Troubleshooting

Things aren't always rosy in the OS X garden, but with **Rob Buckley's** troubleshooting guide, you will

Mac OS X

have a blooming relationship with your OS once more

There used to be two familiar sights in a Mac user's life. The first was a desktop, filled with icons; the second was also an icon: a little computer icon with a smiley face for a screen. This second sight was so familiar because it was the first thing that appeared when you switched on your Mac. Or, more importantly, when you restarted it.

Restarting used to be a 'popular' pastime with Mac users. Every time an application crashed or froze, it was time to restart the computer. Every time you added a printer, scanner, external drive or even a mouse to the system, restart time was just round the corner. Installed a program that did something slightly exciting? Restart time.

And it wasn't even as if application crashes were a rare thing. Merely sneezing or daring to sit down too hard near your Mac could make the most simple of programs crash, and nothing short of a lot of swearing and a swift flick of the power switch/mallet at least three times a day would keep that puppy running smoothly.

Apple knew something had to change and spent a lot of the 90s trying to retrofit the Macintosh OS with the bells and whistles necessary to make crashes a thing of the past. Eventually, Apple decided it couldn't do it, and so bought an Operating System that could: NEXTSTEP, based on Unix. After a few more years of retrofitting, Mac OS X was born and there was a sudden outbreak of stability.

Relative stability that is. There are still problems, some easy to come across, others well hidden. Trouble is, even by the best estimates around five percent of any computer program has bugs, meaning that, charitably, Mac OS X probably has 50,000 or so bugs waiting to be found. Some already have been, but at any moment, you could be the next Mac user to discover a problem.

Fortunately, there are easy ways to combat these problems and even prevent them – if you read on, anyway.

"Merely sneezing or daring to sit down too hard near your Mac could make the most simple of programs crash"

Getting more help

MacFixIt

www.macfixit.com

If it's not on the Apple Support site, it's going to be here. MacFixIt is the central reporting house for Mac owners who have a gripe to share – and hopefully a solution as well – about the latest software and hardware releases. Annoyingly though, you have to pay to access the older archives.

Mac OS X Hints

www.macosxhints.com

Not just for troubleshooting, Mac OS X Hints is a collection of ways of making your OS X life better. Even if your problem is uncommon, it's likely that the other person who has had it will come here and post how they fixed it.

MacInTouch

www.macintouch.com

A news site as well as a fix-it site, MacInTouch has been around for a decade now. Its best features are its software reports – endless lists of reader problems, together with solutions sent in by other readers that can stretch back for years. You might even be able to get Office X to work if you read it for long enough.

The common complaints

Most things people stumble over are not usually that hard to solve. They're often just an inability on the part of computer programmers to realise that what they thought was really, really obvious isn't so obvious to the rest of us. Who, for instance, thought that moving a CD to the Trash was the best way to eject a CD?

But what if that stuck disk refuses to eject? There's no eject button on most Mac CD drives, so there's no 'hard eject' mechanism to force it to come out. That's an actual problem. So how to fix it? The most common reason a CD won't come out is that it is still in use, but you won't find that out until you try the drag-to-the-trash method of ejecting. Even so, what does 'in use' mean? It could mean that iTunes is playing it. But it could also mean that there's an application running off it, so you'll have to quit the guilty application – or quit all your applications if you don't know which one it is. At the absolute worst, you might have to restart your Mac, keeping the mouse button held down at start-up to force open the CD drive.

This, though, is easy stuff. Once you've reached a certain level of skill with OS X, it's only the 'odd things' and the things that are genuinely wrong that will give you any real bother. 'Odd things' are different from person to person. To a Unix user, all the underlying ideas are easy in OS X; it's finding what you want in the maze of graphics that is the problem. To a Windows user, it's not having a 'Start' button, or trying to open an application using the 'Return' key. To a user of OS 9, it's pressing

> "Unfortunately, it's not always obvious to the average Mac user what permissions a certain file or folder has"

Left: When they go wrong, permissions can be enough to make a grown person cry

the 'Apple' key and 'N' only to find that you get a new window instead of a new folder in OS X. But almost everyone tends to get confused by one particular new feature of OS X: permissions.

