

The magazine for members of

The **ARM** *Club*

IYONIX 

**The full report of the new
RISC OS computer**

**Using Net100 to link
laptop and Risc PC**

**Successful buying
and selling
at auction online**

**At the Midlands and
South East Shows**

Issue 45 — Spring 2003

At Last A New Computer

The ARM Club's 2002 pre-Christmas Midlands RISC OS Show will always be remembered in Club history as the one where a new RISC OS computer went on sale.

All the stalls were busy and seemed to be doing good trade but there was no doubt which one was the main attraction as visitors crowded round to see the new Iyonix on show — and on sale — at the Castle stand. Within a few minutes of opening time the first buyers were already carrying boxes out to the car park; some of them having bought without even waiting to see a demonstration.

There were four of the new machines being put through their paces on the extensive Castle stand with others running 32-bit software being demonstrated by other dealers.

Neil Spellings was being kept busy answering enquiries about Aemulor from those planning to run their existing 26-bit RISC OS software on Iyonix.

In response to the importance of the event and the huge interest it has aroused, this issue of Eureka includes the longest review we have ever published, thanks to David Ruck's unrivalled knowledge of Iyonix.

There will be another example of his expertise — on how to adapt your existing software for the new computer — in the next issue as there just isn't enough space for it all in this one! This should also include full information on Aemulor.

We had expected to be including an authoritative report on the Omega, having been told by MicroDigital a couple of weeks before Christmas that it was already being sent out to customers who had placed orders. However, we haven't received the promised review machine at the time of going to press so — once again — it's a matter of waiting and hoping with as much patience as we can muster.

Peter Jennings

All opinions expressed in Eureka are those of the authors and not necessarily those of the Club or its Committee members and officers.

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*Extreme spoddling — as recorded
in Gill's Journal (See page 62)*

Shows Diary

RISCOS SouthWest

Saturday 22 February 2003

10am-4.30pm

The Webbington Hotel

Loxton, Nr Axbridge, Somerset

Full details on page 43

Wakefield 2003

Saturday 19th May 2003

10am-4.30pm

Thornes Park Athletics Stadium

Horbury Road, Wakefield.

Entry £5 Under 16 free, if
accompanied by an adult

Email: showinfo@wrocc.org.uk

Web: www.wakefieldshow.org.uk

Member's Ad — Offering two free computers!

1. The newer of them is a Risc PC 700 with OS 3.6 and with the newer Boot structure. The monitor is an AKF60 which has an intermittent fault, occasionally making it scroll rapidly. Only the basic software is now resident as I have transferred the rest to my Castle Kinetic RPC.

2. The older one is an A5000 with OS 3.11 and a perfectly good AKF18 monitor. As above, it doesn't have much software.

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I have never been more pleased to be wrong. Over the last few years I was one of the people explaining why a machine like the Iyonix couldn't be released, but now it has! Let me bore you with a bit of background explaining why, before I get on to the

the Risc PC getting ever older and, despite very useful upgrades such as the Kinetic and ViewFinder, people are being tempted away by the large numbers of megahertz always being quoted for new machines on the PC side of the fence.

Just about everything you may want to know about the Iyonix, by David Ruck, who has known about it for longer than most of us.

bit you really want to hear about, the review of the new machine.

Ever since that fateful day in September 1998 when Acorn announced that they were closing the workstation division and had cancelled Phoebe, coming as a cruel blow just two days after the news that first working prototypes had been powered up, we've been waiting desperately for a new high end machine to replace the Risc PC. It's been nothing but frustration and disappointment as one project after another has been cancelled, sunk without trace, or forever delayed by just a few more months. All the time

Most of the existing projects were based on a StrongARM with faster memory and discs and better graphics, which would give the benefit of a Kinetic, ViewFinder and a Blitz disc interface and then some, but no one was offering a solution based solely on the newer faster ARM processors. This was for the simple reason that RISC OS wouldn't run on them, as it relied on the 26bit compatibility mode with the original ARM2 and ARM3 that was no longer supported and also was closely tied to the Acorn custom video and memory controller chips, which were not available in faster versions. This meant any new machine could not be

radically different from the Risc PC and in fact would have to attempt the difficult job of being better, while at the same time being exactly the same as far as the OS was concerned.

There was some hope in the fact that when Acorn broke itself up (by the accountants to release the capital in the large amounts of shares it held in its very successful child company ARM Holdings), the digital set top box manufacturer Pace stepped in and bought up the workstation division for a bargain price. This was mainly to secure the services of around 20 very talented software engineers who had worked on Acorn's set top box projects. However they also discovered they now had the rights to a very useful compact operating system, namely RISC OS, that could be used in their products without having to pay royalties to anyone else. They then set about converting it to 32bit in order to be able to use the later ARM9 processors — more powerful 32bit only versions of the ARM7500's used in Acorn set top boxes and A7000 desktop machines.

However the bad news, as I kept on telling anyone that asked, was that

Pace was a big company only interested in deals involving hundreds of thousands of units and millions of pounds. If anyone else wanted to licence the operating system, they would be charged a suitable commercial price for the work of 20 software engineers over two years (an awful lot), even if they were interested in giving anyone else access to something they considered to be a commercial advantage in their market. The interests of a few thousand RISC OS users were small potatoes to them and not even worth getting a lawyer in a room for a few hours to talk about a licensing deal. But with the world wide slump in technology stocks and a particularly bad situation in the UK digital TV market with ITV Digital going bust and the two major cable firms, NTL and Telewest, being in debt to the tune of billions of pounds, it looks like the situation has changed and small potatoes are better than no potatoes at all! Somehow Castle managed to do what no one else could and come away with the licence for the 32bit version of RISC OS.

Once this was in the bag Castle wasted no time and in under six

months their small team of engineers, using the experience they had gained from developing the Kinetic board and the Slym and Neuron network computers, had put together an entire machine based on the very latest Intel XScale (2nd generation StrongARM) 80321 processor. They were joined by a number of well known former Pace and Acorn software engineers to write drivers for the new hardware and spruce up RISC OS 5 with a new look. All this was happening in complete secrecy however.

In a blistering series of events, starting in October, a development conference was held launching Castle's 32 bit versions of the C/C++ development tools. This got people's suspicions aroused that something significant was about to happen and it was confirmed a few days later with the discovery of the www.iyonix.com web site which offered only a list of six tantalising features of a forthcoming new machine (which you would also have seen in the last minute flyer rushed in to the previous copy of Eureka). This was all anyone in the know was allowed to say at the time because Castle had planned a very cunning drip feed of information

to keep people in a frenzy of speculation up to the first unveiling. This occurred at the South East show in November, which was understandably packed to capacity!

Some people could still be forgiven for being sceptical, as seeing a prototype and being able to walk away with an actual computer are two different things, as those waiting for certain other machines are still all too aware as I write this over the Christmas holidays. While Castle didn't announce an exact date at Guildford, they did hint it would be worth turning up at the next show, which was The ARM Club's very own Midlands event, and they didn't disappoint. At the back of their stand, now restored to its former huge size after a few lean shows earlier this year, you could walk out with a brand new machine. What a welcome change that makes after all these years!

Now I have to let you into a secret before I start the review of the machine. I did know about the Iyonix a little before most people as I was one of the developers Castle approached early in development to

ensure that there would be plenty of 32bit software around for the launch, due to my work on ARMalyser and a few other bits and pieces (www.armclub.co.uk/free). While I got hold of an early prototype Iyonix (which you may have seen under the ARM Club stand at Birmingham), I am still a paying customer, so I hope you won't find the review too biased. I do intend to look at any other new RISC OS machines in exactly the same way, based on their merits, when they appear.

The New Machine

Pretending for a moment that I'm taking the new machine out of the box for the first time and placing it next to my Risc PC, you do notice it's a bit of a boring square grey box around the same dimensions as a two-slice Risc PC in tower mode. The only distinguishing feature being the pale blue slanted oval of the power switch, which explains the Iyonix logo first seen on the web site. It's a bit of a shame after the innovative design of the Risc PC case but then people would have hated it if it had been bright yellow (except all those that decided they did like it



My prototype Iyonix. Note it lacks the blue reset button and the Iyonix decal at the bottom but does have the distinctive power switch. The DVD drive shown has now been swapped for the CD writer that comes with the production versions.

again when the empty Phoebe cases went on sale). But anyway it's what's on the inside which counts and while it might not be innovative, being based on the standard PC ATX style, it

is more practical. It's far easier to get at the three 3½" drive bays (one used by the 80GB hard drive) and two 5¼" inch bays (one used by a 48× read 48× write 24× rewrite speed CD writer), giving it almost as much space for drives as my three-slice Risc PC, and its PSU has plenty of juice and free power connectors for everything you might add in the future.

Motherboard

On the motherboard there are four PCI slots, two of which are the longer 64bit wide variety for high specification cards and can run at either 33MHz or 66MHz. Two of the slots are taken up with the PC graphics card, of which I'll say more about later, and a USB card which provides two sockets at the back and a further two on the front of the case for easy attachment of things you might only plug in occasionally, such as digital cameras. A bit of a surprise is a riser socket to allow the attachment of an L-shaped backplane that can take two Acorn style module expansion cards. Suitable ones may be run at up to twice the speed they can be used at in the Risc PC but all will require new 32bit compatible firmware to drive them.

Only one memory socket is present on the board, which may sound a bit limiting, but it will take up to 1GB of PC1600 DDR SDRAM. There are quite good technical reasons for having only one socket as it simplifies the design and many PC motherboards have to slow down access to fast RAM when more than one module is fitted. Castle have said they intend to offer a memory upgrade service, so you can get a discount against a larger DIMM and not get stuck with your existing one.

If anyone is poking around in the case and looking for the XScale on the small motherboard it is quite difficult to find as there is no heatsink the size of a small house to draw your attention to it. It is a discreet black chip with subtle black writing. You'd think Intel were ashamed of producing something so small and power efficient after the almost obscene excesses of the Pentium range.

Moving round the back of the case, at the top there is the main power switch (the one on the front is a soft one —more later), but no mains pass through for a monitor, so you'll need two mains

sockets free for this machine. At the bottom, in the PCI expansion bays, is the monitor and rear USB sockets. Above these are the blanking plates for podules and twin serial sockets and 1000/100/10BaseT networking socket. Missing are PS2 sockets for keyboard and mouse and a parallel port.

The keyboard and mouse are catered for by USB these days. A fairly cheap USB keyboard is provided, which I don't like as much as my Risc PC one (despite it being considerably less filthy) but useable nevertheless. The mouse is a Logitech Pilot wheel mouse (RISC OS 5 currently uses the wheel only as the menu button), which is the ball version of the optical one I bought for my Risc PC. I was a bit disappointed about this; I think all machines should now be supplied with optical mice as standard. I had hoped to be free of the regular ritual of fingernail scraping crud from mouse balls but then this is what there is an upgrade market for. If anyone is considering the use of a KVM switch, to be able to use one keyboard, mouse and monitor with two machines, having USB and PS2 peripherals does present a slight problem but there are

reasonably priced boxes that will convert PS2 to USB and vice versa, allowing various combinations.

What may seem a more serious omission is the parallel port. Although practically all new devices such as printers and scanners, which used to use the parallel port, now come in USB versions, in most cases exclusively, it's understandable that people may want to use their existing parallel port printers, especially given the lack of RISC OS printer drivers for newer models. Castle are offering a USB to parallel converter cable to cater for this. An alternative suitable for those with more than one computer is a network printer box, which can queue the output from several computers and feed it to the printer via parallel.

Switching On

First you have to turn on the master switch at the back, then press the oval blue button once. I say once because you'll either be tempted to press it again or look worriedly round the back to see why it isn't working due to the lack of noise for fans and disc spinning up. If you have a Risc PC next to it or the TV on, you won't hear



The desktop

a thing! Despite it being a PC style case, with the enormous fan hole at the rear, the Iyonix is almost completely silent. The fan operates in whisper mode unless the outside temperature reaches 35°C. The Maxtor 80GB hard disc is also very stealthy, not only idle but also when being used hard. Gone is the reassuring clicking that your software is doing something (cue someone to write a software replacement!). You'll have to be careful to get another quiet disc to match, as when I added a 20GB IBM deskstar it literally increased the noise level tenfold, so I now keep it spun down (using SYS "ADFS_PowerControl",2,5,0).

If you do press the front switch more than once, nothing will happen,

because, like modern PCs, it's a soft switch just indicating to the motherboard it has been pressed rather than actually switching the power. When you shutdown RISC OS 5 instead of the usual *Your machine is ready to switch off* box, it will now say *Your machine will switch*

off in 5 seconds, which it will do unless you hit the restart button within that time of course. This is very useful on PCs as it allows you to leave the office a good 10 minutes earlier while the Windows faffs about doing whatever it does for an unreasonable amount of time. It's less important on RISC OS because after making sure there are no unsaved files it stops in under half a second, but it's a nice touch.

Oval blue button

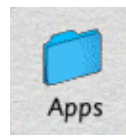
Don't mistake the oval blue button for the smaller round one next to the power and drive activity LEDs as that's the reset button, now more conveniently mounted on the front, rather than having to delve in to a mass of wires round the back to find it on those few occasions it becomes necessary.

RISC OS 5

The desktop is reached on RISC OS 5 in lightning quick time, usually when powering up the monitor hasn't had a chance to lock on to the signal in time to see the start up banner announcing RISC OS running on an XScale 80321. RISC OS 5 is a mix of the old and familiar and the new and different. First you notice that the window, menu and default pinboard textures have changed and now have a cool brushed steel effect. The window tools are more chunky and there is a whole new set of icons for applications and file types.

These are, with a very few exceptions, superb, especially for the standard applications !Alarm, !Draw and !Paint where the redesign has extended to their tool icons too. The filetype icons both follow a theme with the RISC OS 4 style turned up corner but with more distinct graphics, as one of the criticisms of the the RISC OS 4 set was that many were too similar. The icons for the system filetypes (obey, module, etc) feature the *Select* cogwheels on a green background and a coloured strip at the bottom with a shortened form of the name.

I say *Select* cogwheel because it was introduced as the switcher icon in *Select*, but was really designed to be a generic RISC OS logo. In RISC OS 5 the switcher is an Iyonix pale blue slanted oval, but the cogwheel is shown next to RISC OS 5 in the Task Manager info box, which is a little inconsistent but I can live with it.



As a bit of a throwback to the past, the directory icons are Acorn blue again, as there were before RISC OS 4, but they are now slanted at an angle. I'm sure this will reopen the massive I prefer blue/green debates when RISC OS 4 was launched, along with the general I love/hate the new icons that always occurs any time something changes. The only icons I don't like are for the hard drives, being sickly pale yellow 3D boxes. The ShareFS drives are similar but a nicer shade of yellow. I preferred some of the earlier prototype icons, which feature pictures of drive internals, but apparently it was thought that not enough people knew what the inside of a hard drive looked like. RISC OS does allow you to replace these with your preferred designs easily though.

The old and new theme continues into !Configure, which despite a new set of stylish icons, is very much like the single level version from RISC OS 4 rather than the multi-level one of Select. However some things have changed from RISC OS 4, there is no longer any way to alter the number of IDE hard discs, as these are now automatically sensed by the hardware and networking has a DHCP option. Options for 3D window borders, tiled menu backgrounds, JPEGs on the pinboard and iconise windows to the icon bar are all supported. The filing system is the same as that in RISC OS 4, supporting long filenames format, but the filer lacks the Set Directory option from Select which I really miss. Hopefully RISCOS Ltd will produce a version of Select for RISC OS 5 to give us these little features that make quite a big difference, along with other enhancements such as the multi-user !Boot and Configure system.

The Task Manager will look familiar, but has been tied up with the sections in order of Applications tasks, Module tasks, Dynamic areas and System memory allocation. One of the RISC OS 5 programmers proudly

tells me that all the bars now add up to the full amount in the system and previously undisclosed amounts, such as the memory used for page tables, is now shown as a Memory management bar. However one thing you may find puzzling is that the screen memory bar is shown at zero, as the actual memory used is now on the PCI graphics card, but the bar may be dragged up to 32MB which is taken out of main memory. This is pretty useless but it will provide for compatibility with programs that try to request a particular amount of screen memory.

