



Message ends...

So long, farewell: the Macintosh column bows out of Hands On, with Howard Oakley looking at the practicalities of getting your Mac onto the net and using it for email and all things web-like.

A common thread in much of my readers' correspondence is how to get your Mac onto the internet, or how to make it all work when you've got an account. To give any coherent account of this would take a complete book, and by the time it was published, it would have long since become out of date. So allow me to describe the suite of tools which I use. As two of my anchor applications have just undergone revision, now is as good a time as any.

Connecting

Although I have used GeoPort and other avant-garde modems in the past, I now play it safe and use a reliable Motorola 3400. Driving that is the Power Mac native Open Transport 1.1 (which I will upgrade to 1.2 when the British localised version of Mac OS 8 ships in the next few weeks) in System 7.5.3r2. This has proved very stable for me, with only a few applications being notable exceptions.

That combination of hardware and system-level software is the foundation, providing all the low-level services for FreePPP 2.5v2 (Fig 1) which actually makes the connection. When FreePPP 2.5 was being released, there was a slip-up which caused a lot of confusion over the version numbering, and you should make sure that your copy is at least 2.5v2. As it has proved unswervingly stable and does everything that I need, I have not tried its more recent incarnations, although I expect I will have to when Mac OS 8 is installed.

Serving

As I was one of the earliest Demon "tenner a month" subscribers (just missing the hundred who got it all started), I have stuck



Fig 1 FreePPP is the lynch-pin of a modern Open Transport-based internet connection

with Demon and with SMTP, its standard method of mail delivery. I used to run LeeMail, an internet mail application which can talk both SMTP and POP protocols, but switched to the free Apple Internet Mail Server (AIMS) when that became available.

AIMS is a real mail server, which can talk SMTP to your ISP's SMTP servers and talk POP to your local mail applications. To do so, it has to be started once the internet connection is in place, so I have configured FreePPP to open it "on connect". Provided that I remember to connect my mail application to AIMS when it is online and to quit AIMS once the internet connection has been broken, this works a treat.

Another essential tool is Internet Config, now at version 1.3. Before this came along, every net application had screen after screen of dialog settings and, for instance, you had to make sure that your signature was the same in each. Internet Config is now used by most net tools as a repository of common information; a great simplifier.

Mail

I have nothing against Eudora Light or Pro, but a year ago I changed over to Claris

Emailer (Fig 2, p303). Its latest release, version 2.0, is a real gem, with a much-improved interface and wonderful features. For various reasons I severely under-use it: although I am a member of CompuServe, I much prefer to use Navigator (now MacNav)

to cruise its forums, so Emailer's ability to work with several different mail systems passes almost unnoticed. But when I do have to return to Eudora, it is the address book which I notice most. Eudora has, to my mind, never got this right, while Emailer makes it so clear and simple.

News

I have considered several different news readers over the years, but none can compare with the best offline reader of them all, SW15's NewsHopper (Fig 3). My only real gripe with it had been that it did not handle broken connections very well, but this has now been fixed in its latest release, version 1.3.

Normally I make my first connection with my ISP to receive mail, which is collected by Emailer, and for NewsHopper to get the titles and details of all new messages in my chosen newsgroups. I disconnect, mark those news messages which I want downloaded and compose any replies to email. I then re-connect, download the marked news articles and exchange mail again. NewsHopper is ideal for this sort of quick and efficient approach.

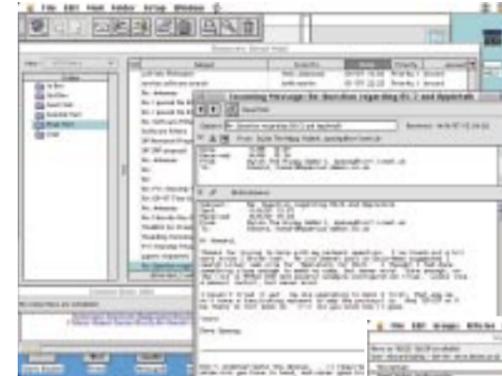


Fig 2 (left) Claris Emailer 2.0 has undergone a major facelift, but retains its versatility and simplicity **Fig 3 (below)** NewsHopper is a remarkably fine offline news reader. It downloads details of new articles, allowing you to choose which you wish to download in full

In addition to improvements in dealing with broken and troubled connections, NewsHopper 1.3 has other, subtle enhancements. Perhaps the most useful is that for messages longer than 5Kb it now displays the size of the message. If you read any of the .binaries newsgroups, you will quickly discover how valuable this is.

