

Volume 4
Issue 6

RISC USER

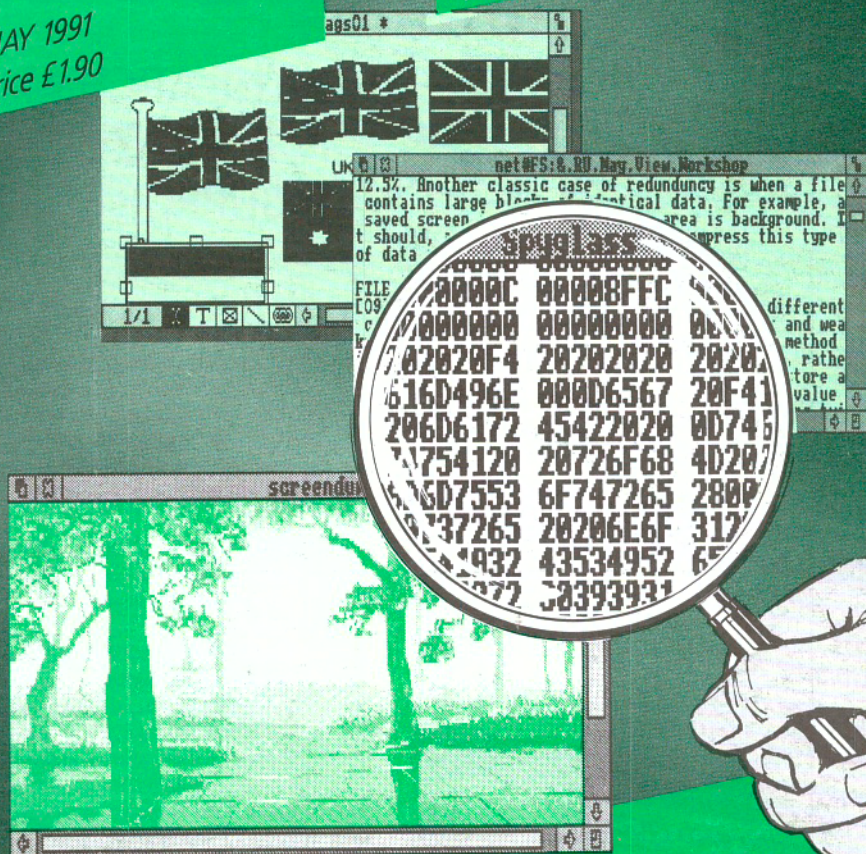
MAY 1991
Price £1.90

Virus Protection

Screen Fade Routines

Desktop File Viewer

Protex 5 Word Processor



*Spyglass: A Multiple
Task Memory Viewer*

The magazine and
support group
exclusively for users
of the Archimedes



CONTENTS

FEATURES

	5
News	9
Infected!	23
The 80 Column	29
C Notebook	38
The Secret Life of Edit	
Programmer's Workshop: File Compression	45
Into the ARC: RISC OS for Beginners (Part 3)	49
WP/DTP	53
Mastering the Wimp (Part 18): Using Outline Fonts	58
Hints & Tips	64
Postbag	67
Technical Queries	69
Personal Ads	71
Points Arising	71

UTILITIES AND APPLICATIONS

Screen Fade Routines	10
Spyglass: A Multiple Task Memory Viewer	17
Desktop Keyboard	30
A Desktop File Viewer	57

REVIEWS

Word Processing with Protect 5	13
Exploring EFF Fonts	21
Tracker	25
A Good idea?	33
DTP Seeds: Inspiration for DTP Users	42

RISC
USERTHE ARCHIMEDES
MAGAZINE AND
SUPPORT GROUP

RISC User is published by BEEBUG Ltd.

Co-Editors:

Dr Lee Calcraft, Mike Williams

Assistant Editor: Kristina Lucas

Technical Editor: Alan Wrigley

Technical Assistant: Glynn Clements

Production Assistant: Sheila Stoneman

Advertising: Sarah Shrive

All rights reserved. No part of this publication may be reproduced without prior written permission of the Publisher.

The Publisher cannot accept any responsibility whatsoever for errors in articles, programs, or advertisements published. The opinions expressed on the pages of this journal are those of the authors and do not necessarily represent those of the Publisher, BEEBUG Limited.

BEEBUG Ltd © 1991

BEEBUG, 117 Hatfield Road, St. Albans,
Herts AL1 4JS.

Tel: St. Albans (0727) 40303.

Fax: (0727) 860263

Printed by Arlon Printers



ARCHIMEDES VIRUSES

Acorn have recently released information about two viruses which can infect any Archimedes. The article entitled **Infected** in this issue of RISC User gives more details on the subject. Fortunately, both of the known viruses are relatively benign, and although they will end up infecting all the files that they can find, they will not normally result in the loss of data. Their existence serves as a timely warning however, that Archimedes users are not immune from the viral threat. This month's disc contains a program for killing one of these viruses, and for inoculating your machine against both. A copy of the RISC User Watchdog is also included. Use of this excellent utility will protect your machine from these known viruses, and from many types of infection as yet unknown.

TWO NEW COLUMNS

This month sees the start of two new occasional columns in RISC User: **The 80 Column** - devoted to all aspects of printing; and **C Notebook** - covering hints and tips on C, together with short library functions. If you have items suitable for either of these two columns, or if you have any contributions to our regular Hints and Tips columns we would be very pleased to hear from you.

ARCSCAN III

We are pleased to be able to announce the release of a disc containing data in ArcScan

format for both Acorn User and Micro User magazines (for use with ArcScan III). This has been backdated to 1st January 1987. The Archimedes first appeared in June of that year, so all Archimedes entries will be covered by the runs supplied. However, we are not limiting the content of the data solely to the Archimedes: everything which appeared in those magazines will be indexed.

In due course we also hope to offer files for A & B Computing (now Archimedes World) from a similar starting date. A new version of ArcScan III has now been produced with one or two small enhancements over version 0.51. The most significant is the introduction of an Extended Wildcard option. This extends the effect of the asterisk wildcard from single words to the full extent of each record. Additionally we have taken the opportunity to relieve some of the restrictions imposed on ArcScan data. Magazine volumes numbers may now range from 0 - 9999, while up to 20 non-magazine objects are now permitted per directory.

Finally, while on the subject, we hope to be able to extend the ArcScan database further, and would like to hear from anyone who has other useful data - whether this be magazine data or something entirely different.

L.G.C.

How much information can you fit into an area 97 by 53 mm?

GULF WAR DRAWS TO CLOSE

by Michael Lawrence
Baghdad Correspondent

Sources close to the American military tonight said that they were hopeful that a ceasefire would be called in Iraq and Kuwait within the next twenty-four hours.

The dramatic change in direction was triggered by a broadcast on Baghdad radio stating that the time had

forces commander General Norman Schwarzkopf, who is nicknamed Storming Norman because of his no-nonsense approach of getting on with it as far as war is concerned, refused to comment directly on the events leading up to the rapid change in the situation. Schwarzkopf did however say that a ceasefire would be seen as an admission of defeat by Iraq, proving that the vast man-power of Hussein's army was no match for the coordinated hi-tech allied forces

was pressing for an answer from the US military commanders as to how an American A10 Thunderbolt aircraft mistakenly launched an attack on a British army unit, killing several soldiers.

Meanwhile, the prime minister, John Major, was yesterday briefed on the new developments by President Bush in a telephone call made to the country retreat Chequers. Sources say that the call lasted over thirty

We've managed 4Mbytes of RAM! (and 2Mbytes of ROM)

The new user-fittable 310 RAM upgrade from Beebug

£349.00

Available May

Price excludes £8 carriage and VAT. Fitting kit consisting of PLCC and ROM extractor tools can be loaned for a deposit of £40 (fully refundable). Full details on request. Information is given in good faith, but Beebug Ltd reserve the right to change the specification at any time without prior notice.

BEEBUG

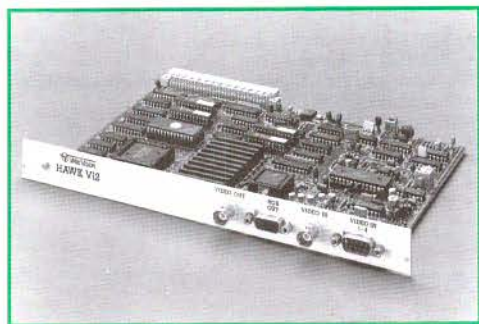
*The leaders in quality memory
upgrades*

ARCHIE SUCUMBES TO VIRUS INFECTION

After nearly three years of apparent immunity, the Archimedes has fallen foul of two viruses, known as the *Extend Virus* and the *Archie Virus*. Fortunately, neither virus causes lasting damage, and an infected machine can be readily cured. Detailed information has been provided by Richard Lloyd of Liverpool University, and a public domain application, *VKiller*, written by Richard is available through SID (we have also included a copy on this month's magazine disc). For further information see the article on this subject in this issue.

NEW MOVES BY WILD VISION

Wild vision has announced its latest contribution to image processing in the form of the Hawk V12 Video Framestore. In combination with ArcImage 4 image processing and analysis software from Foster Findlay Associates, Wild Vision believes that the Hawk V12 is a world beating package in the field of image processing.



The Hawk V12 will store up to four images, each 512 by 512 pixels with 256 grey levels, and with four binary overlay planes for each image. A number of features inherent in the framestore allow high speed calculations and comparisons to take place to provide valuable information about the image being studied.

ArcImage 4 is based on the Foster Findlay C_Images library of image processing routines in C. The software is fully RISC OS compliant, and provides a Wimp interface to many functions in C_Images. The Hawk V12 costs

£1990 and ArcImage 4 supporting software £750 (both prices exclude VAT).

Wild Vision has also moved to new premises, so its address is now Wild Vision Ltd, 15 Witney Way, Boldon Business Park, Boldon Colliery, Tyne and Wear NE35 9PE, tel. 091-519 1929.

LANDMARKS IN EDUCATION

Project Egypt and *Second World War* are the names of two new computer simulations for schools from Longman Logotron. These simulations, which are the first in a series under the general heading of *Landmarks*, allow pupils to communicate directly through the computer with a child living during the times covered by the simulation. Each simulation recognises a vocabulary of over 800 words, more than 600 locations to visit, and over 70 different people and objects with which to interact. Each simulation, comprising pupil's booklet, teacher's booklet and disc, costs £19.00 ex. VAT. Other titles planned in the series are *Rainforest* and *Victorians*. For further information contact Longman Logotron at Dales Brewery, Gwydir Street, Cambridge CB1 2LJ, tel. (0223) 323656.

MORE MUSIC FROM THE EMR STUDIO

Computer music expert Electromusic Research has announced a number of enhancements and additions to its *MicroStudio* and *Studio24Plus* software. A new feature now adds automatic printing of guitar chord parts from any recorded track played on the Midi keyboard, saving hours of work. A free upgrade is available for existing *MicroStudio* users direct from EMR, and it's also an upgrade for *Studio24plus* (to V2.0H). There are also plans for EMR music files to become a supported feature of *Genesis 2*, the multi-format information system from recently formed *Oak Solutions*.

If you fancy a little music while you work, EMR's *Music Player* will provide superior background music from files recorded with *MicroStudio* or *Studio24Plus* for just £19.95 inc. VAT. Music lovers will also find the latest disc of music to be released by EMR (entitled *Symphony 2*) of interest. This includes music by Grieg, Bizet, Beethoven, Mozart, Puccini and other popular composers, for use with *MicroStudio*, *Studio24Plus* or *Music Player*. *Symphony 2* costs £9.95 inc. VAT.

ArcScan III

The new multi-tasking version of Arcscan, the customisable magazine database

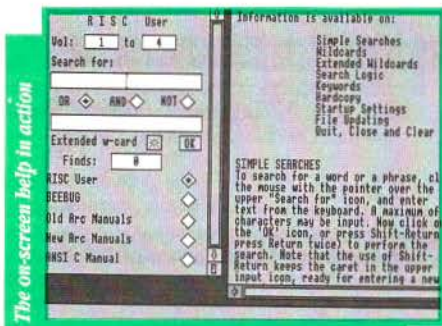
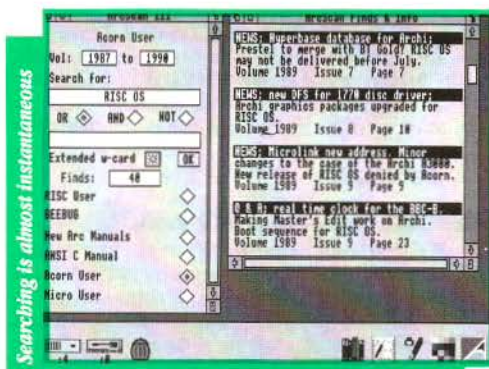
*Now offers two NEW databases:
Acorn User and Micro User magazine indexes*

New ArcScan Library Disc

Offers an index for Acorn User and Micro User magazines from January 1987 to date. This includes all references to the Archimedes, which was launched in June 1987.

The Library Disc will be regularly updated to include the latest issues, and upgrades will be available from BEEBUG. As a **Special Offer** you can purchase an ArcScan Library Disc with vouchers for two upgrades for the price of £12.95.

In the future we are hoping to add an index for A&B and Archimedes World magazines.



ArcScan III Program Disc contains the following Databases:

- RISC User Volumes 1, 2 and 3
- BEEBUG Volumes 1 - 9
- The Indexes to the following major Archimedes manuals:
- Basic User Guide (Arthur)
- Programmer's Reference Manual (Arthur)
- RISC OS User Guide
- RISC OS Basic Manual
- RISC OS Programmer's Reference Manual
- ANSI C Manual (Release 3)

Some of the features ArcScan III offers:

- provides flexible keyboard search on any entry
- improved search logic - choice of 3 logical operators: OR, AND and NOT
- now with new extended wildcard option
- features dynamic memory management, returning unused memory to the Wimp
- uses dedicated ARM code routines enabling rapid information retrieval
- finds are displayed in a fast scrolling Wimp window allowing you to browse through all entries retrieved
- fully user customisable allowing other databases to be automatically incorporated in the control panel display
- a new detailed manual and extensive on-screen help

ArcScan Library Disc	£ 7.95	members (£9.95 non-members)	Stock Code PAL1
ArcScan Library Disc + 2 Upgrades	£12.95	members (£16.95 non-members)	Stock Code PALX
ArcScan Library Disc Upgrade	£ 3.45	members (£4.45 non-members)	Stock Code PALU
ArcScan III Program Disc + Manual	£14.95	members (£18.95 non-members)	Stock Code PAS3
ArcScan III Program Disc + Library Disc+Manual	£19.95	members (£24.95 non-members)	Stock Code PASX

All prices are inc. VAT. Please add £1 p&p. For upgrade, please send the old ArcScan II disc or label. Please quote your Membership number.

• News • News • News • News •

For more details contact EMR Ltd., 14 Mount Close, Wickford, Essex SS11 8HG, tel. (0702) 335747.

STRUCTURAL ENGINEERING

Vision Six is a specialist company in the field of structural engineering. It offers two applications for the Archimedes, *2DFrame*, and *2DGrid*, both priced at £150.00 plus VAT for entry level versions, and £450.00 plus VAT for full versions, with reductions if both packages are purchased together. Vision Six claims that its Computer Aided Structural Analysis (CASA) on an Archimedes is better at the price than any program on any other machine. For more information contact Vision Six at 13 Paddock Wood, Prudhoe, Northumberland NE42 5BJ, tel. (0661) 33017.

ALL FORMATS FOR BIRMINGHAM

The All Formats Computer Fair leaves its usual London haunt for Birmingham on Sunday 21st April. The new venue is the National Motorcycle Museum, Coventry Road, Solihull, West Midlands (on J6 of the M42 where it meets the A45, or alight at BR Birmingham International), and the show will be open from 10am to 4pm. Admission costs £3.00. For more information contact John Reading on (0225) 868100.

TEST FLY AN ARCHIMEDES

Three BEEBUG customers are among the eleven winners in Acorn's *Test Flight* competition which was launched last autumn as part of a major sales campaign for the Acorn Archimedes range. Two of our customers won flying lesson weekends, and the third a Citizen Aerochron watch.

Acorn has relaunched its Test Flight with a similar range of prizes as before (top prize a flight for two on Concorde). The new competition runs till 31st May, and full details are available through Acorn dealers, including of course BEEBUG.

Acorn has also just announced that the Learning Curve and Archimedes Learning Curve packages will be available on 0% finance from Acorn dealers with consumer credit licences throughout April, May and June. BEEBUG will of course be participating in this deal.

MINERVA UPGRADES MULTISTORE

MultiStore, Minerva's multi-tasking database for the Archimedes and A3000 has been upgraded. The new version, known as v11, offers improved speed of operation and has a new style ring binder and box. Existing users can upgrade their current version of the software (only) at a cost of £11.75 inc. VAT for the two discs (and the new version comes complete with a file transfer utility to enable users to convert their old files to the new format). For more details contact Minerva Software, Minerva House, Baring Crescent, Exeter EX1 1TL, tel. (0392) 421762.

MORE BOOKS ON THE WAY

The number of supporting books for the Archimedes range looks set to grow this year. Latest publisher to join the list is Sigma Press which has two books planned, both for the second quarter of this year: *DTP on the Archimedes* by Bruce Goatley 240 pages expected at £12.95 (ISBN 1 85058 248 3), and *ANSI C: Programming the Acorn Archimedes* by Graham Horsington, approximately 250 pages also at £12.95 (ISBN 1 85058 257 2). Sigma Press is at 5 Alton Road, Wilmslow, Cheshire.

EASIWRITER

Another word processor for the Archimedes has been announced by Leicester-based Icon Technology Ltd. Described as a full-featured word processor, *EasiWriter* also allows Sprite and Draw files to be incorporated into *EasiWriter* documents for cropping and scaling. *EasiWriter* costs £150 plus VAT, while an extended version with built-in equation editor, called *TechWriter*, costs £250 plus VAT. For more details contact Icon Technology Ltd., 9 Jarrow Street, Leicester LE2 7DH, tel. (0533) 546225.

ARCHIMEDES MODEM CROSSES THE CHANNEL

Jersey-based RTFM has announced a new 2400 baud pocket-sized modem for the Archimedes/A3000. Compatible with Hayes, Bell 103/212A and CCITT V21/V22/V22bis comms standards, the modem weighs in at £160 inclusive of mains adaptor, battery, leads and driver software. Contact RTFM at 43 Hill Street, St Helier, Jersey, or phone (0534) 67870. **RU**

**ACORN ARCHIMEDES COMPUTERS
EXPANSION OPTIONS
FOR
INDUSTRIAL & SCIENTIFIC
APPLICATIONS**

HARDWARE - IEEE488 Interface, 16 Bit Parallel I/O, Dual RS423 Serial Interface, 12 Bit ADC, STE Bus Interface and complete range of STE Bus Boards, SCSI Devices-Hard discs, Magneto-Optical Drives, Tape Streamers, Gigabyte Tape Drives, Removable Hard Discs Plus all Acorn Products etc.....

SOFTWARE - GINO - F 3D, GINOGRAF, GINO-SURF, HERSHEY+, VIEWGRAF, VIEWSURF, Termulator etc.....

ADVICE - SUPPLY - SUPPORT

**CONTACT
INTELLIGENT INTERFACES LTD
TEL 0789 450925 FAX 0789 450926
-----EST. 1981-----**

**Atherstone Hill Farm, Atherstone-on-Stour
Stratford-upon-Avon . Warwickshire CV37 8NF**

Alan Wrigley looks at some disturbing new developments in the Arc world.

Virus - the word sends shivers down the spine of any PC user whose system is open to more than one person, or who runs programs from unknown or dubious sources. Now it seems that the virus spreaders have moved on to the Arc, with the news that two viruses have been positively identified.

First of all, let me make one thing absolutely clear: unlike the PC and its compatibles, which have their DOS operating system on disc, there is no way a virus can affect the operating system on an Arc, since it is held in ROM. However, viruses can do all sorts of other nasty things, from simply crashing the machine to wiping your entire hard disc (or your network filestore). So it is imperative that you take precautions, both to prevent viruses from attacking your system, and to minimise their effect should you be unlucky enough to be afflicted.

RISC User's *Watchdog* will certainly help to keep viruses out of your computer. The latest version of this application was described in Volume 4 Issue 4, and is included again on this month's magazine disc. It allows you to prevent access to your disc drives at various levels, from partial write protection to total read/write protection. At the same time, you can nominate a de-protected pathname, which will allow you to continue using a suspect disc while protecting your hard drive, for instance.

THE STRAINS

The two viruses which have been identified are referred to as the Extend Virus and the Archie Virus. Extend is a module which operates by attaching code to an application's !Boot file (or creating one if it does not already exist). This code merely loads the Extend module into the RMA and runs it, resulting in 1K of RMA space being claimed every time an infected application is run - not very destructive but ultimately a nuisance. The

Extend module appears under any one of 8 different names: MonitorRM, CheckMod, ExtendRM, OSextend, ColourRM, Fastmod, CodeRM or MemRM.

The Archie Virus is a section of code that appends itself to any file of type &FF8 (i.e. Absolute code). Any application written in C or Assembler would have a !RunImage program with this filetype, for example. A branch to this code is then inserted at the start of the program. The main effect of the virus is to fill the screen on the 13th of every month with a trivial message, but more significantly, the code claims some RMA space, then claims the OS_File vector and points this into its own RMA location. The upshot of this is that, if the RMA is tidied or cleared, the computer may well freeze completely.

INOCULATION

Both these viruses check to see if a file is already infected, and leave it alone if it is. This makes it fairly easy to write an inoculation program which can fool the virus into thinking that a file is infected when it is not. A PD utility, *VKiller*, is available which will inoculate against the Extend Virus, and this is included on this month's magazine disc. The Archie Virus is a little more complicated, but we have written a utility ourselves called *VScan* (also on the magazine disc), which will scan all the files in a specified directory and report any which are suspected of being infected.

As usual, the only defence against viruses is vigilance. Always take precautions if you are running software from a dubious source, particularly PD libraries and bulletin boards. And if you do spot any viruses, please tell us so that we can warn other readers as soon as possible.

This month's magazine disc contains Watchdog (version 3.00), VKiller and VScan, as mentioned above.

RU

Screen Fade Routines

Use these routines from Phill Kent to achieve some professional screen fade effects.

Our ADPC application on the RISC User Volume 3 Special Disc enables you to build a slide show of screen images, with various types of fade between each screen. Phill Kent, the author of ADPC, has extracted two of these fade routines for you to use in your own programs. One of these routines slides one screen down on top of another, while the other simulates a bounce effect. The complete code to perform these fades is given in listing 1.

PROGRAM DESCRIPTION

The actual routines which perform the fades are written in assembler, and are contained within the procedure PROCassembler. *scroll* is the slide routine, while *bounce* causes the second image to drop down over the first, then "bounce" back part way up the screen. The number of bounces, and the height of each bounce, can be controlled by the user.

To use the routines, two short procedures are needed, and these are shown in the listing as PROCscroll and PROCbounce. The parameters required are described below. The routines will only work with mode 12 or mode 13 screens, and both screens must be in the same mode. The routines require raw screen data. Since the simplest way to store a screen is as a sprite using *ScreenSave, listing 2 is provided which will convert a screen saved as a sprite into a raw data file.

USING THE PROGRAM

Listing 1 is a complete program which assembles the code, loads two screens from disc, and then performs a bounce fade followed by a scroll fade. Firstly, an area of memory is dimensioned at line 90 to hold each of these (*scr1%* and *scr2%*). Then the screens are loaded at lines 130-140, using *scr1%* and *scr2%* as the load addresses, and finally PROCscroll and PROCbounce are called. PROCscroll requires just one parameter, which is the address where the second screen is stored (*scr2%*). PROCbounce requires 4 parameters: the addresses of both

screens(*scr1%*, *scr2%*), residual energy percentage, and number of bounces. The residual energy percentage determines how high the second screen bounces relative to its previous position. This is the equivalent of the coefficient of restitution in a physical bounce. For example, a value of 50 would mean that on the first bounce, the image would bounce back up so that its bottom edge stops halfway up the screen, while on the second it would stop a quarter of the way up from the bottom, and so on.

This month's magazine disc contains two screen files which can be used with the program. If you do not have the magazine disc, you must insert the filenames of the screens you wish to use in lines 130 and 140. These should be uncompressed full-screen images in either mode 12 or mode 13, and the appropriate mode number should be used in line 110. If the screens have been created using the Wimp colours, as will most likely be the case, then you must also set the Wimp palette before calling the routines. You can do this by first saving a palette file from the Desktop: click Menu over the palette icon on the icon bar, select *Save*, and save a file called *Palette*. Make sure that the palette you save corresponds to the mode in which the screens are created. If you do not need a palette, delete line 120.

As listed here, the program assumes that the screen and palette files are all in the currently selected directory. It will generally be much easier to turn it into a small application. Create an application directory called *!Bounce*, put the screen and palette files inside this, together with an Obey file called *!Run* with the following lines:

```
Set Bounce$Dir <Obey$Dir>
WimpSlot -min 224K -max 224K
Run <Bounce$Dir>.!RunImage
```

Note that you will have to increase the WimpSlot setting if you wish to store more than 2 screens in memory. Then type in the listing here, but alter line 120 to:

```
*Print <Bounce$Dir>.Palette
```

and lines 130 and 140 to:

```
SYS "OS_File",255,<Bounce$Dir>.Screen  
...etc.
```

Then save it in the application directory as *!RunImage*.

You can of course extend the program if you wish, by loading in more than two screens and making additional calls to PROCscroll and/or PROCbounce. You can also incorporate the entire code into your own programs (but not if you are writing commercial programs of course, since the routines are subject to copyright). However, you must make sure you have enough memory to hold all the screens you wish to use. Each screen requires 81920 bytes to be dimensioned.

The program on this month's magazine disc contains some extra fade routines taken from previous issues of RISC User.

