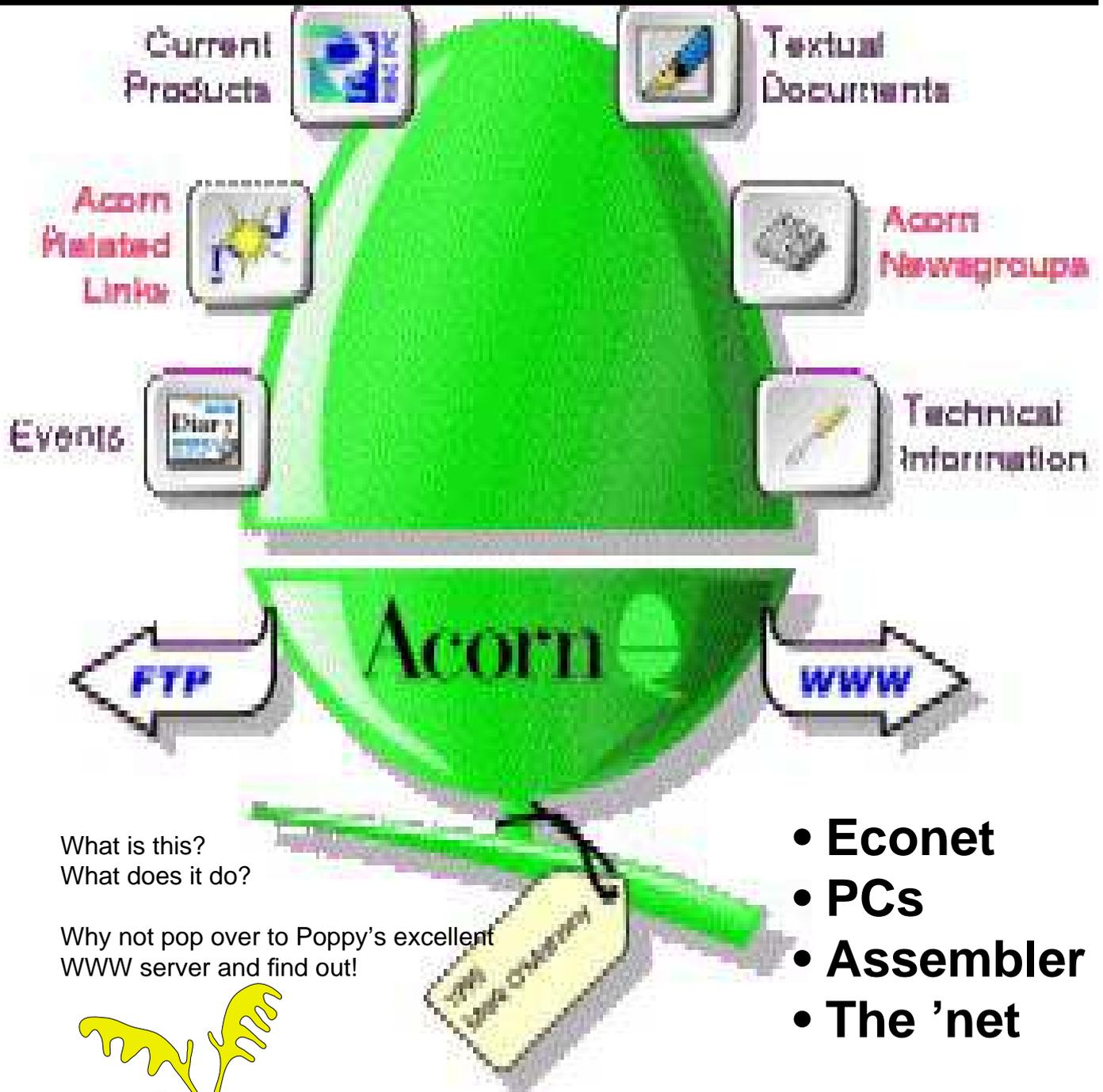


FROBNICATE

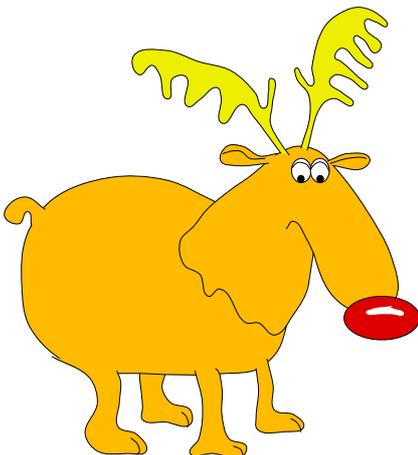
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What does it do?

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WWW server and find out!

- Econet
- PCs
- Assembler
- The 'net

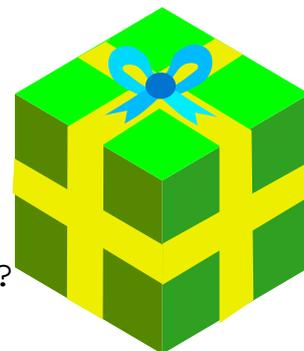


<http://www.ee.surrey.ac.uk/Societies/Acorn/>



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EDITORS PAGE

Well... Those that have Ovation *loved* the new style and those using the demo version hated it. God help us if I ever get around to buying OvationPro. :-)

So whilst the !FrobFonts hack did quite a good job of making the text readable, it seems the only viable solution is to bow down to the lowest common denominator... The RiscOS fonts. If anybody has a problem with this, let me know – we can take a vote on it.

Right. As many of you should know by now – I am the proud (?) owner of a Pentium75 machine.

HOLD IT...

STOP...

Tuck that dustbin back into the corner and carry on reading. There was a reason why I bought the machine, and I don't plan on any fly-by-night defections. Of course, if you don't trust me then by all means can this copy of Frobnicate.

Here I shall get critical of Acorn. If we are to have any success at all in competing with the masses, we either branch into unusual stuff (like the NC) or we examine the competition and see how we can match it or better it. Technical resolution doesn't matter. Joe Bloggs couldn't tell a CISC from a RISC even if the CISC blew up in his face. You often see people promoting MHz ratings and likewise some refer to the harddisc as "memory". It's all a case of mass consumerism and misinformation. It suits manufacturers to switch to using 1000 as a unit of measurement instead of 1024 as then a 1Gb harddisc is quite a few Mb short of a real Gb. Most readers of Frobnicate can follow this (I hope). A sales rep. in a well known computer

box shifter (*Where in the world...*) got utterly confused. I don't hold out much hope for the masses either.