Under the bonnet, the main change of course is that the operating system runs in 32bit mode, so it can run on the XScale, but just as significant is the Hardware Abstraction Layer (HAL). Since its inception RISC OS has been very closely tied to its support chip sets, first MEMC/IOC/VIDC on the Archimedes series, then IOMD and VIDC20 on the Risc PC and A7000 (IOMD and VIDC20 being integrated with the processor on the ARM7500 chip). These chips, made only by Acorn, were very expensive (the faster IOMD2 and VIDC40

developed for the ill fated Phoebe were rumoured to cost £200 each) and limited RISC OS to running on a small set of very similar hardware. RISC OS 5 now incorporates a HAL, which separates the main OS from the underlying hardware, making it far easier to replace the hardware without having to re-write substantial parts of the OS.

The hardware abstraction takes two forms, low level and high level. At the very lowest level are the HAL routines the system needs to get the machine started, such as programming the memory management unit and setting up regular interrupts to drive the clock. These functions used to be provided by the IOMD chip and the code to access them scattered throughout the RISC OS kernel. Most of the functions are now in the XScale 80321 itself, as it contains an integrated memory controller and timers for interrupt generation, so a low level piece of code has been incorporated into the ROM image to drive these. This is called through a specially defined HAL interface and in many cases can also be accessed by programs via the OS_HardwareSWI. Should another RISC OS 5 machine

be based on a different processor, all that is required is new versions of these routines, rather than a whole new build of the OS. The higher level parts of the HAL use the modularity that RISC OS has always offered via the relocatable module system but which wasn't fully exploited for areas such as graphics. Now a module contains all the code necessary to set up screen memory and change resolution on a particular graphics card. If a different brand of graphics card is required, another module can simply be soft loaded, or programmed in to the flash ROM in order to drive it.

The fact that code is now running in a 32bit processor mode does offer one very significant advantage, in that code is no longer limited to the bottom 64MB of memory as for 26 bit mode. This has always meant the Wimp slot available to applications was limited to 28MB in order to fit in 15MB of module area, 8MB of ROM (plus a few MB of stacks and I/O space for compatibility) into that 64MB. To get round this limitation, dynamic areas were introduced into RISC OS 3.5 and later to allow applications to claim large areas of memory to store (just) data. Now,

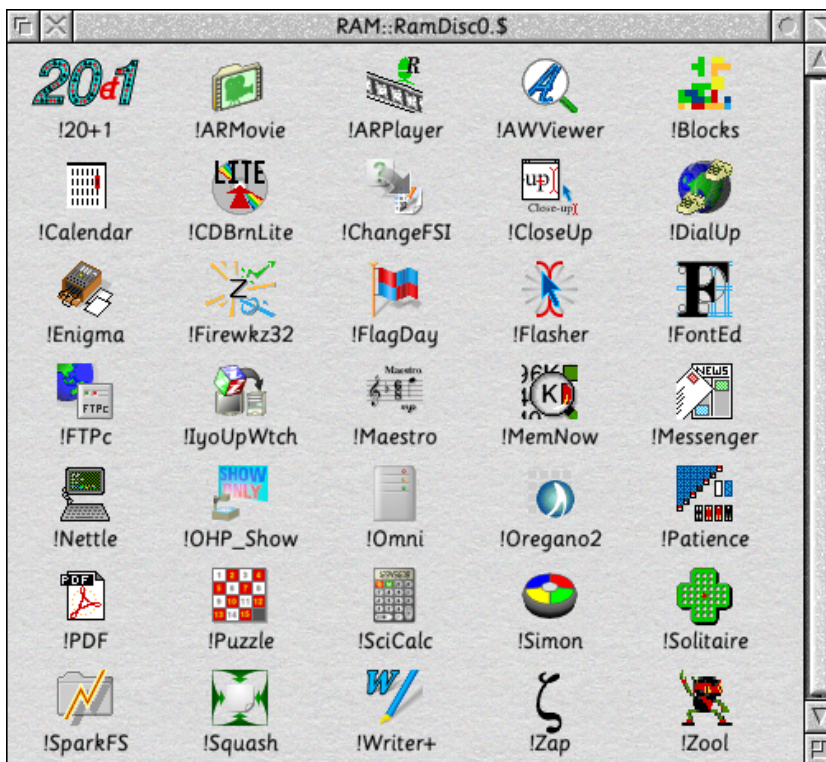
however, running in 32bit mode has enabled the module area, ROMs etc to be moved higher up the memory map, allowing much greater Wimp slots for application use: 128MB with the current firmware but later up to the full 1GB of memory that the Iyonix supports. There is a side effect to this, in that because the Wimp slot is so much bigger and a large amount of address space is used for the PCI memory mapped devices, the amount of space for dynamic areas is a lot less than it was previously. This means application programmers are advised to go back to the RISC OS 3.1 style of operation where large amounts of data are stored in the Wimp slot rather than dynamic areas. Another case where RISC OS 5 is a mix of the old and the new.

Bundled Software

To ensure that you have a good selection of 32bit software available when you first switch on the machine, as well as 32bit versions of all the software you find on the RISC OS 4 disc image, Castle have supplied either full or 'lite' versions of several major packages. !Fireworkz is the very flexible spreadsheet and word processor application, (but the

database functionality of the pro version is not provided). This has always had quite a sluggish screen update and certainly benefits from the additional speed of the Iyonix. For dedicated word processing there is !Writer+ which like !Writer, supplied with RISC OS Select, is a subset of the excellent !EasiWriter from Icon Technology. Unlike !Writer, !Writer+ can also import files from Microsoft Word, although it won't save them as that requires the full versions of !EasiWriter Pro or !TechWriter Pro which are available at a large discount for Iyonix purchasers.

To make use of the CD writer that comes with the Iyonix, !CDBurnLite is provided. This supports creating writable and re-writable audio or data CDs, with CDFS and Joilet extensions (which unfortunately the RISC OS 5 version of CDFS doesn't support so filenames are still displayed in upper case). The lite version of !CDBurn does not allow multi-session writing but a discount is available if you want to upgrade to the full application. I'm pleased to say I was successful on my very first attempt at writing a data CD, although tried at 4× speed. Further experiments



The bundled software

will be needed to see if the maximum capability of the 48× can be reached.

For internet connectivity, R-Comp's easy to use !Dialup software is supplied, along with the lite version of their Messenger Pro news and email reading software. On the first machines available at the launch the email and news fetching parts of !Dialup were not supplied on the disc, making it a little too lite (i.e. not much use) but luckily these were available to download a few days later. If you already have an internet account, you should be able to get the Iyonix on line and reading your email in a

matter of minutes. Having transferred over my 110MB email and news store from the Risc PC, I was very pleased at how fast Messenger performed unbatching new mail and opening some of my folders which contain thousands of messages.

Of course you can't have internet connectivity without

supplying a web browser and the Iyonix comes with a beta version of the long awaited Oregano 2. We have all been disappointed that Oregan Networks stopped development of the very promising version one to focus on version two, as it meant Castle were unable to provide upgrades and bug fixes that they had promised. Unfortunately that disappointment isn't completely over as Oregano 2 still isn't finished but it is a lot further on than the beta version that some people were trying out a year ago. It still runs in a fixed size window and is very un-RISC OS like, although it is a lot quicker, more stable, and seems to

handle more web sites. Castle are now getting regular updates again from Oregon and the latest one has given the facility to load HTML files stored on disc but it still lacks many of the things that were in version one, such as ability to save files, printing and uploading data. New features such as page searching which were suggested would be in Oregon 2 are not present either. I hope that these will be addressed soon.

Document reader

Other software provided includes the !PDF document reader; a read only version of !SparkFS; !Nettle to allow ports of unix software to be run in a ANSI terminal window; !Enigma the facinating simulation of the German world war two encryption machine; !OHPshow a demonstration of the !OHP presentation creation package; !ICAClient allowing Windows sessions to be hosted from a Windows terminal server and the !OmniClient network front end. !OmniClient uses version two of LanManFS, which is supplied in the RISC OS 5 ROM, to allow connections to Windows and Linux machines with full long filename support, unlike the Select version which still uses 8.3 names.

This means you don't require any extra software, such as Lanman98, for this. A bit of entertainment is provided with a few games: !20+1, !Solitaire, !Simon and the action game !Zool.

Updates

As there are frequent updates to the programs supplied on disc and the operating system itself (we even had one on Christmas Day) the !IyoUpWtch utility is provided. This stands for Iyonix Update Watcher, which runs in the background and notifies you when Castle add updates to the Iyonix website. You can then use it to download the archives to your hard disc.

Importantly, it doesn't try to automatically install them without telling you (as occurs on Windows XP). You can examine the archive and either run the obey script provided or manually copy the contents to the correct locations if you have rearranged the provided software on your disc. Because the Iyonix has flash ROM, entire OS ROM updates can be downloaded and programmed into the flash in a few seconds.

Reasons to buy

Well, I've described what the machine has in the way of hardware and software but what are the real reasons to spend some money on it? I already have a pretty much top of the line RISC OS machine, consisting of a much upgraded three slice Risc PC 600, with a Kinetic StrongARM 233MHz, 194MB of RAM, a ViewFinder+ graphics card, IDE, SCSI and 100BaseT networking cards, so it's got to offer some significant advantages over that. My four main requirements are:

- More Performance (processor, memory and discs).
- Better graphics.
- Additional hardware expansion.
- Software compatibility.

So now I'll say why I think the Iyonix fulfils these requirements.

Performance

Those that look at the PC platform with envy as the number of megahertz continues to climb ever upwards might think 600MHz is pretty meagre compared to today's 3GHz PCs but it is still a very welcome boost in performance for the RISC OS

platform, which is what counts. The processor used in the Iyonix is Intel's second generation development of the StrongARM, rebranded the XScale, which is really the name for the family of chips, rather than a single model. The actual model used is the 80321 or I/O Processor 321, running at 600MHz which features an on-board 32 & 64 bit PCI interface and a 200MHz 64bit DDR RAM interface. The XScale family is primarily aimed at low power but increasingly high performance embedded applications, such as PDAs, and the IOP321 is specifically designed at network and storage controller units. These are areas where more and more processing *umph* is being demanded, so it is likely that higher speed versions of these chips will be produced in time.

The good news is that, despite not being targeted at desktop computers, it nevertheless makes a good heart for a RISC OS desktop computer, offering significant performance increases for all operations, not just the memory-bound tasks that the Kinetic helps with or the processor bound ones that benefit an over clocked StrongARM. I haven't

produced a comprehensive set of benchmarks yet but every operation I've tried has been between 1.5× and 2.6× faster than my Kinetic 233. The reason that all are not at least 2.6× (600/233) faster is that the XScale isn't just a StrongARM running at a higher speed, it has significant internal changes to allow it to ultimately run at higher clock speeds than the IOP321's 600MHz and the 733MHz of other members of the family. This does have the unfortunate side effect that some code written for the StrongARM and earlier processors performs slightly less well, but this can be overcome when developers start optimising code specifically for the XScale. The XScale also has some new instructions and features that could be used to speed up many operations, but I'll cover those in a more technical article in the future.

Much has been made of the IOP321's ability to use 64bit wide 200MHz DDR memory which is very much faster than anything previously used in a RISC OS machine. On paper that's 25× faster than the Risc PC's 32bit wide (nominally) 16MHz DRAM and 4× faster than the 32 bit

64MHz SDRAM of the Kinetic. However, in practice it seems the IOP321's is optimised more for low interrupt and PCI bus latencies so it does not achieve the theoretical maximum. My tests show that the peak rates for copying large amounts of data are still 4× that of the Risc PC and 1.7× that of the Kinetic, which may seem disappointing, but due to the Iyonix being freed from the requirement to run the memory bus in a non optimal way, as it is for StrongARM systems, using IOMD some operations such as writing bytes (as used in string operations) are 14× to 31× faster than the Risc PC or Kinetic, which is a big benefit to programs.

Unfortunately with the current version of the firmware I'm using, UDMA disc access is not yet enabled, so filing system operations are running at around 4MB/s which is equivalent to what you can get on the Risc PC with a good third party IDE or SCSI interface. When it is enabled we can look forward to 20-30MB/s transfer speeds which should give great benefits to programs that manipulate large files and I will return to produce a proper set of benchmarks to show off all the capabilities of the new machine.

Better Graphics

Graphics have always been a priority for me. Ever since using eight colour low res graphics of the BBC micro on a portable TV I've dreamt of vast monitors and ridiculous numbers of pixels and I've now got that twice over. Just before my Iyonix was going to be delivered I decided it was time to replace my trusty but now decidedly green tinged 17" AKF85, which I bought with my Risc PC and have been running at 1600×1200 since 1984, first at 256 colours with VIDC and then at 16M colours with ViewFinder. I decided to go for a 22" which are now not as obscenely expensive as they were a few years ago. An Iiyama 512 Pro can be had for under £600 and a 22" Hitachi model can be had for as little as £480 from some RISC OS dealers. All new monitors have duel inputs so, at the same time, I upgraded the ViewFinder card in my Risc PC to ViewFinder+ with a new AGP card.

When the first news of the Iyonix was released the claimed maximum resolution for its NVidia MX400 PCI graphics card was only 1920×1440 in 16M colours, which was a bit disappointing as the ViewFinder+

offered 2048×1536 in 16M colours. But I was able to point out a little bug in the NVidia graphics driver and design a new monitor definition file, so now the machine is specified at the full 2048×1536 (sorry I couldn't resist taking credit for that small achievement). This means that both the Iyonix and ViewFinder plus have equivalent capabilities, but how do they compare?

Well first there is the frame rate. I decided on the Iiyama monitor because it could manage 85Hz at even the highest resolution of 2048×1536, which was better than most competing models. The ViewFinder+ card is right at its limits with this size of screen and can manage only around 68Hz, so I tend to run it at 66Hz but it thankfully isn't too flickery. The Iyonix's graphics card is of a higher specification (350MHz memory clock compared to 300MHz for the ViewFinder+) so is able to drive the monitor right up to its maximum of 85Hz and produce a far more stable display. I have pushed the card to its limits and generated a 2560×1920 mode, but this was only at 56Hz refresh so not really usable. Quite surprising was the difference in

sharpness between the two cards. Flicking backwards and forwards between similar desktops on both machines at the same resolution and refresh rate, the output from the Iyonix's NVidia card is far sharper than the ViewFinder+'s. This could be due to the AGP graphics card I bought being a clone of the now out of production ATI Rage 128 Pro by another manufacturer and not quite of the same quality, but it does go to show that there can be a significant difference between graphics cards.

Lastly there is the issue of performance. The ViewFinder card is excellent on the Risc PC for general use of the desktop, its acceleration affording very fast moving and scrolling of windows, but where it is let down is when large graphics need to be sent over the slow RISC PC podule bus, for example when displaying or editing high resolution pictures. The Iyonix on the other hand has a fast PCI bus to communicate with the graphics card, so large pictures appear on the screen far quicker. It also benefits from the card's acceleration features to make moving and scrolling windows at huge resolutions very smooth.

However, ViewFinder does win on the F12 return test, to redraw an empty desktop, by a small margin, as it keeps the pinboard background image cached in the graphics card's memory where it can be plotted faster than the processor can on the Iyonix. Hopefully, such enhancements will be added to RISC OS 5 before too long.

Hardware Expansion

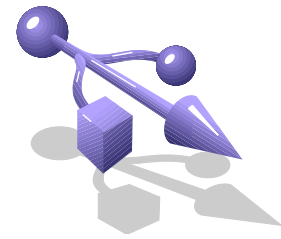
A computer is only of so much interest on its own. To be really useful it has to be able to interact with other peripherals. RISC OS machines with their proprietary podule interfaces have been falling behind other systems as newer forms of interfacing have been developed. The two must-have items for hardware expansion are PCI and USB.