Listing 1

```
10 REM                                     >Fade  
20 REM Program   Screen fade routines  
30 REM Version   A 1.00  
40 REM Author    Phill Kent  
50 REM RISC User May 1991  
60 REM Program   subject to copyright  
70 :  
80 ON ERROR REPORT:PRINT " at line "ER  
I:END  
90 DIM scr1% 81920,scr2% 81920  
100 PROCAssemble  
110 MODE 12  
120 *Print Palette  
130 SYS "OS_File",255,"Screen1",scr1%,  
0  
140 SYS "OS_File",255,"Screen2",scr2%,  
0  
150 PROCscroll(scr2%)  
160 PROCbounce(scr1%,scr2%,70,4)  
170 END  
180 :  
190 DEF PROCscroll(new%)  
200 A%=new%:CALL scrollldown  
210 ENDPROC  
220 :  
230 DEF PROCbounce(new%,old%,left%,num  
%)  
240 A%=new%:B%=old%:C%=left%:D%=num%  
250 CALL bounce  
260 ENDPROC  
270 :  
280 DEF PROCAssemble  
290 DIM code% 10000,b% 12  
300 b%!0=148:b%!4=-1  
310 SYS "OS_ReadVduVariables",b%,b%+8  
320 FOR pass%=0 TO 2 STEP 2  
330 P%=code%  
340 [OPT pass%  
350 .screenbase  
360 EQU D b%!8  
370 .transfer  
380 STMF D R13!,{R0-R10,14}  
390 CMP R2,#0  
400 LDMEQFD R13!,{R0-R10,PC}  
410 .trans  
420 LDMIA R0!,{3-10}:STMIA R1!,{3-10}  
430 LDMIA R0!,{3-10}:STMIA R1!,{3-10}  
440 LDMIA R0!,{3-10}:STMIA R1!,{3-10}  
450 LDMIA R0!,{3-10}:STMIA R1!,{3-10}  
460 LDMIA R0!,{3-10}:STMIA R1!,{3-10}  
470 LDMIA R0!,{3-10}:STMIA R1!,{3-10}  
480 LDMIA R0!,{3-10}:STMIA R1!,{3-10}  
490 LDMIA R0!,{3-10}:STMIA R1!,{3-10}  
500 LDMIA R0!,{3-10}:STMIA R1!,{3-10}  
510 LDMIA R0!,{3-10}:STMIA R1!,{3-10}  
520 SUBS R2,R2,#32*10:BNE trans  
530 LDMFD R13!,{R0-R10,PC}  
540 .wait  
550 STMF D R13!,{R0,R1,R2,R14}  
560 MOV R0,#19:SWI "OS_Byte"  
570 LDMFD R13!,{R0,R1,R2,PC}  
580 .scrollldown  
590 STMF D R13!,{R14}  
600 ADD R0,R0,#80*1024  
610 SUB R0,R0,#640  
620 LDR R1,screenbase  
630 MOV R3,#614000:SUB R3,R3,#640  
640 MOV R2,#640  
650 .down_loop  
660 BL transfer  
670 ADD R2,R2,#640:SUB R0,R0,#640  
680 BL wait  
690 SUBS R3,R3,#640:BPL down_loop  
700 LDMFD R13!,{PC}  
710 .bounce  
720 STMF D R13!,{R14}:MOV R5,R3  
730 ADD R10,R0,#80*1024  
740 MOV R11,R1:MOV R0,R2,LSL #8  
750 MOV R1,#100:BL divide  
760 MOV R6,R2:MOV R7,#256  
770 LDR R1,screenbase  
780 MOV R12,R1:MOV R9,#46  
790 ADR R8,sin_table+180  
800 .loop1  
810 .loop2
```



```
820 LDR R2, [R8], #4: MUL R0, R7, R2
830 MOV R2, R0, LSR #16
840 RSB R2, R2, #256
850 MOV R2, R2, LSL #6
860 ADD R2, R2, R2, LSL #2
870 SUB R0, R10, R2: MOV R1, R12
880 BL transfer
890 ADD R0, R11, R2: ADD R1, R1, R2
900 RSB R2, R2, #80*1024
910 BL transfer: BL wait
920 SUBS R9, R9, #1: BNE loop2
930 MUL R0, R7, R6
940 MOV R7, R0, LSR #8
950 ADR R8, sin_table: MOV R9, #90
960 SUBS R5, R5, #1: BNE loop1
970 SUB R0, R10, #81920
980 MOV R1, R12: MOV R2, #81920
990 BL transfer
1000 LDMFD R13!, {PC}
1010 .divide
1020 STMFD R13!, {R0-R1, R4-R5, R14}
1030 MOV R3, #0: MOV R2, #0: MOV R4, #32
1040 .divide_loop1
1050 SUBS R4, R4, #1: MOVS R0, R0, ASL #1
1060 BPL divide_loop1
1070 .divide_loop2

1080 MOVS R0, R0, ASL #1
1090 ADC R3, R3, R3: CMP R3, R1
1100 SUBCS R3, R3, R1: ADC R2, R2, R2
1110 SUBS R4, R4, #1: BNE divide_loop2
1120 LDMFD R13!, {R0-R1, R4-R5, PC}
1130 .sin_table
1140 ]
1150 NEXT
1160 FOR q%=0 TO 182 STEP 2
1170 sin_table!(q%*2)=INT(SINRAD(q%)*25
6)*256
1180 NEXT
1190 ENDPROC
```

Listing 2

```
10 REM >Convert
20 MODE 12
30 INPUT " Input filename: " in$
40 INPUT "Output filename: " out$
50 DIM B% 12
60 B%!0=148: B%!4=-1
70 SYS "OS_ReadVduVariables", B%, B%+8
80 SYS "OS_SpriteOp", 3, , in$
90 SYS "OS_File", 10, out$, &FFD, B%!8, B
%!8+81920
100 END
```

RU

4Mb RAM for the A305/A310. Now only £299 including VAT.

Expands the A310 and A305 to 4Mb RAM.
No soldering required.
Accepts larger OS ROMs if released.
Includes MEMC1a upgrade worth nearly £80.
ARM3 compatible.
A no quibble money-back guarantee.

For only £299. (£260 plus VAT).

Further information from:



IFEL, 36 Upland Drive, Derriford, Plymouth PL6 6BD. (0752) 847286

Word Processing with Protext 5

Mark Sealey reviews the latest word processor for the Archimedes range.

INTRODUCTION

Protect 5 is a successful full-feature word processor written in C (available for the Amiga, Atari and PC). It boasts many facilities that no other package for the 32 bit Acorn range can yet offer. However, there is a major drawback in that Protect on the Archimedes is not a Wimp-based multi-tasking application, and many of the now-familiar Desktop operations and functions are completely ignored. On the other hand, should this ever be overcome, the package could well turn out to be the definitive word processor for the Archimedes range.

Protect 5 comes in a substantial box on three unprotected discs, and with one main and two subsidiary A5 size manuals. The first disc is the main program disc, the second contains nearly 600K of dictionary, and the third some four dozen printer drivers (Protect does not use the normal Acorn printer drivers).

There is a lengthy if not always clear section in the main manual which instructs you on how to make working copies of the software. But it is here that things first start to get tricky.

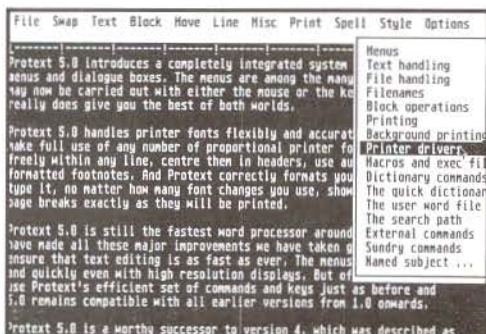
NON-WIMP AND NON-NATIVE

It is perhaps best to deal with the major criticism of this product sooner rather than later. Thus although most references in the Acorn-specific sections of the manual have been 'converted' to Archimedes conventions, this certainly does not apply to the basic design of the software itself.

For example, the manual instructs the user to put the (newly copied) start-up disc in drive 0 and double click on the *Config* icon. In fact this utility is one level lower in the Protect application directory. Then, the software's own printer installation routine hides the chosen driver file where the main program cannot

find it. And both the Configuration and Help data ends up where it cannot be properly accessed from Protect command mode.

Errors result in all these cases; unfortunately the ones that inform you that certain files have not been found are flashed on the screen for less than a second and then disappear.



Protect edit screen showing pull down menu

Only experience of RISC OS, the Desktop and the Archimedes hardware in general will help in sorting out these problems. Such a state of affairs is less than satisfactory for software costing all of £150.

Regrettably, this sets the tone for many Protect file operations: inappropriate 'extensions' (as in the PC world), use of the Backspace key instead of Delete, and a requirement at times to 'log onto' another drive for files, as was the case with Acorn's early Logistix.

If you can live with all of this and wait for the promised upgrade, which Arnor says is likely to be "at a nominal charge, at most", then Protect still has much to offer.

PROTEXT OVERVIEW

Protect will run on any machine in the Archimedes range with a minimum of 1 MByte of memory. Once loaded, the

screen (which can be in any of the usual Archimedes modes) has an unobtrusive banner at the top which can be toggled between a status line and one leading to 12 pull-down menus. These control: filing, movement through the text, block operations, printing, spelling, style and various sundry operations. These are logically grouped, and all have sensible keystroke equivalents.

On pressing Escape, the screen is split into two, the bottom third being available for the entry of commands. There are, in fact, over a hundred of these, many with parameters, although most duplicate functions already available from the keyboard, such as clearing text, or are filing system commands which can be accessed in Protext's 'normal' way.

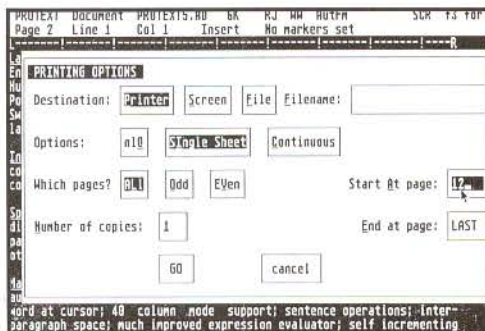
USING PROTEXT

Text entry and editing are all standard - with the exception of that Delete key. There is minimal (but sufficient) mouse control of cursor position, and scrolling is, by and large, smooth - though the text makes a little skip when a page break is reached. It must be pointed out that Protext is not WYSIWYG, surely a disadvantage when even Minerva's diminutive *Easiword* can do better.

Once you have begun to put in a chunk of text and want to edit it, you slowly become aware of the program's strengths: there are useful little features such as character swapping (Ctrl-A over the 'r' of 'wrod' (sic) results in the corrected 'word'); a specified page, line as well as column number, can be reached instantly; blocks can be undeleted (as they can in Pipedream 3), and it is possible to define, display and print semi-graphic boxes to add to the sense of style which you may want your document to have.

There is an auto-indent mode which is particularly useful for assembler or C program writing. On pressing Return the cursor moves onto the next line but at the column which on the line above contains

the first non-blank character. Hard Returns and spaces, as well as tabs, can all be revealed, and multiple files can be viewed in twin windows. The list could go on.



Protext print options

Up to eleven printing styles such as proportional spacing, bold, underline etc. are obtained by prefacing the start of the relevant text with Ctrl-X and a second letter. These can be extended to headers and footers. Multiple columns as well as up to ten different keyboard layouts are supported. There is on-screen help for most functions and background printing.

All of these features worked reliably on the version sent for review, and are reasonably quickly learnt - there is more of a similarity to Wordstar, though, than any native Acorn product.

MAJOR EXTRAS

Once the basic functions have become familiar, many users will want to take advantage of the rest: Protext has a spelling checker (dictionaries in nearly thirty languages are available as extras), mailmerge, a set of simple data manipulation commands and a macro mode. These are somewhat more difficult to use because of the lack of Wimp control, compared, say, with Pipedream or even 1st Word Plus. But they do work, and produce more than passable results.

SPELL CHECK

Once the 110,000 word dictionary (or any of the minor or user supplementary

ones) has been loaded, checking is very swift. On finding an unrecognised word, five options are open to you, including one to skip this occurrence but flag future ones.

The option to look up correct spelling is particularly impressive and does not confine itself to possibilities starting just with the same letter, thus 'snit' (sic) will offer 'unit', 'isn't' as well as 'sit', 'suit' and over a dozen others. Intelligent use of colour is made at this - and several other similar - stages of the program. Single words can be checked in situ, and checking can be restricted to start from the current cursor position; words can also be marked so that they are ignored by the checker. In addition, there is an index and contents generating routine that could hardly be easier to use.

MAILMERGE

Once again, Protext is redolent of Wordstar here. Data macros are surrounded by ampersands (&name1&, &addr1& and so on) and files are read by a simple:

```
DF filename
```

command as you might expect. An extensive set of commands requires careful reading of the manual as some very sophisticated effects are possible.

LANGUAGE AND MISCELLANEOUS COMMANDS

So-called 'language' commands are entered directly in command mode. These support many useful functions from abandoning background printing, through the automatic production of formatted labels (using data within the text) to conditional mailmerging. Note that there are also 'stored' (embedded) commands affecting printing and layout. These are saved with a document but are not intended to be displayed. Again, Wordstar's dot commands are a near equivalent.

Text macros (any series of keystrokes likely to be used again as a unit) can be defined, saved and re-used to a 255 character limit; for example, you might want to reproduce a lengthy data string

such as your bank account number and sort code thus:

```
MACRO B "99999999 05-18-65"
```

Pressing Alt-B will then insert this sequence in the document.

This principle can be expanded and extended so that Exec files (in Protext parlance) can be written, for example, to perform a search and replace function on a previously completed document.

The 'Fsort' utility provided with Protext sorts the contents of a file in various ways. Nor need this be a Protext 5 one: there is also a conversion utility to convert to and from other formats including ASCII and 1st Word Plus.

Although not as comprehensive as Pipedream, Protext will allow a column of figures to be totalled, and the date and time to be entered dynamically - as will 1st Mail, but not 1st Word.

CONCLUSIONS

The main 380 page manual - written with Protext - is testimony to what can be achieved; it is well indexed and well laid out, but you may find it annoying to have to pick your way through references to other implementations of the software - a cost-cutting ploy that surely has not worked.

Protext 5 then, comes on the scene when there is still no clear first choice for an Archimedes/A3000 word processor. It outperforms all of its rivals where features and in some cases speed are concerned. If you 'know no better' than the PC world, you will not necessarily be disappointed with the rather crude (by Acorn standards) user interface.

Regrettably, unless the consequences of Protext's non-Wimp non-Desktop approach can be fully overcome, this otherwise excellent product cannot be recommended unreservedly.

Product	Protext 5
Supplier	Arnor Ltd, 611 Lincoln Road, Peterborough PE1 3HA. Tel. (0733) 68909
Price	£149.95 inc. VAT

RU

"Leading edge technology.....Everyone will program this way, one day."

ARCHWAY 2 lets YOU unleash the huge program power of RISC OS and the ARM easily and quickly. Build powerful multi-window applications with pop-up menus, icons, mouse control, etc. of professional quality. Programs are fully RISC OS multi-tasking.

If you are a little familiar with BBC BASIC then you can create applications using **ARCHWAY 2**. We have optimised the facilities to let you achieve powerful results with a minimum of programming.

ARCHWAY 2 provides a total environment for creating RISC OS applications in BASIC. It includes **tools**, **shell** programs with extensive **run-time** code, comprehensive **examples** and tutorials.

There are **tools** to make menus, windows, icons, mouse pointers, present a wide range of graphics and text in frames, create a simple database and much more. The tools are themselves ARCHWARE applications so they share the intuitive RISC OS user interface. They have been designed to work closely together and with Edit, Paint and the Basic Editor. All are fully multi-tasking.

ARCHWAY shells are ready to run RISC OS applications in line with Acorn's guidelines. Shells include **run-time** code to handle automatically windows, menus, icons, file handling, graphics, etc. so that you don't need detailed knowledge of these complex areas. You create a complete application by extending and fine-tuning a shell. You add menus and windows using the tools, and write functions & procedures to carry out the tasks of your program.

To help you get started there is a series of more than 50 program building sessions starting from the level of a complete beginner. The sessions with supporting examples are fully explained in the user guide. More than 30 example applications are on disc and ready to run.

Beginners should not feel inhibited. You will be amazed at the powerful things you can do with only a minimum knowledge of BASIC. For example, you won't need programming skills to create a shell that will load on the icon bar and run. Displaying graphics from Paint, Draw, Edit, Euclid 3-D and film files requires virtually no programming. To add buttons that trigger actions you will need to know something of BASIC functions. You can work through the examples supplied, at your own pace, developing your knowledge of BASIC while staying within the familiar windowed environment. Assist your progress by copying parts of examples into your own shell and getting them to run correctly.

An example may help clarify how the tools, the run-time and your application interact. Take menu handling. You create menus with the MenuEdit tool. You give each menu a name for easy identification. You link each menu item by name to a submenu, a pop-up window or an action. The run-time code pops up the right menu, in the right place at the right time when the user clicks the mouse MENU button. Before popping up the menu your application is informed to see if it wants to modify the menu. The run-time has functions to tick, untick, shade, unshade, change the text of a menu or its colours, etc. You just have to specify the menu's name and the item number you want to alter. The run-time also decodes and acts on the user's next step. If he chooses a menu item linked to an action then it calls a function in your application with the same name. You have to include such a function and write its contents to carry out the action.

The complete ARCHWAY 2 package (V2.00) comes on 4 unprotected 800k discs with a ring bound user guide. You need an Archimedes or A3000 with 1M or more of RAM and fitted with RISC OS. One disc drive is sufficient. No extra licence fee to distribute copies of applications created with ARCHWAY.

The price is £86.91 exc VAT but with p/p (**£99.95 inc VAT**). VISA & ACCESS are welcome. Please add £5.00 for postage in Europe or world-wide surface mail & £20.00 for world airmail. For schools a site licence is included in the price. Two **FREE** upgrade vouchers when purchasing direct from Simtron.

SIMTRON Programs to help you

4 Clarence Drive, East Grinstead, West Sussex RH19 4RZ Telephone (0342) 328188

Spyglass

A Multiple Task Memory Viewer

David Spencer presents a program that allows you to view other applications' workspace.

There are often times when it is useful to look at another application's memory while it is running, for example, to track down a particularly nasty and elusive bug or to examine internal data structures. *Spyglass* does just this for multi-tasking applications. It allows the user to select any application that has been started since *Spyglass* was installed, and display its memory. This will include the area used to store the program itself, together with all its variables and any data blocks used.

on the icon will bring up a menu, the first entry of which is entitled 'Applic', which points to a sub-menu listing any other applications started since *Spyglass* was installed. If none have been started, then this entry is greyed out. Selecting one of the sub-menu entries will open a viewer onto that application's memory area. The display starts at address location &8000, which is the first location used by applications. The vertical scroll bar will allow you to scroll down to the end of the application's memory, which for some applications can change dynamically.

The format of the display is:

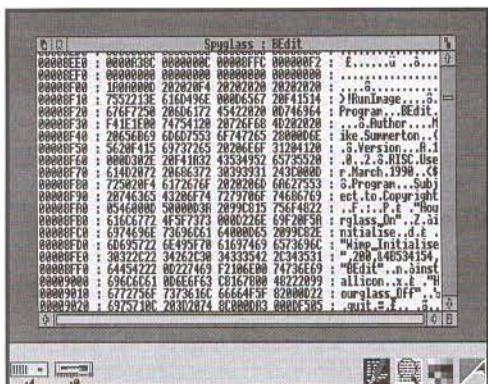
<address> : <hex data> : <ASCII>

Clicking Menu over the memory viewer window will display a menu with three options. The first two allow you to select the display mode for hex data between word and byte formats. The current mode is indicated with a tick. The final entry is Update. To keep redraw times to a minimum, *Spyglass* keeps a copy of part of the other application's memory. Hence, any change in the memory area will not automatically be reflected on the screen. Choosing the Update option forces the display to be updated.

At any time, the icon bar sub-menu can be used to switch between applications, though only one memory viewer can be open at a time. If an application is terminated, it is removed from the menu, and the viewer closed if it applies to that application. You can quit from *Spyglass* by choosing the 'Quit' option from the icon bar menu.

This month's magazine disc includes a version of *Spyglass* with the option to display in assembler format, together with a 'Goto Address' function.

```
10 REM > !RunImage
20 REM Program Memory Peeker
30 REM Version A 1.0
40 REM Author David Spencer
50 REM RISC User May 1991
```



Using *Spyglass* to examine the memory used by the RISC User BEdit application

To build the *Spyglass* application you will need to create an application directory called '!Spyglass', and build within it a 'Run' file to set a suitable Wimp slot (32K should be sufficient), and to run '!RunImage'. The program listed here should be typed in and saved as '!RunImage' within the application directory. Finally, you will need to create a !Sprites file containing a sprite called !Spyglass. This should be 68 by 68 OS units, as is the norm, and is used for both the directory viewer and icon bar.

USING SPYGLASS

When run, *Spyglass* will install itself on the icon bar. Clicking the Menu button

Spyglass - A Multiple Task Memory Viewer

```
60 REM Program Subject to Copyright
70 :
80 DIM block 256, mt 40, menu 1000
90 bsize%=4096:DIM buffer% bsize%
100 word=TRUE:DIM task$(100)
110 DIM handle(100), memsize(100)
120 SYS "Wimp_Initialise", 200, &4b53415
4, "Spyglass" TO , ourtask
130 main=FNcreate(0, 100, 1048, 544, &FF00
0002, 0, 1048, 544, 3, mt)
140 PROCicon:open=FALSE:current=-1
150 tasks=0:quit=FALSE:bstart=-1
160 ON ERROR PROCerror
170 REPEAT
180 SYS "Wimp_Poll", 1, block TO reason
190 CASE reason OF
200 WHEN 1:PROCredraw
210 WHEN 2:PROCopen
220 WHEN 3:PROCclose(!block)
230 WHEN 6:PROCbuttons(block)
240 WHEN 8:PROCkey(block)
250 WHEN 9:PROCmenuselect(block)
260 WHEN 17, 18:PROCreceive(block)
270 ENDCASE
280 UNTIL quit
290 SYS "Wimp_CloseDown"
300 END
310 :
320 DEF PROCopen
330 SYS "Wimp_OpenWindow", , block
340 SYS "Wimp_GetWindowState", , block
350 PROCensure(block!24)
360 ENDPROC
370 :
380 DEF PROCreceive(b)
390 CASE b!16 OF
400 WHEN 0:quit=TRUE
410 WHEN &400C2:PROCnewtask(b)
420 WHEN &400C3:PROCKilltask(b!4)
430 WHEN &400C4:PROCnewslotsize(b)
440 ENDCASE
450 ENDPROC
460 :
470 DEF PROCnewtask(b)
480 IF b!24<>0 AND b!4<>ourtask THEN
490 memsize(tasks)=b!24
500 handle(tasks)=b!4
510 A$="":off%=28
520 WHILE b?off%<>0
530 A$+=CHR$(b?off%):off%+=1
540 ENDWHILE:task$(tasks)=A$
550 tasks+=1
560 ENDIF:ENDPROC
570 :
580 DEF PROCKilltask(hand)
590 off%=-1:FOR F%=0 TO tasks-1
600 IF handle(F%)=hand off%=F%
610 NEXT:IF off%<>-1 THEN
620 FOR F%=off%+1 TO tasks
630 task$(F%-1)=task$(F%)
640 handle(F%-1)=handle(F%)
650 memsize(F%-1)=memsize(F%)
660 NEXT:tasks=-1
670 IF off%=current PROCclose(main):cu
rrent=-1
680 ENDIF:ENDPROC
690 :
700 DEF PROCnewslotsize(b)
710 FOR F%=0 TO tasks-1
720 IF handle(F%)=b!4 THEN memsize(F%)
=b!20
730 NEXT
740 IF current<>-1 THEN
750 PROCnewsize
760 ENDIF
770 ENDPROC
780 :
790 DEF FNcreate(vx, vy, w, h, flags, bcol,
x, y, waf, title)
800 $block=STRING$(88, CHR$0)
810 !block=vx:block!4=vy
820 block!8=vx+w:block!12=vy+h
830 block!24=-1:block!28=flags
840 block?32=7:block?33=2
850 block?34=7:block?35=bcol
860 block?36=3:block?37=1
870 block?38=12
880 block!44=-y:block!48=x
890 block!56=&13D:block!60=waf<<12
900 block!72=title:block!76=-1
910 block!80=LEN$title
920 SYS "Wimp_CreateWindow", , block TO
handle
930 =handle
940 :
950 DEF PROCredraw
960 IF !block<>main THEN ENDPROC
970 SYS "Wimp_RedrawWindow", , block TO
more
980 WHILE more
990 PROCworkarea
1000 SYS "Wimp_GetRectangle", , block TO
more
1010 ENDWHILE
1020 ENDPROC
1030 :
1040 DEF PROCbuttons(b)
1050 IF b!8 AND 2 THEN
1060 PROCmenu(b)
1070 ELSE
```

Spyglass - A Multiple Task Memory Viewer

```
1080 CASE b!12 OF
1090 WHEN -2
1100 IF NOTopen AND current<>-1 THEN
1110 PROCnewsize
1120 PROCtitle
1130 !block=main
1140 SYS "Wimp_GetWindowState",,block
1150 SYS "Wimp_OpenWindow",,block
1160 open=TRUE
1170 ENDIF
1180 ENDCASE
1190 ENDIF
1200 ENDPROC
1210 :
1220 DEF PROCclose(handle)
1230 IF handle=main THEN open=FALSE
1240 !block=handle
1250 SYS "Wimp_CloseWindow",,block
1260 ENDPROC
1270 :
1280 DEF PROCworkarea
1290 ox%=block!4-block!20
1300 oy%=block!16-block!24-4
1310 bottom%= -(block!32-oy%)/32
1320 top%= -(block!40-oy%)/32
1330 FOR i%=top% TO bottom%
1340 MOVE ox%+4,oy%-i%*32-4
1350 PRINT RIGHT$( "0000000"+STR$( &8000+i%*16),8); " : ";
1360 IF word THEN
1370 FOR F%=0 TO 3
1380 PRINT RIGHT$( "0000000"+STR$( buffer%!(i%*16+F%*4+&8000-bstart)),8); " ";
1390 NEXT
1400 ELSE
1410 FOR F%=0 TO 15
1420 PRINT RIGHT$( "0"+STR$( buffer%?(i%*16+F%+&8000-bstart)),2); " ";
1430 NEXT
1440 ENDIF
1450 PRINT": ";
1460 FOR F%=0 TO 15
1470 char=buffer%?(i%*16+F%+&8000-bstart)
1480 IF char<33 OR char=127 char=ASC"
."
1490 PRINT CHR$char;
1500 NEXT
1510 NEXT
1520 ENDPROC
1530 :
1540 DEF PROCmenu(b)
1550 CASE b!12 OF
1560 WHEN -2:PROCdrawmenu(1,"Spyglass,A
pplic,Quit")
1570 menu!36=FNappmenu
1580 IF tasks=0 menu!40=menu!40 OR (1<<
22)
1590 SYS "Wimp_CreateMenu",,menu+4,!b-6
4,184
1600 WHEN main:PROCdrawmenu(2,"Spyglass
,Word,Byte,Update")
1610 IF word THEN menu!32=1:menu!56=2 E
LSE menu!56=3:menu!32=0
1620 SYS "Wimp_CreateMenu",,menu+4,!b-3
2,b!4+16
1630 ENDCASE
1640 ENDPROC
1650 :
1660 DEF PROCdrawmenu(handle,menu$)
1670 !menu=handle:menu!16=7:width=0
1680 menu!17=2:menu!18=7:menu!19=0
1690 menu!24=44:menu!28=0:ptr=menu+32
1700 $(menu+4)=LEFT$(menu$,INSTR(menu$,
"," )-1)
1710 menu$=menu$+", "
1720 WHILE menu$<>""
1730 menu$=MID$(menu$,INSTR(menu$,"")+
1)
1740 IF menu$<>"" THEN
1750 !ptr=0:ptr!4=-1
1760 ptr!8=&7000021
1770 $(ptr+12)=LEFT$(menu$,INSTR(menu$,
"," )-1)
1780 IF LEN$(ptr+12)*16>width width=LEN
$(ptr+12)*16
1790 ptr+=24
1800 ENDIF
1810 ENDWHILE
1820 ptr!-24=ptr!-24 OR &80
1830 menu!20=width+16
1840 ENDPROC
1850 :
1860 DEF PROCmenuselect(b)
1870 SYS "Wimp_GetPointerInfo",,block+2
0
1880 IF (block!28 AND 1) reopen=TRUE EL
SE reopen=FALSE
1890 CASE !menu OF
1900 WHEN 1
1910 CASE !b OF
1920 WHEN 0:PROCchangetask(b!4)
1930 WHEN 1:quit=TRUE
1940 ENDCASE
1950 WHEN 2
1960 CASE !b OF
1970 WHEN 0:PROCchangeview(1)
1980 WHEN 1:PROCchangeview(0)
1990 WHEN 2:PROCupdate
```


