BBC The best-selling magazine for Acorn machines

KIDS' LAB

Can home software be exciting, addictive and educational? We get the kids' real verdict

On the move

What to buy for your portable and Pocket Book

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Take a look at ready-made artwork

PROGRAMMER'S BIBLE

The new programmer's manual reviewed





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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 A4 2 Mb FD Portable £1399.00 A5000 / 2Mb Ram, 80Mb HD Arm 3, Acorn Multiscan Monitor £1399.00 A5000 / Learning Curve / 2Mb Ram £1445.96 as above c/w software A5000 / 4Mb Ram, 120Mb HD Arm 3, Acorn Multiscan Monitor £1599.00 A5000 ES - Econet System Arm 3, Acorn Multiscan Monitor £1299.00 A5000 NS - Network System £1399.00 Arm 3, Acorn Multiscan Monitor A4000 Home Office System £999.00 Arm 250, Acorn Monitor A4000 Home Office Multiscan System Arm 250, Acorn Multiscan Monitor £1049.00 A4000 HD 80 System £949.00 Arm 250, Acorn Monitor A4000 HD 80 Multiscan System £999.00 Arm 250, Acorn Monitor A3010 Family Solution Arm 250, TV Modulator £424.68 A3010 / 2Mb Learning Curve System £680.00 Arm 250, Acorn Monitor A3020 / 2Mb FD System £749.00 Arm 250, Acorn Monito A3020 / 2Mb FD Multiscan System £799 00 Arm 250, Acorn Multiscan Monitor A3020 / 2Mb HD 60 System £899.00 Arm 250, Acorn Monitor A3020 / 2Mb HD 60 Multiscan System Arm 250, Acorn Multiscan 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 Taxan 795 VIDC Modes Disc Technical Reference Manual

A5000 Upgrades

£299.00

£7.50

£65.00

£12.95

£65.00

2Mb Bam Card £110.00 Dust Cover (One piece) **Technical Reference Manual**

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
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A4 Upgrades

A4 2 MB RAM Upgrade	£99.00
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

Expansion ou	00
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 Digitis	ers
A3000 inc. podule housing	£72.30
A400 / A5000	£72.30
Aleph 1/Atomw	vide
Arm 3 Upgrade	£165.00
386 PC Expansion Card 1Mb	£300.00
386 PC Expansion Card 4Mb	£400.00
486 PC Expansion Card 4Mb	£555.00
Parallel SCSI adaptor	£45.00

RemoteFS £45.00

Standard Monitors

Acorn Colour £199.00 All monitors come with free lead. State type of computer when ordering

Multiscan Monitors

Floppy Disc D	Drives
Taxan 795 Multivision	£449.00
Acorn Multiscan AKF18	£299.00

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-10sx	£175.00
Canon BJ10ex inc. turbo driver	£215.00
Sheetfeeder for BJ-10ex	£48.00
Canon BJ200	£279.00
Canon BJ200 inc. turbo driver	£309.00
Canon BJ230	£309.00
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
HP DeskJet 550C	£489.00
Laser Direct (LBP4 Hi Res.)	£849.00
Laser Direct (LBP8 Hi Res.)	£1279.00
Econet	

Level 4 AUN Software

Scanners

£399 00

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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
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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 Deskiet 500/550C Driver £15.00 Star/Epson/Citizen (Colour) £15.00 Electronic Font Foundry BubbleJet - BJ10e/130e Cables Arc - 15 Pin to 9 Pin Adaptors Arc - Monitor - 8833 inc sound Arc - Monitor - 8833 II inc sound Arc - Parallel Printer Cable Keyboard Extender 400/500

BBC Software

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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

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Chameleon	£35.00
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Jigsaw	£27.00
Noot	£50.00

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Newhall Font Pack	£39.00
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TCP/IP Protocol Suite	£199.00
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Switch On	£20.00
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Twin World	£14.00
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Fun School 4 7-11 year olds	£20.00
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Music Player	£35.00
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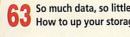
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Farmer Giles	Com	outer Tutorial	£16
Farmer Giles II	Com	outer Tutorial	£17
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Fireball II Xtra		CIS	£9
First Impression	n Word		£28
First Logo		Longman	\$22
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Flare		Silica	£22
Flexifile, KS3,4	0.	Minerva	£75
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Fontasy	R.II	ICS	£15
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Food for Thoug	pht, age 7-16	Sherston	£16
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Freddy Teddy's	s Adventure	Topologika	£18
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Ualactic Dar		Fourth Dim	£19
GuardianPro	Digit	al Phenomena	£14 £99
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MicroDrive Designer	CIS	£25
Micro Music MicroSpell 3.XX	Fisher-Marriott David Pillin	
MicroStudio, age 7+	EMR	£67
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MiG-29 Fulcrum	Domark	£24
Military History, sprites Minotaur	Micro Studi Minerva	o £16 £8
Missile Control	Minerva	£8
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Money Matters	Triple R	£15
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Multistore, KS3,4	Minerva	£125
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Naughty Stories (set of 6)	Sherston	£48
Navigator	Topologika	£44
Nebulus	Krisalis	£19
Newton Night Slov	Longman	£20
Night Sky Noddy's Playtime	Clares Jumping Bear	£67 £21
Noot	4mation	£41
Noot Art Disc	4mation	£10
Notate	Longman	£42
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Numbers and Pictures	Chalksoft	£20
Numberscope	Fisher-Marriott	£19
Number Zoo, age 3-6	Selective	£14
Numerator Numerator Chaos	Longman Longman	£39 £18
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ek Logic	Oak	£79
Oak PCB	Oak	£79
Oh No! More Lemmings		045
(requires Lemmings)	Krisalis	£15
Ollie Octopus'	Sketchp	ad
age 4+	Storm	E12
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Orrery	Spacetech	£93
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Overload	Clares	£13
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TurboDrivers: Canon, Epse HP – each	CC CC	£49
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Recall, age 8-13	Sherston	£37
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Render Bender 2	Clares	£78
Repton 3 Resultz	Superior Colton	£20 £POA
Revelation 1	Longman	£39
Revelation 2	Longman	£75
Revelation 2 CD Rom Revelation ImagePro	Longman Longman	£98 £127
Reversals	Chalksoft	£17
Rhapsody 2 Rhapsody 3	Clares Clares	£45 £79
Rhythm-Bed	Clares	£39
RhythmBox II, age 8+	EMR	£34
RiscBASIC Compiler RiscForth Compiler	Silicon Silicon	£79 £79
Risc OS 3 First Steps		EPOA
Risc OS 3 Programmer's Reference Manual	Acom	/0 £99
Risc OS Companion Vol 1		/0 £49
Risc OS Extras 1992	Acom	63
Risc OS Style Guide RoboLogo	Acorn \ Silicon	/0 £12 £39
Round the World Yacht Race	e, age 9+	
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SparkFS	David Pilling	£20
Sparkle	Morley	£59
Special – site licence	ICS	£10 £30
Speech!		17
Spelling week-by-week Spex	Chalksoft ExpLAN	£21 £98
Spheres of Chaos	Matt Black	£19
Splash, age 7-11	Sherston	£19
Splice	Ace	£34
Split an Image, age 7-16		£16
Spoken Word Spooler	Wyddfa Computer Tuterial	£16 £9
Sporting Triangles	Computer Tutorial CDS	£19
SportsDay	Selective	£22
SportsPeople	Selective	£22
SpriteEd	Computer Tutorial	£17
SpySnatcher	Topologika	£12
Square Route	Computer Eyes	£16
Starspell Plus StartWrite	Fisher-Marriott Icon	£19 £55
StockPack	Topologika	£37
StoryBook, age 3-10	EMR	£59
StrongED	Stallion	£22
Studio24Plus Version 2,		2149
Studio24Plus Version 3, Stunt Racer		210
SUMthing	Fourth Resource	£25 £19
SuperDump	Silicon	£20
Superior Golf	Superior	£14
SuperPlot	Silicon	£20
Supersounds	CIS	£15
Supersounds 2	CIS	£15
Swiv	Krisalis	£19
TABS	ExpLAN	£95
Talisman	Minerva	£8
Talking Pendown	Longman	£58
Talking Pictures	Wyddfa	£16
Target Maths	Triple R	£15
Technodream (Nevryon :		£20
TechWriter Thinklink	Icon £ Xavier	£29
ThinkSheet	Fisher-Marriott	£38
Thundermonk	Minerva	£11
Tiles	Brain Games	£16
Timeshare	Fisher-Marriott	£19
Timetabler		549
Time Traveller, KS2 – Britain Since the 193	ESM BOg KS2	£37 £30
- Expansion, Trade a		
	· · · · · · · · · · · · · · · · · · ·	£36
 Making of the United 	d Kingdom,KS3	£39
- Medieval Realms, K	S3	£36
		£30
- The Victorians, KS2		
TinyDraw/TinyPuzzle	Topologika	£34
TinyDraw/TinyPuzzle TinyPuzzle	Topologika	£34 £24
TinyDraw/TinyPuzzle	Topologika	£34
TinyDraw/TinyPuzzle TinyPuzzle Titler	Topologika Clares £ Clares	£34 £24 119
TinyDraw/TinyPuzzle TinyPuzzle Titler Toolkit Plus Tools Graphics, drawfiles Topographer	Topologika Clares £ Clares	£34 £24 119 £36 £23 £63
TinyDraw/TinyPuzzle TinyPuzzle Titler Toolkit Plus Tools Graphics, drawfiles Topographer Touch Type	Topologika Clares £ Clares S Micro Studio Clares Iota	£34 £24 119 £36 £23 £63 £39
TinyDraw/TinyPuzzle TinyPuzzle Titler Toolkit Plus Tools Graphics, drawfiles Topographer Touch Type Tower of Babel	Topologika Clares £ Clares Micro Studio Clares Iota Cygnus	£34 £24 119 £36 £23 £63 £39 £17
TinyDraw/TinyPuzzle TinyPuzzle Titler Toolkit Plus Tools Graphics, drawfiles Topographer Touch Type	Topologika Clares £ Clares Micro Studio Clares Iota Oygnus David Pilling	£34 £24 119 £36 £23 £63 £39
TinyDraw/TinyPuzzle TinyPuzzle Titler Toolkit Plus Tools Graphics, drawfiles Topographer Touch Type Tower of Babel Trace Trace Trace Tracker	Topologika Clares £ Clares S Micro Studio Clares Iota Cygnus David Pilling Midnight	£34 £24 119 £36 £23 £63 £39 £17 £5 £46 £37
TinyDraw/TinyPuzzle TinyPuzzle Titler Toolkit Plus Tools Graphics, drawfiles Topographer Touch Type Tower of Babel Trace Tracer Tracker Transport, drawfiles	Topologika Clares £ Clares 3 Micro Studio Clares Iota Cygnus David Pilling Midnight Leading Edge Micro Studio	£34 £24 £36 £23 £63 £39 £17 £5 £46 £37 £25
TinyDraw/TinyPuzzle TinyPuzzle Titler Tools Graphics, drawfiles Tools Graphics, drawfiles Touch Type Tower of Babel Trace Trace Tracker Transport, drawfiles Turbo Type	Topologika Clares E Clares Micro Studio Clares Iota Cygnus David Pilling Midnight Leading Edge Micro Studio CIS	£34 £24 £119 £36 £23 £63 £39 £17 £5 £46 £37 £25 £20
TinyDraw/TinyPuzzle TinyPuzzle Titler Tools Graphics, drawfiles Topographer Touch Type Tower of Babel Trace Tracer Tracker Transport, drawfiles Turbo Type Tween	Topologika Clares £ Clares Micro Studio Clares Iota Oygnus David Pilling Midnight Leading Edge Micro Studio CIS Ace	£34 £24 119 £36 £23 £63 £39 £17 £5 £46 £37 £25 £20 £35
TinyDraw/TinyPuzzle TinyPuzzle Titler Tools Graphics, drawfiles Tools Graphics, drawfiles Touch Type Tower of Babel Trace Tracker Tracker Tracker Tracker Transport, drawfiles Turbo Type Tween Twin	Topologika Clares £ Clares 3 Micro Studio Clares lota Cygnus David Pilling Midnight Leading Edge Micro Studio CIS Ace Acom	£34 £24 119 £36 £23 £63 £39 £17 £5 £46 £37 £25 £20 £35 £24
TinyDraw/TinyPuzzle TinyPuzzle Titler Tools Graphics, drawfiles Toobs Graphics, drawfiles Touch Type Tower of Babel Trace Tracer Tracker Transport, drawfiles Turbo Type Tween Twin Twin World	Topologika Clares E Clares Micro Studio Clares Iota Cygnus David Pilling Midnight Leading Edge Micro Studio CIS Ace Acom UBI Soft	£34 £24 119 £36 £23 £63 £39 £17 £5 £46 £37 £25 £20 £35
TinyDraw/TinyPuzzle TinyPuzzle Titler Tools Graphics, drawfiles Topographer Touch Type Tower of Babel Trace Tracer Tracker Transport, drawfiles Turbo Type Tween Twin Win World TWO (Task and Window – site licence	Topologika Clares E Clares Micro Studio Clares Iota Cygnus David Pilling Midnight Leading Edge Micro Studio CIS Ace Acom UBI Soft Organiser) /CS	£34 £24 £119 £36 £23 £63 £39 £17 £5 £46 £37 £25 £20 £35 £22 £35 £24 £14 £10 £30
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PC PRODUCTS ...

AnDi Oddule Baildon £39 I2C Adaptor (needed unless you already have an I2C socket) Baildon £10 I2C SWI (enhanced IIC_Control) Baildon £15 - bought with Oddule £5

SCANNERS, DIGITISERS

ArcScanner including Epson GT-4000

ArcScanner including Epson		
	Clares	£1660
Colour Converter	Lindis	£145
FaxScan	Spacetech	£94
GreyHawk	Wild Visiio	863 r
Handipad	TechSoft	£173
Hawk V9 Mkll	Wild Vision	
- standard	The Parent	£199
- hardware dithered		£259
HiVision Digitiser Colour		1209
Anvision Digitiser Colour	HCCS	
- A3000 External	Alexand 1	£137
- A3000 Series / A4000 In	nternal	£124
- A5000 / 300 / 400		£124
iMage (Sharp JX-100)	Iriam	1
- for A5000		£490
 for other computers 		£589
Image Scanner	lota	£383
 Colour Upgrade Kit 	lota	£239
- Fast Parallel Card	lota	£98
i-Scan 200	Irlam	£539
i-Scan 400	Irlam	£589
Pineapple Colour Video Digi		
	Pineapple	£195
- A3000 boxed	Pineapple	£230
ProImage (Epson GT6000)	Irlam	LLUU
- for A5000	man	£989
- for other computers		£1089
Scan-Light A4	cc	£277
- with Sheet Feeder		£360
	CC	
Scan-Light 256	CC	£190
- A3000 internal	CC	£190
Scan-Light Professional	CC	£565
- as above + SCSI interfa		£699
SnapShot Colour Video Digit		Van de la
	Lingenuity	£195
 A3000 version 	Lingenuity	£275
Spectra	RISC	
- Archimedes / A5000		£545
- A3000 Series / A4000 Ir	nternal	£545
- A3000 External		£555
Vision Digitiser	HCCS	
- A5000 / 300 / 400 Mond		£48
- A5000 / 300 / 400 Colou	ır	£76
- A3000 External Mono	1.16.52	£60
- A3000 External Colour		£89
- A3000 Series /A4000 In	ternal Mo	
- A3000 Series / A4000 Ir		
		£76
MEMORY		

MEMORY

Fitting extra unless otherwise stated

 † Fitting fairly easy ‡ Fitting needs expertise

 A3000 2 Mb Upgradable † Atomwide/IFEL £43

 A3000 4 Mb †
 Atomwide/IFEL £100

 A3020 4 Mb †
 Atomwide/IFEL £100

 A3020 / A4000 2-4 Mb
 IFEL £55

 A3020 / A4000 2-4 Mb †
 IFEL £55

 A3020 / A4000 2-4 Mb †
 IFEL £55

 A310 2 Mb Upgradable soldered ‡ IFEL £88
 = as above + MEMC1a ±113

 - as above + MEMC1a ±152
 - as above + fitting £143

 A310 4 Mb soldered + MEMC1a ±IFEL £152
 - as above + fitting £182

 A5000 2-4 Mb Non-upgradable† Atomwide £52
 - as above + fitting £182

 A5000 2-4 Mb Non-upgradable† Atomwide £500
 A5000 2-4 Mb bincluding fitting Atomwide £500

 A5000 2-4 Mb bincluding fitting Atomwide £391
 A5000 4-8 Mb including fitting Atomwide £391

 A5000 4-8 Mb including fitting Atomwide £391
 A5004 4 Mb †
 Acom £238

 † Fitting fairly easy ‡ Fitting needs expertise PRINTERS Arcl aser 300-6 Calligraph £895

Bubble Jet BJ-200	Canon	£282
	Canon/CC	£219
Bubble Jet BJ-10sx + Tu	urboDriver	
Bubble Jet BJ-10sx	Canon	£187
ArcServer 300-8	Calligraph	£985

For ordering details please turn to page 3



Bubble Jet BJ-230 Canon £315 Bubble Jet BJ-300 Canon £325 Bubble Jet BJ-330 Canon £380 Bubble Jet BJC-800 + TurboDriver Canor/CC£1374

DeskJet 510	Hewlett-Packard	£275
DeskJet 500C	Hewlett-Packard	£375
DeskJet 550C	Hewlett-Packard	£525
Laser Direct HiRes4	CC	£899
- 250-sheet Pape	r Cassette	£99
Laser Direct HiRes8	CC	£1275
Laser Direct HiRes E	Board CC	£325
Refill toner cartridge	for Canon EPS	£50
New toper cartridge	for Canon I BP-4	£50

COMPUTERS ...

A3010 1MB FD Family Solution Acom £420 A3010 2MB FD Learning Curve with Monitor Acom £675

- as above + JP150 Printe	ər	£889
A3020 2MB FD	Acom	£749
A3020 2MB HD60	Acom	£899
A4 2MB FD	Acom	£1395
A4 4MB HD60	Acom	£1695
A4 4MB HD80	Acom	£1699
A4 4MB HD120	Acom	£1799
A4 Extra Battery Pack	Acom	£50
A4 Shoulder Bag	Acom	£35
A4000 2MB HD80	Acom	£945
- as above + Home Office		£995
A5000 2MB HD80 Multiscan	Acom	£1395
- as above + Learning Cu	rve	£1455
Pocket Book	Acom	£212

MISCELLANEOUS. .

386 PC Expansion Card 25 MHz Aleph One

- 1 Mb	£374
- 4 Mb	£468
486 PC Expansion Card	
- 1 Mb	£463
– 4 Mb	£557
4-slot 4-layer Backplane	
A300/400 Fan kit	ICS £15
A3000 Expansion Box	Wild Vision £135
A310 RISC OS Carrier E	
A5000 Fitting Kit for sec	
	ICS £15
Arckey Function KeyStri	
 – pack of 4 	vo £10
ArcNET	ACS £69
ARM3 ‡	Aleph One/IFEL £165
ColourBurst	State £395
ColourCard	CC £225
- A3000 External	CC £225
Dongle Dangle with scre	w fittings ICS £6
Fan filters (pack of 10) (not A5000) ICS £6
FaxPack	CC £289
Floppy Discs, 10 x 31/2"	High Density £10
G16 True Colour Card	State £258
G8 Plus Accelerator	State £238
HiPoint Mouse for A4	Genius £49
Microlin fx Pocket Fax M	odem Pace £179
Micro Mouse	Clares £26
Monitor Stand for A3000) ICS £21
Mono/SCSI	Atomwide £48
Podule Case for A3000	HCCS £16
Printer/SCSI	Atomwide £74
Printer Port Sampler	Leading Edge £42
Publishing Pack	CC £475
RISC OS 3 Upgrade	Acom £42
- Bulk package	Acom £335
- A5000	Acom £19
Seal 'n Type spill-proof I	
- Archimedes / A500	0 Kador £14
- A3000	Kador £14
TouchWindow	Lindis £234
Whisper Fan Quietener	Linuis L20-
(for A300/A400 series	sonly) ICS £15
Wizzo IDE Filing System	
- Wizzo4 for A	1 229
- Wizzo5 for As	5000 620
- The control of As	

"You wonder how you ever managed without QuicKey." 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

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

"DrawBender is quite stunning."

NOW ONLY £10

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

NOW ONLY £15

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.

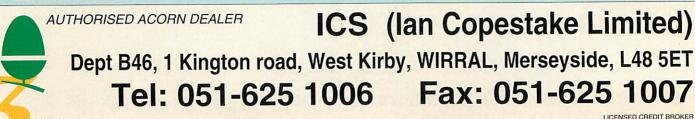
Overseas carriage: If you are paying by credit card we will add airmail and insurance at cost. Otherwise please add £6 (Europe) or at least £12 (elsewhere) for each software item and send a pounds sterling bank draft payable at a London clearing bank, or Eurocheques for not more than £100 each.

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.



Padlock is our top seller for simple disc security.

E&OE D61 93JL19

NEWS



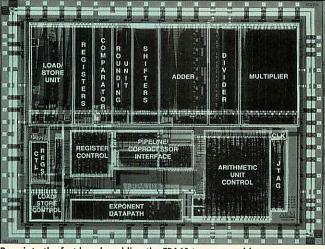
FPA10 BRINGS FASTER MATHS

ACORN and Arm Ltd have finally released the eagerly anticipated FPA10 floating point maths accelerator chip, which can make programs which use floating point instructions run considerably faster. It is attractively priced at $\pounds 99 + VAT$ and should be available immediately.

According to Acorn tests, the performance of certain functions in compatible software can be boosted by as much as 50 times. Applications which are likely to benefit FPA10 include from the computationally-intensive programs like spreadsheets, CAD, image analysis, modelling and vector graphics. Double precision calculations have an accuracy to 14 decimal places and extended precision calculations 18 decimal places.

Basic technical details of the FPA10 were published in last month's *Acorn User*. The 26MHz chip, manufactured in the UK by GEC-Plessey Semiconductors, consumes just 250mW of power: between eight and 25% of the power required by similar chips.

Not all applications will be automatically compatible with the FPA10. For example, no Computer Concepts applications use Risc OS floating point library routines. 'Just about all our products, including *Artworks*, use optimised fixed point arithmetic,' com-



Burn into the fast lane by adding the FPA10 to your machine

mented CC's Charles Moir. He said the FPA10 was good news and the price seemed right.

Colton Software's *PipeD-ream* and *Resultz* spreadsheet applications do use FPA10compatible routines, though Colton's Rob MacMillan was cautious about how much difference the chip would make. 'We haven't tested the chip yet, but I wonder if it will make a great deal of difference to small spreadsheets,' he said.

Whether software houses will start to produce new products which are fully FPA10compatible will depend on how many of the chips reach users. Only the A5000 and some A540/R260 models include a socket to take the chip, though a number of companies now offer Arm3 upgrade boards with an FPA10 socket. A540 or R260 users who find their CPU card doesn't have an FPA10 socket can have a modification carried out free of charge. Customers should contact their dealers or Acorn's Customer Services department for further advice.

A 62-page technical booklet covering processor schematics, a programmer's model, the instruction set and implementation details is now available for £10 from Vector Services, 13 Denington Way, Wellingborough, Northants, NN8 2RL.

(A full review of the FPA10 will be featured in next month's Acorn User. Acorn can be contacted on

(0223) 254254

O'RIORDAN SPEAKS

MIKE O'RIORDAN, Acorn's marketing director, reflected on a number of interesting issues in a speech he made at the annual *Acorn User* lunch.

Addressing concerns that April and May had been slow, O'Riordan revealed Acorn was far from alone, with most education-based suppliers from chalk vendors to book suppliers experiencing the same. By contrast, June trade has accelerated sharply upwards and O'Riordan warned some Acorn lines were out of stock.

He was asked about initiatives in the consumer market. especially as Commodore recently cut the price of its basic A600 Amiga to £199. He replied he was confident the Amiga was no threat to Acorn systems like the A3010 as the A600 was little more than a games machine. O'Riordan also pointed out that Commodore is losing money on a big scale while Acorn has remained in the black. While Acorn remains committed to education, O'Riordan restated Acorn's commitment to the consumer pointing to the autumn Acorn World show.

FARMS TO FLYERS

DIXON and Dixon is a software house, which until now has produced software mainly for the farming industry.

Now the company has brought out an easy-to use-leaflet and flyer printing package for the Archimedes.

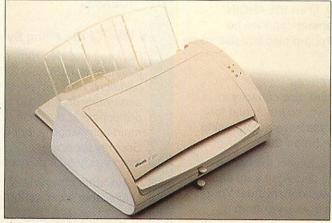
Flyprint is designed to produce tickets, notes, serial numbers, adverts, raffle tickets and so on,quickly and easily. The program exclusively uses fonts resident in Epson dot matrix-compatible printers and is aimed at users who want to avoid Risc OS fonts and printer drivers altogether.

Flyprint is priced £39.97 including VAT. Dixon and Dixon can be contacted on 091-285 3042.

REVOLUTIONARY OLIVETTI PRINTER

A NEW inkjet printer has been produced by Olivetti. The JP250 has a 'revolutionary' new print cartridge claimed to reduce printing costs by up to 40%. With many inkjet printers the print head is attached to the ink reservoir so it is replaced once empty.

The JP250 has a separate ink barrel which can be replaced seven or eight times before the head needs changing. Up to three-pages-per-minute performance is claimed for the JP250 and maximum resolution is near-laser quality 300dpi. The JP250's RRP is £249 + VAT.



The JP250. Looks like a breadbin; saves bread on printing



The ideA range

ICS was the first company to offer IDE products for Acorns back in 1990; now they are the standard choice for new Acorn computers. Building on three years' experience we have continually improved our IDE filing

system. It now offers the highest level of RISC OS compliance, and compatibility with at least 45 different hard discs tested by us. Can any other supplier make this claim?

Our IDEFS abolishes the RISC OS limit of 512 Mb, and offers extra features such as password protection, background operation, disc partitioning, and power saving (which allows some discs to stop spinning when idle).

Partitions can have different levels of protection. Family or pupils can access some of your files while you keep others safely out of their reach. Or you can simply protect the whole disc (reformatting is not required for this).

Our hard disc upgrade kits are based around two internal interfaces at present: IDEA3IN for the A3000 Series, and IDEARCIN for the A300/A400/A500 Series. All kits are designed to a high standard and include all the parts you will need.

IDEA3IN upgrade kits include an I²C expansion socket as standard. They come with a 2½" disc already attached, and are easy to fit once you have opened up your computer. False rumours have been spread in the past (by sellers of SCSI hard discs) that internal upgrades might not be safe in an A3000. In three years we have never heard of an actual problem, but please ask Acorn's Technical Department if you wish to be reassured.

IDEARCIN upgrade kits provide a fast 16-bit link all the way from the computer to the hard disc. They can even be fitted to an A310 without a backplane – quite a cost saving. A second hard disc can easily be added later if required.

Interfaces and hard discs can also be bought separately. By shopping around you may even save a few pounds. But beware: not all IDE hard discs work with all interfaces, and if you have a problem it may be difficult to decide who should put it right. We recommend buying a complete kit from one source.

WZZO is the name given to our IDE filing system when it is supplied as a single rom chip. Wizzo5 is for the A5000, and Wizzo4 is for the A4. You should buy a Wizzo if you need password protection or wish to use larger hard discs. (Wizzo4 has been delayed slightly – we are adding a feature to ensure compatibility with possible future A4 upgrades).

A Wizzo rom by itself will only produce a slight speed improvement. If you need speed in an A5000, fit an IDEARCIN interface instead. Up to 60% improvement can then be achieved, but this does depend which hard disc you use so do check with us first.

How to read our ideA product references

A number at the end is the nominal hard disc capacity in megabytes. We usually round this down, so the actual formatted capacity may be higher. All discs have auto-parking. Average access times vary but all are below 20 ms.

All prices shown exclude VAT and are subject to change without notice. The cost to us for hard discs can vary enormously from week to week – not always downwards! Your local dealer can obtain *ideA* products from us or from a distributor.

Archimedes A300/A400/A500 Series Internal Upgrades

Package includes formatted hard disc, ideA interface card, hard disc cradle and fittings, fan kit, replacement multi-purpose LED (power and drive status), manual with fitting instructions. Can be fitted to an A310 without a backplane. If a backplane is used it must be a 4-layer type. Easily fitted by most users.

£225	IDEARCIN 240	£425
£255	IDEARCIN 330	£500
£275	IDEARCIN 426	£575
£305	IDEARCIN 540	£799
	£255 £275	£255 IDEARCIN 330 £275 IDEARCIN 426

A3000 Series Fully Internal Upgrades

Package includes formatted hard disc mounted on ideA interface card, manual with fitting instructions. Fully internal, using internal expansion slot. Co-exists with floppy drive and memory upgrades. Fits the new 1992 computers. Easily fitted subject to Acorn warranty stipulations.

IDEA3IN 40	£225	IDEA3IN 120	£350
IDEA3IN 60	£275	IDEA3IN 130	£450
IDEA3IN 80	£325	IDEA3IN 209	£499
A3000 FAN KIT	(not usually r	equired*)	£19

*Only required if the computer has been fully upgraded, e.g. with maximum memory AND Econet AND an external podule.

Separates for hard disc upgrades

We can only guarantee the performance of ideA interface cards with hard discs we have tested ourselves, so please check if in doubt. If you are buying a hard disc for an A5000 please say so. If you intend to fit the disc in addition to an existing one we need to know the make and model of the existing disc. Acorn's interface does not support all makes of disc, and some models will work as a second disc but not on their own.

Hard discs on their own are listed as, for example, IDEA 80. An S at the end indicates a $2\frac{1}{2}$ " disc.

IDEARCIN (Arch		rface for Internal disc(s))	£60
IDEA3IN (A3000		r Internal disc)	£75
ARCHIMEDES II ARCHIMEDES A 4-SLOT 4-LAYEF POWER CABLE A5000 SECOND	300 / A400 S R BACKPLAI FOR SECOI	SERIES FAN KIT NE ND HARD DISC	£15 £15 £52 £5 £15
IDEA80	£179	IDEA240	£350
IDEA100	£215	IDEA330	£470
IDEA120	£245	IDEA426	£499
IDEA170	£275	IDEA540	£750
IDEA40S	£140	IDEA120S	£299
IDEA60S	£200	IDEA130S	£399
IDEA80S	£245	IDEA209S	£449

MIZZO IDE Filing System on rom

Package includes rom, manual and fitting instructions. Compatible with RISC OS 3.0 and 3.1. Allows up to four logical partitions over two physical drives. Each partition appears separately on the icon bar and can have different password protection. Makes use of existing Acorn hardware for maximum compatibility, but works with a wider range of hard discs. Security breaches using ADFS can be prevented. Can be fitted easily by a competent user.

Available now: WIZZO5 for A5000	introductory price £29
Available soon: WIZZO4 for A4	introductory price £29
Quantity discounts available • Dea	aler enquiries welcome



ICS (Ian Copestake Limited), Dept B45, 1 Kington road, West Kirby, WIRRAL, Merseyside, L48 5ET

HYBRID OF SCANNER DIGITISER | SEIKOSHA

COMPUTER Concepts and Wild Vision have combined two of their products to produce the ScanLight Video 256.

The package is a hybrid of the Wild Vision GreyHawk mono video digitiser and CC's Scan-Light 256 scanner interface. The card can digitise graphics sourced from either a compatible image scanner or from composite video input.

ScanLight Video is supplied with the same 400dpi 256greyscale hand scanner as the original ScanLight and includes the latest version of Computer Concepts' ScanLight Plus image processing software.

ScanLight Video costs £220 + VAT compared with GreyHawk on its own at £99 + VAT and ScanLight 256 (handheld) which is priced at £189 + VAT. Upgrades are available to the combined product. CC is on (0442) 63933



The ScanLight Video 256, combining video digitiser and scanner

PANASONIC MONITORS

PANASONIC has announced 17in and 20in PanaSync Pro Series monitors with MPRII low radiation conformance, 0.28mm dot pitch, digital control of pincushion and moire distortions.

Anti-glare and anti-static screen coatings are used as well. The maximum resolutions supported reach 1280 x 1024 pixels. The PanaSync Pr 5 TX-D1713 costs £1399 + VAT and the PanaSync Pro 6A



Coming to a screen near you

TX-D@032 will cost you £2199 + VAT. Panasonic is on 853915.

FONTS FOR RISC OS

LOOKSYSTEMS in Norwich has obtained an exclusive licence to distribute the Monotype range of typefaces for Risc OS computers.

The first LOOKsystems pack of 100 fonts is available for £95. The company's founder, Adrian Look, commented that as a result of the



Some of the fonts available

(0344)falling prices of TrueType

fonts in the Mac and PC markets, Risc OS users are benefiting; 'These changes have made it much more viable to convert fonts into Risc OS format. By releasing Monotype fonts, we will transform the range and quality of typefaces available for the Archimedes, and they will be better value for money

The fonts include familiar names and are in either Risc OS 2 or 3 format with scaffolding and learning pairs in the latter. LOOKsystems is on (0603)

764114.

PLAYING THE GAME

GAMESWARE is a new Acorn lar. Gamesware is keen to games software label set up by former manager, Simon Lovesey.

The aim is to produce more titles from the 16-bit market. successful conversions from non-Acorn computers and the company has already secured starved of many of the best Acorn rights to Xenon 2 and games; Robocod with more releases ensure that many leading planned for the Autumn.

Xenon 2 was written by the Bitmap Brothers and was a big hit in the Amiga format. Xenon 2 in next month's Robocod has only just appeared games section of Acorn User. on the Amiga format but also Gamesware is on (0703) looks set to become highly popu-

receive any suggestions from Acorn marketing users and say that they hope to speed up the conversion of big

Lovesey said: 'For a long time, Acorn owners have been GamesWare will games are brought into the Acorn market.'

Look out for a review of 456523.



Simon Lovesey takes a hands on approach to the games market

PRINTER

A FAST inkjet printer capable of 300 characters per second (cps) has been released by Seikosha UK. The SpeedJET 300 is HP DeskJet 500-compatible and has a 128-nozzle print head instead of the 50nozzle head used by some rival manufacturers.

Seikosha claims the Speed-JET is twice as fast as either a HP DeskJet 500 or the new Epson Stylus 800 inkjet in character mode printing. A large ink reservoir is featured and buffers up to 256K are available to supplement standard 16K memory. It costs £359 + VAT.

The latest dot-matrix from Seikosha is the SL-150136 column 24-pin printer. The SL-150 has a RRP of £349 + VAT. Seikosha UK is on (0753) 685873

ACORN POCKET BOOK SAVINGS

ACORN has announced that until 30 September the Pocket Book personal organiser/ computer is available for the special price of £199.69: £50 off the RRP. There's also a new organiser application, *Schedule*, for £19.95.

Schedule is a much-needed version of the Psion Series 3 Agenda application. Sharing most of the features of Agenda, Schedule was written by Acorn and has a different look and feel, with more emphasis on the needs of teachers and stud-

Friday	10th September 1993
10:00am	Visit Acorn User Office to
	Appointment details Copy.
11:00am	Duration 02:00
12:00pm	
3:00pm	

Everything the organised journalist needs to ensure his piece is in on time

ents. *Schedule* reverts to its listed price of £49.95 on 1 October. See page 50 of this issue for a preview.

Acorn's Pocket Book product manager, Henry Howarth,



30 days hath September. And if you don't believe us here's the proof

commented: 'This special offer is designed to get the Pocket Book more established in the schools market as well as making it more attractive for parents to buy for their children.

'We are bringing out the Acorn *Schedule* application as a direct result of feedback from our customers who perceive a need for a personal organiser for their work, leisure and personal life.'

For more information contact Acorn on (0223) 254254

ACORN TWINS UP

THE Swiss-owned software company, Digital Arts AG, has been signed up by Acorn. The aim of the joint venture is to develop applications aimed squarely at the printing, publishing and graphic design markets.

This follows hard on the heels of the news that the prepress printing specialist AB Dick has officially adopted Archimedes computers to deal with its computer-based prepress solutions.

Acorn's business unit manager, Simon Woodward, commented that the Digital Arts involvement with the company would serve to complement another recently-secured deal by Acorn: in this case to support the Kodak Photo CD imaging technology.

'It is quite possible that aspects of the Digital Arts Technology will actually be integrated into the Acorn Risc OS multi-tasking operating system,' he said.

Digital Arts is perhaps best known for its professional publishing applications developed for the NextStep environment as well as the Atari ST platform.

MATT BLACK SEES IMAGE OF THE FUTURE

PHOTOLIB, a CD-Rom photo library featuring over 4000 high quality digitised colour photo images, has been released by Matt Black, with future links to Kodak Photo CD in mind.

Used on their own, *PhotoLib* images are ideal for on-screen presentations. Once Acorn's Kodak-compatible Photo CD system is available, *PhotoLib* will become a catalogue for the full library of professional Kodak Photo CD images. Selections from the 4,000+ image library will be supplied on special theme Photo CDs priced £299.

The basic library disc is in a general CD format, but Matt Black includes Risc OS 'drag and drop' software for image accessing. A demo is available for £5. The 4000 image CD-Rom costs £299.

Matt Black is on (0733) 315439



Red hot and rocking. One of the 4000 images from PhotoLib

In brief

E-mail Acorn User

Acorn User is now on e-mail. The address for the office is editorial@acornusr.demon.co.uk – please note subscription enquiries should not be sent to this address, but to the address on the subscriber's page. All mail will be replied to, but don't expect faster replies than with snail mail.

CC confusion

Many apologies to our readers and Computer Concepts for a misprint in our August issue. The price of the LPB4 direct drive laser printer is £999 + VAT and the price of the LBP8 £1495 + VAT. Both offer fast printing by contructing the image in the printer's own Ram. For more details call Computer Concepts (0442) 63933.

Dealer open days

The following Acorn dealers are holding education and consumer open days in September. Visitors will be welcome: Sharbrook Systems (0823) 334383, 10-11 September, County Hotel, Taunton; Minerva Computers (0392) 410137, 17-18 September, Countess Weir Hotel, Exeter.

Check this out

The 1992 World Chess Computer Championship was won by an Arm Risc-based computer, beating parallel processor specials, 60mips workstations, even a mainframe. The custom Arm PC card was produced by Dutch firm TASC and uses a 32MHz Arm60 chip and extra-fast static Ram.

How to get Resultz

Colton Software was due to start shipping its Resultz spreadsheet package a few days before this issue hits the streets. The price has been set at £119 + VAT. Registered existing users of Pipedream will be mailed direct by Colton with upgrade details.

Software theft

'Innocent' end-users are the worst offenders according to the Federation of Software Theft (FAST). 59 per cent of FAST's activities in the last year centred around end users ignorant of software copyright laws. FAST is on (0628) 660377.

STEP UP TO EUREKA v.2 AND SAVE OVER £40

EUREKA brought the power and innovative features of the very latest in easy-to-**Euse spreadsheet technology to all RISC OS users.** And now EUREKA version 2 has even more to offer you:

In fact, there are over 100 individual improvements upon version 1, including extended documentation and a fully comprehensive index.

What's	 Scale printing of worksheets and print-to-fit a single page Worksheet zoom in and out 	 Eureka macrosheets Complete macro language for creating custom worksheet functions
new in	 Display (and print) formulas Worksheet find and replace Improved worksheet linking 	 User definable page breaks and set print titles - for large worksheets Function key strip
Eureka	 Automatic loading of any supporting documents Fully compacting memory manager - dynamically releases memory when you 	 Chart series editor for direct editing of data series Automatic line of best fit for scatter charts Display / hide points on scatter charts
version 2	close a sheet	 Charting of multiple selections Save a selection as a worksheet, Lotus 123

Save a selection as a worksheet, Lotus 123 file, CSV, SID or drawfile

f you already use another RISC OS spreadsheet, here's an offer you just can't L refuse !

be used in a worksheet or chart

Tust tell us what it is, and where and when you bought it, and we'll supply you with a full copy of EUREKA version 2 at the unrepeatable special offer price of £82.10 (£99.99 including p&p and VAT). That's a saving of over £40 on the RRP.

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Eureka will run on any RISC OS machine with at least 2MB of RAM. RISC OS 3.1 recommend.



ARC FLIES AHEAD OF PC ON CD

AN ARCHIMEDES version of Interactive Learning Productions' (ILP) CD-Rom multimedia title, British Birds, has won a prestigious gold award at the British Interactive **Multimedia** Association's annual awards. Although the same title is produced in the IBM PC-compatible MPC format, it was the Archimedes version which scooped first prize in its category.

The CD-Rom, which was developed in association with the British Library and the RSPB, features full motion video, text, sound, images and hyperlinks. 'The Archimedes is a magnificent machine which offers all the facilities we need on a multimedia plat-ILP's form,' commented director, Fred Grainger, who added that because of this all his company's CD-Rom titles were now being developed and mastered on Archimedes



An exotic, medium-sized European bird which occurs in small numbers in Britain each spring and occasionally stays to breed. Hoopoes are unmistakable pink, black and white birds with long, thin beaks and a distinctive bouncy flight.



ILP found the Arc the best option for the display demands of multimedia

before they are ported to use on other platforms.

Acorn's technical director, Malcolm Bird, added: 'It is encouraging to find our platforms could provide the most cost-effective multimedia capabilities for schools and the *British Birds* CD for the Archimedes deserves recognition.'

ILP won another BIMA gold award last year for a Ministry of Agriculture-commissioned interactive computer display using 30 Acorn computers at Alton Towers.

the

ILP is on 091-261 1255

BETTER BY DESIGN

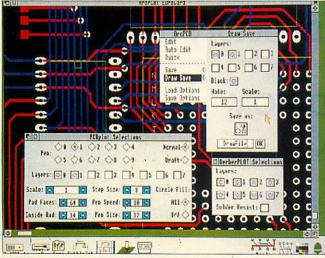
SILICON Vision has released an updated range of multitasking Risc OS electronic design automation (EDA) tools, including its *ArcPCB* family of applications.

All *ArcPCB* versions can now save drawings in multiple layer combinations with scaling, and can use any Risc OS printer driver directly.

PCBPlot provides full plotter control allowing combined layers to be plotted. New GerberPLOT and ExcellonDRILL Risc OS-compliant versions have been added.

A new version of *Power-ROUTER* has full rip-up re-try routing with individual track widths.

ArcPCB v1.8 will be priced at £125; ArcPCB Professional v3.2 £275; ArcPCB Schematics v5.1 £375; Gerber-PLOT v2.1 £75, ExcellonDRILL v2.1 £75, and PowerROUTER £195. Silicon Vision is on 081-422 3556



Get down to some serious circuit training with ArcPCB

CARNIVAL SUCCESS

The second annual Lindis Computer Carnival, which was held at Norwich on 12 June attracted over 1500 visitors and was declared to be an



Carnival time in Norwich

unqualified success by the organiser and Acorn dealer, Lindis International.

A number of third-party Acorn product companies had exhibits and all said they were delighted with response and keen to return next year, according to Lindis' Jonathan Thomson.

Next year's event is expected to return to its original venue at the County INSET Centre.

Lindis International is on (098685) 476

In brief

Tesco is closed

The Tesco Computers for School scheme, which was extended until the end of June, has closed with expectations of record participation. Over 17,000 schools, a proportion of which don't yet use Acorn computers, are expected to claim Acorn software, peripherals and computers in exchange for vouchers collected since the beginning of March. Last year's scheme, which was on a smaller scale, prompted several key schools to adopt Acorn computers for the first time. Schools participating will start to receive their claimed items in September.

Acorn plays games

Acorn is to have another stab at the home computer games market with an appearance at the Future Entertainment Show at Olympia in London between 11-14 November. 'We want people to realise there is more to Acorn than just education,' said Acorn's then consumer marketing manager, Simon Lovesey. 'The Future Entertainment Show will provide us with the perfect platform to demonstrate that we are also a major player in the leisure market,' he added.

Stars in their eyes

Andromeda Interactive has confirmed its recent Interactive Space Encyclopedia CD-Rom for PC will be ported to the Arc. The CD-Rom is practically filled to its 600Mb limit with 2000 photos, 150 3D animations, and over 1000 text documents to help the user explore the the boundaries of the solar system – in the company of Patrick Moore. Al is on (0235) 529595

Electronics mags

A third-party index of electronics publications for Risc Developments' ArcScan III indexing application is now available. The Electronics Magazine Index costs £5 from M Kay, 69 Cobnar Road Sheffield, S8 8QD.

Out of order

Apologies to readers confused by the Ian Copestake advertisement in the August issue.These pages were in incorrect order due to a printing error.

The RISC Disc

Presenting a new concept in value-for-money software. The RISC Disc contains a special selection of high quality stand-alone programs ready to run on your Archimedes.



RISC Disc Number One includes:



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- 6. CatAflop copies images of your floppies onto hard disc in a few K for instant recognition.
- 7. **ImageFx** examples of imaging effects such as embossing
- 8. Handy Hints a dozen topical Archimedes hints
- 9. Hot Art hot keys for ArtWorks a must for all ArtWorks users
- 10. PollMask Manager Desktop programming utility for setting poll masks
- 11. Shutdown Warning provides a customisable warning message when

developments

you close down the Desktop when you close down the Desktop The RISC Disc, which comes with a Desktop menu system providing information on each item, plus full supporting documentation, costs just £5.95 + VAT inc p&p. Order now Code RD01 from:

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The complete CD ROM catalogue produced in association with Acorn. - £29.00

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GRAPHICS



FOREIGN GRAPHICS

WITH the ability to easily read foreign disc formats such as PC and Atari ST, the amount of graphics for the Archimedes has increased immeasurably. Programs such as ChangeFSI and Translator allow you to import non-standard graphic files and convert them to a form recognisable by Risc OS.

The latest version of each now includes the new(ish) JPEG (Joint Photographic Experts Group) format, which is extremely popular in the Multimedia world, due to its phenomenal compression rate.

This has led to an increase in pictures for the Arc, as much of this data is on CD-Rom.

'Picture This' (on page 53 of this issue) goes into detail on clip art available for the Arc on floppy disc. A further, so far virtually untapped resource, is that of CD-Roms primarily produced for the PC market.

The way that CDFS (the compact disc filling system for the Archimedes) is written means that it is relatively simple to read discs designed for the PC and load the information directly into an Archimedes. The standard for bitmap graphics (made up of pixels) on the PC is superior to that of the standard Archimedes, especially when you have a machine fitted with some form of graphics expansion card. Such devices are capable of displaying pictures at extremely high resolution in 24-bit (16,000,000) colour.

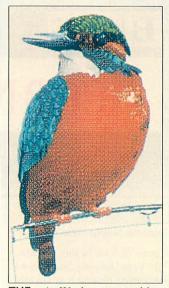
At present the Archimedes is unable to show such graphics in their true glory, although future machines from Acorn (see last month's news) should equal this standard or even surpass it.

The specification for the VIDC 20 chip, successor to the present VIDC 10, means that any new machine is likely to be at the forefront with regards to graphics.

The combination of a virtually unlimited graphics resource and the certainty that a new machine will eclipse other current machines, means the future for Acorn computers in the graphics market looks extremely good.

Kodak's commitment with its Photo-CD standard is another indication that you

ARTWORKS WINNER



THE ArtWorks competition held by Computer Concepts has a winner. Walter Briggs of County Down won first prize for Kingfisher (above) and won a Canon BJC-800 colour printer. Ten runners up were selected; six more than planned as 'the general standard of the entries was far higher than we expected,' says Computer Concepts.

In brief

Scanlight video

Computer Concepts has announced the release of Scanlight 256 Video.

The single-width podule combines both Scanlight circuitry and the GreyHawk digitiser on the one card.

Low-level software is supplied in a Rom; the scanning and digitising application is on disc. Physically, you save a podule slot. The cost is also reduced. If you were to buy the two boards separately, it would cost you £340. The Scanlight 256 Video package costs £260.

You also get an A6, 400dpi, 256-greyscale hand scanner, plus discs. Take-One lets you preview incoming video at up to 50 frames per second.

The Scanlight application provides post-processing tools that can be applied to the output from the scanner and the video digitiser.

Both the original Scanlight 256 and Greyhawk packages will still be available. Upgrades are possible from either package to the new Scanlight 256 Video. Further information from Computer Concepts on (0442) 63933

Morpheus

The new morphing package Morpheus, which was mentioned in these pages last month, is now being distributed by Oregan Developments.

A full release version is expected to be hitting the streets around the middle of July, so it should be out by the time you read this.

Further details from Oregan on 021-353 6044

Call Acorn User

You can contact the Graphics Page with any news, views or comments by writing to us here at The Graphics Page, Acorn User, 101 Bayham Street, London NW1 0AG, or you can contact us by Modem via Arcade BBS user #1144.

Arcade is on 081-654 2212 or 081-655 4412. If using Arcade, please keep it to just messages. Any large files such as pictures should be sent on disc to the Acorn User address above.

THIS MONTH'S PICK OF THE PICS

THIS month's winning reader picture is a rather surreal piece which goes under the simple name of 'Tec'.

Kane Clover, the artist responsible, used a combination of Atelier, Euclid, Arclight, ArtWorks, Paint, ChangeFSI and Render Bender to achieve the many effects present in the picture.

The end result is quite remarkable and illustrates well the use of a number of different packages used together.

The original picture was created on a standard-resolution Acorn Monitor in Mode 15, but we were able to 'grab' it from Artworks in Mode 28, producing a nice contrast between the pixel and vector graphics. £10 goes to Kane for his work.

If you have produced any pictures you think good



enough for the Graphics page, send them in.

Tell us how you created them (what packages you used) and what machine you used to knock your masterpiece together. And don't worry. It needn't be 32-bit: artwork produced on Beebs and Masters is welcome.



COMMS

BBS WITH HOST OF FEATURES

CREATING and running a BBS is a time-consuming affair, but the hard work put in by the Sysop often goes unnoticed when the result is a BBS that is easy to use.

BBS Scrolling systems present information to the user in a fairly simple way, and the way round the BBS is defined by a small number of menu options. Most scrolling BBS users spend little time actually reading the menus or marvelling at the ANSI graphics, but get on with file and message transfers.

When it comes to ViewData systems, there is a new angle – users actually read what's on the screen. The information is presented as complete pages, which may be linked in sequence, but most pages are also accessible from any other. A well-thought out ViewData BBS system may have thousands of pages, all of which have had to be creativelydesigned graphically as well as textually, and have logically linked routing to each other.

VHost by Gareth Babb is a fully multi-tasking PD View-Data BBS system for Risc OS machines that offers comprehensive facilities to its users, and for the SysOp who has time to build all 3072 frames that are possible.

VHost opens a local terminal window when run. Almost all editing and setting up of



frames is done in this window. The ViewData emulation looks good even though it is slightly wider than usual, and does not yet support all the effects available to online users.

The basis of the system is built around Closed User Groups. I found the draft instructions given with the program here a little obscure. Example frames for the basic functions of logging on and user registration are essential, and the lack of these in the supplied database makes getting started quite frustrating. The frame editor is comprehensive but not too friendly for instance the character

under the cursor is not shown. There are numerous frame options, page location and commands by keyword, chat and multiuser chats and an interesting built-in resident user called Hector who looks after the system for you, compiling daily statistics and even talking to other users online. Messaging frames and downloading are all supported including Wizzo, a new version of ViewData allowing eight-bit file transfers, a rudimentary form of compression and special screen functions.

Gareth has crammed a lot into this system, and it can be seen running on CCl4 BBS in Hull on (0482) 798249 (v21-V32bis 8N1 ViewData). VHost is available for download from Bulletin Boards including The World of Cryton, (0749) 670030, and Arcade BBS.

In brief

• The ARMada is coming! Daniel Aston's new BBS located in Plymouth is now online between 9pm and 8am. Supporting speeds from 300-14,400bps, and a FidoNet Point connection, ARMada features a quarterly competition to win one of the big-name games as well as online games, news, messaging and file areas. The BBS runs on an A4000 using RiscBBS, and is FidoNet Point 2:254/25.3. To face the ARMada call 0752 407594 8N1.

 Many older Acorn machine owners will have graduated from now-obsolete machines such as the Dragon 64, Nascom I & II, Osborne, UK101 and many others. A new FidoNet Echo called Obsolete Computers has opened as a forum for discussion of old computers and ancillary equipment. It is also an ideal place to advertise for spare parts and other equipment for old computers. Topics and machines discussed in the Echo must be non-IBM PC compatible and no longer in production. Contact your local FidoNet BBS SysOp in nets 250, 253, 258 and 440 to find out about linking into the Echo.

