

# Of blunderbusses and lifeboats, part two

Modern technology – it does go wrong. If it hasn't happened to you yet, then you can be sure it's just a matter of time. Comforting eh? So listen up and consume part two of the ultimate Mac survival guide from **Paul Ellis – The Digital Plumber**. Here he describes the essential options available to get a Mac back in business. Don't ever say we didn't warn you! Part one can be found in the June edition of this magazine

Carrying on from last time, now we get into the procedures necessary to sort out your Mac when things *have* gone wrong. Then we'll deal with how to partition and format disks for different uses, such as for clients who use PCs.

## Procedures

### • FireWire Target Disk Mode

This transforms your Mac from a computer into an external FireWire hard disk, which can then be attached to any other Mac for fiddling with. Shut down your Mac. Restart it: at the chime, press and hold down the T key. Release it when you see a blue (PowerPC Mac) or grey (Intel Mac) screen with a FireWire symbol jumping around it. Press and hold the power button to turn it off.



### • Apple Hardware Test

This is an Apple hardware diagnostic application specific to the Mac model it shipped with, which runs in a special mode and can test for and diagnose hardware faults. It usually lives on a hidden partition on the Install 1 DVD that came with your Mac. The procedure for running it varies but is always printed on the DVD. You must use the specific version that came with your Mac. Run the Quick Test and see what it says.



### • Bootable backups with SuperDuper! and Carbon Copy Cloner

Have a blank FireWire disk, or a blank partition on a FireWire disk of the same size as your internal boot volume. Both SuperDuper! and Carbon Copy Cloner are set up by default to create a fresh bootable backup. Select your boot volume as the Source and your FireWire disk or partition as the Target. The rest is straightforward. To keep the bootable backup up-to-date, buy SuperDuper! or read Carbon Copy Cloner's manual. I currently prefer Carbon Copy Cloner for this task. OS X 10.5 Leopard's Time Machine is very easy and straightforward to set up to maintain incremental backups but doesn't directly



create bootable backups, although in conjunction with the Leopard Installer DVD it can create a bootable volume from backups. Yet another reason to have copies of OS X Installer DVDs with you.

### • Reset PRAM

This procedure clears and resets the system's Parameter RAM, which can get corrupted and produce unpredictable behaviour. Restart your Mac, pressing and holding down the Apple, Alt, P and R keys at the chime (a bit like playing Twister). Keep them held down until the Mac has chimed three times, and then release them. This will take up to a minute to complete.



### • Reset Open Firmware (PowerPC Macs only)

Another good reset procedure. Restart your Mac, pressing and holding down the Apple, Alt, O and F keys at the chime to start up into Open Firmware. At the prompt, type 'reset-nvram' (no quotes), then press Return. Type 'reset-all' (no quotes) then press Return. The Mac



will restart. It may need some things like Startup Disk, Time Zone and mouse tracking speed resetting from default.

### • Reset the CUDA, Power Management Unit or System Management Controller

This resets your Mac's firmware to its default state, clearing out problems as it goes. The procedure varies by Mac model. See the 'links' boxes over the page.



### • Select boot volume on start-up (for starting from a bootable backup)

Restart your Mac, pressing and holding down the Alt key at the chime. Wait until your bootable backup volume appears as an icon on the screen, select it and press the right-arrow (PowerPC Macs) or the arrow under your bootable backup icon (Intel Macs) to start up from it.



### • Boot from DVD or CD

If a bootable CD or DVD is already in the drive, hold down the C key until the grey apple and spinning wheel appears on the screen. Otherwise, follow the procedure above, insert the CD or DVD, select it when its icon appears and click the appropriate button.



### • Run Apple Disk Utility from an Apple Installer DVD

Using the method described above, boot your Mac from the Installer DVD that came with it, or a retail copy of Mac OS X. The Installer launches. Select 'Choose English as the main language' (if that's what you want) and click on the blue right-arrow button. The main Installer screen appears, and with it, the Menu Bar. From the Utilities Menu select Disk Utility. The Installer disappears and Apple's Disk Utility appears in its place. Use this to repair the boot disk and fix its permissions. Quit Disk Utility and Installer when you've finished.



### • Archive & Install

Rather than wasting a day messing around trying to fix an obscure or complex system problem it's usually quicker and better to reinstall OS X using Archive & Install. I like to run Applejack and then DiskWarrior over a disk before carrying out this process. Here is the procedure for OS X 10.5; 10.6 simplifies it somewhat.



