Mac OS

Macintosh
TROUBLE SHOOTER

MACINTOSH TROUBLESHOOTER GUIDE

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Contents

INTRODUCTION

This guide gives you solutions to most of the problems you'll come across whilst emulating the Macintosh. I've also included information about the MacOS, so that you can understand it better.

I have not (and will not) be covering problems on setting up Mac emulation - that is where it's own documentation comes into play, so read it all thoroughly, first - you'll be glad you did!

Nor have I covered troubleshooting for individual Mac programs, or all the System versions, I don't own them all, although I do have experience with Systems 7.0 to 7.55, and 8.0 to 8.1.

If you find an error in this guide, a problem you cannot solve or even contribute to this guide, then by all means email me at; **MadMike@blizzard.u-net.com**. Or post your problem to one of these Newsgroups; **comp.sys.amiga.emulations** or **comp.sys.mac.misc**.

Disclaimer
**I WILL NOT TAKE ANY RESPONSIBILITY FOR DAMAGE DONE TO YOUR DATA OR COMPUTER, WHILST UNDERTAKING GUIDANCE FROM THIS TEXT. IT IS UP TO YOU TO TAKE PROPER PRECAUTIONS, BEFORE YOU TRY TO REPAIR YOUR DISK OR FILES IN WHATEVER SHAPE OR FORM THEY MAY TAKE.
NOR CAN I GUARANTEE THAT ANY OF MY SOLUTIONS WILL COVER ALL EVENTUALITIES.**

FINDING AND RECOGNISING THE PROBLEM

Most problems occur when you introduce new applications onto your computer. 50% are usually software related, 48% for hard disk directory & file corruption and SCSI errors, and the rest are hardware faults, ie. hard drive failure, chips/RAM blown, battery and power supply problems.

The Cause of the Problem
General Crashes
This is a software related problem most of the time, no matter what anybody tells you, this is the first area you should try to resolve first. You may experience all manner of weird and spectacular crashes; freezes, system bomb messages, start-up crashes, odd behaviour or even pesky viruses. Whatever the cause, this is only a short term problem, so don't be alarmed.

Hard Disk Errors
This can be anything from a flashing question mark (at boot-up) to a full hard disk head crash. To recognise this type of error, you need to look out for; abnormal disk accessing, file corruption when copying files, default icons, programs not loading properly, and fragmentation (slow boot-up and loading of software).
  A more serious problem is with directory errors, which causes; files/folders disappear, programs not to load, data corruption, copying corruption or even a total loss of the entire hard disk's contents (some viruses erase the directory structure).

Hardware Failure
A circuit board type problem can be easily spotted, your Amiga simply won't work. This is the case if it is intermittent or persistent. Only an qualified engineer can fix this.

Hunting Them Down
About nine times out of ten you will be able to sort it out by yourself. But before you dive into the problem, you need to know how to find it first.

What to Associate the Error With
1) If your Mac crashes:
    • Its a program error, extension conflict, a virus or a SCSI problem.
2) If hard disks don't mount or boot-up:
    • Use a disk repair utility, don't reformat it.
3) If programs won't load
    • Its a PowerPC program, or the application is damaged.4).
    • If a program crashes constantly.
    • The program and/or it's modules are damaged. A virus? Your 040/060 libraries need updating, on the Amiga side.
5) If your computer seems slow:
    • A System, network, printer problem, a highly fragmented hard disk, a nearly full HD or just a slow Amiga.
6) The MacOS crashes constantly:
    • It could be a virus, system corruption or both.
7) Disks & devices refuse to work:
    • A SCSI associated problem, or a virus has wiped the disk.
8) Your Mac freezes unexpectedly:
    • It's either a SCSI termination problem, a hard error, or the current program is buggy or corrupted (check for viruses).

Other weird problems (write down notes)...
1) What error message does it display?
    • Check the Error Code list, for the corresponding code.
2) What happens exactly?
    • Then check this with the "What to Associate It With" list above, to determine what caused it. Then check out possible solutions further on in this guide.

HARD DISK & SCSI PROBLEMS

Can I setup a RAID drive on my emulated Mac?

In theory, yes, so long as you have the correct hardware and software. It will have to be a software based RAID, because there are no dedicated RAID controllers for Amigas, and the Mac RAID software would not be able to recognise the controller anyway. Recommended specifications:
- A 68040/060 CPU - it will not work on a slow computer.
- A SCSI 2, or faster controller.
- Two or more identical hard disks (the same manufacturer and capacity, ideally).
- The software; there are only a few commercial packages available at the moment (there aren't any shareware RAID programs as far as I know). I'll list some of the good ones;
  - **RAID Toolkit**, from FWB (www.fwb.com).
  - **Charismac RAID**, from Charismac (www.charismac.com).
  - **Remus**, from Adaptec (www.adaptec.com).

Will I be able to mount/format other external hard disks in Mac emulation?

Yes, in theory (haven't done this myself), if they are connected to the SCSI bus. You should be able to format it straight from the Mac side, and without formatting it on the Amiga side. However you might need 3rd party SCSI hard disk formatting software, if the System software doesn't come up with message asking you whether you want to initialise it. Also note that Apple's formatting utility **Apple HD SC Setup** will only accept Apple branded hard disks, so don't bother using it. However you might have better luck with **Drive Setup** which recognises quite a few hard disks, a copy of it can be downloaded off Apple's Tech Library web site: www.info.apple.com.

   Remember that ShapeShifter and Fusion only needs the setup info for the bootup partition, and not necessarily for each and every device you have for your Mac, such as Zip drives, scanners etc.

Is it possible to repartition a volume without having to re-initialise it again?

No it is not possible. You **have to** reformat (high-level format = re-initialise) the hard disk again to setup the hard disk parameters properly, otherwise you will run the risk of trashing the entire contents of the hard disk, and you can forget about recovering any data.

   If this affects the startup volume, then you'll have to repartition it on the Amiga side first, then format it again on the Mac.

What if I accidentally initialised my hard disk.. how can I retrieve my files?

1) If you installed Norton Utilities' **Filesaver** and set it up to actively scan your drives regularly, then you could use Norton's Volume Recover utility to restore the Directory structure back to how it was the last time Filesaver saved the Master Directory.
2) If however, the first option is not going to work for you, try using Norton's **Unerase** program, to undelete files individually, or all the ones it finds. Note: if your hard disk contains a lot of fragmented files, it will not be able to retrieve and merge the other fragments as it does not know where they are. **Tech Tool Pro** has a undelete feature as well, but with less features.
3) Try this rather good program, called **Data Rescue**, for more information go to; **http://www.wildbits.com/rescue/**
4) Restore from your last backup. Only do this if you are not bothered about losing any new files, as you are highly unlikely to recover any of those files, as they will now be overwritten.
5) You could go to a professional data recovery service, beware, they can be quite expensive - best if you get a quote off them first. Try these companies for starters:
   - **Advanced Data Solutions LLC** (USA), http://www.adv-data.com.
   - **Data Quest International (UK)**, Tel/fax: (+44) 1705 671330, email: dataq@globalnet.co.uk.
   - **DNA Computer Services Ltd** (UK), Tel: 0831 295099 & 0385 261258.
   - Or look inside your Mac magazine for repair shops.

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How big can a Mac disk be?
HFS volumes can go up to 9gig (safely), however I would recommend an upper limit of 4gig in HFS, otherwise it'll start to waste a lot of disk space due to massive, and because Amigas cannot access HD's bigger than this, without FFS patches. HFS+ can go up to 2 terrabytes (2000 gigabytes), and uses a standard 4k block size on all HDs/partitions above 1gig.

However, it all depends on your Amiga setup, and what controllers (SCSI or IDE) you are using for the boot partition(s) and what filing system patches you have installed which can recognise sizes above 4gig. You may have to update FFS to **FFS TD64** from Aminet, to use 4gig+ IDE hard disks,or another filing system altogether, such as **Professional Filing System 2** (PFS2 - Great Effects Development, www.greed.nl), which can handle huge hard disks.

How can I format a PC formatted Zip disk, as a Mac disk?
As you may have noticed, you cannot format a PC Zip disk as Mac HFS disk via the Erase Disk feature, in the Finder's Special menu, if the PC Exchange control panel is activated. It will only reformat it as a PC disk again.

You can either switch off the aforementioned control panel and then use the Finder's **Erase Disk** or, use a hard disk formatting utility such as Iomega's Zip Tools, which can be downloaded from the Iomega's web site; www.iomega.com. The main Zip utility is called **Tools** and lets you set certain formatting parameters as well as update the current disk driver (Rigid Disk Block).

How can I tell if this volume is formatted as a HFS+ disk?
For MacOS8.1 users...
Highlight the disk's icon and press Amiga+i for "Get Info". Near the top of the panel is a subject called Format, it'll list the disk's format as; Mac OS Standard (HFS), or Mac OS Extended (HFS+). You may not see much difference in block size, for hard disks below 250mb.
For MacOS7.x/8.0 users...
A HFS+ disk used on any system below 8.1 will only see a text file on the disk, with no other icons displayed, the Simpletext doc will be named "Where have all my files gone". It'll tell you that this disk is an HFS+ disk, and you cannot access any files accept in OS8.1. However you will be able to see and use a HFS+ volume connected to a Macintosh FileServer.

See the section called **Macintosh Filing Systems (HFS/HFS+)**, on page 60 for more details.

The hard disk icon doesn't appear on the desktop, what happened?
Either the hard disk has not been formatted or an error has developed on the HD...
1) The Desktop File has become corrupted. To rebuild the Desktop, you need to press and hold any Amiga+Alt keys, just before the Finder loads up.
2) The Master Directory Block is damaged - run a repair program, to fix the directory structure.
3) The hard disk driver is not functioning properly. You may have to repair the disk or even re-initialise it (ShapeShifter uses it's own driver info).
4) There is a poor power/SCSI connection to the hard disk, check all cables are firmly in place (even internal drives).

General SCSI Problems
SCSI can cause a lot of problems, especially with Macintosh emulation. It mainly causes; a freeze, the watch spins forever, and inevitably causes data/directory corruption.

To avoid any unnecessary problems, check through this list first, then use your disk repair utility;
1) Make absolutely sure the SCSI bus is terminated on powered up devices only.
2) You can safely use some devices even though some have been switched off, and it'll still be usable - although it isn't recommended.
3) All SCSI devices need to be switched on **before** the computer is powered up. Otherwise the controller will not see these peripherals.
4) Make sure all SCSI device IDs have their own unique numbers. No more than one device can have the same ID number, otherwise you'll have all manner of problems.

5) Do not use very long SCSI cables. SCSI can only have a maximum chain length of about 10m or so (this is not accurate, only a rough guide).

My Mac displays a message saying it wants to initialise the disk I've just inserted, what can I do to get it to recognise the disk properly?
Again you need the services of your favourite disk repair program to recover the disk and its data, assuming of course, that it has already been formatted for the Mac.

If your utility was not able to repair the disk, you'll have to copy the files off the disk, then reformat it again.

If it is a PC disk (**PC Exchange** control panel should be active), then there's nothing you can do to repair the disk, only a PC can fix a PC formatted disk.

Note: many Macintosh disk repair programs cannot repair PC disks. However, if you have a PC emulator, you can repair the disk with the appropriate PC program.

How come I get random system errors and freezes when using a SCSI device?
These are in no particular order, although I'd recommend you check nos.1, 2, 3, 6 and 10 first.
1) Check for viruses, from a clean **write protected** anti-virus floppy disk.
2) Check your SCSI setup for proper termination. This means that your entire set of devices, no matter how many there are, should be terminated at each end of the bus. One for the internal chain of devices (usually a CD drive or hard disk), and one for the external chain. Both **must** be terminated at the very end of the chain.

If your Amiga crashed while using a device, it can damage the Finder and/or the System file, this may cause it to boot up no further than the happy Mac screen. See the section called **Crashing**, on page 12, for a remedy to the problem.
3) Check all SCSI IDs have a different ID number. If any two or more have the same ID, it will either not be recognised by the controller, or it will cause a system freeze, depending on which devices are effected.

4) Check all SCSI cables are connected properly. Switch off all peripherals first. It could be that a cable is faulty, as in, the wire inside is broken. The only way to track this down is to use a working device as a benchmark, and then check all cables, by attaching them one at a time to it, and see what happens.
5) A removable hard disk, eg. optical, Zip, may have serious errors in it's directory, use the disk repair program.
6) It could be a extension conflict. You'll have to disable a few at a time, to find out which one is causing the problem. You may have to reinstall the extension/control panel again, if it worked fine before this problem occurred.
8) Rebuild the Desktop file on all regularly used HDs/removable disks.
9) Update the drivers on all regularly used disks, except for Finder formatted hard disks - you'll have to re-initialise it, to up-date it. It can have a drastic effect on the Mac's performance, if it is damaged. Do this via the utility that formatted the disk. All it is doing is updating the Rigid Disk Block with the correct information.
10) Check the hard disk with your disk repair program, the directory structure may be damaged.

When I copy files across to other disks, they become corrupted, what can I do?
This can be caused by one of two things; bad blocks or the hard disk's maximum transfer is set too high, a limit of 0X1FE00 = 128k is a normal setting. Use HDToolBox (Amiga) to key in a new value (activate the advanced options button). You won't need to reformat the drive.

It could also be caused by faulty SCSI cables (internal or external), or the Mac's directory structure is damaged - run your repair program on the disk, just to make sure. And while you're at it, rebuild the Desktop(s) of your Mac hard disks, and scan your disks for viruses as well, this may have caused some system damage.

BOOT-UP PROBLEMS

Where can I download a bootable Shapeshifter or Fusion filedisk?
There is a bootable 2mb filedisk from; **www.blizzard.u-net.com** - click on the link called "Program Archives" to download it. It also contains Stuffit Expander 4, for expanding MacBinary (BIN) files, Stuffit archives, HQX or Compact Pro archives.
   Note that the System Folder on this bootfile was taken from a System 7.53 bootable floppy disk called Disk Tools.

