Editorial

The editor's comments on the world of RISC OS

Psst..... Would anybody like a second hand OS, with only some slight dents and some of the paintwork is looking a bit scratched and faded. A nice little runner with an up to date MOT and only 600MHz on the clock! Guaranteed to run with little maintenance.

What with a major shareholder of Castle wanting to sell a 30% stake in the company and Castle rumoured to want to sell RISC OS perhaps now is the time to buy a bit of your favourite operating system. But is it an attractive prospect?

With only a small user base of only a few thousand no one is going to make money out of writing new software; it has to be done for love. Also, selling new hardware becomes more and more difficult. RISC OS users are notoriously mean buying new equipment. Only the other day on comp.acorn.hardware people were moaning that some RISC OS apps did not support their 15 year old computers and printers. "They worked on RISC OS 2," they wail, "Can't the software writers make sure that their applications work for us, only a little more code has to be written surely!" Backward compatibility forever! Its like asking Windows XP apps to support DOS. Windows software writers would laugh in your face.

Acorns do last for a long time but do not last forever. Plans do need to be made for the time when the hard disc etc. conks out. If you leave it too long you will have to start from scratch again with both hardware and software. A gradual process of upgrading both hardware and software is much better. If you are a business you can offset all your computer costs against tax.

Without your support the hardware suppliers will go out of business and RISC OS will be lost to the general public forever. So nip out now and buy yourself an A9 or an Iyonix (or both) and perhaps a few shares to keep your favourite operating system viable.

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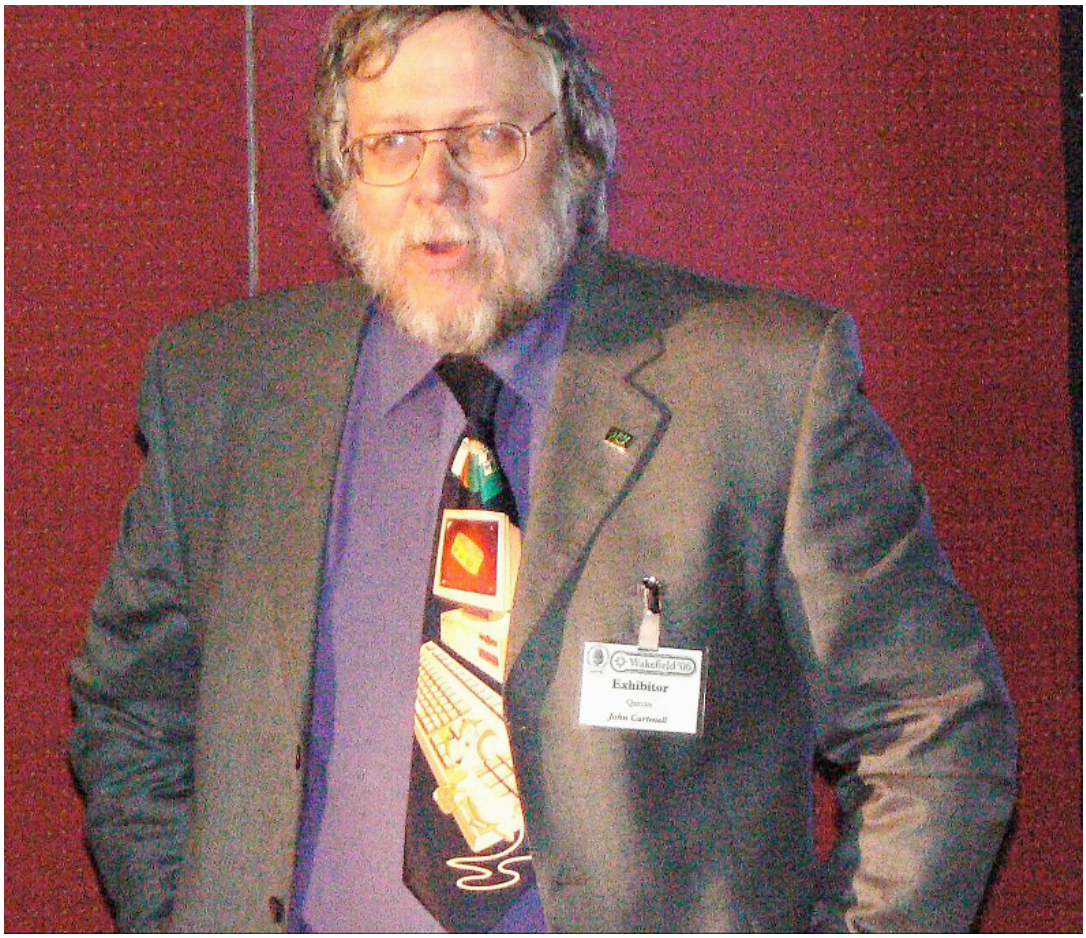


And the winner for worst tie in show is!!!

RISC Bytes

RISC OS news over the last couple of months

Castle Shares for Sale

Pattotek announces investment opportunity in Castle Technology Ltd

Pattotek Ltd owns a 30% share in the voting capital of Castle Technology Ltd ("Castle"), owner of the RISC OS Operating System and developer of RISC OS based desktop computers. Pattotek Ltd announced that, due to diverging business interests, it is examining its options regarding Castle and would like to hear from potential investors in the RISC OS community who could be interested in gaining control of this stake in Castle.

Pattotek's CEO, Pete Wild said, "after almost 20 years personal involvement in RISC OS, it is regrettably no longer core business and we must consider what is best for the future of the OS". He added, "However, Castle still has a dynamic management team, and exciting new plans for the future of RISC OS; here is an opportunity for the user community to have more of a say in those plans. Given the past history between Castle and RISC OS Ltd, this could represent a chance for the re-unification of efforts to move RISC OS forward."

Interested parties should email castleinvest@pattotek.com

About Pattotek Ltd: Pattotek provides highly specialised consultancy services assisting OEMs to develop and implement electronics assembly outsourcing programs. Pattotek technical services include electronic design, design for manufacture and embedded software development with particular skills in the digital television and IPTV marketplace.

Contact:

Name:	Peter Wild, CEO
Company:	Pattotek Ltd,
Email:	pr@pattotek.com
Web:	www.pattotek.com

ARMalayser 0.55 is now available

Enhancements and fixes since last release

SWI function naming. Many C/C++ programs call library functions such as kernel_swi and swix to make SWI calls. The SWI number argument to these functions is now displayed as a SWI name if known, making it easier to follow C code.

* Improved performance analysis.
A target processor of ARM7, ARM9, StrongARM or XScale can be specified and performance warning will be given for non optimal instructions such as single register LDM/STM and conditional LDM/STM on later architectures.

* Register latency detection for target processors has been corrected and warnings are now displayed in all cases. The accuracy of values have been improved and knowledge of the ARM9 core added.

* Total cycle count latency counts added to statistics if a target processor is specified. A follow up article will be posted on the usage of this feature shortly.

Background information

ARMalyser is an ARM code analyser that understands RISC OS executable, module, utility, object and library formats. It can output disassembler or ObjAsm assembler styles, in plain text, fully hyperlinked and syntax coloured HTML, XML, or custom formats for import into Impression, TechWriter and Ovation Pro.

It has extensive analysis features to detect problems that may be encountered when converting code to 32 bits, and to highlight performance issues on different ARM variants. The assembler output may be used as a basis to produce 32 bit versions of code where the sources are not available.

It is available for RISC OS with a desktop front end, and command line versions for Win32, x86/32 and x86/64 Linux. ARM Linux and x86 Open BSD variants have been retired. Also included in this released is a RISC OS version built with GCC and UnixLib which does not require a 32bit SCL.

The ARM Club Free Software :
http://www.armclub.org.uk/free
The 32 bit Conversion page :
http://www.quantumsoft.co.uk/druck

The ArtWorks Wiki!

Philip Pemberton writes

Having used Artworks for a (small) number of years, I recently came to the realisation that there was no easy way (outside the Artworks mailing list on Smartgroups) for AW users to exchange hints, tips and such. To try and remedy this, I've launched... (drumroll)...The ArtWorks Wiki!

For those who don't know, a Wiki is basically a website that can be edited and updated by anyone. The whole idea is that a page gets created by someone, then that person (or anyone else) can add to the page, correct mistakes and so forth. Even better, you don't need to learn HTML in order to use a Wiki - most of them use a very simple mark-up language called "Wikicode", which effectively consists of adding symbols to the beginning and/or end of a line to add formatting (e.g. an = sign is used to denote a heading, and multiple = symbols change the heading level).

Anyone who wants to take a look at this project can see it in its current incarnation at <http://awwiki.philpem.me.uk/>. There's not a lot of content there at the moment - if you've written any tutorials or have anything to share with the ArtWorks community, please feel free to add it to the Wiki.

Please note that you will need to register a username before you start editing pages - this is to help prevent (or at least reduce the likelihood of) vandalism and spamming. You can use any username you like and although you will be asked for an email address, it's only used to allow the Wiki to notify you if a page you're interested in has changed.

Comments to philpem at dsl.pipex.com or awwiki at philpem.me.uk.

New Version of !Searchy

Version 1.08 of !Searchyr has been released, a RISC OS application that provides web searching from the RISC OS desktop, which now includes various bug fixes and support for a longer text input field in the "small" toolbar.

As always, !Searchy is available from http://www.andrewpoole.org.uk/ searchy/or by clicking the "Check for updates" button in !Searchy's info window. Any requests, comments etc should be emailed to me at the email address on the Searchy website.

SuperDoku.

Sine Nomine Software are pleased to announce a new release (v. 1.04) of our popular Sudoku program, SuperDoku.

SuperDoku can now generate and solve Killer puzzles, where a blank 4x4 or 9x9 grid is divided into areas where the squares in that area must add up to the total shown as well as obeying the normal Sudoku rules.

Version 1.04 also includes some new intelligent solving rules - thanks to the user who sent us a puzzle which 1.03 couldn't solve except by trial and error!

You can download it from
http://www.sinenomine.freeserve.co.uk/software/

Registration costs just 5 pounds and is available online or by cheque.
For details see our web page or the SuperDoku help file.

Other highlights of SuperDoku include:

* Samurai puzzles: five overlapping grids of 9x9
* Four sizes of "standard" Sudoku puzzles, from 4x4 to 25x25
* Type in your own puzzles or have SuperDoku generate them for you[1]
* Three levels of difficulty for each style of puzzle[2]
* Rotationally symmetric grids if you like them that way

* Hints on which square you should try to fill in next and what you need to look at in order to solve it
* Guidance on which values are possible solutions to blank squares
* For Killer puzzles, lists of valid combinations of values to fill each marked area
* Full undo and redo facilities
* Solving puzzles for you at amazing speed
* Loading and saving of puzzles (registered users only)

All upgrades are free to registered users. Just download the new version and drop it on top of your registered copy.

[1] The demo version is limited to ten different puzzles of each type, which means a mere four hundred in all.
[2] Except 4x4 puzzles, which are impossible to make difficult.

Films v1.13

Harriet Bazley writes

I don't imagine that this application will be of use to anyone other than myself... but it's now a pretty mature program with a lot of features, so I thought I might as well give it a public release anyhow.

Films v1.13 is basically a timetabling application, currently hardwired to some pretty specific requirements: I wrote it in order to cope with the sometimes insanity-inducing scheduling conflicts created by the National Film Theatre in London. In the month of December, due to the running of three simultaneous 'seasons' of interest, I managed to schedule some twenty-four screenings into 31 days with the aid of this application - I'm really quite proud of that. :-)

It can be downloaded from
http://www.starfighter.acornarcade.com/mysite/utilities.htm#films

This is a non-Wimp program which uses a BBC-style display and menu system - making displaying a screenful of results much easier! Once data on available performances has been entered, the program can display an interactive timetable on the screen, showing the knock-on effects of selecting a given performance in terms of the films with which it clashes. Dates on which you have prior commitments can be eliminated from consideration altogether. As you narrow down the possibilities, any films for which there is only one possible performance remaining will be highlighted in red, and a warning will be given for any which cannot be fitted into the timetable at all.

Results are saved to a text file which is then Filer-Run on return to the desktop, for subsequent printing, or simply for ease of viewing in a multitasking environment. It also allows you to save the entered data in a format reloadable by the program, offering a very useful 'catch-up' feature which will calculate which performances have already happened, eliminate them from consideration, and calculate the knock-on effects - e.g. if you've only got one chance left!

There are many more features, all documented in the usual erudite and compulsively readable help file.

PrintPDF version 0.40

Following Martin Wuerthner's work porting version 8.5 of GhostScript to RISC OS, version 0.40 of PrintPDF has been released which can make use of some of the new features.

All versions of PrintPDF can take advantage of the improved support for Type 3 fonts in GhostScript 8.5. The new version has additional support for creating encrypted and protected PDFs: owner passwords can be applied to prevent a document being modified without permission, and access passwords can be applied to restrict who can read the document as well.

In addition, permissions can be set to limit the things that can be done to a PDF document: printing, exporting content, annotating, re–formatting and so on. Support is available for the full set of options in PDF versions 1.3 and 1.4.

In the light of recent discussions on comp.sys.acorn.apps, the new version includes the option of transparently pre–processing the PostScript data received from !Printers using GhostScript's *ps2ps command. In some situations, this appears to clean up mis–formed output, and allow PDF conversions that would otherwise fail.

PrintPDF is a utility to automate the process of creating PDF documents with GhostScript. In conjunction with a dedicated PostScript printer driver in !Printers, it allows a 'PDF printer' to be set up. Printing to this from applications will open a Create PDF dialogue box, from which the conversion options (quality and PDF version) can be set and the new PDF dragged to a place on disc.