• Another new BBS with a growing Archimedes file section is Total Eclipse BBS in Matlock, Derbyshire. SysOps Chris Foster and Adam Jones want to encourage



INTERNET INFORMATION FILE

VIRTUALLY everyone with to a networked access computer at university or college can get PD software from all kinds of archives of Acorn programs at various sites. Modem users with access to an Internet gateway can also retrieve Acorn material from these same fileservers. Sites you can 'ftp' to include HENSA at Lancaster University - micros. hensa.ac.uk (148.88.8.84). Log on as 'anonymous' with password 'hensa' and select the Risc OS directory with 'cd / micros/arch/riscos' and then type 'get index'. Another site

to try is rusinfo.rus.unistuttgart.de (129.69.1.12) - try 'cd /soft/acorn/riscos'.

The Newcastle University Info-server is a very popular mail-server site with hundreds of Acorn programs available. To retrieve a file from here you send an E-mail message to 'info-server@newcastle.ac.uk' in this special format:

line-limit 1000 request: sources topic: archimedes filename

request: end

You can get an up-to-date index of what's available by substituting 'index' (without the quotes) for 'filename'. The index is a plain text file, but programs will be returned to you in uucode format, which is a way of converting eight-bit code into only the printable seven-bit Ascii characters. To decode it back into eight-bit code, you can use *SparkPlug*, *Spark* or *SparkFS*. *SparkPlug* is available free in the PD.

It may take a day or so for the message-file to be sent out to you. Most of these fileservers are operated by people in their spare time so do give this a thought when you are using them. more Acorn users to join the Amiga and PC users already served. The BBS already has over 200 Archimedes files available for download. Call Total Eclipse on 0629 732081 300-2400 8N1 (16k8 soon) 24 hours.

• You can contact me by writing to: David Dade, BBC Acorn User, 101 Bayham Street, London NW1 0AG or by e-mail to: DaviD@ arcade.demon.co.uk or by modem on Arcade BBS, User #2 – 081-654 2212 or 081-655 4412.

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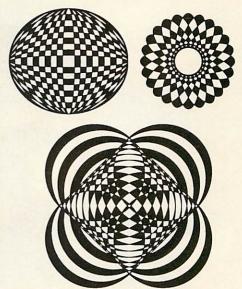
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video games, musical instruments and satellite technology – and you can get your hands on all that too. Then there are the features – Dolby's Home Cinema, the Real Hi-Fi Village, the amazing BT Times Tunnel, live TV and radio broadcasts, celebrity appearances, live music on stage, worldwide satellite links, the Car Stereo & Security Concourse, the MacUser Village, the Games Gallery – the list of attractions is endless.

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your legs.

Tickets cost £7 each or £16 for a family of two adults and three children. (If you're under 16, you need to be accompanied by an adult.)



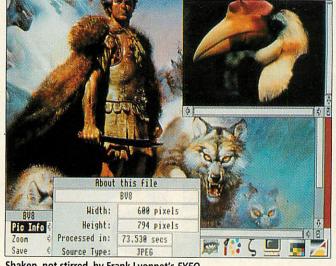
IMAGES FOR YOUR EYES ONLY

'FOR YOUR Eyes Only' is the latest version of a series of graphics convertors produced by Arm's Tech.

Working in C, Frank Lyonnet has produced a faster, more user friendly alternative to Translator or ChangeFSI. FYEO changes GIF and JPEG files (two standard graphic formats for the PC or Mac) into desktop sprites.

Once installed on the iconbar, the program is ready to receive graphics files for conversion. Processing is done in the background, but does slow down the desktop considerably on Arm2 machines. The converted picture then appears row by row.

Unlike Translator, the preferred mode for the picture is not automatically entered, but the multi-tasking capability of the program lets you get this right while the picture is actually being converted.



Shaken, not stirred, by Frank Lyonnet's FYEO

Overall quality is not quite as good as Translator and is actually similar to a Translator conversion without Floyd-Steinberg integration. Hopefully later versions will have better dithering. Although

FYEO doesn't include all the options of its competitors, it's ideal for looking through a large number of JPEG files, given its comparative conversion speed which beats Translator and ChangeFSI easily.

KYSMET

ANYONE with several floppy and hard discs will have experienced the problems of the relatively short desktop iconbar. When it fills up half way on boot up, it doesn't take long before you're running out of room. Risc OS offers a solution to this by scrolling left and right, but a new PD utility from SICK called Kysmet presents a novel alternative.

Placing all icons for the filing system devices above the iconbar certainly makes mouse access quicker, as well as throwing in a few added bonuses. Time, date and free memory can all be shown, and a handy dismount button is also available for those people with 20Mb drives.

Kysmet can be used to control all the main drives and filing systems, as well as compressed 'devices' like CFS or SparkFS. All these features are fairly easy to configure, but it may take a few minutes to enter all the details of your specific filing devices. Full instructions detailing how to do this are included.

In brief

ZAP: APDL B138

Version 0.9 of the editor Zap (see last issue) is now available. Several bugs have been removed and many features added since the previous release. One of the main improvements is a simple C editor, which will be improved further in future releases.

BPP DISC MAG

German coders Bytepool have joined the current trend for disc magazines with Hardliner. The magazine is written completely in German, but as far as I can tell



the first issue is freeware, and further issues cost 5DM. Further information can be obtained from: Zach, BytePool Produxions, Reihwiesenweg 16, 31191 Algermissen, Germany.

THE SCENE

 After making these pages with Nirvana last month, Bytepool is back with its second major demo, Premium Verum. Coded in the week leading up to CeBIT 93, and released during the show, it's a multi-part megademo combining full overscan modes with fast sprites and vectors. Bytepool's presence at the show formed the centre of attention and everyone there on the Arc scene contributed, so it's worth a look. Another German group, XYMOX Project, is still working on its first demo which should be released late this summer. Dave Williams of PPP has produced another excellent Basic demo. Dave gets some effects into the demo and puts many Arm-coded demos to shame. All sections are accompanied by great music. I'm waiting for the first Arm-code PPP demo which should get close to the standard of the best Arc demo crews. If you have any ideas or comments on the PD page, contact me, Paul Wheatley (alias COBRA) at the Acorn User office.

YUL BRYNNER'S MEMORIAL TOOLSHED

THE title of the fourth issue of this successful Archimedes and Amiga disc magazine should give new users an idea of what it's about, but here's a quick explanation just in case.

After an animated musical intro, the magazine itself is entered. Graphics are mixed liberally with the text, and topics range from the serious the seriously to funny. Computer-specific material is avoided as this would hinder the cross-format success.

All the original stories are still there. Ed Maxroom is up to the usual standard (if a little mad) and other highlights include a thesis on engineering with thermonuclear devices.

Editor Andy Bennet has asked me to appeal for contributions about anything other than computers as well as an artist to assist with the design.



Pulling out all the stops with Yul Brynner

"SUMMER SPECIAL" on Cub Colour Monitors



If you've got one of the popular BBC 'B', Master, Commodore 64* or Atari ST* computers, and you're still using a monochrome display, TV or inferior quality colour monitor, then there's never been a better time to look at upgrading.

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* Commodore 64 and Atari ST users will need a special lead to use the Cub colour monitor - available from your local dealer.

IN THE DOCK

Take seven kids, some leading software, put the two together and what do you get? We find out in the first-ever Acorn User kids lab

W ith the advent of the family machine – the A3010 – many parents and children are after good software to use in the home, but it isn't always an easy task. Many of the educational programs are targeted at schools and the negative effects of arcade games are all-too-well publicised.

So what do the children themselves think? Are they only willing to look at games that offer mass destruction or mindless repetition? Can educational software compete against platform games? To find out, we selected a list of well-known programs and asked three families to try them out. Some platform games were included: we chose *Gods*, *Twinworld* and *Lemmings*. Then we picked out some educational software that might find a place in the home: *Crystal Rainforest* is an environmental adventure game, with some complex puzzles to solve. *Kid Pix* is a painting package which was highly successful on other platforms. It includes some novelty features: a Lemming-like voice protests 'oh no' when the Undo option is used.

Finally, *Smart* is an art package with a difference. The user creates pictures from an array of graphical parts found in the original package and the resource packs.



Seven testers tried programs aimed at their own age group. We asked them what they thought: was it a riveting trial or just one big yawn? Then it was over to their parents for the adult perspective.

MATILDA LAWRENCE

Age 8



boyish things'. She's already a seasoned computer user, with four years of *Bughunter*, *Cyber Chess* and *Tetris* under her belt.

Matilda uses Acorn computers both at home and at school.

ZOE LAWRENCE

Age 6

Like sister Matilda, Zoe has also used a computer for four

years. A confirmed socialite, Zoe cites her favourite pastimes as 'bouncy castles and parties'. The Fun School series is on her list of favourite programs and, since she is a violin player, Notate is also high up on the scale.

CHRIS LAWRENCE

Age 4

Christopher is the youngest of the Lawrence clan and he has been engrossed by



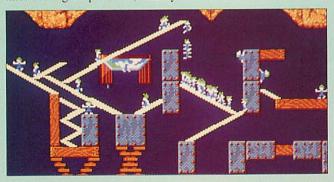
Viewpoints, Lemmings and Fun School during his three year stint on the computer. Christopher told us that the secret of happiness is something to do with, 'toys, friends and nursery school'.

LEMMINGS

A well-known title, where Lemmings are saved from their suicidal tendencies

Supplier: Krisalis Price: £25.99 inc VAT Tel no: (0709) 372290

Everyone's heard of *Lemmings* it seems. Virtually all of our testers had played it at least once before, but that didn't dampen their enthusiasm. It received a unanimous vote of approval as cute and funny, with good graphics. 'I was glued to the screen and liked solving the problems,' Kathryn told us.



Although it got high marks from our panel, as a platform game, *Lemmings* is unlikely to win any education awards. Parents did however feel that it had some benefits. Quick thinking and a good memory are an integral part of the game

and this can be useful to younger children. 'I think it's quite a good

idea because it teaches you to get quick at doing things,' said Zoe.

For older children though it's just a bit of fun or, as one parent put it:

'Once the underlying principles have been grasped, the game is not demanding enough to challenge an intelligent, eightyear-old.' 'I was glued to the screen and liked solving the problems' Kathryn

Scores

Initial appeal	*	*	*	*	×
Overall appeal	*	*	*	*	x
Educational value	*	*	*	${x}$	\bigstar
Anti-yawn factor	*	*	*	${\leftrightarrow}$	¥
Long life	*	*	*	*	\star

CRYSTAL RAINFOREST

The onus is on saving the environment in this educational adventure game

Supplier: Sherston Software Price: £46.94 inc VAT Tel: (0666) 840433

Crystal Rainforest was voted a very likeable program, by parents and children alike. Matilda found it, 'more interesting than *Lemmings*, particularly at first,' and said that, 'some of it is quite hard, especially drawing the crystals'.

But not everyone found it instantly appealing. Freya said: 'I thought it looked boring and childish at first, but when I started to play it, it was quite fun. It was ace at times but then total rubbish at others.'

When it comes to parental approval,



The trees make oxygen.

Crystal Rainforest gained the highest score. 'Imaginatively written and a good introduction to logo and reasoning,' was a typical reaction, although one parent pointed out: 'Not many children would apply themselves to this without adult prompting.' The graphics were also much admired. 'Beautiful presentation,' said one family.

Everyone found this program useful while it lasted but no-one thought it would appeal for very long. 'I'll finish the game in no time,'

Freya



'More interesting than Lemmings, especially at first' Matilda

Scores

Initial appeal	*	*	*	A	Å
Overall Appeal	*	*	*	x	x
Educational value	*	*	*	*	t
Anti-yawn factor	*	*	*	A	x
Long life	*	*	☆	Å	${\simeq}$

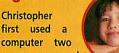
KATHRYN MARRIOTT

Age 8

Kathryn used a computer for three years at school before she finally got one at

home, a few months ago. She quickly acquainted herself with Lemmings and several other programs they don't have in lesson time. Away from the screen, her idea of heaven is a spin on the bike.

CHRIS MARRIOTT Age 6



years ago and now rates it as one of his favourite pastimes. His compu-

ter credentials include Zool, Pacman, Lemmings and Fireball which he plays on the Acorn A3010 at home.

When out and about, he's avid about 'football and horse-riding'.

FREYA WORRALL

When

Age 13 questioned, Freya insisted that she only plays 'the odd game', then pro-

ceeded to reel off a huge list of favourites, including Chuck Rock, Repton, James Pond and many more. You can't fool us Freya.

Freya told us she's well into grunge and always wears 'Docs'.

HANNAH WORRALL

Hannah first started to use computers at the age of five and is now a devo-

Age 10



tee of Repton, Chuck Rock and Pandora's Box.

She also gets a kick out of art, singing, and, like her sister Freya, Hannah enjoys a spot of shopping and spending money.

KID PIX

A childrens' painting package with a novel approach and some game-like extras

Supplier: ESM Price: £47.59 inc VAT Tel: (0223) 65445

'The more I play it, the better it gets,' Christopher Marriott said, and this seemed to sum up the general reaction. It appealed to almost everyone who tried it and one parent liked Kid Pix even

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more than the kids. 'I love it,' he said. 'It's like a fun game you can draw with.'

Freya told us she was glued to the screen: 'I'll come back to this program again and again.' Few

programs manage to appeal to all age groups

GODS

A platform game where the player is an aspiring young hero, intent on becoming a deity

Supplier: Krysalis Price: £24.99 inc VAT Tel no: (0709) 372290

Of all the programs, this one was the most controversial. Hannah and Freda are utter fans and gave it high marks. 'I'm sorry', said Freda, 'but when it comes to playability, it has to get a five. I couldn't stop playing it.' Hannah was equally rapturous. 'It's

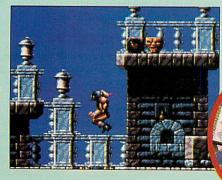
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great. Lots of monsters, different levels, great graphics and loads of things to do in it.'

Yet other testers found it very unappealing. Matilda took one look at it and 'It said, looks gruesome and disgusting.' Kathryn agreed. 'I thought it



but this was one of them. Even fouryear-old Chris Lawrence found the program good fun.

It wasn't all perfect though. One tester lost a complete set of paintings by accident. And the reaction of parents was mixed. One thought that Kid Pix, 'offered no advan-

tage over conventional art materials'. Another parent disagreed. 'With experimental and clever functions, Kid Pix is fun but also allows serious drawing.' Overall, Kid Pix was a good all-rounder with long-lasting appeal. would only go back to it once in a while, but it would last me a couple of years, ' Hannah said.

'The more I play with it. the better it gets' Chris

Scores

Initial appeal	*****
Overall Appeal	*****
Educational value	****
Anti-yawn factor	*****
Long life	*****

would be really exciting,' she said, 'but spikes go up and down and kill you and it's very unpleasant."

The parents were equally divided. 'There is a degree of problem solving,' said the pro-camp, 'because each level is a huge complex maze with hidden traps. The learning curve is the hallmark of a good game.' Yet the anti-camp were unimpressed. 'As a family,

we are opposed to material with violent images,' longevity, well that depends. Six years for Freya or just one game for Kathryn.

'I'm sorry, but when it one parent said. As for comes to playability, it has to get a five' Freva

Scores

Initial appeal	*	*	*	*	☆
Overall Appeal	*	*	*	A	\$
Educational value	*	*	*	Å	☆
Anti-yawn factor	*	*	*	Å	公
Long life	*	*	*	\$	☆

TWIN WORLD

Set in a land of mythical beasts, this involves a quest to find the missing amulet

Supplier: Cygnus Software Price: £19.95 inc VAT Tel: (0533) 559711

again Once the parents were divided platform on this game. 'Endless entertainment value, but nothing else to commend it,' said one parent.

Another was less critical. 'Like many of its type it has a logical structure with an achievement fac-

SMART

An art program where the user can choose elements of a picture from a menu or resource pack

Supplier: 4Mation Price: £64.63 inc VAT Tel: (0271) 25353

The tester who enjoyed this program the most was Zoe who was involved. instantly According to Zoe's parents, this was 'she has because learned to recently read, and the package gave her the chance to try out new words from the

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menu.' Aged eight, Hannah also benefited from the reading month'. But like most of testers she wanted more to do. One parent thought that, 'Smart could form the basis of a more valuable, far-reaching program.'

aspects and thought that it would stay interesting for 'about a 'It made me laugh and I

liked choosing the next picture' Zoe

get to the end and kill

Educational value 🔺 🖈 🛣 🛣

the dragon' Hannah

Scores

Initial appeal

Long life

Overall Appeal

Anti-yawn factor

Scores

The reactions

Yes, our testers can vouch for the fact that platform games are endlessly exciting and addictive. Yet, it seems that the educational offerings can compete to a point against platform games, in terms of entertainment and interest.

Looking at the platform games first, it did not surprise us to find that some parents were not entirely happy about their influence.

'This is typical of the dismal, addictive programs with vaguely violent and fantastic overtones', said Mr Lawrence of one game. 'Children would play this type of game almost permanently, in the same

way as they would eat nothing but junk food, if offered it.' His children however, were undeterred by this disapproval and gave the game a high score.

At the other end of the scale, some parents find themselves drawn into the game and turn into game players themselves. In one instance, the same 'dismally addictive' program mentioned above, became something of a family challenge.

'We found this game very amusing,' was the Worralls' response. 'It is a good game to group play and we all found ourselves making up silly names for the baddies.' As far as educational content goes, most parents agreed that platform games were more valuable to younger children where they helped to foster logical skills and quick co-ordination. Although some of the parents questioned were critical of arcadestyle games, all of our testers were unrepentant fans.

One area where parental influence can make a difference is in the 'educational arena'. We found that child and parent were nearly always in accordance here. This could be partly be due to parental involvement: if a parent is interested in the program they are more likely to offer guidance and encouragement.

One example of this was Crystal Rainforest. Matilda gave it the top score in no less that three categories: while her parents also awarded it five out of five for educational value.

THE YOUNG ONES

Younger children present a very different challenge to the softwarebuying parent. Although most children can play platform games at a early age, it is also easy to steer them towards programs with an educational slant.

Many programs aimed at this age group claim to improve reading skills, for instance, or spacial awareness. In a later issue of Acorn User we will look at some of the special considerations of this age group, looking at software such as Freddy Teddy, the Funschool series and the Talking Books.

tor in understanding.' But he did admit that: 'At the end of the day it's just a game.'

The kids however were united. 'Instant addiction,' said Matilda. 'More than commented brilliant.' Christopher Marriott.

'I have recommended it to all my friends and they love it too,' said Freya.

And it scored well for longevity. Hannah said, 'It took eight weeks to get to the end and kill the dragon and I would still go back and play it every couple of weeks.'





TOWERING ABOVE THE REST





Don't take our word for it see the reviews and previews – ProArtisan 2 has been completely rewritten. And just to show how good we think it is we are making you a special offer until 31st December 1993. Send us your program disk from Artisan, Artisan 2 or ProArtisan with a cheque for \$67.50 and we will send you a full ProArtisan 2 pack – that's a full 50% trade in allowance as a thank you for supporting Clares in the past.

We haven't forgotten the rest of you who have not bought a Clares art package in the past. We are also offering you a special discount price of \$87.50 if you return your program disc from one of the following:

Atelier, KidPix, 1st Paint, PrimeArt, Painter Plus, Imagine, Imagery, Photopia, Revelation, Revelation 2, Revelation Image Pro, or any other purchased art package costing over £35.

If you don't want to trade a package in then ProArtisan is still a bargain at just £135 inc V.A.T. Send off your cheque today or ring us with your credit card NOW on 0606 48511







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First of all

for the recently launched A4, and it has a sleek sloping design which is much more comfortable than the

ing design which is much more comfortable than the previous Acorn mouse. The mouse is also coloured warm grey to match the case. On the back of the computer are a TV modulator socket, two joystick ports, a monitor socket (15 pin, as on the A5000), a headphone output, serial and parallel ports and the power switch. The mouse connector is also on he back of the case, which is far more convenient than the socket under the A3000, and there's a removable flap at the back where one and there's a removable flap at the back where one mini expansion card will fit (the same cards that fit the A3000 will fit the A3010)

WHAT'S NEW, PUSSYCAT? Physically, therefore, the A3010 represents an improvement on the A3000 in a number of ways. However, I found that the newly designed disc drive button, which is now almost flush with the case, was rather hard to locate without looking. Another personal niggle was that the reset button, which is now on the left-hand side of the case to prevent confusion with the disc drive button, is inset into the

pen or similar i mo ucoign icat and of course Ctrl-Break can still be used to reset the machine in most cases, but what use is a button which is so hard to press that most users will opt for simply switching the machine off and on? The offi-

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The two joystic 9-pin joysticks. operating syst which provides joysticks. For SWI number which simply r state of the joy existing games

stick port, as they need specific code to read the joysticks. Quest for Gold, which is provided with the Iamily Solution (see below) makes use of the joysticks, as do most recent games. One small niggle is that the joystick ports are not numbered on the computer's case, but that's not a major problem.

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disc, yo need to to click when yo inserte This fe present A5000 a A4, wa

There are a couple of other interesting points about the hardware side of the A3010. There is only one

Optical character recognition system

Sleuth is a new Optical Character Recognition (O.C.R.) package which converts human readable images of text into machine readable form. It processes a scanned image of printed material and converts it into an ASCII file which may be further processed using a text editor or word processor.

Sleuth is ideal for converting magazine articles, newspaper cuttings, legal documents, program listings, other resource materials etc. etc.

Sleuth v1.0 is a low-cost entry package into OCR and produces excellent results on a range of typefaces and sizes. It is the first in a planned family of products which will take OCR on Acorn machines to full professional level. Any future OCR products will be available as upgrades to existing users.

Sleuth is very easy to use - simply drag your scanned image into the input window, select the area to be converted and click to start. The ASCII conversion is displayed in the output window from where it may be saved. Sleuth is fully multitasking allowing you to correct any mistakes in the converted text while it is still converting the rest of the text.





What Sleuth can convert

Sleuth has been trained with a popular set of fonts (including most PostScript fonts) and can handle type sizes between 9 and 24 point. Other fonts will work too, but with reduced accuracy. Sleuth v1.0 only recognises fonts in their regular styles i.e. not bold, italic, condensed, nor does it recognise accented characters.

Sleuth can achieve an accuracy of over 97% on recognised fonts using good quality 400 dpi scanned images, but the accuracy is reduced if the image is of poor quality or if the font is unrecognised. Conversion speed is between 80 and 250 wpm depending on the hardware in use.

For special applications, RISC Developments will consider training Sleuth on new fonts supplied by the user. A charge will be made for this service.

Equipment required

You will require a hand-held or flatbed scanner which produces mode 18 mono sprites. The minimum resolution required is 200 dpi, but for best results you need 300 or 400 dpi. Sleuth will run on a 1Mb machine, but for 400 dpi scanners we recommend a machine with 2Mb or more.



RISC Developments Ltd 117 Hatfield Road, St. Albans, Hertfordshire AL1 4JS Telephone 0727 840303 Fax. 0727 860263

Please phone for a detailed specification, and for education and site licence prices.



ACCESS – YOUR FLEXIBLE FRIEND

ACCESS IT, Acorn's annual conference for teachers and other users serving the education sector, took place at Nottingham University in July.

260 delegates spent two very intensive days exploring a variety of aspects of computing. educational Training sessions covered topics such as Genesis authoring, ProArtisan2, 'IT- a view of the next ten years' and 'IT supports better spelling'.

The objective of this conference (the third of its kind) has always been software and hardware training – delegates are expected to have gained some expertise on a variety of packages or hardware by the time they depart on Saturday afternoon.

The choice was extremely varied and each timetable slot offered a choice of twenty or so different sessions. Most of the training is conducted by the software and hardware manufacturers and by staff from some of the Acorn in Education Centres.

The presence of the software houses also allows delegates to browse round their stands in the exhibition hall. Oak Solutions was showing the latest version of its Design Processor Software, which integrates over 6Mb of data with site licences for all the appropriate CAD tools needed



Extensive timetable choices allowed students to tailor their conference

for creating and editing designs. This package is being offered at \pounds 900, payable over three years but it is also possible to buy the system preinstalled on an A5000 from 3SL for only £1999.

This offer amounts to less than the combined cost of the software site licences alone. It also includes three years of free updates to the information. SJ Research presented a variety of networking sessions including one on connectivity with PCs and Acorns transferring Rich text format files along the same network. It also demonstrated *Nexus Junior*, a system that allows up to six machines to share the same hard disc – with a variety of cable lengths and easy installation.

Some of us also spent some time with Anglia Television looking at the new data packs available for Key Plus and investigating the new features due to be available in version 3 of this data handling software package.

BACK TO NATURE

HAMPSHIRE Microtechnology Centre has announced the forthcoming release of *Usborne Exploring Nature* for CD-Rom.

It contains text written by teachers and the Risc OS interface will allow easy movement around detailed information. Access to the resources is simple using a menu picture of a child's study bedroom from where a user can pass through doors and windows into common habitats.

Users can browse through a bookcase with pages of text and sprites. Should be around September, at £120. *Details on (0705) 378266*

ESM LINKS TO SCHOOLS

ESM's graphic datahandling package *SEELinks* will be available in September. The current topics are Transport, Pondwatch and Ourselves for primary sector and Tourism for KeyStage 3. Data is searched easily and the graphic interface is very friendly. Information gathered by pupils can be added to the databases. Packs cost £57.50 for a full site licence.

ESM is on (0904) 63441

CAMBRIDGESHIRE SOFTWARE RACES AHEAD

CAMBRIDGESHIRE Software House has announced the completion of a brand new version of its *Cars: Maths in Motion* software running under Risc OS 3.

It allows users to set up a simulation of a Grand Prix on any one of 20 circuits; users can then set up their own teams and races.

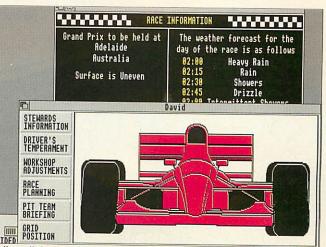
Those of you looking for good simulations to satisfy some of the higher level Key Stage 4 requirements for IT should definitely investigate this further.

Users are required to do a variety of mathematical tasks

away from the computer prior to the race being run. Variables can be altered: pit stops, fuel carried, speeds around bends and weather conditions.

The pack comes with an impressive collection of worksheets and *!Draw* files and an easy-to-understand manual; but the program was sufficiently easy that I didn't need to refer to it initially.

It costs just £49.95 with site licences available and an upgrade price of £30 for people who have purchased the original version. The package is due in September. *CSH is on (0480) 467945*



Adjust all the variables to set up a car even Nigel would be happy with

Fast for the second sec

Managing a class of children all trying to run the same program on floppy drive computers can be a nightmare. Discs get lost or damaged and files can be corrupted, all of which will waste a lot of time at the beginning of a lesson. With hard drive machines things are a little better, but the duplication of resources means wasted money. And there is still the problem of students having different versions of the software or 'accidentally' overwriting it. Not to mention viruses!

Now there is a reliable alternative - Ethernet. Ethernet networking has been used by businesses and universities for some time, and is now available for Acorn computers. The benefits of a fast network are considerable, and you will have total control over the software used by the students. All users will also be able to share resources like CD players and printers, significantly reducing costs.

RISC Developments have designed and produced a full range of fast Ethernet cards for all Acorn RISC computers, to be used in conjunction with Acorn's new AUN Level IV network software. Our cards are being used in a growing number of educational establishments because they offer a fast and reliable solution for only £139. Networking has never been so easy. We also offer a complete range of services for the network user. In the first instance we would be pleased to discuss the planning of your network, and ways to maximise speed and make best use of available resources. We can offer a full cabling service, configure your systems, install your software and train your network manager and staff. We will also still be available afterwards to help with any problems that you encounter later.

For anyone wishing to know more about networking, we have produced a pamphlet called 'Introduction to Networking Acorn Computers'. For a free copy, or if you require more detailed advice about networking, please do write or telephone.



RISC Developments 117 Hatfield Road, St. Albans, Herts, AL1 4JS. Tel: 0727 840303 Fax: 0727 860263

SWIMMING

Supplier: CD Sports Tel: 051-691 0893 Price: £35.95 plus VAT

Rather like driving, swimming is one of those life skills which, when you can't do it, seems impossibly hard, but once you've cracked it, is incredibly easy. The National Curriculum recognises it is vital and says every 11-yearold should have an understanding of water safety and be able to swim 25 metres unaided.

Endorsed by the Amateur Swimming Association and the Royal Lifesaving Society, *Swimming* sets out to help children achieve this aim.

It's based on *Genesis II* and contains around 40 short animations which demonstrate strokes (crawl, breaststroke, backstroke and butterfly) and

To tread water your legs ... are kept still. rotate from the knees. are stretched out.

Hope you don't find creatures like this in your local swimming baths

techniques (gliding, treading water) in some detail. What's good about this is that children can actually see what should be happening underwater. The drawback is swimming is a practical activity and the best way to learn is probably to get in the pool and, with supervision, have a go. These computer materials can, however, be very useful for getting a leg movement just right or sorting out breathing.

Where Swimming really comes into its own is in the sections on safety and survival. These information-based screens also feature a few animations and a degree of interactivity, although this is fairly restricted. For instance, the user is asked to save James from drowning by 'throwing' (dragging) a selection of objects to him, from a choice which includes a football, a brick, a plank and a TV set. Some of the self-test units are a bit slow and, where there is a play element, they don't compare very favourably to real computer games. But I am left with a nagging doubt whether you can learn to swim from a computer application

Alice Smith

TALKING PENDOWN

Supplier: Longman Logotron Tel: (0223) 425558 Price: £64; primary licence £190; secondary licence £330 (preferential prices for registered Pendown users)

The process of software development tends to be evolutionary rather than revolutionary. Now it has produced *Talking Pendown* but there is something radically different about the latest incarnation of Longman Logotron's wordprocessor for education. As the name indicates, *Pendown - The New Generation* has found its voice and can speak, but without extra hardware.

In fact, apart from the talkback facility, this is *Pendown* with refinements. There are a

6 The computer is far **6** more patient than real teachers **9** num- | according to

ber of enhancements to the Wordlist vocabulary utility (it can speak). *Draw* files are now accepted and the program will respond to standard Acorn keyboard shortcuts. Details of these features are given in *Edit* files on the guide disc.

The speech option is accessed via a straightforward

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Have fun typing in non-existent words like 'xoufnjej'

menu which enables you to select letters, words, sentences, marked blocks of text or the whole document for enunciation. Usefully, the first three

are not mutually exclusive.

according to its maker, what marks this program out is input

and output are the same. In other words, the program

doesn't beep when you make an error but doesn't ignore mistakes. So a student can hear when he types a word inaccurately.

In theory this is excellent but in practice there can be a problem. English as she is spoken is not always English as she is written, so some words – proper names are obvious examples – can be spelt correctly but do not sound right when spoken by the computer.

Likewise, a word can be spelt wrongly but is nevertheless comprehensible to the user. This is compounded by the poor audio quality. The speech synthesizer is, to say the least, unsophisticated.

Despite reservations, *Talking Pendown* has been linked to the much-publicised Somerset Talking Computer Project. This documented impressive improvements in pupils' reading ages when taught using a combination of talking computers and traditional methods. A group of students with serious reading and memory difficulties, aged between seven and 14, were given 20 minutes' tuition a day for four weeks: six hours in all.

At the end of the course they showed average improvements of 8.3 months in reading age, five months in spelling age and 16 months in short-term memory. It would usually be optimistic to expect pupils with specific reading problems to make six months' progress in six months of lessons.

Research has shown that, as if by magic, students are motivated by using computers – many teachers have observed this for themselves in their own classrooms – but a talking computer seems to cast a particularly bewitching spell.

Mike Bolton, responsible for special needs technology and a member of the Somerset research team, recently said: 'The feedback we get is the computer is far more patient than real teachers.' He went on to say: 'the children say they don't feel under such pressure'.

Before long chatty computers will no doubt become common and *Talking Pendown* is a necessary link in this evolutionary chain. But I can't help feeling natural selection means *Talking Pendown* is soon superseded by more sophisticated life forms. Alice Smith

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 childs 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.

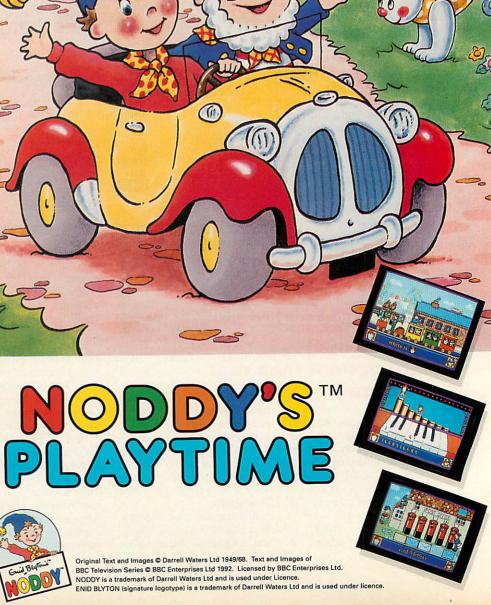
Noddy's Playtime features user friendly icons so that even the youngest family member can learn and have fun.

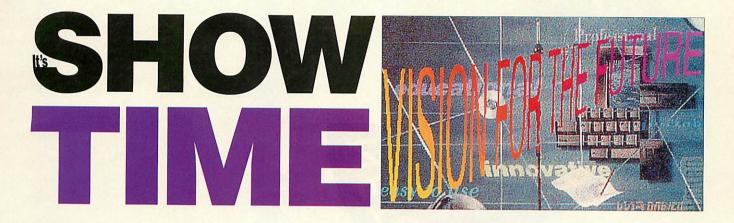
There is a choice of 3 carefully defined learning levels designed in consultation with teachers. Noddy's Playtime also includes FREE: Toytown map, keyboard overlay and wobbler. A comprehensive manual and parent teacher guide will enable you to bring your childs imagination to life.

RISC OS 2 + 3 compatible



THE JUMPING BEAN CO.





Bigger than ever,' said Acorn Computers at the birth of the Acorn World show. Now, several months later, a picture is emerging of the new show.

'We want to look after our visitors from the moment they step through the door,' says Kevin Coleman, the show director. This philosophy is, he says, especially aimed at the families who visit the show, with a number of activities laid on specially for children.

The most flamboyant plan is to involve a group of school children who intend to abseil down a specially-built tower. During the descent, the children will have medical monitors attached to their bodies, and the effect the abseil has on their heart rate and blood pressure will all be monitored and analysed on Acorn machines.

One area that is likely to appeal to many visitors is in the 'concept area' of the show. Acorn says that it intends to use this area as both a showcase for its existing technology and as an innovative way to

ALC: NO DE LA COMPANY



A whole selection of games to choose from, plus a laser light show whizzing past the assembled bods. Laser Graphics whose handiwork is shown above, is providing the laser show. Better known for pop concerts – Elton John was one satisfied customer – this show should make the Games Arcade unmissable

reveal its future directions. Using the latest in computer technology, the concept area is being designed in conjunction with the Science Museum.

'The Science Museum are experts at presenting technical information in an exciting way,' explains Coleman, 'and they use Acorn machines to control many exhibits in the museum.' Acorn has not revealed exactly *what* will be on show in this area, so you will have to wait and see. But for those who are committed followers of Acorn technology, it should make for an interesting stop.

PRINTING POWER

Many people use Acorn machines for DTP layouts, yet others are still mystified by the professional printing world. To shed light on the matter, *Acorn* *User* will be teaming up with Acorn in its publishing area.

As many of you know, *Acorn User* is designed using Acorn machines and *Impression* software. During the show, we will demonstrate how the magazine takes an article, lays it out as an *Impression* page, then finally adds illustrations and colour tints to get a complete mark up. In the last stage, an on-site printing press will roll into action to produce a printed version of an *Acorn World Show Guide*.

AT THE THEATRE

With 150 seats, a screen that stands six feet high and a stream of information from the loudspeakers, the theatre is not exactly the place to relax and put your feet up. It *is* however the place to find out about some new developments: for a a full timetable see below. **Place: Wembley Exhibition**

Centre, Hall 1 Dates: October 29 to 31 Advance ticket prices: Adults £5, children £3, families £15 Ticket hotline on (0784) 483818.

		leatre Timetabl	
TIME	FRIDAY	SATURDAY	SUNDAY
11.00 to 11.30	Networking in the wide world	To be announced	Beginners start here
11.40 to 12.10	Publishing for professionals	Producing a pop CD	Why buy a Pocket Book for my child?
12.20 to 12.50	Open Access – Special Needs	School governors start here	To be announced
13.00 to 13.30	Taking pictures for Photo CD	Photo Retouching – Digital Arts	Publishing magazines – Redwood Publishing
13.40 to 14.10	The Electronic Prospectus	Acorns in the Science Museum	Education Down Under
14.20 to 14.50	Arm Powered – The Vision	Preparing material for a publishing bureau	Multimedia: a solution in search of a problem
15.00 to 15.30	Graphic design	Educational software on CD	Advanced theatre tickets can be
15.40 to 16.10	School Administration	Psion: truly personal portable computers	ordered by writing to Acorn World,
16.20 to 17.00	Acorn Quiz	Technical Question Time	Exhibition Planning Services, PO Box 162, Staines, TW19 5JX.

CALIN FOR ETHERNET

4 GAIN

Netgain for Ethernet provides the fastest transfer rates of any network currently available on the Acorn platform. The product is designed to boost performance by huge margins when used in conjunction with Acorn's Level 4 AUN fileserver on industry standard Ethernet.

FOR ETHERNET

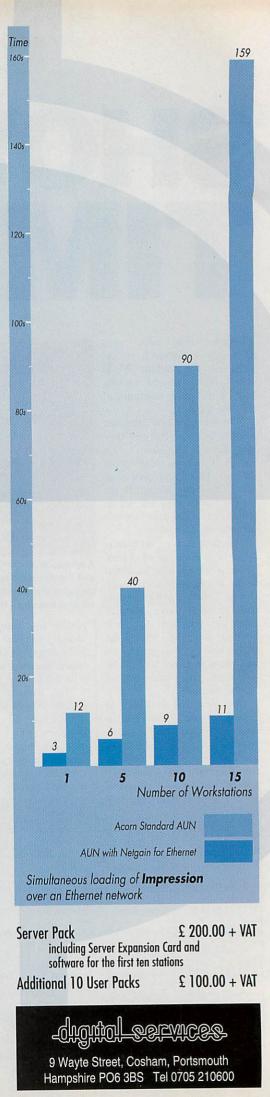
Time taken to load these applications	Level 4 Econet	Level 4 AUN Ethernet	Etherne with Netgair
over an Acorn network	Seconds	Seconds	Second
 Artworks	136	87	8
 Maestro	15	9	3
 Pipedream	20	6	2
 Squirrel	35	10	2
A DECEMBER OF A	State and the state of the stat	a state of the sta	A DESCRIPTION OF A DESC

The only hardware required is an expansion card in the Netgain server, which would typically also run the Acorn Level 4 fileserver. No MORE THAN 64K OF RAM IS TAKEN FROM ANY WORKSTATION. Standard Ethernet interfaces may

be utilised. Typical transfer rate from a standard Ethernet system is

approximately 200K/sec but Netgain achieves up to 900K/sec. In addition to this transport throughput increase, intelligent caching and a general reduction in bottlenecks result in staggering reductions in load times for typical applications.

The system manager simply copies their applications into the Netgain filer on the server, and from then on these products will automatically appear within the Resources directory viewer from the Apps icon on the icon bar, just as if the programs were in ROM.



Destination: Acorn World

WEMBLEY **EXHIBITION** CENTRE DATE: FRI 29TH SAT 30TH SUN 31ST October '93

If you thought computer shows only had the latest word processors and spreadsheets, Acorn World will change your perceptions....

See how a full colour magazine is produced. Experience the sights and sounds of a laser light show in the best games arcade in Britain. See Kodak convert a film onto a photo CD. Discover the secrets of the talking head. Catch a glimpse of the future in Acorn's concept area.

Meet the boffins from the Science Museum. Discover why children are jumping off cliffs as part of the curriculum.

New concepts

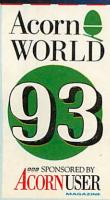
New products New solutions

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FAMILY	£15.00	1200 - 201	£	SERVICES, PO BOX 162, STAINES TW19 5JX.
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Competition details from the Acorn World address opposite. *No purchase necessary



LEARNING CURVE

it. Once you

One step further along the curve, John Rennie shows how to get to grips with the basic tools in Draw, and uses them to create the stylish figure below

There are a number of good drawing applications for the Archimedes: *Vector* and *Artworks* to name just two. But as well as delivering all you need from a basic drawing package, *Draw* has a big point in its favour: it's free.

Like any tool the easiest way to get to grips with *Draw* is to play with it. At first, constructing the curves is a bit like learning to knit with spaghetti, but you will be surprised how dextrous you become.

Once you get the hang of it *Draw* becomes very useful. You can create clipart, graphs and charts. Last month, Rob Miller showed you how to create business stationery. First we will look at the tools in the application, then use them to create a simple figure: *Dude*.

Starting off

Load *Draw* on your iconbar by clicking on it twice from the Apps filer. Clicking once on the resulting icon opens a *Draw* page. Down the left of the page you see the toolbox; this is really a shortcut menu. Clicking once on a tool selects it. If you then click Menu over the page and go into the Enter submenu, you will see the relevant item is ticked: line, curve, ellipse or rectangle.

The ellipse and rectangle tools are straightforward. Click the pointer on the desired icon and move over the page itself, where the pointer becomes a crosshair. Click once, and moving the crosshair out produces the shape. Clicking again will complete the shape.

The other tools are slightly different. For instance, to use the straight line tool you double-click on the screen to start a line, single-click to end have completed the shape you want you double-click and the shape's grey outline changes to black. Using the second icon instead of the straight line tool will produce a closed polygon on doubleclicking by drawing a line back to the start. The resultant collection of joined lines is called a path, and below we will see how to construct paths and edit them. The Curve tools work in the same way.

Undo is another useful command. If you finish a path but it still looks wrong, you simply remove it by choosing to Undo from the Misc menu.

Step one

In the picture on the right you see the basic outline of our figure.

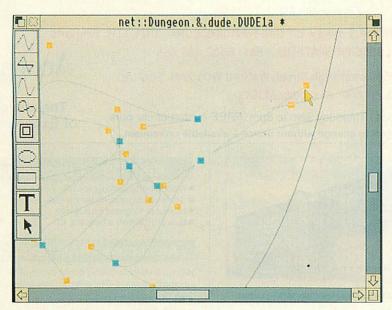
First you need to place the basic shapes on the screen. The head is an ellipse, the trousers and legs constructed with the straight line tools, but the majority of the figure is constructed using the Curve tools.

The arms are constructed using the open curve tool while the body is constructed using the Closed Curve tool.

Call up a fresh page from Draw. Then using the same tools try to create as close a copy as you can.



DUDE



Step two

Using Select we edit the paths we have on the screen. Click on the pointer icon then on a figure. You see a red 'bounding box'. Using the top right 'ear' rotate the figure. The bottom ear lets you stretch or squeeze the shape. Clicking in the box lets you move it.

Path editing lets you fine-tune the shape. You decide Dude's wrist is a bit skinny? Click on the pointer tool, then the arm to place it in a bounding box. Click Edit in the Select submenu and you are in Path Edit Mode. Each section has a blue 'end point' at either end. Click on this with Adjust and the curve is highlighted in red. Clicking with Adjust



Drau

Misc

Save Style

Enter

Zoom

Grid

Ioolbox

°F1

Select

Transform

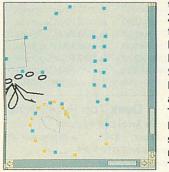
on a yellow control point lets you bend the curve. When you are happy, select the pointer tool and click and drag a box over all the elements of the figure. When you release, each figure has a bounding box. Enter Select and click on Group. The figure is in a single box and can be moved.

DUDE

net::Dungeon.&.dude.DUDE3 *

Step three

For finer work it is easier to work on a magnified image. For the boots choose Zoom from the menu. Get a magnification of two to one. The top of the boot is drawn using Open Line,



F183

then Curve for the toe. Zoom is useful for fiddly work like the laces. Construct the laces using Open Curve. Select the line, select Line Width from Style and choose thicknesses. The eyelets are circles. Draw one, squeeze to shape, thicken, copy as many as you need. Then group the lot.

Step four

Text can be added using the T tool. Simply type in what you want and the text will appear in the system font. At this point you are still able to edit it, correct spellings and so on; it behaves just like a normal piece of word-processed text.

However, system text is neither very attractive nor manipulable.

So, select the whole text using the pointer tool. Enter the Style submenu and you can change the font face, the font size and the

9

T

k

colour of the text. You now find the bounding box can rotate or squeeze the text as with any other shape.

'Dude' is typed in, altered to Frutiger, then stretched to fit the rather attractive star jumper that the man himself is wearing.

net::Dungeon.&.dude.DUDE4 Draw All that remains is to colour in the various parts of Dude. Select the Misc Save Style colours provided can be everything flesh Style Line width \$ altered by adjusting the tone, ungroup, the balance of Red, Green colour individually, to Enter Line colour 4 and Blue. Try playing Save colouring flesh Select F6 \$ Fill colour DUDE with the combinations to get the colour you Transform \$ Line pattern ♦ Piece-by-piece want. Click on the Join Zoom \$ closest colour from the Grid \$ Start cap \$ choice then adjust. The hair needs to be coloured, ^F1 Toolbox End cap then, in Select, sent to Back. Fill colour When you have completed 238 R 238 G 01 B on **NK** None

Step five

whole grouped figure and move to Fill Colour in the Style submenu.

When you get to the palette, you find the

colouring, regroup the whole figure and save it. This can be shrunk, copied, cut and pasted to your heart's content. And, should you be able to improve perfection, you can ungroup the original and have another go. Next month we take a step further into visuals with a look at Paint.

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1

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Watford Electronics Headquarters - Luton

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 £159. 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.
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Scan256 for A3000 Micro

A3010 DTP Pack

Supplied with 3.5" Floppy Disc Drive and a mouse, Colour Monitor and lead, TV modulator, 30Mb fast IDE Hard Disk Drive, 'Compression' utility to increase the Hard Drive capacity to typically 60Mb, 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: £775 A3010 DTP Pack with £875 Learning Curve Additional 1Mb RAM fitted £39

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RISC OS 3.1 Upgrades

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Acorn Multimedia

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Hi-Speed, Low Cost Archi Hard Disc Drive

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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 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 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
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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
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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
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A5000 Internal IDE Drive

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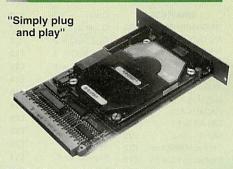
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Archi IDE Hard Cards

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

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£44

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- A3000 User/Analogue/IIC I/O Card
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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

£16

- 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. .
- I/O podule. An InterIC (IIC) Port with a 5 pin DIN socket to connect the A3000 to external IIC devices. . £38

Cortian CKAI Interface

Eliminates need to have a User port in A3000/305/310/400/540 when using Concept Keyboard. £28

Concept Keyboards

- A4 Standard Pack £89
 A3 Standard Pack £94 Primary Pack Primary Pack £95 299
- Designer Pack A4 £104 A3 D Pack £104
- Universal 2010 Keyboard A3
- Universal 2010 Keyboard A4

NEW Special Finance Deal Now everyone can afford an Archimedes Micro with Watford Electronic's up to 60 months instant credit facility. (Please telephone 0582 74 55 55 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. Upto 4 disc drives can be connected, Fully Buffered Board, NO SOLDERING is involved. Supplied complete with necessary lead. Price £21

• A300/400	£15;	• A3000	£14



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 £145. 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 £125

Network Accessories/Software

BBC B Econet Kit	£42
Master Econet Module	£40
Archimedes Econet Module	£40
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A3020/4000 Ethernet Card	£179
AUN/Level 4 Fileserver	£379
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Econet Socket Box	£7.50
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£107

£104

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BBC/Master Games

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Silicon Vision Archimedes Software

Arc-PCB	£79	Arc-PCB Pro	£169
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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 8 chips. Has automatic safety cut-off to switch off the UV lamp when opened. £36

£12

Spare UV tubes.

Archi Real-Time Digitiser



Now supplied with NEW RISC OS Version Software

Watfords' Archimedes Video Digitiser is the most sophisticated digitiser ever designed for a micro. It provides a fast and flexible means of capturing images from a video camera or recorder for display and manipulation on the Archimedes range of Micros. Off-air televison 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 £16 using a video camera

Vision Digitiser

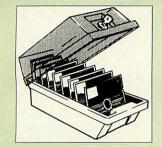
Working in real time, the Vision Digitiser is available in either monochrome or colour versions with a software upgrade to colour. Create high quality images simply by connecting the digitiser to a PAL video source, such as a camcorder, video or digital camera. Includes powerful RISC OS software.

Mono Vision Digitiser £44.00 Colour Vision Digitiser £74.00

Credit Card/Sales: 0582 74 55 55 Sales/Inquiries: 0582 48 77 77

Cambridge Pascal £95

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
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- £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 fo	r 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
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Special Bulk Offer Discs

(Lifetime warranty on Discs)

BULK PACK DISCS in lots of 100

		S/S	D/S	D/S
Туре		40T	40T	80T
 Without Sleeves 	5.25"	£25	£30	£35
• With Sleeves 5.1	25"	£28	£33	£38
• 3.5" D/S D/D	£21 fe	or 50	£39 fc	or 100
• 3.5" D/S H/D	£40 fe	or 50	£75 fc	or 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

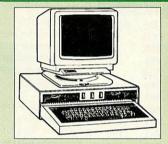
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These top quality 3.5" Double sided, 80 track, are at-tractively finished in BBC beige. They are supplied complete with all cables and a Utilities Disc.

Туре	Description	
a stars aller	Disc Drive without PSU	
• 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	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.

£150

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

Plastic



£4

£4

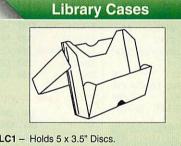
£7

£3

£3

£3

£12



JLCI - 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

D	is		41	bι	III	IS	
		104455		10.024	101005	 Introduced 	10.04

Attractively finished in leather-look PVC	C 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

Cleaning Kits & Aerosols

•	5.25" Disc Cleaning Kit
	3.5" Disc Cleaning Kit
	PC Cleaning Kit
	Professional PC Cleaning Kit
•	Aerosol Dust Spray Can
•	Servisol Foam Cleaner Can

Antistatic Aerosol Spray

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 Mkll 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

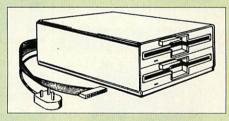
Quality Disc Drives from Watford

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

Туре	Description	
	Disc Drive without	PSU
• CLS400S:	Single, 40/80 track 400K Double sided Drive	£75
• CLD800S:	Twin, 40/80 track, 800K Double sided Drives	£138
	Disc Drive with PS	U
• CS400S:	Single, 40/80 track, 400K Double sided Drive	£85
• CD800S:	Twin, 40/80 track, 800K Double sided Drives	£149

Credit Card Hotline: 0582 74 55 55

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Microvitec Monitors

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

£239 • Touchtec 3000 (For RiscOs 2 only) £POA # 3 years parts & labour warranty

Multiscan Monitors

Eizo T240i	£483	Pan TX1713MA	B £616
Eizo F340i-W	£625	Phil 4CM4270	£289
Eizo F550i-W	£899	Phil 7CM3279	£249
Eizo T560iT	£1345	Phil 7CM5279	£269
Eizo F560i-W	£1195		
Eizo T660i-T20"		Taxan 787	£229
		Taxan 787LR	£239
NEC 2A-N	£274	Taxan 789LR	£289
NEC 3FG	£360		HULSO
NEC 3FGe	£352	Taxan 795-PC	£465
NEC 4FGe	£479	Taxan 875+ LR	£737
NEC 5FG	£899	Taxan 1075-20"	£1189
NEC 5FGe	£789	Taxan1150	£1699
NEC 6FG	£1599	Taxan	
Panasonic C138	B1£199	1095LR-20"	£1699
Panasonic m	onitors	s carry 2 years	on-
site maintena	ance w	arranty	
one maintene	1100 11	unung	

Aries AlphaScan Monitor

Its multiscan circuitry provides automatic adjustment for frequencies between 31 and 56KHz horizontal, and 43 and 70Hz 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 £299 operation in all screen modes. Aries Alphascan 17" Plus £585

Philips Monitors

- BM7502 12" Hi-res Green
 CM8833ii 14" med. Res Colour.
- Ideal for BBC B; Master & Archi-£192 medes
- Dust Cover for Philips Monitors
- Spare Monitor Leads (various)

VIDC Enhancer

Our two unique VIDC add-on boards for the Archimedes cater for all VGA and Multiscan monitors and screen modes. 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 £35 control

MultiVideo VIDC Card: As above £19 but for MultiScan monitors only.