Browsing

I have Netscape Navigator 3.0 and Microsoft Internet Explorer 3.01 installed, but I only use the former for internet web work. I cannot offer a rationale for this, except that I have used Navigator since before Microsoft admitted that the internet officially existed.

Version 3.0 needs plenty of memory, so I

have allocated it 15Mb. It does annoy me when it seems to halt in its tracks to empty files from its cache folder, but it works reliably. I have nearly a dozen plug-ins, too, ranging from Apple's Cocoa authoring support to the Acrobat PDF Viewer.

The only browser adjunct I use to any extent is Apple's Project X, a free experimental application in which you "fly

through" a 3D tree of links. This is not only enormous fun, but a sound start to any sort of research on the web.

FTP

Before web tourism really took off, the greatest attractions of the net were the huge repositories of information in FTP servers. When I was getting started with neural networks I came across a site which contained books, theses, source code, applications... all manner of materials to help me. Early versions of Navigator were not particularly quick or convenient to use for such file transfer, so I tended to use Fetch, a freeware application developed at Dartmouth College, USA. Now in version 3.0.3, I still prefer it when I'm having a serious FTP session as it has retained an edge over the FTP facilities in web browsers. Each of the specialist FTP archives which I monitor has an entry in Fetch, and I can quickly locate files that I need and perform multiple downloads and the like, driven entirely by the mouse.

Pulling together

This combination of applications may seem like a patchwork quilt, but the end result is flexible and works just how I want. It is scalable, catering efficiently with quick connections when I just want to collect and send mail, but having the power to make serious research relatively easy. And I can forget learning the esoteric commands to drive FTP from a command line, instead being able to enjoy having my Mac. Isn't that what it's all about?

■ Correspondence relating to this column can be sent to the postal and email addresses on page 12.

Ten online documentation tools

If you need to create online documentation for Mac users, beware. No matter what you use, you'll annoy at least some of your readership. One answer is to assume that your readers will have Microsoft Word: that is a quick way of getting their blood to boil, but here are ten further ways to achieve the same result.

1. DocMaker: a shareware system that makes documentation applications. Convenient for users, provided that you do not need to support other platforms, which it does not. Available from most online sites.
2. FrameMaker and FrameReader: compose documents using Adobe FrameMaker, view them with freely distributable reader application. Versatile content, but FrameReader is massive and hard to come by.
3. SimpleText & TeachText: free, and bundled with Mac OS, but using pictures is more complex, and there are strict limits on document length. At least you'll be brief.
4. Adobe Acrobat: blossoming into the most complete and widely used system, but document creation tools are relatively expensive and the reader is demanding on resources. Some users just hate it. Excellent cross-platform support, except for the Newton.
5. Apple DocViewer: old, and requires an authoring tool which is not readily available. A nice idea which never got the attention it deserved.
6. Envoy: an also-ran which was eclipsed by Acrobat, although many preferred it.
7. PostScript and GhostScript: easy to author (just print to disk) but a real pain to read. A last-ditch measure if you have to create your documents on other platforms, maybe.
8. HyperCard: a brilliant idea which can go far beyond documentation, but is sadly let down by Apple's lack of determination to fully develop it. Many Mac users now lack a HyperCard reader.
9. HTML and browser: all the rage, and there can be few users now without a suitable browser. Let down mostly by design weaknesses, but very versatile and dangerously popular. Easy to make longer documents incomprehensible by fragmentation.
10. Plain Text: only if you really have to, or the message is so short and simple that this is all you need. The spartan approach will demonstrate how you can focus on essentials.