Spyglass - A Multiple Task Memory Viewer

```
2000 ENDCASE
2010 ENDCASE
2020 IF word THEN menu!32=1;menu!56=2 E
LSE menu!56=3;menu!32=0
2030 IF !menu=0 menu!36=FNappmenu
2040 IF reopen SYS "Wimp_CreateMenu",,m
enu+4
2050 ENDPROC
2060 :
2070 DEF PROCerror
2080 SYS "Wimp_DragBox",,-1
2090 !block=ERR
2100 $(block+4)=REPORT$(+ (Internal err
or code "+STR$ERL+"))+CHR$0
2110 SYS "Wimp_ReportError",block,1,"Sp
yglass"
2120 ENDPROC
2130 :
2140 DEF PROCicon
2150 !block=-1:block!4=0
2160 block!8=0:block!12=68
2170 block!16=68:block!20=&3002
2180 $(block+24)="!spyglass"
2190 SYS "Wimp_CreateIcon",,block
2200 ENDPROC
2210 :
2220 DEF PROCnewsize
2230 !block=0:block!12=0
2240 IF word block!8=1048 ELSE block!8=
1240
2250 block!4--(memsize(current)/16*32+4
)
2260 SYS "Wimp_SetExtent",main,block
2270 IF open THEN
2280 !block=main
2290 SYS "Wimp_GetWindowState",,block
2300 SYS "Wimp_OpenWindow",,block
2310 ENDIF
2320 ENDPROC
2330 :
2340 DEF PROCchangeview(x)
2350 word=x
2360 PROCnewsize:PROCforce
2370 ENDPROC
2380 :
2390 DEF PROCforce
2400 !block=main
2410 SYS "Wimp_GetWindowState",,block
2420 SYS "Wimp_ForceRedraw",-1,block!4,
block!8,block!12,block!16
2430 ENDPROC
2440 :
2450 DEF PROCtitle
2460 $mt="Spyglass : "+task$(current)
2470 IF open THEN
2480 !block=main
2490 SYS "Wimp_GetWindowState",,block
2500 SYS "Wimp_CloseWindow",,block
2510 SYS "Wimp_OpenWindow",,block
2520 ENDIF
2530 ENDPROC
2540 :
2550 DEF FNappmenu
2560 x=menu+200:$x="Apps"
2570 x?12=7:x?13=2:x?14=7:x?15=0
2580 width=0:x!20=44:x!24=0
2590 FOR F%=1 TO tasks
2600 x=menu+228+(F%-1)*24
2610 IF F%=tasks !x=680 ELSE !x=0
2620 IF F%-1=current !x+=1
2630 x!4=-1:x!8=&7000021
2640 $(x+12)=LEFT$(task$(F%-1),12)
2650 width2=LEN(LEFT$(task$(F%-1),12))
2660 IF width2>width width=width2
2670 NEXT
2680 menu!216=(width+1)*16
2690 =menu+200
2700 :
2710 DEF PROCchangetask(sel)
2720 IF sel>0 AND sel<current THEN
2730 PROCclose(main):bstart=-1
2740 current=sel:PROCtitle
2750 PROCnewsize
2760 !block=main
2770 SYS "Wimp_GetWindowState",,block
2780 block!24=0:open=TRUE
2790 SYS "Wimp_OpenWindow",,block
2800 PROCcensure(0)
2810 ENDIF
2820 ENDPROC
2830 :
2840 DEF PROCcensure(yoff)
2850 IF yoff>0 THEN ENDPROC
2860 bs=&8000+INT((-yoff)/32)*16
2870 IF bs<>bstart PROCfill(current,bs)
2880 ENDPROC
2890 :
2900 DEF PROCfill(hand,add)
2910 IF add+bsize%>memsize(hand)+&8000
size=memsize(hand)+&8000-add ELSE size=b
size%
2920 SYS "Wimp_TransferBlock",handle(ha
nd),add,ourtask,buffer%,size
2930 bstart=add
2940 ENDPROC
2950 :
2960 DEF PROCupdate
2970 PROCfill(current,bs)
2980 PROCforce
2990 ENDPROC
```

RU

Exploring EFF Fonts

Clive Gringras delves into the huge variety of outline fonts provided by the Electronic Font Foundry.

DTP software, manipulative applications such as Poster, FontFX and DrawBender, and object-orientated drawing packages like Draw have been receiving much attention in the Archimedes world recently. All these packages rely heavily on two aspects of the Archimedes' operating system: the RISC OS printer drivers, and the Font Manager. Applications disc 1 unfortunately supplies the user with only three fonts (and these are bit-mapped rather than outline) which gives new users little idea of the diversity of fonts now available.

Ruth is intended to look handwritten.

Sophie is a very STYLISH "Script" font.

Swinging Varsity, a Twenties style font.

Although all DTP packages such as Ovation

from BEEBUG are supplied with additional fonts (Paladin, SwissB, SymbolB and Vogue with Ovation), there have been very few other sources of fonts for interested users until the last twelve months. The Electronic Font Foundry (EFF) has now produced over 200 fonts of an excellent quality. A large number of these are PostScript compatible, which means that an Archimedes can output them to any PostScript printer for a very professional result.

Advertising 200 different products is no mean feat, especially when some fonts may have a very similar appearance to each other, but in the right circumstances they can look very different. For this reason each font in the EFF catalogue is illustrated not by a standard alphabet, but by a sample of relevant text.

The basic principle behind an outline font is that it is capable of being magnified without a loss of curve detail. This is different from a bit-mapped font which will tend to look very 'blocky' and pixellated at large magnifications.

EFF has not only designed standard fonts but a great number of more interesting and imaginative ones too. Its standard fonts are supplied in four weights: bold, regular, bold italic/oblique, regular italic/oblique. After some teething problems, EFF now supplies all its fonts hinted and scaffolded. These additional attributes ensure that at very large and at very small sizes (which can otherwise cause distortion) a letter will still be displayed and printed to look as close to its correct style as possible.

"Tamsin, at home on the side of vans!"

Furthermore, EFF uses the proper terminology for its fonts. Oblique indicates letters that are simply slanted from the regular font. Italic indicates the font is actually redesigned, generally with more tails or serifs. EFF has diversified into some interesting fonts, which, although not necessarily suitable for an entire page of text, can set a page alight when used sparsely as headings or for emphasis. With access to almost the entire EFF collection, I have inevitably found a few favourites. Such choices are purely subjective and bear no relation to the quality of the font construction.

The serif section obviously contains the basic Times replicas and variations. An unusual and modern-looking font called Formal, is also sold with three distinct weights. The font's lower case is simply

smaller capitals making titles appear very distinctive. On further investigation it appears that Formal's PostScript equivalent is Copperplate Gothic, which is used for the reporter's name on ITN News. Varsity is also an unusual serif font with a 1920s feel to it.

The san-serif section of the collection has far fewer radical fonts, this being a feature of san-serif fonts. One option in DTP is to employ a serif font for the main body of text, using san-serif for the paragraph titles and headings.

A more informal, 'handwritten' group of fonts are classed as scripts. These are by far the most impressive looking of the collection, but their use is really limited to menus, logos etc. *Tamsin* is quite at home in this sphere, with *Sophie* or *Ruth* useful for writing fake hand-written notes.

EFF is very serious about its business, but a sense of humour also shows through in the decorative fonts. *Fancydress* is a

bulbous font with a piece of 'clothing' attached to each letter. This, initially, may only appear useful for invitations to fancy dress parties. With a little bit of imagination, it is surprising how many documents seem quite at home with clothed-letters! *Snowball* has each letter with snow dripping off its top surface. Christmas cards with unoriginal typefaces are a thing of the past.

EFF manages to produce very many varied and unusual fonts at quite moderate prices ranging between £10 and £45, hardly exorbitant. The catalogue has been carefully thought out and contains high quality printouts of all the fonts, using an interesting story to illustrate the characteristics of each.

Electronic Font Foundry are at 18 Brockenhurst Road, Ascot, Berks SL5 9DL, tel. (0344) 872923.

Note that EFF fonts are now being sold by BEEBUG in a series of eleven font packs. Please write or phone for further details. [F.U](#)

"F I R S T"

ADVANCED STATISTICAL SYSTEM

For Acorn Archimedes; BBC Models B, B+ and Master; "Industry Standard" machines

A powerful and practical tool for Research, Industry, Business, and Teaching

- Integrated, interactive, robust, fast, accurate, modular. Designed to facilitate data critique.
- Many data entry options. Full data management and formatted display. Extensive data transforms.
- Handles missing values and data subsets. Scatterplots, regression plots, function plots.
- Univariate statistics. Paired and unpaired t tests. Chisquare tests. Nonparametric methods.
- Unrivalled REGRESSION facilities eg weighted, through the origin, standardised. Full statistical information.
- Residuals, fitted and predicted values. Much more. Correlations. ANOVA. Contour plots of regressions.
- Regression DIAGNOSTICS - VIFs, influential points etc. Automatic warnings.
- ROBUST regression - many influence functions. Powerful NONLINEAR least squares
- Time Series, eg moving averages, exponential smoothing, causal models.
- One- Two- and Three-way ANOVA subsystems. Distributions generator. Histograms. Linear Calibration.
- Cluster analysis. Many other powerful analytical and descriptive features. Full utilities.

Price £120-£180 (machine and version dependent). Special RISC USER discount available.

There's far too much to describe here. Get full information now from:

Serious Statistical Software, Lynwood, Benty Heath Lane, Willaston, South Wirral L64 1SD Tel. 051 327 4268

The 80 Column

Alan Wrigley introduces a new occasional series which will concentrate on all matters relating to printers and printing.

For most computer users, a printer is the first major addition they make to their system, and so we felt there was a need for a column which could act as a focus for news, hints and information on printers. Hints from readers are welcome; any we publish will be paid for at the same rate as our regular Hints & Tips pages. I will also endeavour to answer any technical queries regarding printers and their use.

ADDITIONS TO PrinterDM

We kick off with a couple of hints concerning the addition of specific printers to PrinterDM. It is quite easy to do this, by modifying the file *PrData* within the !PrinterDM application directory (but note that if you are using release 2 of PrinterDM, you must amend the file *PrDataSrc* and then run the program *PrSquasher* to produce the actual *PrData* file - instructions on how to do this are given in the application's !Help file). To add a printer, study the definitions already in the file and add your own in the same format, replacing the codes given with those appropriate to your printer. Note that the printer number should be the next highest number after the last definition already in the file. The following definition from Matthew White caters for the Shinwa CPA-80:

```
printer_name: Shinwa CPA-80 (120x144 dpi)
printer_number: 1
pxres: 120
pyres: 144
pxres_halftone: 120/8
pyres_halftone: 144/8

dump_depth: 16
line_prologue: "<27>L"
line_epilogue: "<27>A<0><13><27>2<27>J<22>"
interlace: 1
line_interlace: "<27>A<0><13><27>2<27>J<22>"
job_epilogue: "<27>@"
```

Secondly, Alan Mothersole has provided the following information for customising PrinterDM release 2 to produce NLQ printing on a Kaga Taxan KP810. Below the printer number, add the following line:

```
nlq_mode: 1
```

then add the following lines at the end of the definition:

```
nlq_job_prologue: "<18>|[W<0>|{|[R<0>"
```

```
nlq_job_epilogue: "<12>|[@"
```

```
nlq_pica: "<18><27>W<0><27>("
```

```
nlq_underline_on: "<27>-<1>"
```

```
nlq_underline_off: "<27>-<0>"
```

NEWS

If you read the review of the Canon BJ-10e in Vol.4 Issue 4 you will be aware that the print quality of this model is very impressive. Canon has now released two full-size bubble jet printers: the BJ300 (80-column) and the BJ330 (136-column), retailing at £595 and £695 respectively (excl. VAT). Print quality is claimed to be even higher than the BJ-10e as a result of improvements in the technology, while the speed is claimed to be 300 cps (high-speed) and 150 cps (high quality).

In the last few months there has been a proliferation of affordable (i.e. sub-£1500) PostScript-compatible laser printers. This is good news for DTP users, since in general a PostScript printer will be significantly faster than any other type except a direct laser. Brother, Epson, NEC and OKI all have PostScript-compatibles on the market, but two which look particularly interesting are the Panasonic KX-P4455 and the Star LP-4 and LP-8 StarScript models. The Panasonic is essentially the 11-page-a-minute KX-P4450 LaserJet-compatible with a PostScript interpreter added. The Star printers use a Canon engine and operate at 4 and 8 pages per minute respectively. The most attractive feature of these two models is the price (around £1000 for the LP-4 and £1250 for the LP-8).

RU

The Electronic Font Foundry

our latest
Ancient

The Only Archimedes DTP specialists

The Electronic Font Foundry are the only DTP specialists in the Archimedes field. As well as our vast range of professional PostScript® compatible typefaces we sell a range of hardware suitable for both professional or amateur DTP. Take a look at some of our prices to see what value you get from us.

We are expanding our range of fonts into other languages; we already have Greek (Modern and Classical), Cyrillic, Hebrew and Punjabi as well as all European languages, with keyboard modules available if you need them to simplify their use. We will soon have fonts for some more Indic languages available for sale: Bengali, Devangari, Farsi, Gujarati and Tamil.

For Font Catalogue and comprehensive price list write to:
The Electronic Font Foundry • 18, Brockenhurst Road • Ascot • SL5 9DL
telephone (24hrs) or Fax 0344 872923

Archimedes Computers

A3000	£545
A3000 with 2Mb RAM	£595
A3000 Learning Curve*	£645
A3000 Learning Curve* with 2Mb	£695

A410/1	£995
A410/1 with 2Mb RAM	£1095
A140/1 with 4Mb RAM	£1195

A420/1	£1195
A420/1 with 4Mb RAM	£1295
A420/1 Learning Curve**	£1295

A440/1	£1495
A540/1	£2595
A540/1 with 8Mb RAM	£3145

*Learning curve includes 1st Word Plus with Spell Checker, PC Emulator, Genesis and Genesis applications and demonstration video.

** 420 LC also includes Acorn DTP

Monitors

Acorn 14" colour	£199
Philips 14" colour, with stereo speakers	£249
EIZO 9060S 14" multiscan colour	£445
EIZO 9070S2 16" multiscan colour	£675

Taxan 770+LR 14" multiscan colour	£425	complete with 600dpi podule	£1395
Taxan 795 14" multiscan colour	£495	Toner cartridge for above printers	£70

Taxan 775 Viking II	£699	SCSI Hard Drives	
19" paper white monochrome		Removable external drive	£460
		45Mb disc for above	£75
		SCSI Podule	£175

Printers

Canon Bubble Jet, 360 dpi, 64 nozzle head printers. Price includes RISC OS printer driver;		Complete System	£660
--	--	-----------------	------

BJ-10e Portable, prints onto A4	£295	Software	
BJ-300 A4 Paper, built in tractor feed	£450	Impression II	£145
BJ-330 prints on paper up to A2 size, built in tractor feed	£550	Impression II network version for up to 20 computers	£660
		Impression Junior	£75
		FontFX	£10
		Snippet	£29
		Ovation	£95
		Ovation Demo Disc	£5
		Midnight Graphics Clip Art	£29.50
		Equasor	£45
		Poster	£79
		Acorn DTP	£119
		RISC OS Printer Driver For Bubble Jet printers BJ 130, 130e and 10e	£10
		Multi FS	£35

Ink cartridge for BJ-130/ BJ-130e	£13
Ink cartridge for BJ-10e	£17.50
Ink cartridge for BJ-300 series	£13

Laser Printers

Canon LBP4, 4 pages per minute	£895
Laser Direct interface to drive above printer at 600dpi	£325
Laser Direct LBP8, 8 pages per minute,	

Free after-sales service and telephone hotline support with every purchase from us.

Tracker

Reviewed by Ian Waugh

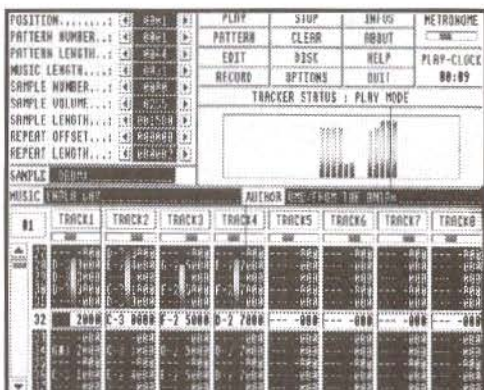
There can be few Arc owners who haven't heard some of the amazing *SoundTracker* sampled music demos freely available in the Public Domain (including the RISC User PD Library). *SoundTracker* started life on the Amiga and fairly soon migrated to the Atari ST. Arch Arc programmer Hugo Fiennes of The Serial Port developed a program for the Archimedes which could read and play *SoundTracker* files, and this too is available from PD sources (BEEBUG PD Library discs PD01 to PD06 for example). But it is only now with the release of *Tracker* that users have the opportunity to create their own Archimedes music files, and edit existing Amiga and Atari ST *SoundTracker* tunes.

OVERVIEW

The *Tracker* package contains four discs - a program disc, one disc of music and two full of samples. They aren't copy-protected, and the manual carries a request to "Spread the Word, not the Disc." 10 out of 10, chaps. Let's hope their trust in Archimedes owners is not misplaced.

You can play *Tracker* through the Archimedes' speaker, but you'll get far better results if you plug it into your hi-fi or use a Walkman. The manual includes details on how to bypass the rather dreadful high pass filter built into the Arc, but this is not for amateurs and it does warn that fiddling about inside your machine will invalidate your guarantee.

Tracker has been designed with the non-musician in mind. It forsakes traditional music notation for an event list. Music is constructed from up to 64 patterns each of which can contain up to 64 events. Events will usually be notes but they can also be performance instructions, for example, to set a voice's volume or stereo position. Up to 128 patterns can be linked together in a sequence to produce a complete tune.



Tracker's main control screen in play mode

Tracker has one main screen, and although it runs under RISC OS, it takes over the screen completely. File handling, therefore, takes place from within the program although you can load and save samples and music files from the Desktop as long as *Tracker* is installed on the icon bar. It can handle eight tracks or notes simultaneously (the Amiga's *SoundTracker* can only handle four) and the events for each track are shown in the bottom half of the screen.

SAMPLES

The sounds or instruments used by *Tracker* are 'real sounds' recorded digitally and stored as numbers. You can use samples you've recorded yourself with a package such as *Armadeus*, but over 100 samples are supplied with *Tracker* so you've plenty to be getting on with. You can 'lift' more samples from PD demo discs.

For the technically-minded, although *Tracker* uses logarithmic samples, it can also load and convert linear and linear signed samples. For the non-technical, this simply refers to the way the samples are stored, and should allow *Tracker* to handle any sample format. Up to 36 samples can be held in memory at once although the maximum limit is 64K per sample - and the memory limit of your Arc.

EVENTS

An event can take several parameters. A note, for example will begin with the note name - C, C#, D, E and so on, followed by an octave number in the range 1 to 3. This may be followed by an optional four-digit command. This is where part of the versatility and power of Tracker music lies, but it is also the area which is initially likely to cause a newcomer the most head-scratching.

Here's a couple of examples:

```
F#2 3G04
--- -H08
```

This plays F# in the second octave using the sample in slot three. The G command slides the volume up (Crescendo) four units, H (Decrescendo) slides it down eight units.

```
G-1 AE04
-E07
```

This plays G in the first octave with the sample in eleventh position (A). The stereo position (E) starts central (4) and then moves to the extreme right (7).

The first character of the command number refers to an instrument number from 1 to 36 which tells the note which sample to use. As there is only one character, the numbers 0 to 9 are used followed by the letters of the alphabet A to Z.

The second parameter describes a command function, and the following two parameters provide data for it. Arpeggio (O) slides the pitch of the note up or down. Portamento slides the pitch of the instrument up (1) and down (2). Crescendo (G) and Decrescendo (H) slide the volume in a similar way. Position Jump (J) jumps to another position in the sequence, Break Pattern (B) jumps to the next pattern. You can set the stereo position (E) of the track across seven positions, alter the tempo (S) and, if you wish to be so precise, set the volume of each note (V).

Every event can execute a command whether or not it contains a note. Some of the parameters such as Volume take data in hexadecimal format so although you may not have to be a musician to use Tracker, you will need a nodding acquaintance with hex. A hex-to-decimal conversion table is given in the manual but, it must be said, note entry and music creation is pretty much a numeric business.

MAKING MUSIC

Okay! With the basic knowledge of how to enter notes, let's see how you might go about creating a piece of music. Let's be conventional and start with a bass line. Load a sample into, say, sample slot 0. Incidentally, on loading, the name of the sample should appear in the Sample Name box automatically but it doesn't. This is a nuisance. Click on Edit and then on the Event Bar of Track 1. You can play the Arc's keyboard to enter a note, or you can enter notes from a MIDI keyboard if you have a MIDI interface. After entering a note, the event list automatically scrolls.

You have to decide how long the shortest note or event is going to be in order to 'space out' the notes in the event list. It will help if you have some concept of 'beats in a bar'.

After creating a snappy bass line, we can add a drum pattern. Load suitable drum sounds and repeat the process. You could use Track 2 for the bass drum, Track 3 for the snare, Track 4 for the hi hats and so on. If the bass and snare don't fall on the same beat (event) you could put them both on one track.

Next, you could insert a sampled voice saying "I know you're gonna dig this" (this sample is actually used by one of the demo tunes).

A sample in an event list will sound until it plays out or until it encounters another note. By recording a sample in several consecutive or closely-placed events, you can create the infamous N-N-

N-Nineteen effect - as long as you realise that this is now rather old hat! As a sample can be rather more than a simple tone, you can use samples which have rhythm built into them such as a couple of bars of drum beat or a guitar riff.

Having created a mega opening pattern, click on the scroll bar to select pattern two and repeat the process. And so you build up your song in sections. The next stage is to link them together. Select Position 0 in the Position counter in the top left of the screen. Below this is the Pattern Number indicator so select the first pattern. Scroll the Position counter on and select another pattern for the second slot.

If you don't use all 64 events in a pattern you can make the sequence play fewer events. Other functions here let you alter the volume of a sample and shorten its length. The Repeat Offset and Repeat Length parameters let you repeat the central part of a sample, useful for sustaining the body of sounds such as strings and organ. However, as you don't know what the sample waveform is like, creating a glitch-free loop is very much a trial and error process - which the manual freely admits.

Several editing options are available from the function keys (a keystrip is supplied). These include event, track and pattern cut, and paste and track swap and mix.

You can load and save samples, patterns and complete pieces of music. All samples used by a song are saved along with it but be aware that this can make music files quite long. One demo, for example, is over 340K!

MANUAL DEXTERITY

The manual is at pains to ensure that the user is not overawed by the apparent complexity of the program. In truth, there is a fair amount to take in, but once you've assimilated the basics it's not terribly difficult to use. However, I tend to feel that telling the user that it's not necessary

to understand what note names or octave numbers are is erring rather too much on the side of optimism! But there is an elementary quick start tutorial which should get you started fairly, er, quick. An index would, as ever, have been useful.

The program disc contains an application called !Jukebox. It's a Tracker Desktop play routine which has been placed in the Public Domain so you can give this to your friends along with your tunes. !Jukebox can't play old SoundTracker files directly. These must be converted to Tracker Music Modules by loading into Tracker and saving out again.

CONCLUSION

The results you can achieve with Tracker speak (ahem!) for themselves although most of the demo tunes originated on the Amiga and it's a shame none use all eight tracks. If you are a musician, you may have to make a small adjustment to Tracker's way of doing things but the manual contains a guide to converting a traditional score which should help. If you are not a master musician, the adjustment will not be apparent, and you can take encouragement from the fact that a good sample or two on their own can sound very impressive.

SoundTracker has become the standard program for playing demo tunes and soundtracks, but now users and programmers can create Archimedes specific tunes. I expect Tracker will now be widely used to create game tunes and soundtracks.

The power of sampled sounds is amazing. If you have even a little musical ability you may astound yourself with what you can accomplish with this program. If you're still not convinced, play some of the demos - you'll be impressed!

Product Tracker
Supplier The Serial Port
Burcott Manor, Wells,
Somerset BA5 1NH.
Tel: 0243 531194
Price £49.95 inc. VAT

RU

Archimedes Software



Disc 7 - A Chess Program for The Archimedes.

A Chess program that takes full advantage of RISC OS, installing itself on the icon bar and running on the desktop in a window at the same time as other applications. You can carry on working whilst the program is thinking of its move. Features: load and save games, edit board, step backwards and forwards through game, computer 'v' computer mode, play black or white, reverse board, save game, multiple levels, print game. Algebraic notation. Full mouse control, on screen clocks. Hint. Choice of piece when promoting pawn. Undo move.



Disc 16 - A New Spark RISC OS Archive program

Spark, allows you to store files and directories in archive files in a very compressed form. e.g. sprites often take up only 10% of normal space. Files in archives, can be accessed just like files in disc directories. Now new Spark series 2.XX, has lots more features. Background operation - archive whilst you do something else. Reads all these formats, zoo, zip, lzh, UNIX and Archie Tar, Compress. Reads and writes PKarc, SEA/PC arc, uucode, atob/CET+, FCET and Archimedes archives. New 16 bit higher performance compression. Script files, message driven operation. DES data encryption. Full info, sort by type etc.