The flashing "? disk" screen appears when I startup the Mac, why won't it boot?
This means that the Mac cannot find a bootable or valid System Folder on any local drives. You need a bootable floppy or CD-ROM disk, to get the Mac up and running. If the your main hard disk is not booting-up as it should, check out these possibilities:
1) Check that your hard disk icon is selected in the Startup Disk control panel.
2) Zap the PRAM (Parameter RAM); press and hold any Amiga key+Alt+P+R keys, right at the beginning of the boot-up sequence - before the happy Mac icon appears.
3) The System file is damaged, either re-install the entire System Folder again or just the System file, from either a backup or an archive of the System Folder.
4) You're trying to bootup with an incompatible System folder. Reinstall the System again.
5) The hard disk's driver (Rigid Disk Block) needs updating/repairing. Use your disk repair utility to repair it, or load the formatting program that initialised the disk, and use "update" to replace the current "driver".
6) If none of the above works, then your hard disk needs repairing with Norton Utilities 3.5 or similar program. If that fails, you may need to re-initialise (high-level format) the hard disk. Use the Finder's Erase Disk feature, found in the Special menu.

The Mac won't boot-up as normal, instead it displays the flashing "X disk", what gives?
This means that the bootable disk you've inserted, or the hard disk's System Folder is not compatiblewith this type of Macintosh (in emulation it's either a Quadra or IIci). Again, you need a bootablefloppy or CD-ROM disk, so that you can access the hard disk. If this happens when you've either justinstalled a new System Folder, or the current System now refuses to boot, then it maybe one of theselisted errors...
1) The System file on that disk is damaged - reinstall a System file.
2) It can also be caused by a virus, corrupting the System file, therefore disabling your Mac. The solution is simple, get an anti-virus program immediately, to eradicate it.
3) The System folder on the disk, will not work with your Mac. The wrong System was installed, or it is completely incompatible with your Mac, ie. a PowerMac System folder. Use a universal System installer, ie. a System CD from any retailer, and not a System disk that came with a real Mac, as these are specific to that Mac only - especially floppy disk sets.
4) There is no System folder on that disk, and it will be ejected or not used.
5) The boot block may be damaged (rigid disk block), try using a disk repair program first. If that fails, then you will need to reformat the disk. You can reformat any removable or external hard disk, which has not been specified by ShapeShifter or Fusion as the main boot disk, with a Macintosh formatting program, or by the Finder's Erase Disk feature.
If it is a specified hard disk, you'll have to format it as an Amiga FFS partition again, and then re-initialise it on the Mac side. Only do this as a last resort, because if you have any data which has not been backed up recently, you will not be able to get it back.
Look in Hard Disk Problems, under **What if I accidentally initialised the hard disk..** for more information, page 4.

Why won't the new System I've just installed boot-up?
You have installed an incompatible version of the Operating System. ShapeShifter (up to v3.9) won't work with MacOS8, I **know**, because I tried it myself.

The correct version to install, is a Custom System Folder, eg. "System for this Macintosh", not a universal one, as this might not have all of the necessary resources for it to work with your particular processor, eg. a 68060.

ShapeShifter 3.10, will now let you to startup with **System 8.0/8.1**, however, when you first install the System and reboot, you need to disable the Extensions (hold the Shift key down until it says "Extensions Disabled" in the "Welcome to Macintosh" screen), then take out the **AppleShare** extension (and any other useless stuff) from the Extensions Folder, and reboot.

The computer totally froze when booting-up, why?
This is either a SCSI problem, or you have a corrupt System file. This can be caused by a virus, a crash that needed a hard reboot, or it crashed while the disk was active.
1) Check SCSI termination is correctly setup.
    The SCSI chain must be terminated at **both** ends of the chain. That means one at the end of the internal chain and one at the end of the external chain.
2) Check all SCSI devices have a different ID number. If any two or more have the same ID, it will not be recognised by the controller, or it will cause a system wide freeze.
3) If it is not a SCSI problem, then try these:
    • Repair the disk.
    • Rebuild the desktop: press and hold the Amiga+Alt keys in the middle of the startup sequence.
    • Trash the Finder prefs.
    • Bin the **ShapeShifter PRAM** file.
4) If the Mac froze just before the Desktop icons appear, then the Desktop File (contains icon info) is severely damaged. Restart the Mac, then initiate a Desktop Rebuild (press Amiga+Alt).
    If this does not work, then there will be no way to mount this disk, even from another startup disk. So what you'll have to do is to

make a bootable floppy disk with a repair program on it (Norton Utilities has such a floppy or disk image). When this boots-up, it will bypass the Finder and load straight into the repair program - hopefully it should be able to make the disk usable again. Once the repair is complete, I strongly recommend that you rebuild the Desktop File, the next time you restart.
5) If it froze whilst loading the extensions upon bootup, then one of the Extensions (inc. Control Panels) is damaged. Just bootup again with the Shift key pressed down to disable all extensions, and then manually, take out any new or suspicious extensions and restart the Mac.
    You can find out more in the section called **Crashing**, under the heading **The system "bombed" or froze whilst booting up the Mac**, on page 12.
6) If it froze before the extensions start to load (no icons are displayed during bootup), then the System file and/or the Finder is damaged. This means either a System re-install, retrieve one from a previous backup, or from an archive, to overwrite the old one in the System Folder.
7) There is an Extension Conflict, or one of your extensions is incompatible with your current System and/or the emulator you're using. Disable all extensions, and then put a few back in at a time to see which one it is.

The Mac boots-up to the Happy Mac screen, but doesn't go any further, why?
I suspect that the last time you used the Mac emulation, it crashed. This normally corrupts the Finder preference file. In all cases, you need a bootable floppy, CD-ROM, another Mac hard disk/partition or a removable hard disk, eg. Zip disk.
1) Delete the Finder preference file, and reboot.
2) Zap the PRAM. Press any Amiga key+Alt+P+R before the Happy Mac screen appears, this will delete the previous semi-permanent System data (for certain control panels). Or delete the PRAM file in the ShapeShifter folder.
3) A directory error, use a disk repair program to fix it.

4) Improper SCSI termination, switch everything off and recheck your setup.
5) The System file is damaged, reinstall again (do this last, if nothing else works). I recommend, that you make an archive of a good system folder, so that you don't have to reinstall the whole lot from scratch again.
6) You have an incompatible Macintosh ROM image for the version of System software you're using. Look at the section entitled **68k Macintosh ROMs and MacOSs** for more details, on page 88.

What is a extension conflict, and how can I resolve it?
An extension conflict is basically two or more extensions that are attempting to use the same System resource. This usually results in no startup, a crash during bootup or even odd behaviour while using the computer. The only way to rectify the problem is to either boot-up with all extensions disabled or (if your Mac is usable) by trial and error. This means remove some extensions at a time to see if the problem goes away.

Now you need to know what all those Extensions do in the System folder. The trouble with the MacOS installer, is that 50% of all the extensions installed are not even necessary.

What you need is information about them, so that you know what you need and what you can safely bin. You can get it from two excellent shareware documents; **Extension Overload** and **InformINIT**. Both cover Systems 7.x to 8.x, from Apples's standard set to all known third party extensions and control panels - both have additional info concerning other topics as well. They can be downloaded from most Mac magazine CDs or from any good, Macintosh internet site.

If you have **Conflict Catcher** (commercial, £57), this will make life much easier, as it does most of the work for you. It monitors what happens and is able to give you information on what is causing the problem. There is a copy of this utility in **www.shareware.com**, I think it is for evaluation purposes only.

Can I have TWO System Folders on a single partition?
This would be highly inadvisable, it would totally confuse your computer, especially if you copy a System by hand onto the main startup disk. It'll have difficulty booting-up next time, and will probably show you the flashing "? disk" screen. However you can install a system folder on a different partition, or onto as many disks as you like.

Will my Mac emulation ever display the Sad Mac bomb screen?
No, it can't possibly show this screen, as this is a hardware check feature for real Macs. Since Mac emulation is via software, and the host computer (Amiga) is a different animal altogether, a hardware diagnostic obviously cannot work, therefore you will never get this dreaded screen. The most you'll experience is a startup freeze.

Why won't the CD-ROM disk eject?
There are two main reasons for this to happen:
1) You've run a program from the CD, and it's still in memory. You have to quit all applications you've launched directly off the CD, before it'll eject.
2) The File Sharing control panel has been activated, this will share all volumes that are mounted on your Mac, including CDs. To disable File Sharing, go to the Sharing Setup/File Sharing Monotor control panel, and click on the Sharing toggle button again, this should release the CD.

Can I create/burn CDs with Mac emulation, and what do I need?
So long as you have a SCSI2 or better controller in your Amiga, and of course the equipment to make them; a CDR drive and a spare 650mb SCSI hard disk partition (remember, this includes the directory and desktop files). IDE/EIDE is not fast enough, and will corrupt data, as it is burnt onto the CD.

The hard disk partition with the data you wish to burn onto a CD, can be anything up to the capacity of the CD you're burning, which at the moment is 650 megabytes.

You may also require a fast 68k processor, depending on the software's requirements, say something like an 030 or better would be a safe bet!
As for the software, I suggest a program called **Toast CD-ROM Pro** v3.54 (probably updated since) from Adaptec, see their web site: www.adaptec.com.

The CD drive won't eject the disk after the Mac crashed, how do I get it to eject?
MacOS always eject disks via the OS, so if the instruction to eject a disk didn't get to the drive, it will not eject it, no matter what (even after rebooting the Amiga). The only way to get the disk out is to either:

1) Power down the Amiga, wait several seconds, and power up again - then press the eject button.
2) Reboot Mac emulation again, and eject the disk - this will only work for other types of removable disks, such as Zip and magneto-optical disks).
3) Force eject the CD disk via the emergency eject pin-hole, with a paper clip.

I can't mount any Mac CDs in emulation, why?
ShapeShifter v3.9 & **v3.10** now has the capability of recognising a CD-ROM drive by using it's own built-in generic driver (in the SCSI setup window). Just go into the SCSI setup screen and switch on the button next to "Use generic CD-ROM driver". However you still need the CD filing system data files found in the extensions folder, these are; **Foreign File Access**, **High Sierra File Access**, **Audio CD Access** and **ISO 9660 File Access**.

Fusion is very picky when it comes to SCSI, as you may know already, however some old SCSI CD-ROM drives may not be compatible with Fusion, or it cannot recognise it properly. In order to mount this drive, you'll require special Mac software, such as FWB's CDROM Toolkit, which supports a lot of CD drives. See their site for a list of supported drives (www.fwb.com).

Fusion also has a generic CD driver, go to the setup window, and set these options...
1) Under the heading Peripherals, select "CD-ROM"
2) The ROM type should be **HFS/PC**.
3) Device Driver = ATAPI.device or SCSI.device (whatever the driver is for your SCSI controller).
4) Unit = x (whatever it should be for ATAPI).

Don't forget those CD-ROM Filing System data files in the System Extensions folder, see above.

On Microcode Solution's web pages, there is a CD driver which is usually updated every so often, download it, if you still cannot mount any Mac CDs, the name of the archive is **MSCD.LHA**. Go to: **www.microcode-solutions.com/amiga/amiga.html** - under the title "Latest Software Downloads".

Some older SCSI CD-ROM drives (1 to 4 speed units) have a major

problem with Fusion, as in, they refuse to recognise any Mac CDs, infact they flat out refuse to boot from a CD as well. A classic example is the **Toshiba** internal SCSI 4x speed **XM**-**5401B/S** unit, which I own. The only way to use these old drives is to buy a copy of FWB CD-ROM Toolkit. This means that you will not be able to use the System CD as an emergency bootup disk, you'll either have to use a floppy disk, such as the Disk Tools disk, or a hard file. Make sure you've made a backup emergency boot disk (of some kind) so that when your partition goes down, you are prepared for it.

For questions concerning IDE CD-ROM support, for ShapeShifter, see the AmigaGuide document **KSSFAQ13**, (Klaatu's ShapeShifter Guide & FAQ v1.3), which can be found on Aminet.

Why can't I boot up from my CD drive?
1) The CD contains a System Folder which is incompatible with your Amiga setup, eg. System 8 will not work with ShapeShifter.
2) Some real 68k Macintosh computers do not support booting from CD-ROM, this is to do with the ROM, so if you have one of these ROMs, you **may** be effected:
    • Macintosh 128k, 512k, 512ke
    • Macintosh Plus
    • Macintosh SE & SE/30
    • Macintosh Portable
    • Macintosh Mac II, IIx, IIcx
    • Macintosh Mac Classic

Why won't FWB CD-ROM Toolkit mount any CDs on my Mac?
CD Toolkit has certain minimum System requirements before it'll work on your computer, these are; System 7.01 or higher, an 020 or higher processor, a SCSI CD drive, and a hard disk.

Note that version 3.02 and above, requires System 7.53 or higher, and 4mb of free RAM. However it now supports ATAPI drives as well as SCSI.

Also note that FWB's web site has a updated list of all supported CD-ROM drives (SCSI & IDE): **http://www.fwb.com/**

I cannot seem to install MacOS from CD, using ShapeShifter/Fusion, what's wrong?
CD's with the Mac OS (7.5, 7.5.5 update, 7.6.1) are CD's with multiple data tracks. Under SS and using the generic CD-ROM driver fresh installs to an empty HD (and most likely updates as well) will FAIL because the later sections of the data cannot be read.