PCW Contacts

Apple Computer is on 0181 569 1199, and has web home pages at www.apple.com and www.euro.apple.com
FreePPP 2.5r2 is freeware and is available from most online Mac archives.
AIMS is free, and widely available. Its successor **AIMS** is being developed by Qualcomm <www.qualcomm.com> but is free at present.
Internet Config 1.3 is freeware, widely available, and supplied with many Mac internet tools.
Claris Emailer 2.0 is available as a £34 upgrade to the freely distributed version 1.1, from Upgrades Unlimited www.unlimited.com.
NewsHopper 1.3 is a free upgrade to existing users. The upgrade and a demo version are available from the NewsHopper folder on ftp.demon.co.uk.
Netscape Navigator is available from home.netscape.com and its mirrors.
Project X is available from Apple sites (see above).



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.

There 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

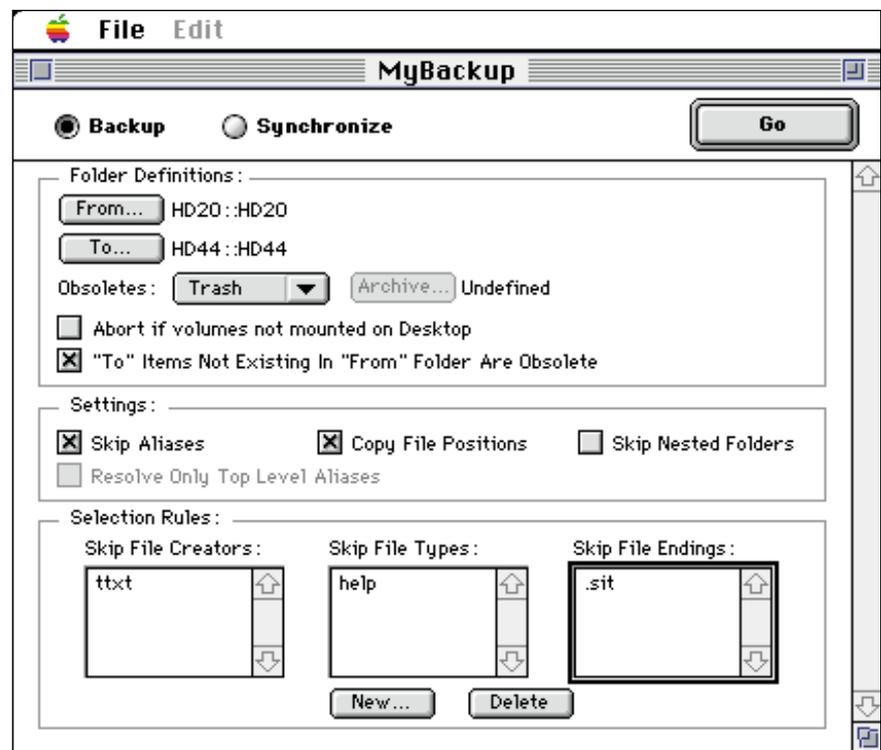


Fig 1 Backing-up is vital before performing significant software surgery. If you have a commercial product like Dantz Retrospect 4.0, then you will have little interest in the shareware product, Synk, shown here. But Synk has much wider appeal as it costs only \$10

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.

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.
Apple Computer 0181 569 1199;
www.apple.com and www.euro.apple.com
Newton pages www.newton.apple.com;
Macintosh pages are at 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.



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.

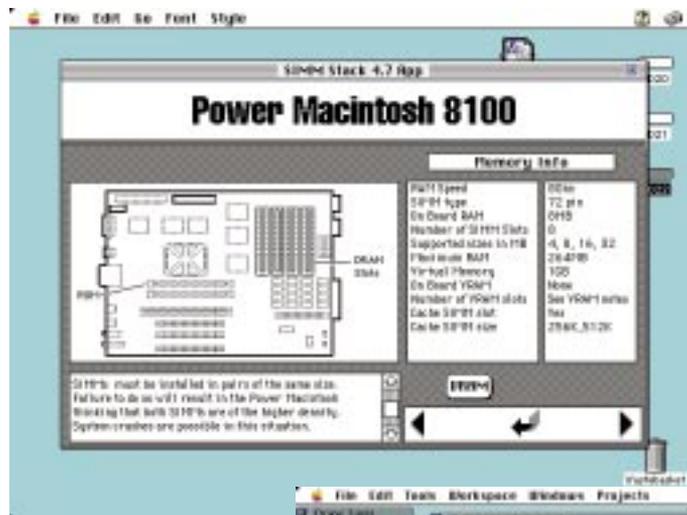
Spiders, heights and confined spaces are among the most popular of phobias. Among Mac users a terror of opening the case and doing anything to the "hardware" ranks almost as high. My wife runs away and hides when I start performing surgery on one of my Macs, although my success rate would do justice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