We all complain about the PC user who can't draw a picture of the Acorn machine or name the operating system, but instantly discounts the thing as a toy... the biggest mistake education ever made... blah blah blah.

So if you disagree with having a dig at Acorn (and don't think the PC gets off lightly) then by all means throw Frobnicate in the nearest trashcan. However, then **you** are no better than the misdirected PC owner. It'll do us all good to examine the world around.

And that is possibly the main point of this special Christmas issue of Frobnicate. There will be some other stuff, as always... A lot of that has yet to be decided.

One thing I have noticed is a drop in the number of submitted articles. As less people are helping out, and with my Open University course looming up – Frobnicate may be stuck on the back burner for a while. I can't say when or where, but it'll keep on trickling.

In an attempt to boost the ratings, issues #9 and #10 and this shall be released in the text & graphics format.

And that... nicely... wraps up the editors page.

Merry Christmas!

(and happy birthday - I'm 23 today!)

/___/ rurray@arcticbb.demon.co.uk
/ \ichard. "Richard Murray", 2:254/86.1@Fidonet

16th December 1996

DEFECTOR!

I have no plans for defection. A point that has sadly escaped a few people. I grew up with Acorn and I've spent over half my life tapping away at an Acorn keyboard. I have more-or-less wasted a good few years doing not-a-lot-really sitting in front of an Acorn monitor. Just because a PC walked in the door, it doesn't mean I'm going to box the Acorn and stick it in the loft.

Yes. I am aware that my code output has dropped dramatically. Right now I'm not in the *mood* for coding. During the summer I wasn't in the *mood* for writing stories – where last night I churned through the third part of a serialised story of mine.

PC owners blindly slag off Acorn owners. Acorn owners blindly slag off PC owners. It's a bit of a mess really.

John Lennon is dead. PM Dawn have vanished into obscurity and Oasis don't count. So it is time to ditch the rose tinted shades and look at the world for what it is.

The first thing you'll notice is a medium sized dislike for a person called Bill Gates. I'm sure you've *all* heard of him. Me? Whilst I am not particularly fond of the guy – you do have to admire him. He started with not-a-lot and now heads up one of the largest industries in the world. Every PC worth being called a PC is running some form of Windows – be it W95 or latterly the NT setup. MicroSoft are known for a bad

case of code-bloat, but on the other hand this has brought the price of harddiscs to a Gigabyte for under £200 and SIMMs are £100 a dozen Mb. Of course these are vague prices. You can probably find 8Mb SIMMs for £25 and a Gb harddisc for £99 if you look hard enough.

Back in 1990, such prices were unheard of. PCs simply couldn't handle discs larger than 512Mb because – heck – who needs something that large?

CD-ROM prices have dropped dramatically. A two-speed CD-ROM was around £150 two years ago when these things started picking up. Now you can find a quad for as little as £40, and any magazine worth it's salt has a CD-ROM on the cover. Whether the software supplied is any good is a moot point. :-)

This saving has been carried into the audio world. You can now pick up a 'mini-system' for £60. I'm sure if you took it apart you'd find something that vaguely resembles a CD-ROM unit inside... Most likely uncased and with a different loading system but...

So even if your personal vendetta is a blind desire to nuke Bill Gates and obliterate MicroSoft – you have to give him credit for this.

But the coin is turning. Reports are that the Americans actually have some form of legislation requiring you to buy

home-grown products. More than one brand of printer is inherently incompatible with anything but Windows – it acts a little like a LASER Direct. And I'm sure I'm not the only person to have thought of such nice words as “megalomania”.

I required the ability to use a package (that I quite like) called WORKS. I required a nice stable PC computer and on top of that I would have liked a CD-ROM.

My choices were:

1. Buy a PC card and CD-ROM for my A5000.
2. Buy some kind of RiscPC.
3. Buy a real PC.

And the results of the international jury were...

1. How compatible will it be? No software is bundled with it, and WORKS cost a fair old amount. For the CD-ROM I'd need an IDE card.

2. Discounted. My price range didn't stretch as high as that, but again more or less the same comments as for #1 – except CD-ROM was supplied.

3. Well, it came with all the trimmings, W95, WORKS, nice amount of memory and harddisc and it cost about the same as buying the base equipment for #1. Compatibility was guaranteed... You can't get much more “PC compatible” than using a PC itself.

So I read out a few numbers over the telephone and these two astoundingly great big boxes arrived a few days later.

The specification (from diagnostics):

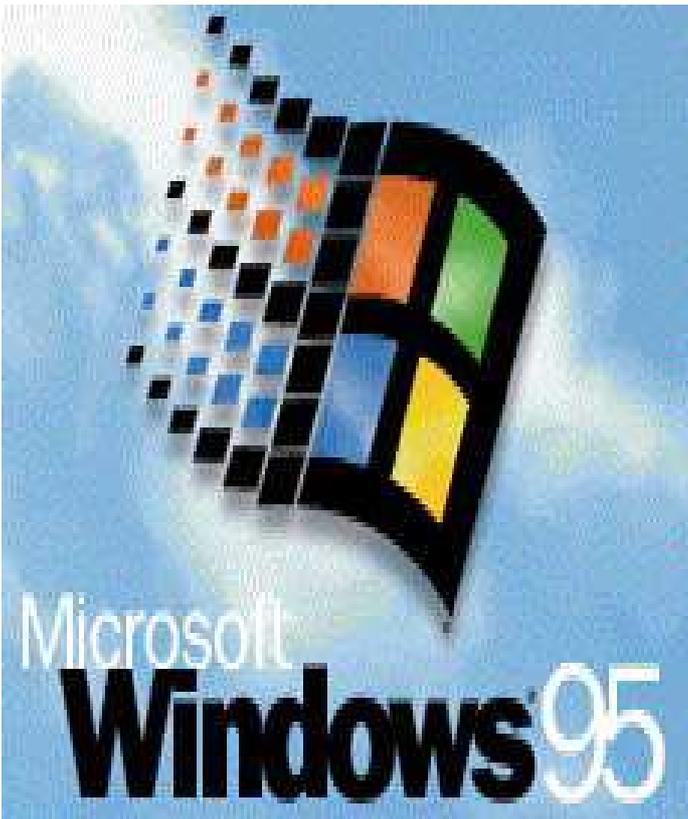
- Pentium 75HMz
- ISA/PCI expansion
- FlashROM BIOS
- VGA/SVGA with 1Mb VRAM.
- CD-ROM (quad)
- 847Mb IDE harddisc
- 16Mb SIMMs
- Energy saving features.
- Software MPEG support (and it is fast!)
- Spatial stereo soundcard.

