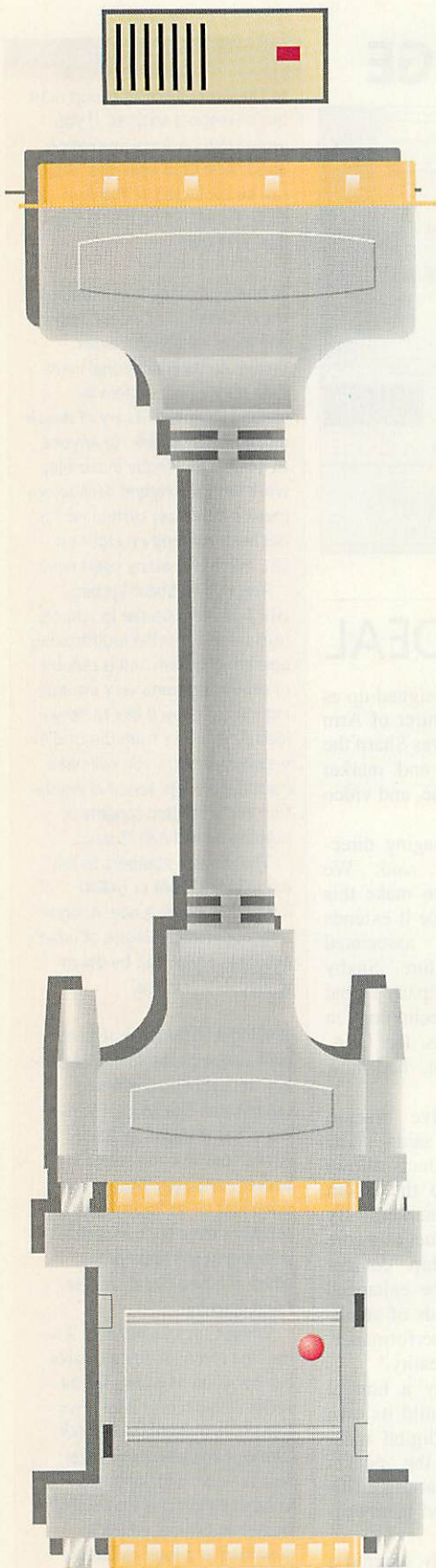
The Hybrid Music System, which is very popular in schools, uses a sophisticated multitasking operating system and is capable of producing some very interesting music. If you'd like to download *Ample* files from the Dudley viewdata system you will need Prestel viewdata terminal emulation and a modem capable of logging on at 1200/75 baud.

The modem numbers to call are (0384) 239944 or (0384) 238073, 24 hours a day. A regularly updated catalogue of what's available online can be downloaded as a text file.

● Widget Software, not to be confused with the similar-sounding education specialists in Leamington Spa, Widget Software, has released its *Games Pack 3* for the Psion Series 3 pocket computer. Widget confirms that all its Psion Series 3 software titles are compatible with the Acorn PocketBook, which is based closely on the Psion machine.

Widget says *Games Pack 3* is the first commercially available compendium of games for the Series 3 and Pocket Book. Five games are included in the £49 cartridge compendium: *Poker*; *Solo* (a version of *Solitaire*); *Reversi*; *Bandit* (for fruit machine freaks) and *Quad*, which is described as a logic challenge game which involves fitting shapes together.

More established Widget titles include a well-reviewed personal finance application (£69.95) and *Chess* for the Series 3/Pocket Book (£49.95). Widget can be contacted on (0438) 815444.



turning concept ...

For the past five years, Atomwide have specialised in producing high-performance solutions for the entire range of Acorn 32-bit computers. From the first ARM3 board, to the latest in SCSI technology, we have continued to deliver innovative products that complement the power of the Archimedes.

We are market leaders in Ethernet technology; a concept essential to networking in both education and business environments. Communication is a fundamental part of today's computer operation and Atomwide's Ethernet range provides a fast and practical answer to the problems of data exchange.

Up till now, adding a SCSI peripheral such as a hard drive or CD ROM player to your computer meant the loss of a valuable podule slot. In particular, if you have an A3010, A3020 or A4000, any further expansion is virtually impossible.

Atomwide's new SCSI interface allows anyone to utilise SCSI devices without sacrificing podule space. By working through the computer's parallel port, the interface makes it possible for A3010, A3020, A4000, A5000 and particularly A4 users to enjoy the benefits of large capacity storage.

The SCSI interface is supplied with a cable and full fitting instructions, all for only £49 (+VAT).

... into reality

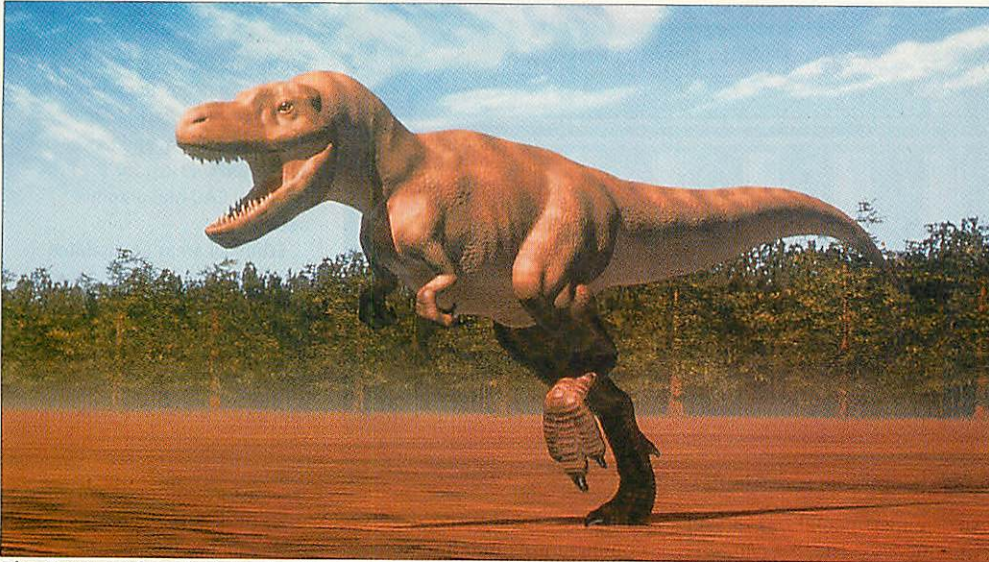


A T O M W I D E

23 The Greenway Orpington Kent BR5 2AY
Tel 0689 838852 Fax 0689 896088



IMAGINA SHOW RUNS NEW RISCS



Dino Tours, a prize winning animation, was created on a Silicon Graphics system driven by Risc processors

IN ITS idyllic setting overlooking the Côte d'Azur, the 12th Monte Carlo Forum on New Images, Imagina, once again left its audience in a state of awe. One aspect this year was the overwhelming presence of Risc technology, in areas ranging from art and animation to virtual reality, simulators and medical research.

This year, the Imagina Forum included graphics workshops. With £150,000 worth of graphics workstation, we were shown how to create

and animate scenes, using methods that are more commonly associated with cinematography and sculpture.

Such machines, whose manufacture has been monopolised by Silicon Graphics, typically use 64-bit Risc processors and are clocked at anything up to 150Mhz.

Silicon Graphics' flagship, the Reality Engine, allows the user to modify and fly around their three-dimensional creations; all rendered in real time. These muscular number-

crunchers, plus some remarkable software, are often used in movie special effects such as Arnie's metallic counterpart in *Terminator 2*. The forthcoming *Aladdin* from Disney was just one of many big-names appearing at Imagina's Pixel prize awards.

For lower-end consumers, owning hardware that photographically renders a scene in a fraction of a second may seem far-fetched. Yet it may not be so very far away.

Jack Kreindler

IN BRIEF

● **SPEX**, the soon to be released 3D environment designer from ExpLAN, has undergone a number of changes and the price has been altered slightly to take this into account.

The secondary school version will now retail at £99+VAT and the primary school version at £59+VAT. A number of refinements, as well as additions, have been made to the software. Both packages will now include extra resource material in the form of work sheets and discs of clip art. As with the previous version, site licences are included as standard. Further details on SPEX can be obtained from ExpLAN UK on (0822) 613868.

● **PROARTISAN**, the 256-colour painting package from Clares, is to get a major revision. Back in the early days of the Archimedes, *ProArtisan* started life as *Artisan*; the first ever art program written for an Acorn 32-bit machine.

Unlike the original *ProArtisan*, *ProArtisan2* is completely Risc OS compliant and runs entirely from within the desktop environment. As well as a complete revamping of the front-end, *ProArtisan 2* includes a wide selection of improved tools. Textures, Blends and Draw file importing are just a few of the new tools that have been added.

Image processing is now a major feature, making *ProArtisan 2* ideal for modifying scanned and digitised images.

Even in its unfinished form, *ProArtisan 2* looks like it could be the art package to which all others are compared. The proposed release date is late Spring 1993. For more details see our preview on page 59 or call Clares on (0606) 61348511.

● You can contact us with any news, views or comments by writing to The Graphics Page, Acorn User, 101 Bayham Street, London NW1 0AG, or by modem via Arcade BBS user #1144. Arcade is on 081-654 2212 or 081-655 4412.

If using Arcade, please stick to messages only. Any large files, such as pictures, should be sent on disc to Acorn User.

Rob Miller

TAKE YOUR BEST SHOTS

ACORN has now licensed the software to allow Acorn 32-bit micros to read Kodak Photo-CDs. But what will this mean for the average user?

The Photo-CD is the result of Kodak's development of a system that would provide a universal format for 'interactive publishing'. It's relatively cheap while being of a high enough quality for professional work.

Photo-CD is the storage of near-photographic quality images on a compact disc medium. Pictures are transferred from normal 35mm film onto a Photo-CD and 100 pictures can be held on a single disc. You can also start off by transferring a single roll of film - say 24 frames - on to a

disc, and then take the disc back to the transfer facility for 'filling up' at a later date.

Each picture is stored on the CD at five different resolutions to offer maximum flexibility. These range from 128x192 up to 2048x3072. A professional format allows pictures from 5x4 sheet film to be stored at full resolution.

At present, standard Acorn hardware is unable to display the high-quality images from PhotoCDs. Installing Computer Concepts' Colour Card, or an upgraded State Machine G8+ card, will allow users to view pictures in full 15-bit colour glory. Other cards are expected from third-party developers. For more details see our preview on page 63.

SIDE SHOW

COMPUTER Concepts' collaboration with Wild Vision has resulted in a new application to accompany Wild Vision's Chroma range of genlock/overlay cards. *SideShow* will be shipped with all Chroma cards in future.

SideShow allows existing graphics and text to be overlaid onto a standard video signal. Uses include captioning and subtitles for videos and presentations. Further details can be obtained from Wild Vision on 091-519 1455.

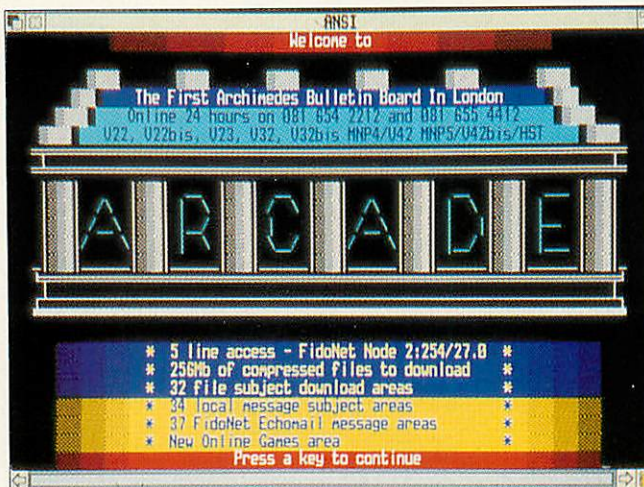
● There are only a few days left till the closing date of Computer Concepts' *ArtWorks* competition. All entries must be in on, or before, 30 April. Further details can be obtained from CC on (0442) 63933.



ARCADE EXPANDS ITS INTERESTS

ARCADE BBS and its hard drives have been whirring away busily for nearly three years, building a dedicated following of users who regularly meet in person to put faces to usernames and talk about Archimedes' and the meaning of life over a pint or two. Such is the calibre of Arcade's regular users that when its main hard disc drive failed catastrophically a year ago, they generously responded with a spontaneous electronic whip-round. This resulted in Arcade receiving enough voluntary donations to replace the old drive with an even larger one and obtain and install a tape-streamer backup system to archive the whole BBS resource nightly.

Arcade has been instrumental in getting several new BBSs off the ground by offering advice and assistance in the complex setting-up process of *ARCbbs* and *ARC-Binkley* software. Atomwide – a well-known local company – has recently sponsored installation of an additional fifth line in appreciation of the friendly atmosphere of the BBS and freely-given time and effort by the operators. Here I should declare my interest as part-time joint Sysop and software applications developer.



Arcade is loyally supported by its users

An experimental FidoNet Archimedes file, *Echo*, is being tested at Arcade. This is a system where, like Echomail message distribution, program and/or text files can be sent out around the Fido network during night-time polling.

Arcade, acting as a link in the chain of BBSs, receives a file, retains a copy and passes them on to BBSs in the scheme that have not already received them.

By popular request, Arcade has just launched two new Archimedes-interest FidoNet message echoes; one covering Archimedes games and gaming, the other expanding the

formerly local *Acorn User* comment area into a nationally distributable message echo. These are private but, if they become sufficiently active, could qualify for national 'Backbone' distribution.

Now *Acorn User* readers can express opinions on the magazine content, exchange ideas about published programs, and make use of the wide knowledge-base of FidoNet Archimedes users. SysOps interested in these message echoes should contact David Coleman at Arcade BBS by netmailing Fido node 2:254/27.0 or calling the BBS number at the foot of the page.

TO BABT OR NOT TO BABT?

A NUMBER of readers have enquired about the '£99 Hayes pocket modem' mentioned in the *Chatter* review, (*Acorn User* March 1993).

There are modems available in the UK at this price level, but BABT approval cannot be expected and actual use of any modem that is not approved by the BABT is illegal. However, the modem that we referred to was a ViVa 2400 Pocket. This is a battery powered product that can be purchased in the US for \$89, considerably less than £99!

In the UK the DynaLink 9624AP pocket modem is currently being advertised by ShiBro, who can be contacted

on 071-224 8320, for £99.95 inc VAT and delivery, and is a V22/V22bis data – but no compression – and 9,600 fax modem. The Dynalink 9624VQP model additionally features V21, V23, V42 and V42bis for £149.95.

These modems will work well with David Pilling's *ArcFax* program using his supplied *EXAR* driver. However, we must stress that, although it's perfectly legal to buy modems without the BABT seal of approval, it is illegal to actually use them in the UK on PSTN circuits.

For a modem round-up, including two pocket-sized models, see page 56

A-LINK FIX

THE RECENTLY available A-Link serial interface includes a replacement Risc OS 3.1 serial device driver module.

Aside from enabling A-Link to work correctly, this has the side-effect of curing most of the problems that have been experienced up to now with higher speed comms on the serial port with Risc OS 3.1.

Presumably Acorn will be making this module available to all users. The current inability of the serial port on older machines upgraded to RISC OS 3.1 to satisfactorily support speeds above 9,600 is particularly irksome with V32bis and higher-speed modems becoming popular and affordable.

NEWS IN BRIEF

- A new system called Raytech BBS is now online, dedicated to computer graphic ray tracing and rendering, and run by SysOp Paul Smith. The Scotland-based board supports most of the popular PC raytracers (*POV-Ray*, *Vidid*, *Ray-Shade* and so on) and has been appointed UK Host for the Professional CAD and graphics network.

Echomail areas are updated daily from the US on all graphics-related subjects including AutoCAD, Raytracing, Fractals, Animation and many others. Raytech BBS is on (0862) 88340 at all speeds to 14.4 V32bis/V42bis 8N1.

- Until now, Acorn A4 portable users have been denied the useful Action key shortcuts offered by *Arcterm7*, the popular comms software. The latest 1.44 version allows the use of an alternative left-hand CTRL-SHIFT key combination to access terminal functions, as well as implementing the new block driver serial interface standard.

This allows neater Econet modem server support and opens the way to linking *Arcterm* into other applications as a terminal emulator. *Arcterm7* costs £68 +VAT. For more details, contact The Serial Port on (0749) 670058.

- Connections BBS, a Viewdata system running on a BBC Master, is now back online with a new SysOp and a new phone number. The BBS is now run by Steve Beattie on 081-423 2878 for 24 hours using the ring-back system. Call the number and let it ring a couple of times then hang up. Call again immediately and the BBS will answer this time.

Connections, which was started by Steve Pursey – now SysOp of Arctic BBS running on an Archimedes – will continue to support the BBC family, and expand the original filebase.

- YOU can contact me with any news or information you'd like to be included on the Comms Page by writing to: David Dade, BBC Acorn User, 101 Bayham Street, London NW1 0AG or by modem on Arcade BBS, User #2 – 081 654 2212 or 081 655 4412

ULTIMATE EXPANSION SYSTEM

The only platform independant expansion system
for all Acorn 32 Bit Micros (except the A4)

Computers

A3000
A3010
A3020
A4000
A305
A310
A400
A440
R140
R260
A540
A5000

Ultimate
MultiPodule

MicroPodules

Vision Colour
HiVision
SCSI (inc CDFS)
Laser Express**
Serial (2 ports)*
Colour Video Out*
MIDI**
Ethernet*
Analogue*

*Being launched Q2 and Q3 1993
**On target for launch in April 1993

The Ultimate System fits entirely within the
computer whilst allowing internal hard drive
expansion

The VISION digitiser Family

**Mono Vision, the ONLY real time 254x720
mono digitiser under £50**

**Colour Vision, the ONLY real time 254x720
colour digitiser under £80**

**HiVision, the ONLY real time 508x720 colour
digitiser under £130**

A3010	£35.00 inc VAT
1Mb RAM Upgrade	
A3010	£149.00 inc VAT
4Mb RAM Upgrade	

**Wise
add-ons**

A3020	£59.00 exc VAT
2Mb RAM Upgrade	
A4000	£59.00 exc VAT
2Mb RAM Upgrade	

**Acorn User
Spring Show '93
Stand 41**

A3000	
Hard Disc Drives	
100Mb External	£479.00
200Mb External	£699.00
HardCard 100	£429.00
20Mb IDE Internal	
with User Port	£179.00
60Mb IDE Internal	
with User Port	£269.00
Memory Upgrades	
1Mb RAM	£39.00
4Mb RAM	£129.00
Expansion	
Econet	£39.00
Serial Upgrade	£17.50
User/Analogue Podule	£39.00
Podule Case	£15.00
Video Digitisers	
Mono Vision Internal	£49.00
Colour Vision Internal	£79.00
Colour HiVision Internal	£129.00
Mono Vision External	£62.00
Colour Vision External	£92.00
Colour HiVision External	£142.00
Ultimate Expansion System	
MultiPodule (3 slot)	£38.00
A5000/400/300	
Hard Disc Drives	
100Mb Internal SCSI	£399.00
200Mb Internal SCSI	£649.00
20Mb Internal IDE	£179.00
60Mb Internal IDE	£269.00
Memory Upgrades	
1Mb RAM for A400	£45.00
2Mb RAM for A5000	£77.00
Expansion	
Econet	£39.00
Video Digitisers	
Mono Vision	£49.00
Colour Vision	£79.00
Colour HiVision	£129.00
Ultimate Expansion System	
MultiPodule (2 slot)	£39.00
A3010	
Hard Drives	
20Mb IDE	£186.38
60Mb IDE	£271.49
Memory Upgrade	
1Mb RAM	£29.79
4Mb RAM	£126.81
Ultimate Expansion System	
MultiPodule (IDE + 2 slot)	£41.70
MultiPodule+20Mb+PSU	£220.43
PSU+Fan+Buffer Kit	£30.00
20Mb for MultiPodule	£169.36
A3020/4000	
Memory Upgrade	
2Mb RAM	£59.00
Expansion	
Econet	£39.00
MultiPodule	
with User Port (3 slot)	£38.00
PSU+Fan+Buffer Kit	£30.00
Micropodules for Ultimate	
Laser Express	£249.00
Colour Vision	£79.00
Colour HiVision	£129.00
SCSI, with CDFS	£69.00
Analogue	£29.00
Colour Video Out	£49.00
Serial	£49.00
MIDI	£49.00
Ethernet	TBA

HCCS products available from
all good Dealers
This is a small selection of our
product range, please ask for full
details

HCCS ASSOCIATES LIMITED,
575-583 DURHAM ROAD
GATESHEAD,
TYNE AND WEAR, NE9 5JJ.
Tel: (091) 4870760
Fax: (091) 4910431

All prices excluding VAT, E&OE.
Carriage FREE for UK Mainland Only

'MICRO-TRADER' BUSINESS SYSTEM

'Micro-Trader' consists of a powerful range of computer programs to meet the many needs of the small to medium sized business.

'Micro-Trader' provides professional integrated accounts that have been designed by a businessman to meet the needs of the businessman.

'Micro-Trader' has been specially developed for multi-tasking operation under RISC-OS on the A3000, A5000 and Archimedes computers.

'MICRO-TRADER' FEATURES

- * Integrated SALES, PURCHASE and NOMINAL LEDGERS
- * The system can grow with the needs of the business
- * Quick entry of information and easy error correction
- * Fully Integrated System avoids repetitive entries
- * Prints Invoice, Crd Note, Statement, Remit. advice
- * Prints P & L ACCOUNT and BALANCE SHEET
- * User can define own layouts of all printed documents
- * Reports can be sent to the screen, disc, printer or even !Edit
- * Automatic date entry - comprehensive Batch Number system
- * Unique 'CASHUP' facility for Retail businesses
- * Double Entry accounts with Audit Trail and Trial Balance
- * Integrated Stock Control records stock holdings & values

COMING SOON PAYROLL MODULE

The system manual is excellent ... it is both comprehensive and easy to follow" - Acorn User June'92

"The forms are masterpieces of good layout and the handbook is comprehensive and well written" - MU May'92

Micro Trader has been examined by a C&E VAT inspector. He has passed MT as being suitable for VAT accounting requirements.

Micro Trader complies with the new VAT requirements including the new VAT return & EC Sales Listing (ESL)

"The Micro Trader System is so flexible and easy to use ... who says accounts can't be fun? ... I have really enjoyed using the system on the Archimedes" - a Yorkshire commercial user

"The package was obviously designed by someone with experience at the sharp end of book-keeping and accounts" - Acorn User June'92

The market leader in Accounts on Acorn Computers - Tried & Tested with 8 years experience. Clear layout - Simple to use - No gimmicks.

"It is powerful, flexible and certainly a pleasure to use" - Acorn User June'92

"The Micro Trader System is so flexible and easy to use ... who says accounts can't be fun? ... I have really enjoyed using the system on the Archimedes" - a Yorkshire commercial user

"Micro Trader offered me all the facilities I required with easily understandable commands at a very reasonable price, especially compared with other PC packages ... I am very pleased to say not only is the system excellent but the help and prompt after sales service has been first class" - A Berkshire user

The 'Micro-Trader' Business System is easy to use and offers a complete powerful and flexible business system for only £79.95+VAT per module - System price £279+VAT - demo disc available. Please call for information on complete business solutions from only £995 exc.

PRES

FOR



CALL 0276 472046

Pocketbook	212	A4000 HomeOffice †*	999
A3010 Family †	424	A5000 2mb 80HD †*	1399
A3010 Lcurve †*	680	A5000 Lcurve †*	1445
A3020 2mb FD †*	749	A5000 4mb 120HD †	1599
A3020 2mb 60HD †*	899	A4 2mb FD	1399
A4000 2mb 80HD †*	949	A4 4mb HD60 ††	1699

Upgraded & tested to 2/4* mb
OR FREE on site service

†† SPECIAL- FREE TML A4

SOFTWARE GAMES

Elite Gold	29.95
Lemmings	18.95
More Lemmings	15.95
Swiv	18.95
Gods	18.95
James Pond	18.95
Lotus Turbo 2	18.95
Chuck Rock	18.95
Populous	21.95
Manchester United	18.95
Omar Sharif Bridge	21.95
Enter The Realm	18.95
Cataclysm	18.95
Break 147	24.95
Pandora's Box	18.95
Saloon Cars deluxe	24.95
Chocks Away Comp	29.95
Galactic Dan	18.95
Chopper Force	20.95
Black Angel	24.95
Cyber Chess	36.95
10 out of 10 English	18.95
10 out of 10 maths	18.95
Mr Doo	18.95
Guile	22.95
Gribbly's Day Out	18.95

SOFTWARE - GENERAL

Artworks	149.00
Impression	123.00
Impression Junior	67.95
Pipedream 4	119.00
Wordz	89.00
EasiWriter 2	125.00
Revelation 2	99.99
PinPoint Junior	24.95
Magpie	49.00
Notate	49.00
PenDown	48.00
PenDown Plus	75.00
Eureka	99.00
Image Outliner	71.00
Image Animator	66.95
Imagery	74.95
Compression	36.95
Colour Printer Driver	18.80

UPGRADES

General

RISC OS 3	41.70
" A5000	16.17
" upgrade kit	25.53
JP150 inc cable	225.00
Citizen Swift 240C	247.00
HP 550c	459.00
printers supplied with cable & driver	
CD ROM pkg	649.00
SCSI interface	99.00
Video Digitiser	49.00
Joysticks	from 6.95

A3010

Monitor Plinth (&3020)	24.95
2mb RAM upgrade	39.00

A300/400

ARM 3	175.00
S.P.A.C.E. kit	32.95
The Missing Link	79.00
TML pair	140.00
TML A4 »Arc	175.00

A3000 UPGRADES

2 mb RAM	39.00
4 mb RAM	99.00
Monitor Plinth	24.95
System Housing	69.50
Podule Case	14.95
Podule Expansion	54.95
Disc buffer	49.95
1770 DFS / reader	19.95
Serial upgrade	19.00
Dust Cover	7.99

HARD DISC UPGRADES

With SCSI Interface

the preferred Interface !

	Internal	External
40 mb	299	384
80 mb	339	424
100 mb	379	449
120 mb	399	459

Price includes drive, i/face cw CD ROM support, scsi utils & cable



Please call for further advice on any products
Prices exclude VAT but include UK delivery. E & O E



PRES Ltd. PO Box 319 Lightwater Surrey GU18 5PW
Tel. 0276 472046 Fax 0276 451427



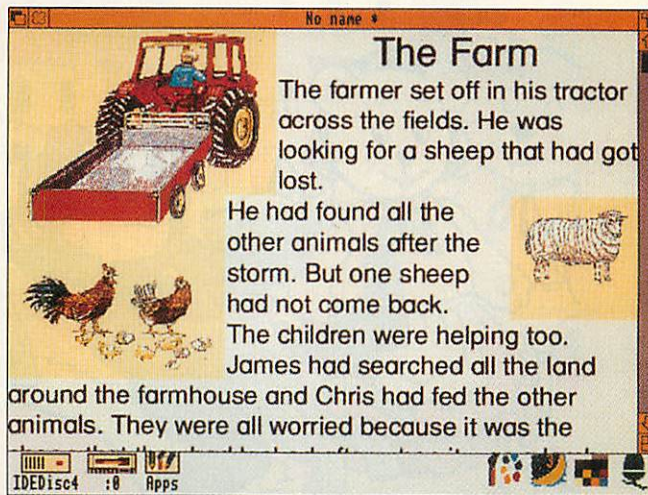
NEW PHASES FOR NW SEMERC

NORTHWEST Semerc has launched *Optima* for the Archimedes. It's a hypermedia database allowing users to link words, pictures and sounds to create multimedia pages.

Sticking to the policy of making software easy to use for special needs children, many of the commands are couched in terms such as 'bigger', 'taller', and 'thinner'. *Optima* is priced at £18.

Also launched recently is an upgrade to the original *Phases* word processing package, *Phases 3*. The new product incorporates the old functions with new ones such as blocking and moving, exporting of text and close procedures. *Phases 3* is fully compatible with *Full Phases*. It is priced at £18, and older versions of *Phases* can be upgraded by applying to Northwest Semerc.

In conjunction with Cumana and Acorn, Northwest Semerc



Phases 3 adds new features to a traditional favourite

has also launched a complete special needs solution machine. Based around an A4000, it contains a pre-fitted Cumana expandable multi-use interface/user port and a selection of software from many educational suppliers.

At £899, it looks an interesting buy for many primary, as well as special needs, schools. The addition of the interface allows easy use of switches, overlay keyboards and other devices. Northwest Semerc can be contacted on 061-627 4469.

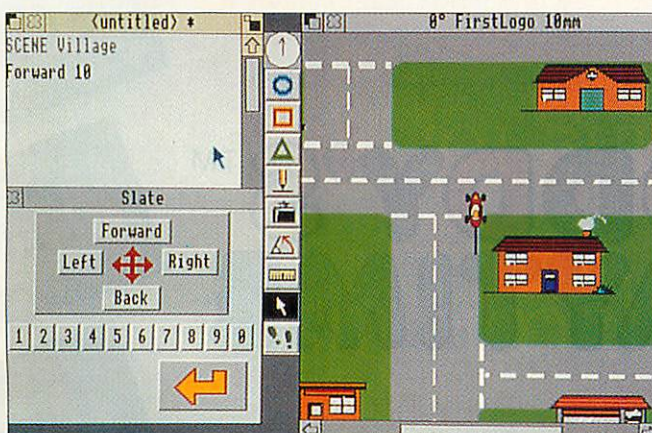
LOGOTRON'S NEW LOGO

LONGMAN Logotron has launched *FirstLOGO*, a Risc Os compliant, multitasking application for beginners in Logo, the graphics-oriented computer language.

FirstLOGO prints in colour from any suitable printer, using a standard printer driver and the ability to save the graphics created as *Draw* files makes this version an interesting development. Children are able to drag the turtle around the screen and *FirstLOGO*

writes the resultant commands. The inclusion of a ruler and protractor tools allowing the measurement of distances and angles is a useful inclusion.

The addition of a new multi-lingual capability makes the price of £24 for a single user copy and £72 for a primary licence worth an initial investigation. Logotron is offering a 30-day trial period; if you are not happy, the company refund your money. Longman Logotron is on (0223) 425558.



Longman's FirstLOGO makes it easy to get around town

ADMIRING THE VIEW

CLARE'S new application for the geography curriculum is a piece of software, based on standard Ordnance Survey map features, that allows the user to draw a map in two dimensions, choose a spot on their map and view the landscape from there in 3D; it is possible to draw in contour lines, forests, rivers and bridges and stand at the top of the hill and admire the view.

The two pieces of software making up the package can be used together, but anything apart from very small maps requires more than 2Mb of memory to switch from 2D into 3D. Care must be taken when designing maps; rivers can run uphill.

The full price for *Topographer* is £79.95, and a demo disc is available on request. This package is one of many launched recently by Clares (including three music titles and an upgrade to *ProArtisan*). For more details, contact Clares on (0606) 48511.

IN BRIEF

● St Johns Infant School in Hampshire marked the installation of a cross-site Econet network recently with a grand opening ceremony. The school-wide Econet network must be one of the first to be installed in an infant school.

The system uses a menu system (*Waiter* from Digital Services) with children choosing the software they wish to use. Each classroom contains a computer and each class has its own saving area on the server. Speed is rarely a problem since the demands made of the network are less than those of a large secondary school. Further information can be gained from Steve Holroyd at the Hampshire IT Centre on (0705) 378266.

● Icon Technology has now completed the addition of a sound module to its primary word processor, *Startwrite*. This feature means that by using software such as *Speech* from Superior Software, it is possible to get typed text spoken back. We will be reviewing this in greater detail next month.

● The series of popular games from Triple-R: *10/10 Maths*, *English* and *Early Essentials* now run under Risc OS 3.10 and the company is also working on further titles in modern languages, science and algebra. All titles are offered on a free 14-day trial. For further information, call (0724) 780370.

● If you are a registered user of Logotron's mathematics package, *Numerator*, then ring for your free set of *Numerator* workcards. This set of work cards has been created for use with the software, which models arithmetical functions and creates 'machines' that add, multiply and perform other functions as desired.

Each activity sheet is directly linked to National Curriculum attainment targets. The book was created by Brian Dye of Hewett School in Norwich. Archimedes *Numerator* costs £39.00 and is fully Risc-Os compliant. Logotron is on (0223) 425558.

Clare Johnson is the adviser for Bexley Acorn Education Centre

EDUCATION WAS NEVER THIS MUCH FUN

Noddy's Playtime is a graded creativity and entertainment package for home computers based on solid educational principles for 3-7 year olds.

Drive with Noddy in his car and explore the magic of Toytown, visiting the 8 special learning locations.

- Railway Station - memory game
- N&B Works - observation game
- Chimney House - musical fun
- Noahs Ark - jigsaw puzzle
- Farm Yard - animal matching
- Market Place - letter recognition
- Post Office - counting
- Police Station - maze game

Also included is a junior Art Package which develops your child's creative ability.

- Picture Colouring.
- Electronic 'fuzzy felts'.
- Freehand drawing with pens and spraycans.
- 50 pre defined fill patterns.
- One finger on, one finger off mouse control for tiny hands.

Noddy's Playtime features user friendly icons so that even the youngest family member can learn and have fun.

There is a choice of 3 carefully defined learning levels designed in consultation with teachers. Noddy's Playtime also includes FREE: Toytown map, keyboard overlay and wobbler. A comprehensive manual and parent teacher guide will enable you to bring your child's imagination to life.

RISC OS 2 + 3 compatible



THE JUMPING BEAN CO.

Leen Gate Lenton Nottingham NG7 2LX
Tel 0602 792838 Fax 0602 780963



ACORN USER
Spring Show 93

See us on Stand No. 67

NODDY'S™ PLAYTIME



Original Text and Images © Darrell Waters Ltd 1949/68. Text and Images of BBC Television Series © BBC Enterprises Ltd 1992. Licensed by BBC Enterprises Ltd. NODDY is a trademark of Darrell Waters Ltd and is used under Licence. ENID BLYTON (signature logotype) is a trademark of Darrell Waters Ltd and is used under licence.



JUDGING CHARACTER

Typing is dead, long live optical character recognition, says Mark Moxon

Optical character recognition (OCR) software is proving to be a most lucrative business: one major OCR software publisher estimated that revenues from OCR hardware and software in the PC world would top \$100 million this year.

It's not hard to see why; OCR can take paper documents and convert them into computer text which, of course, offers more convenience than any paper-based filing system.

The typical scenario where OCR becomes a godsend is when a filing cabinet stuffed full of paper documents needs to be put on to computer; typing the text in by hand is one option, but OCR is both quicker and cheaper than hiring a typist. All you need in order to set up your own OCR system is a hand-held mono scanner and suitable software.

NEW PACKAGE

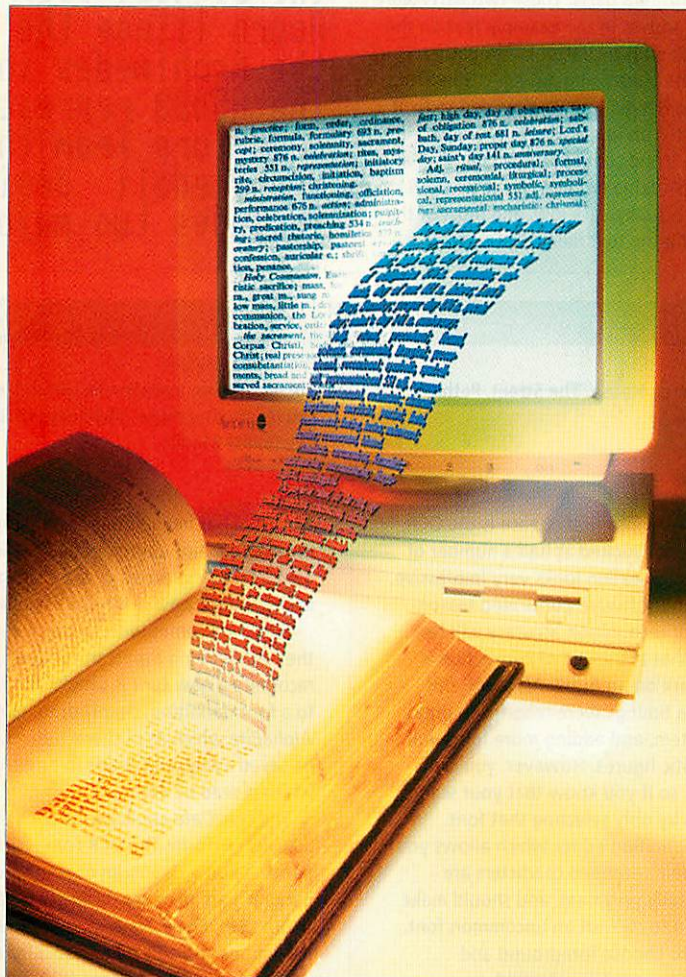
OCR packages have been available for PCs for some time but, until recently, OCR packages for the Archimedes were thin on the ground. Irlam's *EluciData*, released nearly two years ago, was the first stab at this market, but it failed to live up to people's expectations.

However, all that is about to change. There are now three contenders on the OCR scene: Risc Developments is set to release its package within the next few months. Meanwhile, Irlam is updating *EluciData* and a brand new company are about to release *Optical*.

OCR, the working title for Risc Developments' product, is now very near completion, and we tested out a pre-release version.

INTO ACTION

Working with OCR is simplicity itself. To process a page, scan it in and drop the resulting sprite on to OCR's icon.



The sprite pops up in a window: from here you can zoom in on the scan, rotate it or invert it as you wish. The next step is to create a zone on the page, by marking a rectangular area of the sprite to be processed.

By using zones in this way, OCR allows you to control how the page will be deciphered, thus avoiding potential problems such as multiple columns of text and pictures within the text. The zone can be resized in exactly the same way as frames in DTP packages, with eight ears arranged round the edges.

Now for the clever stuff. Start the OCR process, and a window pops up in which the text appears. The scanning

process is multitasking, and it doesn't make the machine too slow to use. When finished, the text can be saved as a standard text file and that's all there is to it.

IN PRACTICE

To test OCR, I scanned in the first two pages of *Acorn User's* review of the A5000 from December 1991, using Risc Developments' own Scavenger hand-held scanner set to 400dpi.

The results were good: out of 6,233 characters scanned, there were only 84 errors, giving a character accuracy rating of 98.7 percent. A quick way of assessing and comparing accuracy ratings is to take 90 from the percentage to give a

new rating. Thus OCR scores a respectable 8.7 points.

The speed of conversion is also impressive; the average rate of conversion for the *Acorn User* example was around 1,200 characters per minute on an Arm3 machine, which equates to around 220 words per minute. A decent typing speed is considered to be around 40 words per minute, so the OCR software wins hands down.

Risc Developments claims that speeds of up to 540 words per minute can be achieved, but this assumes a very clear scan at a lower resolution of 200dpi, and the accuracy does drop off to nearer 95 percent.

On average, Risc Developments aims for 30 words per minute, including scanning, adjusting the contrast, performing the OCR and then editing the text file for mistakes.

OCR software is, by its very nature, complicated. There are many methods for recognising characters from scans, but the latest buzz word in OCR technology is 'omnifont'. This approach works in the same way as the human brain: the software remembers characteristics about letter shapes, and when it sees a letter, it pulls it apart to see if it can work out the letter from its shape.

The advantage of omnifont technology is that, in theory, it can recognise almost any font. Risc Developments' OCR does not use omnifont technology – only PC packages costing well over £500 do – but it has a pretty sophisticated algorithm, enabling it to perform well with a large range of fonts.

The package, when sold, will be programmed to recognise at least the following list of fonts: Trinity, Garamond, Paladin, Bookmark, New Century Schoolbook, Homerton, Vogue and Corpus. However, because of the way the software has been written, it

POSSIBLE PROBLEMS

OCR is not a perfect science: there is no package in existence which can get everything right all the time. However, there are some errors that are quite common in OCR conversion, and they are interesting in that they demonstrate the methods used.

A problem we had with the scan of December's issue was with the lower case 's': the printing was quite faint, and the top and bottom of the character had disappeared in the scanning process.

Because of this, the match with the letter 's' in the shortlist was not good, so OCR tried splitting the 's' into two parts. These two parts were matched to the characters 'l' and 'i', as shown in the example text on the right, with a better fit than the match with the letter 's'. Altogether 17 of the 348 lower case 's' characters in the piece came out as 'li'. However, knowing this, a simple global replace was all that was needed to fix it.

Other errors on a similar tack were with lower case 'b's, which sometimes came out as lower case 'l's and commas if the character in the scan was disjointed, and a few 'n's came out as 'r's and 'i's. However, the number of errors was actually very low, and most of the above were easy to spot when editing the text file.

the A5000. Judging by the buzz of excitement among visitors (especially those who were queueing to buy one) the new machine is undoubtedly the biggest leap forward for Acorn! since the introduction of the Archimedes in 1987. The A5000 represents a departure from the original Archimedei design and includes two major improve-

THE COMPETITION

Product: Optical

Supplier: Neurotron Software, Birch Tree House, The Street, Petham, Canterbury, Kent CT4 5QU

Tel: (0227) 700516

Price: £59

Neurotron is a new software company whose first release is the OCR package *Optical*. The pre-release copy we looked at had a number of features missing, but the projected specification looks very impressive.

In the early version that we saw, the software performed reasonably well. Neurotron says its character recognition accuracy will be better than 90 percent, and reckons that the speed of conversion is around the 240 words per minute mark on an Arm2. Although this sounds much quicker than OCR, these timings were taken with only one font definition built into the system, and adding more fonts will slow the system down to more realistic figures. However, you can select which fonts are to be checked, so if you know that your scan is in one font only, you can speed it up by only selecting that font.

Optical also includes a character definition editor which allows you to edit the font definitions against which scanned characters are matched. This part of the system is really very neat, and should make the package quite flexible if you need to convert an uncommon font. Another useful feature is the ability to choose foreground and background colours, so that colour scans can be converted.

There are a number of features that Neurotron hopes to add, including an intelligent spellchecker and a multitasking option for the conversion, but they hadn't been implemented in the pre-release version. *Optical* looks to be a good application, though it's too early yet to comment on its performance.

Product: Elucidata

Supplier: Irlam Instruments, Brunel Institute for Bioengineering, Brunel University, Uxbridge, Middlesex UB8 3PH

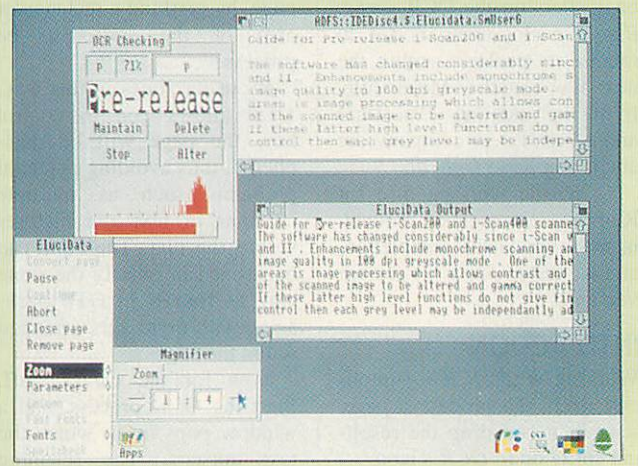
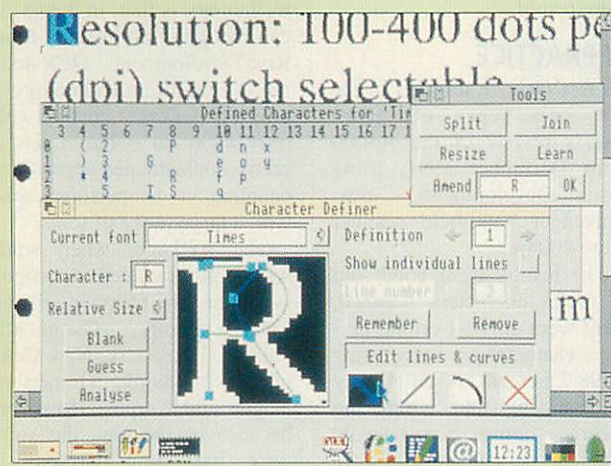
Tel: (0895) 811401

Price: £159

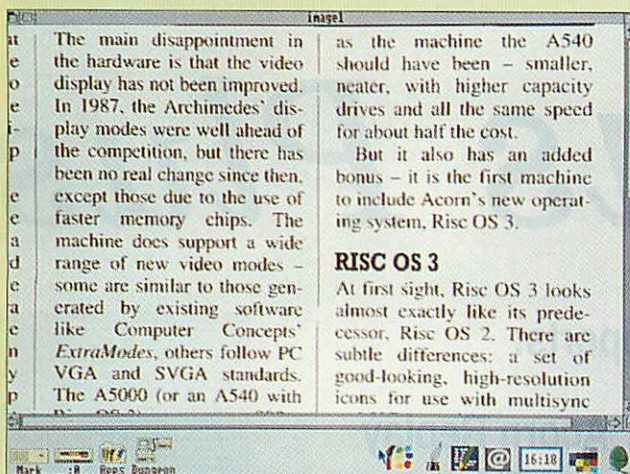
Elucidata has been around for nearly two years, and is now going through a major upgrade, which will be sent free to all registered owners. Early versions of the package were not as effective as people expected, but now it is more reliable and flexible.

Elucidata comes with an application called *AlphaBite* which provides the font learning aspect of the package. Teaching the software to recognise a new font is simple, though a little laborious: to add a letter to a font definition, simply drag a box over a scan of the letter, and tell *AlphaBite* which ASCII character it represents. Font definition files can be saved away, and reside in an application folder called *!Alphabets*, which is read by *Elucidata*.

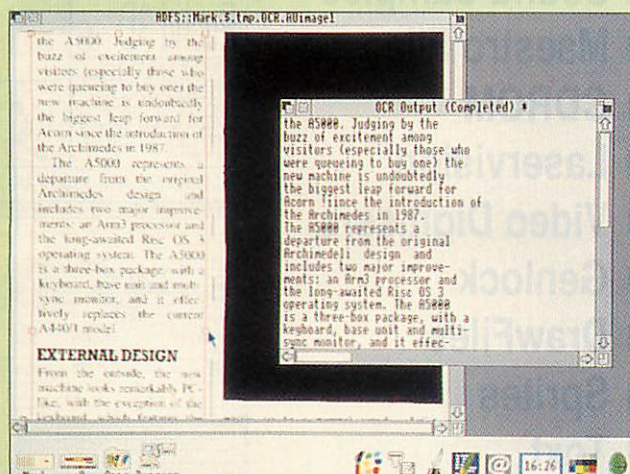
The *Elucidata* application forms the heart of the package, and actually performs the OCR conversion. Performance was quite adequate on a clear scan of some monospaced text in *Corpus*, but the package had immense difficulty with the hand scanned page from *Acorn User*. *Elucidata* is mainly aimed at those with high quality flatbed scanners, like those sold by Irlam, and as a result the package is not really suited to budget OCR. Conversion was also quite a lot slower than Risc Developments' offering, though in the released version it will be faster. There are some nice features, such as the handling of possible errors in the scan and, at this stage, *Elucidata* seems to be a competent package. However, with the competition selling for about £60, it could prove to be rather overpriced.



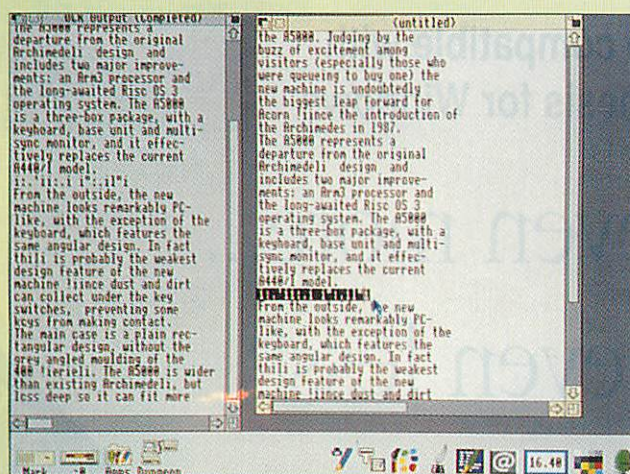
OCR IN ACTION



A portion of the original scan, viewed using *Paint*. This scan was input using a Risc Developments Scavenger hand scanner, and you can see that the scan slopes from left to right: this caused no problems with OCR, though.



The OCR software goes into action. The red box shows the zone to be converted, and the text appears in the grey window as it is read. Notice how the zone avoids including the vertical lines to the right of the column.



The OCR output goes to *Edit*, for corrective editing. Each column was converted separately and, as the processing was multitasking, one column could be corrected in *Edit* while the next was being processed.

should be able to recognise fonts similar in general design to the above.

One important point is that the package (at the moment) has not been taught bold or italic styles, though future versions should be able to recognise these effects automatically. The problem is that as more fonts are added to the OCR database, the system slows down, so a reasonable range of fonts were included.

BEHIND THE SCENES

When a zone is put through the OCR mill, the software tries to find gaps between lines by drawing imaginary lines across the image: if a line can be drawn without going through black, then there is a gap between lines.

Of course, with hand scanners the image might be slightly off level, so the lines don't have to be horizontal, or even straight, as long as a feasible line can be drawn. If lines cannot be drawn through a zone, then that zone is classed as graphics, and is ignored. For example, in our test scan, (see the examples on the right) the zones had to avoid the vertical lines in the original article, otherwise the whole text area would be ignored.

Once the software has decided where the gaps between lines are, it takes each line in turn and processes it. A similar approach to that for line detection is used to work out the positions of the individual characters in the line: the line is traversed, and details of the spread of white space in the line are built up, from which the gaps between words can be calculated, as well as the positions and sizes of individual characters.

Each block of the scan which OCR thinks is a character is then taken and compared to the font definitions which the package knows about; these definitions are stored as sets of statistics, and the software can decide very quickly whether a match is any good.

When OCR has checked through all the font definitions for a match, it builds up a shortlist of the characters which it thinks are the best guesses. If the statistics show that these guesses are not very close, the block is split into

two pieces vertically, and each block is matched; this method is especially applicable to ligatures such as 'fi', where the characters can physically join up on the page. If the match for the two blocks is better than the match for one block, then the two matches are used, otherwise it's back to the shortlist for the best match from there.

The choice from the shortlist is also influenced by the context analysis stage, which makes sure that numbers don't appear in words, to prevent lower case 'l's being interpreted as '1's in the middle of words, for example. Finally, the characters are displayed in the output window a line at a time.

EARLY DAYS

It's too early to compare the three packages on equal terms, as they are all at different stages of development. However, at this stage, the Risc Developments package looks the most promising.

Risc Developments hopes to price the package at around £50 to £60 which is literally a tenth of the price of a decent PC package. Admittedly the PC packages have better technology and have whole companies dedicated to their packages, but the results from Risc Developments' package are probably good enough for most users.

Possible enhancements to the package include an application to teach OCR new fonts, multiple text zones, an intelligent OCR-specific spelling checker, retention of style information, multi-column capabilities, automatic detection of ligatures and a built-in editor, although the first version to be released will be broadly as described above.

If the package sells well, then Risc Developments may consider all sorts of extras: it already has a fast and reliable OCR interpreter, and that's the hardest part to get right.

PRODUCT DETAILS

Product: OCR Software
Supplier: Risc Developments, 117 Hatfield Road, St. Albans, Herts AL1 4JS
Tel: (0727) 840303
Price: £50-60

The *de facto* standard multimedia authoring system for the Archimedes

Genesis Plus

The Genesis family of multimedia authoring systems is the most widely used on the Archimedes, and now produces applications which can also run, without change, under Windows™.

Genesis Plus allows the creation of applications consisting of linked pages of information in a wide variety of formats. Pictures, sounds, animations and text can be added simply by dragging files into frames on your page - just like using a DTP package. Text can also be typed directly into frames and formatted to suit.

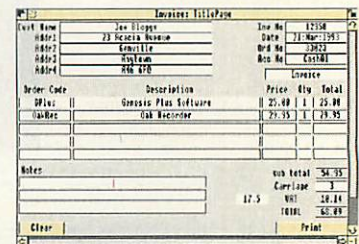
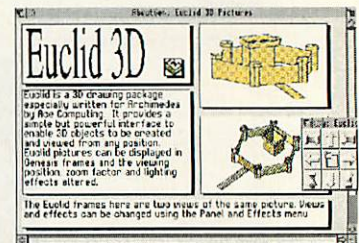
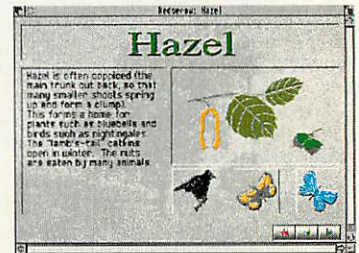
The power of Genesis lies in the fact that every frame can be readily linked to other pages so that information can be organised and cross-referenced very easily. Simply clicking the mouse over a linked frame will then lead to further information about the object in the frame, or might play a sound sample relating to the subject in the frame.

Genesis Plus uses powerful compression algorithms so that data is stored efficiently. It is capable of running well even on 1Mb single floppy disc machines, but has sufficient power to manage even the largest of CDROM based databases.

Supports:

- ☐ Acorn Replay
- ☐ Ace Films
- ☐ Euclid 3D Files
- ☐ Sound Samples
- ☐ Maestro Files
- ☐ CDROM
- ☐ Laservision
- ☐ Video Digitisers
- ☐ Genlock
- ☐ DrawFiles
- ☐ Sprites
- ☐ Text
- ☐ CSV Files
- ☐ Template Files

File compatible with
Genesis for Windows



Now does even more...
and costs even less!

Only £25 + £1.50 p&p + VAT

Oak Solutions Ltd Suite 25 Robin Enterprise Centre
Leeds Road Idle West Riding of Yorkshire BD10 9TE
Tel: 0274 620423 Fax: 0274 620419



SPECIAL OFFER
Buy Genesis Plus at the
Acorn User Show
for only
£25 including VAT

Sheridan Williams' BBC micro database manager, *Masterfile*, now fast approaching a decade old, has now been rewritten and released in a new Risc OS version by Risc Developments.

The early signs for *Masterfile* are encouraging, although the package artwork is clearly reminiscent of the Macintosh database, *Filemaker*. The software arrives on a single floppy disc, accompanied by a second disc of example databases and a quick reference card. The manual is commendably slim at 100 pages, and clearly written. *Masterfile* installs without any fuss; Risc Developments has clearly learned from the adverse reaction to early protected versions of *Ovation*.

However, any favourable impressions are quickly destroyed by the process used to define a database structure. *Masterfile 3* uses a similar 'descriptor' concept to its eight-bit antecedents. This has a distinctly old-fashioned feel. It uses a spreadsheet-like display, with each row of entries defining a field in the database. Into the columns, you fill the field name, type, width, any range checks and options.

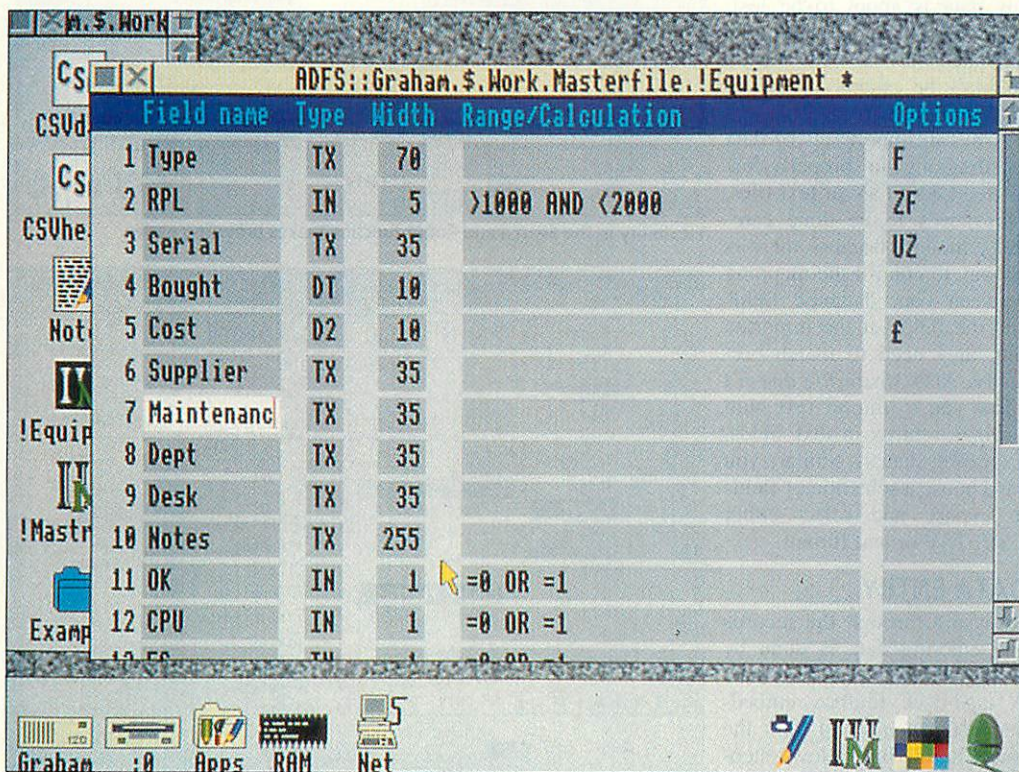
But to do this, there's no help, not even a menu of possible field types or options. You can quickly define the fields you want from the six types available (fixed-length text, integer, real, date, calculation and picture).

Calculation fields can be used to show the results of calculations applied to other fields, for example adding VAT to prices, or automatically allocating a unique serial number to each record in the database; something that Digital Services' *Squirrel* lacks.

Calculations can be entered into the descriptor table using Basic-like maths and string functions, and the same syntax can be used to define range checks for normal fields; upper and lower limits, or even short lists of valid options such as "Mr" OR "Ms" OR "Dr". This is remarkably flexible and easy to use. But there are a couple of silly restrictions: for example, field names are limited to only ten characters – fewer than the eight-bit *Masterfile* – and there are no ready-made boolean (yes/no)

OLD MASTER

Graham Bell examines the latest avatar of Masterfile



The screenshot shows a window titled 'ADF5::Graham.\$Work.Masterfile.!Equipment *'. It contains a table with the following columns: Field name, Type, Width, Range/Calculation, and Options. The rows are numbered 1 through 12.

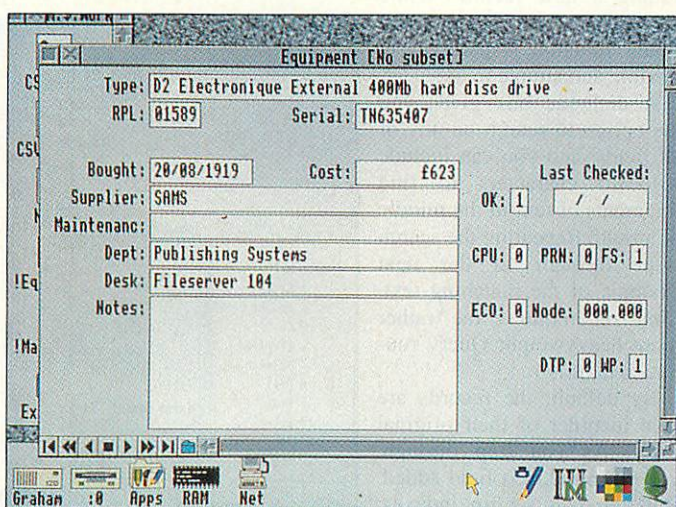
Field name	Type	Width	Range/Calculation	Options
1 Type	TX	70		F
2 RPL	IN	5	>1000 AND <2000	ZF
3 Serial	TX	35		UZ
4 Bought	DT	10		
5 Cost	D2	10		f
6 Supplier	TX	35		
7 Maintenance	TX	35		
8 Dept	TX	35		
9 Desk	TX	35		
10 Notes	TX	255		
11 OK	IN	1	=0 OR =1	
12 CPU	IN	1	=0 OR =1	

A Masterfile database is set up using a descriptor table

fields, though you could use a single character text field with a range of "Y" OR "N". There is no support for arbitrarily long text file fields, nor for the storage of files other than sprites or drawings.

In *Squirrel* or *Datapower*, the process of defining the database structure is integrated with designing the primary card layout, and it is a very slick graphical process. In *Masterfile* the two remain quite separate. Completing the descriptor table and saving it creates the database, stored as a new directory, into which *Masterfile* writes a blank data file, a default card layout and the descriptor itself. It also sets up empty index, report and subset folders.

The layout editor is basic: you can move fields around, change their displayed size, add label text to the card and so on. But there is no way to use outline fonts, nor to



The screenshot shows a window titled 'Equipment [No subset]'. It contains a form with various fields for data entry. The fields are arranged in a grid-like fashion.

Type:	D2 Electronique External 400Mb hard disc drive		
RPL:	01589	Serial:	TN635407
Bought:	20/08/1919	Cost:	£623
Supplier:	SAMS	OK:	1 / /
Maintenance:			
Dept:	Publishing Systems		
Desk:	Fileserver 104		
Notes:			
CPU:	0	PRN:	0
FS:	1	ECO:	0
Node:	000.000		
DTP:	0	WP:	1

Data entry cards can incorporate graphics

change the card colour. You can change the colour of each field, and liven up the presentation by including a drawing or sprite on each card. A grid can be switched on to help position the various elements on the card, but its size cannot be varied.

You can in fact design several different card layouts, which can potentially show different fields: it is possible to hide certain fields, so that, for example, by using one card layout you could type in details of a company's registered address on one card, but

then show the trading address on the normal card layout.

As well as redefining the cards, you can also restructure the whole database by going right back to the descriptor and changing that – perhaps re-ordering the fields so you can enter them in a different order, or adding a new field altogether. *Masterfile* warns you if any data is about to be lost. However, on one occasion this left me with a field which couldn't be edited, though it held valid data.

You can import sets of data by dragging in properly-formatted CSV, TSV or text files. This needs to be done carefully, though, because there is no way to control the mapping between your database fields and the fields of the imported file: they need to match perfectly. Also *Masterfile* doesn't allow you to import text with carriage returns in text fields. Exporting data is similar: you can choose a selection of fields to export, and select either CSV, TSV or text format.

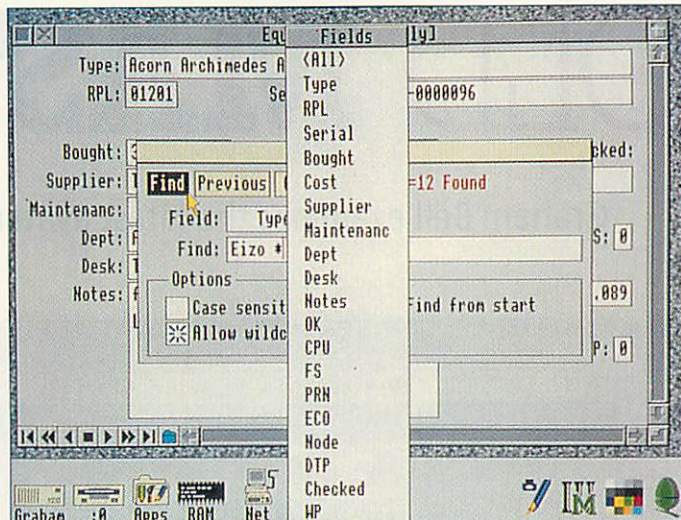
DATA ENTRY

Browsing through the records and entering data is done by using any of the card layouts. A tape-deck toolbox embedded (*Ovation*-style) in the lower scroll bar, allows stepping through the records, or adding a new record. While browsing, the Search and Count function is particularly flexible and simple to use.

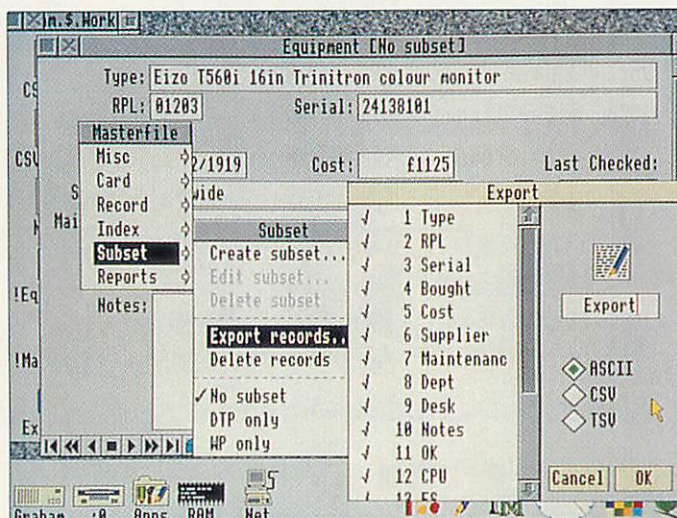
A dialogue box gives you the option to search on any or all fields, and you can include wildcard characters to find fragments of text in the middle of a field. Repeating the search steps through to the next example of the matching text. (*Squirrel* requires the rather more heavyweight Query routine to do this.)

By default, the records are held in order of their original entry. As you step through, you go to the next field added. But you can set up indexes: new orders for the cards. An index can be specified at any time, and is fairly quick. An 800-record database on a fast hard disc was sorted on two fields in under ten seconds.

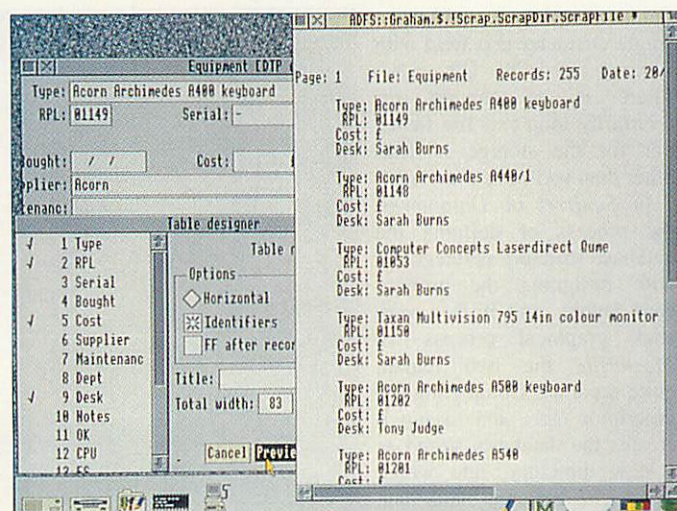
Indexes can sort on up to three fields, and you can give them names and switch order via a menu choice. Allied to



Flexibility in the Search and Count function makes browsing easier



Exporting data to a page layout is very straightforward



Reporting is simple to use and adequate for most needs

the indexes are subsets: browsing can step through only those records that match a specific set of criteria.

You can select by matching data in a combination of fields, but there are limits on using AND and OR together – basi-

cally it's one or the other. For example, constructing a subset of films using ("Disney" OR 12 OR PG) AND < 100 mins isn't possible. There isn't any equivalent of *Squirrel*'s plumbing diagram, nor even of the logical combination of cri-

teria offered by eight-bit stalwart *Viewstore*.

Reporting follows a similar pattern to exporting field data. You can choose, via a dialogue, which fields from each record to include in the report, and add a simple title to the top of the form.

Changing the report format is limited to altering the order in which the field data is printed, and perhaps starting each new record on a separate sheet of paper. However, *Masterfile*'s indexes, subsets and reports interact. If you print a report, the current index is used to order it; only records in the current subset are used.

This makes for a relatively flexible and easy to use system that will be sufficient for most needs. It falls down if you need anything like sub-headings at various points in the report, or automated sub-totalling or averaging of a number field – things both *Squirrel* and *Datpower* excel at. There is one advantage though: because the output is plain text, it is far easier for *Masterfile* to export a report into a page layout application.

END OF A SPECTRUM

Masterfile clearly lies at one end of a spectrum of Archimedes database managers, aimed at rather casual users whose needs for a database lie in 'cataloguing the record collection' or something similar.

For any more ambitious use, another choice – such as *Squirrel* or Iota's *Datpower* – would be more appropriate, though more expensive. And *Masterfile* doesn't even approach the area *S-Base* is aimed at: it's not networkable, not relational, not programmable, doesn't offer even multi-table reporting, and some sections are a little too 'eight-bit'. A shade under £50 is probably about right for what it offers, but beware; as your needs grow, you may need something more sophisticated.

PRODUCT DETAILS

Product: Masterfile 3
Supplier: Risc Developments,
117 Hatfield Road, St Albans,
Herts AL1 4JS
Tel: (0727) 840303
Price: £49+VAT

Colour THE DRIVING FORCE



The first full colour printer drivers available for the Archimedes.

The colour TurboDrivers in conjunction with the BJC800 inkjet printer are ideal for colour proofing work or for anyone wanting a small number of high quality colour prints.

Key features:

- ▶ 360 dpi inkjet
- ▶ A4 and A3 paper sizes
- ▶ Plain paper capability although for best results Canon inkjet paper is highly recommended. Printer supplied with 20 sheets of A4 sample inkjet paper.
- ▶ Four colour, cyan, magenta, yellow and black ink for full spectrum colour and high quality blacks.
- ▶ Individually replaceable ink cartridges.
- ▶ The first true 24-bit colour RISC OS printer drivers. (All existing printer drivers based on Acorn code are only 8-bit or 256 colours maximum.) The colour TurboDrivers can produce millions of colour shades on the BJC800 from programs such as Impression, !Draw and Artworks. Acorn sprites are currently limited to 256 colours.
- ▶ Disc spooling allows background operation once the page has been rendered. This means control is returned as soon as possible and that the computer is not occupied when printing multiple copies.
- ▶ FastText rendering for maximum speed text printing.
- ▶ Advanced under colour removal and grey component replacement for best quality colour reproduction.
- ▶ Print times for A4 colour page approx 4 minutes, 8 minutes for A3.

Compatible with all Archimedes models and operating systems. 4Mbyte RAM minimum recommended.

RRP for Colour TurboDrivers and printer lead for BJC800 £99.00 + VAT (£116.32)

RRP for Canon BJC800 printer and drivers £1895.00 + VAT (£2226.62)

ACCESS & VISA WELCOME

Turbo
DRIVERS

 Computer Concepts Ltd

G a d d e s d e n P l a c e H e m e l H e m p s t e a d H e r t s H P 2 6 E X
T e l : 0 4 4 2 6 3 9 3 3 F a x : 0 4 4 2 2 3 1 6 3 2



**Bishop Sutton
Bristol AVON
BS18 4UJ**

A5000 2M HD 80 Multiscan £1390-00
A5000 Learning Curve £1430-00
A5000 4M HD 120 Multi £1590-00
A540 £1990-00
A4 2M FD £1390-00
A4 4M HD 60 £1690-00
LaserDirect Hires 8 £1279-00
LaserDirect Hires 4 £ 899-00

FREE copy of ArtWorks with 4M HD120 A5000

Scanlight Professional..... £ 529-00
with SCSI £ 699-00
ScanLight 256 £ 179-00
BJC800 colour, driver & lead £1499-00
BJ10ex, driver & lead £ 249-00
FAXPACK £ 279-00
CC/Wild Vision Colour Card £ 249-00
Impression II £ 124-00
Impression Junior £ 79-00
ArtWorks..... £ 139-00

Professional DTP System

Acorn A5000 4Mb HD120, Multiscan, Impression II, ArtWorks, Scanlight 256 Scanner, LaserDirect Hi-res 4, FAXPACK (Direct link to our bureau) £3495-00

Acorn
Authorised Dealer

CD ROM package incl. SCSI card, leads, speakers, Creepy Crawlies, Grooves & Image Warehouse £649-00 (Other packs available)

DTP SPECIALISTS

We can supply complete DTP systems for home or professional use. We offer advice on configuration and can then tailor a system to your exact requirements. Full after-sales service including imagesetting and printing of your finished documents.

IMAGESSETTING SERVICES

Your Impression II, Artworks, Sprite, DrawFiles etc. output to Bromide or Film up to A3 size with crop marks. Resolutions of up to 2400 dpi available.

MONO & COLOUR LASER PRINTING UP TO A3

Send us your files via FAXPACK for prompt service !

All offers subject to availability. Callers by appointment only.
Prices and specifications may change without notice - Catalogue available.

Carriage free, please add VAT @ 17½ %

& FAX (0761) 453308

Part Exchange

your BBC, Master 128, A3000 or
Archimedes 300/400, for a new

A4000, A5000 or A4

The table below shows examples of the balance you can expect to pay when part exchanging your old system, but please fone first to confirm

	BBC B	Master	A3000	A440/1
	Monitor	Monitor	Monitor	Monitor
A4000HD80 System	849	799	549	299
A5000HD80 System	1249	1199	949	699
A4 4MHD60 System	1499	1449	1199	949

Learning Curve, Home Office and HD120 systems also available

Second Hand Equipment

BBC £ 65.00
Master 128 £195.00
A3000 £295.00
A420/1 £495.00
A440/1 £595.00
A440 £495.00
RML Window Box £945.00
Star LC24-200 s/h £100.00

Special Offers

Laser Direct LBP4 £845.00
Cumana CD358 £ 89.00
Star LC24-10 £125.00
Multiscan Monitor £249.00
CUB3000 for A3010 £179.00

AJS

Computers Ltd

51 Heath Drive
Chelmsford
Essex CM2 9HE
tel 0245 345263
fax 0245 345233
All prices plus VAT and carriage

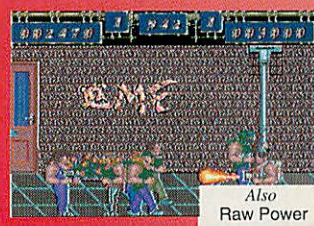
A Totally Wacky New Platform Game



Cycloids is a zany platform adventure - guide a clown on a unicycle through over 25 action packed levels to rid the world of the invading balloons!

Featuring superb 256 colour cartoon style graphics, and comical sampled sound effects.

Don't miss your chance to play the most addictive game and original platform ever.



Also Raw Power



Also F.R.E.D.

Price List:

F.R.E.D. £20
Cycloids £25
Raw Power £25
WolfPack £20
Ixion £25
Land Build £15
DTP Prog Util Disc £15
Label Print £15
Clip Art 1-3 £8.50 each
ArcFS 2 £20
ArcFS 2 Upgrade £12
(send original ArcFS disc)

Please make cheques payable to "Software 42"

Come and see us at the Acorn User Show



Software 42

109 Ferry Road

Hullbridge

Essex

SS5 6EL

New products. The life blood of the Acorn world. Upgrades that keep us in an ever-improving spiral...

Without a constant flow of new ideas and improvements, Acorn machines would have disappeared a long time ago, along with the Orics and Dragons of this world. And at the moment, in a sudden burst of new growth, there are new releases popping up all over the place.

We did a quick poll of the *Acorn User* office to find out how some of the more recent releases had been received and what we are still waiting for.

RELEASE RATINGS

Mark Moxon, technical editor: 'Put a guitarist and a keyboard player in the same room together, and you can get into big trouble: it's a bit like mixing PC users and Arc enthusiasts. I'm a guitarist. Well, I think I am; I'm not so sure my neighbours agree.'

'At home I have a Midi set-up on my computer, but *Inspiration*, the sequencer package I currently use, does not cater for guitarists at all, and besides, it doesn't like Risc OS 3. So, you can imagine how happy I was to see *Serenade*: it copes with guitar chords, and it works on Risc OS 3. Now I've got no excuse: next stop, the rock 'n' roll lifestyle we all crave. Move over, Eric.'

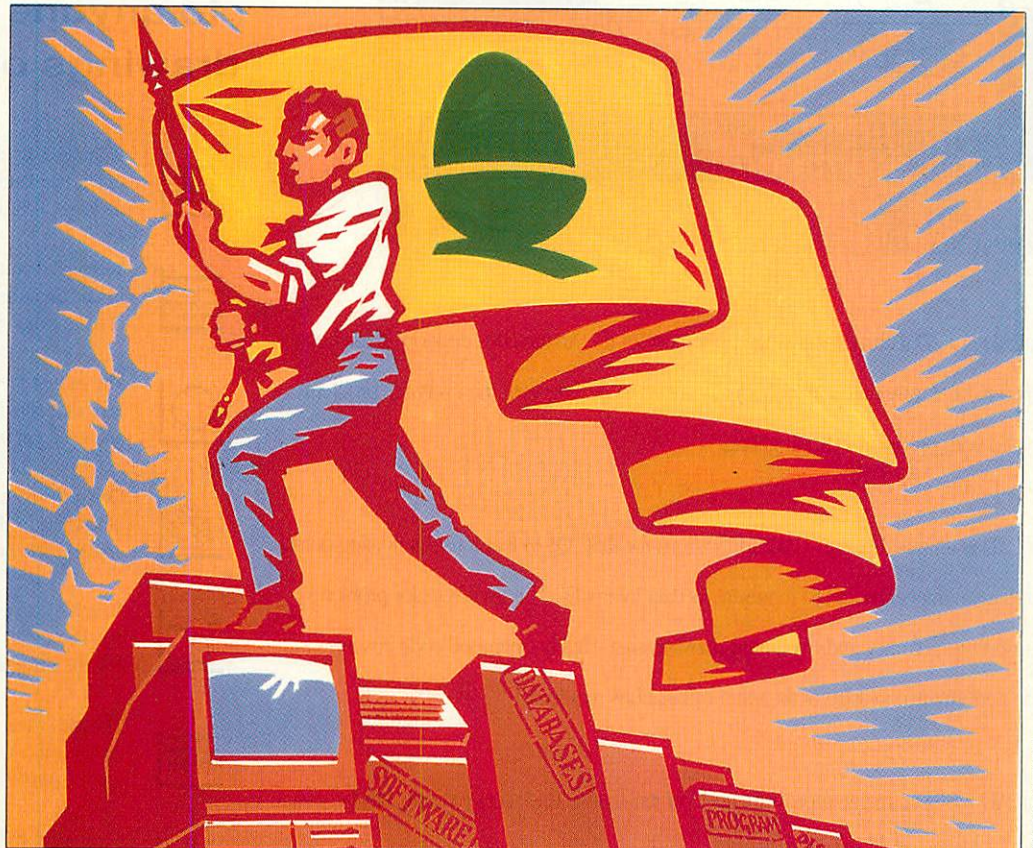
Ian Burley, news editor: 'If you use a Risc-based machine, the chances are that – like me – you are a speed merchant. The problem is that, fast though they may be, Arcs are no longer way out in front; even with an Arm3 upgrade.'

'As I'm always on the look out for an extra mip, Ground Control's limited edition 35MHz Arm3 upgrade almost exercised my credit card. But in the nick of time I got wind of Aleph One's planned Arm600 processor upgrade. According to Arm Ltd's tests, the 20MHz version of this latest version of the Arm is around 40 percent quicker than a 25MHz Arm3. The 25MHz version should be even faster.'

'I'll have some of that, please. And as if that wasn't enough, Aleph One is also

SPRING FEVER

The Acorn User office looks at the season's releases



IVAN ALLEN

promising that the upgrade will feature a floating point accelerator chip.'

Fin Fahey, production editor: 'I always find myself wishing for things commonplace on other platforms, like 99.7 percent bug-free software, that do not seem to have penetrated the Acorn world. Of course, I am quite devoid of any brand loyalty.'

'The outside world has started to peek its nose around the door in the one area of 16-bit games conversions, and there are too many to list. Suffice it to say that I'd love to see *Legend*, *Civilisation* or *Sim Earth* on an Arc and they're all on the cards: sometime.'

Pete Worrall, art adviser for Sandwell AEC: 'I am looking forward to *Architech* from Explan UK, which offers a revolutionary means of 3D

design. Digitised textures and images can be mapped onto the surface facets of simple or complex plans, and printed out for construction, with the appropriate foldlines and flaps. Design on the Arc with tangible, tactile results will soon become an exciting reality.'

Karen Donaghay, editor:

'An editor's view is always a slightly warped one, since any major new product is good news for *Acorn User*. On this basis, the next Acorn launch is probably the thing that I view with the most anticipation.'

'Although there are no hints from Acorn itself, the next machine is – as always – the subject of much gossip. The option for a built-in PC card? The Arm 700? Perhaps even the long-awaited 24-bit graphics? Whatever Acorn has up its sleeve for the next launch, I'm certainly not the

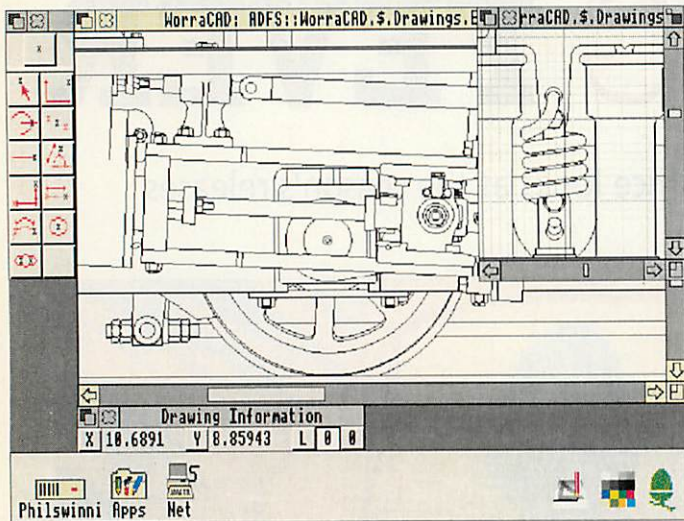
only one who is looking forward to it.'

'Meanwhile, recent releases that have made my life more efficient include *Datapower*, which can follow an article through its many guises: from concept, to commission, to feature list. Also, the latest *Faxpack* is something our office could not do without.'

'But the upgrade which I await like no other is the version of *Impression* which will, at long last, allow automatic runarounds. Finally, present me with a four-colour separation package and I would be a very happy editor.'

● These are just our views: you probably have your own ideas as to what constitutes an earth-shattering release. Many of the most recent products will be at the *Acorn User* show on 16 April: for more details see our news pages.

Technical Drawing for RISC OS



WorraCAD is a 2D technical drawing application for the Archimedes desktop. It has been designed to be a truly practical tool, ideally suited to dealing with the everyday problems associated with precision 2D draughting.

WorraCAD is unique amongst CAD applications for RISC OS in that it uses a floating point, rather than an integer model to represent its data internally. This avoids major problems with respect to accuracy and maximum drawing area. Highly optimised code ensures speedy performance in spite of the extra calculations required.

WorraCAD has seen many improvements over its lifetime, and most recently, has benefited from the addition of ellipses and elliptic arc geometry, and a complete revision of the user interface which is now totally icon driven (although the earlier interface is retained as an option for those who prefer it).

In spite of recent major improvements, WorraCAD's price remains at a very competitive £99.00. Education price is £69.95, and a site licence costs £279.80 (excludes p&p and VAT).

Launched in 1990, WorraCAD was the first CAD system for RISC OS.

After three years of continual refinement, the application has matured into a product essential to anyone creating technical drawings on the Archimedes.



WorraCAD can output files in a wide variety of formats. Drawfiles can be transferred to almost all other Archimedes graphics packages. DXF and HPGL files cater for industry standards.



Technical drawings require the use of different linestyles to show hidden detail, centre lines and so on. WorraCAD provides a range of styles to cover virtually all requirements.



The greatest strength of WorraCAD is its ability to calculate tricky geometric constructions automatically. Tangents, normals, foci and so on can be generated simply by clicking the mouse.



One of the most time consuming tasks at the drawing board is that of hatching. With WorraCAD, you simply select the boundary and any islands to be hatched, click, and the job's done.



WorraCAD allows virtually unlimited scope for zooming in and out. Because of WorraCAD's unrivalled accuracy, even at 500 000 x magnification, the drawing still hangs together.



The grid system in WorraCAD can be set to display in either orthogonal or isometric modes. The vertical and horizontal spacing can be independently adjusted.



Comprehensive dimensioning to BS308 is provided. Dimensions are associative - if the drawing is stretched, the dimension adjusts automatically. Precision and dimension style are easily controlled.



Plotter output is provided using the HPGL format, the industry standard plotter control language. Output can be sent directly to the plotter, or to file for plotting later, perhaps via a bureau.



Printer output goes via the standard RISC OS printer drivers. A preview mode is available, and a monochrome option is provided for output of coloured drawings to monochrome printers.

Move up to WorraCAD and draw your own conclusions

£99.00

Upgrades £30

Please add £1.50 p&p and VAT



Oak Solutions Ltd Suite 25 Robin Enterprise Centre
Leeds Road Idle West Riding of Yorkshire BD10 9TE
Tel: 0274 620423 Fax: 0274 620419



ADVENTURE PLAYGROUNDS

Clare Johnson finds that computers can make the classroom into a fantasy zone

Picture a primary classroom becoming a tropical rainforest, the undersea world of a turtle or the sett of a badger family. Children and teachers can use their imaginations to turn ordinary places into magical ones with a little imagination, a lot of paint and junk modelling and a great deal of fun.

Computer adventure games encourage exploration and problem solving, and are seldom linked solely to one curriculum area. Many have some kind of theme which can

then be used to draw together activities in all subject areas.

Using games of this type in a classroom requires a lot of planning and can take many weeks to work through. Although some computer time might be spent actually playing the game, other software such as word processors, DTP packages and databases are used alongside them. Exploring the variety of language, maths, history, geography and so on that arises can be time-consuming but very rewarding for both teacher and pupil.

There are certain things that adventures need to have. Children love the graphics, and good art work can provoke a lot of discussion and creative productions of their own. Clear language on each screen and not too much reading enables children of all abilities to have a go. A variety of levels of difficulty makes these games more usable in a number of year groups; software is an expensive commodity for many primary schools.

There are a large number of these types of game available

on both the Risc OS machines and the older BBC B and Master 128 machines. I have used many of them and have seldom failed to find that children enjoyed playing them, did not want to be told the answers even when the going got tough and all of them changed the classroom into a totally different place.

I've been in newsrooms, a Roman villa, to a distant planet and in teacher's cupboard. In these places we all learnt the subjects the timetable calls maths, English, and science.