To install from CD it is best to BOOT with a Disktools floppy, and have EMPCD: enabled under Device Disks. The multiple data sessions will now be seen and the installs from CD will work OK. You can then change back from EMPCD: to whatever CD activation you require under SS once it has all gone through OK. NOTE: This may not be the rule, rather the exception.
By John Blyth, Australia

Where can I download Mac CD drivers?
1) There is a generic CD-ROM driver on Apple's web site, this works with some non-Apple CD drives: www.apple.com/Apple_Support_Area/Apple_Software_Updates/ US/Macintosh/**Apple_CD**-**ROM_5.4.img.bin** This is a disk image, so you'll need **DiskCopy** or **Shrinkwrap** (this utility mounts the disk image onto the desktop). Both can be downloaded from any Mac shareware site.
2) Apple's System 7.x CD-ROM Setup software:
    ftp.info.apple.com/Apple.Support.Area/Apple.Software.Updates/ US/Macintosh/Display.and.Peripheral.Software/ CD-ROM.Setup.5.0.1.img.sea.hqx
3) Alternatively, you could download a freeware generic driver called **CD-Sunrise** at: **ftp://mirrors.aol.com/pub/info-mac/cfg/ cd-sunrise-22c.hqx**
4) Try these three, one from NEC and two from Pioneer web sites (for NEC or Pioneer drives only):
    http://www.pioneer-eur.com/drivers/mac220.220 http://www.pioneer-eur.com/drivers/mac402.hqx ftp://ftp.nectech.com/pub/peripherals/mac-cd/speedycd.hqx
5) These are all the known Macintosh CD-ROM drivers available today;
    • ~**CorelSCSI!**, from Corel (www.corel.com).
    • **Anubis CD-ROM**, from Charismac (www.charismac.com).

- **CDROM Toolkit**, £53, from FWB (www.fwb.com).
- **CD-ROM Extension**, from Charismac (www.charismac.com).
- **CD Autocache**, $79, from Charismac (www.charismac.com).
- **CDTECH**, from CD Technology.
- **Drive7Rem** or **DriveCD**, from Casa Blanca Works.
- **MetrooCD INIT**, from MetroCD.
- **NecCDDrvr** or **DriveCD NEC**, from Charismac (www.charismac.com).
- **CLD Access**, from Pioneer (www.pioneer-eur.com/drivers/).
- **PLICDDrvr**, from Charismac (www.charismac.com).
- **Rapid-CD**, £35, from Insignia Solution.
- **RapidTrak-CD**, from MacPeak (www.macpeak.com).
- **SCSI-CD driver**, from Corel (www.corel.com).
- **SpiritTMCD**, from OAC.
- **TSLCDDrvr**, from Trantor.
- **Toshiba CD-ROM Driver**, from Toshiba (www.toshiba.com).
- **TurboCD-ROM Init,** from Charismac (www.charismac.com).

CRASHING PROBLEMS

Why does my Mac crash when I disconnect from the internet with FreePPP?
If the setting **Hangup on Disconnet** is enabled, it will always cause a crash upon disconnection. To disable it, look in the Modem settings in the FreePPP control panel.

I can't seem to shutdown without it crashing?
First of all, check that the hard disk is OK, with your disk repair program. Then I suggest you use a little utility that came with System 7.5x, called •**Shutdown**, which was installed into the Apple Menu. This is remarkably safe to use, and will not cause a crash - strange but true.

What should I do when a crash occurs?
I'd recommend you go through this check list, just to make sure everything is alright;
1) Even if the program quits after a real crash (displays a System Error Message), you should reboot the Mac side, so that any instability in the OS is removed - otherwise it'll freeze later on, and cause even more problems (this may or may not happen, depending on the circumstances).
2) If it reboots successfully, run a disk repair utility on the System hard disk, there may have been some damage done to the directory.
3) If it doesn't bootup, then use your emergency bootdisk (a filedisk, System CD, or the Disk Tools floppy disk), to get back into MacOS. Now find the file "Finder Prefereces" and bin it - this should cure 90% of non-booting problems, otherwise look in the Bootup Problems section for further troubleshooting suggestions, eg. use your disk repair utility.
4) After any crash, and you've rebooted the Mac, you may find some temporary files in the Wastebasket (the bin icon), which some programs tend to leave behind after a sudden crash. Select "Empty the Wastebasket" to get rid of them, they're virtually useless anyway.

Some of my Mac programs display a message "xxx Unexpectedly Quit", what does this mean?
This type of crash often occurs when the application has run out of memory. All you need to do is to allocate more RAM to those programs that regularly cause this problem, a megabyte of allocated RAM should do it.

You will not need to restart the Mac emualtion again, this type of crash doesn't cause the MacOS to be unstable in anyway, infact you can re-launch the same program again, almost immediately.

Why are some programs suddenly quitting?
You've given too much memory for your application(s), and the System does not have any spare memory to expand into. If this is the case, then the best thing to do is to leave 1-3mb of free RAM for the System to "grow".

Or it could just be a case of the program not being able to access one of it's own files or a System Library, and it quit by itself - although it is more likely to crash.

Look in the **Jargon** section for an explanation on customising a program's **Allocated Memory**, on page 97.

Why doesn't Norton Utilities 3.5's CrashGuard work?
Because it is a PowerPC only application, and a good one as well. All it does, is to catch a crash, before it takes down the whole system, it'll keep a log of all crashes and when one happens, it will give you three choices: Fix It, Quit the Application or Reboot the Mac.

What causes my Mac to crash/freeze?
For starters, don't assume that the Mac emulation has frozen, it may be just taking it's time to complete an operation or loading up files - be patient. Remember your dealing with slow 68k apps not PowerMacs. A good sign that the Mac emulation is going Ok, is when you can still move the pointer about the screen. Here are some tips to help you with a crashy situation:
1) Bug ridden programs often cause regular crashes, eg. Shareware/Freeware apps.
2) MacOS is a single tasking OS, so don't try to do many things at once, it will crash or freeze. The best thing to do is let it complete a task before executing another one.
3) A damaged System file, caused by a major crash, or a virus. This may require a System re-install.
4) To get out of an infinite loop type situation, press Apple+"." keys (cancel operation) or Apple+Option+Escape keys (Force Quit out of emulation).
5) A corrupt preference file can often cause many a crash, just delete the application's preference file in the System Folder, and re-setup your prefs for that program.
6) The program could be accessing a damaged Library extension, or trying to access a Library extension that isn't in the System Folder - in either case, reinstall the Library file(s).
7) An extension conflict is another common suspect when a Mac crashes. All you have to do is see what programs or other System enhancement utilities/extensions you have, and take them out of the Extensions Folder, then restart the Mac, see if this cures it. It could also be damaged!
8) Document files may also become corrupted, and often causes instability in the MacOS/application. I'm afraid, if the file is far too gone to salvage, you'll have to recreate the file from scratch, assuming you haven't done a backup recently.
9) Viruses, can also reek havoc on your Mac, so be vigilant with downloaded programs, scan them first before you execute it.
10) If your Mac hard disk is not looked after regularly, it could develop so many faults in the directory structure (or bad blocks) that files and applications will automatically cause crashes, due to the unstable state of the partition(s). Do regular hard disk checks to prevent this.

**My Mac has started to crash a lot, how come, it was alright not long ago?**
1) You may have installed a later version of the 040/060 libraries on the Amiga, this can certainly break some Mac programs, or at least cause some features to crash out on you. Try using an older version, eg. v41 to v43.0 are pretty stable. You may have to switch off SuperScaler (NS) and the Memory Buffer (NB), on an 060 computer

using Fusion, but this would degrade performance by 25-50%. NS & NB are CPU settings; to use any of these commands, you can only do it through the Shell, as a, temporary measure, or via the Startup Sequence script - preferably executed early in the script.

   To use a certain setting, type **cpu040 xx** or **cpu060 xx** (Phase5 accelerators), OR **cpu xx** for 68000/020/030 CPUs. To call up a list of all available options/settings, type **cpu ?** (000/020/030s), OR, **cpu040 ? / cup060 ?** (Phase5).

2) A program has installed additional/newer versions of system extensions? Your Mac doesn't like them. Restart the Mac with all system extensions disabled, then press the Shift key right away, until the message "Extensions disabled" appears under "Welcome to Macintosh". Now remove any NEW extensions and/or control panels, and reboot. This may render some program inoperable.

3) The program is very buggy. It could be a Beta version, best wait until the next official release for that particular application.

4) Run your disk repair utility over the system and application hard disks. It may have developed an error in the main Directory, which can cause instability.

5) The program has become corrupted, check for viruses, then reinstall the program.

6) Has the application got enough allocated memory? Highlight the program, while in the Finder, and press Amiga+i, this will show you, at the bottom of the information panel, the memory allocation fields. The one you need to amend, is the **Preferred Memory** value, it needs to be bigger than the Suggested Memory figure (the numbers represent Kilobytes). See Picture 1.1.

7) This new software requires an FPU, which you either don't have or it doesn't seem to like the one you've got. Install the freeware program **SoftwareFPU**. This control panel emulates an FPU extremely well. Download it from any shareware internet site.

8) Your Mac doesn't have enough memory to function properly, with or without additional programs loaded as well. You need a minimum of 8mb for the MAC, this will accommodate a bare bones system (2-3mb) and one medium-weight (3-4mb) program. OR you have not allocated enough RAM to a regularly used program. To use additional memory, select the program's icon and press
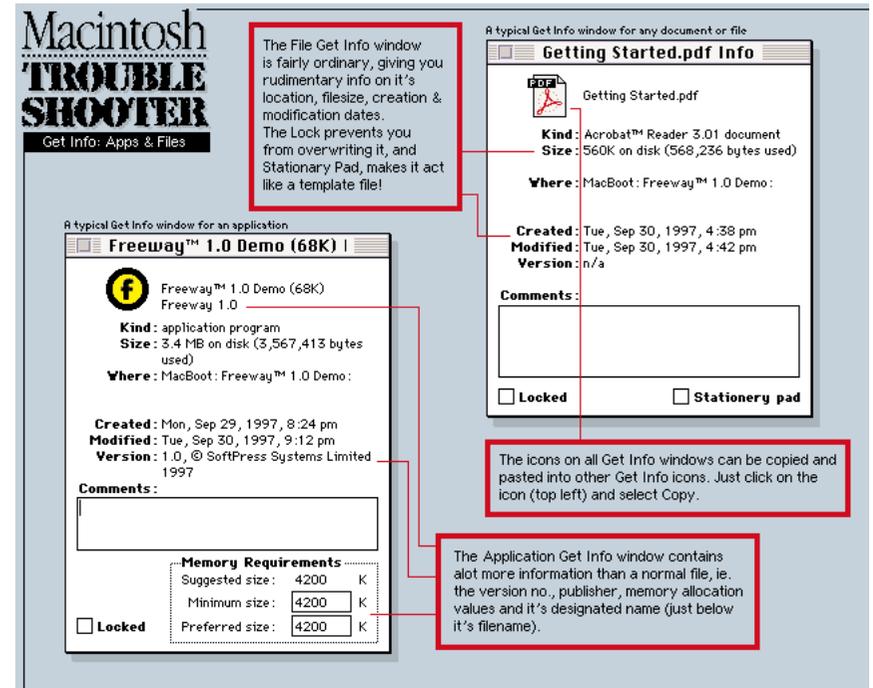
Picture 1.1 - Different types of 'Get Info..' dialogue boxes; program & document info.
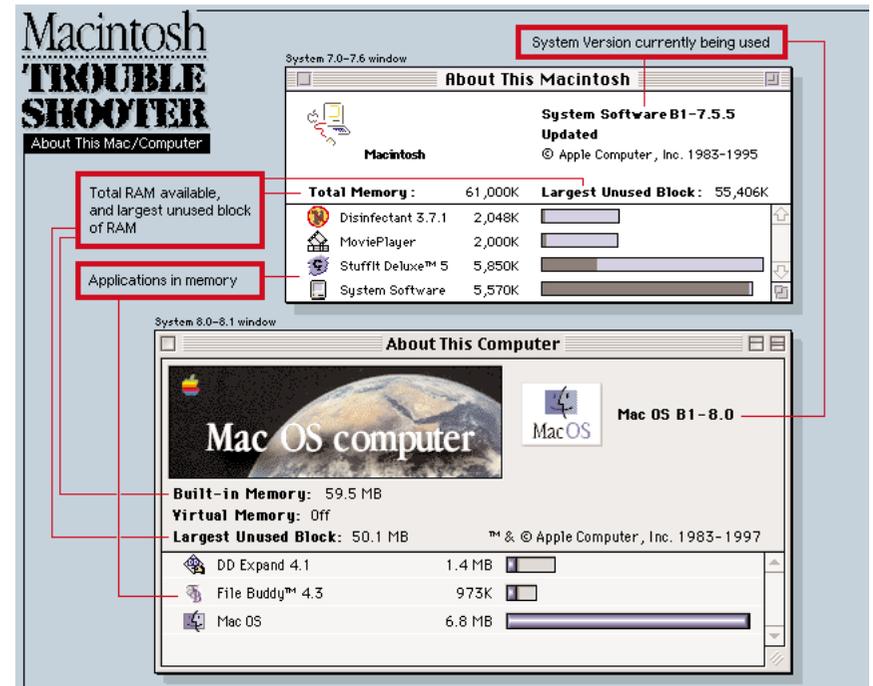
Picture 1.2 - About This Mac window.

Amiga+i keys, to access the Get Info panel. Now go down to the "Preferred Size" box and type in a number (1=1k), it has to be equal or more than the minimum value.

This picture shows you just how much memory you have left. See Picture 1.2 (on the previous page).

9) A bitmap or Truetype font has become corrupted in the System's Fonts folder, replace the suitcase with the master copy. See **Some fonts don't appear to work..**, in the **File and Icon Problem** section for more information, on page 20.

10) The program is incompatible with your emulated Mac or the System version you're using.

11) Check for viruses, these can easily cause sudden crashes and bootup failures. Eradicate the virus first, then see if any programs crash repeatedly, if they do, bin the whole application folder, because the virus has damaged it, and reinstall again.