- 1) Start up from your Mac OS X Install Disc 1 or Install DVD. If you have a later version of Mac OS X than your computer came with, start up from that. Be aware, though, that you can't install OS X 10.5 Leopard on any PowerPC Mac that runs slower than 867MHz. Usually, you can start from the disc by putting it into your Mac, restarting, and holding the C key. Or, put it in the computer and click the Install or Restore icon you see in the

disc's main window, after which the computer will start from the disc without you needing to hold C.

- 2) Select your language. The Welcome to the Mac OS X Installer window appears.
- 3) Click Continue. The Important Information window appears. Click Continue.
- 4) The Software License Agreement window appears. Click Continue.
- 5) An agreement sheet appears. Click Agree.
- 6) The Select a Destination window appears. Click the volume that you wish to install to. This will be Macintosh HD, if you haven't changed its name. Ignore the warning sign attached to this volume.
- 7) Click Options. The installation options sheet appears.
- 8) Select Archive and Install, Preserve Users and Network Settings.
- 9) Click OK.
- 10) Click the Customise button and uncheck Language Translations, unless you need to run your Mac with a non-English user interface.
- 11) Click Continue to begin the installation. After the Mac has finished installing, has restarted and presented you with the mandatory cool introductory movie you might have to re-enter your contact details. Do so; this goes into your Address Book 'Me' card.
- 12) Open System Preferences/Print & Fax and add your printers again. If you're using large format printers such as the Epson 4880 you'll probably have to go to the manufacturer's website and download drivers. →

- Install them.
- 13) Run Software Update repeatedly until there's nothing left to update.
- 14) Install and run Applejack.

Then, you'll need to move your ICC profiles from the old System to the new one, as follows:

- 1) Open two Finder Windows in Column view and place one above the other.
- 2) In the top window, navigate from your boot disk (let's say it's called Macintosh HD) to /Library/ColorSync.
- 3) In the bottom window navigate to [Macintosh HD]/Previous Systems/[a folder named with today's date]/Library/ColorSync.
- 4) Move the CMMs and Profiles folders from the BOTTOM ColorSync folder to the TOP one.
- 5) Open System Preferences/Displays and click on the Color button. Your screens should now automatically switch to their correct profiles. Photoshop, Lightroom, Capture One and your other software will now be able to find all of their profiles and print properly.
- 6) Some applications that install hardware drivers or copy protection might need reinstalling or reauthorising.
- 7) After you've checked that everything works properly, delete the Previous Systems folder and empty the Trash.

It's a bit of a faff but shouldn't take more than an hour or so, depending upon the speed of your Internet connection, and is far easier than trying to debug a really complex problem.

### Partitioning disks

The icon you see on your desktop and think of as a 'disk' is in fact a volume or partition: in the Mac world these terms are interchangeable. Given that a single disk can be partitioned into multiple volumes (or that multiple disks can be RAIDed into one volume) it follows that there has to be a Partition Map on the disk, telling the computer where the volumes are and which format they're in. And so there is. It happens that partition schemes come in three flavours, as far as we're concerned:

- GUID Partition Table;
- Apple Partition Map; and
- Master Boot Record.

Volumes (or partitions) come in five flavours:

- Mac OS Extended (Journaled);
- Mac OS Extended;
- Mac OS Extended (Case-sensitive, Journaled);
- Mac OS Extended (Case-sensitive); and
- MS-DOS.

OSX 10.4 and 10.5 can also read (but not write to) NTFS volumes. Bizarrely, any partition scheme can contain volumes in any format. Which do we choose? Here are the rules:

### Partition Scheme

- To boot any OS X Macintosh, PowerPC or Intel, your disk must be in Apple Partition Map format.
- To properly format an Intel Mac boot disk so that you can apply firmware updates to your Mac, the disk must be in GUID Partition Table format. This is also the most robust format for non-booting data disks to be read by OS X 10.4 or 10.5. OS X 10.3 and earlier can't read GUID-formatted disks.
- To have your disk readable when attached to a PC without requiring special software to be installed on it, your disk must be in Master Boot Record format.

### Volume format

- For use exclusively on a Mac, especially as the boot volume, format it as Mac OS Extended (Journaled). Ignore the rest. However, OS X 10.3 and earlier can't reliably use Journaled volumes so if you're still running OS X 10.3 or even 10.2 (why?), choose Mac OS Extended instead.
- To have your volume readable on both PC and Mac, format it MS-DOS.