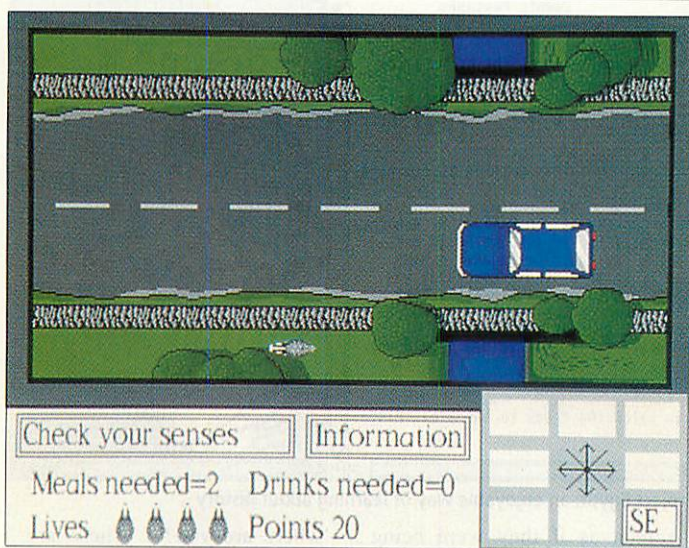
BADGER TRAILS

Sherston Software
Tel: (0666) 840433
£39.95

This is the latest adventure/exploration pack from this company, which has a long tradition of producing excellent games of this type. The pack comes with a video, maps, a teacher's book – without the answers – and a short story book to get the children started. There are two discs, the second of which can be copied to provide work discs for pupils to save screens and finishing positions on.

The exploration is designed around the pupils taking on the role of a badger, who has to be guided back to its sett after travelling too far afield. There is a busy road to cross, streams to negotiate and food and water to find.

We had a lot of discussion before starting, about what senses a badger could rely on, what it might eat, how far off the ground it was and how fast it might move. The children enjoyed this discussion and we



Living out the badger's lifestyle is exciting for children

started collecting pictures and books about badgers some time before starting the game.

Movement around the map is by compass directions – so we did some maths on bearings and angles – and the map is an aerial one so we also had a look at other photographs taken from the air to compare the features.

Badger poetry also abounded, as did lots of art

work and written work about endangered species.

The game is fairly simple. Most of the eight-year olds got through it in only a couple of hours, but discovered a great deal while doing so. Can badgers swim? How often do they get killed crossing roads? Do they eat meat?

Some children were upset at rabbits being eaten by badgers, but this led us into an interest-

ing discussion about eating meat and vegetarians. They were also fascinated by the fact that badgers will attack other badgers when they encroach on their territory.

The game does have a built-in point system which the children enjoyed, and screens could be saved at almost any point and printed out or put into DTP pages for writing about. The children never needed any help with the software, but occasionally needed help to find where they were on the map. They were overjoyed to discover that the badger could cross the road by going under the bridge. But only when it had had a drink and three things to eat...

We all enjoyed this package, and the children were all keen to have another go, even a third or fourth. The graphics are extremely good, and the use of the five senses throughout led us onto a science project about our own senses and disabilities. The adventure only took a couple of weeks, and we didn't get anywhere close to exploring all the directions it could have led us in.

GRANNY'S GARDEN

4Mation Software
Tel: (0271) 25353
£30

I did wonder why 4Mation had decided to rework an old eight-bit game for its tenth anniversary, but I was soon playing the whole adventure through – and I know all the answers – with much enjoyment because the graphics are superb.

It was worth playing just to see one of the baby dragons in its nappy, playing on a pogo stick. This game has now been converted to at least ten computers and never ceases to lose its magic. The story is based around a wicked witch and six missing children. You have to find them and you aren't allowed to back out.

The game comes on four discs and each section is reached by finding a password when you have solved the preceding section. The adventure takes children into a fairytale land of witches, giants, dragons who eat chips and



Granny's Garden is an old favourite enjoying a 32-bit revival

oranges, and a magic forest. The problems to be solved all involve some form of logic and children can encounter hazards if they don't do things in the correct order. They do find it frustrating to go back to the beginning each time, but it doesn't seem to stop them and does wonders for their memories.

It took the children about four hours in total to complete

the game, but that was broken up into short sessions over a period of time. They needed no help, and the discussions that took place in the groups led us on to story telling, model making, work on minibeasts and insects and a variety of language activities.

The game is Risc OS compliant and we could therefore save screens and use them in other programs. The older ver-

sion of this software had some very annoying music; it's still there but you can turn it off.

The animation sequences are spectacular and can be viewed through a remote control panel that allows movement through the sequence one frame at a time. It is also possible to enter answers in abbreviated form, though this isn't always consistent. I chose not to tell the children; it encouraged them to spell things correctly.

4Mation has produced a resource pack to go with *Granny's Garden*, containing Draw files and photocopyable sheets. The files are compressed, and the utility used is provided on the disc.

It was worth using this new version of *Granny's Garden* for the graphics alone. I felt that we were playing a completely new game, and am sure that a new generation of children will gain great pleasure from it. I would recommend to schools even if they already have the older version. What will 4Mation do with it when it is 20 years old?

LANDMARKS: PROJECT EGYPT

Longman Logotron
Tel: (0223) 425558
£24 per topic (seven other topics in the series)

The *Landmarks* series of software offer a different type of exploration for children. In each case children can 'talk' to someone from a time in history, whether Kenhirk-hopeshef (Shef for short) from Egypt 3000 years ago, a maid in an Elizabethan house or a cabin boy on board Christopher Columbus' ship on the way to discovering the Americas.

Each pack comes with one disc, a teacher's book and a pupils' book which contains various worksheets either directly relating to the software or suggesting activities connected to it.

There are also a variety of pictures alongside the 'conversation' screen and these can be used in other software or printed out.

The conversation with Shef starts with an exchange of names. The words appear on



Project Egypt: an enjoyable way of learning about history

screen as if they were being typed on a teletype printer. This appears slow but does make it easier to read large amounts of text. There is always a picture alongside the conversation which changes as you move around the location.

It is possible for the children to talk in everyday language but there are quite a few occasions when Shef doesn't understand and the question has to be rephrased. The system works on key phrases such as 'describe . . .' or

'where are you?'. These are recorded on the function keys to save typing, and the cursor keys are used to move around Shef's world.

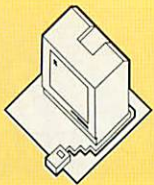
There is a map of his village and it shows the location of the tombs, temples, houses and the rubbish heap. You move around the village with Shef and discover things about how an Egyptian boy would have lived 3,000 years ago. We all found it amusing to discover that people built their tombs long before they died. The

passing of time is also simulated and is active for three full days. We found it interesting to discover things had taken place while we were not using the computer.

The activity book encourages pupils to use sources other than the disc to find out about the Egyptian civilisation and we found that using this software in conjunction with others based on the same subject (such as Sherston Software's *Arcventure 2*, *The Egyptians* and 4Mation's *sMart* file on Egyptians) gave us a great deal of information about a topic required for study at Key Stage 2 (History National Curriculum) and was fun as well.

The conversations could occasionally get frustrating, but the teacher's guide does provide a list of keywords so, with some guidance, the pupils can learn a great deal.

The language is well aimed at ten- and 11-year olds, and the pupils' activities provided some useful ideas for classroom work. I found *Landmarks* a very cost-effective and enjoyable way of teaching children about history.



ICON TECHNOLOGY LTD

5 JARROM STREET • LEICESTER • LE2 7DH • TEL. 0533 546225

EasiWriter

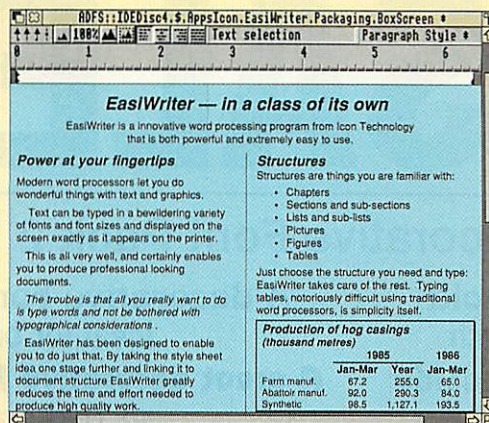
EasiWriter

Modern word processors let you do wonderful things with text and graphics. Text can be typed in a bewildering variety of fonts and font sizes and displayed on screen exactly as it appears on the printer.

This is all very well, and certainly enables you to produce professional looking documents. The trouble is that all you really want to do is type words and not be bothered with fiddly typographical details.

EasiWriter has been designed to let you do just that. You just choose the sort of structure you want - chapter, section, table etc. - then type the words. What could be simpler? Once you've experienced its capabilities you won't settle for less.

Price £149



"I would recommend EasiWriter as the best RISC OS word processor."

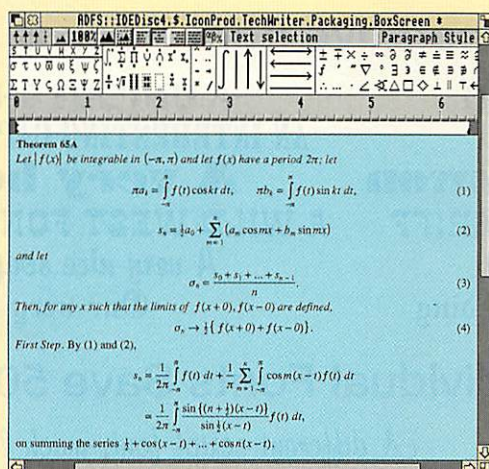
Archimedes World

TechWriter

TechWriter

Do you ever write documents that contain mathematical equations? If so, then you probably type the words first and add the equations later by hand. And no doubt you often dream of the day when you will be able to type the equations along with the words. Well, now you can stop dreaming because TechWriter has turned the dream into reality. We have taken all the features of EasiWriter and to these we have added a powerful equation editor that automatically applies the rules of mathematical typography on your behalf. All you do is choose the functions and type the symbols. TechWriter does the rest. Use it to produce exam papers, worksheets and technical reports with unrivalled ease. The end results are comparable with the best mathematical typesetters.

Price £199



"Looked on as a complete package for producing technical and academic documents TechWriter is nothing short of excellent."

Graham Bell, Acorn User

StartWrite

Just for a second, imagine all the plus points of EasiWriter simplified into a new entry-level word processor.

Well, that is precisely what StartWrite is all about. Even the price is scaled down.

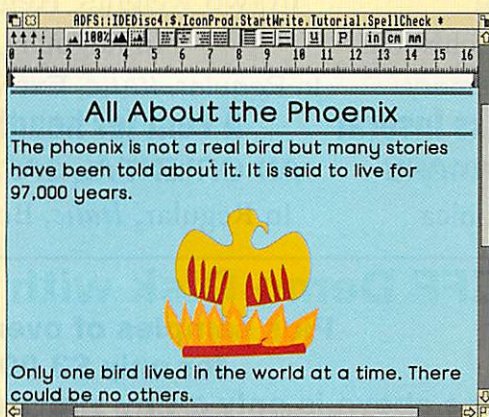
There is nothing complex involved, yet StartWrite still outperforms any comparable word processor on the market. As an indication of its potential, it's often impossible to tell whether a document has been created using StartWrite or EasiWriter.

Without doubt, the younger members of your family will find StartWrite an education in itself. What's more, StartWrite represents the perfect stepping stone to EasiWriter and TechWriter.

Price £69

Prices exclude VAT. Call for education prices and site licences. EasiWriter, TechWriter and StartWrite are ideal for Archimedes and all A-series with 2MB RAM or more.

StartWrite



For a free brochure, complete and return this coupon.

Name

Address



SALE

Save Up to 70% on Font Packs

Many Fonts at Half Price

Demo Disk for only £3.00

Including a Font worth at least £7.50

**EFF can supply
Fonts for the
following
languages**

Afrikaans, Albanian,
Assamese, Bengali,
Bihiri, Braille,
Bulgarian,
Byelorussian,
Croatian, Czech,
Danish, Devanagari,
Dutch, English,
Esperanto, Estonian,
Faroese, Finnish,
French, Gaelic, German,
Greek (Ancient), Greek
(Modern),
Greenlandic, Gujarati,
Gurumukhi, Hebrew
(Ancient), Hebrew
(Modern), Hindi,
Hungarian, Icelandic,
Irish, Italian, Lappish,
Latvian, Lithuanian,
Macedonian, Maltese,
Marathi, Nepali,
Norwegian, Polish,
Portuguese, Punjabi,
Rumanian, Russian,
Sanskrit, Serbian,
Slovak, Slovene,
Spanish, Swedish,
Tamil, Turkish,
Ukrainian, Vietnamese
and Welsh,

Decorative Font Pack 2 (8 Fonts)

Save 60%

Arnold
Clauch
RoadSide
SCIFI
Soho
STAMP
XXIST

A decorative Font with an Art Deco feel
Ideal for both headings and body copy
A great decorative Font for Superb Headings
in two weights REGULAR AND ITALIC
An elegant engraved font
A CAPITALS ONLY STENCIL FONT
GREAT FOR MAKING A MASSIVE IMPACT

All Eight
Decorative
Fonts for Only
RiscOS 2 £25.00
RiscOS 3 £40.00

Decorative Font Pack 3 (6 Fonts)

Save 70%

CLEN
LIPA
Dzwon
SHERIFF
Ida
Wedding

A UNIQUE SHADOW FONT FROM EFF
AN INTERESTING CAPITALS ONLY DISPLAY FACE
A very bold display face
A WILD WEST FONT IDEAL FOR POSTERS
A very nice script font that looks handwritten
Our very popular Black Letter Font

All Six
Decorative
Fonts for Only
RiscOS 2 £25.00
RiscOS 3 £40.00

Individual Fonts Save 50%

Asia	A different script font, much lighter than normal script fonts
aidan	an uncial script font with no upper case characters
Allegro	A beautiful script from EFF (Shelley Allegro™)
Basia	A very individual Script (Present Script™)
Griffo 1	In Regular, <i>Italic</i> , Bold and Bold Italic (Bembo™)
King	In two weights, Regular and Bold (Windsor™)
OldSchBook	In Regular, <i>Italic</i> , Bold and Bold Italic
Rosemary	In Regular, <i>Italic</i> , ExtraBold and Extrabold Italic
Swiss Inserat	A Font for headlines (Helvetica Inserat™)
UTAMARU	AN ORIENTAL CAPS ONLY FONT FROM EFF
Veronica	In Regular, <i>Italic</i> , Bold and Bold Italic (Sabon™)

	RiscOS2	RiscOS3
Asia	£7.00	£10.00
aidan	£5.25	£7.50
Allegro	£12.25	£17.50
Basia	£8.75	£12.50
Griffo 1	£13.50	£20.00
King	£8.75	£12.50
OldSchBook	£12.25	£17.50
Rosemary	£13.50	£20.00
Swiss Inserat	£5.25	£7.50
UTAMARU	£5.25	£7.50
Veronica	£13.50	£20.00

How to order from EFF

All prices exclude
postage and
packing and VAT.
Add up the cost of
your order add P&P
and then add VAT
at 17.5%. P&P for
software is £2.50.

Either phone your
order in to us, or
send it by post.
Most orders are
dispatched within 1
working day.

Handling Charge on
official orders under
£30.00 requiring an
invoice £5.00.

EFF Demo Disk with a font worth at least £7.50

Plus samples of over 50 other great Outline Fonts

for only £3.00 including P&P and VAT

The above is only a tiny sample of the vast range of EFF Fonts, why not
contact us now to receive a copy of our price list and Type Overview

The Electronic Font Foundry

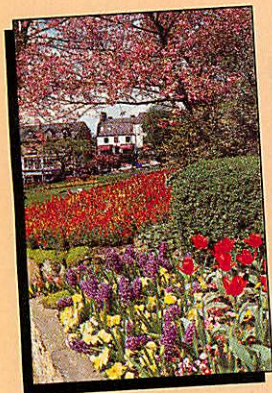
50/52 • Upper Village Road • Ascot • Berks • SL5 7AQ • Tel 0344 28698

Fax 0344 872923

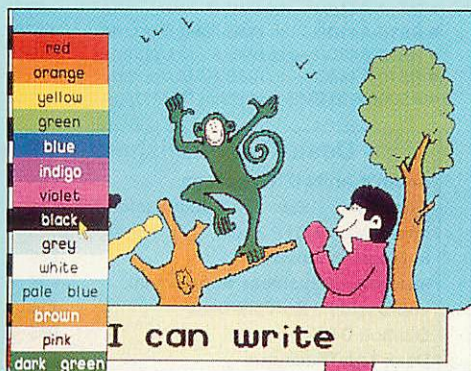
The

BBC
ACORNUSER

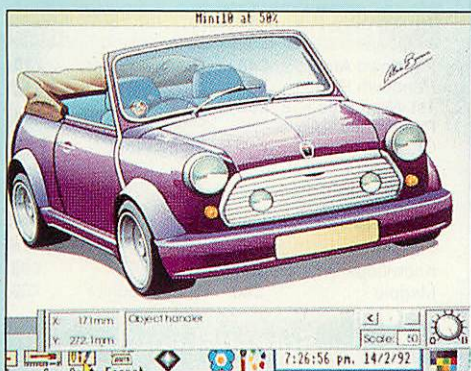
Spring'93



HALL D HARROGATE INTERNATIONAL CENTRE
15TH, 16TH & 17TH APRIL 1993 10 00 A.M. TO 6.00 P.M.



Inspiring new software for students and teachers, covering all areas of education including; Maths, English; foreign languages and talking word processors.



Professionals, will enjoy a superb range of accounting, word processing and graphics software. Look out for scores of bargains and special offers.



Play the day away on a massive range of challenging games for all levels of skill. Try out brand new titles from 4th Dimension, Krisalis and the latest from CIS. Plus surprises from newcomers.

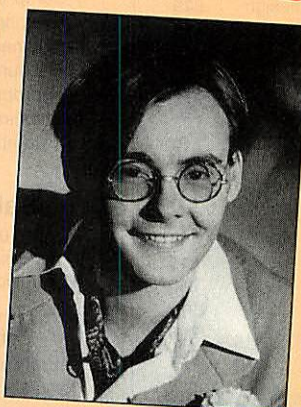
Celebrity visits, Treasure Trail Competition, free show guide, special show offers, low admission rates, free computing advice, school poster competition, surprise attractions.

The Acorn User Spring Show goes to the heart of Britain to bring Acorn expertise to a wider audience. Harrogate, the garden city of the north, is ideally located for easy access by road or rail.

Meet the BBC Acorn User team at our feature stand, for friendly advice, back issues and the perfect opportunity to take out your subscription!

Over 50 exhibitors offer the very latest in educational, professional and leisure technology for the Acorn user. Join the Treasure Trail for your chance to win a bumper pack with prizes from the major exhibitors.

FRIDAY 16TH ONLY



Your chance to challenge TV's Gamesmaster Host

DOMINIK DIAMOND

our special guest who will help with competitions, hand out prizes and, of course, sign autographs for eager fans both young and old.

Low admission prices: Adult £5.00 (£4.00); Under 16 £2.50 (£2.00); Family (2 adults & 2 under 16) £13.00 (£10.00). Under 5's Free admission. The prices in brackets are for advance bookings. Ring 0737 814713 for your advance booking discount.

Watford Electronics Ltd

Established 1972

Mail Order & Showroom: Jessa House, Finway, off Dallow Road, Luton, LU1 1TR, England

Tel: 0582 48 77 77 Tlx: 8956095 WATFRD Fax: 0582 488 588

Showroom Only: Jessa House, 250 Lower High Street, Watford WD1 2AN, England

Tel: 0923 237774 Fax: 0923 233642



The sign of
Quality

Shop Hours: 9am to 6pm (Mon.-Sat.) Thursday 9am to 8pm. FREE customer car park.

All prices exclusive of VAT; subject to change without notice & available on request.



The choice
of Experience

Archimedes micro

System	Basic	Colour	Multiscan
A3010-1Mb Family	£424	£625	£769
A3010-2Mb L/C	—	£680	—
A3020-2Mb FD	—	£749	£799
A3020-2Mb HD60	—	£899	£949
A4000-2Mb HD80	—	£949	£999
A4000-Home Office	—	£999	£1049
A5000 No HD	£689	—	—
A5000-2Mb HD80	—	£—	£1399
A5000-L/C 2Mb HD80	—	—	£1445
A5000-4Mb HD120	—	—	£1599
A5000-2Mb ES	—	—	£1299
A5000-2Mb NS	—	—	£1399
Pocket Book	£212	—	—
Pocket Book Class	£2127	—	—

On-Site Maintenance now available on all Archimedes Micros. Please telephone for details.

Archi A4 Notebooks

A4 Notebook with 2Mb RAM	£1399
A4 Notebook 4M RAM/60M HD	£1699

FREE OFFER

When you purchase any of the above Archimedes Micros, we will give 10% of the value of the machine in Hardware or Software of your choice

Archi Accessories

• 3.5" 800K 2nd Floppy Drive (305/310)	£118
• 5.25" 800K external Floppy Drive	£80
• Acorn I/O Podule (Analogue/User/1MHz bus)	£79
• I/O Podule (Analogue/User)	£59
• MEMC 1A Upgrade	£29
• MIDI add-on to Acorn I/O Podule	£27
• MIDI Expansion Card	£65
• Econet Network Board	£38
• Archi replacement mouse - New design	£29
• PC Emulator v1.9	£95
• Floating Point Unit	£455
• Keyboard Extension Lead	£6
• 2 Podule Backplane	£20
• 4 Podule Backplane	£25
• Fan for above backplanes	£10
• Risc Os Extras Software Disc	£5
• Ethernet Card	£149
• SCSI Card 8 bit	£129
• SCSI Card 16 bit	£149
• SID Utilities Discs - Set of 4	£19
• ST506 Hard Disc Controller Card	£99
• A5000 Dust Cover	£9pr
• A5000 Technical Reference Manual	£65
• A4 Spare Batteries	£49

RISC OS 3 Upgrades

• A 5000 Software Upgrade Kit	£16
• Software Upgrade Kit for the rest	£40
• Hardware Upgrade Kit 300/440	£25

A3000 Accessories

• 3.5" External Drive	£95	• Monitor Stand	£15
• Technical Manual	£39	• Serial Upgrade	£19
• A3000 Dust Cover	£5	• Micro+monitor cover	£9
• Acorn Carrying Case for A3000	£10		
• A3000 User Port/Midi Upgrade Card	£44		
• A3000 User/Analogue/IIC I/O Card	£38		
• A3000 External Podule Case	£15		

Scan256 Grey Scale Scanning

If you need a 256 grey-scale hand scanner for your Archimedes then look no further.

Scan256 gives you up to 256 levels of grey at a maximum of 400dpi and is supported by state-of-the-art sophisticated software - for only £185. This makes it the only sensible scanning and image processing solution for the Acorn 32-bit range. Just compare these features:

- More than one copy of the image held in memory at once.
- Allows multiple consecutive operations without saving the original to disk.
- Highly advanced dithering and image size reduction.
- Convolution digital filtering with over 100 filters gives high quality images from poor quality scans.
- Adjustable scale and size during scan.
- Supports State Machine G8 Graphics Card.
- Includes shearing and rotation.
- Saves images in industry standard formats: TIFF, Sprite and AIM.
- True brightness, contrast and gamma correction.
- Multiple options - scale to page, centre sideways selected area.
- Selectable scanning modes.
- Plus much much more...

Please specify Archimedes type, not compatible with A3010, A3020, A4000.

£185

A3010 DTP Pack

Supplied with 3.5" Floppy Disc Drive and a mouse, Colour Monitor and lead, TV modulator, 20Mb fast IDE Hard Disk Drive, 'Compression' utility to increase the Hard Drive capacity to typically 40Mb, the highly acclaimed Computer Concept's Impression Junior DTP package, EasiWord wordprocessor, Quest for Gold game, applications suite of software packages and comprehensive audio training tape.

RRP: £1095

Sale Offer Price: £739

- A3010 DTP Pack with Learning Curve £839
- Additional 1Mb RAM fitted £39

Special Education discounts available on micros, RAM upgrades, ARM 3 Turbo Card, etc. Please write in or telephone:

0582 48 77 77

Archimedes RAM Upgrade

All our memory upgrades are simple to fit. No soldering required. Fitting instructions supplied.

• R300-4 Layer RAM upgrade board (Bare).	£25
• R302-A3000 - to 2MB RAM Upgrade	£29
• R303-A3000 - to 2MB RAM Upgrade (expandable to 4MB)	£49
• R304-A3000 - to 4MB RAM Upgrade	£99
• R305-A3010 - to 2MB RAM Upgrade	£39
• R306-A3020 - to 4MB RAM Upgrade	£70
• R311-A305 - to 1MB RAM Upgrade	£30
• R312-A305/310 - to 2MB RAM Upgrade	£115
• R314-A305/310 - to 4MB RAM Upgrade	£229
• R412-A410/1 - to 2MB RAM Upgrade	£25
• R413-A420/1 - to 4MB RAM Upgrade	£50
• R414-A410/1 - to 4MB RAM Upgrade	£75
• R810-A410/1 - to 8MB RAM Upgrade	£579
• R820-A420/1 - to 8MB RAM Upgrade	£549
• R840-A440/1 - to 8MB RAM Upgrade	£479
• A5000 - to 2MB additional RAM Upgrade	£82

Desk Top Publishers

Acorn's Archi DTP Package	£69
• Equasor £39; • Expression-PS	£123
Impression 2 DTP Pack	£123
Impression Junior	£65
Impression Business Supplement	£39
Impression II Borders Disc	£19
Ovation DTP	£85
Desk Top Thesaurus	£18

Archi Wordprocessors

Pendown Archi	£48	Graphic Writer	£20
Pendown Plus	£68	Easiwriter	£115
1st Word Plus - 2	£63	EasiWord	£58
Pipedream Spell Checker	£40	Prime Word	£52

Databases

Flexifile	£79	Multistore v2.01	£174
Knowledge Organiser	£42	Pinpoint	£65
Magpie	£40	Pinpoint Junior	£23

Spreadsheets

Eureka	£99	Schema	£89
--------	-----	--------	-----

Business Graphics

GammaPlot	£39	SigmaPlot	£39
-----------	-----	-----------	-----

Integrated Packages

- Pipedream 3 £116 • Pipedream 4 £146
- Desktop Office - Database, Graphs & Charts, Wordprocessor Spreadsheet, Communications £98
- Desktop Folio - Wordprocessor, Desktop & Interactive Publishing. Ideal for school £75



CREDIT CARD 24 HOUR

Ansaphone Hot Lines

(0923) 250234 or 233383

Hi-Speed, Low Cost Archi Hard Disc Drive

Watford's advanced interface allows IDE drives to work on any Archimedes machine, speeds in excess of SCSI devices can be obtained at a fraction of the cost of a SCSI drive.

Up to four drives are supported by the IDE filing system IDEFS, up to two drives can be attached to each expansion card, up to four cards can be installed in a machine.

A powerful security feature has been provided with the two unique commands *IDELOCK and *IDEUNLOCK, ideal for educational establishments where hacking or tempering may be prevalent that may lead to loss of data. Once locked, the configuration can not be changed until a secret password is used. The !IDEForm Write Protect option is particularly useful in conjunction with *IDELOCK as it will prevent any unauthorised deletion of data.

By an innovative use of on-board memory, the card will remember its configuration, even if moved to another slot or even a different machine, this also includes the unique security features.

Hardware

- Supports proposed ANSI ATA (IDE) specification
- Fast 16 bit MEMC interface interrupt driven to support background disc operations
- 5 Mbytes per second peak transfer rate
- Up to two drives (master and slave) per card
- Multiple cards per machine (up to four)

Software

- All software supplied in ROM
- Filing system 'IDEFS'
- Desktop filer with drive ready detection and disc name under icon
- !IDEForm, WIMP based configuration and formatting software
- Drives can be individually write protected
- Power saving standby modes supported with configurable timeout
- Drives can be used without translation in native mode for minimum overhead
- !IDEFSDisk, creates PC emulator hard discs

Prices

Part No.	Capacity	Access Speed	Price
ADA 0520	44Mb	28mS	£189
ADA 0530	100Mb	16mS	£259
ADA 0570	200Mb	15mS	£369
ADA 0580	330Mb	15mS	£599

All above 3.5" Drives are supplied complete with Controller Card & cable for use with A300/A400/A500 series machines.

AAA 0300 External Case & PSU for A3000	£85
AEA 1060 Archi IDE Hard Disc Podule only	£89

A5000 Internal IDE Drive

ADA 0940	100Mb	16mS	£195
ADA 0950	200Mb	15mS	£275
ADA 0580	330Mb	15mS	£525

A5000 2nd Internal IDE Hard Drive

ADA 0960	100Mb	16mS	£205
ADA 0970	200Mb	15mS	£285
ADA 0990	330Mb	15mS	£535

Internal Hard Disc Drives for A3000/A3010

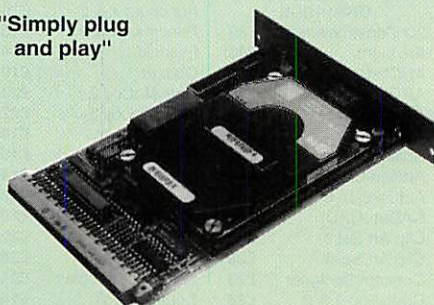
State of the art, 4 layer internal IDE Hard Cards for the A3000. Software supplied in, On-board ROM.

ADA 0150	20Mb	19mS	£149
ADA 0770	30Mb	19mS	£185
ADA 0750	60Mb	18mS	£259
ADA 0720	80Mb	18mS	£299
ADA 0730	120Mb	16mS	£395

Supplied ready assembled. No soldering required. Simply plug into the allotted space.

Archi IDE Hard Cards

"Simply plug
and play"



Watford's easy to instal, low cost, high performance, revolutionary IDE Hard Cards for the A300 & A400 series Archimedes.

ADA 0650	20Mb	19mS	£159
ADA 0800	30Mb	19mS	£195
ADA 0660	40Mb	28mS	£289
ADA 0810	60Mb	18mS	£299
ADA 0670	80Mb	18mS	£309
ADA 0680	120Mb		£405

(All above Hard Cards can be used as Removable Hard Drives. Ideal for Military and Education use.)

DON'T FORGET WATFORD'S HANDS-ON OPEN DAY

On Sunday 18th April, 1993
from 10am - 5pm



Come and see the latest Acorn & PC products including the Aries Perfecta and HP Vectra ranges of quality PC's

Some of the guest companies will include: Acorn Computers, Aries Micro's, Canon, Corel, GST Software, Intel, Lotus and Taxan.

Watford's own technical and sales support staff will be able to offer advice and assistance on the full product range. Seminars will be held by the leading manufacturers and suppliers

Free refreshments will be served all day

Jessa House, Finway (Off Dallow Road)
Luton. LU1 1TR.

Tel: (0582) 487777 Fax: (0582) 488588

A3000 I/O Card (User, Analogue & IIC)

This NEW versatile I/O Card from Watford, fits inside the A3000 and includes an Analog to Digital Converter, a User Port, and an InterIC (IIC) connector.

The card allows many of the peripherals developed for the BBC to be used with the Archimedes A3000. The ADC and User Port have the same pin out and connectors as the BBC computers.

Extensive RISC OS software is supplied to provide BBC OSBYTE calls for support of the ADC and User Ports, including the BASIC keyword ADVAL. The software provides extended RISC OS support for separate interrupts from both the ADC and User Ports, permitting easy interrupt driven operation.

The card is provided with all the software in ROM and is automatically loaded when the machine is turned on.

Peripherals connected to the ports can obtain up to 500mA of power at +5V. A fuse is fitted to the card to protect the A3000 from damage arising from accidental short circuit of the power output.

Features

- An 8 bit User Port with a standard 20 way IDC connector, compatible with the User Port on the BBC computers and the Archimedes I/O Podule.
- A 10 bit Analog to Digital Converter with a standard 15 way D type connector, compatible with the ADC on the BBC range of computers and the Archimedes I/O podule.
- An InterIC (IIC) Port with a 5 pin DIN socket to connect the A3000 to external IIC devices.

£38

Leasing finance at very attractive rates now available to Businesses (subject to status), Schools, Colleges, Universities, Government Depts. and Local Councils. Minimum order £1,000. Please telephone for details.

Archimedes External Disc Drive Interface

With this interface it is possible to connect almost any 5.25"/3.5" disc drive with its own power supply to the Archimedes. Up to 4 disc drives can be connected. Fully Buffered Board. NO SOLDERING is involved. Supplied complete with necessary lead.

Price £21

Back Plate Extension

• A300/400 £15; • A3000 £14

ARM 3 Turbo Card MkII

Simply The Best



Here it is at last - the all new Mark 2 version of Watford's highly acclaimed ARM 3 processor board for the Archimedes and now also the A3000 series computers. Using the latest surface mount technology on a high quality four layer circuit board we have reduced the overall size to a mere 53mm x 45mm, and the cost to only £169. Mk II upgrade will increase the speed of your micro by a factor of 3 to 6.

Any competent A300 or A400/1 series micro owner can fit the upgrade himself, as we provide full fitting instructions and a special ARM chip extraction tool. However for A3000 micros and those not wishing to perform the upgrade themselves, we will collect, upgrade and return your micro by courier service, at an additional cost of £24.

(A300 and old A440 series owners please note - you will need to upgrade to MEMC1A for ARM3 to work.)

RRP £249

Special Offer £145

Acorn have satisfactorily evaluated Watford's ARM 3 upgrade and the A3000 upgrades are fitted by Acorn approved surface mount technology centre, therefore its fitment will not invalidate Acorn's warranty on the micro.

BBC MASTER

MASTER 128K Micro incl. Acorn's View, Viewsheets, ADFS, BASIC Editor & TERMINAL £329

Add-Ons & Accessories

Econet Module for the Master	£42
Twin ROM Cartridge for Master	£9
Quad ROM Cartridge for Master	£14
Master Reference Manual I	(No VAT) £14
Master Reference Manual II	(No VAT) £14
Master Advance Ref Manual	(No VAT) £14
64K Upgrade Kit for B+	£32
ECONET Upgrade Kit for BBC B	£42
ALL ECONET UPGRADES Available	
ARIES' IEEE Interface for BBC B & Master	£238

Continued → → → → → → → → →

BBC Education Software

A vous la France	French programs for beginners	£29
Au restaurant/Accident de route	French games for 12 years +	£26
Bolougne and oh les	French program for beginners	£26
Computer control	Program simulating computer control	£26
Computers at work	Primary education program	£17
Espana Viva	Spanish educational programs	£20
Folks Tales	Listening and reading for ages 7+	£22
Geordie Racer	Look and read for ages 7+	£22
Hall of Mirrors	Practice word & number skills	£22
Help your child learn basic mapwork 2		
Inside Science	Four common science subjects	£18
Letters and pictures	Educational programs for 6-8 years	£15
Make a wildlife garden	Explore wildlife/wea-ther/garden growth	£22
Maths with a story 1	Primary level maths programs	£20
Maths with a story 2	4 further maths programs	£20
Note invaders	Learn sheet music for 7-Adults	£15
Numbers & Pictures	Early number learning (4-6 years)	£15
Picture craft	Geometrical design & Colouring	£17
Puncman 1 & 2	Learning Punctuation (7-13 years)	£15
Puncman 3 & 4	Learning Punctuation (8-14 years)	£15
Puncman 5, 6 & 7	Learning Punctuation (8-15 years)	£15
Ramayana Tales	Simple Desktop Publisher using pictures & characters from the Ramayana	£22
Skyhunter	Look and read educational adventure	£22
Technology and design	Problem solving programs	£22
Through the dragons eye	Adventure game and Map reading	£22
Fun School 3 (Under 5)	Varied range of Education subjects	£17
Fun School 3 (5-7)	Varied range of Education subjects	£17
Fun School 3 (Over 7)	Varied range of Education subjects	£17

Archi Educational Software

• Animated Alphabet (3-6 yrs)	£21	• Glimpse Clip Art Utility (7-16 yrs)	£8
• Arcventure (8-12 yrs)	£29	• Highlighter (6-16 yrs)	£42
• Bookbinder	£43	• Jigsaw	£19
• Bumper Disc	£14	• Mapventure	
• Bumper Disc 2	£14	• Microbugs (9-13 yrs)	£24
• Craftshop 1	£19	• Money Matters	£16
• Craftshop 2	£19	• Nature Park Adventure (7-9 yrs)	£27
• Converta-Key	£16	• Numerator	£60
• Data Word	£16	• Picture Book	£16
• Desktop Stories	£35	• Recall (6-13 yrs)	£39
• DigiSim	£35	• Sellardore Tales	£24
• Dream Time (5-7 yrs)	£23	• Snippet	£37
• Farm (5-7 yrs)	£19	• Space Mission	
• Fleet Street Phantom (9-13 yrs)	£25	• Mada (9-13 yrs)	-
• Fun School 3 Red (up to 6 years)	£17	• Sting of the Dump (9-13 yrs)	£22
• Fun School 3 Green (6-8 years)	£17	• Viewpoints (9-12 yrs)	£33
• Fun School 3 Blue (8 years +)	£17	• Wizard's Revenge (7-10 yrs)	£17
• Gate Array Teaching System	£68	• Worst Witch (7-10 yrs)	£25

Archimedes Software

GRAPHICS			
3D Construction Kit	£39	Puncman 1 & 2	£16
Arc Light	£46	Puncman 3 & 4	£16
ARCTist	£19	Pysanki	£14
ARCTiculate	£19	Quazer	£10
Art Works	£139	Real McCoy 2	£23
Atelier	£60	Real McCoy 3	£22
Artisan II	£45	Redshift	£14
Artisan Gallery	£16	Return to Doom	£16
Autosketch II	£65	Repton 3	£14
CADet (CAD)	£140	Saloon Cars Deluxe	£27
Clip Art Set 1	£28	Sim City	£19
Clip Art Set 2	£28	Spitfire Fury	£22
Concept Designer	£23	Splice	£25
Craftshop 1 & 2	£28	Sporting Triangles	£24
Euclid 2	£50	Superior Golf	£14
Graph Box	£59	Superpool + Break 147	£22
Graphbox Professional	£107	Swiv	£19
HotLink Presenter	£40	Talisman	£12
Illusionist	£69	Timewatch	£24
Kermit	£46	Trivial Pursuit	£22
Mogul	£17	Twin World	£15
PCAD Educ.	£395	U.I.M.	£23
Pro Artisan	£70	White Magic 2	£15
ProCAD	£475	Worldscape	£16
Prime Art	£46	XFire	£19
Render Bender 2	£79	Zelanites	£23
Revelation 2	£80		
Tiler	£119		
Tween	£29		

GAMES

Air Supremacy	£17		
Apocalypse	£14		
Arcade 3 Compilation	£12		
BattleTank	£10		
Black Angel	£27		
Boogie Buggy	£14		
Break 147 + Supa Pool	£19		
Bughunter in Space	£12		
Bughunter/Moondash	£10		
CADet	£135		
Casino	£10		
Cataclysm	£19		
Caverns	£10		
Chess 3D	£16		
Chocks Away	£27		
Compendium	£32		
Chocks Away Extra	£14		
Chuck Rock	£18		
Conqueror	£15		
Cyber Chess	£38		
Ego Repton 4	£-		
Elite	£33		
Enter the Realm	£19		
E-Type Compendium	£20		
E-Type Designer	£13		
Family Favourites	£13		
Galactic Dan	£19		
Gods	£24		
Grievous Bodily Arm	£19		
Holed Out Designer	£13		
Holed Out Golf Comp	£20		
Hostages	£14		
Inter Dictor 2	£26		
Iron Lord	£15		
Jahangir Khan Squash	£19		
Jigsaw	£27		
Lemmings	£20		
Oh no more Lemmings	£15		
Lost Temple	POA		
Lotus Turbo Challenge	£19		
Mad Prof Mariarti	£17		
Masterbreak	£16		
Man at Arms	£14		
MahJong Patience	£15		
Manchester United II	£19		
Nebullus	£21		
Nevryon II	£20		
Omar Sharif's Bridge	£23		
Pandoras Box	£18		
Pipe Mania	£17		
Play It Again Sam	£-		
Populous	£23		

Miscellaneous

Ancestry	£59
Arccomm 2	£38
Arcterm 7	£64
Armadeus Sound	£60
Avante Garde Fonts	£23
BBC DFS Reader	£6
Broadcaster Loader	£65
Chameleon	£34
Chart Well	£25
Chatter	£34
Compression (CC)	£38
Craftshop 1	£27
Craftshop 2	£27
Desk Edit 2	£29
Equasor	£38
FlexiFile	£97
Genesis	£10
Genesis Plus	£68
Genesis 2	£99
Investigator 2	£22
Magpie 2	£42
Notate	£42
Numerator	£66
Pin Point	£65
Polyglot	£16
Presenter 2	£29
Presenter Story	£145
Prophet Accounts	£132
Prophet Demo Disc	£10
Rainforest	£17
Revelation 2	£95
Rhapsody in Blue 2	£45
Score Draw	£46
Show Page	£127
Speech!	£15
The Victorian	£17
Time Tabler	£549
Toolkit (Clares)	£35
Touchtype	£40
Tracker	£39
Turbo Driver BJ10E	£42
Type Studio	£43
Vox Box	£46
Wimp Programmer's Toolkit	£16
WorldScape	£17

LANGUAGES

Desktop C	£199
Macro Assembler	£40
Robo Logo	£69
BASIC Compiler	£77
Logotron Logo	£45
Risc BASIC	£120
Risc FORTH	£110
Cambridge Pascal	£95

Minerva's Archimedes Software

EasyWord	£18	Time Tabler	£549
Home Accounts	£35	System Delta	£59
System Delta Program Reference Manual			£29

Stand alone Business Accounts Packages

Sales; Purchase; Order Processing and Invoicing; Nominal Ledger; Stock management
£79 per module

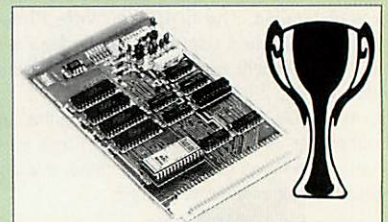
Cortian CKAI Interface

Eliminates the need to have a User port in A3000, A5000 and any other Archimedes without User Port. Fits to the Econet socket. £29

Concept Keyboards

• A4 Standard Pack	£95
• A4 Primary Pack	£100
• A4 Designer Pack	£110
• A3 Standard Pack	£99
• A3 Primary Pack	£105
• A3 Designer Pack	£110
• Universal 2010 Keyboard A3	£115
• Universal 2010 Keyboard A4	£110

Archi Real-Time Digitiser



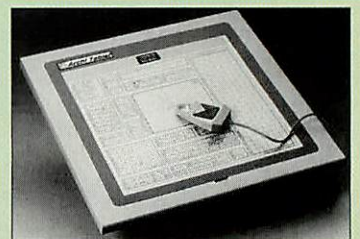
Now supplied with NEW RISC OS Version Software

Watford's Archimedes Video Digitiser is the most sophisticated digitiser ever designed for a micro. It provides a fast and flexible means of capturing images from a video camera or recorder for display and manipulation on the Archimedes range of Micros. Off-air television signals may also be digitised via a video recorder or TV tuner. Please write for further details.

Price £75

A Set of Colour Filters for colour image grabbing using a video camera £16

Archi Graphic Tablet



Special Price £199

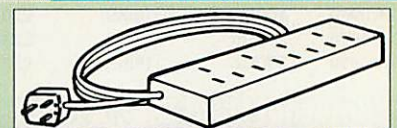
(Price includes Tablet, Leads, Software & Puck)
Stylus Optional Extra £20
Archi Graphic Tablet Junior. Working area 9" x 6". Price includes Stylus £105

Surge Protector Plug

Fitted in place of your normal mains plug, this device protects your equipment (and data from corruption), against mains high voltage transient spikes/surges caused by lightning or thermostats switching.

Protection for only £8.50

4 Way Mains Distribution Socket



4 way top quality mains trailing sockets. Supplied wired up with mains plug ready for use. Can be screwed to floor or wall if required. Very useful for tidying up all the mains leads from your peripherals.

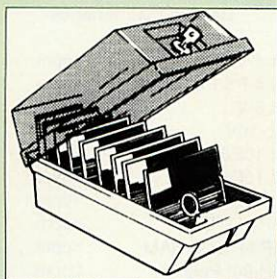
£9.50

Aries Spike Cleaner Unit

A 4 way mains distribution unit as above with a built-in Surge Arrester, providing protection for your complete Computer/Hi-Fi System

£16

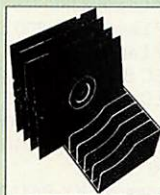
Antistatic Lockable Disc Storage Units



- **M35** – holds up to 50 5.25" discs £4.95
 - **M85** – holds up to 95 5.25" discs £6.95
 - **M25*** – holds up to 25 3.5" discs £4.95
 - **M50** – holds 50 3.5" discs £6.50
 - **M100** – holds 100 3.5" discs £6.99
 - **M10** – holds 8 of No. 10 Data Cartridges £15
- * Not lockable

Disc Plonker Rack

When using ones micro, there is a tendency to have more than one Disc on the desk. This exposes them to the hazards of fingerprints, scratches, dust, coffee and an untidy desk. Why not protect your valuable data from all these hazards with the help of our extremely handy and low cost DISC PLONKER RACK. Holds up to eight 5.25" discs.



£2

3M – Diskettes

Lifetime warranty on 3M Discs

- 10 x 5.25" S/S D/D 40T (744) £5
- 10 x 5.25" D/S D/D 40T (745) £5
- 10 x 5.25" S/S D/D 80 Track (746) £6
- 10 x 5.25" D/S D/D 80 Track (747) £7
- 10 x 5.25" 1.6M D/S D/D High Density for IBM XT and AT £8
- 10 x 3.5" S/S D/D 40/80 Track £6
- 10 x 3.5" D/S D/D 40/80 Track £6
- 10 x 3.5" Double Sided High Density £10

Top Quality Diskettes

Watford's life time guaranteed disc are supplied complete with self stick labels & plastic library case.

- 10 x **M3** 3.5" D/S D/D 80 Track £6
- 10 x **M9** 3.5" D/S High Density £10
- 10 x **M4** 5.25" S/S D/D 40 Track £5
- 10 x **M5** 5.25" D/S D/D 40 Track £5
- 10 x **M7** 5.25" D/S D/D 80 Track £6
- 10 x **M8** 5.25" D/S H/D Hi-Density £9

Special Bulk Offer Discs

(Lifetime warranty on Discs)

BULK PACK DISCS in lots of 100

Type	S/S 40T	D/S 40T	D/S 80T
• Without Sleeves 5.25"	£25	£30	£35
• With Sleeves 5.25"	£28	£33	£38
• 3.5" D/S D/D	£21 for 50	£39 for 100	
• 3.5" D/S H/D	£40 for 50	£75 for 100	

Disc Drive Power Leads

Supply from BBC power supply to standard Disc Drive Connection: Single £3.00; Dual £3.75

Disc Drive Interface Leads

BBC to Disc Drives Ribbon Cable
Single £4 Twin £6

3.5" Disc Drive



These top quality 3.5" Double sided, 80 track, are attractively finished in BBC beige. They are supplied complete with all cables and a Utilities Disc.

Type	Description	
• CLS35:	Single Disc Drive, 400K	£59
• CLD35:	Twin Disc Drives, 800K	£109
	Disc Drive with PSU	
• CS35:	Single Disc Drive, 400K	£82
• CD35:	Twin Disc Drives, 800K	£126

(P.S. CS35 is supplied in a twin case with a blanking plate to enable easy expansion to a dual drive at a later stage)

Disc Drives in Monitor Stand



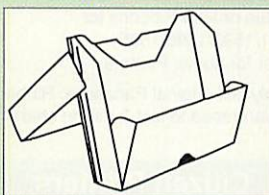
- **CDPM 800S** – Twin 5.25", 800K Double sided 40-80 track switchable disc drives mounted in an attractively finished Beige colour plinth for the BBC B & Master 128K micros. Supplied complete with integral power supply, cables and Utilities disc. The mains switch with neon On/Off light indicator, and the two 40/80 track switches are mounted on the front panel for ease of use.

£165

- **DP35 800** – Same as above except, one disc drive is a 5.25" and the other is 3.5".

£154

Plastic Library Cases



- DLC1** – Holds 5 x 3.5" Discs. £1.50
- DLC2** – Holds 10 x 3.5" Discs. £1.90
- DLC3** – Holds 5 x 5.25" Discs. £1.60
- DLC4** – Holds 10 x 5.25" Discs. £2.00

Disc Albums

Attractively finished in leather-look PVC Vinyl

- DW1** – Holds 6 x 3.5" Discs £2.50
- DW2** – Holds 6 x 5.25" Discs £3.00
- DW3** – Holds 20 x 5.25" Discs £3.50
- DW4** – Holds 40 x 3.5" Discs or 5.25" Discs £4.50

Floppy Head Cleaner Kit

The heads in floppy drives are precision made and very sensitive to dirt. The use of Cleaner Kit is a sensible precaution against losing valuable data. It is recommended to clean the drive head once a week. It is very simple to use. Available in 3.5" & 5.25", please specify.

Price £4

Acorn & Watford DFSs

- Watford sophisticated DFS ROM £16.00
- Watford DFS Kit complete £49.00
- DFS Manual (comprehensive) £6.95
- Acorn DNFS ROM £17.00
- Acorn ADFS ROM only £25.00
- Acorn 1772 DFS ROM Kit £49.00
- Acorn DFS Kit complete £48

Watford's MkII 1772

Single/Double Density DFS

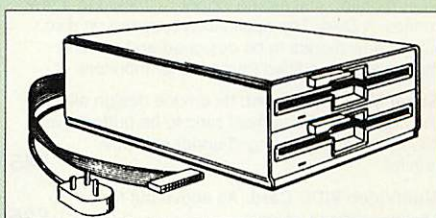
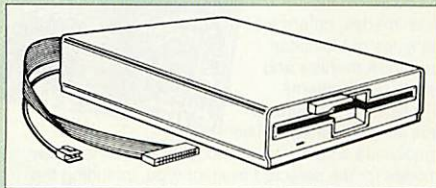
Many of our customers have wanted to use our superior DDFS and Acorn ADFS together. Now our Mk II DDFS Board with its 1772 Disc Controller, has been adapted to allow the use of Acorn ADFS as well. It also has all the commands of the Acorn's 1772 DFS, plus many more added features.

- Complete Kit Special Price £44
- DDFS Manual (No VAT) £6.95
- We will exchange your existing DFS Kit for our sophisticated DDFS for only £26

Quality Disc Drives from Watford

All our Disc Drives are Double Sided and will operate in both Single and Double Density modes. All 5.25" Disc Drives are 40/80 track switchable. For ease of use, the switches are front mounted. Follow the trend with a Watford plinth. (Turn to the 6th page of our advert for the Plinths). P.S. All our 5.25" Disc Drives with PSU are compatible with the Compact Micro. All you require is our special Compact Disc Drive cables designed by us.

"Test Bureau Approved for Use in Education"



Our Disc Drives conform to BS415

Type	Description	
	Disc Drive without PSU	
• CLS400S:	Single, 40/80 track 400K Double sided Drive	£70
• CLD800S:	Twin, 40/80 track, 800K Double sided Drives	£138
	Disc Drive with PSU	
• CS400S:	Single, 40/80 track, 400K Double sided Drive	£80
• CD800S:	Twin, 40/80 track, 800K Double sided Drives	£149

Special Cable to connect both 3.5" and 5.25" Disc Drives simultaneously to the BBC Compact £13

Continued → → → → → → → → →

Microvitec Monitors

- 1431 - Standard Resolution Monitor #£175
- 1451 - Medium Resolution Monitor #£215
- Cub3000 Medium Res for A3000 #£195
- Dust Cover for Microvitecs £5.50
- Touchtec 501 Touch Screen £239
- Touchtec 3000 £-

Includes 3 years parts & labour warranty

Multiscan Colour

- Eizo F550i £749
- Eizo T560IT £1345
- Eizo T660i-T 20" £1655
- Eizo 9060 £398
- NEC 3FG £359
- NEC 4FG £462
- NEC 5FG £839
- NEC 6FG £1509
- Taxan 787 £238
- Taxan 787LR £262
- Taxan 795PC £445
- Taxan 875+ £729
- Taxan 875+ LR £799
- Taxan 970 £1230
- VIDC Enhancer £25

Aries AlphaScan Monitor

Its multiscan circuitry provides automatic adjustment for frequencies between 30 and 60KHz horizontal, and 50 and 90Hz vertical. Its 0.28mm dot pitch high resolution tube provides super sharp text graphics, while a high speed (70/72Hz) refresh rate provides a flicker-free display easing the eye strain. The VIDC Adaptor supplied with the monitor allows high resolution operation in all screen modes.

- Aries Alphascan 17" Plus £325
- £585

Philips Monitors

- BM7502 12" Hi-res Green Monitor £88
- CM8833 14" Med. Res Colour Monitor £195
- Dust Cover for Philips Monitors £6
- Spare Monitor Leads (various) £7

VIDC Enhancer

This unique VIDC add-on board for the Archimedes, caters for all types of Multiscan and VGA monitor and mode requirements. There are 2 versions to suit all requirements. The multimode software supplied, provides all the new modes for the selected monitor type, including the now standard Computer Concepts modes. With VGA monitor, you are no longer restricted to a few modes. A Desk Top application supplied on disc, allows new modes to be designed and existing modes to be modified for particular monitors.

Super VGA VIDC Card: Its unique design allows the horizontal and vertical sync to be buffered and have the polarity changed under software control

- £45
- MultiVideo VIDC Card:** As above but for MultiScan monitors only. £25

Integrex Ink Jet Printers

- Colour Jet 132 Printer £425
- Paper Roll £6.50
- BBC Screen Dump Software £10
- Colour Cartridge £21 • Black Cartridge £12.40
- 100 A4 OHP transparencies £55
- 8K Serial Interface Optional £123
- Colour Jet 2000 £599
- Betajet Ink Jet Printer £185
- Betajet Cut Sheet Feeder £43
- Integrex Colourjet Series 2 £335
- Auto Sheet Feeder for Series 2 £45

Printer Leads

- BBC Centronics 4' £5; 6' £6
- Archi Parallel 2m £5; 5m £9 10m £13
- PC Parallel 2m £5; 5m £9; 10m £13
- 25 pin D Male/Male 2m £5; 5m £10
- Centronics Double Ended 4' £5
- Centronics Double Ended 6' £6
- RS232 Leads Various £POA

Star Printers

Printer	CSF	Ribbon
LC15	£190	£119
LC20	£104	£69
LC100C	£126	£69
LC24-15	£245	£119
LC24-100	£143	£69
LC24-200	£168	£69
LC24-200C	£214	£69
LC200 C	£151	£69
STAR JET	£169	£43
XB24-200C	#£324	£80
XB24-250C	#£389	£139
ZA-200C	#£260	£-
ZA-250C	#£324	£-

Includes 12 months on-site warranty

- Star/Archimedes Colour Printer Driver £15
- Black Ribbons for Colour Printer £5
- Serial 8K Serial Interface LC10/15/24/200 £52
- 32K Buffer LC/XB24-10; 15; 200 £52

NEC Pinwriter Printers

Printer	CSF	Ribbon
P220	£189	£59
P30	£235	£59
P62	£342	£89
P72	£406	£115
P90	£579	£115

- Black Ribbons for P20; P30 £6
- Ribbons for P60/70/P90 Black £8; Colour £14
- P60/70 Colour Option Kit £59
- CSF for P20 £59; P60 £89; P70 £89

Panasonic Printers

Printer	CSF	Ribbon
KX-P1123	£126	£59
KX-P1170	£98	£59
KX-P1624	£264	£126
KX-P1654	£330#	£126
KX-P1695	£267	£126
KX-P2123M	£144	£79
KX-P2123C	£194	£79
KX-P2124	£215	£89
KX-P2180M	£126	£79
KX-P2180C	£143	£79
KX-P2624	£269	£126

Includes 12 months on-site warranty

- Dustcover for 80 column printers £6
- Serial Interface for above Printers £46
- Black Ribbons for P1081, 1180, 1124 £6
- Brown, Blue or Red Ribbons for KX-P1081/1592/1595/1695 £9 each
- 32K Buffer for above Printers £16

P.S. We only sell original Panasonic Ribbons which are guaranteed to last 3 million characters

Citizen Printers

- 120D+ £98
- Swift 9 £145
- Swift 9X £185
- PN-48 £189
- ProJet £299
- Swift 200 £178
- Swift 240 £200
- Swift 240C £212
- Swift 24X £299

- AH29804 Manual Cut Sheet Feeder for Swift 9/24/124. Holds 50 Sheets £29
- Cut Sheet Feeder for 80 col. printers £75

+ FREE 2 years Parts and Labour warranty on all Citizen Printers

- Swift 9 Colour Option £19
- Swift 24 Colour Option £29
- Swift 24 Ribbons Black £4 Colour £13
- Swift 24X Ribbons Black £8 Colour £16
- Citizen/Archimedes Colour Printer Driver £15

Laser Printers

All Laser Printers include 12 months On-site maintenance

Brother HL4-VE	4ppm	£594
Brother HL4-PS Postscript	4ppm	£974
Brother HL8-V	8ppm	£848
Brother HL-10V	10ppm	£1045
Brother HL10PS	10ppm	£1329
Brother HL10DV	10ppm	£1149
Brother HL10DPS	10ppm	£1445
Canon LBP4 LITE	4ppm	£492
Canon LBP4+ 1.5M RAM	4ppm	£644
Canon LBP-8III Plus	8ppm	£945
Canon LBP-8 plus IIIR	8ppm	£1435
Canon LBP-8 IV 600 DPI	8ppm	£993
Epson EPL4000	6ppm	£478
Epson EPL5200 - NEW -	6ppm	£POA
Epson EPL7500	6ppm	£1139
Epson EPL8100	10ppm	£920
Fujitsu VM800 (Best Buy)	8ppm	£549
HP Laserjet IIIP	4ppm	£639
HP Laserjet IIISi PS	16ppm	£2469
HP Laserjet IV (600 dpi)	8ppm	£1035
HP Laserjet 4M PS	8ppm	£1425
NEC Silentwriter S62P P/script	6ppm	£994
NEC Silentwriter 266	8ppm	£669
NEC Silentwriter 290P P/script	8ppm	£1469
NEC Silentwriter S102	8ppm	£995
OKI OL400	4ppm	£440
Panasonic KX-P4410	5ppm*	£462
Panasonic KX-P4430 Satin Print*	5ppm*	£594
Panasonic KX-P4451	11ppm*	£915
Panasonic KX-P4455 Postscript	11ppm*	£1249
Star LP-4 Postscript	-	£774
Star LP-8 III 2	8ppm	£1249
Star LP-8 III	8ppm	£899
Star LP-8 Star(post)script	8ppm	£1130
Star LS-5	5ppm	£489
Star LS-5 EX (RISC Based)	5ppm	£599
Star LS-5 TT True Type + Mac	5ppm	£775

* Now with 2 years On-site warranty

Laser Toners

Canon 2, 3 & 4	£52	Laserjet HP IIP & IIIP	£54
Epson GQ	£13	Laserjet II/D, III/D	£60
EPL4/1/4300	£55	Laserjet 4 & 4M	£75
EPL7100/7500/8100	£117	NEC SWriter	£84
KX-P4420/50/55	£20	Star LP4	£54
Qume Crystal (3)	£75	Star LP8/Canon 8	£59

Laser RAM Upgrades

Type	1M	2M	4M
IIP; IIIP	£49	£80	£132
II & IID	£60	£96	£142
LJ4/4M	£-	£75	£175 8M/£279
EPL4100	£-	£120	- 512K/£52
Canon LB8	£139	£275	-
KX4420/50	£59	£89	£149
NEC S62/S102	£99	£180	-
Star LPB	£139	£275	-

Laser Drum & Developer

- Epson Drum GQ5000 £93
- Panasonic 4420 Drum £60
- Panasonic 4450 Drum £93
- EPL7100 £129
- Developer £80

Jetpage Postscript Cartridge

- HP IIP/IIIP £225
- IID & IIID £227

Various Add-Ons

- HP Adobe Postscript + Cartridge £359
- HP Premier Font Collection £28
- Laserjet various Font cartridges from £45
- Canon LBP-4 Lower Cassette Tray £96
- HPIIP/IIIP Lower Cassette Tray £96
- Laserjet 4 Powered envelope feeder £199
- LP4 500 Sheet paper cassette 3rd Bin £205
- Ethernet Card for Laserjet 4 £359

Laser Direct

P.S. We have now discontinued Laser Direct as the Hewlett Packard Laserjet 4 printer offers better facilities at a lower price. See above.



CREDIT CARD 24 HOUR

Ansaphone Hot Lines

(0923) 250234 or 233383

Hewlett-Packard Printers

DeskJet 500	#£272	DJ Portable	£283
DJ550 colour	#£459	DJ500 colour	#£355
Paint Jet XL	+£1199	Paint Jet	+£495
QuietJet plus	£399	PaintJet XL300	+£1779
+ Includes 12 months on-site warranty			
# Includes 3 years extended parts & labour warranty			
• For additional £49, we will convert above 3 years warranty, to 3 years on-site maintenance warranty			
• Paintjet Cartridges Black £15; Colour £23			
• DJ Portable CSF £49; Carrying Case £49			

Desk Jet 500 Accessories

• 256K RAM Cartridge	£69
• HP Epson FX Emulation Cart. (500 mono);	£45
• Ink Cartridges Black £14; Colour	£23
• High Capacity Black Ink Cartridge	£21
• DJ500 Colour Archimedes Printer Driver	£15
• Dust Cover	£6
• DJ500C Printer Driver for RISC OS 2/3	£15
• DJ550C Printer Driver for RISC OS 2/3	£15
• 636G 50 x Transparencies A4	£32
• 636J 50 x Glossy Paper A4 (also XL)	£25
• 630Z 50 x Cut Sheet Paper A4	£12

HP Paintjet/XL Accessories

• 630P 200 Z-Fold paper 8.5 x 11	£14
• 630Q 50 Transparencies 8.5 x 11	£39
• 630S 50 Transparencies A4	£40
• 630Y 200 Cut Sheets 8.5 x 11	£14
• 631Y 200 Cut Sheets A4	£18

Plug In Font Cartridges for DJ 500

• 22706B - Prestige, Elite, Line Draw fonts	£55
• 22706C Letter Gothic & HP Line Draw fonts	£56
• 22707P - Proprint Emulation Cartridge	£57
• Desk Jet Unlimited (Book No VAT)	£19.75

Canon Bubblejet Printers

Printer	CSF	2nd Bin	Ink Cart
BJ10EX	£166	£43	£16
BJ10SX	£205	£43	£16
BJ200	£275	£43	£16
BJ300*	£335	£88	£65
BJ330*	£369	£110	£79
BJC800C	£1329	£110	£12

* Includes 12 months On-site warranty			
• Spare Battery pack for BJ10E	£33		
• BJ10EX - Archi Turbo Driver	£42		

Special Offer:

Canon BJ10EX Printer + CC's Turbo Driver	£209
--	------

Epson Printers

Printer	CSF	Ribbon
EX1000C	£428	£6
FX870	£273	£4
FX1170	£339	£6
LQ100	£148	£4
LQ570+	£205	£4
LQ870	£359	£6
LQ1060	£585	£6
LQ1070	£310	£6
LQ1170	£434	£6
LQ2550	£673	£6
LX100	£116	£4
LX400	£94	£4
LX850+	£135	£4
LX1050	£203	£6
PSQ870	£409	£23
SO1170	£560	£23
SO2550	£669	£23
Stylus 800	£244	£10

RS232 Interface Standard £28; +8K Buffer	£75
Tractor Feed for: LQ100 £29; FX850/LQ800/850 £69;	
FX/LQ1050 £85; LQ2500/2550	£90
• Dustcovers for Epson 80 col printers	£6

Accessories

• EX800/1000 Colour Option	£45
• EX800/1000 Colour Ribbon	£14
• Multifont Card for LQ550/850/1050	£95

Roland Plotters

• DXY1100	£499	• DXY1200	£649
• DXY1300	£869	• Sketchmate A4	£308
• Sketchmate A3	£475	• HP7440	£670
• HP7570	£2015	• HP7475	£899
• HP7575	£2589		
• Roland plotter Pens, Fibre tip	£7.50		

Fujitsu Printers

- B-100 InkJet - HP Deskjet compatible 300dpi, whisper-quiet & 6 resident fonts #£159
- B-200 InkJet - HP Desk Jet compatible 300dpi. Built in Cut Sheet Feeder. Optional 2nd Bin/Tractor available #£249
- DL-1150 Dot Matrix - 24 pin, 110 column Colour optional £199
- DL-1150colour Dot Matrix - 24 pin, 110 column With colour option £235

• DL1250	£344	• DL3600	£439
• DL4600colour	£799	• DL5600colour	£1049
• DL5800	£999	• DL1250colour	£344

FREE 1 Year On-site maintenance.

- B-100 Cut Sheet Feeder £59
- B-200 2nd Bin Sheet Feeder £89
- B-200 Tractor Unit £59
- B-100/200 Ink Cartridges £14
- DL-1100 Colour Upgrade £39
- DL-1100 Black Ribbon £5
- DL-1100 Colour Ribbon £11
- VM 800 Toner Cartridge (8000 pgs) £99

Full range of Fujitsu Printers available at very competitive prices. Please telephone for details

Listing Paper (Perforated)

- 1,000 Sheets 9.5" x 11" Fanfold Paper £7
- 2,000 Sheets 9.5" x 11" Fanfold Paper £11
- 1,000 Sheets 9.5" x 11" NCR 2 Part Fanfold £21
- 1,000 Sheets 15" x 11" Fanfold Paper £9
- 2,000 Sheets 15" x 11" Fanfold Paper £16
- 1,000 Sheets true A4 Fanfold Paper 70gms £11
- 2,000 Sheets true A4 Fanfold Paper 70gms £21

(All our Fanfold paper is Micro perforated leaving a smooth clean edge when the tractor feed strips are detached).

Carriage 1K Sheets £2.50, 2K Sheets £3.00

Printer Labels

(On continuous fanfold backing sheet)

1,000 off, 90 x 36mm (Single Row)	£6.00
1,000 off, 90 x 36mm (Twin Row)	£6.25
1,000 off, 90 x 49mm (Twin Row)	£7.50
1,000 off, 102 x 36mm (Twin Row)	£6.75

Laser Printer Labels on A4 Sheets

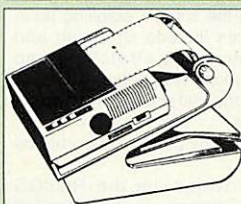
3750 off, 70 x 29mm (3 Rows x 10)	£15.50
2400 off, 70 x 37mm (3 Rows x 8)	£15.25

Printer Ribbons & Various Dust Covers

Type	Ribbons	Dust Covers
BBC B/BBC Master	-	£4.00
Archimedes Micro pair	-	£9.00
Citizen 120D	£3.25	£5.00
EX800/1000	£3.50	£5.00
FX/FX80/85/800/MX80	£2.95	-
FX/MX/RX100/1000	£3.95	-
Kaga/Taxan KP810/815	£3.25	£5.00
LQ400/500/550/800/850	£5.50	£6.00
LQ1050/LQ2500	£12.00	-
LX400/800/850	£3.50	£5.00
M1009/GLP	£2.95	£3.75
NEC P2200	£4.50	£5.00

Dust covers for most 80 column printers available at £5 each

Professional Printer Stand



The 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. Its ergonomic design ensures smooth paper flow and automatic refolding.

80 Column version £19
132 Column version £29

Universal Printer Sharers/Changer

Connect up to 5 Micros to 1 printer or 5 printers to 1 Micro with our combined, Sharer/Changer switch boxes.

Standard Low Cost Type

Connects	Serial	Parallel
• 2 to 1	£10	£10
• 3 to 1	£14	£15
• 4 to 1	£19	£20

Professional Type

Connects	Serial	Parallel
• 2 to 1	£15	£16
• 3 to 1	£20	£23
• 4 to 1	£30	£34

Cables extra at £5 each

Cross Over Manual Switch

2 In/2 Out Parallel	£29
2 In/2 Out Serial	£28
3 In/2 Out Serial	£36

Auto Printer Sharer

Connects	Serial	Parallel
2 to 1	£34	£36
4 to 1	£52	£53
8 to 1	-	£85

256k Multi Spooler

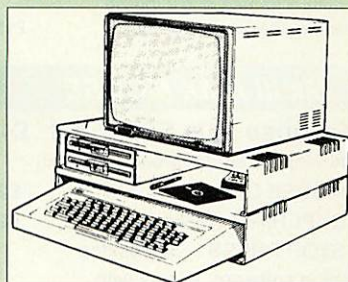
These Auto Parallel Printer Sharers have built-in 256K of Printer Buffers. They can be used as Auto Sharers, Printer Buffers or both.

• 2 In/2 out	£125	• 4 In/2 out	£139
• 8 In/1 out	£185		


Compact Converter Units

Serial to Parallel	£32	Parallel to Serial	£32
--------------------	-----	--------------------	-----

Plinths for the BBC Master and A3000

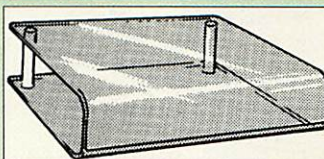


- Single Master Plinth 490 x 310 x 105mm £14
- Double Master Plinth 490 x 310 x 210mm £26
- A3000 Single Plinth (very sturdy & precision made), has a slot on the left for the switch & cut out on the right for 3.5" Disc Drive £15



CREDIT CARD 24 HOUR
Ansaphone Hot Lines
(0923) 250234 or 233383

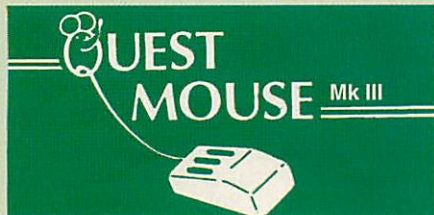
Perspex Printer Stand



Give your Computer System a touch of Class with our elegant, smoke finished Perspex Printer stand.

80 Column version	£16 (carr £3)
136 Column version	£20 (carr £4)

Continued → → → → → → → → →



- Quest Mouse III & Quest Paint £49
- Quest Mouse III, Quest Paint, AMX Stop Press & Pagefont £69
- Quest Mouse III only £25
- Quest Paint Software only £28
- Quest Font Disc (22 Text Fonts) £15
- Quest Mouse Mat (Red or Blue or Green please specify) £3
- Conquest (Quest Paint Extension) ROM £24
- Quest Colour Dump Disc – This new software allows you to print direct from Quest Paint to your Integrex Colour Printer £18
(P.S. Quest Paint is not compatible with BBC Compact)

Quest Paint is the winner of the BBC Acorn User 1990 Award for the Best Art/Graphics software

Mouse Cleaning Kit

To obtain trouble free operation and prolong the life of your mouse, the high tech rodent requires regular cleaning. Our deluxe mouse cleaning kit is ideal for the purpose £3

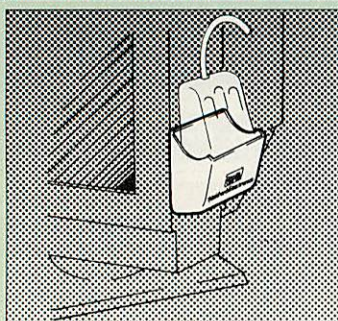
Archi Mouse Port Splitter

Our handy little splitter unit eliminates the risk of damaging your micro due to constant plugging and unplugging of the mouse by allowing you to connect both, a joystick and a mouse simultaneously to your Archimedes. £15

Mk III AMX MOUSE

- **AMX Mouse plus Super Art** £49
(Please specify for BBC, Master or Compact)
- AMX MOUSE ONLY £25
- AMX SUPERART Package £26
- AMX STOP PRESS – A Desktop publishing software. Works with Keyboard, Joystick or a mouse £25
- PAGE-FONTS – Over 20 Fonts for use with AMX Pagemaker £13
- AMX DESIGN (ROM) £29
- AMX EXTRA EXTRA £16
- MOUSE MAT £3

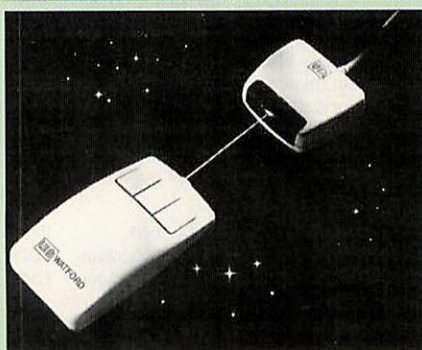
WE Mouse House



Treat your mouse to a cosy Mouse House. This handy little gadget solves the problem of where to store your mouse when it is having a rest. Made of sturdy plastic, the WE Mouse House attaches to the side of your computer, monitor, disc drive etc.

Only £3

Archi Cordless Mouse



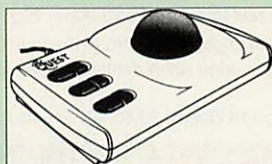
Features

- Infra Red Signal Transmission
- High Resolution 200 DPI
- High Tracking Speed of 600mm/s up
- Anti-static Silicon Rubber Coated Ball
- Low Friction Teflon Footpads
- Power - by two AAA size batteries (not included)
- Automatic Standby Mode after 5 seconds inactive
- Auto Power Shut-Down after 20 seconds inactive

Price £32

Quest – Tracer ball

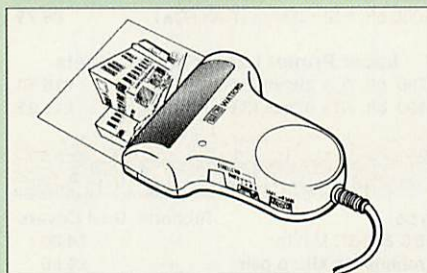
An attractively finished, extremely reliable, mouse replacement, input device. Requires very little desk space. Connects directly to your BBC B, BBC Master or Archimedes Micro.



QT-10 BBC/Master Version
QT-20 Archimedes Version

£25
£26

Beeb Hand Scanner



Watford Beeb HandScan is a compact unit which will allow photographs, diagrams, or any other documents to be digitised quickly and easily, to then be used in a desk top publishing package, art program, or even in your own Basic programs!

Beeb HandScan & Firmware £99

Archi Mk II Hand Scanner

Watford's Mk II hand scanner has a maximum resolution of 400 dpi. The scanning width is 4". The sophisticated software is supplied in a 64K ROM, located on a standard single width expansion podule. As you scan a page, the image appears in the scanning window on the screen, scrolling up in real time. Other facilities include Cropping and scaling to any size including stretching and squashing in X and Y directions separately. Colour tinting. X and Y flip. Edge detection which turns solid objects into outlines.

Images can be printed on any printer supported by RISC OS. On-screen help is provided via the RiscOS interactive help facility. (Please write in for full technical details).

AHS-4 Archi 300/400 Version
AHS-3 Archi A3000 Version

£109
£119



Winner of the BBC Acorn User 1990 Award for the Best DTP/Word Processor

The Wapping Editor

The Wapping Editor from Watford Electronics represents a breakthrough in Desktop Publishing for the Beeb. The package includes a 64K ROM containing ALL the software needed to get into print fast; a very sophisticated graphics module, professional quality typesetting software, a word processor, a comprehensive font editor for designing your own typefaces, and a variety of printer dumps. This mouse-driven system is designed for the BBC B, the B+ and Master computers and will take full advantage of any Sideways and Shadow RAM that may be fitted. It will run under DFS, ADFS and Network filing systems and requires as a minimum just a single 40 track drive.

Wapping Editor Software Pack £49
Wapping Editor plus Mouse £69

(Wapping Editor only works with Master Compact if a Mertec Expansion box is fitted)

Wapping Art Disc

Over 250K of clip art to cut and paste into your Wapping Editor pages. Pictures include maps, transport, people, media, sport, games etc. Two 'ratio' screens for use with hi-res and rotated A5 pages to ensure images are not distorted when printed out. £15

Wapping Font Disc 1

Sixteen additional fonts, including smaller version of Oberon and Daisy and two new sizes of the standard font for the Wapping editor. Also included are two Mode 0 screens containing giant 'headline' fonts to cut and paste to create extra smooth headlines. Supplied complete with instructions. £12

Wapping Font Disc 2

This new addition to our Wapping range of DTP software provides you with additional 23 fonts for the Wapping Editor DTP pack. (80 track discs only). £13

Archi A4 Scanner



The 216mm scanning width can cope with both desktop scanning of single sheets, photographs, diagrams, etc., with its fast ten page automatic document feeder, but it can also detach from the feeder to become a convenient hand-held full page scanner for larger documents or pictures.

Scanned image control can be freely adjusted in increments of 10 dots per inch from 100 up to 400 dpi resolution with 64 levels of grey scaling. A built in shading controller and manual brightness control achieve optimum image clarity.

Unlike some scanners, which use a red light source, the Watford scanner uses a yellow/green source which vastly improves the light/dark contrast, thus eliminating the effect where any red-based colours are faded down to white and so do not show up in the scanned image.

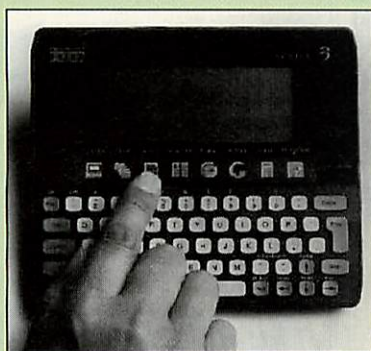
Archi A4 Scanner £259
Sheet Feeder for above £75
Scanner + Sheet Feeder £349

Z88 Portable Micro



- Z88 Portable Micro **£POA**
- 32K RAM Pack or 32K EPROM Pack **£16**
- 128K RAM Pack or 128K EPROM Pack **£32**
- 512K RAM Pack **£86** • 256K Eprom Pack **£55**
- Z88 Eprom Eraser Unit **£38**
- Z88 Carrying Case **£8**
- AA Nicad Rechargeable Battery **£1.50**
- Battery Charger Compact & Fast **£6**
- Z88 Serial Printer Cable **£8**
- Z88 Parallel Printer Cable **£18**
- Z88 to BBC Link **£8** • Z BASE **£49**
- Z88 to PC Link II **£27** • Z88 to Macintosh **£32**
- Z88 Mains Adaptor **£9** • Z88 Modem **£99**

Psion Series III



- Psion Series III Computer**
- Series 3 128K **£155** • Series 3 256K **£179**
- RAM Solid State Discs (SSD)**
- 128K **£68** • 512K **£170** • 1Mb **£255**
- Flash Solid State Disc (SSD)**
- 128K **£34** • 256K **£59** • 512K **£102**
 - 1Mb **£170** • 2Mb **£255**
- Communications**
- Parallel Interface Link **£25**
 - RS 232 Serial Link for PC **£58**; Mac **£59**
- Various**
- Mains Adaptor 9V AC **£12**
 - Spreadsheet **£59**
 - Professional Finance **£42**
 - Spelling Checker/Thesaurus **£42**

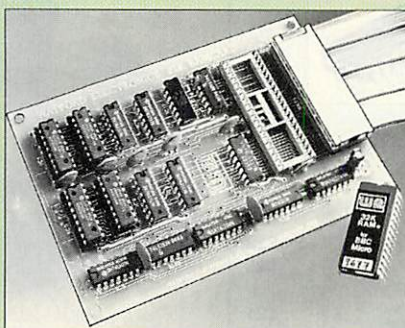
HP Palmtop PC

- HP95LX 512K Palmtop PC **£199**
- P.S. Above price includes Lotus 123, Desk Diary and Memo softwares in ROM
- HP Connectivity Pack **£55**
 - HP95LX 512K RAM Upgrade **£POA**

Fax Machines

- | | | | |
|---------------|-------------|-------------|-------------|
| Brother 305# | £335 | Pana UF121 | £320 |
| Brother 450# | £375 | Pana UF128M | £415 |
| Brother 550M# | £455 | KX F2090BE | £488 |
| Canon 170 | £520 | Tosh TF132 | £349 |

32K Shadow RAM/Printer Buffer Card Expansion Board



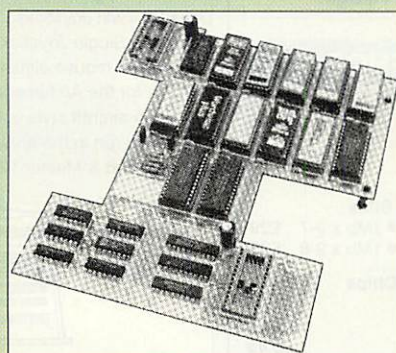
A MUST FOR WORD PROCESSING

Simply plug the ribbon cable plug into the 6502 socket and gain a massive 32K of extra RAM.

- "VIEW" Wordprocessor users can now type in letters in 80 columns and have up to 28K 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.

Only £49

Solderless Sideways ROM Socket Board



- Increases your BBC Micro's ROM capacity from 4 to 16.
- **No soldering required.**
- 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 £35

Battery Backup only £3

16K Sideways RAM £8

- 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

Watford DATA DUCK

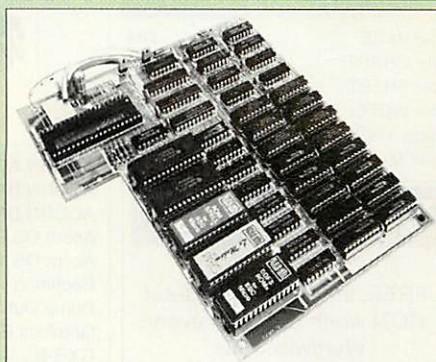
Convert two single Disc Drives into one Dual Drive with this simple external unit (Suitable for Disc Drives with PSU. For Disc Drives without PSU, you will also require Watford Power Duck, see below).

£14

Watford POWER DUCK

£8

ROM/RAM Card



- No Soldering required to fit the board.
- Compatible with BBC B
- Total number of ROMs increased from 4 to 8.
- Up to 8 banks of sideways RAM (dynamic).

PRICES:

- ROM/RAM card with 32k DRAM **£39**
- ROM/RAM card with 64k DRAM **£52**
- ROM/RAM card with 128k DRAM **£83**

OPTIONAL EXTRAS:

- 16k plug-in Static RAM kit **£8**
- 16k DRAM for Upgrade **£13**
- Battery backup **£3**
- Read and Write protect switches **£2 each**
- Complete ROM-RAM card with all options fitted **£99**

ROM Cartridges for the BBC Master

Will accept the larger Piggy Back ROMs like Interword, Quest, etc.

- Twin **£9**; • Quad **£14**

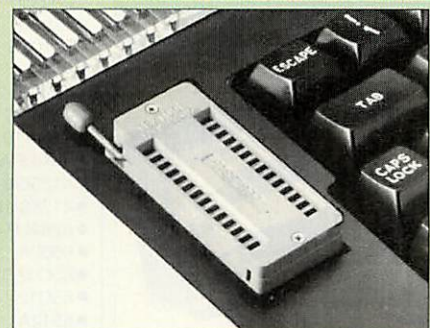


24-Hour Credit Card Order Line
(0923) 233383 or 250234

Miscellaneous Connectors

	Plugs	Sockets
RGB (6 PIN DIN)	50p	75p
RS423 (5 pin Domino)	70p	80p
Cassette (7 pin DIN)	40p	95p
ECONET (5 pin DIN)	35p	50p
Paddles (15 pin 'D')	150p	250p
Disc Drive Plug 4 way	100p	–
6 way Power Connector	120p	150p

Sideways ROM ZIF Socket System



Allows you to change your ROMs quickly and efficiently, without having to open the lid. The ZIF socket is located into the ROM Cartridge's position. It is very simple to install. No soldering required. Also included in the price is a plastic see through storage case with antistatic lining, which allows you to store 12 ROMs.

£18

Leasing finance now available at very attractive rates to Businesses (subject to status), Education establishments, Government Depts. and Local Councils. Min. £1000. Please telephone for details.

Computer Concept's ROMS

Inter BASE	£49
Inter CHART	£25
Inter SHEET	£37
Inter WORD	£36
Mega-3 ROM	£76
Spell Master	£42

Wordwise plus

£38

FREE, the superb Word-Aid ROM worth £24, with every Wordwise Plus.

Word-Aid

This advance utilities ROM extends the power of your Wordwise plus ROM.

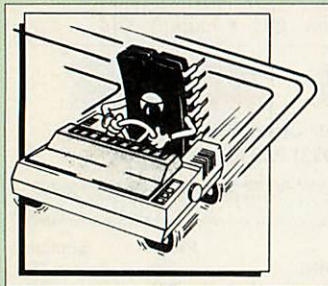
Only £24

(N.B. Word Aid requires a Disc interface in your Micro)

Acorn ROMS

View 3.0 ROM	£45
Viewsheets (Acornsoft)	£36
Viewstore	£36
Viewspell - 80T disc	£25
View-Index	£12

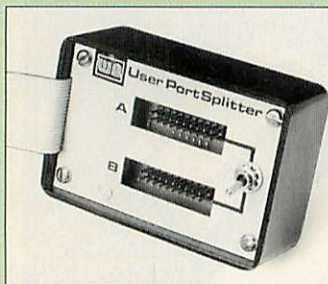
View Printer Driver ROM



View is a powerful word processor, but it seriously lacks in terms of printer driver support. With the View Printer Driver ROM, the View users will find themselves in the realms of advanced word processing.

Price: Only £29

User Port Splitter Unit



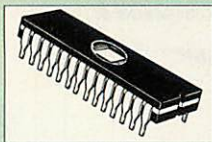
Gone are the days when you had to plug and unplug devices from the User Port. This extremely useful little device allows you to connect two devices simultaneously to the BBC's user port.

Excellent Value at £22



CREDIT CARD
24 HOUR
Ansaphone Hot Lines
(0923) 250234 or
233383

Assorted ROMS



ACORN ADFS	£25
ACORN BASIC 2 plus User Guide	£22
ACORN DNFS	£17
Acorn OS B+	£25
Acorn OS 1.2	£14
Beebmon	£22
Dump Out 3	£25
Graphics Extension Rom	
GXR-B	£21
GXR-B+	£22
Logotron LOGO	£43
MASTER OS ROM	£38
Master ULA (47)	£15
Master ULA (60)	£10
Numerator - Archi	£69
Numerator - BBC	£39
Pendown ROM	£32
Rom Manager	£20
SERIAL ULA	£13
TED	£35
Video ULA	£14
1Mb OS ROM	£39

Watford Electronics'
New High Tech Computer
Boutique is now open in
Luton.

Don't miss your chance to visit
the Acorn Village.

