



# System top-up

Howard Oakley offers tips and advice about upgrading to Mac OS8 or 7.1.1 and warns against putting the cart before the horse. Are your batteries running low? Here's what you need to know.

**T**here are two main camps regarding system upgrades. In one, there are those who will be itching to get hold of Mac OS8 and to be the first on the block to have upgraded. I would guess that these are the people who also drool over the latest software reviews, browse Ric Ford's Macintosh web site and get a buzz out of the arrival of packages from upgrade centres.

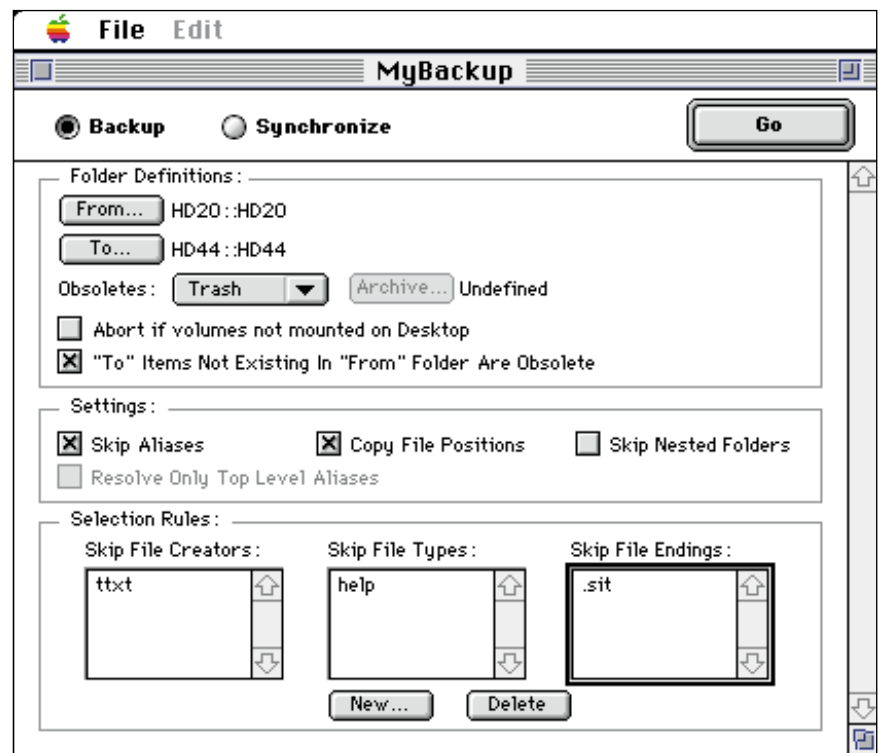
Then there is the other camp. These people will still be running System 7.1 (or even System 6.0.7). The chances are they would not change from Microsoft Word 3, 4 or, at a pinch, 5.1, and having got everything running nicely, see no need to mess around. The most die-hard retro of all will be running an old accounts package which blows the Modern Memory Manager apart, and may not even be 32-bit clean.

## Why upgrade?

There are only three good reasons for upgrading your system software: bugs, features and compatibility.

The nature of the beast is that all software, including system releases, contains bugs. System 7.0 needed a minor revision or two to shake them out, as did 7.1 and 7.6. The saga of 7.5 was more protracted and painful, working through different patches and tweaks before 7.5.3r2 seemed to be reasonably reliable. If you are running an original copy of 7.5, you have not been paying attention to this column.

The advertised reason for each major revision of an operating system is to add new features which no attentive user can be without. While this is often true, as with moving NuBus Power Macs up to Open Transport, there may be associated penalties, too. Needless to say, other



**Fig 1** Backing-up is vital before performing significant software surgery. If you have a commercial product like Dantz Retrospect 4.0, then you will have little interest in the shareware product, Synk, shown here. But Synk has much wider appeal as it costs only \$10

products then move up to take advantage of those new features, so if you wish to be able to run them you are forced to upgrade your system for compatibility.

## Preparation

It may seem obvious, but before you rush off and part with good money for a new Mac OS CD, or devote hours to downloading an update, you should check your current system version (using the Apple menu "About this Macintosh" dialog) to make sure this would be an upgrade and not a retrograde step. If you are running a

British English version of the system, you should also make sure that the upgrade is British English, and not US (which may work after a bit of tweaking). Read the readme files and consult any friendly gurus.

Once you're convinced of a rational basis for your desire to upgrade, perform at least one (ideally two) complete backups of everything on your hard disks. If you don't have a commercial utility, download Synk which will do you nicely (Fig 1).

Although I have had some spectacularly destructive crashes when testing software, the worst have always been when system

## Zoombini heaven



It is hard to keep three children aged from seven to 15 years occupied, but the outstanding Logical Journey of the Zoombinis does just that. Taking them through a series of absorbing games, it builds sophisticated maths and logical skills. It also illustrates well how QuickTime has become justly established as a platform-independent standard

## How to replace your battery

More and more Macs and Power Macs are reaching the end of their battery life. Common signs of this are: a system clock which spontaneously resets itself to a date in 1956, and difficulties starting up; black screens and the like. If you have a helpful Apple dealer which replaces batteries for a song (under £15, say) it is probably best to leave it to them. But if you want to do it yourself, here's how:

■ **Batteries** — Most Macs require a 3.6v, half AA-size lithium battery. Suitable models include the Saft LSL3, the Maxell ER3S and the Sonnenschein SL-150. These are available from Apple dealers, electronics suppliers and some photographic shops. They are also available from Maplin (order code GS99H). Cost should be under £5.

■ **Tools** — Whatever you need to open your Mac: a small flat-blade screwdriver or similar and, if you are unlucky, a Torx screwdriver. Use anti-static protection (e.g. a wristband).

■ **Time** — Less than ten minutes.

■ **Procedure** — First remove the lid of your Mac's case in the usual way. Then locate the battery; this is usually distinguishable as it consists of a relatively brightly-coloured cylindrical battery inside a black plastic cage. Batteries are often near the power supply unit. Once identified, you need to remove the plastic cage. This usually requires you to use the screwdriver to press in a central tab at each end of the battery cage, allowing the upper part of the cage to lift free. This is the most tricky part but, once completed, the battery is obvious. Taking careful note of how it is orientated, lift out the old battery and insert the new one. Replace the cage and close it up. When you restart your Mac you may need to set the correct date and time, and possibly other information stored in your PRAM.

■ **Further information** — Check out the Mac Logic Board Battery Info at [www.academ.com/info/Macintosh](http://www.academ.com/info/Macintosh).

upgrades have gone wrong. One of the most original of my own bugs messed with the innards of the old Apple Colour Graphics card, blowing it into a brisk roll: if I managed to track the moving menu bar with the mouse, I could restart before being overcome by motion sickness, but sometimes it was a close-run thing.

In contrast, I have twice had every single file on several large hard disks emptied out into the giant bit-bucket in the sky when system updates turned sour. Take the opportunity to check through your control panels and other settings and note any important information you will need later, like the entries in MacTCP if you are installing

Open Transport. When you have got the new system in your hands, follow the upgrading instructions.

Unless you are told otherwise, you should first run Disk First Aid from the Disk Tools folder or disk, then update your hard disk driver(s) from the same disk. Don't cut this corner, as it could save you hours restoring everything later. Then move your third-party extensions etc. out of the system folder: a neat way of doing this is by turning on just the standard extensions using Extensions Manager, but I prefer to do it by hand.

### Getting started on the upgrade

If possible, perform the upgrade on an inactive system by restarting from another disk. This is sometimes not ideal for smaller updates, though. If you have to perform a series of updates, restart your Mac and use each new system as you perform the series of installations. Make sure that parameters such as the machine ID are set, and that AppleTalk has been used. Failure to do this is a common reason for an update aborting at the last moment.

### After the deed is done

Once your Mac is up and running under the new system, you will need to work through all the control panels, configuring them to your satisfaction and performing the more obvious functional checks. Only then should you begin restoring your old third-party goodies, and if possible this should be done from the install disks rather than just by dragging them into the system folder.

You will need to keep a close eye on things in the coming days, watching for possible problems with older extensions and so on. Keep particularly careful backups over this period just in case it all crashes and burns. But enjoy Mac OS8, or whatever it is you have chosen to upgrade to.

## PCW Contacts

Howard Oakley loves to hear from Mac users and can be contacted via the usual PCW address or email [mac@pcw.co.uk](mailto:mac@pcw.co.uk).

Apple Computer 0181 569 1199;

[www.apple.com](http://www.apple.com) and [www.euro.apple.com](http://www.euro.apple.com)

Newton pages [www.newton.apple.com](http://www.newton.apple.com);

Macintosh pages are at [www.macintosh.com](http://www.macintosh.com).

Synk is available from most online Mac archives, including Info-Mac and its mirrors.

Logical Journey of the Zoombinis is published by Broderbund on a dual-platform Mac OS and Windows CD-ROM, for around £25; [www.broderbund.com](http://www.broderbund.com).



# Accident and emergency

You may not hear sirens, but surgery on the innards of your Mac could still be needed. Avoid it like the plague, says Howard Oakley; but if you can't, read this for painless operations.

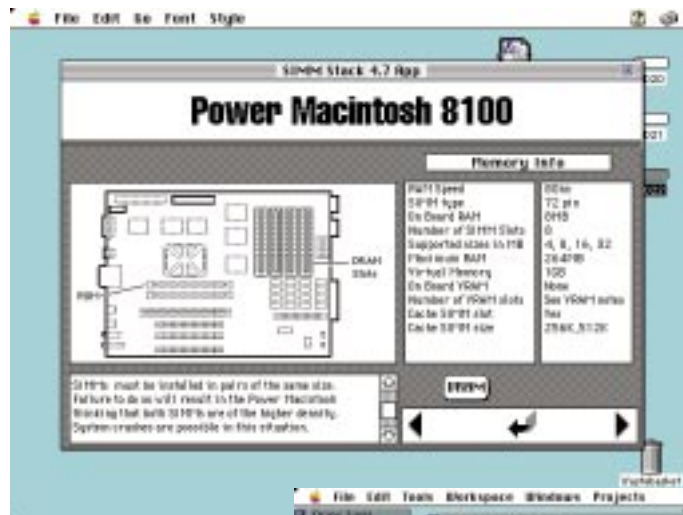
**S**piders, heights and confined spaces are among the most popular of phobias. Among Mac users a terror of opening the case and doing anything to the "hardware" ranks almost as high. My wife runs away and hides when I start performing surgery on one of my Macs, although my success rate would do justice to the best of NHS Trusts.

The summer is a good time to perform hardware maintenance and upgrading. When the weather's fine, take your Mac outside to give it a good clean, far away from those who will object to grey soot wafting over their work. If you need to down networks or inconvenience other users, picking a time when they're on holiday, or perhaps just dreaming of going away, is likely to earn approval rather than disgrace.

Sometimes, opening up your Mac's case is less a matter of choice, more the compulsion of misfortune: that dreadful time when you power up to a black screen or hear something other than the normal startup sound. You could throw the machine into the car and shoot around to your friendly Apple engineer; but will you be wasting their time and your money?

## Anatomy

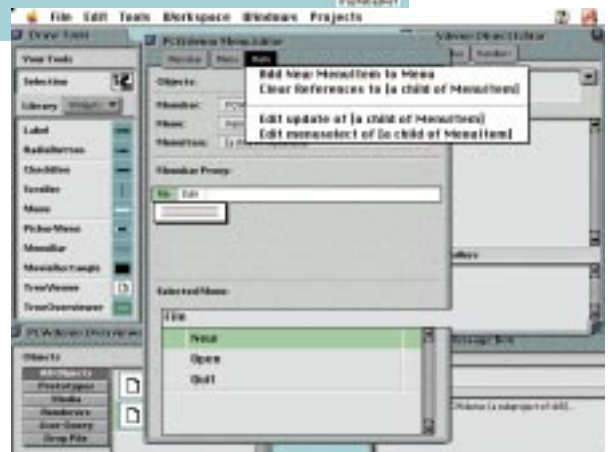
If possible, familiarise yourself with the internal anatomy of your Mac before you start opening the case. Dig out the manuals (that you probably never read) and look for the sections which discuss upgrading memory and other hardware issues. Glance back through your collection of *PCWs*, as our hardware reviews often include photographs and verbal descriptions of the innards. If you are performing elective surgery, browse the Apple support pages on the web (a good starting point is



**Left** The free HyperCard stack, SIMM Stack, lists memory and other upgrades for all Mac models and provides helpful sketches of the layout of their motherboards. Print out details of your Mac(s) in case you need a map later

**Right** Another brilliant light hidden under a bushel: SK8 is an experimental media authoring environment which can teach Visual Basic and its ilk a trick or two.

Developed using Digitool's Macintosh Common Lisp, it is available from Apple's R&D site at [www.apple.com](http://www.apple.com)



[www.info.apple.com/](http://www.info.apple.com/)) and take a glance at the diagrams shown in guides to memory installation, such as the free Apple SIMM Stack. Most Macs are constructed using modules: if an engineer diagnoses a problem with the floppy disk drive, they will not turn watchmaker and start dismantling its intricate mechanism. Instead, the floppy module will be swapped for an Apple replacement.

Next, check your instruments. Although some Macs require oddities such as a Torx

screwdriver (easily distinguished because of the weird head on the screws) most can be tackled with a decent Swiss Army knife. A good quality electronics toolkit is a boon, and should enable you to do what you need with minimal risk of damage.

## Memory

The most difficult task when installing memory SIMM or DIMM units is gaining access to their slots. In some older and more expensive models, they stare you in



## Top Ten Ways to Stay Alive When Working on Mac Hardware

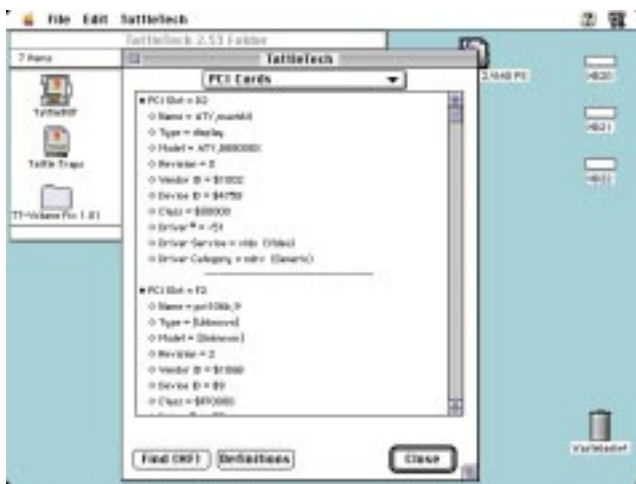
1. Always turn all your computer equipment off before opening any cases. Never, under any circumstances, work on equipment which is still live. If you can, disconnect completely from the mains.
2. Never open a monitor, or any case containing a monitor. Monitors contain circuits which may discharge thousands of volts through you: such high voltages can persist for days after previous use. This also applies to Macs with integral monitors.
3. Always ground yourself to the metal case surrounding the power supply, preferably with a proper strap, before touching any other internals; static electricity kills electronics. Do not open any protective packaging around electronics before grounding yourself.

4. Never attempt to modify, repair or in any other way interfere with the mains lead or power supply. If that is the problem, leave it to a qualified (and better insured) engineer.
5. Never connect or disconnect SCSI or ADB devices (mice, keyboards) with either your Mac or the device powered up.
6. If your Mac is dusty inside, clean it out, preferably using pressurised air (e.g. an air line) rather than suction. Accumulated dust will eventually cause a problem; if you are unlucky, perhaps even a fire.
7. If your Mac can be started up using the Power key on the keyboard, disconnect it from the mains and press this key two or three times before opening the case: these models power up using a capacitor which can

sometimes lead to a shock, and this procedure will discharge the capacitor.

8. Work systematically and carefully, keeping components laid out neatly on a clear surface. Do not rush; if you don't have time to do a proper job now, wait until you do.

9. Check your work meticulously before reassembling the case. Make sure all boards and cables have been replaced, and that all power cables are properly positioned.
10. Do not reconnect or power up your computer until the case has been completely closed and all securing screws replaced. If possible, use an RCD circuit breaker between the mains socket and the plug on your Mac, at least until you are happy that everything is working fine again.



**TattleTech lists useful information about the hardware inside your Mac. It is valuable in diagnosing problems and checking correct function after repair**

### Batteries

Over the past year or so many older Macs have been resetting their dates to the fifties, behaving bizarrely in other ways

the face as soon as you have removed the cover, but more recent and faster models such as my own Power Mac 9500 require you to dismantle almost every module inside and mobilise the motherboard before you can pop in more DIMMs.

Don't panic: approach the problem logically, slowly and carefully. Do not force anything — gentle wiggling using your fingers is much less likely to cause damage. If necessary, keep notes or make sketches to indicate how everything should fit together, and remember the order in which you had to remove modules and cables.

Although Level 2 cache for Power Macs is similar in principle, it has to be installed in a separate slot which looks much like a DIMM expansion. Good suppliers will advise you what memory you should purchase and will provide a guide to installation for your particular model. Beware, as it is too easy to only partially install SIMMs and DIMMs into their seating; so examine the others and make sure that they are pushed fully home.

and refusing to start up properly. Although this can be the result of many other causes, the first one to check is that the battery on the motherboard does not need replacement. It is a simple job using a cheap component. Most dealers charge sensible prices to replace the battery but some may be grossly opportunistic. Replacing a battery is not hard, but you must ensure that you buy the correct size and type for your Mac. Although you may be able to obtain one from a good photography or electronics store, do not rely on the shop assistants to know which one you need.

### Expansion cards

Older Macs, including the larger 68K models but not cheaper versions such as the LC series, use NuBus expansion cards. Adding a new card is straightforward but insertion lacks a "positive" feel; some cards almost float in their slot. Large, heavy cards, particularly with an external cable,

can easily move out of their sockets, causing malfunction which can cause concern. My Mac IIx's video card is still prone to this and whenever it wrestles with resolutions or confusing colours, I just re-seat the board.

PCI, as used in the newer Power Macs, is supposedly better but I am not impressed so far. Admittedly, I have not yet had to administer a thorough re-seating to either of the cards in my 9500, but insertion revealed them to be no more secure than NuBus.

### Go-faster stripes

There is an increasing number of ways in which you can squeeze more speed out of PowerPC systems. Clip-on "clock chippers" which increase the clock frequency of the first Power Mac models, particularly the 6100, took advantage of Apple's conservative engineering. Later designs, using processor daughterboards, have less scope for this sort of trick and you are best advised to install a faster one. This is much easier than adding memory, and the board is a more secure fit than either NuBus or PCI. They are readily distinguished by the massive heatsink fans covering the processor(s).

## PCW Contacts

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[www.apple.com](http://www.apple.com) and [www.euro.apple.com](http://www.euro.apple.com)  
**Newton pages** [www.newton.apple.com](http://www.newton.apple.com)  
**SIMM Stack, TechTool, and TattleTech** are available from internet file archives. TechTool is freeware; TattleTech is shareware (from \$15).



# The end is not quite nigh

Could all those media scare stories be true? Is this the end of Mac OS as we know it? Howard Oakley thinks not: Apple is committed to enhancing it well into the future.

**C**onnections between Douglas Adams, of *Hitch-Hikers' Guide to the Galaxy* fame, and Corporal Jones of television's "Dad's Army" are tenuous, other than both feature a motto which every journalist should commit to heart before trying to decide what is going on: "DON'T PANIC!"

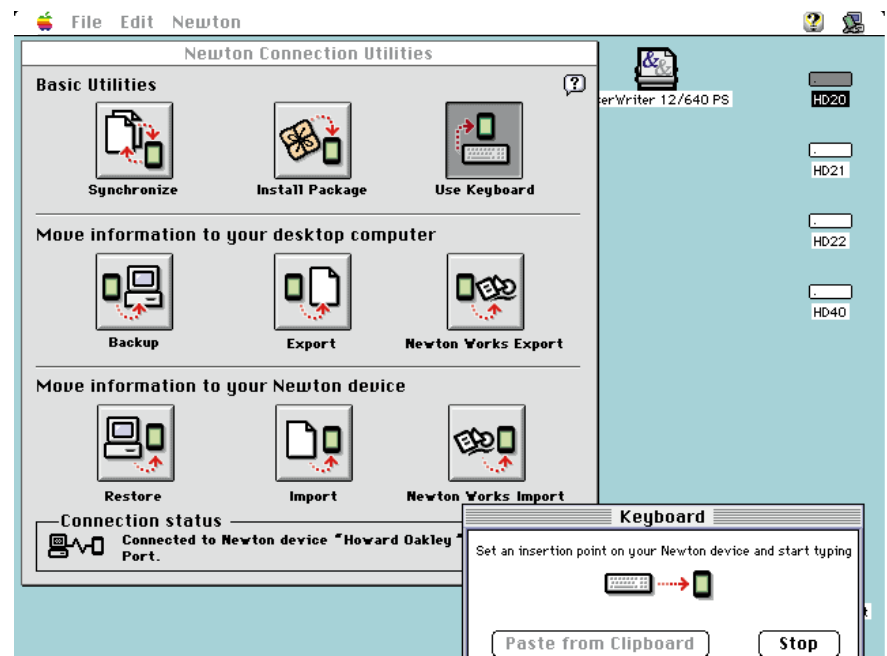
On the face of it, Apple's recent cuts seem dire and interpretations stated as fact in some quarters of the press make them seem even blacker. But press releases of this magnitude are carefully worded and repay careful re-reading.