Paranoid times

Back when the Mac was born, the idea that it would be anything except one individual's personal computer was a far-off idea. Multi-user computers exposed to the world via the Internet were the realms of the US military and research labs. Even more so, the idea that a Mac user would have anything less than total control over his or her computer and be told what to do by it was anathema to Apple. So the Mac let its user do just about anything he or she wanted to, short of deleting the entire OS.

The Unix world is not so trusting. Every single file and folder on a Unix computer has a list of things that users can do to it, depending upon who they are and what 'groups' they belong to.

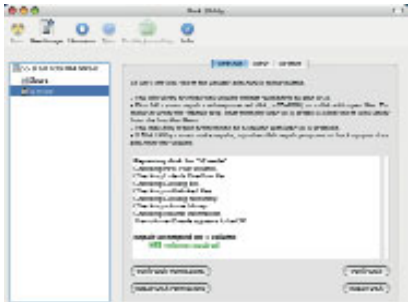
Unfortunately, it's not always obvious to the average Mac user what permissions a file or folder has. So unsuspectingly, you might drop a folder into the Trash and then try to empty it, only to discover that you

Step-by-step | OS X | Solving problems with Disk Utility

When things aren't going quite the way you'd like, a quick blast of the Disk Utility could be just

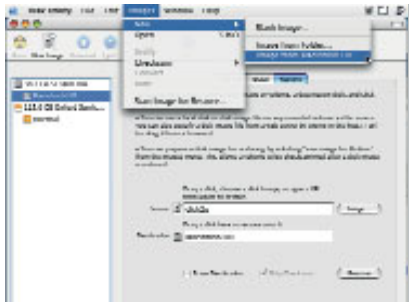
1: Repair permissions

One of the first steps to take when experiencing odd system behaviour is to use Disk Utility to repair permissions on your start-up disk. Don't try to repair permissions on another drive, though.



2: Repair Disk

Start up your Mac using your OS X installer CD. Although not as thorough as third party disk utilities, Repair Disk will usually repair small to medium-sized problems with your disk's file structure.



3: Make a backup

If your disk gets wiped, Disk Utility can also restore it – provided you make a backup. Click a disk in the left-hand side pane, and create an image from it using the 'New' command on the 'Images' menu.

If you suspect you have a networking problem, turn off the usual suspects from here

don't have the permissions to delete one of the files in the folder. Panther, fortunately, has made it easier to discover and remedy this problem than earlier versions of OS X: it will at least warn you that you're about to drag a locked file into the Trash. You can also open the Trash, highlight files or folders while they're still in there, and select 'Get Info' from the Finder's 'Edit' menu to discover what your permissions are and then alter them.

You won't be able to do this or run any troubleshooting software, however, unless you have an administrator account (you can tell from your User Account Systems Preference whether you have a 'standard' or 'admin' account). If you aren't an administrator, there's a whole lot of things you won't be able to do in OS X, and almost nothing you can do to fix it if it goes wrong in any substantial way. If you are intent on fixing your own Mac, make sure you have an administrator account to hand even if you don't log in using it, otherwise the only files you will be able to fiddle with will be your own.

No signs of life

All of this is fine of you have a computer in some kind of working order. But what if yours just sits there quietly, doing nothing when you try to start it up? Now it could be a hardware problem at this stage: a lightning strike has nuked your hard drive, for instance. But we're hoping otherwise. Check your power leads aren't loose; unplug all your peripherals (with the exception of your keyboard and mouse); see if moving the power plug to a different socket helps; if you've added an AirPort card, additional memory, or PCI card, try taking them out again (remembering to de-static yourself first); if you're using a laptop and you're not running off the mains, plug in the power adaptor and remove the battery and if you happen to have a spare power lead or battery, try using that instead. If none of that works, your luck's probably out and it's time to get the hardware specialists in.