CHIP SHOP

1 MB-10 DIL D-RAM	£4.50
1 MB ZIF D-RAM	£4.00
256K x 4-8 DIP	£4.75
256K x 4-8 ZIF	£4.00

Memory SIMs

• 256K x 9-7	£9	• 1Mb x 9-7	£29
• 256K x 9-8	£9	• 1Mb x 9-8	£33

Various Chips

DS3691		£4.50	
DS88LS120		£5.25	
LM324		£0.45	
SN76489		£5.50	
SAA5050		£8.75	
UPD7002		£6.00	
2764-250nS		£3.00	
27128A-250n (12V5)		£2.50	
27128-250nS (21V)		£4.00	
27256-2		£3.00	
27512-2		£4.50	
27C101G (1 Meg)		£7.00	
● 4013	75p	● 68B50	£2.95
● 4020	£1.00	● 7438	50p
● 4164-10	£1.55	● 74LS00	50p
● 4464-10	£3.50	● 74LS04	50p
● 4816 RAM	£2.00	● 74LS10	50p
● 41256-8	£2.00	● 74LS123	£1.00
● 41256-10	£1.50	● 74LS163	£1.00
● 6264LP-8K	£4.00	● 74LS244	£1.00
● 6502A	£5.00	● 74LS245	£1.00
● 65C02 3M	£9.75	● 74ALS245	£2.75
● 65C12	£9.00	● 74LS373	£1.00
● 6512A	£10.00	● 74LS393	£1.00
● 6522	£4.00	● 75453	£1.00
● 6522A	£5.00	● 75159	£3.00
● 62256ALS	£10	● 8271	£30
● 62256P-12	£8.50	● 9637	£2.00
● 6818	£4.00	● ICL7673PA	£3.00
● 6845SP	£6.00		

Acorn Speech Synthesizer
package complete, for the
BBC B Microcomputer
Special Offer £14

Commander Joystick



Features:

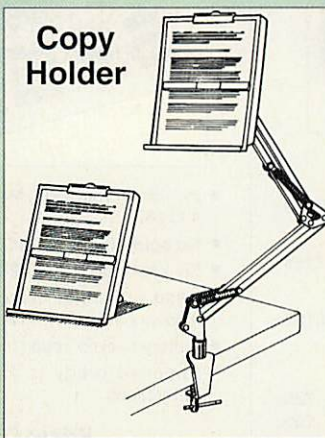
- Direct connection to BBC Analogue input port - interface needed.
- Fully compatible with all BBC Joystick controlled games programmes.
- Switchable springs allow selection of floating or centring operation.
- Trim adjusters for both X and Y axes for fine centre adjustment.
- Convenient stick mounted fire button with additional base buttons.

Price: £15

Voltmace Joysticks

Delta 3B Single Joystick	£10
Delta 3B Twin Joysticks	£15
Delta 14B Single Joystick	£11
Delta-Cat A mouse eliminator	
Joystick for the Archimedes	£24
Analogue aircraft style yoke	
Joystick to run in the analogue port of the BBC B & Master 128	£25

Copy Holder



Whether you want to type in your latest program or the draft of a new trilogy, Watford's manuscript holders are superb for holding your paper at the ideal height and angle to allow you to read and type in ease and comfort.

Available in 2 full A4 versions, desk resting and shelf clamping. Paper is held firmly by means of a plastic retaining ruler and a clip grip.

Desk Top £8

Angle poise £12



Copy holders as above but with a battery operated, remote controlled cursor/ruler. (By hand or foot pedal.) (Batteries 2 x AA not included.)

Desk Top £15

Angle poise £20

Adder EPROM Programmer

Adder EPROM Programs 2764 and 27128 EPROMs for the BBC and BBC Master. Connects to the User port.

Offer Price: **£39**

TEX EPROM ERASERS

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.

- **ERASER GT** - Deluxe version erases up to 18 chips. Has automatic safety cut-off to switch off the UV lamp when opened. **£36**
- Spare UV tubes. **£12**

ROM Extraction Tool

This extremely useful tool allows you trouble free chip insertion and removal from your computer by distributing the removal force over the whole body of any 24 or 28 pin chip.

- Plastic Chip Extractor **£2**
- Metal Chip Extractor **£3**

Servisol Foam Cleaner

This king size multipurpose foam cleaner spray is ideal for cleaning Keyboard, Monitor, Disc Drive & Computer furniture surfaces.

£2.50

Antistatic Aerosol Spray

Ideal for cleaning and preventing static build-up on TV/Monitor Screens.

£2.50

Aerosol Dust Spray

Ideal for removing dust & dirt from Keyboard & similar inaccessible spaces.

£3

OFFICE MASTER

- CASHBOOK • FINAL ACCOUNTS
- MAILIST • EASILEDGER -
- INVOICES & STATEMENT

All this for only **£21 (Disc)**

OFFICE MATE

- DATABASE • SPREADSHEET
- BEEBLOT

Only **£10 (Disc)**

Spares for BBC Micro

UHF Modulator	£4
Speaker £3; Speaker Grill	£1
Keyswitches	£1
16MHz Crystal	£2
17.734 MHz Crystal	£2
32.768MHz Crystal	£2
Replacement 17 way Flexible Keyboard Connector	£4
BBC Master Power Supply	£59
BBC Master Keyboard	£62
BBC Master Casing	£49
Refurbished BBC B Spares	
BBC B Casing	£19
Clear Perspex Keystrip Holder	£3
BBC B Keyboard	£35
BBC B Power Supply	£42

BOOKS (No VAT on Books)

15 Hr Wordprocessing BBC/View	£6.95
15 Hr Wordprocessing BBC/WW & WW+	£6.95
30 Hour BASIC (BBC Micro)	£12.95
1st Word Plus – Mastering	£13.95
1st Word Plus Rel. 2 Manual	£10.00
A3000 Technical Reference Manual	£29.00
A5000 Technical Reference Manual	£–
Acorn DTP A Guide to	£17.00
Advanced User Guide for BBC	£10.95
Archimedes 1st Step – Beginners Guide	£9.95
Archimedes Assembly Language	£14.95
Archimedes Basic V Guide	£9.95
Archimedes BBC Basic Guide	£20
Archimedes DTP Manual	£10.00
Archimedes Game Maker Manual	£14.95
Archimedes Operating System	£14.95
Archimedes Risc-Os Programmers	
Reference Manual	£79.00
Assembly Language Quick Ref.	£21.95
BASIC 2 – User Guide	£2
BBC B Micro User Guide	£15
Budget DTP on the Archimedes	£12.95
C Big Red Book of	£8.95
C Dabhand Guide to 3rd Ed	£16.95
C Programming Lang. 2nd Edition	£24.95
DISC FILING SYSTEM (DFS)	
Operating Manual for BBC	£5.95
DTP on the Archimedes	£12.95
File Handling for All	£9.95
FORTH on the BBC Micro	£9.95
Graphics on the ARM	£14.95
Impression – Dab Hand Guide	£14.95
ISO-PASCAL Reference Manual	£9.95
Master 512 Guide – Dabs Press	£9.95
Master Operating System	£12.95
Master Reference Manual – Advanced	£14
Mouse User Guide to BBC Micro – the Complete	£5.95
Example Programs on Disc for above	£4.95
Mysteries of Disc Drives & DFS Revealed	£4.95
PASCAL Programming	£10.95
Risc OS Style Guide	£9.95
RISC Technical Manual 260 pg	£14.95
Understanding Interword –	
A Beginners Guide	£4.95
View 3.0 User Guide	£10
Viewsheet User Guide	£10
Viewstore User Guide	£10
Wimp Programming for All	£12.95
Z88 – A Dabhand Guide	£14.95
Z88 Computing	£9.95
Z88 Magic	£14.95

BOOKS for IBM PC & Compatibles

386/486 PC Power User Guide	£19.95
8086/8088 Ass. Language Quick Ref	£8.45
8086/8088 Programming the	£17.95
Accountancy software in Business – Using	£14.95
Agenda – Using	£21.95
Aldus PageMaker – Using	£21.45
AMI Pro 3 – Using Special Ed	£25.95
Assembly Language 3e – Using	£27.45
Autocad 4th Ed – Mastering	£31.50
AutoCAD – Inside 10 & 11 Spec Ed	£32.45
AutoCAD – Mastering Rel. II 4e	£31.50
Autocad – Mastering Through Rel. 10	£28.95
Build Your own 386/386SX & Save	£15.50
Build Your own 80486 IBM Computer	£12.95
C Programming Language 2nd Ed	£26.95
C – Waite Group Turbo C Bible	£27.95
C++ Borland C++ 3 Handbook 2e	£24.95
Clipper 5.01 3e – Using	£27.45
Computer Users Dictionary	£9.95
Corel Draw Quick Ref Thru V1.2	£7.95
Corel Draw 2.0 Made Easy	£19.95
Corel Draw v2 Quick Ref	£28.90
Corel Draw Quick Ref v1.2	£8.45
dBase 3/4 Complete Ref	£27.45
dBase III Plus – Complete Reference	£19.95
dBase III Plus Handbook 2nd Edition	£22.95
dBase Instant Reference (III & III+)	£10.95
Desk Jet Unlimited	£19.95
DOS Complete Reference 3e	£23.95
DOS for Dummies Through v5.0	£15.45
DOS – Easy (to ver 5)	£18.45
DOS Instant Ref.	£9.75
DR DOS 6 Quick Reference	£8.95
DTP Looking Good in Print 2e	£21.95
EGA & VGA Cards Prog. Guide to	£27.95
Excel 4 Windows – A Quick Course	£11.95
Excel 4 for Windows Quickstart	£20.45
Excel 4.0 Windows Made Easy 3e	£16.50
Excel 4 for Windows 2e – Using	£27.45

Foxpro 2 Made Easy Revised Ed	£20.95
Foxpro 2 – Using	£27.45
Foxpro 2 – Mastering 2ed	£26.95
Framework III – Mastering	£24.50
GW Basic Users Guide & Ref	£17.95
Hard Disc Instant Ref	£10.95
Hard Disc – Using Your	£27.45
IBM PC & PS/2 – Inside the 3rd Ed	£21.70
IBM PCs 386 486 Power User Guide	£17.95
LAN–Understanding Local Area Networks	£23.50
Locoscript PC v1.5 – Using	£14.95
Lotus 1-2-3 for Windows	£27.45
Lotus 1-2-3 Rel. 2.4 Special Ed – Using	£27.45
Microsoft GW BASIC	£17.95
MS-DOS 5 – 10 Minute Guide to	£9.95
MS-DOS Batch Files Quick Ref	£5.95
MS-DOS First Book	£15.50
MS DOS for Beginners	£17.45
MS-DOS Quick Ref Guide 5	£8.95
MS-DOS – Running 4th edition	£19.95
MS-DOS – Supercharging 2nd Edition	£17.95
MS-DOS Users Guide 3rd Edition	£27.95
MS-DOS 5 – Quick Start	£18.45
MS-DOS 5 User Hand Book	£19.95
MS-GW BASIC User Guide & Ref	£17.95
MS Visual BASIC Workshop incl. Disc	£28.30
Network Understand Local Area	£24.50
Network Users Guide 2.2 & 3.11	£22.95
Novell Network 386 Comp Ref	£29.95
Novell Network 2e – Using	£27.45
Novell Network – Mastering	£27.95
Novell Network – Using	£27.45
Pagemaker 4 IBM – Use incl. Disc	£19.95
Pagemaker 4 for Windows – Using	£27.45
PageMaker on IBM PC – Using	£22.95
Paradox 4 Quick Reference	£8.95
PCs & Compatible Computers for	
Beginners	£17.95
PC Crash Course 2.0 2nd Edition	£19.95
PC Configuration Handbook 2e	£26.99
PC – Fix your own	£22.50
PC – Upgrade & Maintain – Complete	£25.50
PCs – Upgrading & Repairing 2e	£32.45
Quattro Pro 4.0 Made Easy	£16.50
Quattro Pro 4 Special Ed – Using	£25.95
Smart – Using	£21.45
Smartware II – Mastering	£22.95
Supercalc 5 – Mastering	£24.50
Supercalc 5 2ed – Using	£27.45
Timeworks Publ. 2 – Practical Guide	£16.95
Timeworks Publisher Comp. v2.0	£12.95
Turbo C Bible	£27.95
Turbo C++	£22.95
Turbo Pascal 5 – Using	£22.95
Turbo Pascal Using	£27.45
Unix – Using	£27.45
Upgrading & Repairing PC's	£27.45
Ventura Publisher – Using	£22.95
Ventura Tips & Tricks 3e	£21.95
Ventura – 3rd Edition	£24.95
Windows 3.1 10 Minutes Guide to	£9.95
Windows 3.1 Program Ref Vol 4	£19.95
Windows 3.1 A Quick Course in	£11.95
Windows 3.1 Mastering 2e	£25.50
Windows 3.0 3.1 Using Special Ed	£25.95
Windows 3.1 Complete Ref 2e	£23.95
Windows 3.1 Program Ref Vol 1	£26.95
Windows 3.1 Program Ref Vol 2	£35.95
Windows 3.1 Prog Ref Vol 3	£26.95
Windows 3.1 Quick Reference	£8.95
Windows 3.1 Secrets 2e + Disc	£36.95
Window Programming 2nd Ed	£27.95
Word 2 for Windows Made Easy	£16.95
Word for Windows made easy	£15.95
Wordperfect – Quick Reference V5	£8.95
Wordperfect 5.1 – ABC's of	£18.95
Wordperfect 5.1 – 1st Book of	£15.95
Wordperfect 5.1 – Mastering	£24.95
Wordperfect 5.1 Quick Course	£11.95
Wordperfect 5.1 Quick Start	£20.45
Wordperfect 5.1 – Using Special Ed	£25.95
Wordperfect for Beginners	£17.45
Wordstar & CPM Made Easy	£15.75
Wordstar 6.0 Made Easy	£15.95

WORD FOR WINDOW

10 Minute Guide Word 2 Windows	£9.50
DTP with Word 2 for Window	£20.45
MS WORD 2 Windows Made Easy	£16.95
Master MS WORD 2 for Windows 2e	£24.50
Quick Course Word 2 Windows	£10.95
Running WORD 2 for Windows	£29.95
Using WORD 2 for Windows 2e	£25.95

Carriage on Books vary between £4 to
£6.00, depending on their weight

ACORN TO PC

Stop the Confusion!

Do you have to use both Acorn computers and PC's? Would you like to use your Archimedes or A3000 in PC-emulation mode but are unsure of the new commands?

Although Acorn machines (such as the BBC B, the Master, the Archimedes) are mainly used in education, most commercial computers use other operating systems, particularly MS-DOS. As a result school computer users are at a disadvantage when moving into 'business' computing. PCs and other commercial computers use MS-DOS as the operating system, so commands for formatting, copying, backing up, printing and the modem are not the same. Even file names are written differently! And did you know that there is one Acorn command which, if used in MS-DOS, wipes everything in the current directory?

'ACORN TO PC' enables you to change over painlessly. It shows clearly and quickly how, why and where the two systems (Acorn and MS-DOS) differ. As with a foreign language dictionary, you can use the book to transfer either way – from Acorn to MS-DOS, or from MS-DOS to Acorn.

Price: £6.95 (No VAT)

The Complete BBC Computer User Handbook

If you own a BBC B, B+, Electron, Master 128 or Master Compact, or Archimedes, then this is the book for you. It shows how to get the best from your machine, and how to make it work for you.

Only: £9.95 (No VAT)

Beeb PC (BASIC)

Designed for program authors to convert BBC programs to run on IBM PCs.

Price: £38

Beeb DOS 3.0

(Now reads Archimedes Discs)

Beeb DOS is a collection of utilities which run on the PCs and enable it to read and write information on BBC Discs.

Price: £39

The Epson RX/FX Printer Commands Revealed Handbook

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.

£4.95 (No VAT)

- Official orders accepted from government, educational establishments and PLCs.
- Shop Hours: 9am to 6pm, Monday to Saturday. Late night Thursday until 8pm. Free customer car park.
- Mail Order Inquiries: 9am to 6pm, Monday to Friday only
- Technical Inquiries: 9.30am to 5.00pm, Monday to Friday

Carriage (incl. Insurance) Charges

	1st Item	2nd & Subsequent Item
Software	£7.00	£2.00
Hardware	£8.00	£5.00
Lasers	£10.00	£7.00
Accessories	£5.00	£3.00
Small Items	£5.00	£3.00

P.S. Many software packages qualify for the small item tariff

For Next Day Working Day delivery service simply double the cost. All charges subject to VAT

Above carriage charges apply to UK mainland only. On export orders, carriage is charged at cost.

Watford Electronics Ltd

Established 1972

Mail Order & Showroom:

Jessa House, Finway, off Dallow Road, Luton, LU1 1TR, England
Tel: 0582 48 77 77 Tlx: 8956095 WATFRD Fax: 0582 488588

Showroom Only:

Jessa House, 250 Lower High Street, Watford, WD1 2AN, England
Tel: 0923 237774 Fax: 0923 233642

Offers and all items are subject to availability. Prices may have to change for reasons beyond our control. Specifications on products are correct at the time of going to press and given in good faith, but may have to change without notice. Please check suitability of peripherals with your systems, before ordering. All trademarks are acknowledged. Goods are sold subject to our standard terms and conditions of sale and are available on request. GOODS ARE NOT SOLD ON TRIAL BASIS. E&OE.

VAT: UK and EC customers: Please add 17.5% VAT to the total cost, including carriage.

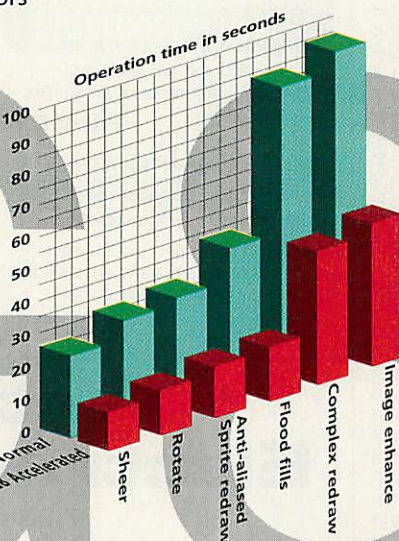
Eureka!

Now Available

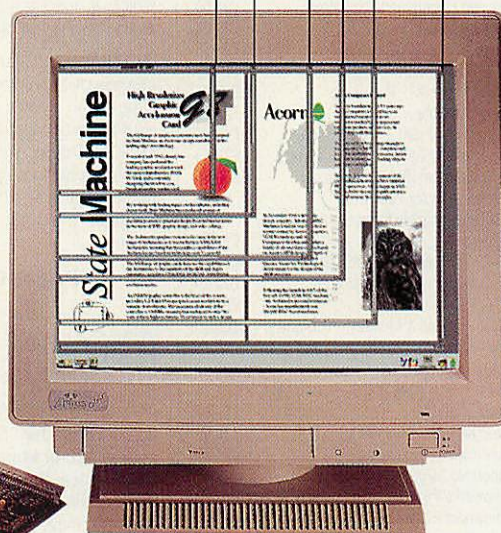
High Quality, High Resolution Colour Graphics for the Acorn Archimedes made possible with the G8 Range of Graphic Accelerator Cards from Watford Electronics

- ◆ Produces high resolution images on screen
- ◆ More colours available due to new palett. Up to 256 displayed on screen from a palett of 16.7 million colours
- ◆ 256 simultaneous grey scales on screen for photorealistic images
- ◆ Increases the refresh rate of the screen to reduce visible flicker
- ◆ Faster graphics re-draw operations
- ◆ Increases the speed of all machine operations
- ◆ Direct Drive video output. Sharper images in all modes
- ◆ Sound output is unaffected
- ◆ Fully tested and compatible with the following monitors
Eizo, Taxan
Radius, NEC
MicroVitec
Aries
Acorn Multisync
Panasonic
Phillips
DEC VR110/VR260
- ◆ Compatible with all Archimedes except A3010, A3020, A4000 & A4

A comparison of speed performance between a standard A440/1 and one fitted with a G8 Accelerator Card from State machine.



640 x 512
800 x 600
1024 x 768
1152 x 848
1280 x 1024
1600 x 1200



£239*
Special Introductory Offer

Performance test on A440/1, ARM2



23 seconds

10.5 seconds



640 x 480 x 256 without G8 card



640 x 480 x 256 with G8 card

Specification

Maximum Resolution
(Square Pixels) 1280 x 1024 @ 4 colours
1152 x 848 @ 16 colours
(Rectangular Pixels) 800 x 600 @ 256 colours
1600 x 1200 @ 16 colours
1152 x 848 @ 256 colours

V. Scan Frequency *56-110Hz (NI), 87Hz (I)
H. Scan Frequency *31.5-75KHz

Video Memory 512KB
Output Video Signal Analogue RGB (RS-343A)
Composite grey level

15 and 9 pin connectors

Sync H. Sync (TTL Level)

V. Sync (TTL Level)

Composite (TTL Level)

Sync on Green

Palette 24 bit (16.7 million colours)

*Mode dependent, (NI) = Non Interlaced, (I) = Interlaced



Watford Electronics

Established 1972

Head Office & Showroom:
Jessa House, Finway, Dallow
Road, Luton, LU1 1TR.
Tel: (0582) 487777
Fax: (0582) 488588
Telex: 8956095

Branch Office & Showroom:
Jessa House, 250 High Street,
Watford, WD1 2AN.
Tel: (0923) 237774
Fax: (0923) 233642

Order Hotline 0582 487777

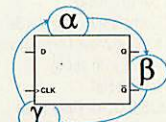
(9am-6pm Monday-Saturday). FAXLINE 0582 488588.

24-Hour Answerphone Line 0923 233383

VAT: UK customers, please add 17.5% to value of order and carriage.



Offers and all items are subject to availability. Prices may have to change for reasons beyond our control. Specifications of all products are correct at time of going to press and given in good faith, but may change without notice. All trademarks acknowledged. Goods are sold subject to our standard Terms & Conditions of Sale available on request. E&OE. Phone for the very latest prices and the quickest delivery options.



State Machine

75 Upper Wellington Street,
Luton, LU1 5AA. (0582) 483377

* Add VAT and \$5 for carriage

Gavin Burns explains how you can get your machine off to a good start

ABSOLUTE BEGINNERS

Suddenly you feel inspired; you know the most brilliant and impressive conclusion for that all-important document due in tomorrow. With great speed, you dash to your computer, turn it on and frantically search for the directory that the document is stored in and begin to type.

A message flashes up before you to say that no word processing application has been installed. You can't write a single word yet. Desperately you load the word processor, relocate the document and . . . well, you've forgotten what you wanted to write now.

Wouldn't your life be easier if everything that you used regularly was automatically loaded, every time you switched on your machine? Well, you can tailor your computer to suit your every need, and here's how to do it . . .

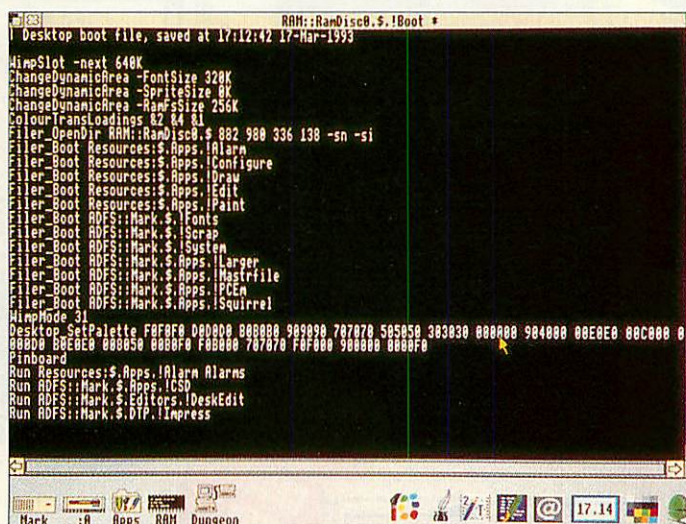
The anatomy or make-up of your machine is stored in a Boot file, a special kind of file that will remember how your machine is set up. Every time you switch on the machine, it's restored exactly as you like it, assuming you've ordered the Boot file to do so.

A Boot file is basically a file containing lots of commands that describe your computer's set up. This file is stored on your disc, and is run when the machine is switched on or reset: this is called booting your machine.

It's simple to set up a Boot file; here's what to do . . .

- Turn on your machine and load up all your favourite bits; a wordprocessing application would be a good idea or, perhaps, you'd find it useful to have a database, like *Squirrel*, already loaded.

- Click the Menu button over the Acorn on the bottom right-hand side of the screen. Go into Desktop boot and drag the



Your Boot file can be as long and complicated as you wish

file icon on to your hard disc or, if you don't have a hard drive, on to a floppy disc (which will now be called your Boot disc). Make sure that the autoboot option is on (meaning the little star is present). You've now saved your Boot file. It's that simple.

- Unfortunately, if you have Risc OS 3.10 (check by clicking Menu over the Acorn on your icon bar and looking at the Info line) there is a little bug which prevents things working as they should. To get round this, press F12 and type the following:

```
*Configure FileSystem ADFS
*ADFS
If your Boot file is on a hard
disc, then you should type:
*Configure Drive 4
*Mount 4
If your Boot file is on a floppy
disc, then type:
*Configure Drive 0
*Mount 0
Finally, type:
*Opt 4 2
*Configure Boot
```

Now your Boot disc is set up. If you perform a SHIFT-BREAK, or turn the machine on, then your Boot file will be run. If you have a floppy system, don't forget to put your Boot

disc in the drive. You can alter the effects of your Boot file if you want. To do this, simply drag the Boot file into *Edit*, and a bunch of lines will be appear as shown above. If you're particularly clever, you can change the set-up of your machine by altering the commands in these lines.

Take a look at the first part; you'll see something about *WimpSlot* and *ChangeDynamicArea*. Nothing to do with a special space for puny bodies, this area is concerned with memory management. The sizes of the font cache and Ram disc are set up here. If you ever need to alter these details permanently, it's better to use the *Configure* application, rather than mess about changing the commands.

Next is the *ColourTransLoadings* command. This concerns your palette. Ignore it.

As you will of course remember, you needed to have a *Filer* window open in which to save the Boot file. *Filer_OpenDir* contains details of this window, but you probably don't really want this window opened every time the computer is turned on. To prevent the window turning up every time, simply delete this line – but

only this line – and resave your Boot file.

Next, you should be able to see a large section of commands that all look the same(ish). These begin with *Filer_Boot* and often make up the bulk of the file, telling the computer which applications or resources to automatically recognise. The full pathname is given, so the computer knows exactly where to find each application. This tells the computer how to load certain files so, for example, the line *Filer_Boot Resources:\$Apps!Draw* will make sure that when you double-click on a *Draw* file, then *Draw* is loaded automatically.

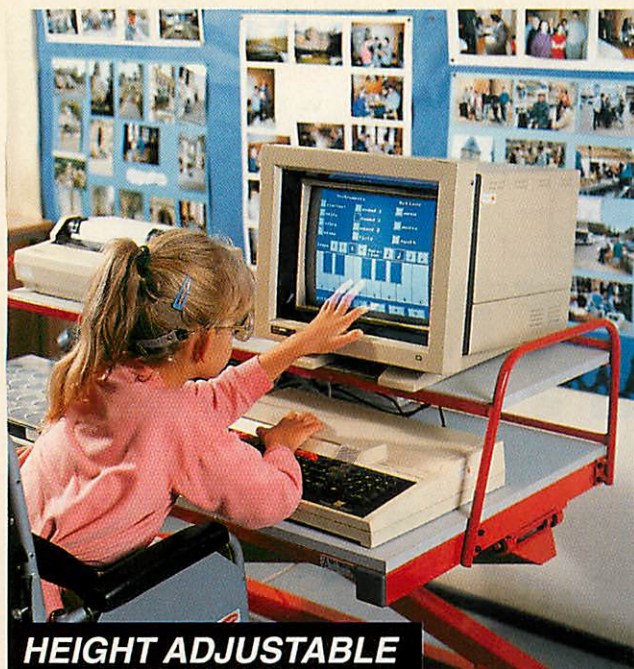
Another wimpy bit follows. Here the mode and palette for the desktop are set up. You will see lots of numbers in the *Desktop_SetPalette* line. If you're curious as to which number corresponds to which colour, look at the palette icon on the bottom right-hand side of the screen; it's the pretty box with coloured squares in it. The first number is the first coloured square on the top left-hand side of the box, the second colour is the second square and so on. Your palette will probably begin with a white square which will have the value F0F0F0.

Next up is the pinboard, the top bit of the desktop which provides a background to the windows. This be completely dull and grey, but the more confident computer users among you will no doubt use some manic chaos pattern.

Finally, you will come across some lines that begin *Run*. These are the applications you are running at this very moment, and the *Run* command simply makes sure they will appear on your icon bar when you switch on.

So, if you want to be a more efficient computer user, give your machine a boot.

The vari-tech Solution TO COMPUTER DESKING AND SPECIAL NEEDS



**HEIGHT ADJUSTABLE
FOR SPECIAL
EDUCATIONAL NEEDS**

Correct posture is often hard to attain by disabled people using normal work benches. With our height adjustable work units it can be achieved in seconds using a simple winding handle. This is removable to make the units tamper proof. This simple method of adjustment gives millimetre accuracy and allows units to be used for various activities by different people, achieving optimum efficiency. The open end at one or more sides allows every current UK wheelchair to be accommodated comfortably. This, coupled with over 500mm of adjustment means that children from 3 years old to adult can use the same unit in complete comfort.

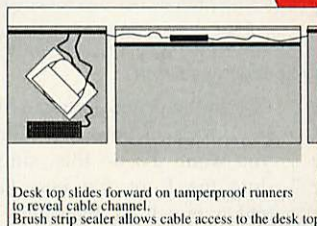
We also manufacture a full range of height adjustable workbenches for Woodworking, Metalworking, Home Economics, Science and Art. Similarly, Vari-tech produce changing beds and ranges of tables for classroom, dining room and office use.

FOR DETAILS OF VARI-TECH
SOLUTIONS TO COMPUTER DESKING
AND SPECIAL NEEDS, PHONE OUR
ADVICE LINE ON: 0254 773524.



**THE
NEW
CABLE
TIDY
SYSTEM**

Developed to facilitate the ease of networking, the Benching System units all have removable blanking plates, allowing wires to pass from desk to desk. To enable the multiple positioning and connection of desks there are four different linking units available.



Desk top slides forward on tamperproof runners to reveal cable channel. Brush strip sealer allows cable access to the desk top.



**Introducing the new
Cable Tidy System
units starting from
£86**

There are two mobile Trolley models, together with a comprehensive range of accessories, allowing all needs to be catered for. All Trolleys are supplied as standard with integrated handrails and rubber wheels for shock absorption and mobility.

vari-tech

Vari-tech, unit 7, Premier Mill, Begonia Street, Darwen, Lancs. BB3 2DP
Tel: 0254 773524 Fax: 0254 706617

In the January issue of *Acorn User* I decided that the early pre-release version of *Wordz* was full of promise, if a little slow. I've now had a chance to try out the second update (version 1.02) of the full release version.

With *Pipedream*, Colton Software has long survived on the principle of cramming as much functionality as possible into a single application. Although at heart it was really a spreadsheet, *Pipedream* could justifiably claim to be a word processor and even a simple database.

By contrast, *Wordz* represents a total rethink. It is a word processor, both in name and in nature, and you will have to buy several separate applications to approach the versatility of *Pipedream*. The new Colton Software family includes *Wordz* itself, the forthcoming *Resultz* spreadsheet and an as-yet unnamed database. Let's hope they don't call it *Databaze*.

NICE AND EASY

Wordz has a bar at the top of the editing window with iconised buttons providing direct access to central functions like text justification modes, style and effect choices, cut/paste, document saving and printing. The very first button contains a pair of spectacles. Click on this and you get the View control dialogue box. This lets you set things like the scale view, the printable area and choose options such as vertical and horizontal rulers or column and row borders.

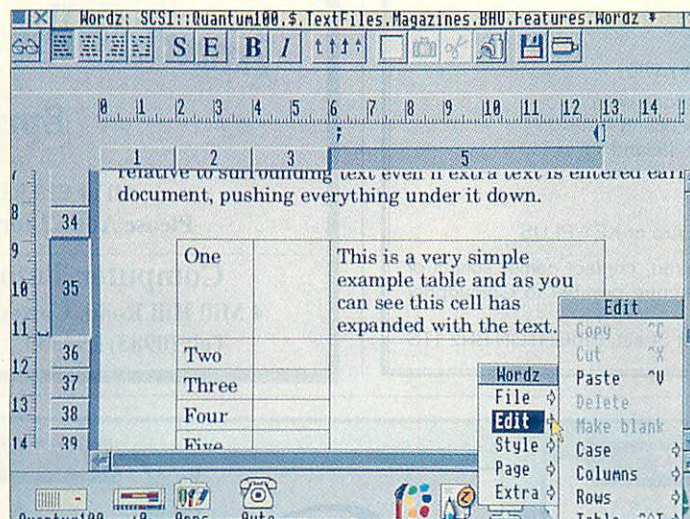
You can also split the editing area vertically or horizontally into two separate windows on the same document. These remain contained within the single overall *Wordz* window and make editing more manageable. Underneath the button bar is a single status line which doubles as context-sensitive help.

Like Computer Concepts' *Impression*, *Wordz* implements layered styles which can be applied to any selected region of text rather than just all the text in one paragraph. Any text region, be it a single character or an entire document, can have a different customised combination of font, size, foreground or back-

WORDZ

MADE EASY

As Ian Burley finds out, Colton's *Wordz* can be both powerful and easy to use



Wordz combines a host of features with ease of use

ground colour, ruler setting, line spacing or whatever is applied to it. Styles can be masked by more recently applied ones, so complex but impressive combinations of effects can be built up.

Once you have used layered styles it's very difficult to return to the restrictions of the old fashioned paragraph styles. However, it can be difficult to keep track of applied styles, so a style region function has been included, that shows you where the styles are and lets you rearrange them.

ON THE TABLE

Wordz has a very powerful and easy to use table editor. By selecting column and row borders you can drag about the table dimensions of all, or part of, the table to your heart's content. Or you can resize an individual table entry by dragging the sides of its box.

You have the choice of showing or hiding boxes in finished tables. Data entered

can be made to flow from one line to another within its column bounds and automatically extend the cell.

Rows and columns are easily inserted, selected and deleted. Pre-prepared data can be directly imported into a table if it is in CSV format. All you need to do is drag and drop the CSV file icon into your *Wordz* document and the program automatically generates a table.

When *Resultz* arrives you will be able to insert whole spreadsheets into *Wordz* tables. As *Wordz* and *Resultz* will share a dynamic link you will be able to edit *Resultz* sheets from within *Wordz* as long as both applications are running at the same time. *Wordz* will also share *Resultz*-generated charts and these too will be updated in real time.

Wordz documents can incorporate either *Paint* or *Draw* images, but not those from *Artworks*. Images can either be imported into the *Wordz* docu-

ment file, meaning the image must be copied, or to save space, *Wordz* can reference external image files.

Illustrations can be resized and moved around the document and there is an option to use an image as a page back-drop. Images can be pinned so they maintain their position relative to surrounding text.

AND THE REST

Other *Wordz* niceties include templates for label printing, a 58,000-word spelling checker with user-dictionary option, fields for fixed dates or today's date, case swapping, word counting on selected regions as well as the entire document and the ability to import *First Word Plus* files.

Wordz is certainly an impressive package to use. Nothing is ever 100 percent perfect and I have some quibbles: although speeded up since its pre-release days, *Wordz* is still a bit sluggish at times when forcing the text to scroll with the arrow keys and there is an annoying screen repaint every now and again, which seems unnecessary.

There is no option for click-selecting a single line with the mouse; two clicks selects a word and three the whole paragraph. I was disappointed that drag and drop editing to supplement the conventional cut-copy-paste method had not been implemented. Colton Software has not ruled these options out, but has no definite plans either. Advanced features like footnotes, indexing and outlining are also not on the priorities list.

Nevertheless, the arrival of *Wordz* has already stirred some of Colton Software's rivals into action to improve their own wares. *Wordz* looks nice, is genuinely easy to use, has powerful features like layered styles and comprehensive tabling and promises a lot, with hot links to *Resultz* and the forthcoming database.

PRODUCT DETAILS

Product: *Wordz*
Supplier: Colton Software, 2 Signet Court, Swanns Road, Cambridge, CB5 8LA
Tel: (0223) 311881
Price: £99



SCHOOLS TV at your fingertips

Details of the Channel 4/ITV Schools service for your school micro. Just one disk brings you descriptions of each individual programme. There are also files on support publications, software, videos and people to contact. For intelligent searching, all files use the easily available KEY or KEY PLUS data handling system.

GML continues the service previously provided by ITC Education.

SUMMER TERM ready now

Annual individual/single site subscription 93/94 school year (+ Summer '93 free) £24.00
Single term - Summer term 1993 now £8.50
(Back copies can be provided, just write terms required)

Multiple copying permitted on the named site. More than one disk version needed? 25% off each subscription if more than one version ordered.

Professional/LEA centres wishing to provide copies to the schools in their area please enquire about special rates.

Versions to suit all Acorn Users:

KEY data for BBC-B or Master DFS 5.25":

- 80 track DS
- 40 track SS, DS or flipover (primary only)

Region: (subsets for BBC DFS versions only)

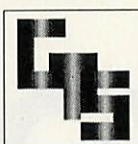
- England
- Scotland
- Wales (S4C/BBC Wales)
- N. Ireland

All UK versions:

- ADFS (L)
- Archimedes 3.5" - use with KEY Arc or KEY PLUS

Writing stating the version(s) required, contact name, school or college, user site address, and cheque payable to Christopher Jones, GML. Post to:

GML, Concorde House, 18 Margaret Street, BRIGHTON BN2 1TS



PAPPUS

The Geometric Drawing Program

For the best in Educational Software

Farmer Giles

Charts & Graphs

Sieve

Farmer Giles II

Computer Basics

SpriteEd

All at £19.95 inc VAT Each

Please Add £1 for Postage & Packing

Computer Tutorial Services Ltd.

4 Mill Hill Road, Cowes, Isle of Wight, PO31 7EA

Tel: (0983) 294333

Fax: (0983) 298439

PREMIUM BULK 3.5" DISKS

	DS/DD	DS/HD
25	11.49	17.49
50	20.99	30.49
100	37.99	56.99
200	71.99	109.99
250	88.99	134.99
500	173.99	259.99

ALL DISKS ARE FULLY GUARANTEED
AND ARE COMPLETE WITH LABELS

3.5" SUPERIOR LOCKABLE DISK BOXES

Qty	100 Cap.	140 Cap.	Bank Box
1	4.49ea	6.49ea	9.95ea
2	4.39ea	6.39ea	9.75ea
4	4.19ea	6.19ea	9.50ea
6	3.99ea	5.99ea	9.25ea

All products are subject to availability
All prices include VAT.
Please add £3.50 p+p
for disks and boxes.
E&OE.



SNAP COMPUTER

SUPPLIES LTD

HOTLINE

0703

457111

3.5" PREMIUM DISKS WITH OUR BOXES

	DS/DD	DS/HD
100 Cap. box + 50 disks	24.99	34.49
100 Cap. box + 100 disks	41.49	60.49
140 Cap. box + 100 disks	43.99	61.99
Bank box + 50 disks	29.99	39.49

RIBBONS - POST FREE

Full Mark Brand	2 off	4 off
	PRICE EACH	
Citizen 120D/124D Swift 24	2.75	2.55
Citizen Swift 24 Colour	13.95*	
Panasonic KXP 1080/1123/1124	3.25	3.05
Star LC10/LC20	2.60	2.40
Star LC10-4 Colour	5.90	5.70
Star LC24-10	2.95	2.75
Star LC24-10 Colour	10.95*	
Star LC200	3.00	2.80
Star LC200 Colour	10.95*	
Star LC24-200	2.95	2.75
Star LC24-200 Colour	10.95*	
Ribbon re-ink	12.95	

Minimum order - 2 ribbons, except those
marked with an asterisk *

COMPATIBLE INK JET REFILL

HP Deskjet 500 Double Refill	9.95
Canon BJ10E Double Refill	9.95



SNAP COMPUTER SUPPLIES LTD Fax: 0703 457222

Unit 16, The Sidings, Hound Rd, Netley Abbey, Southampton SO3 5QA



FANFARE FOR THE COMMON MIDI

Richard Garrett plays along with Serenade, Clares' new Midi package

The trouble with Midi sequencers is that most of them are written for pro musicians who, as everyone knows, speak a foreign language – riff, hook, stab, middle eight and so on – read hieroglyphics – musical notation – sleep during the daytime and have egos bigger than the Albert Hall. Any piece of software that meets their approval must cost loads of money, be totally unintelligible to the average punter and do everything they ever wanted, including mix Alka-Seltzer when appropriate. If you don't fit the above description then read on.

ENTER SERENADE

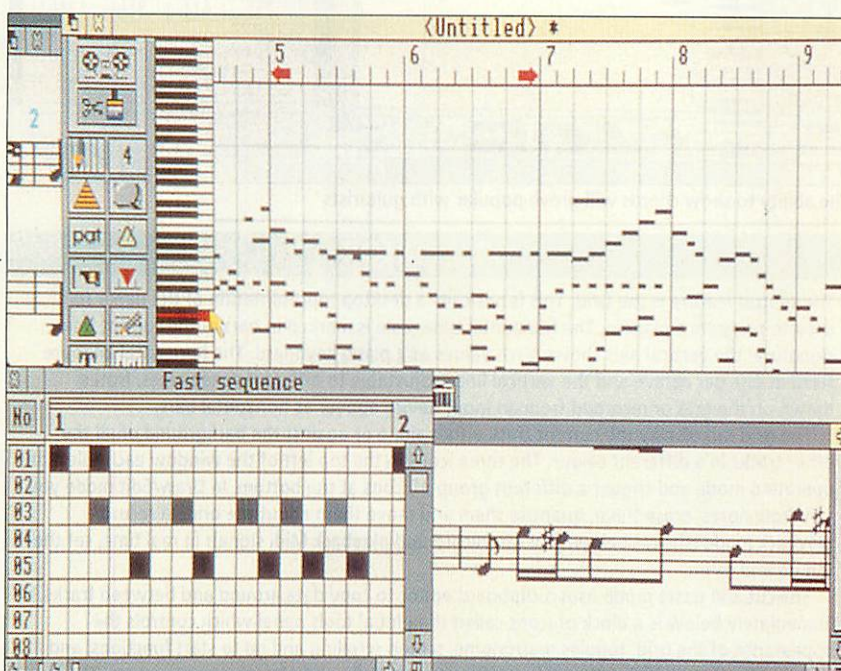
Serenade is an unashamedly entry level Midi sequencer that can write and arrange music for up to 16 electronic instruments. It is a grid edit sequencer which runs in the desktop and uses the analogy of a player piano to represent musical notes as lines on a paper roll rather than dots on a stave.

Clares has used icons extensively in the layout and, unlike many sequencers, it offers a huge number of specialist functions without seriously constricting the user's workspace. This is exclusively a Midi package, and will only work with an appropriate interface card. Since such packages are still rare on the Arc, it's worth describing the function of *Serenade* in a little detail...

Sequencers are programs that help you compose music on screen, record it from a synthesizer keyboard or other input device and play it back using external tone generators (the synth again). This is achieved by passing information between the computer and processor driven musical instruments over five-pin DIN cables.

Unlike sound sampling programs, Midi sequencers never deal in actual sound, but manipulate control signals (the outputs) that tell synthesizers and drum machines what sounds to generate from their own hardware. The system also transmits controller information (inputs) which describes the status of volume knobs, expression pedals, pitch wheels and other modulation devices.

Although Midi addresses instruments on 16 different channels at once, you don't need to connect your computer to 16 boxes. Contemporary multi-timbral synths can generate about 24 notes at once spread over 16 stereo instruments or voices: all from one £300 bit of

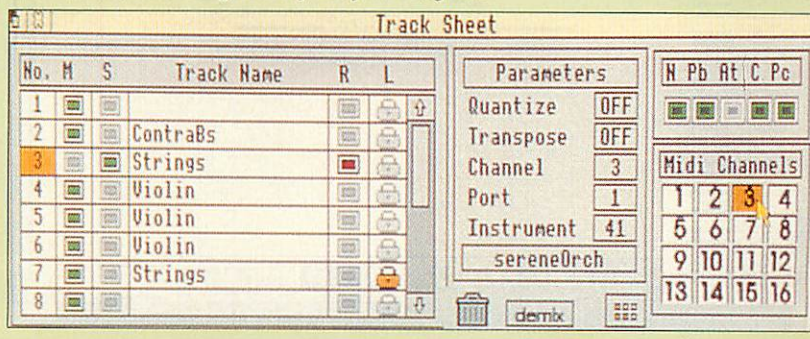


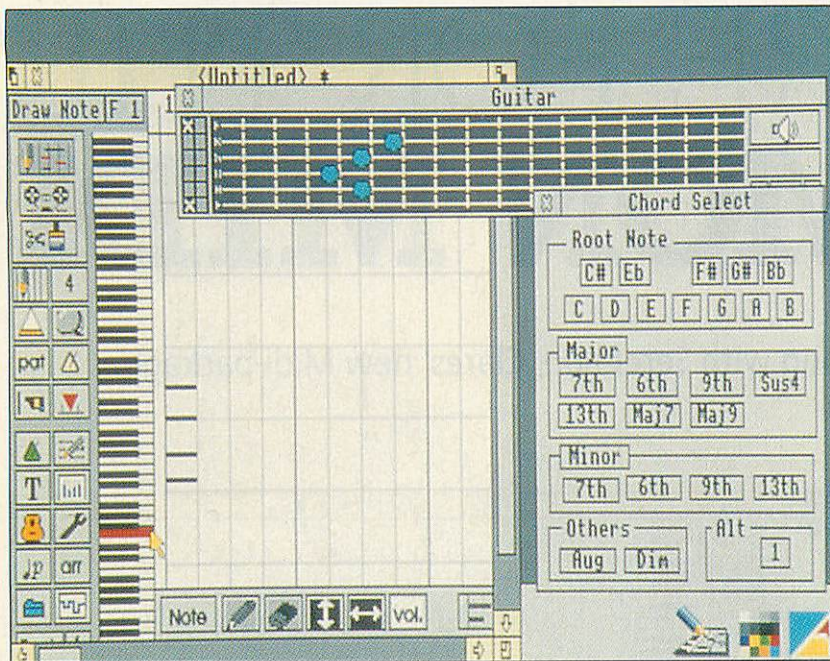
If it looks like a pianola roll, that's because it works much the same way

TRACK SHEET

This is one of the most important windows in the package. It contains a list of the 16 internal tracks – eight visible at once – with writable track names and flags indicating Mute, Solo, Record enable and Lock status. Mute stops a channel from sending data to the tone generator thereby silencing it. Solo is its extreme opposite. When you select it, all other channels are muted so that the track plays alone. Record enable allows you to record signals from a Midi input devices on that particular track and Lock prevents the track from recording.

By selecting and dragging a track name around, you can produce duplicate copies of it, merge it with another track or delete it. When you select a track number from the list, the window will also display its parameters. These are the number of its Midi port, its channel and the name and number of the instrument (voice, program) selected. The list of instruments can be configured to your synth using *Edit*.





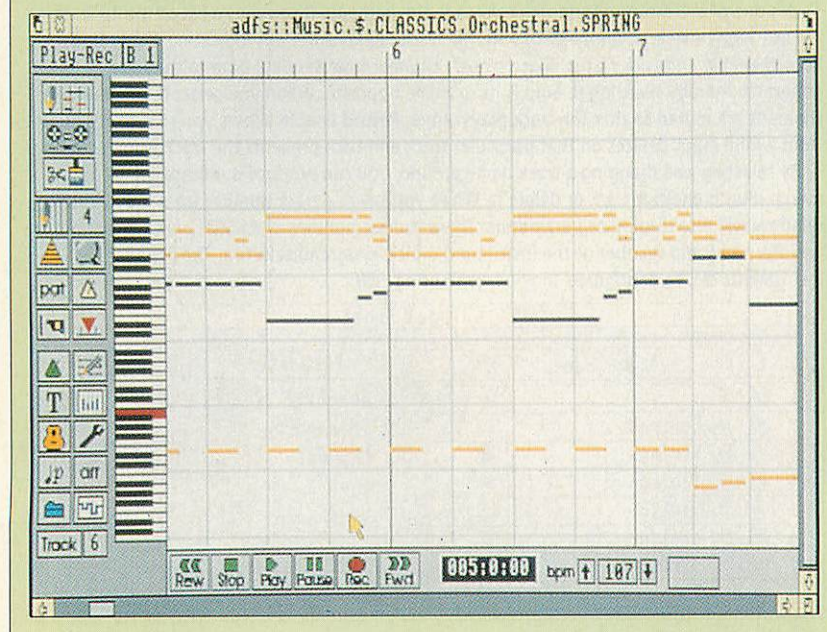
The ability to show chords will prove popular with guitarists

GRID EDITOR

The central feature is the Grid. This is basically a desktop representation of the paper roll used to program a pianola. The horizontal time scale is marked in bars at the current time signature; the vertical axis shows pitch values as a piano keyboard. The horizontal lines are fixed at one per octave and the vertical lines adjustable to different note values. Notes drawn on the grid or recorded from an input device appear as horizontal bars.

The grid can display the current track either alone or against the background of all the other tracks in a different colour. The three icons in the top left of the window each select an operating mode and trigger a different group of icons at the bottom. In Draw/Edit mode you can draw notes, erase them, quantise them and move them about the grid. In record/playback mode (shown below) you can record and playback Midi signals in real time, set the tempo and so on.

The cut and paste mode uses a clipboard editor to copy data around and between tracks. Immediately below is a block of icons called the global tools panel which controls the appearance of the grid; toggles metronome, screen scrolling and go to start functions; and switches between playing through patterns sequentially and playing arrangements. The ten icons at the bottom left of the screen make up the Function panel from which you can set up the metronome, set the time signature, add and remove bars from the grid, save files, and call all the other editors. All icons are duplicated as menu options.



hardware. *Serenade* offers the user two methods of writing music. In Draw/Edit mode, you write notes of fixed duration and loudness (velocity) on to the grid using a pencil icon.

The length and velocity of these notes can be altered much as you would select nib shapes and sizes in an art package. Like conventional drawing packages, it also provides the normal complement of snap to grid, edit and move (transpose) functions.

QUANTISE THEORY

One feature with no obvious counterpart in drawing packages is known as quantisation. This corrects playing errors by detecting notes that occur ahead of or behind the beat and automatically moving them to the right place (one person's playing error is another's expression). In *Serenade*, the quantise function can be altered so that notes move all or part way towards the nearest grid line allowing you to tighten up your playing without making it totally mechanical.

In Record/Play mode, you can enter notes from a synth in real time with their durations and velocities dependant on how you hit the keys. To help with this, the program provides a click track whose pitch, volume and Midi channel can be set from the icon bar. This metronome gives a non-configurable one bar count before the start of the track. If you want to 'drop in' to an existing track and fix an error, you can set the record option to remain inactive until it receives a Midi keypress. There is also an editable tempo track which guides the speed of you tune as it plays.

Having created a number of 16-part phrases, you can build a song structure from the arrange window. This is a list of sections defined by bar numbers which can be repeated and played in order using an arrange play option from the global tools menu. It's great for rock musicians for whom life would not be the same without verse-verse-chorus-verse-chorus-chorus-stop but is rather less useful for those musicians of a classical bent.

If you're a guitarist, one feature that you'll really like is the guitar chord window. When you click on the guitar icon, a window opens to display a 17-fret guitar fingerboard and, by selecting frets with the mouse pointer to indicate where you would put your fingers, you can build chords without knowing exactly what they're called.

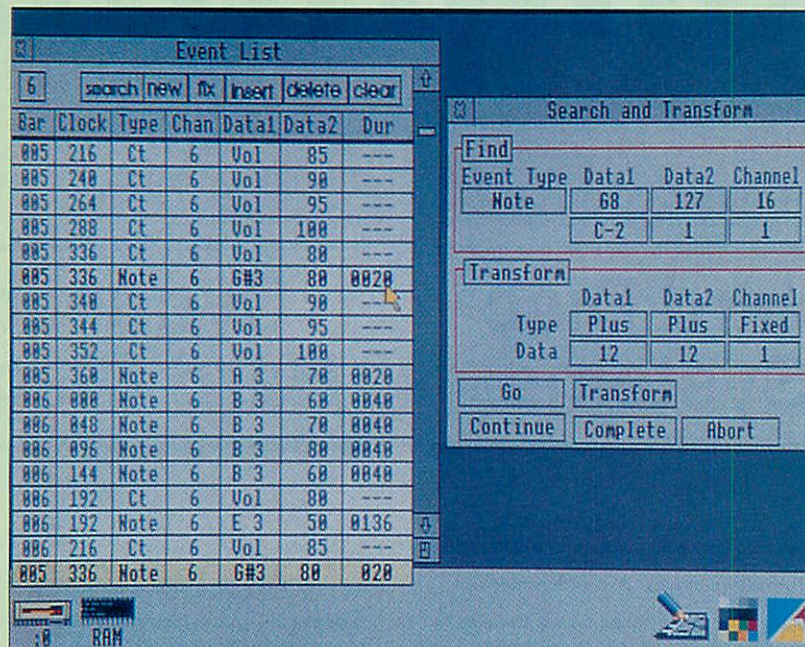
Alternatively, you can use a chord select box to choose common chords by name in up to three voicings. When you hit the loudspeaker icon, *Serenade* strums the notes in a style reminiscent of a seriously depressed flamenco player but it's sufficient to get the idea. With the main screen in Draw/Edit mode, you can write the chord into your current track.

VARIETY ACT

The variety of musical phenomena is such that no one editor adequately displays them all. Standard musical notation is great for showing harmonic relationships, chords and so on but lacks the precision of the grid when describing durations and start times. Neither is as detailed as an event editor and all three are appalling at illustrating drum patterns. Because of this, many

EVENT LIST

If you're a *Tracker* user moving up to *Midi*, this is the screen that you will find most familiar. All the data in the current track appears as columns of numbers in a scrolling window in which each row holds an event. Events are either notes defined in terms of channel, pitch, volume and duration, or *Midi* control instructions (these cover such aspects of the process as pitch bend, program change, modulation wheel, pan, volume). Each event occurs at a point in time shown by its bar number and a clock value within the bar. There are 384 clock values in each bar, so one crochet is equal to 92 clock pulses. Technically, this is referred to as a resolution of 92 ppqn (pulses per quarter note).



When you click on a row, the event data is copied into an edit line at the bottom of the window. From here, you can delete it or, once you've made any necessary changes, you can replace (fix) the original or insert it as an additional event. From the event list, you can also call up a Search and Transform option. This is much like the search and replace feature in a word processor, except that it searches for events of a particular type that fall within a given range of values and then transforms all of them by adding, subtracting or randomising data. For example, if you were to locate all notes on channel 3 and add 12 to their pitch values this would transpose the whole track up one octave.

OTHER MACHINES AND OTHER PACKAGES

Although software *Midi* sequencing has been around for several years, it has until recently been limited, almost exclusively, to packages designed for the Atari ST (for poor musos) and the Apple Macintosh (seen in flash studios only). The market leaders in the field have been £400 plus: products like *EMagic Notator* on the ST, *Opcode Vision* on the Macintosh and *Steinberg Cubase* on both.

During that time, the price of *Midi* hardware has been such that composing on computer has been a hobby limited to wealthy and/or committed enthusiasts. This means that most software has been aimed at a musically knowledgeable bunch of users who've wanted more and more features and have been prepared to put a lot of time into discovering the operational eccentricities of 'pro packages'.

These days, most of these manufacturers have tidied up the front end of their wares and produced cut down versions (*EZ Vision*, *Cubase Lite*, *Notator Alpha*) for the home market. All these packages fall in the £100-£200 price range and are distinguished from their 'pro' siblings by the absence of features like synchronisation to tape and video recorders and the more sophisticated quantisation and editor options.

Serenade alone falls firmly within this group and, combined with *Rhythm-Bed* and *Rhapsody*, would give any of the software packages based on other platforms a run for their money. Unlike many people in the Acorn world I don't generally go in for extolling the virtues of fast processing speeds, which can often be meaningless in themselves, but *Serenade* has a smoothness of operation when writing notes by hand that I've only encountered using *Cubase* on the faster 68030-based Macintoshes. In the Risc OS 3 environment, the only competition for this package is EMR's *Studio 24+* version 3, which is a bit more expensive but has a few more 'professional end' features.

sequencers feature drum pattern and notation editors. As Clares already has notation and drum editors in its catalogue, these features have been left out but hooks into these products have been included.

If you have version 1.26 or later of *Rhythm-Bed*, you can synchronise it with *Serenade* so that when you hit the play button on the main screen, your drum patterns will roll along in time. Currently, this only works if the tempo is fixed throughout the piece. Like many drummers, version 1.26 can't handle changing speed in mid-song.

For users of *Rhapsody*, and of most *Midi* software for that matter, Clares has taken the bold step of storing sequences as type one Standard *Midi* Files. SMFs can be loaded straight into *Rhapsody* and converted into musical notation but, as existing users will know, this is time consuming operation. In practice it's likely that one would only notate completed arrangements rather than swap continuously between the stave and the piano roll.

Clares should be congratulated for this modular approach to software design. It means that users who don't like drum machines or don't want to use standard notation don't have to buy that element of the total package. It also keeps the price down.

CADENZA

Although it is presented as an entry level product, *Serenade* offers a depth and flexibility that are normally associated with professional sequencers. However it has not become cluttered or overly complex. The icons and advice boxes are clear, and writing notes on the grid is very smooth.

Personally, I would like to see the screen layout rationalised a little so that I didn't have to change modes so often. Perhaps the tape and edit controls could have been on the main bar and the cut and paste functions could be left in the menu.

When used in conjunction with *Rhythm-Bed* and *Rhapsody*, it provides a comprehensive working environment for the *Midi* musician and only falls short of professional requirements in one or two points – notably the inability to change time signature in mid track and the lack of tape synchronisation.

Clares says that it still has many enhancements to the system planned and I'm looking forward to them already. If you are an Archimedes user thinking of getting into *Midi* music, or just a musician looking for a good first sequencer, then I suggest you take a look at *Serenade*. At the asking price, we are talking serious business.

PRODUCT DETAILS

Product: *Serenade*
Supplier: Clares Micro Supplies, 98 Middlewich Road, Northwich, Cheshire, CW9 7DA
Tel: (0606) 485111
Price: £135 inc VAT

Rhythm Bed (£49.95) and *Rhapsody* (£61.95) are also supplied by Clares

SCSI systems

The complete

CD ROM Systems

Our CD ROM systems comprise of a Toshiba mechanism (Multisession - Photo CD compatible), a Morley SCSI card, a set of stereo speakers and four collections of discs to choose from (see below). The software on these discs is all RISC OS software and requires no use of a PC emulator whatsoever.

Collection 1 **£649.00**

(Grooves, Creepy Crawlies, Image Warehouse)

Collection 2 **£729.00**

(Grooves, Creepy Crawlies, Image Warehouse and Hutchinsons Encyclopedia)

Collection 3 **£769.00**

(Grooves, Creepy Crawlies, Image Warehouse and Dictionary of the living world)

Collection 4 **£849.00**

(Grooves, Creepy Crawlies, Image Warehouse, Hutchinsons Encyclopedia and Dictionary of the living world)

CD ROM Drive & SCSI Interface **£489.00**

Hard Disc Systems

The Morley Hard Disc systems comprise of a SCSI card together with all the necessary cables, SCSI management software, Hard Disc and a detailed manual. Effectively giving the user a 'plug in and go' solution to Hard Disc storage. Many of our existing customers have commented about how easy it was to connect their Morley Hard Disc to their computer.

External Hard Discs are housed in an attractive metal case with dual SCSI connectors and device ID switch already fitted. As with all of our SCSI cards CDFS is installed as standard.

A3000 or External 40Mb **£349.00**

A3000 or External 80Mb **£499.00**

A3000 or External 240Mb **£709.00**

A300/400/5000 Internal 40Mb **£269.00**

A300/400/5000 Internal 80Mb **£449.00**

A300/400/5000 Internal 240Mb **£699.00**

Syquest Hard Discs

Our removable Cartridge Hard Disc systems are designed to offer the end user the ultimate in terms of portable, mass storage. The systems come in a choice of either 42Mb or 88Mb sizes (non interchangeable). With the benefit of a small on-board cache the mechanisms offer superb performance with transfer rates exceeding that of many standard fixed hard discs.

The biggest advantage of these systems is that when a cartridge is full, you simply have to insert a new cartridge and you have another full 42Mb or 88Mb to play with.

All systems

42Mb system **£499.00**

88Mb system **£775.00**

(Both include SCSI Interface & one cartridge)

Consumables

42Mb Cartridges **£65.00**

88Mb Cartridges **£109.00**



from Morley. solution.

Tape Archive

Tape archive systems tend to be regarded as expensive add ons to an Acorn system. The part that people tend to forget about is how valuable is their data? If you manage a network just think how much time and cost would be wasted if the hard disc failed without you having a recent back-up. Using standard floppy discs for back-up is one option but is incredibly tedious if large amounts of data are involved.

The answer is a Morley Tape Archive system. With every system sold we supply a FREE copy of SAS (Safe & Sound) archiving software to make backing up and restoring as simple as possible. Don't get caught out!

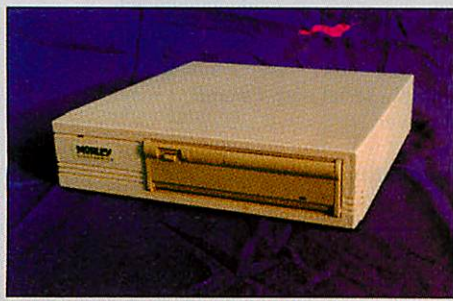
External 250Mb system **£799.00**

(Includes SCSI Interface & one 250Mb tape)

Consumables

250Mb Tapes **£24.99**

150Mb Tapes **£19.99**



Floptical® Systems

The new Floptical® system has been developed in the USA by Insite Peripherals of California while the drives are being manufactured by Matsushita of Japan (one of the worlds largest electronic manufacturers). 3M and Hitachi are currently producing the special 21Mb discs which give this incredible amount of storage. Morley have developed the drive for use on the Acorn range of RISC OS computers and this can now read and write standard 800k and 1.6Mb floppies as well as the 21Mb Floptical® discs. Using the 21Mb discs these drives are approximately twice as fast as normal floppy drives making them perfect for use as a backup system or general purpose program/data storage.

External 21Mb system **£499.00**

A5000 internal 21Mb system **£425.00**

(Both include SCSI Interface & one disc)

Consumables

21Mb disc each **£24.00**

Pack of 5 x 21Mb discs **£99.00**



Other Prices

RISC OS CD ROM DISCS

Creepy Crawlies (MDI) **£99.00**

Grooves (MDI) **£59.00**

Image Warehouse (MDI) **£59.00**

Dictionary Of The Living World (MDI) **£175.00**

Hutchinsons Encyclopedia (PEP) **£99.00**

Woodland (APA) (Incl. free RUCD) **£150.00**

Frontier 2000 (CSH) **£175.00**

Revelation 2 (Longman Logotron) **£139.00**

British Birds (ILP) **£150.00**

Other Products

Morley Analogue & User I/F **£59.00**

Morley SCSI card (inc. CDFS) **£149.00**

Morley cached SCSI card (inc. CDFS) **£199.00**

CD Caddies **£6.50**

Monitors

Microvitec CubScan 14" 0.28dp DMS **£399.00**

Microvitec AutoScan 20" 0.31dp DMS **£1,049.00**

Please note that all prices exclude VAT and carriage. E & OE

MORLEY

ELECTRONICS LTD

Morley House, West Chirton, North Shields
Tyne & Wear, NE29 7TY
Tel. (091) 257 6355
Fax (091) 257 6373
Intl. Tel (+44) 91 257 6355

MODEM TIMES

Ian Burley hacks a path through the communications jungle

It's almost two years since our last feature on comms. Then, the fastest widely available modems operated at 9,600bps (bits per second). That means such a modem can transmit or receive around 1000 characters per second, meaning data files could be shifted to or from your Archimedes over the phone line at about 70K per minute. This didn't come cheap and the most affordable 9,600bps modem then was at least £500.

Today, for as little as £250, you can buy modems which go 50 percent faster and have much better data compression system, meaning lower phone bills. Even if the princely sum of £250 still makes your wallet cringe, you have the more affordable option of going for slower 2,400bps (V22bis standard) modems but these have been enhanced by better data compression systems too.

Finally, since the introduction of *ArcFax* from Dave Pilling, who can be contacted on (0253) 852806, there's the added attraction of sending and receiving faxes.

Undoubtedly, if you are looking for a new modem the best performance standard to aim for these days is V32bis. This manages data transfers at the rate of 14,400bps, 50 percent faster than 9,600bps V32 modems. Even if your phone line isn't the clearest, V32bis is designed to detect this and can automatically step down to a slower but more reliable speed such as 1,200bps.

A point to note is that to fully exploit the V32bis performance, you need to connect your modem to the serial port at a speed of at least 38.4Kbps; otherwise when downloading uncompressed files, your modem will function more quickly than your serial port. The snag is that Risc OS only supports a maximum speed of 19.2K bps but third party serial port interfaces like The Serial Port's new High Performance Dual Serial Card can fix this.

COMPRESSION

V42bis is a modem data compression standard which is steadily replacing the more

familiar MNP5 standard, with which it remains compatible.

V42bis is nice, because its compression algorithm is more efficient and it can work out whether or not data compression is desirable during a file transfer. This is important because a modem can slow down as it tries to compress an already compressed stream of data. Unlike MNP5, V42bis doesn't make this mistake.

FAX

Many modern modems now offer fax machine compatibility. Currently, only David Pilling's *ArcFax* package enables you to do this on an Arc but it's effective and very affordable.

When choosing a modem with fax compatibility, make sure it has both fax send and receive functions – earlier models tended to offer only a fax sender – and check it has 9,600bps transfer rates or higher. Most up to date 2,400bps modems can operate in fax mode at 9,600bps. *ArcFax* currently only supports Class 2 fax modems,

though David Pilling is working on a Class 1 driver.

THE BUYER

In summary, if you are in the market for a new modem, its ideal specification would include 14,400bps V32bis performance and V42bis data compression combined with Class 2 fax compatibility. BAPT-approved modems with this specification, like the new Pace Linnet 32 Plus, for example, can be bought for below £400+VAT and, if you really want to economise, you can go for a non-approved import like the Twincom 144DF for around £250+VAT.

Remember, it's technically illegal to use unapproved modems in the UK. Even if you're going for a less expensive but slower 2,400bps modem, I'd strongly suggest you go for one which features V42bis and fax. Approved models are available for as little as £150+VAT, unapproved for under £100.

Here we look at a sample of four modems: two portables and two desktops.

WORLDPORT 14,400

US Robotics

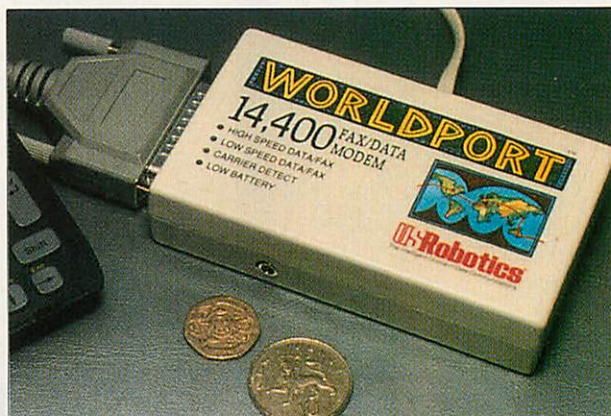
Tel: (0753) 811180

Price: £499 + VAT

Since its acquisition over a year ago by US Robotics, the WorldPort pocket modem range has been extensively revamped. Top of the range is the 14,400 Fax/Data model. It's no longer the smallest pocket modem around, but I don't know of many others which pack more punch into such a small box. It offers 14,400bps V32bis connections, V42bis smart data compression and fax.

It's sad that, especially for Archimedes users, US Robotics hasn't yet adopted the Class 2 fax standard. Until David Pilling brings out his Class 1 driver for *ArcFax*, you won't be able to use this WorldPort as a fax modem on an Archimedes.

A very compact 9V mains transformer is supplied as are a pair of 9V PP3 alkaline batteries. Each of the latter will last between 90 minutes and two hours; not much, so really only useful as an emergency backup. The third option is via pin nine



on the modem's 25-pin serial connector, though this won't work with the Archimedes' nine-pin serial port. Overall, a very desirable pocketful of modem power.

Likes: Compact but powerful

Dislikes: No Class 2 fax compatibility

TWINCOM 144DF**Twincom****Tel: (0101) 201 935 4699****Price: £250+VAT**

The Twincom 144DF is a popular, high specification fax and data modem imported by a variety of UK wholesalers from the US. However, it is not BABT-approved for the UK, but you get V32bis, V42bis, Class 1 and 2 Fax compatibility and a generous array of status LEDs on the front panel of a plain black slimline case.

This particular modem was the subject of considerable debate on bulletin boards when it was first introduced. The Twincom 144DF has attracted less negative attention though the general consensus is that it's best to have version 1.27 or later of the modem's firmware for trouble-free comms. This can be revealed by issuing the Hayes modem command AT13. Indeed, later versions of the Supra seem to be much improved as well. Of all the cheap non-approved imports, the Twincom is one of the better ones.



The Serial Port offers this modem in a bundle which includes *ARCterm 7*, *ArcFax* and an Archimedes modem lead for £350+VAT. For more details contact them on (0749) 670809.

Likes: Good specification, great value

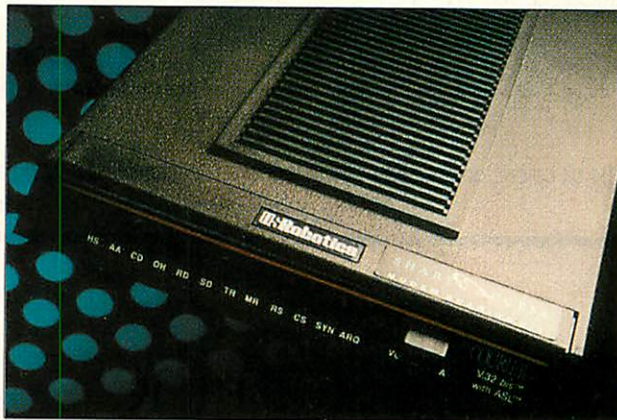
Dislikes: No BABT approval

COURIER V32BIS**US Robotics****Tel: (0753) 811180****Price: £595+VAT**

Steady development plus good marketing has endowed the Courier range with a great deal of respect. Although they aren't the cheapest, Couriers are one of the most popular modems among bulletin board operators.

For 1993 the Courier range has a more compact case and Class 1 Fax compatibility. Couriers are also future-proof, since it will also be possible to upgrade the latest versions to the Vfast standard when it becomes available later this year. Vfast doubles the speed of V32bis.

Some models in the Courier range retain the option of US Robotics' long-standing proprietary HST (High Speed Transfer) protocol. This endowed HST users with 9,600 and 14,400bps speeds before the respective 'official' V32 and V32bis protocols became available. HST has been further tweaked to 16,800bps, but this speed will only be available



when connected to another, similarly equipped, Courier. If the phone line isn't perfect, another proprietary feature called ASL enables a pair of Couriers to optimise their connection settings.

Likes: ASL, it's future-proof and dependable

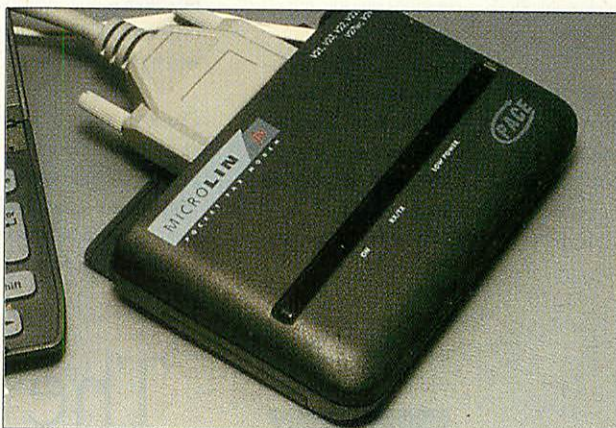
Dislikes: No Class 2 fax compatibility

MICROLIN FX**Pace****Tel: (0274) 532000****Price: £299+VAT**

The MicroLin FX is a gem of pocket modem from Pace. For a fully BABT-approved 2400bps modem it is set at a competitive price, many dealers advertising it for £199+VAT. David Pilling has bundled *ArcFax* and Beebug's *Hearsay 2* comms package with a Microlin for £264+VAT. The Serial Port does a similar deal but swapping *Hearsay 2* for *ARCterm 7*.

Unusually, the Microlin's specification includes the MNP level 10 protocol for optimised transmissions over poor quality phone lines; a worthy feature especially for those who travel a lot or use a cellular phone line. Once again, as with the WorldPort, the Microlin can be switched on and off via the serial port to save its 9V PP3 battery power and a small 9V mains transformer is supplied.

Being a 2,400bps device, the Microlin is the slowest of the modems we have looked at here by a wide margin, but you can



still expect compressed file transfer rates approaching 900cps, equivalent to around 53K a minute and 2,400 is a perfectly acceptable speed for viewdata and other services.

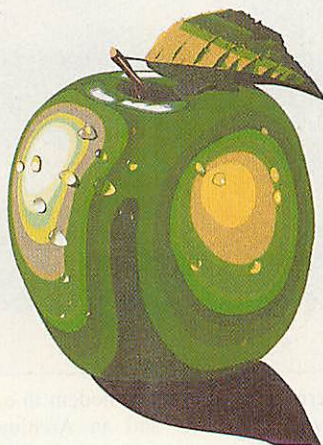
Likes: Nice design, MNP10 for bad lines, good value

Dislikes: Rather slow

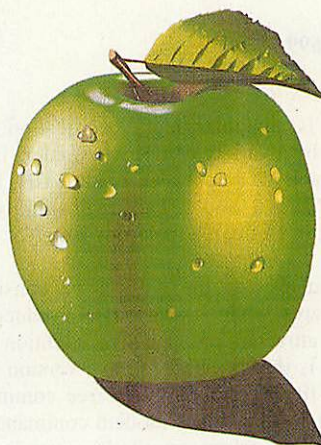
What can an Ace ProDriver do for me?

Standard Deskjet 500C Driver

Deskjet 500C ProDriver



Before



After

Tempted?

24 bit colour, colour separations, spooling, background printing and quality that speaks for itself, with upgrades starting from only £25.
Whatever your printer, contact Ace – leaders in printing technology on the Archimedes.

Oak Solutions Ltd.
Suite 25
Robin Enterprise Centre
Leeds Road
Idle
West Riding of Yorkshire
BD10 9TE
Tel: 0274 620423
Fax: 0274 620419

Hard Discs in the Classroom

As the complexity of software applications increases, hard discs are becoming more and more essential to the business of delivering these applications quickly and easily.

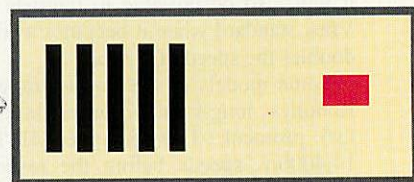
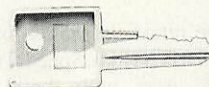
In the classroom, however, the contents of the hard disc are at the mercy of the users. Virus infections, accidental and even malicious deletions of important files are commonplace. Multiply these problems by the number of hard disc machines, and it all adds up to a big headache for the IT staff responsible for the upkeep of the computers.

Oak Solutions have the ideal answer to the problem - ClassRom. Launched originally for SCSI systems, ClassRom is now available for all Acorn ADFS hard discs (ST506 and IDE). It consists of a small circuit board which plugs into one of the computer's expansion slots.

ClassRom works by splitting the drive into two partitions, electronically locking the first partition so that it can only be altered by the system manager via password protected management software. ClassRom goes much further than simple protection however. If a network is present, the ClassRom management tool can automatically manage

and update all ClassRoms on the network, massively reducing the workload of the system manager. Applications can be remote started, and machines can be automatically reset and cleaned up at the start of each session.

ClassRom is available as a plug in card for A300/400 and 5000 series machines. It is also available as an option built into ClassNet ethernet interfaces for all Archimedes machines (except A4), and as a retro-fit to Oak Solutions SCSI hard discs. For machines without a hard disc, a SCSI ClassRom unit can be added including a hard disc.



ClassRom

The complete protection and management solution



Oak Solutions Ltd Suite 25 Robin Enterprise Centre
Leeds Road Idle West Riding of Yorkshire BD10 9TE
Tel: 0274 620423 Fax: 0274 620419

ClassRom for ADFS costs £50.00 + £3.00 p&p + VAT
Please enquire for bulk discounts and prices of
ClassRom upgrades to SCSI and ClassNet cards.

IN BRIEF

Kodak CD waits in the wings, ProArtisan 2 promises artistic splendour and Almanac, the first desktop filofax, aims to organise your life . . .

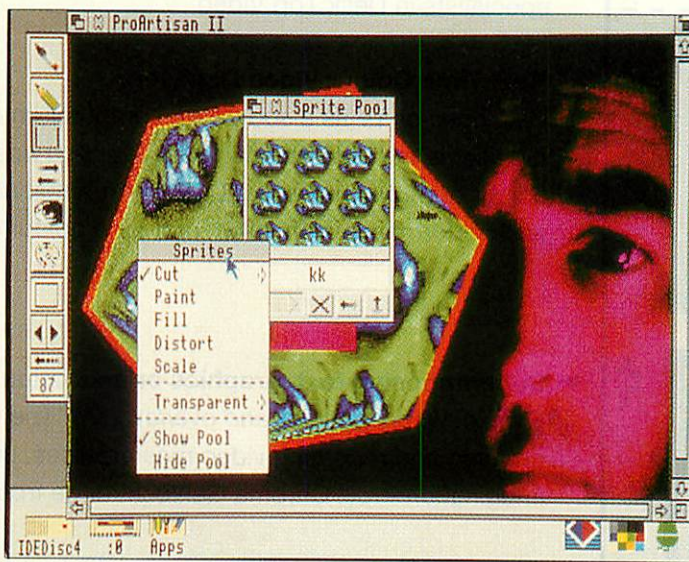
PROARTISAN 2

Clares Micro Supplies
Tel: (0606) 48511
About £135

ProArtisan 2 is a state-of-the-art package from Clares Micro Supplies. Don't be fooled by the 2: this is a brand new addition to the *Artisan* family.

The clear screen display is one of the outstanding design features, showing a configurable working space with nine control panels offering a wide range of painting, drawing and image processing possibilities. Selecting the first paintbrush icon and menu reveals 30 functions, including brushes, sprays, fills, crayons, patterns and blends.

Unique texture effects can be applied over images, creating canvas and even concrete screens. There is also a realistic inkpen for calligraphy. The Fill options are comprehensive, offering plain, circu-



ProArtisan 2: a brand new addition to the Artisan family

lar, angled and three-dimensional with interpolated blends. The Pencil icon contains standard geometric shapes with a special 'designer' polygon tool, a text dialogue box and that all-important Grid function, vis-

ibly displayed on the screen. Sprites can be cut, painted, filled, scaled, distorted and made transparent. Imported sprites can be easily be dropped into a sprite pool, flipped and reversed then tiled on the main screen, Draw files will

also be accepted. Where the software really excels is with the powerful Process control panel, where masks can be defined by colour or shape allowing work on selected areas of the screen. This can be used for the accurate cutting out of complex areas from digitised images, simplifying colour values for printmaking or just free abstract art exploration.

It is difficult to adequately describe in such a small space all the hidden depths of *ProArtisan 2*. Suffice it to say it, thankfully, appears to bridge the gap between advanced image processing and painting software. I found it intuitively easy to use, and enjoyed the powerful interactive features. Indeed it may be all you will ever need for your art and design requirements. The product is still being developed with a proposed release date for Spring/Summer 93.

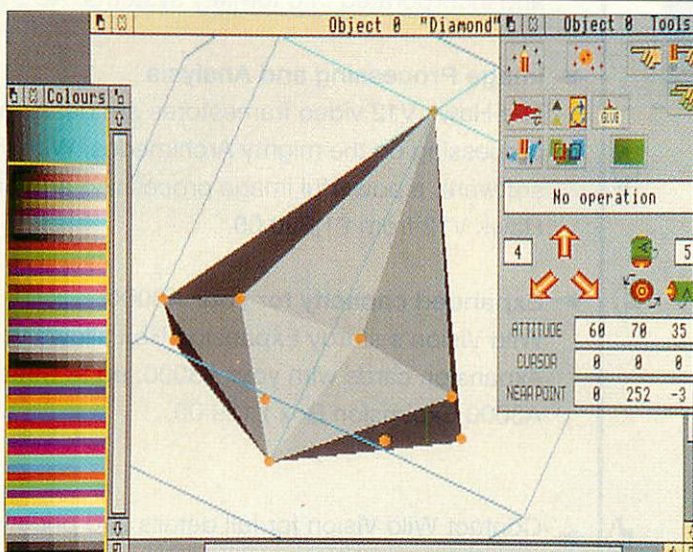
Pete Worrall

COGS

Producer: Android Systems
Tel: (0903) 756443
£70

Android's *COGS* (*Complex Object Generation System*) is a three-dimensional design and animation utility. The system has two main elements, an editor for drawing objects and a group of routines for manipulating them.

In the edit screen you can move around using a three-axis cursor and plot points within a wire frame cube showing the limits and the rotational attitude of your workspace. Once you've plotted a few points you can connect them to form flat triangles or 'trifaces' you can colour to taste and then glue together to make more complex objects. As you do this,



COGS brings 3D shapes within your grasp

you can rotate the whole frame of reference to look at your object from different angles and watch as individual trifaces change shade as they

rotate towards and away from you. If you have specific regular shapes in mind, there is also a menu option that generates these in one go.

When your object is complete, you can save it either in its 3-D form to be used in your programs or, in sprite form, as a two-dimensional projection to be incorporated into still work, art and DTP applications and so on. It is very easy to produce simple polyhedral shapes but I would be unsure about making more complicated designs. More help from the manual on this subject would be useful.

The second half of the package is a set of seven software interrupt calls for handling *COGS* image files and for displaying, rotating and translating images around the screen. Android says these are for manipulating objects within C and Basic but, since they are SWI calls, I don't see why you shouldn't make them from any language you choose.

Richard Garrett

DESKTOP VIDEO

ON THE MENU TODAY...

Wild Vision

Info







Image Processing

A3000 Expansion

Misc

Quit

→ High quality expansions for the Archimedes, A5000 and A3000 from the specialists in Desk Top Video.

→ **Real Time Colour Video Digitisers**

Use video or TV as a source for computer images. The popular Hawk V9 digitiser is the ideal solution wherever you need photograph-like sprites in colour or monochrome for DTP or Art applications. Wild Vision combine quality and performance with value; real-time colour digitisers available from £199.00.

→ **Superimposing text, graphics or animation onto video**

Simple, with a *genlock and overlay card*. The Chroma range is your route to creating and recording video masterpieces. Just let the film - and your imagination - roll! Chroma Genlock range from £215.00.

PAL encoding units with optional multiple display facility also available.

→ **Data acquisition**

The Archimedes is the ideal vehicle for the measurement and analysis of analogue signals such as sound or ECG readings. Wild Vision's high speed 12-bit analogue to digital converters are used in medicine, research, defence, and incorporated into turnkey systems. ADC1208 from £560.00.

→ **Image Processing and Analysis**

The Hawk V12 video framestores are designed specifically for image processing on the mighty Archimedes. With Foster Findlay's Arclmage software, a powerful image processing and analysis system is created. Hawk V12 from £1,990.00.

→ **Expanded capacity for your A3000**

Wild Vision's sturdy Expansion Box allows you to use standard Archimedes expansion cards with your A3000; up to three cards may be fitted at once. A3000 Expansion Box £139.00.

→ Contact Wild Vision for full details and price information on the above hardware and recommended complementary software.

Wild Vision, 15 Witney Way, Boldon Business Park, Boldon Colliery, Tyne & Wear NE35 9PE, Tel: 091 519 1455, Fax: 091 519 1929
Prices exclude carriage and VAT



WILD VISION

TALKING PICTURES

Talking Pictures/The Spoken Word

Wyddfa Software
Tel: (0286) 870101
£20

Talking Pictures is an electronic colouring book with one major difference over the more conventional type: it speaks. The aim of the program is to encourage language development in very young children by helping them to identify both the colours and the names of everyday objects.

Using the mouse, the child can produce bright pictures by selecting colours and objects on an outline stencil. The program's response is inspiring to children; it recites the name of the chosen colour or object.

The program is fully Risc OS compliant and can run in either a scalable window or a fixed window which cannot be accidentally altered. Four stencils are provided on a second disc, each of which invites colouring. Clicking on a colour or object produces a clear, digitally recorded voice with well pronounced words. A rubber is provided although



Talking Pictures gives children a chance to prove their skills

this is really an 'undo' facility, as 'wrong' colours are removed by simply choosing a replacement colour for them.

A text box is available for the child to add a word or two or simply enter their name as proof of authorship. Completed pictures can be saved and printed by using *Paint*. A stencil maker program is also provided and, although creating a non-speaking stencil is quite straightforward, the addition of speech complicates things disproportionately, even

with a sound sampling system available.

Spoken Word takes the concept a step further by showing the colours together with their written names and the names of the objects in the stencil on a side panel. This time each object can be selected via its written name and coloured in or, if children find this jump too great, there is an option to revert to *Talking Pictures* mode. In addition to a text box, *The Spoken Word* offers a 'words window'

in which the words are presented as spoken, reinforcing the link between spoken and written words. All the other features of *Talking Pictures* are present in *The Spoken Word*.

Talking Pictures is immensely suited for preschool and reception children and those with special educational needs like ESL learners. It does its task well being virtually fool-proof; essential for the target audience. *The Spoken Word* will certainly help to deliver English ATs 1 & 2 (level 1) by encouraging understanding of the spoken word and stimulating interest in reading.

I found both these programs ideal media through which to introduce KS 1 children to Acorn A-series computers: each child can quickly create a finished piece of work, printed and mounted with the proud boast it was done with the computer.

Providing children possess the necessary motor skills to use a mouse they should have few problems adapting to these simple yet successful programs. A thoroughly recommended pair of programs.

