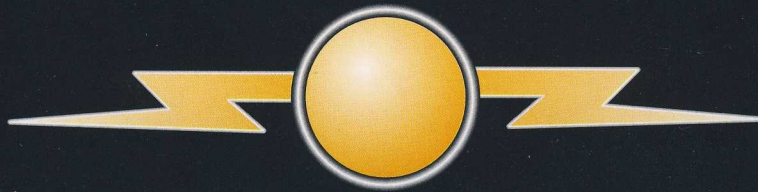


CLAN

NEWSLETTER





With the Clan newsletter undergone a face-lift we would like to know what you think. Or alternatively, if you have any comments you would like other Clan members to know, then please drop me an e-mail on Clan@Acorn.co.uk and we will print the best in future editions of the newsletter.

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Get your kit on

CLAN clothing you cannot refuse



Acorn NC demo at SME Networks

If you didn't go to last month's SME Networks show in London, you missed out on a great opportunity to see Acorn NCs and associated technologies showing how it's done. SME stands for small to medium enterprises and the show's purpose was to highlight networking-based solutions for medium sized and smaller businesses. Acorn and Essex-based Cannon Computing put up an impressive display, demonstrating how effective Acorn Network Computers can be over a local intranet and a wide area network. A Risc PC was set up as a RISC BSD Unix server connected to four NCs connected via ethernet. A second Windows NT server machine demonstrated Acorn platform machines accessing Windows NT applications running on the server via Citrix Winframe on the server and Acorn's new eXtend Xwindow solution. A third server machine, this one running Sun Solaris, was linked into the local network at the show via ISDN from Cambridge. There were also demos of RISC OS applications running on NCs, like Acorn Advance, BBC Basic and others. Acorn's port of Macromedia Director was also given an airing. Meanwhile Clan boss, ChrisCox, chaired a seminar at the show on the importance of network computers.

But if you missed SME...

...Don't miss Wakefield.

See the new Acorn portable and A7000 + exclusively at Wakefield Spring! By the time this issue of the Acorn Clan newsletter falls through your letterbox it may well be less than ten days away from this year's Wakefield show. This year the show takes place on Saturday and Sunday 17th-18th May at the Thornes Park Athletics Stadium, Horbury Road, Wakefield. Last year's event was a thorough success and this year Acorn has a few surprises up its sleeve for show visitors. Acorn will have a prototype of the new portable machine on display at the show. Until then, it remains top secret, so if you want to be the first to get the low down on the new portable you'll have to go to the show. The turbo charged new A7000 + gets its first public showing at the show and there will be NCs running the newly launched RISCafÉ Java virtual machine plus the eXtend client technology which gives Xwindow capability to the Acorn and hence the ability to run Windows applications hosted by a WindowsNT server. RISC OS applications will also be shown running on NCs and you will also get a chance to see the latest version of the Acorn web browser which now supports frames and tables. Multi-tasking! Replay will be on show, running up to a dozen simultaneous movies on a StrongARM Risc PC. For more information on the Wakefield Acorn Spring show, e-mail show97@cumbrian.demon.co.uk

or show97@barc.demon.co.uk.

The show's web site is at

<http://www.cybervillage.co.uk/acorn/wakefield/>

Alternatively, call Chris Hughes on 01924 379 778, or

Mike Wilson on tel: 0113 253 3722.

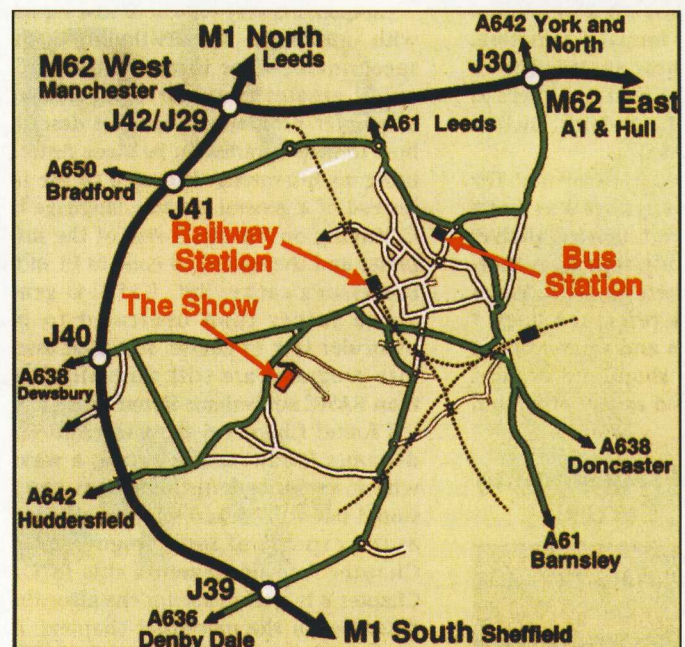
Free PD fonts CD ROM from EFF

The Electronic Font Foundry (EFF) has produced a CD ROM containing no less than 4,000 public domain fonts. All the fonts have been converted to the RISC OS font standard, which involved EFF added hinting and skeletons to each one, ensuring the best possible quality of reproduction, short of hand-crafting. The CD ROM also includes a couple of useful utilities for cataloguing both public domain and professional RISC OS fonts and PostScript equivalents. EFF isn't charging anything for the CD ROM. All you need to pay for is handling charges, either in the form of a cheque for £2.05 (which covers bank charges for processing the cheque) or just £1.50 in stamps.