Disc 23 - Desktop Applications

Disc of RISC OS applications, 24 system fonts, sprites and Draw files. Includes !!Fastdesk, !Backpict, !FileHelp, !CopyOpts, !FontFix, !Pointer(1-3), !RomSprite, !Indicator, !Saver, !SectCopy, !SoundOff, !Timer, !FormatTxt, !Aquarium.



Disc 24 - RISC OS Desktop Multitasking Terminals

Bring Archie comms to the desktop. Stay online whilst using other programs. Good quality high speed, Viewdata and ANSI/VT220/100/52 emulations. Suit Prestel, bulletin boards and mini/mainframes. Auto logon scripts. CET, ASCII and X/Ymodem (batch), file transfer. RISC OS printer driver support. IRS423state.



Discs 12 and 26 - The World and World Map

Database of 130,000 coordinates of points on Earth and !WorldMap to convert the data into !Draw file maps which can be imported into Draw, Ovation etc.

(Discs 12 and 26 bought together cost £6.99 and then count as one disc).



Clip Art Packs

Each pack, consists of three discs, full of black and white sprite format clip art. The use of Spark to compress the files, means each pack contains many 100's of files and Mega bytes.

Pack #1: Alphabets (decorative letters), Anatomy, Animals, Astrology, Books, Egyptian, borders, snippets of text, pointers (hands and arrows), cards.

Pack #2: Assorted cartoon characters plus LooneyToons, Smurfs, Turtles, Escher, Flowers, Foods, Miscellanea.

Pack #3: Music, Monsters, Mythical and religious beasts. People (assorted people plus celebrities). Space, space-travel, and space exploration.

Packs are £5.99 inclusive, and suitable for use with Ovation, Draw, Paint and Impression etc.

Each disc is £5.99 inclusive. Buy four claim another one free!

David Pilling, P.O. Box 22, Thornton Cleveleys, Blackpool. FY5 1LR.

Free Air Mail delivery on overseas orders. Full list available on request.

by Lee Calcraft

Welcome to *C Notebook*, a new occasional column dealing with various aspects of the C language. Contents of the column will vary from month to month, but I imagine that items of a 'Hints & Tips' flavour will be prominently featured, as will C library functions, which is where we kick off this month.

akbd_pollalt()

This function follows the style of those in RISC_OSLib *akbd*. The function returns TRUE if the Alt key is pressed at the time of the call, otherwise FALSE.

SOUND FUNCTIONS

The remainder of the functions listed are for generating sounds of one kind or another. The central function used here is *sound()*. It takes three parameters, as documented within the source listing. The other four functions, just call *sound()* to generate sounds of varying pitch and duration. They are particularly useful during debugging to indicate that a certain line in your code has been reached.

Note the use of *wimpt_complain()* to generate an error message if any of the SWIs fail. If the programs in which you are to use these functions are not Wimp_based, a function such as *perror()* may be used in its place.

```
/* RISC User C library
 * Alt key and Sound functions
 * by Lee Calcraft
 */
#include "wimpt.h"
#include "os.h"

#define OS_Byte          6
#define Sound_Control    0x40189

BOOL akbd_pollalt(void);
void lo_blip(void);
```

```
void hi_blip(void);
void lo_sound(void);
void hi_sound(void);
void sound(int vol,int pitch,int duration);

BOOL akbd_pollalt(void)
/* check for the Alt key */
{
    int r2;
    wimpt_complain(os_swi3r(OS_Byte,0x81,-3,0x
ff,0,0,&r2));
    if (r2) return 1;
    return 0;
}

void lo_blip(void)
/* pitch 70 duration 1 */
{
    sound(0x1ff,70,1);
}

void hi_blip(void)
/* pitch 200 duration 1 */
{
    sound(0x1ff,200,1);
}

void lo_sound(void)
/* pitch 70 duration 5 */
{
    sound(0x1ff,70,5);
}

void hi_sound(void)
/* pitch 200 duration 5 */
{
    sound(0x1ff,200,5);
}

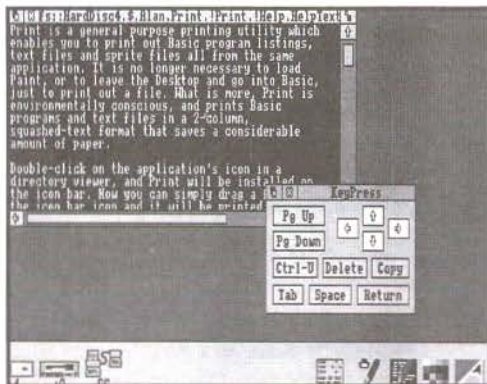
void sound(int vol,int pitch,int duration)
/* generate a sound
 * uses chan 1, Vol is 0x100 to 0x1ff
 * pitch is 0 to 0xff, duration is in 5csec
 units
 */
{
    wimpt_complain(os_swi4(Sound_Control,1,vol
,pitch,duration));
}
```

RU

Desktop Keyboard

This utility from Alan Wrigley allows mouse control of certain keyboard facilities such as Return, Delete, cursor control etc.

When scanning through a document using the mouse, as you might do when proof reading for example, it can be a nuisance having to use the keyboard if all you need are functions such as cursor keys, Return, Space, Delete and so on. The application *KeyPress* allows you to do all this from the Desktop without your hand ever leaving the mouse, and it will work with any Desktop application which accepts keyboard input, such as Edit, Ovation etc. It is also a simple matter to customise the program so that a different set of keys is simulated.



KeyPress installed, together with an Edit window

CREATING THE APPLICATION

First create an application directory called *!KeyPress*, then use Edit to create an Obey file called *!Run*. This should contain the following lines:

```
WimpSlot -min 16K -max 16K
```

```
Run <Obey$Dir>.!RunImage
```

Place this file inside the application directory, together with a *!Sprites* file containing a sprite called *!keypress*. This is necessary since this sprite must represent the application on the icon bar. If you are unsure about creating sprite and Obey files, you could use our Application Shell Generator (Vol.3 Issue 2 and Volume 3 Special Disc) to create the application directory, *!Run* and *!Sprites* files.

Then type in the Basic program listed here, and save it as *!RunImage* in the application directory. Note that the arrow characters in lines 1000, 1020, 1040 and 1060 are obtained from the keyboard by holding down the Alt key, typing the character code on the numeric keypad, then releasing Alt again. The codes required are 136, 137, 138 and 139 in that order.

USING KEYPRESS

Double-clicking on the *!KeyPress* icon in a directory viewer will install the application on the icon bar. Clicking Menu over the icon bar icon simply offers a *Quit* option, while clicking Select opens a small window containing 12 icons representing specific keys or combinations of keys on the keyboard. These are the four cursor keys, plus Page Up, Page Down, Delete, Space, Tab, Return, Copy and Ctrl-U. Clicking Select over any of these icons will send the appropriate key code to any application provided that it is the one with the current input focus (i.e. the application which owns the caret). The cursor icons are set to auto-repeat, while the others are highlighted when the pointer moves over them and respond to a single click only.

PROGRAM NOTES

The program is very straightforward, as you might expect with just one window, one menu item and a very simple process to be carried out. The icon definitions are held in DATA statements at the end of the program, two lines per icon, and this makes it easy for you to alter them if you wish. The first line contains the data which controls the icon's size and position, and the icon flags. I would not recommend altering any of these unless you know what you are doing and have read the *Programmer's Reference Manual*. Note that the flags are set such that icons 0-7 are menu icons (type 9) and 8-12 are auto-repeat (type 2) as mentioned earlier.

It is a simple matter, however, to change the two data items on the second

line, which are the icon's title, and the key code which will be generated when that icon is selected. This allows you to alter the legend which appears on the icon, and the effect of clicking over that icon. Note that, unless you change the icon's size, you must make sure the new title will fit into the icon.

It would be quite possible to customise *KeyPress* to generate a set of function key codes for use with programs which have function key short cuts. For example, you could program keys F2-F5 for use with Edit, plus the Escape key to remove the resulting Edit dialogue boxes from the screen (see the article elsewhere in this issue for more information on Edit).

```
10 REM >!RunImage
20 REM Program Desktop Keyboard
30 REM Version A1.0
40 REM Author Alan Wrigley
50 REM RISC User May 1991
60 REM Program subject to copyright
70 :
80 ON ERROR PROCerror:END
90 PROCinit
100 :
110 REPEAT SYS "Wimp_Poll",1,bk% TO po
11%
120 CASE poll% OF
130 WHEN 2:SYS "Wimp_OpenWindow",,bk%
140 WHEN 3:SYS "Wimp_CloseWindow",,bk%
150 WHEN 6:PROCbutton
160 WHEN 9:quit%=TRUE
170 WHEN 17,18:PROCmessage
180 ENDCASE
190 UNTIL quit%
200 SYS "Wimp_CloseDown"
210 END
220 :
230 DEFPROCbutton:CASE bk%!12 OF
240 WHEN -2
250 CASE bk%!8 OF
260 WHEN 2:PROCmenu
270 WHEN 1,4:!bk%=handle%
280 SYS "Wimp_GetWindowState",,bk%
290 SYS "Wimp_OpenWindow",,bk%
300 ENDCASE
310 WHEN handle%:IF bk%!8 AND 5 SYS "W
imp_ProcessKey",key%(bk%!16)
320 ENDCASE:ENDPROC
330 :
```

```
340 DEFPROCmessage
350 CASE bk%!16 OF
360 WHEN 0:quit%=TRUE
370 ENDCASE:ENDPROC
380 :
390 DEFPROCmenu
400 $menu%=k$:menu%!12=&70207
410 menu%!16=100:menu%!20=44
420 menu%!24=0:menu%!28=&80
430 menu%!32=-1:menu%!36=&7009021
440 $(menu%+40)="Quit"
450 SYS "Wimp_CreateMenu",,menu%,!bk%-
60,140
460 ENDPROC
470 :
480 DEFPROCerror
490 !bk%=ERR:$(bk%+4)=REPORT$+" at lin
e "+STR$ERL
500 SYS "Wimp_ReportError",bk%,1,k$
510 ENDPROC
520 :
530 DEFPROCinit
540 DIM bk% 512,ind% 60,menu% 80,spr%
800,key%(11)
550 quit%=0:k$="KeyPress"
560 SYS "Wimp_Initialise",200,&4B53415
4,k$
570 !bk%=646:bk%!4=172
580 bk%!8=1022:bk%!12=456
590 bk%!16=0:bk%!20=0:bk%!24=-1
600 bk%!28=&87270012:bk%!32=&1070207
610 bk%!36=&C0103:bk%!40=0
620 bk%!44=-284:bk%!48=376:bk%!52=0
630 bk%!56=&3D:bk%!60=&3000
640 bk%!64=1:bk%!68=0
650 $(bk%+72)=k$:bk%!84=12
660 FOR i%=0 TO 11:a%=bk%+88+32*i%
670 READ !a%,a%!4,a%!8,a%!12,a%!16,$(a
%+20),key%(i%)
680 NEXT
690 SYS "Wimp_CreateWindow",,bk% TO ha
ndle%
700 :
710 !spr%=800:spr%!4=0:spr%!8=16:spr%!
12=16
720 SYS"OS_SpriteOp",&10A,spr%,<Obey$
Dir>.:Sprites"
730 !bk%=-1:bk%!4=0:bk%!8=0:bk%!12=84
740 bk%!16=72:bk%!20=&3002:$(bk%+24)="
!"+k$
750 SYS "Wimp_CreateIcon",,bk%
760 ENDPROC
770 :
```


780	DATA	16,-64,148,-12,&C701903D
790	DATA	Pg Up,&19F
800	DATA	16,-128,148,-76,&C701903D
810	DATA	Pg Down,&19E
820	DATA	142,-196,256,-144,&C701903D
830	DATA	Delete,127
840	DATA	266,-196,362,-144,&C701903D
850	DATA	Copy,&18B
860	DATA	16,-196,130,-144,&C701903D
870	DATA	Ctrl-U,21
880	DATA	16,-264,94,-212,&C701903D
890	DATA	Tab,9
900	DATA	230,-264,362,-212,&C701903D
910	DATA	Return,13
920	DATA	108,-264,216,-212,&C701903D
930	DATA	Space,32
940	DATA	180,-96,234,-44,&700203D
950	DATA	←,&18C
960	DATA	308,-96,362,-44,&700203D
970	DATA	→,&18D
980	DATA	244,-128,298,-76,&700203D
990	DATA	↓,&18E
1000	DATA	244,-64,298,-12,&700203D
1010	DATA	↑,&18F

RU

Skyfall

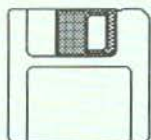
20^p

Yes, just 20p for our great demo disc and detailed 12 page catalogue.

Skyfall has an unrivalled range of Archimedes PD, over 270 discs all fully filled. Discs include RiscOS applications, HiQuality Outline Fonts, HiQuality Art Clips, Powerful Arm demos, 33 Stereo Trackers discs, and just about everything else imaginable. We offer a fast turn around on all orders, with prices between £1.50 and £2.

So if you want the Spring '91 Demo Disc and Catalogue just tape a 20p coin to a bit of paper with your name and address on and send it to:

**SKYFALL, PO Box 2220,
Birmingham, B43 5RZ.**



Understanding Statistics



- Six sets of computer programs
- Menu-driven for ease of use
- Shows basic concepts & principles
- Sample data sets given
- Full use of graphics
- Edit, analyse your data sets
- Interactive development of processes and concepts

Discrete data & the binomial distribution; Continuous data & the normal distribution; Hypothesis testing & confidence intervals; Central Limit Theorem & estimation; Simulations; Correlation and regression.

Versions for the **Archimedes** and the **BBC model B**. Also for **IBM** and compatible machines (VGA or EGA screens. Write for details).

Price: £25 + VAT (= £29.38) includes post and packing.

From: *Centre for Statistical Education, Dept BB, University of Sheffield, S3 7RH*

A Good *ideA*?

David Spencer looks at a new range of hard disc drives from Ian Copestake Software.

IDE (Integrated Drive Electronics) is the latest craze in hard disc drives, following on from the ST506 standard originally adopted by Acorn, and the newer use of SCSI. As the name suggests, IDE integrates all the electronics into the drive itself. This includes not only the complex control and signal processing circuits normally found on a hard drive, but also the hard disc controller chip and data separator. In the case of ST506, these latter two components are located within the computer, as in the Archimedes.

This higher level of integration allows lower cost interfaces, without increasing drive costs. Indeed, because IDE is now very popular in the PC market place, IDE drives are often much cheaper than their ST506 and SCSI equivalents.

THE IAN COPESTAKE SYSTEM

The first company to introduce IDE drives for the Archimedes is Ian Copestake Software (ICS), who have launched a range of drives under the name *ideA* (IDE Archimedes). These include internal 3.5" units for the 300 and 400 series Archimedes, and a 2.5" internal system for the A3000. It is this latter unit that we shall look at in detail here.

Few people will have encountered 2.5" drives, as they have only become available in the last year, and then only from a few manufacturers. Not only are they small, but also extremely compact and neat. The drive is only slightly larger than a packet of cigarettes, and doesn't have the large metal chassis associated with larger drives. Gone too are the separate data and power cables - the 2.5" unit uses just a single miniature cable. Currently, only a 20Mb 2.5" drive is available, but ICS are promising 40 and 60Mb units in the near future.

The actual IDE interface fits into just seven chips, including the EPROM

containing the IDE filing system software. These are mounted on a standard size A3000 internal expansion card, with the drive bolted to the board so that it covers the right-hand half. The EPROM is actually mounted on the reverse of the circuit board, as there would be insufficient clearance between it and the drive otherwise.

The rear panel of the interface carries a 40-way IDC plug which can be used to interface to standard external IDE drives, and a 4 way molex plug providing an IIC interface for 'future use'. IIC (I squared C) is a serial interface developed by Philips for connecting sub-systems together within consumer electronics such as hi-fis and televisions. It is provided on the Archimedes mainly to drive the internal real-time clock and non-volatile RAM. However, it seems to attract hardware developers like a magnet, and ICS have followed Morley's lead of providing an IIC connector.

Unpacking ICS's interface is a bit of a shock. The construction of the printed circuit board is very amateurish. There is no solder mask (the green insulating layer seen on most boards), and no screen (the text showing component location). As a result of this, the boards cannot be mechanically soldered, and must be done by hand instead. This invariably leaves large blobs of dried flux on each joint, and no attempt appears to have been made to clean this off. Few designers would accept this as a prototype, let alone a released product. Apart from making the board look ugly, the lack of solder mask means that all the tracks on the circuit board are exposed, with all the more chance of a dropped screw creating a short circuit and doing damage.

The mounting brackets holding the metal backplate are also of poor design,

and the right-hand one has had to be bent in order to fit the drive. However, the piece de resistance of mishaps is in the form of the connectors on the interface which plug into the A3000. On the A3000 there are sockets for two 17-way connectors, and two 5-way ones. The *ideA* card only needs one of these 5-way connectors, and then only for the IIC bus. Unfortunately, ICS have installed the wrong connector, and have had to cut it off, and re-attach it using two wires. A note apologises for this error.

USING THE *ideA*

The interface can be installed in just a few minutes, the only problem being the proper location of the incorrect connector in its socket. Once installed, the first thing you notice, or rather don't, when turning the machine on is any noise. This is because the PrarieTek PT120 drive used has a sleep mode, and initially doesn't spin until accessed. You should however, see a hard drive icon added to the icon bar, with the name 'IDE 4'. If this doesn't appear then you will need to use the command *Configure IDEdiscs to select the number of drives connected (the IDE standard supports up to two drives). A further configure command, IDEDirCache, allows the amount of memory set aside for caching directory contents to be controlled, just as for ADFS.

Assuming all is OK, clicking on the IDE drive icon will cause the drive to spring into life, and after a short delay a directory viewer will appear, just as for any other drive. Pressing Menu over the icon bar icon offers you the expected Namedisc, Free, Dismount and Verify commands. As with other hard drives, formatting has to be done using a special formatter which is supplied already on the drive. From outside the Desktop, the IDE filing system can be selected using the command *IDEFS, or by using the filing system prefix IDEFS: in pathnames. The drive contains an application to set up an MS-DOS partition for the PC Emulator,

and a further utility to read various low-level information about the drive.

There are three additional star commands provided by the IDE filing system. Two of these, *IDEProtect and *IDEUnprotect, allow you to enable and disable write access to the drive - very useful in an educational environment. The final command, *IDEPowerSave, controls the sleep mode provided by some drives, the PT120 included. You can specify a period of time, in units of five seconds, after which the drive stops spinning if it has not been accessed. Setting the minimum rate of one will effectively stop the drive between all operations, just like a floppy.

In terms of reliability, the drive seemed robust enough, though it was rather sensitive to the computer being moved when it was running. Even rotating the machine slightly without any jerking caused errors until the drive was stopped and restarted. This is probably a direct consequence of the small size of the drive, and will no doubt be improved in the second generation of 2.5" drives.

I decided to delve a bit deeper into the IDEFS software, and made an interesting discovery. The relocatable module that contains the IDE filing system and is loaded into RAM from the on-board EPROM, doesn't claim any workspace. This seemed rather odd, as all programs require some variable storage. Further investigation revealed that this is because the IDEFS module is self-modifying, changing data areas within it as it runs. Any supporter of structured programming will tell you this is not a good idea, especially considering that Acorn provide all the calls needed to claim and release workspace. From a practical point of view, this may not cause problems at the moment, but it is possible that in the future, Acorn will separate the data and code parts of the relocatable module area, and write protect the code. This will stop

the current version of the IDEFS from working at all.

As with many hardware add-ons, the documentation supplied is terse but adequate. It covers installation and use, and also deals with connecting IDE drives from different sources. Many IDE drives have translation modes to mimic the geometries of other drive types, and some advice is given on how to configure this type of drive for the *ideA* interface.

COST AND SPEED

Table 1 gives data transfer rates for the 20Mbyte 2.5" IDE drive, together with figures for SCSI and ST506.

Drive	Transfer rate (kb/s)		
	Mode0	Mode15	Mode21
Acorn ST506 (20Mb)	280	271	16
Oak SCSI (20Mb)	607	536	55
IDE (20Mb)	write 253	246	58
	read 275	275	170

Table 1. Data transfer rates

To compare the timings better, you need to appreciate that both the ST506 and SCSI interfaces are transferring data to and from the computer 16 bits at a time. The A3000 IDE interface on the other hand has to use 8-bit transfers because of the architecture of the expansion bus. The Archimedes version of the *ideA* interface uses full 16-bit transfers, and will be considerably faster. Intelligent drives (SCSI and IDE) can also employ local caching, and this may contribute to the particularly high rate for the SCSI interface. Furthermore, note that in mode 21 (640 by 512 - 256 colours) the IDE system was considerably faster reading than writing. In practice, data will be read more often than it is written, and hence this will increase the overall average speed.

The other comparison has to be cost. Table 2 shows price comparisons for various *ideA* options alongside equivalent SCSI and ST506 systems. You can see

that already, IDE is a cost-effective choice, and with IDE prices still falling, its future looks very rosy indeed.

Drive	Cost (ex VAT)
<i>ideA</i> 20Mb A3000	£375.00
<i>ideA</i> 40Mb Archimedes	£299.00
Oak SCSI 20Mb Arc	£535.00
ST506 20Mb (410)	£173.87
Morley ST506 20Mb (A3000)	£369.00

Table 2. Cost comparisons

CONCLUSIONS

IDE is *the* small-computer drive standard for the future - take it from me. ST506 is on the way out, with rumours that large companies such as NEC will pull out of the ST506 drive market this year. SCSI will live on as an interface bus for large and fast hard drives, and a multitude of other peripherals such as scanners and printers. However, even SCSI has only a limited future in the small drive market.

As for Ian Copestake Software, full marks for getting the *ideA* to the market at a time when few people had even heard of IDE. However, as you may have guessed, I was far from impressed by both their hardware and software, and I think these need to be improved dramatically before buyers will be happy with the product they purchase.

I would, in any case, advise prospective purchasers to wait a while. There is no doubt that IDE drives will drop in price further in the coming months, and in the case of 2.5" units reliability will increase. Add to this the fact that given six months there will probably be a choice of IDE interfaces from several manufacturers, a while longer spent using floppies will be worth it.

Supplier **Ian Copestake Software**
10 Frost Drive, Wirral,
Merseyside L61 4XL.
Tel. 051-648 6207

For full details of current product range and prices, contact ICS directly.

RU

We now offer 25 discs from BEEBUG's Public Domain Library, and we will continue to add further titles in the future.

We are also offering a **Sampler** disc with a selection of public domain programs from all areas of interest.

Our Public Domain discs contain as near as possible to 800k (and not less than 700k). Each disc includes a 'Read Me' file, and there are some instructions with the programs.

It is our policy with our Public Domain Library that the Public Domain discs are available only to RISC User members for **£2.99** (postage is 60p for the first disc and 30p for each additional disc). The discs are offered as seen, and we cannot enter into any discussion regarding their contents.

To order phone **(0727) 40303**,

Fax (0727) 860263, or write to (quoting your membership number):

BEEBUG, 117 Hatfield Rd, St. Albans, Herts AL1 4JS

DEMOS

PD12 Disc

Contains 5 sound and graphics demos from Hugo Fiennes of the Serial Port. All five are stunning examples of what the Arc is capable of.

PD21 Disc

Contains three demos, Balls, Balls2 and BIA-Tetris. The latter is a game as well as a demo.

PD22 Disc

Contains three demos, Noah, Chips and Demo01.

PD23 Disc

Contains four demos, Bounce, Crimbo, ColDemo and Rotate.

PD24 Disc

Contains three demos, Demo, Gopher and Overscan.

PD25 Disc

Contains four demos, Deskballs, DudsDemo, EglIntro, and Z-Brother.

PD 26 Disc

Contains three demos, Sister, Wibble and SkullDemo.

PD27 Disc

Contains two demos, GrannyChow and Windows.

GRAPHICS

PD13 Disc

Contains the !Projector application that displays films created with the Ace Computing Mogul package. Six example films are included.

PD18 Disc

Contains a program that displays several still and animated ray traced pictures.

EDUCATION

PD14 Disc

Contains REG, a suite of programs for recording student achievement levels in schools. Also, included is a way of recording attainment with Colton Software's Pipedream.

ART

PD15 Disc

Contains Artist+ and BigM, both 256 colour art packages, along with Design, a symmetrical pattern designer.

MUSIC

PD01 Disc

Contains Soundtracker playroutine plus the following tunes: Aces-Hi, Acidbat2, AfI, Alf, ArtNoise, AxelF, Backpopped, Big, Blitzwing, Blizzard02.

PD02 Disc

Contains Soundtracker playroutine plus the following tunes: BatMix, Bobby, Brill, Burning, Chartmix, Chippene, Demo2.

PD03 Disc

Contains Soundtracker playroutine plus the following tunes: Confusion, Crack, Criminal, Dear, Demons, Dns, Elephant.

PD04 Disc

Contains Soundtracker playroutine plus the following tunes: Doc12, Funky, Ducksong, Electric_2, EndTheme, Enutomed, Equinox5, FinalTFDML, FinalVis.

PD05 Disc

Contains Soundtracker playroutine plus the following tunes: Fyc, GoodTune, Hello, HowDeepIs, Huba, Humanoid, Hunters, Hymn, Idea, Igarun, IntoB.

PD06 Disc

Contains Soundtracker playroutine plus the following tunes: Jazzid, Jmj_China, LastNinja2, Like, Magnetic4, MegaForce0, Minimize, Mod, New_Biz.

PD16 Disc

Contains 230 tunes for loading into the music package Maestro, with enough variety to suit most tastes.

TRICKS AND NOVELTIES

PD17 Disc

Contains a collection of 27 amusing trick and novelty programs. Some of them produce the weirdest effects!

GAMES

PD19 Disc

Contains 10 games programs, Adventure, Battle, Battleships, Connect4, Darts, Fish (Pelmanism), Fruit Machine, Golf, Hangman and Impact.

PD20 Disc

Contains 12 games programs, Invaders, Line Of Five, Othello, Pelmanism, Rocks, Rubik Cube, Simon, Solitaire, Star Trek, Tetris, Tile Trial and Yahtzee.

UTILITIES

PD28 Disc

Contains 20 utilities of various types. These are all extremely good and there is something here no doubt to please everyone. Space does not permit full descriptions but the file list is, 1stFile, ASm2, CloseUp, Crypt, Dir, Display, Drawlink, Dustbin, Filetypes, FileUtils, Find, Keys, Loadprogs, MultiPrint, NewBar, NewCodes, PD_Impress, PrinterTx, ProgCalc, and Set_Type.

CLIPART AND PICTURES

PD29 Disc

Contains over 4 megabytes of Sprite pictures which can be used as clip art to load into DTP or use in your programs. The files are naturally in a compressed form, and the disc contains the file to decompress them and instructions.