Apple has not announced the death of Mac OS. On the contrary, it has confirmed annual full releases of Mac OS to "continue to enhance" it well into the next millenium. Nor has it killed Open Doc, Cyberdog, Game Sprockets or Open Transport. These will, surely, "receive reduced investments for future upgrades" but they "will be maintained as part of the Mac OS".

More revealing information has been emerging since then, in informal and unofficial statements from Apple employees. For instance, the lead developer for Game Sprockets has taken pains to point out that his team has not been closed down and that games developers can continue to use Game Sprockets for Mac OS. Putting these together, a very different picture emerges, in which Rhapsody is perhaps not the be-all and end-all.

## Mac OS lives!

Even the Microsoft marketing behemoth has discovered that you can take a user to an OS launch but you can't make them update. Rhapsody has most to offer the corporate market, where Apple has most ground to recover and as a credible if not



The Mac's view of a Newton, using Apple's Newton Connection Utilities. These include a good range of file translators and support for many desktop diary applications

impressive response to Windows NT. Until Rhapsody's own native Yellow Box applications are appearing in droves, the small and home Mac user will have little interest in Rhapsody, other than its crucial role in securing a sound future for Apple.

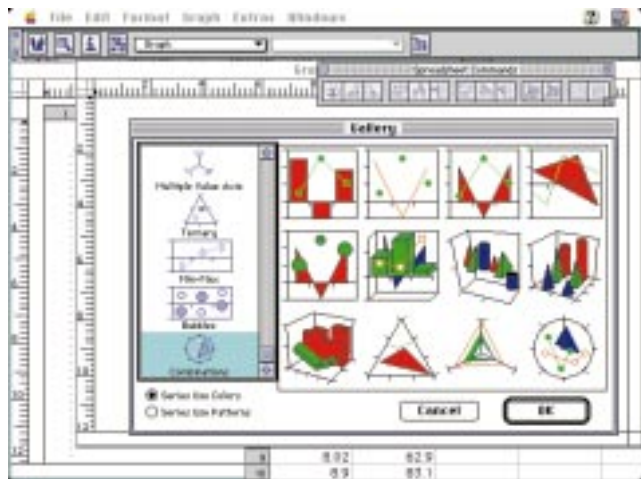
Just as there will continue to be droves of Windows 3 and 95 users as we enter the new millennium, so Mac OS applications will continue to be popular long after Rhapsody's Yellow Box ships.

Apple has probably played down the future role of Mac OS because that would not create a good impression with Wall Street investors, many of whom seem to think in clichés drawn from the advertisement copy of Apple's competitors, and other disinformation.

Apple needs to be seen to be taking Rhapsody seriously and pitching itself unequivocally at Wall Street (which, interestingly, had really taken to the original launch of NeXT systems). But back in the real world, where we can't even dream of throwing away our computers every three years, we need to keep using today's software on today's modest hardware for several years yet. I believe that Apple's real strategy will continue to support us soundly and faithfully.

## MessagePad 2000

Rumours also abound that the unprofitable but innovative Newton products were for the chop. Thankfully, Apple not only retained the Newton group, but has



**RagTime's spreadsheet is a credible alternative to Excel, particularly if you need a richer choice of graph types. It is tightly integrated into a component-based environment which is ideally suited to Open Doc**

StrongARM processor and the excellent bundled software, my greatest reservations

proceeded with the launch of the latest model, the MessagePad 2000. My own MP2K, as it has become known, arrived within 24 hours of being ordered from the distributor, and has already proved that it can replace my PowerBook 5300ce for many tasks. This is a great relief as, although a naked PowerBook looks small and compact, by the time you have swaddled it in a protective case and added those essential accessories to keep it fit and useful, it is no mean burden. The equivalent MP2K kit is but a fraction of the bulk and weight, yet can perform so many of the same functions: most importantly, maintaining my appointments and supporting my writing.

Given the huge performance improvement delivered by the MP2K's new

had been Apple's commitment to making data exchange with desktop computers quick and simple. Although still a beta release, the Newton Connection Utilities (for Mac and Windows) at last address this issue properly. Roll on the eMates and other Newton models due later this year.

#### Alternative Works

If ClarisWorks were not so wonderful and Microsoft Office not so popular, I expect we would all be using B & E Software's RagTime. Although it has an excessive appetite for hard-disk space (nearly 14Mb) and memory (11Mb), if you have the resources it is well worth consideration.

The central metaphor for RagTime's rich documents is the frame-based layout familiar to those in Adobe PageMaker, the

more up-market FrameMaker, and many other fine applications. Frame content is composed in separate views, though, making it a prime candidate for use with OpenDoc. A component-based version of RagTime is currently in beta, and I hope OpenDoc's future remains bright enough to encourage completion of this new version.

What surprised me most about RagTime is not its tight integration of different content types, which is impressive, but its sophisticated features. For example, if you have become jaded with the limited business-orientated charts in Excel, RagTime will be a breath of fresh air, offering dozens of additional types of graph. Indeed, if you seek an alternative to Excel itself, RagTime 4 could fit the bill.

#### In memoriam: a monitor

The only slightly sour note this month has been the demise of my much-loved AppleVision 1710 monitor. From new, it had always been a bit quirky, refusing to turn on for non-Mac computers such as my BeBox (now, I presume, a collector's item).

Last year, the 1710 decided that it would not synchronise properly with my Power Mac in certain resolutions. It was no great loss and I never found the time to get it looked at. Dealers now have a utility from Apple which can reset the 1710's internal controller which my friendly local Apple engineer reckons could have sorted this.

Before we could try it out, there came a sharp *crack*, horribly reminiscent of a video display dying and, no matter what I tried, the display remained black. My 1710 was made in late 1995, at a time when Apple seemed to be having problems with quality control and in some cases at least Apple has been known to provide free repair beyond its standard one-year warranty. This prompted the handy list of causes of black monitors shown here in the panel on the left. Here's wishing that you, yourself, will never hear that ominous *crack*.

### Top 10 causes of a black monitor

A black monitor is as disrupting as a dead motherboard, but is usually much more easily and cheaply solved. Here are the ten most popular causes:

1. The monitor is not turned on, its power cable is disconnected or it is turned off. Check that its power light is green: if the monitor turns on "automatically" (e.g. AppleVision 1710 series) and it fails to, see below.
2. The monitor cable has become disconnected. Check visually or shut your Mac down before disconnecting and reconnecting it at each end.
3. The Mac's backup battery has died. This particularly affects Mac LC and 475 models and the Power Mac 6100. Prior to the black monitor, you may have noticed the date resetting. Get a dealer to replace the battery and everything should work fine again.
4. Energy-saving software has turned the monitor off (or blackened its screen). Moving the mouse or pressing a key should restore the normal desktop.
5. A screensaver has blackened the monitor's screen. Move the mouse or press a key.
6. The contrast and brightness have been turned right down. This is usually perpetrated by well-intentioned cleaners and children.
7. The monitor has failed to synchronise with the video card. This typically affects "smart" monitors such as the AppleVision 1710, which only turn themselves on when they detect a suitable video signal. A dealer's help will be required to solve this.
8. The video card (or the motherboard video output) has become displaced or has died. If you have another Mac, moving your monitor to that system may clinch this, otherwise only a dealer will be able to tell.
9. You are using an old or unsuitable monitor cable. Shut down and turn the power off as quickly as possible in case you do any damage. Some old Apple monitor cables do not work with newer monitors because they do not contain the right signal lines. Use the correct cable.
10. The monitor is dead due to hardware failure. A diagnosis of last resort.

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 Newton pages at [www.newton.apple.com](http://www.newton.apple.com)  
**RagTime 4** from LanMarque 01932 222821; email [info@lanmarque.co.uk](mailto:info@lanmarque.co.uk)  
**CodeBuilder** costs £69.95 from Full Moon Software Distribution 01628 660242; email [www.fullmoon.com](http://www.fullmoon.com)





# Rhapsody and blue

Howard Oakley moves from Copland to Rhapsody via the Blue Box. Plug-and-play with a SyQuest drive drives him slightly mad, after which he resorts to a bit of Mac-tricide....

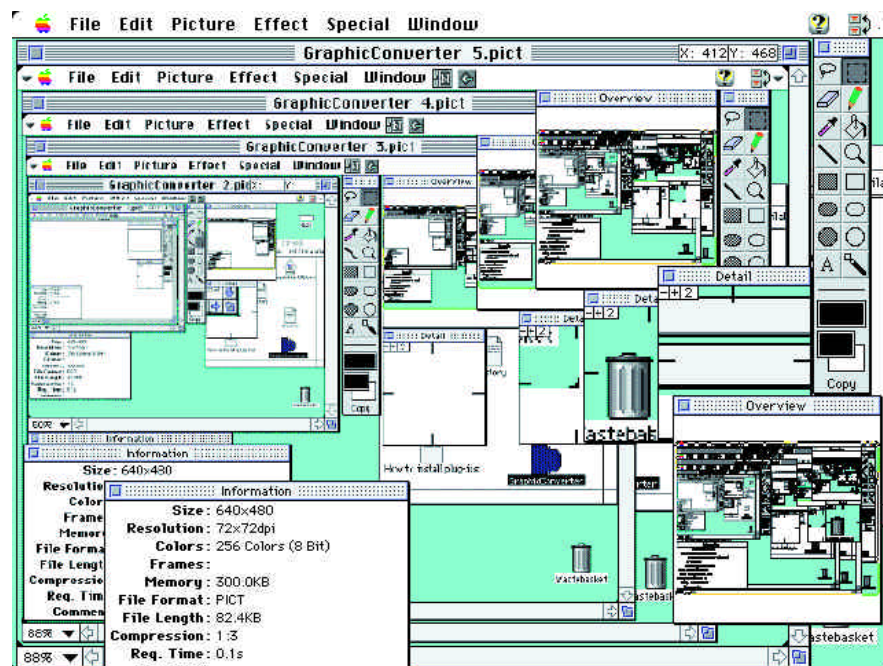
Life with Apple is nothing if not exciting. Just a few issues ago I was advising you how best to prepare for the onslaught of Copland, and now we're looking forward to seeing the first releases of Rhapsody instead, while some are already getting started with BeOS. Thankfully, however different Rhapsody will prove to be internally, most of my previous tips should remain valid. Make sure you have the most recent and capable Power Mac you can afford and your hardware should be well prepared. Trying to work out a software strategy shouldn't be too hard either.

## Bohemian Rhapsody

Rhapsody's compatibility with Mac OS will be achieved through an emulator called Blue Box, as opposed to native Rhapsody services which will be delivered through the Yellow Box. Although Blue Box is described as an emulator, this should not be an excuse for the sort of performance decrement which the 68K Mac emulator (brilliant though it is) provides on Power Macs. Blue Box does not have to pretend to be a different processor, but will work through the native PowerPC code used by current applications; it is just the operating system calls which incur overhead.

Indeed, if the Apple and NeXT engineers get it right, Blue Box should be faster than Mac OS in some respects, notably the file system. The current Mac OS file system is creaking and groaning into old age: a nippy emulator laid on top of a sleek Unix file system could be a great improvement.

You should not be afraid to buy current Mac software products, and to continue to hone your skills with Mac OS. Apple has



Thorsten Lemke's GraphicConverter now reads even more file formats. Here's a picture of it showing a picture of...

made it clear that Rhapsody's human interface is being evolved from that currently in Mac OS 7.6, presumably with some of the changes intended for Copland, and with others such as the "Dock" perhaps being absorbed from NeXTStep. Well-behaved applications for Mac OS should run without trouble — and here I do believe Apple, given its previous record with System 7 and Power Macs — using the Blue Box emulator: it will be our bread and butter until Rhapsody can offer a decent software portfolio under Yellow Box.

## Plug and...

The biggest dread in the future is of further weakening in one of Apple's strongest suits:

plug and play. Back in the days when a wickedly fast Mac sported a 68030 processor, there was so little third-party hardware around that glitches in installation and use were very rare. With every new Mac model, and every step out into the open, the choice has widened and the risks of incompatibility increased. My Power Mac 9500, perhaps a little passé but still a delight to use, is no exception when it comes to adding SCSI devices.

I had always fought shy of 44/88Mb SyQuest drives, but the recent arrival of a 44Mb cartridge brim-full of shareware ham radio software (thank you, Frank) got the better of me. I spent a few minutes with my local Apple dealer, leaving with their badged

d2 drive in my hands and only slightly poorer. With my Mac shut down, I attached the new box to the external SCSI chain in temporary place of my combined hard disk and CD-ROM writer unit, and attached the SCSI terminator.

Flashing up the SyQuest drive and then the 9500, my worst fears were realised: the startup process ground to a halt somewhere around the loading of the AppleVision monitor extension. Clearly this was a spurious sign and of no help to diagnosis. I hit the Power, Command and Shift keys to force a restart, this time keeping the Shift key held down to disable all extensions. Once I was in a position to shut the Mac down properly, I did so, then turned the SyQuest off. I removed the SCSI terminator and tried starting up again.

## ...hooray!

Not only did the startup process complete perfectly this time, with all extensions burning and turning, but when I tentatively put the shareware cartridge into the SyQuest drive, it appeared correctly on the desktop. Admittedly it was my second attempt, but I had plugged and it had played perfectly, and without even using the d2 driver software! I ascribe the latter to my having FWB's fine Hard Disk Toolkit installed for my internal disks.

This is the sort of issue which Apple must get right first time when Rhapsody appears. It is many years ago that I played with a NeXT, but I vividly remember the raw Unix shell hacking which had to be done when it had a problem with driver software. Adding such mechanisms to the Mac interface could be a powerful option, but the moment that they might become requisite, a lot of users would choose to make the final Shut Down.

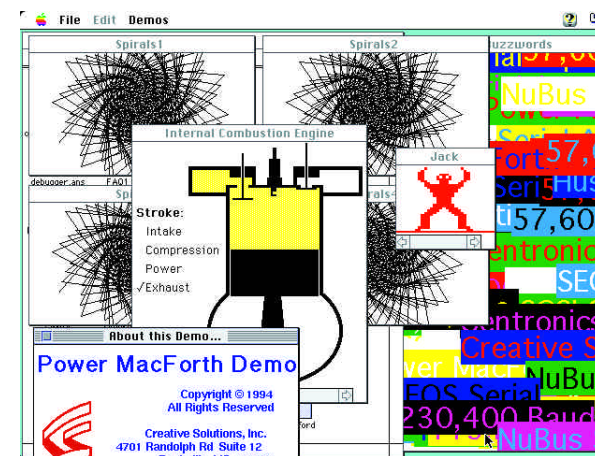
## Go Forth

My copy of Power MacForth arrived a couple of weeks ago, and although these are still early days with it, I am thoroughly impressed. Forth buffs should appreciate its compliance with the new ANSI specification, while Mac lovers everywhere will rejoice in its speed. I'm still in the middle of carrying out detailed benchmarking, but

## Top Ten Ways of Murdering Your Mac

Is it time to end it all? Do you really want to slaughter your CPU or destroy your data? If so, try some of these sure routes to Mac-tricide.

1. Connect and disconnect ADB devices with your Mac powered up. Plugging and unplugging keyboard or mouse when your computer is running can send nasty voltages to the motherboard, which can burn it out. This is almost as much fun as playing Russian roulette, and replacement is surprisingly expensive.
2. Connect and disconnect SCSI devices when they and the Mac are powered up. If you are really lucky, you can simultaneously destroy both the peripheral and your motherboard, adding greatly to the cost of repair.
3. Cut mains power when your system is busy, ideally writing to a hard disk. At best you will lose data, at worst you will crash the disk and blow a fuse or two. It's much more fun than performing an ordered shutdown from the Finder's Special menu.
4. Eject removable storage media while they are being written. If possible, you can force the paperclip (or other emergency eject mechanism) so hard that you will not only damage the data on the disk, but also break the drive mechanism.
5. Assign two external storage devices the same SCSI number, then save all your work to them. There are plenty of other vile things you can do with SCSI, such as using too few or too many terminators, but this is among the most reliably mutilating.
6. Never back anything up. Disaster only strikes when you are ill-prepared and it would have greatest impact. Keeping regular and recent backups takes the fun and risk out of computing.
7. Never run Disk First Aid. Picking up problems on a disk early might deprive you of the added fun of dealing with them when they have grown really big. It's more exciting to leave it for a major wipeout.
8. Never check for viruses. Although the heyday of Mac-borne infections seems to be over, there's still a good choice of nasties which will nibble away at your documents until your Mac comes crashing down.
9. Keep more than one System Folder on a single disk volume. One for those who enjoy subtle, slow deaths, this creates total confusion and a crescendo of crashes.
10. Perform a fresh installation of System 7.5.x and immediately try to update it to 7.5.3r2 (or another later revision). This will appeal to the connoisseur of Apple's arcanery, who will then try to start AppleTalk up using the new System, only to find it is trapped in a fatal deadlock. If you'd prefer a more productive life, you would do best to avoid these like the plague.



This demonstration of Power MacForth's speed is readily available freeware. It shows off performance and support for multitasking and graphics

so far it seems a good match for a high-quality C compiler and only a little slower than a handcrafted assembler. As it supports the use of inline PowerPC assembler on one hand, and has object-like extensions and complete access to Mac OS on the other, it's close to my ideal development

environment. If you're unimpressed by Java's performance in your latest image-processing application, you may find Power MacForth a better investment.

Promised shortly is RagTime 4, which I hope to cover next month. Not only is it supposed to be an outstanding OpenDoc application which bears comparison in its significance with Cyberdog (Apple's unique Internet suite), but I hear tell that it can bring Microsoft Word and Excel documents into an OpenDoc environment. If it can do this reliably, I could see myself using OpenDoc all the time.

## PCW Contacts

Howard Oakley is keen to hear from Mac users and can be contacted via the usual PCW address or email [mac@pcw.co.uk](mailto:mac@pcw.co.uk). Apple Computer is on 0181 569 1199 and has web home pages at [www.apple.com](http://www.apple.com) and [www.euro.apple.com](http://www.euro.apple.com). Power MacForth is \$299 from Forth; email [sales@forth.com](mailto:sales@forth.com). TechTool is freeware from Micromat, GraphicConverter costs \$30 from Thorsten Lemke, and Extension Informant is \$10 from Joseph Cicinelli, all available from most major online services. All prices are exclusive of VAT.





# Speed reading

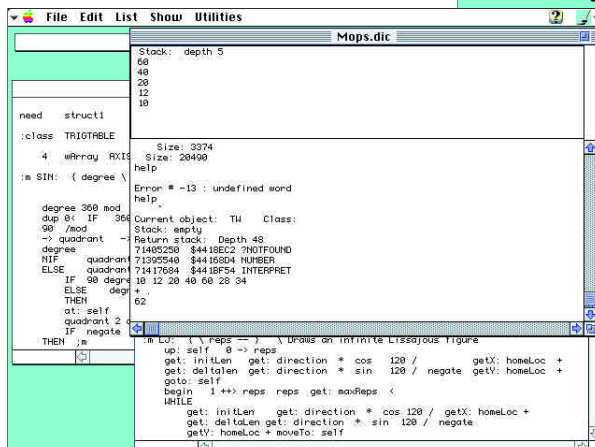
Put aside that “mine’s faster than yours” attitude when comparing the PowerPC and the Pentium and put some zip into your Mac’s performance. Howard Oakley shows you how.

**P**owerPC processors can be amazingly quick. A friend, whose computer research programs take days to run even on high-end workstations, recently chose to buy a box containing 64 PowerPC processors instead of a supercomputer. Clock for clock, 604 models are quicker than the 601, which are in turn quicker than 603 chips. Those with larger on-chip cache memory and distinguished by an “e” suffix are quicker than those without.

Unless you have a high-end workstation, the internal bus and memory will not be running at anything like the speed of the processor. This is because components which work reliably at high clock-speeds are prohibitively expensive and results in Apple using tricks to match different speeds. This limits the maximum speed to which you can upgrade, but at least you know you will be able to afford the upgrades. This is where Level 2 cache comes in, to provide a faster-than-memory store to allow a very fast processor to access data from slower main memory. Level 2 cache becomes increasingly important as performance rises. A 60MHz PPC601 (the original Power Mac 6100) may get a 10-15 percent speed improvement with as little as 256Kb of Level 2 cache, and little more with larger sizes. Faster PPC604 machines should have at least 512Kb if not 1Mb of Level 2 cache.