Printer Leads

5

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	Э	2m	£5;	5m	£10
Centronics Double I	Ende	ed 4'	£5;	6'	£6
		5m	£10;	10m	£14
RS232 Leads Varie	ous			£I	POA

Integrex Ink Jet Printers

Paper Roll for Integrex 132	£6.50
BBC Screen Dump Software	£10
Colour Cartridge	£2:
Black Cartridge	£14
100 A4 OHP transparencies	£5
Colour Jet 2000	£599
Betajet Ink Jet Printer	£18
Betajet Cut Sheet Feeder	£4:
Integrex Colourjet Series 2	£33
Auto Sheet Feeder for Series 2	£4

Star Printers

	Printer	CSF	Ribbon
LC15	£185	£135	£5
LC20	£102	£60	£4
LC100C	£119	£65	£9
LC24-15	£242	£135	£5
LC24-100	£142	£69	£5
LC24-20 MH	2£170	£65	£5
LC24-200C	£209	£65	£12
LC200 C	£151	£65	£12
Star Jet SJ4	8 £169	£43	£16
XB24-200C	£322#	£80	£12
XB24-250C	£389#	£139	£12
ZA-200C	£258#	£89	£12
ZA-250C	£324#	£139	£12
# Includes 1	2 months	on-site v	varranty

£88

£6

£7

Black Ribbons for Colour Printers £5

- Serial 8K l'face LC10/15/24/200 £52
- 32K Buffer LC/XB24-10; 15; 200 £52
- Star/Archi Colour Printer Driver £15

NEC Printers

Printer	CSF	Ribbon
£190	£59	£6
£255	£59	£6
£335	£89	£8
£395	£115	£8
£577	£115	83
	£190 £255 £335 £395	£190 £59 £255 £59 £335 £89 £395 £115

- Black Ribbons P20; P32 £6
- Ribbons P60/70/P90 Black £8; Colr £14
- P60/70 Colour Option Kit £59 • CSF for P20 £59; P60 £89; P70 £89

Panasonic Printers

	Printer	CSF R	ibbon
KX-P1123	£129	£59	£6
KX-P1170	£98	£59	£6
KX-P1624	£267	£126	£8
KX-P1654	£334#	£126	£8
KX-P1695	£270	£126	£8
KX-P2123M	£148	£79	£8
KX-P2124	£220	£89	£8
KX-P2180M	£128	£79	83
KX-P2624	£272#	£126	£8
KX-P2023			EPOA
FREE -	Printer lea	d with eve	ry
Panasor	ic printer	listed abov	ve
# Includes 12	months or	site warra	nty

 Dustcover for 80 column printers £6

- Serial Interface for above Printers £46
- KX-P1081/1592/1595/1695 £9 each
- 32K Buffer for above Printers £16

and KX-P2124 £37

All Laser printers (excludir include 12 Months On-Site	ng HP La	sers)
Brother HL4-PS Postscript	4ppm	£969
Brother HL6 – NEW –	6ppm	£449
Brother HL10-PS	10ppm	£1285
Brother HL10-DV	10ppm	£1149
Brother HL10-DPS	10ppm	£1439
Canon LBP4 LITE	4ppm	£535
Canon LBP4+ 1.5M RAM	4ppm	£644
Canon LBP-8 Plus IIIR	8ppm	£1435
Canon LBP-8 IV 600DPI	8ppm	£975
Epson EPL-4300	4ppm	£520
Epson EPL-5000	6ppm	£459
Epson EPL-5200 - NEW -	6ppm	2544
Epson EPL-7500 PS	6ppm	£1139
Epson EPL8100	10ppm	£920
Fujitsu VM600	5ppm	£569
Fujitsu VM600E	6ppm	£709
HP Laserjet 4 ML	4ppm	2POA
HP Laserjet 4	8ppm	£1065
HP Laserjet 4L - NEW -	4ppm	£475
HP Laserjet 4M PS	8ppm	£1445
HP Laserjet 4si	16ppm	£2225
HP Laserjet 4Si MX 1200 DPI	16ppm	£2399
NEC Silentwriter S62P PS	6ppm	£990
NEC Silentwriter S102	6ppm	£980
NEC Silentwriter2 290	8ppm	£1149
NEC Silentwriter 290P PS	8ppm	£1469
OKI OL400E	4ppm	£449
OKI OL410		£589
Panasonic KX-P4410	5ppm*	£459
Panasonic KX-P4430	5ppm*	£592
Panasonic KX-P4451 DB	11ppm*	£895
Panasonic KX-P4455 PS	11ppm*	£1279
Star LP-4 Post Script	4ppm	£774
Star LS-5	5ppm	£499
	C.S. Martine	

Laser Printers

£625

£775

£100

P S S Star LS-5 EX (RISC Based) 5ppm Star LS-5 TT True Type+Mac 5ppm Star LP-8 III postscript 8ppm £1130 *2 years on-site warranty HP Laserjet 4L 3 years on-site

HP Laserjet 4si 3 years on-site	£505
HP Laserjet 4/4M 3 years on-site	£170

Laser Toners

Canon 2, 3 & 4	£52	KXP4420/50/55	£20
Canon LBP8-IV	£75	KX-P4410/30	£29
Canon 8/Star LP	8£59	NEC SWriter	£84
Epson GQ	£12	HPII/D, III/D	£60
EPL 40/41/4300	£55	HP IIP, IIIP	£54
EPL 71/7500	E117	HP4/4M	£72
EPL 8100	E117	HP Laserjet 4L	£65
Qume Crystal(3)	£84	OKI OL400/800	£21
Star LP4	£52	OKI OL400e	£17
Star LS5	£69	VM800 8K pages	9936

Laser RAM Upgrades

Туре	1M	2M	4M	
IIP; IIIP	£49	£80	£132	
II & IID	£60	£96	£142	
LJ4/4M	£-	£75	£175	8M/£279
EPL4100	-	£120	-	512K/£52
KX4420/50i	£59	£89	£149	
NEC S62/S10	2£99	£180	-	
Star LBP	£139	£275	-	
Laserjet 4L	£75	-	-	

Jetpage Postscript Cartridge ● HP IIP/IIIP £225 ● IID & III £227

Various Add-Ons

- Laserjet Appletalk Interface £135 £359
- HP Adobe Postscript+ Cartridge Pacific Page Postscript £259
- HP Premier Font Collection
- £28
- Laserjet Various Font C'tridges from £45 HP Postscript Module for LJ4 £270
- Laserjet 4 Powered envelope feeder£199
- Jetdirect Ethernet Card for Laserjet
- £359 Illsi/4/4Si
- 500 Sheet paper cassette (3rd Bin) £205
- HPIIP/IIIP Lower Cassette Tray £115 Canon LBP-4 Lower Cassette Tray £96
- KX-P4420 Ozone Filter £8

Citizen Printers	
120D+ £94 Swift 200 PN-48 £179 Swift 240 Swift 90 £132 Swift 240C Swift 90C £198	£178 £200 £212
# 2 years parts and labour warranty above Citizen Printers.	on all
 Swift 24 Ribbons: Black £4 Colot Cut Sheet Feeder for 80 col. printer Citizen 120D Ribbons Archi Colour Printer Driver 	
Hewlett-Packard Printers	
The second se	04045
DJ500 colour £339 Desk Jet 1200C DJ 550 Colour £499 DeskJet 1200C DJ Portable £185 PS Deskwriter £299 Deskwriter 500C Deskwriter 500C £349 PaintJet XL300+I Quiet Jet plus £299 PaintJet XL300+S Desk Jet 510 £242 PaintJet XL300PS	E1479 E459 E1675
+ Includes 12 months on-site warranty 3 years on-site maintenance available as for	
DeskJet & DeskWriter mono DeskJet & DeskWriter colour	£55 £65
Paintjet Cartridge Black £15; Colou DJ Portable CSF £49; Carrying Case	1r -£23 £49
Special Offer	
When you purchase any Hewlett Packard p from us, you qualify for the following software	
offers: • Adobe Type Manager v2 • Designworks Software pack at	£45 £39
Lotus Organiser Software at	£39
Hi-quality InkJet Paper A4 90gsm 500 sheets £12	
Desk Jet 500 Accessories	
Ink Cartridges Black £16; Colo	ur £23
High Capacity Ink Cartridges Black	£21
Ink Refill Double Pack (JetFill) Ink Refill High Capacity (JetFill)	£10 £16
Deskjet Turbo Driver	£45
(only £39 when purchased with prin	
Archi – DJ550 Colour Printer Drive Engage EX Emulation Cost (500 mag)	
 Epson FX Emulation Cart. (500 mon IBM Proprinter Emulation Cartridge 	£59
Wordperfect Cartridge	£89
DJ 500 Dust Covers	£6
 636G 50 x Transparencies A4 636J 50 x Glossy Paper A4 (also X) 	£40
 630Z 50 x Glossy Paper A4 (also x) 630Z 50 x Cut Sheet Paper A4 	£15
Plug In Font Cartridges for DJ 5	
22706B - Prestige, Elite, Line Draw 22706C - Letter Gothic & HP Line Dra	£55
22707P - Proprint Emulation Cartridges	
HP Paintjet/XL Accessories	
 630P 200 Z-Fold paper 8.5 x 11 630Q 50 Transparencies 8.5 x 11 	£14 £39
• 630S 50 Transparencies A4	£40
• 630Y 200 Cut Sheets 8.5 x 11	£14
631Y 200 Cut Sheets A4	£18

Fujitsu Printers

 B-100 InkJet – HP Deskjet compatible 300dpi, whisper-quiet & 6 fonts #£179 B-200 InkJet – HP Desk Jet compatible 300dpi. Built in Cut Sheet Feeder. Optional 2nd Bin/Tractor available #£279 • DL-1150 Dot Matrix - 24 pin, 110 column Colour optional £239 DL-1150colour Dot Matrix – 24 pin, 110 column With colour option £269 • DL1250 £329; • DL4600 £799 • DL3600 £439; • DL5800 £999 Joywriter £269;
 DL1250 colr £369 • B-100 Cut Sheet Feeder £49 B-200 2nd Bin Sheet Feeder £89 B-200 Tractor Unit £69 B-100/200 Ink Cartridges £14 DL-1100 Colour Upgrade £39 DL-1100 Ribbons Black £5 Colour £11 B100/200 Jetfills Twin Pack £9

- Black Ribbons for P1081, 1180, 1124 £6
- Brown, Blue or Red Ribbons for

 - Colour Kit for KX-P2180; KX-P2123

Epson Printers

Printer	CSF	Ribbon
£268	£47	£4
£335	£69	£6
£147	£-	£4
£201	£47	£4
£355	£47	£6
£585	£155	£6
£310	£69	£6
£434	£69	£6
£673	£360	£6
£114	-£	£4
£92	£69	£4
£134	£69	£4
£203	£125	£6
£409	£170	£23
£555	£155	£23
£669	£-	£23
£240	£-	£10
	£268 £335 £147 £201 £355 £585 £310 £434 £673 £114 £92 £134 £203 £409 £555 £669	£268 £47 £335 £69 £147 £- £201 £47 £355 £47 £585 £155 £310 £69 £434 £69 £673 £360 £114 £- £92 £69 £134 £69 £203 £125 £409 £125 £409 £155 £669 £-

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

 Stylus 800 Transparencies (50) £35

Canon Bubblejet Printers

			2nd	Ink
	Printer	CSF	Bin	Cart
BJ10EX	£156	£43	-	£16
BJ10SX	£165	£43	-	£16
BJ200	£265	-	-	£16
BJ230	£290	-	-	£16
BJ300*	£329	£88	£88	£12
BJ330*	£369	£110	£79	£12
BJC800C	£1289	-	-	£16

- BJ10E/10EX/10SX/200/230 Jumbo Ink Refill pack (Jetfill Twin Pack)
- Optional Battery pack for BJ10EX/SX £33 includes 12 months on site warranty

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 ie. 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 £16 132 Column version £25



Give your Computer System	a touch of
Class with our elegant, smok	e finished
Perspex Printer stand.	
90 Column version	014

ou columni version	214
136 Column version	£18

VISA 24-Hour Credit Card Order Line (0582) 74 55 55 / 48 77 77

Universal Printer Sharers

6

Connect up to 4 Micros to 1 printer or 4 Printers to 1 Micro with our combined, Sharer/Changer switch boxes.

Standard Low Cost Sharers Connects Serial Parallel • 2 to 1 £8 £9 • 3 to 1 £11 £12 • 4 to 1 £15 £16

	Constraint in the
Professional Share	r Units
Connects Serial	Parallel
• 2 to 1 £12	£13
• 3 to 1 £15	£17

£24

£26

• 4 to 1

Auto Printer Sharer Switch

Connects	Serial	Centronics
• 2 to 1	£27	£29
• 4 to 1	£44	£45
• 8 to 1	-	£75

256K Multi Spooler

These Parallel Auto printer sharer switches have built-in 256K Buffer.

• 2 In / 2 out £99 • 4 In / 2 out £115 • 8 ln / 1 out £149 (Cables for all printer switches are from £5

each please specify the type required when ordering.)

Compact Converter Unit

Serial to Parallel & Parallel to Serial £32

Listing Paper

- 1,000 Sheets 9.5" x 11" Fanfold £7
- 2,000 Sheets 9.5" x 11" Fanfold £11 1,000 Sheets 9.5" x 11" NCR 2
- Part Fanfold £21 • 1,000 Sheets 15" x 11" Fanfold £9
- 2,000 Sheets 15" x 11" Fanfold £16
- 1,000 Sheets true A4 Fanfold Paper 70gms £11
- 2,000 Sheets true A4 Fanfold Paper 70gms £21
- 500 Sheets A4 80gms Bond £3.50 500 Sheets Special Hi-Quality
- InkJet printer A4 Paper £12

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

Cross Over **Manual Switch**

£28
£36

Printer Ribbons & Various Dust Covers

		Dust
Туре	Ribbons	Covers
BBC B/BBC Master	-	£6.00
Archimedes Micro pair	-	£9.00
Citizen 120D	£3.25	£6.00
EX800/1000	£6.00	£6.00
RX/FX80/85/800/MX80	£2.95	-
FX/MX/RX100/1000	£3.95	-
Kaga/Taxan KP810/815	5 £6.00	£6.00
LQ400/500/550/800/850	£5.50	£6.00
LQ1050/LQ2500	£12.00	£6.00
LX400/800/850	£3.50	£6.00
M1009/GLP	£2.95	£6.00
NEC P2200	£4.50	£6.00
D	I A A A	

Dust covers for most 80 column printers available at £6 each

Printer Labels .000 90 x 36mm (Single Row) £6.00 1,000 90 x 36mm (Twin Row) £6.25 1,000 90 x 36mm (Twin Row) £6.25 1,000 90 x 36mm (Twin Row) £6.25 1,000 102 x 36mm (Twin Row) £6.25 1,000 102 x 36mm (Twin Row) £6.75 Daser Printer Labels on A4 Sheets 3750 - 70 x 29mm (3 Rows x 10) £15.50 2400 - 70 x 37mm (3 Rows x 8) £15.25 Daser Printer Labels on A4 Sheets 3750 - 70 x 29mm (3 Rows x 8) £15.25 Listen Rependencies £15.25 £15.25 Daser Soft Soft Soft Soft Soft Soft Soft Soft	Plotters
Psion Series III	 Single 490 x 310 x 105mm £14 Double 490 x 310 x 210mm £27 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 Copy Holder
 Series 3 Computer128K £108 Series 3 Computer 256K £159 RAM Solid State Discs (SSD) 128K £48 • 512K £97 • 1Mb £199 Flash Solid State Disc (SSD) 128K £30 • 556K £48 • 512K £79 1Mb £139 • 2Mb £199 Communications Parallel Interface Link £25 RS 232 Serial Link for PC £58 PS 29 Serial Link for PC £58 	Available in 2 full A4 versions, desk
RS 232 Serial Link for Mac £59 Various Mains Adaptor 9V AC £12 Spreadsheet £59 Professional Finance £42 Spelling Checker/Thesaurus £42 Voltmace Joystick Delta 3B Single Joystick £10 Delta 3B Twin Joysticks £15 Delta 14B Single Joystick £11	 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
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 Commander Joystick • Connects directly to BBC Analogue port • Fully compatible with all BBC Joystick controlled games. • Switchable springs allow selection of floating or centring operation. • Trim adjusters for both X and Y	Surge Protector Plug Fitted in place of your normal mains plug, this device protects your equipment (and data from corruption), against mains high voltage translent spikes/surges caused by lightning or thermostats switching. Protection for only £8.50 A 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.
 axes for fine centre adjustment. Convenient stick mounted fire 	Very useful for tidying up all the mains leads from your peripherals. £9.50

stick mounted fire button with additional base buttons. Price: £15

Beeb PC (BASIC)

Designed for program authors to convert BBC programs to run on IBM PCs. Price: £38

10 x 105mm £14 310 x 210mm £27 Plinth (very sturdy & e), has a slot on the ch & cut out on the £15 isc Drive full A4 versions, desk f clamping. Paper is

Angle Poise £12

otector Plug

v Mains ion Socket

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

Continued $\rightarrow \rightarrow \rightarrow \rightarrow \rightarrow -$



- Quest Mouse III & Quest Paint £39
- Quest Mouse III, Quest Paint, AMX Stop Press & Pagefont
- Quest Mouse III only
- · Quest Paint Software only £23 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.

£10

£39

£13

£23

£16

£3

Mk III AMX MOUSE

AMX Mouse plus Super Art

- (Please specify for BBC, Master or Compact)
- AMX MOUSE ONLY £25
- AMX SUPERART Package £20
- AMX STOP PRESS A Desktop publishing software. Works with Keyboard, Joystick or a mouse £18
- PAGE-FONTS Over 20 Fonts for use with AMX Pagemaker
- AMX DESIGN (ROM)
- AMX EXTRA EXTRA
- MOUSE MAT

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

7



Features Infra Red Signal Transmission

£59

£25

- . 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 minutes inactive
 - Auto Power Shut-Down after 20 minutes inactive
 - Price £29

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-20 Archimedes Version

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 £89 AHS-3 Archi A3000 Version £99

OFFICE MASTER

- CASHBOOK
 FINAL ACCOUNTS • MAILIST • EASILEDGER -
 - INVOICES & STATEMENT

All this for only £12 (Disc)

OFFICE MATE

 DATABASE
 SPREADSHEET • BEEBPLOT

Only £10 (Disc)

Award winning 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 £39

Wapping Editor plus Mouse £59

(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

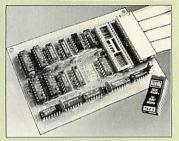


The 216mm scanning width can cope with both desktop scanning of single sheets, photographs, diagrams, etc., with its fast ten page automatic document feeder, but it can also detach from the feeder to become a convenient hand-held full page scanner for larger documents or pictures. Scanned image control 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 redbased colours are faded down to white and so do not show up in the scanned image.

Archi A4 Scanner	£19
Sheet Feeder for above	£7
Scanner + Sheet Feeder	£26

32K Shadow RAM/ Printer Buffer Card Expansion Board



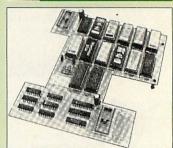
A MUST FOR WORD PROCESSING Simply plug the ribbon cable plug into the 6502 socket and gain a massive 32K of extra RAM

• "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 £45

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

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

OPTIONAL EXTRAS:

£8

£3

- 16k plug-in Static RAM kit
- 16k DRAM for Upgrade £13 Battery backup
- Read and Write protect
 - £2 each switches 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 dial (0582) 74 55 55





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

Acorn Speech Synthesizer package complete, for the **BBC B Microcomputer Special Offer** £6

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 B & Master user port.

Excellent Value at £22

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

Assorted ROMS **BBC B/Master**

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
SERIAL ULA	£13
TED	£15
Video ULA	£14
1Mb OS ROM	£39
View 3.0 £45 Viewsheet	£36
Viewstore £36 Viewspell 80T	
InterBase £49 InterChart	£25
InterSheet £37 InterWord	£36
Mega-3 ROM £76 Spell Master	£42
	£38#
# Price includes a FREE Wordaid	Rom



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) ----

Beeb Dos	
Allows IBM PCs/Compatibles to read	
Acorn format Discs	£39
Beeb PC Basic	
BBC Basic for IBM PCs/Compatibles	£38

Spares for Archimedes

	Contraction of the second	1000 N 1000		
	A3000 PSU	£49;	Disc Drive	£59
1	Controller VID	C £39;	MEMC	£29
	I/O Controller			£39
	ARM 2 CPU			£39
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ARM3 upgrade with floating point accelerator (FPA) option. £165

The first ARM3 upgrade to allow the floating point accelerator chip to be connected directly to the ARM3's 32-bit coprocessor bus. The ARM3 itself increases the speed of your computer by a factor of 3 (typically), and sometimes even more. Acorn's new floating point chip, the FPA10, speeds up maths operations previously emulated by software.

A 68-pin socket is provided on the ARM3 upgrade, and the FPA chip can simply be plugged in at any time. Alternatively, we can supply the ARM3 board with the FPA already fitted and tested.

A BASIC VI program ran 15 times faster when the ARM3/FPA was installed. Ray-tracing and spreadsheet programs also benefit, but of course precise speed increases vary from one application to another.

The upgrade uses a high quality 4-layer circuit board. It may be fitted to the A305, A310, A440, 400/1 series and the A3000. Installation is straightforward for the 300 and 400 series computers, and a proper extractor tool (for removing the ARM2) is included in the price. A 3-day fitting service is available if required. Please note that the A300 series and old A440 require the MEMC1a upgrade.

25MHz ARM3 - £165 MEMC1a - £25 Floating point chip - £95 ARM3 with FPA fitted - £255

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We still have limited stocks of these ultra-fast ARM3 upgrades. Please write or phone for full details.

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An easy to fit and reliable RAM upgrade.Gold plated connectors ensure long term reliability. This upgrade uses a four-layer circuit board as recommended by Acorn. No soldering needed. 2Mb RAM board (upgradable to 4Mb) - £47 4Mb RAM - £99 Bare board (without RAM chips) - £25

2Mb to 4Mb upgrade - £63

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) - £31 A3010 upgrade to 4Mb - £107

All products fully guaranteed. Many products also carry our 14-day money-back guarantee too. Please phone for details.

Other features include extra "background" operations. For example, discs can now be

and also occupy less RAM space.

2Mb of code.

formatted or files copied while the machine is used for other purposes. RISC OS 3 may be used on the A305, A310,

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RISC OS 3

Acorn's new operating system for their range of

(2.00) is just 512K long, whereas OS 3 contains

RISC computers. The old version of RISC OS

Many applications which were previously

supplied on disc are now contained in the OS

on ROM they are always instantly accessible,

Draw, Paint and Edit. Because they are available

ROMs. This includes improved versions of

A440, 400/1 series, A3000, A540 etc. RISC OS 3 £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 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 ("podules").

RISC OS Carrier Board

A5000 systems & memory

£18

A5000 with RISC OS 3, 80Mb hard disc, multisync monitor and ARM3. - £1399. A5000 learning curve. - £1445.

Free 4Mb RAM upgrade included in the price.

2Mb memory board (4Mb total) - £75 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 SCSI or IDE internal hard discs with a year's warranty, in sizes from 40Mb upwards. Complete systems supplied with all metalwork and cables. 400/1 machines merely require the drive and controller card. 300 series require a backplane. 40Mb SCSI - £180 85Mb SCSI - £210 120Mb SCSI - £250 210Mb SCSI - £320 Fast 16 bit SCSI card - £100 50Mb IDE - £160 120Mb IDE - £250 IDE controller card - £75 (add £75 for external version of SCSI discs)

Various

Aleph One 386 1Mb PC Card - £390 (4Mb £475) Aleph One 486 1Mb PC Card - £490 (4Mb £575) Impression 2 - £130

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A310 & A305 upgrade column, 2Mb £89, 4Mb £128

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.

4Mb - £128

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 RISC OS 3.

2Mb - £89

Fully compatible with ARM3 upgrades, backplanes, hard discs etc. This upgrade is supplied on just one, compact board measuring only 195mm by 46mm. 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-tonone has been established.

Is there any other 300 series RAM upgrade wich 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 moneyback guarantee to check it out for yourself.

RISC OS Carrier Board

£18 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 and version 3. It is fully compatible with other hardware upgrades such as the RAM board described above, ARM3's, backplanes, VIDC enhancers and expansion cards.

Note: Early versions of certain 300 series RAM upgrades from other suppliers do not work properly at first with RISC OS 3. The problem can be completely overcome simply by changing a chip on the RAM board. IFEL can supply a replacement chip for only £3. Be sure to specify whether your board is 2Mb or 4Mb.

4-slot backplane with fan

Combination deals

£52

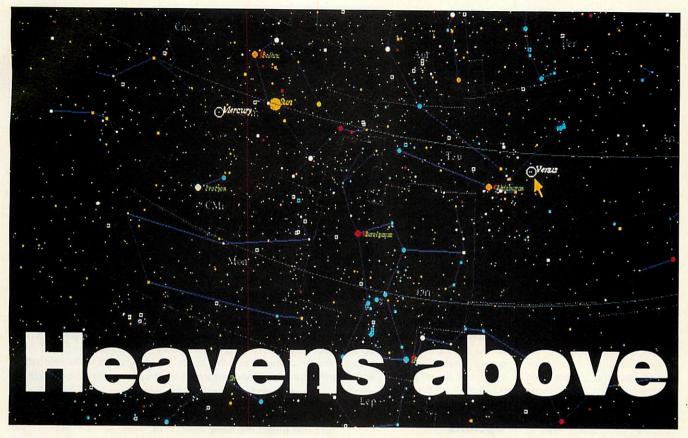
4Mb with MEMC1a, self-fit £152 Collection of your computer, installation of 4Mb of RAM, MEMC1a, and RISC OS Carrier Board, testing, full guarantee, and return delivery £189 As above, but with 2Mb of RAM £125 (Add £40 to have RISC OS 3 fitted at the same time.) Upgrade from 2Mb to 4Mb (self fit) £69

Special prices available on hard discs, ARM3 boards and software when ordered with any memory upgrade.



RAM for 410 & 420

Upgrade from 1Mb to 2Mb - £33 Upgrade from 2Mb to 4Mb - £65 Upgrade from 1Mb to 4Mb - £98 Supplied with full instructions.



A stronomy is a big science; not only because of the billions in research money invested in it or because it is now an integral part of the National Curriculum – it is also one of the great national hobbies, and is right up there with angling and gardening.

All the more surprising, then, that there has not been a really versatile star-mapping program available for the Arc: something that would suit all the different astronomy 'users', from education to comet-seeking, variable star studies or casual interest. All such programs to date, many of which are very good, are nevertheless limited in range.

Clares is now attempting to fill the gap with *NightSky*, the first all-purpose astrographic program I've seen. You can tell that this one is loaded with features; the pre-release version I reviewed came with a 116-page manual (also prerelease) and, if you want to get the best out of the program, careful study of this well-written document pays dividends.

The program itself comes on two discs. One contains the main application, the other, the resource disc, contains example files for you to Star-gazing isn't just a national pastime it is an integral part of the National Curriculum. Fin Fahey looks at a pre-release of Clares' NightSky

examine plus a really sensiblysized star catalogue – no less than 26,200 objects – that will not fit on the other disc. All these files can be very readily transferred to your hard disc. The inclusion of

this catalogue alone means that *NightSky* will be the first program to be of serious interest to telescopic observers; it means that all stars down to magnitude 7.33

are visible, in other words all the stars visible with small binoculars.

Once loaded onto the iconbar, you get some immediate action out of the program by clicking Select. This is, initially, bewildering; you are faced with a four-option menu. Ignoring the details and clicking on Here: Now – which means night sky as indicated by the system clock and seen from Northwick in the UK – the program gives a circular star-field using the default (middle-sized) database.

Stars are unfussy blobs

shown in a variety of colours corresponding to their spectral types, but a beginner could find this first view confusing, since the names of prominent objects (planets

and bright stars) and abbreviated names for the constellations are in tiny (six point) letters. Don't be intimidated by this; it can be altered and we should be thankful there are names on the map at all. As far as I know this is the first commercial program with maps with proper labelling.

The most important thing to learn next is how to move around the map. All the buttons have functions here. Clicking Select will give you a box showing information on the object nearest the pointer, while Adjust recentres the map on the pointer position. Menu gives you access to a wide range of program functions.

An easy zoom facility is included; if you hold the Select button a little longer, a rectangle appears when you release the button. This can be expanded or shrunk using Select and Adjust, while Menu then performs the Zoom. This is pushing the limits of Risc OS compliance, but in all fairness, once you get used to it, it is hard to see how a simpler way of exploring the map could be arrived at.

The Menu button gives you fast access to a range of program functions. The current map can be saved or printed. *NightSky* doesn't support printing itself, but the Print icon is simply dragged over to *Draw* or *Paint* and the map printed from there. The result looks very professional indeed.

Faced with initial confusion, the Find option is very handy. This will tell you where a given planet or star is and show them on the map along with information. I particularly liked the star finder box, where most of the brighter stars can be selected by clicking either on the appropriate Greek letter or constellation abbreviation. It's good to see a program using real Greek letters instead of English translations, too.

Realtime is another versatile option. This will automatically update the map every 10, 30 or 60 seconds to reflect the changing sky. The steps you choose can be anywhere from a minute to 10,000 years. The latter allows you to observe how the axis of the Earth precesses, how the stars move through space and the shapes of the constellations change. Pressing CTRL-R, reverses time and lets you watch things backwards. With all this going on, Lock is a useful tool. This takes you to the Find menu, with the difference that all successive 'realtime' maps are centred on the object you select - useful for keeping track of planets.

Zoom is essential. If you've used the easy zoom, this is where you can zoom back out, simply by dragging a bar across. You can also quickly change the direction of view using this item.

Label means you are able to type a label of your own design on a map; this is very useful if you want to print it out and file it for later use. Map Title lets you change the information on the bar above the program and New Map gives you the same menu as Select on the iconbar.

In spite of all the versatility I've detailed above, New Map is where you discover the true range of the program. This is where you can tell the computer your position and time. Instead of simply asking you to input latitude and longitude, NightSky maintains a file of locations scattered all over the planet. The existing choices here are a little odd, and include Bled, Slovenia and Wake Island (if there's anyone with an Arc in any of these places I for apologise my parochialism). In fact the whole list has a strong southern hemisphere bias, due to John Banks, the programmer, being a resident of Brunei. No matter: you can, if you wish, your add own locations to the list.

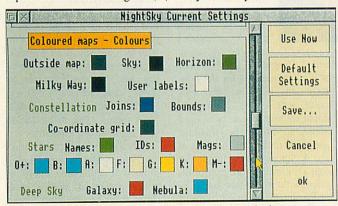
The real power house of the program is the Options menu. Mastering this is the key to getting the most out of *NightSky*. The essence of the program is, after all, to produce customised maps.

Options

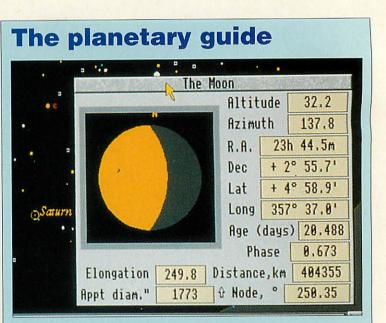
Options lets you turn on and off a wide range of features, many of which I haven't seen on a starmap program before. My favourite one is the constellation boundaries, but you can select grids for different map co-ordinate systems. These can be selected as full grid or an equator for each.

If you don't like the size of the star/planet names, this is also the place to change these. They can be displayed in a range of outline fonts or in the system font, and you can also elect to display the star's Greek letter and/or magnitude.

You can specify a limiting magnitude for names. Overdo the naming and add a whole collection of grids to the map, and you end up with an incom-



Just a small selection of the many options available in NightSky



Fast information can be also obtained on the Moon and planets without having to find them on the map. Another feature that endeared me to the program was the option to plot the paths of planets over a selected time (an analemma). This produces the sort of map often shown on The Sky at Night with the looping path of the planet shown against the background of stars with regular time markings.

prehensible scramble. It would have been nice to have a feature that linked the name limit to zoom level, so as you zoom in, the more stars will get named.

Further features you can toggle are the constellation outlines and boundaries and 'deepsky' - a file of non-stellar objects, such as galaxies and nebulae, that appear on the map as square boxes.

Other important aspects of the map can also be altered, including colours of all objects; this is a particularly thorough part, where an individual colour menu can be called for almost everything. Options is also where you select the size of star database and the location file you want to use.

Finally, another couple of useful options are available from the bar menu. Precession allows you to produce a map showing the movement of the poles over a period, and Occultations – a fascinating item – compiles a file showing which celestial objects pass in front of each other over time. This takes a while to compile.

A special case of occultation is solar eclipses, and it must be noted that the program produces particularly good and accurate representations of these. In fact, accuracy is one of the keynotes throughout the program, right down to the movements (proper motions) of stars in the sky. I was unable to ascertain whether these were true (three-space) or two-co-ordinate motions which fall off in accuracy away from the present day.

A universe of detail

These are not features for their own sake; every observer or educationalist will have quite different requirements, and *NightSky* aims to satisfy them.

And it's fast. Even with the largest star catalogue selected, plotting time is acceptable -a few seconds -and with the smallest it's almost instant.

Complaints? I did feel that the program could have displayed things in a more sensible order. Star names and letters should be displayed last but in fact, if selected, constellation outlines are plotted after them, which ruins legibility.

When it's ready for release, *NightSky* will be something to look out for. With its attention to detail, it is a *tour de force*, appealing to educationalists and observers alike.

Product details

Product: NightSky Supplier: Clares Micro Supplies Telephone: (0606) 48511 Price: £79.95

220 OUTLINE FONTS £169 AND A COPY OF ARTWORKS FREE

In fact the 220 fonts comes free with ArtWorks, but it does emphasise the extraordinary value for money that ArtWorks offers.

ArtWorks has been acclaimed by numerous reviewers as quite simply the best drawing and graphics program for the Archimedes. It offers features found on no other drawing program, be they on Acorn, Apple Mac or PC computers; features such as anti-aliased drawing and lightning fast graduated fills, and infinite undo - there are far too many to list here. Recent performance figures indicate that the redraw speed of ArtWorks on an A5000 computer is as fast as an Intel Pentium based 64-bit PC - and around three to four times faster than the fastest 486 based machines.



ArtWorks is not only fast, but also easier to use than the alternatives, which makes it suitable for all drawing and illustration work, no matter how simple. Yet it also provides professional illustration tools, such as full colour separations, overprint control, CorelDraw, Freehand and Illustrator file compatibility, amongst many others.

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'Currently the leader of the pack because of its general ease of use, comprehensive nature and high RiscOS factor. A well thought out and well supported program. Recommended' - Arc World, July 1993.

The above reviewer is not alone since all the other Acorn magazines have also given Prophet excellent reviews, but the people who really know how good Prophet is are its users (who are not without a sense of humour!).

The following extract is from a recent letter: 'Just returning Prophet V1.29 for upgrading in due course. Its getting better all the time...if you could get it to go out and take photographs for me while I go windsurfing I think that should probably do it!' - E Williams, Photographer.

Compared with other accounting programs Prophet is a breath of fresh air. The few accounting terms which are

used are explained in clear English as is the illustrated 188 page manual (see the review in Acorn Computing - Oct 1992). This combined with our free telephone help line and free upgrades will help ensure you don't go wrong.

You can use as much or as little of Prophet's extensive features as you need - from simply entering your income and payments - to calculating your balance sheet and even your tax liability. (Your data can be entered in any order as sorting by date is automatic).

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Other features include Automatic Standing Orders, Multiple Bank/Cash accounts. Stock Control. Invoicing, Statements, Purchase Orders, Credit & Delivery Notes (all of which can be set

up to your own specification in Prophet's own DTP windows), Mail merging and exporting of data and reports to all the other popular packages.

Prophet is fully multi tasking and compliant with all versions of RiscOS. It will run on any of the Acorn 32 bit range of computers with a minimum of 2mb of memory

Prophet costs £199.75 inclusive of postage and VAT. An entry level version is also available for £10 inc. which includes the save option so you can really give Prophet a test drive. (the cost is refundable on full purchase).

And now..!Shares

A fully multi tasking stocks & shares program with everything you would expect except the price..just £39.95 inclusive

IShares features easy entering and editing of your data, multiple portfolios, graphs and much more. Please send for the free demonstration disc or order direct from Apricote Studios.

The current version of Prophet has a myriad of extra features based on user feedback and this combined with our policy of free upgrades ensure that Prophet will always remain the number one choice for small business accounts software on the Archimedes. There are over 500 Prophet users which include Acorn dealers such as: 4Mation, EFF, Stallion, Spacetech, Davyn, Arm-Tech, Topologika..



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THE JOURNAL OF PHYSIOLOGY

Staff Vacancy

The Physiological Society has an office in Cambridge where it produces the Journal of Physiology, the major serial publication in its field, to the cameraready copy stage.

The Society now requires an additional person to help with both soft- and hardware support in Cambridge. The appointee will also be expected to contribute to other aspects of Journal production, such as preparation of graphics, page layout, typography, and copy editing.

The ideal candidate will be adept with screwdriver and soldering iron; have experience with RISCOS 3, ArtWorks, Impression II and programming in ARM assembler; be numerate, have an interest in Science, and an excellent command of written English.

The Society offers flexible pension arrangements, childcare allowance, and a pleasant working environment.

Applicants should send a curriculum vitae, with details of referees, to:

Miss V. Penrice, The Physiological Society, St George's Hospital Medical School, Cranmer Terrace, London SW17 0RE.

Further information can be obtained by telephoning Mr C. Semmens on Cambridge (0223) 325522.

It's a year since Acorn's portable, the A4, appeared on the scene, time enough for lots of peripherals to hit the stores. Dave Lawrence and Ian Burley look at some add-ons you could get attached to

ON THE MOVE

t's been over a year since the announcement of Acorn's portable computer the A4, and it's taken nearly this long for any peripherals to appear. Now Acorn portable owners can at last start making their machine more useful and flexible and we thought we'd do a quick round up of some of the bits and pieces you can add to your briefcase-sized A5000.

ECONET

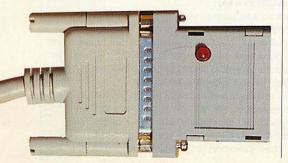
This Acorn board fits in the area above the top left-hand side of the keyboard; this whole panel unclips and is replaced by an identical panel carrying the Econet board. This plugs into a connector on the main circuit board via a small bundle of wires.

I found fitting the thing amazingly tricky, especially plugging the IDC connectors onto both boards. The connection is 26-way, but each 'way' is an individual wire; a ribbon cable would have been less bulky and possibly easier to install. Once in though, the whole panel clips down and is effectively invisible.

External connection is via a micro-Din (like those used by mouse and keyboard) and a suitable lead of a useful length is supplied that will plug into a normal five-pin Din Econet junction box. Strangely though, this lead plugs into the portable upside down.

Risc OS 3.1 recognises the Econet hardware and will automatically start up the desktop net filer; from here you can access fileservers, run a Level 4 fileserver or whatever, in the usual way. I

could find no fault in the operation of the Econet and found it to be a very useful addition to my portable, especially as a quick way of backing up important work onto my main machine.





Product Details

Products: A4 Econet Board (£50), A4 Carrying Case (£35) Supplier: Acorn Computers Ltd Tel: (0223) 254254

Products: Pocket Ethernet Adaptor (£199), Pocket SCSI Adaptor (£49), Hi-point Trackerball (£49.95) Supplier: Atomwide Ltd Tel: (0689) 838852

All prices are excluding VAT

POCKET ETHERNET ADAPTOR

If you think Econet is old hat, perhaps the Atomwide PEA is for you. All it needs is a bidirectional parallel printer port, so it is actually suitable for any of the modern Acorn computers (A5000 and later) as well as the A4. To keep power consumption down, an external power supply is provided, of great value in a portable, where battery life is a major consideration.

Two kinds of Ethernet socket are available: 10Base2 and 10BaseT — you must specify your choice when ordering. Installation couldn't really be easier; fold down the back panel and plug in the adaptor. Once the relevant software has been set up you are free to communicate via

AUN to an AUN server or via NFS to a Unix box in exactly the same way as with an Ethernet podule. You can expect a peak transfer rate of about 200K per second.

HI-POINT TRACKBALL

Acorn toyed with many mouse replacements while designing the portable, but couldn't find anything wholly satisfactory. The simple cursor key and QWE mouse emulation is fine if you just plan to write page after page of text, but as soon as you start to need to move windows about the desktop and so on, the old left thumb starts to get a little sore pressing FN all the time.

> Atomwide has filled this niche with an adapted PC trackerball, the Hi-Point 'mouse'. A fair amount of internal work is needed on the trackerball (including such obvious things as a new connector) before it will work as an Acorn mouse, but Atomwide carries out all the necessary tasks. The device sits comfortably in the crook of your thumb and forefinger: your thumb rolls the small ball and operates the top-mounted Menu button; your finger

presses a side button forward for Select and backward for Adjust. This

takes a little getting used to, but I think after half an hour you'll wonder how you lived without it. A clip is supplied so the trackerball can be fixed the side of the

A4, but I found this got in the way and it was easier to leave it off.

POCKET SCSI ADAPTOR

The most obvious missing connector on the portable is for any form of external drive for back-up purposes. Enter the Atomwide PSA.

As with the PEA, the PSA requires a bi-directional parallel port. There are three varieties: SCSI only, SCSI and printer and dual SCSI and printer. The first (and the one on test here) is tiny: only the size of an Impression dongle.

Again, no power is taken from the A4. Instead, the necessary current is drawn from the SCSI bus itself; a telltale LED should illuminate when the adaptor is connected to a SCSI device. Software support comes in the form of an officially-licensed version of Acorn's SCSIFS and CDFS with a few extra twiddles. For example, on start up you need only run the application BootSCSI, which queries the bus and finds out what drives are connected, then adds the correct number of filer icons to the iconbar.

With the PSA I had I successfully connected my A4 up to the internal SCSI drives on my A5000 and as long as neither machine had cached data, I could read and write the drives concurrently. Another invaluable accessory.

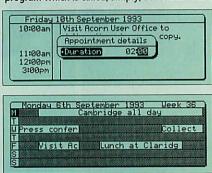
ACORN CARRYING CASE

The problem with all these adaptors is you need some bloody big pockets to carry everything around in, so Acorn sells a carrying case. It can carry the A4, its power supply and lead, and a mouse (or trackerball). It even has pockets to hold about 15 discs - who could ask for more?

Pocket book

There is a very serious computer hidden away in the tight confines of an Acorn PocketBook. There is ample evidence of this in the applications compatible with the PocketBook: most of them developed originally for its Psion Series 3 sibling. Here we look at some offerings from Widget Software, but first a mini-review of the new PocketBook personal diary and scheduler: Acorn Schedule.

One of the most important features missing in the PocketBook, Acorn's version of the very successful Psion Series 3, has been a diary/scheduler. Now Acorn has produced its own program which is called, simply, Schedule. This is a variation on the theme set by the Series



3's much-praised Agenda. Both store daily diary entries with appointment details and durations, show monthly calendars, week-at-a glance schedules, and incorporate to-do lists.

Both applications have daily notepad pages, though Agenda incorporates these on one screen whereas Schedule separates them. The notes page in Schedule is untitled, which could be confusing for a new user. Note entries can be repeated daily, weekly, monthly or forever. Alarms can be set in the

ACOTD

2

1

daily diary/scheduler as well as the to-do and daily notes pages and, like Agenda, alarm settings show on the clock application too. Pocket Book

Acorn

A big difference between the two is the weekly schedule display. Schedule uses a horizontal bar-chart system with the first

few letters of the appointment entry showing through - the longer the appointment duration, the more you see. I can imagine users, like students or teachers, quickly using abbreviations to fit inside the windows, like classroom numbers or subject codes.

I liked Schedule very much: high praise from someone who uses Agenda every day. I wondered if the internals of Schedule were from Psion with a new front end, but Acorn tells me it was entirely developed in-house. Next, I'd like a follow-up Risc OS version for easier management of Schedule's facilities, downloading updated Schedule files across A-Link.

Acorn Schedule is just what PocketBook users have been waiting for and probably has the edge over Agenda for school timetable type needs. At the introductory price of £19.95 Acorn Schedule should be snapped up fast before the price reverts to £49.95 in October. Even better, perhaps Acorn should include Schedule as standard, in the PocketBook's built in software, like Agenda in the Psion Series 3.



Other programs

Now for some PocketBook-compatible applications from Widget. Widget is probably the best known independent software house in this market. Two of its best selling applications are Finance

Pack 3 (£59.95 + VAT) and Series 3 Tools (£49.95 + VAT).

Finance Pack, shown above, is a bank account management utility capable of looking after up to 24 accounts, 24 transaction types and 24 standing orders per data file.

You can also set up 24 different report or statement types per data file. The program can emulate your bank account down to details like auto-incrementing cheque numbers. The package can be used for ordinary accounts as well as credit card or building society ones and warnings can be set to trigger if your balance exceeds a certain level.

Series 3 Tools is a suite of four useful utilities to make life with your PocketBook a little simpler. Power Check shows battery consumption; File Manager is just that, a utility showing the file tree structure of your machine's internal and SSD external drives. Task Master is a to-do list application. Finally, Convert is a multi-purpose unit conversion utility. Widget Software is on (0438) 815444; Acorn Computers on (0223) 254254.

Video and Graphics from Wild Vision

Designers, manufacturers and purveyors of fine expansion cards for the Acorn range of 32-bit microcomputers*

Wild Vision Digitisers

Hawk V9 Mkll

The *ultimate* real time colour video digitiser: in designing the Hawk V9 MkII, Wild Vision have drawn on years of image capture expertise for the Acorn platform. State-of-the-art technology provides hardware processing capabilities *unique* to the Hawk V9 MkII, ensuring you get the image *you* want. Plus, high quality software is provided enabling still images to be grabbed in a variety of formats, including greyscale. Whether you need images for Art, for DTP or for presentations, chances are you need the Hawk V9 MkII. Price £269.00¹⁹⁴

GreyHawk

Wild Vision's DTP¹ video digitiser! GreyHawk is the ideal image capture medium for DeskTop Publishing work. Coupled with Computer Concepts' ScanLight Plus application, GreyHawk offers true 8-bit greyscale video digitising in real time. Processing options include, *blur, sharpen, rotate, crop*, and a host of other operations. The perfect compliment to Wild Vision's colour digitiser range, GreyHawk has been designed and manufactured using the latest technology. It offers 256-greyscale functionality without compromising on performance or flexibility. GreyHawk is also excellent value at an introductory price of only £99.00**

> Wild Vision Genlock and Overlay

Chroma-Genlock

Calling all budding Spielbergs! Unleash your creativity! Wild Vision's Chroma-Genlock lets you superimpose computer graphics onto video to achieve effects like captions, credits and animation. A software application, !SideShow, is included with the genlock card to enable you to overlay text, drawfiles and sprites created in !Draw. The card is also compatible with other software titles. Suitable for use with all Acorn 32-bit machines^{##} Price £215.00^{**}

> Wild Vision Graphics

ColourCard

Graphics handling that *no-one* should be without. ColourCard offers more speed, more colours, more resolution and less screen flicker. It is suitable for Archimedes 300/400/500 series machines^{tt}, the A5000 and A3000. Screen update speed is configurable to 12 or 24 Mhz, broadcast resolution PAL modes are provided for your video needs, and 32000 colour modes provide excellent preview facilities. All this on one card – at one price. £249.00⁴⁴

The above cards have all been designed and manufactured to comply fully with Acorn specifications for expansion cards. In particular, please note that the GreyHawk, in contrast to some other low-cost digitisers, has been crafted to these specifications and meets the very highest standards of production. Software for all the above products has been developed in conjunction with Computer Concepts.

- * Excluding the A4 computer
- ** Price excludes carriage and VAT
- DTP: Digitising to Perfection!
- ¹⁷ Early machines may need a genlock header fitting see your local dealer for details

Also available from Wild Vision

Chroma 150 PAL encoder unit: record your computer output to video	£185.00**
• A3000 Expansion Box: use up to three Archimedes expansion cards with your A3000	£139.00**
 Hawk V12 Video Framestores: convert your Archimedes into a high performance image proc system 	
 ADC1208 range of analogue to digital converters: data acquisition tools for a variety of scient from 	tific applications \sim .
Chroma 250/350 enhanced performance genlock cards	

For more information on any of the above, contact Wild Vision



WILD VISION 15 Witney Way, Boldon Business Park Boldon Colliery, Tyne & Wear NE35 9PE England. Tel: 091 519 1455 Fax: 091 519 1929

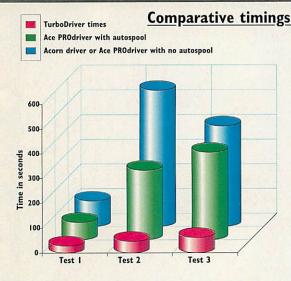
FEATURES

he range of TurboDrivers has expanded to include versions for the Hewlett-Packard DeskJet and LaserJet range of printers, as well as the Canon bubblejet range. The latest release 3 versions are now fully RISC OS 3.1 compliant, offer new advanced features and are faster than ever before.

The bottom line is that if you value your time, the TurboDrivers are for you - they can render pages and give control back typically at between three and ten times faster than Acorn printer drivers or Ace PRODrivers. Indeed once the image has been rendered then the printing continues entirely in the background - as fast as the printer will go. This makes a large difference for just one page and an enormous difference if you are printing more than one copy of each page.

- Full 24-bit colour support for Canon BJC-800 and HP DeskJet colour printers.
- Three or four colour separations even for mono printers.
- Extensive halftone screen control different screen types, angles, screen density; features you would normally only find on expensive PostScript printers.
- Print from file entirely in the background.
- Fully RISC OS 3 compatible works with !Printers and supports rotated text and sprite printing, multiple printers etc.
- By far the fastest printer drivers available for Acorn 32-bit computers - see chart.

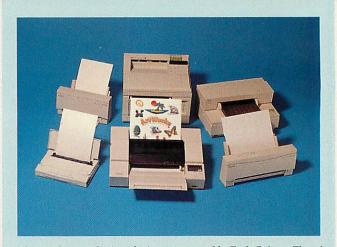




Test1 - A single DTP page of text and scanned graphic images **Test2** - Two copies of a three page text and graphic document **Test3** - A complex full page of graphics from ArtWorks.

The timings indicate the time in seconds to get control back. All tests performed on HP DeskJet 500 printer using a 4Mbyte A440 with an ARM3 fitted. Other machine combinations show similar performance gains.





Illustrated are a selection of printers supported by TurboDrivers. There is constant development in driver support so please contact Computer Concepts for details of latest printers.

Canon TurboDrivers £49 + VAT (£57.57 incl.) (supports all BJ-10, BJ-200, BJ-230, BJ-300 and BJC-800 printers)

HP TurboDrivers £49 + VAT (£57.57 incl.) (Supports all monochrome and colour DeskJet and LaserJet printers)

Please specify printer type when ordering. The BJ-230 and all HP TurboDrivers are only suitable for RISC OS 3.1 machines. 2 MBytes required.

Gaddesden Place, Hemel Hempstead, Herts HP2 6EX Telephone 0442 63933 Fax 0442 231632

Picture this

you hose of who struggled with glue, scissors and photocopiers before the advent of desktop publishing will no doubt have come across the Letraset[©] catalogue with its collection of transfer sheets depicting groovily-dressed people in 'everyday' poses. These pictures could be regarded as the first items of clipart.

Unless you were blessed with some artistic ability, it was the only way of illustrating newsletters or other documents. You also had to make do with whatever was on the sheet, unless you had a go at DIY surgery and tried to cut up and reassemble the bodies.

Today, thanks to the computer, clipart is readily available. It's simple to use and, most importantly, easy to edit to get the picture you want. Clipart (especially vector-based pictures) can be scaled, rotated and generally cut up to suit the task in hand. Any picture or design that can be dropped or Whether you are designing a letterhead or producing your own magazine, clipart gives you strong visuals at the click of a mouse. Rob Miller looks at some choices

incorporated into a page can be regarded as clipart.