But there's still more that can go wrong between pushing the power button and getting to your desktop. As soon as you press that button and power reaches your Mac's circuitry, it looks to something called 'Open Firmware' to tell it what to do next. This is a chip containing a slew of settings about devices, such as your Mac's memory, and which device to boot off. Sometimes, poor old Open Firmware gets a bit confused and you need to reset its data so it can start from the beginning and let you boot up. To get to the Open Firmware prompt, you'll need to hold down four keys at start-up: 'Apple', 'Alt', 'O', and 'F' (for Open Firmware). You'll be presented with a nasty grey screen and an arrow prompt. Just type these commands in and you'll be fine: reset-nvram (hit 'Enter'); set-defaults (hit 'Enter'); reset-all (hit 'Enter'). The machine should reboot, and if you've found the correct source of your problem, all should be well.

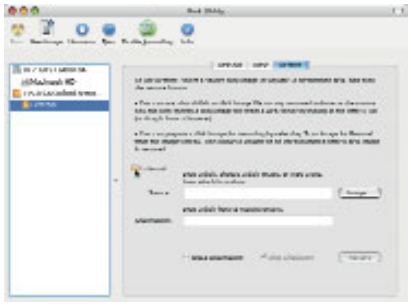
Pushing the PRAM

There are more settings, including the date and time, stored in another chip called the 'PRAM'. Just as Open Firmware can get confused, so can PRAM. Flush it with another ambidextrous set of key strokes at start-up ('Apple', 'Alt', 'P' and 'R') if you're having trouble getting past the boot panel and those 'Starting Network Services' type messages.

In rare situations, you might not make it that far. You get the Apple logo and then nothing. This is usually a symptom of a corrupt 'kernel'. Think of the kernel as the foundations of the OS: everything that makes the computer do more than show you a grey screen is built on it. If the kernel is corrupt (or missing – it has been known for people to boot their computers into OS 9 and move their 'System', 'Applications' and 'Library' folders, together with all the files beginning 'mach' into a folder marked 'OS X stuff' to make it neater for them when they're using OS 9), you're screwed, although a brave soul can try to copy across a clean one from another copy of OS X.

More likely, however, something that communicates with the kernel directly is to blame – a common symptom of this is the 'kernel panic' screen, which tells you something is wrong with your computer and needs to be restarted (the OS X 10.0–10.1 kernel panic message was nasty white text on black background dumped on your screen with no clues as to what was happening). Usually it's a peripheral that's gone wrong or a badly written piece of software for connecting a peripheral to the computer that's known as a driver. Unplugging all your peripherals is a good way to test for possible causes of a repeating kernel panic, but usually, they are infrequent and

the tonic



4: Restore that disk

Restoring is a matter of locating your backup image using the 'Restore' panel and then applying it to your replacement disk. You can clone an entire disk by dragging it into the 'Source' and 'Destination' slots.

What the hell is Terminal?

Underneath the eye candy of OS X beats the heart of an Operating System that really likes people to type instructions, not mouse them. These instructions, crafted over the years by programmers, are immensely powerful and allow you to do just about anything to your Mac – and Terminal is the way to enter them.

You could, for instance, go quietly mad spending hours trying to delete an item in your Trash; but a double-click to open up Terminal, a swift type of 'sudo rm -fr .Trash/*' and a password later and the transgressor is obliterated. Which is nice. But an equally swift type of 'sudo rm -fr .Trash /*' (note the extra space) and a password later and before you know it, the entire contents of your start-up disk disappears. Which isn't.

In regular use, the Terminal is mostly only for 'people who know what they're doing', but sometimes, you need it if you don't fancy logging out or rebooting. If you're still using OS X 10.1, the majority of problems – and there are a lot – are only fixable via the Terminal.