While my friend is getting value for money from his multi-processor system,

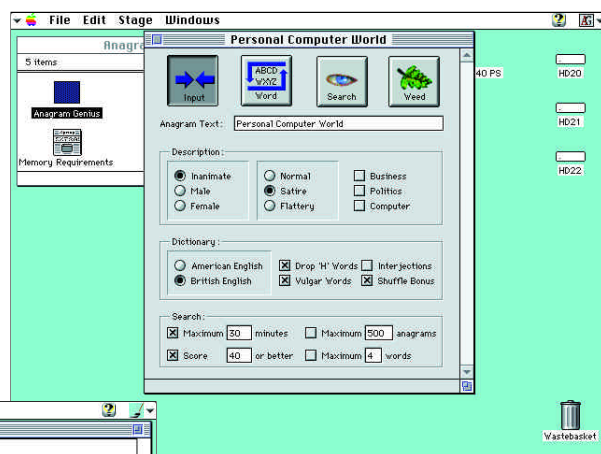
most Mac users will be unable to discern any difference between single and multiple PowerPC hardware. Until we hear the strains of Rhapsody (this month’s variation on the Mac OS 8 theme) a lot louder and closer, a limited range of applications will be able to



do much with a second processor.

All these years after the first Power Macs, it may seem extraordinary that parts of the Mac OS System software have still not been ported to run native on PowerPC Macs. Thankfully, the remaining unconverted sections are among the less frequently used parts of Mac OS so you will be unlucky to find applications which are much affected. This is a good reason for using the latest version of the System, as the proportion of unported code has been steadily falling with each new release.

Third-party products should be treated with care. You may need to gain experience



**Above** Turning your favourite footballer’s or politician’s name into an anagrammatic travesty is made easy with Anagram Genius. Type in the words to be anagrammed, and the rest is done by your Mac. If you want to find out what “Personal Computer World” creates, you’ll have to buy your own copy

**Left** MOPS is a free but polished Forth development system, capable of generating shrink-wrapped applications. It is just a shame that it does not yet run native on Power Macs

of an application and its configuration from the documentation before you can tune it for optimal performance. Although you also need to minimise the number of System extensions and control panels in use, you must do so with care so that you do not inadvertently clobber other extensions.

## Tests and measures

Just as you wouldn’t dream of buying a car without a test drive, you should not buy a “serious” computer system before you have had a good session using it. During that time you should try to estimate the system’s performance: don’t just run benchmarking

## How to slow your Mac down

If you’re sure that you want to slow your shiny new Power Mac 9600 down to remind you of halcyon days with a Mac Plus or SE, here are some good ways to do it:

■ In the Views control panel, check the box to “Calculate folder sizes”. This makes the Finder painfully slow, as each time it displays a folder in a “list” view, it has to add up the file sizes of every file within the folder. And all its sub-folder...

■ Reduce the disk cache (the top item in the Memory control panel) to the smallest possible value.

Although you cannot turn it off any more, making it tiny will slow down all disk reading and writing.

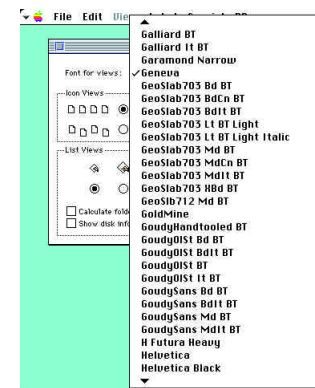
■ Turn virtual memory (in the Memory control panel again) on and run an application like Adobe Photoshop, which operates its own virtual memory scheme. In fact, if you are running System 7.5.3 or earlier, you won’t even have to use Photoshop, as everything drowns in the treacle of Apple’s old virtual memory. So retrograding to System 7.5.3 could be worth thinking about too.

■ Run all your applications with the bare minimum of memory allocated to them.

■ Fill your System folder with extensions and control panels, especially if they do not run native on the Power Mac — old 68K extensions can be ideal for soaking up those spare processor cycles. Don’t allow Extensions Manager to turn any off, either.

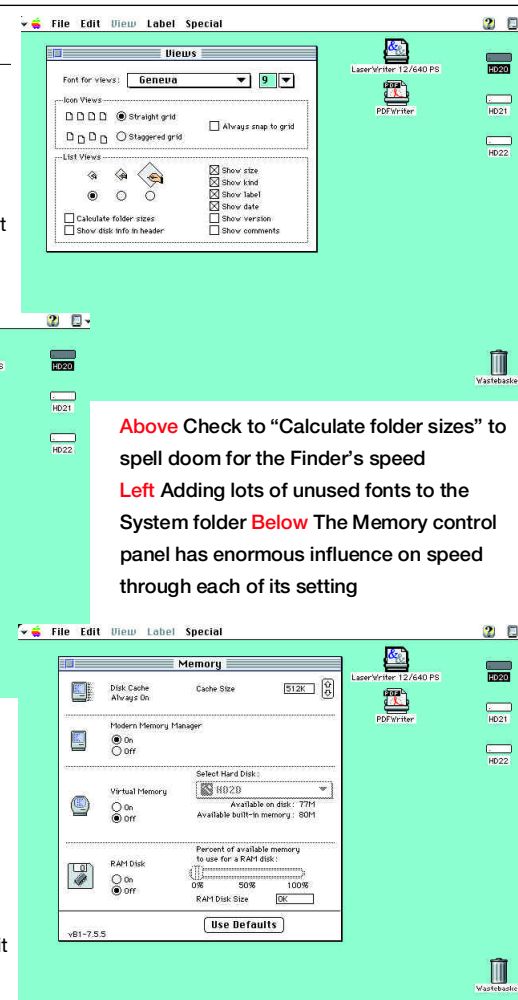
■ Add more fonts than you could ever recognise, let alone use. Then every application and utility which contains a Font menu will have to spend ages putting the list together.

■ Use LocalTalk rather than Ethernet networking. Because of physical limitations, the cheaper and simpler



LocalTalk networking system is about ten times slower than Ethernet, so moving a few big images around will freeze two Macs at a time.

■ Use the 68K Mac version of all applications rather than the latest PowerPC native version. Although the 68K emulator is wickedly quick, it is slow by comparison with a good native port to the PowerPC.



**Above** Check to “Calculate folder sizes” to spell doom for the Finder’s speed  
**Left** Adding lots of unused fonts to the System folder  
**Below** The Memory control panel has enormous influence on speed through each of its setting

programs like Speedometer, but try out standard tasks using your own application benchmarks. These should not include starting the application up, unless this is something you are likely to do more than, say, once every half hour. Instead, select standard time-consuming tasks such as sorting, searching and printing to disk.

Speedometer can give you insight into specifics of a particular computer’s performance when running highly abstract jobs. Thus it might help you spot deficiencies or problems, such as a slow hard disk. But it cannot tell you whether you will need to make a cup of coffee or a three-course meal while waiting for a job to complete.

## Seconds out

Another major issue to bear in mind is that perceived time is very different from actual time. It is easy to demonstrate this if you have an application which provides good feedback during “busy” periods, and one which does not. Hide all clocks and then set each application turn into such a busy period, recording your estimate as to the

time you had to wait. Unless your biological clock tunes in to Rugby every couple of hours, you will overestimate the wait incurred by the application with poor feedback, and underestimate that with good feedback. Add that to the fact that your computer spends almost all its time waiting for your input and actions, and the case for the fastest at any cost looks weaker.

## Back and Forth

Finally, I want to take you back more than ten years and remind you of a high-performance programming language, Forth. When memory meant 64Kb and hard disks cost a king’s ransom, Forth was commonly used for high-performance real-time systems which had tiny memory footprints. Along came Kriya, who developed an object-orientated implementation for the Mac, sold as Neon. With its demise, they placed the source in the public domain, and it has now blossomed into MOPS, thanks to the loving care of Mike Hore. Although he has not yet completed a Power Mac port, MOPS runs happily in emulation and

creates double-clickable applications with real Mac interfaces — free of any cost. Next month I hope to be able to compare it with Power MacForth, a heavyweight commercial implementation.

And in case you think this is all anachronism, Apple has just been advertising for Forth programmers, as it is used to program the boot ROM code for the latest Macs, Suns and other modern computers.

## PCW Contacts

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**Anagram Genius** is available for the Mac and Windows, price £24.99 + £1.65 p&p (both inc VAT) from Genius 2000 Software on 0151 356 8000, with further details on [www.genius2000.com/](http://www.genius2000.com/).  
**MOPS 2.8.2** is freeware by Mike Hore and available from [ftp.taygeta.com/pub/Forth/Mops](http://ftp.taygeta.com/pub/Forth/Mops), with its home page at [www.netaxs.com/~jayfar/mops.html](http://www.netaxs.com/~jayfar/mops.html).  
**Speedometer 4.0.2** is \$40 shareware by Scott Berfield and available from most major Mac archives.





# NeXT on the agenda

Howard Oakley hopes that Apple will capitalise fully on its recent acquisition of NeXT, including giving priority attention to a new MacOS filing system. Plus, comms chaos.

In recent years Apple has been more adept at delivering shocks than surprises, so it's a particular pleasure, when all eyes seemed turned towards Be, that we should hear of Apple's purchase of NeXT. While I am sure that Apple has clear plans for its latest acquisition, I am certain that those plans will prove as flexible as Copland, although hopefully it will unravel to a tighter schedule.

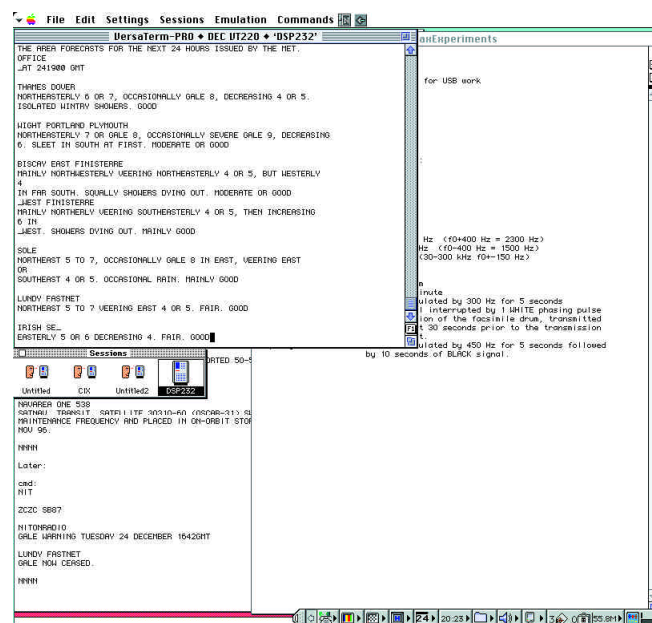
Whatever Apple does with NeXT, it seems sure that its combined products will be more exciting and that it will regain some of the initiative and leadership that has been on the wane. High on my wish list is a replacement filing system for MacOS, which will spare us having to patch up with Disk First Aid after each significant crash.

Just as Apple has managed to transform its implementation of Virtual Memory in System 7.5.5, so it should accord a high priority to the use of memory protection to minimise the consequence of crashes, too: that part of the Copland project (MacOS 8) also needs early introduction. And if the networking and security trappings which the NeXT team brings can turn a hybrid MacOS into a first-class operating system for corporates and the government sector, Apple's purchase will be money well spent.

## Communication breakdown

Having cut my commercial programming teeth on a suite of applications to drive various bizarre devices through the Mac serial port, I tend to assume that ordinary communications can only be more simple.

If only this were so. This month's new hardware was not a conventional computer peripheral, but the ham radio equivalent of a modem (and more). AEA's DSP-232 is a peripheral of traditional and impressive

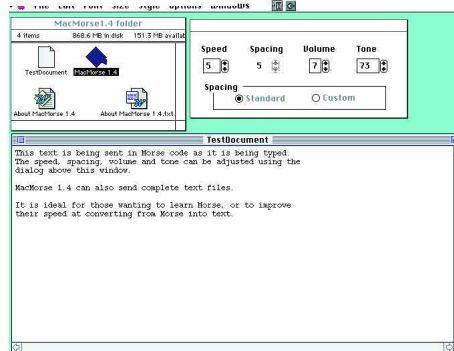


Left AEA's DSP-232 radio modem connected to VersaTerm Pro, showing a received Navtex weather forecast. An hour or so later the software crashed, leading to comms chaos

Below Although most amateur radio software seems to have been written for Windows or MSDOS, MacMorse's fine Morse tutor is an excellent learning tool

design: a black box with lots of flashing coloured lights, more convincing than a succession of faceless and unlit platinum peripherals. Instead of converting between digital data fit for the serial port and whistles down a phone line, the DSP-232 works with the far weirder sounds used in radio data transmission. These range from cicada chirruping to rhythmic grating, demanding far greater versatility in the electronics.

Rummaging through my confused knot of cables, I decided to use the 9-pin "D" (standard, newer PC serial port) to Mac 8-pin "DIN" (standard Mac serial port) cable provided with my new Olympus C-800L digital camera, connected to the 9-pin "D" to 9-pin "D" cable supplied with the DSP-232. With everything plumbed in, and the DSP-232 suitably fed with pops and crackles from an Icom R8500 communications receiver, I flashed up my



regular communications software, VersaTerm Pro. At this stage, my interest was in receiving and decoding Navtex messages which contain weather forecasts, navigational warnings and the other bread and butter of mariners. All you should need is a decent receiver, a DSP-232, and a plain text terminal program. But VersaTerm, having obliged dutifully for a couple of hours, suddenly froze the screen. I tried

## What goes where in your System Folder?

The only enforced rigour on your Mac's hard disk is in the System Folder. If you want your Mac to work properly and benefit from the full features of all your applications, you must ensure that all files and folders within the System Folder are correctly named and at the right level in the hierarchy. Most software now comes with an intelligent installer which puts each file in the appropriate place, but sometimes you will have to install things by hand. Your first recourse is to drop the file(s) onto the System Folder and allow it to sort out the proper location for each: mostly it works, but sometimes you will need to correct errors.

### System Folder A-Z guide

- [f] Apple Menu Items: desk accessories, applications and aliases to be accessed via entries in the Apple menu.
- [f] Claris: if you have installed any Claris applications, contains dictionaries, the XTND file translator system, help files and other materials for those applications.
- Clipboard: the last copied or cut item.
- [f] Control Panels: items accessible via the Control Panel menu, which may contain extension code.
- [f] Control Panels (Disabled): control panels which have been turned off using Extensions Manager.
- [f] Control Strip Modules: will be added to the Control Strip.
- [f] Desktop Printers: LaserWriter 8.4 and later printers shown on the desktop.

- [f] Extensions: a whole mass of extensions, communications tools, and shared libraries.
- [f] Extensions (Disabled): extensions which have been turned off using Extensions Manager.
- Finder: the Finder itself.
- [f] Fonts: installed fonts and PostScript fonts.
- Hosts: definitions for TCP/IP connections.
- [f] Launcher Items: aliases which appear in the Launcher.
- MacsBug: a low-level debugger which can help you cope with crashes.
- [f] Preferences: settings and preference files and folders for applications, although a few older ones still place their files in the System Folder itself.
- [f] PrintMonitor Documents: documents being printed in the background.
- Scrapbook File: the contents of your Scrapbook (in the Apple menu).
- [f] Shutdown Items: aliases etc. to be run automatically before shutting down.
- [f] Startup Items: aliases etc. to be started when your Mac starts up.
- System: the System file itself.
- System Updates: additions to the System file.
- [f] System Extensions (Disabled): older extensions normally littered around in the System Folder itself, when turned off with Extensions Manager.
- [f] Application-specific folders and files.

Note: [f] indicates that the item is a folder; others are files — see Fig 1 for icons.

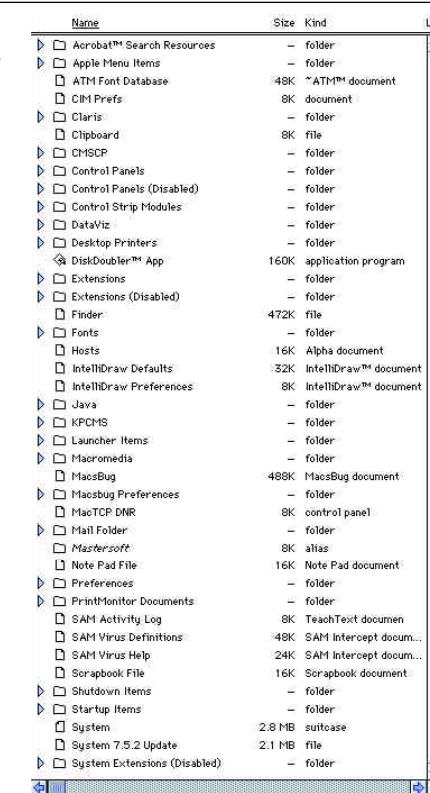
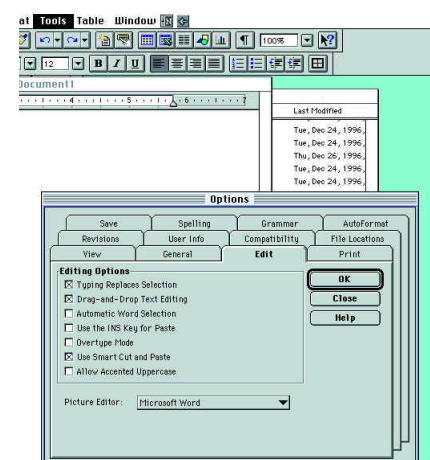


Fig 1 The System Folder contains a strict hierarchy of folders and files. When installing software, give the Finder a chance to put files in the right places, but correct any mistakes

Black Night, a fancy shareware program which uses the same neat communications tools installed in the Extensions folder (in my

Thanks to Ian Cargill of Soliton Software for solving my longest-standing gripe with Microsoft Word 5: its apparent inability to allow you to select irregular parts of words. Use the Tools/Options... menu command to display Word's settings, pick the Edit tab panel and turn Automatic Word Selection off. It's as easy as that (just a bit of tricky navigation to get there)



case, the Serial tool for the connection, and Text or TTY tools for terminal emulation). But it, too, locked up. Taking a multimeter to the cable, it was clear that the Olympus adaptor was not wired to support hardware handshaking, which the software and DSP-232 were expecting to use. When you buy (or make) Mac serial cables, make sure that each one has the special RTS and CTS lines properly connected so you can use hardware handshaking if necessary.

Even when I used a correctly wired cable, or turned hardware handshaking off in favour of the weaker XON/XOFF software method, the crashes still occurred. Switching to VT220 and other tools only made things worse.

I then turned to ZTerm, a popular if vanilla-flavoured shareware comms application. Although the current version predates a proper release version of Open Transport, ZTerm wisely fights shy of the Communications Toolbox while apparently remaining totally compatible with Open Transport. When in plain text mode you can set it to ignore the eighth bit of received characters, and in this way it sat and scrolled its way through pages and pages

of Navtex, packet radio and the gibberish of noise, for hour after hour.

The lesson is that keeping it simple often keeps it stable. Because Apple has switched from the sophisticated but idiosyncratic Communications Toolbox to the sleeker Open Transport, older comms programs may be working through several layers of emulation (the 68K emulator on a Power Mac, and Open Transport's emulated support for tools) and with tools that were never completely debugged. Bring on the truly native Open Transport comms programs and all this should be a thing of the past, but they're not here just yet.

## PCW Contacts

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**AEA** radio modems and radio hardware are distributed by **Nevada:** 01705 662145. Web address [www.nevada.co.uk/](http://www.nevada.co.uk/)  
**ZTerm 1.0.1** is \$30 shareware by David Alverson, available from all Mac online resources  
**MacMorse 1.4** is \$15 shareware from Doug Havenhill and can be found in the Ham Radio archive at [ftp.demon.co.uk/pub/ham/mac/](http://ftp.demon.co.uk/pub/ham/mac/)



# Fighting talk

Operating systems: aren't you sick of them? Everywhere you look, someone is crowing about the advantages of OS X while putting the boot into OS Y. Howard Oakley has had enough.

In common with many people, I find the popular online game of OS Wars extremely tedious. Like it or not, though, Apple, Microsoft, Sun, Be and anyone else wanting to enter the fray has the vital task of convincing the public that their particular operating system is distinct from the others, in ways which are obviously advantageous. I think this is what our American friends refer to as "leveraging", which conjures visions of Archimedes trying to move the globe with the Greek antecedent of a caber.

You can split hairs and argue ergonomics over the human interface, but one area in which Mac OS is highly distinct, and which users and Apple adverts should be leveraging like a contestant in a strongest man contest, is AppleScript. Unfortunately most of the original AppleScript development team have long since left Apple, and I begin to wonder if anyone in marketing even remembers its existence. Look through the old development code examples which were provided to help code geeks implement support for AppleScript in their applications, and you'll see names of luminaries like CK Haun, who not only left Apple years ago, but also left Be some months ago.