There are two distinct types; bitmap (or pixel-based) and vector (or line-based). On the Archimedes, bitmap clipart will include anything made up of pixels (sprites, in other words) while vector clip art includes *Draw*, *Vector* and *Artworks* files.

On other computer formats such as the PC and Mac there are numerous other standards, but all fall into one or other of the two groups.

What is there?

Think of the most bizarre thing possible (then double it) and there's likely to be a piece of clipart relevant to it. Everything from aardvarks to zygotes is covered in one form or another.

The way *Draw* was designed means it is relatively simple to port clipart across from both PCs and Macs.

Alien bitmap formats are also catered for by applications such as *ChangeFSI* and *Translator*. These allow a large amount of PC and Mac bitmap clipart to be transferred across to the Archimedes.

How to get it

to

Because of the huge amount of clipart, the compact disc (CD-Rom) medium is often employed to store files. This offers the benefit of being able to have a complete

library (up

650Mb) on one disc. A number of clipart suppliers use CD-Rom for storage though most still use floppies because not everybody has a CD-Rom drive, and often the size of the library does not justify the transfer to CD-Rom.

Because there is so much clipart, it's impossible to cover it all in an article such as this. Having decided to concentrate on floppy-based clipart in this article. we picked eight general topics and selected what we regard as the best of each. We considered quality of clipart, and value for money: how much you get on a disc.

Some categories had lots of entries while others had only a few; dinosaurs, for example, were very popular. A full list of all the clipart supplied is provided on this month's subscriber's disc to give a clear idea of everything available.

SIGNS AND SYMBOLS

1. Desktop Projects - Special Art: Signs

This collection of four discs contains virtually every sign you could imagine from warning signs to general signs dealing with safety.



Most designs are based on real signs so files could be printed and used around schools and offices. Desktop Projects *Road Signs & Symbols* discs contain a useful selection of symbols.

2. Matt Black – Image Club Disc 23: Borders & Ornaments

Borders & Ornaments is definitely more of a decorative pack and includes all manner of squiggles and patterns. The quality of the files is excellent and files on the discs are ideal for giving your work an established look. A lot of the designs are based on old woodcuts and the contrasting black-and-white effect is reproduced well.

WILDLIFE

1. DEC_dATA – Animals of the World

DEC_dATA carries a large range of clipart based on nature and wildlife in general. Animals of the World contains a mixed selection of sprite and Draw files,

illustrating many animals including lions, elephants and pandas. Other discs in the natural history section include Ponds and Birds of Prey.

2. Desktop Projects - Bright Ideas Disc 5: Bugs

to Slugs If creepy crawlies are your thing, Bugs to Slugs is an ideal choice with over 50 Draw files covering various beetles, flies and bugs. All the drawings depict real insects, so this disc could prove useful for school work or actual case studies.

PEOPLE

1. Matt Black – Image Club Disc 18: Celebrity Caricatures

Caricatures make ideal territory for clipart and this collection of four discs contains 100 of them.

All files are in *Draw* format and have been humorously created by a number of artists. Because the files have been converted from the PC, many of the people depicted here are Americans although most of them should still be familiar and recognisable to a British reader.

2. Sherston - Split an Image

Another collection of caricatures, this time drawn specifically for the Archimedes and therefore mostly native to this country.

Like other Sherston clipart collections, *Split an Image* includes various bits which you can stick together to make your own clipart. All of the clipart is in *Draw* format.

HISTORY

1. Anglia TV – Most of its clip art collection.

The majority of Anglia TV's clip art collection has a historical theme so it's difficult to pick out one particular set. Topics range from dinosaurs to the Second World War. All the files are in *Draw* format and most include a few lines of text describing the illustration.

2. DEC_dATA -Extinct Animals

Dinosaurs had to make an entry and DEC_dATA's collection *Extinct Animals* is one of the best. *Draw* files of dinosaurs and skeletons are included.

A special size comparison chart is included (as a *Draw* file) that

shows you the size of a man in scale compared to the beasts. Typical everyday DRESS of the wealthy.

and a barrier



1. Desktop Projects - Bright Ideas disc 2: Transport



Cars, boats and planes all feature in the Desktop Projects *Transport* disc. All files are in *Draw* format, most are in colour and depict real vehicles. The detail on some is excellent, especially the steam trains, a popular subject in clipart.

2. DEC_dATA -Steam Trains

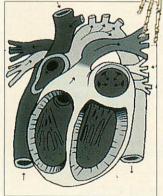
DEC_dATA's Steam Trains disc has a good crosssection of locomotives from Stephenson's Rocket to Mallard. All pictures are in Draw format and all include a few lines of facts and figures regarding each train. Colour and shading are used well throughout all the pictures.



1. SSERC – Any of its clipart library

The SSERC library of clipart deals exclusively with science and technology and contains a vast resource of material suitable for science applications in schools and colleges. Pictures consist of both sprite and *Draw* files and cover subjects such as chemistry, physics and biology, as well as general technology.

2. Matt Black – Image Club Disc 24: Science & Nature



Everything from anatomy to zoology in this collection of 200 *Draw* files. Most would be ideal for illustrating scientific work. The collection is another import from America, so expect lots of pictures of the Space Shuttle.



1. Matt Black -Vanguard Pack 1

In addition, any of their Image Club miscellaneous discs. There's not much you can sav about miscellaneous clipart that it except covers just about everything you could think of. The Matt Black discs are some of the best around and contain lots of images of genuine use. Unlike most of the discs available on the market, a few Artworks files are included, which are very good indeed.

2. ABC Art – All its discs

I almost chose these discs for first place is the miscellaneous section,

but didn't as they contain only Artworks files.

The quality of the pictures here is quite superb and the artist has obviously spent a great deal of time on them.

These two discs represent 'A' and 'B' in the collection and 'C' to 'Z' should become available over the following months.

		, , ,	where to go a			
	2					
COMPANY	PRICE	PICS PER TITLE	TOPICS(2)	TITLES	RATING	DESCRIPTION
ABC Art Fideways, South Rd, Brean, Somerset, FA8 2SE	£8	15	Miscellaneous	2	****	Miscellaneous ArtWorks files. Each disc has a letter theme
Anglia TV (0603) 615151	£12	30	Mostly history	18	***	Mostly monochrome Draw files
DEC_dATA (0392) 221702	£6-£20	25	Various subjects including Nature & History	55	****	Mix of sprite and Draw files covering many themes
DeskTop Projects 061-474 0778	£8-£20	50	Various subjects including Sport & Entertainment	13	****	Mix of monchrome and colour Draw files
Honormead (0332) 510951	£25	Aprox 50 per disc 300 per collection	Two libraries covering various topics	2	***	Mix of sprite and Draw files suitable for younger age group
Matt Black (0733) 315439	£30	100	Various subjects including People and Business	24	****	Monochrome Draw files converted from Aldus EPS format. Vanguard Library consists of Draw and Artworks files drawn on the Arc
MicroStudio (0353) 720433	£20-£30	70 – 350	Various subjects	20	***	Mix of sprite and Draw files
VW Semerc 661-627 4469	£12	50	Various subjects suitable for class work	15	***	Mix of mostly colour sprite and Draw files.
David Pilling PO Box 22, Thornton Cleveleys, Blackpool	£6	300	Miscellaneous	6	***	Mix of monochrome sprite and Draw files
iherston 0666) 840433	£17	50 - 120	People, Food & Christmas	3	****	Colour and monochrome versions of Draw files, plus scenes to incorporate them in
5mart DTP 0332) 842803	£18	300	Miscellaneous	1	****	Mix of monochrome sprite and Draw files
SSERC 031-668 4421	£12	50	Science and Technology for	15	****	Draw and sprite files

SUBSCRIBERS ONLY: A full listing of all the clipart titles available for the Risc OS machines, including those released on CD Rom, can be found on this month's subscriber's disc.

Pro-Pad For those who are into serious game action... ELECTRONICS For all A3000 & A3010 users **21Mb Internal** HardCard £179 **40Mb** Internal HardCard **60Mb** Internal HardCard £259 ■ Fully compatible with: A3000/A3010/A3020 A300 Series R.R.P. £45 + VAT 84Mb Internal A400 Series A500 Series HardCard Really easy to use E289 Game database - stores information on high scores, cheats, etc Easy to set up - press button on pad press key on keyboard to set Set JoyPad buttons to do any other button, e.g. one button for fire, one button for bomb, one button does both! A3010 2Mb It's the new style in the games world inc 21Mb H/D 2559 introducing the new JOYSTEP The joystick interface for those who are into game action... A3010 2Mb inc 60Mb H/D Fully compatible with: A3000/A3020/A4000/A5000 £649 A300 Series A400 Series R.R.P. Joyster £29 + VAT A500 Series R.R.P. Joystick £9.99 + VAT Easy to use A3010 2Mb ■ Game database – stores information on high scores and cheats, inc 84Mb H/D etc £679 Simple to set up just press button on joystick and press key on keyboard Hardware and software supplied in packaging suitable for show-All prices + VAT room presentation Can use one or two joysticks at any time. Suits any Atari style joystick Memory £25 2-4 Mb £49 1-2 Mb **£POA** 1-4 Mb 2-4 Mb £49 **£POA** ELECTRONICS 1-2 Mb £25 1-4 Mb 1-4 Mb **£POA** 65A MIDDLE HILLGATE

from small seeds... ...grow mighty Acorns



STOCKPORT SK1 3EH

Desktop Tracker £49.95

"...programming at its best" - Acorn User January 1993 Continuing in the tradition of the immensely popular Tracker package, use Desktop Tracker to create fantastic tunes with no extra hardware.

Desktop Tracker has been completely re-written to incorporate many new and innovative features:

- Up to 16 tracks
- Fast playroutines
- 4 effects per note on each track, allowing up to 64 simultaneously
- Real time effects include pitch bend, arpeggio, volume
- slide, phasor effects, note retriggering and many more.
 Powerful editing facilities, including transpose, cut and paste, echo and more.
- Score display allows you to see your tunes and samples in traditional stave notation format.
- Public Domain playroutines and jukebox to allow tunes to be played on any machine.

Printer Port Sampler £39.95

Compatible with all Acorn machines - plugs into the Parallel Printer Port.

"Pulse" software provided includes the following editing features - fade in/fade out, over and under sampling, zoom in/zoom out, save and edit marked section, play forward or backwards at normal or high speed.

Save in various file formats - Armadeus, Tracker, Sound Module.

QD Bug £69.00

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VI

for more info.

VERTICAL TWIST

and orders contact:-

Albany House Oving Road, Chichester West Sussex PO19 4BH

> Tel: (0243) 531194 Fax: (0243) 531196

> > designed &

developed by:

"...a must for assembler programmers, and comes very highly recommended" Archimedes World May 1993. (overall rating 95%)

QD Bug is the definitive debugger for all ARM coders both beginner and expert. It has many powerful features including: single stepping, skip and force instructions, SWI history lists and trapping, customised flexible windowing system, view BASIC sources and text files from within the program, keypress emulation with macro record and playback.

Please contact us for further details on QD Bug.

SCSI Systems

Using High-Quality Conner, Quantum or Maxtor drives. All systems are CDFS ready and are Acorn compatible. Internal Systems (300/400/5000 series) 85Mb + 16-bit fast SCSI card with userport - £289 120Mb + 16-bit fast SCSI card with userport - £319 213Mb + 16-bit fast SCSI card with userport - £419 Add £75.00 for external A3000 solution. Call us for the latest prices - they could be lower!

A5000 Extra IDE Drives

Includes all necessary cables and fitting instructions. Using High-Quality Conner, Quantum or Maxtor drives 170Mb £219 250Mb £319

Call us for the latest prices - they could be lower!

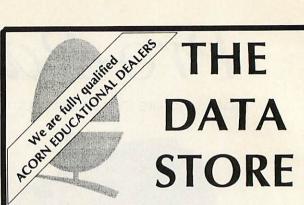
ARM3 35Mhz £219

Turbo charge your machine, capable of nearly 15MIPS. A limited number only manufactured, so this offer is limited to stocks.

Please add £9.00 delivery for hard drives and £2.00 for all other products. All prices exclude VAT

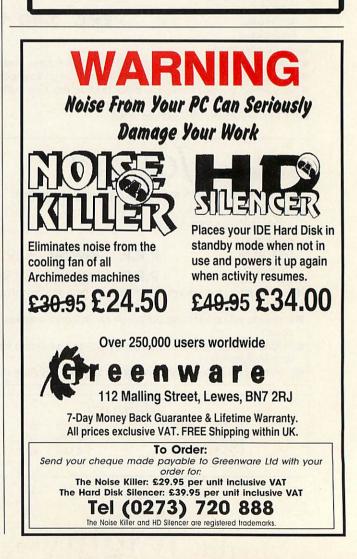


cal Twist



Whether you want the latest game, advice on what to buy, technical or programming information, repairs, spares, or just a pleasant chat about what's new, you'll always be welcome to drop in to see us. You never know, you might spot something unusual amongst our full range of peripherals and software for all Acorn computers. But if you're too far away, why not try our mailorder service? After all, we're celebrating our tenth anniversary this year, so you'd might as well make use of our experience!

6 CHATTERTON ROAD, BROMLEY, KENT BR2 9QN Tel: 081-460 8991 Fax: 081-313 0400



IN BRIEF

We take a look at the first commercial version of Warm Silence's public domain backdrop package and not-just-another-multipurpose-text-editor from Stallion

LARGER

Supplier: Warm Silence Software, c/o Robin Watts, St Catherine's College, Manor Road, Oxford Price: £10 (includes site licence)

I've been using *Larger* in its public domain form for as long as I can remember. Now, author Robin Watts has released it commercially.

Larger is the backdrop application to beat all others. Forget Acorn's Pinboard – *Larger* has far more features than any other program on the market. It's impossible to cover everything here, but...

Larger does everything Pinboard does, and its display is far neater. You can optionally display plinths behind icons on the backdrop for a professional

節業の	Window Map					
			Larger	Larger Info + Save + Load +	Desktop	
07-93			Options + New Backdrop + Open Parent	Desktop User Hap Config	Hone Retrieve Cycle Windo Cycle Mindo	
Letters	Files Filing		Art	Quit	Inpress ABI.	2 IOvation
l6rab ?	Pix	HotKeys Hide Task	Shift-Tab		2/	Thesauru •
ChangeFSI	IBRUList Killer	Set CSD Cycle Hindows C Cycle Tasks	Ctrl-Tab trl-Shift-Tab Print	Load Save	IDeskEdit ForePrnt	!TextRid !FormEd
IfircScan	FastHipe	Front Key	Insert N	OK	Rulers	PlateRea
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Larger in action, showing the window map and the options window

look, and icons can be automatically organised (so applications and directories are forced to any side of the screen you wish). The backdrop acts like the Filer, with a similar menu structure, reducing the learning curve drastically. One excellent feature is the ability to create separate backdrops, which appear on the backdrop like iconised windows; doubleclicking on a backdrop brings up a new layout, so you could have one backdrop for DTP, one for graphics and so on. You can iconise windows in the usual way, and iconise all windows from one application.

The second major feature is the one that gives the application its name: it provides a *virtual desktop*. This increases the desktop so windows can be moved off-screen. To prevent you losing windows there is a map showing where other windows are at any one moment.

Calling it a sticky backdrop program hardly does it justice. For a tenner, this is one of those applications you can't afford to miss. If this doesn't become the *de facto* backdrop application, I'll eat my shorts. Mark Moxon

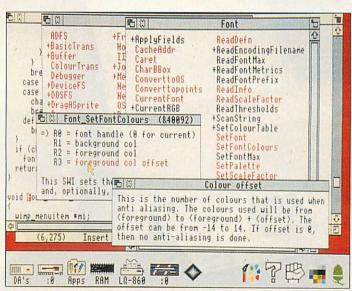
STRONGED

Supplier: Stallion Software Tel: (0225) 339090 Price: £30.20; twoto threeuser licence £47

Room for another multi-purpose text editor in the Acorn market? No chance. Then I tried *StrongEd* for five minutes. And it's one of those pieces of software that makes you say: 'why didn't anyone else think of that?'

Like *DeskEdit* you have a choice of mode, depending on whether you are working in Basic, C or whatever. In Basic there are 'RUN' and 'SAVE and RUN' keys, and another to list DEF PROCs and FNs. In C there is also a key to list functions, plus others to pass your file directly to the compiler. If you're ambitious, customise modes, or create a new one.

Keyboard short-cuts feature heavily and make editing much



The words in red in the help window can be clicked on for additional help

easier (and mouse free). Simply being able to highlight a block of lines by holding down ESCAPE and using the cursor keys is a treat. Indeed, *StrongEd* seems built for people who use editors a lot. The interactive search option offers 'search-as-you-type' and remembers previous searches so you can page up and down. A major selling point is sister application *StrongHelp*, which comes free and offers help on Basic, SWI calls and hardware addresses. Any red words in a help window may be clicked on for more help. Click on *SWI* for a list of SWI groups, then on *OS*, then *SpriteOp*, then *Reason code* for a list of sprite op calls. Extra help, including C, will be sold separately.

Some other features deserve a mention. You can save the current arrangement of viewers, rather like saving the *PinBoard* and can also do a global search & replace that affects *all* loaded text files. Whenever you close a bracket the corresponding opening bracket is highlighted – a brilliant idea, particularly for C.

StrongEd is an excellent piece of software. I think programmers will be particularly impressed with it and it has definitely become the standard to beat.

QUALITY & SPEED

he BJ-200 and BJ-230 are the latest black and white printers from Canon, the market leaders in bubblejet technology.

The BJ-230 is an A3 version of the popular BJ-200. Both printers come with a built-in 80 page sheet feeder and power supply. With a print density of 360dpi the print quality of both these printers is hard to distinguish from a laser printer and better than any other competing black and white inkjet printers. A sample A4 print out is available on request so you can make the comparison. And like all inkjet printers they are whisper quiet and both easy and cheap to maintain.

Both printers are supplied with Computer Concepts' super-fast TurboDriver printer drivers - printing and returning control on average between three and ten times faster than the standard Acorn drivers or the Ace PROdrivers. The RISC OS 3 versions of the TurboDriver also support rotated text and sprite printing, multiple printer icons on the icon bar and full PostScript style control over halftone screen density, screen angle and screen type. They can also handle 24 bit CMYK colour separation and so colour prints can be obtained by using colour inks and passing the paper through four times.

NEW A3 EW LON MODE



We are so confident about these printers that we will guarantee that this combination of TurboDriver and BJ-200 or BJ-230 is the fastest, highest quality printer available for less than a laser printer, or your money back.

Price:

 $\begin{array}{l} BJ-200 \ \pounds 275.00 + \pounds 10.00 \ p\&p + \mathsf{VAT} \ (\pounds 334.87 \ incl.) \\ BJ-230 \ \pounds 319.00 + \pounds 10.00 \ p\&p + \mathsf{VAT} \ (\pounds 386.57 \ incl.) \end{array}$

The package includes the BJ-200 or BJ-230 printer with TurboDriver software, a cable, sample A4 sheets of special high quality inkjet paper.

THE REVIEWER'S OPINION

"This is probably the best inkjet printer yet. ..whether used on its own or with the excellent TurboDriver, the BJ-200 is a fast printer and the print quality is simply superb. A winner." Acorn User

" The TurboDriver excels at its task of providing quick, high quality output.." ".. In my opinion it is well worth the money and will more than pay for itself in terms of better productivity." Acorn Computing

NB: The BJ-230 is only suitable for use with RISC OS 3.1. The BJ-200 can be used with both but please specify which will be used at the time of purchase. Suitable for all models of Archimedes, but a minimum of 2 Mbytes of

RAM is required.

Gaddesden Place Hemel Hempstead Herts HP2 6EX ORDER HOTLINE FOR IMMEDIATE DESPATCH: TELEPHONE 0442 63933 or FAX 0442 231632

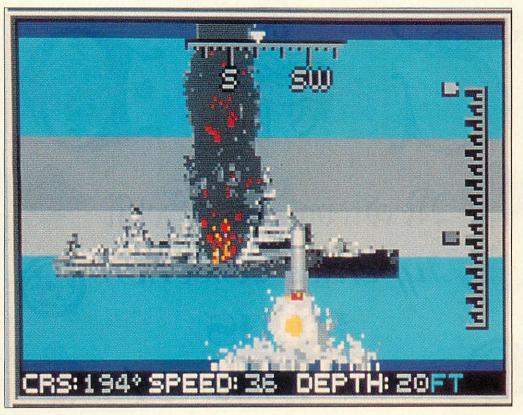
canon

t's hard not to question the sanity of someone who spends over a year re-inventing the wheel. So why release a version of the PC emulator, called *FasterPC* for the Arc?

FasterPC runs on any Arc with a couple of megabytes memory, but you need a conventional monitor or an old multisync like the Eizo 9060 which can display Mode 12. A more modern, high-quality monitor is no use – even one with PC VGA modes 25 to 28. You also need Dos: if you already have the PC Emulator, that's no problem, otherwise it will set you back £50.

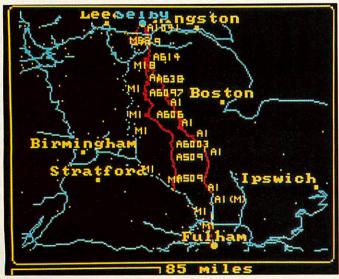
Installing *FasterPC* is simple, especially if you already have Acorn's emulator. They co-exist happily, and can share the same PC hard disc partition. Sharing with an Aleph One PC card also works, although you have to make changes to the *CONFIG.SYS* and *AUTOEXEC.BAT* files because of differences in memory configuration.

But the big question is, how does the speed compare? Running typical PC applications like *Lotus 1-2-3*, C compilers and AutoRoute, it is a bit slower than Acorn's emulator - considerably so for floating point calculations, as used by a spreadsheet, for example. It doesn't let you use PC extended memory, it doesn't run in a desktop window, and, as with the Acorn emulator, you still can't run Windows 3.1 - fitting an Aleph One card is the only way. There are no supplied utilities to transfer data from the PC to the Arc



Reinventing the whool

Who in their right mind would spend a year developing a version of the PC emulator for the Arc? More to the point is it any good, and why didn't Acorn get there first?



Not just for games, FasterPC also runs popular applications like AutoRoute

environment either, though, if you have Risc OS 3, you can open the PC partition and read its files into *Edit*.

But this isn't where FasterPC shines. It is considerably faster than the Acorn emulator when displaying graphics, and this shows best when playing games. The claim that FasterPC is nine-times faster then the PC Emulator isn't borne out for real programs, but a two-times speed improvement is realistic.

In the States, the PC has long been a popular home machine, and so the games market is healthy. The manual contains a list of games which run, including *Populous*, *Prince of Persia* (a favourite on the Mac) and 688 Attack Sub (pictured above). However, most run on the emulator only in 320 x 200 pixel mode. On a real PC, you can choose much better VGA graphics, which add to depth.

It's a wonder one person can put this together when Acorn's emulator has been five years in development. It runs some PC programs admirably but is limited for others.

Even for games, while the speed improvement over Acorn's emulator is worthwhile, the display is disappointing if you're used to VGA-type displays.

Faster PC costs £19.95 from Faster PC, 33 High Street, Farnborough GU14 6ES



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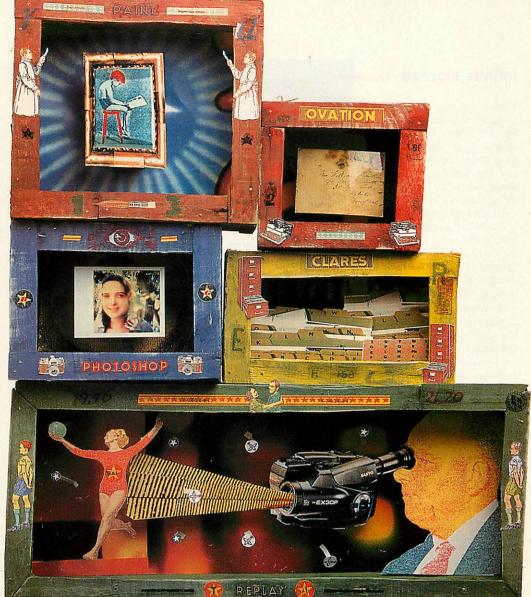
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Letraset®	Letraset® Gothic Extra Bold Shaded. £10	original font data supplied by Letraset and URW.
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STORAGE

You hate to throw anything away but you can only fit so much on a hard disc. Something's got to give. Or does it? Graham Bell looks at options for upping your storage capacity



What's in store?

Y ou can never have too much storage they say. A gigantic hard disc might look like it's stacked to the rafters with bric-a-brac, but there is always the nagging feeling the old files will come in handy. Storage is always a problem.

Arc users have always relied on hard discs for storage, and July's *Acorn User* looked at options for upgrading. But for people with specialised needs, there are alternatives.

If you dabble with Replay DIY, or even still-image grabbing with a video digitiser or scanner, then whatever hard disc you have fitted you'll run out of space. And for every big hard disc there is the problem

Acorn high capacity storage suppliers

Al Systems, tel: (0420) 561111 HCCS, tel: (091) 4870760 Oak Solutions, tel: (0954) 211760 Morley Electronics, tel: 091–257 6355 Serial Port, tel: (0749) 670058

Approximate Cost per Mb

As a rough guideline, storage costs when you get into the high capacity range work out on average as follows.

Floptical £400 + £1 per Mb Syquest£450 + £0.50 per Mb MagOpt£700 + £0.35 per Mb

of backing up: with a 40 or 80Mb drive, a tower of floppy discs is acceptable, but try that on a well-used network.

One answer is another big

hard disc. Adding a second drive to your Arc is relatively simple, particularly if you have an A5000 or A540. The A5000 can take a second hard disc below the floppy drive. Any machine with a SCSI card can also have an external hard disc. If you already have an internal SCSI hard disc, then ensure you order the right type of cable to join up any drive: various Archimedes SCSI cards use 25-way D, 50-way IDC or 50-way Centronicstype connectors.

Number the new one 1 - the internal disc is number 0 - and move the terminator to the end of the SCSI chain. With either SCSI or IDE, you can use Configure or the utility that came with the SCSI card to add the drive icon to your desktop. But a new hard disc isn't the only option.

STORAGE

Infinite storage

The answer may be one of the 'infinite' storage systems – a Syquest drive or a magnetooptical drive. Syquest drives have been available for years, and are popular in the Mac world. They are conventional SCSI hard discs, in a cheap, removable cartridge.

There are other removable hard discs too: Conner makes the whole disc and head assembly removable. Others, like Ricoh, follow the Syquest pattern. The Bernoulli disc relies on aerodynamics to draw a 'flexible' hard disc close to the read/write head when it's spinning.

In competition with these magnetic discs, there are several flavours of optical discs. The first to be developed was the WORM disc – write once, read many. These are a bit like recordable CDs. Good for permanent archiving, but not widely used.

By contrast, magneto-optical discs are rewritable. They're coated with a special material that can be magnetised. Reading the data involves a much lower-powered beam from the laser. The disc in its cartridge can be treated just like a floppy, but is more robust. And there's no need to keep it all dust-free because there's no fragile magnetic head.

These rewritable magnetooptical disc drives are available in two formats: a 3.5in, which holds 120Mb per disc, and a 5.25in, holding between 600Mb and 1.2Gb. The larger format has only specialist uses - but the 120Mb disc drives are ideal for general needs. Sony, Panasonic, Fujitsu, Ricoh and IBM are the main manufacturers and we reviewed the Serial Port MO drive last month.

Magneto-optical discs have a number of advantages over Syquest cartridges. They are considerably more robust and reliable, and can hold more data. The 3.5in discs are the same size and about twice as thick as a 3.5in floppy – a very convenient size. The Fujitsu MO drive can be fitted internally in an A5000 if necessary. And the discs are cheaper than Syquest cartridges, which soon offsets the initially higher price



Syquest drives provide a removable 'infinite' storage system

Software solutions

None of these solutions can just be attached to your Archimedes and used – Risc OS does not cater properly for removable SCSI devices, though some SCSI cards (for example the Morley card) make a better job than others. The exact problems depend on the combination of SCSI card and drive hardware you use.

Typically, a disc can be inserted and it will appear on the desktop iconbar, but cannot be successfully dismounted. With other equipment, discs can be ejected using the button on the front of the drive without the Archimedes noticing: this leads to the possibility of writing data to the wrong disc if another is inserted. All these non-standard storage systems usually need to be supplied with filing system and driver software to make it possible to switch discs safely while the computer is running.

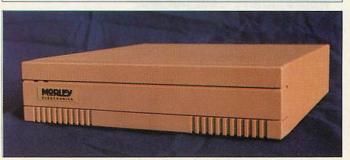


Tape streamers: a useful high-capacity option for network backup

Tape backups

For network managers, backing up a network requires a different solution. Using a second hard disc might not be secure enough. And the various removable storage systems may have too small a capacity – under 200Mb on a 3.5in MO disc. A tape drive may solve the problem.

Quarter-inch tape cartridges are available in a variety of sizes, from DC2000 40Mb tapes to DC6250 (250Mb) and beyond. DC2000s are like precision-built tape cassettes, 6120s and 6250s about twice the size. Dat cartridges are matchbox sized, but store 2Gb. And most modern drives use a standardised recording format called DDS, and incorporate hardware data compression that boosts capacity further, to 4-6Gb. Dat drives are more expensive but have higher capacities, are quicker to backup, and tapes are cheaper and more compact. No drives sit on the desktop and Morley supplies combinations of hardware and backup software.



offsets the initially higher price For some storage problems, a second hard drive is a simple, effective solution

of the drive. But since they are at heart quite conventional hard discs, the Syquest mechanisms work faster than MO drives. Read speeds are similar: 30-40ms access time and about 600K per second transfer rate. But the difference is apparent on writing, as MO discs need to be erased before rewriting.

Most MO drives then verify the new data. So up to three rotations of the disc are needed, compared with a single rotation for both reading and writing a Syquest or normal hard disc. This rules out MO discs as your primary disc with DIY Replay – you need a fast hard disc for digitising and storing the uncompressed video data in real time.

You can of course use MO discs for storing *Replay* files once they are compressed. One thing to watch for – both Syquests and MO drives tend to be noisy.

Floptical drives

The third choice could be the floptical disc drives. These devices, which have yet to become firmly established, can store up to 20Mb of data on a more or less conventional floppy disc.

How? By packing ten times as many tracks onto the disc. A normal floppy disc drive cannot read the narrow, denselypacked tracks, particularly as the disc flexes. But the floptical drive uses a laser to follow a set of concentric rings etched on to the disc, like lane markings on a motorway. This keeps the magnetic head properly aligned over the data.

Simply by switching off this servo-tracking system, floptical drives become ordinary disc drives. So they can also read and write conventional 800K and 1.6Mb ADFS floppy discs. But they are SCSIbased, intelligent devices.

The software built into the drive itself is responsible for the detailed formatting of a disc, and the commercially-available drives are aimed at the PC market: they can read 720K and 1.4Mb Dos discs without problems. But modifying the drives to read ADFS discs for the Acorn market has proved problematic. So problematic that Morley no longer provides flopticals.

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The Net/SCSI interface allows up to 7 computers (A3010, A3020, A4000, A5000 or A4) to share an external SCSI device such as a hard drive. It connects through the computer's parallel port, leaving any podule space free and also allows a printer to be connected if required.

The Net/SCSI interface can be purchased from a starting price of £99 (+VAT) per computer, for a network of 7 machines. A 100Mb SCSI hard drive is included in this cost. The Net/SCSI interface is also available singly.

Two other interfaces are available; Printer/SCSI has just a single SCSI and parallel port, and Mono/SCSI has just a SCSI port. Both are supplied with cable and fitting instructions, and cost £75 (+VAT) and £49 (+VAT) respectively.

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£15 Star letter

I am the owner of an Acorn A4 notebook. Before the release of the A4, I was considering buying a PC portable, but being an Archimedes user, the A4 was the right choice... or was it?

Its speed, performance and portability are, I feel, excellent. My main concern is its lack of expansion support. I was fully aware of the A4's limited expansion capabilities before I purchased it, but I was also aware of what was possible via its standard ports.

Like the latest fax modems (which can be used on an A4 using David Pilling's *ArcFax*) there are many peripherals available which can be connected to the serial port, or the new bi-directional printer port. Why aren't these ports being used to their full potential?

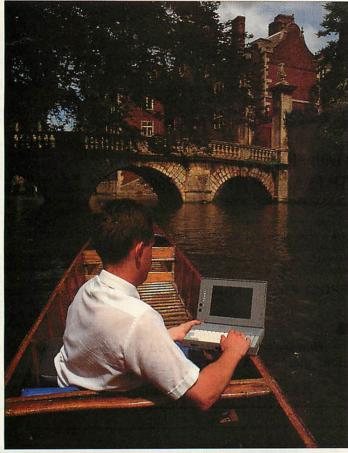
Another area for expansion is the A4's Econet interface. Vertical Twist produces a Midi interface/sound sampler that can be used in place of Econet. When I approached them for an A4 version of their product, their reply was that they were considering the possibility, but there wasn't enough demand to justify manufacturing one.

for Although designed education, the A4 is potentially a powerful business machine (I use it as one). But to compete equivalent PC against notebooks it must have a certain amount of expandability. Standard PC notebook features such as built in fax/modem, SCSI and so on somehow be must implemented if the A4 is to succeed, as must the ability to add on available peripherals.

J Imossi Gibraltar

Very valid letter, this. Since we covered the launch of the A4 back in August 1992, the only expansion products we've been able to find are those mentioned in this month's portable round-up (see page 50): SCSI, Econet, Ethernet, a trackerball and (gasp!) a carry case.

Hardly world-beating, is it? However, you can see the



The A4 portable: up the creek without a paddle?

developers' point: why spend money on creating a product for a machine which has a very small market? It's the classic chicken and egg situation: small market without expansion, little expansion with small market. Sounds very much like the early days of the Arc, in fact.

Not-so public fonts

With reference to the question from Mr Archer in *Questions* and Answers, June 1993, converting commercial Risc OS fonts for use with ATM (Adobe Type Manager) breaks the licence conditions which apply to fonts we supply. We are, of course, quite happy to supply fonts suitable for use under ATM, and indeed any font in our library can be supplied for use under ATM running under Windows 3.1.

It would be rather ironic if the fonts Mr Archer has are PD fonts, as these will have been illegally converted to the Acorn format from ATM versions in the first place, and will not be proper Acorn fonts. I was also interested to see a shot of *FontEd* on the same page displaying a PostScript font with a copyrighted name (Frutiger, copyright Linotype). The font was clearly converted from a Type 1 font, since the control points were all located incorrectly, nor did the font have any hinting or scaffolding. Does *Acorn User* promote the sale and use of illegally converted fonts?

A Timbrell Electronic Font Foundry

Absolutely not, but the above letter does show how easy it is to believe that certain fonts are public domain, even if they are available from PD libraries.

Acorn says in its *Applications Guide* that 'you may only use the [*T1ToFont*] application to convert public domain fonts.' But the problem is how to distinguish genuine hand-crafted public domain fonts from illegally converted ATM fonts: there's more to it than the name of the font file.

The last eight-bit?

The response to the 'Bye Bye Beeb' letter in the July issue was, to say the least, characteristically emotional. Try this for a selection.

'Yes, the BBC is officially dead, but while there are still quite a few people out there who are loyally devoted to their BBC micros, you can't just leave them out in the lurch. It's like leaving people out in the desert to cope by themselves just because they're pensioners and older than most people.'

M Browne, Herts 'I read with the utmost displeasure your statement that the BBC B is dead. Yes, we know that new software is not being written, but thought that those who built up their business on the original computer would not turn their backs on a good thing, as new owners would require information on problems that have already been fully covered.'

M Jeffrey, Avon 'I hope the many owners of BBC micros (including myself) who look for a magazine which will not desert them when a better computer arrives on the scene.'

J Hinks, London 'To ask contributors to provide eight-bit programs is a cop out. You have enough talent on your staff to provide eight-bit versions of your 32-bit offerings.'

T Dooley, Middlesex

It has been fun wading through the passion and intrigue, but I think nostalgia and high expectations could be clouding the issue here. The words 'back issues' spring instantly to mind: Mr Jeffrey is right that the Beeb has been covered already, so why re-publish old articles instead of new, unseen material? And almost all of our technical experts are exclusively 32-bit based now, Mr Dooley. That's progress.

We can't turn the clock back to the days when the Beeb was king of the castle, and we don't want to pretend that we can.

Memory Upgrades and applications to through a serial A3000 1-2 Mb - £53 add applications to through a serial A3000 1-4 Mb - £133 roduct codes and pormats. A3010 1-2 Mb - £35 of these. A5000 2-4 Mb - £96	Aldebaran – £2 Almanac – £6 ArtWorks – £15 Axis – £2
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GAME SHOW

Sam Greenhill updates you on releases, cheats and our competition results

f all the different types of arcade game, it is probably the horizontal shoot-emup which has caused the greatest battles between the games producers.

Programmers have driven themselves round the bend for years trying to create the ultimate classic arcade *R-Type*; the funny thing is that all of their efforts turn out to be much the same.

Nevryon was the first Acorn rendition of this type and, faithfully enough, it sported more firepower and explosions than a *Die Hard* film screened in a Russian-built nuclear power plant on the surface of a supernova. (Not that I've ever been to such a place but I reckon it would be just as apocalyptic as *Nevryon*.)

Nevryon's sequel, Technodream, had twice as much firepower as its predecessor because it was a two-player, but perhaps the game we've all been waiting for is Scorpius, from Arxe Software.

There was a time, about two years ago, when this 'mother of all *R-Types*' was nearly ready. Then, a year ago, it was *actually* ready. Well, not quite. Now, it is nowhere near ready and it seems it probably never will be.

The reason? Arxe has announced that it is no longer in the Acorn market. *Scorpius*, touted as 'the best thing since sliced bread', has turned out to be about as apocalyptic as... sliced bread.

But every cloud has a silver lining. There is a game in the ancient Amiga world which needs no introductions for *R*-*Type* fans and it's coming this way pretty soon.

Xenon 2 has the cornflake connection: the original and best, or at least that's how people remember it. It has lasers,



Technodream is the standard for R-Type clones at the moment. Not for long

more lasers, bigger lasers, more bigger lasers... the list goes on endlessly, but one thing is certain. It has cred, being one of the most popular 16-bit titles to hit the streets. Look out for it at the World of Acorn Show in October.

Behind the Scenes

Speedball 2, the ball game with the greatest violence and the fewest rules, looks like it's all set to become one of the most popular games to be released this year. Its conversion from the 16-bit world is now well under way.

Hot Goss

Excitement is mounting among games gurus following news that the biggest, most popular, game on the PC, *Wing Commander*, is undergoing tweaks and final adjustments for its transition onto Acorn format.

The blockbuster space game, with huge explosions, superfast flying and deadly missions, will be released in time for Christmas, by one of the world's leading games houses... no more for now but just remember, you heard it here first.

Competition

Yup: it's another Games Show competition – just to show you how generous we are. This time you could win a selection of the hottest hits for next Christmas and a trip to the *Acorn User* office to test them all out in this unique Game Show competition.

We'll invite the winner to the office and subject them to the fastest, most gruelling games session they've ever played with the best of this year's crop.

The winner will give each game the once over in the *Acorn User* office then walk out with a copy of each game in a bag. What could be a nicer Christmas present, for you or your family? And it's not as if the competition is hard. Just choose your all-time fave 20 games for the Acorn 32-bit range and rank them in order, number one as your best. Also state the computer you use.

Write on to a postcard or back of an envelope and send to: Twenty Games, Acorn User, 101 Bayham Street, London NW1 0AG. Entries to us by 5 September.

Cheats



Happening Zool goes mega vegan in the fruit and veg

world but do you know where he can pick up some extra bonuses? You never would have thought an innocent radish could hide much but try pulling one up – the tops poke a little way out of the ground. Just stand over them then crouch down and stand up. And if cool Zool finds four in the same place, try pulling them up in a certain sequence...



More Lemmings!

Been there, seen it, done it? I don't think so! Things can get totally, completely wired if you over-use the built-in cheat on these extra screens built into the world's most sadistic game.

We all know that the password FIDDLECODE enables you to hit the space bar and skip levels but now there's even more: Gilbert the Bionic Hamster from London has kindly left the warmth and comfort of his cage to write to the Game Show about some secret levels.

Use FIDDLECODE to activate the cheat then go straight to the last level (code GOODBYEALL). After this level you will discover 40 identical levels – skip them all – and then you will encounter ten completely new ones!

These mysterious hidden levels are all from the two-player levels on other versions of the game. You can get at them, though Acorn users will only be able to play them single handed.

But a word of warning: watch it after those ten levels – the computer bombs out and you will need to reset it.

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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.

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Comp winners

It's summer, right. That's when you crash out in the garden, watching the England cricket team doing a Norman Lamont. Yes?

Fat chance. It's all right for you, soaking up the sun and sipping your Pimms and lemonades (well, warm Coke if you're like me), but I've had to sit down and judge the *Acorn User* Design a Game competition. In this heat.

Yeah, yeah, yeah, so you want to know who the winner is. Do you realise that if you entered and you're reading this then the chances that you've won are tiny. Really miniscule. Unless your name is Mark Harold from Bromley, Kent, in which case you're about to make a lot of friends very quickly. That's because you've just won 50 games for your Acorn, including blockbusters like Lemmings, Populous, Guile and all those others ones you can't afford on the dosh from your paper round.

Fortresses

So what's so good about Mark's game *Fortresses*? First off the winner had to be attention-grabbing and addictive (unlike, for instance, Arsenal) and *Fortresses* achieves just that.

It's an arcade strategy game in which you control dozens of cartoon soldiers, organised into garrisons. Ahead looms a chunky great castle surrounded by a moat. The objective? Kill, maim, shoot, catapult, throw, fire; anything you can to attack the castle. As military advisor to King Arthur you need to capture 150 castles round England and defeat the rival kings Crushyn, Frightenyn and Bashyourheadyn.

The main fighting screen has a set of icons along the bottom, à la *Lemmings*, each showing some nasty way to mutilate the enemy. So, you can send in your soldiers to beat the hell out of the castle with it, then get another bunch to sort out the battering ram while you stay well clear.

You can even send soldiers in one at a time, just for the joy of seeing the poor sods fry. Satisfaction, or what!

Hopefully, though, you'll be able to get shot of all of the bad guys; storm the castle and



Just another day plundering and pillaging at the castle in Fortresses

take control of it; then move onto the next.

But *Fortresses* is not all about action, oh no. Mark has designed it so that you need to invent your weapons of destruction before you can use them to pulverise the hapless enemy. In the strategy/simulation part of the game you have to allocate resources to scientists, engineers and the army. Underfunding these areas will lead to shoddy designs, or to bad workmanship.

There are also some promising extras, like the Merlin the Magician icon which you can use to put a stop to any foolish attempts by the enemy to try to beat you up. They won't be pouring oil for long with their hair set on fire, eh Merlin!

Nice one Mark, you've got yourself a winner design here; let's hope it will one day be a real game. Remember: nothing's impossible. Well, except a Labour government, maybe.

The runners up

The quality of entries was extremely high: no joke. *Of Mice and Men* from James Burke and Robin Carlisle is an idea for an arcade adventure in

Record breaking entries

LONGEST: Dragon Warrior, Andrew Sole: 36 pages. Get a life, Andrew.

• MOST VIBRANT: Upmarket, Mary Graham: moving parts in the form of pop-up book style 'pull' tabs.

MOST SADISTIC: Bluey, Duncan and Richard Hemlock: killin' wabbits.

• SLIMIEST: The BBC Acorn User Game, Tom Howell: you play the editor trying to get an issue together. (Call this a game?!)

• MOST SATIRICAL: Paxman, J Mediock: as Jeremy Paxman you've been sacked and must do a tour of damage round the TV studios getting revenge (in level one you have to try to make Wogan shut up).

MOST FRIGHTENING: Survival of the Fittest, Jack Welsby: prevent chimps from intellectually taking over Earth.

MOST INNOVATIVE: Lazer, Debbie Simpson: a sailing simulator,

which you play a house mouse trying to rescue your brother Frank, who's disappeared.

To get help you must gain total respect from the other mice by performing a number of missions, all against Kevin, son of the Mouse Elder. (Hang on a sec. Kevin the Mouse? *Kevin*? Big bad man-devouring mice need names like Slayer or Hrull, not *Kevin*. Huh! Still, it's a good game concept.) Another good game design is *Houdini's Revenge* from James Anderson, about Houdini the hamster. Another rodent game. *Lemmings* influenced, perhaps?

Anyway, that's your lot. If I didn't mention your entry, sorry. It's nothing personal, I just get this way when deprived of sunrays. Here's to the next competition...

Sam Greenhill



Virtual Golf

Supplier: Fourth Dimension Tel: (0742) 700661 Machines: 32-bit Price: £34.95

Imagine this: you've been invited for a round of pro-celebrity golf on television and you're going to be watched by millions (well, dozens...). The course is Wentworth and there's no excuse big enough to save yourself from this horrific experience.

Calm down! It doesn't mat-

ter if you tee off into the trees, or send a clod of turf into the air. It's just a computer game!

Virtual Golf is from the 'pen' of Gordon Key, the same man who wrote Holed Out. Time has brought a much improved game featuring far more realistic game play. This only meant for us that quadruple bogies outnumbered everything else and as for our handicap, well we thought 80 wasn't too bad.

The graphics are indeed impressive. The yards of fairway stretch before the eye in a beautiful panorama. The acres of rough also seem endless and certainly bring you back to reality. The greens?

Well the groundsman does seem to have done his job and there is a distinct lack of molehills. Even our amazing strokes seemed to leave it all intact and divot-free.

The attention to detail is excellent: you can pick out the individual leaves on the trees and the sumptuous villas where the loaded pros reside. Okay, so there aren't any squirrels for target practice, but this isn't a shoot-em-up.

Virtual Golf is an improvement on most golf games available for Acorn machines at the moment. The actual swinging of the club is the closest thing you will get to the real thing on offer. Instead of the normal power-meter method you move the mouse from right to left and the golfer simultaneously mimics the movement with a complete swing of his club. The mouse is used to time your shot to perfection and swing to your hearts content - the faster you roll the mouse over the table, the harder you hit the ball. This is very realistic and after a few swings it becomes second nature and you won't know how you put up with the old Not even method. CIS' Microdrive comes close.

Virtual Golf can be played by up to four people who all look

like 'Virtual Golf can be played by up to Nick Faldo four people who all look like Nick Faldo only but with a slightly different hairdo.' sporting a

slightly different hairdo. If only our performance matched that of the great man himself.

For the hardened pro there are six tournaments which you can progress through, ranging from the inaugural Beginner's Knockout to a Major, the prestigious British Open. By that point you are in with the big boys. Your handicap will have shrunk to two but your ability will have improved.

There's hours of fun and this is helped by the novel feature of saving your score card so you may resume your round at leisure, cutting out the need for marathon pitch and putt sessions. Virtual Golf also runs from the desktop, like Elite, so it can be loaded alongside other applications, assuming you've enough memory - Virtual Golf needs at least 2Mb.

Another feature is the knowall caddie who advises you on what clubs to use. At first it's probably best that you take his limited to a swish of the club and a slight 'thwack' as you hole out and strike the ball. But it is a golf game so what do you expect: explosions?

advice, though he makes some

dumb choices. Playing with up

to three other players is fun as it's far more competitive and

It is also very easy to get

into and, after a few holes,

you'll have sussed the controls.

The attention to detail is note-

worthy: you can play in any of

the four seasons and the ball

will behave differently accord-

ing to how hard the ground is,

and so on. On the down side,

the sound is pretty minimal,

the par score isn't so vital.

Another limitation: there is only one course: 'based on' Wentworth. Now, that may be a fine venue for the gentlemen's game but it does grate after a while. This irritation is compounded by the fact that there is no built-in course designer, as in Superior Golf.

There are contours (which Microdrive also has) but here they are a bit flat and sobering. Virtual Golf lacks many features but is the best in terms of taking the actual shot, and perhaps this is the most important. There are even action replays.

Virtual Golf is the best golf game so far. It looks good and feels good, but if you're already the proud owner of a golf game, then think carefully before you invest again. John Revill & Rupert Hamer

THE DUNGEON



THE DUNGEON

Created by MARTIN DENNETT with assistance from JOHN PARKER, DAVID POSTLETHWAITE and GORDON KEY.

-0-

They had found the entrance, overgrown and carefully blocked up, near the top of a cliff, just as on the parchment...

... Without warning, the floor they had moved onto dropped almost imperceptibly downwards with a sharp click and gaping holes opened up in the path in front and behind them, leaving them stranded on a pillar of rock. Moroth cursed their stupidity at falling into such a trap, and at that very moment the floor under their feet also vanished and they tumbled and slid down and down, to land dazed in a heap on a wooden pad in a small room far below ...

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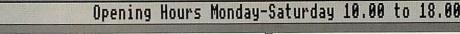
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few more years ago than he cares to remember, Andy Pierson of ESP wrote an application called *Compose* for the BBC Micro. This allowed children to assemble tunes from predefined musical 'building blocks' and hear them played by the computer.

Despite the aestheticallychallenged nature of the BBC sound system, *Compose* was pretty popular in primary schools and was later rewritten as a full screen program for the Archimedes. This year, it was reincarnated under Risc OS as *Compose World*.

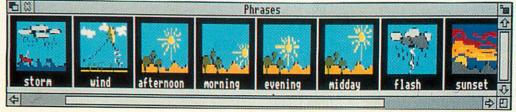
When a child opens a Compose World file, he is presented with two windows. The first, marked 'phrases', contains a number of square pictures, each of which represents a fragment of music. The second window, called the sequencer, contains a grid of blank squares, a set of 'tape recorder' icons and a tempo control. To write a tune, the child drags pictures from the phrase window and drops them onto the sequencer grid in whatever combination and order seems appropriate. When they're in the right order, he selects the Play icon.

The computer plays each fragment in succession using either the Arc's internal sounds or external MIDI devices. If the tune needs changing, he can replace or delete phrases by dragging pictures into and out of the grid. When the tune is complete, it can be saved to disc. There is an optional third window, called Display, which shows enlarged versions of each picture as it plays.

The package includes 35

Music to your ears

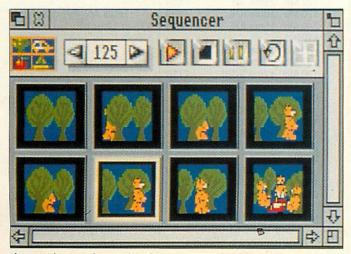
Compose was a big hit in the schools. Now, with Compose World Richard Garrett thinks ESP has struck the right note



Display sizes can be easily altered in Compose World to suit the user, here allowing eight frames to run side-by-side

example files to illustrate the different ways it can be used. Some are collections of useful components for making your own tunes and others contain phrases which can be arranged, jigsaw fashion, until they play well-known tunes. My favourite is The Teddy Bears' Picnic, which produces an animation of teddies who walk through the woods and arrive at a picnic site in the last couple of bars. If the demos get boring, you can make new files by mixing existing components using File Merge.

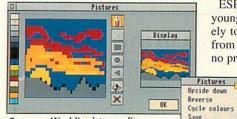
Compose World has two editors with which you create and modify the phrases/pictures used to build tunes. These are Picture Editor and Phrase Editor. Picture Editor alters the



If you go down to the woods today ...

sprites that represent each phrase. Although *Compose World* phrases all use 48 x 24 pixel Mode 12 sprites, the program imports images of any size and scales them.

Phrase Editor is a variation on a piano roll sequencer,



Compose World's picture editor, showing colour range at the left

where notes are shown as blocks on a rectangular grid whose horizontal axis shows time in beats and whose vertical axis shows pitch. An unusual feature is that its vertical axis can be configured to different musical scales: major, minor, chromatic, pentatonic and so on, or customised to any scale you like.

When you select a scale, only those notes that fall within it are shown on the grid so, for example, if you're writing in pentatonic mode, each octave shows just five notes and ignores the other seven. Phrases can play more than one note at a time and each voice can be assigned to a different internal or Midi sound.

There are loads of edit features for pitch, duration and intensity ranging from traditional features to more novel ones like Invert which reflects each note about the middle note of the scale, and Reverse Rhythm which reverses lengths of notes in a phrase without changing pitch.

ESP says that though younger kids are unlikely to make new phrases from scratch, they have no problem editing exist-

ing ones to make variations of their own.