Even with later versions of OS X, a very small percentage of problems simply can't be fixed any other way, and if you're ever forced to use Single User mode, you'll have no other way to do things except Terminal commands. So if you really want to get into hard-core troubleshooting, learning the basics of Terminal and Unix are unfortunately necessary.

Reinstalling OS X

Sometimes, usually after you've been trying to fix something for too long and you've done something a little *too* daring or clever, you realise that your precious copy of OS X has given up on life. Time for a reinstall.

You'll need to find either your OS X installer CDs or the Software Restore CD/DVD that your computer came with and then reboot off it (insert the CD/DVD, restart the computer and hold down the 'C' key as your Mac starts).

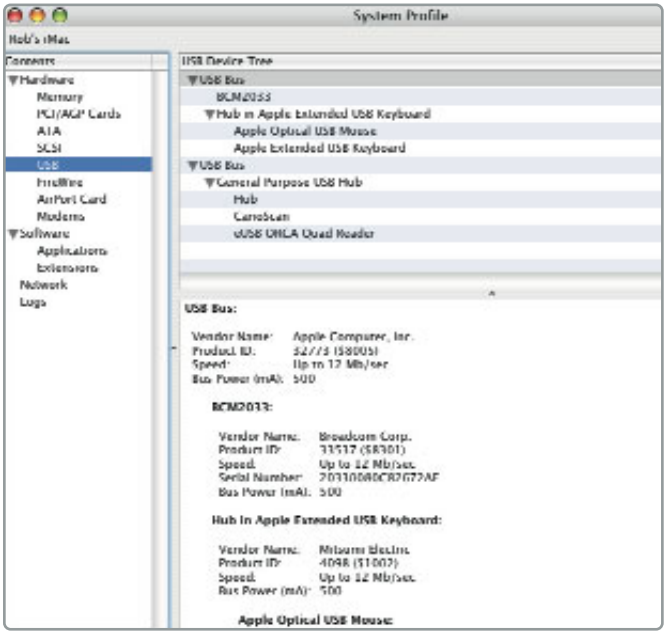
You'll then have a choice: 'Erase and Install' or 'Archive and Install'. If you're not particularly attached to your data; all the applications you've ever installed; any device drivers you've downloaded, or your personal settings and preferences, go ahead and erase the disk: it'll make sure there's nothing wrong with your disk's file structure, at least, and if you still have problems afterwards, you'll know it's almost certainly a hardware issue that caused all this grief in the first place.

If, on the other hand, you want to avoid that much hassle, pick the 'Archive and Install' option and tick the 'Preserve Users and Network Settings' box. After reinstalling OS X, you'll find your 'Users' folder intact and folders on your hard drive marked 'Previous System folder' and 'Previous Library'. This route is slightly riskier than 'Erase and Install', since if you have a corrupt NetInfo database (the source of all your Mac's user data) or network settings, these will be preserved after the reinstallation and you'll have just wasted your time. If you think these might be the problem with your system, don't check the 'Preserve Users and Network Settings'. You'll have to re-enter all your user and network information and your old home directories will be in a 'Previous Users' folder, but you won't have to do another reinstall later.

One word of caution: don't copy across more information from your archives than you need to. Every file or folder you copy into your fresh installation increases the risk that you'll bring the cause of your original problem over with you. Just take the bare minimum, and nothing more.

Exterminate troublesome programs with Activity Monitor

"Verbose mode may not be pretty, but you'll get all the messages of distress your Mac has put out"



Is anybody out there? The System Profile lets you know if your Mac is receiving a signal from peripherals and also contains a wealth of other essential information about your system

unpredictable things. Running the Apple Hardware Test CD that came with your Mac can also help find hardware problems: boot off it like an OS X installer CD and then run the tests to see what might be wrong.