And the bundled software is pretty good too:

- Windows 95 / DOS 7
- Quicken demo (good but cannot register as neither phone number is known to BT)
- WinCIM (which I promptly deleted!)
- Activity manager
- Compaq reference library
- MS WORKS 4.0
- Fax/Internet/comms stuff
- Presario FileVault (encryption)
- Global French/German
- LaunchPad (for kids)
- MediaPilot (some kind of answering machine?)
- Encarta95 (MPEG version)
- DK Encyclopaedia of Nature
- DK The way things work

I could take it out of it's box, plug it in, install WORKS and run a business. So far I've only gotten as far as keeping a record of my bank balance in the spreadsheet.

Windows 95 does hold as much similarity to Windows 3.10/Windows For Workgroups as I had expected. It seems much closer to RiscOS... I'd imagine that the Armed Forces WinRISC package would look like Windows 95... A port of 3.10 with some nice RiscOSy features tacked onto it.



Windows95 itself has this dreadful problem of trying to be nice and do everything for you. Add new hardware? Windows will suss this and try to install the correct drivers for you. Add new software? Just bring up the control panel, click on Add software (or something along those lines) and Windows will search your removable media (floppy/CD-ROM) looking for the software. It can also keep track of some stuff that is W95 aware so you can wipe it off just as easily.

W95 aware programs also put short-cuts to recently opened documents... So forget about loading the software and fiddling around with the file viewer. Simply click on "Start", move up to "Documents" and over to the required document and click it.

I stick D'eux in the CD-ROM drive and tap it closed. After a few seconds, the Compaq audio system pops up and Celine Dion starts to sing my favourite songs, looping. A nifty

little LCDish icon tell me I'm listening to "Cherche encore".

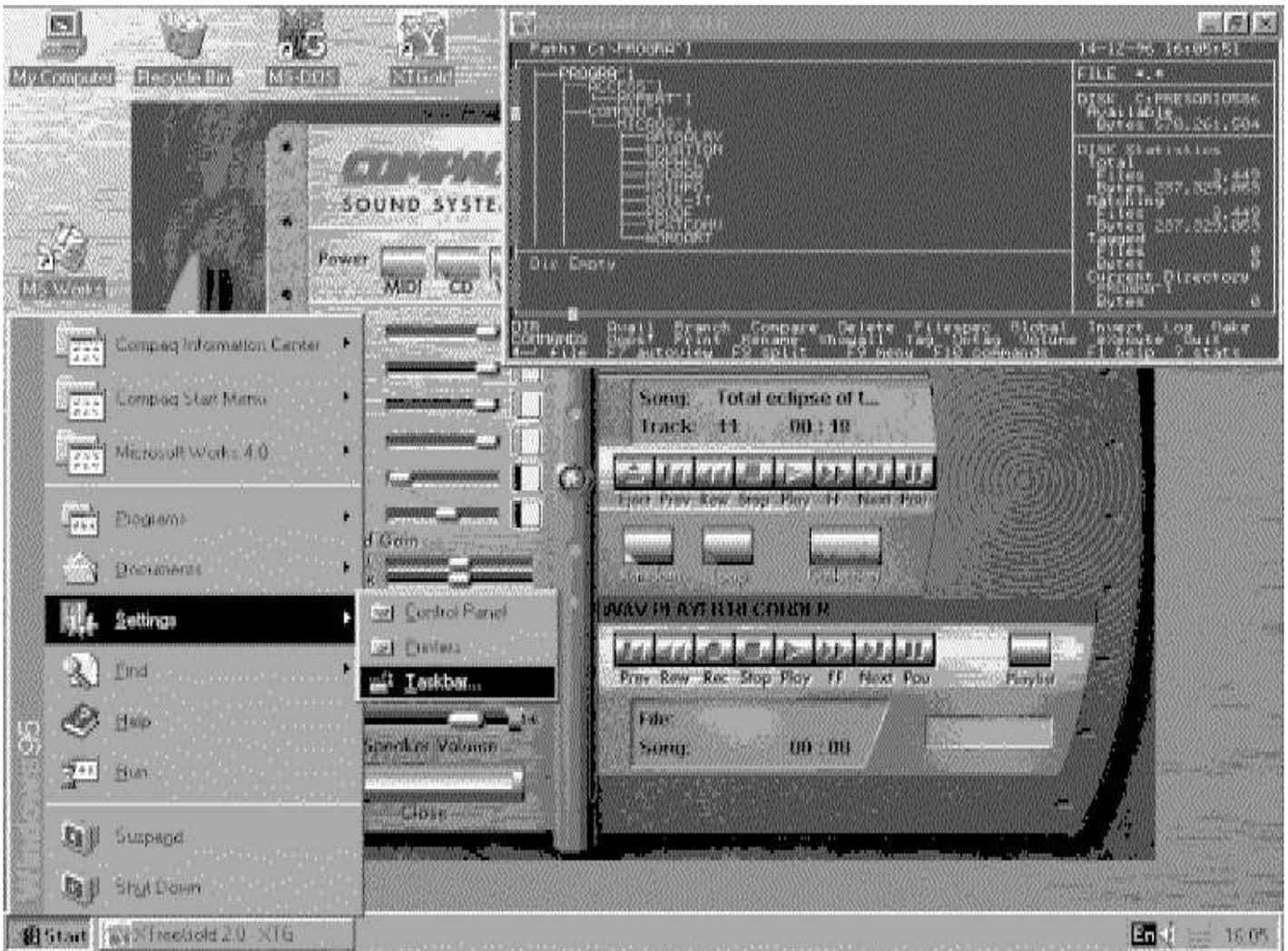
Windows95 may be big, and it may be less competent under the bonnet as, say, RiscOS... But on top it is really quite sexy.