PCI is an expansion bus similar to the Acorn podule bus but, whereas that is 16 or 32bits wide and runs at a speed of 8MHz, PCI is 32 or 64bits wide and can run at either 33MHz or 66MHz. This means that far more capable cards can be used, giving massive increases in transfer rates for cards such as SCSI interfaces and the ability to capture full screen video from digitisers. The Iyonix has four

free slots, of which one is used by the graphics card and one by the USB card, leaving only two free slots. This may seem limiting but some of the cards which you may have in the Risc PC, such as the fast IDE interface, are no longer necessary and as 1000/100/10BaseT networking is built into the motherboard, there is no need to take up a slot with that. Of course PCI cards will only be useful once RISC OS drivers are written for them. At the current time there aren't any available but I'm hoping that this will change rapidly and both Castle and third parties will offer drivers for the most popular items, such as SCSI, very shortly. With the rise of Linux the information needed to write drivers for common cards is much easier to obtain and many developers should be able to rise to the challenge.

While PCI is a traditional screwdrivers out, back off the computer, type of interfacing, the modern way is to connect peripherals by simply plugging in to a socket without the need for tools or fiddly configuration. The closest we've had to that on RISC OS are parallel port devices such as Zip drives and scanners which form a chain of

devices with the printer at the end. USB, which stands for Universal Serial Bus, follows the same idea of



being able to form a chain by plugging one device into another but is far more sophisticated and suffers from none of the compatibility problems between devices which arose with the parallel interface which wasn't designed for the job. Being a high speed (up to 12 megabits per second) serial bus the sockets are small and leads are much easier to handle than thick parallel or SCSI leads. Plug-and-play is fully supported which means as soon as the devices is plugged in the computer recognises it and, if a suitable driver is installed, it is ready to go. The Iyonix has two USB sockets on the back, which you can plug the mouse and keyboard into, and two on the front where you easily can connect other devices temporarily, if required.

While many larger devices offer a pass-through in order to form a chain, you can also get hubs to extend the number of sockets (my monitor has a built in four-port hub) and you can ultimately have up to 127 USB devices connected.

Incidentally the Iyonix should have had USB provided on the motherboard but a problem with the southbridge chip that implements the interface has meant that a PCI card had to be fitted. It is a bit annoying to think that there could be an extra free PCI slot. But every cloud has a silver lining and the good news is that, whereas the on board USB would be the current popular standard of USB1.1, the card actually supports the new higher speed USB2 specification which is beginning to be introduced on PCs offering speeds of up to 480 megabits per seconds. It will require new USB software to implement the different specification but this can be supplied at a later date.

Talking of software, again drivers will be the key to the success of USB on RISC OS. The machine comes with drivers for only the basic human interaction interface class, which covers the mouse and keyboard, and a generic USB printer driver. Castle already have a USB scanner driver for a model of a particular Epson scanner, but many more will have to be supplied by Castle and third parties to offer a good choice to customers. I am a little disappointed in the number of

drivers available, given that both Castle and Simtec have had USB cards available since the Wakefield Show. So far there have been relatively few, possibly because development effort is being split between the two different API's (application programming interfaces). Fortunately the API differences are a relatively minor factor so developers should be able to release drivers for both without too much difficulty. A plus point for development is that USB drivers tend to cover a class of peripherals which all work in the same way, so theoretically only one driver needs to be written for a scanner and another for a digital camera but, as usual, there are minor differences between various manufacturers' devices, meaning that drivers may have to be modified slightly for different makes and models. But this should be much less work than developing drivers for other types of interfaces in the past.

My first priority for a USB driver will be one for my digital camera, as transferring a full 64MB smart media card over serial on the Risc PC takes 80 very long minutes of not being able to use the machine. Conversely

downloading to a PC laptop via USB took around a minute — a massive difference. So I'll be biting Photodesk Ltd's arm off to get hold of their new USB CameraDesk application, which is currently being developed for the Simtec USB interface for the Risc PC but, I'm sure, now will be aimed at the Castle API too so it can run on the Iyonix and Risc PC with Castle USB cards.

Software Compatibility

This would seem to be the weakest area of the Iyonix's appeal as practically every application that isn't written in pure BASIC won't work on a 32bit machine. It was a bit depressing when I first got hold of the development machine and the only software was just the built in !Edit, !Paint and !Draw applications, with no !Zap and none of the other essential utilities with really make RISC OS a pleasure to use. The only thing I could do was compile all the applications I had written myself.

However, just a few months after the 32bit developers conference and the launch of the new Castle 32bit version C/C++ development suite, the pace of development has been phenomenal, with new software conversions

announced every day on the special web database Castle have set up for both commercial and PD developers to use (www.iyonix.com/software). My own list of applications, modules and command line programs installed on my machines shows around 450 of the total of 4500 have already been converted. By the time of the Iyonix launch my favourites such as !Zap and !Thump were taking up their permanent positions on the Iyonix iconbar too and to write this article I have the choice of using either Ovation Pro or TechWriter.

Commercial developers have all rushed to make their programs work on the new machine, some charging a small fees but others, like David Pilling, being unstintingly generous and making free upgrades available for his entire software portfolio. A large number of PD authors, far more than actually own an Iyonix yet, have been making sure their programs continue to work, sending me software by the archive-full to check on my Iyonix. Even some of those that haven't been particularly active in the RISC OS scene recently have had their interest rekindled, often not even needing a gentle prodding!

For many applications written in C, conversion is a simple recompile. Assembler programs and modules are a bit more work but the process is quite straight forward, being documented in the C/C++ suite and helped by guidance from tools such as my ARMalyser, which warns about 26bit code and instruction sequences that may need attention. I've also been doing my bit going through all the useful PD I regularly use, making the conversions and offering them back to the original authors. Often the most difficult part of the process is not the conversion but trying to track people down from old mail addresses!

Even with all the effort that is being put in, there still will be many useful commercial and PD programs that won't be converted to 32bit because the companies or authors have left the market. However, by the end of January, Adrian Lee's Aemulor will be released to allow 26bit programs to be run by emulating an older processor. Unlike RISC OS emulators that run on PCs, this won't have to emulate all the hardware and run all the code because the real RISC OS operating system is available to be used. All it needs to do is to emulate

the actual program and modules and pass on any calls on to the OS so they can be run at the full native speed of the machine. This will mean the performance of programs run under Aemulor will depend greatly on how much time they spend processing internally and how much use they make of OS calls, such as drawing things on the screen. It is hoped most programs will run faster than on an ARM6 Risc PC on the initial version, with faster versions of the emulation being developed for later release.

Aemulor has already been demonstrated at two RISC OS shows, running Impression Publisher perfectly and at a decent speed. This is considered a benchmark application as it's unlikely that Computer Concepts will produce a conversion and being 100% 26bit assembler is one of the most challenging applications for the emulator to tackle. The other major CC application !Artworks is now in the hands of MW software and is being converted. Currently the main application is still 26bit, however the render modules are now available in 32bit form. Using these in conjunction with with main program running under Aemulor, I

was very pleased to see that the standard Apple picture was redrawn considerably faster than on my Risc PC with ViewFinder!

Conclusion

The biggest question likely to be on peoples mind is should they go for an Iyonix, which you can actually buy today, or continue to wait for other promised machines. It's a difficult decision to make, as of course you'd like opportunity to compare them and buy the best. But you have to ask yourself how long have you been waiting for a new RISC OS machine and how much longer are you prepared to wait while there is already one available?

The Iyonix is here now, it is a very good machine and is being actively developed by Castle. The RISC OS market is embracing the new 32bit RISC OS 5 and the new interfaces of the machine are inspiring renewed activity amongst developers, which should open up a much wider range of interesting peripherals to the RISC OS user. The future isn't waiting.

The only concern is of software compatibility. Could it become your

main machine straight away and allow you to retire your Risc PC? At the moment there are only a couple things stopping me doing this. Currently Oregano 2 hasn't got all the features of Oregano 1 and we are still waiting for news of a 32bit version of !PhotoDesk. However Oregano updates are now coming regularly and Aemulor will soon take care of those remaining 26bit programs that have not yet been converted. So I don't see it being very long before I will be able leave the Risc PC switched off, take full advantage of the speed of the Iyonix and bask in the silence, free from the racket of fans not experienced since the days of the BBC B!

In the next issue, David Ruck explains how to convert your existing programs to 32Bit.

Iyonix

Price: £1,249 inc VAT (+delivery)

Special offer to 28 February 03

Supplier: Castle Technology Ltd

Ore Trading Estate

Woodbridge Road

Framlingham, Suffolk IP13 9LL

Tel: 01728 723200

Fax: 01728 727427

Email: sales@castle.uk.co

Web: www.castle.uk.co

The Midlands Show

The ARM Club's Birmingham show has always been a welcome event in the Acorn/RISC OS community show calendar. With the unfortunate dwindling market place it is quite an achievement that we can still support four major shows a year

The hall started to take shape with exhibitors getting ready for the opening, many finding time to pop over and chat with Castle before the crowds came in. By 10am, 20-30 people were already queuing at the doors; not the queues of a bygone era

Matthew Cook took time from The ARM Club and charity stands to see the Iyonix go on sale and what else was happening at the Club's Birmingham show.

in the UK. Will the release of the Castle Iyonix turn this around?

but of a quantity enough to indicate something important was happening.

As a member of the ARM Club Committee it was an early start with Committee members arriving in the morning shortly after 7am. Although Castle, arriving at 5am and unloading pallets of white boxes, did bring back some of the sparkle created in the heyday of the Acorn World shows.

I volunteered to help on the charity stand during the morning, which gave me a great vantage point over Castle's stand.

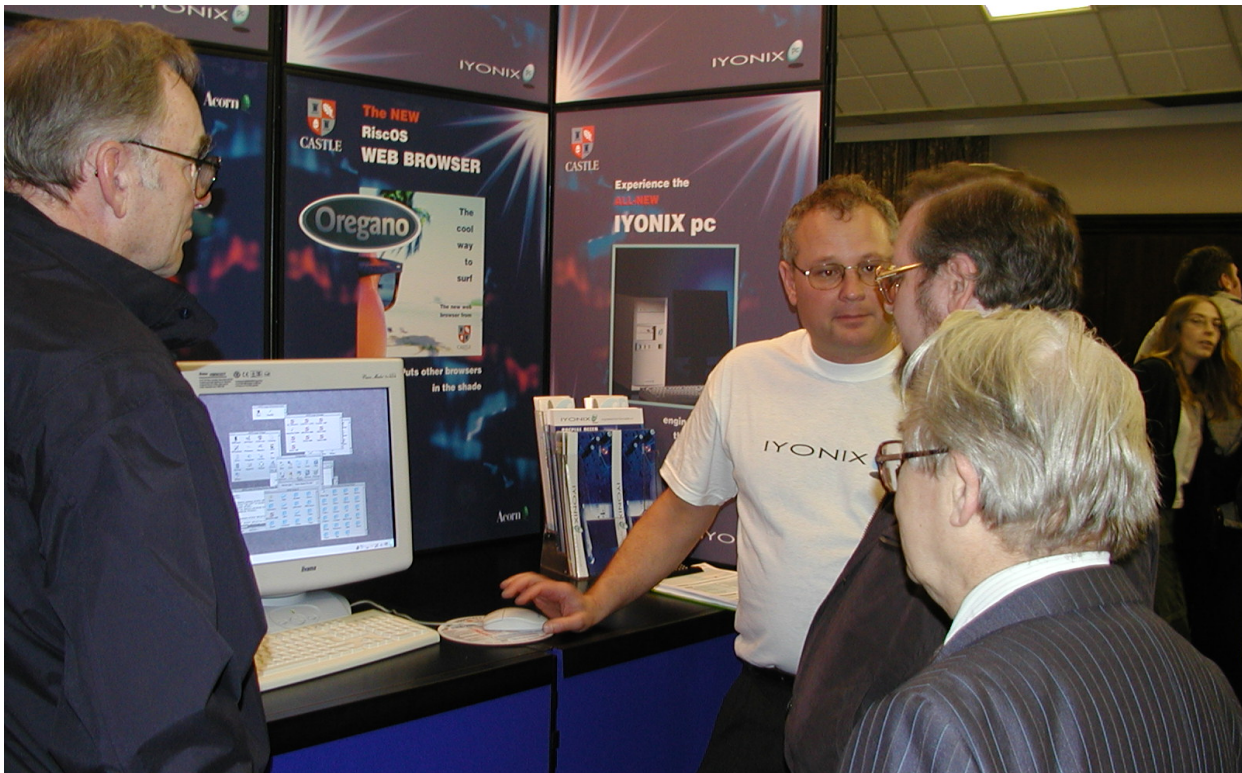
Unfortunately 60 Iyonix machines does not compare to the articulated lorries stacked with Risc PCs but it is a lot better than what we have had since black Thursday all those years ago.

Within the first few minutes at least five people were queuing brandishing credit cards and cheque books. Castle went on to sell an estimated 35 machines out of the 60 they brought. Many orders were taken for higher spec'd machines which would be delivered at a later date.

I had many visitors to the charity stand looking for bargains, or on the



First chance to try and buy a new RISC OS computer at the Castle stand



Jack Lillingston, in the Iyonix T-shirt, deals with a stream of customers



Show bargains at The ARM Club stand

look out for that elusive piece of hardware or software.

After lunch I took the opportunity to wonder around the show. I was chatting to the guys from Kudlian Soft, who had a wonderful array of old hardware to rival the Charity stand including an impressive stack of

A4s for £150. I later went back to pick up some keyboard and mouse spares after being tipped off by a fellow DARC member.

I had a flick through the latest Acorn User, my subscription having lapsed a long while ago. I didn't find anything that inspirational unfortunately but

with the advent of the Internet you have to be something special to survive in the magazine business.

Martin Wuerthner was selling his many Artworks add-ons. I just wish I had the artistic flare to take advantage of the many new features. However he did seem very upbeat about future Artworks developments.

A quick chat and upgrade at Icon Technology got me the latest version of Techwriter. It's good to see everything going strong with 32bit versions of their software available.

R-Comp had 32bit versions of DialUp2, Messenger Pro and WebsterXL.

Neil from Surftec had one of those new Iyonix boxes on his desk with many of his customers taking an interest in the assortment of goodies available: optical mice, smart card readers etc.

Walking past the RISCOS Ltd stand was uneventful, which is rather worrying as one would expect such a big player in the community would have more involvement. But alas the

stand was very quiet with few people daring to ask the "So what about RISC OS 5 and Select, then?"

Our own ARM Club stand, which also had an Iyonix on view, was doing a steady turn around with new and renewed memberships and people purchasing our excellent DiscKnight product. We are still offering *free* upgrades. Forty versions on, several years later and no-one has had to pay for a single upgrade. DiscKnight is currently at 1.40 which has 32bit support for the Iyonix and future hardware.

The Virtual Acorn team were demonstrating their latest version of the Acorn emulator for Win32 platforms. With the licensing of RISC OS 5 from Pace for the Iyonix machine, I wonder is something new is on the cards from the VA guys.

David Holden, from APDL, was on hand with some amazing deals on Risc PC memory. At £24 for a 64MB simm it's cheaper than I have ever seen it, even at PC computer shows!

I had a long chat with Dave from ITC, offering a reliable spares and repairs

service for your beloved Acorn kit. There were some bargains and cheap machines to be had.

I stopped by to say hello to Neil who was advertising the AAUG and the Aemulor 26bit emulator for the Iyonix. Artworks under emulation (with a couple of native 32bit modules) was redrawing the Apple much quicker than a Risc PC with ViewFinder. Impression was running flawlessly.

It is good to see people developing essential software to sustain the viability of the market.

I had a quick chat with Paul on the Archive stand before moving on to the Unix Porting project where I had a chat with Peter about a port of Rsync. I couldn't really justify a subscription at £25 for six months but I explained I would be prepared to buy a CD for £10. Several days later Peter sent me a copy of an Acorn compiled version of Rsync, what more can one ask for!