Orders should be sent to The Electronic Font Foundry, 11 Silwood Road, Ascot SL5 0PY.

New private Clan member pages in Acorn's revamped web site

Acorn's web site has undergone a transformation in the last few weeks. The redesign reflects Acorn's continuing corporate evolution, with the emphasis on the company's growing reputation for developing innovative technologies which can be licensed by third party companies, from Network Computers to specialised multimedia solutions. Clan members have a special private area too. To get there click on the link marked 'private' and then from the sub-menu click on the Clan private area link. This will bring up a user name and password box. Type in your Clan membership number as your user name and your password will be your surname in lower case. For convenience, page mark the entry page. It couldn't be simpler. The private Clan area will archive this and future editions of the new-look Clan newsletter and will also contain various other news updates. There will also be news of competitions and special offers, plus a web links page pointing to interesting web pages nominated by Clan members. There will also be a feedback facility through which you can let Acorn know what's on your mind.

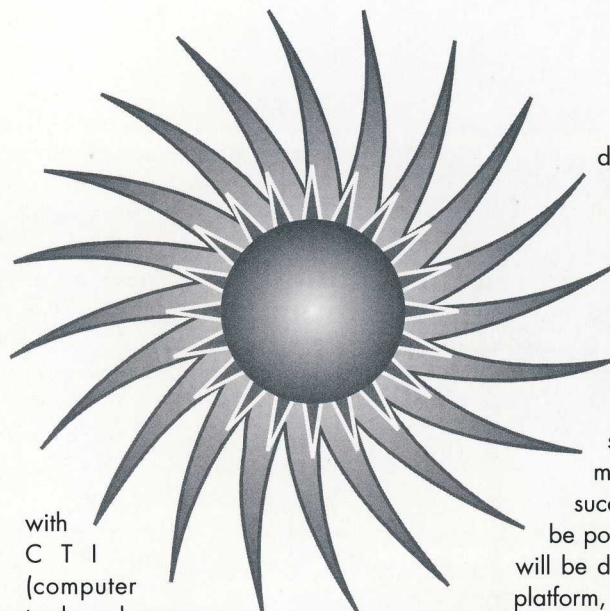


Galileo



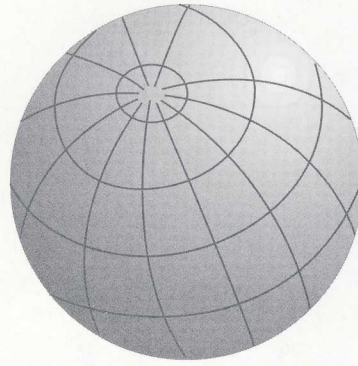
Galileo, Acorn's ultra-modern operating system for the next millennium is underway. Code-named Galileo, the new operating

system will be a versatile and robust solution designed to be implemented on a wide range of products from compact portable devices, like cellular phones and personal digital assistants to more conventional every day computers. Galileo will also be targeted at consumer electronics devices which will be made more smart through more powerful computerised control, like VCRs, TV sets and DVD multimedia players. Galileo is also aimed to be a primary candidate for Network Computer (NC) applications. Galileo has been created by Acorn to address the current problem of having to use a wide range of different operating systems for a rapidly expanding range of consumer devices. The majority of OEM suppliers of television sets, VCRs and recordable DVD players are currently at the stage of working out how to provide access to the huge range of interactive content available on the Internet from their devices and the hunt is on for the key enabling technologies. Today's consumer electronics products are typically limited in their programmability. However, with the arrival of Java and the Internet, these products will need a powerful but compact operating system to glue these exciting new information superhighway resources together. It's a similar story



with
C T I
(computer
telephony
integration) and other communications-enabled product technologies. But Acorn already has RISC OS and a version of that, called NCOS, is already at the heart of Acorn's NC product strategy. So why do we need another operating system and what is so special about Galileo? Acorn has gained considerable success in licensing its Network Computer devices to Oracle, as well as Internet appliances for a range of other OEMs from TV and VCR to games system producers. As a result of this experience, Acorn has valuable knowledge of the different OS requirements of the various devices and the problems associated with their development. Galileo is intended to provide the next step in terms of scalability, portability and use with networked interactive multimedia and will meet the requirements of a broad range of "to be released" consumer devices. Galileo's specification is tightly

dictated by the philosophy that a versatile scalable OS of the future must be very compact at the lowest level and be completely reliable. At the same time it must offer features which used to be the sole domain of high-end mini or mainframe operating systems, like multitasking and multi-threading. For Galileo to be successful on global terms, it must be portable and while early versions will be developed for the familiar ARM platform, it is envisaged that Galileo will be ported to a number of other processors, both RISC and CISC. Key points to make about Galileo include: 1. a new approach to system resource allocation which provides a guaranteed "level of service", 2. an ability to provide a customisable complete software stack. The entire operating system (from kernel to applications) can be based in ROM which means that systems which use Galileo require no local storage, but can still provide immediate access to local applications as well as local and wide area networks. The Galileo kernel will be extremely portable (95% in high level language) and the combination of this and a hardware abstraction layer (for processor portability) will ensure that OEMs (own equipment manufacturers) will be able to make cost effective choices in terms of hardware architecture. The Galileo kernel provides basic services such as memory allocation, interrupt handling, DMA



Development of Acorn's ultra-modern operating system for the next millennium is underway.