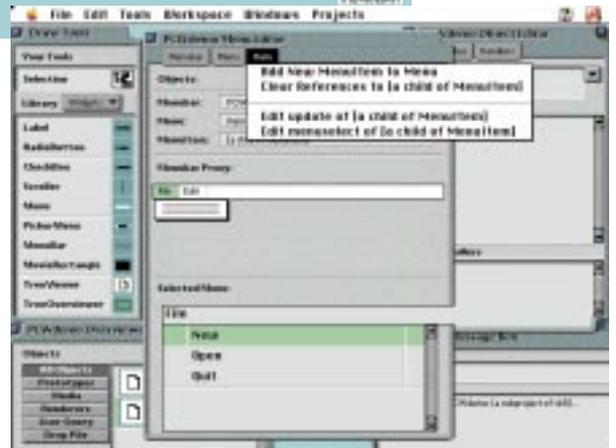
Anatomy

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: SKB 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



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.

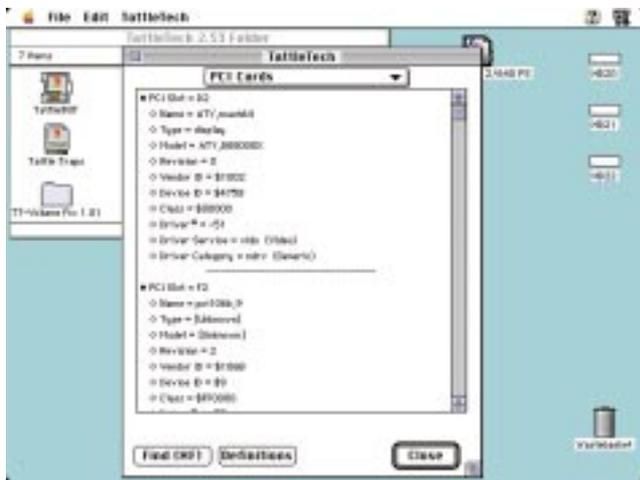
Memory

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

p290 >

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

Howard Oakley loves to hear from Mac users and can be contacted via the usual PCW address or email mac@pcw.co.uk.
 Apple Computer 0181 569 1199;
www.apple.com and www.euro.apple.com
 Newton pages 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.

Connections 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!"

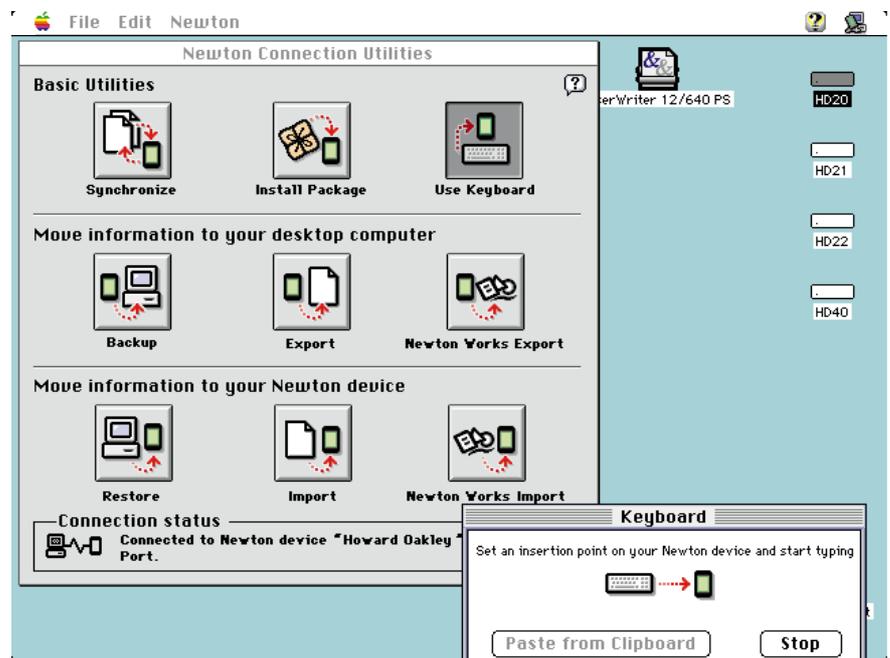
On the face of it, Apple's recent cuts seem dire and interpretations stated as fact in some quarters of the press make them seem even blacker. But press releases of this magnitude are carefully worded and repay careful re-reading.