Photodesk were showing the latest version of the OHP software available to run on the Iyonix. There were quite

a few shiny cameras for punters to buy as well as the usual Photodesk application.

I popped in to have a chat with Chris from CJE, who had everything in stock including LanMan 98 from WSS. Come on Robin it's about time you came to some more shows!

Finally Castle, where I had a long chat with Jack who was very upbeat about things. I also acquired a stack of goodies for the next DARC club meeting. The Iyonix was certainly an impressive product and hopefully Neil's 26-bit emulator should make the software problems disappear.

I had a great day, bought some bargains and got a chance to chat with lots of Acorn enthusiasts and both ARM Club and DARC members. We had an estimated 400 people through the door and we broke even overall on the show. We stopped off for a pub lunch on the way home and had a chance to chat about the future with Neil Spellings and Jim Nagel of Acorn Shopper fame.

Photos by David Ruck

The Pieman Cometh



Some people say it with flowers but a visitor to the Midlands Show chose a custom made pie to express his “thanks to the Club and the DiscKnight author in particular”. Chairman Toby Smith (left) and software writer David Ruck duly appreciated the gesture and the pie was greatly enjoyed, particularly by David who had no lack of enthusiastic help.

Site Seeing: Maths Puzzles & Games

In this issue we're looking at websites which will interest all those who find mathematical puzzles and games both stimulating and fun to do, as well as being helpful to teachers seeking online maths resources. My first offering is the NRICH Online Maths

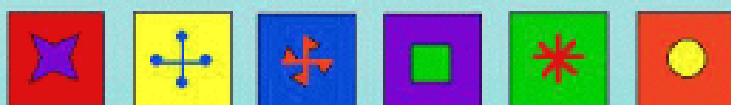
Club (nrich.maths.org/index.html).

Based in Cambridge, it is part of the Millennium Mathematics Project and aims to provide mathematical learning support for very able children of all ages. Without a doubt

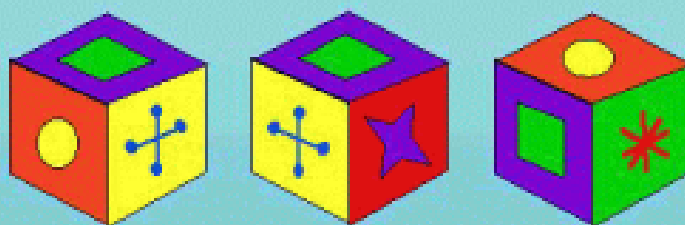
Sue Clamp searches the websites to find a fascinating selection of mathematical problems and games to tease and mystify puzzlers of all ages and interests.

A Puzzling Cube

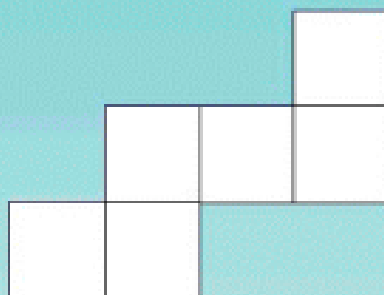
Here are the six faces of a cube - in no particular order:



Here are three views of the cube:



Can you deduce where the faces are in relation to each other and record them on the net of this cube?

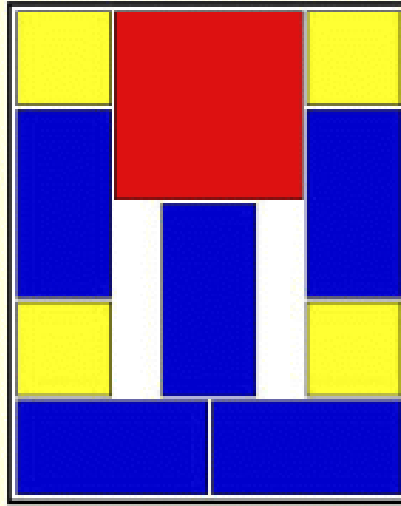


A primary section problem from the NRICH Online Maths Club

Sliding Block Puzzles - Century Puzzle

The object of this puzzle is very simple, it is to get the red square block, which is currently in the middle at the top of the frame, down to the middle at the bottom of the frame.

It is not easy!



This puzzle was invented by John Horton Conway, a mathematician, in about 1975, when he was at Cambridge University.

He called it The Century Puzzle because it can be done in 100 moves.

Each of the ten pieces is made up of 1, 2 or 4 squares.

The Century Puzzle from Exeter University needs 100 moves to solve it.

the puzzles they provide are of interest to adults too! They also have a primary section at rich.maths.org/prime/index.html.

Some of the games on this site rely on the use of Flash, but there is plenty there that doesn't.

The site's magazine, *Plus*, (plus.maths.org/index.html) aims to 'introduce readers to the beauty and the practical applications of mathematics.' The current issue of the magazine (number 22 at the time of writing) includes an article of particular interest to me, as an art lover, on *The golden ratio and aesthetics*.

The University of Exeter's Centre for Innovation in Mathematics Teaching has some useful bits and pieces.

Worksheets and other resources can be downloaded in *pdf* format. My only problem with this site is that it is neither organised according to age group, nor does it have a search engine, which makes finding something useful more a matter of accident than design. It's a bit like rummaging around in an attic — you're bound to find something fascinating there if you spend a bit of time searching! For the treasure hunters among you, the site can be found at www.ex.ac.uk/cimt/welcome.html.



Count On this site being well organised but you can't play all the games

Reading the index page of the Count On site at www.counton.org/ is enough to make any RISC OS user's heart sink—you'll need Flash Player 6 or Shockwave Player 8 to play various games here, but, like the NRICH site, there is plenty here, including interactive puzzles, that work with our browsers. A very well-organised site, it not only has some very useful resources for primary numeracy, but also a GCSE attainment test and a pure maths A level package, comprising of tutorials, exercises and tests.

The Matrix Exhibition, which is part of the site, is an interactive exhibition of maths and technology. I was pleasantly surprised to find that at least some of the java applets worked here! The exhibits include such diverse items as the mariner's astrolabe, the hourglass (where you can alter the length of time for which it runs), mosaics (with a mosaic designer), pyramids (with a polyhedron tester) and cup weights.

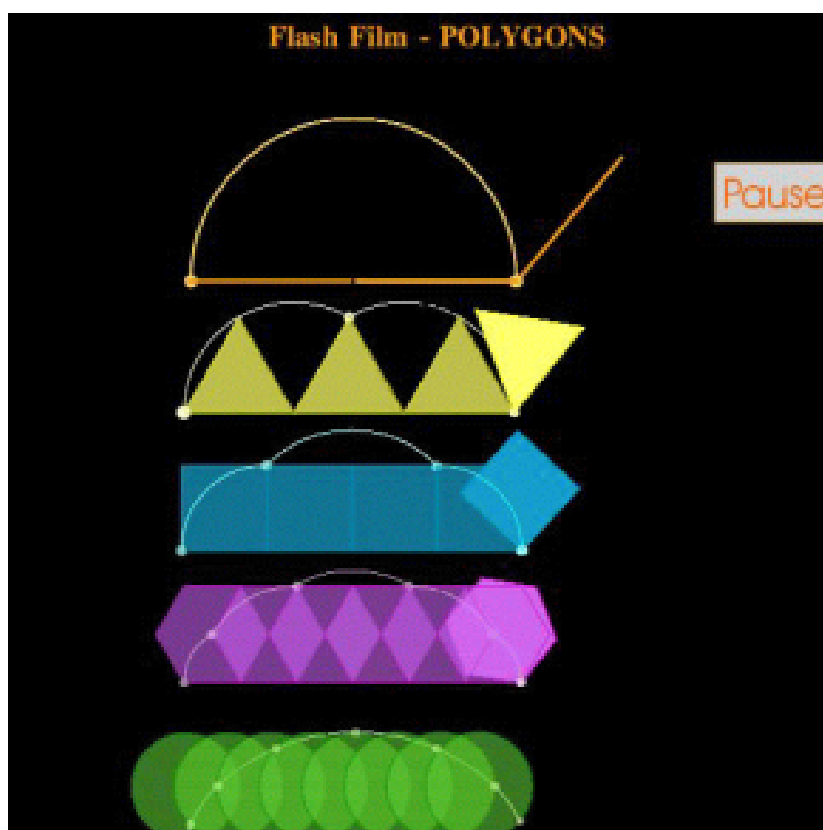
AAA Math is an American site which is organised by topic and grade,

making it relatively easy to find an activity that fits with a particular lesson. They have a World Education Levels page where you can compare which age group corresponds with the American grade system. This gives an approximate guide to choosing an appropriate starting point on the site. There are hundreds of useful online activities, all of them interactive, that are just as relevant to children in the UK as

they are to those in the USA. The only section that might not be relevant is the one dealing with money! AAA Math can be found at www.aaamath.com/.

Linked to from The 7 Sisters page is a nice symmetry quiz (among others), which I couldn't leave out of this review as it is on the site of an Argonet subscriber and has already been tested on Oregano!

The 7 Sisters Kid's Bit is at users.argonet.co.uk/users/gwootten/



Polygons flash animations on the ATM website

children/index.htm and also has a good page on a brief history of clocks with a javascript bar clock and a countdown to the 2003 SATs!

The Association of Teachers of Mathematics has a lovely collection of Flash animations that work with Leo Smier's Flash Player. The animations demonstrate polygons, halves, tangrams, Euclid's Pythagoras proof and tiles. The animations can be accessed from: www.atm.org.uk/resources/flashfilms.html.

Winning Games With Logic

I don't know why, but whenever I set out to write about 'A' I want to write about 'B'. (B here being the emotions of robot dogs). You may have thought I was going to spout on about one particular technique. Well I

quadrant of a maze into another goal location in another quadrant.

Indeed this method can be applied to computer games where the characters move. Just try the tactics of the game

Barry Aulton introduces the Robot's Maze and follows the ants' pheremone trail as he continues his series on how logic can be used to win games.

am, but this time using pheremones. So here as an introduction is the ants' times table.

1 * ANTS = STUPID
2 * ANTS = STUPID
3 * ANTS = STUPID

I think you can see there is a pattern emerging but how about N ants?

N * ANTS = STUPID?

Last time I provided a framework for winning games. Just to show that the method is not just for board games, here is a set of advisors (*on opposite page*) for a robot that must negotiate obstacles to go from a location in one

out and hand craft a reasonable set of advisors.

What you cannot do is look ahead very far since you do not know where the characters will be. For a computer player you also need some means of deciding when it is winning. (In AI terms there is a problem called the credit assignment problem which is: how do you know what caused you to win or lose?)

One way round the problem is to use a 'fitness function' that I will translate as a 'wild guess'.

For example for TEK, we may have a routine which decides how effective a

THE ROBOT'S MAZE

Advisor Name

Description

Tier 1	If one of these are satisfied, look no further.
No Way	Do not enter a goal-free dead-end.
Victory	Move to the goal if it is in sight. (NB: advisors are hand crafted)
Tier 1.5	ELSE try each of these in turn.
Roundabout	Move around the wall if already in the right row or column.
Outta Here	Exit a goal-free dead-end or chamber or a small geographical area.
Probe	Exit a chamber if recently locally constrained.
Super-Quadro	Exit a quadrant if recently locally constrained.
Wander	Take very large steps L-shaped steps if frequently locally constrained.
Tier 2	ELSE take a vote on all these advisors.
Been There	Avoid return to a previous location.
Chamberlain	Avoid or encourage entrances to dead-ends and chambers based upon their extent.
Done That	Avoid repetition of a move in the same direction as one already already taken from a previous location.
Giant Step	Make the longest possible move in some direction.
Goal Row	Move to the same row as the goal.
Goal Column	Move to the same column as the goal.
Mr Rogers	Move as close to the goal as possible.
Opening	Begin the way a previous successful path did.
Plod	Move one location in some direction.
Quadro	Move from one quadrant to another through known gates.

particular tank or ‘heli’ (which we call a unit) is in helping to win the game (*see opposite*).

Next we need something that affects the game play radically. Each unit could have a single bit which if set would indicate that unit would be willing to go to defend the homebase. The units that would be sent can then vote on whether to go or not. we may have a word in each unit’s structure:

BIT No. If set

- 0 Recapture homebase if under attack
- 1 Seek out & destroy enemy
- 2 Find enemy homebase
- 3 Defend homebase

And so on. These are entirely game dependent.

In a computer game there are always some things that are selected at beta test stage. However the tester’s time would be better spent elsewhere, rather than merely selecting these. We need some automatic way of deciding whether our computer controlled characters are performing better or worse than others.

This is the purpose of a fitness function. This is the heuristic magic

function (that is, you choose it) to be optimised.

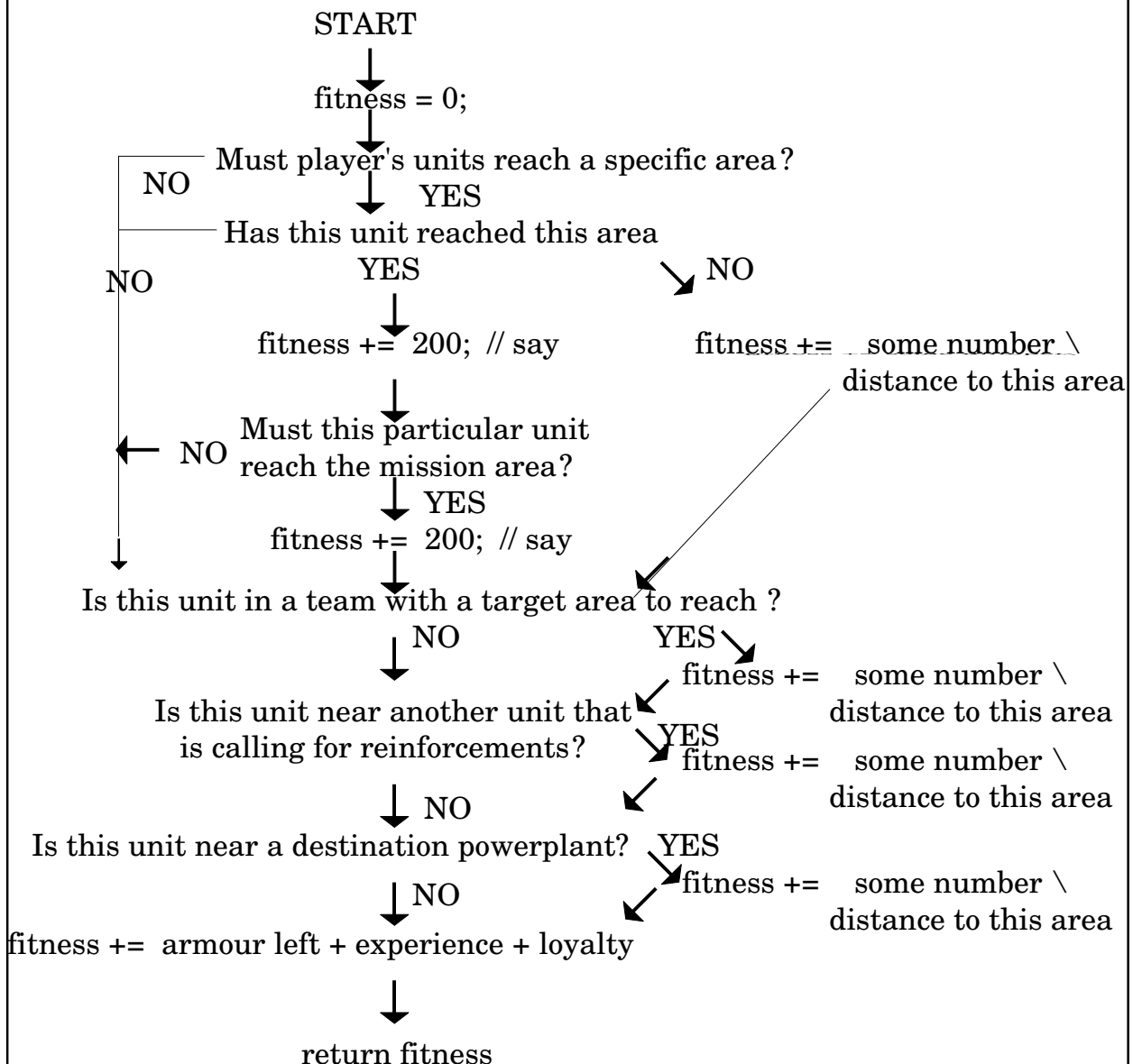
The snag with fitness functions is that if you choose a bad one, your computer player(s) will perform badly. One researcher used a fitness function for a cleaning robot that returned a high value when the robot was fully charged, unfortunately it decided never to leave its power point!