But it wasn't without a measure of criticism. RiscOS comes with a stunningly large book explaining everything in detail. Windows, on the other hand, come with a tiny little book explaining the basics. The computer came with a few pamphlets. Nothing actually told me what software was pre-installed on my computer. The 'how to install' was a kind of a pictorial wallchart. MS WORKS was a bright shiny CD with a "Certificate of authenticity" tucked down the back. Is this the level of literacy that we have come to expect from the average computer user? I have used WORKS previously at night school (going for an RSA/CLAIT in IT) and I bought a big ol' book to assist me. I am aware that on-line help is provided... but I much prefer something printed.

The other criticism is that I got no Windows95 CD-ROM or floppies. Instead I got a paper full of disc labels and every fifth time Windows95 starts, it nicely asks me if I happen to have 30 spare 1.44Mb discs lying around 'cos I'm supposed to copy the setup stuff into disc.

So that is how Bill Gates makes his fortune huh? :-)

All in all, I am not the biggest PC fan – but this hardware and software combination is nice, friendly and lacking is serious



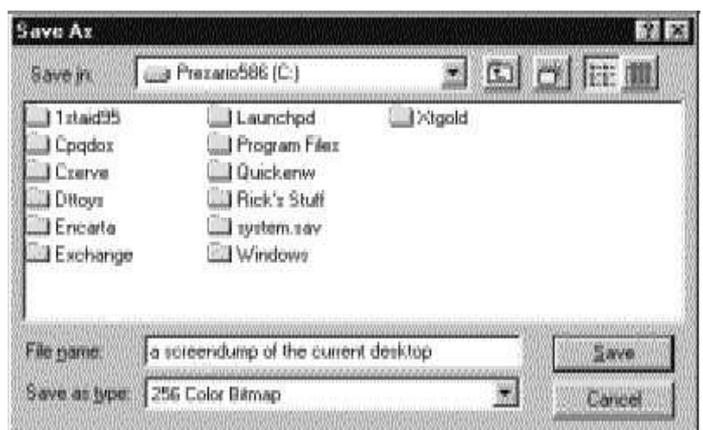
documentation. Looking at it, it is no wonder the masses flock to it. Copy a file a little piece of paper flies from one directory folder to the next. Delete a file, a screwed up piece of paper is tossed out of the folder and it grows smaller until it vanishes with an animated “ping”.

It is cute and it has a sense of humour.

Add to that the fact that you can call a file anything you want – the screenshot above is called “a screendump of the current desktop.bmp”.

Windows is still controllable by keys – but this has been expanded to emulate the mouse using the numeric keypad. Additionally there are various

“Accessibility” features such as sticky keys. Partial drag and drop is implemented. I can drag an MPEG from the explorer (like File Manager on heat) straight into the media player. It is possible to set up default allocations so that you need not even do this. Just click the MPEG and up it comes. An unusual feature is that is you click–hold on a filename it will turn blue and you can edit it...



So how does this compare with the Acorn RiscPC? It goes without saying that a StrongARM is sexy – and several of them in a Hydra setup would be something worth drooling over. In comparison to what I've seen on the PC – Acorn applications might seem a little plain. Conventional maybe?

I'd better hide before I get shot for suggesting that. Hehe... But here are a few ideas for things that Acorn should look into. I'm not suggesting that RiscOS port Windows. But maybe we could benefit from it if...

- RiscOS and associated hardware has the ability to be plug-and-play compliant. As it is, you have to resort to a set of assembler-level tests to work out which processor you have. How would you would out if your ARM3 is 25MHz or 30MHz? PCs since the 486 have been able to interrogate themselves.
- We have support for the cheaper Windows GDI printers? It'd be good to have !Printers able to print a reasonably intensive page to a low-memory LASER without hiccups.
- We had a *slightly* better help system than !Help. Something like Hiper?
- Internet/fax support built in.
- Good bundled software. I noticed that a recent Clan thing had an offer of bundling Ovation with a RiscPC. Nice.

I am impressed by Windows. But please bear in mind that at this time my uses are different. The PC is a utility – as such I use WORKS mainly for educational purposes, as well as such things as the RS CD-ROM and Encarta. The Acorn I use for

programming and DTP. Will there be anything to top Ovation/Pro? :-)

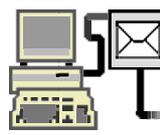
Anybody worried? I could be editing the images in PaintShop Pro and writing the text of this article in WORKS.

Yes. I could. But I didn't.

Images grabbed in Windows using PrintScr. Converted with !ChangeFSI (slow!) and edited in !Paint. Text written in Ovation.

I hope to see some of you debating this in the FROBNICATE echo (Fidonet). It is a bit of a controversial subject I know.

Right. Now that is out of the way, we can return to our regular programming... :-)



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Assembler



If you want to knock up a quick little program, then you can't pick much better than BASIC.

```
PRINT "Froblicate."
```

If you want to write a less-hackable program with large speed benefits, you should pick C or C++. For speed concerns, the old CastAVote vote editor takes around 20 to 30 seconds to delete a vote at the beginning of a full file. The new vote editor tasks this out to VoteModule. It does it in a second.

```
printf("Froblicate.\n");
```

If you want the ultimate speed and flexibility with the ability to perform low-level hackery, you should be looking to assembler.

```
ADR    R0, frobnicate_text
SWI    "OS_PrettyPrint"
SWI    "OS_NewLine"
MOV    "PC, R14"
```

```
.frobnicate_text
EQUUS  "Froblicate."
EQUB   0
ALIGN
```

As you can see, assembler is much more involved. There are quicker ways to write the above, but it is a reasonable example.

You may know that it is possible to call BASIC functions in assembler:

```
MOV    R0, #RND(64)
```

But if you plan to write a fully assembler application, you'll need to know how to write the RND code.

Lets take that example and expand it into a fully fledged application...

```
REM Frobnicate assembler demo #1
:
DIM code% 64
FOR pass%=0 TO 2 STEP 2
P%=code%
[ OPT pass%
```

```
ADR    R0, frobnicate_text
SWI    "OS_PrettyPrint"
SWI    "OS_NewLine"
MOV    PC, R14
```

```
.frobnicate_text
EQUUS  "Froblicate."
EQUB   0
ALIGN
]
NEXT
```

```
CALL code%
```

Let's work through the program. The first line is "DIM code% 64". This reserves enough memory for your program. Luckily BASIC ensures that your memory begins on a word boundary.