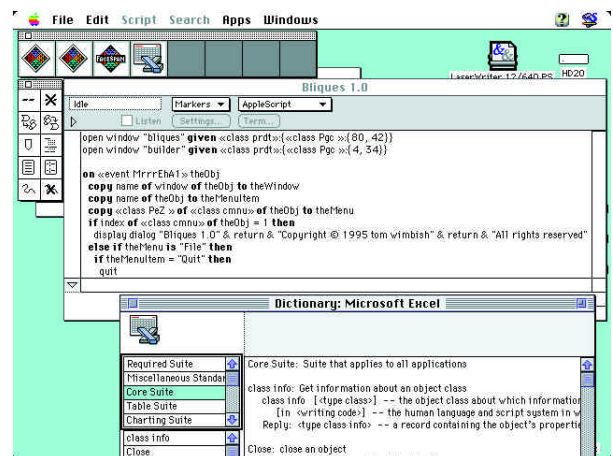
AppleScript is a sophisticated near-English programming language with which you, as an ordinary user, can control and co-ordinate shrink-wrapped applications. Introduced with System 7, it works with applications supporting AppleEvents, which are to AppleScript what keypresses are to the keyboard. In other words, when you run a script, it is converted into AppleEvent messages sent to the target application, which are handled by the target in among the mouse, keyboard, and other items

**If you fancy writing your own AppleScripts, Scripter offers all the tools you'll need, including a dictionary browser and a sophisticated debugger**

which are able to generate events.

Part of the OS war game among many Mac fans is to take every opportunity to castigate Microsoft, in particular claiming that Office for Macintosh is all part of some conspiracy to convert Mac users to Windows 95. This theory is half-baked in many ways, not least of which is the fact that Microsoft applications include extensive support for AppleScript; in fact, armed with AppleScript and Visual Basic for Applications (VBA), Excel for the Mac is superior to its Windows-hosted sibling.

One of the reasons AppleScript has not set the world on fire is that, by some bizarre quirk of fate, Apple seems to have lost all its development team before it could complete the necessary suite of development tools. The rudimentary Script Editor which ships with each copy of System 7 is clear and simple, but falls far short of being a proper tool for script development. Another serious omission in older versions of Mac OS was that the Finder, arguably the most important application for scripting, was not scriptable (although this is not true of recent releases). Although Apple put a lot of early effort into defining the AppleScript language and suites of script commands and objects, and making them accessible via dictionaries, few applications became recordable. (That

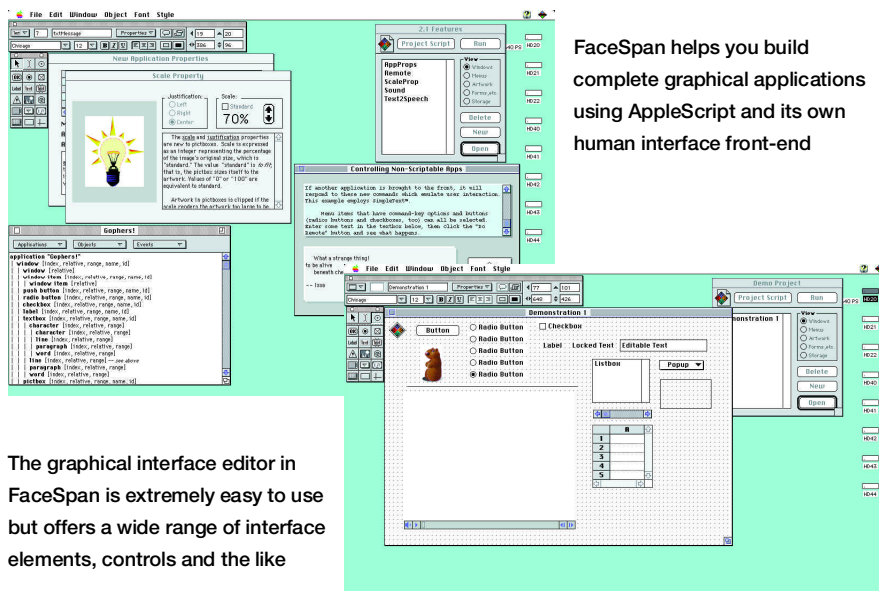


is to say, you can step through a series of actions and have them automatically recorded as a script).

One of the first and most essential features of any script development tool is the facility to debug code which is not working as it should. This is not just for experts; indeed, good debugging facilities are more important for beginners, so that they can track down their errors rather than just getting frustrated and resorting to something more pleasurable, like poking themselves in the eye with a broken bottle.

Various third parties came up with improved development environments, including Paul G Smith, one of the co-founders of Full Moon Software Distribution, purveyors of fine scripting and other development tools to the UK and quite a bit of Europe. But the most durable, and now by far the best, is Scripter 2.0. If you're daunted by the idea of programming your Mac in any way, you should take a look at Scripter because it is not written to satisfy the needs of nerds. It is a highly accessible script development tool designed to work with FaceSpan, one of the most wonderful





The graphical interface editor in FaceSpan is extremely easy to use but offers a wide range of interface elements, controls and the like

pieces of software I have ever seen. Like all the best and most innovative software, you wonder why no-one had thought of FaceSpan before. It is an application generator which uses AppleScript as its programming language, giving you free rein to do what you will in your own application, and to control others.

To illustrate how recursively wonderful this is, you can even script the FaceSpan development environment using FaceSpan.

An integrated graphical interface editor, of the kind popularised but not invented by Microsoft's Visual languages, helps you to construct the user interface, behind which are gobbets of AppleScript to make it all work. You can run FaceSpan projects within the FaceSpan application, or extrude them as standalone applications. Attesting to the wisdom of this approach are the Apple Network Servers, which are administered remotely using AppleScript

FaceSpan helps you build complete graphical applications using AppleScript and its own human interface front-end

with a FaceSpan front-end. So armed with Scripter and FaceSpan, and a selection of standard books including *Danny Goodman's AppleScript Handbook* (Second Edition, Random House) or *The Tao of AppleScript* (Second Edition, by Derrick Schneider, Hayden Books), plus *Apple's AppleScript Reference: English Dialect* (Addison-Wesley), the world is your oyster.

Perhaps the biggest shortcoming with AppleScript, however, has been what you *cannot* do with it. If an application has support for, say, copying all worksheet cells greater than ten, pasting them into the next sheet and sorting them into rank order, then scripting that sequence is straightforward. But many major applications fall short in various respects, most commonly in handling dialogs. It is not uncommon to find yourself blocked by a dialog, a brief piece of interaction which mars a script.

FaceSpan 2.1, the latest version, overcomes this problem in an obvious but ingenious way. It provides two new script commands: "click as user" to mimic mouse actions, and "type as users" to mimic keyboard input. Armed with these, you can get past most previous stumbling blocks.

### Innovation lives!

A frequent riposte in the OS Wars game is that Apple no longer innovates. I recently stumbled across one of many active projects which attest to continuing innovation: Project X, a "fly-through" web navigator which links neatly to the web browser of your choice.

It is worth checking out hot and new items on a range of Apple's sites from time to time so that you keep abreast of these new ideas. Some, like the Communications Toolbox, will fly for a while and then die. Others, like OpenDoc, promise to change the face of computing.

Next month I'll look at how OpenDoc is taking off, and how it fits into Mac OS 7.6 and beyond.

## A quick guide to Apple network protocols

Whether you're trying to decipher an error message or get a mixed network up and running, these are AppleTalk's catchily-named components:

**LocalTalk** A physical connection using a variety of different cabling systems to connect the printer serial port to a network. Not to be confused with AppleTalk itself.

**EtherTalk** A physical connection using any of the ethernet cabling schemes.

**TokenTalk** A physical connection using a Token Ring cabling scheme.

**AppleTalk** The suite of networking protocols which can be run across any of these physical connections.

**LAP** (Link Access Protocol) The lowest level software protocol which is run over the physical connection: it comes in different varieties for EtherTalk (ELAP), LocalTalk (LLAP), and TokenTalk (TLAP).

**DDP** (Datagram Delivery Protocol) The next lowest level software protocol, this time common to all AppleTalk variants, which provides and exchanges data between sockets.

**NBP** (Name Binding Protocol) Discovers named entities on the network and then supports their proper addressing.

**ZIP** (Zone Information Protocol) Supports the division of large networks into zones, and communication between them.

**RTMP** (Routing Table Maintenance Protocol) Acquires and maintains a list of routes to support the transmission of messages over the network.

**ADSP** (AppleTalk Data Stream Protocol) Provides a "pipe" for the reliable exchange of data between two applications.

**AEP** (AppleTalk Echo Protocol) Supports reliable communications over DDP.

**ATP** (AppleTalk Transaction Protocol) Provides reliable transfer of data between network entities: typically used to move files and other data between two systems on the network.

**ASP** (AppleTalk Session Protocol) Extends ATP by helping it transfer an ordered sequence of data.

**AFP** (AppleTalk Filing Protocol) Supports the cross-system and cross-platform sharing of filing system information, including file sharing and program linking.

**PAP** (Printer Access Protocol) Connects workstations and printers, and supports communications between them, including the sending of PostScript documents to the printer.

**SNMP** (Simple Network Management Protocol) A cross-platform system for managing local and remote network connections. Although AppleTalk can support this, so do most other networking systems.

## PCW Contacts

**Howard Oakley** is pleased to hear from Mac users. Contact him at [mac@pcw.vnu.co.uk](mailto:mac@pcw.vnu.co.uk)  
Apple Computers: phone **0181 569 1199**; web home pages [www.apple.com](http://www.apple.com) and [www.euro.apple.com](http://www.euro.apple.com).

Scripter 2.0, costs £169. FaceSpan 2.1, costs £207.50. Distributed in the UK by Full Moon Software Distribution **01628 660242**, which can also supply the AppleScript books. Project X is available free of charge from [mcf.research.apple.com/ProjectX](http://mcf.research.apple.com/ProjectX) (All prices are exclusive of VAT).



# Worth the wait

Just like buses, you wait ages for one, then they all come along at once — new products, that is. Howard Oakley basks in the embarrassment of riches he thought would never come.

**J**ust as a watched pot never boils, the moment I write that I'm still waiting for products, they turn up.

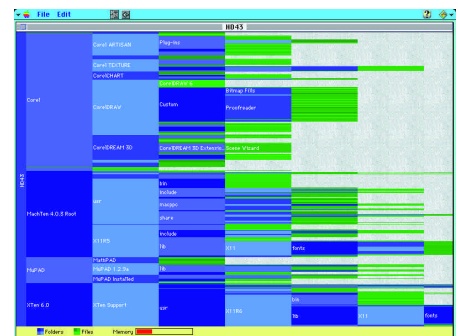
Just after completing last month's column, my dealer (or maybe I should call them a reseller now?) rang to say that my Apple LaserWriter 12/640PS duplex laser printer had arrived. It came in three large boxes: one for the printer, a second for the duplex unit which sits below the printer, and the third for the 500-sheet feeder which goes at the very bottom. Assembly and installation of the 8Mb of extra memory to support duplex printing was straightforward, and I soon had the printer and my Power Mac 9500 powered up and networked.

The first snag came when I tried to find and configure the 12/640 using a copy of the Apple LaserWriter Utility, and the more recent Apple Printer Utility. Although both could see the printer and connect to it, they quickly came to grief when trying to print test pages. I reached for the stack of floppy disks which shipped with the printer and installed LaserWriter 8.4 (already superseded by 8.4.1). Its newer version of the Apple Printer Utility worked fine,

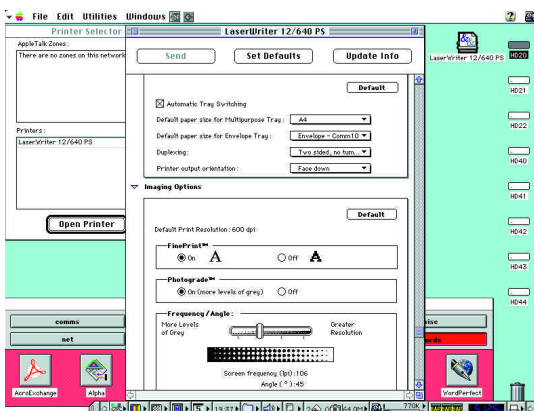
## Full of the joys of spring cleaning

As the dark nights drag on, with Christmas and Hogmanay memories fading fast, set a few hours aside to start spring cleaning your Mac. Focus on these software topics:

1. Make a full backup of everything.
2. Run Disk First Aid to repair any problems which might have cropped up.
3. Run Norton Utilities for Macintosh (or an equivalent) to repair any glitches which Disk First Aid may not have dealt with.
4. Examine the allocation of disk space on each volume, ideally using the shareware DiskSurveyor.
5. Archive little-used files and applications which are wasting a lot of space.
6. Huck out redundant files in your Preferences folder; the shareware tools Prefs Cleaner and Yank can be quick and effective ways of doing this.
7. Clear out unused and unwanted System extensions and control panels; be ruthless!
8. Empty Netscape Navigator's cache folder.
9. Work through folders in which you store documents, archiving those which are inactive.
10. Use the Finder's Find... menu command to look for large files which can be compressed or thrown away altogether, files which have not been modified for more than a couple of months, and so on.
11. Run Disk First Aid and Norton again, and finally defragment each volume if you wish to.



DiskSurveyor maps selected volumes or folders to display how much space each folder and file occupies — a superb tool when you are performing housekeeping



showing me the duplex option, Photograde picture enhancement controls and so on. It was then I discovered that I could not use text and Photograde enhancement at the

**The Apple Printer Utility from LaserWriter 8.4 gives full access to the LaserWriter 12/640 PS facilities, including multiple paper trays, duplex printing, and text and graphics smoothing**

same time as duplex printing, without adding still more memory. A few days later, my dealer was visibly pleased at supplying me with a single 32Mb SIMM. I had a total of 40Mb of memory in the printer, and could make full use of all the options.

The 12/640 has performed faultlessly ever since. By the time I had added the duplex and 500-sheet feeder options, it is rather tall at 42cm, with a further 20cm or so being allocated for the opening top section. It has also printed two copies of the same letter back-to-back on the same



single sheet of paper, when common sense would have suggested that was pretty dumb. Otherwise, it is a beautifully effective printer of high-quality double-sided A4 pages.

### Apple's Net Kit

Apple Internet Connection Kit version 1.1.5 arrived at more or less the same time. If you have a CD-ROM drive but have not yet got onto the internet, it is a cheap, polished and thoroughly sound basis for getting started. If you already know where to look for the latest version of Eudora Light (just released at 1.5.5, by the way) and can't wait for the next round of the Microsoft/Netscape browser battle, you will probably not find much on it to set your modem alight, apart from a limited feature edition of Claris EMailer, of course.

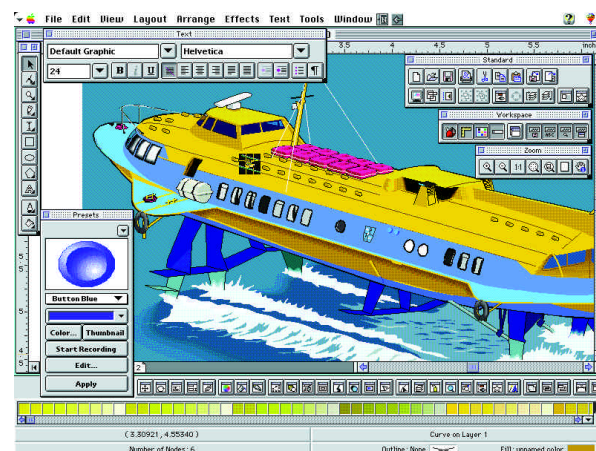
### Free Lisp

I am delighted to be able to add another excellent free Mac programming language to the list started last month. Admittedly it is only a demo version of a commercial product, but this is fully-functional and runs for a limited time before quitting. Mac Common Lisp 4.0 (for Power Macs) is a mature, complete and impressively quick implementation of modern ANSI Common Lisp, from a software house just down the road from MIT, Digitool.

If you still believe that Lisp is slow, ungainly and impractical, MCL should be a revelation. It is also a reassuring piece of Apple history: its original incarnation, Macintosh Allegro Common Lisp, was developed by a small but brilliant third party company called Coral, until Apple bought the product and personnel by mutual agreement. MCL then went on to sell hundreds if not thousands of Macs into MIT and other US universities, where Lisp remains the key language for much of artificial intelligence. Apple's bright minds in Massachusetts fathered the Dylan language too, but a couple of years ago the group was broken up, MCL going back out to a third party, Digitool, who are clearly bearing the torch with pride.

### DAVE not Bob

Software which uses personal names always makes me cringe, more so than inadvertent linguistic blunders in names such as Publish It! After Microsoft's Bob, perhaps it is only appropriate to welcome DAVE, an obviously American product as it



**Left** CorelDraw 6 is a most tasteful port which makes full use of the Mac OS environment but sacrifices none of the power it enjoys on the Windows platform

**Below** Corel Artisan is a combined painting and image-editing tool with more features than the majority of users will ever use

is either in capitals or some hideously contrived acronym. But beneath the name, DAVE sounds like the first item on a lot of wish-lists. By dint of TCP/IP protocols, it enables you to make Win95 and NT files and printers available to networked Macs. Thursby Software Systems claims that it integrates fully with NT Services for Macintosh and supports messaging, and I will report further once I have had a chance to try it myself.



### Corel Classic

After a shaky start, and in spite of some nasty bugs, Novell WordPerfect 3.1 always struck me as being much less irritating than Microsoft Word. Acquisition by Corel worried me greatly, and I confess that I retreated to Word even if it now does everything but highlight the right words and characters. Corel's track record in porting (or rather, failing to port) CorelDraw to Mac filled me with gloom. But I take it all back — the three CD-ROMs which make up the new CorelDraw 6 Suite are exceptionally good value (about £100 for a cross-grade from almost any Mac graphics application) and reveal a true understanding of the Mac interface on the part of the programmers.

On the CDs you'll find the massive suite of Corel graphics software including CorelDraw itself, CorelDream, a 3D modelling application, CorelArtisan, a bitmap image editor, CorelTexture, for bitmap texture creation, CorelTrace, CorelChart and WordPerfect 3.5.1. These are not cheap-and-cheerful tools but are competitive with products from Adobe and Macromedia. Installation of the whole suite, less clip-art and other goodies, will require a

mere 250Mb of disk space, but it is easy to install single components in order to decide whether you want to use them. The price? An astonishing £100 or so provided you are cross-grading from any of a long list of other products. If you have a CD-ROM drive CorelDraw Suite 6 is an essential purchase, even though you may only ever use one or two of the applications.

### •PCW Contacts

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**Apple Computer** is on 0181 569 1199, and has web home pages at [www.apple.com](http://www.apple.com) and [www.euro.apple.com](http://www.euro.apple.com). The Apple LaserWriter 12/640 PS Duplex with 500-sheet feeder and 12Mb RAM costs around £1400 (plus VAT), and the Apple Internet Connection Kit £50 (plus VAT).

**Digitool's** free demonstration version of Macintosh Common Lisp 4.0 is at [www.digitool.com/MCL-demo-version.html](http://www.digitool.com/MCL-demo-version.html). The full version costs from £380 (plus VAT) from Full Moon Software Distribution on 01628 660242. **DAVE** is by Thursby Software Systems, which is on 00 1 817 478-5070 or email [sales@thursby.com](mailto:sales@thursby.com), and should cost around £160 (plus VAT). The **CorelDraw 6** suite for Power Mac costs around £100 (plus VAT) (introductory cross-grade) from Corel on 0800 58 1028.

**DiskSurveyor 1.1** is by Tom Luhrs, costs \$5, and is available from all good online archives.

**PrefsCleaner 1.1** is by Luc Pauwels, costs 450 Belgian francs, and is available from all good online archives.

**Yank 1.3.1** is from Maui Software, costs \$15, and is available from all good online archives.



# Lying in wait

Howard Oakley remains laserless and disillusioned with Apple shipping delays, so to cheer himself up he considers buying a colour scanner. Plus, top ten SCSI tips.

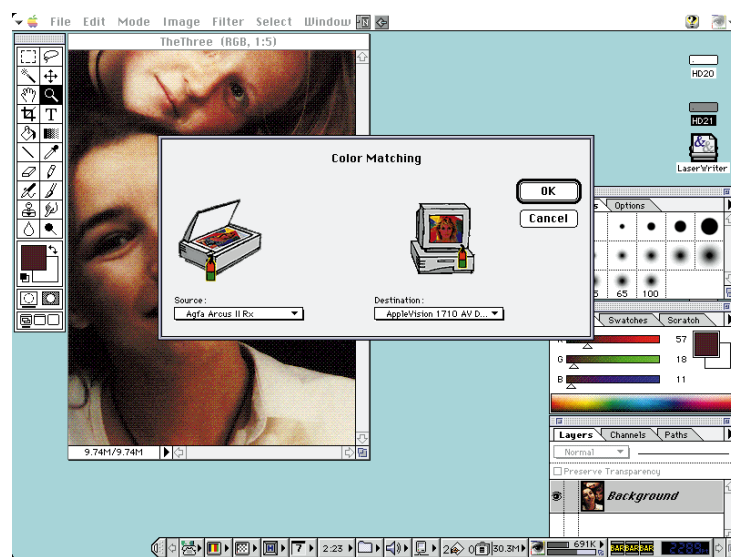
It is frustrating when a product is available yet for the lack of something simple, it cannot ship. Last month, I was still waiting for my new Apple LaserWriter 12/640PS duplex printer, which was to have been delivered imminently. I am still waiting. The delay seems to be because there is no 500-page sheet feeder — a few bits of plastic which condemn me to plod on with my old and highly simplex LaserWriter II.