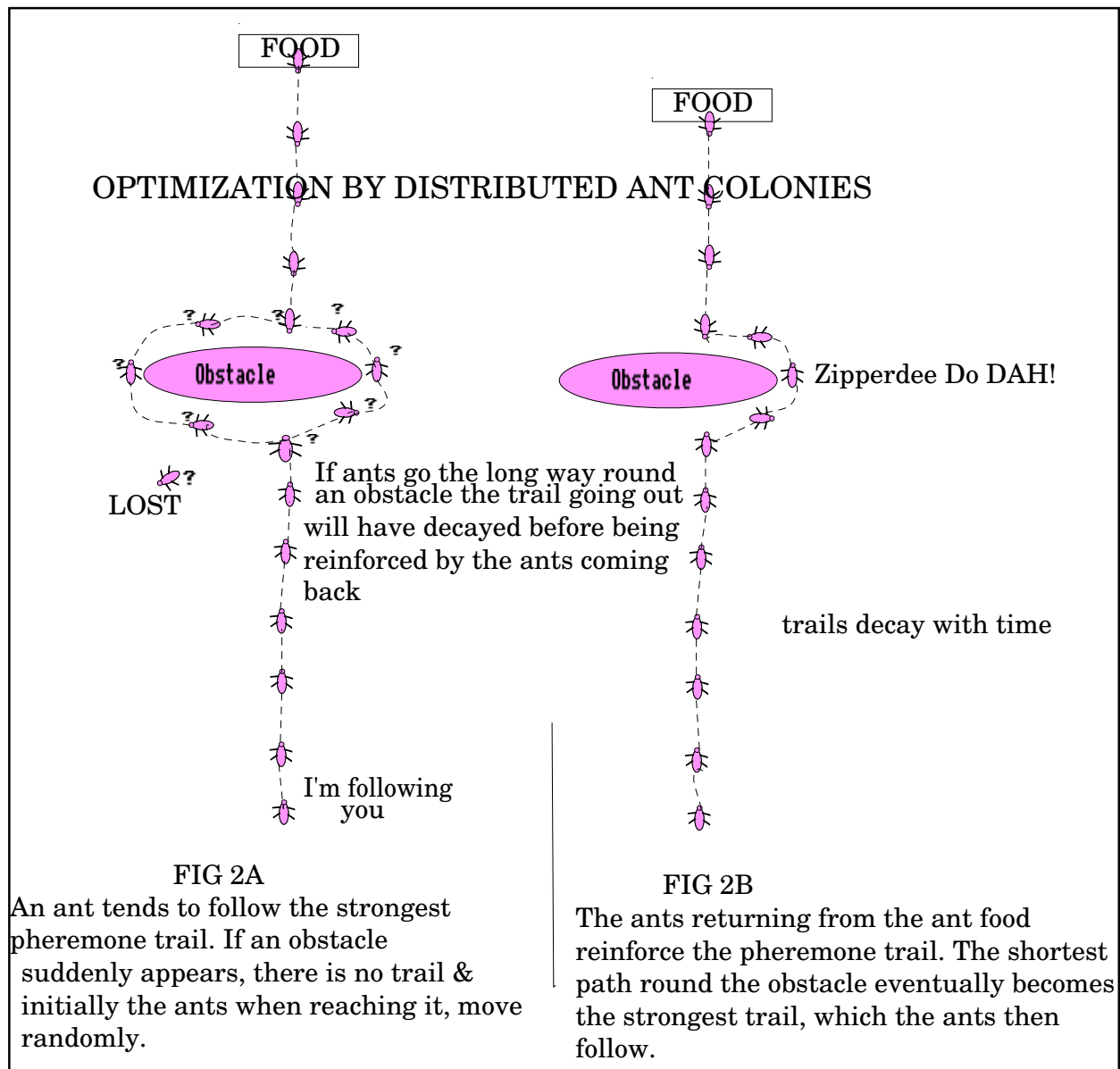
Suppose your fitness function indicated that the computer player (or one computer controlled character) seemed to be doing something that will help win the game. It is then a good idea to copy what this player or character was doing. However we need to automate the process, so that computer players or characters can ‘learn’ to play better. We need an automatic learning mechanism.

This brings me on to pheromones and the ‘distributed ant optimisation’ as one such mechanism. There are several learning algorithms. One of the simplest mimics the behaviour of a colony of ants when they negotiate obstacles. Suppose you have the problem that things need to be done in

A Fitness Function For TEK

A unit can be a tank, trooper helicopter or other detachment





an optimal order, (such as, you need to get the key to the green door before you can enter the red building) If you just sent your computer controlled characters making random decisions they would not be learning from their mistakes.

How do ants learn? A single ant doesn't have the brain power. A single, isolated ant moves almost

randomly, but lays some pheromone on the ground wherever it goes (*see above*). This trail of ant pheromone, marks the path it has travelled for other ants. An ant encountering a previously laid trail, has a preference (all other things being equal) to follow that trail. This reinforces the trail with the new ant's own pheromone trail. This acts like a positive feedback mechanism. The

more ants that decide to go that way, the stronger the pheromone trail is there. Thus the stronger is the incentive for future ants to decide to go that way.

We now suppose we have two-way ant traffic in a near straight line between a food source and home. The constantly reinforced two-way pheromone trail means that ants are unlikely to deviate from this path. But, suppose an obstacle is suddenly placed in the way? The first ant to reach the obstacle has no trail to follow and reverts to moving randomly. However, some ants will, luckily, find a way round the obstacle, back on to the pheromone trail left by ants who have been coming the other way. These ants (now on the beaten track) leave their own (at first weak) pheromone trail. Thus giving a slight preference to other ants coming the other way to follow this new trail back.

The interesting feature of this behaviour is the optimisation that results. What about the ants that have 'chosen' to go the long way round the obstacle?

While they are still negotiating the obstacle, the preference for the shorter path is increasing, (that is, ants further from the obstacle increasingly choose the shorter path. The glitch that occurs due to the ants that have gone the long way round is only transient since the trails from the ants returning from the longer way plus their trails going out will be slightly less strong, due to the longer time lapse between two-way reinforcement (*see figure 2B, opposite*).

Eventually the long path falls into disuse as the trails decay with time. (I use this method too! Having no sense of direction, when returning from a theatre to a train station I sometimes follow the crowd.) We now have the basis of a simple learning technique & something to learn (which for TEK would be which of the above bits should be mainly set and which unset). We also needed a fitness function to help decide how our computer players are doing.

Next time I will show how you tie all this together, continue on learning techniques and introduce some robot dog ideas.

Odd Odes 7

Little Miss Muffet sat on her tuffet

Cursing her flaky PC.

An Iyonix user sat down beside her

She saw it, then said “That’s for me”.

Little Miss Muffet sat on her tuffet

Eating her curds and whey.

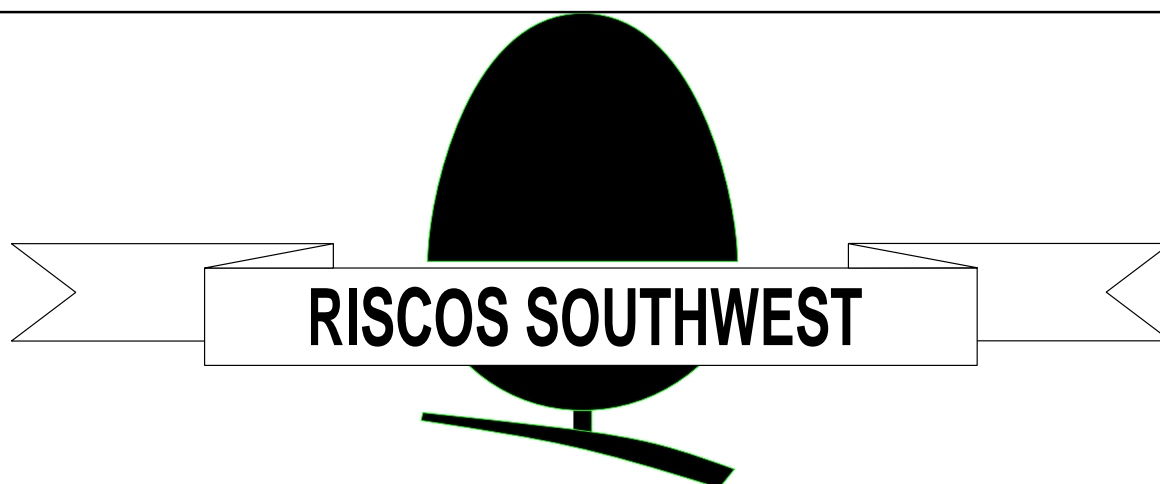
With an Iyonix beside her

She needed no-one to guide her

To throw her old PC away.



Thomas Tucker, Jnr



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<http://www.argonet.co.uk/acornshow>

Net100

Every now and again I bring a laptop home from the day job to finish off some work and I connect it up to my Risc PC, as it's a good way to transfer files to and from the office.

The Risc PC had only a 10Base2 network card, which isn't much use these days as everything uses twisted pair connection, but I got hold of a

network cards using the new faster 100BaseT protocol. I decided to buy one of these, as it would enable me to dispense with the hub to convert between the different cable types and get a bit of extra speed in to the bargain.

The 100BaseT cards should in theory be 10x faster than the old 10BaseT or

David Ruck checks up on his links between the office laptop and home Risc PC and speeds up the connections with a new network card.

little hub with both twisted pair and co-ax connections. However the last time I linked the machines up I found the connection was very unreliable and after a few minutes gave up completely. Prising the network card out of the machine, I found the big black blob (line driver chip) had gone a bit melty, (probably too many years next to the hot PC second processor running RC5 cracking algorithms), so it was time for a new card.

Luckily this coincided with the release of not one but two new

10BaseT cards, however because of the age of the Risc PC, its bus won't allow the full speed to be achieved. But there should still be a useful increase in data transfer speeds of files and also responsiveness when navigating directories on the remote machine.

This gave me a choice of the Castle cards which comes in both podule and network card (NIC) formats, or the Net100 NIC made by Simtec in conjunction with R-Comp and Stuart Tyrell Developments.

There are some important technical differences between the cards. The podule style card should offer speed advantages as it can have a 32bit wide connection to the Risc PC's bus, instead of the 16bit wide connection of the network card slot, allowing twice the transfer speed.



The Simtec Net100 card

However the most important consideration for performance is how effectively the card can buffer data coming in from the fast network and deliver it to the slower RPC bus.

The Castle cards have 8K buffers which is split 6K for receive and 2K for send but unfortunately two of the most common protocols you may want to communicate with to non RISC OS machines, LAN Manager (SMB) and NFS use 8K packets of data by default. Because the Castle card can only hold the first 6K while the computer digests it, the last 2K which contains important information is discarded and has to be retransmitted.

This has led to users reporting very poor performance with these protocols,

even being slower than that achieved with the 10BaseT networking.

The Simtec card has a 16K buffer split 12K receive and 4K transmit, so doesn't suffer from this problem and gives better performance for these protocols.

Peer to peer

Hopefully, versions of the LanMan and NFS software that requests the use of smaller packets will be released to prevent problems with the Castle card. Other protocols such as Access, RISC OS's native peer to peer networking, aren't effected by these problems and work at similar speeds on both manufacturers' cards. Because I mainly use networking between a RISC OS and non RISC

OS machines, I decided the better card to go for at the moment was the Simtec Net100.

On the day I decided, I saw a newsgroup announcement from Stuart Tyrell offering money off depending on the result of that night's England World Cup game: £5 off each England goal and £1 off for each Brazil goal if England won. As it turned out it wasn't a good night for England as they went out of the tournament but Stuart generously decided to still discount the card so the score of 2:1 to Brazil earned me a £7 discount.

Less cluttered

The card arrived a few days later and, on examination, is a much less cluttered design than the old card, featuring only a couple of surface mounted chips.

The fitting instructions are simple: just put it in the network slot and on powering up a new icon will appear in the Apps folder on the iconbar. This didn't happen for me and after a bit of head scratching, I found the driver module for the old network card had been unplugged and so was

preventing the new card's firmware from being seen. After issuing a *RMReinit Net100 and rebooting, I found the new Net100Loader icon in the Apps folder as promised.

!SNAFU

The first thing to do is to copy this program to your hard disc, as running it retrieves the !SNAFU utility which allows the 2Mbits of Flash ROM on the card to be reprogrammed with the latest network driver and any other modules you might want to add.

Adding modules will make them instantly available in the machine to make booting up quicker, or to allow you to boot from network drives over NFS or LanMan protocols. BootP is already included allowing the machine's network details to be retrieved from a suitable server on boot up.

Driver becomes active

Once the Flash ROM is programmed and the machine rebooted, the Net100Loader icon disappears from the Apps folder and the network driver becomes active. You can then set up the interface in the normal way by double clicking on !Boot and

selecting the network component on, or running !InetSetup on older machines.

After setting up the card I connected it up to the laptop using a crossover cable and ran up !OmniClient and Lanman98 to test file sharing, which worked without problems.

Running PowerTec's !Speed utility from the remote disc showed that reading and writing speeds for large files were around 1300K compared to 800K with the old 10BaseT card. Not quite as good as I was expecting but still a useful improvement.

Simtec have promised improvements in the driver software that should boost this further, especially in conjunction with an enhanced RISC OS internet stack that is expected as part of a future RISC OS Select release.

Remote control

My other main use for the network connection apart from file sharing is to remote control the laptop from my Risc PC via Virtual Net Computing, of which there are several client and server programs (see end of article).

This is normally quite slow over 10BaseT but with the new card it seemed far more responsive and was very useable for operating the filer, Word and the Visual C++ development environment.

New Iyonix

Since I wrote this article I have had an addition to my network setup in the form of a new Iyonix, which has built in 1000/100/10BaseT networking.

I am pleased to say I was able to connect the two machines together with a crossover cable and transfer files between them using ShareFS with ease. ShareFS (as Acorn Access is now called) was always a bit of a sluggish protocol achieving only around 500KB/s with 10BaseT but now delivers up to 1100KB/s, making transferring files between the machine not that much slower than using the local disc on the Risc PC.

Five port switched hub

I then bought a five port 100BaseT switched hub allowing the connection of the laptop at the same time and all three machines were able to communicate together on the network. I have the Risc PC set-up as

an internet gateway and all machines were able to browse the internet simultaneously, although putting quite a bit of strain on my poor modem. Oh for a broadband connection!

Obvious choice

There are several reasons to get a new 100BaseT card and if your existing card has failed or supports only the old 10Base2 BNC cabling it is the obvious choice. Cable modems and many ADSL terminal adaptors use 100BaseT ethernet to connect to the computer, so if you are going broadband it makes sense to upgrade at the same time, although even the higher speed connections aren't going to use the full speed of ethernet.

If you already have a working networking set-up and are looking to improve performance, the new card does offer a useful if not massive speed increase, so that's a more difficult decision.

The Net100 card is available from Stuart Tyrrell Developments, R-Comp Interactive and CTA Direct for £89.