Chris Drage

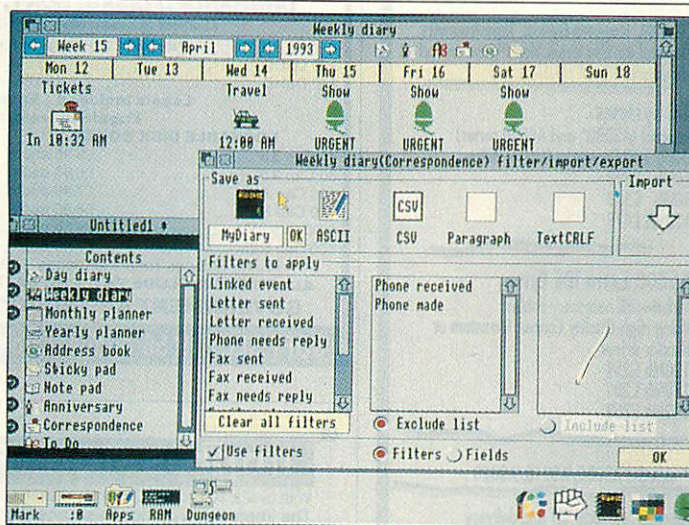
ALMANAC

Stallion Software
Tel: (0225) 483236
£60

You may well have seen computerised personal organisers on a PC, but *Almanac* from Stallion Software is the first Archimedes organiser to hit the streets. The concept is simple: *Almanac* simulates a personal organiser but, of course, has many advantages over the paper-based version.

Almanac even looks like an organiser; its main menu screen has ring binding down the side. This screen provides access to the main sections of the organiser: Diary, Address book, Sticky Pad, Note Pad and Correspondence.

Variations on each theme are available, such as daily, weekly or yearly diaries, anniversary lists, to-do lists and such like. These entries simply provide other ways of looking at the data, so the different diaries actually look at the same database.



Almanac helps you to organise that oh-so-busy life

The power of *Almanac* is in two main areas. The first is that any data in any section can be linked dynamically to any other section, so, for example, if you had a meeting with Sam Smith in your diary, you could link that entry to Sam Smith's address in the address book.

This is a major advantage of the electronic organiser: the

sections are mutually dependent, not physically unrelated. Links do not have to be within the organiser either; details of correspondence can also contain a filename, so the actual letter can be loaded from within *Almanac*.

The second powerful feature is in the use of filters. *Almanac* allows you to create as many entries in the main screen as

you like, so you can have any number of diaries (or address books, or whatever), all of which take their data from the same database, they just display it in a different way.

A filter is effectively a way of deciding which data entries should be shown in a section, so you can create your own tailored organiser. For example, you could create a section called *Acorn Letters* which would contain details of all your correspondence with Acorn.

The Sticky Pad displays the various links between data entries, and Sticky Pad entries can be set up to contain links to any part of the organiser, as well as any files or directories on disc. The Note Pad is exactly what it sounds like: it's for making notes.

Almanac is very easy to use, and is totally Risc OS compliant. It is exceptionally powerful, and I have the feeling that once you've bought it, you'll wonder how you ever managed without it.

Mark Moxon

HARDWARE AND SOFTWARE EXPANSION FOR ACORN COMPUTERS

DUAL RS423 SERIAL INTERFACE - two additional RS423 serial interfaces for communicating with RS423 or RS232 devices eg modems (in order to use bulletin boards), printers, plotters, instruments, etc. Up to four cards can be fitted in a computer.

IEEE488 INTERFACE - enables up to 14 test and measurement instruments, from well known manufacturers such as Hewlett-Packard, Fluke, Philips, Tektronix, etc. to be connected to the computer. For example, voltmeters, oscilloscopes, spectrum analysers, function generators, counters, logic analysers, programmable power supplies, plotters, printers, etc.

16 BIT PARALLEL I/O - provides two separate 16 bit input/output ports. Other facilities include four 16 bit counter/timers, two 8 bit shift registers and eight interrupt inputs. Applications range from measurement and control to high speed data input and output.

12 BIT ADC - provides eight single ended inputs each with an input voltage range of -5 to +5 Volts. Up to 166,000 samples per second can be taken.

STEBUS INTERFACE - overcomes the limitation of a maximum of four expansion cards in a computer by enabling the use of industry standard STEbus boards in an external input/output sub-system for measurement and control applications.

SCSI DEVICES - internal and external hard disc drives, magneto-optical removable disc drives, tape streamers etc.

FORTAN 77 COMPILER - completely compatible with the now discontinued Acornsoft compiler.

GINO-F 3D, GINOGRAPH, GINOSURF and HERSHEY+ - the FORTRAN subroutine graphics libraries.

Intelligent Interfaces are Bradley Associates distributor for GINO-F 3D, GINOGRAPH and GINOSURF for Acorn RISC OS-based computers.

TERMULATOR - enables a computer to emulate a terminal from the VT range (VT52, VT102 or VT220) or a Tektronix 4010 graphics terminal.

Termulator a trade mark of Acorn Computers Limited is applied to this product under licence from Acorn Computers Limited.

COMPLETE SYSTEMS - configured to customer's requirements by fitting RAM upgrades, hard discs, expansion cards, etc.

ADVICE - SUPPLY - SUPPORT - Intelligent Interfaces were established in 1981 and have enjoyed a long relationship with Acorn Computers. This places them in an ideal position to advise on, supply and support systems purchased from them.

Intelligent Interfaces Ltd

P O Box 80

Eastleigh

Hants

SO5 5YX

Tel: 0703 261514 Fax: 0703 267904

INTELLIGENT INTERFACES

SPECIAL OFFERS

Fast Arm 3 Upgrade 35Mhz £219
Fast Arm 3 + Risc OS 3 35Mhz £254
Arm 3 25 Mhz to 35Mhz Upgrade £171

A5000 2Mb Ram upgrade £79

SCSI Systems

Using High-Quality Conner, Quantum or Maxtor drives.

All systems are CDFS ready and are Acorn compatible.

Internal Systems (300/400/5000series)

85Mb Standard System - £259

Pro System - £289

120Mb Standard System - £299

Pro System - £339

213Mb Standard System - £399

Pro System - £439

Original A3000 Solutions - Hard box (including fan, power supply, interface card, and hard drive) - plugs into external expansion socket. Easy to install and portable.

85Mb £329

120Mb £379

A3000* + A4000 Solutions - Our cards are available in internal versions for these machines - Simply add £75 to the above prices for an external drive case and power supply. The standard system is also available with a user port, Midi interface and sound sampler - add £99 to the above prices.

CD-ROM, Magneto-Optical, Tapestreamers, Floptical etc also available. Please contact us for details.

IDE Systems

Internal (A3000* and A4000 series)

Using 2.5" Conner or Maxtor drives.

60Mb £299

80Mb £369

120Mb £479

A5000 Extra IDE Drive

Includes all necessary cables.

Using High-Quality Conner, Quantum or

Maxtor drives

120Mb £259

170Mb £289

212Mb £359

* includes A3000/A3010/A3020

All prices exclude VAT and delivery

Add £9 delivery

This is obviously only a small selection of all the products we sell. For a full list or the price of a particular product please contact us.



QD COMPUTERS
 30-33 SOUTH ST.
 CHICHESTER
 W SUSSEX PO19 1EL
 TEL: (0243) 531194
 FAX: (0243) 531196

SOFT . . . Tel: 0962 863225 . . . SECTOR

UNBRANDED DISKS: SONY, VERBATIM, KAO, DYSAN etc.

(Subject to availability). 100% Certified Guaranteed Error Free

Packs of 10 supplied with FREE Library case

3.5" DSDD	£5.50	5.25" DSDD	£3.82
3.5" DSHD	£10.58	5.25" DSHD	£6.11

Labels included Envelopes & labels included
Enquiries welcome for bulk orders

LOCKABLE DISK BOXES

40 Cap 3.5"

80 Cap 3.5"

100 Cap 3.5"

120 Cap 3.5"

50 Cap 5.25"

100 Cap 5.25"

ACCESSORIES

Library Cases 10 Cap 5.25/3.5"

Mouse Mats Red, Blue, Grey

Disk Labels 3.5"

Disk Labels 5.25"

Disk Envelopes 5.25"

Printer Ribbons Toner Cartridges - Original and Compatible - Ring for Prices

ALL PRICES INCLUDE VAT - NO EXTRA CHARGE FOR POSTAGE & PACKING

GOVERNMENT AND EDUCATION ENQUIRIES WELCOME

SOFT SECTOR 58 Andover Road, Winchester, Hants SO22 6AG

Impression Resource Disc

With over a 100 borders, a range of useful clip art and a selection of hints and tips. £7.95

The Impression Junior Resource Disc as above with working borders. £7.95

NEW The Ovation Resource Disc - contains extra borders, clip art, hints & tips etc. £8.95

Some of the 50+ Clip Art Collections

Home Publisher clip art (Draw) £4.95

Europe Maps colour (Draw/compressed) £4.95

World Maps (Draw/compressed) £4.95

UK Maps (Draw/compressed) £4.95

Parish Magazine - 3 discs of Draw files, 1 disc of £16.98

King James (AV) New Testament files

Ready to run, fully illustrated ClearView

hypertext files, with free copy of ClearView

EuroFactfile for the New Europe £6.95

Scientists & Inventors 300+ biographies £8.95

Christopher Columbus' first voyage £6.95

National Parks (for key stage 2) £8.95

ClearView Advanced version NEW PRICE £25.50

Fonts

Griffis - script font + free decorative alphabet £8.47

BOXI - automatically gives boxed text £8.47

Over 1800 clip art files now available - for A3000/A3010/A3020/A4000/A5000 & Archimedes

Send £1 for the free Auto-Catalogue &

ClearView/Sample disc (free with order)

Add VAT at 17.5% and £1 postage to

all orders.

School order forms accepted

DEC DATA

Dep AU5, PO Box 97, Exeter, EX4 4YA Phone/Fax 0392 221702

KODAK CD

Kodak UK
£4.99 per disc
50p per image

Dig out those old negatives; photography has a new high-resolution role to play for Acorn computer users. In the not too distant future your favourite snapshots will become screenshots using the 'over the counter' service already established by Kodak.

In response to CD technology, Kodak has developed a process that will allow up to 130 photographic images to be transferred to one compact disc. All you have to do is provide the pictures and hey presto, one week later they are on a shiny CD disc.

There are approximately 20,000 outlets nationwide able to transfer your 35mm films to disc. You initially pay £4.99 for the disc with transferral costs of £12.99 for 24 or £16.99 for 36 prints, slides cost 60 pence per image.

Each time you take in the new images to put on to disc



Photo-CD offers high-quality graphics at a low price

denotes a session and transferring all the images in one session has its advantages, as it allows the maximum 130 images to be stored. If you store images in multi-sessions you can only place up to 100

images on disc. The total outlay is around £70 for a full disc and you also receive a conventional set of 6x4 prints for your money. Duplicate Photo-CDs can be pressed for £24.99.

The Catch-22 factor used to be investing £300 in a Kodak player to see the results, but a solution is on the way. Acorn intends to embrace this technology in a similar way to the Macintosh and PC markets. The solution will be in the form of a low-cost application, that lets you to read Photo-CD images from an ordinary CD-Rom drive. The software will also feature over 40 image manipulation options.

Cumana's current 500 series will be able to use Kodak CD discs when used in conjunction with the Acorn application. However, they will only be able to read the images saved in the first session, thus ruling out multi-session Photo-CD discs. However, the new 600 series, at £524+VAT, will read full multi-session images. The 400 series machine is not compatible with Photo-CD.

This emergent technology is set to break new ground in allowing you to plan and develop the image libraries of the future.

Pete Worrall

SERIAL PORT

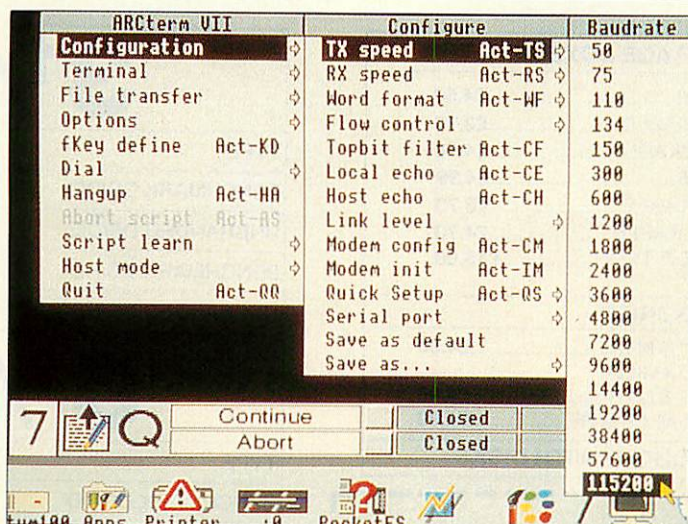
High Speed Dual Serial Port module

The Serial Port
Tel: (0749) 670058
£69

Archimedes users don't get the best of deals when it comes to interfacing their computers with the outside world. You only get the one port, it has a limited top speed and can be prone to errors at high speeds. On top of that, Arc serial cables require non-standard wiring connections.

The new High Speed Dual Serial Port (HSDSP) module from, er, The Serial Port, promises to solve all the above problems. For £69 you get a card containing a pair of serial ports that can both operate at up to 115.2Kbps, six times faster than the fastest Risc OS supported speed (19.2K bps).

Although ordinary modems still operate at just 1,200 or 2,400bps, faster 9,600bps and 14.4Kbps modems are now more affordable. With online data compression systems like MNP5 or V42bis, these modems require faster serial



ArcTerm 7 is one of the packages that can now take advantage of the HSDSP

rates than 19.2Kbps for optimum performance. 14.4K modems are much happier at 38.4K serial rates, and some higher performance modems advise a serial connection of 57.6Kbps.

Even at its comparatively modest top operating speeds of 9,600bps or 19.2Kbps, the Arc's standard serial port can be unreliable if Risc OS 3 is combined with processor-interrupt sapping loads like high-resolution screen modes

and intensive disc operations. The HSDSP minimises these problems; the 16552 serial processor chip used has a small, but effective, buffer to avoid losing characters.

The specification sounds promising, but how well does it work? The early production review sample refused to work on my upgraded A420/1. The same card operated perfectly on an A5000. The Serial Port's Hugo Fiennes tests all cards before they are shipped, but it

seems a minor hardware bug prevents the card from working with some machines. At the time of writing the bug was confidently expected to be squashed soon. The card was also too short to comfortably fit on the podule backplane and this will also be rectified.

The Serial Port's ARCTerm 7 comms application has been modified to support the extra speed and ports provided. Other comms applications like Beebug's Hearsay 2 and the Internet KA9Q package have also been updated.

Atomwide is writing RISCiX and RemoteFS drivers too. Full technical documentation is available, and an optional driver enabling PC serial cables to be connected without Arc wiring modifications is also provided.

Assuming the early hardware teething problems are fixed, I congratulate The Serial Port for remedying one of the Arc's longstanding deficiencies. The HSDSP will be a boon to anyone who has more than one use for the serial port or who requires reliable high speed connectivity.

Ian Burley

Authorised Education Dealers

47 Winchester Road, Four Marks, Alton, GU34 5HG, Hampshire



0420 561111
Alsystems



All prices exclude VAT and carriage
These prices cannot be guaranteed due to currency fluctuations

A5000/400/300 SCSI Hard Discs

16 Bit	Cumana SCSI Interface	£139.00
16 Bit	Morley SCSI Cached Interface	£179.00
85Mb	Conner SCSI Hard Drive	£198.00
121Mb	Conner SCSI Hard Drive	£235.00
170Mb	Conner SCSI Hard Drive	£266.00
212Mb	Conner SCSI Hard Drive	£345.00
540Mb	Conner SCSI Hard Drive	£660.00
765Mb	Micropolis SCSI Hard Drive	£790.00
1050Mb	DEC SCSI Hard Drive	£999.00
2000Mb	DEC SCSI Hard Drive	£1799.00
3500Mb	DEC SCSI Hard Drive	£2999.00

A5000/400/300 IDE Hard Discs

40Mb	Conner IDE Hard Drive	£125.00
85Mb	Conner IDE Hard Drive	£179.00
121Mb	Conner IDE Hard Drive	£210.00
212Mb	Conner IDE Hard Drive	£325.00
251Mb	Conner IDE Hard Drive	£353.00
360Mb	Conner IDE Hard Drive	£599.00
540Mb	Conner IDE Hard Drive	£695.00
1050Mb	Micropolis IDE Hard Drive	£1176.00

Hard/CDROM/Cartridge Drives and Miscellaneous

Syquest 44Mb External SCSI Cartridge Drive	£390.00
Syquest 88Mb External SCSI Cartridge Drive	£475.00
Cumana External SCSI CDROM Drive	£389.00
Special Cumana CDROM Pack (Including Interface)	£547.00
Morley External SCSI CDROM Drive (Including Interface)	£489.00
A3000 Series HCCS 30Mb IDE HD + User Port	£199.00
A3000 Series ICS 60Mb IDE Hard Card	£274.00
A3000 Series ICS 80Mb IDE Hard Card	£324.00
A3000 Series ICS 120Mb IDE Hard Card	£424.00
A3020/A4 Conner 60Mb 2.5" Internal IDE Hard Drive	£225.00
A3020/A4 Conner 85Mb 2.5" Internal IDE Hard Drive	£235.00
A3020/A4 Conner 120Mb 2.5" Internal IDE Hard Drive	£317.00
Aleph One PC 386 Card with 1Mb RAM	£375.00
Aleph One PC 486 Card with 4Mb RAM	£569.00
A5000 Second Drive Fitting Kit	£19.95
External Hard Drive Casing for SCSI Drives	£65.00
IDE Interface for A300/400 series	£65.00
A310 Backplane plus Fan	£63.00
Alsystems Fitting/Assembly Charge	From £10.00
A3000/4000 Series 4Mb Turbo RAM Upgrade - NEW	£129.00

We specialise in

Hard Drives
CDROM Drives
Optical Drives
Cartridge Drives
Tape Streamers
DAT Streamers
PC 386/486 Cards
Graphics Cards
Colour Scanners
ION Cameras
Desktop Video
Econet Cards
Ethernet Cards
Printers
Networks
Desktop Publishing
RAM Upgrades
and much more...

Why not give us a call ?

Unix - Network Specialists - Repairs and Maintenance

DISK STORAGE BOXES

3 1/2" 10 CAPACITY QTY 5	£4.50
3 1/2" 50 CAPACITY LOCKABLE	£3.70
3 1/2" 100 CAPACITY LOCKABLE	£4.70
5 1/4" 10 CAPACITY QTY 5	£4.99
5 1/4" 50 CAPACITY LOCKABLE	£3.70
5 1/4" 100 CAPACITY LOCKABLE	£4.70
200 LOCKABLE DRAWER TYPE	£18.00

ACCESSORIES

IBM PRINTER CABLE 1.8 MTR	£4.90
(ALSO FOR ATARI AND AMIGA)	
25 PIN M-M AND M-F 1.8 MTR	£4.90
36 PIN CENTRONIC M-M 1.8 MTR	£4.90

PRICES ONLY IF BOUGHT WITH DISKS

**Northern
COMPUTER
Markets**

50% OFF
ADULT ADMISSION WITH THIS VOUCHER

1993 DATES

17TH APR	- SHEFFIELD (NOVOTEL HOTEL)
18TH APR	- OLDHAM (PERIQUITO HOTEL)
1ST MAY	- MANCHESTER (BOWLERS EXHIBITION CENTRE)
2ND MAY	- PRESTON (NOVOTEL HOTEL)
15TH MAY	- LIVERPOOL (EVERTON PARK SPORTS CENTRE)
16TH MAY	- DERBY (PERIQUITO HOTEL)
5TH JUNE	- MANCHESTER (BOWLERS EXHIBITION CENTRE)

ALL SHOWS 10AM TO 3PM
NORMAL ADULT ADMISSION £1.50
WITH THIS VOUCHER £1.00

COME & VISIT THE
BEST SHOWS WITH
THE LOWEST PRICES

STALL SALES

061-681 0569

3 1/2" DISKS

TYPE	QTY	25	50	100
BENCHMARK DS/DD		£18.60	£32.20	£47.35
UNBRANDED DS/DD		£13.40	£22.20	£41.35
BENCHMARK DS/HD		£34.80	£63.35	£71.70
UNBRANDED DS/HD		£26.20	£38.35	£63.70

5 1/4" DISKS

TYPE	QTY	25	50	100
BENCHMARK DS/DD		£11.00	£18.00	£28.00
UNBRANDED DS/DD		£9.50	£16.00	£24.00
BENCHMARK DS/HD		£18.00	£31.50	£52.50
UNBRANDED DS/HD		£14.00	£27.00	£48.00

ALL DISKS 100% CERTIFIED ERROR FREE.
3 1/2" INC. LABELS. 5 1/4" INC. ENVELOPE AND LABEL SET.



ALL PRICES INCLUDE VAT & P&P. UK ORDERS ONLY

Cheques and
Postal Orders to:



24 HOUR
ORDERLINE
0597 851 784

Manor Court Supplies Ltd

Telephone: 0597 851 792 Fax No: 0597 851 416

Dept AU2, Glen Celyn House, Penybont,

Llandrindod Wells, Powys, LD1 5SY

EDUCATION AND GOVERNMENT ORDERS WELCOME

SPRING SHOW BONANZA

There's nothing to lose and everything to win at the BBC Acorn User Spring show

Visit the BBC Acorn User Show in Harrogate this Spring, and you could win yourself a pirate's chest full of goodies. We have a prize to gladden the hearts of all including an Acorn Pocket Book computer. Every visitor to the show will have the chance to enter the Treasure Trail, sponsored by *Acorn User* magazine and TDK. The prizes will be sent to one lucky winner just after the show; over £1000 worth. So what's up for grabs?

First of all, the Acorn Pocket Book: a handy pocket-sized minimicro. And for your main computer, you can use Stallion's new *Almanac* software. This handy, desktop organiser could help you change your life.

If you are into music and sounds, Oak Solutions has provided the Oak Recorder, so you can sample sound direct on to your computer using a microphone which simply plugs into your Archimedes printer port. EMR's *Rhythmbox 2*, the drum roll editor, is sure to add to the impact.

Midnight Graphics Express is the easy to use, but powerful, graphic package for designers of all ages from Dabhand Computing. In the entertainment stakes, Krisalis has added *Sim City* and *Battle Chess* to the pack, and 4Mation has offered a copy of *Noot*, the animation package.

The printed word is well catered for in our Treasure Trove with *EasiWriter*, donated by Icon Technology, an very stylish word processor. Quill Marketing has offered a pack of refill ink for the winner's deskjet or bubblejet printer; whichever you've got. To help make your fingers fly over the keys even faster, Iota's *TouchType* programme (with wads of features) is included too. And Computer Concepts has included a copy



Acorn's Pocket Book is just one of the valuable prizes in the treasure chest

of one of its most popular packages; *Junior Impression*. And to get the languages really rolling, Minerva are offering their new *Linkword* package, the language course for German, French and Italian.

To get you on the right tracks, Risc Developments is giving a copy of *Masterfile 3*, the multitasking database. Apricote's small business accounting application, *Prophet*, is also in the chest.

For younger users, Sherston Software has given us a set of their acclaimed *Naughty Stories*; these talking books use recorded human speech to help younger children to recognise and read words.

Infant Windows, from Porters Primary Software, introduces young children to word processing, drawing and painting and page composition.

The Spoken Word from Wyddfa Software, will delight children who are learning to read. And one that is sure to be a great success is a video of *Noddy and the Naughty Tail* to remind everyone that Jumping Bean's software package *Noddy's Playtime* will be available very, very soon.

HCCS will be giving one of its Ultimate Multipodules, to fit the winner's computer. This

could be the start of your expansion system. And just in case you feel that the chest isn't full enough yet, DD International has donated a goodie pack which includes, a joystick, a Carousel Screen Sequencer, mini speakers, *Nosher* and much more. And last, but not of course least: you can have a year's free subscription to *BBC Acorn User*, your favourite magazine.

Quite a chestful, so a big thank you to all the exhibitors who have donated prizes. There will be a lot more in the chest by the time you get to the show, so come along to the *Acorn User* stand to check it out for yourselves.

THE RULES

The Treasure Trail Competition could not be more simple to enter. All you have to do is pick up your Treasure Trail map on your way into the show and look out for the letters shown on doubloons on some of the stands.

Note them down and at the end of the show try and compile an appropriate phrase made up of the letters. Hand in your entry to the *BBC Acorn User* stand and we will give you a free TDK disc just for taking part.

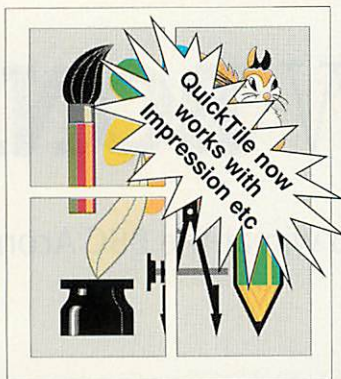
SHOW UPDATE

Several new companies have booked into the show since our special show guide last issue, so here is a more complete list of exhibitors:

Acorn Computers	35/37
BBC Acorn User Centre	
Ian Copestake	1
RISC Developments	3
Icon Technology	5
Iota Software	5
Minerva Software	7
Software 42	9
Acorn Computing	11
Wild Vision	12
Arm Club	19
Krisalis Software	23/25
Simtec Electronics	27
Vertical Twist/ Leading Edge	29
Archimedes World	31
Computer Concepts	33/39
HCCS Associates	41
SJ Research	43/99
Longman Logotron	45
Dabhand Computing	47
The Fourth Dimension	49
IFEL	51
Stallion Software	53
Digital Services	55
Colton Software	57
Cambridge International Software	59
Irlam Instruments	61
Uniqueway	61
DD International	63
Lindis International	65
Jumping Bean	67
Apricote Studios	69
Porters Primary Software	70
Oregan Software Developments	71/73
Sherston Software	75
Morley Electronics	77
PRES	78
Intregrex Systems	79/81
Oak Solutions	83
Avatar/Silicon Village	89
Norwich Computer Services	91
Electromusic Research	92
Quill Marketing	93
TBA Software	95
ArVis Multimedia	97
Micro-Aid	105
Wyddfa Software	107

QuickTile

Up until now it has only been possible to print posters from Draw and Sprite files. Now with QuickTile you can create posters from ANY RISCOS application. The user simply enters the size of the source document, select the required poster size and then PRINT directly from the application! QuickTile does the rest, printing each tile with crop marks and tile references.



£25+VAT

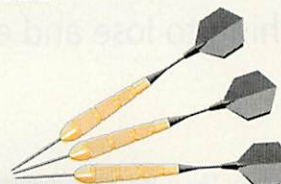
TopicArt

A new form of clip art comprising of single discs containing approximately 50 hand drawn high quality draw format clip art images, each on a single subject. Site and area licences are available, please ring for details.



TopicArt9 - Dinosaurs

£8
+ VAT
per disc



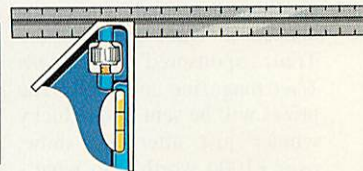
TopicArt7 - Sports Equipment



TopicArt8 - Sports Figures

11 TopicArt subjects are available now. Please specify when ordering.

Buy 4
TopicArt
discs get
one free



TopicArt4 - Entertainment

TopicArt11 - Tools

Finance 14.7% APR

Product	Deposit	24 mths	Total
A3010LC System	79.00	34.50	907.00
A4000HO Standard	117.83	50.60	1332.23
A4000HO MultiScan	123.58	53.14	1398.94
A5000LC System	169.00	73.31	1928.44
A4HD60	199.23	86.11	2265.97

The above finance is available to anybody over the age of 18, subject to status. Payment Protection is available on application. Special offers do not apply to purchases on finance.

Acorn Ext Warranty

1 Year On-Site Service	£25
A3010, A3020 or A4000	£34
3 Year Warranty & On-Site Service	£42
A3010, A3020FD	£51
A3020HD, A4000	£68

The above must be purchased at the same time as the computer system. Call for further details.

Ink Jet Refills

Why throw away empty inkjet cartridges...

...when you can refill them at a fraction of the cost

Colours available include

Cyan, Magenta, Yellow, Black, Red, Green, Blue, Brown

Single Refills (req an orig cartr.)	£6
Twin Refills (req an orig cartr.)	£11
Please specify colour(s) required	
125ml Cleaning Kit	£4
400ml Cleaning Kit	£9
ColourSep software	£15
Can be used with DeskJets, BJ's, JP's + others. Ring for further details.	

Hardware & Books (All prices exclude VAT)

Pocket BK/Psion

Acorn Pocket Book	£212
Psion 3 256k	£185
A-Link for either of the above	£51
Call for other peripherals	

A3010 Series

Family Solution £424

With 2 Free Joysticks
Connects to std TV, 1Mb RAM, Floppy drive, 2 joystick ports.

Learning Curve Sys £680

With Free JoyMaster Software & Joystick
As above with 2Mb RAM, Standard Monitor & Learning Curve software.

A3020 Series

With Free PenDown Plus Floppy Disc System £749

As A3010 less LC software & joystick ports. Inc Std Monitor, 2Mb RAM.

60Mb Hard Disc Sys £899

As above with 60Mb Hard disc. Add £50 for MultiScan Monitor.

A4000 Series

With Free PC Emulator

Home Office System £999

2Mb RAM, Floppy Drive, 80Mb HD, Std Monitor, EasiWriter2, Jr Database

80Mb Hard Disc Sys £949

As above without additional software. Add £50 for MultiScan Monitor.

A4 Portable

Free TrackBall, Spare Batt

A4 4MFD Portable £1399

A4 4MHD Portable £1699

4Mb RAM, 60Mb HD, 2Mb Floppy Disc, LCD Screen, PC Emulator.

Special offers do not apply to the Acorn Assist Scheme or Assisted Finance Scheme.

A5000 Series

Free Impression II OR

ArtWorks with A5000's

Learning Curve Syst £1445

2Mb RAM, 80Mb HD, MultiScan Mon, Learning Curve Software.

2Mb/80Mb HD Syst £1399

4Mb/120Mb HD Syst £1599

Add £175 for Microvitec

CubScan 1440 Monitor

RAM Upgrades

A3000 up to 2Mb RAM £45

A3000 up to 4Mb RAM £129

A3010 up to 2Mb RAM £39

A3010 up to 4Mb RAM £128

A3020/A4000 2Mb £79

A5000 2Mb non exp £79

A5000 2Mb exp to 8Mb £99

A400 RAM £35 per Mb

A540 4Mb £245

Printers

Canon BJ-10ex £179

Canon BJ-10ex Turbo £219

Canon BJ-10 ASF £49

Canon BJ-200 £299

Canon BJ-200 Turbo £329

Canon BJ-300 £339

Canon BJ-300 ASF £99

Canon BJC-800 Turbo £1479

HP DeskJet 500 £299

HP DeskJet 550C £479

HP LaserJet 4 £1099

LaserDirect HiRes4 £949

LD HiRes4 Card £349

Scanners

ScanLight 256 £199

ScanLight Professional £549

SCSI Card for above £139

Monitors

Acorn Colour AKF30/40 £199

Acorn MultiScan £299

Inc cable for A400/A3000's

Microvitec CubScan £399

0.28dp, 40 presets & 3 year warranty

Taxan 795A £469

Upgrades

386PC 1Mb/4Mb £390/£490

486PC 1Mb/4Mb £490/£590

5.25" Disc Buffer Archi £39

5.25" Disc Buffer A5k £35

ARM3 £175

Canon BJ Turbo Driver £42

Colour Card (CC) £249

DeltaCat Joystick £29

Dongle Dangle £6

Dust Covers 2 piece £12

Dust Cover A3070 £8

FaxPack (CC) £279

I/O Expansion Card £79

Joystick I/F (All M/C's) £32

JoyMaster (A3010) £24

Midi Expansion Card £65

Micro Mouse (Clares) £29

Serial Upgrade A3000 £17

Sound Sampler & Midi £79

Speedking Joystick £10

User/Midi Card A3000 £46

Zip-Stik Joystick £15

Digitisers

Hawk V9 MkII £279

Hi-Vision Col Digit'r int £129

Vision Mono Digitiser int £48

Vision Color Digitiser int £76

Vision Mono Digitiser ext £60

Vision Color Digitiser ext £89

RISCOS 3.1 A300 £63.83

RISCOS 3.1 A5000 £16.17

RISCOS 3.1 Others £42.70

Acorn Books

A3000 Technical Guide £29.95

A540 Technical Guide £65.00

A5000 Technical Guide £65.00

BBC Basic Guide £19.95

RISCOS2 PRM's £79.00

RISCOS3 PRM's TBA

RISCOS2 Style Guide £9.95

1st Word+ Manual £10.00

Desktop Dev Env Guide £25.00

DTP Manual £10.00

Assembler Manual £25.00

ANSI C v4 Manual £25.00

Call for books not listed

Other Books

Archi Game Maker's Manual £14.95

Archi Assembly Lang Manual £14.95

Archi Operating System Guide £14.95

Begin. Guide to WMP Prog. £12.95

Budget DTP £12.95

Dabhand Guide to Impression £14.95

DTP on the Archimedes £12.95

Graphics on the ARM M/C's £14.95

Mastering 1st Word+ £13.95

First Impressions £35.00

Good Impressions £30.00

Ink Cart/Ribbons

BJ-10/20 Ink Cartridge £16

BJ-300 Ink Cartridge £11

DJ-500 Bk Hi-Cap Cart. £21

DJ-500C/550C Colour Cart. £22

Swift24 Mono/Colour £5/£15

Ordering by Telephone

Please specify the goods you require and for which computer. Please have your credit/debit card ready. We will require the cardholders name, address, delivery address if different and the expiry date of the card.

Ordering by Post

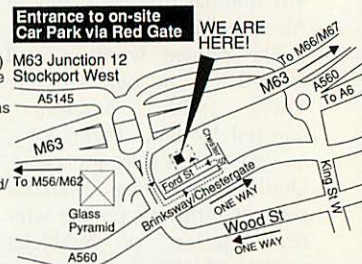
Please specify the goods you require and for which computer in writing including your telephone number & delivery address. Send complete with a signed cheque/postal order or alternatively for credit/debit cards, the card number, cardholders name, address, and expiry date. IMPORTANT - Please write your name, address & credit card details in BLOCK CAPITALS to avoid confusion.

Where to Find Us

From the M63 Junction 12 roundabout follow signs to Cheadle A560 passing the glass pyramid. At the 2nd set of traffic lights turn left onto Brinksway. Turn next left onto Chester St and immediately left again onto Ford St. Enter on-site car park via Red Gates on the right hand side.

Terms

EC residents add 17.5% VAT to all prices except books. Carriage is free (except books, paper & large software applications) on mainland UK, elsewhere at cost. Only Credit/Debit cards accepted for overseas orders. Prices and manufacture's specifications subject to change without notification. Goods offered subject to being unsold and/or available. Goods not offered on trial basis. Restocking fee on non-defective returns. E & OE



Desktop Projects Ltd

Authorised Acorn Dealer (Tel: 061-474 0778, Fax: 061-474 0781)

Unit 2A, Heapriding Business Park, Ford St, Stockport, Cheshire. SK3 0BT

All prices
exclude VAT



QuickShow £25+VAT

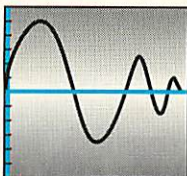
The easy to use slide show presentation and video titling package. Create

QuickShow
Video Titling
&
Slide Show Presentation
Has never been easier!

sequences of frames containing text of any colour with drop shadows, outline shadows and rubout boxes using the RISCOS fonts. Sprites can also be included in frames and positioned and resized as necessary. Several screens can be linked together with the sequence which allows you to fade each screen out and in with the many fades provided. Completed sequences can be converted into stand alone applications which when run, shows the sequence without using QuickShow. 2Mb RAM required and hard disc is recommended.

QuickSnd £10+VAT

Load, play, convert & resave existing Armadeus, Tracker and raw data sound samples and apply special effects including Reverse, Echo, Max Vol, alter replay rate and resample frequency. Convert samples into modules for use with the RISCOS sound system etc. Create stand alone Utility modules which when called, via star commands, automatically play and then remove itself completely from memory (this feature is not available on any other sound package). Use Utility sound modules with RISCOS Alarm to play on activation of an alarm. On screen VU meter included.



Hard Discs IDE

The following are complete HardDisc Systems comprising of IDE disc controller, HardDisc, mounting brackets, cables, utilities disc and manual.

Archimedes Internal

Archimedes Internal hard discs.	
Not suitable for A3k, A3010-A3020	
40Mb 17ms	£199
120Mb 16ms Cache	£299
200Mb 13ms Cache	£399
330Mb 12ms Cache	£699
520Mb 12ms Cache	£899

A5000 Exchange Drives

These systems are only available for the A5000 only.

120Mb 16ms Cache	£200
200Mb 13ms Cache	£300

A3000/Archi External

40Mb 17ms	£279
120Mb 16ms Cache	£379
200Mb 13ms Cache	£479
330Mb 12ms Cache	£779
520Mb 12ms Cache	£979

A3000 Hard Cards

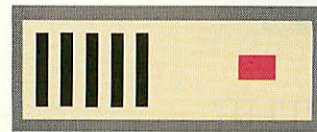
20Mb Internal+User Port	£189
30Mb Internal+User Port	£189
60Mb External+User Port	£329

A3010 Hard Cards

20Mb Internal	£199
20Mb Internal	£269
60Mb External	£399

A3010 Ultimate Multi-Podule HD

20Mb Internal	£269
60Mb External	£399



SCSI

The following are complete SCSI HardDisc Systems comprising of a Morley SCSI interface, HardDisc, mounting brackets, cables, utilities disc and manual.

Archimedes Internal

Not suitable for A3k, A3010-A3020	
105Mb 18ms Cache	£429
180Mb 18ms Cache	£599
330Mb 12ms Cache	£899
520Mb 12ms Cache	£999

A3000/A300/A400 External

105Mb 18ms Cache	£509
180Mb 18ms Cache	£699
330Mb 12ms Cache	£979
520Mb 12ms Cache	£1049

Removable Hard Discs

44Mb (Inc one cartridge)	£499
44Mb Cartridge	£55
88Mb (Inc one cartridge)	£599
88Mb Cartridge	£99

SCSI Controller Cards

Morley Uncached	£139
Morley Cached	£179

Flopticals / CD-ROM Multimedia

A3000/A5000/A300/A400 External Floptical (without SCSI card) £349

The above must be used with an Acorn compatible SCSI card. Reads 720k & 1.44Mb DOS format floppy discs.

A5000 Internal Floptical kit (with Econet SCSI card) £359

Floptical floppies (20Mb) £20

Each of the above systems comes complete with one floptical floppy.

Cumana CD-ROM Multimedia Pack £699

Comprises CD-ROM drive, SCSI card, stereo speakers, 6 RISCOS CD-ROM titles, The Hutchinson Encyclopedia, Dictionary of the Living World, Revelation 2, The Illustrated Holy Bible, The Illustrated Works of Shakespeare, Sherlock Holmes on a Disc, ICDPlayer, 3 caddies, etc.

Cumana World of CD-ROM Multimedia Pack (Ring for details) £579

Cumana CD-ROM Software Pack £299

As above without CD-ROM Drive and SCSI card

Cumana CD-ROM Drive without SCSI Card (Sony Device) £429

Cumana CD-ROM Drive with SCSI Card (Sony Device) £549

Applications

ABC Compiler (Oak)	£77
Advance (Acorn)	£TBA
Ancestry (Minerva)	£59
Arc DFS (Dabs)	£22
ArcComm2 (Logotron)	£52
ArcLight (Ace)	£40
ArcTerm 7 (Serial Port)	£62
Articulate (4D)	£20
Artist (4D)	£20
Armadeus (Clares)	£59
Artisan 2 (Clares)	£43
Art Works (CC)	£129
Atelier (Minerva)	£69
AUNLevel 4 FileServer (Acorn)	£395
Autosketch v2 (Autodesk)	£65
Cable News (Linguinity)	£165
CADet (Minerva)	£139
Chameleon 2 (4Maton)	£35
ColourSep (ICS)	£15
Compression (CC)	£35
Control Panel (Linguinity)	£14
Desktop Assembler (Acorn)	£125
Desktop C (Acorn)	£180
Desktop Office (Minerva)	£95
Desktop Publisher (Acorn)	£125
Desktop Thesaurus (RISC Dev)	£19
Digital Symphony (Oregon)	£40
Draw Print-Plot (Oak)	£55
EasyWord 2 (Minerva)	£55
EasyWriter II (Icon Tech)	£126
Einstein (CC)	£106
Equator (Ace)	£37
Euclid 2 (Ace)	£55
Eureka (Longman)	£99
First Word Plus v2 (Acorn)	£65
Font FX (DataStore)	£9
Font Starter Pack (Acorn)	£35
Gammapiot (Minerva)	£36
Genesis 2 (Oak Solutions)	£109
Graphbox v2 (Minerva)	£57
Graphbox Pro (Minerva)	£109
Hard Disc Companion II (RISC)	£45
Hearsay II (RISC Dev)	£69
Hotlink Presenter (Linguinity)	£41
Home Accounts (Minerva)	£34
Illusionist (Clares)	£76
Imagery (Palette Studios)	£69
Impression v2 (CC)	£125
Impression Junior (CC)	£75
Impression Bus Supp (CC)	£39
Inter-Sheet II (CC)	£30
Inter-Word (CC)	£30
Investigator v2 (Serial Port) (OS2)	£22

MasterFile III (RISC Dev)	£47
Midnight Express (Mid. Graph.)	£39
Mogul (Ace)	£20
Multistore v2 (Minerva)	£219
Notate (Longman)	£54
Ovation (RISC Dev)	£95
PB (Oak)	£99
PC Emulator (Acorn)	£95
PenDown Plus (Longman)	£68
Pin Point (Logotron)	£79
PipeDream 4 (Colton)	£129
Playback (RISC Dev)	£19
Poster (4Maton)	£75
Presenter 2 Hotlink (Linguinity)	£33
Presenter GFI (Ling)	£66
Pro Artisan (Clares)	£75
ProDriver DJ500C/550C (Ace)	£37
Realtime Solids Modeller (Sil)	£99
Render Bender v2 (Clares)	£99
Resultz (Colton)	£TBA
Revelation II (Logotron)	£110
Rhapsody v2 (Clares)	£45
RISCType (CIS)	£16
Rhythm Bed (Clares)	£40
S-Base Personal (Longman)	£95
S-Base Developer (Longman)	£175
S-Base Developer + (Longman)	£275
Schema (Clares)	£95
Serenade (Clares)	£109
ShapeFX (DataStore)	£9
ShowPage (CC)	£130
SmArt (4Maton)	£50
SmArtFilter (4Maton)	£32
Snippet (4Maton)	£35
Speech! (Superior)	£15
Splice (Ace)	£27
Squirrel Database (Dig Serv)	£120
Squirrel 'C' Developers Toolkit	£99
StartWrite (Icon)	£55
TechWriter (Icon)	£159
Titler (Clares)	£120
Topographer (Clares)	£55
Touch Type (IOTA)	£39
Tracker (Serial Port)	£37
Turbo-Type (CIS)	£20
Tween (Ace)	£27
TypeStudio (RISC Dev)	£43
Vector (4Maton)	£75
Vox Box (Clares)	£47
WordWorks (CC)	£38
Wordz (Colton)	£95
Worra CAD (Oak)	£83

Items in red are New/Low price

Games

2067BC (Oregon)	£17
Aggressor (Atomic)	£18
Air Supremacy (Superior)	£17
Alderbaran (Evolution)	£26
Aliped (Dabs)	£12
Bambuzle (Arxe Systems) (OS2)	£19
Battle Chess (Krisalis)	£22
Black Angel (4D)	£26
Blaston (Eterna)	£15
Blitz (Arxe Systems)	£17
Blowpipe (Eclipse)	£15
Bobby Blockhead (Atomic)	£18
Boogie Buggy (4D)	£19
Break 147 & Superpool (4D)	£26
Bug Hunt, MoonDash (Min)	£13
Bug Hunt in Space (Minerva)	£13
Cataclysm (4D)	£19
Champions (Krisalis)	£22
-Includes Man Utd, J Khan Squash, Wild Class Leaderbird & Boxing Mngtr	
Chess 3D (Micro Power)	£19
Chocks Away 2 (4D)	£19
Chocks Away Extra Miss (4D)	£19
Chocks 2 Compendium (4D) 2Mb	£26
Chopper Force (4D)	£22
Chuck Rock (Krisalis)	£19
Cyber Chess (4D)	£26
Cyborg (Alpine)	£19
Dreadnoughts (Turcan)	£26
Dungeon (4D)	£26
Elite (Hybrid)	£32
Enter the Realm (4D) 2Mb	£19
E-Type Compendium (4D)	£19
Fervour (Clares)	£19
Galactic Dan (4D)	£19
Games Wizard (Leading Edge)	£26
GODS (Krisalis)	£19
Gribbly's Day Out (Coin-Age)	£19
Grievous Bodily ARM (4D)	£19
Guile (Dream)	£22
Heimdall (Krisalis)	£22
Hero Quest (Krisalis)	£22
Holed Out Compendium (4D)	£19
Ilex the Viking (Minerva) (OS2)	£14
Iron Lord (Cygnus)	£14
Ixon (Software 42)	£19
James Pond (Krisalis)	£19
Kerbang (Eterna)	£15
Krisalis Collection	£22
-Includes, Mad Professor Mariarty, Pipemania, Terramex & Revelation	
Last Ninja (Superior)	£19
Legend of the Lost Temp (OS2)	£19

Lemmings (Krisalis)	£19
Loopz (Audiogenic)	£18
Lotus Turbo Challenge II (Kris)	£19
Mah-Jong Patience (CIS)	£15
Mah-Jong The Game (CIS)	£18
Man United Europe (Krisalis)	£19
Master Break (Superior)	£15
Micro Drive 2 (CIS)	£26
Mig-29 Fulcrum (Domark)	£25
Nebulus (Krisalis)	£19
Oh No More Lemmings (Kris)	£16
Omar Sharif's Bridge (Krisalis)	£22
Orion (Minerva)	£14
Pandora's Box (4D) 2Mb	£19
Paradroid 2000 (Coin-Age)	£19
Pesky Muskrats (Coin-Age)	£19
Play It Again Sam 1 (Superior)	£19
-Includes Conqueror, Rotor, No Excuses & Hostages	
Populus (Krisalis)	£22
Powerband (4D)	£19
Quest for Gold (Krisalis)	£19
Repton 3 (Superior)	£15
Repton 4 (Superior)	£18
Rockfall (Eterna)	£16
Real McCoy 2 (4D) 2Mb	£26
-Includes Apocalypse, Holed Out, The Olympics & Inertia	
Real McCoy 3 (4D) 2Mb	£26
-Includes Powerband, Nevryon, Drop Ship & The WIMP Game	
Real McCoy 4 (4D)	£26
-Includes Galactic Dan, Grievous Bodily ARM, Cataclysm & X-Fire	
Saloon Cars Deluxe (4D)	£26
Saloon Cars Del Extra Courses	£16
Sim City (Krisalis)	£26
Spheres of Chaos (Matt Black)	£19
Starch (Dabs Press)	£12
Superior Golf (Superior)	£15
Sup Golf Extra Courses (Superior)	£14
SWIV (Krisalis)	£19
Technodream (Superior)	£19
ThunderMonk (Minerva)	£14
Tiles (Brain Games)	£16
Top Banana (HEX)	£19
Tower Of Babel (Cygnus)	£18
Twin World (Cygnus)	£14
Waterloo (Turcan)	£19
X-FIRE (4D)	£19
Zorch (Superior)	£15

2MB - RAM required for RISCOS3.1
OS2 - Runs on RISCOS2 only

Education

Adv. Playground 5+ (Storm)	£17
Amazing Ollie 4+ (Storm)	£14
Coffee 9+ (Storm)	£28
Concept Designer (Logotron)	£23
Converta-Key	£15
Crossword+ 8+	£19
Crystal Rainforest (Sherston)	£35
Data Word (Triple R)	£15
Desktop Folio (ESM)	£89
Farmer Giles 2 (CTS)	£17
First Words & Pictures (Chk)	£26
Flight Path 9+ (Storm)	£28
Freddy Teddy (Topologika)	£19
Freddy Teddy's Adv Topol.	£19
Fun & Games 5-9	£18
Fun School 2 (Database)	£15
Fun School 3 (Database)	£18
Fun School 4 (Database)	£18
(Please spec. age group <5, 5-7, >7)	
Giant Killer (Topologika)	£17
House of Numbers (Chalk)	£19
Hyperbook Reader (Logotron)	£48
Hyperbook Lib (Logotron)	£110
Junior Database (Iota)	£40
Letters and Pictures (Chalk)	£18
Logo (Logotron)	£60
Maggie (Logotron)	£49
Maps & Landsc. 1/2 (Chk) ea.	£19
Money Matters (Triple R)	£20
Numbers and Pictures (Chalk)	£18
Numerator (Logotron)	£60
Numerator Chaos (Logotron)	£19
Ollie Octopus Sketch Pad (Storm)	£14
Pendown (Logotron)	£50
Pendown Fonts (Logotron)	£17
Picture Book (Triple R)	£20
Pin Point Junior (Logotron)	£23
Pirate (Chalk)	£18
Prime Art (Minerva)	£69
Puncman 1-2,3-4,5-7 (Chalk) ea.	£18
Reversals (Chalk)	£18
Search & Rescue 9+	£28
Smudge the Spaniel (Storm) 4-8	£22
Spellbook 4-9 (Soft Stuff (SS))	£19
Star (Logotron)	£16
Target Maths (Triple R)	£20
10/10 Early Essentials <7yr (3R)	£19
10/10 English (3R) 6-16yrs	£19
10/10 Maths (3R) 6-16yrs	£19
Things to do with No's (SS)	£19
Things to do with Words (SS)	£19
Words and Pictures (Chalk)	£18

Please call for titles not listed



Desktop Projects Ltd

Please contact us if you are offered a better price elsewhere, we will do our best to match it. We operate the Acorn Teachers Scheme. This document was produced entirely on the Archimedes using Impression, ArtWorks, Draw & Paint.

Tel: 061-474 0778





THE

EXTERMINATOR

They're back! BBC TV's Peter Clements uses his A5000 to recreate that lovable race of supreme beings, the Daleks

The Dalek is a uniquely threatening image, well known to *Doctor Who* fans throughout the world, who will usually remember hiding themselves behind the sofa as children. As such it presents a great demonstration of the design prowess of an Acorn machine.

I have always been fascinated by model making. Whether for a visual TV effect or a model railway, the art of miniaturising or enlarging an object, precisely to scale, is one that demands a skilled eye and a good deal of patience. Armed with a number of Clares' packages, I undertook to create a complete moving, speaking Dalek, based on the original design. Subscribers can see the final version of the Dalek on their monthly disc, and this is how it was done . .

DALEK DESIGN

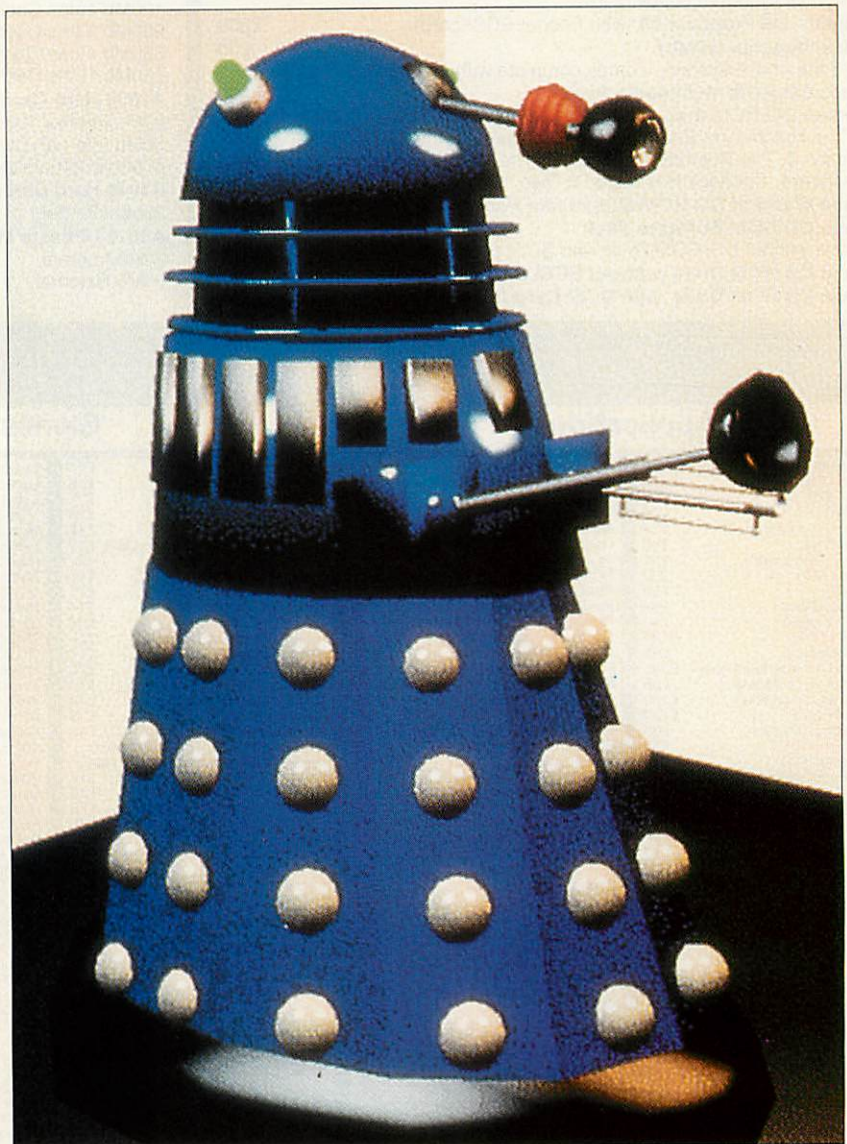
Several versions of the Dalek have appeared, but for this walk-through I chose the MkI version. This had a rounder, flatter head, with smaller lights than its big-screen successors and used the famous sink plunger arm. And yes – it really was a sink plunger, although it was later replaced with a gripping hand at the end of the prod rod.

My reference source for the Dalek design was a *Radio Times* feature 15 years ago. As part of a *Doctor Who* special, it pictured a set of plans to build a full-size version, including the internal construction. However, for your own designs, any detailed reference photo will do.

I cannot over-emphasise the importance of scale. My computer model is comprised of lots of different geometric shapes which, at the end of the design period, should add up to one recognisable object . . . the Dalek.

How you perceive that end view is entirely up to you. If it doesn't look quite right, then some detail is obviously wrong. Maybe the lights on the head are too small, maybe the eye is too large or maybe the lower body isn't the correct shape. What I am trying to stress here, is that the whole designing process of any scene is the most important and time-consuming part.

The Dalek was very hard and at times awkward to visualise and it was certainly something that I would not embark upon unless I was completely *au fait* with the software. When I was first started to use *Illusionist*, the scenes I created were very simple, with few objects. As I progressed, I added more and more objects and arrived at some very complex scenes. When these were rendered, they looked so impressive



Looks like time to start running up and down lots of plywood corridors . . .

that even my lips were left in the shape of a 'wow'.

THE TOOLS

The Dalek was created using a variety of software packages from Clares Micro Supplies: *Illusionist*, *Pro-Artisan*, *Armadeus* with a sampler board, *Animator* from *Render Bender* and the *Sequencer* from *Titler*.

Illusionist is a 3D design program that lets the

user create objects from geometric shapes, assign textures or maps such as wood or marble to these objects and apply surface colours and finishes such as gloss, metal or plastic.

Single objects or room scenes can be created and the user can even have control over lighting conditions. You can go on to specify such things as the type of light, its colour, or the spread of the beam.

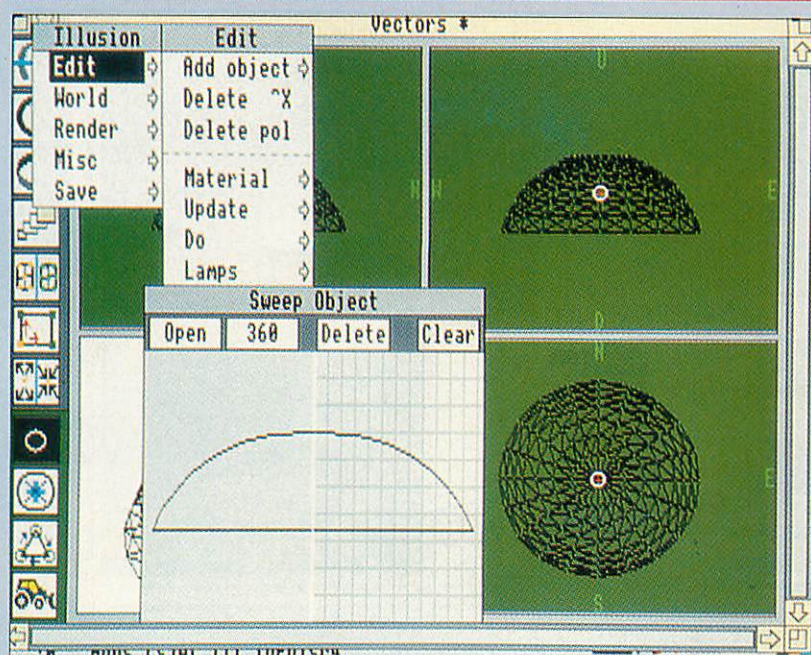
THE FINAL CUT

The complete design process is explained in the boxes and I found the software extremely easy to use. When it came to putting all the images together, I used *Pro-Artisan* to cut frames two to ten as sprites and pasted these smaller pictures back on to the first one, saving each in turn as a full screen picture. These were then loaded into *Animator* and compiled into a stand-alone application. When the head reaches its greatest degree of movement it loops back and follows its original path back to frame one. When set running the head repeats this action and can be either run normally, speeded up or slowed down until it stops.

Sound was added at the end. I wanted my Dalek to say something a little bit different from the usual 'Exterminate, Exterminate!' For this reason I wanted a piece of speech that would make the Dalek sound as though they meant business. I bought a *Doctor Who* video and went through it until I found the passage I was after. This was transferred on to cassette tape and then into the line-in socket on the back of the *Armada* sound sampler board. I had captured about 20 seconds of sound and only needed to clean up and edit the sample at either end of the chosen section.

The result is about 14 seconds of speech. As with the animation, this was set to loop repeatedly. There was nothing further to do by way of enhancement of the speech, as the software had accomplished that for me. I was then ready to combine the two component parts, animation and sound, into one stand-alone application.

GETTING AHEAD



I started with the Dalek's head first. This was made up from a Sweep object, as indeed were a lot of the parts. A Sweep object can be designed by the user simply by drawing the right half of a slice of the shape in an editing window, and the computer mirrors the left half as you draw.

If you understand how this process works, then you can create circular shapes that are quite complex in their construction and offer more scope than the other standard geometric shapes that *Illusionist* provides.

An object can be assigned a number of sides, which, in effect, controls the degree of smoothness a circular shape has. The number of sides is normally set to ten, as can be seen on the sink plunger arm, but was changed to 20 for the head, the lights and the hemispheres on the body.

Doubling the number of sides also has the effect of doubling the information for that object when saved to disc, so use this function with caution, as it is all too easy to run up very large files. Although these might just squeeze on to a disc, they might not be rendered at all if there is not enough memory in the computer.

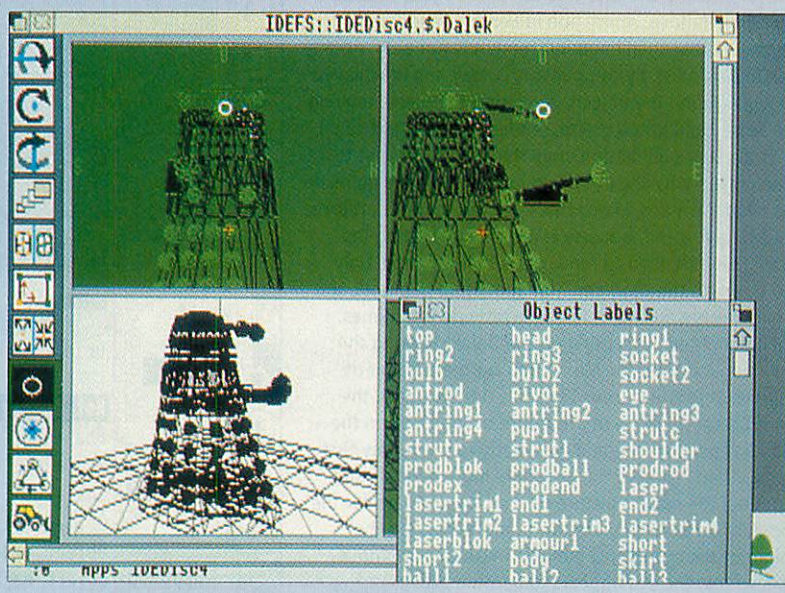
At least the Dalek's head showed a lot of regularity. I was later to face the construction of the lower body, a bizarre 11-sided polyhedron (see next page).

THE JOINING OF PARTS

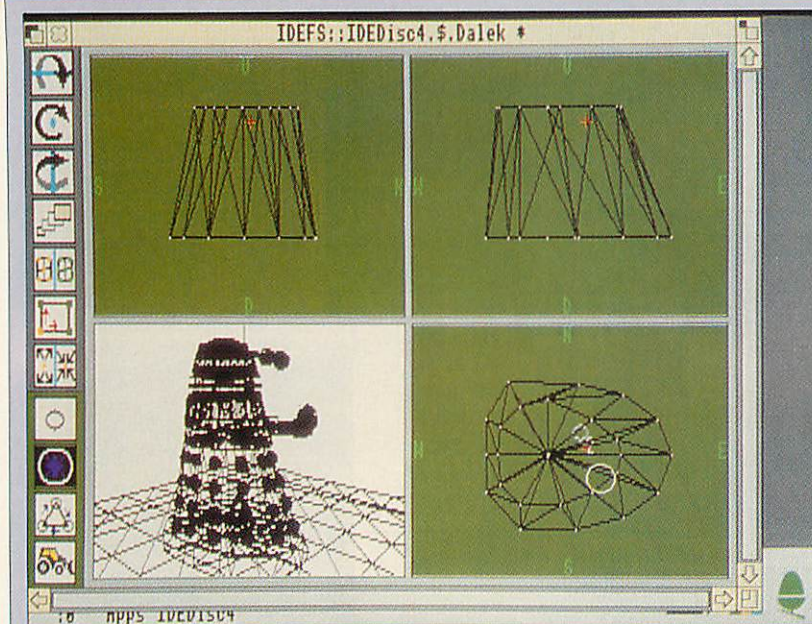
The method I used was quite simple: each component part was designed in turn and placed in the editing window. There are three of these showing the front, side and top view.

Objects can be scaled and rotated in each of the elevations or profile panes and the observer and target positions set. Clicking on the white window draws a wire frame image as seen from the observer position. This is what your finished view will look like. When moving an object or group of objects to a new position, clicking with Select in the label window will cause the intersecting points of each object to be highlighted in white, making it easy to see which objects are active. It is very important to be sure that you only move the parts you intend to, as it can sometimes be very time-consuming to put back something that has been dragged by mistake into its original position.

When creating an object in *Illusionist*, always give each object a name. Each component part that makes up the object then becomes a lot easier to access. Simply click Select on the object name to change the colour of the object or to move it to a different location.



BODY TALK



The most unusual shape incorporated into the Dalek's design is the lower body. This is an 11-sided object and I designed it as a Sweep with vertical sides. It was only after it had been placed in the scene that I was able to select single points from the base of the body and drag them one at a time to create the more familiar shape of the lower section. I used the technique of placing four spheres were in a line, then grouping and copying them so that each line of four became a new object.

By careful adjustment in each of the profile panes I was able to angle each group of spheres more or less precisely. At this point, I had to cheat; my particular disc file was at this time becoming quite large so, to cut back on memory, I only placed the spheres that would be visible from the observer's position into the scene. What you have is a sort of film-set Dalek; but it doesn't show.

It is very much up to the individual as to the colour of their Dalek. I have opted for blue, but a gloss black with metallic gold trim is particularly attractive, and also implies an individual higher in the Dalek hierarchy. If you're not sure, here's a tip. First render the scene in mode 13 without using anti-aliasing. This gives a very coarse picture in only a short time, but you can at least tell if the colour of your model is to your liking before deciding which parts of the picture you are going to animate.

Combining sound and vision is probably the easiest task of the entire project. This was done in the *Sequencer* section of the *Titler* package and in fact most of Clares' demos use the same approach.

When *Sequencer* has loaded and shows on the icon bar at the bottom of the desktop, clicking upon it will cause a window to open. All that needs to be done is to firstly drag your saved sample to the window and then your animation and the software does the rest. You can adjust parameters to control how fast or slowly the animation runs. The combined sound and animation can then be saved back to disc as a single application.

The finished Dalek animation with its sampled sound is rather large and requires a two megabytes in order to run. Of course, most people do not have access to this many products but the animation (without the sound) can be created using just the central design package, *Illusionist*, and *Animator* on its own to animate the creation.

The final Dalek can be seen on the monthly disc but I wonder what Terry Nation, the original creator of the Daleks, would have done if he had had access to a modern Acorn machine and a good selection of graphics software.

Peter Clements is a senior photography technician for BBC Television, and has designed imagery for programmes including The Software Show and Science Challenge

PRODUCT DETAILS

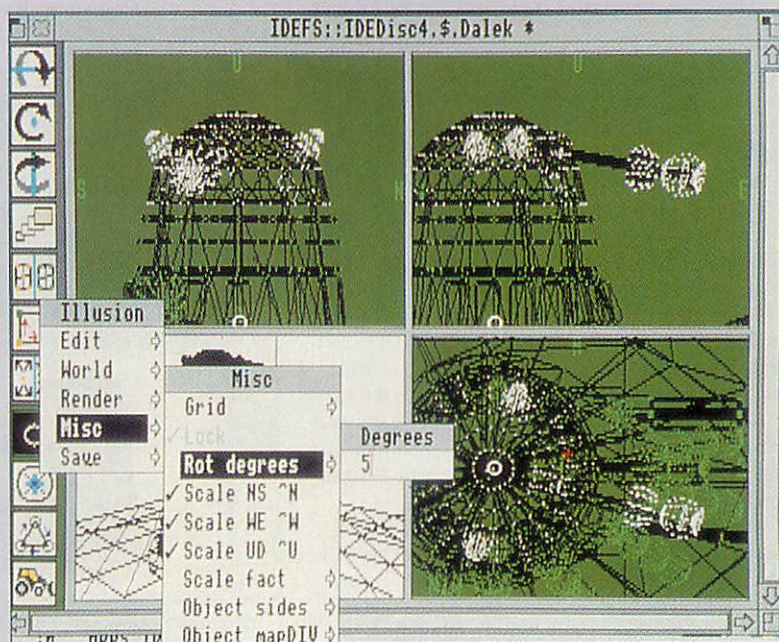
Illusionist: £85.06
Pro-Artisan: £89.36 plus VAT
Armadeus sequencer: £174.47
Titler: £127.62
Render Bender (including Animator): £85.06
Animator: £21.23
Available from Clares on (0606) 48511

MOVING PARTS

This is where the hard part, designing and construction, is at an end and the easy and fun part begins; making your model move. Animation in *Render Bender* using anything other than linear movement is not easy. Animation in *Illusionist*, by comparison, is easy and is achieved by highlighting the objects, rendering the scene, moving the same highlighted group, rendering again and so on.

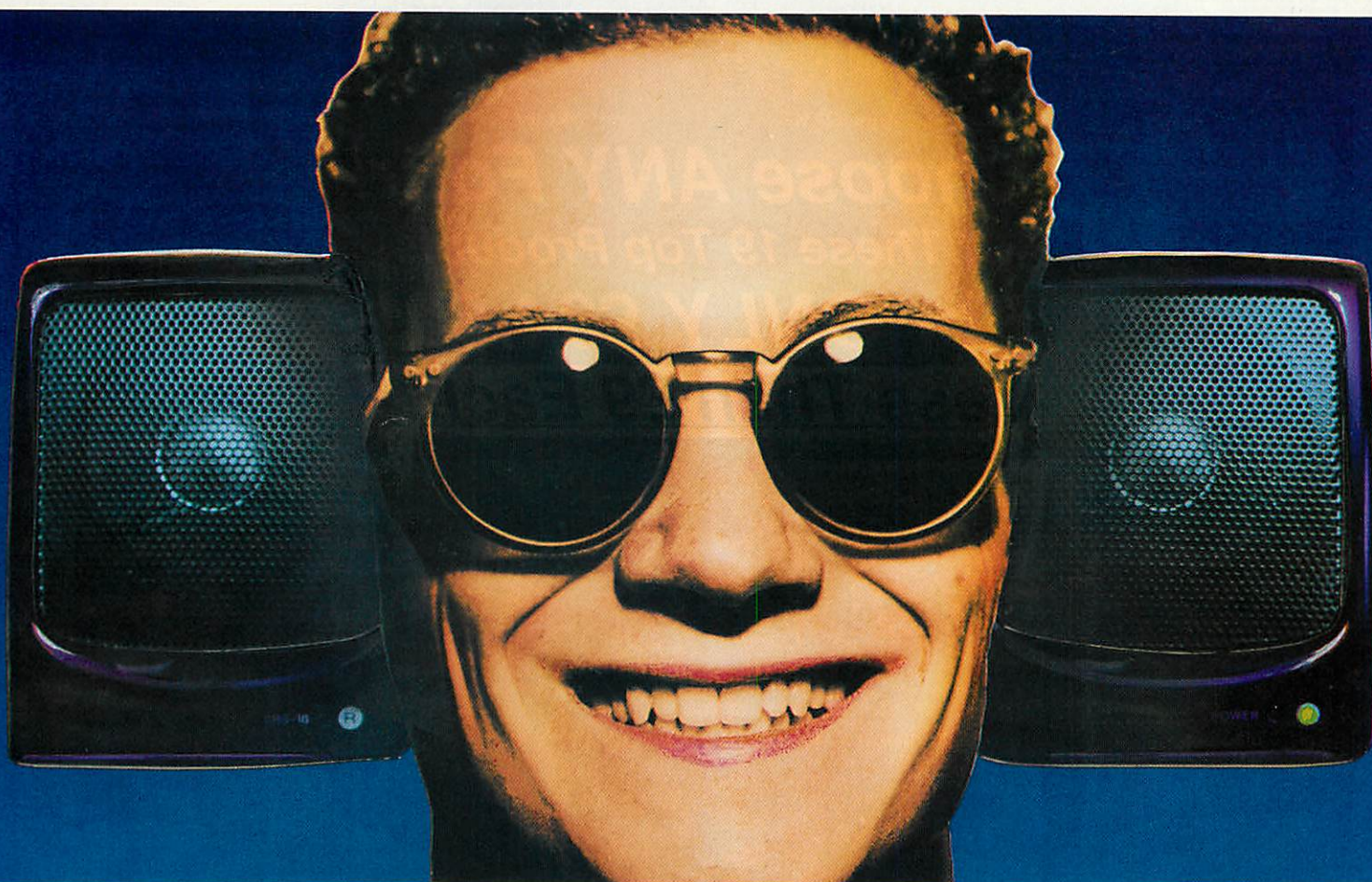
In the Dalek animation, only the head turns, but there is no reason why the eye could not move or the lights on the head flash and so on. There are ten frames in total in my animation and, because I was only animating the head, I did not need to render a complete frame, only just down to the shoulder. This speeds up the work and it only takes a couple of hours to provide ten frames.

I highlighted everything on the Dalek down to the shoulder and from the Misc menu set the number of degrees of rotation from 15 to five. I then placed the Plant Cursor precisely in the centre of the head on the top view profile pane and was ready to render my first frame. Then I rotated the head five more degrees and rendered the second picture but just down to below the shoulder level. At the seventh frame, I changed the colour of the eye from a metallic finish to a luminous one, so that the eye appears to become active.



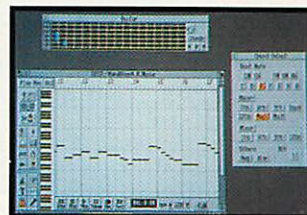
Serenade

YOUR OWN 16 TRACK MIDI RECORDING STUDIO



Serenade is a desktop MIDI sequencer for the full range of Acorn RISC OS machines. A great deal of effort has gone into creating a graphical user interface that gives access to the power of Serenade without making it complex to use.

■ Multi tasking 16 track MIDI sequencer ■ Fully RISC OS 2 & 3 Compliant and 1 megabyte friendly ■ Auto start and syncing of Rhythm-Bed from Serenade ■ Auto drop feature allows you to insert notes in real time whilst replaying ■ Guitar window allows chord input offering an alternative to the standard keyboard - it will recognise most common chords (majors, minors, 7ths, etc..) ■ Scores to Rhapsody via Standard MIDI file format type 1 ■ Can generate Real Time MIDI Events enabling real time mixing, panning, record etc with convenient snapshot facility ■ Audition feature allows undo of most functions **Price £ 135.00 inc VAT**



RHYTHM BED - A MIDI DRUM MACHINE - Rhythm bed is a program which allows you to create percussion tracks for controlling drum machines directly or for export to sequencers, such as Serenade. For those without access to a MIDI system, Rhythm-Bed can access up to eight separate internal sounds.

■ Fully RISC OS 2 & 3 Compliant and 1 megabyte friendly ■ Auto start and syncing of Rhythm-Bed from Serenade ■ Compatible with a range of MIDI keyboards and drum machines ■ Very easy to use grid based entry method ■ Data can be saved as a MIDI file for export to packages such as Rhapsody and Serenade ■ Sequencing facility so you can build up a long rhythm from short patterns **Price £ 49.95 inc VAT**



The best drum editor I've ever seen on any platform - Acorn User Feb 93

Send or ring for a more detailed leaflet and ask for your free demo disk



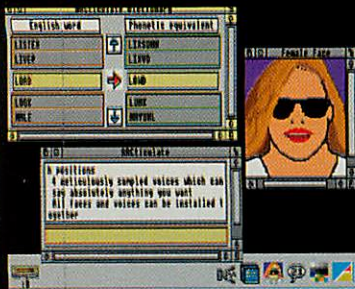
We accept Access and Visa.

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

The NEW Custom McCoy for 1993

Includes 4 BRAND NEW Top Game Additions....

The following Acorn software is compatible with all A3000s, A3010s, A3020s, A4000s, A5000s and ALL Archimedes



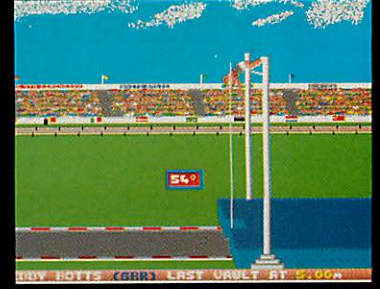
ARcticulate £25.95



Apocalypse £29.95



ARctist £25.95



The Olympics £19.95



Inertia £19.95

**Choose ANY Four
Of These 19 Top Products
For ONLY £34.50!
Less Than £9 Each!!**



Drop Ship £19.95



Powerband £25.95



GRIEVOUS BODILY 'ARM £25.95



CHOCKS AWAY Mk2 Version £25.95



Man-At-Arms £19.95



White Magic 1 or 2 £19.95



X-FIRE £25.95



CATAclysm £25.95



Holed Out £19.95



The Wimp Game £19.95

**Exclusive Mail Order Offer
For a Limited Period Only**

Unbeatable Value

The Real McCoy compilations are terrific value for money. Unfortunately if you've already got 1 or 2 of the products you miss out. Now that's all changed. You can choose ANY 4 from these 19 great titles for yourself!! Each such "Custom McCoy" will be individually packaged in 1 attractive video-style box complete with ALL original discs and manuals.

HOW TO ORDER....

Simply send us a quick letter or give us a ring telling us the 4 products you would like, your name and address, and payment via cheque, postal order or ACCESS or VISA card details.

The Fourth Dimension, 1 Percy Street, Sheffield, S3 8AU.

Tel. (0742) 769950 or 700661.

FREE SAME DAY despatch by 1ST CLASS POST



Nevryon £19.95



Arche Soccer £19.95



E-Type £19.95



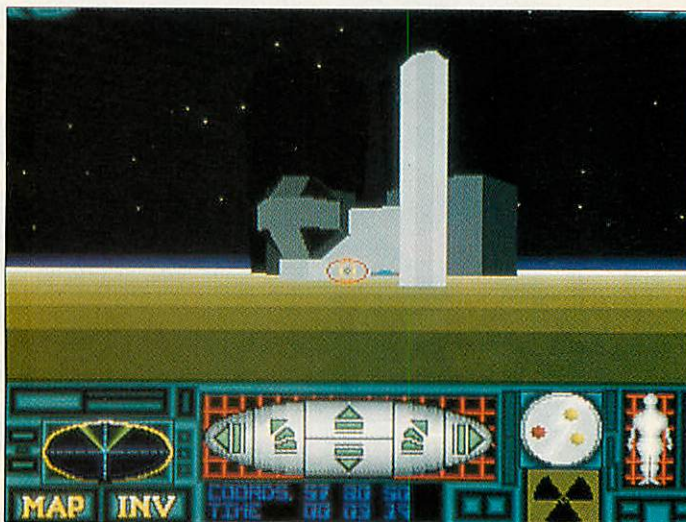
GAME SHOW

It may seem an unusual time of the year to have an *Acorn User* show (Spring) and an unusual place to hold it (Harrogate); but, as long as the latest games are there, this columnist is happy.

Krisalis Software is on stand 23/25 with its full range of products, including the eagerly awaited *Sim City*, reviewed this month. Although *Sim City* has been available on the BBC Micro for two and a half years, it is only now we see it migrating to the 32-bit world.

Also on the stand will be Krisalis' conversion of *Battle Chess*, the hugely popular 'violent' chess game where instead of just taking the pieces from your opponent, you positively pulverise them. Turn to this month's Game Show competition to win yourself a copy.

On Stand 49 The Fourth Dimension will be releasing its latest game, *Dungeon*, a 3D Gauntlet-style arcade adven-



Ixion pops up again

ture. *Dungeon* can be played by up to four players who each have their own energy level and different battle strategies. Armed with medieval-style weapons and the odd magic potion you move through the dungeon fighting huge green spiders and skeletons.

CIS, on stand 59, will be showing the latest stream of games like *Killer Bugs*, *Serpents*, *Humanoids*, *Robotix* and no doubt several others.

It's good to see new games houses booked up for the event, especially promising ones like Software 42, which

last year released one of the best games in the 32-bit world, *Ixion*. The company will be releasing three new games at the show. *Cycloids* and *Fred* have been mentioned before as, respectively, a whacky, red-nose, unicycle platform game and a tricky puzzle game with lasers and mirrors. The company is offering a special reduction to people who buy both at the same time. The third game is *Raw Power*, a beat-em-up martial arts game.

Last but not least, TBA Software is the latest addition to the Acorn games world, and it brought with it the mildly disappointing debut release, *Dragonball* (reviewed last month). At the show, on stand 95, TBA will be launching a horizontal shoot-em-up called *Axis* and a zany yoyo game called *Psychic Yoyo*.

All this and more will be available for you to try out at the show next week.

Sam Greenhill

CONSOLE FEVER

In a high-class Las Vegas hotel recently, a new machine was unveiled to the US market that promises to knock the socks off any games computer currently in existence. It was billed as the dawning of a new games era and the 1,000 or so journalists gathered at the launch didn't beg to differ.

The machine is called 3DO and, although it won't be available in Europe for a few months, it is based on 32-bit Risc technology.

The 3DO Interactive Multi-player can animate 64 million pixels on the screen every second and has a palette of literally millions of colours. The Risc processor at the centre of the machine is complemented by a custom graphics and sound chip, making it the fastest consumer games com-

puter in the world. With power like that, we're talking about games whose appearance will be 'near-television quality'.

The Risc technology leaves existing CD-based machines on the starting blocks. CD-i, CDTV, Mega CD; these will all mean nothing because it will all be in the 3DO machine. The new console, which will sell for about £300, can already play music CDs and, as soon as the movie industry settles on a few standards, there will be CD movies available too.

There are two particularly interesting things about 3DO. Firstly, the console has attracted a lot of attention from Hollywood. Companies such as Warner Brothers, Universal and Paramount have suddenly twigged that they can use the sophisticated techniques of the movie busi-



The 3DO console promises to revolutionise computer entertainment

ness to produce top quality games based on films.

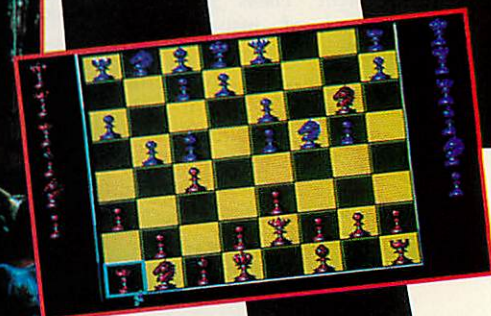
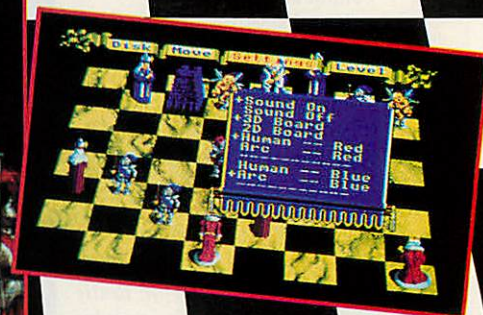
Better still, if games are becoming more and more like films, why not produce films that become more and more like games? In other words, interactive cinema. The next Steven Spielberg film, *Jurassic Park*, will be launched in the summer and followed soon after by an interactive movie version with live actors and clips from the film.

Perhaps the most significant thing for Acorn users is that many of the world's finest games programmers will want to start learning how to program for this blockbuster, mass-market console.

They'll be doing this by using Acorn machines, very probably, and are bound to produce some top notch entertainment software for the Acorn market.

Maurice Truman

Battle Chess™



£29.99
ACORN
32 BIT

The most challenging game on earth comes to life in Battle Chess. An entire medieval world at war is reflected on the checkered field.

Everyone who's ever had a knight take a pawn has seen that capture as more than one piece replacing another on the board. In players' minds, the bold knight, resplendent in his armour of silver or ebon, sallies forth and slays the foul footsoldier. Combat, mortal combat, is the heart and soul of chess, but this aspect of it can only live in the mind's eye... until now!

Lots of computer chess games capture the basics of chess. Only Battle Chess brings chess to life by combining a magnificent chess logic system with colourful, humorous, and dramatic three-dimensional animations.

HOW TO ORDER

LETTER/FAX

SIMPLY SEND A LETTER GIVING DETAILS OF THE GAME(S) YOU WOULD LIKE, YOUR NAME AND ADDRESS, AND PAYMENT BY CHEQUE, POSTAL ORDER, OR BY GIVING YOUR ACCESS OR VISA CARD DETAILS INCLUDING THE EXPIRY DATE.

IMMEDIATE DESPATCH

ALL ORDERS ARE DISPATCHED BY FIRST CLASS POST IMMEDIATELY. CARRIAGE IS PAID BY US IN THE UK. (ORDERS FROM OVERSEAS ADD £3 PER PRODUCT).

FULLY GUARANTEED

IF FOR ANY REASON DISKS SUPPLIED BY US BECOME FAULTY WE WILL REPLACE THEM STRAIGHT AWAY SIMPLY RETURN THEM TO US ENCLOSING YOUR NAME AND ADDRESS.

ACCESS & VISA ACCEPTED



Krisalis Software Ltd. Teque House, Masons Yard, Moorgate, Rotherham, S60 2HD.

TEL: 0709 372290
FAX: 0709 368403

SIM CITY

Krisalis Software
Tel: (0709) 372290.
Risc OS machines
£34.99

It is a well known fact that politicians are conniving, callous schemers who are only ever nice to registered voters and their gruesome babies. But this portrayal is less than fair when that politician turns out to be none other than the mayor of Samville.

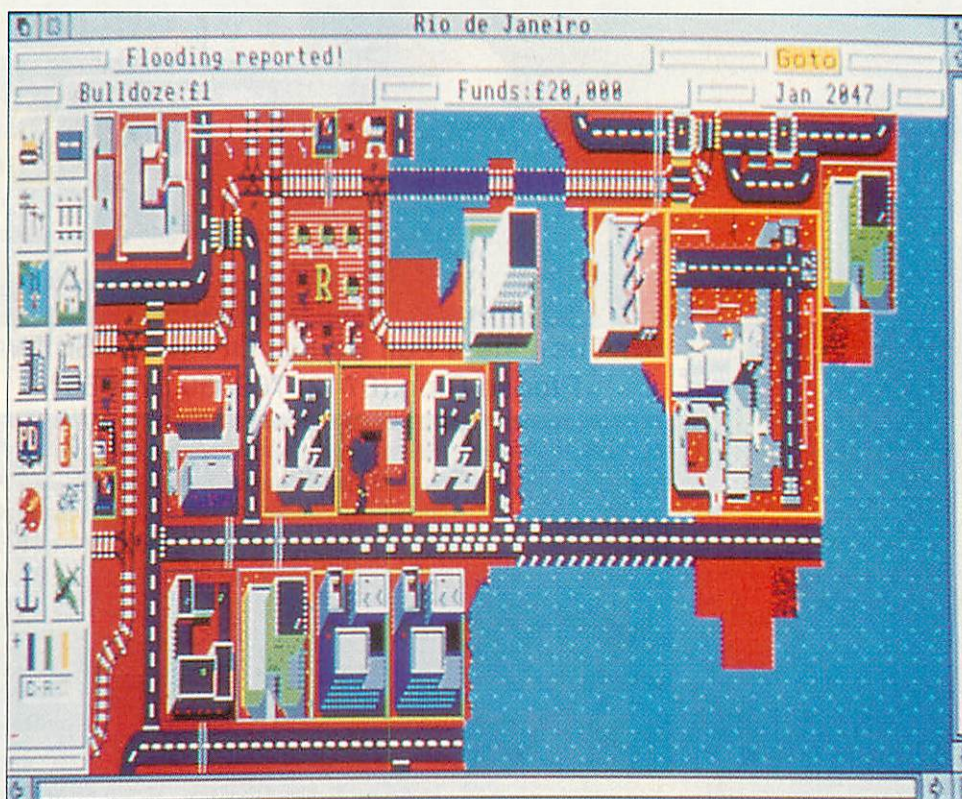
This phenomenally patient mayor has to put up with obnoxious and unreasonable voters on a daily basis who clearly have no capacity for logical thought and apparently don't appreciate his great skill at running a city. But running it into what?