PrintPDF is freeware, and full details can be found at:

http://www.stevefryatt.org.uk/software/printpdf/

Note that the website this points to has changed in the past month; if you have bookmarks to the old FreeUK site, now would be a very good time to update them to use the re–directing URL.

As this is a beta release of PrintPDF, any feedback would be welcome on the application, documentation, etc.

Version 2.30 of !Webgen has just been published

This is quite a big update with a number of new features, bioth large and small, plus a number of bug fixes. Go to http://daves.orpheusweb.co.uk/software/ or click the web button on the webgen2 info window.

Changes from 2.28:

Add percent processing to thumbnail page
Add percent & ratio processing to Full size page
Add Resources location to links page
Add Rename page
Add ChangeFSI page
Add 'HTML Only' option
Fix icon selection bug for simple/extended links
Fix minor bug in Font Menu handling
Fix minor bug with main window not opening if a directory is loaded when one is already loaded
Fix minor bug with odd key presses being accepted as Return when the save window is open
Make Shift F1 same as clicking on blue 'i' button
Make F3 and Shift F3 mirror clicking Select and Adjust on the 'Build Site' button
Make Ctrl F3 and Shift+CTRL F3 mirror Adjust & Select respectively on 'Save Defaults
Ctrl–T inserts the current time into some fields
CTRL–D inserts the current date into some fields
A potential bug in the wimp library that could cause an icon to overflow and wreak havoc on the window has been fixed.
Corrected generic font names. Should have been all lower case.
Added charset option to meta tags window
Allowed captions file to be in messagetran format
Changed, corrected and improved some of the CSS coding, and stylesheet layout
Replaced more of the <table> stuff with CSS

NOTE: It is important that you read the !!ReadMeFirst file if you are upgrading from an earlier version.

For those that don't know, !Webgen2 is a simple application that will take a directory of images, GIF, JPEG, TIFF, PNG, SPRITE and PNG at last count, and turn them into a complete web site/image gallery.

ArmSort v4.00

After a very long gestation period, ArmSort v4.00 is now available.

Major Changes from ArmSort v3.20 are ...

Significant performance improvements by

1. improving the existing Shell Sort

2. using an additional Flash Sort first where possible. Reductions in time of 50% are normal; up to 80% has been seen!

Example times on an Iyonix for a 1 million element array:

Integer 3, String 11, Real 5 seconds.

Removal of 16MB WimpSlot limit for sorting String arrays. Any BASIC strings can now be sorted, certainly up to 400MB and hopefully more!

New ability to sort Indirect Strings, i.e. strings anywhere in memory,

of any length (even >255), with their addresses in an Integer array.

There are NO changes to the *Sort command interface, so any programs

using v3.20 will work unchanged.... but maybe faster!

Removal of message when ArmSort module is loaded or removed.

New Statistics option and *SortOpts command.

New SWI interface suitable for BASIC extension software.

New !ArmSort application v1.00, which can be used for generating

programs for occasional sorts, or as a basis for inclusion in your programs. This is an initial release, and may have some limitations!

Why use ArmSort? Computers are used to hold and manipulate data. This is easily achieved on RISC OS computers by using BASIC arrays to hold the various data items. However, anyone who has experimented with such data manipulating programs is likely to have wished for the sequence of the data in the arrays to be easily changed, or sorted into different sequences. This is perfectly feasible within a BASIC program, using one of the common routines, like Bubble, Shell, or Quicksort, but these can be very slow in BASIC, and usually with just one array and limited features.

Armsort is a module which implements a *Sort command which provides BASIC programmers with very easy and fast facilities for sorting arrays.

ArmSort caters automatically for ANY number of ANY type of single or multiple dimension BASIC array, in ANY combination of Integer, String or Floating Point arrays, in ANY key sequence. It also has flexible parameters and comprehensive error checking. ArmSort is VERY fast, using the Flash and Shell Sort techniques in ARM Machine Code, and it is therefore very capable of complex sorts on the large data volumes that RISC OS computers are able to hold and process.

Full details are available from http://www.avisoft.f9.co.uk/

!SignalBox Revision

Now that the reflashed A9 (beta) computer can do sound, signal box simulation has been revised to work on the A9 as well as other RISC OS machines, including VirtualRPC. The use of !SpecialFX to include vector anti–aliasing is recommended.
The application '!SignalBox!SignalBox' is a full, accurate simulation of a mechanical signalbox. In the simulation, you see the signal box lever frame, block shelf and instruments and track diagram in one window. The working timetable showing the trains that will run is available separately but the train register book, which records the trains that pass from box to box, is shown on screen in another window. The track circuit indicators on the box diagram and the train register are both displayed and kept updated by the computer.

All interlocking, both mechanical and electrical, is fully implemented using original technical data as source data. Context sensitive help messages lead an inexperienced user through the process and the level of difficulty can be selected. The points and signals on the track diagram may be operated by a simple mouse click over them (and signals and points move to show they have been operated). If interlocking is not free a helpful message is given explaining why the lever or electric lock cannot be operated. When a box is operated as a ground frame, then the mechanical locking, below the operating floor, can be viewed as the levers are operated. This is included for all boxes where the data are available and excludes those currently in operation.

As trains move from track circuit to track circuit, lamps light up on the track diagram, and an image of the train concerned moves over the track diagram on both track–circuited and non–track–circuited lines showing the position of every train continuously. A right–mouse–click (ADJUST) over an occupied track will give a menu permitting the engine to be reversed or the stock uncoupled. Context–sensitive help messages will give additional information about whatever the mouse pointer is pointing at. Simulation speed can be adjusted at any point and the simulation paused.

Full simulation is implemented of both Kidderminster Station (SVR, circa 1998) and Exeter West (circa 1964 but using a train service based on Summer 1982). Full simulation gives a choice of timetables, but in the 'free' version only a limited number of train movements are included. Also provided are Morlais Junction, Radyr Junction (as at 1961 and 1987) and Bewdley North (1956), which may be operated as a ground frame (animated mechanical locking is provided for all three boxes, Radyr Junction 1987 only).

In the full (purchasable) version Rotherwas Junction, as well as the other SVR boxes, may be operated as ground frames and many alternative timetables are provided for Exeter West and Kidderminster Station including gala timetables and over six hours of timetabled trains and shunting. In addition, further boxes may be purchased as data files that will operate under the full version: currently available (or in development) are Acton Yard, Oxford Station North, St Austell and Resolven East (these complete with animated 5–bar locking); Penwithers Junction (with mechanical locking, not animated) and Neath & Brecon Junction and St Erth (available with box diagram but not mechanical locking).

The RISC–OS application may be downloaded from
http://www.svrsig.org/software/SigBoxAll.htm
and has also been converted to run under Windoze using R.T.Russell's excellent BBCBASIC for Windows programming environment.

CronTool

CronTool is a new application for RISC OS which will add various 'cron' files to the system, in a similar way to its Linux namesake you can execute various scripts at various times of day.

It includes a flexible script language which allows you to automate various processes, either at specific times of day, after regular time periods or even just (for example) 5 minutes after you've loaded CronTool itself.

A comprehensive manual is included (HTML format) which describes all the commands and various conditional statements.

Some things you can do with CronTool are perform automated offsite backups, monitor remote servers for availability, send automated emails, sound alarms, execute CLI commands or even send automated Happy Birthday greetings to friends.

If you have SparkFS or FTPc it will even let you create automated backup archives and upload them to remote FTP sites.

You can configure 'background' tasks so for instance you could automatically ping a server every 30 seconds and alert you (or send a diagnostic email to a predefined recipient) if there's no response.

CronTool is also subject to ongoing development and new commands are planned for future updates.

CronTool is Shareware and only costs 20.00 to register (a small token compared to the time, effort and peace of mind it can provide) and unregistered versions automatically become fully working demo versions, which run for 15 minutes - enough to give you a taster as to what it can do.

CronTool is available to download now, from
http://www.vigay.com/software/

!ConvText

!ConvText, version 2.01 has been uploaded to http://www.riscos.sprie.nl

!ConvText is a little utility which can perform huge search-and-replace tasks on any type of file, making use of simple scripts. If you search and replace on a regular base, !ConvText can be a real time saver.

* Version 2.00 has an almost completely rewritten user interface, thanks to the efforts of Harriet Bazley. !ConvText is now Style Guide and Pre-RISC OS 5 compliant.

* Version 2.01 has a new built-in command, {EXPOSURETIME}, which automatically recalculates the often bizarre exposure times, found within EXIF files, to the better understandable 1/xxx format.

!ConvText is free. A StrongHelp manual is included.
Cretin version 0.20b is available for download at
http://jymbob.drobe.co.uk/cretin.html

Cretin version 0.20b

Cretin (the smiley–in–a–jar IRC client) was originally created and developed by Antony and Andrew Sidwell in 2002, and was released under an open licence in November 2005, where it was resurrected by James Scholes as self–named maintainer.

As well as the usual features one expects from an IRC client, Cretin also boasts the following key features:
Connects to multiple IRC servers – Only one instance of Cretin is needed
Tabbed channel interface – Keep all channels in one window, or spread them out as you wish
32bit compatible – Making it the only freely available 32bit RISC OS IRC client
Aliases – perform any action with an aliased command
Lua scripting – enables users to add in scripts for advanced functions

Cretin has been set up to be as easy to use and configure as possible in a Graphical way, while keeping a powerful CLI for those who prefer it.

The original plan was to have a 32bit version of Cretin by Easter, with a user–friendly interface. Thanks to several others in the RISC OS community, this deadline was only just missed

It is the intention that Cretin be available from a CVS or SVN database in the near future.
Ray Faure writes ;-

!CSVamp Version 2.20

A few weeks ago several people showed some interest in !CSVamp and subsequently suggested some improvements.

I am happy to say that nearly all have now been incorporated into Version 2.20 - now on my web-site (with links

to many other DrWimp applications) at: www.rayfavre.me.uk/dwapps.html

!CSVamp is a fairly simple freeware application allowing users to produce a new, modified CSV/TSV file from an existing CSV/TSV file.

Some of the things that can be done are:

Re-order fields.
Extract fields.
Add additional fields.*
Sort on any field (with option to retain but ignore 1st field*).
Concatenate fields, with or without intervening added text.
Add text before and/or after any field.
Extract selected records.
Change field separator i.e. comma or Tab
Change record terminator i.e. LF, CR, LF+CR* or CR+LF*

(Items with * are new for this version.)

The new version also:

- eliminates the previous restriction on record length. Now each field can be up to 255 characters long.

- auto-detects and shows the above record terminators in input files.

Apart from the text-only !Help file in the application, there is now also a 'proper' Manual available for down-loading in Impression, OvationPro and HTML formats.

DScript

The first release of DScript is available for download from http://www.zpages.de

DScript generates binary files from scripts. The DScript script languages was designed for maximum convenience and security.

Convenience:

- avoiding avoidable overhead, when entering large amounts of data

- automating generation of repetitive structures

- providing support for common special data structures

Security: define invariants for the given data format, that are automatically checked by DScript.

DScript has the same relation to binary data as a compiler has to executable code, hence it can be described as a "data-compiler".

ZeriLink

Version 2.50 of ZeriLink is now available.

ZeriLink is a freeware parallel port file transfer program.

It allows you to transmit files from/to any machine running RISC OS, Windows or Linux, via a connection between their parallel ports (with a special cable), at up to 800 KB/sec.

Version 2.50 introduces Linux compatibility and a few small tweaks.

Visit:http://web.inter.nl.net/users/J.Kortink/home/software/index.htm

Free UNIX utilities for RISC OS

Andy Burgess

As some of you may be aware I have been developing software (on the PC) using the free GNU C compiler. I still don't like Windows, so have been developing using an excellent PC-based piece of software - something called ***Cygwin***, which is like a UNIX-environment which runs under Windows. I like UNIX like I like RISC OS - they're both powerful, and **reliable** environments! The email to SMS software I have been working on is complete (bar any outstanding teething bugs), and anyone who's interested can try it out. Send an email to *mobilenumber@e2text.net* - eg. *07770123456@e2text.net*. You should receive an SMS text message on the mobile number. I allow a free trial of the system, but if continued use is attempted, I will start charging! It works with ***!Pluto*** and ***!POPstar***, but not sure about ***!Messenger*** - it should work! My working on this is the reason why there wasn't an article last issue!

VIM – www.vim.org

I mentioned in an earlier article about the UNIX-ported compiler for RISC OS (GCC and G++). To develop the programs under ***Cygwin***, I have been using the UNIX VIsual editor. When I used it for the first time at college, I absolutely hated it and fellow students thought it was short for 'vile'. In a later job I persevered with it (as there was nothing else to use on this particular UNIX environment), and now I've got to **prefer** to use it for all my editing! Even the humble RISC OS ***!Edit*** (although easy to use) has its problems, I've never really got to grips with ***!Zap*** and now I've got really quick with VI, I thought it time to try the RISC OS version. With VI on all the machines I use, there's no conversion (or thought) required to use the resident editor's unusual tricks on whichever system I'm on! Indeed VI (in its new VIsual iMproved ***(VIM)*** version is

available for pretty much any platform you can care to name.

UNIX, like our favourite Acorn platform uses sensible file line (LF only) breaks, (in my opinion), and not the silly DOS/Windows CR and LF. That means that ***VIM*** can read any ***!Edit*** or other RISC OS created files. Indeed any standard file created on UNIX should be able to be read on RISC OS without conversion. By the way, you may have come across the terms LINUX (free UNIX) or POSIX (a type of UNIX system), I will refer to all these environments collectively as UNIX - as they are all basically the same. ***VIM*** can be downloaded from following the links from

www.vim.org - download - others.