Net100 Card

Price: £89

Supplier: Stuart Tyrrell
Developments

PO Box 183

Oldham OL2 8FB

Tel: 0845 458 8803

or 01706 848 600

Mobile: 07976 255 256

Fax: 0870 164 1604

Email: info@stdevel.co.uk

Web: www.stdevel.co.uk

Other contacts

Support and the latest network card drivers can be found on the Simtec website:

[www.simtec.co.uk/products/AU
NET100/index.shtml](http://www.simtec.co.uk/products/AU_NET100/index.shtml)

Various VNC clients and servers can be found at:

login.dknet.dk/~henrik/

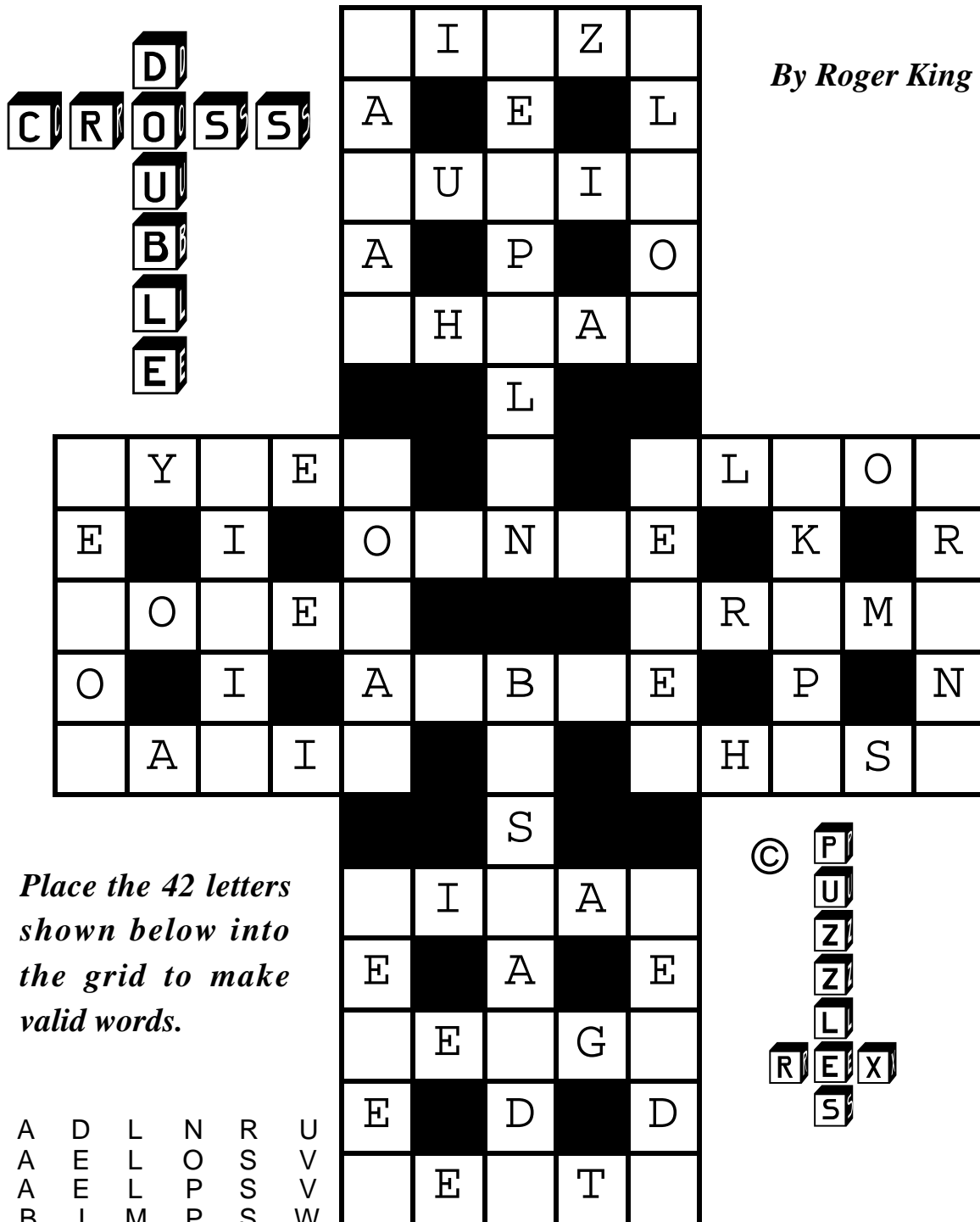
[www.vinc17.org/acorn/riscpc_en
g.html](http://www.vinc17.org/acorn/riscpc_eng.html)

[www.bigblue.demon.co.uk/VNC.
html](http://www.bigblue.demon.co.uk/VNC.html) http

[www.brighteyes.u-
net.com/html/software.html](http://www.brighteyes.u-net.com/html/software.html)

The Word Puzzle

By Roger King



The solution is on page 75.

RISC OS South-East Show

RISC OS South-East was the first show organised entirely by SASAUG and, as the days to the show ticked down, there was some apprehension. Had we forgotten anything? Would all the exhibitors confirm their stands? Would there be

dispatched. Cheques started to arrive and, with them, realisation that the show was finally happening. It was with also a relief that all the promised exhibitors were going to turn up. This meant that all stands were taken, although as we had not established the

John Sawyer, who was responsible for liaison (and worrying) explains the weeks of effort and problem solving leading up to the successful Guildford show.

enough visitors? As a result, October was a little anxious, and rather hectic, for the organising team, namely: Phil Spiegelhalter, Website, printing and theatre organisation; Neil Thurlow, Venue liaison and 'local rep' for Guildford; Dave Lane, Helper recruitment and organiser, plus public transport; Doug Luxford. Treasurer and general financial advice; Geoff Arnold, Show photography and all-round help; John Sawyer, Exhibitor liaison, general help (and all-round worrier).

Deposits had been received from the exhibitors and, in early October, invoices for full payments were

exact size and shape of the RiscStation and Castle stands, the central exhibition area could not be precisely planned.

A further visit to the venue allowed detailed measurements of the hall and theatre. This suggested that one spare stand could be fitted in and could be let to another exhibitor or used for the first aid team. In the meantime, there were plenty of other things to occupy us.

Public liability insurance had to be obtained and a contact put me in touch with a specialist agent in Worthing. I visited them late in



After weeks of work and worry the visitors turned up in force

September and explained the requirements. “No problem, we’ll send you a quote.” Mid October I still had not received anything. Chasing by phone eventually got a quote and another form to be completed. This and a cheque were delivered the following Saturday. Two weeks (to the show) would be plenty of time — wouldn’t it? To cut a long story short, the insurance certificate was finally delivered by hand on the eve of the show. Phew!

Hire a van

We had discovered that the venue had only 20 tables available and we needed more than 30. My wife belongs to a local (Worthing) church and they had 12 tables I could borrow. All I had to do was get them to Guildford. Since the six panel units also came from Worthing, the solution was to hire a van. A Transit was thought to be a bit big but it ended up being fully loaded.

Table covers were needed and while I found it was possible to hire table cloths, these were relatively expensive. Lin Spiegelhalter came up with the idea of using flat sheets. One was bought from a local supplier and

tried out on a church table. This looked good so a further 20 sheets were ordered and collected a week before the show.

Two calls were taken from those who had secondhand Acorn hardware and software and my garage filled up with goodies for the charity stand.

Cost considerably higher

The venue had been booked but aspects to be resolved were refreshments, first aid and telephone lines. The college had a franchise for food and the company agreed to open up the food bar for the duration of the show. The college required that a caretaker was present while we were using the premises. Combined with the need to have a telephone line, the total hall cost was considerably higher than we originally expected.

We needed sign boards for all the stands and a visit was paid to Chris Mercier of Printmaker to arrange the necessary printing. Chris is an Acorn-friendly printer and used Artworks to develop the layouts. The signs were ready in time and Phil collected them.

Phil Spiegelhalter is used to setting up audio-visual presentations and had all the necessary equipment to organise the theatre.

The sheer volume of paraphernalia took up his living room and was transported in his mobile video lab, which also housing his mixing desk. The enormous amount of effort it took to arrange the necessary screens, camera, audio amplification and remote monitors should not be underestimated. The success of the theatre presentations was entirely down to Phil. He also set up the power supply to the central area and the developer 'village'. Power was available above all the stands on either side and three further extensions were used to supply power to that end of the hall (APDL, Virtual Acorn and ITC). Two 10 metre telephone extensions were used to supply the phone line to the theatre end of the hall.

First aid was sought first from St John Ambulance and then British Red Cross, without luck. This is the problem of having a show at the beginning of November. Many big fireworks displays start on November

2nd with the result that all first aid teams were fully stretched. In the event we had to rely upon helpers with first aid experience.

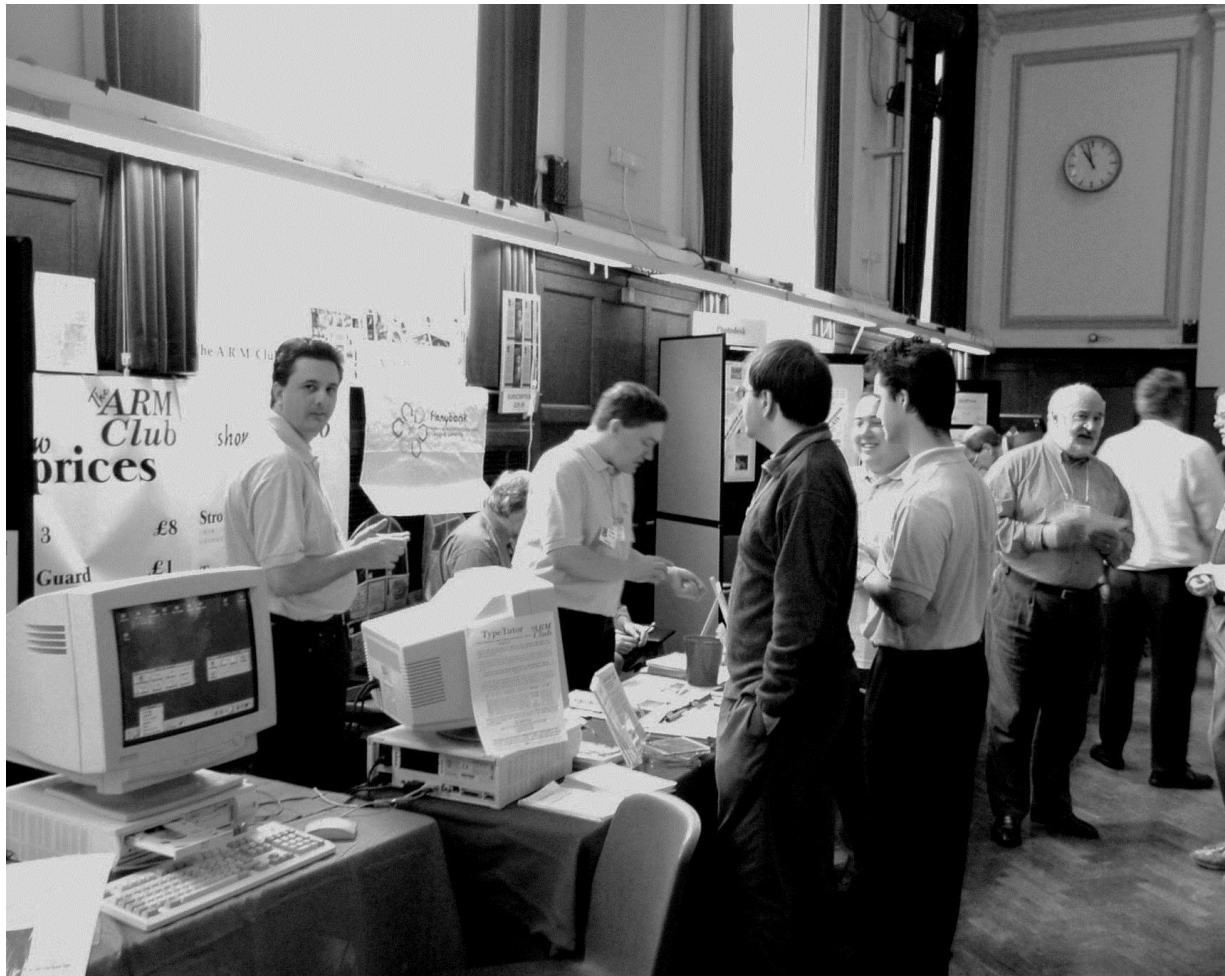
Omega

The spare stand was still available. For several months I had been trying to persuade Microdigital to bring Omega to Guildford. I had talked to David Atkins on the telephone, then at his presentation at Romford. He would not commit to coming to the show and I had almost given up. Then, three days before the show he contacted me to say that Microdigital would be there. Fine, I said, there was a stand available. A complete sell out beckoned. (For whatever reason, Microdigital never arrived, so we had one empty stand after all).

Iyonix

In my last Eureka article I said there would be some exciting new developments released at Guildford. At the time I did not know about Iyonix and the impact this would have.

I became aware of Iyonix about a month before the show. I contacted Jack Lillingston (MD of Castle), who



The ARM Club stand prepares for visitors

said the machine would be at Guildford and he would give presentations about the machine and its operating system. News of Iyonix whetted everybody's appetite but from an organiser's standpoint it posed a problem. How many extra visitors would be attracted by the new machine? The venue would accommodate about 350, the anticipated number of visitors. The theatre would comfortably hold about 100. Iyonix moved the goalposts but

it was too late to make any fundamental changes to the show. Fingers were firmly crossed that we could cope.

November 1st came around too soon. Phil and I arrived at the venue soon after mid-day to find a sea of chairs and tables in the hall. Chairs were stacked in the theatre area and desks moved into the store. Phil moved the contents of his mobile lab into the theatre area. The first helpers were

sent to unload Phil's mixing desk and for the next five hours Phil and two helpers set up the theatre. In the meanwhile, others had helped to unload my van and set up the six panel units. Tables were moved into position and covered. Power was laid on and exhibitor notices put up. The venue finally began to take on the appearance of a computer show.

The charity stand was assembled and loaded with bargains. (Subsequently, several visitors added other 'pre-used' Acorn equipment and we ended the show with more stock than when the show opened.)

In the midst of this, exhibitors started to arrive. Paul Beverley was the first, followed by RComp, Castle, Cerilica and The ARM Club. Helpers directed exhibitors to the unloading area and assisted in moving equipment. We expected to be asked to vacate the hall at 5:00 pm but the caretaker took pity and we finally got finished around two hours later.

Most exhibitors arrived early on Saturday. Access to the venue was from 8:00 am and a hectic two hours saw exhibitors unloaded and set up

and RiscStation even built their stand in this time. Lin handed out passes to exhibitors and helpers. Dave Lane had recruited a good number of helpers and these were much in demand. The first visitors arrived at 9:30. As show time beckoned we had a few dozen visitors sat around the entrance and thought it a bit disappointing. We then realised that the main doors had been shut and the queue extended well down the road. A rapid tour of the hall showed that exhibitors were ready but a number of boxes and other obstacles obstructed the aisles. These were rapidly moved and, at 10:00 am the doors opened.

Hall was packed

To cover our costs we needed about 200 visitors. We rapidly exceeded this number, then 300, then 400, to a final tally of 518. As a result, the hall was packed. Jack Lillingston's first presentation made the hall more comfortable but only because about 250 people tried to get into the theatre. More chairs were put out but it was never intended for such a large audience. The theatre presentation was relayed to two monitors in the hall (another Phil initiative). Jack also agreed to a repeat presentation later in



The exhibitors' view from the Surftec stand

the day, so hopefully nobody missed the talk. We also had presentations from RComp, Simtec and Acorn Publisher. All were to packed audiences. In all probability, visitors were glad to sit down before resuming the wait to visit their favourite stands.

It was not entirely packed solid, I managed to get from one end of the hall to the other in less than five

minutes! The crowds took me back to the 'good old days' at Wembley and, while the venue was much smaller, the same buzz existed.

While the tremendous turnout was beyond our greatest expectations, the people we were most pleased for were the exhibitors. We let the stands at a realistic price, with the hope that they would make a healthy profit. This

encourages them to stay in the RISC OS market and fund future developments. With over 500 enthusiasts spending money, they all did brisk business.