The system "bombed" or froze whilst booting up the Mac?
Make a note of when (during the boot procedure) it happened, this will differentiate between a duff System/Finder/extension or an extension conflict. To find out which one it is, is simple, all folders then extensions, always load-up alphabetically;

• the System and Finder Preference files
• then the extensions
• then the control panels with it's preference file
• then the Finder
• and finally, the Startup Item folder.

1) If it happened before any icons started to appear during boot-up, the System file or Finder preference file is damaged (bin the prefs first, leave the system for now).

2) If it froze or crashed whilst the extensions are loading, then the last icon will give you a good idea as to which one is the troublemaker, because it is either the last extension that loaded before the crash or the one after it. Remember that not all extensions and control panels display it's icon at boot-up. Simply find and disable any suspect extension, and continue to do this until the crashing stops.

3) If it shows a System Error message, freezes or just restarts, after the extensions etc. have loaded, then the Finder program is damaged. Just reinstall it.

4) Beware of viruses, this is a symptom of infection, as they nearly always infect the System file or even the Finder, so scan the hard disk with a bootable CD (it cannot be infected) or a locked anti-virus diskette.

5) Another cause is a corrupt font suitcase, which can prevent the System from booting, by freezing on the Happy Mac screen. The only way out of this situation is to boot from a different disk, then look inside all the suitcases in the System's Font folder, and see if each suitcase opens and that each font size (when you double click on it) shows the correct font and style - if it shows a default font, ie. Geneva, it's damaged. Bin all corrupted fonts and restart the Mac again.

6) It may have been caused by a SCSI ID clash between the boot disk and another device, recheck the IDs on all external devices and change to a different number. Also check SCSI termination is switched ON, for the last device in the chain.

7) The disk's directory structure is damaged, use the disk repair utility to fix it.

The Mac is behaving erratically and files don't open - **what's doing this?**
1) THE most likely cause for a very unstable Mac, is the Master Directory and the Volume Bitmap on the hard disk has incorrect data concerning the number of files and space available on the disk. Do not continue to use the hard disk, as this may cause damage to files and applications. Use a disk repair program to correct it.

2) The Desktop File has become corrupted - either use your repair utility, or restart the Mac and hold down the Alt+Shift keys just after the extensions have loaded, this will display the message "Do you want to rebuild the desktop of [disk name]", click OK. The disk's directory structure could be corrupted, give it a scan, & repair any damage.

3) Also check your hard disk for viruses, and do not attempt to load any more programs, as this may cause further infection. The virus

could be in the Desktop or System files. CDEF is the only virus that infects the Desktop file.

4) The Finder application is damaged - usually causes regular freezes and crashing. Reinstall it.

GENERAL FILE, FONTS & ICON PROBLEMS

How can I convert PC truetype fonts to Mac truetype fonts?
Use a shareware program called **TTconverter**, this utility will convert PC TTF fonts to Mac, and Mac TrueType fonts to PC format. It can be downloaded from any shareware internet site.

When I double click on a iconified document, it loads the wrong program, what's happening?
This happens when either:
1) The desktop file has lost track of it's file association with some the applications. In which case you need to rebuild the Desktop File again (see **Keyboard Shortcuts** on page 90, on how to do this) in order to rectify the problem.
2) Or.. You don't have the latest version installed on any local partitions or disks. Just re-install the program you require and then load the file up again.

Is there a Mac utility that can convert Amiga IFF images to standard picture formats?
Yep! I recommend a shareware program called **GraphicConverter**, it is capable of converting many different types of image file formats (SGI, Mac, PC and Amiga formats, to name a few). It also has image editing, slideshow and batch conversion features.

Also note (to those who can afford it) that Photoshop 4.0 (last version that supports 68k CPUs) also caters for Amiga's IFF format - Photoshop 4 came out in the last quarter of 1997!

How do I make fonts available?
There are two methods; a simple way - for the occasional user; and one for managing a large number of fonts via 3rd party software.

First, the simple method: gather up all the fonts you want to use, they must be either Macintosh Type1 fonts with it's suitcase (screen fonts), or Truetype fonts. Then move them into the System's Font
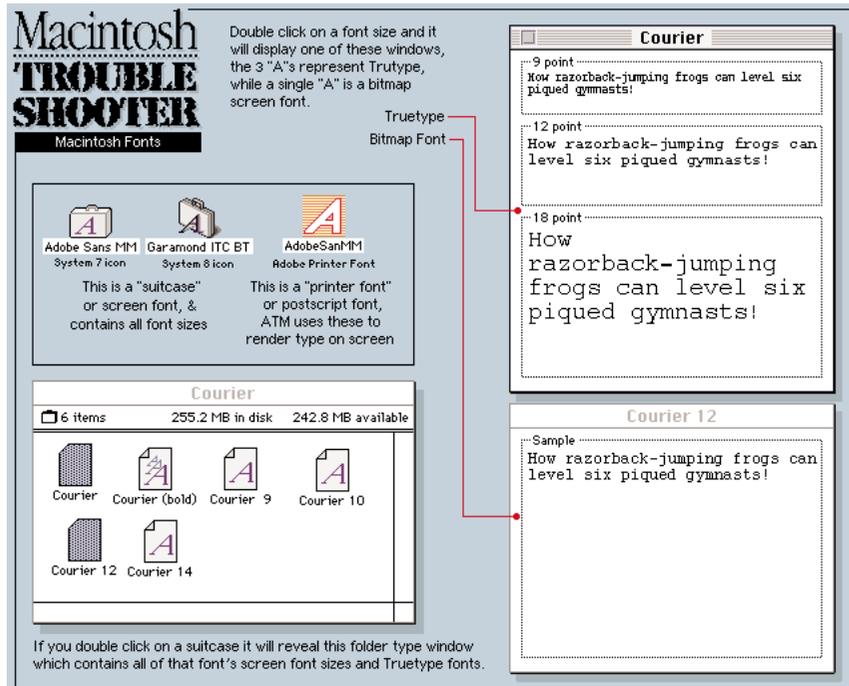
Picture 2.1 - Macitosh fonts consist of a Suitcase files and Printer Font files.

Picture 2.2 - There are many different makers of Printer Fonts.

folder, there is no need to restart the Mac, but you will need to quit and reload the programs you wish to use them with.
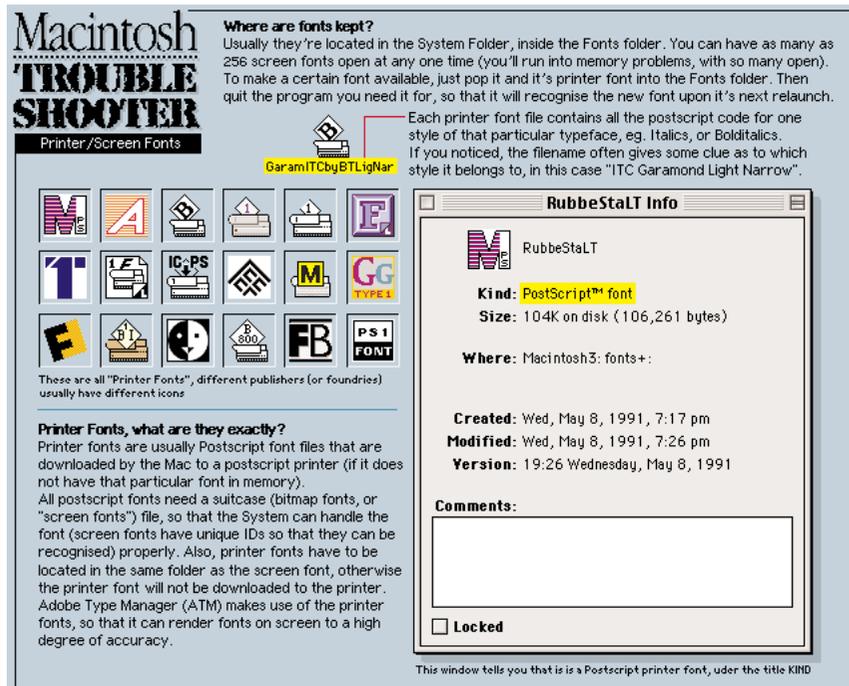
Second method is to buy a commercial or shareware utility that will manage your fonts for you. These programs often allow you to open fonts that are not even on the same volume as the System Folder, so you can open and close them at the same time you are using a program.

Here are a few products available; Symantec's **Suitcase** (commercial), **Master Juggler** (commercial), Adobe's **ATM Deluxe** (commercial), or **Font Manager** (shareware).

For an explanation of what Macintosh fonts consist of, see Picture 2.1 and 2.2.

How can I secure data on my Mac?
You can either buy a commercial package, such as **Norton Disklock, FileGuard** or **Private File**, OR download a shareware program - these can take the form of a disk lock-out or a file encryption utility with a password protection. For 100% protection of sensitive data, I'd suggest you buy a commercial product (such as the one mentioned).

To **erase data** completely, you need a utility that overwrites the file with random binary so as to make it completely unreadable, as well as remove it from the disk's directory. Such as **Norton Utilities' WipeInfo**, or by simply saving unimportant text/data of similar size or more over the original file via any program, but **not** by placing a file of the same name over the original in the Finder. This will only delete the file from the hard disk's directory, and the confidential data will still be recoverable.

I cannot get a file to open, how can I get it to load?
It is most likely a default dog-eared icon, which you won't be able to open by double clicking on it. Instead, load up the program you know can access it (if you know what type of file it is), THEN load-up the file via the Open dialogue box. Look in **Jargon**, page 97, under **Defaulted Icons** for a more detailed explanation of dog-eared icons.

If you don't know what program created it, then see the section called **File Characteristics**, page 61, for information about the file Type code.

If it does not load at all, then it may be damaged. However you could;
1) Restore a previous version from your backups.
2) If the file is text based, then you can recover most of the text by using Norton Disk Doctor's Recover File (only text can be recovered) feature. This will save the text into a separate file.
3) If it is a Quark Xpress document, then you can buy a repair program from Markzware, called **MarkzTools2**. See their web pages: www.markzware.com.

When I copy files across to other disks, they become corrupted, what can I do?
This can be caused by one of two things; bad blocks or the hard disk's max. transfer is set too high, a limit of 0X1FE00 = 128k is an average setting. Use HDToolBox (Amiga) to reset the limit, in the advanced options window.

It could also be caused by faulty SCSI cables (internal or external), or the Mac's directory structure is damaged - run your repair program on the disk, just to make sure. And while you're at it, rebuild the Desktop(s) of your Mac hard disks.

Scan your disks for viruses as well, it may have damaged the system file.

How can I transfer files (large or small) from a PC to a Mac?
To physically transport the files from the PC to a Mac;
1) Email the file(s) to your self.
2) PC formatted Zip disk (use the PC Exchange control panel to mount it).
3) Syquest removable disks (use the PC Exchange control panel to mount it).
4) High density floppy disks (use the PC Exchange control panel to mount it).

If the file(s) are very big, you could split the archive over a number of floppy disks, then rejoin them once you've copied it onto the Mac.

To make sure they are not corrupted, when copied onto alien filing systems:
1) Copy them as they are, without modification. These type of files are cross platform compatible, such as, image file formats; JPEG, GIF,

EPS, PCX and TIFF; text in ASCII format; and some program documents; Quark Xpress, MS Word, MS Excel, Pagemaker, Freehand, Adobe Illustrator, to name a few. However the file must have a 3 character extension, on the end of the file, for easy recognition.
2) As a hexadecimal encoded archive, known as a HQX file (this is it's dot file extension). This archive type uses ASCII characters to encode the data, which is also a universally recognised format, and therefore totally safe to store it until you can copy it to the destination computer.

It is usually necessary to compress the file first, because a HQX archive can and often does, increase the size of the original file by as much as 30%. It might be a good idea to encode large individual files so that they'll fit on a 1.4mb PC disk.

Here are some programs that can encode and/or decode HQX files:
• **Stuffit Lite** (shareware).
• **Stuffit Deluxe** (Commercial).
• **Stuffit Expander** (freeware, expands .cpt, .sit, .zip, .hqx, .uu, & .bin files).
• **ZipIt** (shareware).
• **Compact Pro** (shareware).
• **BinHex 4 & 5** (freeware, expands/encodes HQX files only).
3) Use a cross platform compatible archive program, such as;
• **pkZip** (PC) and Zipit (Mac)
• **LHA** archive program (Mac shareware programs are available).
• **Stuffit** (both for PC & Macs).

What type of compression formats are there for the Mac, and how can I recognise them?
There are 10 common archive formats for the Macintosh, and they usually add a 3 character extension onto the end of the filename, eg. archive.sit. **Stuffit Expander** is THE program to have, it can expand 2 common Mac archive types, SIT & CPT, and 3 file conversion types, BIN, HQX & UU. You can download a free expander for all the other compression types, either from the publisher of the software or from any shareware site.

Extension	TYPE code	Compression program that created it
xxxx.bin	MB2P	**MacBinary** format (combines the resource and data forks into one file).
xxxx.dd	DD??	**Disk Doubler** (??=other various characters).
xxxx.cpt	CPCT	**Compact Pro.**
xxxx.gz	Gzip	**MacGzip.**
xxxx.hqx	ASCI	**BinHex** (there are lots of other HQX creation programs on the internet)
xxxx.pit	PIT	**PackIt.**
xxxx.sea	APPL	**Self Expanding Archive** (expands itself, when you double click it).
xxxx.sit	SIT!	**Stuffit Deluxe/Lite.**
xxxx.uu	UU??	**UUencoded** file, a bit like HQX archives in nature.
xxxx.zip	ZIP	**Zipit** (is PC pkZIP compatible).

How can I tell what type of file this dog-eared page icon is?
As you may have already found out, it is useless to double click on a file which has reverted back to a default document icon, it simply won't launch any program.

This is what you can do to correct the problem; rebuild the entire desktop or use Norton Utilities v3+ to update a single file or files. This feature can be found in the menu of Norton's Disk Doctor, under the heading "Add file to Desktop".