That's the situation you find yourself in when you play *Sim City*, the latest blockbuster game from Krisalis. You have the power to design a city using roads, railways, factories, offices, houses, police stations, power plants, power cables, airports, sea ports; you name it. The city is continually judged for 'success' by a set of complex formulae that were devised for the game by the careful study of real cities and the behaviour of the citizens.

Being the mayor of Samville is a slimy job, but somebody's got to do it. Despite a population of over 70,000, Samville is a friendly place with an enviously low crime rate.

As he watched Samville grow, the mayor was proud to open many new facilities. A sea port sprang up, doing wonders for the export potential of Samville's industrial sectors, and the city was so overwhelmed with joy when the Samville International airport was first opened that it managed to overlook the air-crash that took the lives of several hundred registered voters. This, of course, was quickly forgotten once the flooding began and even that was regarded as trivial compared with the earthquake the following week.

Samville's citizens mourned at their losses but



Sim City: you can fool some of the voters some of the time, but...

were soon welcoming the arrival of a nice big nuclear power station which the mayor – from his bunker – gave his fullest assurances was perfectly safe.

The residents of Samville love their mayor and he loves them. Without his astute qualities of management the city would be in turmoil, plagued by crime and fire, depressed by unemployment and soaring house prices, clogged with traffic congestion and disease spread by slum housing conditions.

So why, in this eventually sad story, did the residents all pack up and leave? Because absolute power corrupts absolutely and the mayor became too greedy with his taxes. Samville was soon a ghost town.

To avoid this happening to you one day, follow this simple rule: buy *Sim City* and get some practice – and a great deal of fun – first.

Sim City works in the Risc OS desktop, which means it is running while this review is being written, although it slows the Desktop down so it feels like I'm typing at five words per minute. The map of the whole city occupies one

window and a close-up of that map takes another.

Other windows around the Desktop have information for the mayor on his popularity and his citizens' problems, another asks for the tax rate every year, and others show graphs on populations density, pollution density and crime rates along with umpteen other handy graphically presented statistics. All in all, it can get a little crowded.

The object of *Sim City* is to build and manage a city, year by year, collecting taxes and expending the revenue on things like roads, railways, power stations and electricity grids. These must be placed in positions that best serve the people's interests.

As chief planner, a critical task is the designation of residential, industrial or commercial zones. Like everything in *Sim City*, the mayor merely establishes 'the right conditions' for growth and the computer simulates the rest. Provided the residential zones are well connected – but not too close – to the industrial parks and they have power and police protection, before long they will develop into high-rise accommodation

where thousands of people will flock to live.

Sim City comes with a short list of existing scenarios – including overpopulated Rio de Janeiro and earthquake-shocked San Francisco in 1906 – but it is more fun to start from scratch and build your own city from the ground up. A random landscape is generated to include rough terrain and wide rivers.

The fact that *Sim City* is multitasking is perfect for a game that should largely be left to its own devices anyway, but unbearable slowness is the unfortunate trade-off here. It is possible to die of boredom before mouse operations like building a road have been completed. Another problem is that the Desktop palette also needs to be adjusted every time you play to avoid ordinary soil looking distinctly tomato-coloured.

In spite of this, *Sim City* is definitely a winner, a fantastically addictive game and worth every penny of the higher than usual prize tag. Go on, you know politics is for you. Everybody will hate you but you'll have exceptional fun making enemies.

Sam Greenhill

The Fourth Dimension

THE 32-bit Acorn Games SPECIALISTS

The following software is compatible with all Acorn 32-bit computers and standard monitors / TVs



The Real McCoy 2 £34.95
Apocalypse, Holed Out, The Olympics & Inertia



ARclist £25.95



Cyber Chess £34.95



Pandora's Box £25.95
Requires 2 or more Megabytes



Break 147 & Superpool £34.95



E-Type Compendium £25.95



The Real McCoy 3 £34.95 Requires 2 or more Megabytes - Powerband, Nevryon, Drop Ship, Wimp Game



Chopper Force £29.95



Enter The Realm £25.95
Requires 2 or more Megabytes



Special Offer

If you buy 2 or more products directly from us you may deduct £10 from the total cost.

How to Order

Simply send us a quick letter or give us a ring telling us the software you would like, your computer's memory (i.e. number of Megabytes), your name and address, and payment via cheque, postal order or ACCESS or VISA card details. Prices include VAT. Postage & packing is free in the UK. (Overseas add £3 per product).

SPECIALIST Acorn Software for all 32-bit RISC Machines

The Fourth Dimension, 1 Percy Street, Sheffield, S3 8AU.
Telephone: (0742) 769950 or 700661.



Oulton Park
Saloon Cars Extra Courses £19.95
Compatible only with DELUXE version



Chocks Away Compendium £34.95
Upgrade for £10 - Requires 2 or more Megabytes



I the Dungeon £34.95 (Hopefully May '93)
Requires 2 or more Megabytes



Saloon Cars DELUXE £34.95
Upgrade for £17.50



Holed Out Compendium £25.95



Black Angel £34.95



The Real McCoy 4 £34.95
Galactic Dan, Grievous Bodily 'ARM, Cataclysm, X-Fire

TECHNODREAM

Superior Software
Tel: (0652) 658585
Risc OS machines
£24.95

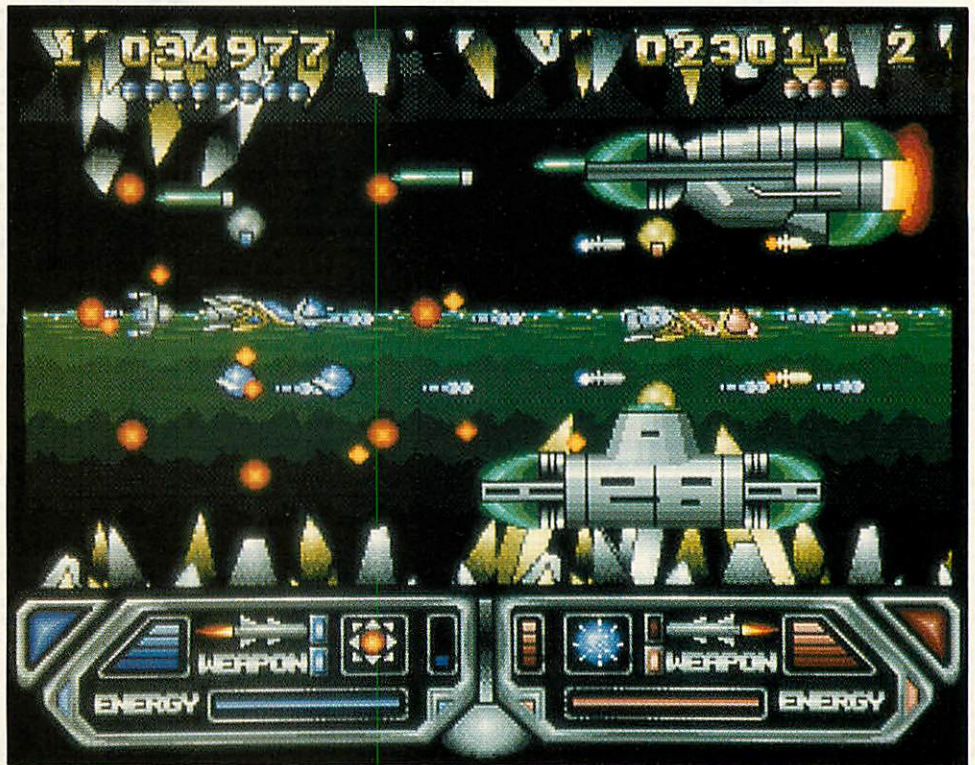
This is billed as the big one, the sequel to *Nevryon*, that fiendishly tricky shoot-em-up of a couple of years ago. *Technodream* is the long awaited sequel but is it really bigger, better, faster and more furious?

There was only one way to find out: buckle up and start zapping. The game begins with the small blue spacecraft launching from a space-age hanger and sliding up into the sky to meet the baddies.

The first generation of alien ships are relatively harmless; they just pass on by, getting shot if they're dumb enough. But soon after that, without much warning at all, it suddenly becomes quite challenging and you can hardly see for firebombs.

One of the main improvements made in *Technodream* is the introduction of a two-player mode, a feature sadly lacking in the original, *Nevryon*. With your best friend by your side you feel as though you can't lose. It brings a whole exciting new aspect to the game; you have somebody else to blame when it all goes wrong.

In *Technodream* the object is perfectly simple: shoot it if it moves, shoot it if it doesn't move and if you're still not sure, shoot it anyway. And there's plenty to shoot, the



Technodream's action gets so fast and furious the screen looks like an abstract painting

further you get, the weirder the aliens become.

Of course, with all games of this type, there are loads of power-ups to be collected. The first power up installs a couple of rocket launchers that fire automatically every few seconds. The most useful power-up is the shield, which can either be left positioned at the front of your ship or can be fired ahead of you where it wreaks havoc with anything that falls in its path.

The power up system in *Technodream* is actually quite amusing. It's all a bit like a petty school playground argu-

ment that gets completely out of hand: whatever power-up you get, the baddies get an even bigger one. So you get a bigger one still. And so on. Before you know what on earth is going on you're both pumping so much lethal fire, rockets and molten metal at one another that the screen looks like something even the director of *Die Hard* would be bewildered at.

And that's where the second main improvement that *Technodream* boasts comes in. There's more space for all the extra explosions. Now you can scroll up and down the screen a short way too and this has both advantages and disadvantages. It may give you more space to get out of the way but, hey, we're all fearless here, right? We don't want to get out of the way so much as blast the pants off the aliens and now they've got a cunning escape, just off the edge of the screen.

The vertical scrolling can also cause some frustrating moments in two player mode when you both suddenly need to get the hell out of the way of some particularly nasty alien and while one leaps up to the top, the other one dives for the deck . . . The screen

can't scroll both ways and you both end up in the middle facing the marauding beast.

The graphics in *Technodream* are extremely detailed and very colourful. The music plays during the actual game itself, which adds to the good atmosphere, but the sound effects themselves are a bit quiet and forlorn, I think.

The options screen gives you the opportunity to redefine the keys but, for some reason, you can't use the numeric keypad so fingers tend to be a bit cramped with two players on the main keyboard, each with seven keys to contend with.

Technodream comes on two discs and, after the huge wave of criticism levelled at its predecessor for taking so long to load between games, it is pleasing to find the authors have evidently made an effort to reduce the overall time between the 'game over' message and the start of the next game. However, this can still take nearly a minute.

On the whole, *Technodream* is a highly polished product and well worth the asking price of £25; now the standard for 32-bit games.

Sam Greenhill



Weep as your good buddy buys the farm

Software Bargains for ARCHIMEDES SERIES!

Product Checklist

Our Price		Our Price	
Arcade Games			
2067 BC	16.95	Digital Symphony	46.95
Aldebaran	31.95	Rhapsody 2	51.95
Black Angel	32.50	Rhythm Bed	44.95
Break 147 & Superpool	32.50	Score Draw	51.95
Cyborg	21.95	Touch-Type (Typing Tutor)	44.95
Chuck Rock	25.99	Utilities	
Dungeon	32.50	Illusionist	89.95
Elite	39.95	PC Emulator V1.8	116.33
Many special offers on games new and old! Details in our FREE catalogue!			
Fervour	21.95	Pipedream 4	149.95
Galactic Dan	24.50	Render Bender 2	89.95
GODS	25.99	Shape FX	11.75
Gribbly's Day Out	21.95	Word Processors	
Grievous Bodily 'ARM	24.50	Desktop Thesaurus	18.95
Guile	18.95	EasyWriter	159.95
Hero Quest	29.99	Pendown Plus	83.50
Ixion	21.95	Start-Write	71.95
James Pond	25.99	Techwriter	214.95
Karma - The Flight Trainer	15.95	Wordz	103.95
Lemmings	25.99	Spreadsheet	
Loopz	9.95	Eureka	119.95
Oh No! More Lemmings	19.95	Schema	114.95
Pesky Muskrats	21.95	Databases	
Populous	29.99	Datapower	149.95
Raw Power	21.95	Desktop Database	52.95
EgoRepton 4	21.95	Multistore II	199.95
Spheres of Chaos	21.95	Pinpoint	103.95
S.W.I.V.	25.95	S-Base Developer	209.95
TECHNODREAM!	21.95	S-Base Developer +	315.95
The Last Ninja	21.95	S-Base Personal	103.95
WolfPack	17.95	Languages	
"Mind" Games		C Development system	81.95
Battle Chess	29.99	Desktop C	234.95
Chess 3D	15.95	Educational	
Cyber Chess	47.95	10 out of 10 Maths	23.50
Omar Sharif's Bridge	29.99	10 out of 10 English	23.50
Simulation Games		10 out of 10 Early Essentials	23.50
Air Supremacy	21.95	An Eye for Spelling	36.95
Chocks Away Compendium	37.50	Ancient Greece	25.95
Chopper Force	26.95	Animated Numbers	25.26
Dreadnoughts	29.95	Arctventure 1 - Romans	35.19
Flight Simulator Toolkit	29.95	Arctventure 2 - Egyptians	35.19
Mig 29 Fulcrum	21.95	Badger Trails	41.13
Populous	29.99	Balloons/Zoo	35.25
Saloon Cars Deluxe	31.95	Best Four Adventure Programs	39.95
Saloon Cars Extra Crses	17.95	Best Four Maths Programs	44.95
Lotus Turbo Challenge 2	25.99	Best Four Language Programs	44.95
Sim City (Due April)	34.95	Billy - Botherome Bully	11.69
Waterloo	21.95	Castle of Dreams	23.50
Adventure Games		Connections	32.31
Enter the Realm	24.50	Doris the Dotty Dog	11.69
Heimdall (Due May/June)	29.99	Edwina's Energetic Elephant	11.69
Pandora's Box	24.50	First Words & Pictures	22.95
Sport Games		Food for Thought	19.92
Champions	29.99	Freddy Teddy's Adventure	18.95
MicroDrive 2	29.95	Fun School 20-6/6-8/8+ yrs - each	15.95
MicroDrive Designer	29.95	Fun School 3 0-5/5-7/7-11 yrs - each	21.95
Quest for Gold	25.99	Fun School 4 0-5/5-7/7-11 yrs - each	21.95
Compendiums		Fun School 3 & 4 offer!	
Champions	29.99	Buy any two £37.95	
Krisalis Collection	29.99	Buy any three £56.95	
Play It Again Sam	21.95		
Real McCoy 2 or 3 (each)	26.95		
Leisure/Various			
Desktop Tracker	69.95	House of Numbers (6-13yrs)	22.95
		Glimpse	9.99
		Graph-It	23.44
		Let's Spell Special Bundle Pack!	24.95
		Linkword French	39.95

Linkword German	39.95
Linkword Spanish	39.95
Little Red Riding Hood	14.95
Letters & Pictures (6-8yrs)	19.95
Mega Maths (A Level)	21.50
Micro English (8yrs - GCSE)	21.95
Micro French (8yrs - GCSE)	21.95
Micro German (8yrs - GCSE)	21.95
Micro Maths (11yrs - GCSE)	21.95
Number Zoo	14.85
Primary Maths (3-12yrs)	21.95
Reading Writing Course	21.95
Round World Yacht Race	29.95
Selladore Tales	28.20
Sherston Naughty Stories Pk	58.46
Shylock Gnomes	16.95
Smudge the Spaniel	21.95
Spelling Week By Wk (6-14)	22.95
Stig of the Dump	25.85
Terry's Tricky Trainers	11.69
The Puddle & The Wardrobe	29.95
The Worst Witch	29.38
Theresa's Terrible Trumpet	11.69
TinyLogo/Tiny Draw (4-9yrs)	29.95
Toby Troublesome Tractor	11.69
TV Fun & Games	18.95

Full range of Educational software available!
Please ask for our FREE catalogue!

Communications	
ArcComm V2	61.95
Arcterm 7	67.95
Hearsay 2	74.95
Desktop Publishing	
Good Impression (Tutorial)	28.95
First Impression (Tutorial)	31.95
Impression 2	145.95
Impression Junior	85.95
Ovation	98.95
Artworks	169.95
Peripherals & hardware	
Joystick Intf V2.4 (Leaching Edge)	39.95
Joystick Intf Extension Cable	9.95
JoyMaster (For A3010)	29.99
Clares Micro Mouse	27.50
Sound Samp. & Midi Card	93.99
Dust Covers	
300/400 K'bd & Monitor	12.25
A3000 K'bd only	5.55
A3000 K'bd & Monitor	12.25
A3010/20 K'bd & Monitor	12.25
A3010/20 K'bd only	5.55
A5000 K'bd & Monitor	12.50
Books	
!Help 3	9.95
D/Hand Guide - Impression	12.95
D/Hand Guide - Graphics ARM	12.95
First Impression	31.95
Good Impression	28.95

All prices include VAT

Remember this when comparing prices!
Free carriage on a total order when you buy a Krisalis product!

£3.00 Off

Buy any of these

- * Champions
- * Chuck Rock
- * GODS
- * Hero Quest
- * James Pond
- * Lemmings
- * Lotus Turbo 2
- * Man Utd Europe
- * Nebulus
- * Omar Sharif's Bridge
- * Populous
- * Quest for Gold
- * Sim City
- * S.W.I.V.
- * The Krisalis Collection

And take £3.00 off anything else!

£3.00 off anything else at the time of ordering (excluding other Krisalis titles) or take a £3.00 voucher to spend at a later date - the choice is yours!

PLUS FREE Carriage too!

The Sherston Naughty Stories!

- * Billy the Botherome Bully
- * Edwina's Energetic Elephant
- * Terry's Tricky Trainers
- * Theresa's Terrible Trumpet
- * Doris the Dotty Dog
- * Toby the Troublesome Tractor

6 beautifully illustrated and animated stories that young children will love to read and listen to over and over again

Doris the Dotty Dog!



Only £11.69 each Age Range 5 - 7 yrs
Or Buy all Six for £58.46!

Spend Over £35.00

and you can have a stylish lockable disc storage box for only **£5.00!**



BBC, Master 128, Electron and Master Compact software!

All the Play It Again Sam compilations from £6.95 each; many other games, and educational software!
Send for our catalogue!

Parents!
Teachers! and Pupils!
BBC B Computers
Only £176.25 Inc
Or £229.95 with 40/80t drive
Also includes View and Speech ROMs!

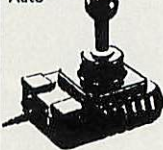
Special Joystick Packs!



(Quickshot 3 Turbo/Python I)

- Pack One joystick Interface V2.4 and 1 X Quickshot 3 Turbo £49.95
- Pack Two joystick Interface V2.4 and 2 X Quickshot 3 Turbo £59.95
- Pack Three joystick Interface V2.4 and 1 X Superpro Auto joystick £51.95
- Pack Four joystick Interface V2.4 and 2 X Superpro Auto £61.95

Superpro Auto



RISC OS 2 and 3 compatible!

Software Bargains & Mercury Games

Dept AU53, C/O Northwood House, North Street, LEEDS LS7 2AA
TEL: 0532 436300 FAX: 0532 423289

- * Access/Visa Welcome
- * Please add 95p P&P (Europe £2.50, Outside Europe £4.50)
- * All prices include VAT @ 17.5%
- * Goods despatched within 48 hrs. (subject to availability)

- * Educational discount of up to 30% off SRP (not Sale prices as shown in this advertisement) available on most Archimedes software; Official Order No. or school headed notepaper required - minimum order value £30.00 for invoicing, otherwise cheque with order. Please call to confirm your order.

(Prices are correct at the time of going to press, E&OE)



Please send me your **FREE CATALOGUE!**

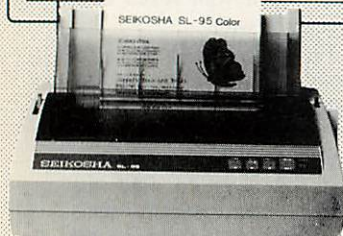
Name

Address

Postcode

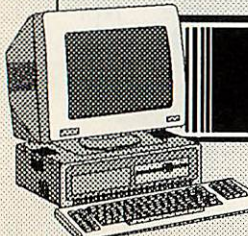
Archimedes Series ☐ BBC B/B+ Master 128/ Master Cpc ☐ Electron ☐

FREE Quarterly news magazine with product descriptions, review comments and Special Offers! Get yourself on the mailing list today!



Seikosha SL 95 Colour Printer
24 Pin Dot Matrix only £249.95

Price includes VAT, Carriage & cable
UK Mainland only, excluding Scottish Highlands

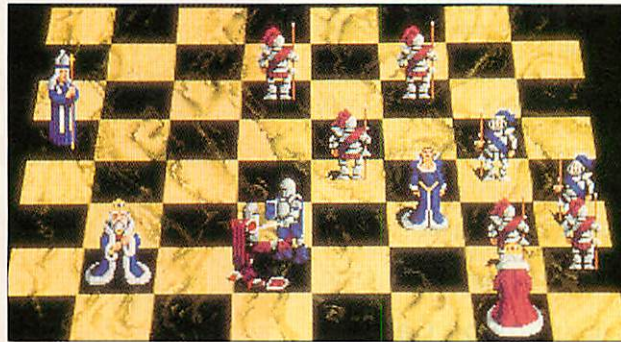


BATTLE CHESS COMPETITION

Never mind the championships, *Battle Chess* from Krisalis Software (reviewed last month) is the most exciting chess game you'll ever see. Where else have you ever seen the pieces barge their way across the board, or bash the living daylights out of each other? Where else is there a queen so full of grace that her 'eliminations' are carried out with lethal elegance? And where else are the foot soldiers so stupid as to get into a fight with a ten-foot ogre made from bricks?

Excitement, action, violence, and it could all be yours; free! *Acorn User* has five copies of the only chess game to give you gore, to award to the winners of the *Battle Chess* competition.

To win a copy, simply answer the three questions below



You too can join the Battle Chess melée

and then complete the tie-breaker. Then send your answers on a postcard or the back of an envelope to:

Battle Chess Competition, Acorn User, 101 Bayham Street, London NW1 0AG. The closing date for entries is 1 June 1993 and the editor's decision is final.

1 Name the British chess player who will be battling it out on a real chess set with Russian chess supremo Gary

Kasparov at the World Chess Championship later this year.

2 One of the funniest conflicts in *Battle Chess* is when two knights clash. The duel is based on a scene in the *Monty Python and The Holy Grail*. What is the name of the actor who played the dismembered loser in the film?

3 Which square does the black king always start on? Black or white?

PARADROID

Coin-Age
Tel: (0282) 692688
Risc OS machines
Price: £25.99

Déjà vu or what? *Paradroid 2000* takes me back to the ancient Spectrum game *Quazatron* in which you are a lone robot who has to save an entire colony, not from a small bunch of the normal run of the mill bad guys, but from the Trimorg Empire (where do they get these names?)

Some freighters, sent to save the earth's colonies, are tampered with. The battle droids are activated and the crew robots go haywire as well, just to make matters more confusing.

Due to government cut-backs the freighters cannot be destroyed, and sending troops would be as about as popular as sending them to Bosnia. So it's once more down to yours truly to save the day. You are a Mark 2 Influence Device who has to clear all five of the freighters of rogue robots.

This is generally done by manoeuvring your ball bearing look-a-like around the decks of the freighters, which



Paradroid: an unearthly world full of killer robots

are viewed from above, zapping the rogues and attempting to 'transfer' with them. This allows you to engage in a sort of duel of electronic circuitry with the robot so that you may steal its body, vital for improving your firepower and armour.

The graphics are not stunning but there is commendable attention to detail, like the computer screens lighting up the desk when you use them. It is the detail that makes the game curiously addictive after initially being frustrating. After a while I really got into being a sentinel – one of the more powerful robots – going around and destroying all and sundry. Far

more interesting than being a boring cleaner robot.

There are several levels to clear on each of the five freighters. This would keep you occupied for quite some time but I'm not sure the game is varied enough to hold my interest for that long.

Overall the game is a dream for the inquisitive-minded, especially because the instructions are very minimal and there is much left to discover for yourself. It is fun, it's just that level after similar level does tend to get a bit of a drag. *Paradroid* is a game that grows on you, but I think it is only for the dedicated fans of this genre.

Josef Koestler

CHEAT'S CORNER

POPULOUS

In all, there are 500 worlds in *Populous*, so we're spoiling none of the fun by giving a little help to those stuck near the beginning:

1. Genesis
2. Swaver
3. Mornigill
4. Weavhapham
5. Bugqueend
6. Verymeend
7. Shidiehole
8. Calozboy
9. Swaingpal
10. Morhippil
11. Bilador
12. Ringgbpal
13. Hobozjob
14. Sadmpt
15. Futloplug
16. Timomar

Passwords supplied by The Bear, St. Albans

AIR SUPREMACY

In *Air Supremacy* from Superior Software, you can swap between air and ground/sea forces as the battle develops.

But, if you've got your biplane in a rut or your WW1 tank stuck in the mud, try these passwords, from Tim Williams in Brendon, North Devon:

- Level 2: Scramble
- Level 3: Staccato
- Level 4: Equanimity

SWIV

This the ultimate shoot-it-whether-it-moves-or-not game from Krisalis Software To cheat at *Swiv* press F1 to pause the game, then type NIGEL. Now press RETURN for infinite lives and, back in the game, shoot one of the token credits repeatedly, until it turns into a star, to get eight-way rapid fire.

Fiery thanks to The Bear of St. Albans for this.

BLITZ

Here's a cheat for the most popular *Pang* conversion in the Acorn games world.

The passwords for this come from Tim Williams in Brendon, North Devon.

- Level 2: Seirra
- Level 3: Mouse
- Level 4: Herbert
- Level 5: Compact
- Level 6: Ferrari
- Level 7: Gelesby
- Level 8: Plane
- Level 9: Deskjet



061 766 8423

Phone lines open :-
Mon - Fri 09.00 - 17.00
Sat 10.00 - 17.00

FAX: 061 766 8425

New Acorn Hardware

Official Acorn Publishing Dealer

A540 4Mb Ram, 120Mb HD £1995.00

A4 4/60 Mb HD Portable £1699.00

c/w Acorn shoulder bag £1399.00

A4 2 Mb FD Portable £1445.96

A5000 / 2Mb Ram, 80Mb HD, as above c/w software £1599.00

A5000 / Learning Curve / 2Mb Ram £1299.00

A5000 / 4Mb Ram, 120Mb HD £1445.96

Arm 3, Acorn Multiscan Monitor £1599.00

A5000 ES - Econet System £1299.00

Arm 3, Acorn Multiscan Monitor £1399.00

A5000 NS - Network System £1399.00

Arm 3, Acorn Multiscan Monitor £999.00

A4000 Home Office System £1049.00

Arm 250, Acorn Monitor £949.00

A4000 HD 80 System £999.00

Arm 250, Acorn Monitor £949.00

A4000 HD 80 Multiscan System £999.00

Arm 250, Acorn Monitor £424.68

A3010 Family Solution £680.00

Arm 250, TV Modulator £749.00

A3010 / 2Mb Learning Curve System £799.00

Arm 250, Acorn Monitor £899.00

A3020 / 2Mb FD System £949.00

Arm 250, Acorn Monitor £949.00

A3020 / 2Mb FD Multiscan System £899.00

Arm 250, Acorn Monitor £949.00

A3020 / 2Mb HD 60 System £949.00

Arm 250, Acorn Monitor £949.00

A3020 / 2Mb HD 60 Multiscan System £949.00

Arm 250, Acorn Monitor £949.00

A Finance option is available on the above machines (14.7% APR)

Written details available on request

Acorn Special Needs Centre

We operate the Acorn Teacher and Academic Schemes

Please call for free information packs

A540 Upgrades

4Mb Ram Upgrade £299.00

Taxan 795 VIDC Modes Disc £7.50

Technical Reference Manual £65.00

A5000 Upgrades

2Mb Ram Card £110.00

Dust Cover (One piece) £12.95

Technical Reference Manual £65.00

A3000/10 Upgrades

1 Mb Ram A3010 (2Mb in total) £39.00

4 Mb Ram A3010 £128.00

A3010 to AKF12/17 adaptor £9.95

1 Mb Ram (2 Mb in total) £45.00

4 Mb Ram £128.00

20 Mb Int Hard Disc (IDE) £199.00

5.25" External f/disc buffer £39.00

Joystick (Quickshot III) £12.00

Joystick Interface £32.00

Serial Upgrade £19.00

User & Analogue Podule £46.00

User & Midi Podule £46.00

A400 Upgrades

1 Mb Ram £35.00

2 Mb Ram £65.00

3 Mb Ram £99.00

5.25" Ext. floppy disc int. £39.00

A4 Upgrades

A4 2 MB RAM Upgrade £110.00

A4 60 MB HD Upgrade £350.00

A4 Battery Pack £50.00

A4 Econet Upgrade £50.00

A4 Shoulder Bag £35.00

A4 Technical Reference Manual £65.00

RISC OS 3

RISC OS 2 -> 3.1 Upgrade £41.70

RISC OS 3 -> 3.1 Upgrade £16.17

RISC OS 3 Hardware Kit A300 £25.00

Expansion Cards

Econet Module £46.00

Hawk V9 Video Digitiser £199.00

I/O Expansion Card £79.00

Midi Expansion Card £65.00

SCSI Expansion Card (Acorn) £229.00

SCSI Expansion Card (Morley) £149.00

ROMBO Colour Digitisers

A3000 inc. podule housing £72.30

A400 / A5000 £72.30

Aleph 1

Arm 3 Upgrade £175.00

386 PC Expansion Card 1Mb £390.00

386 PC Expansion Card 4Mb £485.00

486 PC Expansion Card 4Mb £585.00

Standard Monitors

Acorn Colour £199.00

Microvitec Cub 3000 £199.00

Philips Mono (Green) £85.00

All monitors come with free lead. State type of computer when ordering.

Multiscan Monitors

Acorn Multiscan AKF18 £299.00

Taxan 795 Multivision £449.00

Floppy Disc Drives

5.25" Single 40/80 no psu £95.00

5.25" Single 40/80 with psu £109.00

5.25" Dual 40/80 no psu £185.00

5.25" Dual 40/80 with psu £199.00

3.5" Single with psu £85.00

3.5" + 5.25" 40/80 with psu £209.00

Printers

Canon Bubblejet BJ-10ex £172.00

Canon BJ10ex inc. turbo driver £219.00

Sheetfeeder for BJ-10ex £48.00

Canon BJ200 £299.00

Canon BJC800 (col.) inc. s/w £1469.00

Citizen 120D+ £114.00

Citizen Swift 9 £169.00

Citizen Swift 240 £239.00

Colour Kit for above £29.00

Citizen Swift 200 £199.00

Citizen Swift 200 Colour £225.00

Citizen Swift 128K Memory £35.00

Integrex Colourjet 132 £519.00

HP Deskjet 500 £299.00

HP DeskJet 550C £449.00

Laser Direct (LBP4 Hi Res.) £849.00

Laser Direct (LBP8 Hi Res.) £1279.00

Econet

Level 4 AUN Software £399.00

Scanners

Flatbed A4 256 Grey SCSI (CC) £745.00

Flatbed A4 without SCSI card £585.00

Scan Junior Scanner 256 £199.00

Scanlight Senior Scanner A4 £289.00

Sheet Feeder for above A4 £135.00

Fax

Fax Pack (CC) £259.00

FREE

Acorn - 3 Years On Site Warranty on all Acorn Hardware* purchased from Dabhand Computing

*excludes Acorn Purchase Schemes / Education Schemes
A4 Portable / Acorn Printer

Printer Drivers

Midnight Graphics

Citizen Swift 9 Sprite Dump £26.04

Citizen Swift 24 Sprite Dump £26.04

Epson 24 Sprite Dump £26.04

HP Deskjet 500C Sprite Dump £26.04

HP Paintjet Sprite Dump £26.04

Integrex 132 Sprite Dump £26.04

Integrex Colourcel Sprite Dump £26.04

Juki 5520 Sprite Dump £26.04

Star LC10 Sprite Dump £26.04

Star XB24 Sprite Dump £26.04

Star LC200 Sprite Dump £26.04

Star LC24-200 Sprite Dump £26.04

Ace Computing

Printer JX (Colour Dot Matrix) £14.00

Printer DJ (Deskjet 500C) £14.00

Printer PJ (Paintjet) £14.00

PRO Drivers (All) £40.00

Beebug

Deskjet 500/550C Driver £15.00

Star/Epson/Citizen (Colour) £15.00

Electronic Font Foundry

BubbleJet - BJ10e/130e £10.00

Cables

Arc - 15 Pin to 9 Pin Adaptors £9.95

Arc - Monitor - 8833 inc sound £8.65

Arc - Monitor - 8833 II inc sound £8.65

Arc - Parallel Printer Cable £5.00

Keyboard Extender 400/500 £7.50

Mouse Extender £7.50

BBC Software

Blob 1 £18.00

Blob 2 £18.00

Chick Chase (80 Track Only) £15.00

E-Type £13.00

Master Break £10.39

Modem Master £11.26

Play It Again Sam No's 1 - 16 ea. £11.95

Reversals (80 Track Only) £20.00

UIM £14.95

Where's Blob £18.00

Master Compact

Play It Again Sam No's 1 - 16 ea. £13.00

UIM £14.95

Archimedes Software

4 Mation

Chameleon £35.00

Desktop Basic Editor £25.00

Jiglet £25.00

Jigsaw £27.00

Noat £50.00

Poster £75.00

SmArt £50.00

SmArtFiler £32.00

Snippet £35.00

Vector £75.00

Ace Computing

ArcLight £40.00

Euclid 2 £40.00

Mogul £17.00

Splice £26.00

Tween £26.00

Acorn Computers

1st Word Plus £65.00

Desktop Assembler (V 2) £119.00

Desktop C (V 4) £180.00

Font Starter Pack £39.00

Newhall Font Pack £39.00

PC Emulator / Free Shareware £95.00

TCP/IP Programers Pack £50.00

TCP/IP Protocol Suite £199.00

Arxe Systems

MultiFS £27.00

Beebug

DeskEdit 2 £25.00

Desktop Thesaurus £19.00

Hard Disc Companion 2 £45.00

Hearsay II £69.00

Masterfile 3 £49.00

Ovation £85.00

Playback £17.00

Brilliant Computing

Everyday Signs £20.00

Joystick Games £20.00

Streetwise £20.00

Switch On £20.00

Switch On Actions £20.00

Teds Adventures £20.00

Clares Micro Supplies

Artisan 2 £45.00

Fervour £19.00

Illusionist £79.00

Interdictor £10.00

Interdictor II £23.00

ProArtisan £70.00

Render Bender 2 £99.00

Rhapsody 2 £45.00

Schema £90.00

Coin Age

Pesky Muskrats £14.00

Colton Software

Pipedream 3 £73.00

Pipedream 4 £124.00

Wordz £88.00

Computer Concepts

AvanteGarde Font Pack £24.00

ArtWorks	£129.00
Bookman Font Pack	£24.00
Canon BJ10e/x Driver	£42.00
Canon BJC800 Driver	£95.00
Compression	£34.00
Equasor	£37.00
Graphics Card	£249.00
Impression II Borders Disc	£12.00
Impression Business Supplement	£39.00
Impression II Free Drawfile Disc	£124.00
Impression Junior	£69.00
Inter-Word	£29.00
Show Page	£109.00

Cygnus Software

Iron Lord	£14.00
Tower of Babel	£14.00
Twin World	£14.00

Dabhand Computing

Arc DFS	£22.00
---------	--------

Database Software

Fun School 3 under 5s	£16.95
Fun School 3 5-7 year olds	£16.95
Fun School 3 over 7s	£16.95
Fun School 4 under 5s	£20.00
Fun School 4 5-7 year olds	£20.00
Fun School 4 7-11 year olds	£20.00

Domark

3D Construction Kit	£25.00
Mig29 Super Fulcrum	£29.00
Trivial Pursuit	£22.00

Dyslexia Software

Specialist software for all ages -
home / education
Call for details

Empire

Pipemania	£16.00
-----------	--------

Electromusic Research

Creations Discs 1-8 ea.	£19.00
MIDI Analyser	£29.00
Microstudio	£78.00
Music Player	£35.00
RhythmBox	£29.00
SoundSynth	£39.00
Studio 24 Plus	£149.00

ESM

Desktop Folio	£79.00
---------------	--------

Hybrid

Elite	£31.95
-------	--------

Icon Technology

EasiWriter	£115.00
TechWriter	£195.00

Krisalis Software

Champions Collection - Leader Board / Man. United / Squash / Boxing	£22.00
Chuck Rock	£19.00
Gods	£19.00
Hero Quest	£22.00
James Pond	£19.00

Krisalis Collection - Pipemania / Revelation / Mad Professor Mariarti / Terramex	£22.00
Lemmings	£19.00
Mad Professor Mariarti	£14.00
Manchester United Europe	£19.00
Nebulus	£19.00

Populous	£22.00
Swiv	£19.00
Turbo Challenge 2	£19.00
World Champ. Boxing Manager	£18.00
World Championship Squash	£18.00

Leading Edge

A3010 Joymaster	£24.00
Investigator II	£22.00
Joystick Interface (All Models)	£32.00
Desktop Tracker	£74.00

Lingenuity

CableNews	£149.00
HotLink Presenter	£29.00
Presenter GTI	£69.00

Longman Logotron

ArcComm 2	£49.00
-----------	--------

Eureka!	£99.00
First Logo	£23.00
Landmarks Aztec	£19.00
Landmarks Columbus	£19.00
Landmarks Egypt	£19.00
Landmarks Rainforest	£19.00
Landmarks Victorians	£19.00
Landmarks World War II	£19.00

Magpie	£40.00
Notate	£49.00
Numerator	£60.00
Numerator Chaos	£18.00
Pendown Plus	£69.00
Pendown Outline Fonts	£18.00

Pinpoint	£75.00
Pinpoint Junior	£23.00
Revelation 2	£95.00
Revelation ImagePro	£139.00
S-Base Personal	£89.00
S-Base Developer	£169.00
SkyHunter	£22.00

MicroPower

Chess 3D	£14.00
Zelanites	£15.00

Midnight Graphics

ClipArt 1 / Clipart 2 each	£29.95
Express	£51.02
Tracer	£52.13

Minerva Software

Applications

Ancestry	£59.00
Atelier	£69.00
Cadet	£149.00
Desktop Office 2	£79.00
Easiword 2	£54.00
Flexifile	£89.00
Graphbox	£55.00
Graphbox Professional	£105.00
Home/Club Accounts	£34.00
Linkword - French	£35.00
Linkword - German	£35.00
Linkword - Spanish	£35.00
Multistore II	£179.00
PCAccess	£19.00
PrimeArt	£69.00

Leisure

Bughunter in Space	£11.00
Bug Hunter / Moon Dash	£11.00
Casino	£11.00
Caverns	£11.00
Family Favorites	£11.00
Freddy's Folly	£11.00
Hoverbod	£11.00
Ibix the Viking	£11.00
Jet Fighter	£11.00
Maddingly Hall	£11.00
Orion	£11.00
Redshift	£11.00
Talisman	£11.00
Thundermonk	£11.00

Northwest SEMERC *

Conform Keyboard Software	£18.00
Le Monde a Moi	£18.00
Meine Welt	£18.00
My World (Program)	£18.00
My World 2	£28.00
My World - Christmas Disc	£9.00
My World - Design	£9.00
My World - Fuzz Buzz	£12.00
My World - Geog. Key Stage 1	£9.00
My World - I'm Special	£9.00
My World - Nursery Disc	£9.00
My World - Maths	£9.00
My World - Patterns	£9.00
My World - Sampler	£9.00
My World - Skeletons	£9.00
My World - Village/Town	£9.00
Oldham Keyboard	£99.00
Full Phases	£28.00
Phases 3	£18.00
Phases - Borders disc	£9.00
Phases - Christmas disc	£9.00
Phases - Clip Art 1	£9.00

Phases - Very Hungry Caterpillar	£9.00
----------------------------------	-------

* Please add £2.50 P&P to SEMERC Software

Oak Solutions

Draw, Print and Plot	£39.00
Genesis II	£99.00
Worra Battle	£10.00
WorraCAD	£74.00

Sherston Software

!Draw Help	£15.95
!Help (RISC OS 2)	£7.95
!Help 3 (RISC OS 3)	£9.95
Animated Alphabet	£19.00
Arventure I - Romans	£25.00
Arventure II - Egyptians	£25.00
Badger Trails	£35.00
Dreamtime	£20.00
Farm	£19.00
Fleet Street Phantom	£23.00
Glimpse	£8.50
Mapventure	£23.00
Microbugs	£25.00
Nature Park Adventure	£24.50
Selladore Tales	£24.00
Space Mission Mada	£23.00
Stig of the Dump	£22.00
Story Starts	£25.00
Teachers Cupboard	£24.50
Teddy Bears Picnic	£23.00
Viewpoints	£35.00
Wizards Revenge	£17.00
Worst Witch	£21.50

SIMMIS

Flight Sim Toolkit	£31.00
--------------------	--------

Superior Software

Air Supremacy	£14.00
Conqueror	£15.00
Hostages	£14.00
Master Break	£14.00
Play it again Sam 1	£19.00
Repton 3	£14.00
Speech!	£14.00
Superior Golf	£14.00
Technodream	£19.00
The Last Ninja	£19.00
Zarch	£14.00

The Data Store

FontFX	£9.95
ShapeFX	£9.95

The Fourth Dimension

Apocalypse	£14.00
Articulate	£14.00
Arclist	£14.00
Boogie Buggy	£14.00
Break 147 / Superpool	£25.00
Black Angel	£28.00
Cataclysm	£18.00
Chocks Away 2	£18.00
Chocks Away Extra Missions	£14.00
Chocks Away 2 + Ext. Missions	£27.00
Chopper Force	£22.00
E-Type Compendium	£18.00
Enter The Realm	£18.00
Grievous Bodily 'ARM	£18.00
Holed Out Compendium	£18.00
Nevryon	£14.00
Pandora's Box	£18.00
Powerband	£14.00
Pysanki	£14.00
Saloon Cars - Deluxe	£25.00
The Real McCoy 1	£23.00
The Real McCoy 2	£23.00
The Real McCoy 3	£23.00
The Wimp Game	£14.00
X-Fire	£16.00

Triple R Education

10 out of 10 English	£19.00
10 out of 10 Maths	£19.00
10 out of 10 Early Essentials	£19.00

Books (No VAT)

Archimedes Assembly Language	£14.95
Archimedes Operating System	£14.95
The above books have accompanying discs add £5 for 5.25", £7 for 3.5"	

C: A Dabhand Guide 3rd Edition	£16.95
A3000 Technical Guide	£29.95
Assembler Release 2	£25.00
BASIC V: A Dabhand Guide	£9.95
BBC Basic Guide (Acorn)	£19.95
Budget DTP (Draw & Edit)	£12.95
DTP Seeds (4Mation)	£8.45
Desktop C Release 4	£25.00
Desktop Development UG	£25.00
Graphics on the Arm - A DHG	£14.95
First Word Plus - Dabhand Guide	£13.95
as above with disc	£21.90
Impression - Dabhand Guide	£14.95
as above with disc	£16.95
M128 Ref. Man.Pts 1&2 (ea.)	£14.95
Programming in Ansi C	£14.95
RISCOS 3 PRM's	£TBA
Understanding Spreadsheets	£9.95

Hours of Opening

Monday - Friday 9.00 a.m. - 5.00 p.m.
Saturday 10.00 a.m. - 5.00 p.m.
Lunch 1.00 p.m. - 1.30 p.m.

How to find us



Important Facts

- NO Minimum Order Value
- NO Carriage Charges in Mainland UK
- ALL Goods Despatched within 24 Hours, subject to stock levels
- Acorn Education Dealer
- Acorn Qualified Dealer
- Acorn Service Centre
- Hotline Support on all Hardware and Software purchased from us

Terms & Conditions

TERMS: EC residents add 17.5% VAT to all prices, except books. Carriage *FREE on all items in the UK (*with the exception of "remote" areas). Foreign orders, carriage at cost. (quotations available). Access/Visa cards accepted. Dabhand Computing Ltd. is a Qualified Acorn Dealer. Official orders accepted from public sector/education/PLCs, otherwise cash with order. Tender invitations welcome. Callers welcome. We are 2 minutes north of J17, M62. Prices subject to change without notification. Goods offered subject to being unsold.



**DABHAND
COMPUTING**

DABHAND COMPUTING LTD
5 Victoria Lane
Whitefield
Manchester, M25 6AL

See us
at Harrogate
stand 69





QUESTIONS AND ANSWERS

Q I recently bought an A4000 home office and am very pleased with it but find that the 2Mb of Ram supplied with the machine is too small for my needs.

I understand that the A5000 can be upgraded with an extra Memc chip. Is this possible on my machine and do you know of any companies who have plans for 8Mb boards?

Jonathan Dyer
Nottingham

A It can't be done. There are a number of 8Mb upgrades around for A400 series machines, such as those from Atomwide, Watford and Gnome. There is also one available from Risc Developments, tel: (0727) 840303, for the A5000.

These replace the computer's existing memory controller (Memc) chip with a connection to a circuit board holding sockets for two Memc chips and an additional 4Mb of Ram.

However, on an A4000, A3010 or A3020, this controller is internal to the Arm250 processor and cannot be removed, replaced or connected to anything else.

Don't despair; upgrading to 4Mb may be more help than you think. It is likely that hundreds of kilobytes of memory on your machine are being used by the system for things like font cache, RMA, printer driver and so on. Since these resources can be shared by several programs at once, an extra 2Mb will more than double the space available to your applications.

Q I am a long-standing user of Acorn computers, and currently own a greatly expanded Archimedes 310 with extra memory, an Arm3 and Risc OS 3 fitted.

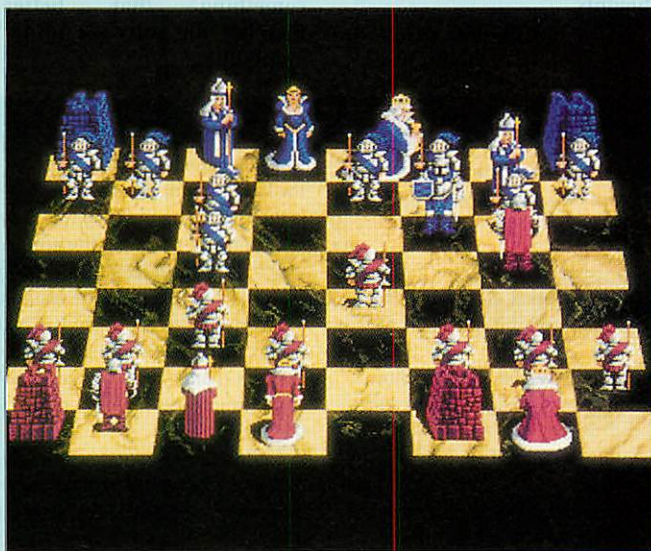
At the 1991 *Acorn User* show, I bought and then installed an ICS 40Mb internal hard disc. One of the features of this unit is a Powersave option which turns the drive off if left unused for more than a given length of time. I set this time to the minimum value of one minute and continued to use the machine.

STAR QUESTION

Q I am writing a *Scrabble* program for the Archimedes and would like to release it as Careware. Would it be infringing anybody's copyright if I did so?

Jeffrey Almeida
Leicester

A Not 'alf! I talked to Spears, which owns *Scrabble*, both as a game and a trademark, and they would be distinctly unamused if someone were to release their own version. The company didn't think US Gold, which holds the software licence, would be too happy either. Apart from the financial side, they're both keen to protect the standard appearance and high quality of the product. It's OK to implement software versions of traditional games like chess, many card games, nine men's morris and so on because their authors, if any, are far too dead to worry about royalty cheques but, as Spears still has about 75 years left to run on its copyright, it isn't about to give licences away.



You can do what you want with chess, but other games may have owners

At the 1992 *Acorn User* Show, I talked with another hard drive manufacturer and was informed that they did not intend to implement a Powersave feature, since continually turning the hard drive on and off can lead to its premature failure.

I asked ICS about this, and they confirmed that hard discs do have finite lives, recommending that resetting the delay to five minutes would

limit wear and tear. I have since discussed this problem with a computer service engineer who says he's never heard of hard discs failing because of them having to endure too many start-ups.

With all this conflicting advice on the matter, I find that I am now not using the Powersave feature at all. Can you clarify things for me?

Terry A. Ellis
Ivybridge, Devon

A This is essentially a problem in physics. A hard disc is a wheel spinning at several hundred rpm on an axle bearing. Wear and tear during starting and stopping is much greater than during continuous rotation because of additional friction when the wheel speeds up and slows down.

The same problem causes car tyres to lose more rubber during acceleration and deceleration than they do when a car moves at a fixed speed. In principle, therefore, turning the hard disc on and off at all is going to contribute to its eventual demise, and it's my experience that fixed discs do tend to crash when you turn them on first thing in the morning, rather than when you're in the middle of something.

Having said all that, leaving the disc running forever will also cause the bearing to fail, albeit at a slower rate. These days, hard discs are built to handle many more 'duty cycles' than they used to. Modern units, particularly those designed to save power on portables and 'green PCs', are actually designed for a long life of frequent stops and starts.

Typically, laptop hard discs power down five minutes after use and save a lot of battery power without, apparently, causing premature senility in hard discs.

ICS says it has had no problems with this feature on its drives but it will, of necessity shorten their theoretical life expectancy. In any case, a one-minute delay before shutdown does seem a little short.

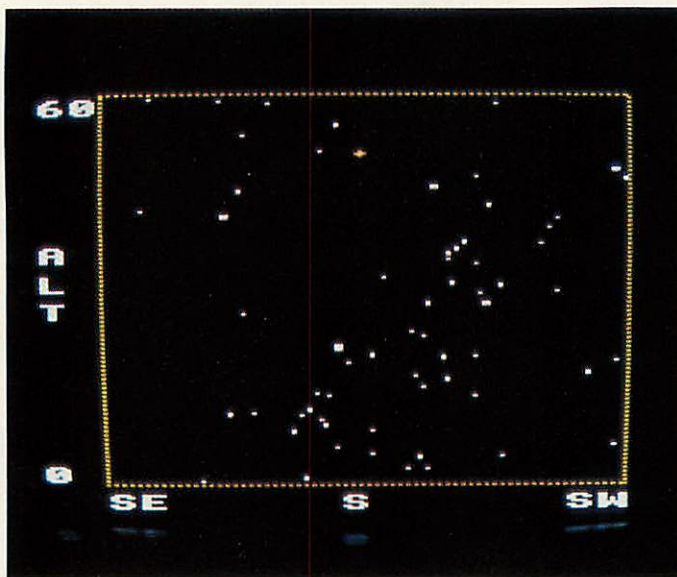
If you use the computer to run games, for example, simply calling a program and running it for hours before you next use the disc, then a five-minute shutdown could be economical. If, however, you're word processing and saving to hard disc every 15 minutes, then this option seems hardly worth the bother. By the way, if you abandon this feature altogether, your hard disc will still fail one day, so keep backing it up.

Q When I use the PC-emulator in EGA or VGA mode, some PC programs only fill a quarter of the screen. Why is this? Is there any way I can make it use the whole screen?

J. Howe
Gateshead

A Like the Arc, PCs have many screen modes. It's not just a question of which graphics adaptor you emulate (Hercules, CGA, EGA, VGA, Super VGA, XGA and so on). Each of these offers several display options which vary in resolution (number of pixels) and number of colours.

Most PC modes are 640 pixels across, so let's take this as an example. When you run a PC program on your Arc, the screen is 'mapped' to the first 640 pixels across the window. If the desktop on your Arc happens to be in Mode 12 or 20 (also 640 dots wide), the emulator window will fill the width of the screen and all of the PC screen, except the bit under the window frame, will be visible. In a mode 16 desktop (1056 dots across),



Eight-bit astronomy is still very much alive and well

the same 640 pixels will only occupy 61 percent of the screen width.

Conversely, if you use a Mode 2 desktop (160 pixels wide), though goodness only knows why you should, the window will only hold a quarter of the PC display at one time. Similar problems occur with conflicting heights.

If a particular program does not fit your screen,

there are two things you can do. First, many PC programs can be configured for different IBM screen modes, so you can try resetting the program to an EGA or VGA mode that is more appropriate to your desktop.

Failing this, you can use *Configure WimpMode to change the desktop mode to something that better matches the software under emulation.

Q I have recently taken an interest in astronomy. Is there any software that covers this subject for an eight-bit machine (Master series)?

K.L. Shenton
Stoke on Trent
Staffordshire

A There's a fair amount of astronomy software about for the Beeb, particularly in the educational sector. This includes simulations of planetary motion, adventures and key datafiles aimed at project work.

Probably the most interesting astronomy programs are those which plot maps of the night sky like those published each month in *The Times*. The beauty of using a computer for this is that rather than working from a general map for a whole month in London, the machine generates an accurate image for a precise time and place.

Check out *Starmap* from Heinemann which is listed, along with ten other astronomy programs for various formats, in AVP's *Big Black Catalogue*. You can contact AVP on (0291) 625439.

CUSTOMER HOT LINE



Every month in BAU, Alan Glover from the Acorn customer service department offers you Acorn's advice and support

MANAGING OUTLINE FONTS

The Outline Font Manager is provided as standard with Risc OS 3, and can be used with Risc OS 2, although it is not a part of the built in OS Rom.

There are a number of configuration settings available which allow you to tune the performance of the Outline Font Manager to best suit the way that you use your system.

It is important to ensure that an adequate amount of space is allocated for the font cache. This is an area of memory used to hold font data within the computer's memory rather than having to go and fetch it from disc each time it is needed. The initial size of the area after a reset/power on can be set with *Configure FontSize <number>K (or by using *Configure*). Even if you only make minimal use of fonts, you should always ensure that there is some font cache available to the system. The optimum setting to use depends upon the degree to which you use fonts.

A useful yardstick is to put aside around 64K to 128K per megabyte of memory in the computer so, on a 2Mb machine, the setting would be between 128K and 256K. The maximum setting is 1024K. Intensive font users may wish to use 256K per megabyte instead.

However setting the size of the font cache is not the end of the story. The next decision to make is where to place the tradeoff between high quality anti-aliased characters and memory consumption/performance.

Anti-aliasing consists of determining how much of a character outline occupies a given pixel. This information is used to choose a colour between the foreground and background colour to represent it (this is

typically a range of greys between black in the foreground and white in the background). The result of this is that characters will look much less jagged and more pleasing to the eye. However, calculating anti-aliasing takes time, so there is a tradeoff to be made. You can also decide at which size of character anti-aliasing should not be used since the character has become large enough not to require anti-aliased pixels.

These settings are controlled by the five FontMax configuration values. Risc OS 3 users may alter them by using *Configure*. Any Risc OS user can change them by pressing F12 and typing 'Configure FontMax<n> <value>'. <n> is the fontmax number (1-5) and <value> is the point size.

Fontmax2 and FontMax3 (described as 'Use anti-aliasing for characters' and 'Use cached bitmaps for characters' in *Configure*) jointly set the maximum point size of character which will be drawn using anti-aliasing. If the point size used is larger, it will be scaled directly from the outlines without being anti-aliased. Set both of these to the maximum point size that you want anti-aliasing to be used with.

Note: The above is a great simplification of the real situation; those interested in reading further should consult the *Risc OS 3 Programmer's Reference Manual*.

POCKET BOOK AND A-LINK

The Acorn Pocket Book A-Link reviewed in last month's BAU, allows you to transfer data between a Pocket Book and an Acorn 32-bit computer, and consists of a hardware link and a software application which runs on the 32-bit workstation.

However, because A-Link has advanced features which aim to make it easy to use it needs Risc OS 3 (Version 3.10 or later). This is provided as standard with new A3010, A3020, A4000, A5000 and A4 computers, and is available as an upgrade to existing Archimedes owners.



Art Works

Clip Art COMPETITION



Any type of drawing or illustration is acceptable. It could be purely illustrative, a technical drawing, a company logo or practically anything created with ArtWorks.

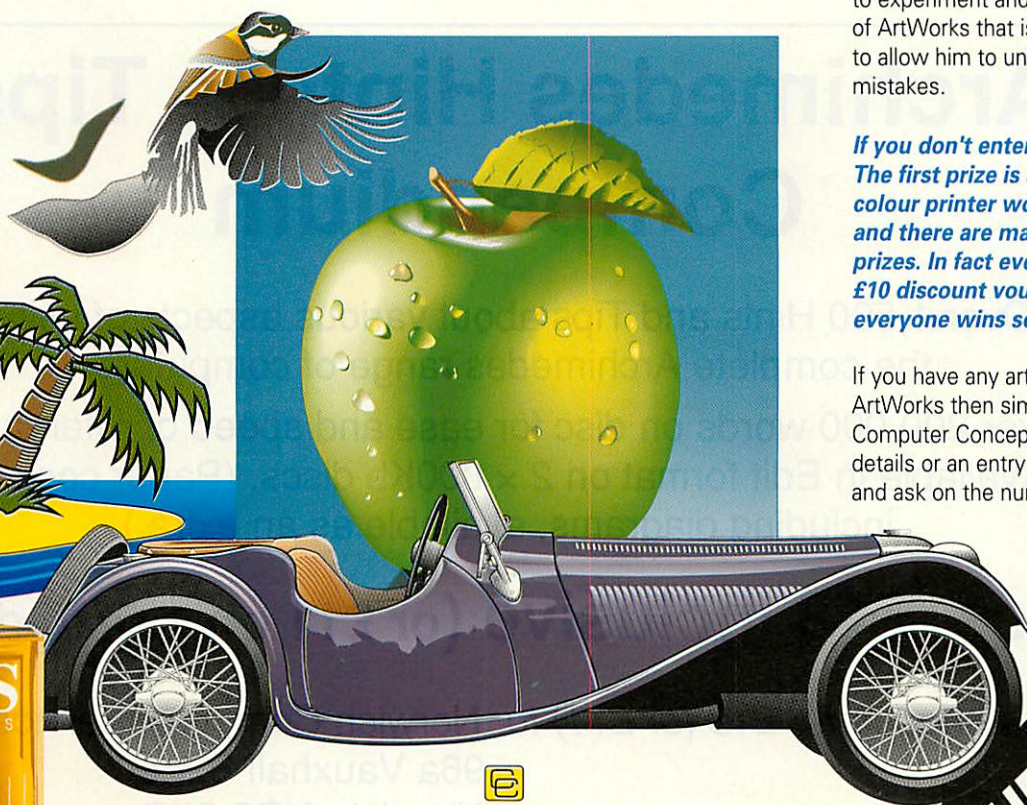
We are running a graphics competition, open to everyone who has a copy or has access to a copy of ArtWorks

You do not have to have any great technical or artistic skill. A simple but visually pleasing design is just as likely to be a winner as a complicated technical illustration.

And don't be put off if you think you are not artistic - you can still win. ArtWorks means that with patience anyone can create good drawings. After all, the ArtWorks apple was created by someone with hardly any artistic ability (the MD!) - just the patience to experiment and of course a copy of ArtWorks that is forgiving enough to allow him to undo his many mistakes.

If you don't enter you can't win. The first prize is a Canon A3 full colour printer worth nearly £1750, and there are many runner-up prizes. In fact every entrant gets a £10 discount voucher, so everyone wins something.

If you have any artwork produced using ArtWorks then simply send it to Computer Concepts. If you want more details or an entry form then just ring and ask on the number below.



Computer Concepts Ltd

GADDESSEN PLACE HEMEL HEMPSTEAD HERTS HP2 6EX
TEL: 0442 63933 FAX: 0442 231632

HURRY!
COMPETITION CLOSING 30th APRIL 1993

36 Park Rd,
Duffield,
Belper,
DE56 4GR

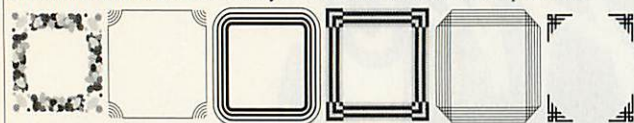
Smart DTP (0332) 842803

NEW Products FROM Smart

Smart Borders 2

£9.95

Over 200 border designs for use with Impression 2. Ideal for the business, school and home user alike. Treat your documents, for less than 5p a border



Smart Borders + Artworks £11.95 Draw £9.95

150 Border designs, available in !Draw and !Artworks format.

Smart Works

£7.95

A must for every !Artworker this two disc package includes moulds, user manual support files, examples & extras

Smart Resources 2 Artworks £11.95 Draw £9.95

No acorn user should be without smart resources 2, two discs packed with vector art..... Stretch, Squash, Rotate, Expand without any loss of detail. Featuring:- Arrows, Borders, Corners, Drop capitals, Flashes, Rules, Symbols, Speech & Think bubbles & general clipart. !Artworks or !Draw format.



BudgetArt

£17.95

A massive clipart collection (Draw & Sprites), 5 compressed clipart discs including, over 380 pieces of clipart. 20+ topics ranging from animals to musical instruments

Suitable for all 32-Bit Acorn's

Please make cheques payable to Smart DTP, also add £1 for P&P (FIRST Class)

COMPUTER CONCEPTS

COLOUR CARD

NOW AVAILABLE AT ONLY - £219.00

COMPUTER CONCEPTS

LASER DIRECT HIRES 4

NOW ONLY £839.00

THE FULL RANGE OF NEW COMPUTERS FROM ACORN

	phone for best prices		
Computer Concepts		Calligraph TQ 1200	
FaxPack	£ 255.00	Very High Resolution	£4250.00
Laser Direct HiRes 8	£1250.00	Scanlight Professional	£ 509.00
BJC 800 Colour printer and driver and lead	£1665.00	Scanlight A4 with sheetfeeder	£ 345.00
BJ10ex printer, + turbo driver and lead	£ 219.00	Scanlight Junior 256	£ 179.00
Calligraph 600 - 4 ppm	£ 825.00	ARTWORKS	£ 129.00
Calligraph 600 - 12 ppm	£1299.00	Impression 2.1	£ 119.00
Express Laser Printer		Impression Junior	£ 65.00
		Impression Bus. Supp.	£ 35.00
		Compression	£ 35.00
		Pipedream 4	£ 148.00
		Squirrel Database	£ 109.00

PRICES ARE EXCLUSIVE OF V.A.T. AND POSTAGE

FOR THE BEST PRICES ON THESE AND YOUR OTHER HARDWARE / SOFTWARE REQUIREMENTS PLEASE PHONE US ON 0689 838819

CHELSEFIELD PUBLICATIONS,

2 BUCKS CROSS COTTAGES,
CHELSEFIELD VILLAGE,
ORPINGTON,
KENT. BR6 7RN

TELEPHONE 0689 838819

FAX 0689 872127

Archimedes Hints & Tips Compendium

Over 1,500 Hints and Tips about various aspects of using the complete Archimedes range of computers.

Over 200,000 words on disc for ease and speed of reference.

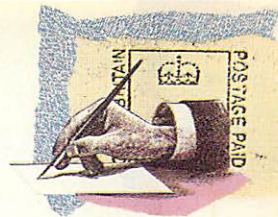
Available in Edit format on 2 x 800Kb discs. (Paper copies, including diagrams, available as an extra.)

Price: £13 inclusive (or £11 on 1.6Mb disc)

Send a cheque for £13 (or £11) to: Norwich Computer Services
96a Vauxhall Street
Norwich NR2 2SD

Phone 0603-766592

Fax 0603-764011



£15 STAR LETTER

I am at the moment a subscriber to your magazine, and I have got complete sets of every volume published. I get enormous pleasure reading through all the back issues, but sadly I am still a BBC B owner and I must say I cannot understand how or why you call yourself a Beeb magazine.

If you cannot improve on the coverage you have at the moment, perhaps you could do yourselves a favour by publishing programs from magazine discs a few years back when you really did support the Beeb, long before this new fangled 32-bit stuff came along. Your comments would be most appreciated; thanking you for the support that we once enjoyed.

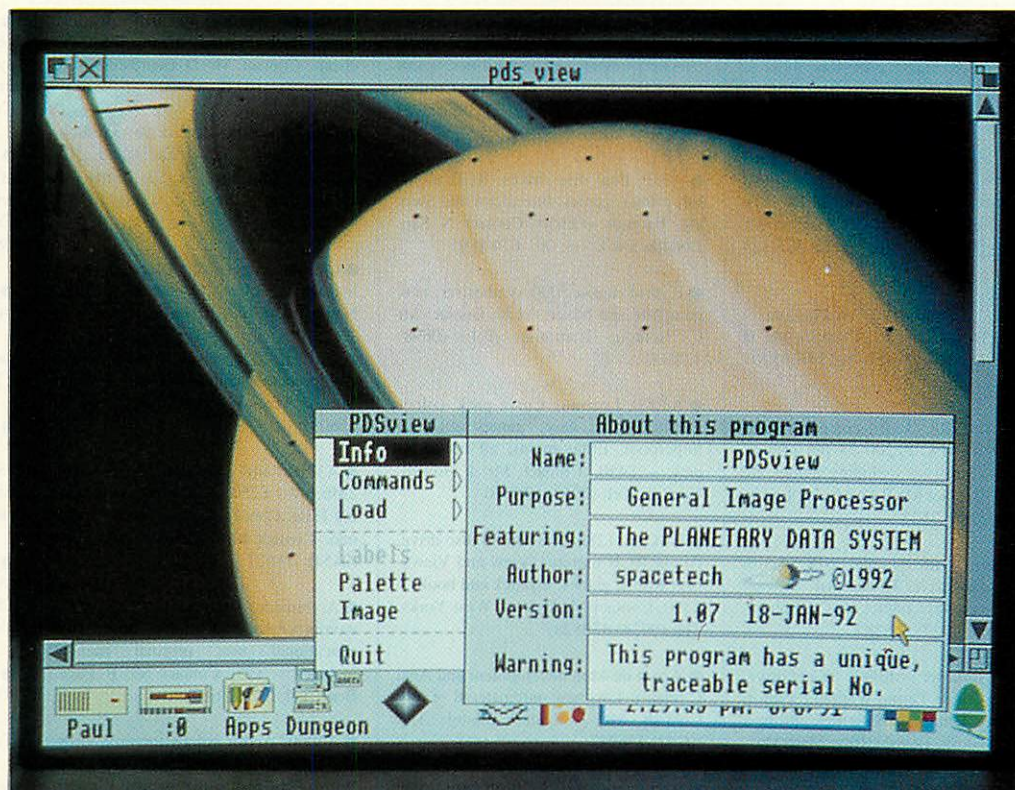
T Parsons
Bedfordshire

I think it's time for us to bite the bullet as far as all you eight-bit owners are concerned. Consider the situation:

- There are virtually no new products released for the eight-bit range.
- The fact that the eight-bit technology has been around for nearly 12 years means that there are precious few original ideas floating around these days.
- The vast majority of our readers use 32-bit machines as their main machines (although a lot of them still have eight-bit machines).

There's no getting away from the fact that there is far more to say about the 32-bit range, but that isn't the only reason for our lack of eight-bit coverage. The problem is that we are sent almost no programs for the Beeb, and therefore we can't publish much for the old machines.

So here is the solution. Send us your contributions and we will publish them. There are still a lot of eight-bit users out there, and the Master is still sold as a new machine, so don't leave us in the dark. We still want to publish software for the eight-bit range, but we need your input.



PDSview: it digitises the parts that other astronomical programs can't reach

CONFIGURE KILL

In response to Ralph Edwards' letter in the March 93 issue, I would like to offer the following advice. In order to disable the 'little angels' from using the *Configure* application, simply press F12 and type *Unplug *Configure* to remove the *Configure* module. A less permanent way is to *RMKill the module, say from a boot file. For both methods the module can be reinstated by typing *RMReInit *Configure*.

Mr Edwards also asks about the scrap directory. A way of getting round his problem is to use the Ram disc as the scrap directory. To set up the Ram disc in this way, simply copy the *Scrap* application into the Ram disc and double-click on it. In this way his application discs can be write protected.

On the third point about the Applications folder appearing on start-up, this must be due to having a command in the boot file which opens up the directory. To prevent this from happening, he should edit his boot file and remove the line which says `File_OpenDir Resource:$Apps`.

I McLaren
Edinburgh

Many thanks to Mr McLaren and all those who sent in replies to Mr Edwards' letter. A couple of other points which were raised by readers were:

- You can unplug any of the Rom applications by using (for example) *Unplug !Draw to remove the relevant modules.
- To remove the whole Apps folder from the icon bar, type *Unplug ResourceFiler.

ANOTHER STAR LETTER

Please pass my thanks on to Fin Fahey for *SkyWatcher* in the March issue of Acorn User. This would be a really incredible piece of software if, when you zoomed in on well known planets, a few details of the planet were given; perhaps they could be digitised.

R Fairburn
York

You may be interested in *Orrery* or *PDSview*. Both contain digitised details of the planets, as well as much, much more. *Orrery* was reviewed in March 91, and *PDSview*, August 92. Contact Spacetech on (0305) 822753 for more details.

FORTRAN LIVES!

I was glad to find a fellow believer (N Ellis, Q&A October 92) who thinks the Arc is a great tool for numerical and scientific programming. But why is he thinking of spending £200 on a C compiler when Fortran programs to design optical systems have been around for 30 years?

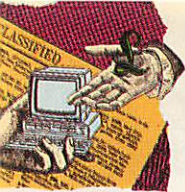
Why not just transport these? It would be significantly cheaper to buy Acorn's Fortran 77 compiler, and Archive's Shareware 44 disc, which contains a Desktop Development Environment front end and libraries.

K Crennell
Oxfordshire

WAIT AND C

In March's letters, you mentioned that Acorn were looking at Cfront 3.0. I am currently porting the GNU C/C++ compilers to the Arc, and hope to have these ready soon. I am looking for beta testers; if any of your readers are interested, please write to me, at the address below.

S Callan
2 Malden Road
Borehamwood, Herts



FREE ADS

● Electron 64 k Turbo, Plus 3, Plus 1, sound expansion, games, View, Viewsheets, books, mags, plus lots more – £200 ono. Contact Mr A Gilfillan, Nottingham. Tel: (0602) 617529

● Sesi interface and 47Mb Worru Winnie (Oak) external hard drive for most machines, excellent condition, rrp £550+, selling for – £450. Contact Mr N Piggott, Longsight. Tel: 061-225 5312

● Acorn Cambridge Workstation – offers? Buyer collects. Contact Mr D Ingles, Lancaster. Tel: (0524) 65201 x2325

● A3000, 2Mb, Acorn colour monitor and stand, NEC P2200 24 pin printer, manuals, software including games etc – £750. Contact Mr B Parkhurst, Leeds. Tel: (0532) 757523

● Electron with Slogger 64k, Acorn Plus 3, disc drive, 34 discs of software – £110 inc p+p. Contact Mr C Oliphant, Kent. Tel: (0227) 368287

● BBC Master, 40/80 disc drive, mouse, Quest, Paint, Wapping Editor, SuperArt, Dumpout 3, games, utilities, twin joysticks, Logo, Office Mate/Master – £300. Contact Mr G Davison, Coventry. Tel: (0676) 34853

● BBC B, immaculate condition, sideways Rom board and many Roms, twin 5.25in 80 track disc drives, Philips mono monitor, other accessories, software, manuals – £200. Contact Mr J Rayfield, Bucks. Tel: (0753) 653466

● A310 Watford Electronics 2Mb Ram upgrade (plug-in) – £75. Contact Mr M Glass, Huntingdon. Tel: (0480) 434184

● Master 128 with internal second processor, dual 40/80 disc drives, modem, green screen monitor, View, Viewsheets, Viewstore, Interword, all manuals and many discs and magazines – £350 ono. Contact Mr G Banyard, Harrogate. Tel: (0423) 870978

● BBC B, colour monitor, recorder, twin drives, Watford Rom/Ram board (full), Replay, Teletext, manuals, books, games, excellent condition, boxed – £325. Contact Mr I Twisleton, Northampton. Tel: (0604) 845257

● Master 128, 40/80 twin drives, colour monitor and swivel base, Quest Rom and mouse, some disc software – £375 ono. Contact D Shilladay, Selby. Tel: (0757) 705558

● A310 basic model, software includes Graphics Writer, Logistics, Artisan, PC Emulator and games plus programmers reference manual – £350. Contact Mr G Cutting, Herts. Tel: (0923) 856663

● A410/1, 2Mb Ram, colour monitor, 40Mb hard drive, internal 3.5in disc drive, 5.25in drive and interface, hand scanner, Impression II – £1000, Panasonic KXP1124 – £125, all excellent condition. Contact Mr M Shields, Cheshire. Tel: 061-973 1894

● Master 128, boxed with 40/80 double sided disc drive, wordprocessor, Spell checker, spreadsheet and utilities, worth over £550, bargain – £250 ono. Contact Mr P Winter, Surrey. Tel: (0372) 452036

● A310, dual disc drives, RGB monitor, printer, games, Interdictor and Swiv etc, bargain – £650. Contact N San, London SW4. Tel: 081-674 8895

● Hybrid music 5000 synthesiser, new complete and boxed – £70. Contact Mr C Benton, Hamilton. Tel: (0698) 428907

● A3000, Learning Curve pack, colour monitor, disc case, games such as Superpool, Elite, extras, all boxed as new – £450. Contact Mr J Howell, Norfolk. Tel: (0953) 605640

● BBC B, 128k DFS, 40/80 disc drive, colour RGB monitor, View and Viewsheets Roms, games, joystick and books – £300. Contact Mr D Stott, West Yorks. Tel: (0924) 430828

● Acorn desktop development and Ansi C release 4, as new unregistered – £160. Contact Mr J Evans, Bristol. Tel: (0272) 736237

● Archimedes 410/2, 20Mb hard drive, 2Mb Ram, external 5.25in floppy, manuals, software, boxed – £775. Contact B Sharrock, Westhoughton. Tel: (0942) 815952

● BBC B and single disc drive, tape deck with Watford DDFS board, Basic II, Wordwise, Watford DFS and discs – £115. Contact Mr N Johnson, Lincs. Tel: (0282) 413596

● BBC master 512, Gem software, disc drive, monitor, all manuals – £350, new unused Star LC/20 printer – £85. Contact L Blackburn, Severn. Tel: (0299) 824476

● Risc Os 3.1 for A3000 (ALA 31), unused – £40, also Acorn DTP – £30, PC Emulator (V1.7 Dr Dos 5) – £50, 1st Word V2 – £25, unused. Contact Mr G Wallace, Inverberue. Tel: (0561) 62452

● Integrex colourjet 132 printer, for high quality colour work (cost £700+) – £320 ono. Contact Mr M Wilson, Somerset. Tel: (0935) 25974

● Scanner, Watford AHS-3, 16 grey-scale for A3000, little used, complete with manual – £110. Contact A Singleton, Kent. Tel: (0580) 753431

● Wanted: Book 'Lisp on the BBC Microcomputer', in good condition please. Contact Mr A Milne, Aberdeen. Tel: (0224) 742234 after 8pm and weekends

● Master 512, green monitor, 5.25in and 3.5in disc drives, Panasonic KXP1180 printer and stand, Accelerator, Dumpout 3, manuals for everything, games – £550. Contact Mr G Cranch, Bath. Tel: (0225) 314126

● Wanted: Printer for BBC B, any other Beeb related items, must be cheap. Contact Mr D Beardsmore, St Albans. Tel: (0727) 839908

● BBC B, 40/80 disc drive, joystick, colour monitor, cover and stand, 50+ discs, all manuals – £150. Contact P McLaughlin, Sevenoaks. Tel: (0732) 450650

● Complete set of Electron User magazines – offers. Contact R Harrison, Notts. Tel: (0777) 703601

● BBC B, 32k, Issue 7 with View, wordprocessor chip – £85 ono. Contact Mr A MacEod, Herts. Tel: (0279) 656082

● A3010 Family Solution, upgraded to 2Mb, over £250 of free games including Elite, Chocks Away, a cool – £450 ono. Contact Mr J Black, Avon. Tel: (0454) 418627

● Archimedes Pendown – WYSIWYG wordprocessor, ideal for home and educational use, original manual included – £25. Contact Mr B Page, Beds. Tel: (0767) 680890

● A3000, Acorn colour monitor, original manuals and application discs, 1st Word Plus and some games – £450, Star LC 10 printer – £75. Contact Mr M Steward, Huddersfield. Tel: (0484) 654368

● 5.25in disc drives, two Acorn double drives – £38 each, one Acorn single drive – £25 ono. Contact R Goodyear, Rothwell. Tel: (0536) 712370

● BBC B, DFS, 80/40 dual drive, double plinth, colour monitor ono – £250. Contact Mr J Jones, Surrey. Tel: (0372) 378135

● A3000 base, 2Mb Ram expansion, new 20Mb IDE, handscanner TV Modulator, joystick interface, five games, original manuals and application discs – £650. Contact M Beezh, Watford. Tel: 081-428 7399

● BBC B, green screen monitor, NLQ 9-pin printer, 40/80 dual disc drives, manuals, wordprocessors including View A3.0, magazines and software – £200 ono. Contact Mr P Mitchell-Gears, Surrey. Tel: (0737) 556863

● A3000 C development system – £60, original BBC B games, hardly used, 40/80 disc drive, all – £25, UIM, Thrust, Citadel, Graphic adventure Creator. Contact Mr P Bussey, Beds. Tel: (0582) 459535

● A310, 40Mb hard disc, 2Mb Ram, Mem CIA, new keyboard, twin Editor, books some software – £350. Contact Mr A Duplain, Brighton. Tel: (0273) 738913 eve

● A3000, 2Mb Ram, Risc Os 3, joystick interface and joystick, colour monitor, Learning Curve, games, lots more – £750. Contact Mr D Kirkham, Tyne and Wear. Tel: 091-253 1883

● Master 128, LC200 colour printer, colour screenprint Rom, Music 5000 synthesizer, colour monitor, 5.25in disc drive, software and manuals – £530. Contact B Wright. Tel: (0279) 655778

● Watford CDPM800S twin 5.25in 800k double sided 40/80 disc drives with power supply unit in plinth – £75. Contact Mr R Young, Middlesex. Tel: 081-427 4039

● Master 128, single 40/80 disc drive, mono monitor, mouse, software, books – £250, Spellmaster Rom – £20. Contact Mr A Stevens, Gosport. Tel: (0705) 528296

● A5000, 4Mb 80 hard drive, Risc Os 3.1, Learning Curve, hardly used, excellent condition, reluctant sale – offers please. Contact Mr R Reed, Surrey. Tel: (0784) 434927

● Good Impression – DTP book with three discs, only – £15, All in Boxing – £5. Contact Mr A Howat, Merseyside. Tel: (0704) 63344 eve only

● A3000, Acorn colour monitor, 2Mb Ram, mint condition, still under GTTE – £500. Contact Mr S Hewitt, Clwyd. Tel: (0492) 545533

● A410/1, 4Mb Ram, 20Mb hard disc, colour monitor, Arm 3, Risc Os 3, floppy interface, 9 pin dot matrix printer – £1000. Contact Mr I Stewart, Liverpool. Tel: 051-734 5989

● Dr Dos 512k board for BBC Master (or BBC B with expansion box), including Gem, manuals etc – £75. Contact Mr Newmans-Brown, Bedford. Tel: (0234) 856070

● Wanted: Laser Direct interface board by Computer Concepts or Calligraph for Canon LBP-4 laser printer, also required Archimedes software and accessories. Contact Mr N Duffield, Coventry. Tel: (0203) 445174

● Programmer's reference manuals for Archimedes Risc OS 2, boxed, good condition – £30. Contact Mr D Wright, Leeds. Tel: (0532) 439736 after 6pm

● Master 128k, Microvitec colour monitor, Cumana 40/80 disc drive, AMX mouse and SuperArt, games – £300 ono. Contact Mr W Dixon, London N1. Tel: 071-266 2011

● Watford double sided 3.5in disc drive without power supply unit – £25. Wanted: Winchester hard drive for Master 128. Contact J Lampard, Wilts. Tel: (0722) 331442

Due to a mighty backlog of free ads, there is no coupon this month. Please do not send in any ads until the coupon reappears. Until then no ads will be accepted.

ARM3 upgrade with floating point accelerator option

The first ARM3 upgrade to allow a floating point accelerator chip to be connected directly to the ARM3's 32-bit coprocessor bus. The 25MHz ARM3 itself increases the speed of your computer by a factor of at least 3, and sometimes even more. In addition the floating point chip speeds up maths operations previously emulated by software.

Other floating point units have the disadvantage of occupying a slot in the backplane. They are also either incompatible with ARM3 boards, or relatively slow due to the 16-bit backplane interface. This upgrade does not suffer from any of these disadvantages.

- ★ **ARM3 alone gives typical 3 to 4 times speed increase**
- ★ **Floating point accelerator chip option for even faster maths functions**
- ★ **High quality 4-layer board**
- ★ **Fits A305, A310, A440, 400/1 series and the A3000**
- ★ **Fully compatible with other upgrades (memory, hard discs, RISC OS 3 etc)**

Installation is straightforward for all machines except the A3000, but a fitting service is available in all cases. Please note also that the A300 series and old A440 require the MEMC1a upgrade. Please write or phone for full details.

Our usual money-back guarantee applies to this product.

ARM3 introductory price - £175
MEMC1a - £36 Floating point unit - £ TBA

ARM3+RISC OS 3 - £199

A3000 memory

An easy to fit and reliable RAM upgrade. 8-chip design for minimal power consumption. **Gold plated** connectors ensure long term reliability. No soldering needed.

2Mb RAM board (upgradable to 4Mb) - £45
4Mb RAM - £110

Bare board (without RAM chips) - £25.50

A3010/A3020/A4000 RAM

These machines may all be upgraded by easy to fit, plug-in components. No soldering is required.

A3020/A4000 extra 2Mb - £55
A3010 extra 1Mb (2Mb total) - £29
A3010 - £424. A3020 2MB FD - £749
A4000 - £999

All products fully guaranteed. Many products also carry our 14-day money-back guarantee too. Please phone for details.

ARM3+RISC OS 3.10 combined package for £199

RISC OS 3.10

Acorn's new operating system for their range of RISC computers. The old version of RISC OS (2.00) is just 512K long, whereas OS 3.10 contains 2Mb of code.

Many applications which were previously supplied on disc are now contained in the OS ROMs. This includes improved versions of Draw, Paint and Edit. Because they are available on ROM they are always instantly accessible, and also occupy less RAM space.

Other features include extra "background" operations. For example, discs can now be formatted or files copied while the machine is used for other purposes.

RISC OS 3.10 may be used on the A305, A310, A440, 400/1 series, A3000, A540 etc.

Orders for RISC OS 3.10 are now being taken on a first-come first-served basis. Phone 0752 847286 for further details.

RISC OS 3.10 £41.70

A305, A310 and A440 owners please note.

Although the ROM sockets inside your machine are large enough to accommodate the new ROMs, simply plugging in RISC OS 3.10 *will not work*. This problem is overcome by installing the RISC OS Carrier Board first. The RCB may be used with any version of RISC OS. This carrier board is compatible with memory boards, ARM3 upgrades and does not in any way obstruct expansion cards ("modules").

RISC OS Carrier Board £20

A5000 systems & memory

A5000 with RISC OS 3, 40Mb hard disc, multisync monitor and ARM3. - **£1399**.
A5000 learning curve. - **£1445**.
Free 4Mb RAM upgrade included in the price.

2Mb memory board (4Mb total) - **£85**
A compact board measuring just 104mm by 49mm, this design fits vertically in your machine. No soldering required. Unlike larger boards, there is no need to remove the disc drive. Four-layer design as specified by Acorn. A bare board (ie without the RAM chips fitted) is also available.

Hard disc upgrades

A range of fast (17ms) SCSI hard discs with a two year warranty, in sizes from 52Mb upwards. Supplied with all metalwork and cables. 400/1 machines merely require the drive and SCSI card. 300 series require a backplane.

40Mb - £POA 85Mb - £220
100Mb - £260 170Mb - £320
Oak 16 bit SCSI card - £100

Various

Aleph One 386 1Mb PC Card - **£390 (4Mb £475)**
Aleph One 486 1Mb PC Card - **£490 (4Mb £575)**
Impression 2 - **£130**

Free price list available upon request.
Prices exclude VAT.

A310 & A305 upgrade column

Memory expansion

Extra memory is without doubt the most worthwhile addition to any A300 series machine. Some programs won't even run with only 1Mb, and 2Mb is a bare minimum. Certain applications, desktop publishing for example, benefit from a 4Mb system.

2Mb - £89 4Mb - £145

Compatibility. The memory is detected and used by the machine automatically, so there are no special commands needed. Works with both RISC OS 2 and 3.10.

The use of only eight RAM chips ensures low power consumption. Compatible with ARM3 upgrades, backplanes, hard discs etc. This upgrade is supplied on just one, compact board measuring only 195mm by 40mm. Four-layer circuitry reduces electrical noise for trouble-free operation. The 2Mb upgrade may be upgraded to 4Mb later by the user, without any soldering. A copy of the fitting instructions is available free of charge.

A complete fitting service is available for our RAM boards covering courier collection, installation and testing, MEMC1a, return delivery and guarantee. This is normally a three-day service (eg, collected Monday, returned Wednesday). We have been upgrading 300 series computers for over three years, and during that time a reliability record second-to-none has been established.

Is there any other 300 series RAM upgrade which has been available for as long as this one, and which has the same reputation for quality and reliability? No.

Still not sure? Compare it with the competition before making up your mind. Use our 14-day money-back guarantee to check it out for yourself.

RISC OS Carrier Board £20

This is an easy to install adaptor board for the larger RISC OS 3 ROMs. A set of links on the board allows it to be used with RISC OS 2 and easily adapted for RISC OS 3 later. Suitable for use with the A305, A310 and A440. The adaptor has been fully tested with RISC OS version 2.00 and version 3.10. It is fully compatible with other hardware upgrades such as the RAM board described above, ARM3's, backplanes, VIDC enhancers and expansion cards.

4-slot backplane with fan £57

Combination deals

4Mb with MEMC1a, self-fit **£181**

Collection of your computer, installation of 4Mb of RAM, MEMC1a, and RISC OS Carrier Board, testing, full guarantee, and return delivery **£199**

Special prices available on hard discs, ARM3 boards and software when ordered with any memory upgrade. (RISC OS 3.10+ARM3 for only £199)

DTP special

Your A300 upgraded with 4 Meg of RAM, MEMC1a, ARM3, RISC OS 3 and Impression 2 software £485

We can supply a range of hard drives with the above system.