At 4:00 pm the show was due to close. At 4:15, large numbers of people were still visiting stands and parting with money, something we were loath to discourage! However, the hall had to be cleared and by 4:30 everybody was packing up. It amazes me that a show that had taken eight hours to set up was broken down in two.

We took all the rubbish down to the skip, trying to avoid the largest puddles (you may remember rained a little in the afternoon), cleared the charity stand, dismantled and packed the six panel units, stacked the tables, reloaded my van, took all the theatre gear back to Phil's transport, swept the hall and finally got to the pub at 7:00 pm.

Exuberant mood

The organisers were in exuberant mood. It had been a tremendous show and completely vindicated our decision to go ahead. There were a couple of things that could be

improved. A PA system in the hall would have been useful but would need to have been loud to enable everybody to hear. The food bar rapidly ran out of sandwiches; disappointing since we told them to expect 400 visitors. Other than that, things had run remarkably smoothly.

Next year's show

The final figures are yet to be calculated but any surplus will be salted away to fund next year's show. The charity stand raised over £350 and this will probably be donated to a children's hospice which has just opened in Guildford.

Phil has produced a DVD with views of the show and all the theatre presentations. email [phil@fill in.co.uk](mailto:phil@fillin.co.uk) if you are interested.

I mentioned a show next year. Does that mean SASAUG will organise RISC OS South-East 2003?

All I can say is that Eureka readers will be among the first to hear the news. Meanwhile, we are still recovering from a busy day in Guildford.

ARM Arena

Welcome to the first ARM Arena column of 2003. Since the last issue there has been the largely unexpected and exciting announcement of a new RISC OS computer with a fully-updated RISC OS operating system, the Iyonix from Castle Technology.

along the new leisure software we'd like to see.

Besides there's no reason not to order that game you never got round to buying to treat yourself with something to do now that Christmas is long over!

Andrew Weston looks at the latest arrivals and has high hopes for what could be an exciting new era of games inspired by the new RISC OS computers.

In my last column I mentioned one major game which was in development specifically for the other main RISC OS hardware project which until recently was arguably the only real hope for the future of the platform —the Microdigital Omega. Although I don't know of any specific titles that are being developed for the Iyonix my point is that, while in the past (probably at least four or five years ago!) the arrival of the Christmas period would have been accompanied by anticipation of one or two major game releases, for the moment we have to hope that the arrival of new machines will bring

There's a list of Acorn/RISC OS suppliers later on in the column to help you to find where you can get these games from today should you not buy Acorn User for example and see their adverts.

eQ R&D

Russian-based group eQ R&D, authors of the Kino MPEG movie player, have converted a multiplatform library of games routines to RISC OS and have several games demonstrating the library in action available for download along with the library from the website provided at the end of this article. The

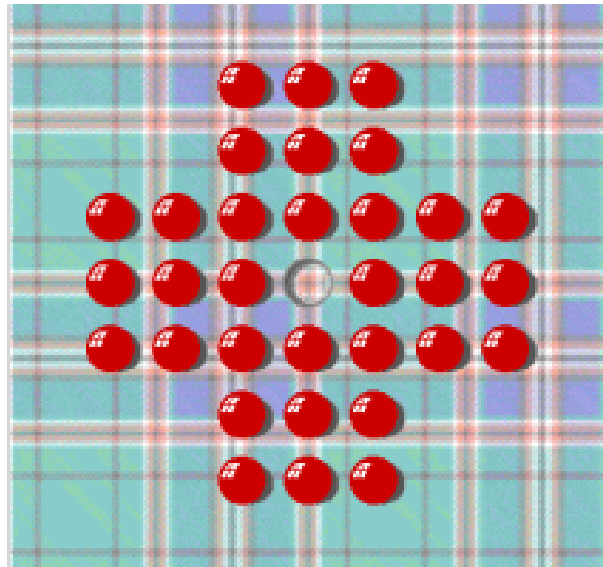
games include a Bomberman-style game which readers may remember in the form of *Marsquake* that appeared on an Acorn User cover disc several years ago. Marsquake is still available as shareware and its URL is given below.

Brain Games

One current developer of computer versions of card and board games for RISC OS is Ian Macfarlane of Brain Games. Ian has released versions of *Solitaire* and *Pontoon* (Vingt-et-un) which are available as freeware versions from his website or commercial versions (Ving-et-un).

In the case of Vingt-et-un, the commerical version (for which you must email Ian for a contact address to send £10 by cheque) there are numerous enhancements including many more veneers to the game (backgrounds, card designs, higher betting-chip values to raise the stakes, a a tutorial with example games etc).

Both games have recently been updated to work with RISC OS 5 (a 32-bit version of RISC OS, all others being 26 bit) running on an Iyonix. If you have been luck enough to get an



Solitaire from Brain Games

Iyonix maybe these games will be just what you're looking for.

Starfighter 3000

One game which crops up here regularly is Starfigher 3000: Other Worlds, the re-release and compatability enhancement of the classic Fednet game sold by iSV and now APDL.

Chris Bazley has continued to update the game since the initial re-release and has now informed readers of comp.sys.acorn.games of a 32-bit version he has been working on for the Castle Iyonix. The address of the official Starfighter 3000 website and contact details for APDL are given at the end.



Repton comes to Rockz

Rockz

A quick piece of news that may be of interest to retro-gaming enthusiasts and particularly those with well equipped web-browsers is that the author of the original BBC Micro game *Repton*, Tim Tyler, has made a version for the worldwide web. It requires a Java plug-in to work and I'm told that unfortunately the old Acorn Java plug-in does not allow the game to function. From a quick look (while at work!), it seems to be quite a faithful reproduction of the original gameplay of post-*Repton 1* versions of the game. That is there are things like transporters and spirits along

with the original rocks and diamonds.

More experienced Repton players will be able to determine exactly which Repton sequel the game most closely follows. The graphics are generally much higher resolution and detailed than the original but it didn't detract from the experience in my short test. I'll leave those lucky enough to have Java

installed on their (non-RISC OS, sadly) computers to try it out, I'd be interested to hear your opinions.

Current games suppliers

As this is the first column of the year, here's a list of major suppliers of commercial RISC OS games titles should you decide to treat yourself or somebody you know to a new or classic game.

CJE: Large supplier of RISC OS software. You should find most new titles and a lot of older games here such as the entire 4D game range (probably were the biggest ever

producer of 32-bit Acorn Games).

www.cjemicros.co.uk

Telephone: 01903 523222

RCI: Distributors of Artex games and publishers of numerous epic PC conversions. Recently announced that their strategy game Heroes of Might and Magic II was to be half-price (but just until the new year) at £17.50. Also sell a range of older games made compatible with RO4 and StrongARM machines.
www.rcomp.co.uk
Telephone: 01925 757377

Liquid Silicon: Scottish suppliers of much RISC OS software. Offering a free RCI game with new Microdigital Omega computers bought, as well.
www.liquid-silicon.com
Telephone: 01592 592265

APDL: sell wide-range of games CDs including those from iSV, Skullsoft and PD games. See at end for contact details

I'd like to wish all Eureka readers, a little belatedly, a happy 2003 and hope they find the time to relax with some of the titles that have emerged this past year and over the festive

period. With the release of two new RISC OS computers, we might be seeing the start of a new era similar to those that began in 1982 and 1987 and we know what came with those, games and all! See you next time.

Contacts

eQ R&D:

www.eqlab.org/english/acornsdl.html

Marsquake:

www.cyplexia.demon.co.uk/mq.html

Marsquake extra levels:

www.smoothartist.com/riscos/

Brain Games:

Solitaire.riscos.org.uk
21.riscos.org.uk

APDL:

www.apdl.co.uk
Telephone: 020 8778 2659

Starfigher:

starfighter.acornarcade.com

Rockz:

www.rockz.co.uk

Gill's Emailed Journal

What's the strangest place you've ever checked your email from? Now, most of the time, I check mine and respond, send mails and ignore spam from a three bedroom (well, one bedroom, two studies) semi-detached

regardless of whether I have a machine and an internet connection. I've been known to check my mail from all sorts of places round the UK. All it needs is a mobile and this is all I have to do:

Gill Smith explores the dangers and delights of extreme spoddling and suggests how it could be extended to add excitement to other pastimes, such as train spotting.

in suburbia. But I have been known to check my email from sports halls in Wakefield (You too? What a surprise!) and Waterloo station (they were trialing internet points around places like that, it was free, I had time to kill.)

I've also checked my email from outside the UK, although my brother's kitchen table in Brooklyn doesn't exactly make for a wild location. That could describe downloading emails to a caravan in deepest Wales, or sneaking a quick look in the depths of Dartmoor — in a delightful B & B.

I've also developed a great way of checking my email from anywhere,

1. Pick up mobile.
2. Unlock it.
3. Press 'names.'
4. Press 'T'
5. Go through and select 'Toby.'
6. Then say: "Darling, can you have a quick look for me..."

I'm sure I'm not the only person to have checked my email from somewhere obscure and I know certain spods haven't been able to cope without a quick trip to an internet café wherever they are around the world.

Of course, they'll kindly put up with the perils of having to use systems designed by a certain well known US



corporate with anti-trust issues, just for the sake of knowing that your emails do not go unread. Unanswered, well, maybe. It depends on how good a time they're having — and whether there was a particularly interesting conversation on linux box settings that they might be missing out on.

But this is an interesting phenomena, that I've named *Extreme Spodding*. (These days, nothing is cool unless there's an extreme branch of it —

although it may take more than that to make spodding cool!) But be warned, it isn't just about where in the world you've spodded from, although extra credit should be given for any nation where we in the UK haven't even heard of any of their politicians. Also, extra brownie points will be awarded for finding RISC OS and Oregano in any country other than the UK or Holland (to rule out your Committee members demanding extra points for trips to the Dutch show) and still spodding from your favourite OS.



But Extreme Spodding can take place in the good old UK, so long as you're doing something else interesting at the same time as checking your email. And no, I don't mean surfing for pictures of Gail Porter.

No, by *interesting* I'm using a definition of the term that involves finding at least three other people — not including members of The ARM Club, your co-workers, or your own family — who also find it interesting.

Such examples might include bungee jumping, white water rafting, or abseiling.

Or, since this is spodding, it might be best to suggest such radical things as watching *The Office*, listening to Radio One, or knocking back the Bailey's. With the first two, the only worry is distraction, although the danger of accidentally sending your boss an email intended for the Gail Porter fan club is a risk that shouldn't

be ignored. With the last on that list, the danger becomes that you're suddenly quite happy to send your boss the sort of email you'd only ever intend for Gail's personal inbox.

Oh yes, Spodding can be a dangerous sport. Imagine trying it (or should I say 'remember,' in the case of some of you?) from a moving vehicle. Please let someone else do the driving though! Unless that's just using a GPS (Global Positioning System) to tell you exactly how lost you really are —geographically, rather than in the quest to find a life.

And I don't count using a car with an electronic dashboard or electric engine as spodding. Otherwise milkmen would be the spoddiest people you've ever met. If there are any left, that is —the nearest I get to a milkman is the spotty youth re-stacking the shelves at Sainsbury's. Yet I still always get stuck behind a milk float when I'm late anywhere.

Toby demands that in-car electronics at the level of a touch-screen is classified as spoddy, however. To save myself being counted as a spod, in return, I insist that this depends

entirely on what you use it for —and if it's only to panic that you're running out of petrol and change radio stations, it's definitely not spoddy.

Anyway, getting back to what passes for a point, there are also risks when using mobile technology —would you really want your poor mother to realise that the most excitement you've had since Christmas (as I write in early December) is outsmarting another spod about what DNS settings he should use? It'd break your poor grannie's heart to get that sort of text by mistake. To see you get over excited about a new bit of shareware might be something your friend Dave can understand —but if you accidentally send it to the address book entry before him: Dad? Your poor father will have to finally accept that you'll only ever play for Arsenal on the Nintendo.

Mobile phones aren't all bad though —at least you get fair warning of who is calling, so you can be really naughty and not answer when you're out with your mates —well, at a RISC OS Show, then —and your mum rings to ask when you're dropping your laundry round. And if



you ever need to find a teenager (perhaps if you've forgotten how to program the video) these tracking devices are firmly implanted between hand and ear. Don't expect to understand the series of grunts that passes for conversation, however, if you've hit the age of twenty.

Do, though, be glad it's going on. Yes, apparently mobiles are good for teenagers' health. Setting aside the average parent's utter conviction that they may as well just fold their teenager into the microwave and have done with it, apparently having mobiles reduces teen smoking.

Personally, I don't think it's lack of desire to rebel but that, after learning manual dexterity in the cradle, they lose it again in their teens. It goes soon after the power of rational conversation, when any child from age ten onwards suddenly returns to their biological roots and starts instead to speak Neanderthal. As this vocabulary change hits, they also lose physical abilities —well, I can't assume they dress themselves like that out of choice! So while their mobile is glued to their fingers texting someone they'll see as soon as school finishes, they don't have the dexterity to also light up. Not while trying to fit

the entire class, minus one or two spods, in behind the bike sheds. Could Nicorette really soon be going broke, while Orange saves the UK's health?! And incidentally, as teenagers refuse to get exercise and cycle to school, why are there still bike sheds to smoke behind?

Of course, the average spod would be perfectly capable of managing both but they usually find better things to do with their hands. One may be clasping the mobile to the ear, while explaining to a second cousin seven times removed, for the fifteenth time, that the bold button is that big bold 'B' but the spod's other hand is still in use coding lines of some complicated program that will save them 0.173 seconds time online every time they dial up. Of course, as a spod doesn't dial up but has broadband, it just means the mails get there that tiny bit quicker. Phew! Those extra milliseconds make all the difference.

And I suspect that this is the real extreme spodding. It's not about where you spod from, what you're on (caffeine being fully expected, alcohol being a bit silly really) or what else you're up to while you

spod. It's about having so little else to do with your life that writing code occasionally to save yourself three nanoseconds becomes not a pointless waste of time but a 'Challenge'.

Along with 'Extreme,' 'Challenge' is a thoroughly over-used word. It used to imply Anneka Rice running around doing something dramatic — something that was virtually impossible but she just about managed anyway, most weeks. It used to imply cool off-road buggy things and tight jump suits. (Shall I pause and leave you with that image for a moment?)

The word also got used for 'University Challenge' where the challenge wasn't between two teams from different colleges to beat the other in the battle of intelligence, wit and general knowledge. No, it was the challenge to persuade any of the audience to care which team won.

'Challenge' according to the good people at the Concise Oxford English Dictionary, means "a call to someone to participate in a contest or fight to decide who is superior." Please note, complicated coding is not, therefore,

a challenge. The computer is not calling. You do not need to prove your supremacy over your RISC machine. If you feel the need to, get up and make yourself a coffee. Your computer can't do that. Then return, say "ner, ner ne ner ner" to your Acorn and promptly surf the internet for the number of a local psychiatrist.

Complicated coding is in fact the desire to show off—but to whom—your computer? If so, please see the last bit of advice above. But maybe definition two from the Concise OED will help here "Challenge—a call to prove or justify something." Still, I think you're only proving to your computer that you love it more dearly than any of the four human beings you know but if it helps you justify to yourself that ridiculously expensive bit of hardware, well, someone has to keep the Acorn market afloat and I'm a big believer in the redistribution of wealth (feel free to send cheques to...) [*Gill's address removed, due to lack of space. -Ed*]

Maybe it's all about showing off to other spods. Back in the dark ages (pre 1983) the best way to show off was the size of your house (larger is

better), wage packet (ditto), car (small, two seater, less practical the better) or job title (back to big is best). These days, with technology, you can be working from a central London bedsit, while someone else does the same job from a four bedroom suburban semi. And no one is fool enough to pay you what you're worth. They'll pay what they can get away with.

Before that (the really-dark-especially-at-night-as-no-one-had-invented-light-bulbs ages) it was all about getting some form of dinner on the table. And not by using the mobile to call for pizza. No, dinner may have been running away not long ago. Or some poor fool had spent hours kneading dough, for you to part with your hard earned, or thieved, cash for it. (Personally, I'm amazed that once electricity was tamed for use in the house, the first invention to follow electric light wasn't the breadmaker.)