If this does not produce an icon, then either you don't have the program that created the file (see **File Types & Creators**, page 62, on how icons are created), or the file in question has no Creator code in it's Finder flags. However, you can view it's codes by using **Norton Utilities**, on the main menu screen, look in the File menu for "Get Info For.." and highlight it, now find and select the file. Or you could find out via **FileBuddy**'s Get Info screen, see the Picture 2.3 and 2.4.

The Creator or file Type may give you a good indication as to what it is, for example, File Type = JPEG, this means the file is an image.

There is a database document for the Mac, called **Type/Creator Database** which can be found on any Macintosh shareware internet site, or go to the authors site:
www.anglefire.com/il/szekely/index.html
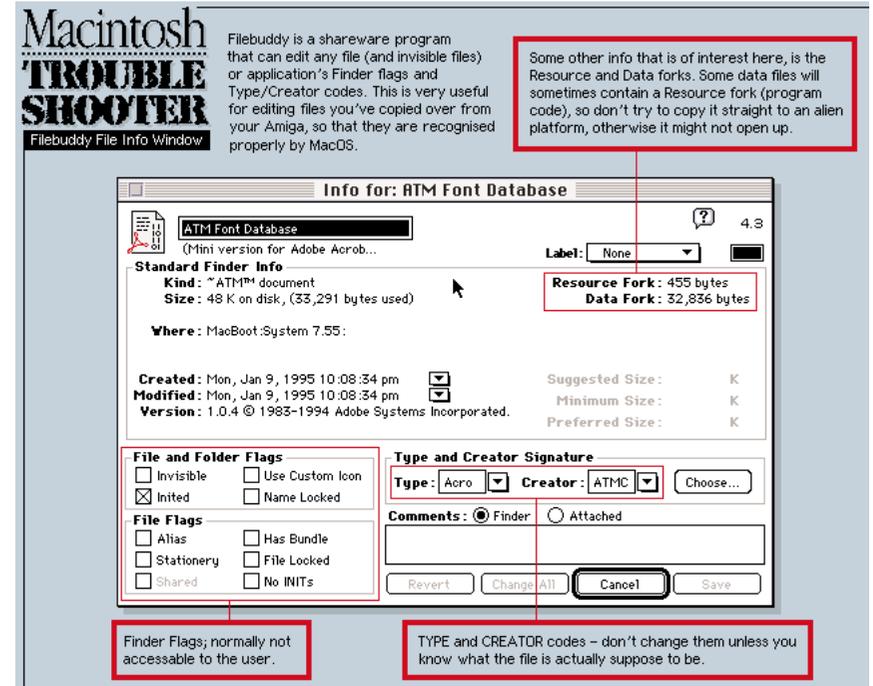
Picture 2.3 - Filebuddy's 'Get Info..' window.
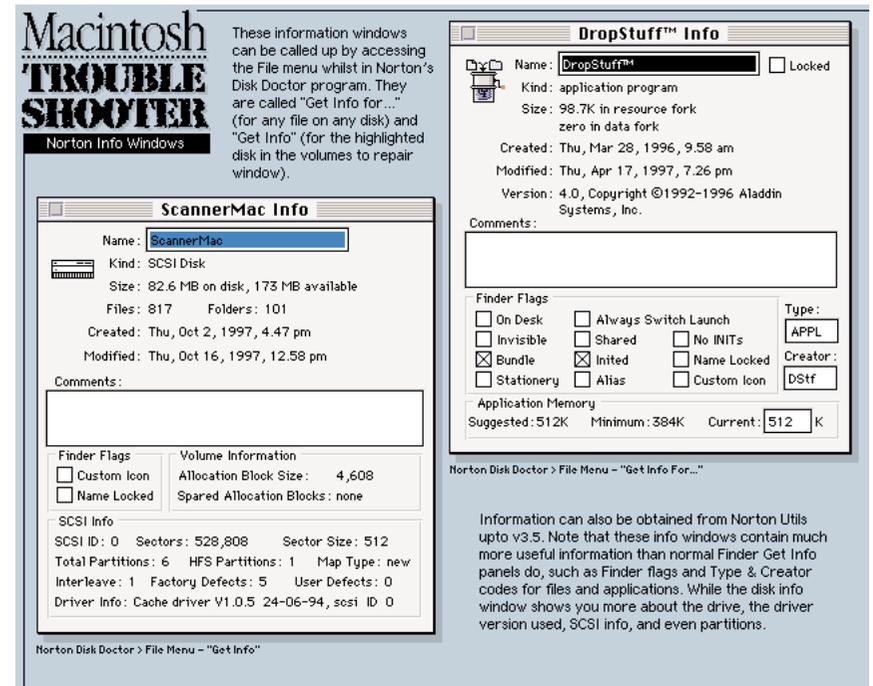
Picture 2.4 - Norton Utilities' own 'Get Info For...' windows.

How come all of the icons on my hard disks have defaulted to generic icons?

The Desktop file which stores information about all the icons on that hard disk has either become corrupted or it cannot update it any more, due to a bad block or bad Desktop file.

All you need to do is to rebuild the Desktop file. To do this, you have to restart the Mac and then hold down the Alt+Amiga (any combination) keys just before the last extension is loaded. The Finder will detect this key combination, and will ask you if you want to rebuild the desktop for the main system disk and then for any other mounted volumes, everything should be back to normal.

If the Desktop fails to rebuild, you need to make the current invisible "Desktop DB" and "Desktop DF" files visible, these are located in the root directory. Use a File editor such as Norton Disk Doctor or FileBuddy to switch off the invisibility Finder flag, and then put them into the Trashcan. Then restart, the Finder should generate the Desktop file automatically. Now, empty the Trashcan.

TIP: If an application defaults to a generic form, you do not need to rebuild the entire desktop. Use any program that can add a file to the desktop, such as Norton Disk Doctor 3.5x, and update just the application with this feature. The rest of the apps associated files and documents will appear properly upon the next reboot.

Some fonts don't appear to work, or I cannot move them out of it's suitcase or folder?

It is more than likely that the bitmap or truetype font(s) in the suitcase (commonly known as a screen font if used inconjunction with Postscript Type-1 fonts, or Printer fonts) are damaged or do not work properly. This type of error does not effect the Printer fonts, they are separate files. There or two manual ways to find out if a font does not work; **a)** Try to move the suitcase to another folder, if an error message appears, then the suitcase is corrupted, or it won't let you move individual font sizes out of the suitcase - both good indicators that the suitcase is damaged, and usually cannot be repaired. **b)** Look inside every suitcase that is normally loaded up, including the System's Font folder, then double click on each font size icon to view the font style & size. Now see if all of the fonts inside the suitcase show the proper

font. A bad font will always display a default font, such as Geneva. A dead give-away is that an italicised font is not only a generic font but also not in italics.

There is a way to get rid of any suitcases that refuse to be moved, simply create a file with the same name as the suitcase and move it into the same folder as the damaged file, it should overwrite it. Just in case the System does not allow you to do this, you can use a file eraser utility, ie. Norton Utilities-Wipe Info. You may have to startup with all extensions disabled first.

On a further note: check that the **Adobe Type Manager** (ATM) control panel (if you are using it) has enough allocated memory for rendering text, something like 256k or above is usually adequate. While I'm on the subject of ATM, is it functioning properly? This is another possible as to why fonts are not displaying properly. The only way to tell, is that large on-screen type is not being rendered accurately. Extremely blocky type means that ATM has been switched off or it is damaged, you may have to reinstall ATM again.

How can I make an invisible file, visible?

You need a utility to edit the file's Finder flags, such as **File Buddy** (shareware) or **Norton Utilities** (under File menu "Get Info for.."). I suggest you only switch on/off the "invisible" flag only, the meddling with any of the other flags could damage the file.

See the section called **File Characteristics** on page 61, for more info concerning Finder flags and what they do.

How can I retrieve deleted files?

Use **Norton Utilities** Filesaver and Unerase features, to manage deleted files. Filesaver remembers up to 500 files that have been erased. However, over a period of time, ie. up to 2 days of constant use, the oldest binned files will be over-written by the Mac, so if you need recover a trashed file, you better rescue it soon. If a directory search does not recover the entire file, you'll have to revert to a backup. See Picture 2.5.

How can I convert a special text document, eg. Word, into another format?

You need a text file type converter program, such a **MacLink**+ from Dataviz (which can be found on the System 7.53 CD) or similar program. This program will convert any supported word processor formatted doc into a similar Mac format.

The only other way, is for the person who sent it, to resave it as an ASCII text file. This would remove any text formatting, or you could open this document with a text editor and remove the junk surrounding the text by hand, and then resave it.

Picture 2.5 - Norton Utilities' Filesaver control panel.

VIRUS RELATED SYMPTOMS & PROBLEMS

What is the safest way to eradicate a virus on my Mac?
First you need a good, up-to-date virus checker. There are about 3 commercial packages:
• **Norton AnitiVirus**, from Symantec.
• **Dr Solomans AntiVirus**, from Dr Solomans.
• **Virex**, from Datawatch.
and 2 shareware programs:
• **Disinfectant 3.71**, is freeware, but was discontinued in July 1998. OK for starters, but it doesn't recognise all viruses.
• **VirusScan** from McAfee, this is shareware, and recognises most viruses.
• There are quite a few virus specific eradicators on the internet.
While you wait for the anti-virus software, there are a few simple steps you can take to prevent any further damage (remember, you could have a really nasty virus that could either destroy files, or format the disk). You can; not use your Mac emulator, full stop, or use a boot disk that cannot be infected by a virus, eg. a bootable CD-ROM disk.

If you do use your Mac this way, don't launch any programs on the infected disk, as all of the executable software will no doubt be infected, and will cause further damage/infection. Do not copy any files off the infected disk either, some viruses infect documents/files as well. If you really need them, make sure the destination Mac has a virus scanner on it, so that the diskette can be repaired.

Once you have it, you need to create an anti-virus bootable floppy disk, and it has to be **write protected**, otherwise the virus will infect the floppy disk and all software on it, making it ineffective. Do this on a "clean" Mac, in other words one that you **know** is free from any virus. Then scan **all** other floppy disks and removable HDs.

All you have to do now, is to set up the software, to make regular checks of the hard disk and to automatically check any disks that are mounted on the desktop.
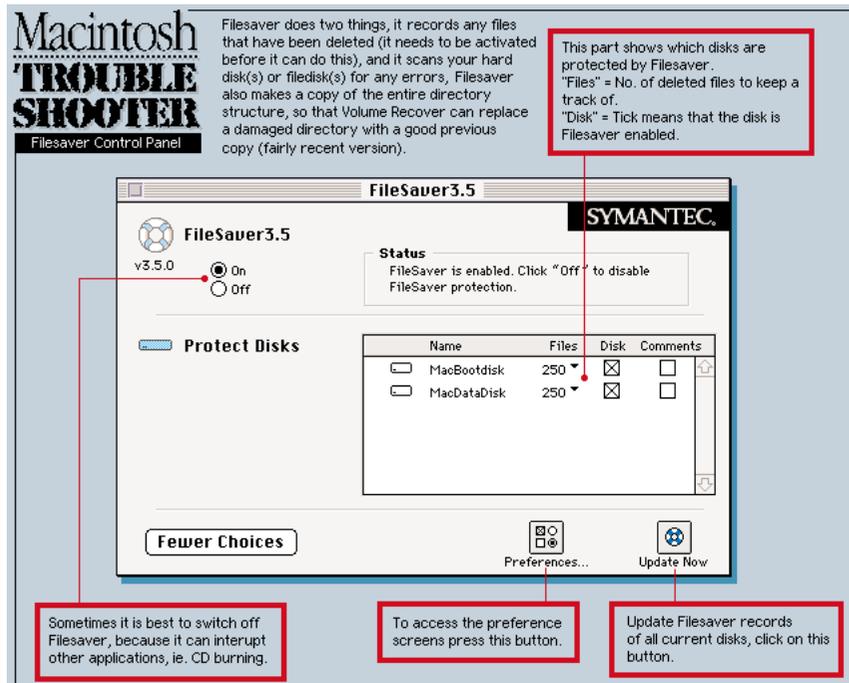
SYMPTOMS

What do viruses infect?

Normally they infect the System file and the Finder, and any programs that you either launch (if it is already in the System file) or any that are located on the hard disk. Of course, some viruses don't infect anything, but prefer to destroy files, the hard disk's directory, or just reformat the hard disk!

I'm experiencing; unexpected delays; some of my files have disappeared or won't open; and long disk accesses. What the hell is going on?

There is a destructive virus on your Mac. Get an anti-virus program immediately. If you don't have an up-to-date virus detection program, all you can do is to switch off the Mac, until you receive the software. This will render the virus inoperable for the duration. When you have the anti-virus utility, make sure the emergency disk is write protected, so that the virus cannot infect it, otherwise it'll be completely pointless trying to repair files with an infected disk/program.

   Check all your Macintosh disks, so that it is utterly eradicated. Don't forget to use your backups with caution, as these may also contain infected programs/files, depending on when the virus got onto the hard disk. See the section about **Viruses in Detail** on page 45, for more info.

   You may need to re-install the System file and Finder again, if you're experiencing a lot if crashes.

What does "This disk needs minor repairs" mean, and what should I do?

It could be a virus misinforming you to write enable it, so that it can infect the disk, sneaky or what! Instead, cancel the requester and eject the disk, then restart the computer with all extensions disabled (this will not disable the virus, but will reduce further infection just a bit). Now scan your main hard disk with an anti-virus program. Also scan the floppy disk for good measure.

   If you know for definite, that a virus is not the cause, then repair it with the Finder (iffy method), or use your disk repair utility (recommended method).

Some applications refuse to launch, or crashes, how come?

Some old programs may not work with later Mac operating systems, or the program is incompatible with the Amiga's processor, particularly 68000/040/060s. I strongly recommend you get an up-to-date version of that software.