I followed the RISC OS link (direct link **www.sparse.net/vim.download.html**), then followed the 'download vim' link.

From there I clicked the 'Download RISC OS Vim' (It took about 20 seconds to download the 1.4MB file on broadband on my A7000). This saved the file vim-5/8/zip.

Then I clicked the 'Download syntax files' which saved the file vim-syntax.zip

I unpacked the 1.4 MB vim-5/8/zip; archive, and ran ***!Vim***, though without checking my versions of ZapFonts - I thought I'd risk it! I got the simple, but pretty ***VIM*** 'V' icon on my taskbar. I clicked on it. I got an error straightaway: "Error detected while processing" followed by meaningless data and then "Can't open Vim:Syntax.Syntax". Then my desktop went entirely grey for a second with a warning about Zap fonts - "can't find something or other Zap.Man+". I've done nothing to fix this message about Zap.Man+, and the screen no longer goes grey. ***VIM*** seems to work without it.

Clicking on the ***VIM*** window did give the familiar VI welcome screen in the RISCOS/BBC Micro system font! Nice! I've always liked the Acorn system font.

I then unpacked the Syntax files and re-ran ***VIM***. This time on clicking the iconbar it took longer to load up.

From this point onwards in this document, I have been writing the stuff in ***VIM!*** It seems to take a long time to load up and close (something in the region of 20-30 seconds) on an elderly A7000, but once started seems to be very responsive It'd fly on an Iyonix (or other modern RISC OS kit), I'm sure!

I dragged and dropped the document I was preparing for this article into the open ***VIM*** window. ***VIM*** loaded my file with a line on the bottom of the screen something like "ADFS:$.text.vim 100L 8056C" - this tells you the physical file name, plus the number of lines (100) and the number of characters (8056).

Using VIM

At this point I think it wise to say a little about using ***VIM***. ***VIM*** has two modes - a command mode (which I've also heard called 'normal' mode) and an edit mode, which may on first glance appear to be a backwards step in light of modern 'visual' editors like ***!Zap***, ***!Edit*** and even the PC's ***Notepad***. However, I believe this is where ***VIM*** scores over other editors - as the same keys can be used to do some extremely powerful activities that would have to be done with mutiple mouse keys and combination of Ctrl-keyed keys on other editors.

VIM starts up in command mode, and if you start typing away some strange things happen. To type properly, you need to be in edit mode - which can initially be started by pressing the 'i' key to start inserting in edit mode. To leave edit mode, press the Escape key. Sometimes VI displays a sequence of lines replaced by blue at symbols (@). To the new VI user, this seems as if it's deleted some of your work, but no, it's just telling you there's not enough room to display the next really long line on the screen - so it's not going to. If you scroll down, you can see it. Also it sometimes displays blue tildes ~ at the end - this indicates the end of the document and again is not an issue.

For an initial guide to using ***VIM***, I'll tell you about the commands I use on a frequent basis - though there are lots of good guides to ***VIM*** on the internet.

For all these commands, you need to check whether your Caps

Lock is on - as commands do different things depending on letter case. Also you can click the mouse to go directly to where you want to edit.

Command mode to edit mode

i - start inserting at the cursor
a - append from cursor
A - append from end of this line
o - open/create new line below current line
O - open/create new line above current line
u - undo/redo last command - very useful if you start typing your text in command mode!

Command mode only commands

a lot of these commands can be prefixed with numbers as a repeat count for the command.

dd - delete line at cursor position (if you prefix the dd with a number - it will delete that number of lines including the cursor line)
yy - yank (copy) line at cursor position (if you prefix the yy with a number - it will copy that number of lines including the cursor line)
p - paste line after cursor
P - paste line before cursor
x - delete character at cursor position (if you prefix with a number will delete that number of characters)
dw - delete word from cursor cw - change word at cursor position
D - Delete from cursor to end of line
J - join current line to following one
R - Start replace (overtype) mode
w - move cursor one word to the right
b - move cursor (back) one word to the left
s - substitute - change one character (number prefix changes that no of characters)
r - replace character with another (or multiple characters)
u - undoes in sequence
. - repeat last edit command at cursor
% - find matching brackets - great in C programs

/ - search for a string
>> - indent text by one tab stop. (that's pressing a >, then pressing another >)
<< - unindent text by one tab stop. Again number prefixes do multiple lines.
. - repeat last commands ~ - change case of letter (doesn't work on all vi's)
ZZ - save and exit ***VIM***.

some : commands

:q! - abandon edit of this file
:w - write this file to disc (equivalent to F3 - but no confirmation).
:w <filename> - Use this to create a new file (:w $.directory.file/txt) if you have not already saved it. VIM will confirm with something like "ADFS:$.text.new [new] 8L, 117C written".
:e <filename> - open a new file for edit
:r <filename> - read and append the file to current edit
:1 - go to line 1
:111 - go to line 111
:$ - go to bottom of text
:! - run command line (Acorn star commands - e.g. :!cat for "*cat")

In addition there are other ':' prefixed commands - of which I only touch on the :set commands (below), plus file commands (above).

Immediately after typing stuff, I noted something different between the text typed into ***VIM*** and that entered in ***!Edit***. ***VIM*** seemed to be splitting my lines into fixed length ones and transferring any word overlapping onto the next line.

I then changed the textwidth (:set textwidth=100) to be 100 instead of 78 or whatever it was to see how it affected what I was typing in. Sure enough the lines got longer!

I then entered the command :set wrapmargin=100. This had the effect of now wrapping lines successful on the stuff I'd written before, but not on the new stuff entered!
I then tried setting the textwidth again to 0, in the hope that

lines will be wrapped a la ***!Edit*** style. It seemed to work!

These commands can be added to a set up file - called .exrc on UNIX - stored in the Unix 'home' directory for the user. On RISC OS you need to create a file in $.!Boot.Choices.VIM called exrc. In this you can add your preferred setup. In my case I set up the following:

```
:set textwidth=0
:set wrapmargin=100
:set tabstop=4
:set shiftwidth=4
:set number
:set ignorecase
:set ruler
```

A little description of these options follows

:set textwidth - stops lines being broken and allows text wrapping.

:set wrapmargin - is equivalent to ***!Edit's*** Display-Work Area.

:set tabstop=4 - indicates that you want the tab key to do 4 spaces.

:set shiftwidth-4 - is similar but is used by VI's indent/unindent feature (>> and <<), which I find invaluable.

:set number - displays line numbers - :set nonumber turns it off. :set ignorecase - means that a search will find 'String', 'STRING' and 'string' for a search, otherwise use ':set noignorecase' and it's case sensitive.

:set ruler - Displays the VIM status line at the bottom of the screen, showing activity.

For instance if you're doing editing by using the i-insert command (or o, O, a, A commands) - the status line shows "-- INSERT --", it also shows a l ine and character count e.g. 111,218 - line 111, character 218. 'Bot' indicates if you're at the bottom of the text. The status line also details what command you've just entered in command mode, and if you're at the top it displays 'Top', or elsewhere in the document, it displays a percentage of way through.

Additionally there is a :help command that brings up a help system (as if it's an editable file). To get back to your file type

:quit. Also you can do line ranges to move lines around: e.g.
:254,302 delete - removes lines 254 to 302 inclusive
:254,$ delete - removes lines 254 to the end of the file lines can then be put back in with the 'p' or 'P' commands.

DOS/Windows compatibility in VIM

VIM handles DOS documents with no problems.
Once the file is loaded, the status bar will say something like "ADFS:$.PC.dosfile/txt [dos]" - the [dos] indicating what format the file is. With Unix/RISCOS files there's only the filename displayed. From there on ***VIM*** handles the DOS file just like PC's notepad would! No more stray [0d]'s kicking about in an ***!Edit*** modified DOS file - and ***VIM*** adds them with every line feed for you!

However in a UNIX/RISC OS-style file you can add the [0d] (or Ctrl-M if you prefer). It's simple (when you know how): Type Ctrl-V, you'll get a blue '^', then Ctrl-M, and it changes to a black '^M'; this is where my ***Cygwin*** VI is better - the ^M on that displays in blue, but there's probably some setting to change that.

I really like VI - though I struggled to use it at first! I just can't wait until someone manages to port the !Gnumeric spreadsheet application to RISC OS. I've used a PC port of it, and it's really good.

If you want to get a VI for the PC to run in native mode - look for the free DOS Watcom C compiler, it includes a DOS-based VI.

AWK

AWK is another useful UNIX tool, and there's an equivalent port for RISC OS. I thought when I first heard it mentioned and tried to use it, that it was short for AWKward, like VI was short for VIle! The initials actually stand for the three programmers' names. However again, with UNIX tools, if you persevere you reap the rewards - though admittedly the commands can look really, really cryptic!

The RISC OS port is derived from the GNU (free) UNIX stuff derivative of ***AWK*** called ***MAWK*** - produced by a chap called Mike Brennan (hence the M prefix), and ported to the RISC OS platform by Gavin Wraith - who has also produced other freeware software - see below:

www.wra1th.plus.com/awk/zip/awk.zip (124K)
www.wra1th.plus.com/awk
It's a bit more complex to set up, but not too difficult.
You can also use it with ***StrongEd*** as a scripting language, but I haven't done this.

Once you've unsparked it, you should have three files - COPYING (GNU standard), mawk (abs) and mawk_1_htm. You need to check the RISCOS system variable run$path contains '!boot.library' (*show run$path), then copy the mawk absolute, the HTML and the GNU COPYING file into there. I didn't do that till later - I ensured the mawk absolute was in my CSD (currently selected directory).

I tried using it on the command line with only one big issue (see below). There's a good in-depth tutorial on ***AWK*** at **www.vectorsite.net/tawk.html**. I'll quote examples from there! You can use ***MAWK*** direct on the command line (or a task window), providing it's visible to the system - either through running it from its own directory, or setting the !Boot.library or included on the run$path.

Although the 'awk' (as opposed to mawk) command appears to run on RISC OS it seems to always give the error - e.g. from awk '/gold/' coins.txt
it gives:

```
mawk: line 1: syntax error at or near %
```

but using

```
mawk '/gold/' coins.txt
```

works.
Note that file names have to have PC format names - 'coins.txt', not the more usual RISC OS version 'coins/txt'. Likewise any long AWK input file, has to have a dotted filename (if used):

```
mawk –f summary.awk coins.txt
```

The only command it seemed to have real difficulty with was

```
mawk '{if ($3 < 1980) print $3} ' coins.txt
```

gives: cannot open 1980) for I/O redirection
This implies that it's not taking the command as being less than

1980, but trying to get input (redirection) from a file called '1980)'!

I added the three files 'mawk', 'COPYING' and 'mawk_1_htm' to my !Boot.library directory, and then I could run ***MAWK*** without setting the directory. I learnt something about RISC OS there! I copied all three files, as I believe this is a requirement of the GNU licence, but you could just copy the 'absolute' file 'mawk'.

Using MAWK in a task window

If you neglect to put the filename in the command line:
mawk /the/
you will get a UNIX-style continuation like the * prompt, but prefix is replaced with nothing. You can continue:

```
RISCOS:  *
me:     *mawk /the/
RISCOS: <blank prompt>
me:     awk.txt
RISCOS: <blank prompt>
me:       ^D
RISCOS: *
```

I don't know how to continue this command, but you can type Ctrl-D to end and abort the command, or press ESCAPE.
I then tried the command:
mawk $1 ~ /^France/ awk.txt
it gave me
mawk: cannot open ~ (no such file or directory)
but I fixed it with:
mawk $1~ /^France/ awk.txt
Which gave me the desired results. However, removing spaces didn't eradicate the '< 1980)' problem above! Likewise doing commands like NR<5 gives the same error - though NR>5 works!

Gavin Wraith's other RISCOS stuff

Lua - a port of the Lua scripting lang Awk - see above **Awkward**
Lua - awklike syntax using Lua Gofer
Gofer is a lazy polymorphically typed language
ArmBob - An object oriented language project of D.Betz **Weave**

- a tool for avoiding wimp programming for simple applications

Other - sundry software
Scripts - an article on using scripting with StrongEd

AWK with RISC OS command line to learn out more about RISC OS commands!

I've done a lot of redirection stuff on UNIX, but had never done it on RISC OS - so I looked at the user guide. In fact, I'm still a bit clueless as to all the commands on RISC OS (I used to be good on the BBC and Master though). I discovered I could redirect all the output from the useful *help system to a file with the following command:

```
*help . { > ADFS:$.DTP.ARMclub.PD7.allhelp }
```

After a pause it came back with the * prompt. I then set the file's type to Text so I could read it in VIM or !Edit.

```
*settype ADFS:$.DTP.ARMclub.PD7.allhelp text
```

This is equivalent to Menu clicking the File 'allhelp' and choosing Set Type - text.
I then wanted AWK to give me all the keywords, and separating the records by the string produced by help - "==> Help on keyword". In effect I told AWK to use the Record Separator of that string (effectively removing it) with the following command:

```
*mawk 'BEGIN {RS="==> Help on keyword "} {print $0} smallhelp
```

Then I changed the command to output to a RISC OS redirected file

```
*mawk 'BEGIN {RS="==> Help on keyword "} {print $0} smallhelp
{ > smallhelp2 }
```

I then did some experimentation with the bane of RISC OS/DOS files - removing line feeds from a DOS file

```
*mawk '{ sub("\r"," "); print }' DOS { > DOS2 }
```

mawk complained with:

```
mawk: cannot open { (No such file or directory)
```

... but did the change OK!
I then tried adding DOS line feeds to a file (again mawk moaned, but did it!)

```
*mawk '{ sub("$","\r"); print }' DOS2 { > DOS3 }
```

mawk: cannot open { (No such file or directory)
Note: I don't think this particular final awk command will work on other awk implementations - it's more of a work-around for RISCOS!