Now you know how to prepare disks for release to clients and be confident they'll be able to read them: Master Boot Record/MS-DOS. PCs and Macs will happily read and write ordinary picture and file data to them.

### LINKS

- SuperDuper!: <http://www.shirt-pocket.com>
- Carbon Copy Cloner: <http://www.bombich.com>
- Resetting Mac hardware: <http://tinyurl.com/2jpk43>



### LINKS

- Applejack: <http://tinyurl.com/ylucgw>
- DiskWarrior: <http://tinyurl.com/cb2osh>

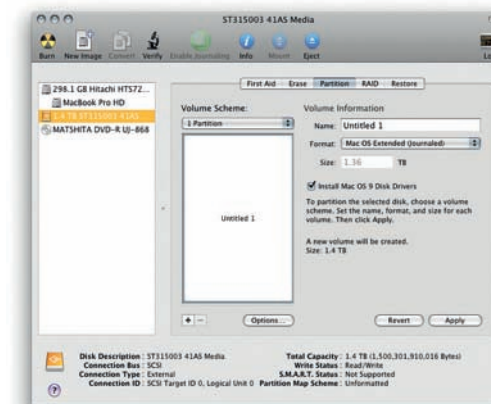
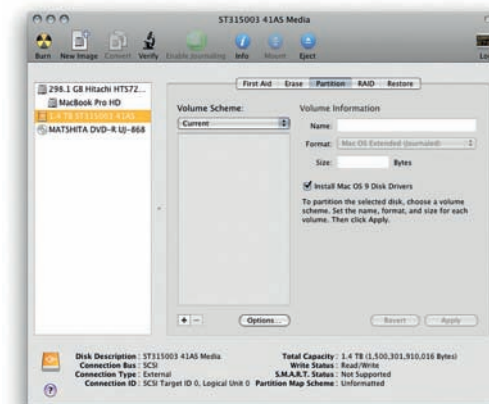
- If you live in the modern world and unless you're preparing a new boot disk for a PowerPC Mac, always partition a new disk to GUID/Mac OS Extended (Journaled) in Disk Utility before using it. Most consumer external disks you buy will be in Master Boot Record/MS-DOS format and, whereas the Mac will happily mount and use them, this format will cause problems if you later attempt to use them for bootable backups or Time Machine. So, reformat them.

This is how you do it for a bare hard disk. If you've bought one in an external enclosure, open Disk Utility (in the Applications/Utilities folder) and skip to step 2.

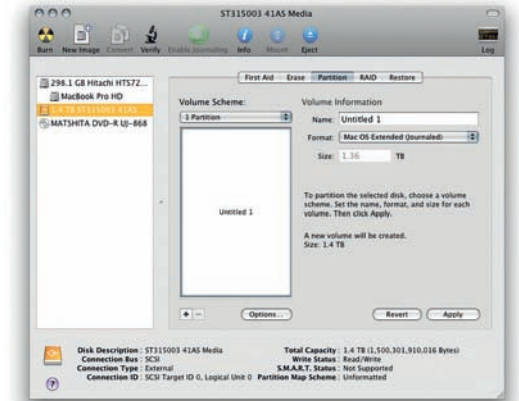
- 1) Install your brand new disk. Turn the Mac on. After the Mac starts up and logs in you'll see this window:



- 2) Click on Initialize. Disk Utility will open. Your new bare disk will appear in the list as a kind of 'serial number', with no volume associated with it. A new pre-formatted disk will have a volume name under the 'serial number', insert to the right. Select the 'serial number' and click the Partition button. (See below, left.)
- 3) Click on the Volume Scheme popdown menu where it says Current and select 1 Partition. (See below, centre.)
- 4) Click on the Options button and select a partition scheme. (See below, right.)



- 5) OK that, and then in the Volume Information field, give your volume a name:



Click Apply. Job Done. Of course you can create multiple partitions (volumes) while doing this, but I don't recommend that except for special purposes which I'll go into next time, when I'll teach you how to make your Mac go so fast you'll have to nail it down. See you then. tP

*The Digital Plumber, a.k.a. Paul Ellis, is an AOP member who spends an increasing amount of his time carrying out Macintosh consultancy and troubleshooting work, mostly for other AOP members and professional photographers. He can be contacted at [www.thedigitalplumber.co.uk](http://www.thedigitalplumber.co.uk).*

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