PD30 Disc

Contains over 2 megabytes of Sprite clip art and Draw files to load into DTP or use in your programs. The files are naturally in a compressed form and the disc contains the file to decompress them and instructions.

Public Domain Sampler Disc (PDS1)

This disc contains sample programs from the Beebug Public Domain Software Library. The programs are as follows:

SOUNDTRACKER

The Soundtracker application is used to play back a music file *Toccata* made of real sampled sounds which are sequenced to form a complete tune lasting several minutes. The quality of this is quite stunning, particularly if played through the computer's monitor speaker, or a hi-fi system.

ACCOUNTS

This is a home accounts program. There are no instructions included with the program but all functions are selected from the main menu which is self explanatory. An example file is included.

DISC LABEL

A versatile disc labelling program producing professional looking labels for 3.5" discs. A Help file is included with the program.

FOLLOW

A novelty program that when run puts a pair of beady eyes on the Desktop which follow the mouse pointer wherever it goes. Eerie!

HANGMAN

A well presented and implemented version of the old word game of Hangman with an animated finale.

MULTIPRINT

A utility to allow the printing of files by creating a task list of the files to print before sending them to the printer. A Help file is included within the program.

ROTATE

A fascinating animated demo in which you can alter the effects by pressing a few keys on the keyboard.

STD

A useful utility to search for telephone STD codes or find a town from its STD code. A ReadMe file is included in the program.

WANDA

A novelty demo program that infests your desktop screen with a shoal of bubble-blowing goldfish!

The Secret Life of Edit

by Lee Calcraft

The Edit text editor supplied with the Archimedes is a very useful piece of software. Indeed if you are developing programs for the Archimedes, whether in Basic, C or any other language, and you want to work within the multi-tasking environment of the Desktop, then you have very little alternative but to use Edit. In what follows, I want to document some of the lesser known features of the beast, and to give some hints on using it to the full. Additionally, Edit's missing keystrip is supplied in a number of different formats on this month's disc.

UNDOCUMENTED KEYS

Shift-F1

As we declared in a hint in RISC User some months back, this key toggles between Insert and Overwrite mode. When you are in the latter, the word *Overwrite* is displayed in the window title bar.

Ctrl-F2

This has the same effect as clicking on the Close icon of an Edit window. In other words it will close the window if no changes have been made to the text since the last secure save (or since the text was loaded). But if the text *has* been changed, you will be asked if you want to save it before deletion. You can respond to this by clicking on the *Yes* or *No* icons. Pressing Return will have the same effect as clicking on *Yes*, and the Save box will appear.

The upshot of this is that if you want to close a window and save the contents, you can use the following sequence:

Ctrl-F2

Return

Return

Because, in accordance with Acorn's guidelines, the function keys can be used to give responses to dialogue boxes, with F1 simulating a click on the first response icon, and F2 on the second, we can use the following sequence to close an Edit window without first saving its contents:

Ctrl-F2

F2

Ctrl-F7

This can be a very useful key. Its effect is to go to the start of a marked section. At the same time, it removes the markers from their previous position, and marks the character immediately following the caret's original position. It therefore acts as a toggle between two positions.

To see it in action, use F6 to mark the character at the caret, then move to somewhere else in the document by using Page-Down etc. Now each time you press Ctrl-F7 you will toggle between the two positions.

At the simplest level, you can use this key as a "Go to marked text" with the proviso that it removes the markers as part of the process.

A USEFUL SCROLLING OPTION

The effect of the cursor keys is well documented in the User Guide, but one particular combination may have escaped your notice. If you hold down Ctrl and Shift together while using the Up or Down

Expand Tabs			
	Close Window		Indent Block
Insert / Over	Insert File		
	Load File	Save File	Find Text

	Format Block
	Clear Block
Go To Line	Mark Block

E



Running Basic from an Edit Task Window

cursor keys the effect is to scroll the display without moving the caret. This means that if the caret is near the bottom of the window, say, and you want to look at lines just out of view at the top of the window, all you have to do is to use Ctrl-Shift-Up, and they will come into view immediately, without having to wait for the caret to crawl up to the top of the screen first.

TEXT MARKING

You have probably found when marking text in Edit that it is all too easy to mark far more than you want to. For example if you use Select to place the caret at the start of a word, then use Adjust to place the caret at the end of the word, and so mark the whole word, that a much greater area becomes marked. This is because Adjust will extend any previously marked area right up to where you put the caret. There are a number of ways to avoid this.

One is to use Ctrl-Z to clear any previous markings beforehand. A simpler, yet more powerful way is to just move the pointer to

one end of the area to be marked, then hold down the Select button, dragging the pointer to the other end of the area to be marked (moving vertically marks all lines traversed).

A different approach is to use a double-click to mark the word at the caret (or a triple-click to mark the line at the caret) - so clearing any previous markers, and then extend the newly marked area with Adjust if necessary.

USING MARKED TEXT

One problem with the way in which text markers are used in Edit is that if you mark a block of text to move (or copy) to some other place, you cannot use the Find option (F4) to find the destination, because when you do this, Edit will have removed your original markers, and placed them at the new position which it has found.

There are a number of ways around this:

1. Create a new window by clicking on Edit's icon bar icon, and first copy or move the required block of text to this as an intermediate stage. Then use Find to find the place where you want to deposit the text, and just move the entire contents of the new window to this point. This approach relies on the fact that you can copy from one Edit window to another just as easily (and by using the same method) as within a single document.
2. Create a new view of your document (using the Misc option on the window menu), and find the destination position in one view (using Find if you like). Then use the other window to find the piece of text to be moved, mark it, and

T

Toggle to Mark	CR <-> LF
ove Marked	
py Marked	Undo

			Exit Desktop
Redo			* Commands

place the caret back in the first window to give the destination of the move.

3. Alternatively, you can use the *Go to* option (F5) to find your place. First find the destination position. Now find what line number it is on by pressing F5, and noting the number displayed. Now find the text to be moved (using *Find* if you wish), and mark it. Then use F5, and supply the line number which you noted down. Pressing Return will take you to the destination position, but will leave the original markers in place. Pressing Ctrl-C will complete the copy, or Ctrl-V will effect a move.

Edit\$Options

Under the section *Customising Edit*, the manual explains how to alter features of edit to suit the user's personal preferences. One which I find easier on the eyes is to set the window background colour to black, and the foreground to white. To do this you can use the command:

```
*SET Edit$Options F0 B7
```

The best place for this command is in the !Boot file of your work disc. Alternatively you could place it in the !Run file of the Edit application, immediately before the last line. See the User Guide for other uses of Edit\$Options.

HARDCOPY

Edit has no hardcopy option on its menus. To print a file, you must first install a printer driver application, and then select Edit's Save option, and drag the file icon to the printer driver application icon on the icon bar. When you do this, you will find that you will normally need to issue a manual form feed on your printer to complete the operation. To avoid this inconvenience, just insert a Ctrl-L at the very end of your text. In other words, use Ctrl-Down to place the caret at the very end of your document, then press Ctrl-L. This will be displayed as "[0c]", but when it comes to printing, it will cause a final form feed. If your document is a program of one sort or another, you should remove the Ctrl-L once printing has finished, but if it is a letter, or some other piece of text, you can happily leave it in

place. Of course, you can use the same technique at any point in your document where you want to force a form feed - such as at the end of a section or chapter.

THE TASK WINDOW

If you select the *Create* option from Edit's icon bar menu, and then choose *New Task window*, a new window will appear containing a star prompt. This is a special window which confers multi-tasking status on a wide range of operations. This is achieved by using preemptive multi-tasking to take a timeslice from the processor.

This can be very useful. For example, it permits you to run the (non-multi-tasking) ANSI C compiler while the Desktop continues to run. Alternatively you can use Basic from here (with certain provisos as indicated in the User Guide). To try this out, type:

```
BASIC
```

at the star prompt in the Task Window. You will see Basic's normal start-up message within the window, while other tasks continue to operate. From here you can load or type in programs and run them (but you cannot use Copy key editing). However, the task window filters out many VDU commands. CLS and mode changes will be ignored, as will graphics commands. But you can run non-Wimp programs whose output is text-based, and perhaps more usefully, you can quickly load and examine a program, and even make small alterations to it, before saving it back.

B_to_T

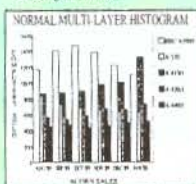
Finally, if you want to use Edit to edit Basic programs, you will need to convert them into a suitable ASCII format first. The very useful Desktop utility *B_to_T* performs this task from the icon bar. For full details see RISC User Volume 2 Issue 8 page 11, with enhancements in last month's issue. Last month's magazine disc contains the enhanced version of this utility.

On this month's magazine disc we include a Draw file and an Impression file for printing a keystrip for Edit using an appropriate choice of printer driver. **RU**

A selection of 12 multi-tasking Desktop Applications MARC ONE

for only
£9.95

- **DataSheet** — Data Presentation Package for creating annotated graphs in a variety of formats for display or printing.
- **Calc 570** — Scientific Calculator, a Desktop Implementation of the Casio FX570.
- **CharDes** — Character Designer for creating new system fonts.
- **Diary** — A multi-tasking Desktop Diary and calendar.
- **R to T** — Application Handler which allows programs to be edited without leaving the Desktop.
- **FileFind** — File-find utility which performs hierarchical search for a given file, application or directory.
- **SetType** — Filetype Setter which you can use to change the filetype of any file by dragging it to the icon bar.
- **HotKeys** — A Desktop hotkeys utility that allows single key presses to perform a wide range of functions.
- **Mouse** — Mouse-speed Controller for changing the mouse speed merely by clicking on an icon.



- **Print** — Multi-format Print Utility — allows text and program files to be printed just by dragging them to the icon bar.
- **NotePad** — A Desktop Notepad application which provides for up to eight pages of jottings.
- **Dustbin** — Desktop Dustbin which sits on the icon bar and allows files to be deleted by simply dragging them to its icon.

MARC THREE 3 Exciting New Outline Fonts

(Chancellor, Katjyo and Chinese)

for only
£9.95

Desktop PC Disc Reader and Background Text Printer

plus:

- **Sticky BackDrop** — places icons anywhere on the desktop.
- **Application Shell Generator** for creating application directories, sprites and 'Run files.
- **Wimp Front End for the Basic Editor.**
- **Watchdog Anti-Virus** — protect your hard and floppy discs from viruses.
- **Keystrip Generator** (both 9- and 24- pin matrix printer versions).
- **Encode** — a file encryption utility
- **CMOS RAM Manager**
- **Ovation Clip-art** — from Beebug's highly successful DTP package Ovation.
- **Amaze** — a graphically superb and entertaining game.
- A selection of the best **Maestro music files.**
- **Advanced Desktop Presentation Creator** — screen display with a choice of different fades.
- **Palette Files for Colour Printers.**
- A complete set of **ArScan** image data for RISC User Magazine Volume 3.



Outstanding Value

A collection of 7 Original Archimedes Games ARCOMNIBUS

for only
£9.95

- **Amaze** — a graphically superb sliding block game with a difference.
- **Cribbage** — an excellent implementation of the well known card game.
- **Moric** — a colourful 'ladders and levels' game.
- **Ogre's Lair** — a highly entertaining arcade type game, providing hours of fun.
- **Pick a Pair** — a colourful game testing your skills of observation and memory.
- **BalloonMan** — burst the balloon — a Pacman style of game.
- **Dominoes** — a Desktop version of the classic game of dominoes.



File Handling for All

by David Spencer and Mike Williams

for only
£9.95

File Handling for All is a comprehensive book which covers all the requirements of data storage and processing by computer, using the popular BBC Basic programming language for the examples. It is aimed at anybody interested in File Handling and Databases, whether beginners or more advanced users, and will appeal to all who want to learn more of this important subject.

The book starts with an introduction to the rudiments of file handling, and in the following chapters develops an in-depth look at the different types of files e.g. serial files, indexed files, direct access files, and searching and sorting. A separate chapter is devoted to hierarchical and relational database design, and the book concludes with practical advice on developing file handling programs.

The associated disc (£4.75) contains complete working programs based on the routines described in the book and a copy of Filer, a full-feature Database program.

BEEBUG LIMITED

117 Hatfield Road, St. Albans,
Herts AL1 4JS
Telephone: 0727 40303
Fax: 0727 860263

Order Form

Desktop Applications Disc and documentation £9.95 + 60p p&hp/UK Stock Code PDA1

mArc Three Disc 3 £9.95 + 60p p&hp/UK Stock Code 1406

ArComnibus Games Disc and documentation £9.95 +

60p p&hp/UK Stock Code PDA5

File Handling for All £9.95 + £1.30 p&hp Stock Code BR02b

Special offer to RISC User members File Handling for All

book + Disc £11.95 + £1.30 p&hp Stock Code BR03

Please note postage for the discs is £1 for Europe and £2.40 elsewhere; the book is £3.60 Europe and £4.80 elsewhere.

I enclose a cheque for £ _____ all cheques must be in pounds sterling, drawn on a UK Bank, or, Please debit my Access Visa account No.

Card Expiry Date _____ Signature _____

Name _____

Address _____

Post Code _____

DTP Seeds

Inspiration for DTP Users

Mike Williams reviews a book from 4mation which could provide an invaluable source of ideas for all DTP users.

So you have purchased your choice of DTP software, and experimented at some length, using the manual, with what the software can do. Now it's time to produce your first serious effort in DTP, but where do you start? It's all very well having the tools to do the job if you have little experience in typographic layout and design. That's where the book reviewed here can help. *DTP Seeds* by Mike Matson is essentially a DTP source book for all

DTP users, though to achieve some of the more fancy effects you will also need a package like 4mation's *Poster* (see review in RISC User Volume 3 Issue 9). What is more, *DTP Seeds* is at times more than usually entertaining.

What you get for your £8.45 is over 100 pages of lavishly illustrated examples of just what can be done. In fact, the very large majority of the book is devoted to illustrations, with just a small amount of text to help you on your way. The first chapter is concerned with overall page layouts, number and spacing of columns, positions of major titles, and use of white space. Each of the samples is accompanied by comments drawing attention to its salient features.

We then move on to covers and front pages, with many full page illustrations, followed by a look at the requirements for firstly school stationery (betraying the educational bias of 4mation) and then business stationery. Becoming more visually oriented, succeeding chapters cover graphs, invitations, advertisements, flyers, and inevitably posters.

Page Layouts



Needn't be Boring



Page Layouts



..needn't be boring

THE Oyez! 75¢

Friday, April 6, 1991 THE BEST SELLER Published by Clarendon

MONSTER SWIMS UP THAMES

MPs accused of scaremongering

Help arrives

Down draught

Spans part falls

LADIES!
Your last chance to win a man!!!
See Centre Pages

The Oyez!
EPIC FLIGHT DIARY

DAY 12

BARNEY BARES ALL IN BRAWL - Pages 6 and 7

The last few sections of the book deal with headers and footers, titles, logos and emphasis, and it is here that some of the gratuitous humour really shows through. I was particularly taken by *Fence Posts for Collectors*, *Be Your Own Undertaker*, and *Rhino-keeping on a Budget*. Given the potential educational readership for the book, I am not sure whether *Sabotage: a*

Beginners Guide and *Explosives in Education* carry dire warnings of the future or are merely preaching to the converted!



I have two criticisms of this book. In my view there is too much in the way of illustration and insufficient constructive comment, analysis and guidance. It might almost be said to be something of a showcase for the author's own achievements, stunning though many of them undoubtedly are. More seriously, there is virtually no information on font styles, guidance on what fonts are suited to body text, what fonts are better for headings and titles, or how best to mix different font styles within the same document.

This is not a guide to DTP per se, but a source of ideas for DTP users, with particular emphasis on the visual and graphical applications as the

accompanying samples from the book (reproduced with 4mation's permission) show. It might also, in an educational context, prove an ideal basis for the discussion and analysis of DTP in the classroom.



A tremendous amount of effort has gone into this book, which might well provide the inspiration and imagination which DTP users need to lift their results above the ordinary, but don't expect it to be a treatise on all aspects of DTP work.

TAPS
the bathroom centre

THE LARGEST
BATHROOM SHOWROOM
IN THE WEST

SUPPLY
DESIGN
PLANNING
INSTALLATION

38 Wolham Wood Road,
Wolham, RC2 4JV
Tel: (0471) 652713

DTP Seeds by Mike Matson,
published by 4mation 1991
at £8.45 inc. p&p if ordered direct.
Contact 4mation, Linden Lea, Rock Park,
Barnstaple, Devon EX32 9AQ,
tel. (0271) 45566.

RU

Base 5

Base5 DBMS

Base5 DBMS is a suite of BASIC V functions and procedures designed to implement database programs. It is fully compatible with RiscBASIC and ABC compilers.

- ◆ Fully compatible with RISC OS
- ◆ User configurable
- ◆ Compatible with both Basic compilers
- ◆ Extensive search features
- ◆ Multiple databases in use simultaneously with easy communication between them
- ◆ Rigorous in-built error checking
- ◆ Comprehensive documentation of tutorial material, language reference and file format
- ◆ Numerous example databases and programs supplied
- ◆ Extensive import and export features
- ◆ A separate library of mathematical, statistical and calendar functions
- ◆ A fully multi-tasking database application !WimpBase5 as a get-you-started entry point

Base5 DBMS is available now for **£69** (no VAT). Site licences available.
Demonstration disc for **£5**, refundable on purchase of full system.

PairData

First of an increasing number of fully compatible products for use with Base5 DBMS.

- ◆ A BASIC V library for the creation and processing of coordinate pair data
- ◆ !MouseIn, a fully multi-tasking application to write scaled pointer coordinates directly into user designated fields
- ◆ Replace, count, delete or recall records meeting distance criteria
- ◆ Centre of Gravity, mean distances, nearest point calculations etc.
- ◆ Requires Base5 DBMS

Base5 PairData costs **£22.50** (no VAT) (£18 for Registered Users)

Direct from:

Base5
P.O. Box 378
WOKING
Surrey GU21 4DF

Introductory Offer

Base5 DBMS plus PairData for

£89 (no VAT)

Programmer's Workshop

File Compression

Barry Christie and David Spencer investigate methods for compressing data files, and describe a program for compressing screens.

Almost every method we use for storing data in a file involves a large degree of redundancy, and hence waste. For example, consider a plain text file. At most, seven bits of data are required per character (as the ASCII set only includes 95 printable characters), but invariably a whole eight-bit byte is used for each character. By eliminating this extra bit, you could immediately save 12.5%. Another classic case of redundancy is when a file contains large blocks of identical data. For example, a saved screen in which most of the area is background. It should, and indeed is, possible to compress this type of data considerably.

FILE COMPRESSION METHODS

As you would expect, there are a number of different compression methods, each with its own strengths and weaknesses. Perhaps the simplest and most intuitive method is called *Run Length Encoding*. Using this technique, rather than storing the bytes of a file directly, you store a value followed by a count of how many times that value should be repeated. In the case where a value occurs twice in a row, the space used is exactly the same (assuming that only a single byte is used for the count). For runs of greater than two in a row, there is a space saving, as the entire run will be compressed into two bytes regardless of its length. However, for isolated bytes that are not the same as their neighbours, this method will in fact double the storage required for that byte.

Run length encoding is best suited to screen compression, where large blocks are likely to be the same colour, and hence represented by the same value. For text files, in its standard form the method scores very poorly, as runs of the same character are uncommon. However, there is a modification that can be used, based on the spare bit in each byte mentioned

earlier. It works like this: if a byte in the file has its top bit clear, then the remaining seven bits indicate a stand-alone character, as for an uncompressed file. On the other hand, if the top bit is set, then the lower seven bits again represent a character, but now, the next byte contains a repeat count for that character. It should be easy to see that this removes the problem of doubling the storage for isolated characters. Now, the worst case is that the 'compressed' file will be the same length as the original - which occurs if no characters are repeated in succession. The best compression that can be obtained is 128:1, which happens when the entire file consists of the same character repeated. This value is derived from the fact that the count is only a single byte, so a separate value-count pair is needed for each 256 bytes.

HUFFMAN ENCODING

Run length encoding is far from perfect in any form, and a better method is required for all but a few specialised cases. The first method, which we shall only touch on briefly, is called *Huffman encoding*. From now on, we will talk of characters rather than bytes. However, the algorithms work just the same with non-textual input.

The aim in life of this technique is to use fewer bits to represent common characters, than are needed for less-used ones. It does this by replacing each character (or byte value for a non-text file) with a code representing that value. If these codes were of a fixed length, then you could predict exactly the length of the output file, given the input length. Furthermore, when compressing eight-bit bytes, each code would need to be at least eight bits long to represent all the possible combinations, and hence there is no saving whatsoever - not a good compression method! Instead, Huffman

encoding must use variable length codes, with the shorter codes being used for the commoner values. For example, consider compressing the word AARDVARK. The word contains three As, two Rs, and one each of D, V and K. We could choose the following codes:

```
A = 0
R = 1
D = 00
V = 01
K = 10
```

Here we have used single bit codes for the two commonest letters, and two bit codes for the others. This compresses AARDVARK to:

```
0 0 1 00 01 0 1 10 = 00100010110
```

This is just eleven bits, compared to the sixty-four bits needed for the uncompressed string (eight bytes).

But, what happens when we try to decompress the result from above. We could split it up thus:

```
00 10 00 10 1 1 0
```

which gives DKDKRRO - not much like an ant-eater. So what went wrong? Simple really. The encoding we chose couldn't be decoded properly. We had no way of knowing whether the first bit '0' represented an 'A', or should be taken with the second bit to give a 'K'. The solution to this is to ensure that no code forms a prefix of a longer code. In our example, 'A' is a prefix of both 'D' and 'V', and 'R' is a prefix of 'K'. A suitable encoding is:

```
A = 0
R = 100
D = 101
V = 110
K = 111
```

This gives a new output:

```
0 0 100 101 110 0 100 111
```

which now takes eighteen bits. However, the result can be correctly decoded, simply by reading the input bits until a valid code is encountered, and then outputting the letter corresponding to it. You can try this for yourself to prove it works and is unambiguous.

There is not space here to describe the method used to assign codes to characters

with Huffman encoding in any detail. Basically, the input file is scanned to build up a table of characters in order of their frequency of use. This table is then used to create a binary tree (a tree at which each non-terminal node has two sub-trees), which grows down to the right. In other words, at any node, the left sub-tree is no deeper than the right sub-tree. The code for a particular character is found by tracing down the tree to the desired character, taking a left branch to indicate a '0', and a right branch a '1'. Figure 1 shows the tree for our Aardvark, and you should be able to see how the codes are read from it.

THE LEMPEL-ZIV-WELCH ALGORITHM

The Lempel-Ziv-Welch (LZW) compression algorithm, named after its inventors, has the big advantage over Huffman encoding that it doesn't need to scan the file first to work out the frequency of characters. This means that it can be used as a filter to compress data in line, without needing to know anything about the data it has not seen yet. Whereas Huffman encoding uses variable length codes to represent individual characters, LZW uses fixed length codes (normally 12-bits) to represent variable length strings of input.

The LZW algorithm starts with a table for the codes (4096 elements for 12-bit codes) and initialises the first 256 entries to represent the single byte strings with values 0 - 255. The first character of the input file is then read, and called the input string, S. The next character is also read, and this is known as the extension character, E. At each stage, the string SE, formed by concatenating E to the end of S is tested to see if it is in the code table. If it is, then the string S is replaced by SE (i.e. the character E is added to the end of S), the next character is read as E, and the whole process is repeated. If however, the string SE is not in the table, it is added in the first free position; the code representing S, which must be in the table to have got this far, is output; and the extension character E becomes the new

input string S. This is repeated until all the input has been read.

Below is a pseudo code algorithm for LZW compression:

```
Read first character into S
While more input
  Read next character into E
  If SE is in the table
    Let S = SE
  Else
    Output code from table for S
    Add SE to end of table
    Let S = E
Endwhile
Output code from table for S
```

The final line is to output the remaining code when all the input has been exhausted.

To illustrate LZW compression we will assume our input alphabet has only the characters A, B and C, and that we are compressing the string:

ABABCABABAAAAAAAAA

The table will be initialised to contain the characters A, B and C in positions 0, 1 and 2 respectively.

To start with, S='A', and E='B'. The combined string 'AB' is not in the table, so it is added in position 3, the code for 'A' (0) is output, and the string S becomes 'B'. Similarly, at the next stage, the string 'BA' is added to the table. Then, we encounter 'AB' again, so continue to get 'ABC' which is added. If you continue the algorithm for yourself, you will find the output is:

0 1 3 2 3 7 0 9 10 0

and the final table looks thus:

Entry	String	Alternate string
0	A	A
1	B	B
2	C	C
3	AB	0B
4	BA	1A
5	ABC	3C
6	CA	2A
7	ABA	3A
8	ABAA	7A
9	AA	0A
10	AAA	9A
11	AAAA	10A

In the form described above, each table entry will be of variable length, probably causing memory management problems within the compression program. To get round this, each table entry can be stored as the code for a previous table entry plus the extension character. The method by which the table is constructed guarantees this is possible, and the alternate representation is given as the third column in the table. The change to the algorithm to accommodate this involves modifying the line:

```
Let S = SE
to read:
Let S = code for SE
```

In the above example, we have compressed seventeen characters (136 bits) into ten output codes (120 bits for twelve-bit codes). However, the compression gets better for longer files when more 'known' strings will be encountered.

Decoding LZW compressed files is very similar to encoding them. The table is initialised in the same way as for the compression, and the strings are added to it in the same way. The only difficulty arises from the fact that a string from the table concatenated with its own first character will not be in the table, and must be added. It is important to appreciate that contrary to what you might think, it is not necessary to include the string table in the compressed file.

THE SCREEN COMPRESSOR

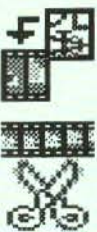
This month's magazine disc contains a program to create a relocatable module-based screen compressor and decompressor. The module provides two commands: *Ssquash <pathname> to save the screen in a compressed format, and *Sexpand <pathname> to load it again. A blank mode 15 screen compresses from 160K to just over 900 bytes. Full instructions are provided on the disc, and the source code is fully commented if you want to study it.

RU

Ace Computing



RISC OS Euclid is the best multi-tasking 3D graphics and animation system for the Archimedes. It is effectively a 3D version of Draw.



Mogul makes full use of **Euclid's** unique hierarchical data structure to generate animations of 3D objects with articulated motion and simultaneous camera motion.

Tween produces films from

Draw files. It uses techniques similar to **Mogul** and generates a film by calculating intermediate frames from a set of key positions.

Arclight is a multi-tasking ray-tracer which will generate a realistic Euclid picture, or a complete Mogul film, while you are free to get on with other work.