The next line is "FOR pass%=0 TO 2 STEP 2". This is important, as the first time through, the assembler cannot resolve all the references. It's a little like C in this respect.

The parameters have the following meanings:

Bit 0	- Produce a listing
Bit 1	- Report errors
Bit 2	- Offset assembly
Bit 3	- Range check

Option	List	Err	Offs	RChk
OPT 0	No	No	No	No
OPT 1	Yes	No	No	No
OPT 2	No	Yes	No	No
OPT 3	Yes	Yes	No	No
OPT 4	No	No	Yes	No
OPT 5	Yes	No	Yes	No
OPT 6	No	Yes	Yes	No
OPT 7	Yes	Yes	Yes	No
OPT 8	No	No	No	Yes
OPT 9	Yes	No	No	Yes
OPT 10	No	Yes	No	Yes
OPT 11	Yes	Yes	No	Yes
OPT 12	No	No	Yes	Yes
OPT 13	Yes	No	Yes	Yes
OPT 14	No	Yes	Yes	Yes
OPT 15	Yes	Yes	Yes	Yes

So as you can see, the first pass ignores everything, and the second time through we do the standard error checking. If you want to see the assembly taking place, amend the line to say:

```
FOR pass%=1 TO 3 STEP 2
```

The third line, "P%=code%" tells the assembler where to compile the code. The variable P% is just assumed to be the pointer to this – so it is advisable that you set it to something. :-)

"[OPT pass%" is an important line. The opening square bracket denotes the following as assembler op-codes. The "OPT" then specifies which compilation options are to be used this time in (refer to the table above).

"ADR" is not a real op-code. What it does is place the address of the specified value into the given register. In this line ("ADR

R0, frobnicate_text") it places the address of frobnicate_text into register zero.

Next, two SWIs are called. This is similar to BASIC's SYS command. Firstly "SWI "OS_PrettyPrint"" prints the text, and automatically wraps it to fit nicely in the available space. Secondly, "SWI "OS_NewLine"" prints a newline character. Unlike BASIC, this is not implicit.

Many registers exist, and some of them have special functions. This is detailed below. However I shall tell you here that register 15 (also known as "PC") is the program counter. When a program is started, or when a branch with link occurs, the return address is stored in register 14 – the link register.

Therefore it becomes easier to understand the line "MOV PC, R14". It places the value of R14 (currently holding the return address back to BASIC) into the program counter. Hey presto, we are back!

Finally the block ".frobnicate_text" defines a zero terminated string and aligns the tail end so it is on a word boundary.

The closing square bracket marks the end of an assembler section. Unlike in BASIC, a closing statement does not mean the end of the routine. You must explicitly return before closing up, as shown in this example.

The "NEXT" matches the "FOR".

Finally, we "CALL code%", or in other words we branch to the address of the variable code% and begin execution there – hence we execute the assembler section.

Try it.

The ARM processor has twenty seven registers, some of which have conditions applied to you only get to use sixteen at any one time...

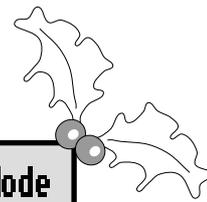
- Register 0 to register 7 are general purpose registers.
- Register 8 to register 12 are general purpose registers, but they have shadow registers which come into use when you switch to FIQ mode.
- Register 13 is typically the stack pointer, but can be used as a general purpose register. Each of the processor modes shadow this register.
- Register 14 is dedicated to holding the address of the return point to make writing subroutines easier. When you branch with link (BL) the return address is stored in R14. Likewise when the program is first run, the exit address is stored in R14. All instances of R14 must be preserved in other registers (not really efficient) or in a stack. This register is shadowed across all of the processor modes. This register can be used as a general purpose register once the link address has been preserved.
- Register 15 is the program counter. It holds the status of the processor as well as a twenty–six bit number which is the address of the program currently being used. Upon examination you will notice that the address is only twenty–four bytes long and it is wrong anyway. There is an explanation for this. Assembler opcodes must be word aligned, so the lower two bits of the twenty–six bit number are always zero. And if they are always zero, why bother storing them? As for the pointer being incorrect, that is because of the pipeline. The program counter is eight bytes beyond the opcode currently being executed.

By now you may be wondering about these “modes”. I shall detail them for interests sake – but we won’t be looking at processor modes in any detail just yet.

- User Mode, the usual mode for applications to run in.
- Supervisor Mode (SVC Mode), used mainly by SWIs. This mode has additional privileges which allow greater control of the computer. For example, you have to go to Supervisor Mode in order to read from a podule. It cannot be done in User Mode.
- Interrupt Mode (IRQ Mode), used to handle peripherals that issues interrupts. This mode is also privileged. Such devices causing IRQs are the keyboard, the VSync (when the screen refresh is occurring), IOC timers, serial, harddisc, floppy etc etc...
- Fast Interrupt Mode (FIQ Mode), used to handle peripherals that issue fast interrupts. This mode is also privileged. Such devices causing FIQs are the floppy disc requesting data, the serial port (on 82C71x machines such as the A5000) and Econet.

The difference between IRQ and FIQ is with FIQ you have to processor your stuff as quickly as possible and then get the ... out of there. An IRQ may be interrupted by an FIQ but an IRQ cannot interrupt an FIQ. To make FIQs faster, they have more shadow registers. FIQs cannot call SWIs. FIQs must also disable interrupts. If it becomes necessary for an FIQ routine to re-enable interrupts, it’s too slow and should be IRQ not FIQ. Phew!

To make this a little clearer... A picture!



User Mode	SVC Mode	IRQ Mode	FIQ Mode
	R0		
	R1		
	R2		
	R3		
	R4		
	R5		
	R6		
	R7		
	R8		R8_fiq
	R9		R9_fiq
	R10		R10_fiq
	R11		R11_fiq
	R12		R12_fiq
R13	R13_svc	R13_irq	R13_fiq
R14	R14_svc	R14_irq	R14_fiq
	R15 (PC / PSR)		

RISC vs CISC

A *Complex Instruction Set Computer* (CISC) provides a large and powerful range of instructions, but executes them more slowly. The 6502 is an example of a CISC processor. There is an instruction to move data from register X to Acc (TXA). There is another to move data from register Y to Acc (TYA). Two more instructions move data the other way (TAX and TAY). What if you should desire to move something from register X to register Y?