(direct memory access) services and scheduling. It is also responsible for the resource allocation and guaranteed preservation that provides the Galileo quality of service concept. The kernel is multi-threaded and fully pre-emptive. Virtually all Galileo tasks run in user mode, which means there is virtually no interaction directly with the kernel. This ensures that misbehaving or malicious applications downloaded from the network are unlikely to crash the entire system. There is complete memory and CPU usage protection between simultaneously running applications and this is a major factor in preserving the quality of service concept. The Galileo quality of service concept has been designed to provide an approach to system resource allocation (processor scheduling, memory, network bandwidth allocation etc) which supports the handling of networked interactive multimedia formats such as 3D animations, audio and video. Each Galileo binary object is able to declare resource requirements which ensures that the system requirements of each operating system task are clearly defined. The Galileo quality of service concept ensures that system resources are always allocated in a manner which is consistent with user needs and preferences. For example, a networked appliance may be downloading a web page, performing a background print job and saving a word-processing document, whilst at the same time receiving and rendering a streaming audio/video source. Galileo will

establish the system resources required by each task (some of which like video are extremely performance reliant) and ensure that an appropriate level of system resource is allocated to its completion. Once allocated this guaranteed "quality of service" cannot be diverted without specific intervention. In the event that a new task needs to be run by the OS, the system will inform the user if the new task requires more system resource than is available. At this stage, the user would have the option to reduce the amount of resource allocated to current tasks, to a minimum level which the task requires, or suspend that task altogether. Because each new system object declares its resource requirement the Galileo kernel is always able to determine exact allocated and available system resources. The Galileo kernel is just 15KB in size and the rest of the OS is extremely modular in design. The full operating system which can include a graphical user interface, font manager, graphics libraries, multimedia codecs (coder/decoders) and network stacks as well as the rest of the elements which you would expect from a fully featured OS, can be constructed according to the specific requirements of a particular OEM. Therefore Galileo can be customised closely to the needs of a particular host device. Galileo also has the notable advantage of being able to load additional components at run time which are able to extend the functionality of the ROM based OS. If a multimedia codec or network stack is required it can be downloaded off a

server and run on a system wide basis without requiring the user to restart their system. In order to ensure system security, Galileo can also require user authentication for updating system code, and support for smart-card based authentication can also be provided. The Galileo font manager provides scalable anti-aliased font presentations standard which dramatically improves the presentation of fonts at multiple sizes. This means that OEMs don't have to perform expensive "re-touching" of web pages or interactive content to improve text display and the consumer can make their own choice in terms of the ISP and the webpages they visit. Other optional modules will include specific software for TV based displays as well as a FLASH filing system (Acorn flash Display). This allows information such as TV listings, personal organisers and other regularly accessed information to be downloaded into FLASH ROM and run straight away and will be available with the new OS. System costs ROM based Galileo is able to execute system modules and applications "inplace" thus minimising the system RAM requirement. As a result of this, a complete functional system can be up and running with access to ROM based applications, access to the local area network and the Internet in a matter of seconds. Adding functionality whilst keeping costs and memory footprints as low as possible will represent as big a challenge to OEMs in the "InfoTainment" market as elsewhere and Acorn believes that Galileo will be a key resource in achieving this both in terms



of development and product costs. An example of this will include anti-twitcher software which will be shipped with Galileo for TV based applications. This will provide very high quality, stable screen display where other operating systems require expansive dedicated hardware. The Galileo OS is designed to provide excellent support for graphics of all forms, including anti-aliased outline 16 bit fonts (16 bit fonts allow many more characters - especially important for East Asian languages), postscript-style drawing primitives and 3D support. It also provides extensive networking support including TCP/IP, UDP, NetBEUI and AppleTalk. Early physical device support will exist for various speeds of modems, Ethernet, ISDN, ADSL (digital video over ordinary telephone lines) and ATM. Another strength will include multimedia codec support with most major video and audio codecs being supported including AVI and MPEG2. Applications Galileo will be shipped with a highly integrated set of ROM-based applications. These will include a web browser, email client and newsreader. Other ROM-based applications can be added such as word-processors or spreadsheets and the system will provide support for Java applets via a target hardware optimised Java Virtual Machine. A Java just-in-time (JIT) compiler and X-Server (for running server based applications such as multiuser Windows, Solaris or Linux) are also expected to be available as

optional extras which can be included within a ROM image or loaded at run time. Where does this leave RISC OS?

Where does this leave RISC OS?

RISC OS proven itself to be a very capable operating system and it is now used within a very wide range of devices including Acorn's desktop computers and Network Computers. Galileo will address a broad section of devices, together with a wide range of processor architectures. RISC OS was originally developed over 10 years ago and has been continually developed by Acorn for its range of OEM licences as well as for Acorn's own products. Galileo is intended to add to the number of devices which include Acorn technology and so will not replace RISC OS in the short to medium term. RISC and Galileo will run in parallel with RISC OS being targeted at high functionality ARM based devices and Galileo being targeted at a broad range of portable

and networked interactive multimedia devices with varying functionality. Some people have asked why re-invent the wheel as there are several excellent operating systems out there. Acorn believes that Galileo is unique in that it is the only OS which has been specifically designed for consumer devices which will handle interactive multimedia i.e the new massive range of consumer devices which will provide access to the Internet and other networks which contain high quality interactive content. The prototype Galileo kernel is already up and running and the Galileo development team is currently being strengthened to accelerate the project's progress. It is hoped that a prototype of Galileo will be completed in time to be shown at Acorn World later this year. Galileo will build on Acorn's growing success in building versatile and imaginative hardware solutions. Galileo provides both Acorn and the plethora of third party hardware designs with an operating system which can be customised perfectly for a chosen application. Galileo completes the picture.