Using !Zap as a command 'Task Window'.

I was unhappy with the lack of the BBC Micro style 'copy' facility on a standard RISCOS task window (is there a way of doing it?), until I then discovered that ***!Zap*** has this facility. After a little bit of experimentation, I found out how to do it. Menu-click the Zap icon on the task bar, and then select Create-Task Window, and there it is! To do the copy functionality in Zap, you press the 'End' key on the keyboard (in the little block of 6 keys, under 'Home'). This now enables it to act like the BBC Micro's Copy key, and the way it works in '* Commands' (F12). Move the cursor to copy the command (or whatever) in the time-honoured way.

I found I could also run ***VIM*** under !Zap ! A pretty pointless exercise, as !Zap has its own interpretation of the ***VIM*** command sequences who knows what the output would be like! I quickly entered :q! (abandon edit), and apart from the extra character codes - managed to prevent damage to my file! You can open a ***VIM*** file by entering Filer_Run textfile - this will run it as if it had been double-clicked.

RISC OS South East Show

Surrey and Sussex Acorn User Group are proud to announce that the fifth RISC OS South East Show will take place at Guildford College on Saturday 21st October 2006.

The show will be open from 10am until 4 pm.

Anyone interested in exhibiting at the show should contact John Sawer (sawer@orpheusmail.co.uk).

Inspiration and reasons for my programming

Kevin Wells

This is a short article about the reason and inspirations of my various bits of software, which can all be downloaded from my web site. **http://kevsoft.topcities.com**. I will try and explain the reasons for writing my programmes.

Probably the main reason for a lot of them is laziness, I would rather the computer did boring laborious work than me. This is not a guide to good programming. All the desktop programmes use the excellent ***Dr Wimp*** from

http://www.rayfavre.me.uk/ .

Risc World magazine had an article some years back about ***Dr Wimp*** and programming and that inspired me to start programming again.

!Lcheck: A national lottery checking programme was written to check the lottery numbers against the syndicate where I worked at the time, as there were about 9 or 10 of us in the syndicate. It was much too easy to misread numbers or lines on a ticket, so I decided to write a programme to do the work for me, what it does is you put in the lottery numbers you use and save that, then you put in the drawn numbers and it checks each line to see if you have 3 or more numbers in it, if you do, it then displays a message saying which line and how many numbers, but if not it then displays a message saying "Sorry you have not won".

!Ffiller: A form filling programme was written when one day whilst updating some other software I wrote, I placed it on the iconbar's updated software list and mistyped my web address in, so I decided to write a programme to stop that and ***!Ffiller*** is the result, it has had various updates in that time and now it has 10 forms each with 10 editable buttons on, plus buttons for

the Return key, the Space bar, the Delete key, the Tab key, shift back Tab, and Control U.

!Cpm: Cost per mile was written at the time I was a dispatch rider and wanted to know how much it was costing me a mile to run the motorcycle compared to how much it was earning. You just enter how much you spent and earned then the distance and then it works out the cost per mile and income per mile.

!Laptime: An average speed worker out, was written so that I could work out the average speed in motorcycle races.

!Kclock: A simple clock that displays the time and date, was written when some one on the comp.sys.acorn newsgroup was asking about a simple clock that could go on the desktop, so I had a go.

!Tina: A talking clock was written after I had a look at the speech module from Jonathan Duddington and reading the SWI document I thought I would have a go and see if I could understand it and do something with it and ***!Tina*** is the result. The name is **T**ime **I**n **N**ice **A**ccent.

!IPwhois: Gets contact information about IP address or domain names was written so that I could see where visitors to various web sites that I do came from, you put in the IP address or domain name and then it launches a web browser onto the page from **http://www.DNSstuff.com** with the details for what was entered.

!Bdrop: A background image changer, it changes the background image according to what month it is, it was written on New Year's Eve one year when I had the flu and could not go out. At the time it was written the World Super Bikes web site had 12 images one for each month, with the races for that month highlighted, so I wrote ***!Bdrop*** to take advantage of it. I use it in conjunction with ***Organizer*** to run a task alarm at one am on the first of every month to run ***!Bdrop.***

Ticket: A single tasking random number generator that displays the drawn number in large type, was written for a club's Christmas draw, you enter the last number sold and it then draws a random number between 1 and the number

entered and displays it on screen, until you hit another key then it draws another number, it will not draw the same number twice.

Raffle: A single tasking raffle number generator that is similar to the above, but you can have many different books and starting and finishing numbers.

For help with programming for RISC OS there are many places you can go for help. Here are some of them

comp.sys.acorn.programer
http://www.iconbar.com/forums/viewforum.php?forum=programming
http://www.tofla.iconbar.com/

Following our previous successful shows near Birmingham, The ARM Club will be running a show at Featherstone and Hilton Community Centre near Wolverhampton on 25th November 2006. The full address is:

Featherstone and Hilton Community Centre
Baneberry Drive
Featherstone
Wolverhampton
West Midlands
WV10 7TR

This is a couple of miles from the M6. From the North leave the M6 at junction 11 and take the A460 towards Featherstone. From the south leave the M6 at junction 10A and follow the M54 to junction 1 then leave on the A460 north towards Featherstone. From the A460 turn into New Road and then left into Baneberry Drive where you will find the community centre.
Anybody wishing to exhibit at the show should contact the organiser, Ralph Sillett, at ralph@armclub.org.uk.

The show will be open from 10am to 4pm and there will be an entrance fee of £3 (£2 for club members) with accompanied children under the age of 12 admitted free.

Wakefield Show 2006

Andrew Wyver

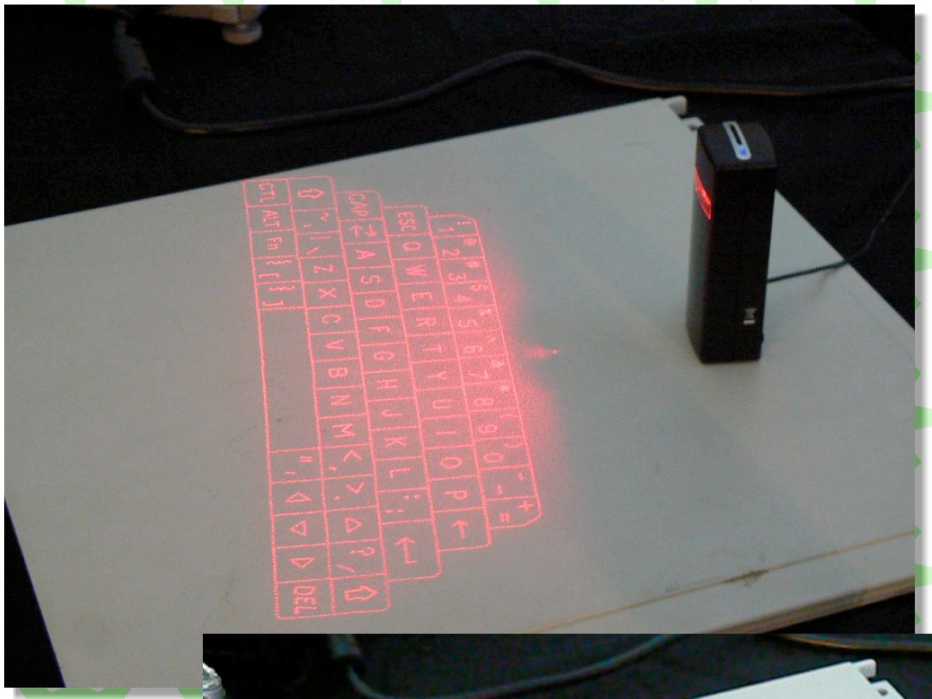
The queue started to form about 9.30am. This was an encouraging sign and in fact the whole day was quite busy. The usual suspects had their stands at the show and most of them seemed to be doing good business all day - the only slight lulls came when the talks were on.

The first talk was John Cartmell of Qercus the invisible RISC OS magazine. John told us that he has restarted but now for only six issues a year. There were troubles due to illness and a failed revamping of the magazine, but this is now behind them and should be regular from now on. *(However another issue has yet to materialise.)* John made a plea for assistance editing articles but there was no money available unless you wrote an article for them.

Sudoku

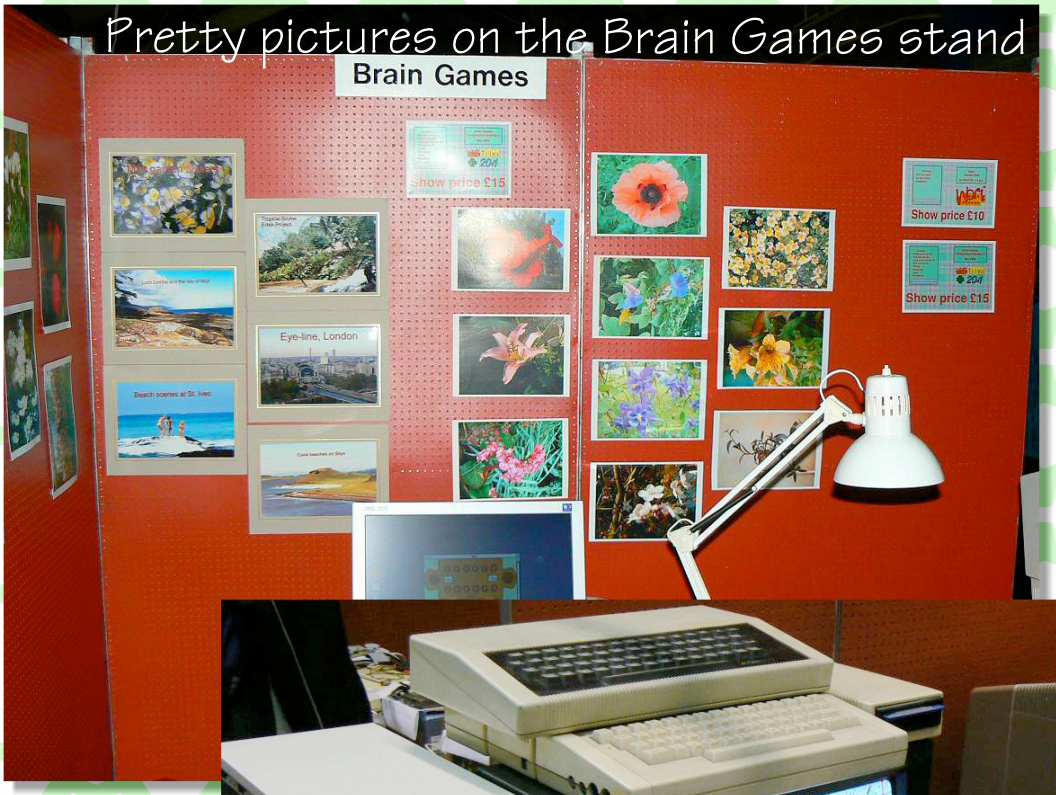
Back in the hall Mathemagical software had a new version of ***Sudoku*** out and updates on ***Turtle Chalk*** a schools' elementary maths program. Neil Spellings was showing

Cino



It's all done by magic

The A9's virtual keyboard



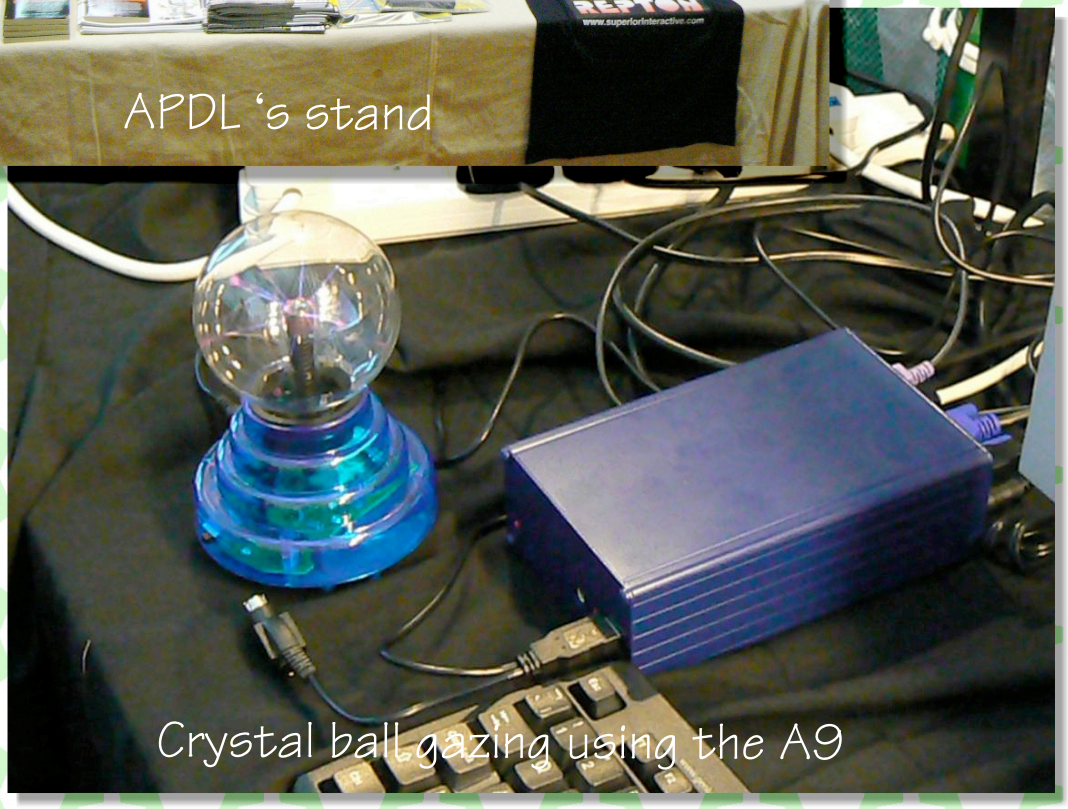
Pretty pictures on the Brain Games stand

Acorn collection

Gremlins in the works

Busy, busy

APDL 's stand



Crystal ball gazing using the A9

Chilli con-struction
The Wuerthner recipe

Photos by the Editor

Silicon Graphics

off ***Geminus*** and also running ***Cino*** (DVD player software) which is still slowly being developed.