Compose World is the musical equivalent of a clip art

graphics program, and while it is designed mainly for children at key stages 2 and 3, it could be enjoyed by people on either side of that range. I certainly had fun. At its simplest, it needs no formal musical knowledge. The move to the desktop has made this application much easier to use and definitely more pleasant to listen to.

Product details

Product: Compose World Supplier: Expressive Software Projects Tel: (0602) 295019 Price: £48.00 + VAT (includes site licence); Files 1 support pack £12.00+VAT; Voice Pack 1 £15.00+VAT

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Back to Dasics

In the second part of his Basic programming series, Mark Moxon takes a look at the different types of variable and shows them in action

Right, so now you're able to type in programs and run them. Great. Now comes the tricky part: learning to create your own.

The first step in most tutorials is to look at the concept of a variable, and, just because this series is far cooler than most, there's no reason why we shouldn't start that way too. So, what's a variable?

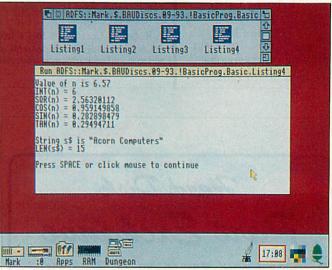
The BBC Basic Guide says 'a variable has a name and a value associated with it'. This means we can invent a variable name for ourselves, and give it a value. So, if you want to define the number of eggs in a basket as seven, you create a variable called number_of_eggs with value 7 (variable names can't contain spaces, so we have to use underline). The command to do this is: number_of_eggs=7

Now whenever we use the name number_of_eggs in our program, 7 will be substituted.

Why call them variables? It's because we can change the value associated with any variable at any time. If, later in our program, we have the line: number_of_eggs=10

then the value for number_of_eggs will be 10 from that point on.

Try typing in Listing 1, which simply prints out two values when run. In line 4 the variable number_of_eggs is set to 7, printed out in line 5 using the PRINT command, which will be described in full in a later article. In line 6 number_of_eggs is set to 10, which is printed out in line 7.



Running Listing 4 to demonstrate various variable functions

Line 8 terminates the program, and line 3 is our standard error handler, described last month.

Variable types

There are three important types of variable: *integer* variables, which can only have whole number values; *floating point* variables, which can have any number values; and *string* variables, which have strings of characters as values.

You tell the computer which type you are defining by the last character you choose for the variable name. A name by itself, such as number_of_eggs, denotes a floating point; a name ending in a per cent (number_of_eggs%) denotes an integer; and a name ending in a dollar (number_of_eggs\$) denotes a string. Don't worry about string variables: we'll look at them later.

In Listing 1 we used a name without a per cent character, so the variable number of eggs is a floating point variable. We could give the variable a noninteger value, such as 3.5, by altering one of the assignment statements (lines 4 and 6) to number_of_eggs=3.5 or similar. If we wanted to make sure the number of eggs was always a whole number (which makes sense) we could add a per cent to the variable name. This makes no difference in this example, but the following shows why you should make sure to use the correct variable.

The real power of variables is apparent when you consider *expressions*. An expression is the name given to something which can be evaluated to produce a value. The following are expressions: 1+2 and number_of_eggs+1, as they can

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IDE Interfaces

Numeric operators

Op Function

- + Addition eg number_of_eggs+3 - Subtraction
- eg number_of_eggs-6 * Multiplication
- eg number_of_eggs*48 / Division
- eg number_of_eggs/2 () Brackets
- eg (number_of_eggs+1)/10 Raise to the power eg number_of_eggs²
- DIV Integer division eg number_of_eggs DIV 2
- MOD Integer remainder eg number_of_eggs MOD 2

Numerical functions

Operator Description

- ABS(n) Makes n positive, so ABS(-65) evaluates to 65 INT(n) Rounds n down to an integer, so INT(6.7) evaluates to 6 SQR(n) Evaluates the square root of n, so SQR(9) evaluates
- to 3 COS(n) Evaluates the cosine of n (n is in radians)
- SIN(n) Evaluates the sine of n (n is in radians)
- TAN(n) Evaluates the tangent of n (n is in radians)
- ACS(n) Evaluates the arc-cosine of n (n is in radians)
- ASN(n) Evaluates the arc-sine of n (n is in radians)
- ATN(n) Evaluates the arc-tangent of n (n is in radians)

String functions

Op Description

LEN(s\$) Evaluates to the length of the string s\$ – the number of chaacters in the string STR\$(n) Converts the number n into a string, so

STR\$(456) evaluates to "456" (a string) be evaluated; the first to 3, and the second to the value of the variable number_of_eggs plus 1.

Variables can be assigned values not only by putting number_of_eggs=7 or whatever, but by putting any expression on the right-hand side of the equals sign. So the *syntax* for the assignment of a variable (in other words, the standard way of laying out the statement) is: variable_name=expression

Try entering and running Listing 2. This makes number_of_eggs% seven, and defines more_eggs% to be the value of the expression number_of_eggs%+1. This evaluates to 8, No problems there, but try changing line 6 to: more_eggs%=number_of_eggs%-

+1.5

The value of more_eggs% doesn't change, although we'd expect it to be 8.5. The reason is that more_eggs% is an integer variable, not allowed to contain a non-integer number. In this case, the value of 8.5 is rounded down to 8 when assigned to more_eggs%.

Now remove all the percentages, and run again. The expected value of 8.5 is shown. The moral is simple: only use integer variables when you need to, but do use them if you know a variable will never have a fractional value.

Expressions can be far more complicated than simple addition. Table 1 shows the more common numeric operators, though I have left out a lot of the more technical ones to keep things simple.

Addition, subtraction, multiplication and division are all pretty obvious: the only thing to notice is that an asterisk is used as a multiplication sign. Brackets allow otherwise ambiguous expressions to be evaluated, such as 1+1/2, which could be evaluated to 1.5 or 1, depending on how you read it. Basic has a built-in method of avoiding this problem, 'operator precedence', but I reckon using brackets removes ambiguity and means you don't have to remember the rules to understand the expression. Stick to (1+1)/2 or 1+(1/2), rather than 1+1/2.

The raise to the power operator is also pretty easy: 5² means five-to-the-power-oftwo, or 25. Finally, the integer operators. DIV is essentially the same as / except the result is rounded down to the nearest integer, and MOD gives the remainder from the division. 5 DIV 2 evaluates to 2 (as 5/2 is 2.5 which rounds down to 2), and 5 MOD 2 evaluates to 1 (as the remainder when 5 is divided by 2 is 1).

String variables

Before discussing variables and their uses further, we have to look at string variables, which have names like number_of_eggs\$. A string is a string of characters, like "Abcdef" or "Welcome to our world!". Notice the string is in double quotation marks; this is how a string is denoted.

To assign a value to a string variable, you still use the same syntax as for the numerical variable_name=expression This time the variable name ends in a dollar, so an example of string assignment would be: name\$="Mark Moxon"

Try entering Listing 3, a quick demonstration of assigning two string variables and printing them out one after the other. The strings are assigned in lines 4 and 5, and are printed out by the PRINT commands in lines 6 and 7. You can include a quotation mark in a string by putting two quotes next to each other; the quotes around the word "Acorn" are entered in the program using this method.

Variables

Basic has a large number of built-in functions for manipulating variables, these can be used in expressions to calcuvarious mathematical late values. Table 2 shows a collection of mathematical functions which can be used on numerical (integer or floating point) variables: Table 3 shows some string functions. Using these, expressions such as (COS(angle)*PI)/ABS(sign)) can be constructed for your amusement.

Listing 4 shows these in action, and should help explain how they work. Type it in and have a go.

Next month I'll take a look at the functions available for variable manipulation in more detail, so don't worry if the tables don't instantly make sense: they will then.

Listing 1

REM >Listing1¶ :¶ /

ON ERROR REPORT:PRINT " at line ";ERL/10:ENDM number_of_eggs=7M PRINT "The value of number _of_eggs is";number_of_egg sM number_of_eggs=10M

PRINT "The value of number _of_eggs is ;number_of_egg s¶ END¶

Listing 2

REM >Listing2¶ :¶

ON ERROR REPORT:PRINT " at line ";ERL/10:ENDM number_of_eggs%=7M PRINT "The value of number _of_eggs% is ;number_of_eg gs%M more_eggs%=number_of_eggs% +1M PRINT "The value of more_e ggs% is ";more_eggs%M ENDM

Listing 3

REM >Listing3¶ :¶ ON ERROR REPORT:PRINT " at line ";ERL/10:END¶ first_string\$="Hello. I am an"¶ second_string\$="""Acorn"" Computer."¶ PRINT first_string\$¶ PRINT second_string\$¶ END¶

Listing 4

REM >Listing4¶

:¶

ON ERROR REPORT: PRINT " at line ";ERL/10:END¶ n=6.57¶ s\$="Acorn Computers"¶ PRINT "Value of n is ";n¶ PRINT "INT(n) = "; INT(n) ¶ PRINT "SQR(n) = "; SQR(n) ¶ PRINT "COS(n) = "; COS(n) \P PRINT "SIN(n) = ";SIN(n) ¶ PRINT "TAN(n) = "; TAN(n) \P PRINT¶ PRINT "String s\$ is """;s \$;""""" PRINT "LEN(s\$) = ";LEN(s\$ P(END¶

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QUESTIONS ANSWERS

C I have an A5000 with Risc OS 3.10. I have been trying to alter the colour of the pointer, backdrop and the iconbar without altering the palette. Is there any way I could alter any of them using another method?

> Chris Davis (No address supplied)

Altering the colour of the pointer is not too tricky, although it's a little longwinded. First, you need to get hold of the sprite for the printer, which is held in the sprite file *Resources:\$. Resources.Wimp.Sprites.* Save the two sprites *ptr_default* and *ptr_double* into a separate file on disc, which we will call *Pointers.*

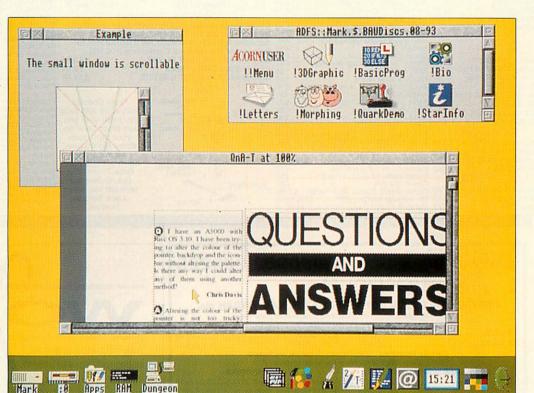
Next, load the sprite file into *Paint*, and give each of the two sprites a palette. You can now alter the definitions for colours one and two; these correspond to the outside and inside colours of the pointer respectively; they will be dark blue and light blue in the default.

The next step is to create an Obey file, using *Edit*, containing the following line: IconSprites <Obey\$Dir>.Poin ters

Save this Obey file in the same directory as the *Pointers* file, and double-click on it to install your new coloured pointer.

If you have high-definition sprites loaded from *SetIcons*, then edit the sprite definitions in the file *!SetIcons.22Sprites*, rather than the set built-in to Rom. You can run the Obey file from your boot sequence (using a line like Run ADFS:: Mark.\$.Library.LoadPoint).

Changing the colour of the backdrop is not simple at all,



Now you too can have a disgusting desktop like this

but a clever method was described in *****INFO in April.

Changing the colour of your iconbar is not difficult if you have a copy of the template editor *FormEd* (or equivalent). Yet again we have to turn to the resources in Risc OS Roms, this time to the template file *Resources:\$*. *Resources.Wimp.Templates*.

Copy this file to disc, and load it into *FormEd*. One of the window definitions is called iconbar, which is, not surprisingly, the iconbar window definition. Change the colour of the bar using the Colours submenu (you want to change the work background), and save the file back again.

Finally, you need to rehash your desktop boot file, to

ensure that the new template file is used by the Wimp manager before the desktop itself is initialised. First, press F12 and type the following:

Configure Language 19 to set the start-up language to Basic. Next, rename your *!Boot* file to *!Boot2* (or save a desktop boot file as *!Boot2* if you don't already have one).

Finally, create an Obey file in your root directory containing these three lines: Set WindowManager\$Path ADFS ::Mark.\$.Library.Wimp.,<Win dowManager\$Path> RmReInit WindowManager Run ADFS::Mark.\$.!Boot2 and save this as *!Boot.* Note that in this example, the template file was saved in the directory *\$.Library.Wimp.* There is one point to note. Applications which use the iconbar often assume the bar is coloured with desktop colour two, so if there is any text under the icon (as with the device icons), then the text will still be printed on a grey background.

Since upgrading my Archimedes to Risc OS 3, I've experienced a couple of very strange problems.

The first is an error which is displayed on the initial black screen when the computer starts up, before the desktop welcome sign. Below the display of how much Ram I have appears the message Drive Empty. One solution I have found is to place a floppy disc in the drive when I turn on the



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system, but this is hardly an ideal situation, is it?

My second problem is more of a vanishing act. Under Risc OS 2, my hard disc displayed approximately 50Mb in size when I chose the Free option from the disc menu. However. since upgrading to Risc OS 3, it now only shows 47Mb in the multi-tasking free space display. What on earth has happened to my missing 3Mb? Steve Fiet

Leslie, Fife

The error you are getting on start-up is easy to explain. There is a configuration option called Dir which governs whether the computer mounts the current drive when the machine is turned on, or ignores the drive.

You have got your machine configured to mount the current drive. To change this, press F12 and type Configure NoDir. You will now find that switching your machine on will no longer require a disc to be present.

Your second problem is somewhat easier to explain: don't worry, you haven't lost any disc space.

On Risc OS 2, the free

	Free Used Size	Free spac 10MBytes 30MBytes 41MBytes			
		Free	4		
Bytes fr Bytes us	ee &888AEA ed &81E2D	E00 = 1144786 200 = 3164211	18		
Press SP	ACE or cl	ick mouse to o	continue		
RDFS:: Name di Dismoun					
Format + Baskop Verify					•
Free			1:5 0	1 17.2	

Looks like a whole megabyte of disc space has gone missing - but it hasn't

space display showed the amount of space used and the amount free in bytes, but the new multi-tasking window shows the amounts that you have in megabytes.

Remember that 1Mb is in fact 1024K, not 1000K, and 1K is 1024 bytes, so a 47Mb disc has 47 x 1024 x 1024 = 49283072 bytes free, not 47 million. So on Risc OS 2, the display would have been very near to 50 million.

All that is happening on Risc OS 3 is that the computer is telling you that you actually have a 47Mb drive, not a 50Mb drive as you may have thought you had.

(C) I am writing an application and want it to load a data file in response to a double-click on that file.

At the moment, if you double-click on a file the application loads, but not the file. Firstly, how do I get the application to load the file automatically. Secondly, how do I then prevent the application from loading a new copy of itself every time I double-click on a relevant file.

> Paul Fernando Guernsey

Bit of a technical one this. First, there must be two lines in your !Run file along the lines of the following: Set Alias@RunType_XXX Run < App\$Dir>.!Run %%*0 Run <App\$Dir>.!RunImage %*0

The %%*0 and %*0 sequences are the vital parts: they are substituted for the filename to be loaded. Note that XXX is the hexadecimal filetype for the file you wish to load.

The next step is to put the following lines at the start of your main *!RunImage* program:

SYS "OS_GetEnv" TO env\$
IF INSTR(env\$,"-quit") THEN
I%=INSTR(env\$,"""")
I%=INSTR(env\$,"""",I%+1)
REPEAT

I%+=1

UNTIL MID\$(env\$,1%,1)<>" " env\$=MID\$(env\$,1%)

This sets the variable env\$ to the filename of the file which has to be loaded by dissecting the command line which is passed to Basic.

Customer hotline

Each month in Acorn User, Alan Glover offers you the latest support and advice from the Acorn customer service department

This month's column concentrates on the Acorn PC Card, with various hints and tips, plus details of a software upgrade.

SOFTWARE UPGRADE

The revised software will be available from 1 September 1993. You can obtain it free by returning the original Acorn PC Card Software Disc, and Windows Driver where supplied, along with your name and address, in an envelope clearly marked 'PC Card U, grade', to:

Customer Services Acorn Computers Limited Fulbourn Road Cherry Hinton Cambridge CB1 4JN

RUNNING DOS APPLICATIONS

There is a problem with the current version of the software which, may result in loss of data. However, this problem is unlikely to be encountered in normal use and can be avoided.

When running Windows in enhanced (386enh) mode, don't attempt to run Dos applications from within Windows itself. This is not supported and causes Windows to crash, possibly resulting in data loss from your hard disc.

Shut down Windows and return to the Dos prompt before starting up Dos applications. If you need to run Dos programs from within Windows, start Windows in standard mode, using the command WIN/s. Certain benchmarks, such as those provided by Windows User magazine, attempt to run DOS applications from within Windows. Ensure these are only run from within Windows when in standard mode.

USING DOS HARD DISC PARTITIONS GREATER THAN 32MB DosFS, an integral part of Risc OS 3, does not support Dos hard disc partitions larger than 32Mb. If you create a Dos partition which every partitions larger than 32Mb.

partitions larger than 32Mb. If you create a Dos partition which exceeds this size, it will not be possible to access it from the Risc OS desktop. Dos partitions greater than 32Mb can only be accessed from within

the PC Card environment. Transfer files between a Dos partition greater than 32Mb and a Risc OS-based filing system via floppy disc(s) or another Dos partition of 32Mb or less.

WINDOWS 3 AND MEMORYMAX

As supplied, by default, DR-Dos provides access to additional memory via the use of MemoryMAX (MEMMAX) software. During the boot sequence you will be prompted to load this software by the command:

Load MemoryMAX software (y/n)

Replying "n" to this prompt will allow Windows to be started in enhanced mode, by entering the command:

WIN

If you wish to run Windows with the MemoryMAX software enabled, you should ensure that Windows is started in standard mode, by entering the command: WIN /s

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RISC OS 3

A HEAVY READ

When Acorn decided it was time for the Risc OS 3 Programmer's Reference Manual, it didn't hold back on detail... or size. Dave Lawrence found it well worth the weight

What has 3220 pages, costs one hundred pounds and weighs fifteen pounds? The *Risc OS 3 Programmer's Reference Manual*, that's what.

Ever since the announcement of Risc OS 3, programming types have been screaming out for documentation on its features. Incomplete (and sometimes inaccurate) photocopies of development versions have been available for some time to ISVs (Independent Software Vendors), but the general public has been in the dark – until now.

Contents

Presentation

command

ColourTrans_SetGCOL).

page header entry.

Everything you could want to know about the Risc OS is here. Everything, that is, except the *Style Guide*, still being worked on but to be sent to all registered owners when ready.

The kernel, I/O, filing systems, networking, desktop, printing, sound and hardware are all covered. And, at last, C library calls are documented. Machine-specific extensions, like the *Joystick* module (on the A3010) are also explained here.

If you've moved from an eight-bit machine and are used to the *Advanced User Guide*, the important thing to note is that this is a manual for Risc OS 3, not for the machines, so you'll find no detailed memory maps of OS workspace or odd calls directly into the Rom. It is a programmer's, not a hacker's, manual.

The first thing you notice is the sheer size of the

manual. Aside from the aforementioned weight

and page count, there are four volumes plus an

index, each over an inch thick. Like the

Risc OS 2 manual, the books are perfect bound

and so only stay open after about page 100.

Flicking through reveals a clear layout, with

lots of white space, making it very easy to read.

Small grey edging marks on sides of pages delineate major sections, like *The Desktop*. The

top right-hand corners of right-hand pages

contain the sub-section (Program Environment,

ColourTrans) and top left-hand corners of left-

hand pages contain the name of the call or

This could have been better arranged: a call

Each volume starts with a contents page for

the whole manual, but the index is separate. In

described on a right-hand page could have had a

(OS_RemoveCallBack,

Spiral binding would make a big difference.



addition to the complete subject list, the slim index tome details all star commands, OS_Bytes, OS_Words and SWIs and service calls, both numerically and alphabetically.

My think-of-five-things-and-look-them-up test worked. There may well be omissions within the books, but I certainly didn't come across them.

Within the volumes, each section contains many more cross references than the OS 2 manual. In a SWI call, the 'related SWIs' section contains page references – very useful. Strangely the 'related commands' section has no references.

Conclusion

I've been 'lucky' enough to have a set of the pre-production photocopies for a while, and I'll miss the spiral binding and six-volume format. Acorn has deliberately pitched this at this price and informs me a sub-£100 price tag is very desirable. This may seem a lot but for aspiring programmers they are essential and represent amazing value for money.

Acorn Computers is on (0223) 254254

Afterthought...

With manuals approaching this sort of size, the value of paper and ink rapidly diminishes. It becomes inevitable that your whole desk space is taken up with 1000-page volumes with pens sticking out and marking vital pages.

The release of a CD-Rom version of the Risc OS 3 PRMs is rumoured to be imminent, and although an electronic manual has its own problems – ideally you need a second machine on which to run the retrieval program, and a suitable huge screen mode to view a page full of information – perhaps this is really the way to go. Time will tell.

news from Colton Software

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.

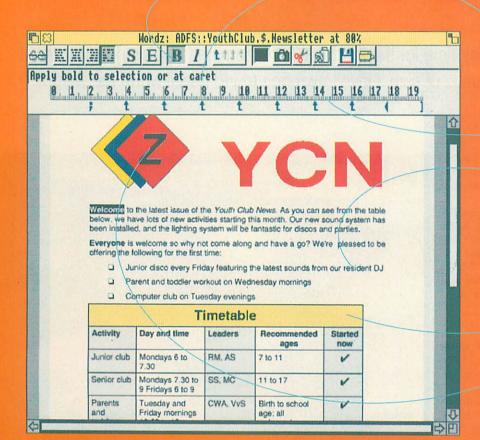
Wordz is the first of a family of programs which share the same easy user interface and include dynamic data linking. The spreadsheet Resultz will be available in mid-1993.

Wordz costs £99+VAT. "Is it easy to use? It's falling-off-a-log easy to use."



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A new dimension

ne thing which our sim-ple 3D module did not cater for in its original incarnation was the idea of hidden surface removal. Although objects which lay wholly outside the 'view pyramid' were instantly discarded, those surfaces which faced away from us and were clearly invisible were still calculated and plotted. Naturally the sorting of surfaces meant they disappeared behind the visible faces in front of them, so that the only effect was to slow down the rendering.

n (x1,y1,z1) a (x2,y2,z2) (x3,y3,z3)

Figure 1

Of course, we can only remove hidden surfaces of 'closed' objects – those without holes. Imagine a simple square pillar box with a slot for letters. Even the rear surfaces would still always have to be plotted since we would be able to see one or more of them through the slot.

Many objects (like last month's cathedral) are 'closed' (hole-less) though. By marking them such (with the new keyword 'closed') in the file, a renderer can ignore hidden surfaces. With the side benefit of fewer surfaces to sort, the time saving can be more than 50 per cent.

But how do you tell whether a surface pointing away from you? The method requires the use of 'normals', 'scalar products' and 'vector products'. For those of you who are familiar with these everyday concepts, here's a quick guide to the method.

Consider the triangle in

This month, a little refinement of our BAU3D module. If you'd like to skip the maths, the latest copy of BAU3D with source is on the subscriber's disc

Figure 1. We first must calculate the normal to this face (any vector perpendicular to it). The normal is calculated by taking two (non-parallel) vectors that lie on the face. Two suitable vectors are a

and b.

The geometrical entity called the vector product of a and b (denoted as $a \times b$) is actually a vector that is normal to a and b. We can then make use of the scalar product, which provides us with the way of finding

the angle between this normal and our line of sight. If this is more than $+90^{\circ}$ or less than -90° the surface is hidden and can be ignored.

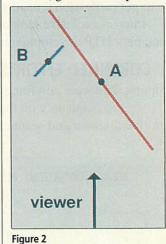
Better sorting

The simple BAU3D module broke the scene down into surfaces and sorted them according to mean z co-ordinate. This is time consuming, making no use of the fact that surfaces are grouped together to form larger objects which may themselves be grouped. Also, it got the rendering wrong from time to time, since the mean z coordinate is no guarantee of getting the right order. Look at Figure 2, where surface A's mean z is in front of surface B. Clearly, surface A should be plotted first. How can we get around this problem and speed up our rendering too?

The answer lies again with a little co-ordinate geometry. Our rendering algorithm is changed as follows.

Go through the list of objects and sort them. If the z-extents of two objects do not overlap (one is clearly behind the other) there can be no doubt as to the order in which to plot them. If there is an overlap proceed to step 2.

Consider the bounding cubes of the two objects, rotated according to their position and our point of view. If they overlap, if any one corner of the bounding cube of an object lies within the bounding cube of another, we need to break the objects down into their component parts. Having done so, go back to step 1 and



mu again. If the ou

try again. If the cubes are separate, go on to step 3.

Look at Figure 3. Although the house A and cathedral B do not overlap, it wouldn't be obvious, from looking at their mean z coordinates, which to plot first. Thus we first look at A and consider the point of its bounding cube furthest from us, at the corner of three surfaces of the bounding cube. What we need to do is to find whether the *B* lies wholly behind any of these three surfaces. If it does,

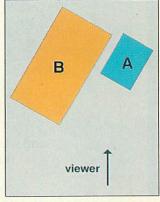


Figure 3

we plot it first. If not, we repeat the same check but the other way round – seeing if Alies behind any of the three rearmost surfaces of the bounding cube of B. If the test works out at all, we know the order in which to plot. If not, our best strategy is to break down the objects into their component parts and try again.

To see whether an object lies behind a surface, we need to find the equation of the plane through that surface. Again, we find a normal to that surface and from it we deduce an equation from the plane. Now we feed the eight co-ordinates of the bounding cube of the other object into the equation of the plane. If the result is negative (or positive, depending on how you have described your world) we know the object lies behind the surface.

This algorithm is applied recursively to each group of objects sorted. So, a surface or object is only compared with others local to it not with those clearly in front or behind.

NEXT MONTOLINA M

SPECIAL DTP ISSUE

DTP is well on its way to becoming universally popular: DTP packages are taking over where once the wordprocessor reigned supreme...

So how does the Acorn solution compare to Macs and PCs and why *does* the Macintosh machine still hog the publishing market?

> Find out the true story in next month's Acorn User

PROFESSIONAL PUBLISHING

Three publishing houses reveal how they use Acorn machines to get professional results. Plus an exclusive look at some new DTP developments

COMBINED EFFORTS

Wild Vision and Computer Concepts join forces to come up with the all-in-one digitiser and scanner

THE FLOATING POINT ACCELERATOR

Promises of faster processing can now be realised with the release of the FPA co-processor. We look at how its performance can affect the speed of your daily work

PRO ARTISAN 2 REVIEWED

The manual is written; the features are all in place and at last, ProArtisan 2 is ready to roll. Find out how the new graphics program fares in next month's review

MORPHING REVIEW

Just one month after the *Acorn User* morphing program, another contender was released in the form of *Morpheus*. Next month we take a look at the first commercial morphing program

ON THE PAYROLL

Discover how to computerise your payroll using *Payroll Manager*

HOW TO PRINT T-SHIRTS

Harlington Upper School demonstrate how it produces silkscreen printed T-shirts from ProArtisan paintings your copy, please fill in the coupon below and hand it to your newsagent. Or why not take out a subscription, which includes a free monthly disc. See The Subscriber's Page for details

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BBC Acorn User is published by Redwood Publishing, 101 Bayham Street, London NW1 0AG. Distributed by BBC Frontline, Park House, 117 Park Road, Peterborough

Not so baby Bio

The ever-expanding Bio gains a short module to protect your files, another quickie to wipe them again, and one to convert text files to Draw files. Dave Lawrence fills you in

Due to the popularity of our *Bio* application, we are once again able to bring you a selection of extension modules. If you've never heard of *Bio* and would like to find out more, look at the February, April and August issues.

Due to a lack of yellow pages listing space, we will no longer be printing out the reams and reams of data needed to generate sprite files for *Bio* modules. Instead we hope you will be able to use your own artistic skills to come up with sprites of your own. Instructions can be found in the yellow pages, and the original sprites will, of course, be provided on the subscriber's disc. Any templates required will still be listed.

Filelock

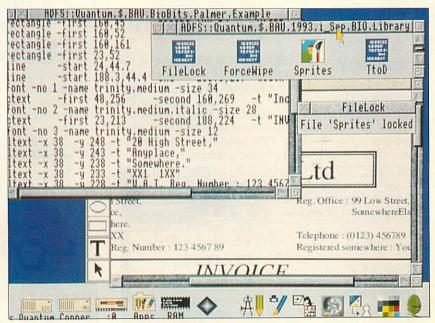
First a short, simple, but useful module from Duncan Roberts, consisting of 20 lines, most of which are comments. Dragging a file to the *FileLock* icon will set its access permissions to LWR, meaning it can be written to and read but not deleted. Obviously this can be done from the Filer menu, but two submenus need to be traversed to find the Protected option. A results window displays a quick confirmation message along the lines of 'File X locked', to let you know what's going on. Ideally you should be able to drag a selection and lock them all, but that's not Duncan's fault – we need to build multiple file loads into *Bio* itself.

Duncan's module inspired the next shortie: *ForceWipe*. This performs the opposite of *FileLock*. Any object (file or directory) can be dragged to the *ForceWipe* icon and irrevocably removed from your disc. I don't like to leave the Force option set from the filer Options menu and with this utility you don't need to set it.

Risc OS 3 owners have a little value added in that the Filer Action window is used, so it can carry on in the background. We hope to cover this in *****INFO. Very briefly, a Filer_Action task is started; the name of directory containing the object to be deleted and the object itself are communicated to the task with a couple of SWI calls; then a delete object command is sent with another SWI. The global variable version% contains the version number of the operating system to check if Risc OS 3 is installed first. If not, the appropriate wipe is executed via OS_CLI

TtoD

Gary Palmer's *TtoD* module provides a preprocessor that converts a series of commands in a text file into a diagram in a *Draw* file. This



enables precise drawings to be created without any need to muck around with the innards of a *Draw* file. It becomes very easy to write other programs that produce 'draw description files' as output. A summary of commands available is shown in the table in the yellow pages.

The code is written such that there are no 'start' and 'stop' points for non-grouped objects (not including commands in the 'path' command). Hence the two co-ordinates ('first' and 'second') are sorted to ensure output conforms to the *Draw* file standard. This was initially implemented in case the user got the lower-left and upper-right co-ordinates the wrong way round but, Gary decided, why make the user do something computers are good at, namely comparing two sets of numbers?

To conform to the Acorn *Draw* file standard, the colour identifiers are given in hexadecimal. So, for example, if you need to do colour, use &FF0000 to get saturated blue. '-line' stands for the colour of the line, and '-fill' stands for the colour the object is filled with.

It would be easy to extend the program to '#include' a file defining commonly-used colours, so that they would not have to be specified as RGB quantities every time. Gary has not added colour selection to the text commands in the module, as that would serve to further complicate commands. The *TtoD* module in action, taking a text file from *Edit* and producing a neat invoice in *Draw*. An example program, that produces a text file suitable for processing by the *TtoD* module, will appear in a future *Bio* column.

The three *Bio* sprites on the iconbar above are (left to right) *TtoD*, *ForceWipe* and *FileLock*. You might find it useful to base your own sprite file on these designs; for the uninitiated, the *ForceWipe* sprite is in fact a plughole.



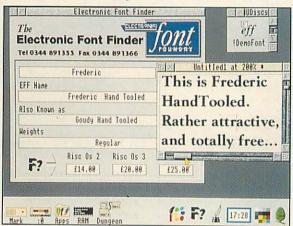
Excellent programs, beautifully-presented applications, comprehensive help files:





We lucky Risc OS users have at our beck and call one of the most powerful

outline font managers in the business, and the Arc's high quality font display knocks the socks off PCs and Macs. The Electronic Font Foundry has been the biggest Acorn font supplier for years, and to show how much they care, those kind and caring people at EFF have donated a complete outline font for our subscriber's disc: Frederic.HandTooled.



There's also the EFF database, which will tell you all about EFF's range of fully hinted and scaffolded fonts, and there are a couple of *Draw* files showing off other fonts and utilities for your delectation.



Grapevine Files

The Grapevine is the student newspaper of Harlington Upper School, and it is entirely produced using *Ovation* on Acorn computers. Last month we investigated how a newspaper of such a high standard could be produced using the same technology that people have in their homes, and on the disc this month are the *Ovation* files which make up the magazine.

The files are arranged in stages, going from a blank page all the way to a complete page with headlines, articles and text styles. There is also the complete Ovation file for the May 1993 issue, so you can see exactly how the whole magazine is laid out from end to end.

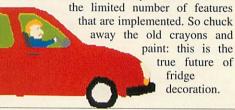
As in all great marketing strategies, read the article, load the files, then go and try it for yourselves.



Kidpix Demo

ESM's *KidPix* is great fun: you certainly don't have to be an accomplished artist to produce fantastic pictures of box-like houses with smoke curling out of the chimney. And there's lots of little clip art characters which you can stick onto your picture, like dinosaurs, palm trees and other common garden accessories.

This demo version will let you explore the world of *KidPix*, and you can produce some excellent effects yourself, even with





variables, variables... rolls off the tongue rather less smoothly than one would hope, but this *is* a programing tutorial we're talking about.

Yup, this month it's the thorny concept of the variable that gets star treatment in our new(ish) Basic programming series. And, of course, all of the listings from the article are present on the disc in all their glory.

On the other hand, bear in mind that typing in programs is a very good way to learn how to program. So no cheating. Don't use the programs from the disc: type them in yourself. The only reason we're putting these listings on the disc is that the icon is really rather neat.

You have been warned.





The theme for *****INFO definitely seems to be graphics. Graphical neural networks, graphical creepers, a graphical underground map. Our fast sprite rotation routine produce some of the strangest effects this side of the Great Barrier Reef, And we delve into the Shared C Library.



RIBER'S DISC

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It's all go down at the 3D Graphics creativity department. Hidden surface removal is the main theme for this month. As our 3D world gets more and more realistic, the listings inevitably get longer, so they're now exclusively on the subscriber's





It's always nice to see your babies growing up, but at the rate Bio is expanding, you start to wonder at it all. Yet again we've got some top class modules for you to ForceWipe add. and FileLock make file deletion and locking as simple as is humanly possible; all you have to do is drag your files to Bio to remove them or protect them.

Or, with *TtoD*, you can create *Draw* diagrams from simple text files. Now you can produce accurate circles and lines, without using your mouse.



Clip Art List

Clip art is a fantastic resource, and it can really add sparkle to the presentation and layout of DTP work. On the other hand, there is so much of it about, that it's very much a case of dabbling around in the clip art market, trying to find suitable pictures for your work.

We've compiled a list of all the major clip art suppliers in the Acorn scene, so you can narrow down the choice.

And don't forget that on top of the commercial companies which appear in our list, there are numerous public domain libaries which can supply a nearly limitless range of clip art: the choice can be bewildering. But we've done the legwork

so liven up your printouts, and explore the world of clip art today.

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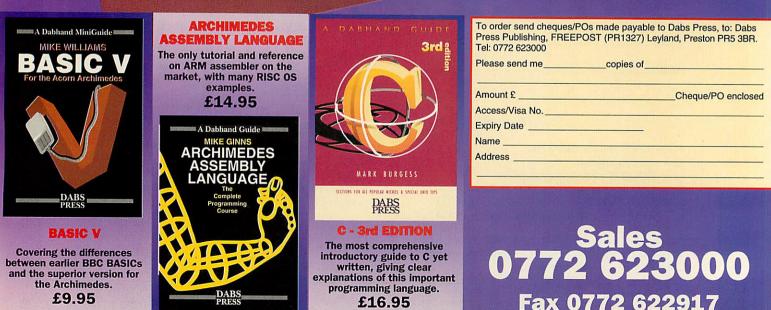
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53

Learn how to create WIMP applications for the RISC OS range of computers using the BASIC programming language. To assist program development, this book provides many example programs which are designed to be easily adapted and expanded. An extensive library of procedures and functions is also provided to simplify the program writers task.

- Topics covered in this book include:
- An introduction to the WIMP environment
- The user interface
- Communication with RISC OS
- Application structure
- Memory allocation
- Creating applications
- · Error handling and debugging
- · Polling and event handling
- Programs examples
- · Detailed descriptions of all operating system calls used.

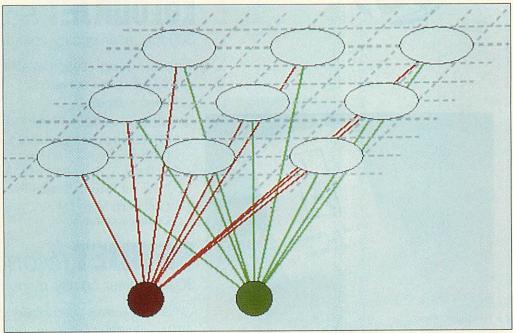




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Dave Lawrence and Dave Acton present their monthly mix of programs, for all Acorn users



Schematic of a Kohonen map. Don't worry, we can't pronounce it properly either

weights are adjusted such that the two-dimensional layer of neurons organises itself to respond to particular inputs in a spatially-ordered manner. This self-organisation is illustrated by the program, which implements Kohonen's algorithm as detailed below.

When trained according to Kohonen's algorithm,

the

The two weight connections for each neuron are initialised to random values between 0.4 and 0.6. During each cycle of the algorithm, the two input neurons are set to random values between 0 and 1. These two values can be considered to specify an x,y point in a plane, and, in this simulation, on the screen. The neuron whose two weight connections to the inputs (which can also be considered as another x, ypoint) are closest to those input values is considered to be the

'winner'. The winning neuron's two weights are then adjusted to bring them closer to the input values.

The key to the algorithm is that the weights of all the other neurons are likewise adjusted, but by some lesser amount according to how far away from the 'winning' neuron they are - the further away, the smaller the change. In this instance 'closeness' is measured not as the distance between weights on the screen, but in terms of the physical distance between the two neurons in the two-dimensional layer as illustrated in the diagram.

It is this feature of the algorithm that gives the net its apparently elastic behaviour and results, after a number of cycles, in the net organising itself such that its weights mark out a plane covering the domain of the input values (from 0-1 in both axes in this case). This behaviour is particularly interesting as there is significant neurobiological evidence that similar phenomena occur in the human brain itself, particularly in the visual and auditory cortex.

In the latter case, it is observed that neurons which respond to particular frequencies are spatially arranged within the cortex so as to trace an almost logarithmic scale. This arrangement may well have occurred in an analogous manner to that in which the Kohonen map orders itself.

The program draws a 64neuron, 8 x 8 Kohonen map on screen in the form of a sheet, where each vertex denotes the co-ordinate specified by the weights of a particular neuron, whose position within the physical two-dimensional layer should be clear from the geometry of the sheet itself.

Because the weights are initialised between 0.4 and 0.6, to begin with the net looks very much like a crumpled-up sheet of paper. Over time it should evolve a more uniform 'square' geometry. The net can be seen to be pulled in varying directions, exhibiting the

Machine: 32-bit ElasticNet is a graphical

STAR PROGRAM

NET RESULT Program: ElasticNet Description: Graphical Neural Network Author: Mike Tipping

simulation of a type of artificial, self-organising neural network known as the elastic net, or Kohonen map after its originator. Schematically, a typical network is shown on the right. This example consists of two input neurons, each linked by a weighted connection to every neuron in a two-dimensional layer above.

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and it is this effect between neighbouring neurons that causes the sheet to flatten out. However, the net can become twisted, and in some cases may not be able to untwist.

An extra feature of the program (which has no biological relevance) is the ability of the user to override the random input co-ordinates using the mouse. By holding down the Select button, the inputs are set to the co-ordinates of the mouse pointer instead. Try it and see.

Finally, it is worth experimenting with different values of the three variables at the beginning of PROCinitialise in the program. size% defines the width of the x-y array of neurons, and should always be an even number. Taking this down to 4 results in a very quickly evolving net. Increasing it to 16 slows the program considerably.

eta is the training rate. Increasing it causes the weights to take larger steps toward the input values, and results in jerkier motion on screen. Lowering it has the opposite effect. sigma2 is a parameter that effects the elasticity of the net. A larger value will cause neurons further away from the winner to be pulled more. A lower value effectively makes the sheet 'stiffer'.

A POCKETFUL OF VIBES

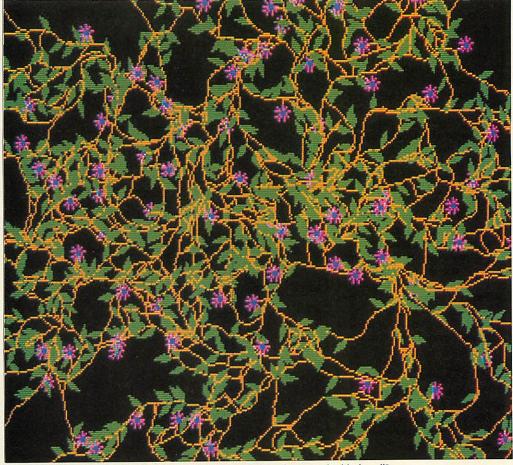
Programs: Creeper, Métro, Kalejdo Author: Jan Vibe

Description: Assorted Dutch weirdness Machine: 22 bit

Machine: 32-bit We haven't carried an offering from Jan Vibe for quite a

from Jan Vibe for quite a while, so this month we've delved deep into the sack and pulled out three Dutch oddities. And, if that's not enough, there's a one-liner from Jan coming up later.

Métro draws a map of the Paris Metro. Well, that's a bit of a fib, I'm sure the French would think it's a map of our illustrious Underground. Actually, everyone in the *****INFO office thinks it's really the Moscow tube, so who can tell? Perhaps it's really a plan of those LA sewers where the



A beautiful creeper climbing up a wall. Sigh! Still, when did you last see a jet-black wall?

Step-by-step

JAN VIBE'S KALEJDO

DEF PROCcolours – This sets up a random palette for colours 1 to 15. Colour 0 is left untouched to keep a black background. The components are stored in an array so they can be twiddled later.

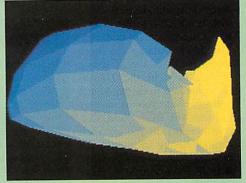
DEF PROCscreen – This sets aside a block of memory and initialises it as a sprite area (SpriteOp &109). Next a 320 x 256, Mode 9 sprite is generated and VDU output is redirected to it.

1000 randomly-coloured triangles are plotted in random positions on this sprite, and, finally, VDU output is redirected to the screen. This procedure could have plotted the triangles onto the screen and then grabbed the screen as a sprite, but this method is more elegant.

DEF PROCkalejdo – This is the main routine. Two banks of screen memory are used to ensure smooth animation (update and display). A point (x,y) and a random direction (dx,dy) are chosen and the main loop entered.

This waits for VSYNC, then swaps the displayed and updated screens. x and y are moved by dx and dy and if either co-ordinate goes off the edge of the screen a new dx and dy are chosen. A randomlychosen colour (RND(15)) then has its r, g and b coordinates randomly 'nudged' by a small quantity.

The VDU is then redirected to the 'triangle' sprite and a sprite called 'box' grabbed from the current x, y co-ordinates. This sprite is then used as the basis for



the kaleidoscope. The pattern consists of the 'box' sprite reflected four times in each corner of the screen. The procedure PROCplot plots four copies of the sprite at 512 pixel offsets.

This is called to plot the bottom-left-hand elements of each corner. SpriteOp 47 is used to flip the sprite about the y-axis, and the bottom-right element is then plotted. SpriteOp 33 flips about the x-axis and is followed by plotting the top-right element.

Finally, the sprite is flipped back about the y-axis to plot the top left element.

PROCerror – This is the error routine, which will normally only be called when ESCAPE is pressed. This simply prints the error message, but first makes sure that output is directed at the screen and the correct screen bank is being displayed. ants in *Them!* hid. Come to think of it, the most likely explanation is that this the first viewing of the inside of Jan Vibe's brain...

Jan claims that *Creeper* is a development from *Métro*, although it's quite hard to spot the connection. One of the last submissions from Jan was a cabbage simulator, and next month we have a recursive carrot lined up – opening letters marked 'The Netherlands' is getting very unpredictable these days.

Finally, in this section is *Kalejdo*, Jan's entry to our unofficial kaleidoscope competition from a few months back. It's quite amazing what you can do with a handful of lines of Basic and a few SpriteOp calls. For those interested, *Kalejdo* is carefully teased apart in this month's *Step by Step*.

PASTURES NEW

Programs: DTwelcome+ Author: Allister Jenks Description: Changes the Risc OS welcome message Machine: 32-bit

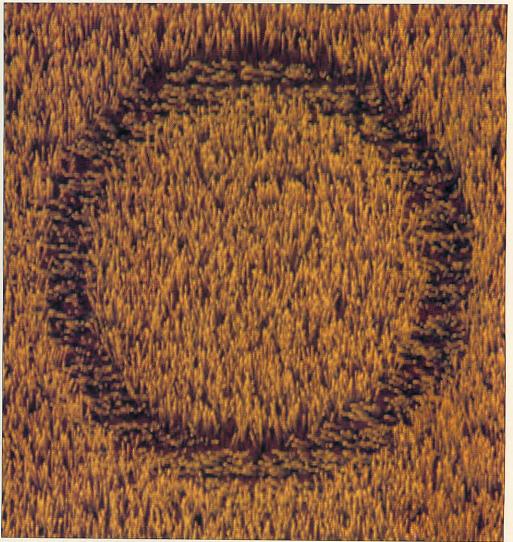
One of the most amazing things about the *INFO postbag is the origin of some of our submissions. Allister Jenks has written to us from Wellington, New Zealand (currently in the depths of winter, he he!) with a hint, a tip and a one-liner – how's that for good value.

The Hint: Adding the lines shown in the listing *DTwelcome*+ to the *DTwelcome* module from the March issue enables you to display the standard Risc OS 3 welcome banner if you so wish without having to remove the module. With the new version: ● If *Welcome*\$*Sprite* is unset or is not a string type, the standard banner will be displayed.

• If *Welcome*\$*Sprite* is set to a valid sprite file, the first sprite in the file will be displayed.

• If *Welcome*\$*Sprite* is set to any value starting with a dash (Ascii code 45), as in "-none", or is not a valid sprite file, nothing is displayed.

The Tip: There is a bug in the Risc OS 3.10 Roms in the *Configure* application. Namely, configuring Caps or ShCaps using the application gives ShCaps or Caps respec-



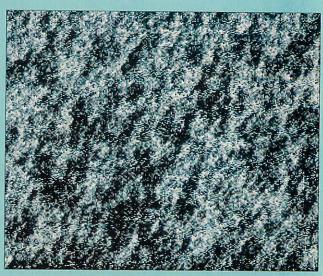
Sights like this sparked off pandemonium in Shropshire and Wiltshire. It's a funny old game ...

One line corner

We have three one-liners for you this month, starting with a surprisingly realistic mystical phenomenon.

Allister Jenks' CropCircle draws a field of wheat, strangely flattened into a circular pattern. The radius and width of the circle can be altered by changing the values of r and w at the start of the line. Owners of multisync monitors might like to run the program in Mode 20 to get a finer display.

Next up is Jan Vibe's Granite. This uses a simple averaging formula with a cunningly-chosen random number to produce a granite rockface. Other effects can be achieved by changing the equation after the GCOL. Instead of 8*(RND(1)-.44) try 2*RND(1) for a surprisingly biscuitlike effect.



Finally in this section, TVsnow is an amazingly-useless eight-bit ditty from Andy Jeffries. This uses video registers to generate an overscanned screen and then palette effects to give that genuine BBC-at-3 o'clock-in-the-morning feeling. Sorry, but 32-bit owners will have to sit this one out, as the emulator can't quite cope with all these hardware addresses.

tively. As *Configure* is written in Arm code, the easiest way of remedying the bug is to alter the template file.

Save a copy of Resources: \$. Resources. Configure. Templates to a disc, then load it into FormEd. Open the window called 'Keyboard' and click Menu over the Shift Caps radio button.

Go to the Renumber #0 submenu, type in 15 and press RETURN. This swaps the icon numbers of the Caps and Shift Caps options. Save the template file back to disc. Now you will need to make use of the *Register* utility, which, you may remember, appeared in the November 1992 issue of *Acorn User*, to create a module which can then be easily installed in your boot sequence.

A copy of the altered template file is to be found included on the subscriber's disc. Whether you think that having a 'correct' configure templates file is worth losing 13K of Ram for is entirely up to you, however.

WHIRLED IN ACTION

The One-liner: This appears in one-line corner, coming up soon... Program: Rotate Description: Fast sprite rotation demo Author: David Williams Machine: 32-bit

Although sprite rotation is nothing new – even Risc OS does it now – this particularly short and fast example is certainly worth a look. It also has a feedback option so you can relive those special effects from *Doctor Who* and *Top of the Pops* circa 1975. You'll need a Mode 13

a Mode 13 picture to try out the demo;

copy one (or create one by saving a desktop screen using Paint while in Mode 13) and save as rot_pic. Then simply run Rotate and enter 'N' for feedback. Move the pointer to alter the centre of rotation. The left and right mouse buttons rotate the image, and the middle button zeros the rotation. Use the spacebar and 'L' to zoom in and out. The number of frames per second is shown on the right, together with a small version of the original picture. With an Arm3, 25 or more frames per second can be achieved.

Really wacky effects can be seen by selecting feedback at the start, in which case a screen won't be loaded. Random dots are displayed around the pointer. The keys and buttons work slightly differently – experimentation is best. At first, move the pointer only slightly around the centre of the screen and use the space bar to zoom in slowly. What is happening is that the rotated screen is being copied to the 'original' store every frame, rather than keeping the original intact. Thus the rotation effect is cumulative and the random dots develop into trails or curious patterns.

The rotation works in a classic way. For each displayed row on the screen, the row from the original is calculated - that is, the x and y coordinates of each end of that row are found. Then x and ysteps are calculated. Bytes are read from the original image one at a time, and the x and yposition incremented by the steps each time. When eight bytes have been read these are stored in one go on the screen using STM. To avoid checking bounds, David immerses the original image in a big area of black. In this way you needn't worry about reaching the edge of the picture since you never actually can.

SLIME TIME

Program: Slime, Sparkle, Cycle Description: Graphical demos Author: Christopher Bassett Machine: Eight-bit

Here are a couple more colourcycling animations from Christopher Bassett. The original *Cycle* program that animates them has been upgraded slightly to enhance the effect of *Slime* so you'll find a revised listing with the two new demos. Each demo creates and saves a screen and two new lines of DATA at the end of *Cycle* add them to the menu.

The original *Cycle* only allowed one colour to be visible at a time. To let the *Slime* really ooze, an extra

When some people look at this, all they can see is Australian surf. Some see vanilla ice cream being scooped up in the summer sun by Mr Whippy and his travelling van. Others see astronomical nebulae and other galaxies. All I can think about is Old Spice adverts and Carmina Burana. Not quite the same, really, is it? parameter (offset) has been added to each animation's data. This is simply the difference between the next colour to make visible and the next to change back to black. An offset of one leaves things as they were last month, but Slime uses an offset of seven so consecutive groups of seven colours are changed to green for a really slimy result.

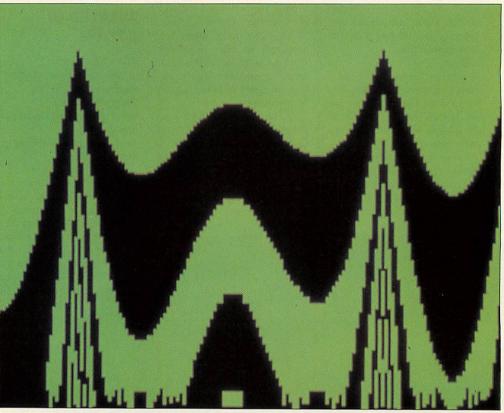
SHARE ALIKE

You may well think that the *SharedCLibrary* module is only for use by applications written and compiled in C. In general, that is indeed the case but there are a couple of SWI calls that allow you to communicate directly with the library and use the many routines therein. So even Basic-only programmers can have access to the C Library functions and machine code programmers can save themselves a lot of code and time.

The C Library, which is a part of the Risc OS 3.1 Rom, exists to save space. Many C routines, such as those to print things, input values, perform maths operations and manipulate strings, are used by just about all C programs. Rather than include copies of the necessary code in each program it was decided to put the most commonly-used routines into a module. By using 'stubs' (effectively just tables of branch instructions which jump into the SharedCLibrary module) all applications can have access to the same set of library calls.