LAUNCH PAD

A7000+



Acorn's trusty A7000 will celebrate its second birthday in July.

Well in time for that milestone Acorn is unveiling the A7000 +.

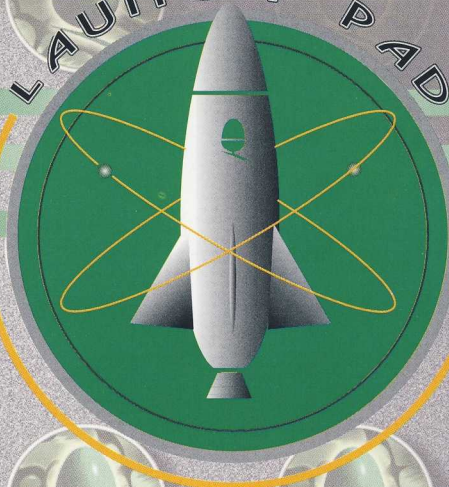
It looks much the same as before on the outside, but it's all-change inside.

A7000 + introduces hardware floating point and 50 percent performance boost. Acorn's trusty A7000 will celebrate its second birthday in July. Well in time for that milestone Acorn is unveiling the A7000 +. It looks much the same as before on the outside, but it's all-change inside. In place of the 32MHz ARM7500 CPU is the latest specification ARM 7500FE, clocked 50 percent faster at 48MHz. The FE designation means

the chip includes hardware floating point, the first time an ARM-based Acorn has shipped with hardware floating point as standard. Other improvements include the adoption of EDO (extended

data output) DRAM and 8 megabytes of it as standard instead of the previous model's 4 megabytes of ordinary DRAM. Practically all programs running on an A7000 get a noticeable performance

LAUNCH PAD



boost and some which rely heavily on floating point operations, like IPOV (the Persistence of Vision ray tracer) and IQuake, experience considerable improvements. The extra horsepower means !Replay movies now run smoothly, even at 25 frames per second. Boot up time has been reduced to just 15 seconds and the improved memory bandwidth courtesy of the EDO RAM means the A7000 + can now display 1024x768 resolution screen modes in up to 256 colours or 800x600 with up to 32,000 colours. The A7000 + comes fitted with RISC OS 3.71. Although it does not offer as many expansion options as a Risc PC, the A7000 + can be configured to work as an excellent network terminal and will be ideal for running Acorn's newly announced eXtend Xwindows server solution and the equally new RISCafÉ Java virtual machine when it becomes available for RISC OS later this year. A 8x CD ROM drive option replaces the old model's 4x drive and the standard hard disc has been increased in capacity from 540 megabytes to 1.2 gigabytes. CD-quality 16 bit stereo sound is built in and there is a mixer for combining a second audio source, from the CD ROM drive, for example. The A7000 + is a major step forward from its predecessor and compares favourably with a Risc PC 700 in general performance terms - if you don't require the ultimate in expansion capability or PC co-processor functionality offered by the Risc PC. A7000 + supplies should be available by the end of May and the A7000+ will make its public debut at the Wakefield show on the 17th and 18th of May.

Specification summary for Acorn A7000 +:

CPU Integrated ARM 7500FE - includes ARM7 RISC core, floating point unit, memory management, I/O control and audio/video control all on one chip.

Memory

- * 8MB EDO RAM on board plus one EDO RAM SIMM slot for up to 128 MB total expansion
- * 4MBytes Page Mode ROM
- * 240 Byte battery backed up CMOS SRAM
- * Unique reference 48-bit software-readable unique identifier for use by networking software

System Software

- * RISC OS 3.71 ROM based operating system capable of supporting soft-loadable extensions.

Audio

- * CD quality 16 bit stereo digital sound system with mixer for 2nd internal audio source (e.g. CD-ROM)
- * 3.5 mm stereo jack socket capable of driving 32 Ohm headphones or for use as a line output, plus internal speaker.

Video Modes include

- * 32 thousand colours at 800 x 600 pixels
- * 256 colours in 1024 x 768
- * 16 million colours in 480 x 352
- * 16 colours in 1280 x 1024

Expansion

- * Dedicated Network expansion slot giving choice of Ethernet (10base2, 10base T) or ATM (asynchronous transfer mode)
- * 32-bit EASI expansion slot
- * 5 1/4 drive bay for second IDE hard disc or ATAPI CD-ROM drive.