Splice allows you to edit films

produced by **Mogul** or **Tween**. You can even produce hand-drawn cartoons by converting sprites from any source.

Such is the enthusiasm for **Euclid**

there is a user group called **Elements**, now in its second year, which provides a quarterly disk containing hints, tips, animations and user pictures.

Arclight £50

Euclid £70

Mogul £20

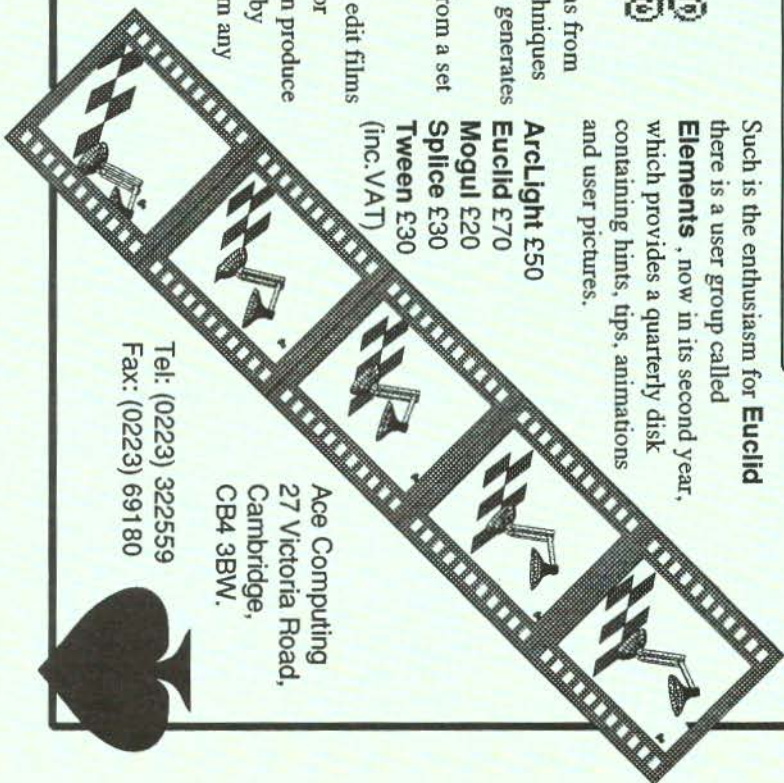
Splice £30

Tween £30

(inc. VAT)

Ace Computing
27 Victoria Road,
Cambridge,
CB4 3BW.

Tel: (0223) 322559
Fax: (0223) 69180



Into the Arc

RISC OS for Beginners (Part 3)

Alan Wrigley continues his look at the Arc's filing systems.

Last month I answered some common questions about filing system principles, concentrating mainly on the ADFS. In this issue I will turn my attention to some specific filing system operations, and address some of the problems which often confuse newcomers to the Arc, using the same question and answer format as before.

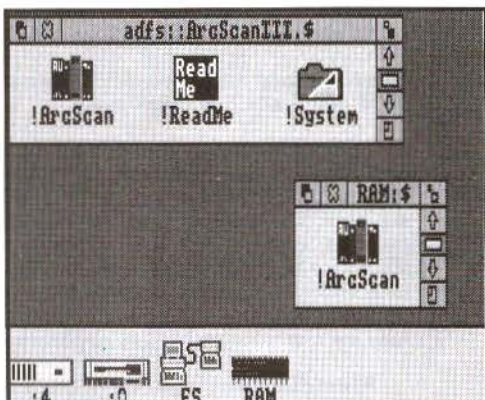
If I try to copy a single application from one floppy to another, I am often prompted to swap discs a dozen times or more, which is very infuriating. Why does this happen?

Copy operations are performed on one file at a time. Each file in turn, however small, is copied into the Arc's memory from the source disc, and copied out again to the destination disc. Obviously this requires the discs to be swapped each time. If the length of the file exceeds the available free memory, then it must be copied in chunks, which involves even more disc swapping. An application can contain several files, often five or more, and may also contain sub-directories with their own files. So you can see that, for a single application, a great deal of swapping must often take place.

This seems very inefficient. Is there a way to avoid this, assuming that I only have a single floppy drive in my machine?

Yes there is. This is where the RAM filing system becomes useful. By transferring the whole application, or a group of applications, from the source disc to the RAM disc, and from there to the destination disc, the whole process can be done with just one disc swap. To use the RAMFS in this way, you must have sufficient free memory to hold all the files you wish to copy. If you click Menu over an icon in a directory viewer, follow the arrow alongside App 'xxx', File 'xxx' or Directory 'xxx' (depending on the nature of the item), and select the Count option, this

will tell you approximately how large the item is.



The RAM disc in operation. The ArcScan application has just been dragged from the floppy disc

There are two ways to set up a RAM disc. Firstly, you may configure your machine so that there is always a RAM disc available on start-up. To do this, press F12 to get to the command line, and type:

```
Configure RamFsSize nK
```

where n is the size required in kilobytes. The next time the computer is switched on, or a Ctrl-Break is performed, you will see a new icon on the left-hand side of the icon bar, looking like a RAM chip and marked "RAM".

The second way to set up a RAM disc is to use the Task Manager. Click Menu over the Task Manager icon and select *Task Display*. Now scroll down the Tasks window until you see the entry for the RAM disc, and pull out the slider with the mouse until it reaches the required size. The icon will appear on the icon bar as described above. If you use this method, the RAM disc will not reappear after a Ctrl-Break or power-on.

Clicking Select over the icon bar icon opens a directory viewer onto the RAM disc, and this behaves in exactly the same

way as an ADFS viewer. Now you may drag your application from the source disc into this viewer, swap the discs over, and drag it back out again to the destination (if you do the second drag with Shift held down, the RAM disc will be emptied at the same time). Figure 1 shows the RAM disc directory viewer containing an application which has just been dragged from a floppy.

That sounds much easier! Does the RAM disc have any other uses?

The RAM disc is potentially very useful indeed, but it does rather depend on how much memory you have in your machine. The memory used for the RAM disc has to come from that which would otherwise be available to applications, so on a 1 Mbyte machine, for example, there may not be much to spare if you are running any memory-hungry applications.

Provided that you have memory available, however, the RAM disc can be used to speed up some operations significantly, since accessing memory is much faster than accessing a disc. For example, putting your fonts into RAM can help to make DTP work faster, while using the RAM disc as a temporary filing system when working with an application can not only save time but also disc and head wear. If you only have a floppy drive on your machine, you may also find it useful to transfer your system resources, and our *Dustbin* if you use it, to the RAM disc before each session, to avoid the inevitable disc-change prompts later.

Two points should be stressed, however. Firstly, if you move !System or !Fonts after they have been seen by the Filer (which will inevitably be the case if you use the Desktop to drag them), then you must double-click on them once they are in their new location, since otherwise the Filer will use the original pathname if they need to be accessed.

Secondly, remember that anything stored in the RAM disc will be irretrievably lost if the computer is switched off, or if you press Ctrl-Break. So make sure that any important files are saved regularly to disc.

When copying a file from one directory to another, I find that if the filename already exists in the destination directory, the destination file is left intact and the source file not copied. Why is the destination file not deleted, or at the very least, why am I not told that the file already exists?

All copy operations are governed by a set of options held in a system variable called *Copy\$Options*. There are twelve of these options altogether, and a full description of these is on page 208 of the *User Guide*. You can see what the current settings of these options are by going to the command line and typing:

```
Show Copy$Options
```

If you copy files by dragging, the options currently held in *Copy\$Options* will be used, though if you use the command line to copy files you can specify the required options as part of the command, and these will override those in the system variable.

The one we are interested in here is *F(orce)*, which forces the overwriting of existing objects. Normally this is turned off, which is indicated by the tilde character (~) in front of it. If you want to turn the option on, simply use the **Set* command to alter *Copy\$Options*. By default, the variable string looks like this:

```
A C ~D ~F ~L ~N ~P ~Q ~R ~S ~T V
```

so the following command would achieve the desired result:

```
Set Copy$Options A C ~D F ~L ~N ~P ~Q  
~R ~S ~T V
```

Note that you only need to specify the options you are interested in.

If you *do* choose to use the *F* option, be very careful. If the destination file exists, it will be deleted unceremoniously, even if it is locked or has no write permission. You should also note that these options are not retained over a power-off or Ctrl-Break, so if you want to have a set of options other than the default in permanent use you will need to set them up each time you use the computer. The best way to do this is with a boot sequence (see last month's article on creating a !Boot application).

It is worth studying the relevant section of the *User Guide* carefully, since

you may find that some of the other Copy options are useful to you. For instance, the N(ewer) option will only copy a file if the source has a more recent date stamp than the destination, while the C(onfirm) option prompts you for confirmation before performing the action. There is a similar set of options for the *Wipe and *Count commands. All three sets of options can be set and changed from the Desktop by using our *FS_OptSet* utility (Volume 3 Issue 4 disc).

Why is it that sometimes when I open a directory of, say, Ovation files, all the icons are blank, and double-clicking on one gives me the message "No run action specified for this file type"; while other times they have the correct icons and I can load Ovation by double-clicking on a file?

RISC OS can only recognise a certain number of filetypes when it is first started up. Obviously, a great many applications have been written since RISC OS was released, and it would be impossible for the filetypes and icons associated with all these to be built into the operating system. So RISC OS relies on the applications themselves to tell it what filetypes they own, and what to do when they are double-clicked or dragged to a printer driver. This is normally done in the application's !Boot file, which is run automatically by RISC OS the first time the application appears in a directory viewer. In other words, once the Filer has "seen" Ovation, all Ovation files will be correctly displayed (though if the viewer containing them is already open they will not be updated until the window is redrawn), and the correct actions will be carried out when they are accessed.

You can actually see which filetypes are built into RISC OS by running the following short program:

```
10 SYS "Wlmp_BaseOfSprites" TO b%
20 SYS "OS_SpriteOp",268,b%,"ROMSprites"
```

This will save a sprite file in the current directory called *ROMSprites*, which contains all the sprites, including filetype icons, built into the operating system

ROM. Simply load it into Paint to view them.

Often when I try to delete a directory, it stubbornly refuses to be deleted, and remains in the directory viewer. Why is this?

It is possible for directories, and files within them, to be locked against deletion. If you click Menu over a file, then move the pointer across *Access* on the *File 'xxx'* sub-menu, you will see a dialogue box showing the current access state of the file. If the file is shown as locked, it can be unlocked by clicking on the appropriate icon followed by the *Update* box. The file can then be deleted. The procedure is similar for directories except that the dialogue box only has the lock option and no others.

It is possible to select all or some of the items in a directory viewer and perform an access change operation on them all, but if the selection includes items of more than one object type, a hierarchical order is applied, and only those items in the highest rank are updated. The order is applications (highest priority), files and then directories. In other words, if the selection contains applications, only they will have their access state updated. If the selection contains files and directories, only the files will be updated.

Note that, if a directory or application cannot be deleted, it may be because objects one or more levels down the directory tree are locked, and not necessarily the parent directory itself. You will therefore need to move down the tree until there are no further sub-directories to be opened, and then unlock the relevant items, if necessary using the hierarchical order described above.

There is, of course, a lot more to the Arc's filing systems than we have been able to cover in these two articles. The complexity of the subject makes it hard for beginners to computing to grasp fully, but is one of the keys to the power of the Archimedes. However, all the information you need is in the *User Guide*, and you should always turn to this first if you have a problem.

RU

42M Removable Drives – £540

If you are looking for a hard drive for your Archimedes or A3000, why not consider using a MicroNet MR45 removable hard drive ?...

- **Fast** – The average access time is 20 milliseconds, so these are FAST devices. When used with an Oak SCSI card, the file transfer rate is the same as a standard 45M hard drive.
- **Reliable** – The technology of these drives has been proven by use in huge quantities on the Apple Macintosh computers.
- **Robust** – The discs, when not in the drive, are extremely robust. We (deliberately!) threw one half-way across the office, it dropped on the floor and rolled over a couple of times. We then verified it and found that it did not have a single error on it!
- **Flexible** – The medium is removable, so you can use different discs for different uses, each with its own boot file – one for DTP, one for games etc.
- **Physically secure** – The medium is removable, so you can take out the disc and lock it up in a safe place.
- **Secure data** – The discs can be write protected, like floppy discs, to protect the data.
- **Cheap** – The price of the drive, including a single 42M disc, is just £540. (£640 inc VAT) Extra 42M discs are £82 each inc VAT. (SCSI podules are available from £170 inc VAT.)

Public Domain Software

Norwich Computer Services has a range of over 40 discs of Archimedes public domain software from various sources. Many of the discs contain several quite substantial applications for as little as £3.50 per disc. Some of the more popular applications are...

- **!PCDir** – A desktop utility that allows the transfer of files between MS-DOS discs and Archimedes discs. (One of many programs on Careware N°7 – £7. The aim of Careware discs is to raise money for charity. For each disc, £6 is sent direct to charity.)
- **!Translator** – This application allows you to translate between various image file formats – sprite, GIF, TIFF. (Shareware N°21, £3.50, which also has other graphics applications.)
- **!Draw+** is an updated version of !Draw with many extra features including keyboard shortcuts. (Shareware N° 34, £3.50, which also has !Draw lineart and other DTP utilities.)
- **Keystrip printer** – Creates !Draw keystrip from an !Edit file of the text. (Shareware N°32, £3.50 – also has a lot of other DTP stuff on it.)
- **YAIG** – Yet Another Invaders Game – excellent implementation. (Shareware N°16, £3.50)
- **DOS filing system and DFS reader/writer** – These are available on Shareware N°31, £3.50, which also has a 'C' editor and various other utilities.

Ring, write or fax us if you want a full list of our PD software.

Norwich Computer Services

96a Vauxhall Street, Norwich NR2 2SD. (0603-766592 / Fax 764011)

This month David Cawsey presents a new approach to printing fancy letterheads, while Mike Williams examines some of the unexpected consequences which can arise when using BEEBUG's Ovation for double-sided paper.

PRINTING LETTERHEADS ON A TEXT DOCUMENT

by David Cawsey

The Archimedes provides us with two alternative ways of sending output to a printer. Firstly we can output text to the printer in character-mode; this is fast, but we are relatively limited in the styling that we can apply to the document. Alternatively, we can use Draw, or a Desktop Publisher, and output to the printer via the printer-drivers. Even with a dot-matrix printer we can create quite good effects, but the penalty is the slow printing speed.

A potential way of combining the best of both is to create a single page in which a styled portion (e.g. a letterhead) is output via PrinterDM (or other appropriate printer driver), and the remainder is output in character mode. Some applications software may allow this, but it would be convenient to have a general method of achieving it.

This sounds straightforward at first, but there is a snag. PrinterDM issues a 'formfeed' at the end of its output to the printer, and there seems to be no way of suppressing this. A crude solution is simply to wind the paper back before printing the remaining text. It is also possible to edit it out of the appropriate printer entry in the PrData file contained within the PrinterDM application directory (see RISC User Volume 3 Issues 6 & 9), but that would affect all output. A better way is to proceed as follows.

Create the letterhead using Draw. With PrinterDM loaded, and the paper limits displayed, drag the graphics to the

bottom left-hand corner of the Draw window. Then tailor the size of the 'page' using *Page Size* from the menu on the PrinterDM icon, removing all margins and ending with a 'page' just larger than the item to be printed. The graphics may need to be finally positioned, for example, centred across the page width. Now name a file for the printer stream, again via the PrinterDM menu, and then tell Draw to 'Print', creating a spooled print-file. This file can now be called at any time to print a letterhead.

We now address the problem of the formfeed. Edit is capable of editing the print-file directly, even though it is not of type 'Text' (but if in doubt, change the type of the spooled file to make it editable by using:

```
*SetType <filename> Text
```

Using Edit, inspect the end of the file. The end sequence depends on the driver used, but for the Epson 9-pin driver it will be '...[0c] [1b] @'. Delete the [0c] which is the formfeed. We still have the re-initialisation command ([1b] @), and if we leave this, the Top-of-Form position will be reset (which we definitely don't want at this stage). Change the '@' to '<' which simply homes the print-head. Save the file, and if necessary, restore the filetype using:

```
*Set Type <filename> Printout (or  
&FF4)
```

We then only need to issue the *Copy command to print the letterhead (and we can do this from within any application, multi-tasking or otherwise) which allows us access to the Command Line, by typing:

```
*Copy <filename> printer:
```

Then print the character-mode text to have both appearing on the same page.

DOUBLE-SIDED PAGES IN OVATION

by Mike Williams

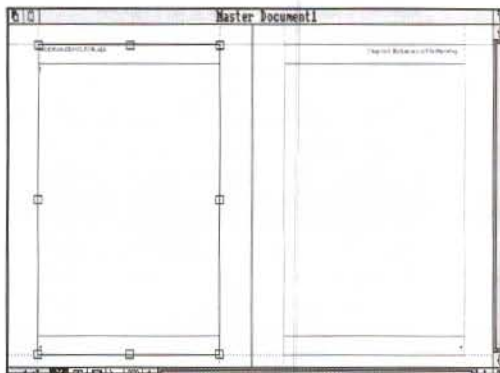
When editing the book *File Handling for All* which BEEBUG published last December, I encountered a situation with one aspect of Ovation, the DTP package I chose for typesetting the book, which I found initially confusing. Books, like many publications, are printed on both sides of each page, and if you are going to make full use of software like Ovation, then it is important to specify your document as *double-sided*.

This will ultimately ensure that page numbers, for example, are positioned alternately to the right and to the left of each page (if that's what you want), and that if your left and right page margins are different (as well they might be) then they also alternate from one page to the next.

The starting point for this is to click on the *Double Sided* option in the *New Document* dialogue box which is used to specify paper size, margins, space for headers and footers, number of columns etc. When starting a new project like a book it is worth looking at other books to see the kind of page layouts they use before determining your own. Even then it is probably worth experimenting until you are sure you are quite satisfied with what you have. At this stage it can be helpful to have a file of text you can simply pour onto the page to get a better idea of what the final result might look like.

At this stage it is also helpful to use the *Paragraph Style* feature to create the different styles you are going to need, at least those that you can think of - more can always be added later. However, the crucial feature as far as we are concerned is the setting up of *Master Pages*. Note the plural: because the document has been specified as double-sided, Ovation will automatically

display two Master pages, one for a left-hand page and one for a right-hand page. Using these you can determine where any footers and headers are to be positioned (and any other features you want to appear on every page).



Double-side page layout used for 'File Handling for All'

In the case of *File Handling for All*, page numbers are positioned as footers, to the left for a left-hand page, and to the right for a right-hand page. The header is used for the book title on the left-hand page (and left justified), and for the chapter title on the right-hand page (right justified) - see figure 1. Incidentally, for convenience, each chapter of the book was treated as a separate document. Finally, as a consequence of that last point, the *Modify Chapter* option from the *Page* menu was used to ensure that each chapter was numbered automatically from the correct page number.

So what went wrong? Inevitably, after most of the chapters were complete, minor editing resulted in some chapters growing or shrinking by a page, and subsequent chapters had to be renumbered. I also found myself both adding new pages, and at times deleting pages. To my horror, I found that as a result, instead of the normal and desirable sequence of left-hand pages with even page numbers and right-hand pages with odd page numbers,

I had some chapters with this sequence reversed. Even worse were some chapters with two (or more) consecutive left-hand or right-hand pages, sometimes in addition to the previous problem.

To understand why this happened it is necessary to think more carefully about the way in which Ovation handles double-sided pages. By default, when you start work on a new document, using double sided pages, Ovation assumes naturally enough that your first page is going to be page one, and page one is normally a right-hand page (like all odd numbered pages). Even if you subsequently specify that the first page number of a document is to be even numbered, it will stubbornly remain as a right-hand page in Ovation. Thus all your left-hand pages will have been transformed into right-hand pages and vice versa.

There is a simple cure for coping with this situation (but do read further as well) and that is to delete the first page of the document. Don't worry; you will not lose any text (unless it has been placed in separate frames), as it will be forced to flow onto the following page with Ovation adding additional pages at the end of the document to accommodate any overflow which results.

For example, suppose you have marked the first page of your document to be page 20, but by default the first page (page 20) is incorrectly a right-hand page. Delete the first page of the document; the text will be reflowed and page 20 will now be a left-hand page in format.

If you think about it, you will realise that this process can cause havoc if you have made extensive use of text and picture frames on subsequent pages of the document. Although the main text will be reflowed, all text and picture frames are likely to be on the wrong pages. It clearly pays to plan ahead, and get the page numbering sorted out as far in advance as possible.

The other problem I highlighted, of consecutive left or right-hand pages comes about in the following way. Suppose you decide to insert a new page into a document. By default, when dealing with double-sided pages, this will always be a right-hand page. In effect, you have a pair of Master pages, a right-hand page followed by a left-hand page; choose one page for insertion and you get the first of that pair. After the insertion, you have destroyed the original right-left-right sequence of pages.

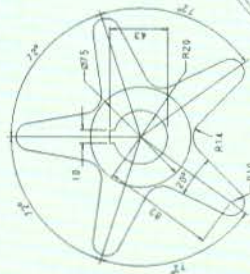
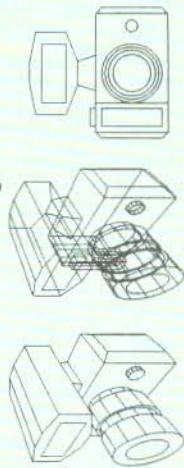
The solution to this problem is to ensure that whenever you insert pages for a double-sided document, you always insert an even number of new pages. Even then you must make sure that each pair is inserted after the correct format of existing page (i.e. always inserts pairs of pages after an even-numbered page). This is what Ovation does; whenever a document overflows its last page, Ovation adds a pair of double-sided pages.

I did also try other solutions to some of my problems, such as inserting a pair of new pages in front of the existing first page, and then removing the first of the new pair. The moral of this tale (which can so often be applied to any computing application) is in two parts: planning ahead before getting into too much detail will nearly always save time and trouble later; secondly, a thorough understanding of how your software works is important if you are to be able to use it efficiently and correctly. Don't blame the software for your lack of understanding. Complex applications like Ovation will nearly always do their best to please, but don't expect them to be mind-readers.

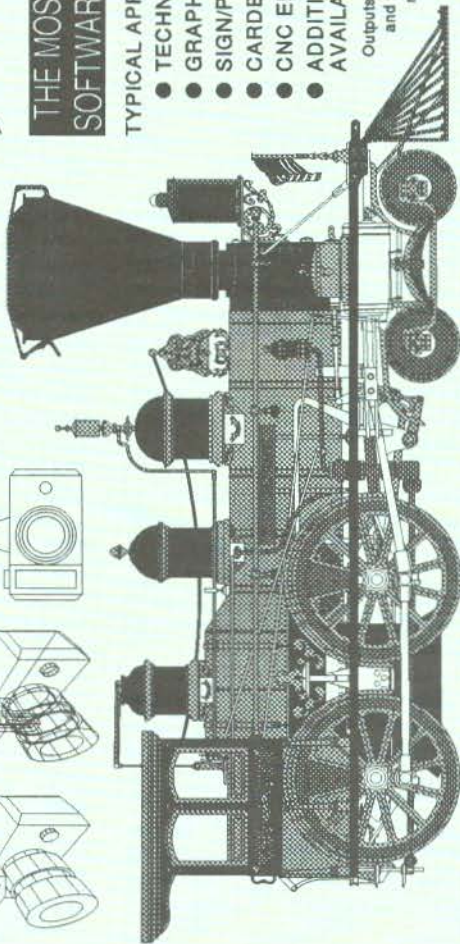
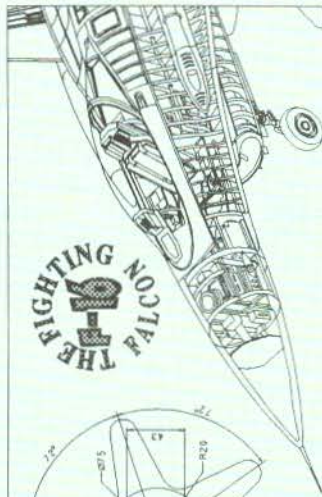
If you use Ovation, then I suggest you check out for yourself what I have outlined above. Your own experience will teach you far more effectively than reading my descriptions, but at the end you should have a better understanding of this aspect of Ovation, and save yourself time and trouble in the future.

RU

TECHSOFT DESIGNER V.3



THE
RIGHTING
NOVA
FALKE



THE MOST VERSATILE GRAPHICS SOFTWARE FOR THE ARCHIMEDES

TYPICAL APPLICATIONS:

- TECHNICAL DRAUGHTING
- GRAPHIC DESIGN
- SIGN/POSTER DESIGN
- CARDBOARD ENGINEERING
- CNC ENGRAVING/MILLING
- ADDITIONAL POST PROCESSORS
AVAILABLE FOR CNC LATHES

Outputs to plotters, cutter plotters, CNC engravers,
and via RISC OS printer drivers. User editable
menus make DESIGNER ideal for education.

£195 + VAT

Site and LEA licences
available. Education
software available free.

PRODUCT GUIDE AVAILABLE DETAILING ALL TECHSOFT PRODUCTS, INCLUDING:
● CAD and CAD/CAM software for the BBC/Master ● DRAWMILL CAD/CAM milling software for the Nimbus
● SIGDESIGN signwriting software for IBM/Nimbus ● wide range of plotters and accessories ● digitisers
● Roland CAMM products ● cutter plotters ● CNC engravers/milling machines ● CAD peripherals, etc.

TECHSOFT

TechSoft UK Ltd.

Old School Lane, Ennys,
MOLD, Chwyd, CH7 4DA
Tel: (082 43) 318 Fax: (082 43) 584

A Desktop File Viewer

by Graham Crow

This program is included only on the magazine disc for this issue.

The application described here, called *ViewFile*, provides an easy way of accessing the OS commands *Dump, *List, *Type and *Print from the Desktop in order to view a file.



The ViewFile window

When run, by double-clicking on its icon in a directory viewer, the application adds its icon to the icon bar. Clicking Select or Adjust over this icon opens the ViewFile window. You can now drag a file from a directory viewer and deposit it either on the icon on the icon bar, or in the File slot in the application's window. The full pathname is displayed, together with the filetype and the file's length. The filename may be edited.

Click on the radio buttons at the left of the window to choose the type of output required (page references may be a few pages further on in early editions of the User Guide):

***Dump** is described in the User Guide (page 209) and the PRM (page 939). It displays the contents of a file in hex and ASCII codes, and may be modified by the addition of a file offset (in hex) and/or a start address (also in hex).

***List** (User Guide page 218, PRM page 948) displays the file contents with line numbers. It may be modified by clicking Tab-Expand which causes Tab characters (ASCII 9) to be expanded to spaces.