To use the C library routines you must register yourself with the module. This means using one of two calls: SharedCLibrary_LibInitAPCS_R (phew!) if you're an application, or SharedCLibrary_LibInitModule if you're a relocatable module, like our example, based on the one in the latest Programmer's Reference Manuals.

Whichever call you use, the idea is that you tell the C library module where you want it to put branches to its functions and where certain static data can be placed. These data include things like a 256-byte array containing an eight-bit mask for each character that describes it (control code,



Remember The Blob? And that green slime you could buy in pots when you were a kid? Nostalgia, eh...

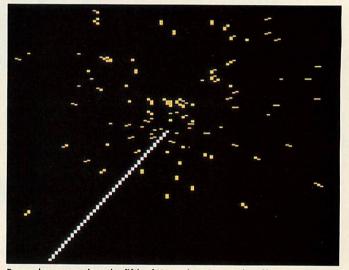
upper/lower case) and the stdin and stdout FILE structures used in C.

Having registered yourself with the C module you can then begin to call its routines. These are arranged in two sets - library kernel functions and C library functions. Kernel functions include those providing an interface to certain SWI calls (like OS_File and OS_Word), division routines, calls to enable/disable IRQs and so on. The more glamorous routines are in the C library table and these include things like printf and scanf - versatile input and output routines, string and file handling calls, mathematical functions, even searching and sorting calls, as in our example.

Our example has been written in 'bits' so you can add calls to it. The main part of the source is *SCLsrce*. It looks in the directory *SCL* (create this) for *Version* (which contains a function returning current module version number) and any files called *SWIxx*. Each *SWIxx* defines a SWI call and contains a set of functions.

***DISC**

We have a bonus public domain application from Liquid Silicon. *FreeMem* sits



Remember, remember, the fifth of November. Seasonal stuff

on the iconbar and keeps you informed of the free memory you have in your machine. It uses very little memory (about 3K) and can be configured to use outline fonts for improved legibility. Full details in the help file in the application.

*QUIT

For submissions, all but the shortest of programs should be on disc accompanied by quick instructions as to how to use them. Please write your name, address and program title on all discs and include a suitable, stamped addressed envelope if you want your disc returned. Program explanations and further details are very helpful and, if possible, should be included on the disc in the form of a *ReadMe* file.

We also welcome hints, tips, suggestions, ideas for features, questions, answers, applications, patches, features and comments. Above all keep sending in programs, because what we'd like to see on these pages is your work!

Submissions to: *****INFO, BBC Acorn User, Redwood Publishing, 101 Bayham Street, London NW1 0AG.

YELLOW PAGES

Free programs for you to type in and use

HOW TO ENTER THE PROGRAMS

This section describes how to enter and use the more complicated programs in the yellow pages. Some of the explanations mention the Currently Selected Directory (CSD): for more details on the CSD, see the box below.

***INFO (page 95)**

Info5

The lines in the listing DTwelcome+ should be added to the DTwelcomeS program from *INFO, March 1993. When the new DTwelcomeS is run, a module called DTwelcome is saved in the CSD. This module allows you to remove the Risc OS 3 welcome banner when the desktop is started, or to display a sprite of your choice in its place. The module must be loaded before the desktop is started (before *Desktop is issued).

Info6

If the feedback option is not chosen when Rotate is run, then the program looks for a sprite called rot_pic in the CSD. If this is not present, then an error will be given. If feedback is chosen, then no sprite is loaded.

Info7 – Info9

Type in the three programs and save them all on the same disc. Run Slime (by typing CHAIN "Slime") to create the file SimetScr, and run Sparkle (by typing CHAIN "Sparkle") to create the file SparScr. Finally, type CHAIN "Cycle" to run the main program. Note that the program includes options to load the two screens (VortScr and WatrScr) from last month's *INFO, but these options will not work if the screens are not present on disc.

Info10 – Info16

To create the SCLmod module, do the following:

• Type in and save SCLsrce in a directory of your choice, and set this to the CSD.

• Create a directory called SCL in this directory.

Save Version, SWI00, SWI01. SWI02 and SWI03 inside SCL. • Double-click on SCLsrce to compile the module, which will be saved in the same directory as the source code.

To use the two test programs, SearchTest and SortTest, you must first load the SCLmod module by double-clicking on it. The two test programs will give a 'SWI not known' error if run without the SCLmod module loaded.

BIO (page 91)

To add the three new modules to your copy of Bio (which must include the enhancements presented last month), do the following:

• Type in and save the three programs, FileLock, ForceWipe and TtoD, inside !Bio.Library.

• Create a sprite file, called Sprites, inside IBio.Library. This must contain at least the following sprites:

bio4, forcewipe4, filelock4, ttod4

which should be 34 pixels wide, 17 high, Mode 12 sprites. You can also optionally create high resolution versions of the sprites with names:

bio2, forcewipe2, filelock2, ttod2 which should be 34 pixels wide, 34 high, Mode 20 sprites.

Setting the Currently Selected Directory (CSD)

Some of the explanations above require the CSD to be set to a certain directory in order for them to work. To do this, you must first create an Obey file (using Edit) containing just the following line:

Dir <Obey\$Dir>

Next save it under the name ThisDir in the directory you wish to set as the CSD. Finally, double-click on ThisDir to set the CSD to that directory.

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 footnotes at the end of the table.

Article *INFO (page 95)	Program Name	8-bit	32-bit
Info1	ElasticNet		*
Info2	Creeper		*
Info3	Métro		*
Info4	Kalejdo		*
Info5	DTwelcome+		*
Info6	Rotate		*

Info7	Slime	*		
Info8	Sparkle	*		
Info9	Cycle	*		
Info10	SCLsrce		*	
Info11	Version		*	
Info12	SWIOO		*	
Info13	SWI01		*	
Info14	SWI02		*	
Info15	SWI03		*	
Info16	SearchTest		*	
Info17	Granite		*	
Info18	Granite2		*	
Info19	TVsnow	*		
Info20	CropCircle		*	
BIO (page 91)				
Bio1	FileLock		*	
Bio2	ForceWipe		*	
Bio3	TtoD		*	
	The second s			

PROGRAMS

*INFO (page 95)

			thin o (page :
Listing Info1	1040 BPL winner_loop 1050 .draw_net	390 IF j=5 d2-=1 400 ENDIF	180 END 190 :
10 REM >ElasticNet (Info1)	1050 MOV index,#0 1070 MOV R0,#112	410 IF RND(1)>.9 THEN	200 DEF PROCcolours
20 REM By Mike Tipping	1070 HOV R0, #112 1080 LDR R1, bank	430 a1=a-20:a2=a+20	210 DIM r(15),g(15),b(15) 220 FOR i=1 TO 15
30 REM For 32-bit machines 40 REM (c) BAU September 1993	1090 RSB R1,R1,#3	440 MOVE x(i,e),y(i,e)	230 r(i)=RND(510)
50 :	1100 STR R1, bank 1110 SWI "OS Byte"	450 GCOL 2:MOVEx(i,e)+20*SINRADa1 ,y(i,e)+20*COSRADa1	240 g(i)=RND(510) 250 b(i)=RND(510)
60 multiscan=FALSE 70 :	1120 SWI vdu+12	460 PLOT 85,x(i,e)+20*SINRADa2,y(260 COLOUR i, ABS(r(i) MOD 510-255),
80 PROCinitialise	1130 MOV netx,#size% 1140 .loopx MOV nety,#size%	i,e)+20*COSRADa2 470 PLOT 85,x(i,e)+40*SINRADa,y(i	S(g(i) MOD 510-255), ABS(b(i) MOD 510-2
90 PROCassemble 100 PROCcycle	1150 .loopy MOV R8,#(outputs%/2) 1160 MLA R2, index, R8, winner	,e)+40*COSRADa	270 NEXT
10 END	1160 MLA R2, index, R8, winner 1170 LDR lambda, [metric, R2, L	480 ENDIF 490 IF RND(1)>.99 THEN	280 ENDPROC 290 :
20 : 30 DEF PROCcycle	SL#2]	500 a=a(i,e)-60*SGN(RND(1)5)	300 DEF PROCecreen
40 *POINTER 1	1180 SWI vdu+18 -1190 MOV RØ,#Ø	510 xx=x(i,e)+32*SINRADa 520 yy=y(i,e)+32*COSRADa	310 DIM spr &20000 320 spr!0=&20000
50 mouse=FALSE 60 REFEAT	1200 SWI "OS_WriteC" 1210 ADD R0,nety,netx	530 GCOL 6:LINE x(i,e),y(i,e),xx,	330 spr!8=16
170 MOUSE mx, my, mz	1220 SWI "OS_WriteC"	YY 540 GCOL 5:FOR a=40 TO 360 STEP 4	340 SYS spop, £109, spr 350 SYS spop, 256+15, spr, "scr",0,320,
180 IF mz AND 4 THEN 190 F%=mx	1230 MOV RØ,#85 1240 CMP nety,#size%	Ø:LINE xx, yy, xx+16*SINRADa, yy+16*COSRADa	6,9
200 G%=my	1240 CMP nety,#size% 1250 SUBEQ RØ,RØ,#17	:NEXT 550 GCOL 4:CIRCLE FILL xx, yy, 4	360 SYS spop,256+60,spr,"scr",0 370 FOR i=1 TO 1000
210 ELSE 220 F%=RND(1024)	1260 LDR x, [weight, index, LSL #2]	560 ENDIF 570 ENDIF	380 GCOL RND(15)
30 G%=RND(1024)	1270 RSB R8, x, input0, ASL#6	580 NEXT	390 x=RND(1280) 400 y=RND(1024)
40 ENDIF 50 CALL network	1280 MUL R8, lambda, R8 1290 ADD R8, x, R8, ASR#16	590 SWAP d,d2:SWAP e,e2 600 Q=.9	410 MOVE x+RND(300)-150,y+RND(300)
60 UNTIL FALSE	1300 STR R8, [weight, index, LS	600 Q=.9 610 IF d<10 Q=.8	420 MOVE x+RND(300)-150,y+RND(300)
70 ENDPROC 80 :	_ L#2]	620 UNTIL d=0	0
90 DEF PROCinitialise	1310 ADD index, index, #1 1320 LDR y, [weight, index, LSL	630 IFINKEY(300) 640 UNTIL FALSE	430 PLOT 85,x+RND(300)-150,y+RND(3) -150
00 size% = 8 10 sigma2 = 4	#2]	The second s	440 NEXT
20 eta = 0.05	1330 RSB R8, y, input1, ASL#6 1340 MUL R8, lambda, R8	Listing Info3	450 SYS spop,256+60,spr,0,0 460 ENDPROC
330 IF multiscan THEN 340 MODE 28:MODE 27	1350 ADD R8, y, R8, ASR#16	10 REM >MLETtro (Info3) 20 REM By Jan Vibe	470 :
50 ELSE	L#2]	30 REM For 32-bit machines	480 DEF PROCkalejdo 490 update=1:display=2
60 HODE 15:MODE 12 70 ENDIF	1370 CMP netx,#1	40 REM (c) BAU September 1993 50 :	490 update=1:display=2 500 x=512:y=384
880 ORIGIN 128,0	1390 MOV x, x, ASR#6	60 MODE 13:OFF	510 dx=4*RND(4)*SGN(RND(1)5) 520 dy=4*RND(4)*SGN(RND(1)5)
90 PRINT "Please Wait" 00 OFF	1400 MOV y,y,ASR#6	70 DIM x(500,1),y(500,1),dx(500,1),dy (500,1),c(500,1)	530 REPEAT
10 outputs% = size%^2	1410 SWI "OS_Plot" 1420 ADD index,index,#(size%	80 REPEAT	540 WAIT 550 SYS 6,112,update:SYS 6,113,dis
20 DIM weights% 4*outputs%*2 30 DIM metrics% 4*outputs%*2	*2-1)	90 CLS 100 d=1:e=0:e2=1	У
40 FOR 1%=0 TO 1	1430 LDR x, [weight, index, LSL #2]	110 x(d,e)=640	560 SWAP update, display 570 z=x+dx:IF z>980 OR z<0 dx=4*(F
<pre>450 FOR o%=0 TO outputs%-1 460 weights%!(4*(o%+outputs%*i%)) =</pre>	1440 MOV x,x,ASR#6	120 y(d,e)=512 130 dx(d,e)=4*(RND(3)-2)	4)+1)*SGN(-dx)
268+RND(13000)	1450 ADD index, index, #1 1460 LDR y, [weight, index, LSL	140 dy(d,e)=4*(RND(3)-2)	580 z=y+dy:IF z>724 OR z<0 dy=4*(F 4)+1)*SGN(-dy)
470 NEXT 480 NEXT	#2]	150 c(d,e)=RND(62) 160 REPEAT	590 x+=dx:y+=dy
490 FOR n%=0 TO outputs%-1	1470 MOV y,y,ASR#6 1480 SWI "OS Plot"	170 d2=0	600 c=RND(15) 610 r(c)=(r(c)+RND(20))MOD510
500 FOR m%=0 TO outputs%-1 510 lambda = eta * EXP(-(((n% MOD si	1490 SUB index, index, #(size%	180 FOR i=1 TO d 190 GCOL c(i,e)	62Ø g(c)=(g(c)+RND(2Ø))MOD51Ø
%)-(m% MOD size%))^2+((n% DIV size%)-(*2) 1500 .skip ADD index,index,#1	200 POINT x(i,e),y(i,e)	630 b(c)=(b(c)+RND(20))MOD510 640 COLOUR c,ABS(r(c)MOD510-255),A
DIV size%))^2)/sigma2) 520 metrics%!(4*(n%*outputs%+m%)) =	151Ø SUBS nety, nety, #1	210 IF RND(1)>.85 THEN 220 j=0	g(c)MOD510-255),ABS(b(c)MOD510-255)
mbda*65536	1520 BNE loopy 1530 SUBS netx,netx,#1	230 REPEAT	650 SYS spop,256+60,spr,"scr",0 660 SYS spop,256+16,spr,"box",0,x,
530 NEXT 540 NEXT	1540 BNE loopx 1550	240 j+=1 250 dx(i,e)=4*(RND(3)-2)	+256, y+256
550 FOR 1%=1 TO 15	1560 MOV RØ,#19	260 dy(i,e)=4*(RND(3)-2)	670 SYS spop,256+60,spr,0,0:0FF 680 PROCplot(0,0)
560 COLOUR 1%,15+1%*16,15+1%*16,256-1 16	1570 SWI "OS_Byte" 1580 MOV RØ,#113	270 UNTIL POINT(x(i,e)+dx(i,e),y(i ,e)+dy(i,e))=0 OR j=3	690 SYSspop, 256+47, spr, "box"
570 NEXT	1590 LDR R1, bank	280 ENDIF	700 PROCplot(256,0) 710 SYSspop,256+33,spr,"box"
580 ENDPROC 590 :	1600 SWI "OS_Byte"	29Ø x1=x(i,e)+dx(i,e) 30Ø y1=y(i,e)+dy(i,e)	720 PROCplot(256,256)
600 DEF PROCassemble	1610 MOV PC,R14 1620	310 IF POINT(x1,y1)=0 THEN	730 SYSspop,256+47,spr,"box" 740 PROCplot(0,256)
10 x=1 20 y=2	1630]	32Ø d2+=1 33Ø x(d2,e2)=x1	750 UNTIL 0
630 dx=3	1640 NEXT pass% 1650 ENDPROC	34Ø y(d2,e2)=y1	760 ENDPROC 770 :
540 dy=4 550 weight=10	Listing Info2	350 c(d2,e2)=c(i,e) 360 dx(d2,e2)=dx(i,e)	780 DEF PROCplot(px,py)
660 index=11		37Ø dy(d2,e2)=dy(i,e)	790 LOCAL x,y 800 FOR x1=0 TO 1023 STEP 512
570 metric=7 580 netx=3	10 REM >Creeper (Info2) 20 REM By Jan Vibe	380 GCOL 63:POINT x1,y1 390 IF RND(1)>.9 THEN	810 FOR y1=0 TO 1023 STEP 512
59Ø nety=4	30 REM For 32-bit machines	400 d2+=1	820 SYS spop, 256+34, spr, "box", px+ +x1, py+y1, 0
00 closest=1 10 distance=2	40 REM (c) BAU September 1993 50 :	410 x(d2,e2)=x1 420 y(d2,e2)=y1	830 NEXT
20 winner=9	60 MODE 9:OFF	430 c(d2,e2)=RND(62)	840 NEXT 850 ENDPROC
30 input0=5 40 input1=6	70 DIM x(500,1),y(500,1),a(500,2) 80 COLOUR 6,200,140,0:COLOUR 2,0,128,	440 j=0 450 REPEAT	and the second
50 lambda=12 60 vdu=256	Ø	460 j+=1	Listing Info5
70 :	90 REPEAT 100 CLS	47Ø dx (d2, e2) = 4* (RND (3) - 2) 48Ø dy (d2, e2) = 4* (RND (3) - 2)	300 EQUS "0.02 (" 490 BVS exit
80 DIM code% 1024	110 d=1:e=0:e2=1:Q=.2	490 UNTIL POINT(x1+dx(d2,e2),y1+d	510 BNE exit
90 FOR pass%=0 TO 2 STEP 2 00 P%=code%	120 x(d,e)=640 130 y(d,e)=512	y(d2,e2))=Ø OR j=3 500 ENDIF	511 512 LDRB R8, [R1]
10 [OPT pass%	140 a(d,e)=RND(360)	510 ENDIF	513 CMP R8, #ASC"-"
20 .wptr EQUD weights% 30 .mptr EQUD metrics%	150 a=RADa(d,e) 160 REPEAT	520 NEXT 530 SWAP d, d2:SWAP e, e2	514 BEQ no_sprite 1449 .exit
40 .bank EQUD 1	170 d2=0	540 UNTIL d=0	
50 .network 60 LDR weight,wptr	180 FOR i=1 TO d 190 x1=x(i,e)+5*SINRAD(a(i,e))	550 IFINKEY(300) 560 UNTIL FALSE	Listing Info6
TØ LDR metric,mptr 80 MOV closest,#&700000000	200 y1=y(i,e)+5*COSRAD(a(i,e)) 210 c=POINT(x1,y1)	Listing Info4	10 REM >Rotate (Info6) 20 REM By David Williams
90 MOV index,#(outputs%*2-	220 IF c>=0 AND c<>6 THEN		30 REM For 32-bit machines
00 .winner_loop	230 d2+=1 240 x(d2,e2)=x1	10 REM >Kalejdo (Info4) 20 REM By Jan Vibe	40 REM (c) BAU September 1993 50 :
10 LDR dy, [weight, index, LS	250 y(d2,e2)=y1	30 REM For 32-bit machines	60 PROCinit
1	260 a(d2,e2)=a(i,e)+RND(41)-21	40 REM (c) BAU September 1993 50 :	70 PROCdo 80 END
30 SUB index, index, #1	270 GCOL 6:LINE x(i,e),y(i,e),x1,y 1	60 MODE137:MODE9:OFF	90 :
40 LDR dx, [weight, index, LS]	280 IF RND(1)>Q THEN	70 SYS "OS_SWINumberFromString",, "OS_ SpriteOp" TO spop	100 DEF PROCinit 110 MODE 15
50 SUB dx, dx, input0, ASL#6	300 x(d2,e2)=x1	80 ONERRORPROCerror:END	120 aa%=0
60 MUL R12, dx, dx 70 MOV R12, R12, ASR#16	310 y(d2,e2)=y1:j=0 320 REPEAT	90 PROCcolours 100 PROCscreen	130 PRINT "Use mouse to move, Left Right button - Rotate"
	320 REPEAT 330 j+=1	110 PROCkalejdo	140 PRINT " , Centre
		120 END	utton - Stop rotation"
90 ADD distance, R12, R8, ASR	340 a(d2,e2)=(RND(120)+a(i,e)+30	130 :	150 PRINT "Space to zoom in and. I.
990 ADD distance,R12,R8,ASR 6 200 CMP distance,closest	Ø)MOD360 350 a=a(d2,e2)	130 : 140 DEF PROCerror	zoom out."'
990 ADD distance, R12, R8, ASR 6	Ø)MOD36Ø	130 :	<pre>150 PRINT "Space to zoom in and, L t zoom out." 160 INPUT"Use Feedback (Y/N) ";a\$ 170 feed%=(a\$="Y" OR a\$="y")</pre>

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pic		THEN *SCREENLOAD rot_	134Ø 135Ø		SUB MOV	R2 ,R2,R4 R1Ø,R2,ASR #1
21Ø	OFF GCOL Ø TINT Ø		136Ø 137Ø		MOV ADD	R11, R10, LSL # R11, R11, R10, L
	RECTANGLE FII scr2size%=400	L 1024,0,256,768	138Ø]		LDRB	R11, [R11, R6, A
24Ø	DIM q% 16, sci		139Ø 14ØØ		ADD ADD	R5 ,R11,R5,LS R6 ,R6,R3
260	scr2%!a%=Ø		1410		SUB	R2 ,R2,R4
28Ø	NEXT scr2%+=100000	,	142Ø 143Ø		MOV MOV	R10, R2, ASR #1 R11, R10, LSL #
	!q%=148 g%!4=-1		144Ø 145Ø		ADD LDRB	R11, R11, R10, L R11, [R11, R6, A
31Ø		/duVariables",q%,q%+8	1		ADD	
33Ø	x%=Ø		1460 1470		ADD	R5 ,R11,R5,LS R6 ,R6,R3
	y%=Ø s%=512		148Ø 149Ø		SUB MOV	R2 ,R2,R4 R1Ø,R2,ASR #1
	ang%=9Ø PROCcode		1500 1510		MOV	R11,R10,LSL # R11,R11,R10,L
38Ø	work%!12=scr2	28	1520		LDRB	R11, [R11, R6, A
400	*POINTER MOUSE TO 512,	512] 1530		ADD	R5 ,R11,R5,LS
	PROCsmall ENDPROC		154Ø 155Ø		ADD SUB	R6 ,R6,R3 R2 ,R2,R4
430			156Ø 157Ø		MOV MOV	R10, R2, ASR #1 R11, R10, LSL #
45Ø	FOR y%=Ø TO	155 STEP 4	158Ø		ADD	R11, R11, R10, L
460	r%=ss%+y%*32		1590		LDRB	R1 ,[R11,R6,A
48Ø 49Ø	FOR x%=Ø TO w%?(x%DIV4)		1600		ADD SUB	R6 ,R6,R3 R2 ,R2,R4
500			162Ø 163Ø		MOV MOV	R10, R2, ASR #1 R11, R10, LSL #
52Ø	ENDPROC		164Ø		ADD	R11, R11, R1Ø, L
53Ø 54Ø	: DEF PROCdo		1650		LDRB	R11, [R11, R6, A
	nf%=Ø TIME=Ø		166Ø 167Ø		ADD ADD	R1 ,R11,R1,LS R6 ,R6,R3
57Ø	IF NOT feed%	THEN CALL COPY	1680		SUB	R2 ,R2,R4
59Ø	REPEAT nf%+=1		169Ø 17ØØ		MOV	R10, R2, ASR #1 R11, R10, LSL #
600 610	IF NOT feeds IF INKEY-95		171Ø 172Ø		ADD LDRB	R11, R11, R10, L R11, [R11, R6, A
62Ø	IF INKEY-87 ELSE	7 8%+=1] 1730		ADD	R1 ,R11,R1,LS
64Ø	IF INKEY-9		1740		ADD	R6 ,R6,R3
65Ø 66Ø		/ 8%+=3	175Ø 176Ø		SUB MOV	R2 ,R2,R4 R10,R2,ASR #1
	ENDIF MOUSE x%, y%	.b%	177Ø 178Ø		MOV ADD	R11, R10, LSL # R11, R11, R10, L
69Ø	x%-=514 y%-=508		1790		LDRB	R11, [R11, R6, A
710	x%=x%/2		1800		ADD	R1 ,R11,R1,LS
	y%=y%/2 w1=SINRAD(a)	ng%)	1810		ADD	R9!, {r1 ,R5} R6 ,R6,R3
	q1=COSRAD(a) w2=SINRAD(a)		1830		SUB SUBS	R2 ,R2,R4 R7 ,R7,#1
76Ø	g2=COSRAD (a)	ng%+9Ø)	185Ø 186Ø		BGE SUB	1bg R6,R6,R3,LSL
78Ø	w3=SINRAD(a) w4=SINRAD(a)	ng%+27Ø)	187Ø		SUB	R6 , R6, R8
800	x1%=512+x%+1 x2%=512+x%+1	s%*w2+s%*q2	188Ø 189Ø		ADD	R9 ,R9,#64 R14,R14,RØ
81Ø 82Ø		s%*w3+s%*q1 s%*w4+s%*q2	1900 1910		SUBS	R12,R12,#1 lp1
83Ø	IF b% AND4	ang%-=1	1920			R131, {pc }
84Ø 85Ø			193Ø 194Ø	.copy	LDR	RØ, vss2
86Ø 87Ø	PROCshow_ge IF feed% TH	t_areas EN	195Ø 196Ø		LDR MOV	R1, V88 R2, #255
88Ø 89Ø	ax%=RND(20)-RND(20)+128)-RND(20)+128	197Ø 198Ø	.cl1	LDMIA STMIA	R1!, (r3-r12) RØ!, (r3-r12)
900	ss%?(ax%+a) ENDIF	y%*320)=RND	199Ø		LDMIA	R11, (r3-r12) RØ1, (r3-r12)
920	PRINT TAB(3	2,16);INT(1/(TIME/100)	2000 2010		LDMIA	R1!, (r3-r12)
	PS ":TIME=0 UNTIL FALSE		2020		LDMIA	RØ!, {r3-r12 } R1!, {r3-r12 }
94Ø 95Ø	ENDPROC		2040 2050		STMIA	RØ!, (r3-r12) R1!, (r3-r12)
96Ø	DEF PROCshow		2060		STMIA	RØ!, (r3-r12) R1!, (r3-r12)
98Ø	work%!16=ss% !work%=x2%	° °			STMIA	RØ!, (r3-r12) R1!, (r9-r11) RØ!, (r9-r11)
	work%!4=y2% work%!8=x1%		2050		LDMIA STMIA	R1!, (r9-r11) RØ!, (r9-r11)
	work%!20=y1% CALL lbga		2100 2110 2120		LDR STR	R12, [R1], #68 R12, [RØ], #132
1030	ENDPROC		2130		SUBS	R2, R2, #1
1040 1050	DEF PROCcode		214Ø 215Ø		BGE MOV	PC,R14
	DIM code% 10 FOR pa%=0 TO	000,work% 1000 2 STEP 2	216Ø 217Ø	.vw	EQUD	work%
1080	P%=code% [OPT pa%		2180	.vw .vss .vss2 .vlu	EQUD	85% 8CT2%+64+(384
1100	.lbga LDR	RØ, vw			EQUD	Ø
111ø 112ø	MOV	D R13!, {r14 } R12, #255	221Ø 222Ø	NEXT		
113Ø R14}		A RØ, (r3 ,R4,R6,R8,R9,		ENDPROC		
114Ø 115Ø	SUB	R3,R3,R6 R4,R4,R14	Listi	ng Inf	07	
1160	RSB	R11,R3,#Ø		REM By		(Info7) copher Bassett
117Ø 118Ø	MOV RSB	R3 ,R3,LSL #3 R10,R4,#0	by DA)			machines
1190 1200	MOV ADD	R4 ,R4,LSL #3 R9 ,R9,#255	40	REM (c)		eptember 1993
121Ø 122Ø	MOV ADD	R6 ,R6,LSL #11 R6 ,R6,#64<13		MODE 2		
1230	ADD MOV	R6 ,R6,R8,LSL #13		DIM mc PROCass		
1240 1250	MOV	R8 , R10, LSL #3	90	k=1Ø r1=RND(
1260	.lp1 RSB MOV	RØ ,R11,LSL #3 R2 ,R14,#32Ø<<13	110	r2=RND(k)	
1280	.lbg MOV MOV	R3, R3, L5L #3 R10, R4, #0 R4, R4, L5L #3 P3, R9, #255 R6, R6, L5L #11 R6, R6, #64<<13 R14, R14, L5L #13 R14, R14, L5L #13 R0, R11, L5L #3 R0, R11, L5L #3 R12, R14, #320<<13 R7, #31 R10, R2, ASR #13 R14, R10, L5L #8	130	r3=RND(FOR z=Ø	TO 160	3
1300	MOV	R11,R10,LSL #8 R11,R11,R10,LSL #7 R5 ,[R11,R6,ASR #13		11x=(z	*8)	AD(+1++)+COSB
1320	LDRB	R5 , [R11, R6, ASR #13)+COSP 160	AD(r3*z CALL 1)))*32+	16
] 1330	ADD	R6 ,R6,R3	170			

13	180 *SAVE SlmeScr 3000 8000 190 END
#8 USL #7	200 : 210 DEF PROCassem
ASR #13	220 oswrch=&FFEE 230 ly=&70:hy=&71
3L #8	240 1x=&74:hx=&75 250 1s=&78:hs=&79
13	260 FOR pass=0 TO 2 STEP 2 270 P%=mc
8	280 [OPT pass
USL #7 ASR #13	290 .line 300 LDA #255
3L #8	310 STA ly 320 LDA #3
	330 STA hy 340 LDA #25
L3 ‡8	350 JSR oswrch 360 LDA #4
LSL #7 ASR #13	370 JSR oswrch 380 LDA 1x
3L #8	390 JSR oswrch 400 LDA hx
	410 JSR oswrch 420 LDA ly 430 JSR oswrch
L3 #8	440 LDA hy
USL #7 ASR #13	450 JSR oswrch 460 LDX #1
	470 1000
13	480 LDA 418 490 JSR oswrch 500 LDA 40 510 JSR oswrch 520 TXA
#8 LSL #7	510 JSR oswrch 520 TXA
ASR #13	530 JSR oswrch 540 SEC
3L #8	550 LDA 1y 560 SPC 1s
13	570 STA ly
#8 USL #7	590 SBC hs
ASR #13	520 TXA 530 USR oswrch 540 SEC 550 LDA ly 560 SBC ls 570 STA ly 580 LDA hy 590 SEC hs 600 STA hy 610 BMI end 620 LDA #25 630 JBE oswrch
SL #8	630 JSR oswrch 640 LDA #5
	650 JSR oswrch 660 LDA 1x
13 #8	670 JSR oswrch
LSL #7 ASR #13	680 LDA hx 690 JSR oswrch
SL #8	700 LDA 1y 710 JSR oswrch
	720 LDA hy 730 JSR oswrch
	740 INX 750 CPX #15
L #8	760 BNE loop 770 LDX #1
	780 JMP loop 790 .end
	800 RTS 810]
	820 NEXT 830 ENDPROC
	Listing Info8
	10 REM >Sparkle (Info8) 20 REM By Christopher Bassett
)	30 REM For 8-bit machines
}	40 KEM (C) BAU September 1993 50 : 60 MODE 2
)	70 VDU 19,15,7;0;
}	80 c=1 90 FOR s=1 TO 50 100 xs=RND(32)-16
) }	110 ys=RND(30)-3
))	120 x=700 130 y=500
}	140 p=0 150 MOVE x,y
2	160 REPEAT 170 p=p+1
	180 GCOL 0, c 190 x=x+xs
	200 y=y+ys 210 ys=ys-0.5
	220 DRAW x,y 230 c=c+1
4<<6)	240 IF c=15 THEN c=1 250 UNTIL p=35
	260 NEXT 270 GCOL 0,15
	280 MOVE 400,0 290 DRAW 700,500
	300 *SAVE SparScr 3000 8000 310 END
(mods	Listing Info9
	10 REM >Cycle (Info9)
	20 REM By Christopher Bassett (mods by DCA)
	30 REM For 8-bit machines 40 REM (c) BAU September 1993
	50 : 60 DIM file% 25,code% 200
	70 PROCassem 80 ON ERROR VDU 20:REPORT:PRINT" at 1
	ine ";ERL:END 90 REPEAT
AD(r2*z	90 REPEAT 100 MODE 7 110 PRINTAB(13,0)CHR\$(141);CHR\$(130)
	120 PRINTTAB(13,1)CHR\$(141);CHR\$(130)
	;"Cycle Ride"

r 3000 8000 TO 2 STEP 2 arkle (Info8) istopher Bassett it machines September 1993 Ø; -16 HEN C=1 cr 3000 8000 cle (Info9) istopher Bassett (mods it machines September 1993 , code% 200 20:REPORT:PRINT" at 1 3,0)CHR\$(141);CHR\$(130)

130 PRINTTAB(13,2)CHR\$(132);STRING\$(1
2,"_")
140 PRINTTAB(8,3);CHR\$(129);"by Chris
topher Bassett"'
150 RESTORE
150 n%=0
170 REPEAT
150 REPEAT
150 PRINTTAB(5,c1%,c2%,off%
190 IF name\$;rNs=n%+1
200 UNTLL name\$;"NN="N+1
200 UNTLL name\$;"IN=n%+1
200 UNTLL name\$;"END"
210 PRINT'"Select animation (A-";CHR
\$(n%+65);")"
220 REPEAT
230 k%=OET AND &DF
240 UNTLL k%>=55 AND k%<65+n%
250 MODE 2
260 PROCload_pic(k%=65)
270 VDU 23;8202;0;0;0;
280 PROCanimate
300 :
310 DEF PROCanimate</pre> 290 UNTIL FALSE 300 : 310 DEF PROCanimate 320 *FX 229,1 330 speed%=1 340 Idir%=1 540 PROFEM 350 REPEAT 360 p%=INKEY(speed%) 370 IF p%>48 AND p%<52 speed%=(p%-49) 370 IF p%:46 AND p%:52 speed%=(p%:49)
*3
380 IF p%=32 THEN !dir%=-!dir%:?oc%=?
c%:?c%=FNin_range(?oc%+!dir%*off%)
390 CALL anim
400 UNTIL p%=27
410 *FX 229,0
420 ENDPROC
430 :
440 DEF FNin_range(v%)
450 IF v%:1 THEN v%=v%+14 ELSE IF v%>1
4 THEN v%=v%=14
460 e=v%
470 : 468 =v% 478 : 478 : 480 DEF PROCload_pic(a%) 490 7col%=0 500 RESTORE 510 FOR 1%=0 TO a% 520 READ name\$,fn\$,c1%,c2%,off% 530 NEXT 540 7col%=c1% 550 7c%=14 560 7oc%=7c%=off% 570 VDU 19,15,c2%;0; 580 FROCoscl1(~LOAD "+fn\$+" 3000"). 590 ENDPROC 600 : 600 : 510 DEF PROCoscli(line\$) 520 \$file%=line\$ 530 X%=file% NOD 256 640 Y%=file% DIV 256 650 CALL &FFF7 660 ENDPROC 7.7 .
 000
 HDF NOC

 670
 :

 660
 DBF PROCassem

 690
 Oswich #FFE:osbyte=&FFF4

 700
 C%=670:c%=271:col%=£72:dir%=£74

 710
 PCR opt%=0 TO 2 STEP 2

 720
 P%=code%

 730
 IOPT opt%

 740
 .am

 750
 LDA #19

 760
 JSR osynch

 800
 JSR osynch

 810
 LDA c%

 820
 JSR osynch

 920
 JSR osynch

 930
 JSR osynch

 930
 JSR osynch

 930
 JSR osync 67Ø : 68Ø DEF PROCassem 980 LDX #oc% 990 .move_on 1000 LDA &00,X 1010 CLC 1020 ADC dir% 1030 NDE not0 1040 LDA #14 1050 .not0 1060 CMP #15 1070 ENE not15 1080 LDA #1 1090 .not15 1080 LDA #1 1090 .not15 1100 STA &00,X 1110 RTS 1120] 1130 NEXT 1140 ENDPROC 1150 . 1440 SMPRAG 1150 : 1160 DATA "Water", "WatrScr",6,5,1 1170 DATA "Vortex","VortScr",6,4,1 1180 DATA "Slmed","SlmeScr",2,0,7 1190 DATA "Sparkler","SparScr",3,7,1 1200 DATA "END","END",0,0,0 Listing Info10

10 REM

20	REM By	DCA, ba 32-bit	sed on PR	example		1100 nd)
40	REM (C)	BAU Sep	tember 199	13		1110
5Ø 6Ø	: DIM cod	le% &1000	Ø, swi\$(64)	,swi(64),		1120 1130
def(6	4) def()=F				d	1140
8Ø	max_swi					1150
	1%=Ø REPEAT					1160 1170
110	SYS "C	S_GBPB", ,,read%,	9, "SCL", co	ode%, 1, i%,	d	1180
120	IF rea	d%=1 THE	N			1190
13Ø 14Ø	WHILE	?j%>=32				1200 1210
150 160	j%+= ENDWH	1				122Ø 123Ø
170	?j%=1	.3				1240
18Ø 19Ø		lc(\$code FT\$(f\$,3	%))="swi" Th	IEN		bInitModu 1250
200 210	swi_		ID\$(f\$,4))			126Ø 127Ø
22Ø				_swi=swi_n		128Ø
0 23Ø	swi\$	(swi_no)	="SCL."+f	;	C	k 1290
240 250	ENDIF				1.1	1300 1310
260	UNTIL i					1320
	IF max_ found!"	swi=-1 E	RROR Ø, "No	source f		1330 1340
28Ø)="SCL.V	ersion"			1350
300	swi_chu	nk=&CE44	ø			1360 1370
	vbit=1< r0=0:r1		r3=3:r4=4			138Ø 139Ø
33Ø	r5=5:r6	=6:r7=7:	r8=8:r9=9:		1 2	initialia
5		-		lr=14:pc=1		1400 1410
	swi_chu vbit=1<	nk=&CE4C <28	0			1420 1430
37Ø	wk=Ø size=FN	4				1440
390	librelo	c=FNwk(4				145Ø 146Ø
		eloc=FNw =Ø TO ma				147Ø 148Ø
420	IF def	(swi) TH	EN Z=EVAL	"FNswi"+R		1490
430	NEXT	\$swi,2)+	"_vars")			1500 1510
	Lib_Off	set=20 Offset=5	40			1520 1530 .cal
460	_kernel	_modulei	nit=38*4			154Ø
470	_clib_f	nitialia inalisem	se=20*4 odule=179*	4		155Ø nel_modul
		nt_Offse s%=4 TO				1560 1570 .ter
51Ø	P%=Ø					158Ø
520	O%=code [OPT pa	55%				1590 1600
54Ø 55Ø	.module	_base DCD	ø			161Ø 162Ø
56Ø		DCD	init			163Ø
57Ø 58Ø		DCD DCD	d Ø	1		164Ø 165Ø
59Ø 6ØØ		DCD	title help			1660
610		DCD DCD	ø		e	67Ø
62Ø 63Ø		DCD DCD	swi_chunk swicode			168Ø Einalisem
64Ø 65Ø		DCD	switbl			L69Ø
660	.title		"SCL"+CHE			1700 1710
67Ø 68Ø	.help	EQUS ALIGN	FNversion	+CHR\$Ø		1720 1730
690	-				1	1740 .swi
710	.switbl		"SCL"+CHR	50		1750 1760
720	FOR swi IF def	=Ø TO ma: (swi) TH	K_SWI RN			177Ø 178Ø
74Ø 75Ø	[OPT	pass%			1	1790
\$("Ø"+	STR\$swi	EQUS ,2)+"_nam	EVAL ("FNs ne")+CHR\$0	W1"+RIGHT	1	1800 1810
760 770] ELSE					82Ø 83Ø
78Ø	[OPT				1	840
79Ø "+STR\$	swi,2)+	EQUS CHR\$Ø	"Unused"+	RIGHT\$ ("Ø	et	850
800 810) ENDIF					86Ø 87Ø
82Ø	NEXT				1	88Ø
830	[OPT pa	DCB	ø			.89Ø .9ØØ
85Ø 86Ø		ALIGN				910
87Ø	.init	STMDB	(sp)!,{r7	-r11 ,lr)	1	.92Ø .93Ø
88Ø 89Ø		MOV	sl, sp, LSR sl, sl, LSL	#20 #20		.94Ø .95Ø
900 910		LDMIA STMDB	sl, (r4 ,r	5}	1	960
92Ø		MOV	(sp)1,(r4 rØ,#6			97Ø .use 98Ø
93Ø 94Ø		FNadrl(1 FNadrl(1	4, rw_base 5, rw_limi) t)		.990 1000]
95Ø		SUB	r3,r5,r4		2	Ø1Ø FOR
960 FF)			r3,r3,#(w		2	020 IF
97Ø ØØ)		ADD	r3,r3,#(w	k AND &FF	i,	2)+"_ini 040 [0
980			"XOS_Modu	le"	2	050
990 1000			r9,r12 r2,[r12]			060 070]
1010 1020		MOV	r12,r2 r3,[r12]		2	080 END 090 NEXT
1030		ADR	rØ, stubs		2	100 [OPT
1040 1050			14, kernel r14, [rØ,#			110
1060 end)			14, kernel		2	130
1070			r14, [rØ,#		2	140 .use 150
1080 1090			14, kernel r14, [rØ,#			160 170