Storage

- * Optional 8-speed CD-ROM drive model available. 1200 Kbytes per second data transfer rate

- * Internal Mass storage 1.2 gigabyte hard drive: 2MB 3 1/2 inch Floppy Disc Drive

I/O ports and interfaces

- * RS 232 serial port with 9 pin D-type connector
- * Parallel printer port with 25 pin D-type connector
- * PS2 interfaces for both keyboard and 3-button mouse
- * Monitor output via a standard 15-way high-density D-type connector

Physical

- * Dimensions: width 357 mm, depth 283 mm, height 102 mm.
- * Weight approx 4kg
- * 103 key PS/2-style keyboard and 3-button PS/2 mouse.

Electrical

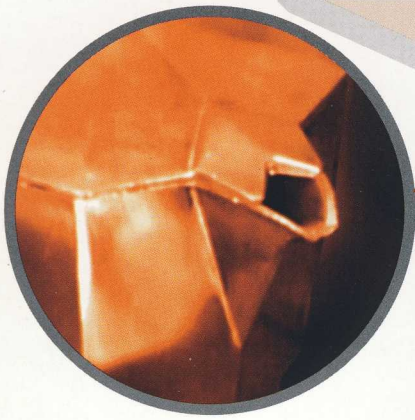
- * Integral 35 Watt switched mode PSU with IEC 320 power inlet and outlet connectors.
- * Auto-ranging PSU from 110V to 240VAC, 50 or 60



BREWING UP

JAVA

The wonderful thing about Java is that it levels the playing field.



GLOSSARY

If you think the Java phenomenon is something to do with exploding Indonesian volcanoes in the last century, you will be in for a surprise. Java is a software revolution which originated back in 1990 at Sun Microsystems, the company best known for open systems workstations and servers and Sparc RISC processors. Java is a crucial software factor in the future of an increasing number of computer companies and Acorn is no exception. Acorn has just announced RISCafÉ, a comprehensive solution for running Java on the Acorn platform. Java is something you will inevitably have to get to know. Microsoft, at first reticent about supporting Java because it challenged some of its fundamental platform strategies, has also been forced to adopt Java wholeheartedly. Java lies at the heart of Network Computer and Internet access technologies. Some have predicted that Java will eventually be as ubiquitous as the microchip, running on devices as simple as home appliances to those as complex as intelligent personal digital assistants. PC, Mac and Unix already have easy access to Java-enabled resources, mainly provided as part of leading Web browsers on those platforms. Acorn has joined the Java club too with the recent announcement of RISCafÉ, an optimised environment for running Java software on top of NCOS, the version of RISC OS developed for Acorn's NC products. By definition,

Applets: The conventional name used by Java programmers to describe applications written in the Java language.

Interpreter: Java applets are designed to be executed via an interpreter. This differs from conventional software which is usually presented to the computer in machine code, either hand-coded or generated by a compiler. RISC OS Basic, for example, is an interpreted programming language. Conventionally compiled code is executed more efficiently than interpreted code but to run on a particular hardware platform the source code needs to be compiled to the native machine code of a specific processor. This is a bulky process which cannot be carried out on the fly. Java source code should run on any platform which supports the Java language, without any platform-specific modifications to that code or the need for a cumbersome conventional compilation process. In fact Java programs, which are stored as ASCII scripts for portability, can indeed be compiled using a JIT or Just In Time Java compiler before they are executed on the native processor. However the Java JIT compilation process is relatively rapid, on the fly process, minimising any delay in operation.

Java Beans: A component architecture for Java applets. Beans are compact modular programs which can be utilised by other Java programs via an API (application programming interface). Components are important to Java because the Java environment is optimised to run on systems with relatively small resources like memory. Components are only loaded from the server when they are required and the smaller they are the faster they are made available to the user's main program.

JavaScript: A scripting language developed by Netscape, the Internet application software company, which is closely modelled on the Java language. JavaScript is designed to enhance Netscape's Navigator Web browsers and has been implemented in Navigator versions since version 2.0. Netscape hopes JavaScript will become a standard for scripting control of browser programs. JavaScript complements Java, but is not actually part of the core Java family of tools developed by Sun.

JavaSoft: The Sun Microsystems division responsible for the maintenance, development and marketing of Sun's Java products.

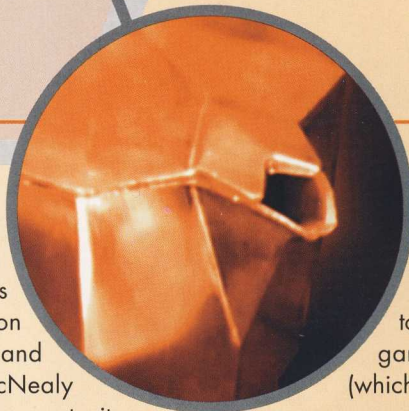
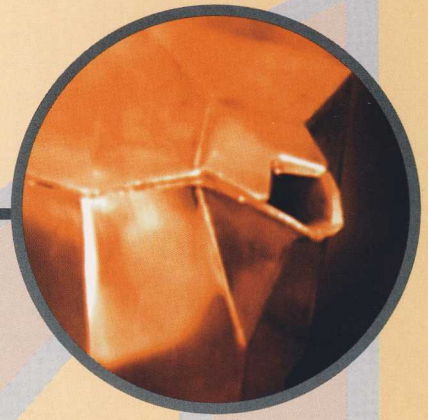
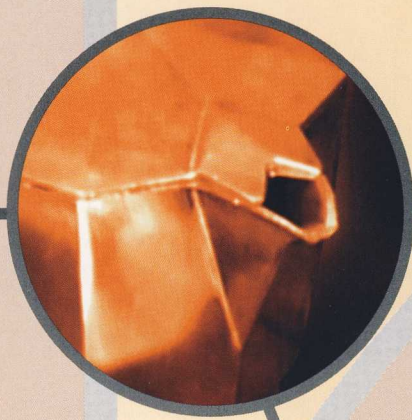
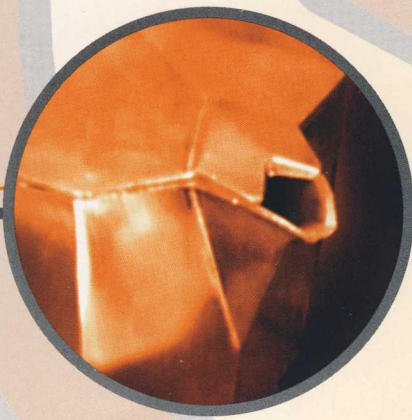
HotJava: This is Sun's Web browser which is written entirely in Java.