The *Reduced Instruction Set Computer* (RISC) concept is to identify the subcomponents and use those. For example, TXA and TYA and TAX and TAY all move data between the processor registers, so why not have one simple instruction? The ARM provides the MOV command which can move the contents of any available register into any other available register. You saw this happening with the MOV PC, R14.

Some of the CISC instructions (look at the 80486 instruction set if you want a heart attack) may translate into several RISC instructions, but as the RISC isn't spending so long faffing around, it is able to get execute instructions much more quickly.

Another benefit of the ARM chip is conditional execution. You can test something, then only do the next few commands if the criteria of the test matched. No branching off, you simply add conditional flags to the instructions you use.

More next time!

Is YOUR computer the fastest?

The Performance Database Server

<http://performance.netlib.org/performance/html/dhrystone.intro.html>

Extract showing the top 32 processors (read 14th December 1996), full list shows over 300.

###	System	OS	CPU	CPU (MHz)	MIPS V1.1	MIPS V2.1
001	AlphaServer 8400 5/300	UNIX V4.0	DEC 21164	300.0	550.1	464.8
002	AlphaServer 8400 5/300	UNIX V4.0	DEC 21164	300.0	523.5	457.2
003	Dell Dimension Pro150	NT 4.0 srvr	Pentium Pro	200.0	-----	446.9
004	Dell Dimension Pro150	NT 4.0 srvr	Pentium Pro	200.0	-----	419.5
005	DEC Alpha 600 5/266	OSF/1 V3.2c	21164-EB5	266.0	-----	366.8
006	DEC Server 2100 5/250	UNIX V3.2b	DEC 21064	250.0	-----	360.4
007	Dell XPS Pro 200n	NT 3.51	Pentium Pro	200.0	372.8	312.4
008	DEC 3000/900 AXP	OSF/1 V3.0	DEC 21064	275.0	-----	291.9
009	DEC Alpha 600 5/266	OSF/1 V3.2c	21164-EB5	266.0	-----	290.0
010	Micron Pro Magnum+	WindowsNT4.0	Pentium P6	200.0	294.7	275.7
011	DEC 200 4/233	OSF/1 V3.2	DEC 21064A	233.0	189.3	245.8
012	DEC Alpha 250 4/266	OSF/1 V3.2c	-----	266.0	-----	226.2
013	Pentium P6-200	Solaris x86	Pentium P6	200.0	258.5	220.7
014	DEC 10000/610 AXP	OpenVMS V1.0	DEC 21064	200.0	194.9	214.8
015	SGI Indigo2	IRIX 6.2	MIPS R10000	195.0	223.8	214.4
 016	Acorn RiscPC	RiscOS	ARM SA110	200.0	-----	204.1 
017	DEC 7000/600 AXP	OSF/1 V1.3a	DEC 21064	200.0	195.5	203.3
018	SGI Indigo2	IRIX 6.2	MIPS R10000	195.0	221.1	202.9
019	Power Macintosh 7500	MacOS7.5.3R2	PPC 604	132.0	283.2	196.7
020	DEC Alpha 250 4/266	OSF/1 V3.2c	-----	266.0	-----	196.0
021	DEC 7000/610 AXP	OpenVMS V1.0	DEC 21064	182.0	177.3	195.6
022	DEC 3000/800 AXP	OSF/1 V1.3a	DEC 21064	200.0	192.9	189.7
023	DEC 4000/710 AXP	OSF/1 V1.3a	DEC 21064	190.0	188.7	189.7
024	HP 9000/735	HP-UX 9.03	PA-RISC7150	125.0	224.5	189.2
025	SGI Indigo2	IRIX 6.2	MIPS R10000	195.0	200.2	188.0
026	Sun Ultra 1	Solaris 2.5	UltraSPARC	167.0	189.7	179.0
027	Pentium P5-133	Windows 95	Pentium P5	133.0	-----	178.4
028	Sun Ultra 4000	Solaris2.5.1	UltraSPARC	167.0	194.6	173.9
029	DEC 4000/610 AXP	OpenVMS V1.0	DEC 21064	160.0	159.0	173.0
030	DEC 3000/600 AXP	OSF/1 V1.3a	DEC 21064	175.0	168.5	167.4
031	PowerMac 9500/120	System 7.5.2	PowerPC 604	125.0	-----	167.4
032	DEC 3000/500 AXP	OpenVMS V1.0	DEC 21064	150.0	146.7	160.1

NEWS! (well, kinda)

Would **YOU** want to run Windows on your ARM?

Windows CE ports to PowerPC, ARM may give the device OS a boost

By Cara Cunningham and James Niccolai

InfoWorld Electric

Posted at 2:47 PM PT, Dec 4, 1996

Microsoft announced on Wednesday that its Windows CE operating system for hand-held devices will be available for Motorola's PowerPC chip and Advanced RISC Machine (ARM) processors.

The software company is working directly with Motorola on the PowerPC port, and has solicited help from Digital's semiconductor division and Cirrus Logic to port the operating system to their implementations of the ARM processor, company officials said. The announcement was made at the Hand-held and PDA Expo and Forum in San Francisco.

This slimmed down version of Windows already runs on processors from NEC Electronics, Hitachi, and Philips Semiconductor.

In addition to boosting Windows CE's profile, the announcement of these additional chip architectures may accelerate the development of other types of consumer products that the OS was designed for.

"This just further emphasizes the momentum that is gathering behind Windows CE," said analyst Diana Hwang, of International Data Corp., in Framingham, Mass.

The PowerPC and ARM architectures were selected because they meet various OEMs' demands for optimal levels of price, power consumption, and performance, said Harel Kodesh, general manager of Microsoft's consumer appliance group.

"Definitely some of these chips will find their way into hand-held PCs," Kodesh said. "Others will appear in multimedia and entertainment products. It allows OEMs to choose what they want."

Last month, Microsoft chairman and CEO Bill Gates confirmed that Windows CE is also running on Intel's x86 architecture in Microsoft's labs. Gates added that Microsoft would port the operating system to other vendors' chips as well, if hand-held makers request it.