The hardware test CD is also useful for the opposite problem: the peripheral or printer that has no effect whatsoever on the Mac. If you can't print, the 'System Profiler' in your 'Utilities' folder and the hardware test CD can both tell you if your Mac is receiving signals from your invisible printer or not. If it can't, you may have a dodgy lead or you may have too many peripherals connected to an unpowered USB hub, overloading it and forcing it to turn off all its attached devices. If the signals are getting through, you may need to fire up a copy of Printer Setup Repair (see walkthrough on page 37) to repair your printing system. You may not have the right drivers installed for your printer, but you can usually download the correct drivers from the manufacturer's Web site.

Keep it safe

If you do get as far as the boot panel – but no further – make a note of which service stopped the Mac in its track; if it's something that relies on having a network, for example, you'll know there's probably something up with your network settings. Holding down the 'Shift' key at start-up can help you get past these boot-up problems: it puts the computer into Safe Mode (another one of those ideas Apple has started to borrow from Microsoft), which loads a minimal system and allows you to get into the Mac's graphics-based interface to change settings, if possible. If it's not, it's time to learn some more sets of start-up key strokes (somehow, holding down F8 at start-up to get all these choices seems preferable): 'V', 'Apple' and 'S'. The former puts you in Verbose mode: bye, bye eye candy, hello nasty white on black text. It may not be pretty, but you'll get all the messages of distress your computer may have been putting out until this point and maybe a clue as to what's causing the problem. The second set of key strokes puts the computer into Single User mode: you are given only a command line and nothing else. Together, assuming you have the Unix experience necessary, you may be able to hold out against that looming OS X reinstall you've been fearing.

Not networking

Typically, Verbose mode will reveal that something can't be accessed on the network or that permissions are wrong for some directories. The latter can be fixed with Disk Utility (see walkthrough on page 32), but the former is usually a sign of damaged network preferences. Use Safe Mode to get into your computer, make arbitrary changes to the network settings, save them, and then change them back. Also, turning off network interfaces you don't use (such as Ethernet, AirPort or Internal Modem) is a good help in situations where your boot panel freezes, since your Mac may be waiting for a response from these unavailable networks. Equally important is to make sure you have them listed in the right order in the 'Network' section of the 'Systems Preferences'. An AirPort connection, whose base station tries

to connect to AOL for Internet access, is perfectly valid as a network configuration, so OS X will look no further down its list of connections than AirPort. Which is fine, as long as you're only trying to network with other AirPort users within range. But since AOL UK doesn't support AirPort Base Stations with its software, no Net connection can be made. Even if your internal modem is properly set up for Internet access, you'll never be able to network with other computers using AirPort and obtain a Net connection unless you swap their order in the 'Network' interfaces list.

Corrupt preferences can kill programs and Operating Systems, depending upon whose preferences they are. Safe Mode will help you overcome the corrupt preferences of a log-in item, since it stops all log-in items from running, but obviously it won't fix anything particular to an application once you've made it through to your desktop.

Other enemies of application stability are third party programs that modify OS X's behaviour; particularly well known culprits are things like Default Folder, extra menu bar items, or any of Unsanity's 'haxies' such as WindowShade that use its Application Program Enhancer (APE). If you are experiencing odd crashes or slow performance, locating the APE preference pane (in any of the 'PreferencePane' folders in the various 'Library' folders of your hard drive), dragging it to the 'Trash' and then logging out and back in can often bring merciful relief.

Even worse than the application that crashes is the application that won't go away. Force quit (available from the 'Apple' menu or by pressing 'Apple', 'Alt', 'esc') allows you to terminate any badly behaving application with extreme prejudice. Sometimes even that isn't enough, and you'll have to use the Activity Monitor's 'Quit' function to kill a program that refuses to die.

Oldie but goodie

That covers most of the possible problems with OS X itself. Like a pensioner in a retirement home, however, OS 9 waits ready for the slightest bit of attention you might give it. Run some old program and up it pops ready to do its best to help you in case you'll visit it again.