RAM for 410 & 420

Upgrade from 1Mb to 2Mb - **£34**
Upgrade from 2Mb to 4Mb - **£65**
Upgrade from 1Mb to 4Mb - **£99**
Supplied with full instructions.



IFEL Ltd

Educational and quantity discount available.

34 Culver Road, Saltash, Cornwall PL12 4DR. Tel (0752) 847286. Fax (0752) 840029

C.U. ELECTRONICS LTD

COMPUTERS, UPGRADES AND ELECTRONICS

Tel: 061 476 0576

Special Offer whilst stocks last

A3010 2Mb inc 21Mb H/D £559

A3010 2Mb inc 60Mb H/D £649

A3010 2Mb inc 84Mb H/D £679

Calling all A3000 / A3010 Users

21Mb Internal Hard Card £179

40Mb Internal Hard Card £229

60Mb Internal Hard Card £259

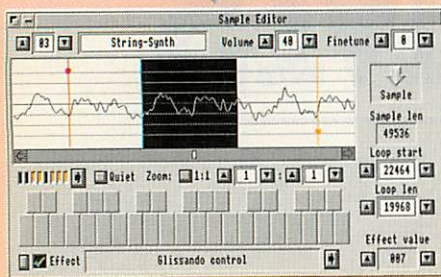
84Mb Internal Hard Card £289

65a Middle Hillgate, Stockport SK1 3EH. Prices exclude VAT & P+P

BBC ACORN USER MAY 1993 91

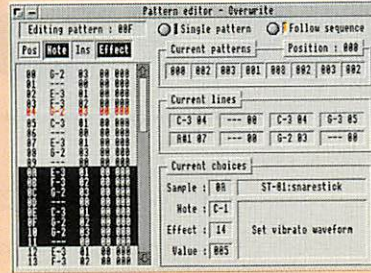
Digital Symphony

The Definitive
SoundTrack Editor

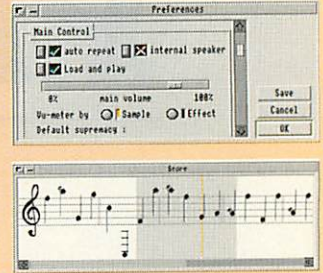


Built in Sample editor, allows you to Cut and Paste parts of the sample. You can try out any of the 40 different special effects, and define a repeat loop by dragging visual markers.

Powerful, deadly accurate, Realtime Monitor, displays Digital Score Data, Vu Bars and Instrument Waveforms.



The Pattern Editor, used in conjunction with the Musical Notation score display, makes editing a track very easy. Once created each pattern can be slotted into the sequence, wherever you wish. Cut and Paste, Copy, Transpose, Exchange, etc... facilities are offered to enhance flexibility.



...but we are not alone in thinking that Digital Symphony is the best ever music sequencer for the Archimedes. Read what Richard Hallas of Risc User said. - Apr 93

- "Every aspect of the program's implementation, and presentation is very polished, and classy."
- "Digital Symphony's facilities are sophisticated, extensive, flexible, and easy to use."
- "It is very difficult to fault this excellent piece of software. The facilities couldn't be better, and make it very easy to produce music quickly."
- "Altogether this is a first class product, which lives upto all the claims made of it."

Perfect ProTracker Implementation · MIDI Compatible
Compressed Files · 4096 Patterns · Score Display
Maestro Conversion · 40 Special Effects
100% ARM Code · OctaMED Import

Now with 100% Accurate Real-Time Midi Entry
and New Step by Step Tutorial Guide.

£49.95 INC

Upgrade from Tracker,
and Save 20%. Phone for details.



Oregan
DEVELOPMENTS

Oregan Software Developments
36 Grosvenor Avenue, Streetly,
Sutton Coldfield, B74 3PE.
Tel: 021 353 6044

Send an 800k blank disc, and a 1st class Stamp
for a Free Demo copy of either Package.

ARCHIVIST PRO

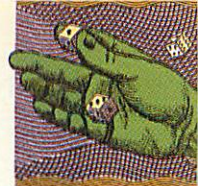
Display Textfiles, Sprites, and Drawfiles ■ Store and Play Maestros, Symphonies, Samples
Master cards created simply by dragging fields to position ■ Flexible label printing
Impression Impulse link ■ Incredibly fast Searches ■ User definable date and formula fields
Master card altered at any stage without data loss ■ Primary and secondary sorting
Fast search and replace ■ Clipboard facilities ■ CSV output with optional Graphbox headers
Print cards using outline fonts ■ Reports generator for quick tabular representation
Running Max, Min, Average and Totals statistics ■ Import from most existing databases

■ Six free exclusive Outline fonts & Demonstration files disc ■



£44.95 INC

The No Nonsense Database



History is replete with examples of ideas whose time has come. The printing press, quantum physics, double-entry book-keeping: all innovations that shattered conventional cultural and scientific paradigms.

Twenty years ago this year human minds were sent reeling by the appearance of an entire new technology that would deeply alter the lifestyles of millions of consumers.

That apparently innocuous product appeared under the humble name of *Pong*, the world's first successful commercial video game. It is hard to believe, but prior to 1973 computers were used only for trivial small-scale applications like defence, corporate book-keeping and scientific research.

All the life-enhancing aspects of computer technology that we take for granted these days – zapping aliens; pretending to be Fatima Whitbread; software piracy – were denied to the world prior to *Pong*. Hell, in those days people thought a joystick was something you burned to make your groovy crash-pad reek of patchouli oil, and a pixel was a Cornish fairy.

It's not easy to visualise the excitement that gripped a punter on first encountering *Pong*. In 1972, what you expected from a TV tube was passive entertainment, but this thing fought back; perhaps there some demon in there.

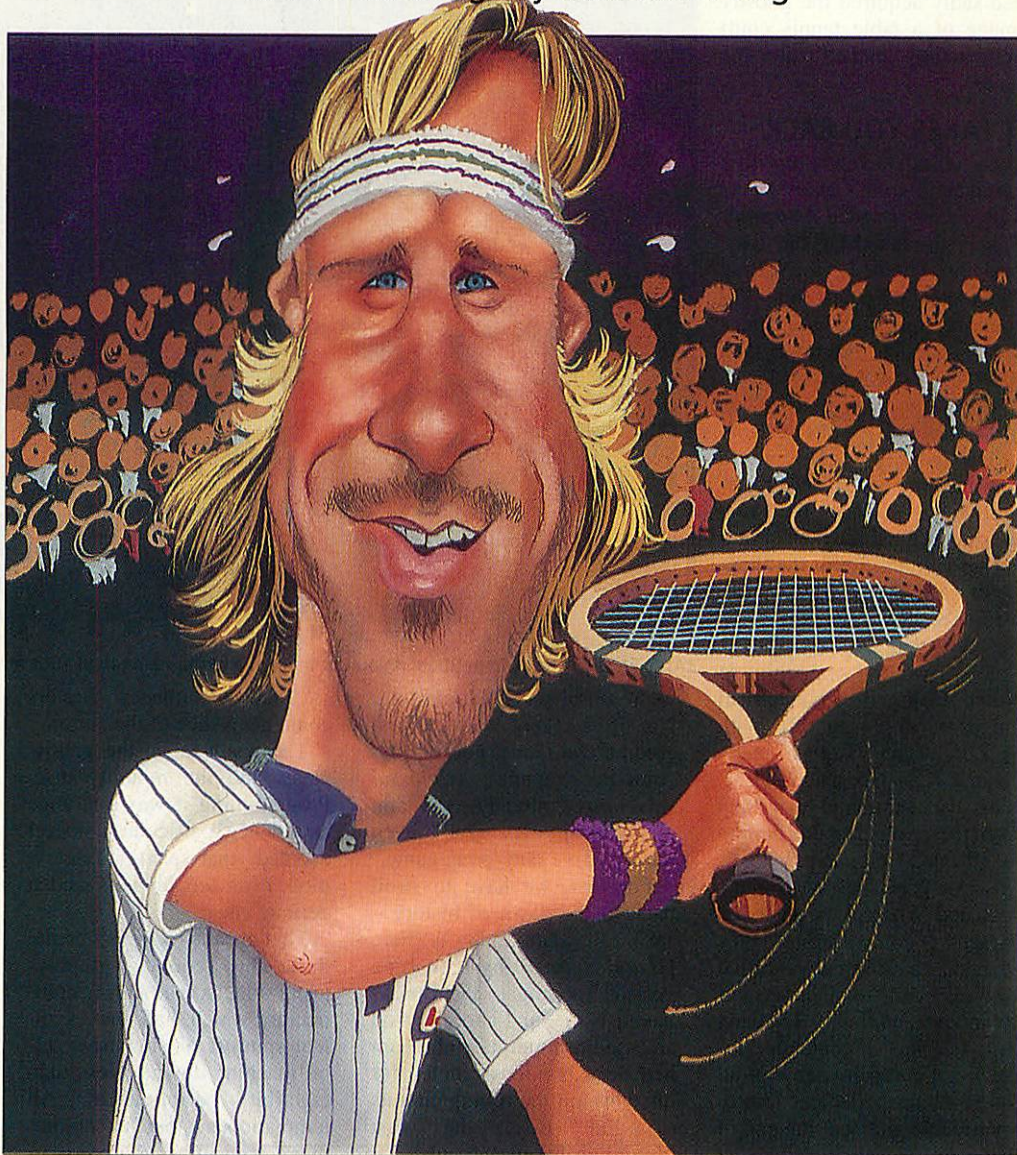
The first *Pong* was quite simply a no-frills two-person table tennis game. It offered a classic purity of concept; a black-and-white no-resolution display with two little knobs on the front, one for each player.

Game interaction was simplicity itself; you dropped in your shilling, dime or

BJORN AGAIN

You can learn a lot from history, or so Fin Fahey reckons.

Marvel at the glory that was Pong



MARK DRAISLY

whatever, twiddled the knob and a short, thick vertical line moved up and down the screen. This enabled you to deflect a tiny, rapidly moving dot in the direction, hopefully, of the other person's goal; then it was their turn.

But to the computer-starved world this was sufficient; no-one could get over the idea of a TV set that responded to you. Interactive video was born, laying the foundation of a leisure industry that is

now worth billions. *Pong* was also strangely addictive, the touchstone of a true computer game. Although pong-playing was necessarily defensive in nature, true *Pong* Jedis were rapidly to emerge.

To start with, computer-naïve punters would simply spin their bats (paddles) up and down the screen in an effort to create an impenetrable wall. A good player, however, developed an uncanny ability to compute trajectories and anticipate the

optimum intersection point of paddle and ball. This is the sort of skill that us modern game-players take totally for granted. Added to this was the use of backspin, the game's most advanced feature.

This meant that you could faze out your opponent by clobbering the ball with a moving bat, altering its course and speeding it up. Variants of *Pong* rapidly multiplied and when computer entertainment rolled out of the arcades and into the home, *Pong* was in the

first wave. The mid-1970s console boom was initially led by machines that were little more than home *Pong* consoles: little boxes with two knobs on.

The game may have led, in fact, to the introduction of the screen blanker; keen *Pong* junkies rapidly found that their state-of-the-art Sony Trinitrons had sadly acquired the ghostly image of a table tennis court permanently etched into the screen.

IT TAKES YOU BACK

Pong wasn't actually the first commercial video game. It had a predecessor called *Computer Space*, marketed by the curiously named Nutting Associates of California. For some reason, *Computer Space* didn't catch on, and fewer than 3,000 machines were made.

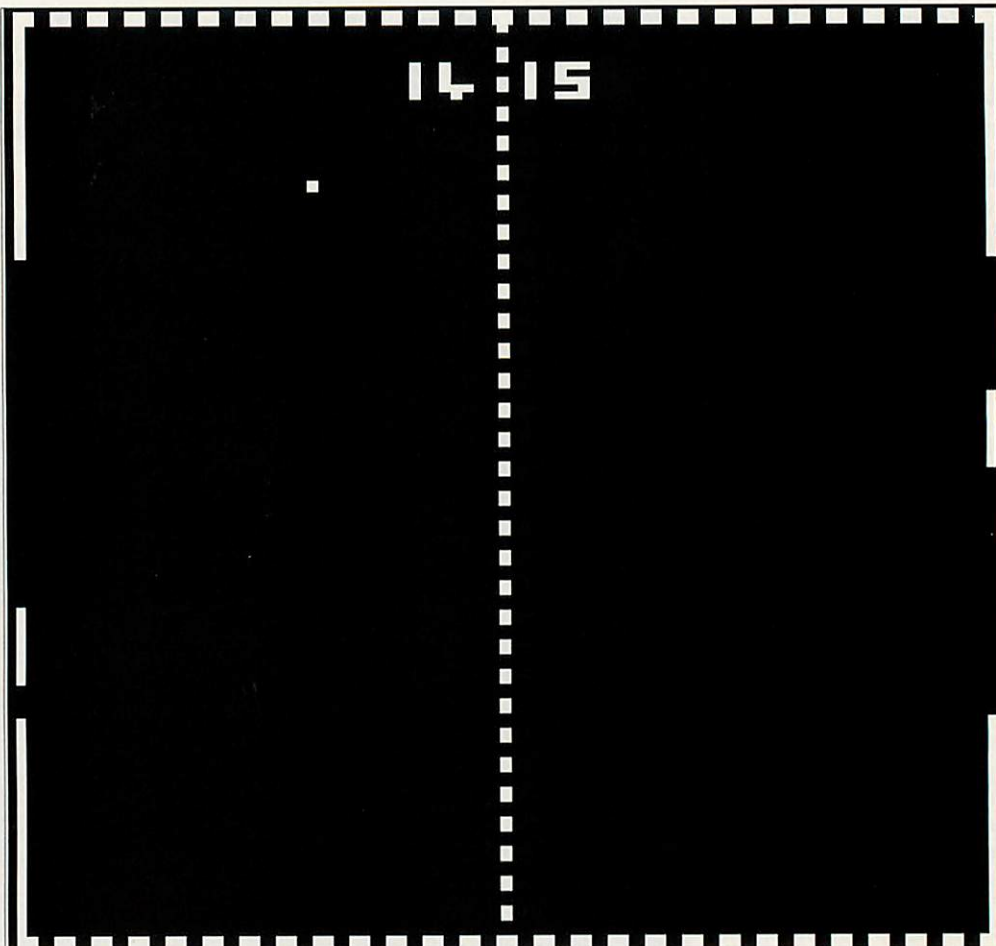
Computer Space lived on for a while as a console Rom called *Space War*. This was a very peculiar result since *Computer Space* was the first shoot-em-up; since then shoot-em-up variants are in the thousands and *Pong* has begat, well, *Breakout*, *Arkanoid* and, well, like that.

Pong was the brainchild of Nolan Bushnell, an electrical engineer who, together with his colleague Ted Dabney, created it in November 1972. It is also rumoured that they were the original brains behind the ill-fated *Computer Space*.

Some years before Apple's Jobs and Wozniak popularised garage computing, they founded a company called Syzygy with total assets of about five dollars. Realising that this was a contender for the worst company name of all time – unspellable, unpronounceable and near the end of the alphabet – they changed it in short order to . . . Atari.

Then came *Pong* and the money came rolling in, enough so that Bushnell could sell the infant Atari to Warners for \$30 million in 1976. Considering the company's current problems, that may be seen as very prescient indeed. Bushnell, however, was done with home entertainment.

He was last heard of running a fast food chain called Pizza Time Theatre that featured a giant rat called Chuck E. Cheese as a mascot. While



BAU's Spot The Ball competition; if you can think of a better name than Spot for this ball, you've got a problem

we're on history, that ain't all. No sirree. *Pong* was the first commercial game, not the first computer game (*Colossal Adventure* already ran on mainframes). It wasn't even the very first ping-pong game.

For that, we have to stroll back to the dawn of history – 1958 – when one William Higinbotham, a physicist, got a version running at the Brookhaven National Laboratory on an oscilloscope. Higinbotham had been previously noted for his work on the timing circuits of Fat Boy, the first plutonium-based A-bomb.

Finally, *Computer Space* itself had antecedents ranging back to 1972, when *SpaceWar* appeared at MIT, running on a PDP-1, a supercomputer of the time with an awesome memory of 9K.

THE FUTURE IS HERE

Gripped by a profound nostalgia and having long since given away my last 1975-vintage Philips games console to a luckless niece (cheap birthday present), I decided to recreate the 1973 megagame

so that Archimedes punters could get a slice of the action.

The result is on the yellow pages and the monthly disc. Programming it was a strange experience, particularly since I decided that using Teletext mode was too obvious and a definite cheat.

That meant trying to create those big chunky graphics using RECTANGLE FILL commands, which had the excellent spin-off of slowing a 32-bit machine down to less than eight-bit performance. All temptation to put in colour, nice scrolling messages, sprites, sample sound, high-score tables and so on had to be firmly resisted; harder than you think.

The result is probably not so much classic *Pong*, as *Pong* as I remember it; so if you've got better ideas, feel free to tailor the basic structure to your liking. I think the biggest problem is that, sadly, you can't get quite the right feeling with digital controls. What *Pong* really needs to do it justice is a couple of rheostats interfaced with a suitable analogue/digi-

tal podule. Perhaps some kind reader would like to supply a hardware solution?

Play is, of course, simplicity itself. Press a mouse button on the impressive title screen to start. Player one moves the bat up and down with the A and Z keys, player two uses Select and Adjust.

To leave the game, hit ESC. Each player starts with 15 points, and the first to zero loses. It just shows how far we've come; remember that the original *Pong* was written in machine code, and here we have a version written in an interpreted high-level language that has to be slowed down.

It almost makes you believe that realtime virtual reality is just round the corner. Almost. Beep-bloop-blip!

PRODUCT DETAILS

Product: *Pong* Console circa 1973

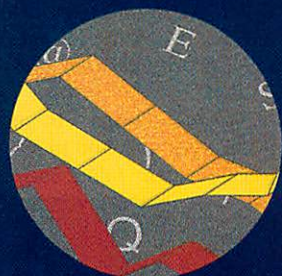
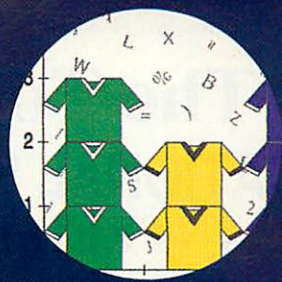
Supplier: Brick Lane, Arthur Daley or similar outlets.

Alternatively, turn to the Acorn User yellow pages or to the subscriber's disc

COLTON software

Coltonsoft Limited
2 Signet Court
Swanns Road
Cambridge
CB5 8LA
Tel: (0223) 311881
Fax: (0223) 312010

PIPEDREAM



PipeDream 4 word processing. Flexible word processing using fonts and pictures for stunning presentation, a 93,000 word spelling checker and user dictionaries for letter-perfect writing.

PipeDream 4 spreadsheets. Full background recalculation so *you* work while *it* computes. Over 160 built-in functions, plus programmability. External references for 3D models. The most dynamic and flexible charts package on the Archimedes. Spreadsheets link live into word processing. Other spreadsheets might do it one day - PipeDream does it now.

PipeDream 4 databases. Fast, compact databases with full sorting, searching and selection criteria. With links straight to

the word processor for printing mailshots and labels.


PipeDream 4 service. PipeDream 4 is fully backed up by our renowned telephone support service. The independent PipeDream user group, PipeLine, publishes regular magazine articles and disks for all types of user. No other Archimedes software has so much support.

PipeDream 4 ease-of-use. We listen to our customers and take feedback seriously. When you buy PipeDream, you buy the experience of tens of thousands of existing users.

"PipeDream 4 is more simple and versatile than the competition and remains the best option to go for." BBC Acorn User

PipeDream 4 getting your work done.

RRP £129+VAT. Call for education prices and site licences. PipeDream 4 is ideal for any computer running RISC OS 2 or 3 with 2MB RAM or more.

For a free  brochure, complete and return this coupon.

Name

Address

Postcode

AU/5/93

The Top Selling 10 out of 10 Series

EDUCATIONAL SOFTWARE SYSTEMS THAT REALLY WORK!
GUARANTEED to help educate children from 3 to 16 years of age



HOW THE SYSTEM WORKS...

A brief demonstration of the 10 out of 10 English package in action.



The games and menus are all mouse driven and easy to use.



The Main menu: Start by selecting New Player.



Pete's achievement chart is now set-up.



The Game Menu - Pete is ready to learn!



Each game has its own achievement summary...



... and a high score table to add to the fun!

THE 10 out of 10 SERIES is an innovative collection of educational software. It covers traditionally accepted educational concepts and automatically records progress in a wide range of areas - all linked to the National Curriculum.

Children learn - and are assessed - by playing cleverly devised games, each with SIX grades allowing the child to progress at his or her own rate. Where appropriate, the achievement tables show the correlation of the grades to the

National Curriculum statements. You start by entering your child's name. This automatically creates his or her blank achievement chart - the program can hold up to 64 of these (ideal for the average class or a large family).

Moving the mouse pointer around a chart you can discover exactly what a child will learn by playing a particular game at any grade. The achievement charts are automatically updated to record progress as the the six compulsive games are played.



Sniper: Rearrange the words - with correct punctuation.



Cover Up: Match all the words with their opposites.



Word Fit: Fill the grid - but only use verbs!



Grab It: There are plenty of collective nouns up for grabs!



Librarian: Sort the books, then match the adjectives.



Cheers: Discover the meaning of sayings.

THE SIX CHALLENGING GAMES in each 10 out of 10 package are designed to be played by a child alone, with friends or with you. Each game has six grades to cover a wide age range and include practise levels where appropriate - you can easily set many options to suit ability and taste too! You can even leave the child and return later to check progress.

Children work their way through the six grades of each game trying to turn the achievement chart green as they go. As an illustration, the screen shots

below show a middle grade of each of the six games in the English package - suitable for children at Key Stage 2 of the National Curriculum (age about 8 to 11 years).

Remember, all the games have five other levels and many features - such as graphics and speed - can be easily customised by parents or teachers. This flexibility makes 10 out of 10 English suitable for all ages and abilities from age six to sixteen.



Children can print a certificate of achievement...



... and they love to see their name on the high score table!



By pressing R you can see the aim of the game at a glance.



Each game has its own achievement summary.

MOTIVATION & ASSESSMENT are provided in two ways: an achievement chart displays academic results and high scores show gameplay. The former records progress as the games are played:

RED means help needed. **YELLOW** means practise needed. **GREEN** means 10 out of 10!

Now you can see where your child is not succeeding and use the various options to customise the games to help him or her progress more quickly. Children achieving 10 out of 10 in one or more grades can print a certificate - both on-screen and printed certificates are catered for. Children using the Early Essentials package are awarded stars too!

Pete's Achievement Record 10/10 English						
SUBJECT	Sniper	Cover Up	Word Fit	Grab It!	Librarian	Cheers
Spelling	4.2b.1	4.5.3a	4.5.6b	2.3c.2	2.2a.1	
Punctuation	3.3a.1			3.6b.2		3.7b.2
Nouns		3.3a.6	2.5e.3	3.4d.3	4.2c.2	
Verbs	3.8c.1		3.3a.1			3.3a.2
Adjectives		2.1b.1			3.4e.2	3.5e.1
Language use	2.7d.1	2.8e.1		2.7c.3		3.5e.1
Words	2.2a.1		4.2c.1	3.7e.4		2.5e.1
Pairs		4.3a.1	4.3a.2		3.7e.4	
Sound patterns		2.2e.2	2.5e.3		2.3d.3	3.8c.1
Figures of speech	2.7e.5			2.2f.1	2.7e.2	
3.3e.8 Simple use of past tense						
RETURN TO MENU						

The achievement chart shows progress. By moving the pointer you can view a layman's interpretation of Curriculum numbers.

GUARANTEED TO EDUCATE

... or you don't have to pay!

Our **FREE 14 DAY TRIAL** is exactly what it claims to be! We don't bank any payment until you've had chance to test the software for yourself.

YOU CAN TRY IT FREE - THERE IS NO CATCH!
TELEPHONE 0742 780370 NOW!

HOW TO ORDER ...

Each package is **ONLY £25.95** and you can order by **CREDIT CARD, CHEQUE or EDUCATION AUTHORITY ORDER**. We will send you the software by **First Class Post** without processing the payment. If you do not wish to keep the package simply return it to us within 14 days and we will return your **ORIGINAL** cheque or order or not process your credit card for payment. You need not even say why you are returning the package!

NO QUESTIONS, NO QUIBBLES, NO HASSLE

Order by Post or Phone from:

10 out of 10 Educational Systems

1 Percy Street, Sheffield, S3 8AU

0742 780370

Site and Network Licences are available - please ring for details

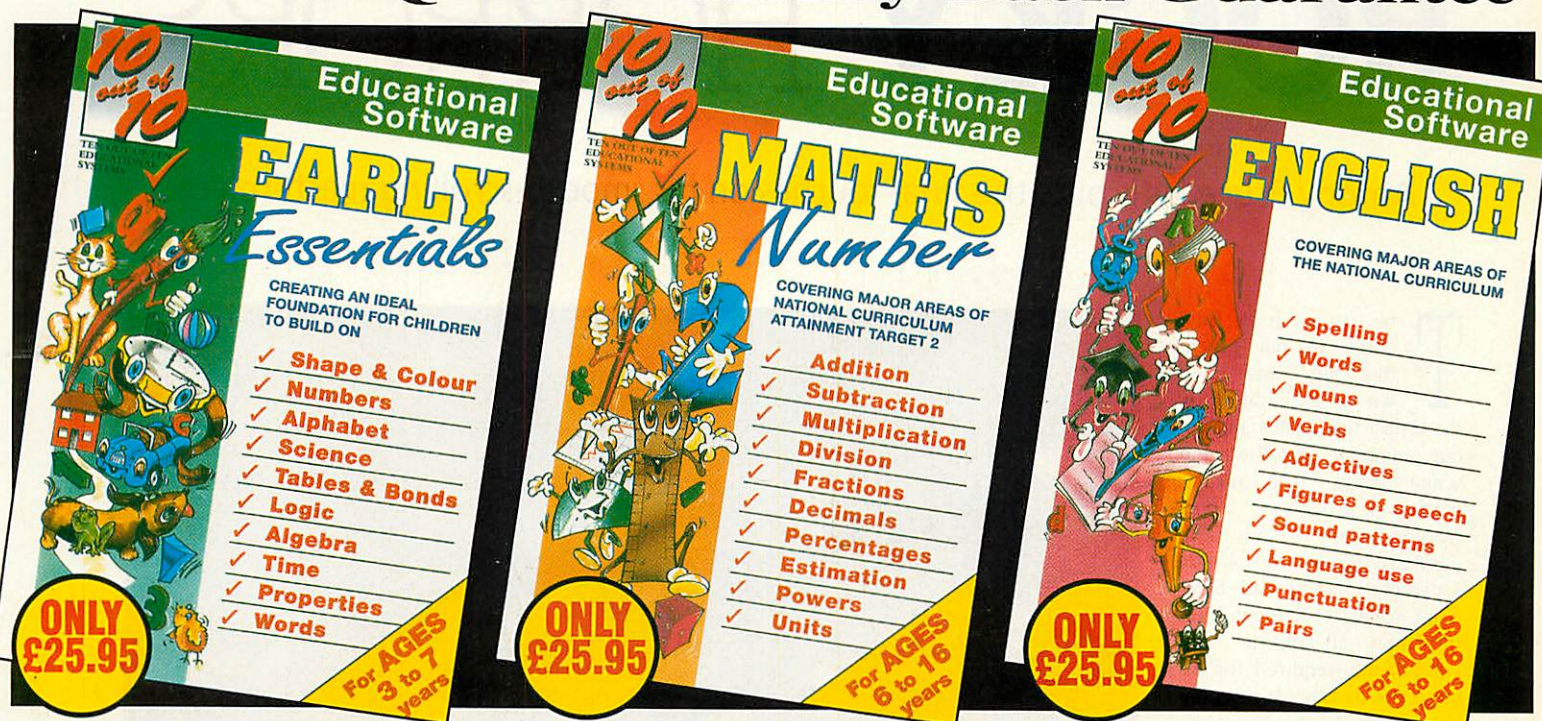


FREE ... A chance for YOU to TEST THE BEST on your Acorn, Amiga or IBM/PC ..



14-Day FREE Trial

No Quibble Money-Back Guarantee



Early Essentials

For Children Under 7 Years

Subject Areas Covered

Grashier	Grab It	Stones	Racer
G1 Recognise simple shapes and colours	Shape/Col	G1 Understand number conservation	Shape/Col
G2 Learn the order of the numbers 1 to 10	Numbers	G2 Stepping through the alphabet	Numbers
G3 Simple sequences including odd and even numbers	Alphabet	G3 Patterns of growing and shrinking shapes	Table/Bond
G4 Discover properties of common objects	Logic	G4 Learning to tell the time	Properties
G5 Experiment with numbers and operations	Table/Bond	G5 Practising number skills	Algebra
		G6 Using common sense to follow a sequence	Science
			G6 Accurate and rapid time recognition
Link Up	Artist		
G1 Match and link shapes and colours	Shape/Col		
G2 Learn to count up to ten	Numbers		
G3 Recognise the link between upper and lower case	Alphabet		
G4 Link two shapes to composite pattern	Logic		
G5 Match analogue to digital clocks	Table/Bond		
G6 Know a selection of simple words	Properties		

Maths (Number)

For Children 6 to 16 Years

Levels of Attainment Target 2 Covered

Carnival	Grab It!	Silicon Brain	Cheers
G1 2a.1 Know and use addition facts up to 10	Addition	G1 3a.1 Use decimal notation with money	G1 2b.1 Whole number add and subtract problems
G2 3c.2 Understand remainders in a calculation	Division	G2 3b.2 Know and use the 2, 5 and 10 times tables	G2 3c.2 Make estimates based on familiar units
G3 4a.2 Multiplication facts up to 10 x 10	Mult.	G3 4a.5 Mental subtraction of 2 two-digit numbers	G3 4a.14 Solve multiplication and division problems
G4 5b.2 Calculate percentages of quantities	Percents	G4 4a.6 Mental addition of several single-digit numbers	G4 5a.1 Imperial units in daily use
G5 6a.5 Relate equivalent fractions to decimals	Decimals	G5 6b.1 Estimate multiplication and division	G5 5a.4 Use index notation
G6 8c.1 Use of estimation to check size of answers	Estimate	G6 7a.2 Division of multiples of powers of 10	G6 8b.2 Four rules of fractions
Cover Up	The Big Bang		
G1 3a.4 Know and use subtraction facts up to 20	Subtract.		
G2 3b.1 Multiplication facts up to 5 x 5	Mult.		
G3 4a.4 Mental addition of 2 two-digit numbers	Addition		
G4 4a.10 Division of two-digit nos. by single digits	Division		
G5 6a.4 Using equivalence of fractions (and ratios)	Fractions		
G6 6a.10 Convert fractions to percentages	Percents		

English

For Children 6 to 16 Years

Attainment Targets and Levels Covered

Sniper	Grab It	Librarian	Cheers
G1 4.2b.1 Simple monosyllabic words	Spelling	G1 2.2t.1 Read a range of simple material	G1 3.3a.6 Check for consistent use of comparatives
G2 2.2a.1 Read & understand Signs, Labels, Notices	Words	G2 2.2c.2 Phonics cues in reading	G2 3.3b.6 Simple use of past tense
G3 3.3a.1 Capital letters full stops and question marks	Punct.	G3 3.4a.3 Structures of English (Collective nouns)	G3 2.5e.1 Word play
G4 2.7d.1 Retrieve information (Abbreviations etc.)	Lang. use	G4 3.5b.2 Use of the Apostrophe	G4 3.5e.1 Use and misuse of colloquialisms
G5 2.7e.5 Literary devices (Proverbs)	Speech	G5 2.7c.3 Choose vocabulary	G5 3.7e.2 More complex punctuation
G6 3.8c.1 Grammatical constructions (Passive Tense)	Verbs	G6 3.7c.4 Lexical features	G6 3.8c.9 Poetical constructions
Cover Up	Word Fit		
G1 2.1b.1 Recognise simple words (adjectives)	G1 4.2c.1 Spelling patterns (blends)		
G2 2.2a.2 Respond to poems (rhyming words)	G2 4.2c.2 Spell a wider range of words (plurals)		
G3 3.3a.6 Masculine to feminine nouns	G3 2.3d.3 Appreciate links between words and sounds		
G4 4.3c.1 Awareness of word relationships (opposites)	G4 3.4e.2 Revise & redraft writing (descriptive words)		
G5 4.5.5a Spell words of greater complexity	G5 2.7e.2 Use of literary devices - Similes		
G6 2.6a.1 Lang. change over time	G6 3.7c.4 Choose a wider vocabulary		

Before you buy ANY educational software ASK these questions:

- Is it designed and developed in **BRITAIN** and directly linked to the **NATIONAL CURRICULUM**?
- Has it been designed to use the **POWER** of your 16 or 32-bit computer and not just converted from an existing 8-bit product?
- Does it **MOTIVATE** and **REWARD** the children?
- Is children's progress constantly **MONITORED** and **RECORDED**?
- Can it be **CUSTOMISED** to meet your child's needs?
- Do parents and teachers agree on its **QUALITY**?
- Will it **EDUCATE** your child now but also have sufficient **FLEXIBILITY** to last for several years without the need to purchase the next level?
- Are the producers **CONFIDENT** enough in its quality to let you test it yourself **FREE** - at home or in school?
- Does it **CHALLENGE** more able students but also have levels for beginners?
- Are there **CLEAR** and **OBVIOUS** educational objectives?

If any answer is no, it's not 10 out of 10!

Coming soon in 1993

- ✓ French
- ✓ German
- ✓ Science
- ✓ Maths (Algebra)
- ✓ Spanish
- ✓ Italian
- ✓ Junior Essentials



Please ring for availability

0742 780370

ROCKY HORRORS

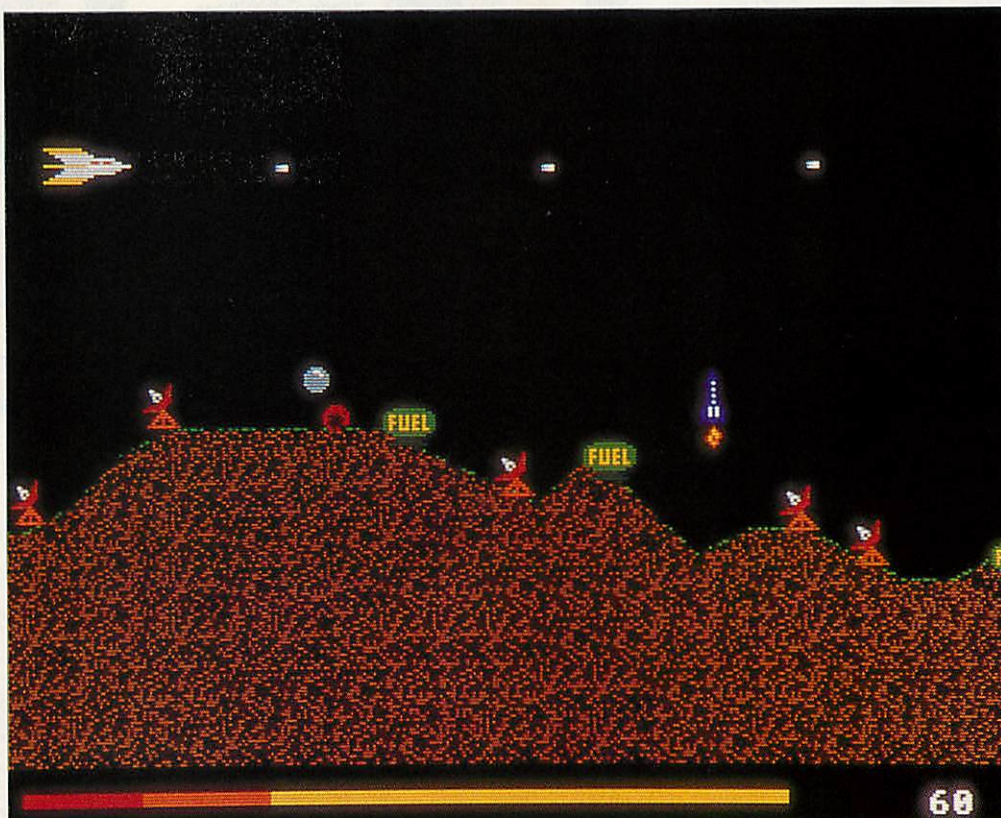
Antony Bruce Lytis puts the final touches on his smooth-scrolling masterpiece

The time has finally come to put together the bits and pieces we've assembled over these past few issues and write our complete scrolling landscape game. The resulting epic, *Rocky Trade*, (resemblance to any other game, living or dead is purely accidental) could still benefit from some refinement, but it illustrates all of the major components required for most games of its type. It is so big it would not fit on the yellow pages, so the full system will be on the subscriber's disc.

As well as landscape scrolling and sprite plotting, *Rocky Trade* features 'collision detection' – finding out which bullet has hit which unfortunate space being – and an 'alien management system'.

GAMEPLAY

The object of the game is quite simple. Using the keys shown at the start, navigate your rocket through the various sections of the landscape and destroy the (slightly) camouflaged secret nuclear base at the end. Energy is shown at the bottom; when it reaches zero your craft will 'do a SkyLab'. To refuel simply bomb/shoot the fuel dumps; illogical, but traditional. You have just three lives and must restart each mission from the beginning. There are no cheat modes but you have the source code, so invent your own.



Rocky Trade contains all the most important shoot-em-up elements

ALIEN MOVEMENT

A feature common to most games is how to keep track of all the 'aliens' or whatever nasties feature in them. In *Rocky* there are several hundred aliens waiting to appear on the screen as you fly along and it would clearly be impractical to worry about all of them all of the time. The game scrolls at 50 frames a

second and we are replotting the whole screen each frame. We therefore have to be very careful with our limited time allowance. When you add bullets and bombs to the picture, we have to be more careful still. The answer is a linked list, or rather two.

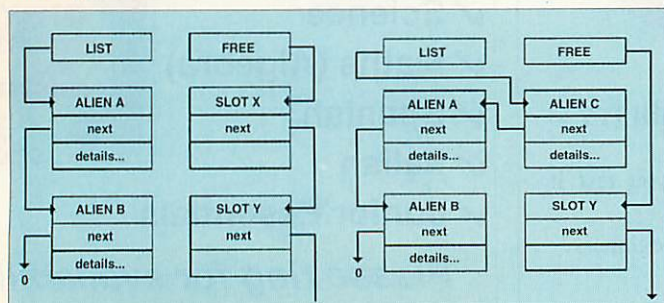
The linked list is an age-old data structure that is particularly handy in situations like this. It consists of a pointer to the first element in the list. This too contains a pointer to the next element as well as its own data. The next element contains a pointer to the third and so on.

The last element has a next pointer of zero indicating that the list is at an end. The advantage of a linked list is that an element may be added to the list – or removed – very easily. Only the pointers need to be

changed so there's no great shuffling of memory; crucial when time is of the essence.

In *Rocky*, two linked lists are maintained. One contains all the details of the currently active aliens. When an alien is created its details are added to the linked list as a new element. To make this possible a second linked list of free slots is kept. Whenever a new alien is created, a slot is borrowed from the free list and added to the active list. When an alien dies or disappears, the slot is returned to the free list so it can be used again.

In the diagram, Aliens A and B are already active and the free list contains slots X and Y amongst others. When alien C is created, the first slot in the free list is 'de-linked' and the details for the new alien are entered into it. Then



A linked list before and after the creation of an alien

it is linked into the start of the active alien list. The aliens located along Rocky's landscape are stored in sequence with a pointer to the next one that may appear.

COLLISIONS

One of the trickiest features of a game like *Rocky* is detecting when two sprites have collided. In fact, there are two distinct sorts of collision. Some sprites may collide with the background and a check needs to be made at the start of each frame to see whether this has occurred.

Secondly, some sprites may collide with others and a separate check needs to be made for this. To reduce the scale of these checks, sprites are 'classed' depending on their nature. In *Rocky* there are three classes: one contains the ship, bullets and bombs, another the nasties like rockets, fuel dumps and dishes. A final class is allocated to the meteors which are special; they are nasty but cannot be destroyed by being shot at.

For each frame, the background is plotted with a call to `copy_bank`. At this point the next frame is ready to have the sprites added to it. Next `do_alien` is called; this processes the aliens, moving them, checking for new arrivals or departures and so on. Now `back_collide` is called.

This goes through the list of active aliens, checking the class of each to see if it could potentially collide with the scenery. If so, the routine `collide_check` is called. This is very similar to the sprite

plotting routine `show_sprite` except that the screen isn't actually altered. Instead, the contents of the screen are ANDed with the sprite's mask. If the result is ever non-zero, the alien must have crashed.

Collisions between two different types of aliens are a little more complicated. First, the list is examined to find aliens of type one (ship, bullet, bomb). For each one found, the list is searched again for aliens of the other types. If found a sprite is compared with the first sprite. Initially this is done by finding the 'bounding boxes' of the two sprites – the smallest rectangles which you can be sure wholly contain the sprites. If these do not overlap the comparison need go no further.

If the boxes do overlap, further checks must be made. How accurate this check needs to be depends upon the type of game and nature of the sprites involved. In some games bombs may be set off when an alien gets near enough and this is far easier to check for than the overlap of a single pixel.

In *Rocky* however, we do things properly to show how that can be done. The two sprites are plotted on a 'mini' screen (called `small_screen`). They are plotted in the same relative positions they have on the main screen and the plotting is done in a special way. First the mini screen is cleared to zeros. Then each sprite's mask is ANDed with &11111111. That is, a 1 is produced for each solid pixel in the sprite. The values are literally added to the small



Scrolling backgrounds can vary a lot throughout the game

screen. Whenever two pixels overlap, the two ones of the colliding aliens will have been added to form a two. The diagram on the right shows this happening, as a bullet hits the side of a fuel dump. Because two is a different value from one, a quick check of the small screen using multiple load instructions can be made to speedily discover any overlapping pixels.

Sprite plotting was described in a previous article and the routine `show_sprite` is based on one of those earlier examples. For each sprite loaded, four versions are created – one for each byte alignment within a word – and their addresses are stored in the table `move_sprite%`.

Animation is not supported in this version, but an extension to this table could easily cater for it. By using four images, all plotting can be done in words which is much faster than bytes. Further speed increases could be achieved using LDM and STM as described previously, but LDR and STR are fast enough.

Dead aliens are plotted using a special routine adapted from `show_sprite`. The hybrid `show_sprite_dying` takes an extra parameter in R3 which specifies how 'dead' the alien is. This is used to look up a special 'fade' sprite in which the dying sprite's shape is 'covered'. The fade sprites can be found in `Sprites.Aliens`.

Sound isn't featured in this version of the game, so you'll have to wait for next month's disc for the whooshes and pings you crave.

0	0	0	0	0	0	1	1	1
0	0	0	0	0	0	1	1	1
0	0	1	1	1	2	1	1	1
0	0	1	1	1	2	1	1	1
0	0	0	0	0	1	1	1	1
0	0	0	0	0	0	1	1	1

How a bullet collides with an alien

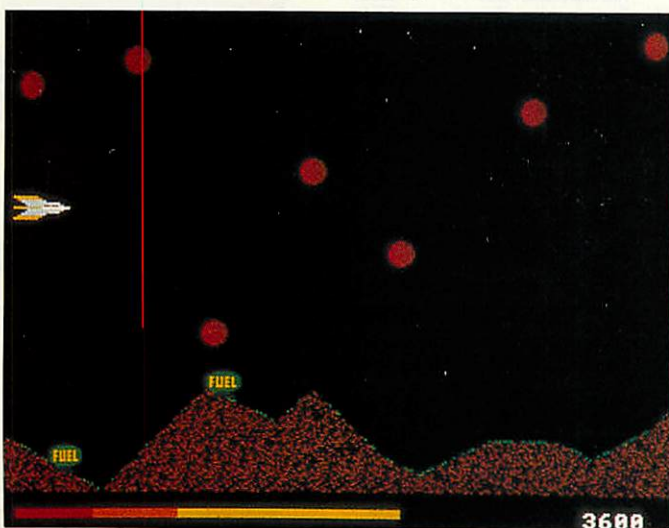
If you really *do* want to type this listing in, send us an SAE marked *Rocky*, and we will send the complete listing.

The component files are located in these subdirectories:

- \$.Rocky.Games.Rocky
 - \$.Rocky.Layout.level1
 - \$.Rocky.Maps.Rocky
 - \$.Rocky.Movement.Aliens
 - \$.Rocky.Patterns.Aliens
 - \$.Rocky.Rocky
 - \$.Rocky.Scenery.Land16/9
 - \$.Rocky.rockypal
 - \$.Rocky.Sprite.sprite
- For simplicity, a directory `$.Rocky` is assumed. All the files are of the formats described in the earlier articles; refer back for details.

Rocky is the game itself and can only be run when the other files have been created. *RandScape2* is an updated version of *RandScape*, which created a random landscape for the game. For a new landscape re-run the program.

Additional code was added to populate the landscape with suitable aliens and provide the various stages. *MakeLand2* is another updated program. This creates background sprites, including some blocks for the 'city' and 'maze' sections. Finally, *RockyDat* creates the alien sprites and a data file called *RockyPal*, which defines the colours used.



Meteors can be made to behave viciously; they're indestructible

DABS PRESS

Acorn  The choice of experience

0772 623000

Formerly Orion Computers

A3010

£424

from



A3010 WITH A FREE DABS BUNDLE: JOYSTICK, 5 ALIEN IMAGES GAMES, 3 DABS PRESS BOOKS OR WITH THE FS A FREE 1MB RAM UPGRADE (TO 2MB)

A3010 Family Solution £424
A3010 Learning Curve £680

A3020

£749

A3020 FD System £749
A3020 HB 60 System £899

These prices include a FREE 2Mb to 4Mb Upgrade
A3020 Option: Multiscan monitor included for extra £50

ACORN COMPUTERS

ACORN A4 ACCESSORIES

A4 2Mb RAM Upgrade	£110
A4 60Mb HD Upgrade	£350
A4 Battery Pack	£50
A4 Econet Upgrade	£50
A4 Portable Handbook	£7.50
A4 Shoulder Bag	£35
A4 Technical Reference Manual	£65
A4 Welcome Guide	£10

FINANCE SCHEMES

We Operate the Acorn Educational, Teachers and Finance Scheme. Call for details

MONITORS

Philips CM8833 MkII	£199
Acorn Colour (AKF30/40)	£220
Microvitec Cub Scan 1440	£399
Taxan MultiVision 795	£460

UPGRADES

RAM

A3000	1 to 2Mb RAM	£45
	1 to 4Mb RAM	£129
A3010	1 to 2Mb RAM	£39
A3020/4000	2 to 4Mb RAM	£85
A5000	2 to 4Mb RAM	£85
A400 Series RAM	£30 per Mb	

RISC OS 3.1 UPGRADES

A5000	£16 Other	£40
Rom carrier is required for A305, 310, 440		
(Above memory fitted for £10.00 plus courier charge)		

HARDWARE UPGRADES

ARM3	from £175
Econet Module	£47
Joystick Interface (Leading Edge)	£34
Joysticks	from £10
Midi Expansion Card	£65
Scanlight Junior 256	£199
Scanlight A4	£289
Vision Digitisers	
A3000/3010/3020/4000/5000	
Mono Internal	£49
Colour Internal	£79
Hi-Colour Internal	£129

ARC/A3000/A4000/A5000 APPLICATIONS

D.T.P.

Impression II (CC) Latest Version	£125
Impress. Bus. Supplement (CC)	£39
Desktop Folio (ESM)	£79
Equisor (CC)	£34
Showpage (CC)	£108

WORDPROCESSORS

1st Word Plus Rel. 2 (Acorn)	£69
Impression Junior (CC)	£75
PenDown (Longman Logotron)	£46
PenDown Plus (Long. Logo.)	£68
Wordz! (Colton)	£89

INTEGRATED PACKAGES

Pipedream 4 (Colton) New	£178
Desk Top Office II (Minerva)	£79

DATABASES/HYPertext

Flexifile (Minerva)	£84
MultiStore Version II	£154
Genesis II (Oak Solutions)	£109
Knowledge Organiser (Clares)	£41
PinPoint (Long. Logo.)	£79
PinPoint Jnr (Long. Logo.)	£23
Maggie (Long. Logo.)	£53
Squirrel (Dig Serv)	£120
Archivist Database (Oregon) New	£26

ACCOUNTING SOFTWARE

Home Accounts (Minerva)	£34
Business Accounts (Minerva)	£298

LANGUAGES

Desktop C (Acorn)	£185
Desktop Assembler (Acorn)	£125

EDUCATION

Fun Sch. 3 Series (Database) Each	£18
Fun Sch. 4 Series (Database) Each	£18
Adventure Playground (Stormsoft)	£14
10 out of 10 (Triple R)	
Early Essentials New	£19
English	£19
Maths	£19

10 out of 10 **Coming Soon**
French, German, Italian, Maths (Algebra), Science, Spanish
Christmas Adventure £19

SPREADSHEETS

Schema (Clares)	£96
Eureka (Long. Logo.)	£99
Resultz! (Colton)	£TBA

UTILITIES

Compression (CC)	£39
MultIFS (Arxe)	£26
Hearsay II (Beebug)	£69

ARCTerm7 (Serial Port)	£67
ProDriver (Ace)	£34
Dot Matrix Colour Printer Driver	£15
Turbo Driver + Cable (CC)	£49
HP Deskjet 500C Printer Driver	£15
Desktop Thesaurus	£19

MUSIC

Ancestry (Minerva)	£59
Armadaeus (Clares)	£59
Rhapsody II (Clares)	£45
Tracker (Serial Port)	£38
Notate (Long. Logo.)	£51
Scoredraw (Clares)	£44
Digital Symphony (Oregon) New	£40
Rhythm Box (EMR)	£36

GRAPHICS

Artworks (CC) New	£149
Poster + Font (4Mation)	£79
Render Bender II (Clares)	£98
Graphbox Pro. (Minerva)	£104
Pro Artisan (Clares)	£79
Revelations (Long. Logo.)	£66
Revelation II ImagePro (Long. Logo.)	£102
Atelier (Minerva)	£69
Chameleon (4Mation)	£33
SmArt (4Mation)	£50
SmArt Filer (4Mation)	£32
Snippet (4Mation) V.2	£37
Vector (4Mation)	£79
ARCLight (Ace)	£46
Euclid (Ace)	£64
Mogul (Ace)	£24
Splice (Ace)	£32
Tween (Ace) Version 2	£42
Illusionist (Clares)	£78
Titler (Clares)	£120
PrimeArt (Minerva)	£59
Type Studio (Beebug)	£38
Font FX (Data Store)	£9
Shape FX (Data Store)	£9

Misc

PC-Emulator Latest Version (Acorn)	£93
Investigator II (Leading Edge)	£22
ARCtulate (4th Dimension)	£18

BOOKS/MANUALS

Program. Ref. Manuals	£77.00
Arc. Games Makers Man.	£14.95
BASIC VI Guide - BBC	£19.45
A3000 Technical Guide	£28.95
Acorn D.T.P. Manual	£10.00
Acorn Desktop C	£25.00
Acorn Desktop Assembler	£25.00
First Impressions + Disc	£29.95
Good Impressions + Disc	£26.95
There is NO VAT (0%) on all books.	

RIBBONS AND PRINTER CARTRIDGES

BRANDED RIBBONS

Amstrad DMP2000/3160	£5
Citizen 120D	£5
Citizen Swift 24 Black	£5
Citizen Swift 24 Colour	£11
Epson LX80/86	£4
Epson FX80, MX80, LX800	£5
Epson LQ400, 550 fabric	£6
Epson MX100, FX1000, FX1050	£6
Epson EX800/1000 Black	£7
Panasonic KXP145, KXP115	£6
Panasonic KXP140	£10
Star LC10	£4
Star LC10 4 Colour	£6
Star LC200 Black	£11
Star LC200 Colour	£8
Star LC24/10 / LC24 200 Black	£11
Star LC24 200 Colour	£11

PRINTER CARTRIDGES

Canon LBP4 Toner Cartridge	£55
Canon LBP8 Toner Cartridge	£82
Canon BJ130 (BJ1481)	£10
Canon BJ10e/10ex (BC01)	£15
Canon BJ300/330 (BJ642)	£10
Cjet 132/Canon PJ1080 Black	£10
Cjet 132/Canon PJ1080 Colour	£12
HP Paintjet Black	£18
HP Paintjet Colour	£20
HP Deskjet Black High Capacity	£18
HP Deskjet 500C Colour	£20
Qume Crystal Print Toner Set	£58
Qume Crystal Print Drum Set	£88

COMPATIBLE RIBBONS

Amstrad DMP2000	£3
Amstrad LQ3500, PCW8256	£3
Brother M2024	£5
Brother M1009, M1109	£4
Brother HR10, 15, 20, 25, 35 Fabric	£4
Brother HR10, 15, 20, 25, 35 MS	£4
Canon PW1080A	£4
Citizen 120D/Swift 24	£3
Epson LX80, 86	£3
Epson FX80, MX80, LX800, LX850	£4
Epson FX1050, LX1000	£4
Epson LQ500, LQ800, LQ850	£4
Epson LQ1000, LQ1050, FX1000	£6
Epson LQ2500, LQ2550	£6
Epson EX800	£6
Panasonic KXP1081/90, 1180/24	£4
Seikosha GP100	£3
Shanwa CP80 Multistrike	£5
Star LC10/LC20	£3
Star LC10 4 Colour	£5
Star LC24/10, LC24/200	£3
Star LC200 Black	£3

Discounts available on all ribbons for quantities of 3 or more.

Please call for prices on ribbons not listed here. We supply almost any ribbon required and dependent on quantity, any colour. Please Note - Quoting the CARMA Group Code speeds up our search for a ribbon compatible with your printer.

PRINTERS

CANON (INKJET PRINTERS)

BJ10EX	£162	BJ10EX ASF	£42
BJ10EX Batt	£42	BJ10EX Turbo	£220
BJ300	£299	BJ330	£359
BJ200	£274	BJC 800	£1285
Turbo Driver + Lead for BJC800	£89		

CITIZEN (2 YEAR WARRANTY)

120D+ Parallel	£94	Swift 9 Colour	£144
Swift 200	£152	Swift 200 Col	£175
Swift 240	£199	Swift 240 Col	£211
Project	£309	PN48	£189

EPSON (NEW MODELS)

LX400	£92	LQ-570	£205
-------	-----	--------	------

HEWLETT PACKARD

Paintjet	£499	DeskJet 500	£269
DJ 500 Col.	£339	DJ 550 Col.	£429

PANASONIC

KX-P1170	£100	KX-P2123	£149
KX-P1123	£129	KX-P2123Col	£185
KX-P2180	£129	KX-P2624	£268
KX-P2180Col	£144		

STAR

LC20	£102	LC24/20	£148
LC100 Col	£129	LC24/100	£149
LC200 Col	£155	LC24/200	£162
SJ48	£164	LC24/200 Col	£219
LC15	£185	LC24/15	£255

Other Star prices please Call

LASERS

Qume 300dpi	£866
600DPI Laser Direct Card (CC)	£326
Canon LBP4 lite	£478
Canon LBP4 + 1Mb - 4ppm	£629
HP LaserJet 4 (600 dpi)	£1027

We will quote on many lasers not listed

PLEASE NOTE

All our printers are UK Models and NOT grey imports. Please take this into account when deciding where to purchase your printer.

FREE ARC CABLE WITH ALL PRINTERS

Please Call For Any Printers not Listed.

A5000 from

£1249

A5000 2Mb HD80 System £1399
A5000 Learning Curve £1445
A5000 4Mb 120 System £1599

SPECIAL OFFER A5000 2Mb 120HD £1249

Includes A5000, Connor 120Mb Hard Drive, AKF40 Colour Monitor or add £50 for Acorn Multiscan Monitor, add £85 2Mb to 4Mb Upgrade



POCKET BOOK



Pocket Book £212
256k RAM 16 bit processor
Up to 4Mb SSD storage
SPECIAL FREE OFFER
4 Batteries & Recharger

Cumana World of CD-ROM £595

Call for details

Dabs Press - Acorn

Dabs Press - Acorn

Dabs Press - Acorn

FREE 2Mb to 4Mb Upgrade

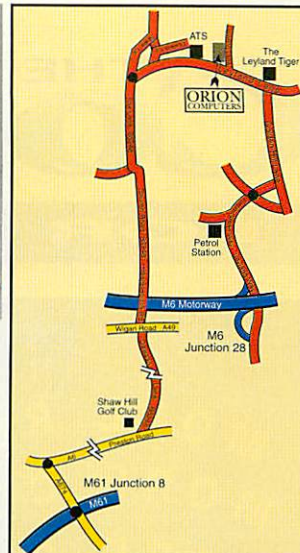
FREE WITH AN A4 A Spare Battery & Shoulder Bag

NEW GAMES IN RED
COMING SOON IN YELLOW
Please ring for current prices
software **NOT** listed here

Please specify machine when ordering.

All our disks come complete with labels etc. and are 100% certified error free. In the event that a disk fails it will be replaced immediately.

TERMS: Add 17.5% VAT to all prices, except books, for all UK/EEC orders. UK carriage charged at appropriate rate. Overseas carriage charged at cost. Quotations available. Access, Visa, Switch, AMEX accepted. All prices are subject to change without notification. Goods available subject to being unsold. Official orders accepted from public sector, education. Plc's. Tender invitations welcome. E & O F



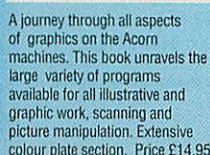
Dabs Press,
Department 23
250 Leyland Lane, Leyland,
Preston, PR5 3HL.

Telephone orders may be placed between 9.00am and 5.00pm. Please have your credit card number and both start and expiry date ready.

Tel: 0772 623000
Fax: 0772 622917
Open Mon-Fri: 9am - 5pm.
Sat: 10am - 1pm.

Dabs Press - Acorn

A guide to this powerful document processor which explains how to produce anything from a business card to a full length book.
Price £14.95 or £16.95 with disc.



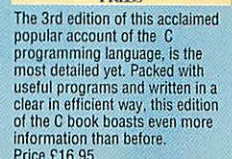
Budget DTP The book that will save you money. Takes you step by step through all aspects of DTP on the Archimedes. Price £12.95

Smith's comprehensive guide to View word-processor. "For those who want a complete thorough and readable guide to View." (Beebug).
£12.95 or £17.95 with disc

Master 512 Technical Guide
The companion guide with full 512 programming information and hardware expansion projects. Price £14.95 or £19.95 with disc.

computer, packed with hints and tips on how to get round problems, tackle awkward jobs etc. Makes you realise that you cannot get full potential from this machine in 5 minutes!!

or Access/Visa No. with
start date & expiry date to:
Dabs Press Publishing
FREEPOST (PR1327)
Leyland, Preston
PR5 3BR



THE ColourCard

FOR THE ARCHIMEDES

MORE RESOLUTION
MORE COLOURS
MORE SPEED
LESS FLICKER



HATS OFF TO COLOURCARD



A new graphics accelerator card for the Archimedes, the ColourCard brings a host of improvements to the video capabilities of any Archimedes A300*, 400*, 540 or 5000 series computer.

The simple to fit, single width expansion card is completely compatible with all RISC OS desktop software, but brings much higher screen resolutions at higher screen refresh rates (less flicker and easier on the eye).

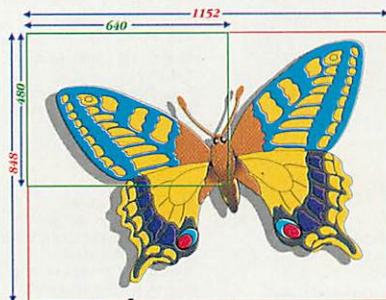
In 16 and 256 colour screen modes all the colours are selectable from 16 million hues. This means scanned pictures can be seen with 256 true grey-levels on screen and that you are no longer restricted to the preset Acorn palette. Some applications, such as ArtWorks, can provide better screen colouring using the new palettes.

In addition, the ColourCard offers 15 bit-per-pixel true colour screen modes having over 32,000 colours on screen at once. Although these screen modes are not yet desktop software compatible, it is expected that programs will become available that take advantage of the modes. The ColourCard is supplied with a 24-bit preview utility to show 24-bit Clear files in stunning full colour.

The ColourCard reduces the load on the main Archimedes memory and so allows the ARM processor to run much faster than would normally be possible in high resolution screen modes. Depending on machine and screen mode, graphic operations can be up to twice as fast.

The ColourCard revolutionises DTP and graphics work, and opens up the world of true-colour graphics to the Archimedes user for the first time.

The ColourCard has been developed and is backed by



ColourCard offers 3 times the pixel area of standard Acorn VGA mode 27.

the largest and most successful Archimedes developer. It is available now, and for added peace of mind comes with a 14-day, no quibble money back guarantee.

KEY COLOURCARD FEATURES:

- ArtWorks version 1.1 now supports 32,000 ColourCard screen modes
- Video pass through for guaranteed compatibility with all software without having to unplug your monitor
- 15 bpp (ie 32,000 colour) screen modes
- No quibble money back guarantee
- A3000 version now available
- New configurable screen update speed

(The ColourCard is compatible with all multi-scanning monitors. †Only higher scanning rate monitors can manage 1152 x 848 resolution. Lower scanning rate monitors may display some resolutions at lower refresh rates. *A300 and early A400 computers may need an additional Genlock connector to be fitted internally.)

Price £249.00 +£6 p+p + vat (£299.62 inc)
Available from all good dealers and from:



15 Witney Way, Bolden Business Park,
Bolden Colliery, Tyne & Wear, NE35 9PE
Tel: 091 519 1455 Fax: 091 510 1929



Computer Concepts Ltd
Gaddesden Place, Hemel Hempstead,
Herts, HP2 6EX
Tel: 0442 63933 Fax: 0442 231632

E&EO Details are subject to change without notice.

SOME OF THE SUPPORTED SCREEN RESOLUTIONS	
1600 x 600	65Hz
1024 x 768	72Hz
1152 x 848	64Hz†
1280 x 512	80Hz
800 x 600	85Hz
1152 x 424	80Hz
800 x 300	80Hz
576 x 424	90Hz

16 colours

256 colours

32,000 colours



*INFO

The two Daves present their
colour-curdling mixture of
cabbages, snake dancing and more



COLOUR SUPPLEMENT

Programs: Graduate, Select, RGBcube, HSVcone, CIE, Interpol

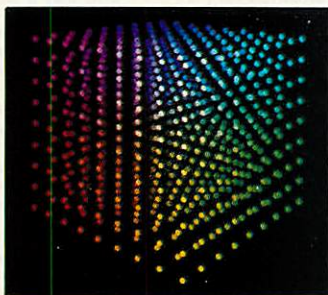
Description: Colour demos

Authors: Michiel van Schaik, DA

Machine: 32-bit

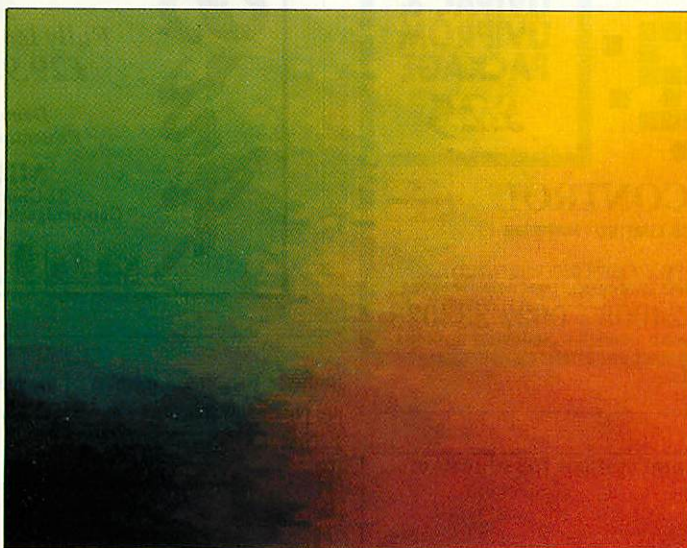
Listings: 20-120/line Basic, M/C

The good old *ColourTrans* module has undergone a bit of an overhaul in Risc OS 3.1 so we thought it was about time to do a little feature on colours; what they are exactly (there's more to it than mere R, G and B) and how to use them effectively in your own programs. This coincides with a submission from **Michiel van Schaik** of Delft in the Netherlands which demonstrates some of the new *ColourTrans* SWI calls.



The standard RGB cube

Defining colour is actually a very hard business indeed. The human eye was not designed to fit in with the metric system but evolved naturally. As a result, colour models are inevitably rather strange at first appearance, since they must take account not only of the physics involved but of the physiology too.



Graduate shows the advantages of dithering

Computers generally use the RGB (Red, Green, Blue) system of colour selection. That is, all colours are considered as being made up of red, green and blue – the three primary colours – added together in the appropriate proportions. When all three of the components are at their maximum intensities, the mixture is of course white.

The shot to the left shows the standard RGB cube, which you can plot on your machine using the program *RGBcube*. Each axis has one of the RGB components. Three of the cube's corners are thus pure red, green and blue. Three others are the secondary colours cyan, magenta and yellow, and the other two black and white.

The *ColourTrans* module was designed to take away the bother of writing colour software that could work in different screen modes. The

idea is that rather than selecting a colour yourself with GCOL or the like, you ask *ColourTrans* to do it for you by providing it with the 'perfect' colour you desire in terms of red, green and blue. The simplest *ColourTrans* call is perhaps...

```
SYS "ColourTrans_SetGCOL", &BBGGRR00
```

... which takes red, green and blue values, each in the range 0-255 – combined into a single word for simplicity – and chooses the nearest available colour it can find. This has the added advantage that when graphics hardware improves, software selecting colours via *ColourTrans* will automatically take advantage of the improvement without any modification.

Other *ColourTrans* calls exist to choose colours and to build colour translation tables

for sprite plotting. These have all been featured in *INFO in the past.

One of the most useful extensions in the new *ColourTrans* is the ability to select 'dithered' colours, that is, ask *ColourTrans* to mix colours to get a better approximation if it can. This is done by setting bit 8 in R3.

Michiel van Schaik's program, *Graduate*, shows the advantages achieved using dithered colours. Two 'maps' showing red content against green are plotted, one of which is dithered and one not. Note how much smoother the changes are.

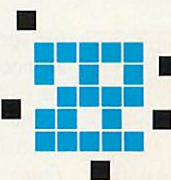
The program *Interpol* is another example. Select the colours on the left and right by dragging their R, G and B bars. The program then interpolates between them. Change the number of steps with + or -



Interpol: how to get from R to B

and switch the dithering on and off with D. You may notice that the improvement is particularly good with flesh colours.

RGB is only one way of defining and choosing colours. Because monitors display pictures by means of red, green and blue dots, it is the natural system for computers. Not

ARM 35 Mhz PROCESSER £190	A3000 1-2mb £24	A3000 1-4mb £75
A5000 2-4mb £75	A310 4mb £160	A310 4mb + 35Mhz ARM 3 £339
MEMC1a £24	TELETEXT ADAPTOR (New Advanced Package) £94	UVIPAC (Universal Eprom Eraser) £15
UVIPROM (Eprom Programmer for BBC) £15		UVIPAC & UVIPROM PACKAGE £25

GROUND CONTROL
ELECTRONICS LIMITED

HOURS OF BUSINESS: 9.00 AM - 5.30 PM (24 HOUR ORDERING FACILITY)
PRICES EXCLUDE VAT, BUT INCLUDE CARRIAGE CHARGES (UK MAINLAND) PACKAGING AND INSURANCE

FOR FURTHER INFORMATION TEL: 0635 524008 or 0622 833023
UNIT 7, KINGFISHER COURT, HAMBRIDGE ROAD, NEWBURY, BERKSHIRE RG14 5SJ.

Art School

**EASY TO USE ART AND GRAPHICS
PROGRAM WITH BUILT IN HELP
FOR NEW USERS**

Art School has been designed as a comprehensive Art program that would fill all the needs of Primary, Junior and Home users needs. It contains tools for pencil drawing, brush painting, spray painting, lines, circles, ellipses, rectangles, parallelograms, triangles etc. with graduated fill and 256 colours. Having the ability to use clipart discs and print on any printer, it also has a selective undo rubber and complete undo of the last operation. Together with the useful facility for a teacher or parent to be able to switch off tools which are not needed, this is the easiest art package ever.

**Fully icon driven with built in help.
£29.95 inc vat / postage**

Demo disc £5 refundable.
Educational discounts, licenses.

MICRO STUDIO
22 Churchgate Street, SOHAM,
Cambridgeshire CB7 5DS Tel.(0353) 624997

Save

x8 x4       **BIG**

Acorn network interfaces and systems for education

	x1	x10
Ethernet:		
A3000 internal 10base2 (thin Ethernet)	£149	£134
A3000 external 10base2	£172	£157
A3000 internal 10baseT (unscreened twisted pair)	£199	£184
A3020/4000 10base2	£199	£180
A3020/4000 10baseT	£185	£165
A3020/4000 10base5 (thick Ethernet)	£ 67	£ 50
A400/5000 10base2	£149	£134
A400/5000 10baseT	£199	£184
A400/5000 10base2 & 5	£199	£184
Please state whether AUN, NFS or non-booting. If you don't know, ask us!		
Econet:		
A400/3000/5000	£ 49	£ 46
A3020/4000 incl new drop-lead	£ 49	£ 46
Nexus: including router droplead		
A3000 A3020/4000 A400/5000	£ 65	
A3000 & user port	£ 99	
Please state whether for Nexus Disc-sharer or Network system		
Ethernet cabling:-		
10base2 thin Ethernet wall-sockets. Single skt	£ 20.11	
Double skt	£ 27.11	
21/2m swivel downlead	£ 26.24	
Repeaters 3 BNC (10base2) & 1 AUI (10base5)	£830	
4 BNC (10base2)	£870	
12 port 10baseT with BNC & AUI	£510	
16 port 10baseT with BNC & AUI	£790	
Acorn Level 4 fileserver - AUN vers, site licence	£399	
NetManage for Level 4 fileserver	£ 50	
AUN Document server - NETprint, site licence	£ 89	Phone for availability
AUN Fax server - incl fax card for A5000/A540	£448	Phone for availability

All Acorn computers can be supplied with the correct network interface installed and the machine configuration properly set for booting. Ask us for a Quotation.

ExpLAN UK Ltd., The Acorn Network Specialists
Freeport, Tavistock, Devon PL19 9BR Tel/Fax 0822 613868

Software Bargains, a member of the Micro Power Group, are pleased to announce the **ARRIVAL** of the **FINAL CONSIGNMENT** of...

Unused!

BBC B Computers

£150
Ex VAT

Here are 8 good reasons why you should **ACT NOW** and buy a BBC!

- They are **new**
- At £150.00 they are **cheap**
- All machines are supplied with **VIEW word processor, as standard!**
- All machines are supplied with the **Disc Filing System as standard!** This means you can connect a disc drive straight away - our BBC and drive packs start at an incredibly low £195.70!
- All machines are supplied with a **Speech ROM as standard!**
- They include additional **safety features** such as steel re-inforced keyboards
- If you already have a BBC, our research shows that the **cost to repair/replace** the most common components to wear out, such as the keyboard or power supply unit, would be at least half the cost of one of our new ones!
- Our new BBCs carry a **6 month warranty** - probably twice as long as a repair warranty; plus, the guarantee is for the whole machine, not just on the component which has been repaired!

Monitors

Philips 7502 Mono Screen £85.06
Microvitec Cub 1431 Colour £199.96
(14" Standard Res)
Microvitec Cub 1451 Colour £238.26
(14" Medium Res)

Microvitec monitors are of the highest quality, with strong metal casing, available only with BBC purchase

BBC connecting cable - Free!
Prices exclude VAT; add £1.50 carriage

BBC Disc Drive Pack!

BBC Pack 1a £195.70
Includes BBC B and a Greyhound single 5.25" 4080 track drive without Power Supply Unit

Greyhound single 5.25" 4080 track switchable drives without PSU, are available as single units £68.04

Discount available for quantity!

Why do we say "Unused" rather than "Brand New"?

These machines were originally manufactured for export to America. Having now shipped them back we have to make various modifications, which includes fitting a UK power supply and TV modulator, for effective, safe use in the UK. So they are not "straight from the factory" but nonetheless they have **never been used**.
A full specification is available on request.

Software Bargains & Mercury Games
Dept AU453, C/O Northwood House, North Street, LEEDS LS7 2AA
TEL: 0532 436300 FAX: 0532 423289

For 1 - 4 units
Contact
Software Bargains

Greyhound Marketing Ltd
Dept AU453 Clifdale House, 376 Meanwood Road, LEEDS LS7 2JH
0532 621111 Fax 0532 374163

For 5 or more units
Contact Greyhound Marketing
Also for TRADE enquiries

* Please add VAT to all prices, including carriage
* Carriage £2.50 per unit/pack; multiple orders POA
* Official Local Authority or orders welcome; or independent schools, headed notepaper with Headteacher's signature
* Goods despatched within 48 hrs, (subject to availability)

While every effort is made to ensure the accuracy of this information, we reserve the right to change prices and specifications without prior notice. Please ensure that you check the price and specification of the BBC B system, northwood house would not.

(Prices are correct at the time of going to press, EAOB)

only this, the three types of 'cone' in the retina also correspond to these three primary colours.

There are many other colour systems around, however, and *ColourTrans* now provides calls to convert between RGB and the most common of the other systems.

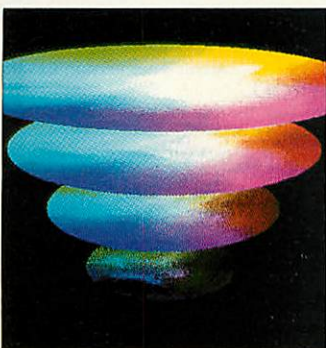
CIE

You may recall a program a good while back in **INFO* that showed the so-called CIE chromaticity diagram.

In order to define all light sensations we might perceive with our eyes, the Commission Internationale L'Eclairage produced a new standard way back in 1931.

The resulting diagram, an odd horseshoe-shaped affair, showed all the 'chromaticities' that the human eye could perceive. Colours may be thought of as a chromaticity – which is, loosely speaking, what makes a red red or a green green – and a luminance which is how 'bright' that colour appears.

Colours with the same chromaticity but different luminances are mapped onto the same point in the CIE diagram. Each colour is defined in terms of three 'primaries'; X, Y and Z. These are themselves, oddly enough, all outside the visible range.



Cross-sections of the HSVcone

One clever thing about the CIE diagram is that if you take any two points within it, all the colours that lie along the line drawn through those points can be made from combinations of those two colours. This can be extended by picking three points. The triangle formed as a result contains colours which can be made by combining the three corner colours in appropriate proportions.

The range of colours your RGB monitor produces can be defined as such a triangle within the CIE diagram. It is interesting to note that there are some colours that simply cannot be defined using RGB and are therefore not displayable. Printing processes and film are also limited in the number of colours they can produce and are shown as a subset of the complete CIE diagram.

The program *CIE* plots that part of the diagram the RGB system can represent. It uses the call ...

SYS "ColourTrans_Convert CIEToRGB",X,Y,Z TO r,g,b

... which takes three CIE primary co-ordinates X, Y and Z and attempts to convert them into red, green and blue values. Not all may be converted, and only valid RGB values are displayed.

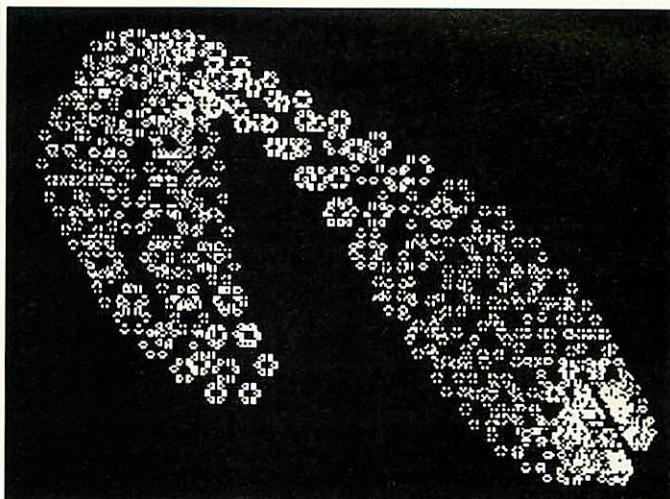
The result is a slightly tilted triangle of colour. The program is in machine code because there are an awful lot of X,Y and Z combinations to go through and it isn't very intelligent. It still takes quite a long time to plot the chart, so be patient.

HSV

This is quite an intuitive system. Unlike the RGB cube, colours are represented as a hexagonal pyramid or cone. The program *HSVcone* plots some cross-sections of this cone so you can see the idea. Dithering is used for good effect, and each of the sections is circular rather than hexagonal, which makes it much easier to code.

It should be clear how to use the relevant *ColourTrans* calls by looking at the listing. *HSVcone* currently runs in Mode 15 but you can change to Mode 21 for a better result on multisync monitors.

In the HSV system, the V stands for value and runs from 0 at the point of the cone to 1 at the base and is measure of the intensity of the colour. S is saturation and is the distance from a colour to the central axis of the cone. A saturation of 1 corresponds to a pure colour and areas of this saturation are found on the outside of the cone.



Recursive hexagons meet Lissajous patterns in Snake

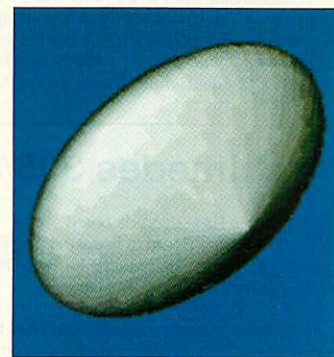
Moving towards the central axis, S decreases and colours change much as you would expect by mixing a coloured paint with more and more white. Hence, the central axis of the cone runs from black to white. H is the hue and is defined as an angle around the cone. Looking down at the point of the hexcone, it appears exactly as the RGB cube when looking at the black vertex.

CMYK

This is yet another colour system designed for the printing industry. Colours are defined as being made up of different amounts of the secondary colours cyan, magenta and yellow. The system is subtractive rather than additive. That is, colours start off at white and quantities are subtracted until the desired effect is achieved (in printing you start off with white paper of course).

Each secondary colour can be thought of as being NOT a primary colour, so cyan is NOT red and (R=1,G=0,B=0) therefore corresponds to (C=1,M=0,Y=0). That is, increasing C decreases R equivalently. In fact, only two of the C, M and Y values need to be used at one time. The fourth parameter, K, is subtracted from each component of the final colour.

For example, (C=0, M=0, Y=0, K=0) is white, (C=0, M=0, Y=0, K=1) is black, (C=1, M=1, Y=0, K=0) is pure blue, (C=0.5, M=0.5, Y=0.5, K=0.5) is half-blue. The cyan and magenta components here subtract red and green respec-



A 2,400-faced polygon tops it all

tively from the white, leaving just the blue.

So that you can play about with the different systems, try the program *Select* from Michiel. Here a colour is shown together with its RGB, HSV and CMYK components. Drag whichever you like and watch what happens to the others. Note that if you try to increase C, M and Y the program will react by increasing K. The value of K also imposes a limit on the C, M and Y components.

SNAKE DANCE

Programs: Snake, Top

Description: Graphic demos

Author: Jan Vlietinck

Machine: 32-bit

Listings: 160, 520 lines M/C

Here are two more zippy machine-code demos from regular Jan. *Snake* is a very pretty piece of recursion. The snake consists of hexagonal stars, plotted recursively. These are zoomed sinusoidally and the whole pattern moves along a Lissajous path. Move the mouse to move the snake and press a button for a new Lissajous figure.

SIMTEC Upgrades

4 Mb TURBO card - £129 A4000/A3020/A3010

Speed up your machine and make RISC-OS3, DTP, PC Emulation and CD-ROM run more smoothly. Our new card not only expands your machine to a full 4Mb of RAM but also increases its speed by more than 40%. The compact 4-layer boards have evolved from our successful 4Mb upgrade for the A3010, and enable Acorn ARM250 machines to increase their speed from 7 to 10 MIPS (million instructions per second). This compares favourably with a 25Mhz ARM3 machine which runs at 12.7 MIPS. Although the memory card simply plugs in, a small modification is needed to the mother board to achieve the enhanced performance. This work can be performed only by ourselves or another Acorn Surface Mount Service Centre.

ARM3 with FPA Socket - £165

Our 25MHz ARM3 uses surface mount technology on an ultra compact 4 layer board and, like the A5000 and newer A540s, incorporates a socket which is directly connected to the co-processor bus, ready for a Floating Point Accelerator chip. No extra adaptor unit is needed since the FPA chip will plug directly into the empty socket provided as standard on our ARM3 board. The universal ARM3 board with FPA socket plugs into a 300, 440, A400/1 or R140 machine, although 305/310 and old style 440 machines will need upgrading with a MEMC1a for an ARM3 to work correctly. A high quality PLCC extractor tool (available separately at £8) is provided free with each upgrade. The A3000 requires a board modification which can be carried out by our Surface Mount Service Centre.

Archimedes 305/310

305/310 4Mb RAM upgrade board	£129
Risc-OS3 Carrier Board to adapt existing ROM sockets	£18
MEMC1a Upgrade kit, required for Risc-OS3	£25
PLCC Extractor tool for DIY fittings	£8

Our solder-in memory upgrade board has been engineered to be compatible with other upgrades by fitting under the disk-drive bridge. Its low-power consuming, fully buffered, eight-chip design avoids overheating for reliable operation. MEMC1a not necessary, unless you wish to run RISC-OS3. An efficient three-day fitting service is available, which includes courier collection of your machine, fitting of the above three items, testing and return for a special price of £189.

Plug-in Memory Upgrade Kits

We have designed a series of easy to fit memory upgrades which require no soldering or special expertise. They just plug in! Full instructions are included in each pack, describing the fitting procedure step by step.

A3000	1Mb upgradeable Memory card - £43	4Mb card - £108
A3010	1Mb memory pack - £30	standard 4Mb RAM card - £108
A3020/A4000	Memory upgrade from 2 to 4Mb -	£55
A5000	Vertical fit 2 to 4Mb memory card -	£75
A4 Portable	Memory upgrade from 2 to 4Mb -	£55
A400	Memory packs to upgrade to either 2 or 4Mb - per Mb	£33

We are an authorised SURFACE-MOUNT SERVICE CENTRE fully capable of servicing and repairing Acorn computers to component level. We also offer a fitting service for any of the above upgrades - please contact us for details.

Quality Assurance - We manufacture to the highest standards. Everything we sell is rigorously tested before despatch and guaranteed for 12 months.

17½% VAT to be added to EC orders. Carriage free in UK. Educational discounts.

SIMTEC
ELECTRONICS

Avondale Drive, Tarleton,
Preston, Lancs PR4 6AX
Tel: (0772) 812863

Gnome Computers Limited

25A Huntingdon Street, St. Neots, Cambs, PE19 1BG
Tel./Fax: 0480 406164 E-Mail: support@gnome.co.uk

X Window System R11.4

This software package, developed in association with Acorn Computers, converts a RISC OS based Archimedes into an X Terminal. The software will allow communication with X clients over Ethernet or Econet. Graphic support includes both the state machine G8 and Computer Concepts ColourCard.

X Software	£199
Complete Colour X Terminals from	£1150

Archimedes upgrades


External SCSI 200MB H/D + Acorn SCSI Card	£990
External SCSI 1.2GB H/D + Acorn SCSI Card	£1999
External 150MByte SCSI Tape Drive	£650
External 8GByte SCSI DAT Tape Drive	£1500

Transputer & i860 Systems

Gnome Computers offers a complete range of transputer and i860 boards to fit into either RISC OS or RISC IX based Archimedes machines. Prices start at £1385 for a single 10 MIP, 2 MFLOP transputer system including a parallel FORTRAN-77 compiler.

UNIX & Network Specialists

12th successful year



GENEALOGY

(See review in Feb '87 and Aug '89)

FAMILY HISTORY SYSTEM The most popular program ever written for us. Enables you to produce a full family tree and many other genealogical listings. **BBC/Master/Compact version £21.95 Archimedes version £25.95**

PAYROLL

(Now in its twelfth year. The only BBC program for wages, tax and National Insurance for up to 400 employees covered by a single bit. Four weekly and Monthly pay, whether of data per employee in hours or employee information. Extended to include pension deductions, sick pay, SSP, SMP, the tax and post tax adjustments and even no pay. Three types of payroll printout and an optional coin analysis. An annual contract keep you up to date with the budget changes. Send for demo disc £59.50)

BOOKKEEPING

(see review in March '89 Acorn User)

1) CASHBOOK Double entry bookkeeping for home or club use. All data kept in memory. Three character analysis code enables you to know where the money comes from and where it goes. 48 transactions per A4 page. Analysis summary up to 30 categories. **£14.95**

2) CASHBOOK D As 1) + random access giving 2000 items. CASH/BANK or VAT/BANK headings. Password control. String or numeric searches. For schools, clubs & non credit businesses. **£24.95**

3) ACCOUNT As 2) + Credit facility and statements. For small businesses working with credit. **£39.95**

4) ACCOUNT-PLUS As 3) + Invoicing. Orders, Quotations etc. Full sorting of data by 5 options. Automated statements, mailing labels. Multiple automatic nominal ledgers. **£59.95**

For independent schools and VAT businesses who wish to cut the effort. **£59.95**

5) TAXMAN This new program which has been under development for three years allows you to enter all your transactions and to printout end of year results with balance sheet and even calculate tax due. The Inland Revenue love it and so do we. Results can be taken from our other accounting programs and entered into TAXMAN making a superb combination. **£59.95**

6) Micro-Trader is a full accountancy package with features right through to final balance sheet. Stock Control at £75.00 extra. £235.00

For shops/firms, accountants wanting full accounting facilities. Payroll can be integrated. **£88.13**

MAILING

218 addresses in memory or up to 1875 on random access disc. Multiple selected and repeat labels, mail merge, full sorts. Ideal for subscription lists, promotions, any kind of mailing. **£14.95**

Ask for detailed brochure for more software and other items. **£35.95**

(FAX AVAILABLE) Kildonan Courtyard, Barnhill, S. Ayrshire Scotland, KA26 0PS. Tel: 0465 82288

PLEASE NOTE OUR MOVE & CHANGE OF ADDRESS FROM CORNWALL

Each frame consists of 32 stars and each of these is constructed with about 200 points. On Jan's A4000 these can be plotted comfortably plotted within a frame.