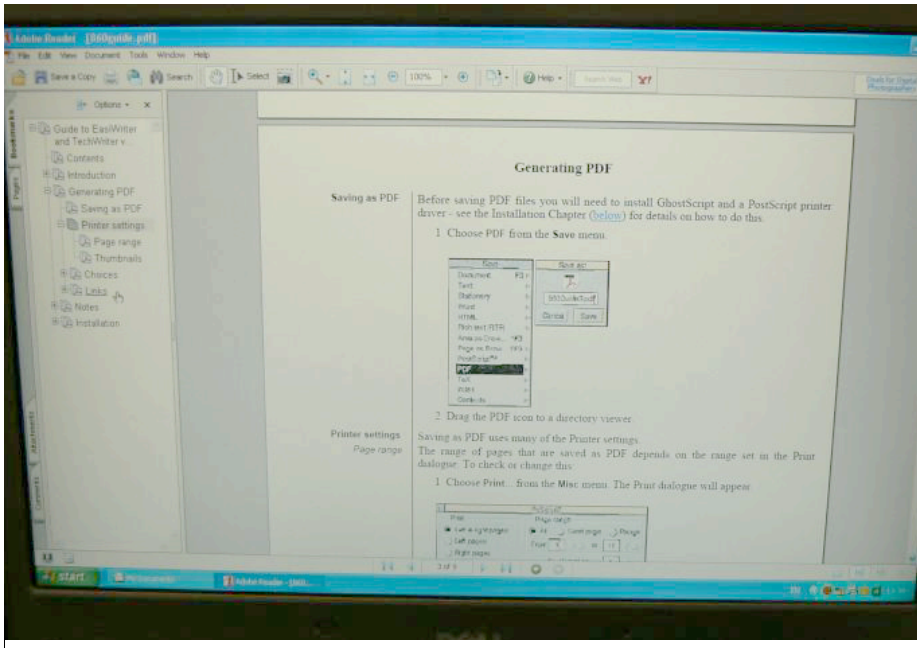
Silcon Graphics were demonstrating touch screens and their music software.

Mike Glover was demonstrating the new features of ***Easy Writer*** and ***Tech Writer*** especially PDF (Portable Document Format) export, allowing one to export a PDF file directly from ***Easy Writer***.

The queue for Advantage6's presentation

R Comp, APDL, CJE Micros were all doing a fairly brisk trade with CJE selling A9s like hot cakes and APDL with ***Schema*** updates now with ***Excel*** file compatibility. R Comp were launching ***UniScan*** which acts like ***Uniprint*** which allows you to use scanners connected to PCs over a network.

Back in the theatre both the Castle and RISC OS Ltd presentations were more or less what they did for the SE show. However the Advantage6 presentation was far more interesting. This was done in two parts - one in the morning and one in the afternoon. Matt Edgar started off by saying that apart from a few niggles mainly with the serial port the A9home was now ready and CJE was selling it on their stand. Also that depending on what their OEM customers required



An Easy Writer generated PDF file as veiwed on Windows

Fortran Friends

additions such as Bluetooth may appear. The A9 would only appear in laptop form if a particular customer wanted something similar but nothing was on the horizon. In the afternoon talk Matt showed us some Bluetooth applications that were now working on the A9. The first was demonstrating mobile phone calls to the A9. The phone could be heard over the connected speakers and Matt was able to talk back using his headset. Secondly he showed off a Bluetooth keyboard which uses a laser to project an image of a keyboard onto any flat surface. The image can be used just like an ordinary keyboard *(see pictures on page 31)*. The projector was not much bigger than a pack of playing cards.

Martin Wuerthner's ***Artworks*** demonstration was also interesting as he showed you how to construct an advert for chillies using ***Artworks*** *(see pictures on page 34)*. He also showed us how to export as PDF files and the new arrow head features - lots of new arrows which you can now snap to the arrow tip. Martin also told us that he was working on producing a new set of Postscript printer drivers to replace the old Acorn ones.

Other stands included Archive selling subs to Archive and Living with Technology *(though LWT has now folded.)*, Risc Cad, Fortran Friends and of course the ARM Club.

All in all it was quite a busy show and gave the impression that there was still life in the RISC OS scene yet.

The Ron Briscoe Column

Well you cannot say that you weren't warned. Here is the latest dollop of Ron's adventures in the world at large, including my trip to Wakefield.

The first thing to report is that Christine's new chair has safely arrived and thankfully does not make horrid noises whenever she changes position, the better to see what I am up to. I, naturally, am totally forbidden to use the afore mentioned object in case I destroy it. They just don't make things like they used to.

After my adventures with the Weston Show I decide that rather than travel up to Wakefield on the train I would ask my good friends in the MUG group if anyone would be kind enough to give me a lift up there, and hopefully back again. As per usual my luck holds and Doug Webb kindly offers me transport to and from the show, even to the extent of first driving away from Wakefield to pick me up, thus adding several more miles to his journey. This is accepted with grateful alacrity, not least because Christine does not like long journeys by road and so elects to go to the local zoo instead. All the more time to spend at the show.

The day of the show dawns and I am at the pick-up point nice and early and you would be surprised, well I was, to see what goes on at major road junctions before they liven up. Doug arrives and we are soon on our way and he uses the journey to test out his new navigation system, it is not too impressive. Doug thinks that he has probably set it up wrong but I personally think that somewhere said device interacts with Microsoft Windows and so is doomed to fail.

We are well on our way and enjoying an interesting

conversation, well Doug's input was, when a nagging little thought poked its way into my mind. It concerns Doug in some way but what? After the obligitary caffeine stop it suddenly comes to my mind what it is. I think that Doug is a Birmingham City supporter! Do I reveal that I am a Villa fan? Will he eject me from his car? Will he slow down first? I decide to say nothing and avoid at all costs talking about football. Not that discussing the Blues or Villa have anything to do with football at present.

Doug times our arrival to perfection, just enough time to enjoy a Spellings special before the doors open. Once inside I do my usual tour marking out the places to visit so as to wrench money from my wallet in return for bargain goods. I upgrade ***Artworks***, worth every penny, I hardly ever use ***Draw*** now. My wallet is further lightened by the upgrade of ***TechWriter***, but not by much. Whilst waiting to part with my money to whoever is free first I strike up a conversation with another chap eager to part with cash and am astonished to find that I am talking to no less a person than David Llewellyn-Jones, aka 'The Flying Pig' whose software has given me and thee so much pleasure. I offer profuse thanks but desist when I see that, like many more RO developers, he is pleasantly modest about his accomplishments and I am only embarrassing him.

I wander over to the ARM Club stall and am horrified to see Windows software on the table. I am assured that there is no need to rip my membership card up as it is an old copy of ***Office 97*** that Ralph Sillet is attempting to sell to raise the cash for a ***UniPod*** purchase. This would be sale of rubbish fails I am pleased to say and Ralph has to use his charm to get a reduction in the ***UniPod*** price. Having experienced his charm offensive myself on occasions I was surprised to hear that he got more than a 10p reduction.

Whilst at the stand I ask our esteemed Editor why the latest copy of the magazine has so far not landed on my mat. "It's at the printers," blithely says he. I am aghast. Has my eyesight so deteriorated that I am talking to the Qercus Editor by mistake? (I nearly spelled Qercus wrongly there but should be excused on the grounds that I haven't seen a copy for so long I forgot its name.) No I am assured it really is at the printers and I will receive a copy soon.

Reassured and feeling hungry I decide to eat. People who have bothered to read my drivel in the past will be aware that my normal Wakefield visit consists of zooming round spending cash and then departing to meet Christine, have something to eat and then catch the train home. This time I decide that I will take the opportunity of exploring the local area.

When I reach the entrance I find it is raining. There is a WROCC helper sheltering under a large umbrella and I toy with the idea of borrowing it from him. I decide not to as, he is younger, fitter and bigger than me. I ask about the pub over the road and although he has had no personal experience of said place he thinks that it is probably OK as "Bikers use it."

Turning my collar up I venture down the drive and woe! There is a coach on the pub forecourt and as I do not wish to fight my way through hordes of thirsty daytrippers I decide to go back later and so return to the show to spend and chat to the WROCC guys whilst watching Phillip Marsden organize. What energy the man has, I almost forgive him for some of the dross he posts on the A-O-L mailing lists... Almost. I am so pleased by the, as ever, efforts of the WROCC guys to make my day a good experience that I decide to become a long distance member of the club. My joining fee disappears a lot quicker than it takes to fill the membership form.

Deciding to try the pub once more, I am pleased to see that the coach has now gone carrying all its passengers onwards. Upon entering the bar I feel everyones' eyes swivel towards me. "Who is this chubby bloke?" is the unasked question. But I am a Brummie and everyone from anywhere in the UK knows someone from Brum and I am soon enjoying some of the local banter and a surprisingly good pub meal washed down by a decent pint.

Reluctantly saying farewell to my new friends I return to the show to further deplete my wallet and to observe my fellow RISC OS users enjoying themselves. Whilst purchasing something from the EFF stand I am asked to take a seat whilst the young lady serving me enters some details on her computer for the software I am purchasing. Suddenly one of the RO dealers appears at my shoulder asking if I need anything. The

young lady has to explain that I am actually in the middle of purchasing software and the would be protector apologies. Yet another instance of the RO community looking after its own.

As to the work machine, we now have internet access (not allowed on our machine) and I am yet again amazed at the ease that people are building up access to all sorts of things when the machine is supposed to be disabled except for one or two applications.

The ink is running out on my keyboard so I leave you to shred at your leisure.

SMALL ADS

Two large boxes full of software & some bits of hardware going free to anyone prepared to pick them up. All of it is compatible with a RiscPC 600. Much of it is educational software, some family history & photographic programs, some are Arm Club CDs, two keyboards, mice etc. etc.. For further details please contact my e-mail address - vml@tinyworld.co.uk

RiscOS bits (4 RPCs and I think either a A5000 or something similar plus monitors and assorted bits) in our storeroom which need clearing out. Cheap (name your price!) to the person who comes to pick them up.
Christopher Price @ Merton Court School, Sidcup, Kent. DA14 4QU. UK.
Email: chrisprice@orpheusinternet.co.uk
Home: 0208 302 4078
Work: 0208 300 2112

i–Mate JasJar and NetGear WG602 Wireless Access Point

David J. Ruck

Last weekend I didn't have much on for a change, so decided to have a bit of a lazy one, and getting out of bed to web browse would have been too much effort. I have in the past taken company laptops home, but they are generally quiet heavy, have loud fans which come on from time to time, and still get uncomfortably warm even through the duvet. The battery life doesn't last long enough for a good lie in, so that means trailing power and ethernet cables across the room.

However at work we are developing for PDAs and have got a few of the latest models in, one of which being the i-Mate JasJar. At last this is a type of PDA that is a true successor to the Psion-5 clamshell screen and keyboard style, rather than the touch screen tablets of late – or rather it is both. It opens up to reveal a landscape orientation screen and keyboard, the clever bit is that you can rotate the screen around and lay it flat back over the keyboard, at which point it automatically flips the orientation to

NetGear router on top of my Iyonix, next to my 1:18 scale RX-8

portrait and becomes a tablet style touch screen PDA. The screen is 640x480 but the same size as other PDAs working at 320x240, which means double the dots per inch and a much clearer display. There is only one draw back to the device, in that it runs the Devil's own operating system, which this week is known as the mouthful: Windows Mobile 5 Smart Phone Edition.

For connectivity the PDA has built in Bluetooth, Wi-Fi and is also a 3G phone which should allow you to connect to the internet just about anywhere, although with shocking costs per MB over mobile phone networks I resisted the temptation to try this out. Powered by a 533MHz X-Scale and a decent battery life its possible to use it for around 4 hours connected to the internet via Wi-Fi, with absolutely no wires to get in the way. But this meant I also needed to borrow a wireless access point to connect it to, and see if I could add it to my home network from RISC OS. I was going to borrow an old model we weren't using any more, but when asking the boss for permission he pointed out that it needed setting up via USB using PC specific software, so instead and as long as I had it back by Monday, he let me borrow our backup access point, a NetGear WG602, which is configurable via its built in web server.