Intel is expected to announce next week that its x86 processor also will support the Windows CE platform, one industry source said. A Microsoft representative added that such an announcement from Intel is expected in the near future.

Motorola's MPC 821 and 823 will be among the PowerPC chips to run Windows CE, because they both

offer features key to hand-held devices, such as low power consumption and on-chip Communication Processor Modules. The 821 is currently used in hand-held products such as digital cameras and bar code scanners; the 823 is a scaled down version of the 821 that will be available early next year, a Motorola representative said.

The Windows CE port to the PowerPC architecture is expected to be fairly simple, because Windows NT already runs on the Motorola chip, the representative added.

Motorola's semiconductor division is prepared to supply silicon to any device maker -- be it within Motorola or external -- looking to use the PowerPC chip and Windows CE in its computers, the representative said. Motorola is already in discussions with a number of OEMs and expects to have the Windows CE port available on the PowerPC chip in early 1997.

Digital expects to make available to OEMs Windows CE running on its StrongARM chip by mid-1997, a company representative said. However, the computer company is more interested in supplying its chip to Windows CE device makers than jumping into that market as a competitor, the representative added.

"That's really not the direction at this point,"

Digital's representative said, when asked if Digital will manufacture its own hand-held device.

Digital maintains that its RISC chips, which range from 100 MHz to 233 MHz, are as much as six times faster than other chips currently available for Windows CE-based devices.

Cirrus Logic plans to make available to OEMs Windows CE running on its ARM-based embedded chip in the coming year, said George Alexy, the company's senior vice president of marketing.

In other Windows CE news, Sanyo Electric said that early next year it will ship a hand-held PC based on Microsoft's operating system.

Sanyo will market the unit under its own name, company officials said. It is now deciding final details of the device, such as whether to use a processor from NEC or one from Hitachi, said Yukinori Kuwano, managing director and general manager of Sanyo's research and development headquarters.

Kuwano expressed concern that Sanyo would have difficulty differentiating its device from the pack of others, echoing some analysts who said the strict specification laid out by Microsoft has left little room for vendors to innovate.

Motorola Inc.'s Semiconductor Products Sector, based in Austin, Texas, is at <http://www.mot.com/sps/>.

Digital Equipment Corp.'s Semiconductor group, based in Hudson, Mass., is at <http://www.digital.com/info/semiconductor/>.

Cirrus Logic Inc., based in Fremont, Calif., is at <http://www.cirrus.com/>.

Using Econet

By Glenn Richards

[editor's note : If you don't see the examples in the system font, you will find the font of one of your RiscOS applications discs.]

This article will explain how to write programs that use Econet as a device, rather than just as a filing system.

SWIs

There are 6 SWIs that we shall be using:

```
Econet_CreateReceive
Econet_ExamineReceive
Econet_AbandonReceive
Econet_WaitForReception
Econet_DoTransmit
Econet_ReadLocalStationAndNet
```

These names are fairly obvious.

Initialisation

If you are planning to receive data over the network you will need to set up a receive buffer. The obvious way to do this would be:

```
DIM rxcb% 2048
```

This however will not work unless your program is non-multitasking, the reason being that data is read by RISC OS itself, not the application. The Econet module within RISC OS will attempt to write to the address given, but because the MEMC has remapped it will overwrite another application and may cause a complete system crash.

The solution is to claim workspace in the RMA. The following SWI will do the trick:

```
SYS "OS_Module",6,,,2048 TO rxcb%
```

You can define your transmit buffer in the normal way, ie:

```
DIM txcb% 2048
```

as RISC OS makes a copy of the transmit block before starting the transmit operation.



*The author, Glenn, on the right.
Helen Rayner on the left.*

Next we need to add some library procedures:

```
PROCgetstationaddress
FNcreaterx
FNgetrxdata
FNrxstatus
FNwaitforrx
PROCtransmit
```

Receiving Data

PROCgetstationaddress returns the local network (will always be 0 unless you have a bridge) and station number of your machine:

```
DEFPROCgetstationaddress(RETURN net%,RETURN station%)
  SYS "Econet_ReadLocalStationAndNet" TO station%,net%
ENDPROC
```

It should be called as your program is initialising, like this:

```
net%=0
station%=0
PROCgetstationaddress(net%,station)
```

Now on to the receive functions. FNcreaterx will create a receive block, returning the block handle:

```
DEFNcreaterx(port%,station%,net%)
  LOCAL rxhandle%
  SYS "Econet_CreateReceive",port%,station%,net%,rxcb%,2048 TO rxhandle%
  =rxhandle%
```

FNgetrxdata reads back any received data from the given block handle as a string:

```
DEFNgetrxdata(rxhandle%)
  LOCAL rxdata%,bytes%,rxdata$
  SYS "Econet_ReadReceive",rxhandle% TO ,,,,rxdata%,bytes%
  rxdata%?bytes%=13
  rxdata$=$rxdata%
  SYS "Econet_AbandonReceive",rxhandle%
  =rxdata$
```

FNrxstatus will return TRUE if data has been received on the given handle or FALSE if either no data has been received or a reception is currently in progress:

```
DEFNrxstatus(rxhandle%)
  LOCAL status%
  SYS "Econet_ExamineReceive",rxhandle% TO status%
  IF status%=9 =TRUE ELSE =FALSE
```

The final receive function, FNwaitforrx, will wait until either data is received from the given station and port number or a specified timeout (in centiseconds) is reached, in which case it will return a null string.

```
DEF FNwaitforrx(port%,station%,net%,time%)
  LOCAL rxhandle%,rxdata%,bytes%,status%
  SYS "Econet_CreateReceive",port%,station%,net%,rxcb%,2048 TO rxhandle%
  SYS "Econet_WaitForReception",rxhandle%,time%,0 TO status%,,,,rxdata%,bytes%
  IF status%=10=""
    rxdata%?bytes%=13
  =$rxdata%
```

Transmitting

Finally the transmit procedure:

```
DEF PROCtransmit(port%,station%,net%,txdata$)
  $txcb%=txdata$
  SYS "Econet_DoTransmit",0,port%,station%,net%,txcb%,LEN(txdata$),64,2
ENDPROC
```

The last 2 numbers on the DoTransmit SWI are the number of retries and the delay between retries in centiseconds; in this example it will try 64 times to transmit with a 2 centisecond delay between each attempt.

Ok, that's all very well, but how do you use them?