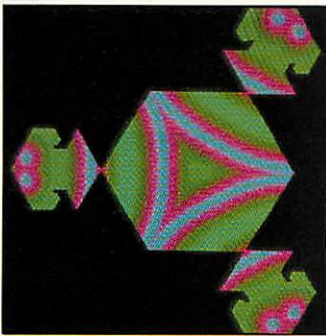
Top is a 3D demo, displaying a solid top that consists of no less than 2,400 faces. These are shaded accordingly using a fixed light source. Move the mouse around to change the point of view.

The shading of a polygon is achieved by calculating the z component of its normal, multiplying this by a precalculated normalisation factor – the inverse of the surface of the polygon – and using it as an index value to look up an entry in a colour table.

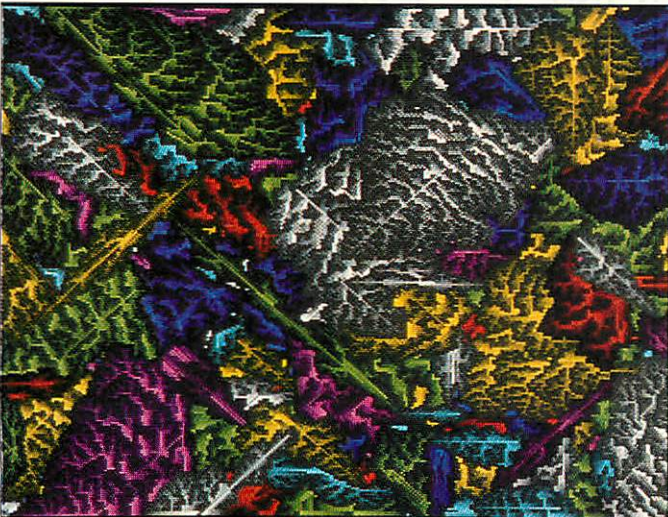
Because hidden facets aren't shown, only about 1,200 need to be shown at any one time. Arm3 users might like to increase the number of polygons by changing the values of m1 and m2.

VIBE-RANCY

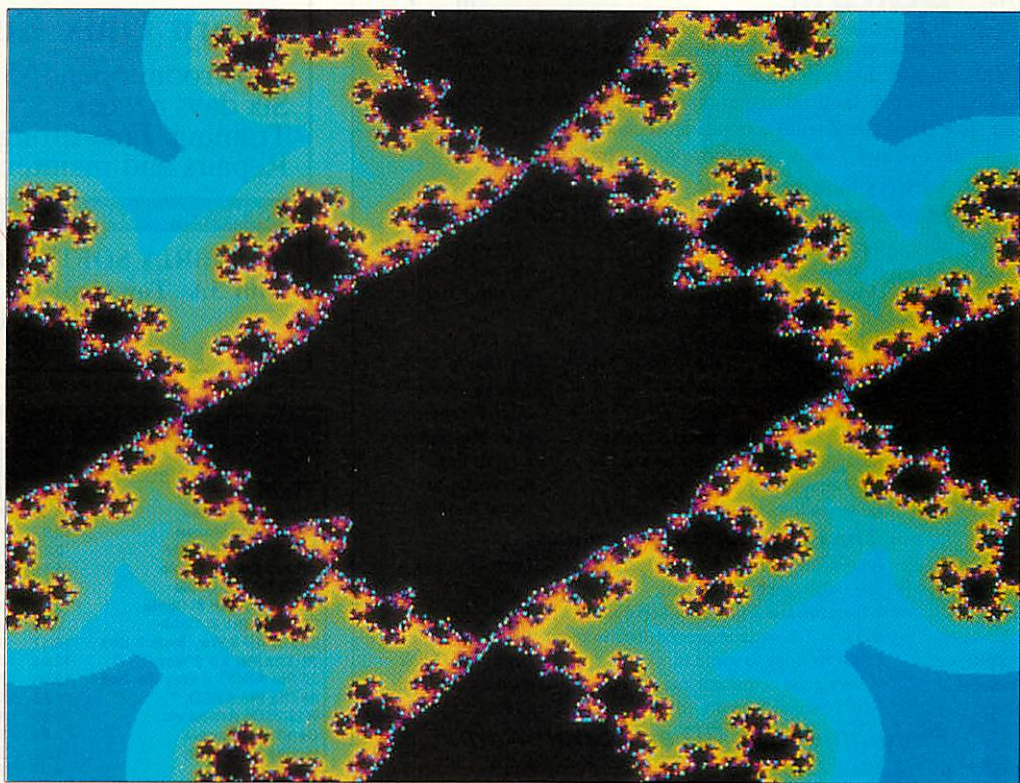
Program: Cabbage, Pulsar
Author: Jan Vibe
Description: Graphic demos
Machine: 32-bit
Listing: 50 & 130 lines Basic



From pulsars...



... to cabbages as Jan Vibe roams the cosmos in search of who knows what?



Michael Rozdoba's mix of the Julia and Mandelbrot sets makes clear the relationship between them

Scarcely an issue can go by at the moment without a little ditty or two from our resident graphics-mad Dutchman Jan Vibe. This month is no exception, and Jan has provided two excellent demos for your delectation.

The first was originally entitled *Texture*, but we felt that *Cabbage* was a much more descriptive name. The program will work in either Mode 13, or Mode 21 if you have a multiscan monitor. Apart from that, there isn't really much else for us to say, except to wonder whether this is the first of the spring crop of vegetable

simulators. When will we see the first fractal turnip?

Jan's second program, *Pulsar*, 'Displays a pulsating, ever-changing, pattern symmetric about two, three, four or five axes'. The program uses 16 colours and it will run quite happily in Modes 12, 20 or 31. You are prompted to select a polygon to draw which then controls the number of axes of symmetry in the finished pattern. Jan recommends you try the hexagon first. In Jan's words:

'The figure is made by defining an angle and constructing a triangle with two points resting on the X-axis of the co-ordinate system and the third point defined by the angle.

'This triangle is sub-divided by a recursive procedure until the triangle is made into a sufficient number of smaller triangles. These triangular 'pixels' are then coloured according to a mathematical formula. The triangle is mirrored in the X-axis and turned round the co-ordinate system until a solid polygon is constructed.'

The figure is constantly animated by cycling the colours using Jan's cunning rotating method that we have covered before in *INFO.

UP THE QUASI

Program: QuasiJ+M
Author: Michael Rozdoba
Description: Fractal pictures
Machine: 32-bit
Listing: 135 lines Basic/185 lines machine code

Mandelbrot and Julia set generators are among the most common submissions to *INFO. We've covered them so many times that we rarely give a disc labelled 'Julia' or 'Mandelbrot' a second look. Our policy on repeating features is quite simple; if a submission is in some sufficient way faster, shorter or different from the last one we carried, we will include it in *INFO.

Michael Rozdoba's quasi-Mandelbrots and Julias fit into the last category. The mathematics that lies behind the program is a little complex, so we'll leave it up to Michael to explain what is involved:

'*QuasiJ+M* generates images that resemble those of the Julia & Mandelbrot sets for the iteration of the map...

$$z \rightarrow \{ \text{Re}(z^2) + i.\text{Im}(z^2) \} - c$$

... where c is a complex parameter & z is a complex variable. The letter i denotes

THE Datafile



71 Anson Road, LOCKING, Weston-Super-Mare, BS24 7DQ

To celebrate the libraries third year it now boasts a new, fully multi-tasking catalogue application that runs from the iconbar. It loads the complete catalogue from disc in just 55 seconds. It's search facility is extremely fast and it supports Acorn's interactive !Help.

Author **Dirk-Willem van Gulik.**

800k Catalogue / Demo Disc XII contains:

DrawFiles	Cartoon and game characters.	Thomas Whittaker
!Bricks	A small but excellent demo.	Michael Porter.
!ImpCompr	Compress those Impression files automatically. Requires !SparkFS.	Jonathan Marten.
!TheFace	A funny animated pointer.	The Loris
Morse Code	An Outline font. Teach yourself Morse.	Michael Jackson
!PyPipes	A very addictive game.	Andrew Cawte.
!Player2	Tracker player and module.	Hugo Fiennes
!FracLand2	Design / manipulate fractals landscapes.	Peter Millerchip
!Menon 2.06	An application launcher. Invaluable.	Joris Röling.
!TempConv	Easy temperature conversion.	Elliott Hughes.
!ViewHelp	Help windows designer.	David Radford.

The HD version also includes

!Spaticence	A compendium of card games.	Jason Horsnell
GraphProgs	80+ basic graphic programs.	Various.
Images	1 Jpeg file and 1 GIF file. Top quality.	Anon.
!Translatr	Version 7.12 with improved Jpeg usage.	John Kortink.
!SupRender	Converts draw to sprite files.	Ferdinand Oeink
!LineEdit	A very good command line editor.	Richard K Lloyd
!Zap	Fast Text and Memory editor.	Dominic Symes.

Recommended PD and Shareware.

Utility 19 - PowerBase 4.79c now includes a suite of programs for teachers. Exam stats, attendance records, parents evening appointments.

Utility 61 - MiniHound a shareware 30,000 word thesaurus. Top class.

Utility 76 - !BlakHole2 a desktop waste basket with many great features and 23 other useful utilities.

Utility 62 - A 12 disc electronic globe !EarthMap. Requires 24 megs free on a hard drive to instal. Once installed it uses 13.5 megs. **Package costs £12.50.**

Clip Art 31,32 & 33 - Hundreds of first class archived draw files.

Games 1 - An outstanding invaders game plus 13 other great games.

NewDawn Issue 2 - The best Archimedes magazine includes a new game and a flight simulator called 1914. Highly recommended.

Demo 25 - !Brat. This must be one of the best animations on the Arc. Get it!!

Games 23 - At last the finished version (3.5) of Tom Cooper's classic arcade adventure Gyrinus II - Son of Gyrinus. Two discs archived on to one.

What has The Datafile got to offer you?

1. A top class library with over 690 archived discs.
2. £1.25 per DD disc plus a free disc for every 10 purchased.
3. HD discs are available at only £2 each, these contain two DD on one HD disc. Plus a Pick 'n' Mix service.
4. Fast turn round of orders 95% are despatched the same day.
5. The library is willing to swap PD and we offer authors free discs of PD when they send their programs to us.
6. The library gets all the latest updates as they are released and the catalogue is updated weekly to keep you informed.
7. We offer a registered users scheme. For £6 per year (£9 for HD discs) you get the latest catalogue disc automatically bi-monthly. You are also entitled to two free discs for every ten discs purchased.

Why not register now and be sure of your catalogue disc?

What type of PD and Shareware have we got?

- 11 discs Coconizers songs and samples - 17 Commercial Demo discs
- Fractal generators and pictures on 15 discs - 16 discs of Jpeg files
- Thousands of Utilities on 80 discs - Replay movies and sound tracks
- 135 discs of STracker modules containing over 1500 songs
- 33 Clip Art discs - 14 discs of Animations - 33 games discs
- 110 discs of Graphics files - 25 discs of Sound Samples
- 121 Demonstration discs - 9 discs of Desktop toys
- Ray Traced pictures and animations on 10 discs
- and a selection of magazine discs. Plus More!!!

ALL OF THESE DISCS ARE 100% ARCHIVED FOR GREAT VALUE.

PRICES - HD cat/demo disc £1.50. 800k cat/demo disc £1 add 50p for a second disc with the HD programs on. All other discs are £1.25 each. For Europe add 20pence per disc. Rest of the world add £1 for first disc and 50p for each additional disc.

ie. Package !Earthmap would be £14.90 in Europe or £17 for the rest of the world. AIRMAIL.

CSS Computer Centre Acorn Education Centre Acorn Unix Centre



Showroom open 9-5.30

Six days a week

Training. Free fitting of add ons
Repairs and maintenance



NEW: A3000, A4000, A5000 & Pocket Book now in stock

CUMBRIA SOFTWARE SYSTEMS LTD
Unit 3A, Townfoot Ind. Est., BRAMPTON
CUMBRIA CA8 1SW
% 06977 3779

ACORN USER SHOW

APRIL 93 - STAND 63

Free Show Tickets. Ask for details

DD International

Software & Computer Supplies

ITEM	1+	10+	3M BRANDED	10	50	100
Bus Aglier Mouse	25.49	23.99	3.5" DS/DD	5.92	28.90	57.50
Serial Atlas Mouse	16.97	14.95	3.5" DS/H/D	11.70	57.90	109.00
6" Arc Printer Cable	2.51	2.25	5.25" DS/DD	4.21	20.50	39.90
15" Arc Printer Cable	4.95	4.50	5.25" DS/H/D	8.47	39.90	79.00
25/25 M&F 3" Cable	3.36	3.10	Bulk Disks (Price, subject to availability).			
25/25 M&F Pin 6" Cable	5.92	5.50	3.5" DS/DD	3.79	17.95	34.90
36/36 Centr 6" Cable	5.92	5.50	3.5" DS/H/D	6.77	29.95	55.90
25 Pin AB 2 Way Switch Box	10.17	9.95	5.25" DS/DD	2.51	11.49	22.00
36 Ctx Pin AB 2 Way "	12.95	11.95	5.25" DS/H/D	4.21	19.50	35.00
25 Pin ABCD 4 Way Sw Box	19.95	17.95	Show Prices will be lower on some goods. EXTRA			
36 Ctx Pin ABCD " " "	21.95	19.95	10% discount with this ad, as long as you hand it to			
9/15/25/36 Adapts etc.	4.95	4.45	us with your name & address on the back.			
Gender Changers	4.95	3.95	Photocopies will do. (offer does not apply to disks).			
Mouse Mats 4mm	2.51	2.25				
Printer Stands	4.21	3.95				

NOSHER GAME - only £5.95 (£4.95 at the show).

TEL: 0924 368294, FAX: 0924 383499,

CAR: 0831 554758.

Free Delivery. Prices exclude VAT.

Goods are US Imported every 5 weeks. Back orders taken. (Country of manufacture may vary). (E & OE)

LOWEST ADVERTISED PRICES

**A5000 Learning Curve
Multisync System
ONLY £1299**



**A4 Portable 60Mb HD
ONLY £1475**



Phone for prices of other models !

A3010

Family Solution

ONLY £382

Mail Order Only

Education orders welcome.
VAT extra on all prices.
Access and Visa welcome.
Carriage £8
Next day supplement £5

MICRO DISCOUNT phone 031-668 4700
55 Clerk Street, Edinburgh, EH8 9JQ.

SQR(-1), the basis of complex number theory, $\text{Re}(z)$ means the real part of z & $\text{Im}(z)$ means the imaginary part of z . Compare this method with the familiar Julia sets & the Mandelbrot set, which result from the iteration of...

$z \rightarrow \{+i.\text{Im}(z^2)\} - c$,
[that is, $z \rightarrow z^2 - c$]

'When in Mandelbrot mode, *QuasiJ+M* can be used to explore the Mandelbrot set for this function and to select the parameters that will produce interesting images that you can then feed into the Julia generator.

'Support for a reasonable degree of zooming is permitted, although this is limited by the fixed-precision arithmetic I have used to maintain good speed of image generation.

'Images can be generated in any usable 16-colour screen mode & may be saved into the current directory afterwards. I recommend Mode 9 for browsing & Mode 12 (or 20 if you have a multisync, 31 for Risc OS 3.1) for generating final images.

'To use *QuasiJ+M* double-click on the Basic file and select if you wish to start with Mandelbrot or Julia. In the latter case you will be prompted for a pair of parameters. The appropriate set will then be drawn.

'Pressing S saves the image into the current directory; press N to enter a new screen mode. Space lets you zoom in on the current image using the mouse; Select reduces the size of the target window; Adjust increases it; while Menu starts image generation for the target window selected.

'Alternatively, pressing I lets you type in manually a new set of window co-ordinates. Finally, keys J and M swap between plotting the Julia and Mandelbrot set. When going between the Mandelbrot and Julia sets, the Julia set parameters are taken from the current Mandelbrot view.'

SQUIGGLE REVISITED

Program: Squiggle1

Author: Alan Beasley

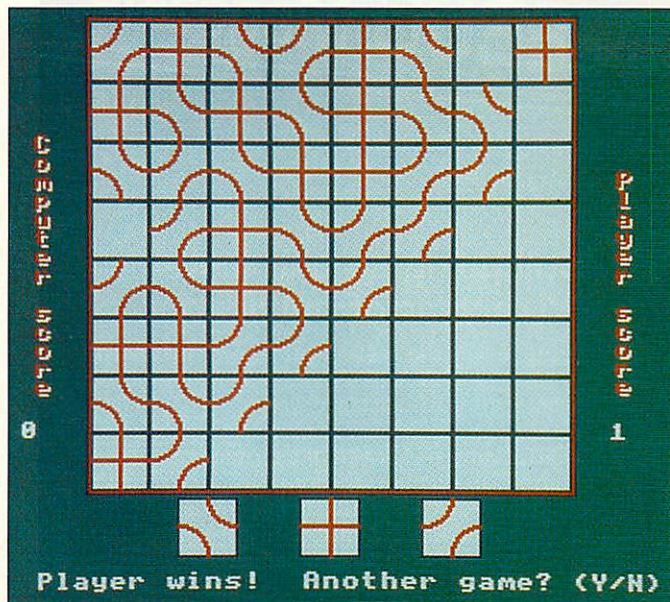
Description: Computer-play routines for Squiggle game

Machine: 32-bit

Listing: 240 lines Basic

In the July 1991 issue, we carried a two-player game by Barry Wickett called *Squiggle*. At the time we asked if anyone could come up with a set of routines that would allow the computer to play. Well, it's taken nearly two years, but Alan Beasley has done just that. For those in the dark, the game takes place on a square board and starts in a corner square.

Two players then take it in turn to play one of the three



Squiggles can now give you a real run for your money

pieces shown, such that it continues the path already laid. You win if you make the path reach the opposite corner from the start and lose if you make it lead off the side.

Barry explains: 'In my first attempt, the computer moved in a randomly selected direction, simply avoiding paths that lead off the board. This proved very easy to beat. A little analysis reveals that the winning strategy – provided no intermediate squares have been visited already – is: If the number of the moves to the right and up is odd then move right or up, otherwise move left or down. This version of the program was not very successful either.

'I then tried combining these two methods and determining the computer's move by picking one of the methods at random. This seems to provide quite a playable game. Although it is almost impossible for the computer to win by reaching the target square – as the player can usually baulk it at the last moment – it is quite difficult for the player also and more often than not the game develops into a cat-and-mouse chase in which the loser finally gets trapped on a square from which all the exits lead off the board.

'It is very easy for the player to make a mistake during the end-game when most of the board is covered by a spaghetti-like line, whereas the computer will never make a wrong move.'

DANCING & SKATING

Program: Dancer & Skater

Author: Mark Hobson

Description: 'String-thing' graphics

Machine: 32-bit

Listing: 50 & 60 lines Basic

One of the most popular one-liners we have published was *StringThing*, which has reappeared in a number of weird and wonderful incarnations. Mark Hobson's programs both use the same sort of routine as *StringThing* but with stronger negative gravity. This is used to calculate the backbone of the figure.

The arm and leg positions are calculated from different parts of the backbone. The mouse is used to control both the figures. *Skater* is identical to *Dancer* except that he/she has a skateboard, a floor, gravity and a box to jump over.

* QUIT

Listings, applications, hints, tips, requests are always welcome.

All but the shortest listings should be on disc together with a description. And *please* write your name and address on all discs. A stamped, self-addressed envelope will ensure the return of your disc. If you are a particularly young (or old) reader please let us know your age.

Send your submissions to:

*INFO, Acorn User, Redwood Publishing, 101 Bayham Street, London NW1 0AG.

HINTS AND TIPS

● A quicky from Geoffrey Lane. He reminds us that in *Draw* it is possible to use the cursor keys to move the pointer as well as the mouse. This allows objects to be positioned with much more precision. This function also works when using the 'edit' option, but the mouse Adjust button must be kept pressed.

● From Mike Williams, a useful extra facility for the *DrawItalic* program featured in the December issue. If you want drop shadow letters that really stand out, take some text in an outline font and convert it to a path. This can be achieved with *Draw3*, *Draw+* or *Artworks*. Set the line colour to black and the fill colour to white then save it. Run *DrawItalic*, set the nib thickness to zero. The nib width controls the depth of the 3D effect; experiment for the best results. Now load both files back into draw and position it exactly over the top of the italicised version. Precise positioning can be achieved by using a grid of the same value as your nib width and using 'snap to grid'.

● Finally, from Duncan Breckels, a hint for running *The Train Game* from the desktop. First create an application directory with a suitable name and design and save a *!Sprites* file. Place a copy of the game in the directory and call it *!RunImage*. You might also like to place a copy of *65Tube* there. The *!Run* file you need is then:

```
RMEnsure 65Tube 0 RMLoad <Obey$Dir>.65Tube
Key 0 *Run <Obey$Dir>.!RunImage!M
FX 138,0,128
EmulateTube
```


BEEBUG Magazine

the only magazine still devoted solely to the BBC Micro and the Master 128

Still going strong in its 11th year of publication

BEEBUG was the first magazine ever published to cater for BBC enthusiasts, and is still as popular after 10 successful years.

BEEBUG offers a wealth of information: from articles on how to write Basic programs to ready-to-use utilities and complete stand-alone applications. BEEBUG also offers frequent 'fun' programs and entertaining games.

If you want to find out more, write to us for a **FREE** BEEBUG magazine or phone on **0727 40303**. Please quote this advertisement to receive your free magazine.

RISC Developments, 117 Hatfield Rd, St. Albans, Herts AL1 4JS

SENALAC Computing Limited

Art/Graphics

Artworks	145.00
Chameleon 2	42.00
GraphBox Pro	115.00
Illusionist	85.00
Imagery	82.25
Revelation 2	128.75
smArt	54.00
smArt Filer	38.00
Vector	89.00

Books

First Impressions	31.00
Good Impressions	29.00

Communications

ArcComm 2	55.00
ArcTerm 7	70.00

Databases

Flexifile	133.00
Squirrel	150.00

Score Draw	55.00
VoxBox	55.00
MIDI/Sampler (Econet)	75.00

Peripherals

Vision Colour Dig. (Int)	89.50
HiVision " " (Int)	89.50
ScanLight 256	220.00
ScanLight Professional	640.00
with SCSI interface	790.00

Don't pay until you receive your order!
Cash-on-Delivery is available on orders up to £350 for only £3.50 extra.

Printers

Canon BJ-10ex	205.00
with CC Turbo Driver	255.00
Epson: EPL-5200 Laser	669.00
Epson LQ570	290.00
LaserDirect HiRes 4	1050.00
Panasonic KX-P1124i	230.00

Spreadsheets

Eureka!	128.75
Pipedream 4	199.00

Bargain Box!

** Courier v32bis FAX Modem...465.00, with HST...695.00 **	
Saloon Cars	15.00
3D Construction Kit	22.00
Fax Pack	282.00
!Tracer	30.00
EasiWriter	120.00
Mid. Graphics Clips 1	25.00
ShowPage (not RiscOS 3)	90.00
EasiWriter	125.00
Enter the Realm	18.50
Cataclysm	18.50
Pandora's Box	18.50
ScanLight 256 (Arc)	190.00

Limited Stocks!

DTP/WP

Impression 2	145.00
Impression Junior	81.00
Pendown Outline Fonts	19.95

Education

Fun School 4 (0-5)	21.00
Fun School 4 (5-7)	21.00
Fun School 4 (7+)	21.00

Hypermedia

Genesis 2	130.00
Magpie	56.00

Music

Notate	59.00
Rhapsody 2	55.00

Utilities

Articulate	19.00
Compression	48.00
Investigator 2.2	25.00
Speech!	16.50

Cheques/postal orders should be made payable to
SENALAC Computing Ltd. (AU0593)

P.O. Box 304

BRIGHTON, BN2 2TT

Don't forget to tell us which machine you have!
Please send a S.A.E for our current price list.

VAT Reg. No. 508 7594 16

Company Registration No. 2277309

Established
1983

Contex Computing



BANK MANAGER

Complete and versatile personal accounts program. Consistently acclaimed!
'data entry is a delight...professional...excellent product'
'Impressed...ideal...easy to use'

Enter cheques and receipts. Automatic date sequencing. Reconcile statements. Search, amend and delete. Analyze expenditure. Forward cash flow forecast. Budgets. Up to 36 bank accounts online, inter account transfers, 9999 standing orders, 99 analysis headings, unlimited postings (depending upon disk space). Reports to screen or printer. Mix foreign currencies, graphics, password, file recovery, field editing, programmable reports, Arc RAM disks, wild card analysis enquiries, sort and more.

Bank Manager £25.00

BUSINESS UTILITY

For the club accounts or small business user. Prints a "trial balance" or "P&L reports" via the programmable spreadsheet generator. Needs the Bank Manager. Saves hours of work.

Bus Util Pack £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. Word scan or exact key checking, targets may be revised, rhythm metronome, key click, free format options. Recommended for adult education.

Typing Tutor £15.00

SPREADSHEET MK V

Low cost, versatile spreadsheet. 26 cols by 900 (Arch) or 99 (BBC B) rows, loaded with many functions and facilities inc programmable report writer and input scripts.

Spreadsheet MK V disk £15.00

Add £1 p&p per order (Overseas £3.50). Programs suitable for all
Archimedes, A3/4/5000, BBC Master, Compact and BBC B series.
State computer type (eg A3000, BBC B etc) and disk type (eg 3 1/2" or 5 1/4" 80 track or 5 1/4" 40 track)

CONTEX COMPUTING

(Ref AU), 15 Woodlands Close,

Cople, Bedford MK44 3UE



Tel: 0234 838347

NEW

A3010 Family Solution
A3010 Learning Curve
A4000 Home Office
A5000 Learning Curve
A4 Portable
Acorn Pocket Book

If it's made **by** Acorn Computers
or it's made **for** Acorn computers,

THE DATA STORE
can help.

We're stocking all the new Acorn models to go with the vast selection of peripherals and software on our shelves.

TRY BEFORE YOU BUY IN OUR ATTRACTIVE SHOWROOM

6 CHATTERTON ROAD BROMLEY KENT

Tel: 081-460 8991 Fax 081-313 0400

BEGINNERS' BIT

Variable names ending with a dollar character (\$) are used to hold 'string variables'; computer-speak for words. They are called strings because they consist of a string of characters. They can be assigned, INPUTed and PRINTed in much the same way as ordinary numeric variables. It is also possible to add two strings together with the + operator; sadly, no other numerical operators will work. However, there are a handful of functions provided by Basic specifically for handling strings in interesting ways.

Starting from the simplest, we can find the length of a string with LEN. This takes a single string variable as an argument and returns the length of the string as its result; for example, LEN("Acorn") = 5. In practically all cases the brackets are optional. Two other functions exist for converting strings into numbers. The first function, VAL, treats as much of the string as it can as a number and then returns this as its result. Hence VAL"12" is 12, VAL "10 green bottles" is 10 and VAL "Nothing" = 0.

Unfortunately (you might think) VAL "3*2" is 3 rather than 6, but this is where the next function, EVAL, comes in. This can be passed a string that can contain any valid expression (as you might see in an assignment for example). You are free to use numbers, numerical operators, other functions such as SIN and COS, user-defined functions with FN and even variable names. It is therefore perfectly legal to have the line: EVAL"2*COS(theta)+3*SIN(theta)". You can even EVALuate expressions with string variables in them: EVAL"a\$+b\$". One quite common use for this enables you to have a routine that can easily execute a number of different subroutines without a complex CASE statement:

```
INPUT "Name of function ";f$
dummy=EVAL("FN"+f$)
```

This type of structure can often be seen in *INFO programs. It is also possible to convert numerical variables into strings. For this we use the function STR\$. This is exactly the opposite of VAL. STR\$(12)="12", thus n=VALSTRn. Once a number is stored as a string, it can be manipulated by all the other string functions which makes it easy to perform functions such as centring or right justifying; we will see routines for these two in a while. As a simple example, LENSTR\$num will return the number of digits in the number.

Moving on, it is often quite useful to generate a string of identical characters, for deleting a line of text on screen for example. To save having a FOR...NEXT loop such as...

```
FOR i=1 TO 40
  PRINT " ";
NEXT i
```

... you can use the single statement: PRINT STRING\$(40," "); As you can probably guess, STRING\$ repeats a given string a given number of times. The only limitation is that the resulting string must be less than 256 characters long.

The next group of functions all perform string chopping to extract 'sub-strings'. Given the string a\$="BBC Acorn User", then LEFT\$(a\$,3)="BBC", RIGHT\$(a\$,4)="User" and MID\$(a\$,5,5)="Acorn". In other words, LEFT\$ extracts the leftmost 'n' characters from the string, RIGHT\$ takes them from the right and MID\$ takes them from the middle. In the latter case the two parameters are the start character and length respectively. Thus MID\$(a\$,11,2)="Us". It is possible to leave off the length parameter, in which case the rest of the string is returned, so MID\$(a\$,11)="User" (the same as RIGHT\$(a\$,4)).

You can remove a single character from the middle of a string by modifying this slightly; to delete the nth character from a\$...

```
LEFT$(a$,n-1)+MID$(a$,n+1).
```

Two common requirements of these functions have been allocated a shorthand notation. To find the rightmost character in a string (normally written RIGHT\$(a\$,1)) you can miss out the ,1 and just write

RIGHT(a\$). Likewise to remove the last character from a string (for which you'd have to write LEFT\$(a\$,LENa\$-1)) you can use the much simpler LEFT\$(a\$).

One of the many enhancements made to Basic in Risc OS allows us to overwrite portions of strings using these same three functions. The expression, LEFT\$(a\$,3)=b\$, will replace the first three letters of a\$ with the first three letters of b\$. If b\$ is less than three letters long, then only those characters up to the length of b\$ will be overwritten. Fairly obviously you can use RIGHT\$(a\$,3)=b\$ to overwrite the last three characters in a\$ and MID\$(a\$,2,3) to overwrite the second, third and fourth.

I mentioned centring and right-justifying earlier on in reference to printing STR\$ed numeric variables, of course the same routines will work for ordinary strings. Centring first, then...

```
PRINTTAB((width-LENa$)/2);a$
```

... this is very straightforward; we take the length of the string to print and subtract it from the width of 'field' in which we are centring it. This number is amount of white space either side of the string. This is divided by two and uses a parameter to TAB. To right-justify a string in a field of 'width', we could use...

```
PRINT RIGHT$(STRING$(width," ") + a$,width)
```

... here STRING\$ is used to provide a padding string that would definitely be long enough even if we were printing a null string. The string to print is added to the right of this padding and then the desired number of characters are extracted from the end of the string with RIGHT\$. This method has the added bonus of printing over any characters that were previously on the screen with spaces. If you were printing the score in a game, you might want to right justify the number with zeros (e.g. Score: 0001020). In this case you'd simply replace the " " with "0". A similar procedure can be used with LEFT\$ to left justify a string within a given field and ensure the rest of the field is blank. In this case you could use...

```
PRINT LEFT$(a$+STRING$(width," "),width)
```

The final function we are going to take a look at is INSTR. This takes two strings as parameters and searches for the second within the first. If it is a valid sub-string, then INSTR returns its position otherwise it returns 0. Thus INSTR("Computing","put")=4. An extra, numeric, parameter can also be supplied, meaning the search for the sub-string starts at that character. INSTR("shipshape","sh") = 1, but INSTR("shipshape","sh",2)=5. INSTR can have many uses, partly because it can take away the need for writing array searches, for example...

```
REPEAT
  INPUT "Enter month (e.g. jan) : ";month$
  month=INSTR(" jan feb mar apr may jun jul aug sep oct nov dec ",
    " "+month$+" ") - 2
UNTIL month MOD 4 = 0
PRINT "Month number: ";(month DIV 4) + 1
```

One quite common use of INSTR, in *INFO at least, appears after a menu...

```
PRINT "(L)oad (S)ave (P)rint (E)dit (Q)uit : ";
REPEAT
  opt=INSTR(" LIsSpPeQq",GET$) DIV 2
UNTIL opt > 0
IF opt=1 PROCload
IF opt=2 PROCsave
```

This makes for a very short, neat and idiot-friendly system. Upper and lower case are catered for and you could quite easily change the keys without the need for lots of alterations to the IF statements.

DO YOU NEED A USER-FRIENDLY ACORN PUBLISHING BUREAU?



Your Partners in Publishing

IMAGESETTING

Direct from your DTP files created in Impression, Ovation, TechWriter, EasiWriter, Pipedream, Wordz, Draw, Poster, Artworks, Vector etc.

DISC FORMATS

800k/1.6Mb floppy, 44Mb Syquest or 21Mb floptical discs, standard or compressed (SparkFS, ArcFS etc), FaxPack file transfer also supported.

OUTPUT

Bromide paper or film, including 4 colour separations, at resolutions up to 2540 dpi, screen rulings up to 175 lpi.

PLOTTER BUREAU

8 pen plotter output up to A1 from Worrad, Designer V3 and Draw files.

PUBLISHING

Typesetting/page make-up service with over 1500 type-faces available, including the entire Linotype™ Type 1 font library and most RiscOs outline fonts. Although we use mainly Acorn DTP equipment we can deal with many Mac/PC files, and can help with translation or output direct.

REPROGRAPHICS

Reprographic & Platemaking facilities up to A2, which we can combine with DTP film output (stripping in high quality photographic halftones, PMTs etc).

PRINTING

With several years experience dealing with Printers and their needs, we would be happy to advise on, or arrange any printing you may require.

EXPERIENCE

Established in 1989 to provide local Printers & Designers with a Typesetting, Repro, and Platemaking service, we can also call on more than 10 years previous experience within the Printing & Publishing industry.

For details, prices etc, please write, fax or phone to:-

T.J. REPRODUCTIONS

Unit 42, Sapcote Trading Centre, Dudden Hill Lane,
Willesden, London NW10 2DJ
Tel: 081-451 6220 Fax: 081-451 6441

**YOU need the
Acorn technical
documentation
on CD-ROM!**

Oh no!
Coordinate
transformations?



```
ADFS::16_56_Sat.$!Librarian.c.pr
/* Set transformation matrix, and position.
 * "pagestr" contains the page parameters, "po:
 * draw units, and is updated. "box" points to
static void print_set_page(s_pageview *pv, prin:
oxtyp *box)
{
  #if 1
  draw_bboxtyp *paper = (draw_bboxtyp *)&(pv->d:
  #else
  draw_bboxtyp *paper = (draw_bboxtyp *)&(pv->:e:
  #endif
  draw_bboxtyp pagelimit ;
  draw_bboxtyp visiblelimit ;
  draw_bboxtyp page ;
  rotate ;
  BOOL
```

Problems with your code? Dog-eared manuals? Can't find what you need in the PRM? Spend all your time thumbing the DDE guides?

You need The Tekkie Disc - all Acorn's technical documentation on CD-ROM with comprehensive searching software.

You can: open several manuals at once ♦ follow cross-references with the click of a mouse button ♦ add your own notes to pages ♦ mark useful places ♦ search one or more books for bits you need ♦ use your paper manuals to hold up your desk ♦ save money by not buying the new PRM ♦ give your CD-ROM drive a purpose in life.

Texts include RISC OS 3 PRM, *User Guide*, *Applications Guide*, *BASIC Guide*, *DDE*, *C* and *Assembler manuals*, *Style Guide* & more.
£99 + VAT (p&p free in UK) from Emerald Publishing
166 Shelford Road, Trumpington, Cambridge CB2 2NE.
Tel 0223 840138 ♦ Fax 0223 844652

High performance dual serial card £79

This allows serial comms at up to 115,200 baud, with FIFOs for maximum efficiency.

If you have a fast modem, you need this!

Works with ARCTerm 7 & ARCbbs.

(please call for information about compatibility with other packages).

v22bis (2400 bps) FaxModem bundle £269

BT Approved Pace FaxModem, ARCTerm, ARCFax, and a cable. All you need!

v32bis (14400 bps) FaxModem bundle £349

Twincom v32bis FaxModem (NOT BT APPROVED), ARCTerm, ARCFax, and a cable. Very quick! (best with a serial card)

20Mb Floptical disk systems from £349

DOS 1.44Mb and Acorn 1.6Mb capable.

Works with practically all SCSI cards.

ARCTerm 7 £68

ARCbbs (3 line version) £85

PC Keyboard/mouse interface £89

A5000 - 120Mb 2nd hard disk £279

Fujitsu 496Mb SCSI (over 2Mb/sec) £899

External 120Mb Magneto-Optical £999

Insured delivery on storage systems £10+VAT. Education is entitled to a 5% discount on all our own products.

Please add VAT at 17.5% to all prices. Plastic welcome.

THE SERIAL PORT



Our shop in Wells should be open, if you are thinking of visiting, call first!

The Serial Port
Burcott Manor, Wells,
Somerset, BA5 1NH

Telephone (0749) 670058
Fax (0749) 670809
Modem (0749) 670030
ISDN (0749) 670883

This is the second to last article in this series, so I am going to finish off with a summary of everything I've talked about to date this month and a question and answer page about machine code next month. After that, you're on your own.

The Arm processor has a 32-bit data bus, allowing it to handle 32-bit numbers (up to 4,294,967,296 in decimal). It has 16 data registers, one of which (R15) is a dedicated program counter (pc) and another (R14) which doubles as the 'link' register on a subroutine call. The other 14 are undedicated and can be used freely. A number of conventions are usually adhered to about some of these, however, the only one you are likely to run into at this stage is the stack pointer (R13).

Arm instructions generally consist of two or three registers and sometimes a shift value. The destination register is always on the left and source registers on the right, so instructions could be thought of as direct translations of their mathematical counterparts (for example: $x=a+b$ -> ADD x,a,b).

Registers can be loaded with immediate constants using MOV for positive numbers or MVN for negative numbers. A wide range of constants can be used because of Acorn's clever use of the 12 bits available for the constant. Eight bits are used to represent the data part of the number and the other four are used as a shift. In general you don't need to worry about this,

If you get a 'bad immediate constant' error, you've tried to load an illegal value and you'll either need to load it from memory or generate it in some way. The instruction MVN behaves the same as MOV except it loads the logical inverse of the number you supply (meaning NOT).

Instructions exist for simple mathematical manipulation: ADD and SUB should be self-explanatory. There is also a Reverse SuBtract (RSB) instruction which subtracts the first register from the second. Versions of these also exist which make use of the carry flag (ADC, SBC and RSC), which allow you to extend the 32-bit limit of calculations.

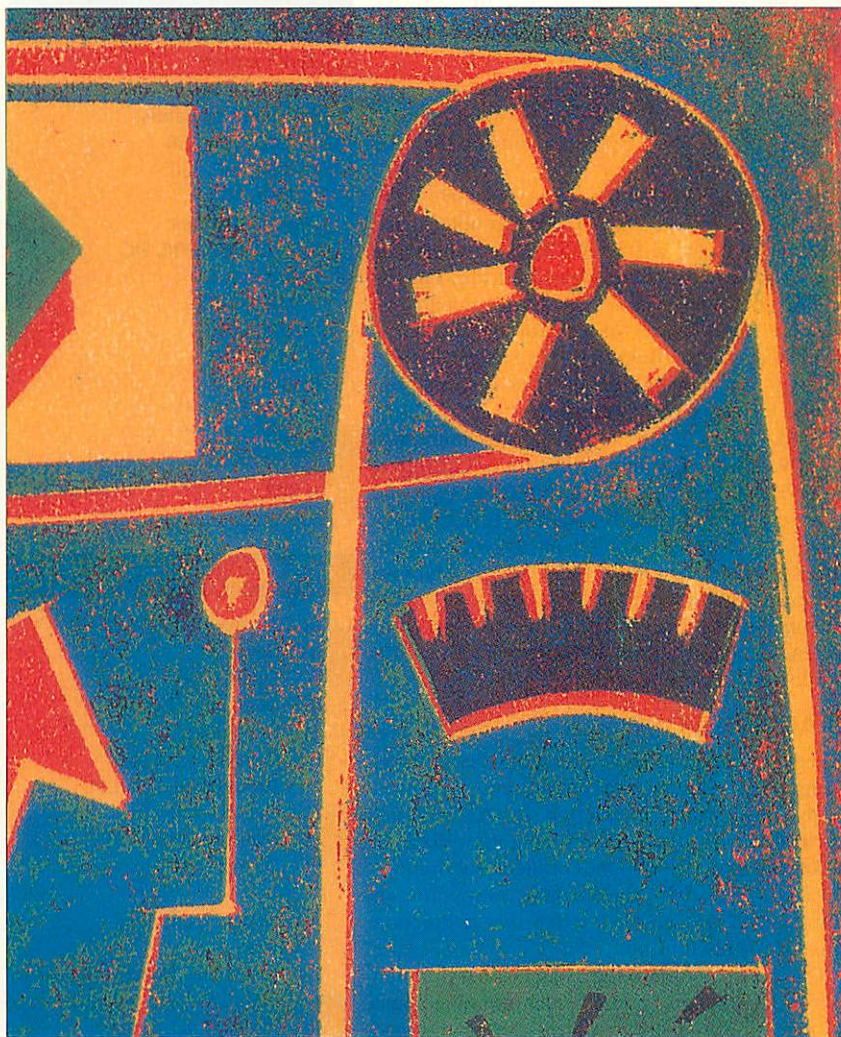
ROLL OUT THE BARREL

All of these instructions can have an optional shift applied to the second source register by means of the barrel shifter, which is one reason why there is a RSB instruction. This can take any of the forms ASL, ASR, LSL or LSR - which mean Arithmetic or Logical shifts Left or Right - followed by an immediate constant shift value or a reference to a further register.

This shift takes no extra time to execute and it can thus be used to great effect in calculations. A right rotate is also allowed (ROR). There is no explicit left rotate instruction; you have to use ROR 32-(left). An extra rotate, RRR, or Rotate Right with eXtend performs a 33-bit rotate including the carry flag.

Two multiplication instructions are provided, MUL and MLA. MUL takes two operands - but no shift - and simply multiplies them together. MLA takes three, multiplies the first two and adds the third, but again no shift is allowed.

Bitwise logical functions are supported with AND, ORR and EOR, all of which perform as expected. The 'opposite' of ORR, which sets bits,



PAUL SCHOFIELD

ASSEMBLY LINE

Dave Lawrence
sums up a year of
machine code as
Assembly Line
draws to a close

is BIC, which clears specific bits. It is exactly equivalent to OR NOT. Shifted operands can freely be used with these operators.

As it stands, the Arm will execute every machine code instruction as it comes to it. It is possible to change this - without using branching instructions, which we will come to in a while - by using conditional execution. A total of 16 condition codes are supported by the Arm chip. By adding one of these condition codes to

the end of an instruction, it will only be executed if the chip's status flags are in the appropriate state.

These flags can be set in a number of ways, the most common of which are by adding an 'S' to an instruction, or by using one of the four comparisons available.

Adding an S will set the flags according to the result of the instruction, so, for example, if the result is zero, the Z flag will be set, which can then be detected and acted on by using the EQ or NE condition codes. The four comparisons allow a finer degree of control over what is compared. CMP compares a register with a constant or another register, CMN is similar but is used for negative comparisons.

Unlike MVN, CMN compares the numerical negative of the operand rather than the logical inverse. TEQ is a slightly more refined CMP and only sets the Z flag (it stands for Test EQuivalence). It is useful when you do not wish to affect the other condition flags. TST is a bitwise comparison performing an AND on its operands but not storing the result anywhere (for completeness, note that CMP and CMN perform a SUB but do not store the result).

BRANCHING OUT

When you need to take more drastic steps in changing the order of execution, you will need to use the branch instruction B. As with all instruction you can add any condition code to make this into a conditional branch. Subroutines are also handled by the Branch instruction, so you need to add an L to make this instruction into a Branch with Link.

This is exactly the same as an ordinary branch except the old program counter is copied into R14 (the link register). Control can be returned to the calling routine with the instruction MOV PC,R14. If you wish to preserve the original status flags you can add an S to the MOV. If your subroutine needs to call a further subroutine, you will need to make use of the stack; more on this below.

Data can be transferred between the Arm's registers and the memory using either the LD (load) or ST (store) instructions. They come in two flavours, the vanilla flavour, LDR for handling single words and the super-duper chocolate fudge sundae flavour, LDM for dealing with multiple registers. LDR (and STR) actually have a little extra hidden up their sleeve; they can also transfer single bytes by adding a B. In this form they can load and save bytes from any memory location.

When dealing with whole 32-bit words – meaning, without the B – they only work as you expect on word boundaries (meaning addresses divisible by four). The source of a load (and the destination of a store) must be an 'indirected register'. In other words, a register must be set up to contain the address you wish to access, which is represented by putting the register in square brackets.

Pre- and post-indexing is supported, which allows you to add a constant to this register before or after the access to memory is made. Pre-indexing is represented by including this offset – which can be a constant or a register with an optional shift – within the square

ARM INSTRUCTIONS

Data transfer:
MOV, MVN

Arithmetic operators:
ADD, SUB, RSB
ADC, SBC, RSC
MUL, MLA

Logical operators:
AND, ORR, EOR, BIC

Data storage:
LDRB, STRB
LDR, STR
LDM, STM

Branching:
B, BL

Other:
ADR
SWI

ARM CONDITION CODES

AL Always (The default)
NV Never
EQ Equals (Z set)
NE Not equals (Z clear)
CC Carry clear
CS Carry set
MI Minus (N set, i.e bit 31)
PL Plus (N clear)
VS Overflow set
VC Overflow clear

For comparing unsigned numbers:

LO Lower than (same as CC)
HS Higher/Same (same as CS)
HI Higher (C set, Z clear)
LS Lower/Same (C clear, Z set)

For comparing signed numbers:

LT Less than
GE Greater/Equal
GT Greater than
LE Less/Equal

LDM/STM SUFFIXES

STMFD	STMDB	②
LDMFD	LDMIA	③
STMFA	STMIB	①
LDMFA	LMDA	④
STMED	STMDA	④
LDMED	LDMIB	①
STMEA	STMIA	③
LDMEA	LDMDA	②

LDM/STM TYPES

① ADD reg,reg,#4 : LDR a,[reg]
② SUB reg,reg,#4 : LDR a,[reg]
③ LDR a,[reg] : ADD reg,reg,#4
④ LDR a,[reg] : SUB reg,reg,#4

brackets separated from the 'address register' by a comma. If you add an '!' after the closing square bracket this constant will be permanently added onto the address register; this is called write-back. With post-indexing the offset is put after the close bracket and write-back is assumed (it wouldn't make sense without it). Both of these forms of indexing come 'for free' and take no extra time.

The chocolate fudge sundae variety of transfer, which amounts to the instructions LDM and STM, take a single register as an address and a list of registers – in curly brackets – to store starting at that address. This can either be represented singularly (R0,R1,R2) or in shorthand (R0-R2). The action to take between the storage of each register needs to be specified, which is achieved by adding a couple of characters to the LDM or STM.

Two instruction notations are supported; one designed for stacking registers and the other for data transfer, there is no actual difference in the instructions assembled, but it does make code easier to write (and read). Tables three and four show the various types and their equivalents in each notation; in essence the suffix dictates which instructions in table four are executed.

GETTING WRITE-BACK TO YOU

Write-back is also supported by adding a '!' to the name of the address register. You will often see subroutines that stack the registers they use at the start – so they are not corrupted on return to the calling routine – along with the link register and restore the same registers and the PC on return, to return to the calling routine. An extra ^ after the list of registers will restore the original values of the processor status flags as well (in much the same way as the line MOV PC,R14).

One common function needed is not actually provided by the Arm, but is supported by most assemblers. As you must provide an address register when using LD and ST, a means of pointing a register at an address is needed. ADR does just that. It takes a register as an address as parameters and assembles a suitable ADD or SUB instruction with the PC as the other parameter so that the destination register contains the desired address. Obviously the address needs to be at an offset that can be assembled into a 12-bit constant or you will get an 'outside address range' error.

The only other instruction you are likely to meet is SWI, which is the magic one that gives you access to all the wonderful operating system routines. You will have seen a few over this series, but a full list is slightly beyond the scope of this article.

THE END IS NIGH

That's the end of our whistle-stop tour of simple Arm programming. If you have any queries, please refer to the relevant issue for more details. Or, if you are still stuck, please write to me care of *INFO at the usual address and either Dave Acton or I will do our best to help you. As I said at the start, next month will be a question-and-answer page covering the queries I have received about Arm programming over the last few months.

WeServe of Hampshire

High quality products. Full technical support.

Visit our Showrooms. See before you buy.

WeServe COMPUTER SERVICES

New Citizens

These printers are a new generation of dot matrix printers with noise levels and quality usually only found in inkjets.

Swift 240

24pin Colour*

Advanced 24pin printer, lots of new features. Please phone for a data sheet
*optional colour. Price with cable & paper

240 Mono £245
240C Colour £265

2 year warranty on Citizen printers

Swift 200

24pin Colour*

Enhanced 24pin printer. SWIFT 24E plus:
Extra type faces & features. Please phone
for a data sheet. *optional colour.
Price with cable & paper

200 Mono £195
200C Colour £225

Citizen 120D+

with cable & paper

£115

Canon BJ-10ex

360dpi inkjet printer with cable & paper.

New Price £199

Printer Packs

All printers are supplied with a printer pack
consisting of printer paper and a
connection cable.

Free of charge

A stand is £5.00 extra (with a printer)

Philips CM8833 MK2

Stereo Medium Res, with cable,

£215

Colour Mono, no cable
£211

8271

disk controller chip

£38.26 + VAT

Archimedes

We stock the full range of Acorn computers.
Teachers and Educational Discounts are available
on most Micros.

If you want free on site service on A3010's as
Dixons offer we can provide it for.

If you want 10% off other peripherals with
Archimedes as Watford offer we can do that.

We are able to match most offers on Acorn products
and provide real customer service. First class
customer service before & after sales try us today.

Laser Printers

Special Offers

Epson ELP8010 £699
HP Laserjet 4 £1049
HP Laserjet 4M PS £1429
OKI OL830 PostSc £899
Canon LPB8-4 PostS £989
Canon LP84 1/2M £475
Panasonic KXP4410 £419
Panasonic KXP4430 £579
Laser prices exclude VAT

Deskjet 500

HP 300dpi inkjet printer. Laser quality at
dot matrix price. 3 year warranty. With
cable & paper

£325

Deskjet Colour

300dpi colour inkjet printer. Colour laser
quality at 1/10 of the cost. 3 year warranty.
With cable & paper

£419

Deskjet 500C

HP 300dpi inkjet printer. Colour laser
quality, with colour and black cartridges
resident. 3 year warranty. With cable &
paper

£529

Acorn Spares

	Exc V	Inc V
Power Supply unit	42.00	49.35
Keyboard.....	34.00	39.95
Keyswitch (white)	1.00	1.18
Case top & bottom	19.00	22.33
View 2.1 ROM only	9.00	10.58
Speech ROM only	13.00	15.28
TMS5220 Speech	13.00	15.28
OS 1.2 ROM	12.00	14.10
8271 controller	31.49	37.00

	Exc V	Inc V
Power Supply unit	58.00	68.15
Keyboard.....	59.00	69.33
Keyswitch (black)	1.00	1.18
Case top & bottom	19.00	22.33

Archimedes **Exc V** **Inc V**

Acorn Mouse	28.00	32.90
Mouse cable	7.62	8.95

Please phone for full range

SONY DISKETTES

SONY branded

(lifetime warranty)

(100% certified error free)

10x 3.5" DS/DD 135tpi.....£7.50
50x 3.5" DS/DD 135tpi.....£32.30
100x 3.5" DS/DD 135tpi£59.93
250x 3.5" DS/DD 135tpi ...£141.00
1kx 3.5" DS/DD 135tpi.....£540.50

DISKETTES

SONY/DYSAN bulk

(lifetime warranty)

(100% certified error free)

10x 3.5" DS/DD 135tpi.....£5.95
50x 3.5" DS/DD 135tpi.....£21.86
100x 3.5" DS/DD 135tpi£39.60
250x 3.5" DS/DD 135tpi£94.88
1kx 3.5" DS/DD 135tpi.....£379.53
40x 3.5" Disk box with lock...£5.49
100x 3.5" Disk box with lock...£7.50
Carriage on 50+ disks £3.53

Phone for our 70 page catalogue. All prices include 17.5% VAT

EDUCATIONAL AND GOVERNMENT ORDERS WELCOME.

All products have a 30 day money back & 12 month warranty.

Prices are subject to variation without prior notification.

Please phone for express clearance of cheques.

Established 7 years. 3 minutes from M27 Junction 11.

Free Parking. Open 9 to 5.30 Monday to Friday & 9 to 5 Saturday.

Postage 94p or £3.53. Securicor £6.46 Securicor AM £11.75

Acorn/User Dept.

40-42 West Street

Portchester Hants

PO16 9UW

Tel: 0705 647000

APR 93

Phone for our 70 page catalogue. All prices include 17.5% VAT

EDUCATIONAL AND GOVERNMENT ORDERS WELCOME.

All products have a 30 day money back & 12 month warranty.

Prices are subject to variation without prior notification.

Please phone for express clearance of cheques.

Established 7 years. 3 minutes from M27 Junction 11.

Free Parking. Open 9 to 5.30 Monday to Friday & 9 to 5 Saturday.

Postage 94p or £3.53. Securicor £6.46 Securicor AM £11.75

Acorn/User Dept.

40-42 West Street

Portchester Hants

PO16 9UW

Tel: 0705 647000

APR 93

Phone for our 70 page catalogue. All prices include 17.5% VAT

EDUCATIONAL AND GOVERNMENT ORDERS WELCOME.

All products have a 30 day money back & 12 month warranty.

Prices are subject to variation without prior notification.

Please phone for express clearance of cheques.

Established 7 years. 3 minutes from M27 Junction 11.

Free Parking. Open 9 to 5.30 Monday to Friday & 9 to 5 Saturday.

Postage 94p or £3.53. Securicor £6.46 Securicor AM £11.75

Acorn/User Dept.

40-42 West Street

Portchester Hants

PO16 9UW

Tel: 0705 647000

APR 93

Phone for our 70 page catalogue. All prices include 17.5% VAT

EDUCATIONAL AND GOVERNMENT ORDERS WELCOME.

All products have a 30 day money back & 12 month warranty.

Prices are subject to variation without prior notification.

Please phone for express clearance of cheques.

Established 7 years. 3 minutes from M27 Junction 11.

Free Parking. Open 9 to 5.30 Monday to Friday & 9 to 5 Saturday.

Postage 94p or £3.53. Securicor £6.46 Securicor AM £11.75

Acorn/User Dept.

40-42 West Street

Portchester Hants

PO16 9UW

Tel: 0705 647000

APR 93

Phone for our 70 page catalogue. All prices include 17.5% VAT

EDUCATIONAL AND GOVERNMENT ORDERS WELCOME.

All products have a 30 day money back & 12 month warranty.

Prices are subject to variation without prior notification.

Please phone for express clearance of cheques.

Established 7 years. 3 minutes from M27 Junction 11.

Free Parking. Open 9 to 5.30 Monday to Friday & 9 to 5 Saturday.

Postage 94p or £3.53. Securicor £6.46 Securicor AM £11.75

Acorn/User Dept.

40-42 West Street

Portchester Hants

PO16 9UW

Tel: 0705 647000

APR 93

Phone for our 70 page catalogue. All prices include 17.5% VAT

EDUCATIONAL AND GOVERNMENT ORDERS WELCOME.

All products have a 30 day money back & 12 month warranty.

Prices are subject to variation without prior notification.

Please phone for express clearance of cheques.

Established 7 years. 3 minutes from M27 Junction 11.

Free Parking. Open 9 to 5.30 Monday to Friday & 9 to 5 Saturday.

Postage 94p or £3.53. Securicor £6.46 Securicor AM £11.75

Acorn/User Dept.

40-42 West Street

Portchester Hants

PO16 9UW

Tel: 0705 647000

APR 93

Phone for our 70 page catalogue. All prices include 17.5% VAT

EDUCATIONAL AND GOVERNMENT ORDERS WELCOME.

All products have a 30 day money back & 12 month warranty.

Prices are subject to variation without prior notification.

Please phone for express clearance of cheques.

Established 7 years. 3 minutes from M27 Junction 11.

Free Parking. Open 9 to 5.30 Monday to Friday & 9 to 5 Saturday.

Postage 94p or £3.53. Securicor £6.46 Securicor AM £11.75

Acorn/User Dept.

40-42 West Street

Portchester Hants

PO16 9UW

Tel: 0705 647000

APR 93

Phone for our 70 page catalogue. All prices include 17.5% VAT

EDUCATIONAL AND GOVERNMENT ORDERS WELCOME.

All products have a 30 day money back & 12 month warranty.

Prices are subject to variation without prior notification.

Please phone for express clearance of cheques.

Established 7 years. 3 minutes from M27 Junction 11.

Free Parking. Open 9 to 5.30 Monday to Friday & 9 to 5 Saturday.

Postage 94p or £3.53. Securicor £6.46 Securicor AM £11.75

Acorn/User Dept.

40-42 West Street

Portchester Hants

PO16 9UW

Tel: 0705 647000

APR 93

Phone for our 70 page catalogue. All prices include 17.5% VAT

EDUCATIONAL AND GOVERNMENT ORDERS WELCOME.

All products have a 30 day money back & 12 month warranty.

Prices are subject to variation without prior notification.

Please phone for express clearance of cheques.

Established 7 years. 3 minutes from M27 Junction 11.

Free Parking. Open 9 to 5.30 Monday to Friday & 9 to 5 Saturday.

Postage 94p or £3.53. Securicor £6.46 Securicor AM £11.75

Acorn/User Dept.

40-42 West Street

Portchester Hants

PO16 9UW

Tel: 0705 647000

APR 93

Phone for our 70 page catalogue. All prices include 17.5% VAT

EDUCATIONAL AND GOVERNMENT ORDERS WELCOME.

All products have a 30 day money back & 12 month warranty.

Prices are subject to variation without prior notification.

Please phone for express clearance of cheques.

Established 7 years. 3 minutes from M27 Junction 11.

Free Parking. Open 9 to 5.30 Monday to Friday & 9 to 5 Saturday.

Postage 94p or £3.53. Securicor £6.46 Securicor AM £11.75

Acorn/User Dept.

40-42 West Street

Portchester Hants

PO16 9UW

Tel: 0705 647000

APR 93

Phone for our 70 page catalogue. All prices include 17.5% VAT

EDUCATIONAL AND GOVERNMENT ORDERS WELCOME.

All products have a 30 day money back & 12 month warranty.

Prices are subject to variation without prior notification.

Please phone for express clearance of cheques.

Established 7 years. 3 minutes from M27 Junction 11.

Free Parking. Open 9 to 5.30 Monday to Friday & 9 to 5 Saturday.

Postage 94p or £3.53. Securicor £6.46 Securicor AM £11.75

Acorn/User Dept.

40-42 West Street

Portchester Hants

PO16 9UW

Tel: 0705 647000

APR 93

Phone for our 70 page catalogue. All prices include 17.5% VAT

EDUCATIONAL AND GOVERNMENT ORDERS WELCOME.

All products have a 30 day money back & 12 month warranty.

Prices are subject to variation without prior notification.

Please phone for express clearance of cheques.

Established 7 years. 3 minutes from M27 Junction 11.

Free Parking. Open 9 to 5.30 Monday to Friday & 9 to 5 Saturday.

Postage 94p or £3.53. Securicor £6.46 Securicor AM £11.75

Acorn/User Dept.

THE PERFECT ANSWER



Speed comparison table

Comparison print times using Acorn printer drivers with a Deskjet500 against TurboDrivers with a BJ-200.

All times are in seconds shown on the ARM3 and ARM2 based computers.

To print a 4 page document consisting of a spread of different fonts, text sizes and graphics:

	DeskJet 500	BJ-200	Speed increase factor
Time to get control back - ARM3	313	59	5.3
Last page completed - ARM3	316	200	1.6
Time to get control back - ARM2	832	155	5.4
Last page completed - ARM2	834	232	3.6



Computer Concepts Ltd

GADDESSEN PLACE HEMEL HEMPSTEAD HERTS HP2 6EX

The BJ-200 is a brand new black and white printer from Canon, the market leader in inkjet printing. This is a high speed, high resolution printer ideally suited to the Archimedes range of computers.

Computer Concepts supply the BJ-200 with a special version of their TurboDrivers - the fastest printer drivers available for the Archimedes. The printer also includes a built-in 80 page sheet feeder. The price for the printer with TurboDrivers is just £299 + vat (+p&p) - a full £100 less than the recommended retail price.

At 360 dpi the BJ-200 offers significantly higher resolution than other 300 dpi inkjet printers and at faster than 1 page per minute for a full page of graphics (or 3 pages per minute for plain text) it is also faster than other printers in its price range. And being an inkjet it is whisper quiet when printing.

RISC OS
Turbo
D R I V E R S

The BJ-200 with TurboDrivers is the perfect answer to those users seeking the best quality prints in the least possible time, without going to the expense of a laser printer. In fact we guarantee this is the fastest high quality printer available for less than a laser printer, or your money back.

Price

£299 + £10 p&p + VAT (£363.07 inc)

ORDER HOTLINE
TELEPHONE THIS NO. FOR IMMEDIATE DESPATCH
0442 639333
OR FAX YOUR ORDER ON 0442 231632

THE SUBSCRIBER'S PAGE

Subscribe and receive your free disc every month,
packed full of exclusive programs and resources

DISC CONTENTS: MAY 1993



MENU

The Acorn User disc menu makes the subscriber's disc a pleasure to use. Run the programs of your choice quickly and easily or, if you're perplexed, get instant on-line help



DALEK

Time to hide behind the sofa. Well, please don't, because Peter Clements' Dalek animation, complete with sampled sound effects and ray traced graphics, is a joy to behold. The application has been compressed using Computer Concepts' Compression, and decompression is fully automatic. Turn to page 68 to find out how Peter recreated the scourge from planet Skaro



ROCKY TRADE

Our popular Games Designer series reaches an awesome climax, featuring a complete arcade game designed using our system. Scroll that landscape and blast the living daylight out of anything that moves. Best of all, you can program your own fast scroller using the system. We'll be interested to see how your offerings compare with ours. Check it out on page 98.



PONG

Once upon a time microcomputers, arcade games, bank dispensers and microwave dinners were just a twinkle in someone's eye. Now you can recreate those heroic first days of computer gaming with our deluxe 32-bit version of one of the classics, all the way from 1972. Sprites? Sampled sound? Scrolling? Who needs them... Turn to page 93 for a rewarding, life-enhancing experience



*INFO

You could say this contains the usual concoction of the wacky and wonderful, but there's nothing predictable about this month's *INFO. From Jan Vibe's computer-generated cabbages to the artificial intelligence routines underlying Barry Wickett's board game *Squiggle*, there are ideas here in massive profusion. You'll find this phantasmagoric feast on page 103

BBC ACORN USER ORDER FORM

Name.....

Address.....

.....

..... Postcode.....

Please tick if you are taking out:

☐ A new subscription

☐ A renewal of a current subscription:

I use the following machines: A3010 ☐ A3020 ☐

A4000 ☐ A5000 ☐ A540 ☐ A3000 ☐ A440 ☐

A310 ☐ A410 ☐ Master ☐ BBC B ☐ A4 ☐

Other (please specify)

Rates listed are valid until 31/5/93. The 3.5in disc is compatible with all Risc OS machines. The 5.25in disc contains all eight bit programs

SUBSCRIPTION OFFER

AUP593

To receive BBC Acorn User every month, together with your free monthly disc, simply fill in the form below and send it to BBC Acorn User, Fulham House, Goldsworth Road, Woking, Surrey, GU21 1LZ or call (0483) 727762. Your subscription will start with the next available issue.

Subscription rates 3.5in disc ☐ £22.95 5.25in disc ☐ £22.95
For details of overseas subscription rates, contact the address above

BINDER OFFER

☐ Please send me..... binders at £5.95 each

BACK ISSUES/DISCS OFFER

Month.....Year ☐ 1992 ☐ 1993

Magazine ☐ £1.95 Discs ☐ £5.95 (3.5in)

Overseas orders add £1 (Europe) and £3 (rest of the World)

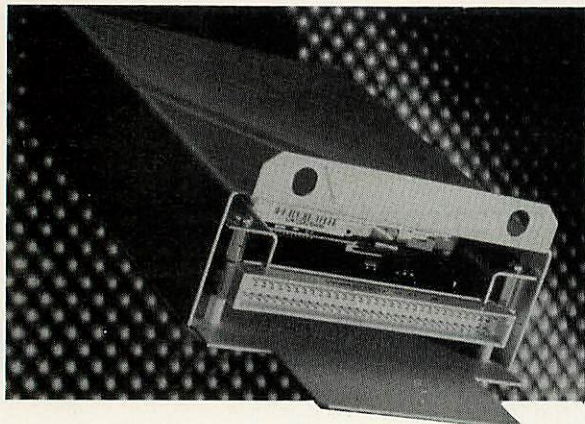
I enclose a cheque/PO (made payable to BBC Acorn User)

for a total of £

Access/Visa card no..... Exp date.....

Signature.....

A3000 SPECIAL OFFERS FROM CUMANA



CAA 740 Podule

By far the best way to add a fast 40 Mb hard drive to your A3000 and get a SCSI/CDFS card at the same time. SCSI Manager™ is provided free with other utilities.

• **JUST £355.00** •

A3000 4Mb RAM upgrade still only £95.00. Add a floppy disk drive (5.25" or 3.5") to your A3000 . . . but first you need an interface:

- Unbuffered interface only £10 • Buffered only £18 •

CUMANA FLOPPY DISK DRIVES (WITH PSU)

- Single 5.25" 40/80T Switchable Double sided £141 •
- Single 3.5" 80T Double sided £108 •

NAME ADDRESS

 POSTCODE

I would like to order:

AU/5/93

- | | |
|---|---|
| <input type="checkbox"/> Cumana CAA 740(s) at £355 each | <input type="checkbox"/> Cumana buffered FDD Interface(s) at £18 each |
| <input type="checkbox"/> Cumana 4Mb upgrade(s) at £95 each | <input type="checkbox"/> Cumana single 5.25" 40/80T FDD at £141 each |
| <input type="checkbox"/> Cumana unbuffered FDD Interface(s) at £10 each | <input type="checkbox"/> Cumana Single 3.5" 80T FDD at £108 each |

Please debit my ACCESS/VISA card (please delete):

No: Expiry date:/..... Signature

Cheques should be made payable to Cumana Ltd. • Please send me information on: (please tick box):

- ☐ EMU ☐ SEMERC A4000S ☐ CD-ROM Special Offers ☐ My nearest Cumana dealer



NEW EMU, NEW EMU...

. . . An expandable multi-use interface designed with care and attention to detail, to fit all A3000, A4000, A3010 and A3020 systems. 100% Acorn Compliant. The EMU interface:- as specified for the SEMERC A4000S . . . user port, midi, analogue, SCSI, IDE, Companion™ and more.



Orders may be placed by: telephone - 0483 503121, or fax - 0483 451371 or sent to: Cumana A3000 Offers, Pines Trading Estate, Broad Street, Guildford, Surrey GU3 3BH

• OUR GUARANTEE •
 ORDER WITH CONFIDENCE. CUMANA RAM UPGRADES CARRY OUR 28 DAY MONEY-BACK GUARANTEE OF SATISFACTION. YOUR STATUTORY RIGHTS REMAIN UNAFFECTED.



Cumana reserve the right to increase the price at any time.

YELLOW PAGES

Free programs for you to type in and use

COMPATIBILITY CHART

Use this chart to check if a program will work on your machine. There are two columns, one for eight-bit machines like the Model B and Master 128, and one for 32-bit machines, like the A3000, A400 or A3010. If there is a star for the program in the column then it will work on your machine. Special exceptions and hardware requirements are listed as foot notes at the end of the table.

Article	Program Name	8-bit	32-bit
BJÖRN AGAIN (page 93)	Pong		*

*INFO (page 103)

Info1	Graduate	*
Info2	Select	*
Info3	RGBcube	*
Info4	HSVcone	*
Info5	CIE	*
Info6	Interpol	*
Info7	Snake	*
Info8	Top	*
Info9	Cabbage	*
Info10	Pulsar	*
Info11	QuasiI+M	*
Info12	Squiggle1	*
Info13	Dancer	*
Info14	Skater	*

*INFO

Listing Info1

```
10 REM >Graduate (Info1)
20 REM By Michiel van Schaik
30 REM For 32-bit machines (R03.1)
40 REM (c) BAU May 1993
50 :
60 MODE 15
70 OFF
80 SYS "OS_SWINumberFromString",,"Col
ourTrans_SetGCOL" TO set_gcol%
90 step%=4
100 FOR dither%=0 TO 1
110 ORIGIN 640*dither%,0
120 action%=dither%*4100
130 FOR red%=0 TO 255 STEP step%
140 FOR green%=0 TO 255 STEP step%
150 col%=(red%<<16)+(green%<<8)
160 SYS set_gcol%,(red%<<8)+(green%
<<16),,,action%,0
170 RECTANGLE FILL red%*2,green%*2,
2*step%-1
180 NEXT green%
190 NEXT red%
200 NEXT dither%
210 END
```

Listing Info2

```
10 REM >Select (Info2)
20 REM By Michiel van Schaik
30 REM For 32-bit machines (R03.1)
40 REM (c) BAU May 1993
50 :
60 MODE 15
70 IF MODE=21 VDU 23,17,7,110,8,16;0
80 *POINTER 1
90 MOUSE ON 1
100 PROCinit
110 PROCrgb_to_hsv
120 PROCrgb_to_cmyk
130 PROCdrawbars
140 REPEAT
150 MOUSE x%,y%,b%
160 IF (b% AND 5)>0 PROCclick(x%,y%)
170 UNTIL (b% AND 7)=7
180 MODE 0
190 END
200 :
210 DEF PROCinit
220 DIM x%(9),y%(9),c%(9),v%(9),
bar$(9)
230 x%=(656,656,656,96,96,656,96,656,
96,656)
240 y%=(864,736,608,448,320,320,160,1
60,32,32)
250 l%=(511,511,511,1071,511,511,511,
511,511,511)
260 c%=(00000F000,00F000000,0F0000000
,0F0F0F000,0F0F0F000,0F0F0F000,0F0F00000
,0F000F000,000F0F000,000000000)
270 v%=(255,255,255,0,0,255,0,0,0,0)
```

```
280 bar$()="Red","Green","Blue","Hue",
"Saturation","Value","Cyan","Magenta","Y
ellow","Key"
290 VDU 5
300 SYS "ColourTrans_SetGCOL",&5050500
0,,,0,0
310 RECTANGLE FILL 80,592,544,408
320 RECTANGLE FILL 80,16,1136,272
330 RECTANGLE FILL 80,304,1136,272
340 RECTANGLE FILL 640,592,576,408
350 FOR i%=0 TO 9
360 SYS "ColourTrans_SetGCOL",&8080800
0,,,0,0
370 RECTANGLE FILL x%(i%),y%(i%),l%(i
%)+32,112
380 SYS "ColourTrans_SetGCOL",&F0F0F00
0,,,0,0
390 MOVE x%(i%)+16,y%(i%)+96
400 PRINT bar$(i%)
410 NEXT i%
420 ENDPROC
430 :
440 DEF PROCshowcolour
450 SYS "ColourTrans_SetGCOL",(v%(2)<<
24)+(v%(1)<<16)+(v%(0)<<8),,,&100,0
460 RECTANGLE FILL 96,608,512,376
470 ENDPROC
480 :
490 DEF PROCdrawbars
500 LOCAL i%,len%
510 FOR i%=0 TO 9
520 MOVE x%(i%)+16,y%(i%)+16
530 IF i%=3 THEN len%=v%(3)*3 ELSE le
n%=(v%(i%)*2)
540 SYS "ColourTrans_SetGCOL",c%(i%),
,,&100,0
550 PLOT 97,len%,32
560 SYS "ColourTrans_SetGCOL",&5050500
0,,,0,0
570 PLOT 97,1%(i%)-len%,-32
580 SYS "ColourTrans_SetGCOL",&8080800
0,,,0,0
590 MOVE BY 0,48
600 PLOT 97,-16*LENSTR$(v%(i%))-64,32
610 SYS "ColourTrans_SetGCOL",&F0F0F00
0,,,0,0
620 PRINT;" ";v%(i%)
630 NEXT i%
640 ENDPROC
650 :
660 DEF PROCclick(x%,y%)
670 type%=-1
680 FOR t%=0 TO 9
690 IF x%>=x%(t%) AND x%<=x%(t%)+1%(t
%)+32 AND y%>=y%(t%) AND y%<=y%(t%)+64 T
HEN type%=t%
700 NEXT
710 IF type%<>-1 THEN
720 x%=x%-x%(type%)-16
730 IF type%=3 x%=x% DIV 3 ELSE x%=x%
DIV 2
740 IF type%=3 max%=359 ELSE max%=255
750 IF x%<0 x%=0 ELSE IF x%>max% x%=m
```

```
ax%
760 v%(type%)=x%
770 CASE type% OF
780 WHEN 0,1,2:
790 PROCrgb_to_hsv
800 PROCrgb_to_cmyk
810 WHEN 3,4,5:
820 PROCrgb_to_rgb
830 PROCrgb_to_hsv
840 PROCrgb_to_cmyk
850 WHEN 6,7,8,9:
860 PROCcmyk_to_rgb
870 PROCrgb_to_cmyk
880 PROCrgb_to_hsv
890 ENDCASE
900 PROCdrawbars
910 PROCshowcolour
920 ENDIF
930 ENDPROC
940 :
950 DEF PROCrgb_to_rgb
960 IF v%(3)=0 AND v%(4)=0 THEN v%(4)=
1
970 SYS "ColourTrans_ConvertHSVtoRGB",
v%(3)*&10000,v%(4)*&100,v%(5) TO v%(0),v
%(1),v%(2)
980 ENDPROC
990 :
1000 DEF PROCrgb_to_hsv
1010 SYS "ColourTrans_ConvertRGBtoHSV",
v%(0),v%(1),v%(2) TO v%(3),v%(4),v%(5)
1020 v%(3)=v%(3) DIV &10000:v%(4)=v%(4)
DIV &100
1030 ENDPROC
1040 :
1050 DEF PROCrgb_to_cmyk
1060 SYS "ColourTrans_ConvertRGBtoCMYK",
v%(0),v%(1),v%(2) TO v%(5),v%(7),v%(8)
,v%(9)
1070 v%(9)=v%(9)-&FF01
1080 ENDPROC
1090 :
1100 DEF PROCcmyk_to_rgb
1110 SYS "ColourTrans_ConvertCMYKtoRGB",
v%(6),v%(7),v%(8),&FF01+v%(9) TO v%(0),
v%(1),v%(2)
1120 ENDPROC
```

Listing Info3

```
10 REM >RGBcube (Info3)
20 REM By DCA
30 REM For 32-bit machines (R03.1)
40 REM (c) BAU May 1993
50 :
60 MODE 15
70 OFF
80 SYS "OS_SWINumberFromString",,"Col
ourTrans_SetGCOL" TO set_gcol%
90 step=1/8
100 rot=RAD(130)
110 ORIGIN 640,1200
120 FOR r=0 TO 1 STEP step
```

```
130 FOR g=0 TO 1 STEP step
140 FOR b=0 TO 1 STEP step
150 SYS set_gcol%,((r*&FF)<<8)+((g*
&FF)<<16)+((b*&FF)<<24),,,&100,0
160 xx=r-0.5
170 zz=g-0.5
180 x=xx*COS(rot)+zz*SIN(rot)
190 z=3*xx*-SIN(rot)+zz*COS(rot)
200 y=b-1.5
210 x1=1800*x/z
220 y1=1800*y/z
230 CIRCLE FILL x1,y1,8
240 NEXT
250 NEXT
260 NEXT
270 END
```

Listing Info4

```
10 REM >HSVcone (Info4)
20 REM By DCA
30 REM For 32-bit machines (R03.1)
40 REM (c) BAU May 1993
50 :
60 MODE 15
70 OFF
80 SYS "OS_SWINumberFromString",,"Col
ourTrans_ConvertHSVtoRGB" TO hsv_to_rgb%
90 SYS "OS_SWINumberFromString",,"Col
ourTrans_SetGCOL" TO set_gcol%
100 v_step=0.2
110 ORIGIN 640,1200
120 FOR v=v_step TO 1 STEP v_step
130 s_step=0.05-0.035*v
140 FOR s=s_step TO 1 STEP s_step
150 h_step=3-2.5*v*s
160 FOR h=0 TO 360-h_step STEP h_ste
p
170 SYS hsv_to_rgb%,h*&10000,s*&100
00,v*&FF TO r%,g%,b%
180 SYS set_gcol%,(r%<<8)+(g%<<16)+
(b%<<24),,,&100,0
190 x=s*v*500*COSRAD(h)
200 z=2000+s*v*500*SINRAD(h)
210 y=800*v-1200
220 x1=2000*x/z
230 y1=2000*y/z
240 CIRCLE FILL x1,y1,4
250 NEXT
260 NEXT
270 NEXT
280 END
```

Listing Info5

```
10 REM >CIE (Info5)
20 REM By DCA
30 REM For 32-bit machines (R03.1)
40 REM (c) BAU May 1993
50 :
60 MODE 13
70 OFF
80 size%=1600
```



```

90 DIM code% &1000
100 sp=13:link=14:pc=15
110 FOR pass% = 0 TO 2 STEP 2
120 P% = code%
130 [OPT pass%
140 .cie
150 MVN r8,#255 ; =&FFFFFFF
00
160 ADR r9,div_tab
170 MOV r5,#0
180 .xloop SWI &100+30
190 MOV r0,r5
200 ADR r1,str
210 MOV r2,#8
220 SWI "XOS_ConvertCardin
all"
230 SWI "XOS_Write0"
240 MOV r6,#0
250 .yloop MOV r7,#4
260 .zloop MOV r0,r5
270 MOV r1,r6
280 MOV r2,r7
290 SWI "ColourTrans_Conve
rtCtEtoRGB"
300 TST r0,r8
310 TSTEQ r1,r8
320 TSTEQ r2,r8
330 BNE next_z
340 ADD r10,r5,r6
350 ADD r10,r10,r7
360 MOV r0,r0,LSL #8
370 ORR r0,r0,r1,LSL #16
380 ORR r0,r0,r2,LSL #24
390 MOV r1,#0
400 MOV r2,#0
410 MOV r3,#&100
420 MOV r4,#0
430 SWI "ColourTrans_SetGC
OL"
440 LDR r3,[r9,r10,LSL #2]
450 MUL r1,r5,r3
460 MUL r2,r6,r3
470 MOV r1,r1,ASR #16
480 MOV r2,r2,ASR #16
490 MOV r0,#69
500 SWI "XOS_Plot"
510 .next_z ADD r7,r7,#1
520 CMP r7,#256
530 BLT zloop
540 ADD r6,r6,#1
550 CMP r6,#256
560 BLT yloop
570 SWI "XOS_ReadEscapeSta
te"
580 MOVCS pc,link
590 ADD r5,r5,#1
600 CMP r5,#256
610 BLT xloop
620 MOV pc,link
630
640 .str EQU$ STRING$(8," ")
650 ]
660 div_tab=P%:P%+=4*301
670 NEXT pass%
680 idiv_tab=0
690 FOR i%=1 TO &300
700 div_tab!(4*i%)=(size%*&10000)/i%
710 NEXT
720 CALL cie
730 END

```

Listing Info6

```

10 REM >Interpol (Info6)
20 REM By DCA
30 REM For 32-bit machines (RO3)
40 REM (c) BAU May 1993
50 :
60 MODE 13
70 OFF
80 *POINTER 1
90 DIM rgb%(1,2)
100 FOR i%=0 TO 1
110 FOR j%=0 TO 2
120 rgb%(i%,j%)=RND(256)-1
130 NEXT
140 NEXT
150 steps%=32
160 flags%=&100
170 quit%=FALSE
180 PROCinterpolate
190 PRINTTAB(12,16)"Drag colour bars"
200 PRINTTAB(12,20)"", - alter steps"
210 PRINTTAB(12,22)"D toggles dither"
220 REPEAT
230 FOR i%=0 TO 1
240 FOR j%=0 TO 2
250 MOUSE mx%,my%,mb%
260 x%=640+(i%*2-1)*460+(j%-1)*80
270 IF ABS(x%-mx%)<20 AND (mb% AND
5)>0 THEN
280 y%=(my%-100) DIV 2
290 IF y%<0 y%=0 ELSE IF y%>255 y%
=255
300 rgb%(i%,j%)=y%
310 GCOL 0 TINT 0

```

```

320 RECTANGLE FILL x%-20,100+2*rgb
%(i%,j%)+4,40,512-(2*rgb%(i%,j%))
330 PROCinterpolate
340 ENDF
350 GCOL 3<<(2*j%) TINT 192
360 RECTANGLE FILL x%-20,100,40,2*r
gb%(i%,j%)
370 NEXT
380 NEXT
390 CASE INKEY$(0) OF
400 WHEN "+","=":IF steps%<256 steps
%+=steps%<<1:PROCinterpolate
410 WHEN "-","_":IF steps%>4 steps%=
steps%>>1:PROCinterpolate
420 WHEN "D","d":flags%=&100-flags%:
PROCinterpolate
430 WHEN "Q","q":quit%=TRUE
440 ENDCASE
450 UNTIL quit%
460 CLS
470 END
480 :
490 DEF PROCinterpolate
500 LOCAL s,col%,j%,k%,width%
510 width%=1280 DIV steps%
520 FOR k%=0 TO steps%-1
530 s=k%/(steps%-1)
540 col%=0
550 FOR j%=0 TO 2
560 col%=col%+(rgb%(0,j%)+s*(rgb%(1
,j%)-rgb%(0,j%)))<<(8+8*j%)
570 NEXT
580 SYS "ColourTrans_SetGCOL",col%,,,
flags%
590 RECTANGLE FILL k%*width%,640,wid
th%,300
600 NEXT
610 ENDPROC

```

Listing Info7

```

10 REM >Snake (Info7)
20 REM By Jan Vlietinck
30 REM For 32-bit machines
40 REM (c) BAU May 1993
50 :
60 MODE 13
70 OFF
80 PROCinit
90 PROCass
100 PROCmain
110 END
120 :
130 DEF PROCmain
140 MOUSE A%,B%,but%
150 REPEAT
160 B%=RND(8)/RND(4)*256
170 F%=RND(4)
180 REPEAT
190 SYS "OS_Byte",&70,bank%
200 CLS
210 last_but%=but%
220 MOUSE A%,B%,but%
230 CALL snake
240 WAIT
250 SYS "OS_Byte",&71,bank%
260 bank%=bank% EOR 3
270 G%+=2
280 UNTIL but% AND last_but%<<but%
290 UNTIL FALSE
300 ENDPROC
310 :
320 DEF PROCinit
330 DIM cs 512*4,sn 512*4
340 a=400*64
350 b=300*64
360 FOR i=0 TO 2048 STEP 4
370 h=i*PI/1024
380 csi=COS(h)*a
390 snfi=SIN(h)*b
400 NEXT
410 C%=cs
420 D%=sn
430 bank%=2
440 G%=0
450 ENDPROC
460 :
470 DEF PROCass
480 a=0:b=1:scr=2:cs=2
490 c=3:sn=3:f=4:g=5
500 s=6:k=6:h=7:x=8:y=9
510 r=10:m=11:t=12
520 sp=13:link=14:pc=15
530 DIM q% 4000
540 FOR pass=0 TO 2 STEP 2
550 P%=q%
560 [OPT pass
570 .screen1
580 EQU$ EQU$ 148
590 EQU$ EQU$ -1
600 .screen EQU$ 0
610
620 .set STMFDF (sp)!,{r0-r1
,link)
630 ADR r0,screen1
640 ADR r1,screen

```

```

650 SWI "OS_ReadVduVariabl
es"
660 LDMFDF (sp)!,{r0-r1 ,pc)
670
680 .snake STMFDF (sp)!,{link }
690 BL set
700 RSB b,b,#1024
710 MOV h,#0
720 MOV m,#512
730 SUB m,m,#1
740 .for MUL t,f,h
750 ADD t,k,t,ASR #8
760 ADD t,t,#130
770 AND t,t,m
780 LDR t,{cs,t,LSL #2}
790 ADD x,t,a,LSL #6
800 ADD t,h,k
810 ADD t,t,k,LSR #3
820 AND t,t,m
830 LDR t,{sn,t,LSL #2}
840 ADD y,t,b,LSL #6
850 MLA t,g,h,k
860 AND t,t,m
870 LDR t,{sn,t,LSL #2}
880 ADD r,t,#160*256
890 MOV r,r,ASR #1
900 STMFDF (sp)!,{0-12 }
910 LDR scr,screen
920 ADD scr,scr,#8
930 ADD scr,scr,#8*320
940 MOV c,#255
950 BL star
960 LDMFDF (sp)!,{0-12 }
970 ADD h,h,#16
980 CMP h,#512
990 BLO for
1000 LDMFDF (sp)!,{pc }
1010
1020 .star MOV r,r,LSR #2
1030 CMP r,#2*256
1040 BHI skip
1050 CMP x,{(320-16)<<8
1060 CMPLD y,{(256-16)<<8
1070 MOV pc,link
1080 SUB a,x,r
1090 MOV b,y,ASR #8
1100 ADD t,b,b,LSL #2
1110 ADD t,scr,t,LSL #6
1120 STRB c,{t,a,ASR #8}
1130 ADD a,a,r,LSL #1
1140 STRB c,{t,a,ASR #8}
1150 SUB h,r,r,LSR #3
1160 SUB a,x,r,LSR #1
1170 ADD b,y,h
1180 MOV b,b,ASR #8
1190 ADD t,b,b,LSL #2
1200 ADD t,scr,t,LSL #6
1210 STRB c,{t,a,ASR #8}
1220 ADD a,a,r
1230 STRB c,{t,a,ASR #8}
1240 SUB b,y,h
1250 MOV b,b,ASR #8
1260 ADD t,b,b,LSL #2
1270 ADD t,scr,t,LSL #6
1280 STRB c,{t,a,ASR #8}
1290 SUB a,a,r
1300 STRB c,{t,a,ASR #8}
1310 MOV pc,link
1320
1330 .skip STMFDF (sp)!,{x
,y,r,link)
1340 ADD x,x,r
1350 BL star
1360 LDMFDF sp,{x ,y,r}
1370 SUB x,x,r
1380 BL star
1390 LDMFDF sp,{x ,y,r}
1400 SUB x,x,r,LSR #1
1410 ADD Y,Y,r
1420 SUB Y,Y,r,LSR #3
1430 BL star
1440 LDMFDF sp,{x ,y,r}
1450 ADD x,x,r,LSR #1
1460 ADD Y,Y,r
1470 SUB Y,Y,r,LSR #3
1480 BL star
1490 LDMFDF sp,{x ,y,r}
1500 SUB x,x,r,LSR #1
1510 SUB Y,Y,r
1520 ADD Y,Y,r,LSR #3
1530 BL star
1540 LDMFDF (sp)!,{x ,y,r}
1550 ADD x,x,r,LSR #1
1560 SUB Y,Y,r
1570 ADD Y,Y,r,LSR #3
1580 BL star
1590 LDMFDF (sp)!,{pc }
1600 ]
1610 NEXT
1620 ENDPROC