JasJar in clamshell mode

On getting home on Friday evening, I plugged it in to a spare port on my PAE-CE84 ADSL router. I have my Iyonix and Risc PC set up to use fixed IP addresses rather than using DHCP, but the router has a DHCP server which I'd previously set up to allocate addresses in a higher range in case I plug anything else in to the network such as a laptop. I then powered up FireFox and tapped in the address of my router which is 10.0.02 to get in to its configuration server. Incidentally FireFox is the only RISC OS browser which works fully with the router, Oregano 2 can just about be used, but you have to log on every time a page is fetched which is incredibly tedious. I looked at the routers LAN page which lists all the devices on the local network it knows about, my Iyonix and Risc PC were on there as 10.0.0.8 and 10.0.0.6, and also a new address of 10.0.0.192 which must be the wireless access point. So I then tapped in this address in to FireFox and it brought up the login page for the access point, which luckily was still set at the default, and the the boss hadn't changed it when borrowed it himself recently. I had expected pages and pages of configuration like the router, but it was quite straight forward, I just chose a name that the network would announce itself as (the SSID), turned on security – highly recommended, unless you want all and sundry gaining access to your local network and internet connection. Several types of security are supported including WPA, which is the latest and

JasJar in tablet mode

strongest, and WEP, which you may have to use on older devices. I went with WEP as that's what we are still using at work so all the PDAs work even though the JasJar supports WPA. To set this up you just enter a pass phrase in the box and the access point then generates a 128bit hex value.

I then turned on the PDA, and straight away it found my Wi-Fi network and tried to connect to it. This worked OK as mine was the only network in range, but this over-eagerness is often a problem at work where a new PDA tries to connect to the networks of all our neighbouring businesses before ours. It then asked for the security key to be entered, so I typed in the 32 hex digits from the access point page. That was the trickiest part, as despite it being on the screen right in front of me, and using the PDAs keyboard rather than the touch screen which can be tricky, I still needed three attempts before I got it right! Then the PDA was connected using the routers DHCP sever to assign itself an IP address, and the setup was done. I didn't need to do anything else to it or the wireless access point for the rest of the weekend.

The real test was then the lie in Saturday morning, without turning on my computers I just grabbed the PDA off the bedside table and was straight on to the internet to check BBC news, the Met Office Aviation forecast (as I was studying for my meteorology exam), and the RX-8 owners club forum. The high res screen is almost as crisp as printing on paper, which means you can turn the font size right down and still read it from a distance of 18 inches. However, it can lead to a bit of eyestrain though if you keep switching focus between the nearby PDA to the TV screen further. The mobile browser has improved a lot from the Pocket PC 2003 one, making sensible choices for the scaling of the page, so the main column of most sites is the width of the display, allowing the full BBC news site to be used rather than the cut down low graphics version normally used for mobile devices. It works particularly well in landscape orientation, but you have to set it to run full screen otherwise the title and menu bars reduce the page to a thin strip. You can navigate round the page using the cursor keys on the keyboard and space bar to activate links, or use the 5 way button next to the screen, although I found it easier to drag the scrollbars with the stylus. In landscape mode you have the keyboard available, which makes it easy to type in URLs, but its still a lot smaller than the Psion 5's keyboard so you wouldn't want to type

anything very long it to it, especially as most of the punctuation is are on various keys in combination with the FN key. I did manage to type in a few forum replies on it without much difficulty, except when I came to want to enter style tags which use square brackets, and these aren't on the keyboard, requiring you to bring up the onscreen keypad.

I decided to get up around mid-day as I need to check my email, and as the PDA is lacking any decent email software, it would have been pointless to even look at it with the abomination that is Pocket Outlook. There was still a good amount of battery charge left, so I wandered around the house checking the Wi-Fi signal strength, which reached in to every corner of the building with no apparent drop in connection speed. I didn't check to see if it worked from the top of the garden as it was freezing and blowing a gale that weekend, but there was still good signal on the edge of the patio, which would offer the temptation of both sun and internet during the summer! The PDA is only using the slower 11Mb/s 802.11b networking rather than the faster 54Mb/s 802.11g which the access point also supports, the faster speed can degrade more rapidly with range, will still be as good as or better than the speed of the 'b' networking.

So would I buy a JasJar and access point? Well I'm tempted, but I'll have to resist, the JasJar is quite an expensive device (£600 standalone, around £300 or less with a phone contract where its sold under several operators brandings), just to use in bed at the weekend to web browse. I've already got a PDA in the car for sat nav, and although the JasJar doesn't have a built in capability it can be used on the move with a Bluetooth GPS receiver, and the maps look great on a high res screen. As it is aimed at being a phone the size is kept down which means the screen and keyboard aren't quiet good enough for prolonged web use, although if I could afford the mobile data rates the ability to connect anywhere would be great for when I'm on holiday, and desperate to keep in touch. For my use I'm thinking something between the size of a Psion5 and a sub note book would be a better match, with a bigger screen and keyboard, but with good battery life for wireless operation. If I did get something with wireless though, I'd definitely get the NetGear access point to go with it, as its easy to set up from RISC OS, looks good, and since we've been using that model at work, far more reliable than before.

A9 at IRUG

Andrew Wyver

IRUG (The Invicta RISC OS Users Group) is a small group of Acorn users based in East Kent. The group has been active for the last two years with a small but very keen membership.

Kevin Wells, one of the group's founders, brought his newly acquired A9 along to the July meeting. This was quickly hooked up with mouse, keyboard and an old Iiyama Vision Master 17 inch monitor and turned on. It took about 30 seconds for the desktop to appear in an 800×600 display. Setting it to a larger

Kevin with his new A9

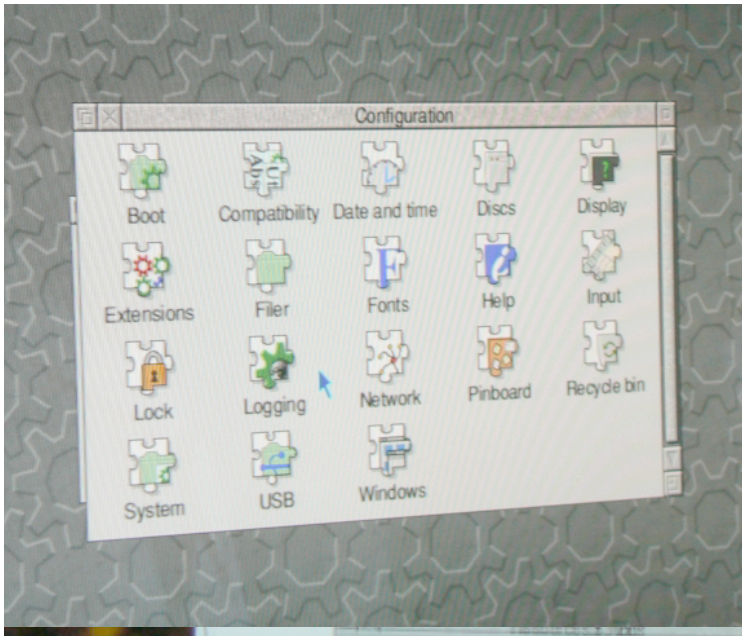
display just required going into configure and in no time we were looking at 1280×1024 in 16 million colours.

Kevin had only received the A9 a couple of days before and had not loaded much onto the machine yet. The computer runs

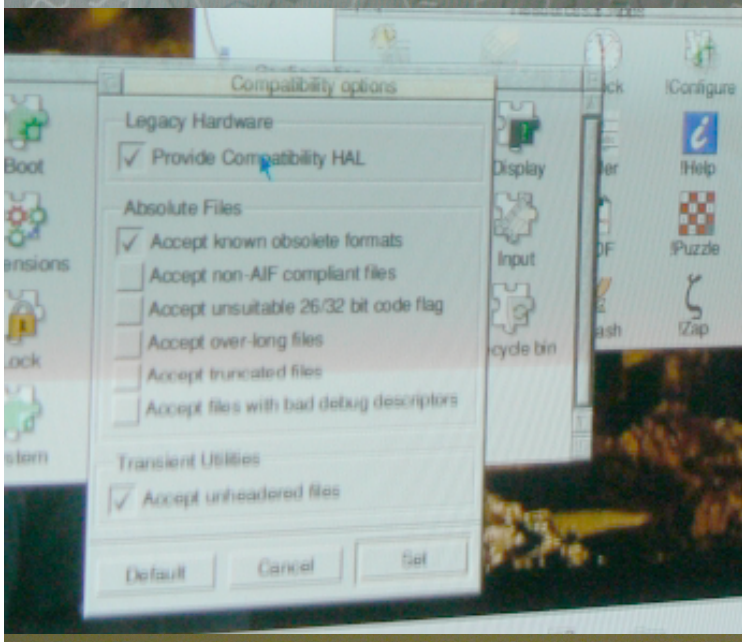
RISC OS Ltd's Adjust operating system (RISC OS 4.4)
The standard apps were there - ***Draw***, ***Paint*** etc a couple of browsers ***(Firefox*** and ***Netsurf)*** and a couple of Kevin's own applications (of which more later).

The A9home specifications consist of at the rear a PS2 mouse socket, a keyboard socket, a power on switch, 2 USB ports, Monitor port, ethernet port and serial port. At the front are 2 USB ports, microphone/line in socket, speaker/line out socket, on/off/reset switch and a hard disc activity light.

Kevin had brought along a USB multicard reader which was plugged into one off the USB sockets. The Icon for this came up on the Icon bar showing that there was a Smart Media Card (168 megs) in the card reader so we used it to load up the pictures I had been taking of the meeting. My camera uses an SD card (1



Configuration, notice the new extensions configuration



The new extensions window

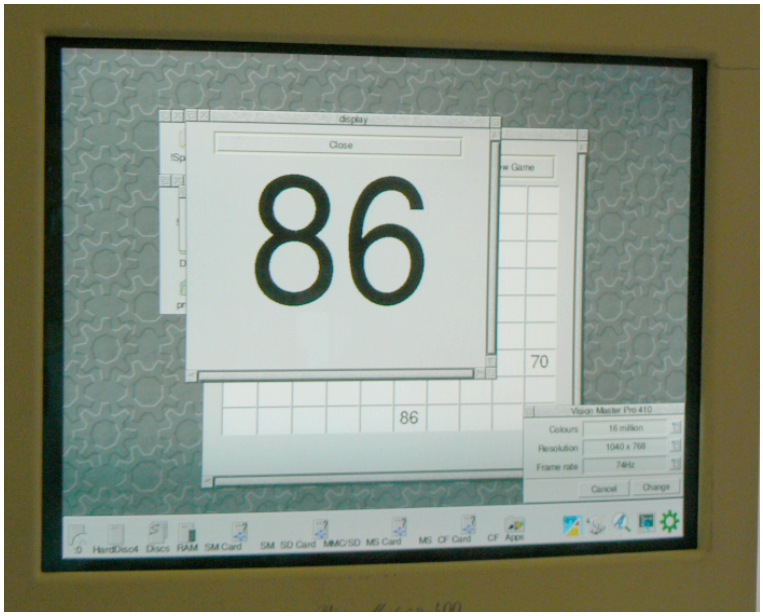
General screen shot showing USB volumes on the icon bar

A9 back

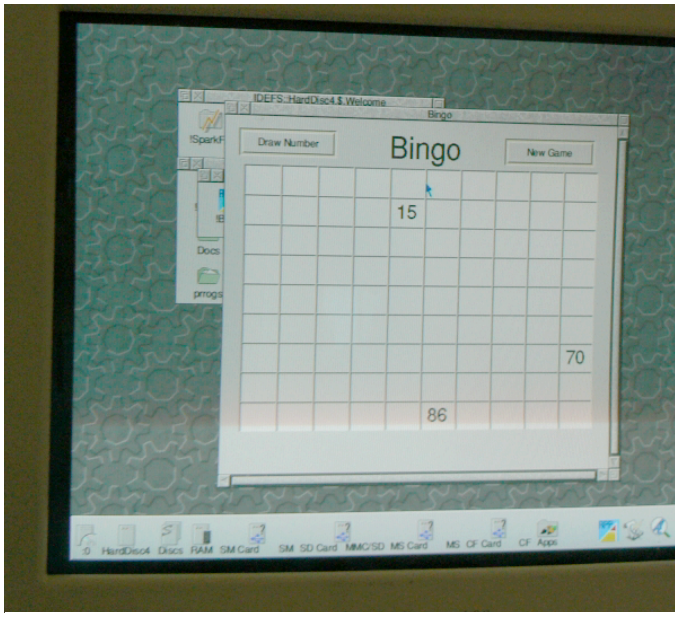
gig). I took the card out of the camera, which was then pushed into the card reader. Immediately the icon for the card appeared on the icon bar - one mouse click and the picture folder appeared. This was opened showing all the individual picture icons. The A9 will display the icons as thumbnail images but as I had over 200 6 million pixel images on the card we did not wait to display them all but just double clicked on one of the pictures I had taken of the meeting and after a wait of about six seconds, lo and behold it appeared on the screen.

A9 front

We then opened an ***Artworks*** file (the orca picture) which took about two seconds to render. Opened ***Firefox*** (took about seven seconds to load) and then Kevin demonstrated a new application he had written recently called ***!Bingo*** using BASIC and ***Dr Wimp***. The program is an application caller for bingo which replaces the glass cylinder and the ping pong balls. It uses



Ist draw your number



Then place it on your card

a random number generator to choose the 'balls'. The app is not quite finished (only the help files remain to be written) *(now all done and available from kevsoft.)* but when it is it will be freely available along with Kevin's other software at **http://kevsoft.co.uk**

The A9 as it came supplied seemed at first viewing quite a useful machine and at the next IRUG meeting (see website for details) we will hopefully get more applications loaded onto it and submit it to further testing.

Just to show some degree of scale - might be small outside but it's big inside!