hule* ADD r f, r1, #Lib_Offset LDMIA r8, (r7, r8) STMIB r12,(r7, r8) STMIB r12,(r7, r8) ADR r14, module_base STR r14, [r6] ADR r14, rts_block STR r14, [r6] STNDB (sp)1, (r2) ADD r0, sp, #(10-7.2)* ADD r0, sp, 15, 230 LDMIA (sp)1, (r4, r5) LDMIA (sp)1, (r7-r11, IR STNDB (sp)1, (r7-r11, IR NOV s1, sp, LSR #20 MOV		STR FNadrl(1 STR	r14,[rØ,#16] 14,clib_vectors)
<pre>FMadr1(r14,clib_vectors_e STR r14,[r0,#24] FNadr1(r14,clib_statics_ STR r14,[r0,#32] FNadr1(r14,clib_statics_ STR r14,[r0,#32] FNadr1(r13,zibase) DT, r12,r3 FNadr1(r13,zibase) MOV r2,r12,r3 FNadr1(r13,zibase) MOV r5,#4<.16 STN r14,r12,bloc STR r14,r12,bloc STR r14,r12,bloc STR r14,r12,bloc STR r14,r12,blockend ADD r14,r12,blockend STR r14,r14,r5 LDMIA (sp)!,(r1,r1) BL user_init STMDB (sp)!,(r1,r1) BL user_init STMDB (sp)!,(r1,r1) DN s1,s1,LSL #20 LDMIA (sp)!,(r1,r1],12 ADD s1,s1,#12,[r11,r12] ADD s1,s1,#12,[r11,r12] ADD s1,s1,#12,[r11,r12] ADD s1,s1,#12,[r11,r12] ADD s1,s1,#12,[r11,r12] ADD s1,s1,#12,[r11,r12] ADD s1,s1,#12,[r11,r12] ADD s1,s1,#12,[r11,r12] ADD s1,s1,#12,[r11,r12] ADD s1,s1,#20 LDMIA s1,(r1,r2,r11,r22] STMIA s1,(r1,r2,r11,r22] ADD s1,s1,#20 LDMIA s1,(r1,r2,r11,r22] ADD s1,s1,#20 LDMIA s1,(r1,r12] ADD s1,s1,#20 STMIA s1,(r1,r2,r11,r22] ADD s1,s1,#20 STMIA s1,(r1,r2,r11,r22] ADD s1,s1,#20 LDMIA s1,(r1,r2,r11,r22] ADD s1,s1,#20 STMIA s1,(r1,r2,r2,r11,r22] ADM S1,s1,#20 STMIA s1,(r2,r2,r11,r22] ADM S1,s1,#20 STMIA s1,(r2,r2,r</pre>	1	FNadrl(r STR	14, clib_vectors)
<pre>FMadr1(r14,clib_vectors_e STR r14,[r0,#24] FNadr1(r14,clib_statics_ STR r14,[r0,#32] FNadr1(r14,clib_statics_ STR r14,[r0,#32] FNadr1(r13,zibase) DT, r12,r3 FNadr1(r13,zibase) MOV r2,r12,r3 FNadr1(r13,zibase) MOV r5,#4<.16 STN r14,r12,bloc STR r14,r12,bloc STR r14,r12,bloc STR r14,r12,bloc STR r14,r12,blockend ADD r14,r12,blockend STR r14,r14,r5 LDMIA (sp)!,(r1,r1) BL user_init STMDB (sp)!,(r1,r1) BL user_init STMDB (sp)!,(r1,r1) DN s1,s1,LSL #20 LDMIA (sp)!,(r1,r1],12 ADD s1,s1,#12,[r11,r12] ADD s1,s1,#12,[r11,r12] ADD s1,s1,#12,[r11,r12] ADD s1,s1,#12,[r11,r12] ADD s1,s1,#12,[r11,r12] ADD s1,s1,#12,[r11,r12] ADD s1,s1,#12,[r11,r12] ADD s1,s1,#12,[r11,r12] ADD s1,s1,#12,[r11,r12] ADD s1,s1,#20 LDMIA s1,(r1,r2,r11,r22] STMIA s1,(r1,r2,r11,r22] ADD s1,s1,#20 LDMIA s1,(r1,r2,r11,r22] ADD s1,s1,#20 LDMIA s1,(r1,r12] ADD s1,s1,#20 STMIA s1,(r1,r2,r11,r22] ADD s1,s1,#20 STMIA s1,(r1,r2,r11,r22] ADD s1,s1,#20 LDMIA s1,(r1,r2,r11,r22] ADD s1,s1,#20 STMIA s1,(r1,r2,r2,r11,r22] ADM S1,s1,#20 STMIA s1,(r2,r2,r11,r22] ADM S1,s1,#20 STMIA s1,(r2,r2,r</pre>	1	STR	14, clib_vectors)
<pre>FRAdr1(r14,clib_vectors_e FRAdr1(r14,clib_statics) STR r14, [r0, #32] FNAdr1(r14,clib_statics) STR r14, [r0, #32] FNAdr1(r14,clib_statics) MOV r1,r12,#wk ADD r2,r12,r3 FNAdr1(r1,z,z)base) MOV r5,#42-GLibrary_ ADD r8,r1,#Lb.Offset LDHIA r6, (r7, r8) ADR r14, frb.bOckend STR r14, [r0,#4] ADR r14, rts_block STR r14, [r0,#4] ADR r14, rts_blockend STR r14, [r0,#6] EDHIA r6, [r7, r8] ADR r14, rts_blockend STR r14, [r0,#6] EDHIA r6, [r7, r8] ADR r14, rts_blockend STR r14, [r0,#6] EDL call_moduleint STRDB (sp)1, [r2] ADD r0, sp,#(10-7.2)*4 LDHIA r6, [r0, r1] BL call_moduleint STHDB (sp)1, [r2] ADD r0, sp, #(10-7.2)*4 LDHIA r6, [r0, r1] BL user_int NOV s1, spLSR #20 MOV s1, spL</pre>	1	FNadrl(r	
<pre>PRAdr1(r14,clb_statics) STR r14,[c0,#32] PNadr1(r14,clb_statics_e STR r14,[c0,#32] ADD r1,r12,#wk ADD r2,r12,r3 PNadr1(r13,z1,base) MOV r5,#4<cl5 STM r2,r17,r3 PNadr1(r3,z1,base) MOV r5,#1,#Lib_Offset LDMTA r5,(r7,r8) STM r12,(r7,r8) ADR r14,rts_block_end STR r14,[r0,#4] ADR r14,rts_block_end STR r14,[r0,#4] ADR r14,rts_block_end STR r14,[r0,#4] ADR r14,rts_block=nd STR r14,[r0,#4] ADR r14,rts_block=nd STR r14,[r0,#4] ADR r14,rts_block=nd STR r14,[r0,#4] ADR r14,rts_block=nd STR r14,[r0,#4] ADR r14,rts_block=nd STR r14,[r0,#6] ADR r14,rts_block=nd STR r14,[r0,#6] ADR r14,rts_block=nd STR r14,[r0,#6] ADR r14,rts_block=nd STR r14,[r0,#6] ADR r14,rts_block=nd STR r14,[r0,#6] IDMTA (sp)!,[r1] BL clb_vectors+_cli LDMTA (sp)!,[r2] ADD r0,sp,#(10-74)*4 UDMTA r0,[r0,r1] BL user_int NOV s1,sp,LSR #30 MOV s1,sp,LSR</cl5 </pre>			14, clib_vectors_en
STR 14, [C0, #32] FNAdr1(r14, C14) statics_e STR r14, [C0, #36] ADD r1, r12, #wk ADD r2, r12, r3 PRAdr1(r3, z1, base) MOV r5, #4<<16 SWI "XSharedCLibrary_ ADD r8, r14, FD, F1 LDMTA r5, (r7, r8] STMTB r12, (r7, r8] ADR r0, kernel_init_b1 ADR r14, rts_block_end STR r14, [r0, #4] ADR r14, rts_block_end STR r14, [r0, #6] ADR r14, cost STN DB (sp)1, (r1) BL clib_vectors+_cli LDMTA r0, (r0, r1) BL clib_vectors+_cli LDMTA (sp)1, (r4, r5) STMIB (sp)1, [r4, r5] STMIB (sp)1, [r4, r5] STMDS (sp)1, [r7-r11,]T MOV s1, sp, LSR #20 MOV s1, sp, LSR #20 M			r14,[rØ,#28]
<pre>FMadr1(r14,clb_statics_e STR r14,(r0,#36] ADD r1,r12,#wk ADD r2,r12,r3 FMadr1(r3,z;base) MOV r5,#4<-16 SWI "XSharedCLibrary_ ADD r8,r1,#Lib_Offset LDMIA r8,(r7,r8) STWIE r12,(r7,r8) ADR r0,kernel_init_b1 ADR r14,rts_block STR r14,(r5,H0) ADR r14,rts_blockend STR r14,(r5,H0) ADR r14,rts_blockend STR r14,(r5,H0) ADR r14,rts_blockend STR r14,(r5,H0) ADR r14,cr5,H0 STR r14,(r5,H0) ADR r14,cr5,H0 STR r14,(r5,H0) ADR r14,cr5,H0 STR r14,(r5,H0) ADR r14,cr5,H0 STR r14,(r5,H0) ADR r14,cr5,H0 STR r14,rts_blockend STR r14,rts_tr1,rts_tr2 LDMIA (sp)1,(r7-r11,rt MOV s1,s1,LSL #20 LDMIA s1,(rt,r5) LDMIA s1,(rt,r5) LDMIA s1,(rt,r5) LDMIA s1,(rt,r5) LDMIA s1,(rt,r5) LDMIA s1,(rt,r1) ADD s1,s1,#SL #20 STMIA s1,(rt,r1) ADD s1,s1,#SL #20 STMIA s1,(rt,r5) LDMIA s1,(rt,r5) LDMIA s1,(rt,r7) MOV r1,sp MOV s1,s1,LSL #20 STMIA s1,(rt,r5) LDMIA s1,(rt,r7) MOV s1,s1,LSL #20 STMIA s1,(rt,r7) MOV s1,s1,LSL #20 STMIA</pre>			14, clib_statics) r14, [r0, #32]
ADD r1, r12, #wk ADD r2, r12, r3 PNadr1(r3, zi_base) MOV r5, #4<<16 SWI "XSharedCLibrary_ ADD r8, r1, #Lib_Offset SWIT r12, (r7, r8) STHTB r12, (r7, r8) STHTB r12, (r7, r8) ADR r14, rts_block_end ADR r14, rts_block_end STR r14, (r0) ADR r14, rts_block_end STR r14, (r0, 40) ADR r14, rts_block_end STR r14, (r0, 40) ADR r14, rts_block_end STR r14, rts_block_end NOV s1, sp.LSR #20 NOV f0, f3 NOV s1, sp.LSR #20 NOV f0, f3 NOV s1, sp.LSR #20 NOV s1			14, clib_statics_en
ADD r2, r12, r3 FMdr1(r3, zi, base) MOV r6, #4<<16 SWI "XSharedCLibrary, ADD r3, r1, #Lib_Offeet LDMIA r5, (r7, r8) ADR r0, kernel_init_b1 ADR r14, rts_block_end STR r14, [r0, #1] ADR r14, rts_block_end STR r14, [r0, #3] ADR r14, rts_block_end STR r14, [r0, #3] ADR r14, cst BL clib_vectors+_cli LDMIA (sp)1, (r2) BL clib_vectors+_cli BL user_init NOV sl.sp_LSR #30 NOV sl.s	1	STR	r14,[rØ,#36]
<pre>PMadr1(r3, zi base) MVV r5, #4<-16 SWI "XSharedCLibrary_ LDMTA r5, (r7, r8) STMTB r12, (r7, r8) ADR r0, kernel_init_bl ADR r14, rts.block STR r14, (r5) ADR r14, rts.block STR r14, (r5) ADR r14, rts.blockel STR r14, (r5, blockel BL call_moduleinit STNDB (sp)1, (r2) BL clib_vectors+_cli BL clib_vectors+_cli CMP r0, 80 BICEQS pc, 1, \$vbit clibinit STMDB (sp)1, (r7-r11, 1r MOV sl, sp, LSR #20 MOV cl, sl, LSL #20 LDMTA (sp)1, (r7-r11, 1r MOV sl, sp, LSR #20 MOV cl, sl, LSL #20 LDMTA sl, (r1, r12) ADD sl, sl, #sl_Lib_off MOV f0, sl BL clib_vectors+_cli MOV f0, sl BL clib_vectors+_cli MOV f0, sl BL clib_vectors+_cli MOV sl, sp, LSR #20 MOV sl, sl, LSL #20 EDMTA sl, (r1, r12) ADD sl, sl, #sl_Lib_0ff MOV f0, sl MOV cl, sl, LSL #20 STMIA sl, (r1, r12) ADD sl, sl, #sl, 23 LDMTA sl, (r5, r9) LDMTA sl, (r1, r12) ADD sl, sl, #sl, 24 MOV r1, 80 MOV sl, sp, LSR #20 MOV cl, sp, LSR #20 MOV cl, sl, LSL #20 STMIA sl, (r1, r12) ADD sl, sl, #sl, L1b_0ff MOV f0, #8 BL user_swi MOV sl, sp, LSR #20 MOV cl, s</pre>			
<pre>SHI ** XSharedCLibrary_ hule* ADD r8,r1,#Lib_Offset LJMIA r8,(r7,r8) STMIB r12,(r7,r8) ADR r0,kernel_init_b1 ADR r14,trs.block STR r14,(r0) ADR r14,rts.blockend STR r14,(r5,48) ADR r14,rts.blockend STR r14,(r5,48) ADR r14,crs.blockend BL call_moduleinit STNDE (sp)1,(r2) BL clib_vectors+_cli BL clib_vectors+_clib BL clib_vectors+_clib BL</pre>	1	FNadrl(r	3,zi_base)
ADD r , 1, #Lb Offeet LDHIA r8, (r7, r8) STMID r12,(r7, r8) ADR r0, kernel_init_bl ADR r14, rmodule_base STR r14, (r5, #4) ADR r14, rts_block_st STR r14, (r5, #6) ADR r14, rts_block_st STR r14, (r5, #6) ADR r14, rts_block_st STR r14, (r5, #6) ADR r14, cs = block_r12 STR r14, (r5, 16) STR r14, (r5, 16) ADR r14, cs = block_r12 STR r14, (r5, 16) ADD r0, sp, #(16, -7.2)*4 LDHIA (sp)1, (r2) ADD r0, sp, #(16, -7.2)*4 LDHIA (sp)1, (r4, r5) STHIA s1, (r4, r5) STHIB (sp)1, (r7-r11,]r CHP r0, 40 BICCOS pc, 1r, #vbit ORSS pc, 1r, #vbit STHOB (sp)1, (r7-r11,]r MOV s1, sp, LSR #20 MOV s			"XSharedCLibrary_L
ADR r0, kernel_init_bl ADR r14, module_base STE r14, [r3] ADR r14, rts_block STR r14, [r5, 44] ADR r14, rts_block_end STR r14, [r5, 46] ADR r14, cs.block_end STR r14, [r5, 46] ADR r0, gs, 416-742)*4 LDMIA (gs)1, [r4, r5] STMID al, [r4, r5] STMID al, [r4, r5] STMID (gs)1, [r7-r11,]r CHF r0, 46 BICEOS pc, 1r, #vbit ORSS pc, 1r, #vbit STMDB (gs)1, [r7-r11,]r MOV s1, sp, LSR #20 MOV s1, sp, LSR #20 LDMIA s1, (r4, r5] MOV s1, sp, LSR #20 LDMIA s1, (r4, r5] LDMIA s1, (r4, r5] MOV s1, sp, LSR #20 MOV s1, sp,		ADD	r8.r1.#Lib Offset
ADR r0, kernel_init_bl ADR r14, module_base STE r14, [r3] ADR r14, rts_block STR r14, [r5, 44] ADR r14, rts_block_end STR r14, [r5, 46] ADR r14, cs.block_end STR r14, [r5, 46] ADR r0, gs, 416-742)*4 LDMIA (gs)1, [r4, r5] STMID al, [r4, r5] STMID al, [r4, r5] STMID (gs)1, [r7-r11,]r CHF r0, 46 BICEOS pc, 1r, #vbit ORSS pc, 1r, #vbit STMDB (gs)1, [r7-r11,]r MOV s1, sp, LSR #20 MOV s1, sp, LSR #20 LDMIA s1, (r4, r5] MOV s1, sp, LSR #20 LDMIA s1, (r4, r5] LDMIA s1, (r4, r5] MOV s1, sp, LSR #20 MOV s1, sp,		LDMIA	r8, (r7 , r8)
ADR r14, module_base STE r14, [r0] ADR r14, rts_block STR r14, [r0, 44] ADR r14, rts_block STR r14, [r0, 46] ADR r14, rts_block=12 BL cclls_wetchst_cli STNDB (sp)1, (r5) BL cllb_wetcrst_cli LDMTA (sp)1, (r2) ADD r0, sp, 4[0-7+2]*4 LDMTA r0, r0, r1] BL user_init NOV sl, sp, LSR #20 NOV sl, sl, LSL #30 LDMTA (sp)1, (r4, r5) STMID al, (r4, r5) STMID al, (r4, r5) STMID (sp)1, (r7-r11, lT CHP r0, 40 BICCOS pc, lr, *whit ORRS pc, lr, *whit ADD sl, sl, LSL #20 MOV sl, sp, LSR #20 MOV sl,		ADR	r0,kernel_init_blo
<pre>STR r14, [r3] ADR r14, rts_block STR r14, [r3, #4] ADR r14, rts_block_end STR r14, [r3, #4] ADR r14, (r3, #3] ADR r14, (r5, #3] ADR r14, rts_block+12 EL call_moduleinit STMDB (sp)1, (r2) ADD r0, sp, #(10-74) *4 LDMTA (sp)1, (r2) ADD r0, sp, #(10-74) *4 LDMTA (r0, (r0, r1) EL user_init MOV s1, sp, LSR #30 MOV s1, sp, LSR</pre>			
<pre>STR r14, [r3, #4] ADR r14, r5, Block_end STR r14, [r3, #6] ADR r14, rc, Block_end STR r14, rts, block_end EDR r14, rts, block_end EDR r0, pp, #(10-74) *4 LDR r0, [r0, r1] BL user_init NOV s1, pp, LSR #20 HOV s1, pp, LSR #20 DIMIA (sp)1, (r4, r5) STMIB (sp)1, (r7-r11, lr CHP r0, #0 BICEQS pc, 1r, #vbit STMDB (sp)1, (r7-r11, lr HOV s1, sp, LSR #20 HOV s1, s1, LSL #20 LDMIA s2, (r4, r5) HOV r0, r12 LDMIA s1, (r4, r5) HOV s1, s1, LSL #20 LDMIA s1, (r1, r12) ADD s1, s1, s1, 22 LDMIA s1, (r4, r5) LDMIA s1, (r1, r12) ADD s1, s1, s1, s2 LDMIA s1, (r4, r5) LDMIA s1, (r1, r12) ADD s1, s1, s1, s2 LDMIA s1, (r4, r5) LDMIA s1, (r1, r12) ADD s1, s1, s1, s2 LDMIA s1, (r4, r5) LDMIA s1, (r5, r9) HOV r0, r11 HOV f0, #0 STMDB (sp)1, (r7-r11, pc ricode STMDB (sp)1, (r0-r9, 1r) MOV r1, sp MOV r0, sp MOV r0</pre>		STR	r14, [r0]
ADR r14, r5, block_end STR r14, [r6, 4] ADR r14, c, str STR r14, [r6, 4] BL call_moduleinit STMDB (sp)1, (r5) BL clib_vectors+_cli LDMTA (sp)1, (r2) ADD r0, sp, #(10-7+2)*4 LDMTA r0, (r0, r1) BL user_init MOV s1, sp, LSR #20 MOV s1, sp, LSR #20 MOV s1, sp, LSR #20 LDMTA (sp)1, (r4, r5) STMDB (sp)1, (r4, r5) STMDB (sp)1, (r7-r11,)r CMP r0, 40 BICCOS pc, 1r, *vbit ORRS pc, 1r, *vbit arminate STMDB (sp)1, (r7-r11,)r MOV s1, sp, LSR #20 MOV s1, s		ADR STR	r14,rts_block r14,[r0,#4]
ADR r14, cc_str STR r14, rts_block+12 BL call_moduleinit STHDB (sp)1, (r2) ADD r0, sp, #(10-7.2)* ADD r0, sp, #(10-7.2)* ADD r0, sp, #(10-7.2)* LDHTA r0, (r5, r1) BL user_init NOV sl, sp, LSR #20 NOV sl, sp, LSR #20 LDHTA (sp)1, (r4, r5) LDHTA (sp)1, (r4, r5) LDHTA (sp)1, (r4, r5) STHDB (sp)1, (r7-r11, lr CCP r0, 40 BICEQS pc, lr, *vbit ORRS pc, lr, *vbit ORRS (sp)1, (r7-r11, lr NOV sl, sp, LSR #20 NOV sl, sp, LSR #20 LDHTA sl, (r1, r12) ADD sl, sl, #SL, L10, off NOV fp, #0 STHDB (sp)1, (r7-r11, lr MOV sl, sp, LSR #20 LDHTA sl, (r1, r12) ADD sl, sl, #SL, L10, off NOV fp, #0 STHDB sp, LSR #20 MOV sl, sp		ADR	r14, rts_block_end
<pre>BL call_moduleinit STMDB (sp)1,(r2) BL clib_vectors+_cli ADD r0,sp,#(10-74)* LDMTA (sp)1,(r2) ADD r0,sp,#(10-74)* BL user_init MOV sl,sp,LSR #20 MOV sl,sp,LSR #20 MOV sl,sp,LSR #20 LDMTA (sp)1,(r4-r5) LDMTA (sp)1,(r4-r1),Ir CMP r0,#0 BTC2QS pc,Ir,#vbit All_moduleinit STMDB (sp)1,(r7-r11,Ir MOV sl,sp,LSR #20 LDMTA (sp)1,(r7-r11,Ir MOV sl,sp,LSR #20 LDMTA (sp)1,(r7-r11,Ir MOV sl,sp,LSR #20 LDMTA (sp)1,(r7-r11,Ir MOV sl,sp,LSR #20 LDMTA sl,(r1,r12) LDMTA sl,(r1,r12) ADD sl,sl,#20 LDMTA sl,(r1,r12) ADD sl,sl,#SL_L120 LDMTA sl,(r1,r12) ADD sl,sl,#SL_L120 MOV f0,#8 BL clib_vectors+_cli MOV f0,sl,sl,LSR #20 MOV sl,sp,LSR #20 MOV sl,sp,LSR #20 MOV sl,sp,LSR #20 MOV sl,sl,LSL #20 STMTA sl,(r1,r12) ADD sl,sl,#SL_L120 LDMTA (sp)1,(r7-r11,pc ricode STMDB (sp)1,(r0-r9,1r) MOV r1,sp MOV r1,sp MOV r1,sp MOV r1,sp MOV r1,sp MOV r1,sp MOV r2,r12 LDMTA sl,(r1,r12) ADD sl,sl,#SL_L20 STMTA sl,(r1,r12) ADD sl,sl,#SL_DOF MOV r1,sp MOV r2,r12 LDMTA sl,(r1,r12) ADD sl,sl,#SL_DOF MOV sl,sp,LSR #20 MOV sl,sp</pre>		ADR	r14,c_str
STMDB (p)].(f3) BL clib_vectors.cli lase LDMIA (sp)!,(f2) ADD r0, p, #(10-7+2)*4 LDMIA r0,(r0,r1) BL user_init MOV sl, sp,LSR #100 MOV sl, sl,LSL #100 LDMIA (sp)!,(r4,r5) STMIA sl,(r4,r5) STMIA sl,(r4,r5) DIMIA (sp)!,(r7-r11,lr CMP r0,#0 BIC205 pc,lr,#vbit ORRS pc,lr,#vbit arminate STMDB (sp)!,(r7-r11,lr MOV sl,sp,LSR #100 MOV sl,sp,LSR #20 MOV sl,sp,L		STR	r14, rts_block+12 call moduleinit
isee LDHA (sp)1,(f2) ADD r0,sp,#(10-7+2)*4 LDHA r0,(r0,r1) BL user_init NOV sl,sp,LSR #20 NOV sl,sp,LSR #20 LDHA (sp)1,(f4,r5) STMIA sl,(f4,r5) LDHA (sp)1,(f4,r5) STMIB (sp)1,(f7-r11,lr CHP r0,80 BIC205 pc,lr,#vbit ORRS pc,lr,#vbit STMDB (sp)1,(f7-r11,lr NOV sl,sp,LSR #20 MOV sl,s		STMDB	(sp)1, (r9 }
LDMIA (sp)1, (r2) ADD r0, sp, f(7.2)*4 LDMIA r0, (r5, r1) BL user_init NOV s1, sp, LSR #20 MOV s1, sp, LSR #20 LDMIA (sp)1, (r4, r5) STMIA s1, (r4, r5) LDMIA (sp)1, (r7-r11,]r CHP r0, #0 BICEOS pc, 1r, #vbit ORSS pc, 1r, #vbit ORSS pc, 1r, #vbit STMDB (sp)1, (r7-r11,]r MOV s1, sp, LSR #20 HOV s1, sp, LSR #20 HOV s1, sp, LSR #20 LDMIA s1, (r4, r5) LDMIA s1, (r4, r5) HOV s1, sp, LSR #20 HOV s1, sp, LSR #20 HOV s1, sp, LSR #20 LDMIA s1, (r4, r5) MOV r0, r12 LDMIA s1, (r4, r5) MOV s1, s1, LSL #20 LDMIA s1, (r1, r12) STMIA s1, (r1, r12) ADD s1, s1, #SL, Lib_Off MOV fp, #0 BL c1ib_vectors+_cli MOV s1, sp, LSR #20 HOV s0,	ase		
<pre>bL user_init NOV sl.sp.LSR #30 NOV sl.sp.LSR #30 LDMIA (sp)1, (r4,r5) STMIA sl.(r4,r5) LDMIA (sp)1, (r7-r11,lr CHP r0,#0 BICEQS pc,lr,#vbit sTMDB (sp)1, (r7-r11,lr NOV sl.sp.LSR #30 NOV f0,#0 LDMIA sl.(r1,r12) ADD sl.sl.#st_Lib_Off NOV f0,#0 STMIA sl.(r1,r12) ADD sl.sp.LSR #30 NOV f0,#0 NOV f0,#0 LDMIA sl.(r1,r12) ADD sl.sp.LSR #30 NOV sl.sp.LSR #30 NOV sl.sp.LSR #30 NOV sl.sp.LSR #30 NOV sl.sp.LSR #30 NOV sl.sp.LSR #30 NOV r0,r11 NOV r1,sp NOV r0,r11 NOV r1,sp NOV r1,sp NOV r1,sp NOV r1,sp NOV r1,sp NOV r1,sp NOV r1,sp NOV sl.sp.LSR #30 NOV sl.sp.LSR #30 NOV</pre>	1	ADD	(sp)1, {r2 } r0, sp, #(10-7+2)+4
<pre>bL user_init NOV sl.sp.LSR #30 NOV sl.sp.LSR #30 LDMIA (sp)1, (r4,r5) STMIA sl.(r4,r5) LDMIA (sp)1, (r7-r11,lr CHP r0,#0 BICEQS pc,lr,#vbit sTMDB (sp)1, (r7-r11,lr NOV sl.sp.LSR #30 NOV f0,#0 LDMIA sl.(r1,r12) ADD sl.sl.#st_Lib_Off NOV f0,#0 STMIA sl.(r1,r12) ADD sl.sp.LSR #30 NOV f0,#0 NOV f0,#0 LDMIA sl.(r1,r12) ADD sl.sp.LSR #30 NOV sl.sp.LSR #30 NOV sl.sp.LSR #30 NOV sl.sp.LSR #30 NOV sl.sp.LSR #30 NOV sl.sp.LSR #30 NOV r0,r11 NOV r1,sp NOV r0,r11 NOV r1,sp NOV r1,sp NOV r1,sp NOV r1,sp NOV r1,sp NOV r1,sp NOV r1,sp NOV sl.sp.LSR #30 NOV sl.sp.LSR #30 NOV</pre>	1		
DTC205 pc,1r,#vbit ORRS pc,1r,#vbit STMDB (sp)!,(1r) B kernel_vectors+_k leinit srminate STMDB (sp)!,(r7-r11,1r MOV sl,sp,LSR #20 MOV sl,sl,LSL #20 LDHTA sl,(r1,r12) LDW r0,r12 LDW r12,(r11,r12) ADD sl,sl,#SL_Lib_Off MOV fp,#0 BL clib_vectors+_cli MOV sl,sl,LSL #20 LDHTA sl,(r1,r12) ADD sl,sl,#SL_Lib_Off MOV fp,#0 BL clib_vectors+_cli MOV sl,sl,LSL #20 STMIA sl,(r1,r12) ADD sl,sl,#SL_Lib_Off MOV sl,sl,LSL #20 STMIA sl,(r1,r12) ADD sl,sl,#SL_20 STMIA sl,(r1,r12) MOV sl,sl,LSL #20 STMIA sl,(r1,r12) LDMIA (sp)!,(r7-r11,pc ricode STMDB (sp)!,(r0-r9,1r) MOV sl,sl,LSL #20 STMIA sl,(r1,r12) LDMIA sl,(r1,r12) MOV sl,sl,LSL #20 MOV sl,sl,LSL #20 MOV sl,sl,LSL #20 STMIA sl,(r1,r12) ADD sl,sl,#SL_Lib_off MOV fp,#0 BL user_swi MOV sl,sp,LSR #20 MOV sl,sl,LSL #20 STMIA sl,(r1,r12) ADD sl,sl,#SL_Lib_off MOV fp,#0 BL user_swi MOV sl,sp,LSR #20 MOV sl,sp,LSR #2			
DTC205 pc,1r,#vbit ORRS pc,1r,#vbit STMDB (sp)!,(1r) B kernel_vectors+_k leinit srminate STMDB (sp)!,(r7-r11,1r MOV sl,sp,LSR #20 MOV sl,sl,LSL #20 LDHTA sl,(r1,r12) LDW r0,r12 LDW r12,(r11,r12) ADD sl,sl,#SL_Lib_Off MOV fp,#0 BL clib_vectors+_cli module MOV sl,sl,LSL #20 LDHTA sl,(r1,r12) ADD sl,sl,#SL_Lib_Off MOV fp,#0 BL clib_vectors+_cli HOV fp,#3 STHIA sl,(r1,r12) ADD sl,sl,#SL_Lib_Off MOV sl,sl,LSL #20 STHIA sl,(r1,r12) ADD sl,sl,#SL_20 STHIA sl,(r1,r12) LDHTA sl,(r1,r12) MOV sl,sl,LSL #20 STHIB (sp)!,(r7-r11,pc ricode STHDB (sp)!,(r0-r9,1r) MOV sl,sl,LSL #20 STHIA sl,(r1,r12) LDHTA sl,(r1,r12) ADD sl,sl,#SL_20 MOV sl,sl,LSL #20 MOV sl,sl,LSL #20 MOV sl,sl,LSL #20 MOV sl,sl,LSL #20 STHIA sl,(r1,r12) ADD sl,sl,#SL_Lib_off MOV fp,#0 BL user_swi MOV sl,sp,LSR #20 MOV sl,sp,LSR #20 MOV sl,sp,LSR #20 MOV sl,sl,LSL #20 STHIA sl,(r1,r12) ADD sl,sl,#SL_Lib_off MOV fp,#0 BL user_swi MOV sl,sp,LSR #20 MOV sl,sp,LSR #20	1	NOV	sl,sl,LSL #20
DTC205 pc,1r,#vbit ORRS pc,1r,#vbit STMDB (sp)!,(1r) B kernel_vectors+_k leinit srminate STMDB (sp)!,(r7-r11,1r MOV sl,sp,LSR #20 MOV sl,sl,LSL #20 LDHTA sl,(r1,r12) LDW r0,r12 LDW r12,(r11,r12) ADD sl,sl,#SL_Lib_Off MOV fp,#0 BL clib_vectors+_cli module MOV sl,sl,LSL #20 LDHTA sl,(r1,r12) ADD sl,sl,#SL_Lib_Off MOV fp,#0 BL clib_vectors+_cli HOV fp,#3 STHIA sl,(r1,r12) ADD sl,sl,#SL_Lib_Off MOV sl,sl,LSL #20 STHIA sl,(r1,r12) ADD sl,sl,#SL_20 STHIA sl,(r1,r12) LDHTA sl,(r1,r12) MOV sl,sl,LSL #20 STHIB (sp)!,(r7-r11,pc ricode STHDB (sp)!,(r0-r9,1r) MOV sl,sl,LSL #20 STHIA sl,(r1,r12) LDHTA sl,(r1,r12) ADD sl,sl,#SL_20 MOV sl,sl,LSL #20 MOV sl,sl,LSL #20 MOV sl,sl,LSL #20 MOV sl,sl,LSL #20 STHIA sl,(r1,r12) ADD sl,sl,#SL_Lib_off MOV fp,#0 BL user_swi MOV sl,sp,LSR #20 MOV sl,sp,LSR #20 MOV sl,sp,LSR #20 MOV sl,sl,LSL #20 STHIA sl,(r1,r12) ADD sl,sl,#SL_Lib_off MOV fp,#0 BL user_swi MOV sl,sp,LSR #20 MOV sl,sp,LSR #20		STMIA	sl, (r4 ,r5)
DTC205 pc,1r,#vbit ORRS pc,1r,#vbit STMDB (sp)!,(1r) B kernel_vectors+_k leinit srminate STMDB (sp)!,(r7-r11,1r MOV sl,sp,LSR #20 MOV sl,sl,LSL #20 LDHTA sl,(r1,r12) LDW r0,r12 LDW r12,(r11,r12) ADD sl,sl,#SL_Lib_Off MOV fp,#0 BL clib_vectors+_cli module MOV sl,sl,LSL #20 LDHTA sl,(r1,r12) ADD sl,sl,#SL_Lib_Off MOV fp,#0 BL clib_vectors+_cli HOV fp,#3 STHIA sl,(r1,r12) ADD sl,sl,#SL_Lib_Off MOV sl,sl,LSL #20 STHIA sl,(r1,r12) ADD sl,sl,#SL_20 STHIA sl,(r1,r12) LDHTA sl,(r1,r12) MOV sl,sl,LSL #20 STHIB (sp)!,(r7-r11,pc ricode STHDB (sp)!,(r0-r9,1r) MOV sl,sl,LSL #20 STHIA sl,(r1,r12) LDHTA sl,(r1,r12) ADD sl,sl,#SL_20 MOV sl,sl,LSL #20 MOV sl,sl,LSL #20 MOV sl,sl,LSL #20 MOV sl,sl,LSL #20 STHIA sl,(r1,r12) ADD sl,sl,#SL_Lib_off MOV fp,#0 BL user_swi MOV sl,sp,LSR #20 MOV sl,sp,LSR #20 MOV sl,sp,LSR #20 MOV sl,sl,LSL #20 STHIA sl,(r1,r12) ADD sl,sl,#SL_Lib_off MOV fp,#0 BL user_swi MOV sl,sp,LSR #20 MOV sl,sp,LSR #20		LDMIA	(sp)!, (r7-r11 , lr} r0.#0
<pre>all_moduleinit STNDB (p)!,(Ir) B kernel_vectors+_k eleinit STNDB (p)!,(T7-r11,]T NOV al.pp.LSR #20 LDNTA al.(r4,r5) HOV v0,r12 LDNTA al.(r1,r12) DNTB r12,(r11,r12) STNTA al.(r11,r12) STNTA al.(r11,r12) MOV fp.#8 BL clib_vectors+_cli MOV sl.ap.LSR #20 MOV al.ap.LSR #20 MOV cl.ap.LSR #20 MOV cl.a</pre>	1	BICEQS	pc, lr, #vbit
STNDB (p):(IT) B kernel_vectors+_k lleinit srminate STNDB (p):(T7-r11,]T MOV sl.pl.Ex8 #20 HOV sl.pl.Ex8 #20 HOV r0,r12 LDMTA sl.(r1,r12) STMTA sl.(r11,r12) STMTA sl.(r11,r12) STMTA sl.(r11,r12) MOV fp.#8 BL clib_vectors+_cli MOV sl.pl.Ex8 #20 HOV sl.spl.Ex8 #20 HOV fp.#0 HOV fp.#0 HOV fp.#0 HOV fp.#0 HOV fp.#0 HOV sl.spl.Ex8 #20 HOV sl.spl.Ex8 #20 HOV fp.#0 HOV	0	DRRS	pc, lr, #vbit
<pre>B kernel_vectors+_k lleinit srminate STMDB (sp)!, (r7-r11, lr MOV sl.sp,LSR #20 LDHTA sl.(r4, r5) MOV r0, r12 LDR r12, (r11, r12) ADD sl.sl.k2t, r11, r12) ADD sl.sl.k2t, r11, r12) ADD sl.sl.k2t, r11, r12) MOV fp,#3 BL clib_vectors+_cli MOV sl.sp,LSR #20 MOV sl.sl.k2t, r25 LDMTA sl.(r1, r12) ADD sl.sl.k2t, r25 LDMTA sl.(r1, r12) MOV fp,#3 STMTA sl.(r4, r5) LDMTA sl.(r4, r5) LDMTA sl.(r4, r5) LDMTA sl.(r5, r5) MOV sl.sp,LSR #20 MOV sl.sp,LSR #20 MOV sl.sl.k2t, r25 LDMTA sl.(r5, r5) MOV r1, sp MOV r2, r12 LDMTA sl.(r1, r12) ADD sl.sl.k2t, r25 MOV sl.sp,LSR #20 MOV sl.sp,LSR #20 M</pre>			
<pre>srminate STHDB (sp)!, (T7-r11, lr NOV sl,sp,LSR #20 LDHTA sl,(r4,r5) HOV r0,sl,sl,LSL #20 LDHTA sl,(r1,r12) LDNTB r12,(r11,r12) ADD sl,sl,#sL_Lib_off HOV fp,#0 EL clib_vectors+_cli HOV sl,sp,LSR #20 HOV sl,sl,LSL #20 STHIA sl,(r1,r12) LDHIA (sp)!,(r7-r11,pc LDHIA (sp)!,(r7-r11,pc LDHIA (sp)!,(r7-r11,pc LDHIA (sp)!,(r7-r11,pc LDHIA (sp)!,(r7-r11,pc LDHIA (sp)!,(r7-r11,pc LDHIA (sp)!,(r7-r11,pc LDHIA sl,(r14,r5) LDHIA sl,(r14,r5) LDHIA sl,(r14,r12) HOV sl,sp,LSR #20 HOV sl,sl,LSL #20 STHIB sp)!,(r3-r9,lr) HOV r0,r11 HOV r1,sp HOV r1,sp HOV r1,sp HOV r1,sp HOV r1,sp HOV sl,sp,LSR #20 HOV sl,sp,LSR</pre>	1	В	kernel_vectors+_ke
STHOB (sp)1,(77-r11,1r MOV sl,sp,LSR #20 LDHIA sl,(r4,r5) MOV r0,r12 LDR r12,(r11,r12) STHIA sl,(r11,r12) ADD sl,sl,#sL,LLb_Off MOV fp,#s BL clib_vectors+_cli MOV sl,sp,LSR #20 MOV r1,sp MOV r1,sp MOV r2,r12 LDHIA sl,(r1,r7) MOV fp,#0 BL user_swi MOV sl,sp,LSR #20 MOV sl,sp,LSR #20 MOV sl,sp,LSR #20 MOV r1,sp MOV r2,r12 LDHIB r12,(r11,r12) ADD sl,sl,#SL_Lib_Off MOV fp,#0 BL user_swi MOV sl,sp,LSR #20 MOV sl,sp,LSR #20 MOV sl,sp,LSR #20 MOV sl,sp,LSR #20 MOV r2,r12 LDHIB r12,(r11,r12) ADD sl,sl,#SL_Lib_Off MOV fp,#0 BL user_swi MOV sl,sp,LSR #20 MOV r0,#0 STRIB (sp)1,(r4-r9,lr) HOV r0,#0 : swied T0 max_swi cMF r0,#0 LDHNBIA (sp)1,(r4-r9,pc) DDF	leini	t	
<pre>NOV sl.sp.LSR #30 NOV sl.sl.LSL #20 LDHTA sl.(r4 ,r5) MOV r0,r12 LDR r12,(r11,r12) LDR r12,(r11,r12) ADD sl.sl.#8L_Lb_Off MOV fp.#0 BL clip_vectors+_cli module MOV sl.sp.LSR #20 MOV sl.sp</pre>			(en) /r7-r11 1r)
LDHIA el.(r4 , r5) MOV r0,r12 LDR r12,(r11) LDR r12,(r11,r12) STHIA el.(r11,r12) ADD el.el.(r11,r12) ADD el.el.(r11,r12) ADD el.el.(r11,r12) ADD el.el.(r1,r12) MOV fp.#0 El.(r1,r12) HOV el.el.(r1,r12) LDHIA (sp)1,(r7-r11,pc) ricode STHDB (sp)1,(r7-r11,pc) HOV el.el.(r1,r12) MOV r0,r11 MOV r1,ep HOV r2,r12 LDHIB r12,(r11,r12) ADD el.el.ER #20 MOV el.ep.LSR #20 HOV r2,r12 LDHIB r12,(r12) LDHIB r12,(r12) ADD el.el.ER #20 HOV r2,r12 LDHIB r12,(r12) ADD el.el.ER #20 HOV r2,r12 LDHIB r12,(r12) CMP r0,#0 STRIE r0,[sp] LDHIA (sp)1,(r4-r9,lr) HOV r0,#0 : awied TO max_swi CMP r0,#0 LDHNBIA (sp)1,(r4-r9,pc) DDF	1		sl, sp, LSR #20
<pre>MOV r0,r12 LDR r12,(r11,r12) LDNTB r12,(r11,r12) ADD s1,s1,44L_Lb_Off MOV fp,40 BL clib_vectors+_cli module NOV s1,sp,LSR #20 MOV r0,r11 MOV r1,sp LDMIA s1,(r6,r5) LDMIA s1,(r6,r5) LDMIA s1,(r6,r5) MOV r0,r11 MOV r2,r12 LDR r12,(r12) LDR r12,(r12) LDR r12,(r13) MOV s1,sp,LSR #20 MOV s1,sp,LSR #20 MOV s1,sp,LSR #20 MOV s1,sl,LSL #20 STMIA s1,(r1,r12) ADD s1,s1,45L_LbOff MOV s1,sp,LSR #20 MOV s1,sp,LSR</pre>		LDMIA	sl,sl,LSL #20 sl,(r4 .r5)
LDMIB r12, (r11 ,r12) STHIA 8.1, (r11 ,r12) ADD s1,s1, #5L_Lib_off MOV fp,#8 BL clib_vectors+_cli module MOV s1,sp,LSR #20 NOV s1,sp,LSR #20 STHIA 1.1,LSL #20 STHIB (sp)1, (r7-r11, pc ricode STHDB (sp)1, (r7-r11, pc ricode LDMIA 51, (r5, r2) MOV r0,r11 MOV r0,r11 MOV r0,r11 MOV r2,r12 LDMIA 51, (r5, r2) MOV r0,r11 MOV r0,r11 MOV r1,sp MOV r2,r12 LDMIA 51, (r1, r12) STHIA 51, (r11, r12) STHIA 51, (r11, r12) STHIA 51, (r5, r2) CMP r0,#0 STANE 70, [sp] LDMIA (sp)1, (r4-r9, lr) HICCQS pc, 1r, #vbit er_init STMDB (sp)1, (r4-r9, lr) MOV r0,#0 I mUN r0,#0 I mUN r0,#0 STANE (sp)1, (r4-r9, lr) HICCQS pc, 1r, #vbit er_init STMDB (sp)1, (r4-r9, lr) MOV r0,#0 I mUN r0, r0 I mUN r0 I mUN r0 I mUN r0 I mUN r0 I mUN r0 I mUN r0 I)	IOV	rØ, r12
STMIA sl, (rll, rl2) ADD sl, sl, #SL_Lib_Off MOV fp,#S BL clib_vectors+_cli module MOV sl, sp,LSR #20 MOV rl, sp MOV rl, sp MOV rl, sp MOV rl, rl2 LDMIA sl, (r5, r9) MOV rl, rl2 LDMIB rl2, (rl1, rl2) STMIA sl, (r1, rl2) ADD sl, sl, #SL,Lib_Off MOV sl, sp,LSR #20 MOV sl,	1	LDMIB	r12, {r11, r12}
<pre>MOV fp,#3 BL clib_vectors+_cli module MOV sl,sp,LSR #20 MOV sl,sl,LSL #20 STHIA sl,[r4],r5] LDMIA sl,[r4],r5] LDMIA sl,[r4],r5] LDMIA sl,[r4],r5] MOV sl,sp,LSR #20 MOV sl,sp,LSR #20 MOV r1,sp MOV r2,r12 LDMIA sl,[r6],r9] MOV r2,r12 LDMIA sl,[r1],r12] ADD sl,sl,#SL_LbD.off MOV r2,r12 LDMIA sl,[r1],r12] ADD sl,sl,#SL_LbD.off MOV sl,sp,LSR #20 MOV sl</pre>		STMIA	sl, (r11 , r12)
BL clib_vectorscli module NOV sl.sp.LSR #20 NOV sl.sp.LSR #20 STHIB sl.(r4.r5) LDMIA (sp)1,(r7-r11,pc lcode STHDB (sp)1,(r7-r11,pc NOV sl.sp.LSR #20 MOV sl.sp.LSR #20 MOV sl.sp.LSR #20 MOV r0,r11 NOV r0,r11 NOV r0,r11 NOV r2,r12 LDMIA sl.(r8,r9) MOV r2,r12 LDMIA sl.(r1,r12) ADD sl.sl.#SL_LbD.off MOV fp.#0 BL user_swi MOV sl.sp.LSR #20 MOV sl.sp.LSR #20 MOV sl.sp.LSR #20 NOV sl.sp.LSR #20 CMP r0,#0 LDMIA (sp)1,(r4-r9,pc) DIF			
<pre>MOV = 0. gp.LSR #20 MOV = 0. gp.LSR #20 STMID = 0. (r4 .r5) LDMIA (sp)1, (r7-r11 .pc icode STMDB (sp)1, (r7-r11 .pc MOV = 0. gp.LSR #20 MOV = 0. gp MOV = 0. gp M</pre>			tp,#0 clib_vectors+_clib
<pre>WOV 81,61,LSL #20 STHIA 81,(r4,r5) LDHIA (sp)1,(r3-r11, pc ALCODE STHOB (sp)1,(r3-r9,1r1) MOV 81,8p,LSR #20 LDHIA 81,(r2,r7) MOV 10,sp,LSR #20 LDHIA 81,(r1,r12) MOV r1,sp MOV r2,r12 LDR r12,(r11,r12) ADD 81,81,#SL_Lib_Off MOV 21,sp,LSR #20 MOV 91,sp,LSR #20 MOV 70,80 LDMIA (sp)1,(r4-r9,pc) MDF</pre>			sl,sp,LSR #20
LDMIA (sp)1,(r7-r11,pc ricode STHDB (sp)1,(r3-r9,lr) MOV s1,sp,LSR #30 MOV s1,sp,LSR #30 MOV r1,sp LDMIA s1,(r8,r9) MOV r2,r12 LDM r12,(r13) LDMIA s1,(r1,r12) ADD s1,s1,#SL_LbD.off MOV f2,s12 LDMIA s1,(r1,r12) ADD s1,s1,#SL_LbD.off MOV s1,sp,LSR #30 MOV s1,sp,LSR)	IOV	sl,sl,LSL #20
STHUB (sp); (:G-r9, lr) MOV sl.sp,LSE #20 LDHIA sl.(r8,r9) MOV r0,r11 MOV r1,sp MOV r1,sp MOV r2,r12 LDHIB r12,(r11,r12) ADD sl.sl.45L_Lb_Off MOV f0,s0 BL user_swi MOV sl.sp,LSE #20 MOV r0,#0 twied TO max_swi def(swi) THEN =EVAL(*Nswi*+RIGHT\$(*0*+STR\$st LDENEIA (sp)1,(r4-r9,pc) DDF			(sp)1, (r7-r11, pc)
STHUB (sp); (:G-r9, lr) MOV sl.sp,LSE #20 LDHIA sl.(r8,r9) MOV r0,r11 MOV r1,sp MOV r1,sp MOV r2,r12 LDHIB r12,(r11,r12) ADD sl.sl.45L_Lb_Off MOV f0,s0 BL user_swi MOV sl.sp,LSE #20 MOV r0,#0 twied TO max_swi def(swi) THEN =EVAL(*Nswi*+RIGHT\$(*0*+STR\$st LDENEIA (sp)1,(r4-r9,pc) DDF	icođe		
<pre>MOV el,el,LSL #20 LDMLA el,(r8,r9) MOV r0,r11 MOV r1,ep MOV r2,r12 LDM r12,(r13) LDML m12,(r11,r12) STMLA el,(r11,r12) ADD el,el,#SL_Lb_Off MOV f0,#0 BL user_swi MOV el,ep,LSR #30 MOV el</pre>	5	TMDB	(sp)!, (rØ-r9 , lr)
LDMIA s1, (r5, r9) MOV r0, r11 MOV r1, sp MOV r2, r12 LDR r12, (r11, r12) STMIA s1, (r11, r12) ADD s1, s1, s12, (r11, r12) ADD s1, s1, s12, r11, r12) ADD s1, s1, s12, r12, r12, r12, r12, r12, r12, r12, r		VOV	sl,sl,LSL #20
<pre>MOV r1, pp MOV r2, r12 LDR r12, (r11, r12) STHIA s1, (r11, r12) ADD s1, s1, s1, r11, r12 ADD s1, s1, s1, r11, r12 ADD s1, s1, s1, s1, r12 MOV f0, s0 BL user_swi MOV s1, sp, LSR #20 MOV s1, sp, LSR #20 MOV s1, s1, r15, r20 CMP r0, s0 STHIA s1, r15, r20 CMP r0, s0 STHIA r0, (r0) LDMIA (sp)1, (r0-r9, lr) BIC20S pc, lr, #vbit ORAS pc, lr, #vbit ORAS pc, lr, #vbit STHOB (sp)1, (r4-r9, lr) MOV r0, #0 Stwied TO max_swi def(swi) THEN =EVAL(*Nawi*+RIGHT\$(*0*+STR\$st LDMENIA (sp)1, (r4-r9, pc) DIF</pre>	• I	DMIA	sl, {r8 ,r9}
<pre>MOV r2,r12 LDR r12,[r12] LDMIB r12,[r11,r12] STHIA s1,(r11,r12] ADD s1,s1,#sL_Lb_Off MOV fp,#0 BL user_swi MOV s1,sL_LSL #20 STHIA s1,(r5,r9) CMP r0,#0 STRNE r0,[sp] LDMIA (sp]1,(r6-r9,lr] BICEQS pc.lr,#vbit er_init STHDB (sp]1,(r4-r9,lr] MOV r0,#0 : swi=0 70 max_swi 'def(swi) THEN =EVAL(*Nawi-*RIGHT\$(*0**STR\$s CMP r0,#0 LDMNEIA (sp]1,(r4-r9,pc)</pre>)	IOV	r1,8p
ADD s1, s1, #SL_Lib_Off NOV fp, #0 BL user_swi NOV s1, sp, LSR #20 NOV s1, sp, LSR #20 NOV s1, s1, LSL #20 STNIR s1, (r1, r7) CMP r0, #0 STNIR r0, [s0] LDMIA (sp)i, (r3-r9, lr) BIE025 pc, lr, #vbit ORAS pc, lr, #vbit er_init STMDB (sp)i, (r4-r9, lr) MOV r0, #0 : swi=0 TO max_swi def(swi) THEN =EVAL(*Nawi*+RIGHT\$("0"+STR\$st LDMINIA (sp)i, (r4-r9, pc) DIF	I	DR	r2, r12 r12, [r12]
ADD s1, s1, #SL_Lib_Off NOV fp, #0 BL user_swi NOV s1, sp, LSR #20 NOV s1, sp, LSR #20 NOV s1, s1, LSL #20 STNIR s1, (r1, r7) CMP r0, #0 STNIR r0, [s0] LDMIA (sp)i, (r3-r9, lr) BIE025 pc, lr, #vbit ORAS pc, lr, #vbit er_init STMDB (sp)i, (r4-r9, lr) MOV r0, #0 : swi=0 TO max_swi def(swi) THEN =EVAL(*Nawi*+RIGHT\$("0"+STR\$st LDMINIA (sp)i, (r4-r9, pc) DIF	I	DMIB	r12, (r11 ,r12)
<pre>NOV fp,#0 EL user_swi NOV s1,s1,LSL #20 MOV s1,s1,LSL #20 STHIA s1,(r5,r9) CMP r0,#0 STRNE r0,[sp] LDHIA (sp],(r6-r9,1r) BICEQS pc,1r,#vbit er_init STHDB (sp]1,(r4-r9,1r) MOV r0,#0 :swi=0 70 max,swi 'def(swi) THEN =EVAL(*NNsWi-*RIGHT\$(*0*+STR\$s it*) OPT pass* CMP r0,#0 LDMNEIA (sp]1,(r4-r9,pc)</pre>	1	DD	sl, sl, #SL_Lib_Offs
<pre>BL user_swi MoV s1.sp.LSR #20 MoV s1.s1.LSL #20 STHIA s1.(r5.r9) CMP r0.#0 STRNE r0.[sp] LDHIA (sp].(r0-r9.,lr) BICEQS pc.1r,#vbit er_init STHDB (sp]1.(r4-r9.,lr) MOV r0.#0 :swi=0 70 max.swi 'def(swi) THEN =EVAL(*NNwi*+RIGHT\$(*0*+STR\$s CMP r0.#0 LDMNEIA (sp]1.(r4-r9.,pc)</pre>	,	IOV	fp,#Ø
MOV 81,61,LSL #28 STMIA 81,(r8,r9) CMP r0,#0 STRNE r0,#0 STRNE r0,#0 STRNE r0,#0 DEMIA (cp1,(r0-r9,)r) DEDEX pc,1r,#vbit ORS pc,1r,#vbit STMDB (sp1,(r4-r9,)r) MOV r0,#0 :swi=0 TO max_swi def(swi) THEN =EVAL("FNswi"-RIGHT\$("0"+STR\$s; if") OPT pas% CMP T0,#0 LDMNEIA (sp1,(r4-r9, pc))	E	BL I	user_swi
STHIA sl.(r8,r9) CMP r0,80 STRNE r0,[sp] LDHIA (sp], [r0-r9,]r] BICEQS pc,lr,#vbit ORRS pc,lr,#vbit er_init STHDB (sp]1,(r4-r9,]r] MOV r0,#0 : swi=0 70 max.swi 'def(swi) THEN =EVAL(*NNsWi-*RIGHT\$(*0*+STR\$s it*) OPT pas% CHP r0,#0 LDHNEIA (sp]1,(r4-r9,pc) DIF	k	IOV	sl, sl, LSL #20
STANS T0, [9] LDMIA (sp], (r0-r9,]r] HIC2QS pc, lr, #vbit ORAS pc, lr, #vbit STMDB (sp)1, (r4-r9, lr) MOV r0, #0 : swi=0 T0 max_swi def(swi) THEN =EVAL("FNswi"+RIGHT\$("0"+STR\$s it") OFT pas% CMP r0, #0 LDMNEIA (sp)1, (r4-r9, pc) DIF		STMIA	sl, (r8 ,r9)
er_init STMDB (sp)1,(r4-r9,lr) MOV r0,#0 swi=0 TO max_swi 'def(swi) THEN =FVAL("FNswi"+RIGH\$("0"+STR\$s it") OPT pas% CMP r0,#0 LDMMEIA (sp)1,(r4-r9,pc) DIF	8	TRNE	r0, [sp]
er_init STMDB (sp)1,(r4-r9,lr) MOV r0,#0 swi=0 TO max_swi 'def(swi) THEN =FVAL("FNswi"+RIGH\$("0"+STR\$s it") OPT pas% CMP r0,#0 LDMMEIA (sp)1,(r4-r9,pc) DIF	L	ICEQS	pc, lr, #vbit
er_init STMDB (sp)1,(r4-r9,lr) MOV r0,#0 swi=0 TO max_swi 'def(swi) THEN =FVAL("FNswi"+RIGH\$("0"+STR\$s it") OPT pas% CMP r0,#0 LDMMEIA (sp)1,(r4-r9,pc) DIF	0	ORRS	pc,lr,#vbit
swi=0 TO max_swi 'def(swi) THEN =ZVAL(*Nnswi*+RIGHT\$(*0"+STR\$s it") OPT pass% CHP r0,#0 LDHNEIA (sp)1,(r4-r9,pc) DIF	er_ini	t	
<pre>=EVL("FNswi"+RIGHT\$("0"+STR\$st it") OPT pass% CMP r0,#0 LDMMEIA (sp)!,(r4-r9,pc) DIF</pre>		IOV	r0,#0
<pre>=EVL("FNswi"+RIGHT\$("0"+STR\$st it") OPT pass% CMP r0,#0 LDMMEIA (sp)!,(r4-r9,pc) DIF</pre>	swi=0		
it") OPT pas% CMP r0,#0 LDMNEIA (sp)!,(r4-r9,pc) DIF	def (s	wi) THE	N
CMP rØ,#Ø LDMNEIA (sp)!,(r4-r9,pc) DIF	it")	FASW1"	TALORIQ ("D"+STR\$BW
LDMNBIA (sp)!, (r4-r9 ,pc)		ISS%	r0,#0
		DMNEIA	(sp)!, (r4-r9 ,pc)^
T			
T pass%	T T pass	18	
MOV 10, #0		10 1	
			(sp)1, {r4-r9 ,pc}^
er_swi	er_swi	TMDB	(sp)1, (r8 ,r9, lr)
	C	MP .	rØ. #max swi+1
CMP rØ,#max_swi+1 ADDCC pc,pc,rØ,LSL #3	A	unce]	Acthetrator #2

314

2180 в unknown_swi 2190 B Unkno 2190] 2200 FOR swi=0 TO max_swi 2210 [OPT pass% swi(swi) 2220 BL 2230 В done swi 2240] 2250 NEXT 2260 [OPT pass% 2270 .done_swi 2280 LDMIA 2240 (sp)1, (r8 ,r9,pc) 2290 .unknown swi r0,bad_swi_err (sp)!,(r8-r9 ,lr) pc,lr,#vbit 2300 ADR 2310 LOMTA 2310 LDN1A 2320 ORRS 2330 .bad_swi_err 2340 DCD 2350 EQUS £1E6 "Unknown SCL opera tion" 2360 DCB ø 2370 ALIGN 2380 2390 .stubs DCD i FNtable(16) 2400 DCD 2 FNtable(16) 2410 2420 2430 DCD 2440 2450 .kernel_init_block 2460 FNtable(12) 2470 2480 .rts_block 2490 DCD rts block end-rts block 2500 FNtable(20) 2510 .rts_block_end 2520 2520 2530 .c_str EQUS "C"+CHR\$0 2540 ALIGN 2550 2560 .kernel_vectors FNtable(48*4) 2570 .kernel_vectors_end 2580 2590 .clib_vectors FNtable(183*4) 2600 .clib_vectors_end 2610 1 2610 1 2620 REM Statics will be copied into wo Kaspace, but we have to pretend 2630 REM they're further on in the modu 2640 rw_base=P% 2650 kernel_statics=P% 2660 kernel_statics_end=kernel_statics+ 1112 331C 2670 clip_statics=kernel_statics=end 2680 clip_statics=end=clip_statics=#B48 2690 ri_base=clip_statics_end 2700 rv_limit=ri_base+&40 2710 (OPT pass% 2720 .ull_swi 2730 MOV pc,lr 2740 MOV pc,lr 2736 MOV PC/11 2740] 2750 FOR swi=0 TO max_swi 2750 IF def(swi) THEN 2770 swi(swi)=P% 2780 k=EVAL("FNswi"+RIGHT\$("0"+STR\$sw 2760 K=5VAL("FREW!"+RIG 1,2)+"_code") 2790 ELSE 2800 swi(swi)=null_swi 2810 ENDIF 282Ø NEXT 2830 NEXT Dass 2840 SYS "OS File", 10, "SCLmod", &FFA, .co de%,0% 2850 END 2860 : 2880 DEF FNtable(size%) 2880 WHILE size%>0 2880 WHILE si: 2890 10%=0 2900 0%+=4 2910 P%+=4 2920 size%-=4 2930 ENDWHILE 2940 =0 2950 -2950 : 2960 DEF FNwk(reg) 2970 wk+=reg 2980 =wk-reg 2990 : 3000 DEF FN1c(a\$) 5000 DEF FRIC(aş) 3010 LOCAL b\$,i,c 3020 FOR i=1 TO LEN(a\$) 3030 c=ASCMID\$(a\$,i) 3040 IF c>=ASC"A" AND c<=ASC"Z" c+=32 3050 b\$+=CHR\$c 3060 N±T 3070 =b\$ 3080 : 3080 3080 : 3090 DEF FNadrl(reg,off) 3100 off=(off-(P%+8)) 3110 [OPT pass% ADD reg,pc,#(off AND & 3120 3120 FF) 3130 &FF00) 3140] 3150 =0 reg, reg, #(off AND ADD Listing Info11 10 REM SCL.Version (Infoll) 20 REM By DCA 30 REM For 32-bit machines 40 REM (c) BAU September 1993 50 60 DEF FNversion 70 ="SCL"+CHR\$9+CHR\$9+"0.10 (27-Jun-9

Listing Info12 10 REM >SCL.SWI00 memcpy (Infol2) 20 REM By DCA 30 REM For 32-bit machines 40 REM (c) BAU September 1993 50 : 60 DEF FNswi00_name 70 ="memcov" 80 80 : 90 DEF FNswi00_init 100 =0 110 : 120 DEF FNswi00_vars 130 memcpy=38*4 140 =0 150 . 150 : 160 DEF FNswi00_code 170 [OPT pass% 180 .scl_memcpy (sp)1, {lr } 190 STMDB r1, (rØ ,r1,r2) clib_vectors+memcp 200 LDMIA 210 BL 220 230 240] 250 =0 MOV rØ,#Ø LDMIA (sp)!,{pc} Listing Info13 10 REM >SCL.SWIØ1 memmove (Info13 20 REM By DCA 30 REM For 32-bit machines 40 REM (c) BAU September 1993 50 : 60 DEF FNswi01_name 7Ø ="memmove" 80 : 80 : 90 DEF FNswi01_init 100 =0 110 : 120 DEF FNswi01_vars 130 memmove=39*4 140 =0 150 : 160 DEF FNswi01_code 170 [OPT pass% 180 .scl_memmove 190 STMDB (sp)1, {lr }
r1, {r0 , r1, r2}
clib_vectors+menmo 200 LDMIA 210 BL e 220 230 240] 250 =0 MOV r0,#0 LDMIA (sp)!,{pc} **Listing Info14** 10 REM SSCL.SW102 qsort (Info14) 20 REM By DCA 30 REM For 32-bit machines 40 REM (c) BAU September 1993 40 KBM (C) BAO Sept 50 : 60 DEF FNswi02_name 70 ="gsort" 80 : 90 DEF FNswi02_init 100 =0 110 110 : 120 DEF FNswi02_vars 130 strcmp=45*4 140 qsort=76*4 150 =0 160 : 170 DEF FNswi02_code
 170
 DEF
 FNsw102_co