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.

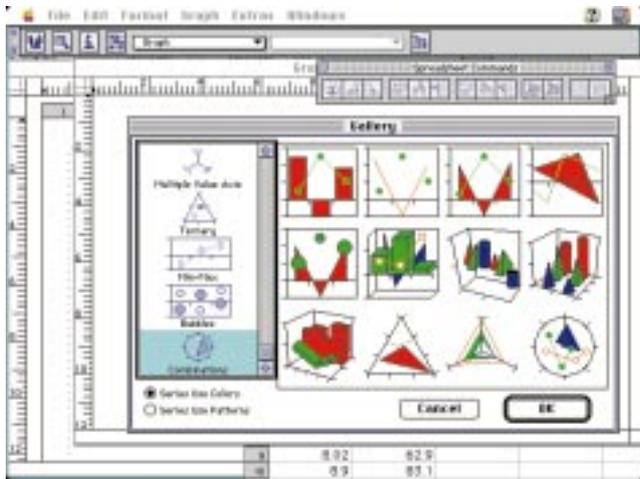
Just as there will continue to be droves of Windows 3 and 95 users as we enter the new millennium, so Mac OS applications will continue to be popular long after Rhapsody's Yellow Box ships.

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
RagTime 4 from LanMarque 01932 222821; email info@lanmarque.co.uk
CodeBuilder costs £69.95 from Full Moon Software Distribution 01628 660242; email 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....

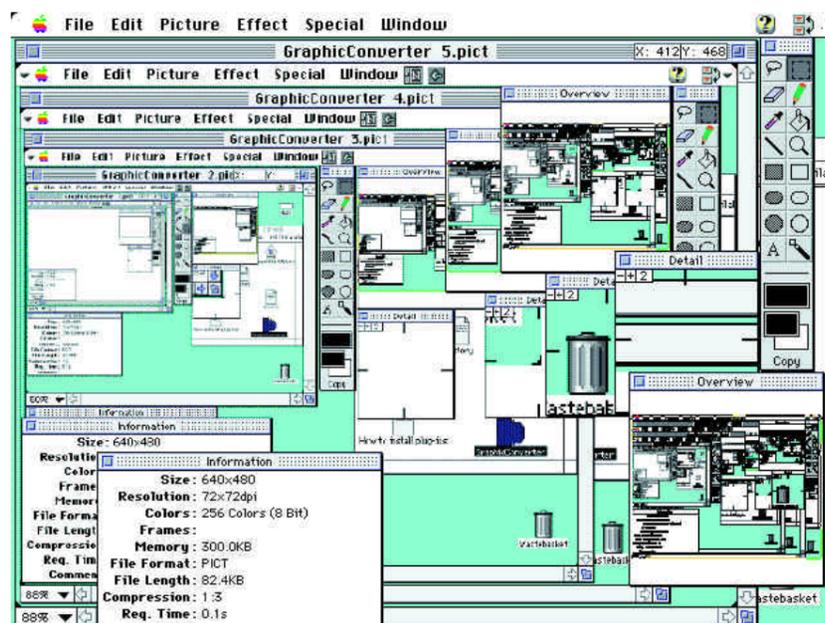
Life with Apple is nothing if not exciting. Just a few issues ago I was advising you how best to prepare for the onslaught of Copland, and now we're looking forward to seeing the first releases of Rhapsody instead, while some are already getting started with BeOS. Thankfully, however different Rhapsody 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.