The best way is, as ever, to have a very short example program. It will multitask, but will not have any windows, icons or menus. It will simply record everything transmitted on port 128 into a file in the CSD.

Note that if you specify to receive from station 0, you will be able to receive from any station on your network (ie not from across a bridge).

Yes, I know this doesn't comply with the style guide, but it's only a demonstration!

```
DIM taskid% 4,block% 2048
$taskid%="TASK"

SYS "OS_Module",6,,,2048 TO ,,rxcb%
SYS "Wimp_Initialise",200,!taskid%,"Econet demo"

quit%=FALSE

station%=0
net%=0
port%=128
rxhandle%=FNcreaterx(port%,station%,net%)
```

```

file%=OPENOUT"NetData"

REPEAT
  SYS "Wimp_Poll,,block% TO action%
  CASE action% OF
    WHEN 0 : IF FNrxstatus THEN PROCdatareceived
    WHEN 17,18: IF block%!16=0 quit%=TRUE
  ENDCASE
UNTIL quit%

CLOSE#file%

IF rxcb%<>-1 THEN SYS "XOS_Module",7,,rxcb%

END

```

You will need to add the procedure PROCdatareceived to the program later, but first a quick description.

The first few lines are just a standard WIMP application header, the third line claims workspace from RMA. Notice that you should set up the receive block before the start of the main polling loop, otherwise you will get an "Unknown or missing variable" error.

When the WIMP returns control with a reason code of 0 (ie a null poll) this is when you check the state of the receive block with FNrxstatus. If the result returns TRUE it calls the procedure PROCdatareceived, which we shall come to in a short time.

You can quit this program from the Task Manager (reason codes 17 and 18), the final line before the END releases the workspace we claimed earlier back to the RMA.

Now for the procedure PROCdatareceived:

```

DEFPROCdatareceived
  LOCAL rxdata$
  rxdata%=FNgetrxdata(rxhandle%)
  rxhandle%=FNcreaterx%(port%,station%,net%)
  BPUT#file%,rxdata$
ENDPROC

```

This is fairly straightforward, but notice the requirement to create a new receive block immediately after reading out the data. This is because once the block has been filled a new one must be created before any new data can be received.

Once the new block has been created it then writes out the received string to the file that was opened at the start of the program.

To demonstrate that it's working we shall need a transmit program, this is a very simple single-tasking affair:

```

MODE 12
DIM txcb% 2048
port%=128
net%=0
INPUT "Enter station number"station%
REPEAT
    INPUT txdata$
    PROCtransmit(port%,station%,net%,txdata$)
UNTIL FALSE
    
```

Attach PROCtransmit above to the end of this program and run it on another station somewhere, and whatever you type should be saved into the file. Press ESCAPE to quit the transmit program.

© Glenn Richards, December 1996

People and places on the Internet:		
Hensa	ftp://micros.hensa.ac.uk/micros/arch/riscos	<i>...not visited this yet</i>
Acorn	http://www.acorn.co.uk	<i>...visited, recommended</i>
Cybervillage	http://www.cybervillage.co.uk	<i>...visited, recommended</i>
Acorn demos	http://droopy.imag.fr/~elisei/	<i>...visited</i>
Arcade BBS	http://arcade.demon.co.uk/	<i>...visited briefly</i>
Arctic BBS	http://arcticbb.demon.co.uk/	<i>...visited briefly</i>
Digital Oasis	http://www.argonet.co.uk/users/aok/	<i>...visited</i>
Stewart Brodie	http://www.dsse.ecs.soton.ac.uk/~snb94r/	<i>...not visited</i>
Justin Fletcher	http://users.essex.ac.uk/users/gerph/	<i>...visited, recommended</i>
"The clan"	http://www.art.acorn.co.uk/CLAN/	<i>...visited - when was it last updated?</i>
Robin Watts	http://www.comlab.ox.ac.uk/oucl/users/robin.watts/	<i>...visited, exceedingly strenuously recommended</i>
Poppy's server	http://www.ee.surrey.ac.uk/Societies/Acorn/	<i>...visited, highly recommended</i>
Seriously spooky	http://www.igc.apc.org/millennium/inds/	<i>...visited</i>
Werewolf	http://www.werewolf.demon.co.uk/	<i>...visited</i>

And where would we be without the
traditional Christmas greetings?

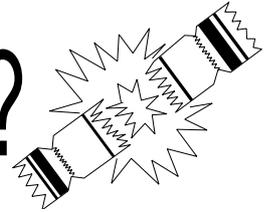


Merry Christmas!

From Frobnicate.

Best wishes for 1997.

Qu'est-ce que c'est, ça?



Well... What a weird year! Our beloved computer company went from gloom and doom mongering to residing with the world's fastest processors... indeed the future looks very good. So good, in fact, as to sound like a delusional fantasy. Three-VIDC multiple StrongARM RiscPCs? Hehe... I'd like to see that. And I don't think I'd like to see the price tag attached.

This issue brings up over ten, so we can party on down (hic!) and celebrate over ten issues, over a year and heck, Christmas and New Years. Did you ever need a better excuse to party (except maybe your graduation day)???

As to 1997, the future and all things besides... I see a green logo in the shape of a seed. The runes indicate that the de facto industry standards will change in 1997, and a computer company based in Cambridge will be celebrating toooooo!

Ahem.

Well. Here goes another year. Here goes another issue. I'd like to look back over the past year and comment, but I'm sure you'll all agree without needing to read it here. This *has* been a good year for Acorn. Somebody finally pulled their finger out of their butt and gave Acorn a presence. Yeah, the dreaded **P** word... *PUBLICITY!!!*

Acorn had the RiscPC competition on the front of Byte magazine. There was that nice advert with the RiscPC in bars and... well... people are going to have to rethink their ideas about Acorn being classroom toys.

Though frankly, and after thinking about the PC article earlier, who cares about what the man in the street thinks? Looking through press releases I have come to the conclusion that many many PC owners are sheep. Somebody somewhere said that a many-megabyte OS was the way to go, and everybody has gone. Acorn, therefore, really only need to convince the sheepdogs (the media etc) and it'll trickle down to the sheep.

Well, we know the truth in the saying "Small is beautiful". It's our little secret, soon to become a worldly truth.

Ah, slagging off PCs.

It's good to be home isn't it?