In comparison to OS X, OS 9 is a dream to fix. No keystrokes to memorise for Classic since the 'Advanced' tab of the 'Classic System Preferences' provides its own Safe Mode ('Turn off Extensions') and permissions fixer ('Rebuild Classic Desktop'). If these simple tools aren't enough, a

Turn off the extensions in Classic to reach Safe Mode

glance in a couple of folders is usually enough to fix most problems. Unlike OS X, and its cryptic naming system and hidden folders and files inherited from Unix, OS 9 wears its files on its sleeves: problem with QuickTime? Just drag all the files marked 'QuickTime' out of the 'Extensions' folder in your 'System' folder, download the latest installer and then reinstall it. Your corrupt files are a thing of the past. Similarly, there's only one folder that will contain all the computer's preferences rather than numerous ones inflicted on us by OS X

I've forgotten my password

Memory can be a funny thing, but forgetting your password isn't. Fortunately, there are ways around a lost password. One is to create a second administrator account that is never used – except in dire emergencies – when you first get your computer. Give this account a password that you *cannot* forget or write it down and stick it in a safety deposit box. Then you can log in with this second account and change your normal account's password via the System Preferences, since an administrator is free to change the password of any other account.

Forgetting two passwords is as easy as forgetting one, so this approach isn't watertight. Apple has cleverly realised this and includes a utility on the OS X installer discs to reset passwords, even when you can't remember any administrator passwords. You need to be booted off your installer CD to run it, however, so put your OS X/Software Restore CD/DVD into your Mac, restart it, and keep the 'C' key held down until you reach the Installer screen. You'll find a 'Reset Password' item in the Apple menu that you can use to regain access to your Mac.

Essential troubleshooting kit

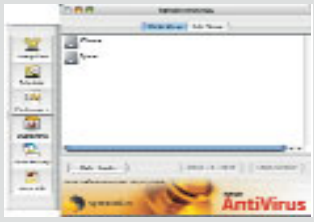
You may find a problem Panther doesn't have the tools to fix or you might need some extra kit to get out of a pickle. Here are our recommendations...

Retrospect Express/Retrospect
www.dantz.com

The premier back up utility, available in both consumer and professional versions, it can save your data to practically anything. It can also back up other computers on your network, including PCs.

Norton Disk Doctor
www.symantec.com

Although OS X's built-in tools are useful, Norton Disk Doctor is still the must-have of disk utilities. It goes beyond repairing file structures, and can check files for minor problems such as corruption or missing icons.

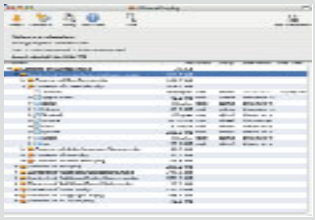


Norton AntiVirus
www.symantec.com

You don't even need the fingers of one hand to count the number of viruses that affect OS X. But there's nothing to stop you passing on Windows viruses to your PC-using friends unless you get a copy of Norton AntiVirus. And if you have Virtual PC, of course...

An iPod
www.apple.com/ipod

Remember, an iPod isn't just a music player: it's also a portable external hard drive. If you don't want to carry all those repair CDs around with you, install an Operating System and a full range of repair tools on your iPod and you'll have a perfect, compact Swiss-army knife for fixing your Mac.



Pacifist
www.charlessoft.com

Deleted Disk Utility, Mail or some other application by accident and don't want to have to reinstall the whole of OS X? Pacifist is a handy utility for opening .pkg/.mpkg installer packages. Extract as much as or as little as you want, without those annoying error messages about your system being too new.

DVD-R discs
www.apple.com/ukstore

Time was, you could back up the whole of your hard drive on to a Zip disk. Nowadays, a DVD is the only way to have a permanent copy of your data to hand that just about any computer can read. DVD-Rs are the preferred format of Apple, which sells 4xs at a very reasonable price.