```

Listing Info8

```

10 REM >Top (Info8)
20 REM By Jan Vlietinck
30 REM For 32-bit machines

```

```

40 REM (c) BAU May 1993
50 :
60 PROCinit
70 PROCmain
80 END
90 :
100 DEF PROCmain
110 REPEAT
120 PROCcalc
130 SYS "OS_Byte",&70,bank
140 CLS
150 CALL begin
160 WAIT
170 SYS "OS_Byte",&71,bank
180 bank=bank EOR 3
190 MOUSE x%,y%
200 hx=(y/512-1)*PI/2
210 hy=(x/640-1)*PI/2
220 UNTIL FALSE
230 ENDPROC
240 :
250 DEF PROCinit
260 MODE 15
270 MODE 13
280 PRINT "Please Wait"
290 COLOUR 128+100
300 MOUSE ON
310 *POINTER
320 m1=40
330 m2=60
340 DIM f(m1)
350 nrd=m1*m2
360 OFF
370 DIM rx(2,2),ry(2,2),rz(2,2),t(2,2)
380 PROCquadangle
390 PROCass
400 PROCvul
410 k1=255
420 hx=0
430 hy=0
440 hz=0
450 bank=1
460 ENDPROC
470 :
480 DEF PROCcalc
490 rx(1)=1,0,0,0,COSHx,SINhx,0,-SINhx,0
COShx
500 ry(1)=COShy,0,SINhy,0,1,0,-SINhy,0
COShy
510 rz(1)=COShz,SINhz,0,-SINhz,COSHx,0,0,1
0,0,1
520 t(1)=rx(1).ry(1)
530 t(1)=t(1).rz(1)
540 v=2*15
550 t(1)=t(1)*v
560 tr10=t(0,0)
570 tr14=t(0,1)
580 tr18=t(0,2)
590 tr112=t(1,0)
600 tr116=t(1,1)
610 tr120=t(1,2)
620 ENDPROC
630 :
640 DEF PROCvul
650 p=1jst
660 FOR i=0 TO m1-1
670 h=i*PI/(m1-1)
680 f(i)=SINH*1600
690 NEXT
700 FOR j=0 TO m1-1
710 k=(j-m1/2)*PI/m1*600
720 FOR i=0 TO m2-1
730 h=i*PI*2/(m2-1)
740 lpf=(j)*COSh
750 p+=4
760 lpf=(j)*SINH
770 p+=4
780 lpf=k
790 p+=4
800 NEXT
810 NEXT
820 lpf=1
830 p=1jst+lnr+8
840 q=1jst
850 FOR j=0 TO m1-1
860 FOR i=0 TO m2-1
870 t=q+12*m2
880 x3=lt
890 y3=ti4
900 z3=ti8
910 t+=12
920 x4=it
930 y4=ti4
940 z4=ti8
950 x1=liq
960 y1=q14
970 z1=q18
980 q+=12
990 x2=liq
1000 y2=q14
1010 z2=q18
1020 IF x1=x2 AND y1=y2 THEN
1030 x2=x4
1040 y2=y4
1050 ENDF
1060 a1=x1-x3

```



```

1070 a2=y1-y3
1080 a3=z1-z3
1090 b1=x2-x3
1100 b2=y2-y3
1110 b3=z2-z3
1120 c1=a2*b3-b2*a3
1130 c2=a3*b1-b3*a1
1140 c3=a1*b2-b1*a2
1150 d=SQR(c1*c1+c2*c2+c3*c3)
1160 IF d<=0 IP=2*20/d
1170 P+=12
1180 NEXT
1190 NEXT
1200 ENDPROC
1210 :
1220 DEF PROCass
1230 DIM q% 120000
1240 x=0:y=1:z=2:s11=3
1250 s12=4:s13=5:s21=6:s22=7:s23=8
1260 c=9:t=10:u=11:v=12
1270 a=13:b=14
1280 x1=0:y1=1:x2=2:y2=3
1290 x3=4:y3=5:x4=6:y4=7
1300 col=8:i=9:j=12
1310 FOR pass=0 TO 2 STEP 2
1320 P%=q%
1330 [OPT pass
1340 .tr EQU$ STRING$(24,CHR$(0)
1350 .spat EQU$ 0
1360 .linkst EQU$ 0
1370 .nr EQU$ (nrd+800)*12
1380
1390 .begin
1400 STR sp,spat
1410 STR link,linkst
1420 ADR t,cr
1430 LDMIA t,(f3-r8)
1440 ADR a,lijst
1450 LDR b,nr
1460 ADD b,b,a
1470 .trans LDMIA (a),t,(x,y,z)
1480 MUL t,x,s11
1490 MLA t,y,s12,t
1500 MLA t,z,s13,t
1510 MOV u,t,ASR #15
1520 MUL t,x,s21
1530 MLA t,y,s22,t
1540 MLA t,z,s23,t
1550 MOV v,t,ASR #15
1560 STMIA (b),t,(u,v)
1570 ADD b,b,#4
1580 CMN x,#1
1590 BNE trans
1600 STR x,[b]
1610 LDR 13,spat
1620 LDR link,linkst
1630 STMFD (sp),t,(link)
1640 BL set
1650 .pl ADR u,lijst
1660 LDR t,nr
1670 ADD u,u,t
1680 MOV i,#m1-1
1690 STR i,id
1700 .lo2 MOV j,#m2-1
1710 .lo1 ADD t,u,#m2<<3
1720 ADD t,t,#m2<<2
1730 LDMIA (t),t,(x3,y3)
1740 ADD t,t,#4
1750 LDMIA (u),t,(x1,y1,col)
1760 CMP col,#0
1770 LDMIFD (sp),t,(pc)
1780 LDMIA u,(x2,y2)
1790 CMP x1,x2
1800 CMPEQ y1,y2
1810 LDMBQIA t,(x2,y2)
1820 SUB x4,x1,x3
1830 SUB y4,y2,y3
1840 MUL i,y4,x4
1850 SUB x4,x2,x3
1860 SUB y4,y1,y3
1870 MUL x4,y4,x4
1880 RSBS i,x4,i
1890 BMI ov
1900 LDMIA t,(x4,y4)
1910 MUL col,i,col
1920 MOVs i,col,LSR #16
1930 ADR t,col
1940 LDR col,[t,i,LSL #2]
1950 STMFD (sp),t,(r8-r12)
1960 MOV t,#160
1970 ADD x1,t,x1,ASR #4
1980 ADD x2,t,x2,ASR #4
1990 ADD x3,t,x3,ASR #4
2000 ADD x4,t,x4,ASR #4
2010 MOV t,#128
2020 SUB y1,t,y1,ASR #4
2030 SUB y2,t,y2,ASR #4
2040 SUB y3,t,y3,ASR #4
2050 SUB y4,t,y4,ASR #4
2060 BL quadrangle
2070 LDMFD (sp),t,(r8-r12)
2080 .ov SUBS j,j,#1
2090 BNE lo1
2100 ADD u,u,#12
2110 LDR i,id
2120 SUBS i,i,#1
2130 STR i,id
2140 BNE lo2
2150 LDMFD (sp),t,(pc)
2160
2170 .id EQU$ 0
2180
2190 .kol EQU$ %00000000
2200 EQU$ %00000001
2210 EQU$ %00000010
2220 EQU$ %00000011
2230 EQU$ %00101100
2240 EQU$ %00101101
2250 EQU$ %00101110
2260 EQU$ %00101111
2270 EQU$ %11010000
2280 EQU$ %11010001
2290 EQU$ %11010010
2300 EQU$ %11010011
2310 EQU$ %11111100
2320 EQU$ %11111101
2330 EQU$ %11111110
2340 EQU$ %11111111
2350 EQU$ %11111111
2360 EQU$ %11111111
2370 EQU$ %11111111
2380 EQU$ %11111111
2390 EQU$ %11111111
2400 .lijst
2410 ]
2420 NEXT
2430 ENDPROC
2440 :
2450 DEF PROCquadrangle
2460 DIM ditable 4*320
2470 FOR I=1 TO 320
2480 ditable!(4*I)=(1<<16)/I
2490 NEXT
2500 DIM q% 2000
2510 ax=0:ay=1:bx=2:by=3
2520 cx=4:cy=5:dx=6:dy=7
2530 col=8:t=9
2540 a=10:b=11:c=12
2550 f=8:g=9:t=9:n=10
2560 q=11:s=12
2570 x1=0:xr=1:l=2:r=3:ct=4
2580 cl=5:c2=6:c3=7:c4=8
2590 t=9:os=10:l=11:ra=12
2600 sp=13:link=14:pc=15
2610 FOR p=0 TO 2 STEP 2
2620 P%=q%
2630 [OPT p
2640 .screen1
2650 EQU$ 148
2660 EQU$ -1
2670 .screen EQU$ 0
2680
2690 .set ADR r0,screen1
2700 ADR r1,screen
2710 SWI "OS_ReadVduVariabl
2720 MOV pc,link
2730
2740 .axd EQU$ 0
2750 .bxd EQU$ 0
2760 .cxd EQU$ 0
2770 .ab EQU$ 0
2780 .ac EQU$ 0
2790 .bd EQU$ 0
2800 .cd EQU$ 0
2810 .ad EQU$ 0
2820 .bc EQU$ 0
2830 .aa EQU$ 0
2840 .bb EQU$ 0
2850 .cc EQU$ 0
2860 .kl EQU$ 0
2870 .ditabd EQU$ ditable
2880
2890 .quadrangle
2900 STMFD (sp),t,(link)
2910 STR col,kl
2920 FNmax(ax,ay,bx,by)
2930 FNmax(bx,by,cx,cy)
2940 FNmax(cx,cy,dx,dy)
2950 FNmax(ax,ay,bx,by)
2960 FNmax(bx,by,cx,cy)
2970 FNmax(ax,ay,bx,by)
2980 STR ax,axd
2990 STR bx,bxd
3000 STR cx,cxd
3010 SUB a,dx,ax
3020 SUB b,dy,ay
3030 SUB s,cx,ax
3040 SUB t,cy,ay
3050 MUL t,a,t
3060 MUL s,b,s
3070 SUBS f,s,t
3080 BEQ q1
3090 SUB s,bx,ax
3100 SUB t,by,ay
3110 MUL t,a,t
3120 MUL s,b,s
3130 SUBS g,s,t
3140 BEQ q1
3150 BORS t,f,g
3160 BLT q1
3170 BGE q2
3180 .q1 LDR q,ditabd
3190 SUB t,bx,ax
3200 SUB n,by,ay
3210 LDR n,[q,n,LSL #2]
3220 MUL n,t,n
3230 MOV n,n,ASR #10
3240 STR n,ab
3250 SUB t,cx,ax
3260 SUB n,cy,ay
3270 LDR n,[q,n,LSL #2]
3280 MUL n,t,n
3290 MOV n,n,ASR #10
3300 STR n,ac
3310 SUB t,dx,bx
3320 SUB n,dy,by
3330 LDR n,[q,n,LSL #2]
3340 MUL n,t,n
3350 MOV n,n,ASR #10
3360 STR n,bd
3370 SUB t,dx,cx
3380 SUB n,dy,cy
3390 LDR n,[q,n,LSL #2]
3400 MUL n,t,n
3410 MOV n,n,ASR #10
3420 STR n,cd
3430 SUB a,by,ay
3440 SUB b,cy,by
3450 SUB c,dy,cy
3460 STR a,aa
3470 STR b,bb
3480 STR c,cc
3490 LDR o,screen
3500 LDR col,kl
3510 ADD t,ay,ay,LSL #2
3520 ADD o,o,t,LSL #6
3530 ADD c4,c4,c4,LSL #8
3540 ADD c4,c4,c4,LSL #16
3550 MOV c1,c4
3560 MOV c2,c4
3570 MOV c3,c4
3580 LDR ct,aa
3590 CMP ct,#0
3600 LDR t,axd
3610 MOV l,t,LSL #6
3620 MOV r,t,LSL #6
3630 LDR la,ac
3640 ADD l,l,la,ASR #1
3650 ADD l,l,#1<<5
3660 LDR ra,ab
3670 ADD r,r,ra,ASR #1
3680 ADD r,r,#1<<5
3690 BLNE piece
3700 LDR ct,bb
3710 CMP ct,#0
3720 LDR t,bxd
3730 MOV r,t,LSL #6
3740 LDR ra,bd
3750 ADD r,r,ra,ASR #1
3760 ADD r,r,#1<<5
3770 BLNE piece
3780 LDR ct,cc
3790 CMP ct,#0
3800 LDR t,cxd
3810 MOV l,t,LSL #6
3820 LDR la,cd
3830 ADD l,l,la,ASR #1
3840 ADD l,l,#1<<5
3850 BLNE piece
3860 LDMFD (sp),t,(pc)
3870
3880 .q2 LDR q,ditabd
3890 SUB t,bx,ax
3900 SUB n,by,ay
3910 LDR n,[q,n,LSL #2]
3920 MUL n,t,n
3930 MOV n,n,ASR #10
3940 STR n,ab
3950 SUB t,cx,bx
3960 SUB n,cy,by
3970 LDR n,[q,n,LSL #2]
3980 MUL n,t,n
3990 MOV n,n,ASR #10
4000 STR n,bc
4010 SUB t,dx,cx
4020 SUB n,dy,cy
4030 LDR n,[q,n,LSL #2]
4040 MUL n,t,n
4050 MOV n,n,ASR #10
4060 STR n,cd
4070 SUB t,dx,ax
4080 SUB n,dy,ay
4090 LDR n,[q,n,LSL #2]
4100 MUL n,t,n
4110 MOV n,n,ASR #10
4120 STR n,ad
4130 SUB a,by,ay
4140 SUB b,cy,by
4150 SUB c,dy,cy
4160 STR a,aa
4170 STR b,bb
4180 STR c,cc
4190 LDR o,screen
4200 LDR col,kl
4210 ADD t,ay,ay,LSL #2
4220 ADD o,o,t,LSL #6
4230 ADD c4,c4,c4,LSL #8
4240 ADD c4,c4,c4,LSL #16
4250 MOV c1,c4
4260 MOV c2,c4
4270 MOV c3,c4
4280 LDR ct,aa
4290 CMP ct,#0
4300 LDR t,axd
4310 MOV l,t,LSL #6
4320 MOV r,t,LSL #6
4330 LDR la,ad
4340 ADD l,l,la,ASR #1
4350 ADD l,l,#1<<5
4360 LDR ra,ab
4370 ADD r,r,ra,ASR #1
4380 ADD r,r,#1<<5
4390 BLNE piece
4400 LDR ct,bb
4410 CMP ct,#0
4420 LDR t,bxd
4430 MOV r,t,LSL #6
4440 LDR ra,bc
4450 ADD r,r,ra,ASR #1
4460 ADD r,r,#1<<5
4470 BLNE piece
4480 LDR ct,cc
4490 CMP ct,#0
4500 LDR t,cxd
4510 MOV r,t,LSL #6
4520 LDR ra,cd
4530 ADD r,r,ra,ASR #1
4540 ADD r,r,#1<<5
4550 BLNE piece
4560 LDMFD (sp),t,(pc)
4570
4580 .piece STMFD (sp),t,(link)
4590 .lo CMP l,r
4600 ADDLO x1,o,l,LSR #6
4610 ADDLO xr,o,r,LSR #6
4620 ADDHS x1,o,r,LSR #6
4630 ADDHS xr,o,l,LSR #6
4640 SUBS t,xr,xl
4650 BEQ endspan
4660 CMP t,#2
4670 STRLSB cl,[xl]
4680 STRLSB cl,[xr,#-1]
4690 BLS endspan
4700 TST xl,#01
4710 STRNEB cl,[xl],#1
4720 TST xl,#10
4730 STRNEB c2,[xl],#1
4740 STRNEB cl,[xl],#1
4750 TST xr,#01
4760 STRNEB c2,[xr,#-1]
4770 TST xr,#10
4780 STRNEB cl,[xr,#-1]
4790 STRNEB c2,[xr,#-1]
4800 SUBS t,xr,xl
4810 MOVs t,t,LSR #3
4820 STRCS cl,[xl],#4
4830 MOVs t,t,LSR #1
4840 STMCSIA (xl),t,(c1,c2)
4850 ADR xr,base
4860 SUB pc,xr,t,LSL #2
4870 FNvulc
4880 .base
4890 .endspan
4900 ADD l,l,la
4910 ADD r,r,ra
4920 ADD o,o,#320
4930 SUBS ct,ct,#1
4940 BNE lo
4950 LDMFD (sp),t,(pc)
4960 ]
4970 NEXT
4980 ENDPROC
4990 :
5000 DEF FNvulc
5010 FOR i=1 TO 20
5020 [OPT p
5030 STMIA (xl),t,(c1,c2,c3,c4)
5040 ]
5050 NEXT
5060 =""
5070 :
5080 DEF FNmax(ax,ay,bx,by)
5090 [OPT p
5100 CMP ay,by
5110 MOVHI t,ax
5120 MOVHI ax,bx
5130 MOVHI bx,t
5140 MOVHI t,ay
5150 MOVHI ay,by
5160 MOVHI by,t
5170 ]
5180 =0

```

Listing Info9

10 REM >Cabbage (Info9)
 20 REM By Jan Vibe
 30 REM For 32-bit machines
 40 REM (c) BAU May 1993
 50 :
 60 MODE 13:OFF


```

70 DIM dx(8),dy(8),col(7)
80 IF MOD=21 step=2 ELSE step=4
90 FOR i=1 TO 8
100 READ dx,dy
110 dx(i)=dx*step
120 dy(i)=dy*step
130 NEXT
140 col(1)=0,1,4,5,16,17,20,21
150 REPEAT
160 FOR i=1 TO 10
170   rnd1=RND(8)
180   REPEAT
190     rnd2=RND(8)
200   UNTIL rnd2<>rnd1
210   SWAP dx(rnd1),dx(rnd2)
220   SWAP dy(rnd1),dy(rnd2)
230 NEXT
240 count=0
250 REPEAT
260   x=RND(1279)
270   y=RND(1023)
280   count+=1
290 UNTIL POINT(x,y)=0 OR count=5000
300 IF count<5000 PROCcabbage(x,y,RND
(7),RND(75)+25)
310 UNTIL count=5000
320 END
330 :
340 DEF PROCcabbage(x,y,col,depth)
350 LOCAL dir,gccl
360 gccl=(depth DIV 4) MOD 12+4
370 GCOL (gccl DIV 4)*col(col) TINT (g
col MOD 4)+c
380 POINT x,y
390 IF depth=2 THEN
400 FOR dir=1 TO 8
410 IF POINT(x+dx(dir),y+dy(dir))=0
PROCcabbage(x+dx(dir),y+dy(dir),col,dept
h-1)
420 NEXT
430 ENDIF
440 ENDPROC
450 :
460 DATA -1,-1,0,-1,1,-1,-1,0,1,0,-1,1
,0,1,1,1

```

Listing Info10

```

10 REM >Pulsar (Info10)
20 REM By Jan Vibe
30 REM For 32-bit machines
40 REM (c) BAU May 1993
50 :
60 MODE12
70 PROCshape
80 PROCinit
90 ON ERROR PROCerror
100 PROCdraw
110 END
120 :
130 DEF PROCerror
140 IF ERR<>17 PRINTREPORT$;" at line
"ERL
150 END
160 :
170 DEF PROCshape
180 PRINT"1: Square"
190 PRINT"2: Hexagon"
200 PRINT"3: Octagon"
210 PRINT"4: Polygon with 12 sides"
220 PRINT"Polygon number ";
230 *Fx15,0
240 REPEAT
250   poly%=GET$
260 UNTIL INSTR("1234",poly$)>0
270 poly=VAL(poly$)
280 CASE poly OF
290   WHEN 1:ang=0 :rad=512:w=1.0
300   WHEN 2:ang=30:rad=580:w=1.5
310   WHEN 3:ang=45:rad=512:w=2.0
320   WHEN 4:ang=60:rad=512:w=2.5
330 ENDCASE
340 ENDPROC
350 :
360 DEF PROCinit
370 ang1=RAD(ang)
380 ang2=RAD(90)
390 ang=180/(90-ang)
400 IFRND(-TIME)
410 cycle=1
420 rgb=RND(3)
430 ctime=TIME
440 DIM sin(angs),cos(angs),col(15,3),
x(6),y(6),w(6)
450 FOR i=1 TO angs
460   a=RAD(2*(90-ang)*i)
470   sin(i)=SINa
480   cos(i)=COSa
490 NEXT
500 FOR i=1 TO 15
510   READ col(i,1)
520   col(i,2)=col(i,1)
530   col(i,3)=col(i,1)
540 COLOUR i,col(i,1),col(i,2),col(i,
3)
550 NEXT

```

```

560 CLS:OFF
570 CASE MODE OF
580   WHEN 12,20 : ORIGIN 640,512
590   WHEN 31 : ORIGIN 800,600
600 ENDCASE
610 ENDPROC
620 :
630 DATA 16,32,80,112,144,176,208,240,
224,192,160,128,96,64,32
640 :
650 DEF PROCdraw
660 REPEAT
670   rnd=RND(6)
680   mul=28/(2*rnd)
690   FOR i=1 TO rnd
700     x(i)=RND(rad)
710     y(i)=RND(rad)
720     w(i)=w*RND(1)+.5
730 NEXT
740 PROCpoly(0,0,rad*SINang1,rad*COSa
ng1,rad*SINang2,rad*COSang2)
750 when=TIME+1000
760 REPEAT
770 PROCcycle
780 UNTIL TIME>when
790 UNTIL FALSE
800 ENDPROC
810 :
820 DEF PROCpoly(x1,y1,x2,y2,x3,y3)
830 LOCAL x12,y12,x23,y23,x31,y31
840 PROCcycle
850 IF (x2-x1)^2+(y2-y1)^2=256 THEN
860   x12=(x1+x2)/2;y12=(y1+y2)/2
870   x23=(x2+x3)/2;y23=(y2+y3)/2
880   x31=(x3+x1)/2;y31=(y3+y1)/2
890 PROCpoly(x1,y1,x12,y12,x31,y31)
900 PROCpoly(x12,y12,x2,y2,x23,y23)
910 PROCpoly(x12,y12,x23,y23,x31,y31)
920 PROCpoly(x31,y31,x23,y23,x3,y3)
930 ELSE
940   xmid=(x1+x2+x3)/3;ymid=(y1+y2+y3)
/3
950   col=0
960   FOR i=1 TO rnd
970     col+=(1+SINRAD(w(i)*8QR((x(i)-xm
id)^2+(y(i)-ymid)^2)))
980   PROCcycle
990 NEXT
1000 PROCcol(mul*col+1)
1010 PROCcycle
1020 FOR i=1 TO angs
1030   c1x=x1*cos(i)+y1*sin(i):c1y=y1*c
os(i)-x1*sin(i)
1040   c2x=x2*cos(i)+y2*sin(i):c2y=y2*c
os(i)-x2*sin(i)
1050   c3x=x3*cos(i)+y3*sin(i):c3y=y3*c
os(i)-x3*sin(i)
1060 MOVE c1x,c1y:MOVE c2x,c2y:PLOT
85,c3x,c3y
1070 MOVE c1x,-c1y:MOVE c2x,-c2y:PLOT
85,c3x,-c3y
1080 PROCcycle
1090 NEXT
1100 ENDP
1110 ENDPROC
1120 :
1130 DEF PROCcol(col)
1140 GCOL ABS(14-((col+13)MOD28))+1
1150 ENDPROC
1160 :
1170 DEF PROCcycle
1180 LOCAL i,col
1190 IF TIME-ctime>=8 THEN
1200 IF RND(1)>.6 rgb=RND(3)
1210 col=col(15,rgb)
1220 FOR i=15 TO 2 STEP -1
1230   col(i,rgb)=col(i-1,rgb)
1240 NEXT
1250 col(1,rgb)=col
1260 cycle=cycle MOD 15+1
1270 FOR i=1 TO 15
1280 COLOUR (i+cycle+15)MOD15+1,col(i
,1),col(i,2),col(i,3)
1290 NEXT
1300 ctime=TIME
1310 ENDP
1320 ENDPROC

```

Listing Info11

```

10 REM >QuasiJ+M (Info11)
20 REM By Michael Rordoba
30 REM For 32-bit machines
40 REM (c) BAU May 1993
50 :
60 scrn%=1
70 mem%=1024
80 DIM code% mem%
90 R%=50
100 M%=90
110 :
120 MODE 0
130 PRINT "(J)ulia or (M)andelbrot ";
140 REPEAT
150   set=INSTR(" JjMm",GET$)DIV2
160 UNTIL set>0

```

```

170 IF set=1 THEN
180   PRINT"Julia"
190   A=-1.12:B=-1.13:I=1.12:J=1.13
200   INPUT "Enter m & n (eg 0 & 0.3)
";pm,pn
210 ELSE
220   PRINT "Mandelbrot"
230   A=-.45:B=-1.8:I=2.10:J=1.8
240   pm=0:pn=0
250 ENDP
260 PROCmode
270 REPEAT
280   hinc=(I-A)/hpix
290   vinc=(J-B)/vpix
300   IF hinc*vinc=0 PRINT"image size t
oo small":END
310 PROCcode
320 CALL doit%
330 REPEAT
340   VDU 7
350   goon=TRUE
360   CASE GET$ OF
370     WHEN "S","s":
380       SYS "OS_CLI","ScreenSave Image
J"+STR$scrn%
390       scrn%+=1
400       goon=FALSE
410       WHEN "I","i":
420         PRINT "Current co-ordinates
":("I","J");("I","J");("I","J")
430       INPUT "Enter new values (A,B)
":*A,B
440       INPUT " (I,J)
":*I,J
450       WHEN "J","j":
460         IF set=2 set=1:pm=jm:pn=jn
470       WHEN "M","m":
480         IF set=1 set=2:pm=0:pn=0
490       WHEN "N","n":
500         PROCmode
510       WHEN " ":
520         PROCzoom
530       OTHERWISE:
540         goon=FALSE
550       ENDCASE
560 UNTIL goon
570 UNTIL FALSE
580 END
590 :
600 DEF PROCmode
610 REPEAT
620   ok=TRUE
630   VDU30
640   INPUT "Screen mode ";mode
650   SYS "OS CheckModeValid", mode TO
;F%
660   log2bpp=FNvar(9)
670   log2bpc=FNvar(10)
680   hpix=FNvar(11)+1
690   vpix=FNvar(12)+1
700   scrx=hpix<<FNvar(4)
710   scry=vpix<<FNvar(5)
720 IF #AND2 PRINT"Selected mode is
unavailable":ok=FALSE
730 IF log2bpp<>2 PRINT"Not a 16 colo
ur mode":ok=FALSE
740 IF log2bpp<>log2bpc PRINT"Double
pixel" modes are not allowed":ok=FALSE
750 UNTIL ok
760 MODE mode:OFF
770 RESTORE
780 FOR i=0 TO 15
790   READ r,g,b
800   COLOUR i,r,g,b
810 NEXT i
820 ENDPROC
830 :
840 DEF PROCzoom
850 MOUSE ON
860 s=512
870 MOUSE x,y,b
880 GCOL 3,15
890 RECTANGLE x-s*scrx/(scry<<1),y-s/2
,s*scrx/scry,s
900 ox=x
910 oy=y
920 os=s
930 REPEAT
940   MOUSE x,y,b
950   WAIT
960 RECTANGLE ox-os*scrx/(scry<<1),oy
-os/2,os*scrx/scry,os
970 RECTANGLE x-s*scrx/(scry<<1),y-s/
2,s*scrx/scry,s
980 IF set=2 THEN
990   jm=A*(I-A)*x/scrx
1000   jn=J*(J-B)*y/scry
1010 PRINT TAB(0,0);"Julia parameter:
";jm;" ";jn;SPC(12);
1020 ENDP
1030 ox=x:oy=y:os=s
1040 IF b AND 4 s=2*(s+16)
1050 IF b AND 1 s=2*(s<scry)
1060 UNTIL b AND 2
1070 w=I-A:h=J-B
1080 I=A+w*(x+s*scrx/(scry<<1))/scrx

```

```

1090 B=J-h*(y+s/2)/scry
1100 A=A+w*(x-s*scrx/(scry<<1))/scrx
1110 J=A-h*(y-s/2)/scry
1120 MOUSE OFF
1130 ENDPROC
1140 :
1150 DEF PROCcode
1160 lcode%=148
1170 code%14=-1
1180 SYS"OS_ReadVduVariables",code%,cod
e%
1190 scrst%=lcode%
1200 L%=code%+mem%
1210 xc=0
1220 yc=1
1230 x=2
1240 y=3
1250 cc=4
1260 m=5
1270 n=6
1280 r=7
1290 addr=8
1300 FOR opt%=8 TO 10 STEP 2
1310   P%=code%
1320   [OPT opt%
1330     .ar% EQU D R%*65536
1340     .ax% EQU D 0
1350     .ay% EQU D 0
1360     .axo% EQU D A*65536
1370     .ayo% EQU D B*65536
1380     .axi% EQU D hinc*65536
1390     .ayi% EQU D vinc*65536
1400     .am% EQU D pm*65536
1410     .an% EQU D pn*65536
1420     .ascrst% EQU D scrst%
1430     .asptemp% EQU D 0
1440 :
1450 .doit%
1460 STMF R131,(r14 )
1470 STR R13,asptemp%
1480 LDR r,ar%
1490 LDR m,am%
1500 LDR n,an%
1510 LDR addr,ascrst%
1520 ]
1530 IF set=1 THEN
1540 [OPT opt%
1550 LDR y,ayo%
1560 STR y,ay%
1570 ]
1580 ELSE
1590 [OPT opt%
1600 LDR n,ayo%
1610 STR n,ay%
1620 ]
1630 ENDP
1640 [OPT opt%
1650 MOV yc, #vpix
1660 .rowloop%
1670 ]
1680 IF set=1 THEN
1690 [OPT opt%
1700 LDR x,axo%
1710 STR x,ax%
1720 ]
1730 ELSE
1740 [OPT opt%
1750 LDR m,axo%
1760 STR m,ax%
1770 ]
1780 ENDP
1790 [OPT opt%
1800 MOV xc, #hpix
1810 .colloop%
1820 ]
1830 IF set=2 THEN
1840 [OPT opt%
1850 MOV x, #0
1860 MOV y, #0
1870 ]
1880 ENDP
1890 [OPT opt%
1900 MOV cc, #1
1910 .cloop%
1920 FMSQU16(x,13,11,12,14)
1930 FMSQU16(y,10,11,12,14)
1940 ADD R14,R13,R10
1950 CMP R14,r
1960 BGE gotcc%
1970 SUBS R13,R13,R10
1980 RSEMI R13,R13,#0
1990 SUB R13,R13,m
2000 FMSQU16(x,y,10,11,12,14)
2010 ADD y,R10,R10
2020 SUB y,y,n
2030 MOV x,R13
2040 ADD cc,cc,#1
2050 CMP cc,#M%
2060 BLE cloop%
2070 MOV cc,#1
2080 :
2090 .gotcc%
2100 SUB cc,cc,#1
2110 ADR R14,lut%
2120 LDRB cc,[R14,cc]
2130 :

```



```

2140 LDRB R14,[addr]
2150 TST xc,#1
2160 ANDNE R14,R14,#15
2170 ORRNE R14,R14,cc,LSL #4
2180 ANDEQ R14,R14,#240
2190 ORREQ R14,R14,cc
2200 STRB R14,[addr]
2210 :
2220 ADDNE addr,addr,#1
2230 IF set=1 THEN
2240 [OPT opt%
2250 LDR y,ay%
2260 LDR x,ax%
2270 LDR R14,axi%
2280 ADD x,x,R14
2290 STR x,ax%
2300 SUBS xc,xc,#1
2310 BGT colloop%
2320 LDR R14,ayi%
2330 ADD y,y,R14
2340 STR y,ay%
2350 :
2360 ELSE
2370 [OPT opt%
2380 LDR n,ay%
2390 LDR m,ax%
2400 LDR R14,axi%
2410 ADD m,m,R14
2420 STR m,ax%
2430 SUBS xc,xc,#1
2440 BGT colloop%
2450 LDR R14,ayi%
2460 ADD n,n,R14
2470 STR n,ay%
2480 :
2490 ENDIF
2500 [OPT opt%
2510 SUBS yc,yc,#1
2520 BGT rowloop%
2530 LDR R13,asptemp%
2540 LDMPD R13!,{pc }
2550 .lut%
2560 EQUB 0
2570 :
2580 FOR CL%1 TO M%
2590 [OPT opt%
2600 EQUB CL% MOD 15+1
2610 :
2620 NEXT CL%
2630 NEXT opt%
2640 ENDPROC
2650 :
2660 DEF FNmul16(x%,a%,r%,u%,v%,w%)
2670 [OPT opt%
2680 MOVs w%,a%,LSL #1
2690 RSBSC a%,a%,#0
2700 TEQ x%,#0
2710 RSEMI r%,x%,#0
2720 :
2730 IF r%<x% THEN
2740 [OPT opt%
2750 MOVPL r%,x%
2760 :
2770 ENDIF
2780 [OPT opt%
2790 MOV w%,pc,LSR #31
2800 MOV w%,w%,LSL #28
2810 TEQ w%,pc,LSR #1
2820 MOV w%,r%,LSR #16
2830 BIC r%,r%,w%,LSL #16
2840 MOV v%,a%,LSR #16
2850 BIC a%,a%,v%,LSL #16
2860 MUL u%,a%,r%
2870 TST u%,#1<<15
2880 MOV u%,u%,LSR #16
2890 ADDNE u%,u%,#1
2900 MLA u%,u%,r%,u%
2910 MLA u%,u%,w%,u%
2920 MUL r%,v%,w%
2930 ADD r%,u%,r%,LSL #16
2940 RSBVS r%,r%,#0
2950 :
2960 =0
2970 :
2980 DEF FNsqu16(x%,r%,u%,v%,w%)
2990 [OPT opt%
3000 TEQ x%,#0
3010 RSEMI r%,x%,#0
3020 :
3030 IF r%<x% THEN
3040 [OPT opt%
3050 MOVPL r%,x%
3060 :
3070 ENDIF
3080 [OPT opt%
3090 MOV w%,r%,LSR #16
3100 BIC r%,r%,w%,LSL #16
3110 MUL u%,r%,r%
3120 TST u%,#1<<15
3130 MOV u%,u%,LSR #16
3140 ADDNE u%,u%,#1
3150 MUL v%,w%,r%
3160 ADD u%,u%,v%,ASL #1
3170 MUL r%,w%,w%
3180 ADD r%,u%,r%,LSL #16
3190 :

```

```

3200 =0
3210 :
3220 DEF FNvar(var)
3230 SYS "OS_ReadModeVariable",mode,var
TO ,val
3240 =val
3250 :
3260 DATA 0,0,0
3270 DATA 192,0,240
3280 DATA 144,48,240
3290 DATA 96,96,240
3300 DATA 48,144,240
3310 DATA 0,192,240
3320 DATA 0,240,192
3330 DATA 48,240,144
3340 DATA 96,240,96
3350 DATA 144,240,48
3360 DATA 192,240,0
3370 DATA 240,192,0
3380 DATA 240,144,48
3390 DATA 240,96,96
3400 DATA 240,48,144
3410 DATA 240,0,192

```

Listing Info12

```

10 REM >Squigglel (Info12)
20 REM By Alan Beasley
30 REM From original game by Barr
y Wickett
40 REM For 32-bit machines
50 REM (c) BAU May 1993
60 :
70 PROCsetup
80 REPEAT
90 PROCinitialize
100 PROCprompt("Player/Computer to sta
rt? Press P or C")
110 char$=FNget("p","c")
120 IF char$="p" THEN player%=1 ELSE p
layer%=2
130 PROCprompt(STRING$(40," "))
140 PROCkey_numbers
150 REPEAT
160 player%=3-player%
170 PROCplay(player%)
180 UNTIL winner%=0
190 score%(winner%)+=1
200 VDU 4
210 COLOUR 1
220 PRINT TAB(3,22); score%(1)
230 PRINT TAB(34,22); score%(2)
240 PROCprompt(name$(winner%)+ " wins!
Another game? (Y/N)")
250 again$=FNget("y","n")
260 UNTIL again$="n"
270 MODE12
280 END
290 :
300 DEF PROCplay(pl%)
310 rx%=FNord(x%)
320 ry%=FNord(y%)
330 GCOL 3,3
340 RECTANGLE FILL rx%,ry%,96,96
350 MOVE BY -60,-32
360 IF pl%=1 THEN
370 VDU 67
380 key%=FNcomputer
390 ELSE
400 VDU 80
410 key%=FNplayer
420 ENDIF
430 PROCdraw(FNord(x%),FNord(y%),key%)
440 board%(x%,y%)=key%
450 REPEAT
460 pd%=entrance(board%(x%,y%),pd%)
470 x%+=ix%(pd%)
480 y%+=iy%(pd%)
490 off_board%=x%<1 OR y%<1 OR x%>8 OR
y%>8
500 home%=(x%=8 AND y%=9) OR (x%=9 AND
y%=8)
510 UNTIL board%(x%,y%)=0 OR off_board
%
520 IF home% THEN
530 winner%=pl%
540 ELSE
550 IF off_board% THEN winner%=3-pl%
560 ENDIF
570 ENDPROC
580 :
590 DEF PROCsetup
600 MODE 1
610 PROCreset
620 COLOUR 0,0,100,100
630 COLOUR 1,200,200,200
640 COLOUR 2,0,0,100
650 COLOUR 3,200,0,0
660 DIM board%(9,9),ix%(4),iy%(4),entr
ance(3,4)
670 DIM name$(2),keys%(2,4,3),score%(2
)
680 FOR dir=1 TO 4
690 READ ix%(dir), iy%(dir)
700 NEXT dir
710 FOR piece=1 TO 3

```

```

720 FOR entrance=1 TO 4
730 READ entrance(piece,entrance)
740 NEXT entrance
750 NEXT piece
760 name$(1)="Computer"
770 name$(2)="Player"
780 FOR m%=1 TO 2
790 FOR j%=1 TO 4
800 FOR k%=1 TO 3
810 READ keys%(m%,j%,k%)
820 NEXT k%
830 NEXT j%
840 NEXT m%
850 RECTANGLE 96,96,804,804
860 GCOL 0,2
870 RECTANGLE 92,92,812,812
880 FOR piece=1 TO 3
890 px%=FNord(.5+piece*2)
900 py%=12
910 PROCdraw(px%,py%,piece)
920 NEXT piece
930 VDU5
940 FOR n%=1 TO 2
950 IF n%=1 THEN
960 px%=0: py%=736
970 ELSE
980 px%=976: py%=676
990 ENDIF
1000 str$=name$(n%)+ " score"
1010 FOR p%=1 TO LEN(str$)
1020 GCOL 0,1
1030 MOVE px%,(py%-32*p%)
1040 asc%=ASC(MID$(str$,p%,1))
1050 VDU asc%
1060 GCOL 0,3
1070 MOVE BY -36,4
1080 VDU asc%
1090 NEXT p%
1100 NEXT n%
1110 ENDPROC
1120 :
1130 DEF PROCreset
1140 VDU 26
1150 ORIGIN 124,100
1160 ENDPROC
1170 :
1180 DEF FNord(a)=(a*100) AND NOT 3
1190 :
1200 DEF PROCdraw(rx,ry,piece)
1210 VDU 24,rx;ry;rx+96;ry+96;
1220 GCOL 0,1
1230 RECTANGLE FILL rx,ry,96,96
1240 GCOL 0,2
1250 RECTANGLE rx,ry,96,96
1260 GCOL 0,3
1270 FOR ix=0 TO 4 STEP 4
1280 FOR iy=0 TO 4 STEP 4
1290 CASE piece OF
1300 WHEN 1:
1310 CIRCLE rx+ix,ry+iy,50
1320 CIRCLE rx+ix+96,ry+iy+96,50
1330 WHEN 2:
1340 LINE rx+ix,ry+iy+50,rx+ix+100,ry+
iy+50
1350 LINE rx+ix+50,ry+iy,rx+ix+50,ry+iy
+100
1360 WHEN 3:
1370 CIRCLE rx+ix+96,ry+iy,50
1380 CIRCLE rx+ix,ry+iy+96,51
1390 ENDCASE
1400 NEXT iy
1410 NEXT ix
1420 PROCreset
1430 ENDPROC
1440 :
1450 DATA 0,-1,-1,0,0,1,1,0
1460 DATA 4,3,2,1
1470 DATA 1,2,3,4
1480 DATA 2,1,4,3
1490 DATA 1,2,3
1500 DATA 1,2,3
1510 DATA 3,2,1
1520 DATA 3,2,1
1530 DATA 3,2,1
1540 DATA 3,2,1
1550 DATA 1,2,3
1560 DATA 1,2,3
1570 :
1580 DEF PROCinitialize
1590 board%()=0
1600 board%(1,1)=2: board%(8,8)=2
1610 FOR x=1 TO 8
1620 FOR y=1 TO 8
1630 PROCdraw(FNord(x),FNord(y),board%(
x,y))
1640 NEXT y
1650 NEXT x
1660 winner%=0
1670 X%=2: Y%=1: pd%=4
1680 ENDPROC
1690 :
1700 DEF PROCprompt(s$)
1710 VDU 4
1720 COLOUR 1
1730 tab%=20-(LEN(s$) DIV 2)
1740 PRINT TAB(tab%,30) s$

```

```

1750 VDU 5
1760 ENDPROC
1770 :
1780 DEF PROCkey_numbers
1790 FOR piece=1 TO 3
1800 px%=FNord(.5+piece*2)
1810 py%=12
1820 GCOL 0,3
1830 MOVE px%+42,py%-32
1840 VDU5,48+piece
1850 GCOL 0,1
1860 MOVE BY -36,4
1870 VDU5,48+piece
1880 NEXT piece
1890 ENDPROC
1900 :
1910 DEF FNsafe(a%,b%,p%,k%)
1920 board%(a%,b%)=k%
1930 REPEAT
1940 p%=entrance(board%(a%,b%),p%)
1950 a%+=ix%(p%)
1960 b%+=iy%(p%)
1970 on_board%=(a%>0 AND a%<9 AND b%>0
AND b%<9)
1980 home%=(a%=8 AND b%=9) OR (a%=9 AND
b%=8)
1990 UNTIL board%(a%,b%)=0 OR NOT on_bo
ard%
2000 =on_board% OR home%
2010 :
2020 DEF FNget(a$,b$)
2030 REPEAT
2040 g$=CHR$(GET OR 32)
2050 UNTIL g$=a$ OR g$=b$
2060 =g$
2070 :
2080 DEF FNplayer
2090 REPEAT
2100 k%=GET-48
2110 UNTIL k%>=1 AND k%<=3
2120 =k%
2130 :
2140 DEF FNcomputer
2150 PROCpause
2160 IF RND(2)=1 THEN =FNcomp1 ELSE =FN
comp2
2170 :
2180 DEF PROCpause
2190 time%=TIME+50
2200 REPEAT UNTIL TIME=time%
2210 ENDPROC
2220 :
2230 DEF FNcomp1
2240 k%=RND(3)
2250 try%=0
2260 REPEAT
2270 k%+=1
2280 IF k%=4 THEN k%=1
2290 try%+=1
2300 UNTIL FNsafe(x%,y%,pd%,k%) OR try%
=3
2310 =k%
2320 :
2330 DEF FNcomp2
2340 try%=0
2350 odd_moves%=(16-x%-y%) MOD 2 = 1
2360 IF odd_moves% THEN m%=1 ELSE m%=2
2370 REPEAT
2380 try%+=1
2390 k%=keys%(m%,pd%,try%)
2400 UNTIL FNsafe(x%,y%,pd%,k%) OR try%
=3
2410 =k%

```

Listing Info13

```

10 REM >Dancer (Info13)
20 REM By Mark Hobson
30 REM For 32-bit machines
40 REM (c) BAU May 1993
50 :
60 MODE 0:OFF
70 h=10
80 size=200
90 E=.7
100 g=-2
110 D=size/h
120 DIM v(h),w(h),x(h),y(h)
130 bank=1
140 REPEAT
150 MOUSE x,y,b
160 x1=x:y1=y
170 FOR i=1 TO h
180 dx=x(i)-x1+v(i)*E
190 dy=y(i)-y1+w(i)*E
200 d=D/SQR(dx*dx+dy*dy+.4)
210 x1+=dx*d:x(i)=x1
220 y1+=dy*d:y(i)=y1
230 d=d/2-.5
240 v(i)+=dx*d
250 w(i)+=dy*d-g
260 v(i-1)-=dx*d
270 w(i-1)-=dy*d+g
280 NEXT
290 WAIT
300 bank=3-bank

```



```

310 SYS 6,113,bank
320 SYS 6,112,3-bank
330 CLS
340 MOVE x,y
350 FOR i=1 TO h
360 DRAW x(i),y(i)
370 NEXT
380 CIRCLE x(h),y(h)+40,40
390 MOVE x(h),y(h)
400 DRAW x(h-6)+70,y(h-6)
410 DRAW x(h)+40,y(h-8)
420 MOVE x(h),y(h)
430 DRAW x(h-6)-70,y(h-6)
440 DRAW x(h)-40,y(h-8)
450 MOVE x,y
460 DRAW x(h-2)-50,y-(y(h-6)-y)-30
470 DRAW x(h-6)-30,y-(y(h)-y)-60
480 MOVE x,y
490 DRAW x(h-2)+50,y-(y(h-6)-y)-30
500 DRAW x(h-6)+30,y-(y(h)-y)-60
510 UNTIL FALSE

```

Listing Info14

```

10 REM >Skater (Info14)
20 REM By Mark Hobson
30 REM For 32-bit machines
40 REM (c) BAU May 1993
50 :
60 MODE0:OFF
70 h=10
80 size=200
90 E=.7
100 g=2
110 D=size/h
120 DIM v(h),w(h),x(h),y(h)
130 bank=1
140 MOUSE RECTANGLE -100,300+size,1479
,1023
150 REPEAT
160 MOUSE x,y,B
170 x1=x:y1=y
180 IF y1>300+size MOUSE TO x,y-16:IF
y<300 MOUSE x,300
190 FOR i=1 TO h

```

```

200 dx=x(i)-x1+v(i)*E
210 dy=y(i)-y1+w(i)*E
220 d=D/SQR(dx*dx+dy*dy+.4)
230 x1=dx*d:x(i)=x1
240 y1=dy*d:y(i)=y1
250 d=d/2-.5
260 v(i)=dx*d
270 w(i)=dy*d-g
280 v(i-1)=-dx*d
290 w(i-1)=-dy*d+g
300 NEXT
310 WAIT
320 bank=3-bank
330 SYS 6,113,bank
340 SYS 6,112,3-bank
350 CLS
360 MOVE x,y
370 FOR i=1 TO h
380 DRAW x(i),y(i)
390 NEXT
400 CIRCLE x,y+40,40
410 MOVE x,y
420 DRAW x(6)+70,y(6)

```

```

430 DRAW x+40,y(8)
440 MOVE x,y
450 DRAW x(6)-70,y(6)
460 DRAW x-40,y(8)
470 bx1=x(6)-30
480 by1=y(h)-(y-y(h))-60
490 bx2=x(6)+30
500 by2=y(h)-(y-y(h))-60
510 MOVE x(h),y(h)
520 DRAW x(2)-50,y(h)-(y(6)-y(h))-30
530 DRAW bx1,by1
540 MOVE x(h),y(h)
550 DRAW x(2)+50,y(h)-(y(6)-y(h))-30
560 DRAW bx2,by2
570 IF x<x(h) bx1=x:bx2=x(h) ELSE bx1
=x(h):bx2=x
580 MOVE bx1-45,by1
590 DRAW bx2+45,by2
600 CIRCLE bx1-20,by1-16,16
610 CIRCLE bx2+20,by1-16,16
620 LINE 0,0,1279,0
630 RECTANGLE 600,0,80,150
640 UNTIL FALSE

```

BJÖRN AGAIN

Listing Pong

```

10 REM >Pong
20 REM By Fin Fahey
30 REM For 32-bit machines
40 REM (c) BAU May 1993
50 :
60 MODE 12:CLS:CLG:OFF:SOUND ON
70 DIM Chardat%(15,15)
80 FOR n=0 TO 12
90 FOR m=0 TO 14
100 READ Chardat%(n,m)
110 NEXT m
120 NEXT n
130 :
140 Gap%=600:Pad%=80:PSpeed%=10
150 Padio%=(1000-Gap%)/2:Padhi%=Padio%
+Gap%-Pad%
160 Turn%=0:PROCEnd
170 :
180 WHILE 0=0
190 PROCGame
200 PROCScreen
210 PROCLoop
220 PROCEnd
230 ENDWHILE
240 :
250 REM Start Game
260 DEF PROCGame BSpeed1%=0:BSpeed2%=
0
270 Score1%=15:Score2%=15:Win%=0
280 PROCstart
290 ENDPROC
300 :
310 REM Main game loop
320 DEF PROCLoop WHILE Score1%>0 AND
Score2%>0
330 IF INKEY(-98) THEN PROCDown1
340 IF INKEY(-66) THEN PROCUp1
350 :
360 MOUSE x%,y%,But%
370 IF But%>3 THEN PROCUp2
380 IF But%>1 OR But%>3 THEN PROCDown2
390 :
400 PROCball
410 IF Win%>0 THEN PROCNew
420 ENDWHILE
430 ENDPROC
440 :
450 REM Check score
460 DEF PROCNew IF Win%=1 THEN
470 Col%=0:PROCscore1
480 Score1%=Score1%-1:Col%=1
490 PROCscore1
500 ELSE
510 Col%=0:PROCscore2
520 Score2%=Score2%-1:Col%=1
530 PROCscore2
540 ENDIF
550 GCOL 0:RECTANGLE FILL 8,8,8
560 PROCstart
570 ENDPROC
580 :
590 REM Animate Ball
600 DEF PROCball GCOL 0:RECTANGLE FIL
L 8,8,8 TO Ballx%,Bally%
610 Win%=0:Chy%=0
620 Bally%=Bally%+Ballyv%:Ballx%=Ballx
%+Ballvx%
630 :
640 IF Bally%<=30 THEN
650 Bally%=30:Ballyv%=-Ballyv%:Chy%=1:
SOUND 1,-15,110,5
660 ELSE

```

```

670 IF Bally%>=999 THEN Bally%=999:Bal
lvx%=-Ballyv%:Chy%=1:SOUND 1,-15,110,5
680 ENDIF
690 :
700 IF Chy%=0 THEN
710 IF Ballx%<=400 THEN
720 IF POINT(Ballx%-8,Bally%)=7 THEN
730 Ballvx%=ABS(Ballvx%):tim%=tim+1
740 IF Bally%>Padio% AND Bally%<Padhi%
THEN
750 Ballyv%=Ballyv%+SGN(Ballyv%)*BSpee
d1%:SOUND 1,-15,80,5
760 IF tim%>8 THEN Ballvx%=Ballvx%+3:B
allyv%=Ballyv%+2:tim%=0
770 ELSE
780 SOUND 1,-15,110,5
790 ENDIF
800 ELSE
810 IF Ballx%<=40 THEN Win%=1:SOUND 1,
-15,130,5
820 ENDIF
830 ENDIF
840 :
850 IF Ballx%>=624 THEN
860 IF POINT(Ballx%+8,Bally%)=7 THEN
870 Ballvx%=-ABS(Ballvx%):tim%=tim+
1
880 IF Bally%>Padio% AND Bally%<Padhi%
THEN
890 Ballyv%=Ballyv%+SGN(Ballyv%)*BSpee
d2%:SOUND 1,-15,90,5
900 IF tim%>8 THEN Ballvx%=Ballvx%+3:B
allyv%=Ballyv%+2:tim%=0
910 ELSE
920 SOUND 1,-15,110,5
930 ENDIF
940 ELSE
950 IF Ballx%>=990 THEN Win%=-1:SOUND
1,-15,130,5
960 ENDIF
970 ENDIF
980 ENDIF
990 GCOL 7
1000 RECTANGLE FILL Ballx%,Bally%,8 TO
8,8
1010 IF Win%=0 THEN RECTANGLE FILL Ball
x%,Bally%,8
1020 WAIT
1030 ENDPROC
1040 :
1050 REM Determine ball values
1060 DEF PROCstart Bally%=INT(RND(1)*80
0)+100:Ballvx%=0:Ballyv%=INT(RND(1)*3)+1
1070 IF Turn%=0 THEN Ballx%=400:Ballyv%
=-INT(RND(1)*8)-3
1080 IF Turn%=1 THEN Ballx%=624:Ballyv%
=-INT(RND(1)*8)+3
1090 IF Turn%=1 THEN Turn%=0 ELSE Turn%
=1
1100 ENDPROC
1110 :
1120 REM Move paddle 1 down
1130 DEF PROCDown1 IF Padi%>Padio% THEN
1140 GCOL 0:PROCpad1
1150 GCOL 7:Padi%=Padi%-PSpeed%
1160 PROCpad1
1170 IF BSpeed1%>4 THEN BSpeed1%=BSpee
d1%-2
1180 ENDIF
1190 ENDPROC
1200 :
1210 REM Move paddle 1 Up
1220 DEF PROCUp1 IF Padi%<Padhi% THEN
1230 GCOL 0:PROCpad1

```

```

1240 GCOL 7:Padi%=Padi%+PSpeed%
1250 PROCpad1
1260 IF BSpeed1%<4 THEN BSpeed1%=BSpeed
1%+2
1270 ENDIF
1280 ENDPROC
1290 :
1300 REM Move paddle 2 down
1310 DEF PROCDown2 IF Pad2%>Padio% THEN
1320 GCOL 0:PROCpad2
1330 GCOL 7:Pad2%=Pad2%-PSpeed%
1340 PROCpad2
1350 IF BSpeed2%>4 THEN BSpeed2%=BSpee
d2%-2
1360 ENDIF
1370 ENDPROC
1380 :
1390 REM Move paddle 2 Up
1400 DEF PROCUp2 IF Pad2%<Padhi% THEN
1410 GCOL 0:PROCpad2
1420 GCOL 7:Pad2%=Pad2%+PSpeed%
1430 PROCpad2
1440 IF BSpeed2%<4 THEN BSpeed2%=BSpeed
2%+2
1450 ENDIF
1460 ENDPROC
1470 :
1480 REM Draw screen
1490 DEF PROCScreen CLS:CLG:Score1%=15
:Score2%=15:GCOL 7
1500 y=0:PROChor
1510 y=1000:PROChor
1520 x=516:PROCVert
1530 :
1540 RECTANGLE FILL 96,0,8,(1000-Gap%)/
2
1550 RECTANGLE FILL 96,500+Gap%/2,8,(10
00-Gap%)/2
1560 :
1570 RECTANGLE FILL 936,0,8,(1000-Gap%
)/2
1580 RECTANGLE FILL 936,500+Gap%/2,8,(1
000-Gap%)/2
1590 :
1600 PROCscore1
1610 :
1620 PROCscore2
1630 Padi%=400:Pad2%=400
1640 PROCpad1
1650 PROCpad2
1660 ENDPROC
1670 :
1680 REM Draw paddle 1
1690 DEF PROCpad1 RECTANGLE FILL 96,P
adi%,0,Pad%
1700 ENDPROC
1710 :
1720 REM Draw paddle 2
1730 DEF PROCpad2 RECTANGLE FILL 936,
Pad2%,8,Pad%
1740 ENDPROC
1750 :
1760 REM Draw score 1
1770 DEF PROCscore1 score%=Score1%:x=43
0:y=920
1780 PROCNum2
1790 ENDPROC
1800 :
1810 REM Draw score 2
1820 DEF PROCscore2 score%=Score2%:x=53
0:y=920
1830 PROCNum2
1840 ENDPROC
1850 :

```

```

1860 REM Draw horizontal line
1870 DEF PROChor FOR x=96 TO 928 STEP 3
2
1880 RECTANGLE FILL x,y,16,12
1890 NEXT x
1900 ENDPROC
1910 :
1920 REM Draw vertical line
1930 DEF PROCVert FOR y=0 TO 1024 STEP
32
1940 RECTANGLE FILL x,y,8,12
1950 NEXT y
1960 ENDPROC
1970 :
1980 REM Draw two digit score
1990 DEF PROCNum2 num1%=INT(score%/10):
num2%=score%-num1%*10
2000 GCOL 0:RECTANGLE FILL x,y,66,40:GC
OL 7
2010 IF num1%<0 THEN num%=num1%:PROCNu
m
2020 x=x+36:num%=num2%:PROCNu
2030 ENDPROC
2040 :
2050 REM Draw one digit
2060 DEF PROCNum b%=0
2070 FOR n=0 TO 2
2080 FOR m=0 TO 4
2090 IF Chardat%(num%,b%)=1 THEN
2100 RECTANGLE FILL x+10*n*scale,y+8*m*
scale,8*(scale+z%),6*(scale+z%)
2110 ENDIF
2120 b%=b%+1
2130 NEXT m
2140 NEXT n
2150 ENDPROC
2160 :
2170 REM Make big pong
2180 DEF PROCPPong scale=4:z%=1:x=400:y=
500:num%=10:PROCNu
2190 x=550:y=500:num%=0:PROCNu
2200 x=700:y=500:num%=11:PROCNu
2210 x=850:y=500:num%=12:PROCNu
2220 scale=1:z%=0
2230 ENDPROC
2240 :
2250 REM Waiting to play
2260 DEF PROCEnd CLS:CLG:But%=0
2270 WHILE But%=0
2280 GCOL 7:PROCpong
2290 GCOL 0:FOR n=0 TO 15000:NEXT n
2300 PROCPPong:FOR n=0 TO 15000:NEXT n
2310 MOUSE x%,y%,But%
2320 ENDWHILE
2330 ENDPROC
2340 :
2350 REM data for characters
2360 DATA 1,1,1,1,1,1,0,0,0,1,1,1,1,1,1
2370 DATA 0,0,0,0,0,1,1,1,1,0,0,0,0,0,0
2380 DATA 1,1,1,0,1,0,1,0,1,0,1,0,1,1,1
2390 DATA 1,0,0,0,1,1,0,1,0,1,1,1,1,1,1
2400 DATA 0,1,1,1,1,1,0,0,0,0,1,0,0,0,0
2410 :
2420 DATA 1,0,1,1,1,0,1,0,1,1,1,1,0,1,0
2430 DATA 1,1,1,1,1,0,1,0,1,0,0,1,1,1,0,0
2440 DATA 0,0,0,0,1,0,0,0,0,1,1,1,1,1,1
2450 DATA 1,1,1,1,1,1,0,1,0,1,1,1,1,1,1
2460 DATA 0,0,1,1,1,0,0,1,0,1,1,1,1,1,1
2470 :
2480 DATA 1,1,1,1,1,0,0,1,0,1,0,0,1,1,1,1
2490 DATA 1,1,1,1,1,0,1,1,0,1,1,1,1,1,1
2500 DATA 1,1,1,1,1,1,0,0,0,1,1,1,0,0,1,0

```


SOFTWARE SHOWCASE

EDUCATION

The Spoken Word

SEE US ON STAND 107



The Spoken Word is designed for children who are just beginning to read. It covers National Curriculum attainment targets 1 & 2, at level 1.

Wyddfa Software

English and Welsh versions are £20 inc. VAT (£15 to purchasers of Talking Pictures) from Wyddfa Software, FREEPOST CS50A, Caernarfon LL55 4BR. Tel (0286) 870101 Fax (0286) 871722

EDUCATION

!LogiSim DIGITAL LOGIC SIMULATOR

!LogiSim enables students to design logic circuits using menus and pointer to select and place devices in a circuit. Devices are then connected and autorouted using the mouse. The completed circuit can then be 'run' in real time on the computer screen, all logic states being shown changing dynamically as the student interacts with the circuit. Upto 25 devices in each circuit, choice of AND, OR, XOR, NAND, NOR, JK flipflop, clock & counter.

Cheques payable to RMD £15 inc. P&P
12 PADSTOW ROAD, Demo Version £2
GREASBY
WIRRAL L49 3AQ 051-677-4269
Developed with Silicon Vision RiscBASIC

Fun & Games NEW! £22.95

A3000, A5000 & Archimedes

"T.V. Fun & Games" - 3 National Curriculum games for ages 5 to 9

HS SOFTWARE, FREEPOST, SWANSEA SA2 9ZZ. TEL: (0792) 204519

STATISTICS

STATISTICS FIRST

IS NOW MULTI-TASKING!

Our new enhanced products **1st and 1stJR** Have been released

For full information contact

Serious Statistical Software
Lynwood Benty Heath Lane Willaston
South Wirral L64 1SD

Tel: 051 327 4268

SSERC SOFT 93 Software for Serious Science & Technology

SSERC GRAPHICS LIBRARIES FOR DRAW, DTP, VECTOR, ARTWORKS, MAGPIE, GENESIS etc

Only £10.50 + vat per disc. Version 8.01 = 8 discs
Version 8.01 - Chemistry, Interfacing, Technology, Electronics, Physics, Utilities, Circuit Boards (E&L and Alpha)

June '92 update discs - Update 1 & Cell Biology
Buy 5 or more discs - free SITE LICENCES on all November '92 update discs - MOLECULES 1, MOLECULES 2, TECHNO 2, TECHNO 3, BODYBITS.

All at £10.50 + vat. Send for FULL DETAILS of all discs before deciding upon the graphics you want.

SSERC IDRAW PRACTICAL GUIDES - £12.60 + vat
100 pages, A4, loose leaf. Get the most out of DRAW for minimal cost. Includes 2 discs of exercises

COMING SOON - The SSERC GRAPHICS CD-ROM
7000 FILES: EASY KEYWORD ACCESS: NEW

SSERC CHEMICAL MODELLER (V. 3.1) - £52.50 + vat
This substantial piece of software needs 2 Mb min. & includes Teacher & Pupil Guides. GET INFO NOW!

Please make all cheques payable to SSERC
SSERC, 24 Bernard Terrace, Edinburgh EH8 9NX
Tel. 031 668 4421 for more information
or send a stamped (£1 please) self-addressed envelope

Banner

Banner is a RISC OS signwriting application for printing large wide banners quickly and easily.

- Full control of text, background, border & shadow colour
- Drop shadow in four directions plus many different border styles
- Imports Draw files and Sprites
- Uses standard RISC OS outline fonts
- The banner length is not limited by page size and may be set to print continuously

Kudlian Soft, 8 Barrow Road, Kenilworth
Warwickshire, CV8 1EH Tel: 0926 - 851147

£23.50 inc. VAT
(Site licences also available) **Kudlian Soft**

Make the most of your Computers with the excellent Education Programs from APPIAN WAY SOFTWARE.

* "Picture It!" the powerful picture-building program, including animated sequences - on a wide range of Topics, inc. Map-Maker2, Dinosaurs, Transport, Mini-Beasts 2.

* "Find It" Database the new child-friendly database specially designed to introduce primary children to data handling skills.

Explorations a series of computer packs covering topics at key stage 2 and 3, which allows pupils to explore "pages" of clear, informative text and attractive, colourful graphics. Topics currently available: Victorian Household, Woodlands, Seashore, Maps & Mapping and Young Artists at Work.

All available for ARCHIMEDES
For more details, plus "FREE DEMO DISKS, please contact:
APPIAN WAY SOFTWARE LTD. TEL/FAX: 091 373 1389

DATABASES

IMPACT!

Astoundingly easy to use!
Acorn Computing Dec. 92

The Database

A new easy to use database with direct Impression links

Impact! offers easy to use yet powerful features for home or school, at a sensible price.

If you use Impression, you need Impact!

Circle Software

33, Restrop View
Purton, Swindon
SN5 9DG
Tel: (0793) 770021

Phone today **£49.95 + vat**

SPECIAL NEEDS

C.J. COMPUTING SPECIAL NEEDS

SALES · REPAIRS · SPECIAL NEEDS
Please contact us for all your Acorn computers (Hardware & Peripherals)

We specialise in tailoring computer systems for



57 Westbury Hill,
Westbury-on-Trym,
Bristol
Tel: (0272) 624553

SUPPLIES

FREE MAIL ORDER COMPUTER SUPPLIES CATALOGUE

exclusive to:
ARCHIMEDES - BBC
MASTER - COMPACT
Users

First Issue Bargains
Software - Ribbons - Printers
Accessories - Discs - Paper
Complete Systems
NO MINIMUM ORDER
Write or phone NOW...

Dixon & Dixon
Mail Order Dept. AU3
35 Rokeby Drive
Kenton
Newcastle Upon Tyne
NE3 4JY
Tel or Fax 091 2853042

New! for the A3000 to A5000
NUMBER ZOO

A first number program.
Features 4 early skill games,
plus a matching pairs game.
Excellent value. Only £16.45 incl.




Selective Software
64 Brooks Road
STREET, BA16 0PP
Tel (0458) 43079

SOFTWARE SHOWCASE

PUBLIC DOMAIN



New and Exclusive Digital Symphonies

Arcaenya now stocks the first 10 discs of official Digital Symphonies. These now replace Trackers as previously stocked, due to the vastly superior quality.

Many of these tracks are converted from OctaMED, so have never been heard on a Risc Machine before.

You can order the entire pack of 10 for just £12.00, or individually £1.50 each as \$01-\$10. (Min 2 discs)

Send a £1 coin to receive our full catalogue for all 32 bit Acorn machines, along with Demonstration Disc No. 13.

PO Box 1927 : Sutton Coldfield : B74 3QZ

PUBLIC DOMAIN



The No.1 name in Public Domain

For all RISC OS 2 & 3 computers
(inc. A3000/A5000/A3010/Archimedes)

CLIPART MEGABUNDLE - 2100 clips for draw/paint etc compressed from 33 discs - just £20 all inclusive.

GYRINUS Version 3.50 - The best PD game ever - £1.25
POWERBASE - Best shareware database program - £1.25
MINI WORD HOUND - 30000 word Thesaurus - £1.25
EDUCATION BUNDLE (6 discs of educational PD) - £7.50
GOOD GUIDE TO PD (with PD !Clearview) - £3.00
650 Disc Pick 'n' Mix Catalogue disc - THE BEST - £1.00

Arch Angel PD, PO Box 41, Exeter, EX4 3EN.
Enquiries (0392)-422759

SKYFALL PD

100 FONTS

JUST

£10

Eight discs crammed with one hundred outline fonts, all are designed to a high standard for use with programs such as Impression, Ovation, or Artworks. Many have Bold and Italic styles.



Send £1 for Catalogue & Disc to:
PO Box 2220, B'ham, B43 5RZ.
Enquiries: 021 358 7078.

COMMERCIAL SOFTWARE

Say it Quiz the Language Tutor

*computer speaks like a native
specify your desired language
£5 inc VAT & P&P*

Archimedes Commercial Titles

Dave Pilling, Clare's, Colton, Serial Port, EFF, and many many more.

Public Domain

100's of PD Titles, Clip-Art, Trackers, and Samples.

*Send a disc and a stamp and we will
send you back your disc with FREE
PD and our catalogue, or phone
until 8pm each night!*

Bits n Bytes, 26 Grenville Road,
Plymouth PL4 9PY.
(0752) 667599

GAMES



For: Demos, clipart, games, utilities, trackers, etc.
All sprite files are compressed with ArkFs2.
All discs are checked for virus' & duplications.
No minimum order of discs.
Quantity and subscriber discounts.
Send for our latest catalogue / demo disc which has over 1.3 Meg. of software for just a £1 coin.
Send this ad. with your first order for an additional 5% off our price list.

Five Star Marketing, 18 Woburn Close,
Bushey, Herts. WD2 3XA.

Volume 23 borders&ornaments



Decorative borders, centrepieces, corners, drop caps and ornaments. All that you will ever need to spruce up your DTP page designs and prints.

215 Draw files
8 discs ⇒ 10Mb ⇒ £34.95

Image Club Best Sellers

Volume 24 science&medicine

Detailed diagrams and instructive illustrations for biology, physics, chemistry, physiology and related subjects. Great for science worksheets and projects.



200 Draw files
5 discs ⇒ 8Mb ⇒ £34.95

Add £2 P&P per order. No VAT to pay.
MATT BLACK, Dept AU4, P.O. Box 42,
Peterborough, Cambs. PE1 2TZ ☎ 0733 315439

CHEATS



Can't get past the mutant banana beast on level 3 ? Splat him with this :

The Hacker is The original games hacker

The Hacker was first released in summer '92, since when it has been constantly upgraded, existing owners receiving upgrades in return for a blank disc.

The friendliest games hacker

The Hacker has an easy to learn and use WIMP interface, making the features quick, accessible, and flexible.

The most useful games hacker

The Hacker can create game-specific stand-alone cheat modules which you can distribute as you want.

The best games hacker

The Hacker has many more features than any other similar program, so you can cheat without any knowledge of hacking - and there are even more features for those who know ARM code.

And, it costs just £5 - or 50p or a blank disc for demo.

"The Hacker is by far the most slick... but The Hacker does a bit more, is also easier to use, and costs only a fiver." -BAU

DoggySoft, 7 Blackhorse Crescent, Amersham, Bucks, HP6 6HP.
Cheques payable to Andrew Clover

DISCOUNT SOFTWARE



8 Old Gate Avenue
Watton on Trent
Derbyshire
DE72 2BL

Discount Software - No VAT to pay, P&P £2 extra per item.

ArtWorks	169.00	Black Angel	30.00
Compression	39.00	Break 147 and Superpool	30.00
Chameleon	38.00	Chocks Away Compendium	34.00
Eureka	119.00	EGO: Repton 4	21.00
Impression II (special offer)	145.00	Gods	22.00
Impression Junior	80.00	James Pond	22.00
Ovation	95.00	Lemmings	22.00
Pendown+	79.00	Lotus Turbo Challenge	22.00
Revelation II	77.00	Oh no! More Lemmings	17.00
smArt	55.00	Populous	26.00
smArt files	16.00	Saloon Cars Deluxe	30.00
Vector	85.00	FunSchool 2 18.00 FunSchool 3/4 21.00	

Cheques/Postal Orders Payable to ET Software - Send SAE for full list. (E&OE)



34 Norbreck Close, Great Sankey, Warrington, Cheshire, WA5 2SX.

Send £1.00 for a copy of our latest catalogue,

OR send £1.50 for a copy of the catalogue and an extra disc with around 1600k of compressed

high quality Public Domain software.

Please make cheques payable to 'The Data Stream'.

SPECIAL OFFER - Utility Pack featuring :
Coconizer, Translator (v7.11), Creator, Dissi,
PVRay (raytracer), FormEd2, Guardian3,
Powerbase (top PD database) and more...
Four compressed discs for ONLY £2.99

Prices : Normal Discs £1.00, Pic'n'Mix Discs £1.50

SOFTWARE SHOWCASE

UTILITIES

KEYLINK PROLOG V2.1

For all RISC OS machines

- Standard Edinburgh syntax with integer & real arithmetic.
- 140 page manual developed for the first time Prolog user.
- RISCOS compliant.
- Execution tracing and configurable exception handling.
- Suitable for use with large Prolog programs such as the Open University's Micro Interpreter for Knowledge Engineering.
- Widely used for Scottish Standard and Higher grades.

£69.95 + VAT (postage included). Site licences available.

Keylink Computers Ltd, 2 Woodway House, Common Lane, Kenilworth CV8 2ES Tel: 0926 50909 Fax: 0926 864128

MAGAZINES

Illusions

20 College Road, Wembley, Middx, HA9 8RL.

Illusions is the most popular disk magazine that caters for the whole range of Acorn users. The latest issue contains over 30 articles on: Wimp, ARM, Basic and Impression Tutorials, the latest software/games reviews, news etc...

Illusions consists of 3 disks, an articles disk + 2 disks of the latest and greatest Public Domain Software.

Subscriptions: 1 month - £3.00
6 months - £9.00
12 months - £15.00 (one issue free)

Reviews: 'Illusions seems to be holding off any challengers to its status of number disk magazine' - Archimedes World March 1993

'The two PD disks ... are strong collections. There's something for everyone' - Archimedes World Jan 93

The 100th person to order from this advert wins a years free subscription to the magazine!!

suotrupu

Fonts

NEW FONTS

The ongoing saga of the amazingly affordable fonts
Only £4 each (Foundation:£8)

This is LucidMedium
THIS IS MAIRO OPEN
This is Foundation.Bold

Design Concept

Design Concept
30 South Oswald Road
Edinburgh EH9 2HG
☎ 031 668 2000



£2 coverage on all orders
Call for our free catalogue

CLIP ART

A is for...

your first disc in this new series of drawings created with **Artworks**. Each disc will contain about 1.5Mb of quality drawings on a wide range of subjects starting with a letter of the alphabet.

Cheques / PO to:

ABC of ART

Tideways
South Road
Bream
Somerset
TA8 2SE

only £8

MUSIC

THEORY OF MUSIC

Questions and Exercises

Archimedes £16 Master £15* B £13.50*
*(plus £1 for 3½-inch or 40-track)

LEVEL 1 THEORY OF MUSIC
(prices as above)

PLAY WHAT I PLAY

Archimedes £13.50 Master / B £12.50

TED KIRK (BAU), 33 Humber Crescent, ST. HELENS,
Merseyside WA9 4HD 0744 818761
(detailed information on request)

ACORN USER ADVERTISEMENT PAGES MAY 1993

10/10 96-97	Cumana 118	ICS (Ian Copestake Software) .. 4-5,6,8	Q.D. Enterprises 62
4th Dimension 72,76	Dabhand Computing..... 80-81	IFEL..... 89	R.M.D. 125
5 Star Marketing 126	Dabs Press..... 100-101	Illusions Magazine 127	Risc Developments..... 12,110
A.B.C. of Art..... 127	Datafile 108	Intelligent Interfaces 62	Selective Software..... 125
AJS 115	Datastream..... 126	Keylink Computers 127	Senlac Computing 110
Alsystems 64	DD International 108	Krisalis Software 74	Serious Statistical Software .. 125
Appian Way..... 125	Dec Data..... 62	Kudlian Software 125	Simtec..... 106
Apricote Studios 82	Design Concept 127	Longman Logotron IFC-1,11	Skyfall 126
Arcaynia P.D..... 126	Desktop Projects Ltd 66-67	Manor Court Supplies 64	Smart DTP..... 86
Arch Angel 126	Dixon & Dixon 125	Matt Black 126	Snap Computer Supplies..... 50
Atomwide Ltd 14	Doggy Soft 126	Micro Discount..... 108	Soft Sector 62
BBC Acorn User Spring Show... 35	E T Software..... 126	Micro-Laser Designs..... 115	Software 42 28
Bits & Bytes..... 126	Electronic Font Foundry..... 34	Micro Studio 104	Software Bargains 78,104
C.U. Electronics..... 90	Emerald Publishing 119	Micro-Aid 106	SSERC Graphics Library 125
Chelsfield Publications..... 86	Explan 104	Minerva Software 115	Superior Software..... OBC
Circle Software 125	G.M.L. 50	Morley Electronics..... 54-55	T.J.E. Reproductions 112
CJ Computers 125	Gnome Computers..... 106	Northwest Semerc..... 48	Ted Kirk 127
Clares Micro Supplies..... 71	Ground Control 104	Norwich Computer Services 85	The Data Store..... 110
Colton Software 95,IBC	HCCS Associates..... 17	Oak Solutions 24,33,58	The Jumping Bean Company 20
Computer Concepts.. 27,85,102,116	HS Software 125	Oregon..... 92	The Serial Port 112
Computer Tutorial Services.. 50	Icon Technology 33	PRES..... 18	Unique Way 82
Contex Computing 110			Watford Electronics 36-46
CSS..... 108			We Serve 115
			Wild Vision..... 60
			Wydfra Software..... 125

THE MOXON INTERVIEW

IAN GOODALL

Within hours of the release of the new Acorn range, I said to the design team: "We make high quality upgrades for Acorn computers; that's true. But you guys aren't going to have much to do if we don't design something to allow the new machines to take more than one card." That's how the Ultimate Expansion System was born.'

Ian Goodall, the man responsible for HCCS' product sales and marketing, doesn't pretend that having a product strategy is vital: 'They realised this was a serious point: we sell upgrades for Acorns, and as the new machines can only take one expansion card, we were seriously jeopardising our long-term future as a hardware manufacturer.'

'We had a long meeting, and the team decided it was possible to design an expansion system which would be contained completely inside the machine, as long as the problems of cooling and power supply could be overcome. The designing of credit card sized micropodules was the key, with a standard d-type connector for every podule to allow them to slot in easily.'

The result of the Newcastle-based team's efforts is the Ultimate Expansion System, which may well become the standard expansion route for owners of the new range, as well as older machines.

'We started off by designing the multipodule for the A3010, which has a hard disc and two slots for micro podules. This was closely followed by the A3020 and A4000 versions, though at this point we'd not actually seen an A4000. They were that rare.'

'Finally we made a strategic decision to produce a version for the A5000, so that micropodules are the only expansion cards for the Archimedes that will fit in all the machines in the range (except the A4).'



Indeed. The coupling of a market-driven product philosophy and a team of technical designers has meant HCCS has released some pretty innovative products.

'In 1991, when I was working for Kelator, Acorn's main distributor at the time, I saw it would be beneficial to broaden the available product range with a video digitiser, and HCCS had designed one for the BBC some years before.'

'As a result, HCCS designed and built a digitiser to compete with Wild Vision's Hawk V9, and it sold reasonably well. However, having got into the digitiser market, HCCS' design team saw the possibility of a high-performance, low-cost, real time digitiser with the software mainly on disc, cutting the cost of the product.'

'The decision was taken to bring out a monochrome version of the add-on, at a cost to appeal to those people who might not know they wanted a

digitiser. The increase in camcorder sales gave us confidence, and next the monochrome Vision digitiser was launched in January 1992 at a price of £49.

'A colour version soon appeared for £79, and a high resolution digitiser called HiVision followed at £129.

'At the October *Acorn User* show we managed to sell 300 digitiser units in just three days, which was fine, except for the fact that we had only had 200 units at the show. It was obvious by the Saturday morning that we were going to sell out, so we manufactured another 100 and brought them down on Sunday.'

Accelerating sales curves seem to prove Ian's point: decide on a market and go for it. It worked for Computer Concepts with *Impression* and *ArtWorks*, and it's working for HCCS. Maybe that's why the Acorn marketplace is awash with new products this spring.

NEXT MONTH

Buying a new application can sometimes be a tough and time-consuming decision. With new packages – and upgrades – coming on the market little by little, it is often difficult to make a direct comparison. Which is why *Acorn User* has decided to step into the breach.

Our new buyer's guides will look at major packages in a certain field and compare the results. Price, ease of use and, of course, the features they provide, will all be assessed by an experienced reviewer.

The first buyer's guide will take a look at graphics, so if you want to see the real state-of-the-art in the Acorn world, don't miss our June issue.

THE LATEST RELEASES

One package that should be of interest to home users, and may also find a home in many geography classrooms is *Topographer*, an application that can turn a humdrum map into a three-dimensional landscape.

For teachers, and parents, we have a special round-up next month, with a 'back to nature' feel. *Woodlands*, *Badger Trails*, *Creepy Crawlies* and *Living Birds* are just some of the packages that signify a growing interest in wildlife and the environment. On a more scientific bent, *Computer Aided Design* comes in many guises, and *ProCAD* strives to take the professional approach. But how does it fare against the most well-known CAD package of them all: *AutoCAD* on the PC?

And finally, something that will appeal to all those on the upgrade trail is our special look at Ram upgrades. When you are short on memory space, the benefits are all too clear, but which is the best buy?

THE BEST ADVICE

Next month's issue will – as always – be packed full of advice, tips and techniques.

Our music series will explain how programmers can use the Arc's amazing sonic abilities to best advantage, while a brand new series starts you on the road to designing fast 3D graphics.

Marvel at the quotidian zaniness of *INFO, with contributions from all over the globe, and dig into our brand new series of hints and tips.

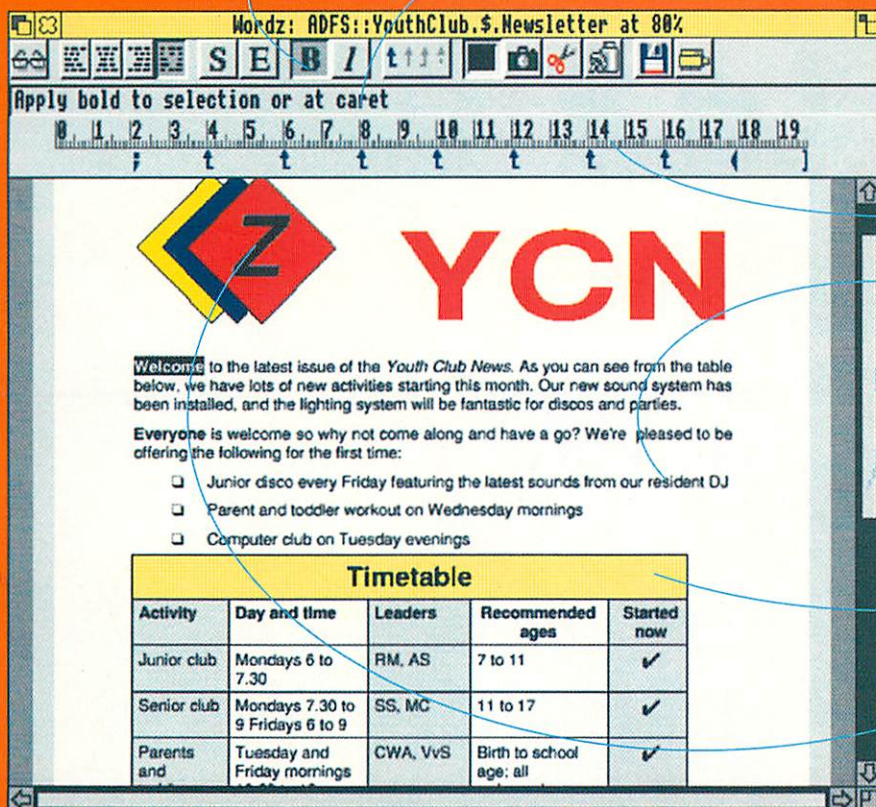
DAN BURTON

At last, the word processor the Archimedes has been waiting for. A program that's so easy to use you'll be able to create great-looking documents the first time you use it. The facilities used most are in the *button bar*, and the *status line* gives you instant feedback. Just click and drag in the *ruler* to set margins and tabs; click on a button to cut and paste - it's that easy.

Wordz has all the features you'd expect from a state-of-the-art word processor. The powerful style editor gives you complete control over all aspects of your text; *font*, *spacing*, *margins*, and *colour*. Unparalleled control over *tables* including dragging to resize columns and rows. Speedy check-as-you-type or whole document spell checking. Import *pictures* and text from other programs, including PipeDream.

Wordz is the first of a family of programs which share the same easy user interface and include dynamic data linking. The spreadsheet Resultz will be available in mid-1993.

Wordz costs £99+VAT. "Is it easy to use? It's falling-off-a-log easy to use."



word[®]z[™]!

1993...4...

for a free Wordz brochure, complete and return this coupon

name

address

postcode

COLTON software

2 Signet Court, Swanns Road,
Cambridge CB5 8LA
Telephone 0223 311881
Fax 0223 312010

TECHNODREAM



TECHNODREAM

At last, the action-packed sequel which everyone has been waiting for! Now, in addition to a 1 player option, you can choose to have 2 players simultaneously. Now, in addition to horizontal parallax scrolling, there is vertical scrolling to give a much enlarged playing area.

You have been directed by the Terran Defence Agency to pilot the new V7 Terrastormer against the alien forces. Although vastly out-numbered, and initially out-gunned, you can collect extra primary and incendiary weapons and shields as you progress through Outer Space, the Satellites of Kirius and, finally, for the fearless few, the Colonised Worlds.

There are 18 increasingly fiendish stages, with brilliant arcade-quality graphics and massive animated sprites, plus digitised sound effects and 6 atmospheric pieces of stereo music. Control by keyboard or joysticks (Acorn A3010 or RTFM).

Acorn 32 Bit Computers £24.95 (inc VAT)

Other Acorn 32 Bit titles available for immediate despatch by 1st class post:

PLAY IT AGAIN SAM 1 – Four top quality, classic games, for the price of one!

Conqueror, Rotor, No Excuses, Hostages£24.95 (inc VAT)

THE LAST NINJA – 140 screens of Ninja action and strategy£24.95 (inc VAT)

AIR SUPREMACY – The unique air/ground/sea strategy game£24.95 (inc VAT)

EGO: REPTON 4 – Brilliant, new Repton puzzle game.....£24.95 (inc VAT)

REPTON 3 – Four-game compilation plus game designer.....£24.95 (inc VAT)

SPEECH! – The widely praised speech synthesiser£24.95 (inc VAT)

All our Acorn 32 Bit titles are suitable for the full range of Acorn RISC OS computers, i.e. Acorn A3000, A3010, A3020, A4000, A5000 and Archimedes.

BBC Micro, BBC Master 128, Master Compact and Electron owners. Please note that we have a massive range of games available for these computers, including several compilations. Write to the address below or phone for an illustrated list of all our titles for these computers.

SUPERIOR SOFTWARE

(Superior Software is a trading name of Superior Microcomputing Ltd.)
Dept. E1, P.O. Box 6, Brigg, S.Humberside DN20 9NH. Tel: (0652) 658585

PLEASE MAKE CHEQUES
PAYABLE TO "SUPERIOR SOFTWARE."



24 HOUR TELEPHONE
ANSWERING SERVICE FOR ORDERS

OUR GUARANTEE

- All mail orders are despatched by first-class post
- Postage and packing is free
- Discs that are faulty on receipt will be replaced immediately

(This does not affect your statutory rights)