***Type** (User Guide page 233, PRM page 963) displays the file contents without line numbers, and may be similarly modified by its Tab-Expand option.

***Print** (User Guide page 222, PRM page 952) displays raw text and should therefore only be used with simple text files (those containing printable ASCII characters plus control codes and Escape sequences which will be understood by the printer you use).

***Configure DumpFormat** (User Guide page 290, PRM page 927) allows you to configure the layout for the above commands. It is a decimal number between 0 and 15, with a default of 4.

If you want hard copy as well as a screen display, select the *Printer* option, making sure that you have installed an appropriate printer driver before proceeding.

To initiate the display, either click on OK or press Return when the caret is in the File slot. The application will then open a window within which the selected file will be displayed in a form determined by the settings of the ViewFile window.

RU

Mastering the Wimp

Part 18: Using Outline Fonts

by Lee Calcraft

Up to now we have only considered the use of the system font when writing text in a task window. In this final part of the series, I want to take a brief look at the use of the outline fonts for both screen displays and for printed output. The support provided by RISC OS for the outline fonts is considerable, and it is not possible to cover all aspects of the topic in this article. For an introductory treatment, the reader is referred to RISC User Volume 1 Issue 3 page 12, and Volume 2 Issue 7 page 13; while for an in-depth treatment, there is no substitute for *The Programmers' Reference Manual*.

There are 34 SWIs associated with the outline fonts, but we shall concentrate on just five or six. Here is a typical sequence of calls which could be used to display a piece of text in one of the outline fonts:

```
SYS "Font_FindFont"  
SYS "Font_SetFont"  
SYS "Font_SetPalette"  
SYS "Font_Paint"  
SYS "Font_LoseFont"
```

The first 'opens' the font in the size required. The second establishes this as the currently selected font and size. Next the anti-aliasing palette is set up, with parameters supplying the foreground and background colours together with the required number of colours to be used in the anti-aliasing process. At last the required text is painted on the screen with SYS "Font_Paint", and finally the font is 'closed' by a call to SYS "Font_LoseFont".

If the program is operating in the Wimp environment, then the sequence is more complex because, as always when redrawing Wimp task windows, a WHILE loop must be used to redraw the rectangles requested by the Wimp. In addition, we cannot use SYS "Font_SetPalette" because this will corrupt the Desktop palette. Instead we

must use either SYS "Wimp_SetFontColours" or SYS "ColourTrans_SetFontColours".

To see how this works out in practice, we will turn to a real example. Listing 1 supplies two procedures to replace those used with last month's program. The effect of using them will be to display outline fonts within the task's window, and to send text in outline fonts to the printer when required.

As well as replacing the two procedures, you will also need to place some calls to SYS "Font_FindFont" at the start of the program, and a corresponding set of calls to SYS "Font_LoseFont" at the end. The following six lines should be inserted immediately after line 80 (which sets up *block%* and *iblock%*):

```
REM 20 pt Trinity  
SYS "Font_FindFont",,"Trinity.Medium",  
320,320 TO f1%  
REM 60 pt Homerton  
SYS "Font_FindFont",,"Homerton.Medium"  
,960,960 TO f2%  
REM 120 pt Trinity  
SYS "Font_FindFont",,"Trinity.Bold",19  
20,1920 TO f3%
```

This 'opens' three fonts for use within the program. The second parameter for this call (R0 is not used) is the name of the font. Normally the name supplied will be that of a font resident in the !Fonts directory - or more precisely, a font resident at the end of a path whose name is held in the system variable Font\$Path. The next two parameters give the x and y point size respectively. The units for this are sixteenths of a point. The first font in our example uses the value 320 for both x and y dimensions, yielding a point size of 20, and a width of 20.

The parameter returned by SYS "Font_FindFont" is the handle of the font, and this is used for identification purposes

with some of the other font SWIs - in much the same way as a file handle. And like files, the fonts must be 'closed' after use. To achieve this, the following three lines should be inserted immediately before the program's END statement:

```
SYS "Font_LoseFont", f1%  
SYS "Font_LoseFont", f2%  
SYS "Font_LoseFont", f3%
```

The parameters supplied here are the font handles of the fonts to be closed.

DISPLAYING OUTLINE FONTS

Once the three fonts have been 'opened' at the start of the program we can ignore them completely until we hit a redraw request. The response to this is handled in the relatively short procedure PROCredraw. Again, for the sake of simplicity, we have opted to redraw the whole window whenever we are asked to redraw any part of it. As you will see, the redraw loop consists of five separate font calls. The first establishes the anti-alias palette. This is then followed by two pairs of calls. The first of each of these selects a particular font, while the second paints the text at the location supplied.

To set up the palette, I have used SYS "Wimp_SetFontColours" (SWI &400F3 PRM page 1285). The second and third parameters (R0 is not used) are the font background and foreground colours respectively. With this call, logical colour numbers are used, and it is assumed that colours 0-7 form a grey-scale sequence. This may not be the case if the Wimp palette has been altered.

I have used colours 0 and 7 - white background and black foreground, rather than the palette used with windows from earlier experiments. The reason for this is to make the screen palette mirror the palette which will be used for hardcopy. To make this work, you will need to use the Template Editor to change the background colour of the task's window to colour 0 (white). Note incidentally, that you cannot effectively use anti-aliasing on the Desktop with colours other than those in

the range 0-7, since there are no intermediate colours available within the Wimp palette.

SYS "Font_SetFont" takes a single parameter, the handle of the required font (as supplied by SYS "Font_FindFont" above). Finally SYS "Font_Paint": the parameters of this call are given in table 1. We have used a plot type of &10. This means that the text will be left justified, with no 'rub-out box', and that x and y co-ordinates marking the start of text will be supplied in OS units. For details of text justification, and of rub-out boxes, the reader is referred to the PRM page 1444. A final point to note in connection with this call is that, as usual, the origin is at the top left-hand corner of the work area, so that y co-ordinates range from zero (at the top of the window) to negative values.

On entry

R1 pointer to string to be painted
R2 plot type
R3 x coord (OS units or millipoints)
R4 y coord (OS units or millipoints)

On exit

R1, R2, R3 and R4 are preserved.

Plot type

Bit	Action
0	1=justify 0=left justify
1	1=rub-out box 0=no box
2	reserved - must be 0
3	reserved - must be 0
4	1=OS units 0=millipoints

All other bits are reserved, and must be set to zero.

Table 1. The parameters used with SYS "Font_Paint" (SWI &40086)

When you come to run the program, you should get a display similar to that in figure 1. As always when using the outline fonts you should ensure that sufficient memory has been allocated for font use, either with:

*Configure FontSize <size>
(followed by a reset), or from the Task Manager. The example here makes use of

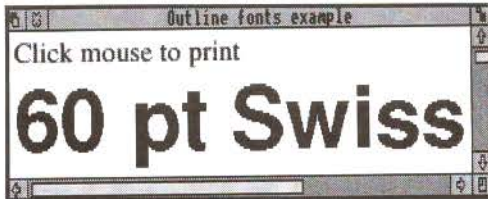


Figure 1. Using the outline fonts in a redraw loop. Note that only the smaller font is anti-aliased

some fairly large fonts, and you should if possible allocate around 128K to minimise file access during redraws.

USING THE PRINTER DRIVERS

Depending on the quality of your printer, some quite spectacular results can be obtained by sending graphics and outline fonts to the printer drivers. If you replace last month's PROCprint with the version listed here, you will get an idea of what can be achieved. If you run the new application, and follow the message on the screen, and click Select over the application's window, printout will begin (assuming that a printer driver has been installed). The result is featured in figure 2, but this does not do justice to the crispness of the finished article (assuming that a high resolution printer has been used).

Looking at the code, you will see that the new version of PROCprint is very much like the old one, except that the lines falling within the redraw loop follow the style of those used in this month's window redraw loop - but with one vital difference: the anti-aliasing palette is set using SYS "ColourTrans_SetFontColours" rather than SYS "Wimp_SetFontColours". It is essential to use the former here to achieve the best conversion of the colour palette into printed output.

The parameters used with this call are as follows:

- R0 font handle (0 for current font)
- R1 background palette
- R2 foreground palette
- R3 maximum colour offset

The palette is supplied in the usual &bbggrr00 format described last month, and we have used white as the background colour, and black as the foreground. The final parameter gives the number of colours to be used for the anti-alias palette (the number of the 'in-between' colours used), and may take values from 0-14. Now if we are sending all this to the printer drivers this parameter will be ignored, since you cannot perform anti-aliasing on a mono printer, because 'paper pixels' can only be black or white (white=no dot). I have nevertheless used a parameter of 6 (the Wimp grey palette runs from colour 0 to colour 7, and has 6 'in-between' colours) for compatibility with screen use, as we shall see in a moment.



Figure 2. Printed output from the program. The quality of Acorn's outline fonts is excellent; though you will need a high resolution printer to see the full effect

If you look at the printout produced, you will see that it is different from the screen display. It contains an additional rectangular border, and the text is different. This is easy to achieve, because we have used different code for redrawing the task's window from that which addresses the printer drivers. In many applications, however, it is vital to achieve a WYSIWYG

effect. In a word processor or DTP package, for example, it would make a great deal of sense to use a single piece of code which could be called by the equivalents of PROCredraw and PROCprint.

The simplest way to achieve this is to use SYS "ColourTrans_SetFontColours" for both screen and printer colours. In this case, the final parameter supplied with this call becomes important, since it is necessary for on-screen anti-aliasing.

There is clearly much to experiment with here, and the program could easily be extended to generate almost any kind of hardcopy. For example, it could read in a file of names and addresses, and print out smart looking address labels; or you could generate graphs, bar charts, posters, or whatever - all with the same pixel perfect crispness, given of course a good quality printer.

As I hinted earlier, this really is the last episode of this long-running saga, though we have barely scratched the surface of the innermost workings of the Wimp in many cases. However, I hope that the techniques covered will provide sufficient incentive to experiment further with Acorn's excellent windowing environment.

This is not of course our last word on the subject! We expect to carry a number of articles in due course on further aspects of programming the Wimp in Basic, and next month we will be starting a new series on using C to create Desktop applications.

```
2000 DEFPROCredraw
2010 SYS "Wimp_RedrawWindow",,block% TO
more%
2020 x0%=16+block%!*4-block%!*20
2030 y0%=-16+block%!*16-block%!*24
2040 WHILE more%
2050 SYS "Wimp_SetFontColours",,0,7
2060 SYS "Font_SetFont",f1%
2070 SYS "Font_Paint",,"Click mouse t
o print",&10,x0%,y0%-40
2080 SYS "Font_SetFont",f2%
2090 SYS "Font_Paint",,"60 pt Swiss",
&10,x0%,y0%-200
2100 SYS "Wimp_GetRectangle",,block%
```

```
TO more%
2110 ENDWHILE
2120 ENDPROC
2130 :
2140 DEFPROCprint
2150 DIM trans% 16,rect% 16,plotat% 8,r
ectin% 16
2160 OSCLI ("RMensure PDriver 0 ERROR 2
55 No printer driver installed")
2170 SYS "Hourglass_On"
2180 pf%=OPENOUT("printer:")
2190 IF pf%=0 THEN ERROR 255, "Printer
not available"
2200 SYS "PDriver_SelectJob",pf%,"Test
job"
2210 LOCAL ERROR
2220 ON AbortJob LOCAL:RESTORE ERROR:SYS "
PDriver_AbortJob",pf%:CLOSE#pf%:PROCerro
r:ENDPROC
2230 REM Given rectangle
2240 rect%!*0=0:rect%!*4=0
2250 rect%!*8=1000:rect%!*12=850
2260 REM Transformation
2270 trans%!*0=1<<<16:trans%!*4=0<<<16
2280 trans%!*8=0<<<16:trans%!*12=1<<<16
2290 REM Where to plot it in milli pts
2300 plotat%!*0=1*72000:plotat%!*4=6*7200
0
2310 SYS "PDriver_GiveRectangle",0,rect
%,trans%,plotat%,&FFFFFF00
2320 SYS "PDriver_DrawPage",1,rectin%,0
,0 TO more%
2330 WHILE more%
2340 SYS "ColourTrans_SetGCOL",0
2350 RECTANGLE 0,0,950,800
2360 SYS "ColourTrans_SetFontColours"
,,&FFFFFF00,0,6
2370 SYS "Font_SetFont",f1%
2380 SYS "Font_Paint",,"Trinity 20 pt
int",&10,20,700
2390 SYS "Font_SetFont",f2%
2400 SYS "Font_Paint",,"SWISS 60 pt",
&10,20,400
2410 SYS "Font_SetFont",f3%
2420 SYS "Font_Paint",,"Trinity",&10,
20,100
2430 SYS "PDriver_GetRectangle",recti
n% TO more%
2440 ENDWHILE
2450 SYS "PDriver_EndJob",pf%
2460 SYS "Hourglass_Off"
2470 RESTORE ERROR
2480 CLOSE#pf%
2490 ENDPROC
```

FU

the Archimedes

An equation building tool that complements many RISC OS applications, in particular DTP and word processor programs such as Impression and Impression Junior.

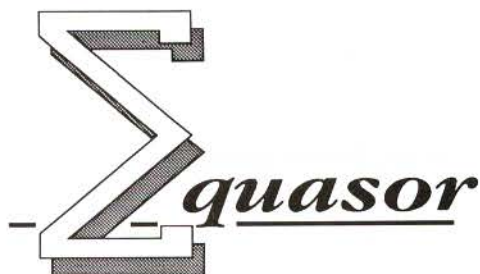
Many users of the Archimedes have a need to include complex mathematical formulae or equations into documents. Equasor allows equations to be built up on screen, graphically, from their component parts. Using the Acorn outline font system it presents a totally accurate view of the final equation at all times.

It simplifies the building of equations by presenting palettes of symbols, functions and operators which can be selected just by clicking with the mouse. It intelligently scales and re-sizes features such as summation symbols, brackets, and square roots as the equation is edited so they are always the right size.

Once the equation has been created it can be saved or exported to any number of compatible RISC OS applications. In DTP packages it can be dropped into frames just like any other drawing where it can then be scaled and positioned as required.

When used in conjunction with Impression II, it can take advantage of the latter's embedded frame capability to embed

equations into the text, even on the line. Once embedded in this way, the equation will then flow with the text as part of the text.

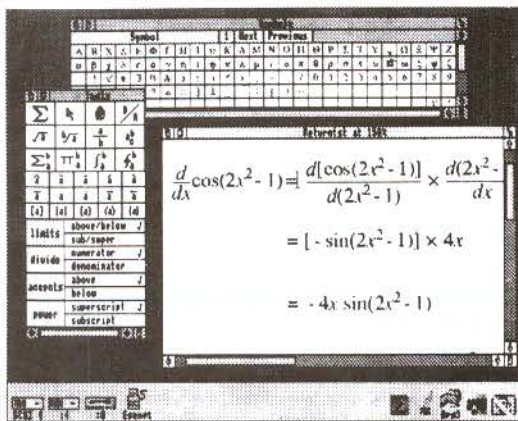


Features:

Multi-tasking RISC OS application. Supports direct in-memory transfer of equations for the fastest, simplest integration with other RISC OS applications. Any number of equations can be handled at the same time. Equations can be viewed and edited at any scale. Saves equations as Drawfiles compatible with all applications that support this format. Supports multiple different RISC OS outline fonts and so is not limited to the Math/Greek font supplied.

- Supports region selection and cut, copy, paste between equations and documents.
- Styles for global control over fonts, size, spacing etc. of variables and operators effects give additional control over the appearance of individual parts of an equation.
- Small, compact program perfectly suitable for 1 Mbyte machines.

Package includes a 60 page spiral bound manual with detailed tutorial reference, and index. Discs include the program, example equations, and Math/Greek outline font.



£49+VAT (£57.57incl.)



Computer Concepts Ltd

Hints & Tips... Hints & Tips

MULTIPLE LOADS

Alan Wrigley

In nearly all cases where a file can be dragged to an application's icon on the icon bar, it is also possible to drag a selection of files to the icon, whereby each file will be processed in turn. This is because the Wimp simply issues a string of *Message_DataLoad* broadcasts, each of which will be picked up by the application when it next calls *WimpPoll*.

FATAL DRAW ERROR

Garry Frost

Beware: do not set any of the grid co-ordinates in *Draw* to zero with *Auto adjust* turned off, or you will suffer a fatal error type 2, which quits the application and removes *Draw* from the icon bar. Any work not saved will be lost. If *Auto adjust* is on and the co-ordinates are set to zero, no error will be shown. However, next time *Auto adjust* is turned off the fatal error will occur.

SETTING MODE ON AUTO-BOOT

Alan Wrigley

If you regularly use a screen mode other than those supplied as standard (for example mode 66 which is supplied by Computer Concepts as part of the *NewModes* module with *Impression*), it can be useful to include this in a boot application at start-up. This can be done as follows. First place the module containing the mode inside the *!Boot* application directory. Then create a short utility called *RunMode* by running the following Basic program:

```
10 DIM code% 32
20 newmode=66
30 FOR i%=4 TO 7 STEP 3
40 P%=0:O%=code%
50 [OPT i%
60 MOV R0,#newmode
70 SWI "Wimp_SetMode"
80 MOV PC,R14
90 ]NEXT
100 SYS "OS_File",10,"RunMode",&FFC,
,code%,O%
```

Alter the value of *newmode* in line 20 to the mode number you require. Now make sure that this utility is also in the *!Boot* directory.

Finally, add the following two lines to *!Boot's !Run* file:

```
RMLoad <Obey$Dir>.NewModes
Run <Obey$Dir>.RunMode
```

DELETING LINES

Alan Wrigley

Don't forget that a quick way to delete the entire text within a writeable icon is to use *Ctrl-U*. This key sequence is processed automatically by the Wimp and therefore works in *any* writeable icon. It is particularly useful in save boxes, where you may wish to replace the name already in the box with one of your own.

WIMP SLOT SIZE

Andrew Cumming

Hints & Tips (Vol.4 Issue 3) described how to use SWI "Wimp_SlotSize" to allocate memory dynamically for a Basic Desktop application. A useful routine is as follows:

```
DEFPROCgrab(a%)
LOCAL new_current%
SYS "Wimp_SlotSize",limit%-&8000+a%,-
1 TO new_current%
IF new_current%+&8000=limit% THEN
ERROR 1, "No room!"
ELSE
limit%=new_current%+&8000
ENDIF
ENDPROC
```

where *limit%* is a global variable pointing to the last byte in the dynamic workspace, and *a%* specifies the number of bytes required.

After a successful call, this routine does not assume the new size is the size requested, since memory is allocated in page-sized chunks, and may be more than was asked for. Instead, the routine uses the value returned from the call.

ARCSCAN FILES IN PIPEDREAM

Francis Aries

Some readers may be more familiar with *PipeDream* than with *Edit*. *ArcScan III* Custom files may be prepared in *PipeDream*, and after the final two hashes, two carriage returns may be added by performing the

Hints & Tips. . . Hints & Tips

following action twice: hold down Alt, enter 13 at the numeric keypad, then release Alt again. To save the file, fill in the name in the save dialogue box, change the line separator to 'CR' and the format to 'Tab', then click on OK to save. If you then display the file in a new PipeDream window, the two final CRs do not show, but *Dumping the file shows that they are there. Update and Magazine files may be prepared similarly with PipeDream, saving in the same way and then altering the filetype with:

```
SetType <filename> ArcScan
```

CONVERTING SOUND MODULES FROM GAMES

Nick Smith

Most sound samples in games, for example those from the 4th Dimension, are stored as individual modules. If you want to load these into a sampler package such as Armadeus then the module player code must be stripped off the start of the file. This can be done by inspection, or with the following Basic program:

```
10 INPUT"Filename: "a$
20 a%=OPENIN(a$)
30 l%=EXT#a%:CLOSE#a%
40 DIM z% a%:SYS "OS_File",16,a$,z%
50 SYS"OS_File",i0,a$,&FFD,,z%+&568
,z%+1%
```

UNPLUGGED MODULE

Alan Wrigley

Some naughty programs unplug modules to free more memory for themselves. One of the candidates for unplugging is the international keyboard module. If this is done, then the standard method of obtaining international characters from the keyboard, i.e. by holding down Alt while entering the character code on the numeric keypad, will not work. All you will get instead is just the number you have typed appearing on the screen, which may lead you to think your keyboard is faulty. Unplugged modules stay unplugged over a power-off or Ctrl-Break, so you must use the following command to restore them:

```
*RMReinit <module name>
```

To see if any modules are unplugged, simply issue the following command:

```
*UnPlug
```

RUNNING APPLICATIONS FROM COMMAND FILES

Glynn Clements

When running an application from a command file, you should always precede the pathname with the *Run* command, and you should always include the filing system and media name (or number) in the command, for example:

```
Run adfs::HardDisc.$ Apps.!Edit
```

If this is not done, then system variables such as *Obey\$Dir* do not include the filing system name. The effect of this is that if a different filing system is later selected (such as RAM:), the program can crash.

STACK EXTENSION PROBLEMS IN C

Lee Calcraft

If your C program overwrites memory (for example by using larger array indices than you have allowed for), the results will be quite unpredictable. You might get an apparently unrelated error message, or the program might hang etc.

One of the more common messages is:

```
No trap for stack handler
```

Unfortunately this message is also associated with a known bug in Clib/RISCOSlib (apparently fixed in the very latest versions - though these are not on general release). If you encounter this message, there is a way to determine whether you have hit the bug, or whether the problem is in your own code. All you need to do is to set the global variable:

```
__root_stack_size
```

to a large value, and re-compile. For example:

```
int __root_stack_size=50000;
```

Note the double underscore at the start of this variable name; the two subsequent underscores are single ones. If this completely fixes the problem (after extensive testing), then the problem is likely to be in the supplied libraries.

The variable `__root_stack_size` controls the default size of the stack (16K in ANSI C version 3.0). The known bug only occurs during stack extensions, so making the stack excessively large for test purposes should prevent the crash. Note that this variable is undocumented, and is not guaranteed to be valid in future versions of the compiler.

RU

ARE YOU GOOD ENOUGH?

As the leaders in software for the Archimedes range of computers, CLARES MICRO SUPPLIES are looking to extend our range even further. We are looking for people who are as excited by the Archimedes as we are.

If you have written any programs, completed or not, then we would like to hear from you.

If you have any ideas for programs and have the ability to execute the ideas then we want to hear from you.

If you have the ability to program the Archimedes but not the ideas to program then we want to hear from you.

Programs can be written in any language as long as they perform their stated task. Many of our programs contain large chunks of BASIC with ARM code in the areas that it is needed. BASIC on the Archimedes is a very powerful language and we do not attach any snob value to its use. If your program does what is meant to do then that's all we are interested in. Why not join the top team on the Archimedes. You get the support of our in-house team, privileged access through us to Acorn and invitations to our informal programmers seminars.

The most important point is that you will be earning top royalty rates of if you prefer we will purchase your program outright.

Please write, in confidence, to Mr. D. Clare at:

**Clares Micro Supplies,
98 Middlewich Road,
Northwich,
CHESHIRE CW9 7DA**

If you have a program either complete or in development then please enclose a copy for our evaluation.

To protect yourself we advise that you lodge a copy of the program with your bank or solicitor BEFORE you send us a copy. You can then prove that your program pre-dates anything that we have.

Act today and become part of the leading software team producing software for the worlds fastest micro.



NUMBER CRUNCHING TO THE FORE

Most of your software reviews are concerned with the manipulation of words, pictures or sounds, and very few, if any, are concerned with the manipulation of numbers. Yet a large body of software exists in both the private and public domain, for essentially numerical, scientific, engineering and financial applications, much of which would work on the Arc, certainly with a PC emulator.

For example, I know that there are some very sophisticated programs for handling airflow round solid shapes, such as car bodies and buildings which I would very much like to locate for my own use.

Dennis Carey

Much of the popular attention on the Arc does seem to concentrate on its capabilities in sound and graphics, and on popular applications such as DTP, word processing, databases, and spreadsheets. Numerical applications are seen as difficult, and not for the average user but for the specialist.

Because of the smaller specialised market for such products, less information appears, and adverts for such software are often tucked away in small ads where they can be readily overlooked.

I would draw the attention of readers to two companies that operate in this field, *Serious Statistical Software* (which advertises in RISC User from time to time), and *Vision Six* which provides Computer Aided Structural Analysis for the Archimedes range. If other readers can provide information on such specialist products we will investigate ways of making such information more readily available. One source is in specialist trade magazines - for example, *Vision Six* advertises in *The Structural Engineer*. For reference, *Serious Statistical Software* is on 051-327 4268 and *Vision Six* is on (0661) 36163.

When it comes to PC software then it is probably worthwhile investigating any publications covering these machines, and/or visiting appropriate exhibitions.

GROUND CONTROL TO RISC USER

Many thanks for printing my letter concerning version 1.07 of our Teletext

software (*Postbag*, RISC User Volume 4 Issue 3). With regard to the comments from Sir George Young, further assessment has led us to discover that there are unpredictable timing differences on the printer port between various models of Archimedes/A3000 machines.

To cure this completely, we have produced version 1.08 of the Teletext software, and this upgrade is available free of charge to customers who return their original disc (V1.01 to V1.07) to us.

Kevin Reeman, Ground Control.

BASIC FROM THE DESKTOP

We use a system for programming in Basic in a Wimp environment which might interest other readers of RISC User, particularly teachers. What we have done is to use a new filetype which we call a **program file**. These are essentially text files but with a run type given by 'Basic -chain %*0'.

The !Boot file on students' discs sets up an icon for the new filetype (here called **ProgFile**) sets the run action for the new filetype, sets function key F12:

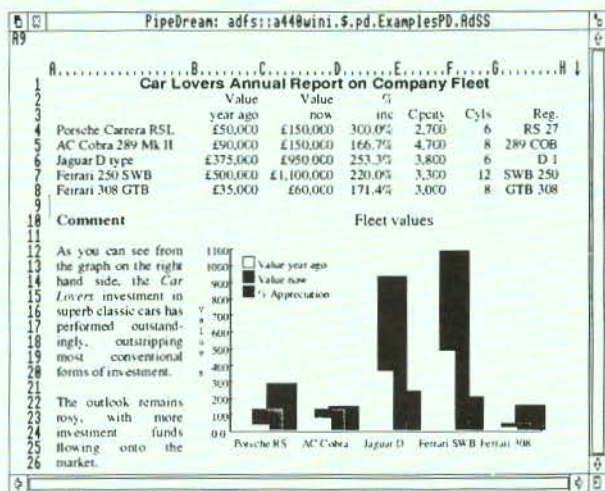
```
Set File$Type_XXX ProgFile
Set Alias$@RunType_XXX Basic -chain
%*0
Key12 **Q.|M"
```

(yes - two *s) where 'XXX' is the three digit hex number chosen to be the filetype, and provides them with a tiny application **Prog**. When a text file is dragged onto Prog's icon, it appends a newline character on to the end of the text file, and converts it to a ProgFile filetype. So to write a Basic program, the student simply creates a text file with Edit (no line numbers) and drags it onto Prog. To run the program the student double-clicks on the program's icon. To edit the program it is dragged onto the Edit icon. This system has worked quite smoothly for a year now.