Similarly, Apple promised many of us its Apple Internet Connection Kit as recompense for the demise of eWorld last spring. Although I have seen and touched this product in the USA, the closest I've come to it here is a series of apologetic letters promising its eventual arrival and tempting me with web sites which I already know, from my long-standing use of the internet, to be overused and choked. A few copies of version 1.0 of the Kits were distributed to dealers but the production run was quickly terminated. I now await version 1.1.5, which is promised for delivery in a few days' time.

## System 7.5.5

Apple has been skipping version numbers a lot recently, a worrying trend. Not only has the near-legendary Internet Connection Kit mysteriously leapt from 1.0 to 1.1.5, but we are now being tempted to upgrade from System 7.5.3r2 to 7.5.5, missing an ill-fated 7.5.4. Needless to say, our friends in the US (we should admire their fortitude as beta-testers for later European versions) have been reporting many bugs and incompatibilities, including an accepted inadequacy in the size of the Finder's heap allocation. Thankfully, John Brisbin has

**Software support for the Agfa Arcus II scanner is nicely integrated into Adobe Photoshop, and supports professional-quality colour management**



produced a control panel, prosaically called "Finder Heap Fix 1.0.1", which fixes this, so if you are brave enough to make the leap to 7.5.5, only to discover the Finder whingeing about there being insufficient memory, download this from an internet archive or CompuServe and rejoice for John's kindness in the face of Apple's myopia.

Although 7.5.5 does have some incremental improvements, including LaserWriter 8.4 and Apple's first serious attempt at high-performance virtual memory I might, for once, watch the dust settle a bit before upgrading.

## System 7.6, and 8.0?

News of Mac OS 8 is more encouraging now. System 7.6, internal codename "Harmony", looks due to ship in January, the next step on the long road to OS 8.

What is certain is that it will not incorporate the new customisable human

interface which has been so widely touted since we first got to learn of "Copland". Apple has justly taken great pride in the Mac's human interface, in spite of gathering criticism that it is now old-fashioned and less rich than other, more recent, pretenders. Rather than betraying its principles, it has now decided to hand over power to the user. Knowing, from meticulous experimental work, that clean and impeccably-designed interfaces are most productive, it is giving us the choice of whatever else we want. This is accomplished by the user setting preferences which then become their personal flavour for the interface.

When we can finally enjoy Mac OS 8 in its fullness, we will be able to make it look and behave more like Windows (of 3.x or 95, if not 97, variety), any of the range of Unix windowing front-ends, or whatever. Controls should extend beyond mere

## Dear Santa...

Top of this year's Christmas wish-list are those products for which I am still waiting: the Apple LaserWriter 12/640PS duplex printer, Internet Connection Kit and a faster Newton with a larger screen. The last is perhaps the most important as my old MessagePad is rapidly turning into a dead end: given more poke, a screen on which I can write and see more words and do useful sketches, it may be less pocketable, but it will be certainly more useful.

Next (but not first, because of its impossibility) is Mac OS 8. Not for its features but as tangible proof that, in the end, Apple can deliver. To go with it, there should be a sensitive port (to run native on the Power Mac) of Microsoft Word 4 and Excel 4. Both versions had achieved the zenith of their usability, providing good compromises with raw features. But now Word 6 torments me by seemingly being unable to select portions of words, often forcing me to resort to the delete key when the mouse could have done it better. Excel 5 is little better, turning graph production from a couple of mouse motions into an animated display of dialogue drama.

Above all else, I would love to come downstairs on Christmas day to find a really good WYSIWYG web page editor: something technically brilliant like HoTMetal Pro, with its extensibility and parsing potential, but which provided consistent tools for the direct manipulation of tables, frames and graphics. It is a sad indictment of the software industry that no-one has yet achieved this relatively easy goal despite more than ten years experience developing pre-press applications. Adobe's new version of PageMill promises to be a big step forward, but beta versions have had a rough and inconsistent interface and cannot be extended to cope with future enhancements to HTML. What we have to do now is comparable to having to embed raw PostScript in documents to be printed — quite unconscionable.



SoftQuad's HoTMetal Pro 3 is a technically excellent web page editor but has not reached full WYSIWYG standard

appearance, but include some of the features currently offered in At Ease, for instance. A range of standard flavours, intended to start different types of user on their personal quest for GUI nirvana, should provide ideas.

## Scan and SCSI

Having been prevented from enjoying my first duplex printer, I had urgent need of a good colour scanner, and was tempted into buying (a novel concept, perhaps) an Agfa Arcus II flatbed model. Not only is this a capable beast which makes my old greyscale OneScanner look like an ageing toy, but it also reminded me of the vagaries of the SCSI standard and the black art required to successfully install a new device.

At first, I hooked it up to the external SCSI bus of my Power Mac 9500 as the sole device. As Agfa provides only one Centronics-type SCSI connector on the Arcus, I placed a terminator between the cable and the scanner: a standard way of ensuring that the bus was correctly terminated at both ends. The 9500 took grave exception to this. Although it powered

up perfectly, the auto-sensing AppleVision 1710 monitor decided that there was no video signal, and refused to turn on.

Driving a Mac without a mouse can be tricky, but when you cannot see the screen at all it is a true test of ingenuity. I could hear the rattling of drives as various extensions were loaded, including FWB's rumbling hard disk callisthenics. Then all went quiet, as the invisible desktop awaited my command while I wondered what to do next. If I shut the power off, I would risk damaging the contents of my hard disks and would almost certainly have to wait for hidden files to be rebuilt when I restarted. So I pressed the Power key which, in my mind's eye, I saw displaying an (invisible) dialogue, in which the default button produced an orderly shut-down. Pressing Return, it was a relief to hear the disks whine down as the Power Mac powered down, in perfect order.

The answer to getting the scanner to work was to remove the terminator and allow it time to complete its power-on self-test routines before turning the computer on. Well, it's reasonably standard, I suppose.

## Ten Top SCSI Tips

1. Put a terminator at the far end of your SCSI chain. If the chain is short, it may work better without an external terminator.
2. Avoid using internally-terminated devices.
3. Check that all devices have IDs set between 1 & 6, and that none are duplicated.
4. Keep all cable lengths as short as possible.
5. Use only the highest-quality SCSI cables.
6. Make sure that all connections are home and secure before starting anything up.
7. Never connect or disconnect SCSI devices when any device is turned on.
8. Turn on all peripheral devices first and let them run up to speed before starting up your Macintosh.
9. Shut down your Mac first, before turning each SCSI device off in turn.
10. Keep a copy of SCSI Probe handy in case of problems.

## Cheap programming

Macs have always attracted new and experimental programming languages, including Object Pascal (designed for Apple by Wirth) and the purely visual language Prograph (early 68K versions are now free).

There is no shortage of free or nearly-free development systems to enable enthusiasts to start creating their own programs. Among my current favourites are Concurrent Clean and Python. Concurrent Clean is a functional language with an impressive academic pedigree. It is remarkably efficient as far as functional languages go, and to demonstrate this a full-featured spreadsheet and nifty text editor have been written in Clean.

Python enables fuller access in a more conventional syntax (not unlike C) with objects, modules and more. Being interpreted, it is not quick, particularly when crunching numbers, but for this there are specialist mathematical languages, including MuPAD from the University of Paderborn which I will report on subsequently.

## PCW Contacts

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**Apple Computer** 0181 569 1199; web home pages [www.apple.com](http://www.apple.com) and [www.euro.apple.com](http://www.euro.apple.com)  
**System 7.5.5** is available as an update to 7.5.3 from [www.support.apple.com](http://www.support.apple.com).  
**Agfa Arcus II** scanners (around £1,700); Agfa 0181 231 4200  
**Concurrent Clean** from [ftp.cs.kun.nl/pub/clean](http://ftp.cs.kun.nl/pub/clean)  
**Python** from [ftp.python.org/pub](http://ftp.python.org/pub)  
**HoTMetal Pro 3** from **SoftQuad** 0181 387 4110





**A**pple's most difficult market has always been servers. It is easy to justify a user-friendly graphical interface on client computers, but the inevitable overhead that would impose on a server cannot be justified when you may even run it "headless" (without a monitor).

AppleShare servers are famously easy to set up and maintain, but once you need to run serious applications, such as a heavyweight database, even high-end Macs quickly run out of steam. You were probably as puzzled as I was when Apple launched its Network Server systems a few months ago. I wasn't sure whether they were a step towards the promised multiple operating system, CHRP (now PPCP) machines, or whether they were the final nail in the coffin of Apple's old Unix clone A/UX (replacing it with IBM's AIX).

Having spent time at Computers Unlimited, the UK distributor for Apple Network Servers and their software, I can report that the servers are something quite different. They are aimed squarely at those whose requirements cannot be met by an Apple Workstation Server (running Mac OS) and who need the performance of Unix in the form of AIX. But they offer more than any other server I have seen and are already building a fine reputation at Apple's major web sites, such as the QuickTime

# Mail bonding

Howard Oakley gets chummy with Apple network servers, bemoans system problems and beats battery bugs.

web server in Napa, California.

The touch of genius which Apple has applied to its Network Servers is to incorporate an AppleTalk stack in the networking protocols and build in support for AppleScript. These allow you to perform almost all network administrative tasks from a Mac, even dialling in with AppleTalk Remote Access if you wish. IPT has come up with some incredible tools to make user administration tasks as simple as the Users and Groups control panel, and allow you to build your own scripts, using Facespan's pleasant Mac-friendly human interface.

## Mail servers

Using Macs with some Internet Service Providers (ISPs) can remain a troubled business. The otherwise excellent Demon, for instance, normally delivers mail using the Simple Mail Transfer Protocol (SMTP), as commonly used between servers on the internet. Sadly, most Mac mail applications only support the Post Office Protocol

(POP). Until recently, the solutions were limited. You could receive mail using LeeMail, and send it from Eudora, but that made replying to messages very messy. Then Alan Staniforth wrote AddMail, an SMTP receiver which could con Eudora into working with its received mail. Although very effective, AddMail has its problems, and may be unstable on recent Power Mac models.

There are only three affordable mail servers which support SMTP and POP. CommuniGate is an impressive mix-and-match toolset which can be tried freely but costs a fair amount to buy. It is fiddly to configure, and I have not yet got it to provide a POP service to other mail applications. Vicom's Internet Gateway is available in demo version on the internet but is more expensive still. I haven't managed to get this to work fully, either. The best solution for now seems to be the cheapest: Apple Internet Mail Server (AIMS) version 1.1.1, which is free if you register online.

I have now configured FreePPP 2.5v2, the new updated version of FreePPP, to start up AIMS as soon as my internet connection is made. AIMS then runs the SMTP exchange with Demon's Unix servers, and allows Claris EMailer to connect to it using POP. The only real snag is that AIMS only works its magic when the internet connection is live, so I have to exchange mail with it while online. As soon as FreePPP disconnects, AIMS plays dead and must be quit.

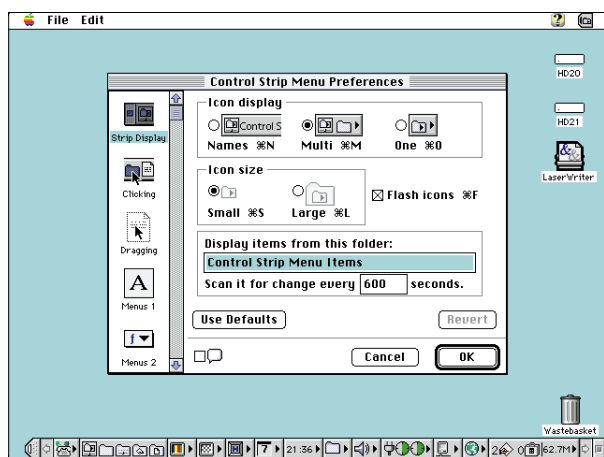
## Odds and ends

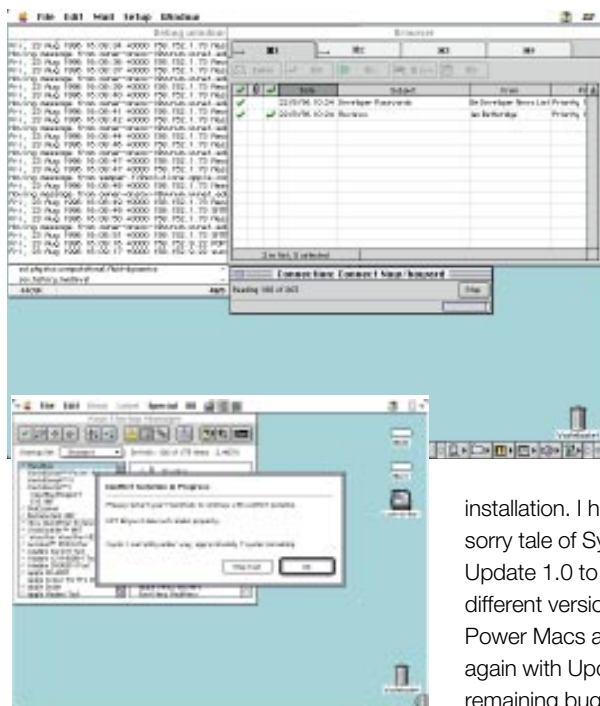
KPT Bryce 2 is frequently touted as a brilliant tool for creating landscapes, and so it is. But when I bought my copy, it seemed to behave oddly in some respects (now, I

p330 ➤

## Control strip tip

Turn your System 7.5's Control Strip into a powerful document and applications launcher with the shareware Control Strip Menu 3.0, available from major online sites. Drop folders, files and aliases into its folder within the System Folder to add new items to its pop-up launcher menu.





**Top left** Claris E-mailer accessing the free Apple Internet Mail Server (AIMS) while online with Demon. Although this combination is cheap, effective and reliable, it is irritating that AIMS will only work when the internet connection is active

**Bottom left** Now Startup Manager, a component of Now Utilities, includes assistance for isolating extension conflicts

installation. I hope that it is the end of the sorry tale of System 7.5, patched with Update 1.0 to 7.5.1, confused with two different versions of 7.5.2 to support PCI Power Macs and PowerBooks, patched again with Update 2.0, and now with remaining bugs fixed in Revision 1.

### Mac OS 8

Apple needs to be careful that Mac OS 8 does not go the same way. Its surprise announcement that Mac OS 8 would not be a single, clean release, but a series of upgrades appearing at regular intervals, brought dismay to many.

Some have second-guessed that this new strategy indicates serious problems in the already huge development team, yet the evidence is against it. Early demonstrations have shown that OS 8 is making good progress, and many components are almost ready to release. That is precisely why Apple says it is changing to this new approach. But I think another good reason is to ensure a smooth transition among third parties, so that OS 8 is not starved of good applications for many months. Closer

gather, it has been fixed in version 2.1 available to registered owners). Having just bought Now Utilities 6.0, I went into the Now Startup Manager, which is the more sophisticated equivalent of Apple's free Extensions Manager, and tweaked the list of enabled extensions. Somewhere along the line, I must have turned off the Shared Code Manager because for several intensely frustrating hours I suffered from all sorts of weird problems.

My AppleVision 1710 monitor switched back to the default 640 x 480 resolution, and its controls disappeared. AppleTalk could not be turned on and refused to give a clue as to why this was. If you ever experience this sort of disaster, go back and check that the core extensions, particularly the Shared Code Manager, are turned on. This type of problem is getting more and more irksome. Apple has at last released the international version of System 7.5 Revision 2, thankfully a mere two disks rather than Update 2.0's 14. It is essential for those using RAM Doubler on a Power Mac, and for those with PowerBooks containing PowerPC processors. Other users will probably not benefit from its

### PowerBooks ahoy!

PowerBooks are *de rigueur* on private craft and commercial fishing boats. MaxSea is an integrated navigational and charting



package. The charts aren't cheap (this one is part of a £1,000 CD of Admiralty charts for the Channel) but are easier to use than paper versions.

collaboration with Microsoft and other major vendors should allow us to keep running Word and Excel without a hiatus.

■ Next month, I will deal with OS 8's human interface, and will look at ways of programming the Mac without turning pro. I will share my experience of Apple's LaserWriter 12/640PS duplex laser printer.

## Batteries Included

An introduction to problems caused by a flat battery in desktop Macs.

### 1. Your Mac is one of the following models:

- LC series (LC, LCII, LCIII)
- 475 series (Quadra, Performa or LC475)
- Power Mac 6100

(some others may suffer similar fates).

### 2. Your Mac fails to start up.

- Typically, the startup process begins, you hear the normal startup sound (no sinister "chimes") but everything halts early on.
- The screen is usually black, but may show part of the startup process.
- If using an AppleVision monitor (which turns on automatically), the monitor may not turn on at all.
- If using a video card, your Mac may start up better if the monitor is connected to the built-in monitor port instead.
- The Mac may fail to start up altogether.

### 3. If you manage to get it started, behaviour may be odd.

- Various settings may be reset to default.
- The System clock is reset to a time just after midnight many years ago (this is almost diagnostic).

**Solution:** Replace the battery on the motherboard. The component is, in most cases, a 3.6V Lithium battery and should cost less than £10 inclusive of fitting. Once replaced, although you will have to reset the clock etc, abnormal behaviour should be eradicated.

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**Apple Computers** 0181 569 1199 or [www.apple.com](http://www.apple.com) and [www.euro.apple.com](http://www.euro.apple.com)  
**www.support.apple.com** for System 7.5 Rev. 2  
**Computers Unlimited** 0181 358 5857 for Apple Network Servers

**AIMS** [www.cybertech.apple.com/](http://www.cybertech.apple.com/)  
**Claris** 0181 756 0101 for Claris E-mailer (£40 plus VAT)

**Now Software** 01525 237100 for Now Utilities 6.5 (£50 plus VAT)

**Island Computer Systems** 01983 821717 for MaxSea (£700 plus VAT)





# California dreaming

Everything seems to be rosy in the Apple garden, as Howard Oakley discovered when he went to California. Mac OS 8 is under construction, and famous faces are in the corridors.

**F**inding myself in California, I took the opportunity to visit Apple's R&D building at the wryly-named 1 Infinite Loop, Cupertino, ostensibly to find out about QuickTime 2.5 and its future. Bearing in mind tales of imminent corporate disaster, I was pleasantly surprised to see a huge and active campus, from the Apple Fitness Centre on Bandle Drive, to giant models of the infamous "dogcow" (an intermediate species featured in the page orientation icons of the Page Setup dialogue) and other iconic nobility.

There were no vacant parking spaces, empty offices, or worried faces. Plenty of employees were walking round barefoot, some arrived on skateboards or inline rollerblades, but all were purposefully busy.

## Star spotting

While in the lobby of 1 Infinite Loop, sensing the nearby industry of hundreds of programmers crafting Mac OS 8, I saw Don Norman, emeritus Professor of Cognitive Science, and Apple Fellow. Thankfully I had just left the Apple Company Store with a copy of Voyager's CD-ROM, "First Person: Donald A. Norman", which contains his three seminal works on human-centred design. Back in the UK, I thought it would be a delight to browse his thought-provoking books with the added benefit of original talks and hypertext links. But there were some hurdles to overcome first.

This CD is one of a series (others cover Marvin Minsky's work on artificial and real intelligence, and Stephen Jay Gould on evolution) released in 1994, using HyperCard, QuickTime and custom fonts. So, I first had to install the stacks and their fonts onto my hard disk.



Another acquisition from the Apple Company Store's fine collection of Mac software was Fractal Design's Poser. This allows you to pose and render an infinite variety of different human models, against PICT backgrounds. Already widely used in as diverse fields as ergonomics and advertising, it is also great fun

As I had bought all three, I opened one of the font suitcases and ensured it contained all the fonts required for the different CDs, by opening the other two suitcases and dragging extra fonts over to it. Sometimes you can avoid actually having to put such a suitcase in the system folder, by keeping it in the same folder as the application. But as this was HyperCard, this ploy did not work, and I had to drop the composite suitcase onto my active system folder to install the fonts.

## HyperCard hassle

Once this was done, I tried opening Don Norman's stack using my copy of HyperCard 2.3, the latest version which runs well on Power Macs. While much of

the text content worked correctly, graphics and displays were missing. My next thought was that this was the result of running at 800 x 600 pixels screen resolution and 32-bit colour, so I quit HyperCard and opened the Monitors and Sound control panel. This quickly brought me to a more standard 640 x 480 and 256 colours, but the

stacks were still broken.