HotJava Views: A radical desktop graphical user interface developed by Sun with the execution of Java applets in mind.

JavaOS: Sun Microsystems' operating system designed specifically to run Java programs. JavaOS is an operating system, not just a Java environment. JavaOS competes against a number of other operating systems which have been Java-enabled, like some versions of BSD Unix and Acorn's NCOS.

JDK: Java Developers Kit, software suite for developers wishing to build Java applets. The kit includes: a Java Compiler, Java Interpreter, Java Class Libraries, Java Applet Viewer, Java Debugger and other tools. Acorn's RISCafÉ Java Virtual Machine is based on the Java 1.0.2 JDK. Acorn has already begun work on its Java 1.1 JDK implementation and intends to release a Just-In-Time compiler (JIT) which will further improve Java performance.

JIT Compiler: Just In Time Compiler. A compiler designed to translate Java applet source code into faster run-time code. A JIT compiler compiles the code as fast as possible because users have to wait for the compilation process to finish before they can use the applet. **Java Virtual Machine:** This is an optimised environment in which Java applications can operate. Acorn's RISCafÉ is a Java Virtual Machine or JVM. Through the use of a JVM, which is usually implemented as a layer on top of a host operating system, Java code can execute optimally on that host system. The Acorn Java VM provides support for applets which run inside Acorn's browser environment as well as applications which are able to run outside the web browser.



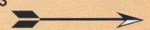
RISCafÉ will run on RISC OS. So what exactly is Java and is it really here to stay? This article examines the history of Java and explains why it has become so attractive to the global software community. Java has spawned many spin-off technologies and it has caused some confusion. Hopefully, this article will clearly illustrate the key Java technologies and explain why Java is going to be crucial to the future of computing on the Acorn platform.

In the beginning

The story behind the birth of Java could have been penned by a Hollywood script writer. The story goes that back in 1990 a disgruntled Sun Microsystems software engineer, Patrick Naughton, handed his notice to Sun supremo Scott McNealy. McNealy wanted to know why Naughton was jumping ship and when the explanation was revealed, he decided there was a serious problem which needed to be fixed. Naughton felt he had nothing to lose and he pulled no punches in his analysis of problems within Sun. He told his boss that he was completely demoralised by the rapidly increasing set of software standards which Sun was having to support. He challenged McNealy to abandon major Sun software initiatives in favour of streamlining Sun's standards and

simplifying the support and development process. McNealy was moved by this frank communication from Naughton and decided to act. McNealy offered Naughton the opportunity to set up a research group with almost limitless freedom to investigate and fix the problems which had led to his frustration within Sun. The secret project group 'Green' was born. The Green group members soon realised that there were literally hundreds of different microprocessors operating devices from TV game consoles to mobile phones and personal computers. It was all very well having an operating system which was able to be ported from one platform to another, but the applications written for that operating system needed to be portable as well. The team knew that an object oriented solution was needed and they started experimenting with the C++ language. The problem here was that C++ was too large and cumbersome to be conveniently portable, so the team worked to strip it down. The analogy between CISC (complex instruction set computing) and RISC (reduced instruction set computing) hardware processor development is remarkable. For Acorn fans another amusing anecdote is that the very first prototype language produced by the Green team was called 'Oak'. Implementing Oak in

the real world proved to be a bit of a headache. Deals with Time Warner for the use of Oak in set top boxes and the 3DO game console company (which, incidentally, used ARM processors in their products) fell through because of commercial issues. However, in 1993 the Internet was just about to take off with the first widely distributed World Wide Web Mosaic browsers from the NCSA (National Center for Supercomputing Applications). The Green team, which had since been formed into a Sun-owned company called First Person, realised the potential for Oak on the Internet. Following the Internet's example of being largely free to the user, it was strategically decided to make the core Oak technology public domain. A Oak compiler was produced from native Oak code and this spawned a browser called Webrunner. At this point, Sun applied some product marketing to Oak and the name Java was coined, complete with the versatile coffee metaphor and the rest is history. Later, JavaSoft was formed by Sun to oversee the development and marketing of Java-based products. Java applets reside on a server and only appear on a client machine while they are being used. To minimise the bottleneck of the network, Java applets must be as small as possible. Java follows the RISC analogy. It's



Key computing industry heavyweights, Sun and Oracle quickly saw the potential for Java as an enabling technology for a diverse new category of computing devices which would be Internet-based.

possible to translate the C source code of, say a complex office word processor application, into Java without changing its functions and features, but that would be missing the point. A Java-based word processor, for example, would retain only the features which the majority of users used most of the time. Other, less popular, functions would possibly be developed as 'beans' which could be dynamically loaded from the server as and when the user required them. This strategy avoids the reality of a typical Windows Office suite requiring nearly a hundred megabytes of local disc storage. Java applets must execute as quickly as possible after they have been loaded from the server. To enable this the applets can be executed via an interpreter or a JIT or Just In Time compiler. The latter offers better performance while the former is a more compact solution which is chosen for less exacting performance requirements, or for where code space is a premium - portable devices, for example.