Step-by-step | OS X | Printer Setup Repair

Keep your printer running smoothly with this handy app from www.fixamac.net/software/psr

1: Those bloody permissions

One of the most useful utilities around for fixing printing problems is Printer Setup Repair. First of its many skills is checking that all the correct users and groups are present and have the right permissions.

2: Checking permissions

The next step is to check that all the printing system's file permissions are correct. It's worth hitting all these buttons, if only to find out what the problem is and perhaps find out what caused it.

3: Start from the beginning

If that doesn't work, more drastic measures might be needed. Use the '501' button on the left to reveal options to delete preference files that may have been corrupted.

Regular use of Software Update will help things run smoothly

(/etc, /var/db, /Library/Preferences and ~/Preferences, to name just a few). That's not to say every OS 9 problem is easy to fix: damaged fonts can be the root causes of many problems that are seemingly unrelated and you'll need a third party utility such as Font Doctor to identify and repair a damaged font.

Know your tools

OS 9 and OS X are similar to analogue and digital TV. OS 9 can be flaky and temperamental and as more bugs appear, offer progressively poorer performance; but usually, all you have to do is fiddle with the aerial and it's fine, albeit not brilliant. OS X, however, is crystal perfect until enough bad things have accumulated that the whole picture just goes completely.

It pays to ensure you maintain your system: back up your data; run Disk Utility regularly, particularly after you've installed new software; run Software Update to ensure you have the very latest versions of your system software; be careful not to install software from unknown third parties that puts files in awkward places or modifies the system too severely (be especially wary of anything that needs an administrator password for no good reason); and a surge protector is a must if you happen to live in a part of the country that gets stormy weather often. Take good care of OS X and we promise that it will take good care of you.

> "Be careful not to install software from unknown parties that puts files in awkward places or severely modifies the system"

My Mac is dead

It may turn out there's nothing you can do. Your Mac is dead. Maybe your iBook's logic board is broken and you can't see the screen any more. It's time to call the repair shop.

Which shop you call can depend on how old your Mac is. If it's less than two weeks old, Apple will replace it, declaring it 'Dead on Arrival'; if it's anything up to a year old, call Apple's support number: it is actually surprisingly good compared to most PC technical support operations; if there's anything you haven't done, you'll be run through possible fixes, before eventually conceding it's broken and organising a pick-up, repair and return. You'll have to wait anything between two days and forever for the whole process, but a week is about average in most cases.

But remember, unscrewing bits from your Mac, ferreting inside to see whether something's loose, and trying to eject that stuck CD with a steel ruler are the kinds of things that make many a benevolent computer maker unwilling to honour their side of a warranty agreement; once you know it's a hardware problem, *leave the Mac alone* until the day comes when you have to parcel it up for the courier – the only exception to this rule is if you can safely make a backup of your data, since Apple might need to replace your machine or your hard drive to fix the fault.

If your Mac's over a year old and you haven't taken out Apple's extended warranty, Apple Care, there are plenty of Mac repair companies listed in the back of this magazine who'll help you out for a fee; also, some shops, such as John Lewis, offer extended warranties of up to three years with your original purchase so it's always worth hanging on to your receipt – and reading the small print.

Essential shortcuts

At start-up

Apple+S – Single-User (command-line) mode

C – Start up from a CD

Option – Pick which device to start up from

T – Start up in FireWire Target disk mode

Shift – Start up in Safe Boot mode and temporarily disable log-in items and non-essential driver files (Mac OS X 10.2 and later)

X – Boot into OS X

R – Force PowerBook screen reset

Apple+Option+O+F – Enter Open Firmware prompt

Apple+Option+P+R – Reset the PRAM

When logged in

Apple+alt+esc – Force-quit applications

Control+eject – Restart, Sleep, Shutdown dialog box

Control+Apple+Eject – Quit all applications and restart