The solution lay in reverting to the copy of HyperCard 2.1 supplied on each CD. Although not as fast and fancy as version 2.3, this still runs sweetly on modern Power Macs, and clearly provides facilities on which Voyager's stacks are dependent. A more traditional printed book which had nearly cost me excess baggage was Hayden Books' 1300-page *Maclopedia*, a monumental compilation of all things Mac, from Apple history to internet shareware.

## QuickTime 2.5

Back at the leading edge, this latest version of QuickTime is a major release which will delight those with Power Macs (bringing them speed increases of 20 to 200

## Crash course

### An Aide Memoire

1. If the crashed application remains open, try Cmd-Opt-Esc which forces it to quit, or click on a "bomb" dialogue to quit the application, or restart your Mac.
2. Restart your Mac using, in order of decreasing preference: **Special/Restart** Finder menu command. **Power** key produces the restart/sleep/shutdown dialogue. **Cmd-Power** breaks into MacsBug (if installed), then type **rb** and press return to restart. **Cmd-Control-Power** forces restart (on some models). **Cmd-Opt-Shift-Power** forces restart (on some models). **Restart switch/button**. Press this if provided on the case of your Mac. Press on/off switch to turn off, if one is fitted.

**Disconnect from mains** if all else fails (most damaging).

For the last two, you will then have to start your Mac up again.

3. Get your Mac restarted successfully. Using Shift disables all extensions if held during startup.

**Cmd-Opt-Shift-Del** bypasses the current startup disk, picking the next instead.

**Cmd-Opt-P-R** zaps the parameter RAM, which may be messed up.

4. Run Disk First Aid to verify at least the startup disk (containing the active system folder).
5. Using Disk First Aid, repair any disks reported as being damaged. Remember it cannot repair the startup disk: you may need to restart from another hard disk, or the Disk Tools floppy disk. Don't soldier on with a potentially damaged file system. It will only lead to more crashes.

6. Look at the Wastebasket. If it contains a folder named (for example) "Rescued items from HD20", you may be able to recover those files by starting the application which crashed.
7. Check possible causes of the crash, including extensions, control panels, disk drivers, applications, and preferences (in the preferences folder within the active system folder). If damaged, they should be thrown away.



Apple's Disk First Aid remains the primary utility for checking and repairing disk damage

percent), MIDI musicians, and many more. Unlike other system software components, there are only cosmetic differences between the British and US localised versions, so you can use whichever is easier to download.

Charles Wiltgen is maintaining informative FAQ pages on the web which list the new features in 2.5, and detail all the compression/decompression "codecs" available. Sadly, these still exclude AVI, making it messy to convert or run many Windows movies, but now include MPEG. I was heartened to hear that QuickTime is already running well under Mac OS 8.

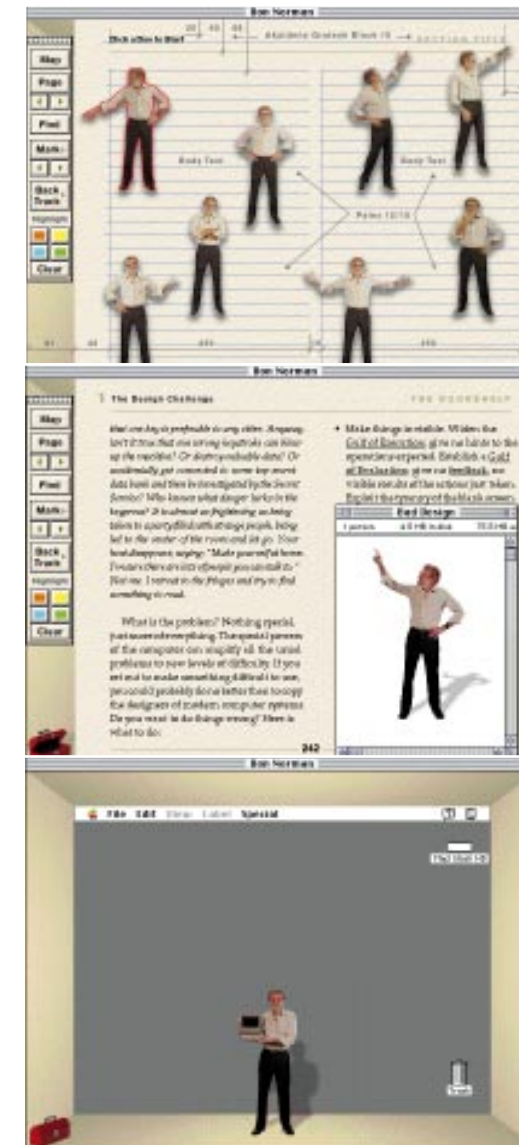
## Mac OS 8

A major advance touted for Mac OS 8 is memory protection, to make Macs more stable in the face of crashing software. The current situation is a mess. Although almost all Macs have hardware memory management units (MMUs) which could implement this, legacy usage and code in the system and third-party applications have made it impossible.

In order to maintain an acceptable level of backward compatibility and accommodate other design requirements, Mac OS 8 will not place the system and each application in their own protected memory spaces. Most applications will share a single address space of up to 4Gb, with only faceless "server" applications enjoying their own protected spaces.

Critics claim that this is a major weakness, and that Mac OS 8 will not improve stability much. In practice, though, it should prevent most situations in which a crashing application can take the system out too, forcing you to restart.

Another major culprit is the rogue or conflicting extension. Mac OS 8 will introduce a new architecture to support system patches which are currently the bread-and-butter of most extensions. This new Patch Manager should be a big step forward. In practical terms, you should be weaning yourself away from dependency on large and complex extensions, but need not



Don Norman, on his Voyager CD-ROM, doesn't even spare Apple his sharp criticism of interface design

be scared of investing in new applications, or upgrading existing ones.

Next month I will consider the changes in human interface under Mac OS 8.

## PCW Contacts

**Howard Oakley** welcomes feedback from Mac users and can be contacted at the usual PCW address, or by email as [howard@quercus.demon.co.uk](mailto:howard@quercus.demon.co.uk) or [hoakley@cix.compulink.co.uk](mailto:hoakley@cix.compulink.co.uk) or **CompuServe 70734,120**. **Apple Computer** is on 0181 569 1199; [www.apple.com](http://www.apple.com) and [www.euro.apple.com](http://www.euro.apple.com). **Voyager's "First Person: Donald A. Norman, Defending Human Attributes in the Age of the Machine"**, ISBN 1-55940-506-6. CD-ROM costs around £30. **Maclopedia**, ISBN 1-56830-281-9, is published by Hayden Books at £54.95 net of VAT. **The QuickTime FAQ** web page is at [www.quicktimefaq.org/](http://www.quicktimefaq.org/). **Fractal Design's Poser** 1.0 costs £89 from Computers Unlimited on 0181 358 5857.





# Feel the **force**

Howard Oakley is reeling from the power of his new Mac, but installing OS8 brings him back to earth.

**A**lthough Apple's troubles are not trivial, it is all too easy to relegate the company to the edge of bankruptcy. That august organ of corporate America, *The Wall Street Journal*, recently published a correction to its report that sales in the final quarter of 1995 were 11 percent down on those of a year before. The truth is that Apple's sales had *risen* by 11 percent.

However, all in the orchard is not rosy, and Gil Amelio still has many problems to solve before he can declare that the trees are laden with fruit once again.

## All change

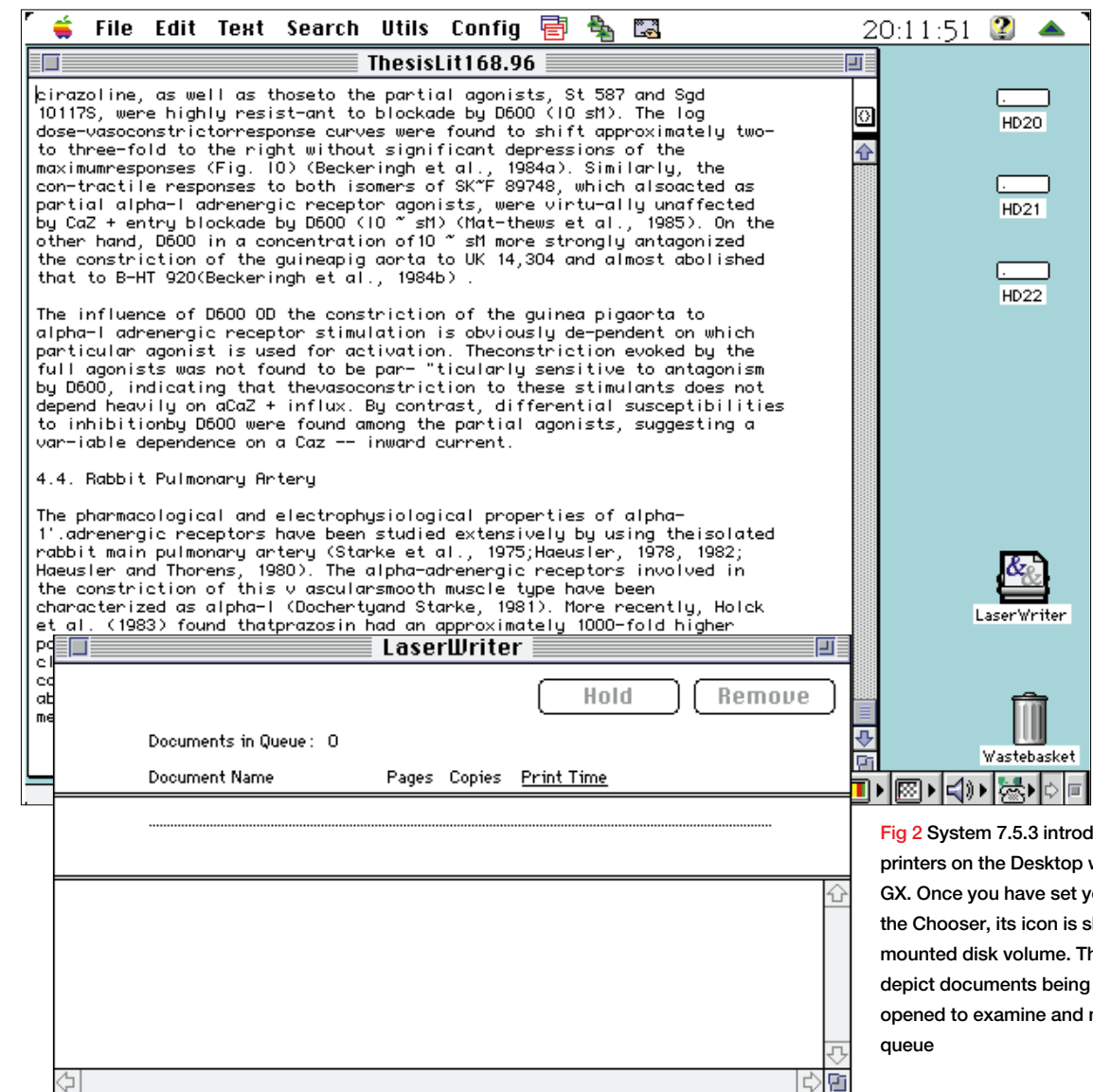
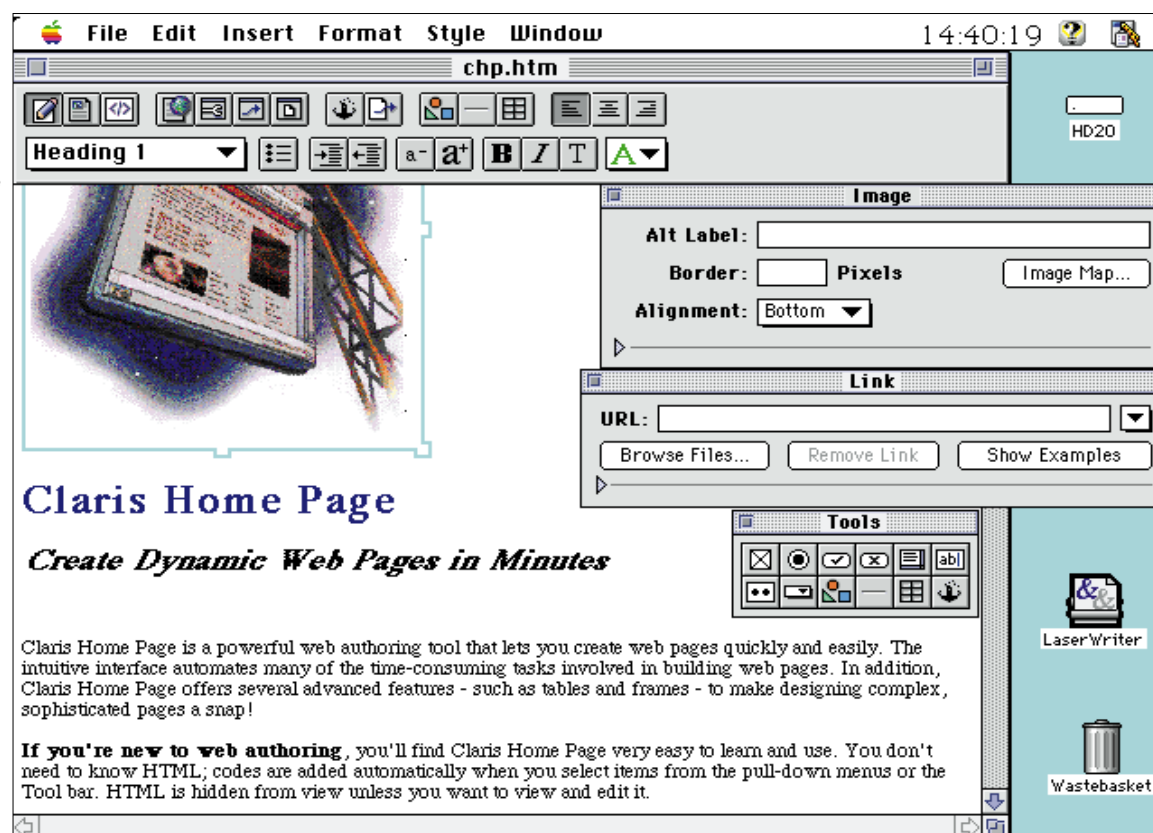
Another story used to spread gloom is the departure of two of Apple's luminaries. Steve Capps was a principal architect of the Finder, and had a major influence on much of the Mac/human interface. More recently, he was a key member of the Newton team and his contributions to both areas will be sadly missed. Walter Smith, who gave his name to WallyScript (alias NewtonScript), saved the Newton project from foundering on the rocks of Dylan: this latter would have been the new language for the Newton but was scrapped at the last minute. Smith

implemented a derivative of the little-known language called "self", and breathed life into the Newton.

While Steve and Walter are a loss to Apple and a gain to Microsoft's adolescent internet division, such movements are common and frequent. For every Capps and Smith, there are a dozen bright young people vying to succeed them as Apple heroes.

Meanwhile, Apple has been wooing developers like never before. In spite of anything you may hear to the contrary about Apple's business, it has been attracting new programmers in droves. Many appear to be dyed-in-the-wool Windows-wrights, who have completed the move to Win32 and are trawling for fresh markets. Apple's new regime has made Guy Kawasaki (eclectic evangelist, father of the 4th Dimension database and, more recently, Claris eMailer) an Apple Fellow responsible for liaising with developers. It

**Fig 1** In a bold move, Claris not only announced its new web authoring application, Home Page, but made time-limited beta versions available on the internet. Offering tools as easy as those in ClarisWorks, it looks ideal for constructing small to medium-sized sites. A Windows version is promised later in the year



**Fig 2** System 7.5.3 introduces, at long last, printers on the Desktop without QuickDraw GX. Once you have set your printer up using the Chooser, its icon is shown below your last mounted disk volume. The icon changes to depict documents being printed, and can be opened to examine and modify the print queue

has put Heidi Roizen, past president of T/Maker and vendor of WriteNow, in charge of developer relations. Inventory surpluses have been turned to advantage by selling them off to registered developers, enticing them with bargains.

## Power crazy

The upshot of Apple's generosity is that I am now the proud owner of a Power Mac 9500/132, which has quickly become my main development system. It arrived with a 16Mb memory, so my first task was to add two 32Mb DIMMs to bring it up to 80Mb in total.

Having languished for two years with an otherwise delightful 16Mb Power Mac 6100, I decided that the savings in the cost of the base unit should be invested in hardware resources. I also wanted to use the internal SCSI chain by adding a 4Gb hard disk to the 2Gb disk and CD-ROM supplied. If this seems gluttonous, consider

that I needed to move files and applications from my old IIfx, the 6100, and my PowerBook 5300ce, which between them had access to a total of 6Gb of disk space.

Fitting memory is clearly not for the faint-hearted. The 9500's vertical case stands the motherboard to one side, against which there are fixed plastic columns to hold internal drives and power supply. To add DIMMs, you have to remove all connections to the motherboard, then slide it gently forward before dropping it down as if hinged along the bottom edge. There is a lot to disconnect, including the heavily-finned processor daughterboard, all PCI cards, the plastic clip-on power switch, and a series of ribbon and other connectors along the top of the motherboard.

Fitting the hard disk is easier and does not require disassembly beyond removing the case, provided that you buy the right plastic "sled" on to which the disk is screwed. Also, remember to set the SCSI

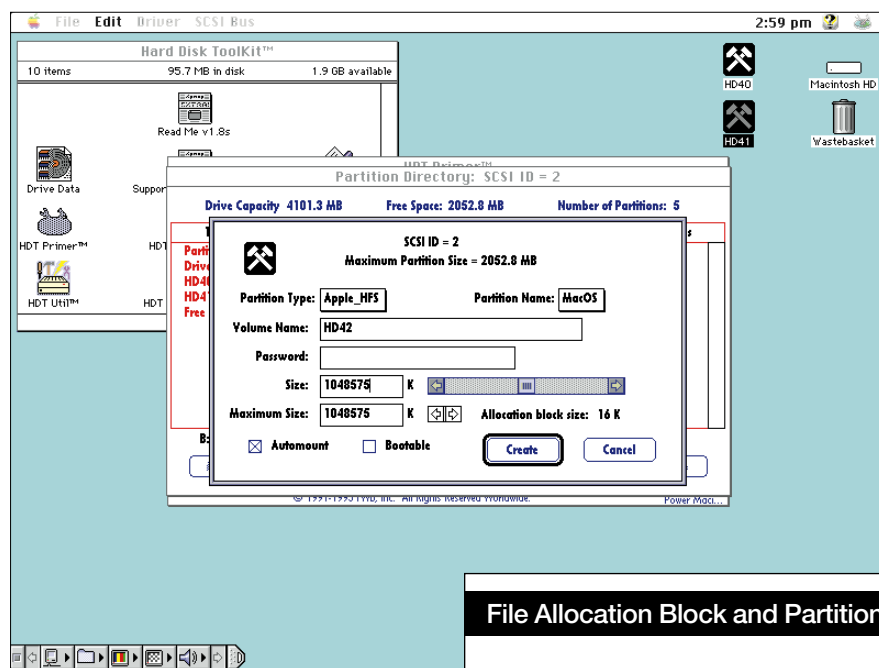
ID jumpers so that they don't conflict with other devices on the internal chain.

## Splitting up

Once everything had been reassembled, I had a couple of days' work ahead of me before it would be configured and ready to use. I formatted the new hard disk with FWB's Hard Disk Toolkit, dividing it into five partitions of different sizes.

Until I got my first big hard disk, I had not appreciated how the Mac's file system limits can waste space on disks. Just as with Windows 95, MacOS divides a partition into a maximum of 64k allocation blocks.

While files typically occupy more than one block, they can only occupy an integral number of blocks and cannot share a block with another file. If you have many small files, say of less than 4Kb in size, it is a shock to see in their Get Info dialogue that they are each swallowing up 32Kb of your hard disk. Thankfully, the Hard Disk Toolkit



**Fig 3** Configuring hard disk partitions is easy when you are formatting a hard disk using FWB's Hard Disk Toolkit: you can adjust the size of partitions to achieve a desired allocation block size. Apple's own Apple HD SC Setup and Drive Setup utilities require you to calculate partition sizes manually

can set partition sizes so that allocation blocks are of a particular size, so all I did was create some partitions for holding smaller files (block size 8Kb) and some for larger files (block size 16Kb).

Once completed for the 4Gb disk, I installed System 7.5.3 on it, restarted from that System, using the Startup Disk control panel, and repeated the process with the 2Gb disk.

### Situation normal?

Just as I got everything running sweetly, and found the new desktop printer feature, I noticed that Apple had leaked a couple of bombshells over System 7.5.3.

Remaining bugs and problems with System 7.5 Update 2.0 have led to the release of a further, mercifully smaller, update known as Revision 2. As this is currently only available in US form, we in Europe will have to wait before knowing what it offers. But in the course of clarifying this, Apple engineers revealed that System 7.5.3 resulting from the Update 2.0 is more advanced than 7.5.3 installed afresh. So they advise us to apply Update 2.0 on top of PCI Power Mac 7.5.3. When Revision 2 arrives in British English form, we'll have to install that, too. What a mess!