Java and the NC

Key computing industry heavyweights, Sun and Oracle quickly saw the potential for Java as an enabling technology for a diverse new category of computing devices which would be Internet-based. Together with Netscape, the ambitious young company which was leading the rapidly growing market for Internet software, plus other key players, the specification for the low cost

Network Computer (NC) was born. Through the use of Java, NC manufacturers could select the processor of their choice around which to build their hardware. No longer were they tied to the cosy Microsoft and Intel duopoly which gripped the PC world. Acorn was soon in the thick of it having been chosen by Oracle to produce key NC reference platform designs based around the ARM processor family and RISC OS. Meanwhile, Sun announced it was to design new RISC processors, based on their Sparc processor family, which would be optimised for Java devices. These would be called PicoJava processors. Just four short years since its debut, Java has


And to the future

not only developed at a phenomenal rate, it has clearly been adopted as a universal Internet programming resource. All the major software vendors and developers have embraced Java - even those who originally saw it as a threat, like Microsoft. Being able to program in Java is already a valuable asset. All manner of things are becoming Java-enabled, from Web browsers to personal digital assistant (PDA) devices. In the not too distant future you will find

Java in mobile phones and even domestic appliances which can be controlled via the Internet. **The wonderful thing about Java is that it levels the playing field.** Developers are no longer forced to use inappropriate hardware or implement proprietary and incompatible software. This widens the opportunities for both hardware and software developers to build cheaper devices which more people can afford. Java also sparks the Internet into life. But let's not get carried away - Microsoft thinks Java is a great browser-enhancing technology but thinks it is inappropriate as an operating system level solution. It's true that Java applets compromise on functional richness and ultimate number crunching performance.

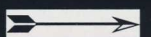
However, Java has already earned its place in the destiny of personal computing. Nobody really knows what Java's limits will really be, especially as processor power continues to grow. What ever, Java is here to stay.





Acorn Network Computer: All This and RISC OS too!

Although the Acorn Network Computer was originally designed with the high-level platform-independent requirements of being able to render HTML, run Macromedia Director movies and support Java, it must not be forgotten that NC OS is based very heavily on RISC OS. To this end, it is possible to make many RISC OS applications run successfully on NC OS; it is predicted that about 70% - 75% of RISC OS apps can be made to run either "out of the box" or with only minor modifications.





It should be noted that the following modules significant to the operation and networking of RISC OS 3.60 have been removed:

- AUNMsgs
- Freeway
- ShareFS
- TaskManager
- Filer
- ResFSFiler
- Display
- Pinboard
- DOSFS

...along with all Econet / Level 4 support modules and the POST (Power-On Self Test) code.

The absence of these modules implies that certain modes of operation under RISC OS are by default not feasible under NC OS; there is no concept of a filer window, for example, so all loading, saving and cataloguing of files must be done via an alternative interface.

OS and Environment Detection

It is no longer feasible to rely on the version number of UtilityModule to reflect the version number of the OS. The OS type and version may be determined by looking for the OSVersion module; in NC OS this is a non-functional dummy module which has the same version number as the OS, in RISC OS the module is not present.

If your application is already known to be portable between NC OS and RISC OS without modification, you use SWI"OS_Byte",129,0,255 ; a version code of &A6 is returned in R1 for both RISC OS 3.6 and NC OS 1.06.

Note that this issue also impinges on ISystem (see below).

Filetyping and File Naming

As the Acorn Network Computer uses NFS to mount the exported root of the server containing the bootstrapping application, it is essential that the files stored on this server reflect the file typing metric expected by the NC OS NFS client.

The simplest way to ensure that files have the correct type is to upload them to the server using an NFS link from a RISC OS system, as the RISC OS NFS client uses the same filetyping convention; if this is not feasible, the files should be manually named according to the following guidelines:

- File leaf names as seen from the server console comprise a name component, a comma, and a three hex-digit filetype component. For example, !Run, feb denotes the file !Run of type &FEB (Obey).
- All characters contained within filenames must lie within the 7-bit ASCII domain (so no top-bit-set accented characters). If any top-bit-set characters are present, they should be changed to the closest corresponding 7-bit character and all references to the original filename must be amended. As with RISC OS, spaces are not permitted in UNIX filenames; as "hard space" lies above the 7-bit watershed, all white space characters should be removed.

- To aid portability of files across server types, the length of the component of the filename preceding the comma should be no more than 10 characters, and should not rely on case sensitivity.

- All files belonging to a RISC OS application (other than plain-ASCII text files) must be assigned filetypes.