G.C.Wraith

This approach works well and avoids the problems that many beginners encounter in trying to write Basic programs from within the Desktop. Our application *B_to_T* (see RISC User Volume 4 Issue 5) is also an ideal way of creating and editing Basic programs in Edit (with or without line numbers). **RU**

PIPEDREAM 3



PipeDream 3 breaks down the barriers between word processor, spreadsheet and database. You can include numerical tables in your letters and reports, add paragraphs to your spreadsheets, and perform calculations within your databases.

Based on PipeDream 2, the best-selling integrated package for the Archimedes, PipeDream 3 has been completely re-written to take full advantage of RISC OS - if you can use RISC OS, you can use PipeDream 3. It is fully multi-tasking and multi-windowing, so you can work on many documents at once and instantly move information between them. And since PipeDream 3 can automatically load and save most popular file formats, including VIEW and First Word Plus, switching to it from other programs has never been easier.

Power, flexibility, speed, ease of use. PipeDream 3. Breaking down the barriers.

For a free brochure, see your Archimedes dealer, or phone us on 0954 211472 or return the coupon.

PipeDream 3 is for all Archimedes computers with RISC OS and 1Mbyte of RAM.

PipeDream 3 costs £147.00 +VAT.

Major features include:

- many documents loaded at once
- intuitive RISC OS user interface
- displaying and printing of pictures within text
- built-in 93,003 word spelling checker
- file compatibility with PC & Z88 PipeDream and BBC View Professional
- background recalculation
- keystroke compatibility with Z88 & PC PipeDream
- Z88 filing system
- automatic loading of VIEW, ViewSheet, Lotus, First Word Plus, Tab and CSV files
- automatic saving of VIEW, Lotus, Acorn DTP format, Tab and CSV files
- multi-field sorting
- use of all available fonts
- 62 spreadsheet functions
- external references for 3-D modelling
- macro file recorder
- slot protection

For a free brochure, complete and return this coupon

PipeDream 3 View Professional

Name

Address

Post code

Colton Software, Broadway House, 149-151 St. Neots Road, Hardwick, Cambridge CB3 7QJ, England.
 Fax: 0954 211607 Tel: 0954 211472

All trademarks acknowledged. The chart in the screen shown above was produced by sending numbers from PipeDream 3 to Lingewit's Presenter 2 and then loading the resulting graph back into PipeDream 3.

Colton Software, Broadway House, 149-151 St. Neots Road, Hardwick, Cambridge, CB3 7QJ, England.

Fax. 0954 211607 Tel. 0954 211472

Technical Queries

SPRITE CALLS

Dear Sir

In the article RISC OS Sprite Calls (Volume 2 Issue 6) you list the call SYS "OS_SpriteOp" 50, but without giving details. I notice also some (not fully explained) calls used in the Masked Spheres program (Volume 2 Issue 2). Can you give me fuller details about the parameters, saving masked sprites etc.?

Ray Hemmings

SYS "OS_SpriteOp" is a very powerful call, allowing you to perform almost any conceivable action on a sprite. There are some 42 different reason codes for the call, and to make matters more complicated, each of these can take three forms, depending on whether you are using the system sprite area, the user sprite area with a pointer to the sprite name (add 256 to the reason code), or the user area with a pointer directly to the sprite (add 512). Clearly there is a lot of detail which needs to be understood (it occupies 60 pages in the PRM), and in a future article we hope to explain some of the more useful applications of OS_SpriteOp.

The call you refer to, OS_SpriteOp 50, plots a mask with scale factors. The parameters are as follows:

- R0 = 50 (or 306 or 562)
- R1 = pointer to sprite area control block
- R2 = sprite pointer
- R3 = x coordinate of plot
- R4 = y coordinate of plot
- R6 = scale factors

R6 points to a four-word block containing the x multiplier, y multiplier, x divisor and y divisor at offsets 0, 4, 8 and 12 respectively. The pixel size of the mask is scaled according to these factors.

If you are writing programs, you should *always* set up a user sprite area within the program, rather than using the system sprite area. Full details on how to do this were given in our article on user sprites in Volume 2 Issue 3.

Alan Wrigley

READING TEXT FILES

Dear Sir

Why do all the ReadMe files flash past at impossible speeds unless I load Edit?

Miss E M Gibbs

ReadMe files are usually saved as Text filetypes (&FFF). The default action for running such files is simply to *Type the file. Unfortunately, this results in the text output being sent to a command window in the centre of the screen in scrolling mode, which as you point out, means that the text scrolls off the screen too fast to be read. When Edit is "seen" by the Filer in a directory viewer, its !Boot file will be run, and this sets the run action for filetype FFF to install Edit (if it is not already installed) and load the file.

Various methods to overcome this have been published (see in particular *Hints & Tips* Volume 3 Issue 9); possibly the most useful is to create an application !ReadMe, which when run outputs the text file contained therein to the full screen in paged mode. This was described in our article *Readable ReadMes* (Volume 3 Issue 2), and is the method we have adopted on many of our discs, such as Desktop Applications. It would certainly be helpful if other users adopted a similar process for ReadMes, since not everyone wants to have Edit installed all the time. Readers are free to use our routine on their own discs if they wish.

Alan Wrigley

OSCLI AND OS_GBPB

Dear Sir

Is there a simple way in Basic to save a screen on disc giving the file a name via a statement such as:

```
INPUT filename$
```

*The problem is that the command *ScreenSave does not work with a string variable, so the program needs to be edited each time a different screen is to be saved.*

Also, when I have a number of screens saved, is there a simple way to input

Technical Queries

the filenames from the directory into a string array?

Dr Hubert Reyners

Any star command can be implemented in Basic using the OSCLI statement. OSCLI is followed by a string which evaluates to the correct star command when executed. So it is a simple matter to include a string variable, as follows:

```
INPUT filename$
OSCLI "ScreenSave "+filename$
```

To read filenames from a directory, you can use OS_GBPB 9, which reads the names into a buffer. The following code will read all the names from directory *dirname* into the array *name\$*. Note that, unless you know in advance how many files there are, the buffer should be made long enough to cater for a full directory, e.g. 77 files with the ADFS or 255 with Econet. OS_GBPB returns in R3 the number of names read, so *name\$* can be dimensioned to the correct size. On a filing system which

allows an unlimited number of files per directory, you would need to modify the program to read in a certain number at a time.

```
DIM buff% 1000
SYS "OS_GBPB",9,"dirname",buff%,77,0,
1000,"*" TO,,,n%
DIM name$(n%-1)
FOR i%=0 TO n%-1
REPEAT name$(i%)+=CHR$(?buff%)
buff%+=1:UNTIL ?buff%=0
buff%+=1:NEXT
```

The asterisk passed to R6 in the SYS call is the wildcard character, which ensures that all names are matched. Note that the names when placed into the buffer are null-terminated, which is why the program cannot simply read them with \$buff%, but must accumulate the string character by character until a zero is found. More detailed information on OS_GBPB is in the *Programmer's Reference Manual*, pages 871-878.

Alan Wrigley **RU**

!Personal Accounts A3000/Arc Special Edition Version 2 : £28.95

- RiscOS Multi-Tasking Application
- 28 Automatic Standing Orders/Any Period
- 48 Income/Payment Headings with budget columns
- 10 Bank/Credit/Cash Accounts on-line
- 20 Quick Entry Pre-sets
- 3000 Entries per File
- 50 Character Description Space
- Full Scrolling Entries for easy input/edit/search
- Reports to Screen/Printer/File
- Calculator/Note Pad/Autosave & Much More

"Personal Accounts is very powerful, good value for money, easy to use and comes highly recommended"
Review of Version 1, Archive, November 1990

Apricote Studios

2 Purfls Bridge Farm, Manca, Cambs, PE15 0ND



Tel: 035 478 432



Advertisers' Index RISC User May 1991

Ace Computing	48
Apricote Studios	70
Base5	44
BEEBUG ArcScan	6
BEEBUG Hardware	4
BEEBUG PD Library	36,37
Centre for Statistical Education	32
Clares Micro Supplies	66
Colton Software	68
Computer Concepts	62,63
David Pilling	28
Electronic Font Foundry	24
IFEL	12
Intelligent Interfaces	8
Morley Electronics	72,73
Norwich Computer Services	52
RISC User Products	41
Serious Statistical Software	22
Simtron	16
Skyfall PD	32
Techsoft UK Ltd	56

Personal Ads (free to members)

Archimedes software, Interdictor £12, Nevryon £12, The Real McCoy £16, Twinworld £14, Render Bender £45, Hewlett Packard printer £160. Tel. (0924) 430230.

FREE to a good home; A&B Computing magazine, complete set (must be collected from London area), Speed Read course (tapes) £3. Tel. 081-698 3772.

Archimedes 310M colour, RISC OS, boxed condition & all manuals, PC Emulator, variety of software £700. Tel. (0734) 731574 after 6pm.

WANTED: To contact other Archimedes users (beginners or advanced) interested in prolog programming esp. with Acorn's PrologX. Please send details to Andrew Wenn, 5 View Street, West Essendon, Victoria, Australia, 3040.

Ovation £65, Apocalypse £10. Tel. 069 76 530.

Archimedes A310 with Philips colour monitor, also 20Mb SCSI hard disc, podule and software. Offers! Tel. (0366) 501001.

Archimedes 310, colour system, double disc drive with 5.25" disc interface £900 o.n.o. Tel. (0526) 44149.

Impression Junior S/N 503795, complete and registered £65. Tel. (0428) 713326 eves only.

FOR SALE: Second internal 3.5" disc drive previously installed in a Arch 310 £75 o.n.o. **WANTED:** Single drive for fascia for Arch 310, also MEMC 1a chip. Tel. (0253) 700578 or (0283) 36044.

Archimedes 310 with RISC OS, Modulator, 40Mb hard disc & Panasonic KXP-1124 printer £900 - will split, Geniscan 4" scanner £90, Acorn DTP & Tempest £60 each, Rhapsody & 1st Word Plus £30 each, Knowledge Organiser & A3000 midi interface £25 each, F. Sim III & ArcDFS £15 each, Interdictor I & Superior Golf £10 each, Acorn umbrella & modem £15 each. Tel. (04867) 80632.

Original software £15 for this lot; The Pawn, UIM, PresenterII, Startrader, Monotour, Quazer. £25 for this lot; Interdictor II, Terramex, Repton 3, Arcade 3 compilation, Tallisman, Zarch and £10 for E.F.F. Albert, Sophie and Tamsin fonts. Tel. (0803) 832505.

WANTED: RISC User - Vol. 1 No. 4 £5 offered for clean copy. Tel. (0481) 56266 after 6pm.

• POINTS ARISING • POINTS ARISING • POINTS ARISING •

ADPC (Volume 3 Special Disc)

A curious problem has arisen in that, under some circumstances when creating a Demo, either the program crashes or the Demo application is not completed. This can be overcome by amending line 4350 of !RunImage as follows:

```
4350 OSCLI"ScreenLoad "+file$
```

The reason for the problem is obscure, and may be due to a bug in RISC OS. As published, the program used OS_SpriteOp 3 to load a screen. Substituting this with *ScreenLoad as above appears to work, but all that *ScreenLoad does is to perform an OS_SpriteOp 3!

BIN (Volume 4 Issue 1 disc)

If you try to drag a file to the bin with copy option P (for Prompt) set, the computer appears to hang (though in practice pressing

Return twice clears the condition). To get around this, alter line 2490 of the !RunImage program to:

```
2490 OSCLI ("Copy "A$+" "+C$+" -CF-PR-V")
```

We are grateful to Christian Caminade for pointing this out.

MASTERING THE WIMP (Part II) (Volume 3 Issue 9)

A small error crept into this article on page 57, a few lines above the illustration. \$(block%/72) should read:

```
$(block%/72)
```

IBMCHARS (Volume 4 Issue 4)

Instructions were given in this article for modifying the !Run file of 1stChars. This file should also include the line:

```
Alphabet UK
```

in order to restore the normal 1st Word Plus alphabet.

RU



Archimedes

THE WORLDS
MOST POWERFUL
MICRO

SPECIAL OFFER

Phone for details of our latest special offers. We will match or better any advertised offer.

A3000	£599
410/1	£1099
420/1	£1299
440/1	£1699
The Learning Curve	£699
Arc. Learning Curve	£1299
Jet Set Pack	£649

JET SET PACK

*No Monitor
Needed!
TV Modulator
Included*

A3000 with "monitor quality" adaptor eliminates the need to purchase a dedicated monitor. Comes with four games - Interdictor, Superior Golf, Trivial Pursuit and Euclid. **£649**

PERIPHERALS

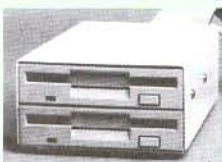
Microvitec CUB3000	£189	Econet Upgrade	£49
Acorn Col. Monitor	£199	Acorn Rom Podule	£56
Philips 8833	£219	300 2 Slot Backplane	£37
Mono Monitor	£73	300 4 Slot Backplane	£59
Monitor Stand	£19	300/400 I/O Podule	£85
A3000 User Port & Midi	£49	300/400 Midi Podule	£69
Serial Upgrade	£19	300/400 3.5" Drive	£115

SOFTWARE

1st Word+	£65
Minerva Home Accts	£79
Minerva Bus. Accts	£305
Minerva Multistore	£228
Acorn Desktop Pub	£121
Acorn View	£42
Clares ProArtisan	£82
Clares Artisan 2	£49
Colton Pipedream	£80
Colton Pipedream 3	£119
Shareholder	£160

This is a small selection of the software that we can supply at competitive prices. Please call for any item you require.

A3000 3.5" SECOND DRIVE



The kit consists of a 3.5 inch floppy disc drive, data cable, power cable, metal case (cream coloured), an

interface carrier board and full fitting instructions.

You will be required to take the current drive out of the A3000 and replace it with the interface carrier board (unlike some add-on drives, you can still use your internal podule socket). The original drive then fixes in the case with the second drive and the case is connected to the A3000 with two cables. As the connectors are detachable, the unit can be easily disconnected from the computer if the need arises. **£125**

TELETEXT

THE BIGGEST SELLING ADAPTER

The Morley Teletext Adapter is now available for the Archimedes. Advanced specifications, include digital tuning, screen dumps etc. Connects via the external podule socket or our Analogue/User Port **£125**



Existing users of our BBC Teletext Adapter can have the unit converted to an Archimedes version for **£35**

The kit and assembly are similar to our 3.5" kit except the case is larger and the mechanism is a high quality TEAC 5.25" drive. The drive (unlike some you can buy) is also buffered to Acorn specifications so eliminating the possibility of damage to your A3000 (buffering is not required for an additional 3.5" drive). **£169**

A3000 5.25" SECOND DRIVE



LEADS & MISC. HARDWARE

SCART Monitor Lead	£8	80 col Printer Stand	£15
9 Way Msync Lead	£8	132 col Printer Stand	£19
Arch Serial Lead	£8	A3000 Monitor Stand	£29
Printer Lead	£6	Tilt & Swivel Stand	£11
2 to 1 Printer switch	£20	Eprom Eraser	£18
3 to 1 Printer switch	£30	Eraser with Timer	£23
4 to 1 Printer switch	£36	5.25" Discs x 10	£5
64k Printer Buffer	£115	3.5" Discs x 10	£10
256k Printer Buffer	£199	27128 Eproms	£3

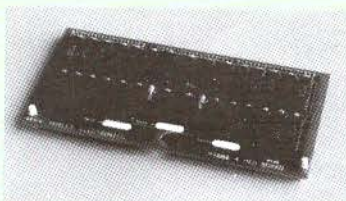
FURTHER INFORMATION

A catalogue of our products is currently available. Please call or write if you require this or further information on any A3000 or Archimedes product.

O.N.I.C.S. L.T.D

MEMORY EXPANSION

THE BEST VALUE MEMORY UPGRADES



Unlike most other upgrades, our 1MB upgradeable card can be upgraded with another 2MB (4MB total in machine) at a later date for maximum flexibility. Furthermore, our card can be upgraded without throwing away the memory that you already have on the card.

- Fully compatible with all Acorn software.
- A must for all serious Archimedes owners.
- Make full use of powerful RISC-OS packages.
- Can use extra RAM as a second drive.

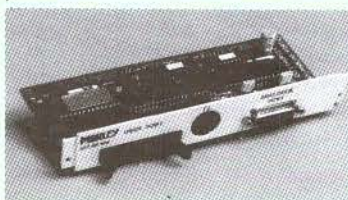
A3000 1 MB Expandable	£89
A3000 1 MB Non-Expandable	£65
A3000 3 MB Upgrade	£179
A3000 1 MB to 3 MB (free fitting)	£140
305/310 2MB Expandable	£245
305/310 4MB	£375
400 Series 1 MB	£50

A3000 BBC Analogue & User Port Podule

Full specification BBC analogue and user port. The analogue port is accessible using ADVAL from BASIC5 with all BBC OSbyte calls supported.

£69

Interface software written by Acorn for maximum compatibility with the BBC.



MORLEY

E.L.E.C.T.R.O.N.I.C.S. L.T.D

Morley House
West Chirton
North Shields
Tyne & Wear
NE29 7TY

Tel (091) 257 6355
Fax (091) 257 6373

Shop hours:
9am to 5:30pm (Mon-Fri)

Acorn

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

If there is anything you require which isn't advertised, please ring for a competitive quote.

HARD DISK DRIVES

ST506 HARD DISK DRIVE UNIT

INTERFACE	
ST506 Podule Kit	£169
A3000 DISK DRIVES	
Including ST506 Podule, cased drive with power supply, cable & leads	
20MB	£379
40MB	£459
55MB	£559
CALL FOR 300/400 PRICES	

Compatible with Acorn's ADFS. 16 bit interface for extra speed. Drive mounted in separate colour coordinated case with switched mode power supply and fan. Complies with Acorn's new recommendations on RF emissions.

SCSI HARD DISK DRIVES

INTERFACES	
A3000 SCSI Pod.	£149
300/400 SCSI Pod.	£149
SCSI DISK DRIVES	
Including SCSI Podule, drive, cable & leads. A3000 drives also include case and power supply.	
A3000 20MB	£399
A3000 40MB	£459
A3000 60MB	£559
300/400 20MB	£349
300/400 40MB	£409
300/400 60MB	£509

Please call for prices on larger drives for A3000 or 300/400

How To Order....

BY POST: Enclose cheque made payable to MORLEY ELECTRONICS LTD.

BY PHONE: By quoting your ACCESS or VISA card number.

CARRIAGE: £1 on most orders. £3 on larger items. Hard Disks, Computers + Monitors £10 (carrier).

VAT: UK customers please add 15% to cost incl. carriage.

GOODS USUALLY DESPATCHED BY RETURN.

Government and Education orders welcome.

Acorn and Archimedes are trademarks of Acorn Computers Ltd.

RISC USER MEMBERSHIP

RISC User is available only on subscription at the rates shown below. Full subscribers to RISC User may also take out a reduced rate subscription to BEEBUG (the magazine for the BBC micro and Master series).

Renewal Subscription Rates

UK, BFPO, Ch. Islands
 Eire & Rest of Europe
 Middle East
 Americas & Africa
 Elsewhere

RISC User
 £18.40
 £27.50
 £33.50
 £36.50
 £39.50

RISC User & BEEBUG
 £27.50
 £41.50
 £50.50
 £55.50
 £59.50

All subscriptions, including overseas, should be in pounds sterling. We will also accept payment by Connect, Access and Visa, and official UK orders are welcome.
 Please note that new subscription rates are £1.50 more than renewals.

Back Issues

We intend to maintain stocks of back issues. New subscribers can therefore obtain earlier copies to provide a complete set from Vol.1 Issue 1. Back issues cost £1.20 each (£1.60 for Volume 3.) You should also include postage as shown:

Post and Packing

First Issue
 Each subsequent Issue

UK, BFPO, Ch. Is
 60p
 30p

Europe plus Eire
 £1.00
 50p

Elsewhere
 £2.00
 £1.00

MAGAZINE DISC

The programs from each issue of RISC User, together with a number of additional items, are included on a monthly 3.5" disc. This will be available to order, or you may take out a subscription to ensure that the disc arrives at the same time as the magazine.

Disc Subscription Rates

Single issue discs
 Six months subscription
 Twelve months subscription

UK
 £4.75
 £25.50
 £50.00

Overseas
 £4.75
 £30.00
 £56.00

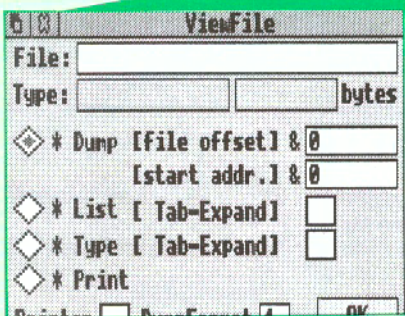
Disc subscriptions include postage, but you should add the appropriate rate (see above) per disc for individual orders.

RISC User & BEEBUG, 117 Hatfield Road, St Albans, Herts AL1 4JS.
 Tel: St Albans (0727) 40303 Fax: (0727) 860263

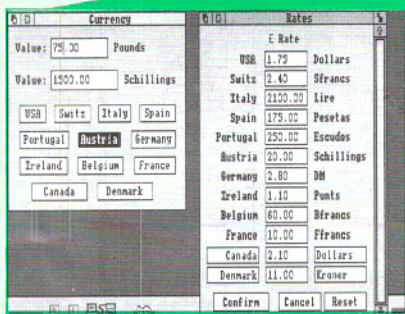
RISC USER MAGAZINE DISC CONTENTS



Screen Fade Routines



A Desktop File Viewer



Currency Converter

PROGRAMS IN RISC USER MAY 1991

Screen Fade Routines

The two routines for fading screens, described in this month's article plus two additional routines: a scrolling fade and a sizzle fade.

SpyGlass — A Multiple Task Memory Viewer

A multi-tasking memory viewer which allows you to select any running application and display in a window the contents of the memory allocated to it.

C Notebook

An occasional column on the C language with this month a program which demonstrates the use of Alt key and Sound functions.

Desktop Keypad

A short application which provides a window for frequently used functions like Return, Delete, etc., which can be selected by clicking on the mouse.

Mastering the Wimp (Part 18)

A short program demonstrating the use of outline fonts for screen displays and printed output.

ADDITIONAL PROGRAMS DESCRIBED IN THE MAGAZINE

A Desktop File Viewer

An application which provides an easy access to the commands: *Dump, *List, *Type, and *Print from the Desktop.

Programmer's Workshop

A program which creates a relocatable module-based screen compressor and decompressor.

BONUS ITEMS

Virus Protection

Three programs which will help you combat viruses:

- a utility VScan which will scan all files in a specified directory and will report for suspected viruses,
- the RISC User application Watchdog for protecting your machine against viruses,
- a PD utility VKiller, which will provide some cure, if your files have already been infected.

The Secret Life of Edit

A Draw file for printing the keystrip for Edit.

Tracker

A tune which demonstrates the abilities of Soundtracker using sampled sounds.

Currency Converter

A short application which allows you to convert certain foreign currencies into pounds and vice versa.

Text Read

This application allows you to read text files which automatically word-wrap when resizing the window.

Special Offers to RISC User Members May 1991

Each month RISC User will include a list of special prices for BEEBUG's own Archimedes software, available only to RISC User members.

Code	Product	Members' Price inc.VAT	Code	Product	Members' Price inc.VAT
1406a	Volume 3 Special Disc	9.95	BK01b	File Handling for All book and disc	11.95
PDA1a	Desktop Applications	9.95	BK02b	File Handling for All book	9.95
PAOMa	ArcOmnibus Games	9.95	BK03a	File Handling for All disc	4.75
1410a	RISC User Movie Maker	4.75	2420b	RISC User Binders	4.20
1401a	RISC User Toolbox (Arch.)	5.75	0102a	DFS reader	10.12
PAS3a	ArcScan III Program Disc + manual	14.95	0106b	Hard Disc Companion	35.76
PAU3a	ArcScan III (upgrade) (on return of ArcScan II disc)	4.75	0101c	Hearsay	52.88
PAL1a	ArcScan III Library Disc	7.95	0107c	ISO C Development System	80.72
PALXa	ArcScan III Library Disc + 2 upgrades	12.95	0100b	Masterfile Archimedes	16.86
PALUa	ArcScan III Library Disc Upgrade	3.45	0111b	Outline Font Pack 1	50.57
PASXa	ArcScan III Program Disc + Library Disc + manual	19.95	0108c	Ovation (Beebug DTP)	101.16
			0090a	Star/Epson Colour Printer Driver	15.86
			0796b	Serial Link	17.63

OTHER MEMBERS' OFFERS

These offers are available for one month from publication. To avoid disappointment please order early, as offers are only available while stocks last and demand is always high. Orders are dispatched on a first come first served basis.

FlexiFile (Minerva)

Offer price £99.95 (inc VAT)

Save over £44

Normal Members' price £144.84 inc VAT

A powerful multi-tasking database for education and small business users. It allows for multiple files to be opened at the same time with relational linking between any two files, and for fast sorts to be carried out.

Stock Code 1992c

BEEBUG Retail Spring Clearance Sale

In order to make room for new releases and products featured in the forthcoming new Beebug Retail Catalogue we are selling off a number of new and ex-demo equipment at substantially reduced prices. Please phone for details of the offers available:

St. Albans (0727) 40303

Armadaeus (Clares)

Offer price £58.69 (inc VAT)

Save over £17.00

Normal Members' price £76.14 inc VAT

A powerful RISC OS application allowing the accurate manipulation of sampled sounds. Supplied complete with 2 discs of sampled sounds free. The package was reviewed in RISC User, October 1989.

Stock Code 1091c

Twin

Offer price £19.36 (inc VAT) + p&p

Stock Code 1083b

Please add P&P when ordering.

Please quote your membership number.

Software Developer's Toolbox

Offer price £29.95 (inc VAT) + p&p

Stock Code 0918d

Post & Packing	UK	Europe	USA, Canada	Middle East, Africa	Elsewhere
a	£ 1.00	£ 1.50	£ 2.50	£ 3.00	£ 3.50
b	£ 2.00	£ 2.50	£ 3.50	£ 4.00	£ 4.50
c	£ 3.00	£ 3.50	£ 7.00	£ 8.00	£10.00
d	£ 4.00	£ 4.50	£11.00	£12.00	£15.00