### Mac OS8

Sources inside Apple indicate that the company hoped to ship an initial alpha release of Mac OS8 in August or September. This was another factor in my decision to get some PPC muscle, although the final public release should run on all

### File Allocation Block and Partition Sizes

MacOS divides each hard disk partition into a fixed number of storage allocation blocks (Fig 3). The table below shows, for given block sizes, the maximum size of partition you can create. Because files can only occupy an integral number of blocks, 1,000 files which are 100 bytes long will consume 3.9Mb on a 255Mb partition, but 31.3Mb on a 2,047Mb partition. If you have a large hard disk, divide it into partitions of different sizes so that you can put small files on smaller partitions with smaller allocation block sizes.

Allocation Block (Kbyte)	Max Partition Size (Mbyte)
4	255
8	511
12	767
16	1023
20	1279
24	1535
28	1791
32	2047

PowerPC-based Macs with 16Mb of memory.

If you have been wavering over Power Macs, OS8 is a good incentive to buy, as there are no plans to support 68K hardware. This also means that cheaper PowerPC upgrades on add-in cards will be bereft of Mac OS8, as they cannot relinquish full control to the card.

Mac OS8 is a complete redesign and reimplement of MacOS. Instead of the complex and broad hierarchy of different Managers which make up System 7.x, it consists of a small and efficient microkernel, a larger set of core system services sitting on top, and layers of higher-level service managers such as networking, graphics and multimedia.

The microkernel not only supports pre-emptive multitasking, which automatically cycles between running processes according to their priority, but also provides virtual and protected memory. The current implementation of virtual memory is safe but slow and inefficient. By contrast, that in Mac OS8 will be permanently enabled, and function transparently and efficiently.

My older Macs have small, slow internal

hard disks which are 90 percent full with the System folder, utilities and common applications. As I needed more disk space, I added external drives of greater speed and capacity. To get the best out of OS8, these internal startup disks should be replaced with modern, fast drives of greater capacity and kept with large, adjoining, free space for the backing store for virtual memory. Those who use Adobe Photoshop to process large, deep colour, images already make similar arrangements for its scratch files.

Next month I will consider the thorny issues of memory protection and System extensions, and how Mac OS8 promises to reduce data-destructive crashes.

### PCW Contacts

**Howard Oakley** welcomes feedback from Mac users and can be contacted at the usual PCW address or by email as

**howard@quercus.demon.co.uk**  
or **hoakley@cix.compulink.co.uk**  
or **CompuServe 70734,120**

**Apple Computer** is on 0181 569 1199;  
[www.apple.com](http://www.apple.com) and [www.euro.apple.com](http://www.euro.apple.com)

**FWB's Hard Disk Toolkit** costs £110 (plus delivery and VAT) from MacLine 0181 401 1111

**Clarix** is at <http://www.clarix.com/>





# Beating the system

**New Mac-man, Howard Oakley, tackles System 7.5.3, looks at working with other architectures, and gives a mouseless driving lesson.**

Having been handed Chris Cain's Hands On column, my intention is to maintain the high standards set by Chris in the past. I first wrote for PCW ten years ago and migrated to the Mac, in 1988, to develop software. Since then I have been an ardent Mac user, programmer, and evangelist.

Like Chris, I welcome your submissions and comments, and will endeavour to keep you productive, enthusiastic and informed. Now, to business...

## System update

System 7.5.3, alias System 7.5 Update 2.0, rumbles on. In the US, problems have meant a further update to the update, but some of these repairs appear already to have been incorporated into the British English version.

My experience of applying Update 2.0

has varied from sublimely easy to horrendous. My three Macs are now running different Systems. My everyday workhorse, a IIcx which originally cost more than two limbs, remains on 7.0.1 much of the time because it runs my accounts and some golden oldies which I never got around to upgrading. Although I'd love to run something more glitzy, my Ritz accounts software has been trusty, requires minimal effort on my part and satisfies the VAT inspector. It illustrates one of the reasons why many of us use a Mac. It does what we want simply, cleanly and efficiently. Unfortunately, accounting systems often end up with a "Do not disturb" notice on the System Folder. I'm sure that some are still running under System 6 or earlier.

My Power Mac 6100 has been running 7.5.3 in various US and now UK

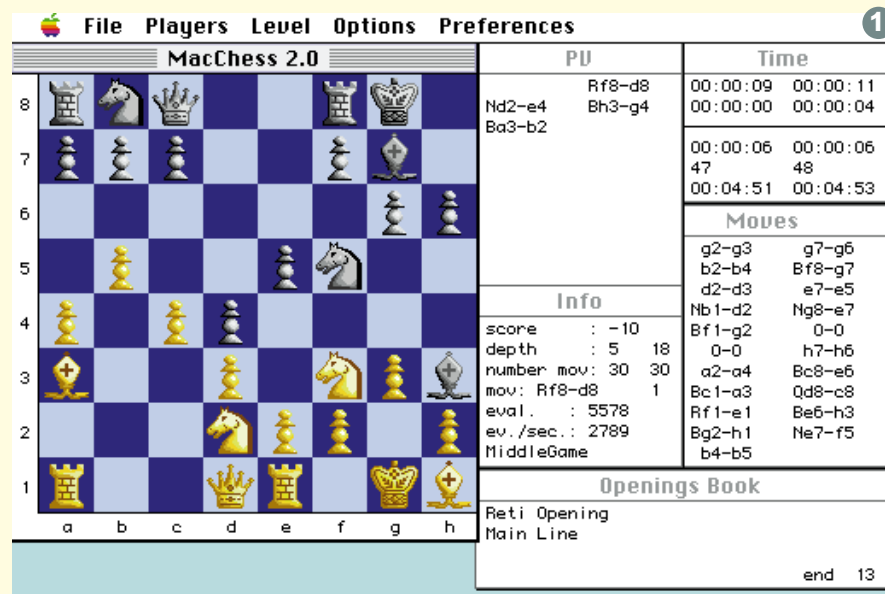
incarnations since Update 2.0 first hit the freeways and FTP servers. The only problems I have encountered were with disk drivers and screensavers. Ever since I first hooked up an external hard disk to it, then running System 7.1.2, I had infrequent and apparently random crashes. Once Update 2.0 had been installed, they became more frequent. Installing a clock accelerator to boost it to 84MHz made the crashes so common that they halted useful work. In the end, FWB's Hard Disk Toolkit solved it and I have put the rabbit's foot and other lucky charms away now.

The issue of hard disk drivers illustrates how far we have come, willingly or unwittingly, from Apple's original concept of the Mac as the simple-to-use computer. Before my IIcx I had a succession of Macs, from the SE to the IIcx, and relied almost entirely on Apple-supplied internal hard disks. If your Mac is equipped only with a standard Apple internal hard disk, the instructions provided with Update 2.0 to update its disk drivers should work a treat. With any luck, you shouldn't have to invest in a third-party "techie" product like the FWB Toolkit.

The increase of third-party hard disks has supported a whole industry producing software drivers. They are extremely low-level products which sit in between the System software, notably SCSI Manager, and the disk hardware, converting System calls to read and write from the disk into commands for the disk itself.

The one thing which was still troubling my Power Mac was its screensaver. Software which automatically blackens the screen is probably unnecessary. Modern colour monitors, with the excellent Sony Trinitron tube, do not appear to suffer from "burn in", even after years of use. After Dark is enormously and justly popular yet it does not seem to get on well with some Power Macs, particularly my 6100. Having tried a range of alternatives, such as the shareware application, Eclipse, I thought that I had found the answer in the freeware port of the Unix utility, "cron" (by Chris Johnson). But this, too, crashed every once in a while, typically when the IIcx accessed a shared folder on the Power Mac. Using the cron screensaver on its

**(1) Several chess games have fallen by the wayside as a result of recent hardware and System software introductions. One which has proven robust, attractive and a worthy competitor is WA van Beusekom's MacChess 2.0, for which he seeks only appreciative email or postcards**



own resolved that last problem.

The other problem with Update 2.0 is communicating. If you have a PCI Power Mac you'll understand this only too well, having lived through Apple's struggle to get Open Transport fully usable. But it is not that simple, as there are still plenty of printers, modems and other peripherals which leave Open Transport standing.

A disappointing loss is Hewlett-Packard's fine

PostScript driver for its older DeskWriter printers, such as the 560C. While HP has updated the regular non-PostScript driver, those of us who forked out the extra money to get excellent results from

Illustrator or Freehand have been left out in the cold with a product which doesn't work with Open Transport. There isn't any promise of a future revision resolving this. Some smarter modems which use

## Mouseless Mac-ing

Apple's philosophy is that you drive your Mac with a mouse. There are occasions when a keyboard can be easier, or you might have started your Mac with the mouse disconnected or dysfunctional. Trying to plug your mouse, or any ADB (Apple Desktop Bus) device, back in while the Mac is powered up risks serious hardware damage. You must shut down your Mac before messing with the ADB chain. But without a mouse, how can you do that? Here are some essential keyboard shortcuts to save you time and the occasional motherboard!

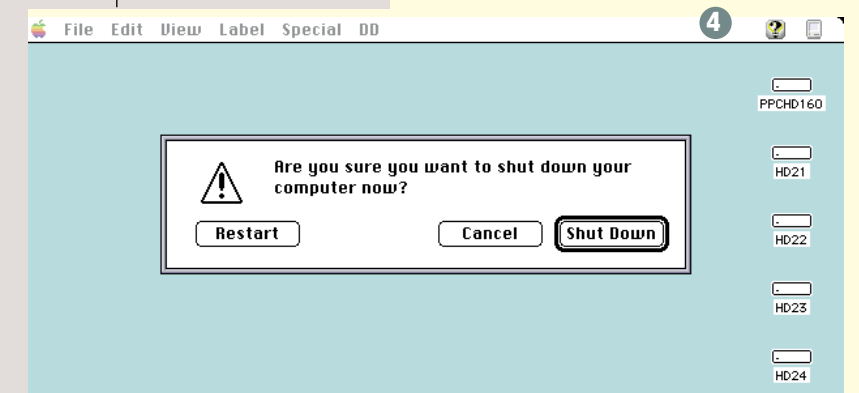
<b>Power key</b>	Brings up a restart/shutdown dialogue (most Macs, System 7.5.x); see (4), below
<b>Cmd-Opt-Esc</b>	Forces application to quit
<b>Cmd-Shift-Power</b>	Forces Mac to restart

<b>Dialogues:</b>	
<b>Return</b>	Accepts default button
<b>Cmd-. or Esc</b>	Cancels
<b>Tab</b>	Moves to next entry field
<b>Shift-Tab</b>	Moves to previous entry field

<b>Finder Views:</b>	
<b>Arrow (cursor) keys</b>	Moves selection
<b>Cmd-RightArrow</b>	Expands folder in list view
<b>Cmd-LeftArrow</b>	Collapses folder in list
<b>Cmd-Opt-RightArrow</b>	Expands folder fully in list view
<b>Cmd-Opt-LeftArrow</b>	Collapses folder fully in list view

<b>File save or open dialogues:</b>	
<b>Cmd-UpArrow</b>	Moves up one folder level
<b>Cmd-D</b>	Goes to Desktop
<b>Up and down arrows</b>	Moves up and down file list
<b>Cmd-N</b>	Creates new folder (save dialogue only)

**(4) It's make your mind up time**



**(2) For a mere \$10, Net-Prezenz is a remarkably simple FTP server running native on Power Macs**

System-level drivers have also broken, although their manufacturers are being much more conciliatory.

## Working with PCs

Networking peer-to-peer in a purely Mac workplace couldn't be simpler. The only "nasty" likely to sneak up and ruin your day is when some of your Macs undergo

a System upgrade: for instance, System 7.5 Update 2.0.

Before trying this, you need a copy of the current Network Software Installer, a single floppy available from Apple dealers. Install this on the other Macs and it will ensure that their AppleTalk drivers and other networking software are compatible with those undergoing the full upgrade. Using Macs networked among other Macs is often simpler than using other machines, such as IBM compatibles and Unix boxes, whether from a Netware or an NT server. Your only potential problem is making sure that system administrators become Mac-literate and don't try to abandon you.

Bringing PC clients into an all-Mac shop can be more fraught. I recently added an HP OmniBook to my little farm of Macs, but I don't wish to run a PC server or install more layers of networking software. The answer to this dilemma lies in TCP/IP protocols, which are ably supported by both MacOS and Windows 95.

First, I turn file-sharing on so the Power Mac 6100 is offering at least one folder to enabled users. If necessary, I open the TCP/IP control panel and make sure that

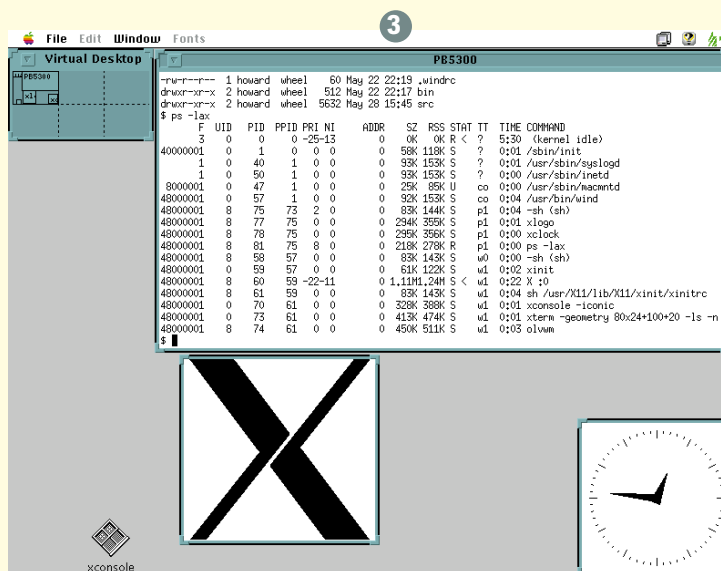
the Mac server has a valid IP address, such as 129.129.1.1, offered over the Ethernet, and does not rely on a name server. This also loads the TCP/IP driver into the memory. It is worth noting that one of the few remaining problems in Open Transport 1.1 is that repeated loading and unloading of this driver can lead to memory fragmentation and crashes. Whether you use it for local networking or dial-up connections to the Internet, if you use it often, opt for it to be permanently loaded into the memory.

Next, I start up NetPresenz 4.0.1, a ridiculously cheap shareware FTP server written by Peter Lewis. This is easily configured to allow named or guest (anonymous) access to all shared volumes or folders. All that remains is to start up an FTP client on the OmniBook. Under Windows 95 you will either have to go for the overkill of a full internet suite such as Microsoft's Internet Explorer or Netscape Navigator, or revert to power-user mode by running the command line FTP program at an MSDOS prompt. Something with the simple elegance of Fetch, which is Dartmouth College's freeware FTP client for the Mac, would fill this obvious gap.

### Working with Unix

Connectivity with Unix systems is not a problem. If you're content with the basic functions expected of an internet connection, then the combination of System 7.5's MacTCP or 7.5.3's Open Transport and the rich array of public domain and commercial tools, is pleasant and productive.

Things are different if you need to run an X server. In its curiously inverted terminology, an X server runs on the client computer. Apple's MacX is long in the tooth and, until recently, WhitePine's eXodus was the only contender. Now, Tenon Intersystems has launched a mature competitor, XTen, based on its long experience with Mac-based versions of Unix. True to the Unix and X mould, it is profligate with resources and my Power Mac's humble 16Mb of memory were insufficient to let it fly. Once given the freedom of 32Mb on my PowerBook



(3) *PowerMach Ten is an implementation of BSD 4.4 Unix, including X11R5. XTen is an X11R5 server which can run with PowerMach Ten or as a standalone X server*

5300ce, it quickly got airborne and offered a full implementation of X11R6 with Motif and window managers, various.

Tenon is most famous for its implementation of Unix for 68K and Power Macs. As Apple decided not to port its own A/UX to the PowerPC processor it was, until recently, the only way that you could run Unix on a Power Mac. If this seems a bizarre intention, remember that Macs are commonplace in further education, particularly in the US.

Power MachTen is a delight to use. Running on top of the Mac file system in its own windows, you can even build hybrid MacOS and Unix applications using Metrowerks' CodeWarrior development system. If you discover that the only signal processing application requires Unix, it can be a lifesaver.

Previous efforts to build a public domain Unix for Macs had been less than ideal. MacBSD runs on a narrow range of 68K machines such as the IIci, although it is free. In the last few weeks, the first developer release of a Mac implementation of Linux, mkLinux, has become available. If you don't pay for your internet connection, you can now obtain it by FTP. Faced with a minimal download of 40Mb, I'll settle for the CD-ROM version from Prime Time Freeware, a specialist US publisher whose list includes such gems as a two-volume collection of artificial intelligence software.

The other small snag with mkLinux is that it only supports the first wave of non-PCI Power Macs.

### Copland

All this concern would have been irrelevant had Apple shipped multi-OS machines running Copland, or MacOS 8 as it is officially known. Long delays in finalising the specifications of what were initially PREP, and are now PowerPC Platform (PPCP) computers, along with delays in completing its micro-kernel architecture OS, were the last thing that Apple needed. It had to get the specifications right, or risk disaster.

The annual gathering at Apple's recent worldwide developer's conference had been expecting to receive alpha releases of Copland and were miffed to be told that not even a preview version could be provided. But they were given the first set of documentation, and movies illustrating its new look

and feel.

Over the coming months, I will be discussing the changes that MacOS 8 will bring and helping you to prepare your Macs for next year's upgrade. The chances are that your first view has been through Greg Landweber's shareware extension, Aaron (US composer Copland's first name). Ingenious though this is, it cannot portray the way in which MacOS 8 will allow users to set up their own personalised interface. Apple will call these functions "Themes". While I am sometimes aghast at the riotous use of clashing colours and customisations seemingly enjoyed by some users, Themes will provide the interface you want, even if it does ape Windows 95.

### PCW Contacts

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**Apple Computers** 0181 569 1199; [www.apple.com](http://www.apple.com); [www.euro.apple.com](http://www.euro.apple.com)  
**FWB Hard Disk Toolkit** costs £129.25 (incl VAT) from MacLine 0181 401 1111  
**Cron, NetPresenz, Fetch, MacChess** and **Aaron** are on major online services  
**Tenon** products from Shute Associates 01223 514531; and Full Moon 01628 660242

**Prime Time Freeware**  
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# Brave new Apple world

**Chris Cain peels back the covers on a new direction for Apple. Plus, upgrades and updates and Mac Hexen, forsooth.**

It's happened. On 13th May, Apple's new CEO, Dr Gilbert Amelio, took the stage at the Mac World Wide Developers Conference to announce his plans for getting Apple back on track. The so-called "turn-around king" revealed his strategies for hardware, software and the development of key markets.



I didn't make it to the conference but it sounds as if Amelio knows what he's doing. His plans aren't earth shattering but they do appear to be exactly what the Mac market needs. Everything, from the amount of RAM shipped with machines to the Internet and Mac OS, has been addressed in what seems like a sensible fashion.

According to Amelio, from now on every Mac will come with at least 12Mb of RAM as standard. At least 16Mb would have been preferable, but 12Mb is enough to ensure new systems can run today's larger RISC-based applications comfortably and concurrently.

The next step is a 50 percent reduction in the number of Mac models over the next 12 months and a move to standardise around a core motherboard. This won't happen overnight but it should make it easier for Apple and third parties to develop more standardised software that will work across the entire line-up, including a universal version of the Mac operating system.

**It's official**

Copland is now officially called System 8, and it has been decided that this will definitely be a 1997 event. However, many of its key components will be released as upgrades to 7.5 as soon as they are finished, including the new Appearance Manager.

It's a messy way of doing things but Apple claims it will enable the Mac OS programmers, who have

*Gil Amelio is taking a slow and steady approach to getting Apple back on track*

been centralised in one department for the first time, to deliver a more stable product.

Amelio also stressed the importance of the Internet, saying that all future Macs would be Internet-ready. Quite what this means we don't know, as not all Macs come with modems — but you can't expect him to get everything right first time, can you?

Other Internet-related moves include the release of the Golden Master version of CyberDog 1.0, available (by the time you read this) for downloading from the company's Web sites; an agreement with Netscape to bundle a QuickTime plug-in with the upcoming Navigator 3.0 to help establish it as the standard multimedia format for the Web; and a deal with Sun to integrate its Java programming language into the Mac OS.



*Due for release in July, QuickTime version 2.5 will bring multi-processor support, an improved music architecture and compatibility with M-JPEG*

For more on Amelio's speech and the Apple position see this month's *Newsprint*.

**QuickTime 2.5**

The next version of QuickTime, Apple's software architecture for handling time-based media, will not be 2.2 as detailed a few months ago. Apparently, the company has improved QuickTime so much that it has upgraded to version 2.5 and, at the time of writing, everything looks set to arrive in July.

Among the recent enhancements are support for the Motion JPEG video file format, often used by video professionals with products like VideoVision, multi-processor support for power-hungry real-time editing and improvements to the text track which allow you to search for strings in movies. The last feature will be particularly handy for finding clips when searching for information across the Internet.