 180
 [OPT
 pass%

 190
 .scl_qsort
 200

 210
 MOV
 220

 200
 DDR
 DDR
 (sp)1, (r9 , lr) r9,r1 r3,[r9,#8] r3,#6 22Ø 23Ø CMP r3,#6 r1,compare_table r3,[r1,r3,LSL #2] r3,r3,r1 r0,[r9,#4] r1,[r9,#0] r2,#4 lib weatsrauger 240 ADRLO ADRLO ADDLO LDR LDR 250 260 270 280 290 MOV 300 BL clib_vectors+qsort r0,#0 310 MOV 320 LDMIA 330 340 .compare_table 350 DCD (sp)1, {r9 ,pc} compare_cardinal-c ompare_table 360 DCD compare_integer-co mpare_table 370 DCD compare_cardpt-com pare_table 38Ø DCD compare_intpt-comp 380 are_table 390 are_table 400 DCD compare_strci-comp DCD compare_strcs-comp are_table 410
 410
 .compare_cardpt

 420
 .compare_cardpt

 430
 LDR r0, [r0]

 440
 LDR r1, [r1]

 450
 .compare_cardinal

 460
 LDR r0, [r0]

 470
 LDR r1, [r1]

 480
 CHP r0, r1

 490
 WINDO - r0 #0

r1,[r1] r0,r1 r0,#0 r0,#0

rØ,#1 pc,lr

MVNLO

MOVEO

MOVHI

MOVS

49Ø 5ØØ

510

520

30 REM For 32-bit machines 40 REM (c) BAU September 1993

10 REM >TVsnow (Info19) 20 REM By Andy Jeffries 30 REM For 8-bit machines 40 REM (c) BAU September 1993

10 REM>CropCircle (Info20)20 REM ByAllister Jenks30 REM For 32-bit machines40 REM (c)BAU September 1993

50: 60 r=350:w=50:NODE12:0FF:FORm=1T015:C 0LOURM,16*n,12*n,0:NEXT:COLOUR0,112,64,0 :FORy=50FOOSTEF-50:FORx=0T01280STEF2:a= x+RND(32)-16:b=y+RND(40)-20:z=ABS(SQR(4 -640)²+(b=512)²)-r):vwic=RND(64)-32:d=R ND(30)+50:d=(d=x4(3)*2)/15:c=(c=x*c/2*3) (5.5)=0.0000+50:D

15:s=1+z/5:MOVEa, b:FORn=1T015:GCOLn*s:D

1130 IF pad%<>0 THEN FOR no%=1 TO pad%: BUUT#file%, 0:NEXT no% 1140 ENDPROC

1160 DEF PROCttod_generate_file(in_file %, out_file%)
1170 LOCAL in\$, com\$, param\$, line_no%,
no%, font_handle%, real_handle%, first%

1180 line_no%=0:first%=TRUE 1190 WHILE (NOT EOF#in_file%) AND (NOT

1220 IF FNttod_parse(in\$, com\$, param\$

1250 CASE comp or 1240 WHEN "ltext": 1250 FROCttod_generate_ltext(out_fi le%, font_handle%, param\$, line_no%) 1260 WHEN "ctext":

1260 WHEN "ctext": 1270 PROCttod_generate_ctext(out_fi 1e%, font_handle%, param\$, line_no%) 1280 WHEN "font": 1290 STS 420049, ttod_font_args\$, p aram\$, ttod_work%, 1024 TO ;status% 1300 IF (status% AND 1)=1 THEN PROC ttod_error("Syntax error", line_no%):END PROC

 1330
 IF (NOT FATCO_CHECK_CON_DATA

 16(ttod_used_handlesk_no%)
 THEN

 1340
 font_handle%=no%

 1350
 ELSE

 1360
 PROCttod_error("SERIOUS INTER

 NL BRACR : I've lost track of a font han
 Int (a font, b font,

1370 ENDIF 1360 IF first% THEN first%=FALSE EL SE SYS &40082, real_handle% 1390 SYS &40081, ttod_font_nams(fo nt_handle%), ttod_font_mise[nc%]*16, tto d_font_size(nc%)*16, 0, 0 TO real_handle

1400 WHEN "line": 1410 FROCttod_generate_line(out_fil e%, param\$, line_no%) 1420 WHEN "units": 1430 CASE FNlc(param\$) OF 1440 WHEN "inch": ttod_scale=ttod _inch_scale:ttod_millipoints=ttod_mp_per inch

_inch 1450 WHEN "mm" : ttod_scale=ttod_m m_scale:ttod_millipoints=ttod_mp_per_mm 1450 OTHERWISE : PROCEttod_error("I 14egal measurement scale in 'units' comm and",line_no%):ENDPROC

1470 ENDCASE 1480 WEEM "rectangle" : 1490 PROCtod_generate_box(out_file %, param\$, line_no\$) 1510 PROCttod_include_sprite(out_fi le%, param\$, line_no\$) 1520 WEEM "path" : 1530 FROCttod_generate_path(in_file to out_file%, param\$, line_no\$)

1550 What Gillpse : 1550 PROCtod_generate_oval(out_fil e%, param\$, line_no%) 1560 OTHERWISE: IF (LEFT\$(com\$, 1)<>" #") THEN PROCttod_error("Unknown command

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out_file%, param\$, line_no%) 640 WHEN "ellipse" :

1400 WHEN "line" :

no%=VAL(FNget_str(ttod_work%!Ø 1320 IF no%<1 OR no%>64 THEN PROCtt od_error("Incorrect font number",line_no

IF (NOT FNttod_check_font_hand

in\$=FNstrip_spaces(GET\$#in_file%)

BIO (page 91)

60 MODE1: VDU23; 8202;0;0;0;0;0;; FORX=&30

Listing Info19

Listing Info20

RAWBYC, d:NEXT,

status%

ttod_error%) 1200 in\$=F

THEN

PROC

1310

%) : ENDPROC

1330

inch

1470

1540

1210 line no%+=1

CASE com\$ OF

1120 PTR#file%=EXT#file%

60 MODE9:OFF:FORn=0T015:COLOUR n,16*n

,16*n,16*n:NEXT:FORy=4TO10165TEP4:FORx=4 TO12725TEP4:c=POINT(x-4,y)+POINT(x-4,y-4))+POINT(x,y-4)+POINT(x+4,y-4):GCOL(c/4+2 *RND(1))MOD16:POINTx,y:NEXT,

	53Ø		
	540	.compare_intpt	
	55Ø	LDR	rØ, [rØ]
	560	LDR	r1, [r1]
	57Ø	.compare_intege	r
	58Ø	LDR	r0, [r0]
	59Ø	LDR	r1, [r1]
	600	CMP	rØ, r1
	610	MVNLT	rØ,#Ø
	62Ø	MOVGT	rØ,#1
	63Ø	MOVEQ	rØ,#Ø
	64Ø	MOVS	pc,lr
	65Ø		
	66Ø	.compare_strci	
	67Ø	STMDB	(sp)!, {lr }
	680	MOV	r3,#%Ø1
	69Ø	LDR	r2, [r1]
	700	LDR	r1, [r0]
	710	MVN	rØ,#Ø
	720	SWI	"XTerritory_Collat
e	v		
	73Ø	LDMIA	(sp)!, {pc }^
	74Ø		
	75Ø	.compare_strcs	
	760	LDR	rØ, [rØ]
	77Ø	LDR	r1, [r1]
	78Ø	В	clib_vectors+strcm
p			
	79Ø	1	
	800	=0	

Listing Info15

10	REM		>SCL.SWIØ3	bsearch	(Info15
	REM				
30	REM	For	32-hit macl	nines	

40 REM (c) BAU September 1993

Listing Bio1

- 10 REM >FileLock (Biol) 20 REM By Duncan Roberts 30 REM For use with Bio application 40 REM (c) BAU September 1993
- 50 RND
- 60 : 70 DEF FNfilelock_name="File Protecto
- 80 DEF FNfilelock args="-in * -result
- 8 1 90 DEF FNfilelock init
- 100 110
- 120 DEF FNfilelock(in\$, RETURN title\$, R ETURN a\$)
- cutw a;)
 130 SYS "OS_CLL","Access "+in\$+" LWR"
 140 tile\$="FileLock"
 150 a\$="File ("+FNleaf_name(in\$)+"' lo
- 160 =0
- 170
- 1/0 : 180 DEF FNfilelock_help(window%,icon%) 190 IF window%=-1 THEN ="Drag a file t 0 lock it against deletion." THEN =""

Listing Bio2

- 10 REM >ForceWipe (Bio2) 20 REM By Dave Lawrence 30 REM For use with Bio application 40 REM (c) BAU September 1993
- 60 DEF FNforcewipe_name = "Wipe with

force 70 DEF FNforcewipe_args = "-in * -dir

ectory" 80 DEF FNforcewipe_init = 0

- 100 DEF FNforcewipe(in\$)
- 110 IF version%>300 THEN 120 leaf\$=FNleaf name(in\$)
- 130 path\$=LEFT\$(in\$,LENin\$-LENleaf\$-1
- 140 SYS "Wimp_StartTask", "Filer_Actio

- 140 515 Hards n" TO fa_task% 150 SYS "FilerAction_SendSelectedDire ctory", fa_task%, path\$+CRR\$0 160 SYS "FilerAction_SendSelectedFile ",fa_task%,leaf5+CHR\$0 170 SYS "FilerAction_SendStartOperati on",fa_task%,2,%10101,0,0
- 180 ELSE 190 SYS "XOS_CLI", "Wipe "+in\$+" FR"C"
- 200 ENDIF
- 210 =0 220
- 230 DEF FNforcewipe_help(windows, icon%

240 IF window%=-1 THEN ="Drag a file o r directory here to wipe it. R(ecurse) a nd F(orce) will be used." THEN =""

Listing Bio3

- 10 REM >TtoD 20 REM By Gary Palmer 30 REM For use with Bio 40 REM (c) BAU September 1993
- 50 END
- 60
- 70 DEF FNttod_name="Text to DrawFile" 80 :

70 ="bsearch" 80 : 90 DEF FNswi03_init 100 =0 120 DEF FNswi03 vars 130 bsearch=75*4 140 =0 150 : 160 DEF FNswi03_code 170 [OPT pass% 180 .scl_bsearch STMDB (sp)!, {r4 , r9, lr} r9,r1 r4,[r9,#8] r4,#6 MOV LDR CMP ADRLO r1,compare_table
r4,[r1,r4,LSL #2]
r4,r4,r1 LDRLO ADDLO r4,r4,r1 (sp)!,{r4 } r0,r9,#12 r1,[r9,#4] r2,[r9,#0] r3,#4 STMDE ADD LDR LDR MOV BL clib vectors+bsear ADD STR sp,sp,#4 r0,[r9,#0] r0,#0 (sp)!,{r4 ,r9,pc}^ LDMIA

360] 370 =0

60 DEF FNswi03 name

110

190

200

240

250

260

270 280 290

300

310

32Ø 33Ø 34Ø

35Ø

ch

Listing Info16

10 REM >SearchTest (Info16)

- 90 DEF FNttod args="-in Text -out dra wfile -send" tile -send"
 100 :
 100 per PNttod_init
 120 SYS "Hourglass_On"
 130 LOCAL font_no%, status%
 140 ttod_inch_scale=180*256:ttod_mm_sc
- ale=ttod inch scale/25.4
- alettod_inch_scale/25.4
 150 ttod_mp_per_inch=72000:ttod_mp_per
 _mm=ttod_mp_per_inch/25.4
 160 ttod_scalettod_mm_scale:ttod_mill
 ipoints=ttod_mp_per_mm
 170 DIM ttod_font_name\$(64), ttod_font
 _size(64), ttod_work% 8192, ttod_error_q
- \$ 256
- % 256 180 ttod_font_no%=0 190 ttod_rect_args\$="first/k,second/k, width=w/k,fill=f/k,line=1/k" 200 ttod_line_args\$="start/k,end/k,wid th=w/k,line=1/k"
- 210 ttod_ltext_args\$="x/k,y/k,text=t/k
- 210 ttod_ltext_args\$="x/k,y/k,text=t/k
 ,path=p/a"
 220 ttod_ctext_args\$="first/k,second/k
 ,text=t/k,path=p/a"
 230 ttod_font_args\$="number=no/k,name=
 n/k,size=sz/k"
 240 ttod_sprite_args\$="file=f/k,sprite
 prace/k first the args4"
- =name/k, first/k, second/k'
- 250 ttod_path_args\$="width=w/k,fill=f/ k,line=1/k"
- 260 ttod_one_args\$="to/k" 270 ttod_three_args\$="to/k,first/k,sec
- ond/k4 280 ttod_ellipse_args\$="centre=c/k,hor z=h/k, vert=v/k, width=w/k, line=1/k, fill=f
- 290 ttod_used_handles\$="" 300 SYS "Wimp_ReadSysInfo",7 TO ttod_v ersion%; status% 310 IF (status% AND 1)=1 THEN ttod_ver
- sion%=200
- 320 SYS "Hourglass Smash" 330 =0

- 340 : 350 DEF FNttod(in\$, out\$) 360 ttod_error%=FALSE 370 LOCAL in_file%, out_file%
- 38Ø SYS "Hourglass On"

- 380 SYS "Hourglass_On" 390 in_file%=0PENIN(in\$) 400 IF in_file%=0 THEN PROCEtdd_error(Cannot open input file", 0):=1 410 out_file%=0PENOUT(out\$) 420 IF out_file%=0 THEN PROCEtdd_error "Cannot open output file", 0):CLOSE #in file%=01
- file%:=1 430 PROCttod_scan_fonts_needed(in_file
- %)
- %) 440 IF NOT ttod_error% FROCttod_start_ file(out_file%) 450 IF NOT ttod_error% FROCttod_create font_table(out_file%) 460 IF NOT ttod_error% FROCttod_genera te_file(in_file%, out_file%) 470 CLOSHiout_file% 480 CLOSHiout_file% 480 CLOSHiout_file%
- 490 SYS "Hourglass_Smash" 500 IF ttod_error% THEN =1 ELSE =0
- 520 DEF PROCttod_scan_fonts_needed(fil
- e%) 530 LOCAL in\$, line_no%, com\$, param\$,
- name\$, size\$, no%, status\$, handle\$ 540 PTR#file%=0 550 line_no%=0:ttod_used_handles\$="" 560 WHILE (NOT EOF#in_file%) AND (NOT tod error")
- - od_error%) 570 in\$=FNstrip_spaces(GET\$#file%)

20 REM By DCA 30 REM For 32-bit machines 40 REM (c) BAU September 1993 50 : 50 : 60 MODE 0 70 n%=10000 70 n%=10000 80 DIM q% 4*n%,temp% 4 90 FOR 1%=0 TO n%-1 100 q%!(4*1%)=1%*10 110 NEXT 120 FOR test%=1 TO 10 100 130 val%:10*(RND(n%)-1) 140 PRINT"Searching for ";val%;" - "; 150 SYS "SCL_bsearch",n%,q%,0,val% TO

- 160 IF where%=0 PRINT "not found!" EL SE PRINT "matches item "; (where%-q%) DIV
 - 17Ø NEXT 18Ø END

Listing Info17

Listing Info18

line no%+=1

580

PROC

DPROC

DPROC

DPROC

67Ø

o%) : ENDPROC

710

750

e%)

1000 \$) <>Ø THEN 1010

CHR\$ (Ø) : 1080 UNTIL usedS=""

1020 BLSE

ENDIF

ENDCASE 760

700 ENDIF 770 ENDWHILE 790 PTR#file%=0

800 ENDPROC

65Ø

- 10 REM >Granite (Infol7) 20 REM By Jan Vibe 30 REM For 32-bit machines 40 REM (c) BAU September 1993

10 REM >Granite2 (Info18) 20 REM By Jan Vibe

580 line_no%+=1 590 IF PRItod_parse(in\$, com\$, param\$) AND (LEPT\$(in\$, 1)<>"#") THEN 600 CASE com\$ 0P 610 WHEN "font": 620 SYS £20049, ttod_font_args\$, p aram\$, ttod_work%, 1024 TO; status% 630 IF (status% AND 1)=1 THEN PROC ttod_error("Syntax error", line_no%):END PROC

640 IF ttod_work%!0<>0 THEN no%=VA L(FNget_str(ttod_work%!0)) ELSE PROCttod error("Font number needed",line_no%):EN

cd_used_handles\$, no%) THEN 660 IF ttod_work%14=0 THEN PROCtt od_error("Font name needed",line_no%):EN

od error("Font size needed", line no%) :EN

DPROC 660 name\$=FNget_str(ttod_work%14) 690 SYS £60081, name\$, 16, 16, 0, 0 TO handle%;status% 700 IF (status% AND 1)=1 THEN PRO Cttod_error("Incorrect font name", line_n

SYS £40082, handle%

710 SYS \$440882, handle% 720 ttod_font_name\$(no%)=name\$ 730 ttod_font_size(no%)=VAL(FNget _str(ttod_work%18)) 740 IF ttod_used_handles\$<>"" THE N ttod_used_handles\$=STR\$(no%) ELSE ttod_used_handles\$=STR\$(no%)

810 : 820 DEF PROCULD_start_file(file%) 836 BPUT#file%, "Draw"; 846 PROCWput(file%, 201) 856 PROCWput(file%, 0) 868 PROCWput(file%, 0) 899 PROCWput(file%, 1cd_scale*210) 908 PROCWput(file%, ttod_scale*210) 916 RDDPROC 920 : 930 DEF PROCULTOD

930 DEF PROCttod create font table(fil

940 LOCAL used\$, len%, tmp\$, no%, pad%

IF FNttod_parse(used\$, tmp\$, used

1222 ELSE
1233 no%=VAL(tmp\$):used\$=""
1240 ENDIF
1250 len%=LEN(ttod_font_name\$(no%))+2
1260 BPUT#file%, no%
1270 BPUT#file%, ttod_font_name\$(no%)+

1000 DTR#file%+Imp% 1100 TTR#file%+Imp% 1100 Ttmp%=len%+len%=(len%+3) AND NOT 3: pad%=len%-tmp% 1110 PROCwput(file%, len%+8)

940 Hover and the second secon

no%=VAL(tmp\$)

IF FNttod check font handle(tt

IF ttod_work%!8=Ø THEN PROCtt

50 : 50 *0089:0FF:FORm=07015:COLOUR n,16*n ,16*n,16*n:NEXT:FORy=4T01016STEP4:FORx=4 T012723TEP4:c=P01NT(x-4,y)+901NT(x-4,y-4) +901NT(x,y-4)+F01NT(x+4,y-4)=01NT(x-4,y-4) *(RND(1)-.44))MOD16:FOINTx,y:NEXT,

- ",line_no%) 1570 ENDCASE 1580 ENDIF
- 1590 ENDWHILE
- 1600 IF NOT first% THEN SYS &40082, rea
- handle%
- 1610 ENDPROC

- %12(30) text%=FNget_str(ttod_work%18) IF path% THEN % x=x*ttod_millipoints:y=y*ttod_mil 730
- lipoints
- ipoints 1740 SYS &4009E,%1,8 1750 SYS &40086,0,text\$,%011000000000,x
- Y 1760 SYS £4009E,0,0 TO ,need% 1770 IF need%>=8184 THEN PROCttod_erro r("Text path too big for buffer!!", line
- %) : ENDPROC
- !ttod_work%=0:!ttod_work%=8184 1780 1790 SYS &4009E,%10010,ttod_work% 1800 SYS &40086,0,text\$,%01100000000,>

- ,Y 1810 SYS &4009E,0,0 TO ,need% 1820 SYS "OS_GBPB",2,file%,ttod_work%, need%-ttod_work%
- 1830 ELSE
- 1840 SYS &40097,,text\$ TO ,,, bound_x,
- bound_y 1850 bound_x=bound_x/ttod_millipoints*
- ttod_scale 1860 bound_y=bound_y/ttod_millipoints
- ttod scale 1870
- 1880 1890
- scale x=x*ttod_scale:y=y*ttod_scale len%=(LEN(text\$)+1+3) AND NOT 3 FROCttod_put_head(file%, 1, 52+le y, bound_x+1+x, bound_y+1+y) FROCwput(file%, 0) FROCwput(file%, eFFFFF00) FROCwput(file%, handle%) FROCwput(file%, ttod_font_size(ha)*640)
- 1910
- 1920
- 1930
- ndle%)*64Ø)
- ndle%)*640)
 1940 PROCwput(file%, ttod_font_size(ha
 ndle%)*640)
 1950 PROCwput(file%, x)
 1960 PROCwput(file%, y)
 1970 PROCttod_put_padded(file%, len%,
 text\$-tCHR\$(0), CHR\$(0))
 1960 PNOC

- 1980 ENDIF 1990 ENDPROC

- 2000 : 2010 DEF FROCttod_generate_ctext(file%, handle%, paras, line%) 2020 LOCAL x1, y1, x2, y2, x_low, y_low x_high, y_high, text\$, bound_x, bound_ y, len%, status%, path 2030 SYS &20049, ttod_ctext_args\$, para m\$, ttod_work%, 1024 TO ;status% 2040 IF (status% AND):=1 THEN PROCttod _error("Syntax error",line%):HNDPROC 2050 IF ttod_work%!de THEN FROCttod_er ror("Missing first position definition from 'ctext' command",line%):HNDPROC 2050 IF ttod_work%!de@ THEN FROCttod_er

- 2070 IF ttod work%18=0 THEN PROCEttod er
- acro if the workstow has rooted of the roote
- k%10), x1, y1) 2090 PROCttod_get_xy(FNget_str(ttod_wor

- 2890 PROCttod_get_xy(FNget_str(ttod_wor k%i4), x2, y2) 2100 text5=FNget_str(ttod_work%i8):path %=((ttod_work%i12):>0) 2110 xi=xi*ttod_scale:y2=y2*ttod_scale 2120 yi=i*ttod_scale:y2=y2*ttod_scale 2130 IF xi=x2 THEN x_low=x1:x_high=x2 E LSE x_low=x2:x_high=x1 2140 IF y1<y2 THEN y_low=y1:y_high=y2 E LSE y_low=y2:y_high=y1 2150 SYS &40097,,text\$ T0 ,,, bound_x, bound_y

- bound_y
 2160 bound_x=bound_x/ttod_millipoints*t
- tod_scale 2170 bound_y=bound_y/ttod_millipoints*t
- tod_scale 2180 IF (x high-x_low) < bound x THEN PRO
- 2180 IF (x_high-x_low)
chound_x THEN PRO
 Cttod_error("Bounding box too small (in
x) in ctext command",line%):ENPFROC
 2190 IF (y_high-y_low)
chound_y THEN PRO
 Cttod_error("Bounding box too small (in
y) in ctext command",line%):ENPFROC
2200 x_low+=(y_high-y_low-bound_y)/2
2210 len%=(LEN(text\$)+1) AND NOT 3:IF (
(LEN(text\$)+1) MOD 10:Field
2240 x_low=x Durktod_millinoises/text

- 2240 x_low=x_low*ttod_millipoints/ttod 106 BBC ACORN USER SEPTEMBER 1993

scale:y_low=y_low*ttod_millipoints/ttod

2910 PROCwput(file%, width) 2920 PROCwput(file%, %00000000) 2930 PROCttod_put_path(file%, 2, x1, y1

2940 PROCttod_put_path(file%, 8, x2, y1

2950 PROCttod put path(file%, 8, x2, v2

2960 PROCttod_put_path(file%, 8, x1, y2

2970 PROCttod_put_path(file%, 8, x1, y1

0020 DEF PROCttod_include_sprite(out_fi

3010 : 3020 DEF PROCttod_include_sprite(out_fi le%, param5, line_no%) 3030 LOCAL x1, y1, x2, y2, x_low, y_low x, high, y_high, file\$, in_file\$, sprit e\$, status\$, number\$, len%, tmp\$, tmp\$ 3040 SY8 420849, ttod sprite_args\$, par am5, ttod_work\$, lo24 TO ;status\$ 3050 IF (status\$ NND 1)=1 THEN PROCttod error("Missing file name from 'sprite' com mand*, line_no%):ENDPROC 3060 IF ttod_work\$(1=0 THEN PROCttod_er ror("Missing sprite name from 'sprite' com mand*, line_no%):ENDPROC 3060 IF ttod_work\$(1=0 THEN PROCttod_er ror("Missing file name from 'sprite' com mand*, line_no%):ENDPROC 3050 IF ttod_work\$(1=0 THEN PROCttod_er ror("Missing files THEN PROCttod_er ror("Missing files THEN PROCttod_er ror("Missing files THEN PROCttod_er ror("Missing second position definition from 'sprite' command*, line_no%):ENDPROC 1300 Erttod_work\$(1=0 THEN PROCttod_er ror("Missing second position definition from 'sprite' command*, line_no%):ENDPROC 3100 erwite\$_ENDER expkt(1)

3100 sprite\$=FNget_str(ttod_work%!4)

3160 sprite\$=FNget_str(tbd_work%i4) 3110 IF LEN(sprite\$)>12 THEN PROCtbd_e rror("Tllegal sprite name in 'sprite' co mmand", line_no%):ENDPROC 3120 file\$=FNget_str(tbd_work%i0) 3130 in_file\$=OFENIN(file\$) 3140 IF in_file\$=0 FHEN FROCtbd_error("File '*file\$+" not found in 'sprite' command", line_no%):ENDPROC 3150 number%=FNget_it(i,file\$) 3160 IF number%=0 THEN PROCtbd_error(" File '*file\$+" contains no sprites"):E NDPROC

NDPROC 3170 PTR#in_file%=FNwget(in_file%)-4

herser len%=FNwget(in_file%) tmp\$=GET\$#in_file% IF tmp\$<>sprite\$ THEN number%=-1

ELGE number%-1
2330 IF number%0 THEN PTR#in_file%=PT
R#in_file%+len%-16:tmp%=PTR#in_file%
3240 UNTLi number%<1
3250 IF number%<1 THEN PROCttod_error
("Sprite "**prite\$*" not found in file
"*file\$*":):ENDPRC
3260 PROCttod_get_xy(FNget_str(ttod_wor
b(R)_str))</pre>

3260 PROCEDd_get_xy(FNget_str(ttod_wor k%16), xi, yi) 3270 PROCEDd_get_xy(FNget_str(ttod_wor k%12), x2, y2) 3260 x1=x1*ttod_scale:x2=x2*ttod_scale 3290 y1=y1*ttod_scale:y2=y2*ttod_scale 3300 IF x1<x2 THEN x_low=x1:x_high=x2 E</pre>

3300 IF X1XZ THEN X_10wxX1:X_nigh=X2 E LSE X_10w=X2:X_high=x1 3310 IF y1<y2 THEN y_10w=y1:y_high=y2 E LSE y_10w=y2:y_high=y1 3320 PROCtod_put_head(out_file%, 5, 24 +((1en%+3) AND NOT 3), x_10w, y_10w, x_h iob x_hidt

3350 SYS &c, 4, in_file%, ttod_work%, 350 SYS &c, 2, out_file%, ttod_work%,

3380 tmp%=0 3400 SYS &c, 4, in_file%, ttod_work%, 1024 TO ,,,tmp% 3410 SYS &c, 2, out_file%, ttod_work% 1024-tmp% 3420 ENDWHILE 3420 ENDWHILE

3450 ENDFACC 3460 : 3470 DEF PROCttod_generate_oval(file%, param\$, line,no%) 3480 LOCAL x, y, horz, vert, width, lin e_col%, fill_col%, const are viewed the 8:colour*=&800000:const=0.55 3420 vidth=8:colour*=&800000:const=0.55

2255944 3500 STS £20049, ttod_ellipse_args\$, pa ram\$, ttod_work\$, 1024 TO ;status\$ 3510 IF (status\$ AND 1)=1 THEN FROCtod error("5yntax error", line_no\$; INDEPROC 3520 IF ttod_work\$10=0 THEN FROCttod_er

ror("Missing centre position definition
from 'ellipse' command", line_no%):ENDPRO

5530 IF ttod_work%:4=0 THEN PROCttod_er ror("Missing horizontal size definition from 'ellipse' command",line_no%):ENDPRO

3540 IF ttod_work%!8=0 THEN PROCttod_er ror("Missing vertical size definition fr om 'ellipse' command",line_no%):ENDPROC

3550 PROCttod_get_xy(FNget_str(ttod_wor k%!0), x,y)
3560 horz=VAL(FNget_str(ttod_work%!4)):

igh, y_high) 3330 PTR#in_file%=tmp%

337Ø ELSE 338Ø tmp%=Ø

3430 ENDIF 3440 CLOSE#in_file% 450 ENDPROC

2256944

3340 IF len%<=1024 THEN

3180 tmp%=PTR#in_file% 3190 REPEAT

3220 ELSE number%-=1

2980 PROCWput(file%, 5)

2990 PROCwput(file%, Ø) 3000 ENDPROC

vert=VAL(FNget_str(ttod_work%18))
3570 IF ttod_work%12>0 THEN width=VAL
(FNget_str(ttod_work%12))*640
3580 IF ttod_work%16>0 THEN line_col%
=EVAL(FNget_str(ttod_work%16))
3590 IF ttod_work%16))
3590 IF ttod_work%160>0 THEN fill_col%
EVAL(FNget_str(ttod_work%16))

3590 IF ttod_work%120×00 THEN fill_col% EVAL(RNget_str(tod_work%120)) 3600 x=x*ttod_scale:y=*ttod_scale:horz =horz*ttod_scale:v=r=v=rt*ttod_scale: 5610 PROCtod_put_head(file%, 2, 172, x -horz,y=v=rt,x+horz,y+v=rt) 3620 PROCyput(file%, fill_col%) 3630 PROCyput(file%, line_col%) 3650 PROCyput(file%, width) 3650 PROCtod_put_path(file%, 2, x, y=v ert)

3670 PROCttod_put_bezier(file%, x+horz, y, x+horz*const, y-vert, x+horz, y-vert

const)
3680 PROCttod_put_bezier(file%, x, y+ve
t, x+horz, y+vert*const, x+horz*const,
+vert)
3690 PROCttod_put_bezier(file%, x-horz,
y= beziert

y, x-horz*const, y+vert, x-horz, y+vert

3700 PROCttod_put_bezier(file%, x, y-ve rt, x-horz, y-vert*const, x-horz*const,

3740 : 3750 DEF PROCttod_generate_path(in_file %, out_file%, param\$, RETURN line_no%) 3760 LOCAL in\$, com\$, par\$, status%, he ad_pos%, x_low, x_high, y_low, y_high, s ub%, x1, x2, y1, y2, finish% 3770 finish%=PALSE:sub%=PALSE:x_low=SF

FFFFFF:x_high=0vy_lows&TFFFFFFF;y_high=0
3780 head_pos%=PTR#out_file%
3790 PROCttod_put_head(out_file%, 2, 0,

3790 PROCttod_put_head(out_file%, 2, 0, 0, 0, 0, 0) 3800 SYS 620049, ttod_path_args5, param \$, ttod_work%, 1024 TO ;status% 3810 IF (status% AND 1)=1 THEN PROCttod _error("Syntax error in command 'path'", 11ne_no%):ENDPROC 3820 IF ttod_work%18-0 THEN PROCwput(out _file%, JENEPERPON) BLSE PROCwput(out_file%, VAL (FNget_str(ttod_work%10))) 3830 IF ttod_work%10))) 3830 IF ttod_work%10))) 3840 IF ttod_work%10)) 3840 IF ttod_work%10)) 3840 IF ttod_work%10)) 3840 IF ttod_work%10); 3850 PROCwput(out_file%, 0) 3850 WHLE (file%), ALS (NO (NOT tto

3860 WHILE (finish%=FALSE) AND (NOT tto

_error%) 3870 in\$=FNstrip_spaces(GET\$#in_file%) 3880 line_no%+=1 3890 status%=FNttod_parse(in\$, com\$, p

3910 WHEN "draw" : 3920 IF NOT sub% THEN 3930 PROCttod_error("Not in a sub-p ath for 'draw' command", line_no%):ENDPR

 Joss
 Factor
 Jark
 Jine_no%, xl, yl)

 3960
 IF xl>x high THEN x high=xl
 3970
 IF xl<x_low THEN x_low=xl</td>

 3970
 IF xl<x_low THEN x_low=xl</td>
 3980
 IF yl>y_high THEN y_high=yl

4000 BBDI 4010 WHEN "move": 4020 sub%=TRUE 4030 PROCtcd_path_move(out_file%, p at\$, line_no%, x1, y1) 4040 IF x1>, high THEN x_high=x1 4070 Trix, high THEN x_high=x1

4040 IP x1xx high THEN x high=x1
4050 IP x1xx low THEN x low=x1
4050 IP y1xy high THEN y high=y1
4070 IF y1xy low THEN y low=y1
4080 WHEN "curve":
4090 PROCttod path curve(out file%, par\$, line_no%, x1, y1, x2, y2)
4100 IP x1xx high THEN x high=x1
4110 IP x1xx high THEN x high=x1
4120 IF y1xy high THEN x high=x1
4130 IF y1xy high THEN x high=x1
4140 IF x2xx high THEN x high=x2
4150 IF x2x low THEN x low=x2
4150 IF y2xy low THEN y low=y2
4150 WHEM "close":
4190 IF sub%=RLSE THEN

WHEN "Close" : IF sub%=FALSE THEN

4200 PROCttod_error("Not in a sub-p ath for 'close' command", line_no%):ENDP

sub%=FALSE PROCwput(out_file%, 5)

ENDIF WHEN "end" : PROCwput(out_file%, Ø) finish%=TRUE

4280 OTHERWIGE : 4290 IF LEFT§(com\$, 1)<>"#" THEN PROC ttod_error("Tilegal command in path segm ent", line_no%):RNDFROC 4300 RENORASE 4310 RENORASE 4310 RENORASE

4320 len%=PTR#out file% - head pos% 4330 PTRFout_file%head_pos% 4340 PTRCttcd_put_head(out_file%, 2, 1e n%, x_low, y_low, x_high, y_high)

PROCttod_path_draw(out_file%,

IF v1<v low THEN y low=y1

-vert) 3710 PROCwput(file%, 5) 3720 PROCwput(file%, 0) 3730 ENDPROC

onst)

const)

3740 :

_error%) 387Ø in 388Ø li

3900 CASE com\$ OF

ELSE

ENDIF

ar\$)

3940

3950

3990

4000

4190

421Ø 422Ø 423Ø

4240

4250

4260 4270 ELSE

ENDIF

4280 OTHERWISE :

- SYS &4009E,%1,8 SYS &40086,0,text\$,%01100000000,x 2260
- 2200 S1S 440805,0,CERLS, Wollboodcoup,X low,ylow 2270 SYS 44009E,0,0 TO ,need% 2280 IF need%-8184 THEN PROCttod_erro (""ext path too big for buffer!!", line %):ENDPROC
- PROC !ttod_work%=0:!ttod_work%=8184 SYS &4009E,%10010,ttod_work% SYS &40086,0,text\$,%01100000000,x 2290
- 2310
- low, y_low 2320 SYS
- SYS &4009E,0,0 TO ,need% SYS %0S_GBPB",2,file%,ttod_work%, ttod_work% 2330
- 2340 ELSE
- 2340 ELSE 2350 PROCttod_put_head(file%, 1, 52+le n%, x_low, y_low, x_low+bound_x, y_low+b
- ound_y) 2360

-) PROCwput(file%, Ø) PROCwput(file%, &FFFFFFØØ) PROCwput(file%, handle%) PROCwput(file%, ttod_font_size(ha 2390 ndle%)*640)
- PROCwput(file%, ttod font size(ha 2400 ndle%)*640)

- nales, sev 2410 PROCwput(file%, x_low) 2420 PROCwput(file%, y_low) 2430 PROCttod_put_padded(file%, len%, text\$+CHR\$(0), CHR\$(0))

:colout%=60000000 2500 SYS £20049, ttod_line_args\$, param \$, ttod_work%, 1024 TO;status% 2510 IF (status% AND 1)=1 "HEN FROCttod error("Synta error", ine_no%;INOFROC 2520 IF ttod_work%;0=0 THEN FROCttod_er

error("Syntax error", line_no%):ENDPROC 2520 FF tod_work%05 TENP FROCtod_er ror("Missing start position definition fr 2530 IF tod_work%14=0 TENP FROCtod_er ror("Missing end position definition fro 1 line' command",line_no%):ENDPROC 2540 FROCtod_get_xy(FNget_str(ttod_wor %14), finish_x, finish_y) 2550 FROCtod_get_xy(FNget_str(ttod_wor %14), finish_x, finish_y) 2560 IF tod_work%180):*640 2570 FF tod_work%180):*640 2570 FF tod_work%180:*00 TENP width=VAL(FNget_str(ttod_work%12)) 2580 start_x=start_x*ttod_scale:start_y =start_y*ttod_scale 2690 IF start_xcfinish_x*ttod_scale:finis 2690 IF start_xcfinish_x TENP x_low=start 1 xy=Kinghefinish_x ELSE x_low=sfinish_x *x highestart_x

rt_xix_high=finish_x ELSE x_low=finish_x ix_high=start_x 2610 IF start_y<finish_y THEN y_low=sta rt_y:y_high=finish_y ELSE y_low=finish_y iy_high=start_y 2620 PROCttod_put_head(file%, 2, 68, x_ low= bigh_ bigh)

abb FROCTCO put_lead(FIG*, 2, 66, X_ low, y_low, x_high, y_ligh) 2630 FROCwput(file*, 6FFFFFFF) 2640 FROCwput(file*, colour*) 2650 FROCwput(file*, %00000000) 2670 FROCtcd_put_path(file*, 2, start_ ctart

x, start_y)
2680 PROCttod_put_path(file%, 8, finish

2720 DEF PROCttod_generate_box(file%, p

aras, line_not%) 2730 LOCAL x1, y1, x2, y2, x_low, y_low , x_high, y_high, width, status%, line_c ol%, fille_col% 2740 width=0:line_col%=\$00000000;fill_c ol%=\$FFFFFF 2750 ST\$ \$20049, ttod_rect_args%, param 5. trod_work%_ 1024 The status%

2750 SYS £20049, ttod_rect_args\$, param \$, ttod_work\$, 1024 To jstatus\$ 2760 IF (status\$ AND 1]=1 THEN FROCttod_ error("Syntax error",line_no%):ENDPROC 2770 IF ttod_work%id=0 THEN FROCttod_er rom 'box' command",line_no%):ENDPROC 2780 IF ttod_work%id=0 THEN FROCttod_er ror("Missing second position definition from 'box' command",line_no%):ENDPROC 2790 PROCtod_ner_w(Phast strifted_wor

2790 PROCttod_get_xy(PNget_str(ttod_wor

From 'box' command, line_now\):BNDFACC 3750 FROCtod get_xy(FNget_stritod_wor k%10), x1, y1) 2800 FROCtod_get_xy(FNget_stritod_wor k%14), x2, y2) 2810 IF ttod_work%18:0)*640 2820 IF ttod_work%18:0)*640 2820 IF ttod_work%10:0 2830 IF ttod_work%112:0 2830 IF ttod_work%112:0 2840 X1:4tod_scale:x2=x2*ttod_scale 2850 y1=y1*ttod_scale:y2=y2*ttod_scale 2850 Procesy2:y_high=y1 2890 PROCtod_put_head(file%, 2, 108, x 100, y_low, x_high, y_high) 2900 PROCeput(file%, fill_col%) 2900 PROCeput(file%, line_col%)

x, finish_y) 2690 PROCwput(file%, Ø) 2700 ENDPROC

- 244Ø ENDIF 245Ø ENDPROC
- 2450 ENDFROC 2460 : 2470 DEF FROCttod_generate_line(file%, param\$, line_no%) 2480 LOCAL start_x, start_y, finish_x, finish y, x_low, y_low, x_high, y_high, width, status%, colour% 2490 width=0:start%=FALSE;finish%=FALSE

1007%=600000000

4350 PTR#out_file%=EXT#out_file%	4580 SYS &20049, ttod_three_args\$, para	4810 ENDPROC	5080 ENDPROC
4360 ENDPROC	m\$, ttod_work%, 1024 TO ;status%	4820 :	5090 :
4370 : 4380 DEF PROCttod_path_move(file%, para	4590 IF (status% AND 1)=1 THEN PROCEtod _error("Syntax error in 'curve' command"	4830 DEF PROCttod_put_path(file%, id%, x, y)	5100 DEF FNttod_check_font_handle(handl es\$, no%)
m\$, line%, RETURN x, RETURN y)	,line_no%):ENDPROC	484Ø PROCwput(file%, id%):PROCwput(file	5110 = (INSTR(handles\$, STR\$(no%)) = 0)
4390 SYS £20049, ttod_one_args\$, param\$	4600 IF ttod_work%10=0 THEN PROCttod_er	%, x):PROCwput(file%, y)	5120 :
, ttod_work%, 1024 TO ;status%	ror("Missing co-ordinates from 'curve' c	485Ø ENDPROC	5130 DEF PROCttod_error(error\$, no%)
4400 IF (status% AND 1)=1 THEN PROCETOd error("Syntax error in 'move' command",	ommand",line_no%):ENDPROC 4610 IF ttod work%!4=0 THEN PROCttod er	4860 : 4870 DEF PROCttod put bezier(file%, x,	5140 IF no%=0 THEN 5150 \$(ttod_error_g%+4)=error\$
line_no%):ENDPROC	ror("Missing co-ordinates from 'curve' c	y, x1, y1, x2, y2)	5160 SYS &400DF,ttod_error_g%, %1, "Te
4410 IF ttod_work%!0=0 THEN PROCttod_er	ommand", line_no%) : ENDPROC	4880 PROCwput(file%, 6):PROCwput(file%,	xt-2-Draw"
ror("Missing co-ordinates from 'move' co	4620 IF ttod_work%!8=0 THEN PROCttod_er	x1):PROCwput(file%, y1)	5170 ttod_error%=TRUE
mmand",line_no%):ENDPROC 4420 PROCttod_get_xy(FNget_str(ttod_wor	<pre>ror("Missing co-ordinates from 'curve' c ommand",line_no%):ENDPROC</pre>	<pre>4890 PROCwput(file%, x2):PROCwput(file% , y2)</pre>	5180 ELSE 5190 \$(ttod_error_g%+4)=error\$+" at li
k%10), x, y)	4630 PROCttod_get_xy(FNget_str(ttod_wor	4900 PROCwput(file%, x):PROCwput(file%,	ne "+STR\$ (no%)
4430 x=x*ttod_scale:y=y*ttod_scale	k%!0), x, y)	¥)	5200 SYS &400DF,ttod_error_q%, %1, "Te
4440 PROCttod_put_path(file%, 2, x, y) 4450 ENDPROC	4640 PROCttod_get_xy(FNget_str(ttod_wor k%!4), x1, y1)	4910 ENDPROC 4920 :	xt-2-Draw"
4460 :	4650 PROCttod_get_xy(FNget_str(ttod_wor	4930 DEF PROCttod_put_head(file%, id%,	5210 ttod_error%=TRUE 5220 ENDIF
4470 DEF PROCttod_path_draw(file%, para	k%18), x2, y2)	size%, x1, y1, x2, y2)	523Ø ENDPROC
m\$, line%, RETURN x, RETURN y)	4660 x=x*ttod_scale:y=y*ttod_scale	4940 PROCwput(file%, id%):PROCwput(file	5240 :
4480 SYS £20049, ttod_one_args\$, param\$	4670 x1=x1*ttod_scale:y1=y1*ttod_scale	%, size%)	5250 DEF FNttod_parse(in\$, RETURN com\$,
, ttod_work%, 1024 TO ;status% 4490 IF (status% AND 1)=1 THEN PROCELOD	4680 x2=x2*ttod_scale:y2=y2*ttod_scale 4690 PROCttod_put_path(file%, 6, x1, y1	4950 PROCwput(file%, x1):PROCwput(file% , y1)	RETURN par\$) 5260 LOCAL pos%
_error("Syntax error in 'draw' command",)	4960 PROCwput(file%, x2):PROCwput(file%	5270 pos%=INSTR(in\$, " ")
line_no%):ENDPROC	4700 PROCwput(file%,x2)	, y2)	528Ø com\$=FNlc(FNstrip_spaces(LEFT\$(in\$
4500 IF ttod_work%!0=0 THEN PROCttod_er ror("Missing co-ordinates from 'draw' co	4710 PROCwput (file%, y2) 4720 PROCwput (file%, x)	4970 ENDPROC 4980 :	<pre>, pos%))) 5290 par\$=FNstrip_spaces(RIGHT\$(in\$, LE</pre>
mmand", line_no%) : ENDPROC	4730 PROCuput (file%, y)	4990 DEF PROCttod_put_padded(file%, len	N(in\$) - pos%))
4510 PROCttod_get_xy(FNget_str(ttod_wor	474Ø ENDPROC	%, str\$, pad\$)	5300 IF pos%=0 THEN com\$=in\$:par\$=""
k%10), x, y)	4750 :	5000 LOCAL strlen%	5310 =pos%
4520 x=x*ttod_scale:y=y*ttod_scale 4530 PROCttod_put_path(file%, 8, x, y)	4760 DEF PROCttod_get_xy(par\$, RETURN x , RETURN y)	5010 strlen%=LEN(str\$) 5020 IF strlen% < len% THEN	5320 : 5330 DEF FNttod_help(window%,icon%)
4540 ENDPROC	4770 LOCAL pos%	5030 BPUT#file%, str\$;	5340 IF window%=-1 THEN ="Drag a draw d
4550 :	4780 pos%=INSTR(par\$, ",")	5040 BPUT#file%, STRING\$(len%-strlen%,	escription file here to generate a draw
4560 DEF PROCttod_path_curve(file%, par	4790 x=VAL(FNstrip_spaces(LEFT\$(par\$,po	pad\$);	file." ELSE =""
am\$, line%, RETURN x1, RETURN y1, RETURN x2, RETURN y2)	s%-1))) 4800 y=VAL(FNstrip_spaces(RIGHT\$(par\$,L	5050 ELSE 5060 BPUT#file%, str\$;	
4570 LOCAL X, Y	EN(par\$)-pos%)))	5070 ENDIF	
		BIO:	TtoD file format (page 91)
units <mm inch=""></mm>			
Address of the second sec	dinates are encified in Either millimet	ess (mm) as inchas (inch)	
Change the units that co-o	rdinates are specified in. Either millimet	res (mm) or inches (inch).	
6			
font -number <no> -name <nam< td=""><td></td><td></td><td></td></nam<></no>			
Specify the local font. The	number is the internal Draw file font nu	mber. The name is the Risc OS font nar	ne, such as Trinity.Medium. The size is
the point size of the text. I	f you have defined a font previously in t	the same file, just put 'font -number <n< td=""><td>umber>' to recall the definition.</td></n<>	umber>' to recall the definition.
	· · · · · · · · · · · · · · · · · · ·		
line -start <x,y> -end <x,y></x,y></x,y>	[-width <w>] [-line <&BBGGRR00></w>		
Draw a line. Start and end	parameters are in x,y format (e.gstart	10,10). The width is the line width that	t will be used. Zero represents the
	produce. The colour is a hex number, t		
thinnest line the device ta	i produce. The colour is a nex number, a	the format of which is abbeddiated, so ca	siour azozori gives a light rea colour.
	and the second second second second second	and the second second second second second	
rectangle -first <x,y> -seco</x,y>	nd <x,y> [-width <w>] [-line <&B</w></x,y>	BGGRR00>] [-fill <&BBGGRR00>]	
Draws a rectangle. The co-	ordinate pair can be specified any way y	ou like, as long as the two co-ordinates	represent opposite corners. Width
and colour as above.	,		
and colour as above.			
and the filmet was a			
	<pre><x,y> -file "file" -name "name"</x,y></pre>	and the second sec	and the second se
Deadle in a set of the	'file" and displays sprite called "name" i		

ltext -x <x> -y <y> [-path] -text "text" Displays the text in the text parameter at the specified x y co-ordinates: the x y are

Displays the text in the text parameter at the specified x, y co-ordinates; the x, y are at the bottom left. The path parameter converts the text to a path (Risc OS 3 only).

ctext -first <x,y> -second <x,y> [-path] -text "text" The text centred vertically and horizontally in the box, with optional conversion to a path. (Again, path parameter is Risc OS 3 only).

ellipse -centre <x,y> -horz <x> -vert <y> [-line <&BBGGRR00>] [-fill <&BBGGRR00>] Draws an oval (ellipse), centred at the specified co-ordinates, with major and minor diagonals specified by horz and vert.

```
path [-width <w>] [-fill <&BBGGRR00>] [-line <&BBGGRR00>]
Starts a path object.
```

move -to <x,y> Moves the 'cursor' in the path object.

draw -to <x,y> Draws a line in the path object.

curve -to <x,y> -first <x,y> -second <x,y> Draws a bezier curve to the specified co-ordinates, using first and second as control points.

```
close
```

Close the path.

end

End the path object.



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THE MOXON INTERVIEW

DAVE McCARTNEY

Sometimes it's hard to see why people do things. Take the public domain scene: as far as the punter is concerned, it's a great idea, somewhere you can obtain quality software for next-tonothing. But what about the poor sod who runs the PD library, who has to keep track of hundreds of discs, duplicate and send them out?

Not my idea of fun, but for Dave McCartney, full-time chef and the man responsible for The Datafile, one of the largest Acorn PD libraries in the country, it's the hobby that went out of control.

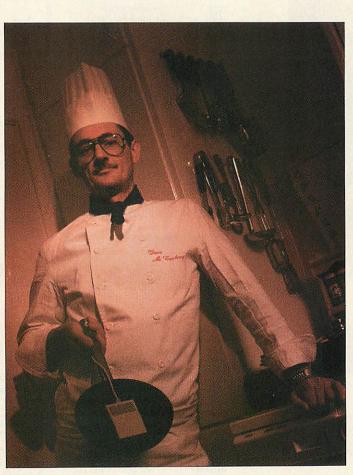
'It's a labour of love, no doubt about it,' says Dave. 'Today, I sent out 60 discs, and on average I send out 2000 discs per month. You sometimes wonder if it's worth it – it takes up all my spare time.'

Ever heard the phrase 'everything in moderation'? Well, it doesn't seem to apply here. While I'm chatting to Dave, the sound of a disc duplicator chugging away upstairs disturbs the otherwise peaceful RAF base where Dave lives with his wife Sue. Apparently it's in use almost constantly, even at night.

What on earth drives an otherwise sane man like Dave to run a PD library?

'I receive new stuff from people every day,' says Dave. 'That's one of the great things about running a library – the variety. The public domain can only get bigger and the quality of PD software is getting better all the time. The market as a whole has become much more professional than it was even a year ago, and it's up to the owners of PD libraries to keep the standards high.'

Excellent PD applications like *Translator*, *Powerbase*, and *Zap* back up Dave's theory. However, he's less optimistic about the concept of shareware, where users are supposed to register their



Public domain is a labour of love. It's a hobby that got out of control.

details with the author, enclosing a small amount of money.

'I can't see shareware ever working in general,' he says. 'On the whole shareware is of a high standard because the authors want a good response to their registration, and there won't be one unless the software is good.'

Another reason Dave likes the PD scene so much is that it enables him to keep his ear close to the ground. Not being commercially dependent on any particular aspect of the computer market, he's able to take an impartial look at the Acorn world. And he's not one to mince his words.

'I don't think the Acorn market is heading in the right direction,' he says, expressing an opinion most of us have heard before. 'Acorn doesn't seem to push their products properly in any markets except education. They've got the Arc into the high street, but if you go into Dixons they don't know anything about the computer and they'll try to sell you an Amiga or an ST. Acorn should have made sure those who do the selling know how. They didn't.' Sounds harsh, but is it fair? Listen to this...

'I went down to a print shop to see about printing some brochures, and I saw they had a Mac and asked why they used one. The girl behind the counter said: "What else is there?" and when I told her about the Arc, she'd never heard of it.

'If you talk about the BBC computer, then everyone knows what you're on about. If you say Amiga, Atari, Sega, IBM or Nintendo, they know what you mean. If you say Acorn or Archimedes, nine times out of ten you get a blank. Acorn have to get their name known again, like in the heyday of the Beeb.'

But why is this? The Archimedes is respected as a very powerful machine – a potential world beater, basically. Why the pessimism from someone who knows the Acorn world better than most?

'The Arc doesn't have the large, powerful packages to make businesses think "Let's ditch our IBMs and get some Acorns." Look at *Impression*; it's easily the best DTP package on the Archimedes. However, it seems to me that CC have lost momentum. New versions take ages to appear, there have been precious few radical new features added and the Mac equivalent is still considerably more powerful.'

Ouch! It's never nice to hear this sort of criticism, but think about it: how many businesses do you know which have seriously considered Acorns? According to Dave, once someone buys an Acorn, they're converted, it's the lack of software that's the problem.

Maybe the exposure to so much free software has tainted Dave's viewpoint. Or maybe he's right. Whatever the reasons, it's refreshing to hear people in high places speak their minds. If this is public domain, I want in.

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