   It could be a virus attack. Most viruses change or damage the code in every program it infects, rendering it either unusable or unstable. Once you have completely eradicated the infection, I suggest you bin the useless applications, then install them again.

   See the section called **Crashing**, on page 12, for more info.

VIRUS FACTS & INFORMATION

The European Institute for Computer Anti-Virus Research (EICAR)
http://www.eicar.org/

Mac Viruses FAQ
http://www.cis.ohio-state.edu/hypertext/faq/usenet/computer-
         virus/macintosh-faq/faq.html
http://www.faqs.org/faqs/computer-virus/macintosh-faq/
http://emt.doit.wisc.edu/macvir/macvir.html
http://www.macvirus.com/reference/
http://webworlds.co.uk/dharley/

Symantec Antivirus Research Centre - **Virus Encyclopedia**
http://www.symantec.com/avcenter/vinfodb.html

Mac Virus
http://www.macvirus.com/reference/viruses.html
Network Associates (was McAfee Associates) -
Virus Information Library
http://www.nai.com/vinfo/
http://www.nai.com/vinfo/f_13707.asp

University of Hamburg, Virus Test Centre, Macro Virus List
(THE definitive listing)
ftp://agn-www.informatik.uni-hamburg.de/pub/texts/macro/

http://agn-www.informatik.uni-hamburg.de/vtc/eng.htm
OR
ftp://ftp.informatik.uni-hamburg.de/pub/virus/texts/viruses/
ftp://agn-www.informatik.uni-hamburg.de

Dr Solomon's Mac Viral Zoo - Virus Encyclopedia
http://www.drsolomon.com/products/virex/zoo/maczoopg.html
Dr Solomon's Software Ltd
http://www.drsolomon.com/vircen/enc/
Central Command
http://www.avpve.com/viruses/macro/
Data Fellows
http://www.datafellows.com/macro/

INTERNET CONNECTION PROBLEMS

To find out more information on Open Transport, Classic Networking and where to download relevant files and software updates, go to page 24.

What software do I need to connect to the internet?
You have two choices, **Classic Networking** (CN) or **Open Transport** (OT). Both require certain Control Panels and Extensions, as listed below:
CLASSIC NETWORKING...
MacPPP and **ConfigPPP** (Control Panels), or **FreePPP** (Control Panel), **MacTCP** (Control Panel).

OPEN TRANSPORT...
Open Transport **PPP** (Control Panel) or **FreePPP** (Control Panel), **Modem** (Control Panel), and **TCP/IP** (Control Panel).
Open Transport v1.1 Extensions: **Open Tpt AppleTalk Library, Open Tpt Internet Library, Open Transport Library, OpenTptAppleTalkLib, OpenTptInternetLib, OpenTransportLib.**

How do I get my modem "on-line"?
You will find that **Classic Networking** will work much better than Open Transport, for most Mac emulation setups - use Open Transport, only as a last resort!
    Go to the PPP control panel (whatever it is you're using), and press the **Connect** button. Now you can use your internet browser, email or newsgroup program, that's it! Assuming of course that you have setup the PPP control panel correctly, ie. you've supplied all the relevant data into it.
    Also make sure that the modem port is free, as in, the printer is not currently setup to use that port at the moment - if it is, switch off the printer and plug in the modem and switch it on, then retry connecting via the PPP control panel.

Where do I type in the settings for internet access?
The two control panels you'll need to setup are the TCP/IP (Transport Control Protocol/Internet Protocol) and PPP (Point of Presence Protocol). All settings are saved in these two, however in OT, it has a modem control panel, which stores information on the exact modem you're using.

Please note that FreePPP will work with both CN and OT standards, except that it will be a little slower under OT, due to it not being fully OT optimised.

Don't forget that in MacOS 8, it has a program that will take the hassle out of setting up internet access, it is called **Internet Setup Assistant**, and can be found in the Apple menu (or do do a search via the Find command in the File menu, in the Finder). You still need to know information about your Internet Provider and your modem etc, so that you can type it in the relevant boxes.

What type of files can I download from the internet?
You have two choices; as an archive, or "as is" (unarchived and unencoded). There are many different types of archive that are pretty much standard on Macs: HQX, MacBinary, Zip, Compact Pro, Stuffit, UUencoded and Disk Doubler being the most common.

Some files can be transported as they are, because they do not have a resource fork, only a data fork, therefore they cannot be damaged when transported onto different platforms. The type of files I've managed to download from the net, onto my Amiga, and then onto my Mac, are: PDF (Adobe Acrobat) files; SIT (Stuffit), GZIP, ZIP and LHA archive files; all types of image files (they really need a 3 character extension on the filename, for file type recognition). There may be others, but you're best sticking to these file types, and archiving any files your not sure about, before you upload them.

See the section called **File & Icon Problems**, on page 18, for further information on transferring files to/from a foreign platform, and about archive types that are used on the Mac today.

USEFUL INTERNET INFORMATION

Downloadable Software
FreePPP and MacPPP can be obtained from:
• ftp://ftp.tibits.com/pub/tidbits/tisk/tcp/com/**mac-ppp-201.hqx** or **free-ppp-105.hqx**
• MacPPP & ConfigPPP is on the System 7.53 CD (v1.1).
• http://www.info.apple.com/
  Most of the CN extensions/control panels can be found here, or in the System 7.0/7.01 disk image sets.

Open Transport can be found at/in:
• the System 7.53 CD (v1.1).
• the System 7.6 CD (v1.11).
• the System 8.0/8.1 CD (v1.2).
• http://www.info.apple.com/
  Open Transport v1.x installer + associated files.
• http://www.tucows.com/ - OT updaters to v1.11 & v1.12.

Internet browsers:
• **Internet Explorer**
• **Netscape Navigator** both can also be downloaded from a lot of internet sites, and from mag CDs.

Emailers:
• **Endora Lite** - from most internet site, this is the shareware version (I think).
• **Endora** - is the commercial version, much more features than Endora Lite.
Other commercial software:
• **CE Quickmail Pro** (£53) - commercial only.
• **CE Quickmail LAN** (£116) - commercial only.
• **Claris Emailer v2** (£45) - commercial only.

Modem Compatibility:
Download an updater program called **Modem Updater v1.3**, this contains the profiles of all modems known modems (v1.21 is for USA

users), however you need the updater for your particular country: **ftp://ftp.info.euro.apple.com/Apple_Support/Area/Apple.Software.Updates/English-British/Macintosh/Modem/** - the last few parts is obviously for us Brits!

Open Transport PPP

System requirements: **Open Transport v1.11** or above, and Systems 7.1, **7.11, 7.12, 7.53** or later (Systems 7.5, 7.51 and 7.52 are **not compatible**), and only TCP/IP control panel with work with OT PPP.

Open Transport PPP can be downloaded from Apple's web site (www.info.apple.com) or from Tucows web site (www.tucows.com).

Internet Config Extension

This extension comes as part of System 8, it is also freely downloadable from many Mac shareware sites. What this useful utility does (comes with a small program to setup your preferences) is to allow access to your personal internet setup to all other internet applications, saving you the hassle of having to setup each program individually. Most browsers, email etc, accept Internet Config as standard now a days.

PRINTING PROBLEMS
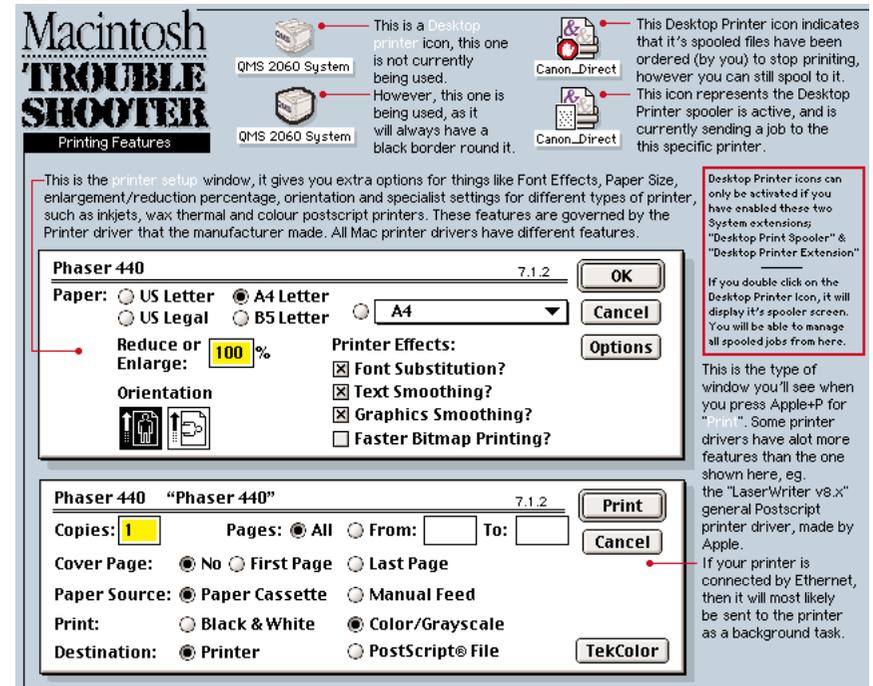
Picture 3.1 - A typical printer driver Page Setup window and Print screen.

How do I use the Desktop Printing feature?

This feature came with System 7.5 upwards, and requires two system extensions: **Desktop Printer Spooler** and **Desktop PrintMonitor**. Both can be installed individually by the System installer.

To create any Desktop Printer icon, go to the Chooser and select the printer driver, and the connection type (network or printer/modem port), then close the Chooser. Immediately after you've done that, an icon will appear on the desktop.

To view the contents of the Desktop Printer spooler, just double click on the Desktop Printer icon and it will display a list of current (if any) spooled documents. Also note that when you highlight the
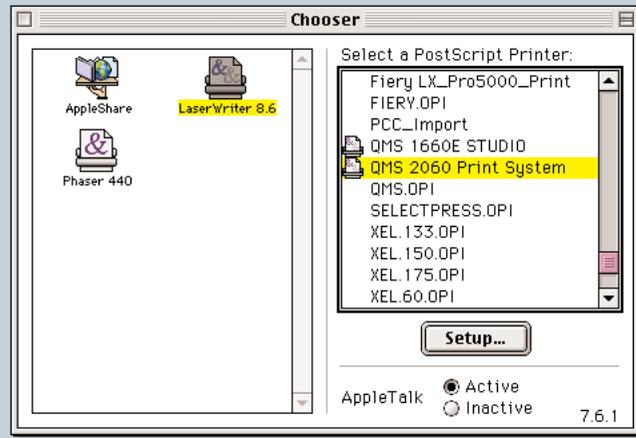
*Picture 3.2 - **The Chooser and printer driver selection dialogue screen.***

Desktop Printer icon or the you have Desktop Printer window is displayed, an extra menu is visable. This is called "Printer", and is located between the "View" and "Special" menus. This menu controls the spooler.

Why won't my printer print anything?
It is a known fact that printing in ShapeShifter is at best a lost art, it is very picky about how you've setup your System - Classic Networking will have better success than Open Transport will. If you have OT installed but not Classic, then I'd recommend you to reinstall your System Folder again, this time without OT (it stores OT code in the System file, which may interfere with the connection process to the printer, and a modem).

I've tried OT and printing, and it doesn't work with my Epson Stylus 500, at all! As for Fusion, well, this is much less hassle to setup and get working.

1) You might need a bi-directional parallel cable (PCs use them).
2) Check that the printer is switched on, cabled up properly, and the parallel port is selected in ShapeShifter's/Fusion's setup window, before you select the driver icon in the Chooser.
3) If it is a dot matrix printer, then you can try **Chucks Printer Driver**, it can be downloaded from any internet site. It is basically a generic printer driver - it does work.
4) Did you get a Macintosh printer driver disk supplied with the printer? If you did, then all you need to do is to install/copy it into the System's Extensions folder. You should see it in the Chooser after you have restarted the Mac. It is imperative that you use a driver for your model of printer, otherwise it will not work properly.

Many manufacturers supply their printer drivers on their web sites, so you may need to download the latest version. See their documentation for the web address, or go to "Peter's Amiga Homepage" at **www.blizzard.u-net.com**, which contains a wide selection of printer driver links/URLs to either the manufacturer's web site or to 3rd party web pages.
5) Try an **older** version of the driver. The one you're using could be incompatible with Mac emulation, or your particular version of MacOS.
6) Is the correct printer driver and the Printer Port, selected in the Chooser?

If you don't select these in the Chooser, the data cannot be directed through the parallel port. Or you could try **Power Print v4.0**, from Infowave, it allows you to use parallel printers - it's a lot like the Amiga's TurboPrint package.
7) Make sure AppleTalk is Inactive. If it is On, switch it off via the Chooser, and restart the Mac.
8) Are you using the correct version of Laserwriter, version 7.x is Postscript Level 1 compatible, while Laserwriter 8.x is Postscript Level 2 compatible.
9) You can only use Ethernet or parallel port compatible printers.

I'm trying to print a document, but it keeps giving me error messages, or crashing?
It is highly likely that there is something wrong with the file that you're trying to print;
1) The doc is using a corrupt font - **Some fonts don't appear to work..** for info on how to find a damaged font suitcase.
2) Check the **Page Setup**, has the correct printer settings. If you're using a PS printer, make sure the correct PPD (or whatever description file you're using) is selected.
3) If you are using Background Printing, the spooled print job file may be damaged - delete it and try it again. If this still doesn't work, run a disk repair program on the System hard disk.
4) You may be trying to use PostScript fonts on a non PostScript printer, only Truetype fonts work with bitmap and PostScript printers.
5) There may be a corrupt element in the document you're trying to print. Resave the doc with a different filename, or copy all elements out and into a brand new document, now try and print it.
6) There maybe a picture in the document that the printer is having trouble rendering. Try simplifying the image, ie. reduce the resolution/filesize of the pic, and/or reduce the number of colours it is using, say, to 256 colours.
7) Have you setup the Print options correctly... such as the proper paper size eg. A4 (sometimes called Letter), and the correct printer dpi.