- Files which under RISC OS contain a / character (/ is the directory separator under UNIX; as this is usually hardwired into the UNIX kernel there is no way to modify the server to change this) should under UNIX substitute a . for the / .

Be aware that there is one exception to the rules above; HTML files which are intended to be accessed and rendered directly by NCFresco (either by standard URLs if you are running an httpd, or by standard page links using) should not be named as <filename component>,faf but should retain the standard UNIX convention of <filename component>.html . This also ensures that they may be easily viewed by browsers on other platforms.

To aid the transfer of files to the server on floppy, a utility exists which is able to uncompress Spark file archives; portable source code for this utility can be found on ftp.acorn.co.uk as /pub/riscos/releases/nspark.tar . When decompressing a Spark archive, nspark's -T option can intelligently set filetypes for you (but beware filename truncation).



!System, !Scrap and !Fonts

In its current server-based boot sequence, NC OS does not boot a !System application per se, but aliases System\$Path to a directory. As NC OS is currently only single-versioned and therefore there are no compatibility issues intrinsic to NC OS, it is envisaged that, rather than having the multilayered !System structure common to RISC OS 3.5 and above the structure should be kept fairly flat. Networking and Toolbox modules are best kept within their own subdirectories within the Modules directory, but otherwise all other softloadable modules can reside within the Modules directory (to be *RMLoaded with a simple Repeat ... IfThere loop).

In the current server-side boot sequence !Scrap is entirely absent, and Scrap\$Dir is unset (thus RISC OS applications which require scrapfile storage will crash). Unless your boot sequence-hosting partition is exported read-only, there should be no problem in inserting a standard RISC OS 3.60 !Scrap (with correct filetyping) into the bootstrap application and OBEYing its !Boot,feb file within !RunEther,feb ; thus applications which require access to !Scrap may have it. As it is often not possible to determine which application will want to write to !Scrap from which machine and with which UserID, however, it must be ensured that !Scrap.ScrapDirs is world-writable.

As with !Scrap, it is possible to add a RISC OS 3.60 !Fonts hierarchy to !NFSBoot. The standard RISC OS

distribution of Corpus, Homerton and Trinity (along with the additional Sidney font) are included as part of the resource filing system, the Font\$Path macro is set to <Font\$Prefix>.,Resources:\$.Fonts. as with RISC OS, and the font handling and painting modules are in ROM.

Application !Boot and !Run Files

In order to run most applications on a Acorn Network Computer, as on any other RISC OS computer, both the !Boot and !Run files (where present) belonging to the application must be *OBEYed. Assuming that you have loaded your application into a suitable place on your server, copied any shared resources into the areas which correspond to !System and !Fonts, and have set the filetypes in accordance with the notes above, you should proceed as follows:

- Load !Boot,feb into your text editor of choice
- Look for occurrences of DOSMap; if any are present, they should be commented out. If files to be used with RISC OS applications are loaded onto the server which have DOS-style filenames, they should be renamed according to the file naming metric above.
- Look for occurrences of Filer_Boot and Filer_Run . If these are present, you need to create a new obeyfile in your application's directory for each occurrence of Filer_Boot or Filer_Run, where each file contains the equivalent Boot or Run command. The occurrence of Filer_Boot or Filer_Run should then be replaced with an OBEY pointing to the relevant obeyfile.

Now make sure that the application does not make appeal to any ROM-based ResourceFS objects which may not be present in NC OS (eg sprite, message and template files for !Draw, !Paint, !Edit etc). If it does, you will need to create replacement files as part of your application, and have it point to these instead.

Starting the Application

Once you have an application which should run on NC OS, there remains the matter of attaching commands to the hooks in the server-side boot structure to start it. If the application is of the conventional sort (ie it has a !Boot file and a !Run file), you should insert the line

```
Run Apps:!<application name>!.!Boot
```

in the sequence commencing on or around line 120 of !RunEther,feb and add a line to whichever HTML page you wish the application to be booted from of the form:

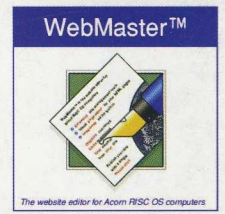
```
<h3><a  
href="saferun:Root:Apps:<application  
name>.!Run"><application  
name></a></h3>
```

For applications such as !MPEGFast which do all the work of !Boot and !Run within !Boot and simply claim one or more filetypes, the second hook is not required. However, it will often be necessary to modify the !Boot file to ensure that NCFresco has all the data it needs to know when and how to start the application.





IMS News



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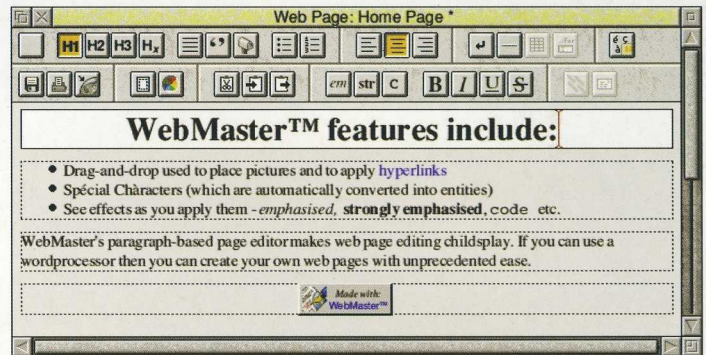
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