These days you have all that spare time when someone else is catching the food, or kneading the bread and so instead, the width and reliability of your broadband becomes much more important. So if you can, in just a few

lines of Perl script, or a bit of nearly forgotten BASIC programming, save yourself a bit more of that spare time, then naturally, you're better off than all the other spods, still working on ways to save themselves seconds, that they won't know what to do with when they have.

Scripting something that you'll probably only ever do once anyway is really just about showing off your skills at saving time. It's not surprising, since the world and particularly the Innovations catalogue, is packed with time saving devices, from dishwashers to lights that save you the bother by turning themselves on.

The whole world is trying to save time. After all, time, is, allegedly money. And money, as you know, can't buy you love. But instead, it could buy you a brand new Iyonix, which will then consume all of your remaining time playing on it, and money buying programmes for it and peripherals to make it even cooler. Your machine may not love you back but I'm sure you can give it a woman's name and pretend.

By which point, you'll be needing to write some more time saving scripts, just so that you can still find time to show off your coffee making skills — sorry guys but that's not yet an available attachment for the Iyonix, to the best of my knowledge. And if it is, then show off to your new and shiny machine by drinking the coffee. I'm sure there are ways to get the coffee inside the computer but I'm equally sure it won't get a caffeine buzz and work harder after you do that. Please, just trust me on that one.

Well, while I've got the dictionary out, what does it have to say about 'Extreme'? I suspect "a way to make activities sound cooler than they really are" isn't the OED's definition. And even if it was, would it stop people signing up for classes in extreme knitting, or stamp collecting? See, there are plenty of other hobbies out there that need some effort to sound trendy. Presumably extreme knitting is a matter of making something really huge, while in stamp collection, I can only assume it's finding stamps from radical countries. Maybe you even need to go to war-torn third world dictatorships and send yourself postcards?



And what about train spotting? Could that be extreme, other than in the sense of extremely sad? How about, instead of just spotting the trains, you have to touch them too? So train spotters risk life and limb for a glancing blow from the 4:50 from Paddington. Extreme plane spotting appears to be a hobby best pursued on the military bases of Greece.

So, extreme: 1. very great (knitting big things, spodding on big bits of code) ; very severe or serious (I think normal train spotting can be counted as extreme, if it's all about how seriously you take the hobby!) 2. far from moderate, especially politically. Well, I think number two sums up The ARM Club members and their

attitude to nasty American corporates that blind the poor innocent public as to what they really want from computers. Although I trust you don't decide to trash your computers at work just because your boss isn't as enlightened as he/she ought to be.

Of course, I haven't noticed a march through London by spods, demanding decent computing for all. But obviously that would involve going outside into daylight and also getting exercise, which would be far too radical from most spods. Maybe the way to do it is to arrange an evening's dithering round Parliament Square?

Cartoons by Howard Read

RISC OS Rhymes

In this issue we are privileged to publish the first of a series of literary masterpieces created from an unusual source. Alan Wickham, who sent the verses in, explains their origin:

I have recently discovered that my Computer (a four-year-old RPC) has been secretly writing verse without my knowledge.

I don't know if it's the result of a Pre-Programmed Poetical Podule, Recursive Rhyming Registers or a Virulent Versification Virus but in my 42 years or so of using computers I have never come across such a thing before. These verses were certainly not there when I bought the machine, new.

It uses the pseudonym "Arnold Kilroy Byte" [A KByte - get it!].

Mathathon

In days of yore, when folks were poor
And Computers weren't invented
They lived and died and MULTIPLIED.
It could not be prevented.

They battled on in Avalon.
They did not sleep or slumber.
They did not rest but did their best,
And ADDED to their number.

In bedroom dark or public park
To which their nature guided.
Bereft of cares, in matching pairs
That could not be DIVIDED.

But all the same, computers came
One sees how folks reacted.
They sit and type, accept the hype
Former pleasures now SUBTRACTED.

Arnold Kilroy Byte

Another verse from A K Byte in our next issue

Getting It Right In On-line Auctions

The on-line auction company, eBay, was the brainchild of a Pierre Omidyar of San Jose, who created it in his living room back in September 1995. From this small idea eBay has flourished into a large multinational business, one of the few dot com successes of the era.

eBay's vision of a company purely connecting people and not selling, was born and, with in excess of a million users, they seem to have got something right.

Why is eBay successful? The business plan involves eBay making

Like to do some buying or selling in on-line auctions? Matthew Cook suggests how to do it using eBay, which offers everything from computer items to real estate.

eBay moved from the collectable market to widen its scope to cover upscale markets and now even auctions real estate.

In 1998, Pierre and co-founder Jeff Skoll hired specialists in business and branding to strengthen the team. eBay forged deals with large multinationals like Sun to provide a way of selling end of line equipment, Sun has sold more than \$10 million worth of hardware, sometimes listing upwards of 100 items a day! eBay even has a deal with the world renowned auction house Sothebys.

money out of customers listing items and then taking a traditional commission at the end of a successful transaction. They also remove some of the annoying features of a tradition auction house. eBay offers an auction for almost anything, open 24x7 (except for maintenance) where you can view at your leisure the item description and photo.

This anywhere, anytime, auction has to be one of the key advantages over the traditional auctions. The world can sit in and bid on line. No longer do you have to have specialist auctions because items get lost in



Where to start on eBay

general sales. You can search for what you want and let eBay notify you as soon as items of interest to you become listed.

After signing up with eBay you are able to start selling and buying but I recommend lurking and watching for a while until you are used to the way the system works. You are entering a different online community with its quirks and customs. It is like UseNet, you have to lurk to see how a particular forum works before joining in, which is only polite. For the first

month, eBay depict you with an icon of a pair of sunglasses, affectionately named *shades* within the community.

Making your first purchase is always a big step. The biggest piece of advice I can give is to read everything and then read again. You need to check that what you are buying is what you think it is, as initial headings can be deceptive. Sellers pack a lot of information into their listing. You will find details of postal costs, extra fees for using online purchase methods, extras for insurance, and the list goes

on. Some sellers will not sell to people with 'shades' or those with zero and less than zero feedback. Other sellers require you to email them before bidding. It's a lot to take in but worth it! If in doubt re-read the listing and if you are still in doubt email the seller.

When you are ready to place a bid, I seriously recommend you set yourself a higher limit for your purchase and you don't overstep it. It may also be worth checking other outlets to see if the item is such a bargain. I have often seen people pay more money for things available much cheaper, brand new, in the shops.

You have two bidding options: you can use Proxy Bidding (eBay to place bids on your behalf up to your limit) or you can wait and bid at the last moment. The first option is recommended, as you are guaranteed to offer the maximum you are prepared to pay and you don't have to wait up until 2am in the morning for that elusive hardware. The other option is to wait until a few minutes before the auction ends and then bid. This method is one being increasingly adopted by bidders to avoid the price

being hiked by others. It is very risky for a number of reasons; someone could come in with a bid of a slightly higher amount and you may not have time to re-bid. Also, computers and the internet are not perfect. Imagine your annoyance when the item you have waited ten days for is lost because of a Fresco Type 5 error!

Once you have won the auction you have to contact the seller within a few days or, if they have clearly stated the postage and online purchasing costs, you can purchase on line and just await delivery of your auction item.

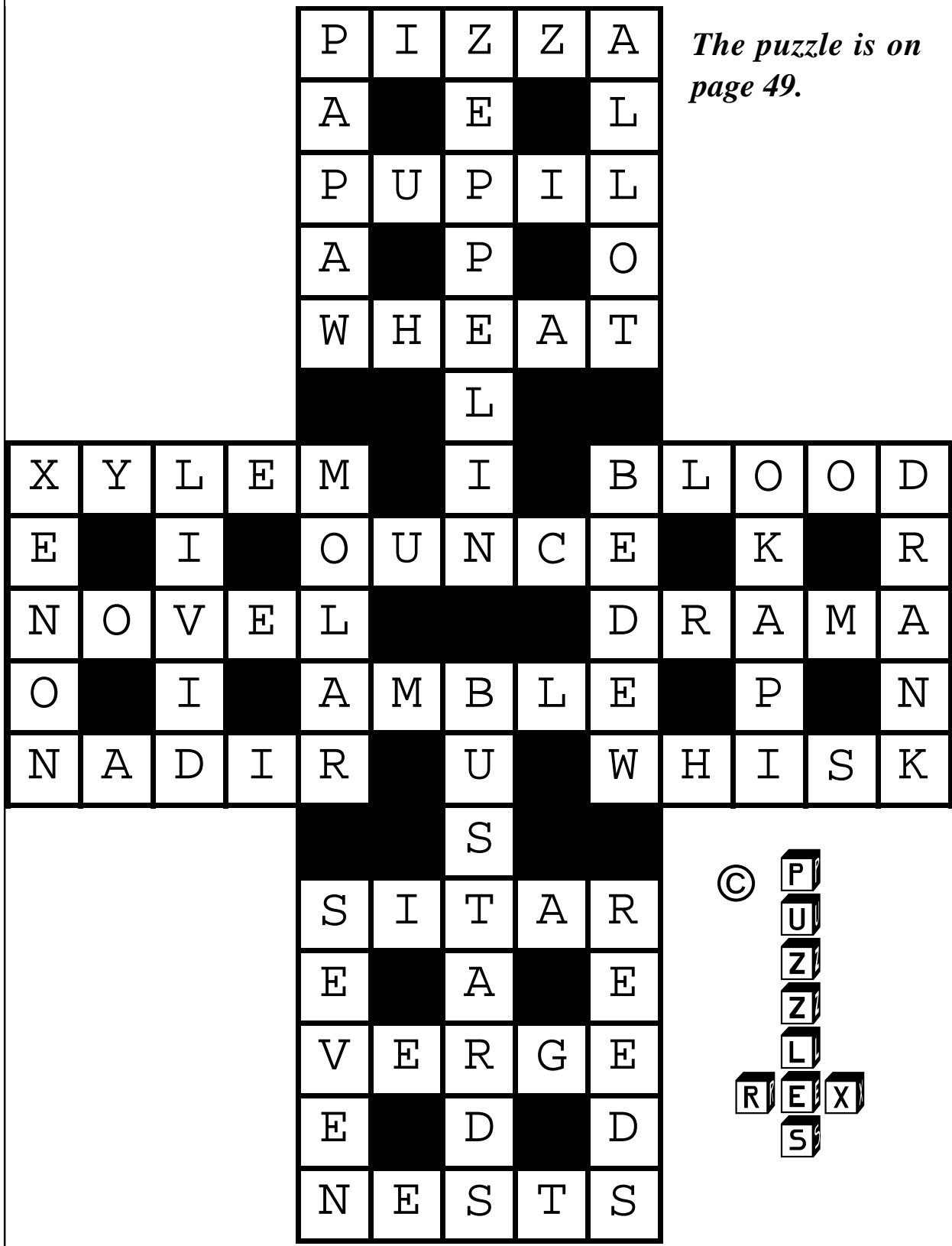
When you have received the item it is good practice to leave feedback for the seller. Unless you have previously contacted the seller with any problems, I would strongly recommend you do not leave neutral or negative feedback.

Now congratulate yourself on your first eBay purchase. You should also receive some positive feedback in return from the seller.

You are now ready to search for more bargains, or perhaps do some selling.

The Double Cross Solution

*The puzzle is on
page 49.*



You Ask — We Answer

Filetype &AE6

Question:

I have been emailed an attachment to a standard email. Looking at the options on my menu I am advised that its file type is &AE6.

Command not recognised

Question:

When I switch the computer on, !BOOT looks at StrongED. It downloads any mail/news. If I try to send an email, I can type in the addressee and the subject but when I

Some of the problems sent by members to our free Technical Help Service, co-ordinated by David Ruck, and the answers given by email, phone or letters.

When I try to change its format to a recognisable RISC OS form it is rejected by !ChangeFSI and !Attacher—from which I conclude that it is not a Word document encoded in Base 64 but nor is it a picture.

Please advise what you think it is. Is it a Word document with an embedded picture?

Dominic Price

Answer:

Yes. You need to load it into Easi/TechWriter and have ImageFS loaded if you want to see the pictures (which are only two bits of clip art).

try to open it to input the text I get two error messages. The first is 'Command not recognised' and after I close that I get 'Unable to find an OLE server'. I then run StrongED, It installs on the icon bar and I can proceed with the email. I used to be able to write email texts without running StrongED.

Robert N Hunter

Answer:

Edit the !StrongEd !Boot to stop it trying to edit files before is loaded.

Place a | character at the beginning of the four lines shown below:

```
| Set Alias$@RunType_FFF Run  
<Obey$Dir>.!Run %%*0
```

```
| Set Alias$@EditType_FFF Run  
<Obey$Dir>.!Run %%*0
```

```
| Set OLEServer$Type_fff -N  
StrongED -R /<Obey$Dir>
```

```
| Set OLEServer$Type_ffb -N  
StrongED -R /<Obey$Dir>
```

PCA resources

Question:

I bought a new hard disc, and a CD rewriter with CD burn at the recent show.

When my computer boots up, I now get an error message saying: 'Please locate PCA resources'. What are they, and how do I locate them?

Also with the new CD drive, when I run the latest Foundation CD it gets half way through the initial screen before the dreaded 'no stack for traphandler' crashes the computer. It runs perfectly (if slowly) on my Proteus CD drive.

Alan Griffin

Answer:

PCA resources are plug-in tools used by graphics packages such as Compo. It's not related to CDBurn. You should have had a copy of !PCAs with some other application, which you should place in !Boot.resources. If you can't find a copy, one can be found in the PCA Paint archive at:

www.claresmicro.com/support/index.html

Swarm of bees

Question:

I have recently bought an LCD monitor for my Risc PC, which is running RISC OS 4.02. I used to have the screen saver with a swarm of bees, and decided that it would be better to use the DPMS setting and let the monitor power down with the new one. When I go in through Boot and set this mode it works fine, but if I restart, or switch off the machine, the next time it returns to the bees as a default.

I cannot see where I set the default and save it.

David Orton

Answer:

The screensaver is set up by the file:
!Boot.Choices.Boot.Tasks.ScrnSetup.
When a DPMS screen saver is selected this should just contain the line: Unset ScrSaver\$Dir

If this isn't the case after running !Configure, try deleting the file in case it has been made read only, then run !Configure again.

!WimpZarch

Question:

Years ago I bought an ARM Club CD and found the game !WimpZarch on it but, unfortunately, when trying to run the game it claims the original disc to be inserted. Do you know how to run it without having the disc? The original !Zarch came with my first Archimedes 310 Arthur. Do you know if the game is freely available and if so, where from?

Helge Hammer

Answer:

!MultiZarch is a patch to the normal game to allow it to run in a window. Zarch itself is a commercial product so it is not legal to distribute it on a PD disc.

Unfortunately I suspect being an Acornsoft title, it is no longer available to buy, however you may be able to pick up a second hand copy by asking on the newsgroups. It will require !StrongGuard to run on a StrongARM machine.

Digi Tip

When using a digital camera there is often a problem catching the exact moment you need —such as in wild life photography —because of the slight delay in the shutter opening when you press the button.

This can usually be overcome by focussing and setting the exposure in advance by pressing the release half way down and holding it there until you see the picture you want.

Some cameras allow continuous shooting but record just the last five exposures when you take your finger off the button so you can begin shooting a fraction early.

There will be a special section on digital photography in our next issue.

Coming in Eureka 46...

Omega: In our next issue we *hope* this time to have a full report on Omega.

26Bit to 32Bit: There *will* be David Ruck's tutorial on how to adapt your existing 26Bit software to 32Bit to run on the Iyonix and a look at how Aemulor does it.

Digital photography: We have a special feature with a series of articles on digital photography. If anyone would like to contribute something to it please send it in.

Internet auctions: More on buying and selling through eBay.

Regulars: And our regular favourites including Technical Help answers, ARM Arena, Site Seeing (on genealogy websites) and Gill's Journal.

The Last Word...



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