Can you print using an Ethernet card and compatible printer, in SS/Fusion?
Yes, provided you have set up all the networking equipment correctly (the Amiga Ethernet card, the Amiga driver software, plus cables), for ShapeShifter and Fusion.
    You should be able to set up Ethernet software from 7.1 with the Tune-up updater, up to 7.55 with classic networking (no Open Transport).
    Open Transport requires System 7.5 and above, this is probably much easier to setup, than classicnetwork software.
by John Blyth (Australia)

    As for Ethernet compatible printers, most of them are Postscript (PS) laser printers, although they are quite hard to find they are gradually growing in number. I'll list a few:
• Apple Laserwriter IIG
• Epson Stylus Colour1520 - 1440dpi A2 PS colour inkjet, £451 ex VAT.
• GCC Elite 12/600 - 600dpi B&W A4 PS laser printer, £849 ex VAT.
• GCC Elite 1212 - 1200dpi B&W A4 PS laser printer, £999 ex VAT.
• GCC ELite XL61 - 600dpi B&W A3 PS laser printer, £1299 ex VAT.
• Lexmark SC1275 - 600dpi Colour A4? PS laser printer, £2419 ex VAT.
NOTE: It is impossible to print via LocalTalk, on a standard Amiga.

Do I need any special software for Ethernet printing to work?
Yes, just the printer driver software for your make of printer. Postscript printing via an Ethernet card to either a directly connected printer, or even a networked printer, all work as per standard Mac OS printing procedures; everything is handled by the driver. It will also work with Desktop Printer icons.
by John Blyth (Australia)

Do I require a PPD file for my printer?
No. Only Postscript Level 2 printers use PPDs, all other types of printer just require it's printer driver. The printer driver always affects how the Print window will look, it is different for all makes of driver, in layout and what options are available to you.

POSTSCRIPT PRINTING PROBLEMS

Laserwriter 8.x doesn't work with System 7.6x, how come?
All 68k Macs cannot use Laserwriter v8.43 in System 7.6 without the **CFM-68k Runtime Enabler v4** extension installed in the System Folder. This applies to all versions of Laserwriter v8.4 and upwards. This extension may also be worth while installing for older versions of Laserwriter v8.x, it'll reduce crashing to an absolute minimum. Look in Apple's web site (www.apple.com) to download some later versions of Laserwriter 7 and 8.
    Note: System 8.x does not require this extra extension, as it is now built into the System file.

Nothing will output from my laser printer, or the Mac crashs regularly when printing, why?

Some programs may not like your current version of Laserwriter 8 or PSPrinter, in which case use an older version. The oldest (but non buggy) versions I'd recommend using, are; Laserwriter v8.43 and/or PSPrinter v8.31. As for Laserwriter 7, use v7.2 or later.

USEFUL PRINTING INFORMATION

The Chooser

Allows you access to devices connected to a normal Mac's Modem or Printer ports (parallel or serial ports to you and me). It is also the only way to choose a printer as the current output device - you have to select a printer driver in the Chooser, before you can print anything. This is also where Background Printing and AppleTalk can be turned off or on. Amigas cannot support AppleTalk, because it is a hardware feature of real Macs.

The left hand side of the Chooser window lists all available **Printer Drivers, Network Drivers, and any other driver icon** that'll use the Printer and/or Modem Ports, except for modems, which only requires the PPP and TCP/IP Control Panels. Just click on any driver icon to activate it - now go to the right hand side of the window. This panel should list either the Modem or Printer port icons, if your printer is connected directly to your mac, or any networked printers, it should appear as a list. All you have to do is to highlight the printer name or the port it is currently connected to.

If your network has **Zones** (individual network groups that are connected together), then these will appear underneath the printer and network driver panel. To select a Zone, simply highlight the Zone name, and then go the right hand side again to make your printer or server selections again.

Printer Drivers

All Mac compatible printers come with a floppy disk, with the printer driver on it (usually with an installer present). The Printer Driver always goes in the System Folder/Extensions, and is accessed via the Chooser (via the Apple icon menu). For every model of printer, there is usually a different printer driver for it, don't assume one will work with another similar make, because it won't.

At the moment there are two Postscript (PS) Level 2 printer drivers that work with every PS printer, and they are Apple's **Laserwriter 8** and Adobe's **PSPrinter**. Laserwriter v7.x will only work with Postscript Level 1 printers. Also note, that some programs prefer PSPrinter rather than Laserwriter, such as Pagemaker (also from Adobe).

The best versions of these two postscript printer drivers, are: Laserwriter v7.2 upwards, Laserwriter v8.34 upwards and PSPrinter v8.31 and above (Laserwriter 8.4+ requires the **Finder Scripting Extension**, in order to work properly) - these have must of the bugs ironed out of them. To get the latest version, visit Apples web site: **www.info.apple.com/**

Printing Software

PowerPrint v4.0 ($99) is a software package that is similar to the Amiga's TurboPrint package, basically what it allows the Mac to print to serial or parallel port compatible printers. See Infowave's web site: **www.infowave.net.**

Note that the latest version (4.5) **requires** that you use the Mac to PC cable converter, this will not work on the Amiga, instead try and get v4.0.

Another useful utility from Infowave is **StyleScript** (£70). This program allows you to use Postscript with Postscript incompatible inkjet printers - it basically converts the PS language into a bitmap image before it goes to the printer.

Background Printing

This spools the print job to the hard disk and then proceeds to send the data to the printer as a background task, allowing you to do other things. The program that usually handles this is **Print Monitor** (an Apple program), which is located in the Extensions folder.

To enable background printing, either call up the Chooser in the Apple menu, and click the **On** button under the title **Background Printing**. Or, when using Laserwriter 8.x, go to the "Print" window in any application, and select **Background Printing**, in the pop-up menu and activate it from there.

PPDs

These are Postscript Printer Description files, and are used inconjunction with Postscript Level 2 printers and the Laserwriter 8 printer driver. PPDs contain device specific information, so that you can setup certain options in any application, such as paper and resolution. Other types of printers do not require PPDs, just the printer driver in the Chooser window.

Desktop Printer Icons

These are introduced in System 7.6 upwards, they allow easier access to printer selection and printing of documents via drag and drop.

PostScript

Is an industry standard printer language. It describes an entire document (when sent to the printer) as a list of instructions, which explains how the page(s) should be printed. This means it is "resolution independant", as in it can be scaled and output in any number of different ways and still retain it's EXACT layout without any loss what's so ever.

Printer Fonts

This term actually refers to the Postscript fonts (stored on your hard disk). These are downloaded tothe printer, at the same time you send your document. You can always tell if a file is a Postscriptfont, by the icon, and by it's "kind" in the Get Info window.

PRINTER DRIVER WEB PAGES

This is a complete list of manufacturers, and where you can download their printer drivers.

Apple ....http://www.apple.com/laserwriter/
Atari ....http://www.lapd.demon.co.uk/
Brother............................http://www.brother.com/eu-printer/dlupdate.html
Canon..............................http://www.europe.canon.com/drivers/printers/
Citizen America.............http://www.citizen-america.com/drivers/index.htm
C.Itoh ....ftp://www.citoh.com/
Dataproducts..................http://www.dpc.com/market/tec_drvr.html
Digital.............................http://www.pc.digital.com/~ftp/options/ printer/digital/
Epson ....http://www.epson.co.uk/support/download/
Fargo ....http://www.fargo.com/support/driver_list.html
GCC Technologies ....http://www.gcctech.com/support/swol.html
Hewlett Packard ....http://www.hp.com/cposupport/nonjsnav/ prhome.html
                                      Freeware printer driver: HPDJ 3.1
                                        By Marius Lichte (Germany)
IBM ....http://www.printers.ibm.com/driver.html
Kyocera...........................http://www.kyocera.co.uk/htdocs/drivers.htm
LaserMaster ....http://www.lasermaster.com/tech/arch.html
Lexmark..........................http://drivers.lexmark.com/drivers.nsf
Microsoft Printer ....http://www.microsoft.com/uk/
NEC................................http://cssweb.nectech.com/drivers/printers.htm
Okidata...........................http://www.okidata.com/drivers/drv-main.html
Panasonic ....http://www.panasonic.com/host/support/drivetop.htm
Olivetti ....http://www.olivettilexikon.com/uk/software/index.html
Olympus ....http://www.olympusamerica.com/printers/
                                      downloads/download.html
QMS................................http://www.qms.com/www/QMS_Soft.html
Star Micronics...............http://www.starmicronics.com/
Radio Shack...................http://support.tandy.com/soft.htm
Tektronics ....http://www.tek.com/Color_Printers/
Texas Instruments http://www.ti.com/printer/docs/p20a.htm
Toshiba ....http://www.toshiba.com/
Xerox http://www.xerox.com:80/soho/drivers.html

CONNECTING TO A MAC NETWORK

To find out more information on Open Transport, Classic Networking and where to download network related software updates, see Network Information on page 33.

Can I use Amiga Ethernet with Mac emulation?

Yes, as long as you don't want to use any TCP/IP based programs simultaneously, because the hardware doesn't appear to be able to discern between the Mac & the Amiga (they both want the same hardware address for the same sort of packets). AppleTalk/Ethertalk, AMIGA TCP/IP and the Mac based Novell (nds) client will all happily coexist. The Novell client for the Mac does require ShapeShifter 3.9 to work fully (its fairly sensitive to the internal Ethernet calls).
You also have to manually choose the right protocol in the MacIPX control panel (it sometimes gets stuck - just delete the MacIPX prefs and start again).
by John Blyth (Australia)

What software do I need for networking?

You have two choices, **Classic Networking** (CN) or **Open Transport** (OT). Both require the standard MacOS Ethernet driver extensions, and Open Transport or Classic Networking control panels;

CLASSIC NETWORKING...

Control Panels: **MacPPP** & **ConfigPPP** or **FreePPP**, **MacTCP**, **Users & Groups**, and **Sharing Setup**.
Extensions: **Ethertalk Phase 2, Network Extension, File Sharing Extension** and **AppleShare**.

OPEN TRANSPORT...

Control Panels: **PPP** or **FreePPP, Modem, TCP/IP, Users & Groups**, and **Sharing Setup**.
Open Transport v1.1 Extensions: **Open Tpt AppleTalk Library, Open Tpt Internet Library, Open Transport Library,**

OpenTptAppleTalkLib, OpenTptInternetLib, OpenTransportLib.
Other Extensions: **Ethertalk Phase 2, Network Extension, AppleShare**, and **File Sharing Extension**, and **Printer Share** (if you plan to share the printer connected to your Amiga).
*__Do not__ use these extensions: Ethernet CS, Ethernet NuBUS or Ethernet LC. Also, AppleShare versions **3.64** and **3.65** in System 7.6x, it will cause ShapeShifter (any version) to freeze, use v3.62 from System 7.53-7.55.
*__by John Blyth (Australia)__

How do I connect to a network, via Classic Networking?

Make sure that you have installed the CN control panels, the Ethernet driver, and network server extensions (if you need it), and that your Ethernet card is working.
    Now go and open the **Network** control panel, you should see the Ethernet/Ethertalk icon, select it it should tell you that the previous network connection is now unavailable, press OK (CN allows you to use only one type of network at any one time).
    Now open the **MacTCP** control panel, and select the protocol you wish to use, Ethernet in this case (note that some internet settings are located here as well), click on the more button to fine tune your settings. You are now connected to the Ethernet network.
    If you get a message saying that you cannot connect to an Ethernet network, then check;
1) The Ethernet card is functioning properly.
2) ShapeShifter/Fusion, has the correct Ethernet driver is selected.
3) That you have all the appropriate extensions in your System Folder (see above).
4) The File Sharing control panel, it should have an Owner Name, and a Computer Name, if they don't, then filled them in (any name you like) - networking will not work without these user names.

How do I connect to a network, via Open Transport?

Open the AppleTalk control panel, and select Ethernet from the pop-up menu (this will display all available communication ports open to you), now go into the Options screen and make any additional settings. Also check that the TCP/IP control panel's settings for

Ethernet are also correct. You may need to get some information from your Network Administrator, such as passwords, and the current protocol that is in use.

Check the File Sharing control panel has an Owner Name, and a Computer Name, if they don't, then fill them in with your name and the computer's name (it doesn't need to be anything specific). All you need to do now is to select a network service (Server or Printer etc) from the Chooser. See Pictures 4.1, 4.2 and 4.3.

Should I use Open Transport or Classic Networking software?
This depends on the emulator you're using. If you're using ShapeShifter, then Classic Networking will work - Open Transport just refuses to play along. However, if you're using Fusion, then you should be able to use both OT and CN. Again CN is much more compatible in emulation than OT.

Picture 4.2 - Selecting a Fileserver - Type in the password, or be a guest.