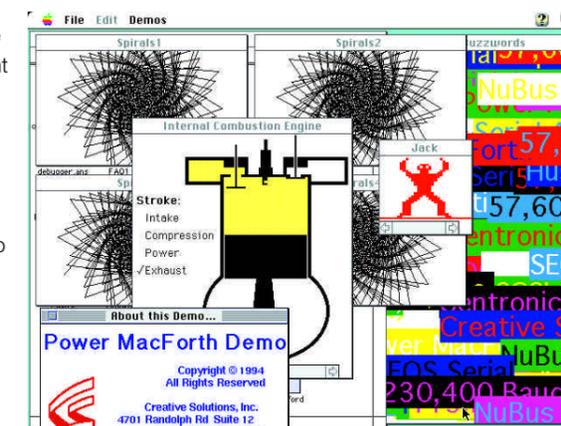
Go Forth

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

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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.

PowerPC 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.

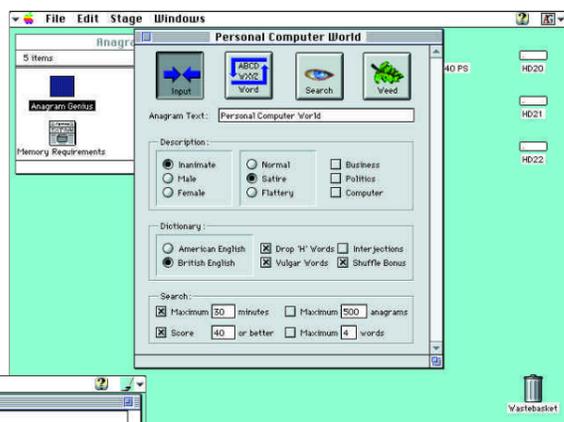
While my friend is getting value for money from his multi-processor system,

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.

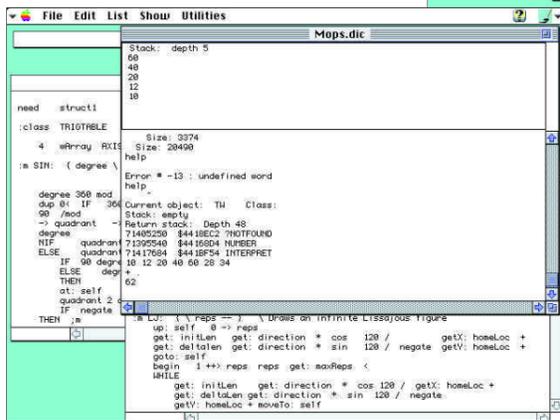
All these years after the first Power Macs, it may seem extraordinary that parts of the Mac OS System software have still not been ported to run native on PowerPC Macs. Thankfully, the remaining unconverted sections are among the less frequently used parts of Mac OS so you will be unlucky to find applications 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.

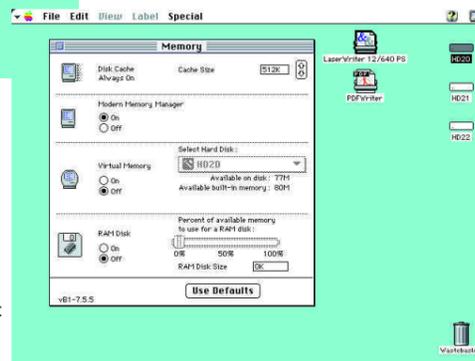
- Add more fonts than you could ever recognise, let alone use. Then every application and utility which contains a Font menu will have to spend ages putting the list together.
- Use LocalTalk rather than Ethernet networking. Because of physical limitations, the cheaper and simpler



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.

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Apple Computer is on 0181 569 1199 and has web home pages at www.apple.com and www.euro.apple.com.
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/
MOPS 2.8.2 is freeware by Mike Hore and available from ftp.taygeta.com/pub/Forth/Mops, with its home page at 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.