For more information on IRUG visit the website http://irug.kevsoft.co.uk

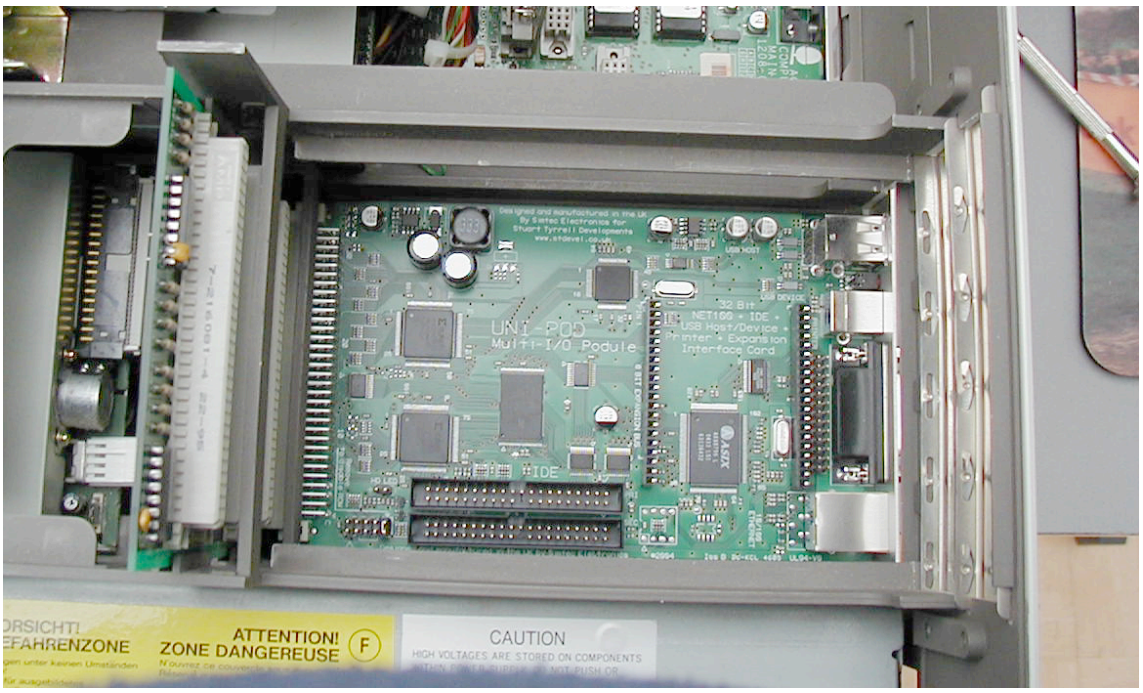
Unipod, fully loaded

Ralph Sillett

I have been toying with the idea of purchasing a ***Unipod*** with USB for my ageing RISC PC for sometime and I finally decided to go ahead at the Wakefield Show in May. As it turned out I purchased the fully loaded ***Unipod*** with Network, IDEFS and USB already installed.

The fitting of the ***Unipod*** was simple as it it uses one of the podule slots (I have four on my twin sliced RiscPC). A SCSI podule occupies the second one up so I placed the ***Unipod*** into the first slot (at the bottom). Before it is installed into the machine the backplate needs to be screwed onto the podule which is very easy. Once installed it was time to switch on. All the files needed to configure the ***Unipod*** are now in Resources:Apps.Unipod and needed to be copied to the hard drive for safety.

Unipod layout of board



Inside my RISC PC

As I wanted the USB part of the ***Unipod*** I tried to connect a couple of devices but without any luck even after reading the supplied file with regards to getting a device to work. So far I have been unable to get anything working on the USB podule. Two of the items are pen drives: one is a 2Gb Sony Micro Vault and the other a Buffalo 256Mb with reference number RUF-CC256M/U2. Both the pen drives created the !MassFS Icon on the icon bar and when the icon was clicked upon it brought up an empty filer window but both drives had about 47mb of JPEG files which did not show in the window, but when checking on how much was Free on the drives it was registering as 47mb used. I am still trying to get the drives to work but have run out of time to get this article to the editor for inclusion in the magazine. I hope to update you all in the next issue

Fitted into RISC PC

of Eureka with how I get on with connecting these drives. On the other hand the Network interface worked straight out of the package.

I have just tried out the IDEFS after removing the SCSI podule so that I could get at the connector for the IDE cable. A slightly longer IDE cable was required to allow the cable to be positioned away from the StrongARM processor. Its a good job that the processor does not require the cooling that a Pentium does. On switch on once all connectors were attached the supplied program, !IDETools, performed its job and I was able to back up my main hard drive. The formatting took about 20 minutes on the 12.5 gig hard drive.

On the whole the ***Unipod*** is a quality made product let down by the manual! I would like to see a more professional manual which is easy enough to produce in either ***Impression*** or ***Ovation***. Just look at this magazine which is produced in ***Ovation Pro***. Even a manual on disc would be helpful.

I only wish I could get the USB to run the items I have which are brand named products but I will have to keep trying. Also I now have a spare network card.

Purchased from Stuart Tyrell Developments at the 2006 Wakefield Show.

Address: Stuart Tyrell Developments
PO Box 183,
OLDHAM,
OL2 8FB
Telephone: 0845 458 8803 or01706 848744
Fax: 0870 164 1604
Email: Info@stdevel.co.uk
WWW: http://www.stdevel.com

Current price as printed on web page:

Unipod with one function enabled (USB, Net or IDE)
£99.00 inc
Enable one further function (at purchase time or later)
£25.00 inc
Unipod with 32-bit USB, Networking and IDE
£139.00 inc

Winning games with logic part 14

Barry Aulton

We have looked at the type of data structure, namely the Finite State Machine, that is useful for storing information about objects in a computer game. We now need to go from one state to another, eg from one place to another in a maze game or try to solve simple logical problems (eg you need the blue key to unlock the blue door but the key is guarded by the blue dragon etc.) This requires simply searching through all possibilities (if there is time, usually there isn't) to find a solution. These logical problems have been the basis for traditional AI and are used for chess playing programs; indeed research on chess predates the field of AI. Of course, chess isn't a very interactive game compared to say football. Also there are not too many legal moves that can be performed at any one time. Even so chess playing m/cs have a chequered history:-

In 1800 a man named Von Kempelen exhibited an 'android' dressed up to look like a Turk seated at a chess board. The Turk won games all over Europe and the US. Alas it was a fake, with the 'android' hiding a human chess player. The basis for chess programs today, stem from 2 landmark papers written in the 50's : the 1st by Claude Shannon (who provided the basis for automating the game and the 2nd by Alan Turing. Turing proposed an initial heuristic for chess - Simply add the 'value' of Blacks pieces (B), add the value of White's pieces (W), compute W/B and use that as an evaluation function for how good a possible move is. In 1966, John McCarthy arranged for a chess match between two programs, one developed at Stanford and the other in the USSR; neither was much good, but the match did stimulate interest in the research. By 1973 the program chess 3.6 by David Slate and Larry Atkin of North-western University was consistently winning tournaments. However they had got bored with the program. "We could have tried to push Chess 3.6 by yet another notch; but that would have required

expending much effort for rather little return. The design deficiencies went much deeper than the fact that it was an old fashioned program that depended on searching large trees filled with unlikely positions. It was poorly documented and not very modular..... No, it had become too painful to look at Chess 3.6 any more let alone work on it." Due to the short deadline to the next tournament, they decided to simplify the program AND rely on search techniques rather than litter the program with chess heuristics.

However, chess is such a logical type of game; one that we would expect computer simulations to be good at. Most computer games are a whole lot messier and several AI techniques may have to be used together. Disaster can strike when the results of one technique interfere with those of another. For example, consider the problems the Developer Atomic Games had with their tactical wartime game Close Combat. This is part of an email sent by the developers plus some added comments I have made:-

"At the time, it was not apparent that handling interaction between the low level simulator and the high level AI would be such a difficult task. A lot of effort went into resolving these issues. For example, the simulator determines line of sight to a team by tracing from individual soldier to individual soldier, but the high level AI has to have some type of abstraction which divides the map into locations and provides information about whether a team can fire from one location at another. If the abstraction didn't work well, you'd either have teams moving to locations from which they couldn't attack the enemy or moving out of locations from which they could. The solution we ended up with was to iterate over all locations on the map deploying teams into the divided map locations and then have the simulator determine whether a line of sight existed (which took a considerable amount of time).

Anyway, we had a lot of issues like these that had to be worked on through almost the entire development cycle, so as the AI was being developed I just used very straight forward approaches to determine team actions (i.e. if the AI can't figure out a location to move to from which a team can attack the enemy, no one will care what technique the AI uses)".

Having scrapped a more ambitious AI system in favour of a traditional hierarchical rules-based approach. Here's a brief description of the implementation.

The Strategic Artificial Intelligence (SAI) in Close Combat (CC) handles the task of creating high and medium level orders for the teams under direct computer control and medium level orders for the teams under player control. Sometimes, a player's teams will be placed under computer control (either by the player clicking the advance or retreat buttons or if the player has not issued an order to a team for a long period of time) in which case the SAI will also generate high level orders for the player's teams placed under computer control.

When creating orders, the SAI reasons only about the teams as a whole. It never reasons about individual soldiers in the teams. (Note this is the standard 'black box' approach to AI in battle games see Fig. 1) It reasons about locations on the CC map, the SAI divides the map into a square grid. The squares in the grid are referred to as megatiles. The size of a megatile is roughly the

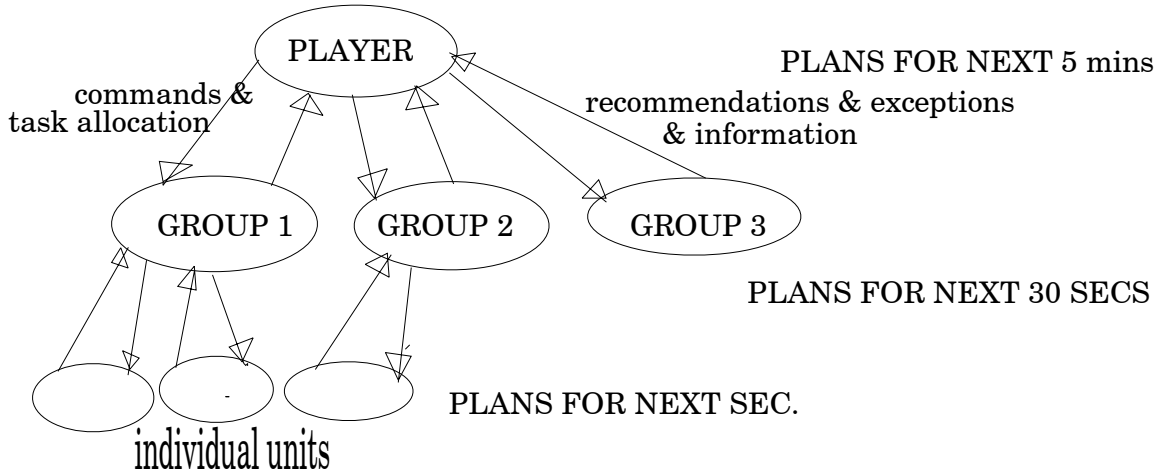


Fig. 1 The command structure in a battle game with the player or computer player at the top & individual soldiers, tanks etc. at the bottom These 'units' simply report back up the command structure.

size of the smallest square building which can be found on the CC maps (about 18 by 18 meters). High level orders correspond to the orders in the pop-up menu that appear when a player clicks on a team. An example of a high level order would be

"Move alpha team from megatile grid location (3,5) to megatile grid location (6,11)." The SAI generates high level orders for the computer controlled squads using information about the current game situation and victory conditions.

(Fig. 2, where the word topos is used instead of megatiles shows how individual soldiers etc. can be moved with this type of system)

Player controlled units are given high level orders by the player

Fig. 2 Unit Movement In a Battle Game When
The player has clicked on an icon meaning Guard

This routines searches the topo,s surrounding the unit for own & enemy units to move towards.

If a topo is chosen with no units on it the unit will move towards it's previous position to guard, or it's initial position

The probability a topo will be selected to move towards or away from depends on a weighted sum of the armour of friendly & enemy units in the topo,s surrounding the unit.

The weighting depends on the units armour , experience & loyalty

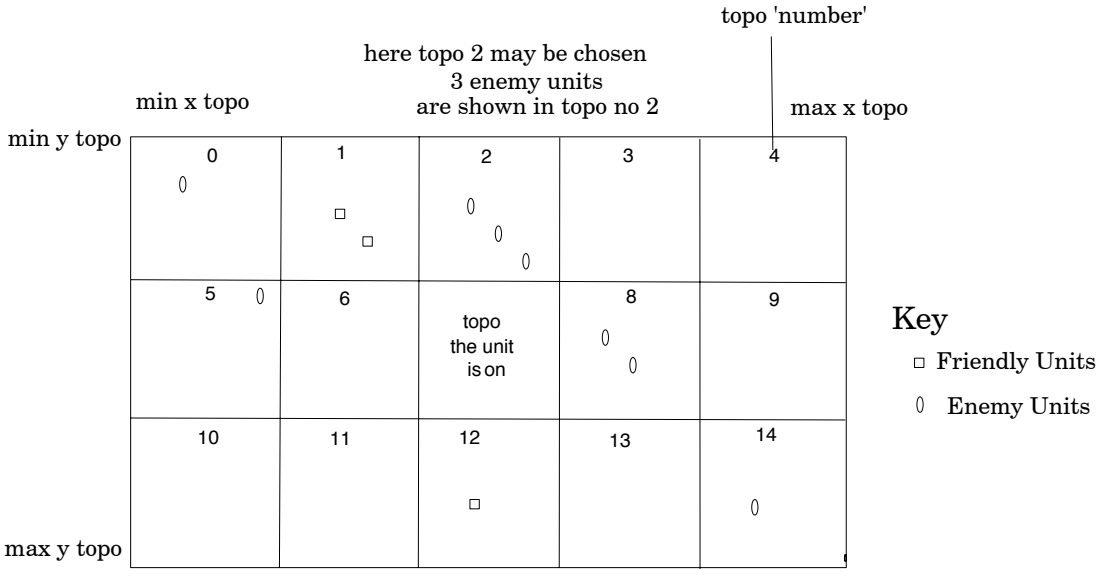
e.g. attackweight = (units armour + experience) /2

attackweight weighting the probability the unit will attack (move towards) enemy units

fleeweight = (100 - (units loyalty + experience)/2)

fleeweight weighting the probability the unit will move away from enemy units.