One feature that still hasn't made it into the new version is the much-trumpeted software MPEG playback. According to Jonathan Knowles, senior product manager for QuickTime, new developments in the playback engine mean that it won't be ready until the end of the year.

The good news is that it will give full-motion video with 44.1KHz CD-quality sound on a 60MHz PowerMac or greater. Obviously, the more processor power you have the better, but Knowles says it will work perfectly on low-end PowerMacs. Naturally, I'll believe it when I see it.

A new version of QuickTime VR is also due, complete with programmers' API and support for speech, music, directional sound and hot spots that can be linked to URLs. Version 2.0 is expected to ship in August.

**Going into Overdrive**

This month, I finally got my hands on one of Apple's long-awaited processor upgrade cards. The first models are primarily designed for the 7500 and 8500, and provide you with either a 120MHz or 132MHz PowerPC604.

At first glance, the most obvious thing about the card is its enormous heat sink (shown, right) which completely covers the board concealing all the components. Installation is simply a matter of removing the existing processor card and firmly inserting the new one. There are no additional jumpers to tweak or software to install — simply put back the lid and away you go. The only other thing I can say about the

hardware is that you should make sure the card is firmly seated in the processor socket.

I tested a 132MHz model on my 7500 and, as expected, there were instant speed improvements. The difference was specially noticeable using time-consuming filters in Photoshop and with 3D routines that make heavy use of the 604's floating-point capacity.

If you plan to make heavy use of QuickDraw 3D, now or in the future, then a 604 upgrade is a good idea. The end result is a machine that runs almost as fast as a top-of-the-line 9500, as shown by the graphs in Fig 1.

The 120MHz card costs £455 (plus

VAT) while the 132MHz version is priced at £682 (plus VAT). These prices might seem expensive, especially when compared with PC CPU upgrades, but they are actually quite reasonable when compared with the cost of a whole new system. It's basically the equivalent of moving from a Pentium to a Pentium Pro, and you can't even do that yet.

**Matrox update**

PCI Mac users with a Matrox Millennium graphics card will be keen to hear that a patch for the card's flash BIOS has been posted on-line. A new driver is also available and the company strongly recommends users to update for maximum performance.

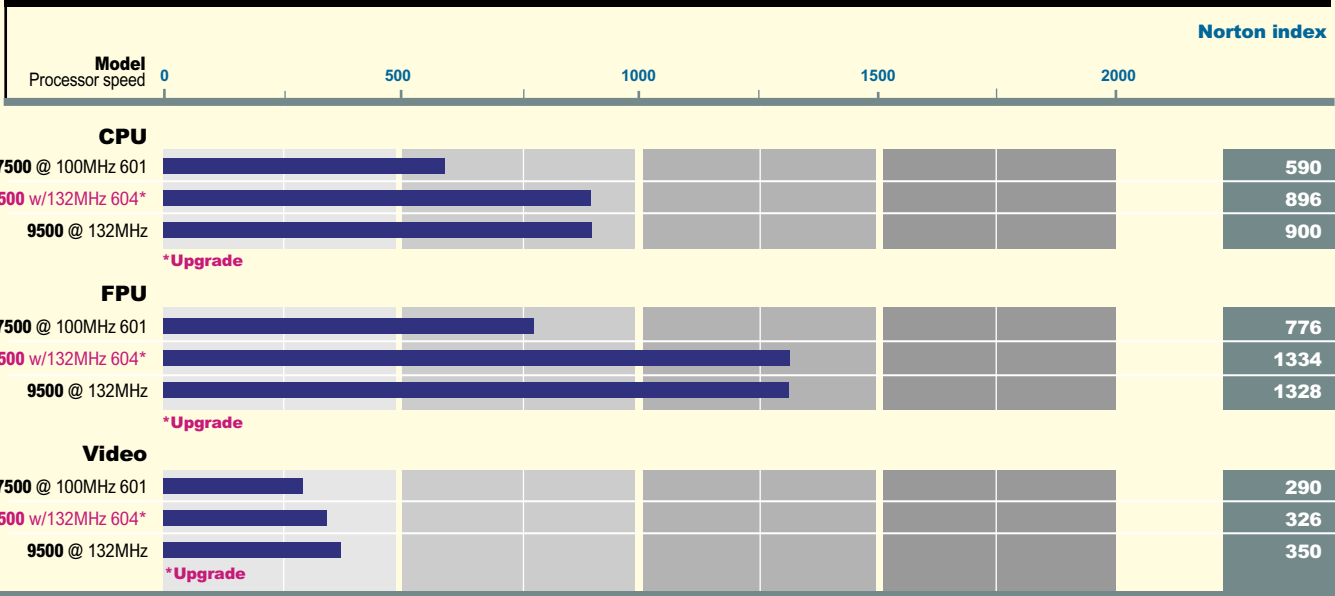
The BIOS upgrade is supplied as two files — an application called FlasherMGA and an accompanying ROM image. Before running the program you need to make the BIOS editable by changing a jumper on the bottom right-hand corner of the card. Then simply run the program and follow the screen prompts.

The latest revision of driver software is version 1.1, which includes updates for both the MGA PowerDesk Control Panel and the MGA 3D accelerator.

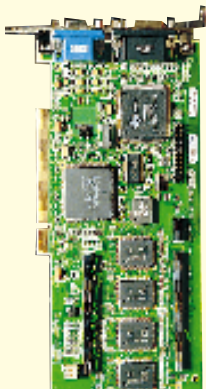


*Lurking beneath the enormous heat sink is a 604 processor running either a 120 or 132MHz*

**Fig 1 — Upgrade Performance**







*Matrox has improved the BIOS and driver software for its PCI Millennium graphics accelerator*

### Take that ye Varlet!

Regular readers will know that I occasionally take time out from working to enjoy the odd game of Doom or Marathon.

This month sees the launch of the Mac version of Hexen, GT Interactive's medieval 3D romp, aka "Doom in tights". A demo has appeared on the Web, so naturally I downloaded it.

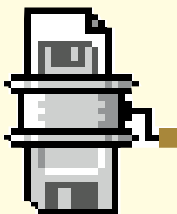
Hexen allows you to explore its 3D world as a Fighter, a Cleric or a Mage. Each character has its own special abilities and a unique style that affects the way the game develops.

For example, a Mage can use magical weapons and spells to obliterate the enemy, whereas a warrior has only his brute strength and cunning to rely on. The idea is that once you complete your quest with one character, you can do the whole thing again, slightly differently, with another character.

Graphically, Hexen is similar to Doom, except in a medieval style, but the game-play has been engineered to be quite different. Instead of simply following on from one another, the levels are connected via a series of interlinked hubs. This has you running backwards and forwards several times because actions on one level change things on another.

Guaranteed to keep you up half the night, the Hexen demo can be downloaded from <http://www.gac.edu/~bgustafs/hexen>.

### Utility of the month



This month's life-saving utility is Drop Disk, a tiny Apple-made application that lets you mount disk images on your desktop and access them as if they were normal floppy disks. Although unsupported by the authors, it can save you a lot of tedious work.

For the uninitiated, disk images are files that contain the complete contents of a floppy disk. They are often used as a convenient way of sending exact duplicates of disks across the Internet, or for archiving copies of floppy disks onto a hard disk. If I

wanted to send someone a copy of a program that came on seven disks, for example, I could make a disk image of each one and then send them all via email. The person on the other end would then use a utility, such as Disk Copy 4.2, to copy the images to blank disks and make their own disk set.

The only disadvantage with all this is that when you want to use the files in a disk image you must have a blank floppy disk ready on which to copy them, assuming you already have a copy of Disk Copy. With Drop Disk you can simply drag the image onto the application and a couple of seconds later it appears as a mounted volume on the desktop. It can then be opened and accessed like a normal disk.

● Drop Disk can be download from various sites on the World Wide Web, including <http://www.peak.org/~labquest/Dimages.html>



*Cry "hey, nonny nonny" and vanquish the demons infesting the world of Hexen*



### PCW Contacts

Chris Cain loves to hear from PCW's Macintosh readers and can be contacted at the usual PCW address, or on-line as [chris@cix.compulink.co.uk](mailto:chris@cix.compulink.co.uk) or [CainUK@AOL.com](mailto:CainUK@AOL.com) or [chris\\_cain@pcw.ccmil.compuserve.com](mailto:chris_cain@pcw.ccmil.compuserve.com)

Apple Computers 0181 569 1199  
GT Interactive 0171 258 3791  
Matrox 01793 114444





# It's the business

**Chris Cain finds the answers to some common problems with running Microsoft Office on Macs. There's bumps, raves and sprockets, too.**

While Microsoft is often seen as the baddie of the Mac world, in reality, almost everyone prefers to use its software. Despite the fact that Apple bundles the integrated suite ClarisWorks with its Performas, Word is the most popular Mac word processor with over 3.6 million units sold. Excel is also up there in the high numbers, and many businesses with both PCs and Macs have standardised on Microsoft Office.

On the opposite page we take a look at the top ten support questions regarding Microsoft Office. If you can't get Excel to load or are having trouble with Word file formats, then this is for you.

## Bumps bounce prices

Apple is set to release its "Speed Bump" PowerMacs, officially known as the 7600 and the 8200.

The former is a 120MHz 604-based desktop model in the same case as the 7500, while the more impressive-sounding 8200 is a mini-tower based on either a 100MHz or a 120MHz 601. Both machines have all the usual Mac goodies and the 7600 comes with a 256Kb second-level cache as standard.

The launch of these machines has brought PowerMac prices down and the range now starts with the 7200/90/8/500/CD at a street price of around £1,150. An 8200/100/1.2Gb/CD will go for £1,500 and a 7600/120/16/1.2/CD for £1,875. All prices exclude VAT.

## Card sharp

Apple has announced two new DOS compatibility cards for PCI systems,

which should fit into any current PCI model. They feature a choice of either a 100MHz Intel Pentium or another "586"-class processor.

The Pentium version is a 12in card with 256Kb of secondary cache, 8Mb of RAM expandable to 72Mb and SoundBlaster 16 compatibility. It supports networking via Ethernet and both VGA and SVGA video displays, driven

by 1Mb of VRAM and an ATI Mach64 graphics controller.

The 586 version will be slightly cheaper and is a 7in card with 128Kb of second-level cache, a maximum of 64Mb of RAM and 1Mb of non-expandable DRAM or video. Both boards will run DOS, Windows 3.1, 3.11 and Windows 95, and come with System 7.5.3 and MSDOS 6.22.

I'll be writing more about these products when I get my hands on them.

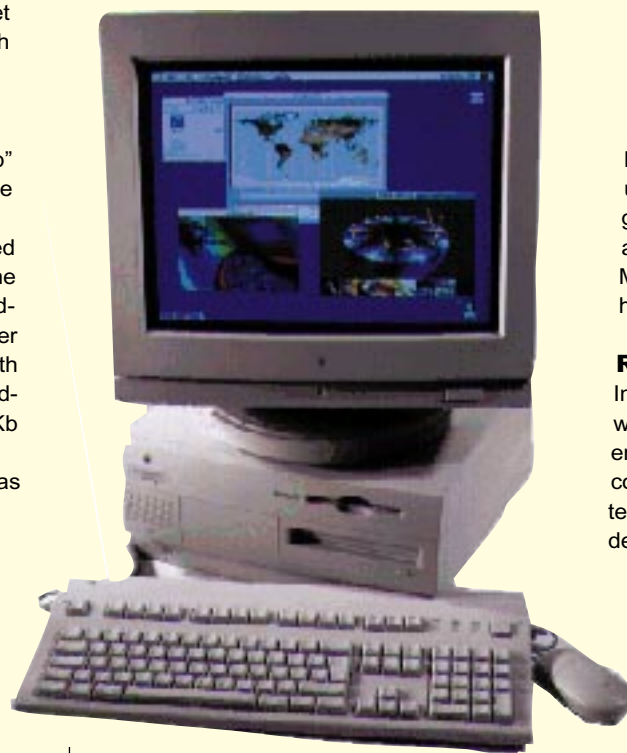
## Goodbye, David

The down side of the Mac news this month is that Dr David Nagel, Apple veteran and head of the R&D Labs in Cupertino, has resigned from Apple to head up a division at communications giant AT&T. David was a likeable, prominent figure on the Mac scene and I for one will miss his evangelistic presentations.

## Rave on

In a bid to carry PowerMacs forward in the 3D graphics and entertainment arenas, Apple has come up with two new software technologies designed to give developers the flexibility they need and get maximum performance from the hardware without breaking the rules laid down in the operating system. The first new arrival is QuickDraw 3D Renderer Acceleration Virtual Engine, or RAVE.

According to Apple, this is a software



*New "Speed Bump" PowerMacs boast even better performance*

## Microsoft Office sort-out: the top ten support questions... and answers

**D**esigned for both 68K and PowerPC machines, Microsoft Office is the standard business office suite for the Macintosh. The current version, 4.2.1, is bigger and better than ever before but sometimes it just doesn't want to work the way you do. Thanks to Microsoft's Mac software support team I've got the answers to the top ten most commonly asked technical support questions. If you're having problems with Office, read on.

**Q When I open Excel I get the message "Cannot find English Lexicon" and the program fails to load. How can I fix this?**

Having made sure that the Excel icon is in the Excel 5.0 folder, the first step is to rebuild the desktop by holding down the Command and Option keys on startup until prompted to Rebuild. Answer yes and then try to run Excel. If the Lexicon message still appears, remove the Registration Database and Embedding Preferences from the Preferences Folder and try again. If it works, then the program will create new preferences and the old file can be deleted.

If this doesn't work, ensure that Virtual Memory is switched on in the Memory Control Panel and restart. Finally, try running the program after booting with a clean system disk.

**Q PowerPoint gives me the message "The Server Application or Source File cannot be found". Why?**

This can happen when inserting an object from the Insert menu. To fix it, first make sure that the Shared Code Folder and Shared Code Manager are in your Extensions folder and that the Microsoft Folder has not been moved from its original position (it's normally installed on the root directory of your hard disk). Next, double-click on the ClipArt gallery application in the Microsoft folder in an attempt to re-register it.

If this doesn't help, there are three more steps you can try. First, try increasing the program's preferred memory size in its Get Info box. Next, check for an extension conflict by turning off all other extensions except those required to run Office. Finally, try removing and re-installing the ClipArt Gallery and files using the Office Setup program.

**Q I'm running System 7.5.2 and now that I've installed Office my Mac won't Shut Down. Why should this be?**

There is a known conflict between System 7.5.2 and version 4.2.1 of the Microsoft Office Manager (MOM). A free patch called Office Manager 4.2.1b will fix this. The only other workaround is to use the applications without the MOM Control Panel.

**Q Why do I keep getting an Error 11 in all the Office applications?**

Error 11 can crop up when running Office on a PowerMac, usually in Word and Excel. To fix this, you need to place a patch called Office 4.2.x PowerMacintosh Update into your Extensions folder.

**Q Is there a way to increase the number of Import/Export file options in Word 6?**

Yes. A supplemental converter kit is available from Microsoft Product Support Services.

**Q How can I open a file created in Word 6 with Word 5?** A supplemental converter is available that lets you open both Mac and PC Word 6 files in Word 5. The converter is installed by dropping it onto the Word Commands folder in the main Microsoft Word folder.

**Q When I bring ClipArt into PowerPoint via the ClipArt Gallery, a grey box is displayed instead of the image. Can I fix this?**

Yes. This problem occurs on PowerPC 603 machines and a temporary workaround is to go to the Memory control panel and turn off the Modern Memory Manager, then restart. This isn't an ideal situation, but it works.

**Q When I launch PowerPoint I get the message "Please Locate the Speller". Why?**

This usually occurs when the PowerPoint preferences file is damaged, and there are two ways you can try to fix it:

**Fix method 1:** Drag the file Microsoft PowerPoint Settings (4) to the wastebasket, run Office Setup in maintenance mode and choose Add/Remove. Under installed components click the option triangle for PowerPoint. Leave the PowerPoint option on the second level selected and click the following options to clear them: Presentation Translators, Help, Quick Preview, Templates, Genographics Drivers, Clip Art Files. Under Installed Components, click the option triangle for Tools. Leave the spelling option selected but click the other four options to clear them: Microsoft System Information, Setup, Fonts and Shared Resources. Now Click continue and then OK. After the program finishes its business run Setup again, choose Add/Remove and select Microsoft PowerPoint and Tools. Click Continue and then OK.

**Fix method 2:** If you can select the UK English Dictionary but cannot spell-check your document, reset the spelling checker locations in the following way. Drag the Microsoft PowerPoint Settings (4) file to the Wastebasket and empty it. Start PowerPoint and on the Tools Menu click Spelling. When the dialogue box appears, click MS spelling and then UK English Dictionary. If you're still having problems remove all installed components and re-install Office.

**Q When I try to load Excel I get the message "OLE2 cannot be found" or "Visual Basic Apps Lib Cannot Be Found". Everything is installed so what's the problem?**

Both of these errors occur on a PowerMac when virtual memory is switched off. Due to the way in which PowerMac code is written, with VM turned off the entire code base for Excel must be loaded into memory in order to run it. So you must have enough free memory available.

With VM turned on, the Mac becomes more flexible and the PowerPC can load its programs in component chunks when they are needed. The amount of memory required to run the software is drastically reduced. Unfortunately, using VM with System 7.5.2 has quite a performance hit and a better solution in some cases is to use a third-party product such as Connectix RAM Doubler. This flips the component switch and uses data compression rather than swapping files to hard disk.

**Q I have to use virtual memory to load Excel but the application startup time is ridiculous. Is there a way to speed things up?**

Yes. Installing Apple's System 7.5 Update 2.0 will take your system software to version 7.5.3 and significantly speed up launch times when using VM.

*If you were having trouble with Office, then hopefully one of these solutions will have cured the problem. Special thanks to Janine and colleagues at the Microsoft Mac Support Team who can be contacted during office hours at the numbers given in our Contacts panel, page 328).*

layer designed to support the low-level rasterisation operations required for interactive 3D rendering. In other words, it's a low-level 3D driver that works in a similar way to traditional 2D APIs except that it provides support for Z buffering, used to perform hidden surface removal; double buffering, to conceal the flashing that occurs when images are drawn and re-drawn on screen, and to decrease those awful tearing artefacts as seen in Doom2; and texture mapping.

RAVE is aimed primarily at specialist application vendors (i.e. games and entertainment developers) and at third-party hardware manufacturers who can produce 3D accelerators. It doesn't replace Apple's existing QuickDraw 3D technology; rather, it works with it to accelerate applications.

### Sprockets abound

Apple's other new technology is Apple Game Sprockets, a series of developer tools designed specifically for game creators. The set comprises DrawSprocket, for 2D graphics routines and buffering; SoundSprocket, for 3D location-based sound; NetSprocket, for developing multi-user titles; SpeechSprocket, for user-independent voice recognition; and InputSprocket, for controlling joysticks and other input devices.

QuickDraw 3D RAVE is a spin-off of the new Sprockets.

Just how good any of these tools are remains to be seen. Whether developers will start to take Mac game development seriously is another matter, but rest assured that as soon as the first Sprocket-assisted title appears I'll bring you a full report. Plus, I'll be checking out both these developments in greater detail in a future column.

**Utility of the Month: Fat Cursors**

**C**atch that cursor! Why give yourself a hard time trying to find the standard cursors on your screen when you could have a nice fat arrow and a big broad I-beam? It's useful enough on a standard Mac screen but could also make PowerBook users' lives a lot easier. The documentation claims that Fat Cursors v1.2.1 works with just about all applications, even those that install their own cursors.

It installs simply and displays its icon at startup. With the set of buttons provided, you can switch from fat to standard cursors whenever the fancy takes you. There are "Fat" Keys and "Find" Keys options — you use the former to enable or disable the fattened cursor while selected modifier keys are pressed. "Find Keys" can be used to select modifier keys to enable (or disable) the "find cursor" function: when invoked, a large circle will flash around the cursor's present location.

Fat Cursors is shareware. It costs \$10 to register and can be downloaded from Scott's Place which has some useful Mac shareware (some of which has been written especially for disabled computer users): <http://www.ecnet.net/users/gnorris/place.shtml>

**Patrick Ramus**

### Mac's best friend

There's a wonderful little program I've been playing with, called Dogz. "Dogz — your computer pet" is a hilarious piece of software that gives you your own virtual dog on the Mac.

You start by adopting one of five puppies, each a different breed with its own characteristics. You train your puppy

using various toys and treats, and watch it grow into a fully-fledged pooch.

The things you can do with your dog include playing fetch with a ball, teaching him tricks, and indulging in a bit of tug-of-war with an old shoe. You also have the option of making him into a Guard Dog screensaver when you're not at the keyboard.

Totally useless but tremendous fun, Dogz is a must for all mad Mac owners.



### PCW Contacts

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Microsoft's Mac Software Support  
Team 01734 271580; Fax 01734 271974  
Microsoft 01734 271676;  
Web [www.microsoft.com](http://www.microsoft.com)

Dogz is £14.99 from Mindscape  
01444 246333