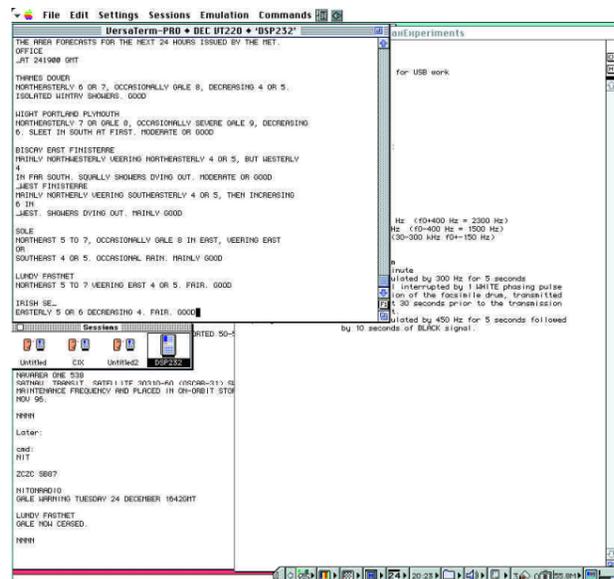
Whatever Apple does with NeXT, it seems sure that its combined products will be more exciting and that it will regain some of the initiative and leadership that has been on the wane. High on my wish list is a replacement filing system for MacOS, which will spare us having to patch up with Disk First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

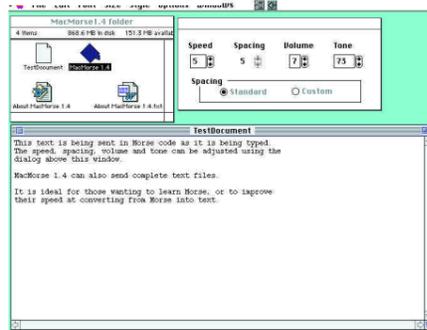


Left AEA's DSP-232 radio modem connected to VersaTerm Pro, showing a received Navtex weather forecast. An hour or so later the software crashed, leading to comms chaos

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.
- **[f]** 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.
- **[f]** Finder: the Finder itself.
- **[f]** Fonts: installed fonts and PostScript fonts.
- **[f]** Hosts: definitions for TCP/IP connections.
- **[f]** Launcher Items: aliases which appear in the Launcher.
- **[f]** 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.
- **[f]** 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.
- **[f]** System: the System file itself.
- **[f]** 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.

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- **[f]** Application-specific folders and files.

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

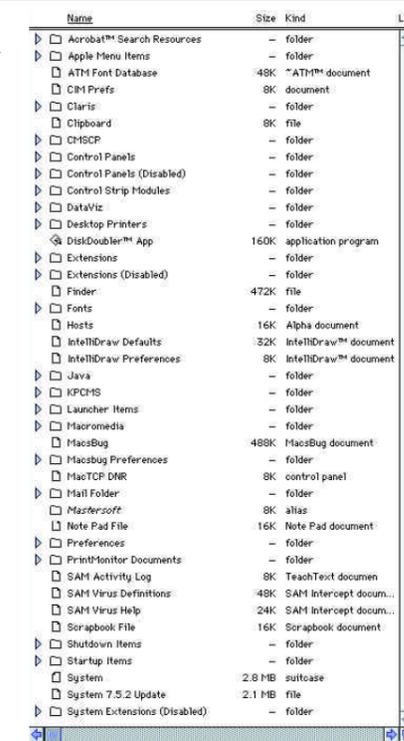
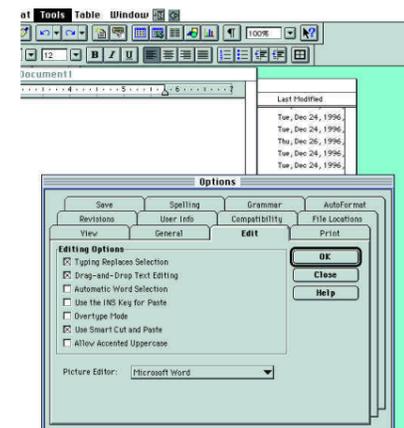


Fig 1 The System Folder contains a strict hierarchy of folders and files. When installing software, give the Finder a chance to put files in the right places, but correct any mistakes

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.

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Apple Computer: 0181 569 1199. Web address www.apple.com and www.euro.apple.com

AEA radio modems and radio hardware are distributed by **Nevada: 01705 662145.** Web address 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/