An experienced unit can search further out & is more likely to move towards enemy units. A less loyal unit or less experienced 1 may choose to flee from a topo containing heavily armed enemy units.



if topo 2 is selected but the unit is fleeing, the coordinate stored in topo 12 will be selected to move towards

through the pop-up menu that appears when the player clicks on units under his control. Medium level orders are generated by the SAI to accomplish high level orders at a team level (see Fig 1). For the previous example of a high level order, the medium level orders might include "Move alpha squad from megatile grid location (3,5) to megatile grid location (4,6), "Move alpha team from megatile grid location (4,6) to megatile grid location (5,7)," and so forth. The SAI always generates the medium level orders required to accomplish high level orders regardless of whether the high level orders were created by the SAI or the player.

The SAI is comprised of three main systems: the location selector, the path planner (this requires a search technique see below) , and the target selector. The location selector is used by teams under SAI control for generating high level goals. It determines where the team should be on the CC map. If the team is not at its desired location, the path planner is invoked to determine the medium level movement orders needed to get the team where it needs to be. The path planner can generate paths based on speed, safety, or a combination of the two. Once at its desired location, a team uses the target selector to determine which enemy team (if any) it should attack.

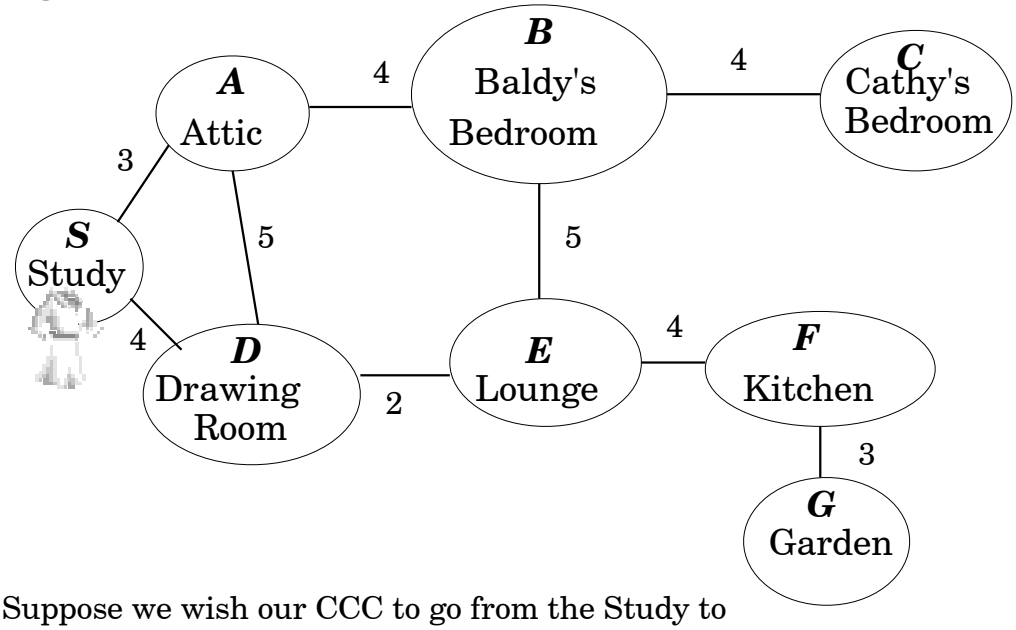
When a player gives a move order to a player controlled team, the player's order becomes a high level movement order. The path planner is then invoked to generate the medium level goals to get the team to the specified location. Fire and smoke orders issued by the player are converted to medium level orders indicating that the team should fire at the specified location. A defend order issued by the player invokes the target selector which picks an enemy target for the player's team to attack. The location selector uses a number of criteria for selecting a desired location for a team. First, it determines if the team should just stay where it is. When a tank first sees an enemy tank or anti-tank team, it's most likely to try to get the first shot at the enemy rather than moving on its way. Infantry under intense fire EFFin a good defensive position tend to stay at their current location as do mortar teams since they like to deploy and stay out of the enemy's line of sight. If the location selector decides that a team should consider moving to other megatiles, it begins a search for the best megatile in which to position the team. Since each CC map contains hundreds of megatiles, the

location selector uses a number of heuristics to prune the search space. For example, moving a rifle team into the middle of a large open field is almost always a bad idea. (N.B. computer games are usually littered with these rules of thumb or heuristics, eg for a chess playing program evaluation functions like C1 * piece-advantage + C2 * advancement + C3 * centre - control are often used, C1,C2,C3 being constants)

The location selector uses a number of factors to both prune and rank the list of megatile locations being considered. The factors include the defensive benefit of the megatile, the strategic importance of the megatile (is it a victory location), the amount of time it will take to reach the megatile, the amount of danger involved to reach the megatile, and the number of friendly and enemy casualties expected when the team attacks the enemy from the megatile. When dealing with enemy teams, the location selector hypothesizes the location of enemy units rather than cheating by looking at the real positions of teams that it should not be able to see (i.e. the individual soldiers report back what they can 'see', then dead reckoning i.e. guesswork is used).

We can see that the same search techniques that are used in computer chess games are used in this game, the only difference being the heuristics used. As a simple example where a search technique may be used, Fig. 3 shows a representation of some rooms in a haunted house, where our computer controlled ghost must find his way from the study where he lurks, to the garden to haunt the player's character. We are here simply letting the room the ghost is in be it's state; reducing the problem to finding the 'shortest' way for it to travel from the study to the garden. Usually in a game we need to find the way which will be most effective to win the game for the computer side. Thus, if some high level AI strategy decides that we need to move our CCC from say the Study to the Garden, we may have a whole host of ad hoc formulae giving an estimate of "how much of a good idea" it is to move our CCC from any one room to another. These may depend on the strength and position of the players characters in the game; eg the player may have a character lurking in the Drawing room waiting to Zap the Ghost with his 'MegaZapperGhostBuster'. Also, we usually have to predict where the players characters will be by the time our CCCs get to other rooms (megatiles in Close Combat, see above). Hence we

Fig. 3 ***A SEARCH EXAMPLE***



Suppose we wish our CCC to go from the Study to the garden by the shortest path given the distances in metres between rooms.

We can do this by exploring the network of places , Lounge , Drawing room etc. By convention the places in a net are called nodes, thus here Kitchen , Garden etc. are nodes & the connections between nodes, for example the Kitchen F 'connects' to the Garden G with a distance 3 M are called branches.

If we trace out all possible paths from the study to a node (room) that we have already visited we end up with a tree like structure shown as figure 4, which also shows the distance from the study to the end of each branch Here the node at

the top of the tree is S the Study. It is called the root node in that it has no children. If we want our CCC to travel from the study to the Garden by the shortest route the simplest way is to use a lookup table which we can precompute. For example the shortest (& only) path from the kitchen to the garden is directly to the garden. So we write G (Garden) in the look up table entry (Kitchen,Garden) where the kitchen is the source node (the node where the CC is) & Garden is the Goal Node, the place we want our CCC to get to. Suppose we insert into the transition lookup table the next step in the path from every source node to every specific goal node, (i.e. everywhere to everywhere) in the Net. (Yes you can see the problem when there are many places to search) If we want our CCC to go from the study to Cathy's bedroom by the shortest path it needs to next go to the attic, so we write down Attic A in our lookup table for the entry (Study,Cathy's bedroom). Similarly for the entry (Attic, Cathy's Bedroom) the shortest path is via Baldy's bedroom B. For this simple net we can write down all transitions (entries in the table) from all source nodes to all goal (destination) nodes.

There are only 8 nodes (places) so there are only 64 entries in the table. To determine the shortest path from any node to another we can then do a series of lookups into this table.

have essentially two problems:-
Firstly, how do we estimate "how much of a good idea" it is to move from one room, grid square or megatile to an adjacent one; and secondly how do we extend this to find the best way to move our CCCs larger distances.

For the first problem we can use many ad hoc game dependent formulae and a technique called Fuzzy Logic (which I will discuss next time). For the second problem we can use a standard search technique. Initially we will assume we are only concerned with distances. From Fig. 3, we can see that since there are not many rooms, we can simply set up a look up table to choose the next room to go to. Unfortunately there are usually many more places to visit in a game so we must find a path from where the CCC is to where it needs to go to. Fig 4 shows all the possible paths from the Study to all other rooms without going in circles. You can see even in this case the number of possible search paths is not trivial. The bog standard search method (that is probably plaguing students now) used in games is depth first search.

With this method you try to reach your destination by attempting to move forward as long as there is hope of reaching your destination.

This is a sensible idea if you are say lost in an historic house and have no sense of direction. From Fig. 4, the order you would search rooms would start with Study, Attic, Baldy's bedroom and Cathy's bedroom. At which point you realise you have gone the wrong way, since the only way you can go from there is back to Baldy's bedroom where you saw the entrance to the lounge. This is the next branch to explore. From the lounge you can go into the drawing room from where you can only go back to the study. Traversing the tree like structure of Fig. 4 in this way we eventually find that the shortest path from the study to the garden is Study - Drawing Room - Lounge - Kitchen - Garden and is 13 M.

The basic search technique used here is called depth 1st search, which has the following procedure :-

1 Record Failure
2 Form a 1 element queue (i.e. first in last out list) consisting of the root node (here the Study)

3 Until the queue is empty (at which point you have realised you cannot reach the goal and must give up the search), or the goal (here reach the garden) has been reached, decide if the 1st element in the queue is the goal node.

3A if the 1st element in the queue is the goal node record success

3B if the 1st element of the queue is not the goal mode, remove it

from the queue and add the 1st elements children (eg from fig 4 the study node has 2 children the Attic and Drawing Room)

Variations on this brute force search technique are in wide use in game programming. However,we usually talk in terms of cost of getting to the goal node (eg if most of the CCC's units would get killed off in a battle game our fudge factors should predict a high cost!) This brings us back to problem 1, how due you combine many heuristics? This is where Fuzzy Logic comes in and will be discussed next time.

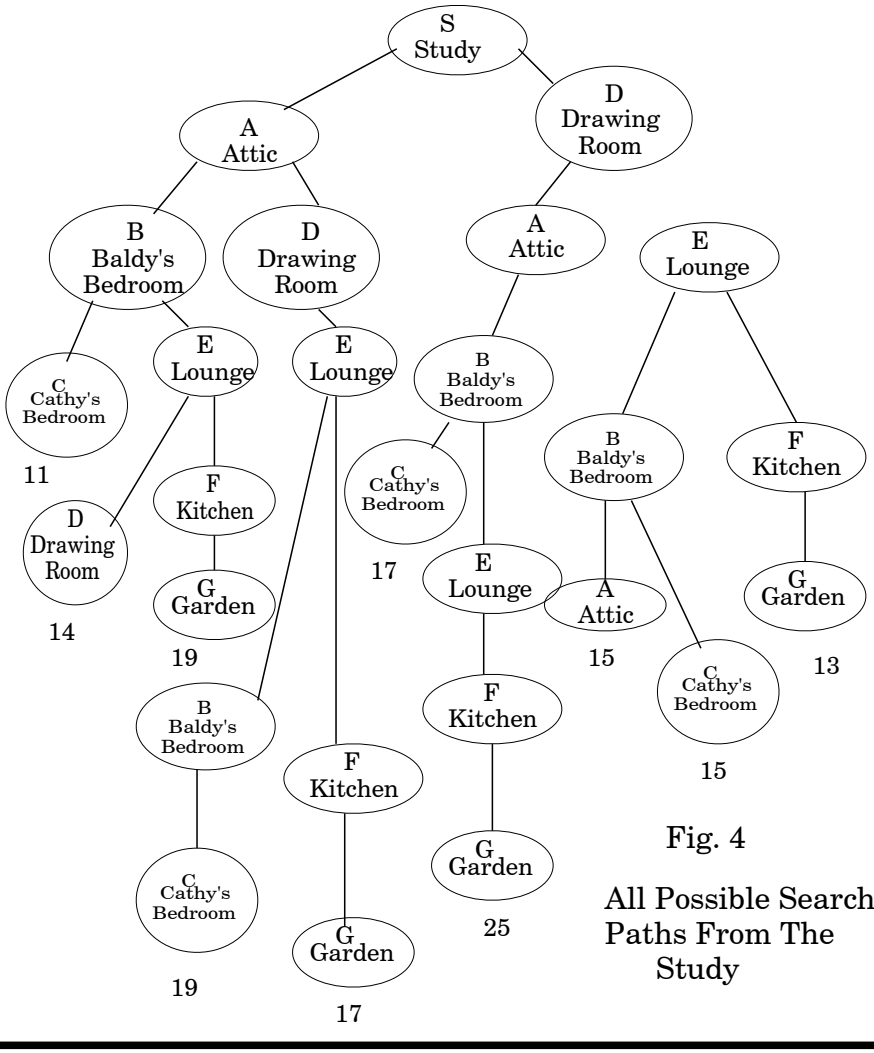


Fig. 4

All Possible Search Paths From The Study

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