Picture 4.1 - Selecting a Fileserver - Choose the server by name.
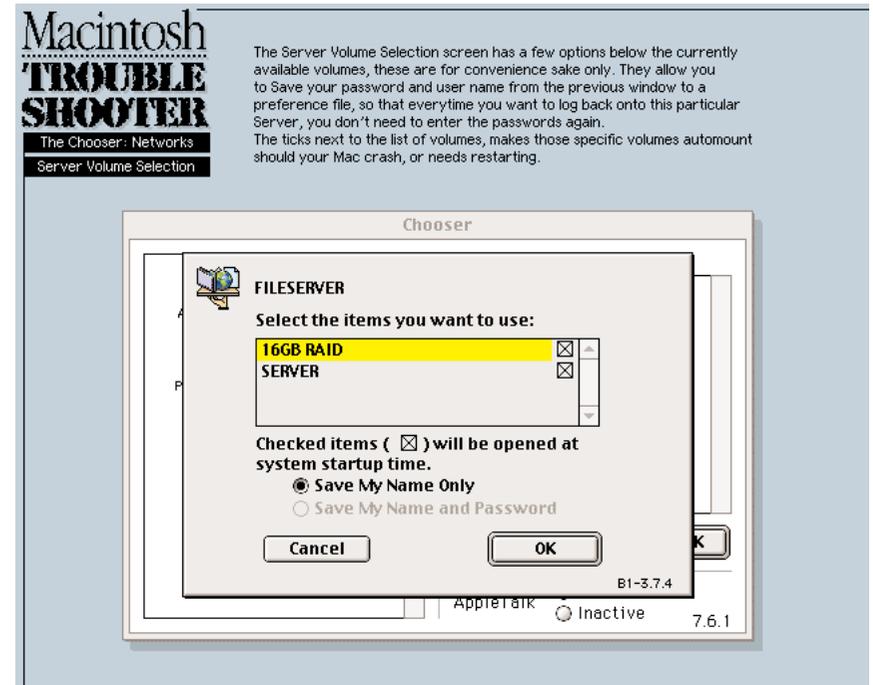
Picture 4.3 - Selecting a Fileserver - Select the volumes to mount.

How do I connect to a single Mac?
This is done via the **File Sharing** control panel.
Check that AppleTalk is enabled (in the Chooser). Open the control panel called **Network**, you have two choices, Localtalk or Ethertalk, select Ethertalk (it should display the AppleTalk and Ethertalk versions, also in this window).

Your next port of call is the **Sharing Setup** control panel. Enter the owner of the Mac and give it an unique name. This name will later be shown in the list of available Mac servers in the Chooser. All you have to do now is to click on the Start button in File Sharing, then restart the Mac. Note: whenever you disable or re-enable AppleTalk, you **have to** restart the Mac.

In the **Users & Groups** Control Panel, give the guest account full access. Now enter the Chooser again and select the AppleShare Icon. In the right window there should be the other Mac Servers. Select the one you want to connect to and change the log-in from "registered user" to "guest". Now you have a list of all the volumes on this server that you can connect to. Now choose the volume you want to mount. The selected hard disk should immediately show up on the desktop.

If all has gone to plan, you should be able to copy files to and from the "shared" volume or load programs directly from the other Mac. If you want to disconnect from the shared hard disk, all you need to do is to drag the volume's icon into the trashcan.
By Marius Lichte (Germany)

What is the best way to get it up and running, without much trouble?
1) *Use the latest version of your emulation program, eg. ShapeShifter 3.10 or Fusion 3.1.
2) *Make sure your Ethernet setup is connected, and terminated.
3) You should be able to install OT on top of your present System, provided you do it via the installer, it will not work by simply copying the extensions over, since the System file needs modifying as well. CN just requires the appropriate control panels and Ethernet drivers.

If you still have problems, especially with System 7.53/7.55, reinstall the System software again except this time install both OT

and CN - don't forget that you need the Network Software Selector program, to switch between Open Transport or Classic Networking (which is also installed with OT).
4) *Don't use the AppleShare extension that comes with System 7.61 - if you propose to use your emulated Mac on a network under ShapeShifter up to 3.9, it'll freeze your Amiga when you bootup. To stop it from loading, press the SHIFT key right at the beginning of the startup sequence to disable all extensions. Take out MacOS7.61's AppleShare and put in an older version, eg. from System 7.55, and reboot.
*By John Blyth (Australia)

CONNECTING TO A PC NETWORK

How do I connect my Mac emulator to a Windows95/98 PC?
The problem here is to make both computers speak the same language. Macs use AppleTalk, while Windowsuses SMB (Server Message Block). There are two ways to get these computers to talk:
1) Make Windows speak AppleTalk, by installing **PC MacLAN** on the PC. PC MacLAN is a commercial software available from Miramar (info at: www.brainworks.de).

There is also a time limited demo version you can download (it works with SS).
2) Make the Macintosh speak SMB, by installing **Dave** on the Mac.

Dave is a commercial software available from Thursby, (info at: www.thursby.com or www.prismaexpress.de). Unfortunately **Dave doesn't work very well** in SS, it crashs a lot.

Networking with Shapeshifter:
I have two Amigas here, both equipped with Ethernet Boards, and have succesfully tried some networking between Shapeshifter and a Windows'95 PC with Novell Netware. These setups work:
• Connect ShapeShifter with System 7.5 to Netware 4 via Mac Client.
• Connect ShapeShifter with System 7.1 to Netware 4 via Mac Client.
• Connect ShapeShifter with System 7.5 to Win95 PC via PC-MacLAN.
• On a real Mac, running SoftPC, connect to a Netware 4 Server - this may work on ShapeShifter too!

- Dial into BBS via a modem connected to a Multiface III serial port.
- Print on my laserprinter attached to the parallel port of the Multiface III.

Things that I have tried and that gave trouble:
- Use Dave (SMB Client) on Shapeshifter = it crashes!
- Connect to the internet with the modem = hangs on configuring PPP!

By Marius Lichte (Germany)

Is it possible to connect to another PC while running PC emulation in Mac emulation?
It does work, honest!! Start a PC emulation like SoftPC 3.0 or SoftWindows 1.0.1 under Shapeshifter,this should work quite smoothly. You need:
- **LSL.COM** - Version 2.14 or higher; found on your PC NIC driver disk.
- **etherspc.com** - From Softwindows 1.0.1 or 2.0.
- **IPXODI.COM** - Also found on your PC NIC driver disk.
- **NET.CFG** - Editable file to load the etherspc and set the right ipx frame.
- A client program like **NETX** or **Netware Lite.**

You can connect to a Netware Lite Server or an old Netware 3.x Server this way. Basically every DOS based IPX Network solution should work. This is a really nice feature, as it is not possible with Amiga PC emulators - PC Task and PCx do not have Ethernet support.
By Marius Lichte (Germany)

How do I connect my Mac emulator to a Windows NT4 Server?
This only works with the "NT4 Server" version. The Volume to be exported should be in NTFS Format because of the long filenames.
  Windows NT has Macintosh support already built-in. This can be installed under Network/Properties. Click Services and then ADD, then choose **Services for Macintosh** in the upcoming list view. After the installation is complete, the NT Server shows up in Chooser/AppleTalk on the Mac. NT Volumes can be exported via the FileManager (MacFile/Create new volume) They are accessible in the same manner as MacVolumes.
By Marius Lichte (Germany)

How do I connect my Mac emulator to a Novell Netware Server?
I won't explain the installation of the Server here. This is recommended for advanced users as the installation is quite difficult. You'll want to connect to an existing Netware Server. Ask your Netware administrator if the Mac Namespace is enabled on the Server. First you need the Netware Installation CD. Insert it while ShapeShifter is running. Open the CD Icon and start the MacOS Clients Installer. Select **Netware Client for MacOS**. After the Installation has completed restart the Mac. Check the status of MacIPX is running on Ethernet. The title bar should have a new symbol (the tree). Select configure to find your favourite Netware Server. Ask your Netware administrator about the entries in the context field. You can mount the Netware volumes on the Mac with the **Netware Volume Mounter** in the folder **Netware Client Utilities**. With the **Netware Directory Browser** you can search the whole NDS tree for volumes and printers to mount.
I have used this and it works very well, even under System 7.1.
By Marius Lichte (Germany)

How do I connect my Mac emulator to a Linux box?
I can't tell you anything about installation or usage, but only the required software for Linux. The software is called **Macintalk**, it is part of many Linux distributions. Macintalk is, as all Linux software, free to use.
By Marius Lichte (Germany)

USEFUL NETWORKING INFORMATION

About Ethernet
There are two types of Ethernet (usually supplied on separate cards), they are; 10Base-T (10 megabits per second) standard Ethernet, and 100Base (100 megabits per second) fast Ethernet. Ethernet is just a type of hardware networking, it doesn't effect standard network protocols. Also,you only require the MacOS installed network extensions, and the Amiga's own drivers for the card,then all you have to do is set it up in Fusion or ShapeShifter.

About Classic Networking
This can be installed on all Systems up to MacOS 7.55, it is still possible to use it in 7.6 to 8.1 (Open Transport (OT) is standard in these OSs), and you need the **Network Software Selector** program, to switch between one or the other, you cannot use both OT & Classic Networking (CN) at the same time.

It consists of two control panels and Ethernet system extensions (Apple drivers). Classic Networking is biased towards AppleTalk as it's main communications protocol, this meant that all other protocols were translated into AppleTalk, before being sent over the network.

About Open Transport
Requirements: a 68030 processor or higher; compatible with Systems 7.1, 7.11, 7.12, 7.53 and above; and a minimum of 5mb of total RAM.

Open Transport is much faster than Classic Networking, and is not biased towards any one protocol, instead, it supports them all. OT uses two control panels, AppleTalk instead of Network, and TCP/IP instead of MacTCP, plus all the OT library files (you may have less libraries with later versions of OT). Note that you cannot use OT and CN control panels at the same time, the System will remove both of the CN control panels after the next restart, permanently! Also note that you can use FreePPP with OT, instead of Open Transport PPP, but not both at the same time - do not mingle the two standards of networking, it'll cause a lot of crashing.

The latest version that can be downloaded from the internet is v1.12 (this is only an updater), you need an installed version of Open Transport 1.1 or 1.11, to begin with. It can be obtained from, **www.tucows.com** or **www.info.apple.com**. and can be installed from these System CDs: **System 7.53 CD (OT v1.1), System 7.6 CD (OT v1.2)** and **System 8.0/8.1 CD (OT v1.3)**.

The Chooser
Is the only application that allows access to any networked printers and Server volumes. You can also turn Background Printing and AppleTalk on or off (Amigas do not support AppleTalk, because it is a hardware feature of real Macs).

The left hand side of the Chooser window lists all available Printer and Network drivers, just click on the AppleShare driver icon to activate it - now go to the right hand side of the window. This panel should list all network Servers and any "shared" hard disks/volumes in your particular zone. To select a Server volume or shared hard disk, double click on the Server's name (the one that owns the volume you want to mount on your desktop), it will show another window with a list (assuming it is not password protected) of all the Server or Mac's partitions and hard disks. Highlight the ones you want (Shift+click) and press OK. They will now appear on your desktop, and should be fully accessible.

If your network has more than one **Zone**, eg. different departments with their own network, then these will appear underneath the printer and network driver panel. To select a Zone, simply highlight the Zone name, and then go the right hand side again to make your printer or server selections.

File Sharing
This term actually describes an individual user enabling his Mac's hard disk to be accessed over a network, by all other networked users. This is NOT a File Server, but more of a temporary way to gain access to a specific hard drive.

Also note, that when you share a disk (any local volume on that Mac), you can set certain privileges that other users have to use, eg. read-only, access to a specific folder or read & write to any part of the disk. This is all accomplished via th File Sharing control panel.

Why can't I install a System Update, or even optimise my System volume... it complains that there are files in use! Whats all this about?
The trouble with Macintosh System software is that it will not allow you to change any fundamental parts of either the System or any files that are on that System volume while they are active. This means that you cannot optimise, defragment [certain files only] or even update your System folder/hard disk (reformat it) while they are in use. The only way round this, is to bootup from another hard drive, CD or floppy disk, in order for you to carry out whatever it is you wish to do.

What is the minimum System configuration you can have for any Mac?
For **System 7.0** to **7.6**, all you need is the System Folder, the Finder and the System file. All other control panels and extensions are "extras" - don't forget items that are loose in the System Folder as well (if you need them), they will also load upon bootup.
    While **MacOS 8.0** to **8.1**, requires the same as System 7.x, however it needs the Appearance Extension, otherwise it will not boot up at all. If you are using HFS+ hard disks, the system also requires the Text Encoding Converter extension and the Text Encoding folder.

Can I mix different System version components?
Yes and no. You can incorporate individual extensions eg. a later AppleGuide extension from MacOS 8 into System 7.55, but not individual Open Transport extensions. I would advise against mixing the System file and the Finder from different OS versions, as this would cause major System instability. It probably won't boot up, either.

Why has the Mac suddenly decided to rebuild the Desktop File, should I stop it?
No, let it complete the rebuild process, otherwise all the icons on that particular drive will become generic icons. You could call this

automatic "house keeping", sometimes the Desktop File may become unreadable by the Finder, so it rebuilds it again, but only for that affected disk.
    Remember all Macintosh formatted disks has it's own Desktop File, so that it can keep a record of what file belongs to which program.

Why do some folders in MacOS 8.x list files in reverse order, ie. Z to A?
All folder windows in MacOS 8 contain an extra gadget on the righthand side of the title bar, it looks like an up-side-down pyramid, made up of horizontal lines, this displays the List view in reverse order. To toggle it back to alphabetical order (top to bottom), just click on this triangle gadget once and it will flip itself back to the proper position, pointing up!

Where can I download free Macintosh System software?
You can download System 7.01 and 7.53, as self mounting disk images (SMIs) from Apple's web site: **http://asu.info.apple.com/** - Apple site search engine.
    All you have to do is to type "System 7.0" or "System 7.5" in the search field, this should give you the full set of System 7.0/7.53 related downloadable files, including most of the MacOS 7.x updaters. Note that, System 7.53 consists of twenty 1.3mb SMIs. Also, **make sure you select the correct language** in the pop-up menu (on the search engine page), before you start to download any files, otherwise you'll be using a System catered for the USA (the default language).
    The disk images come in two flavours; HQX and BIN. Both can be safely downloaded onto any computer and then transfered to the Mac side without any corruption (use Stuffit Expander to decode them). Also note that these disk images do not need to be copied onto floppy disks.
    You can also copy a whole set of SMI files of System 7.53 from Amiga Format magazine's cover CD No39. Look in: Seriously Amiga/ Emulation/ - I believe it is the International English or British version.
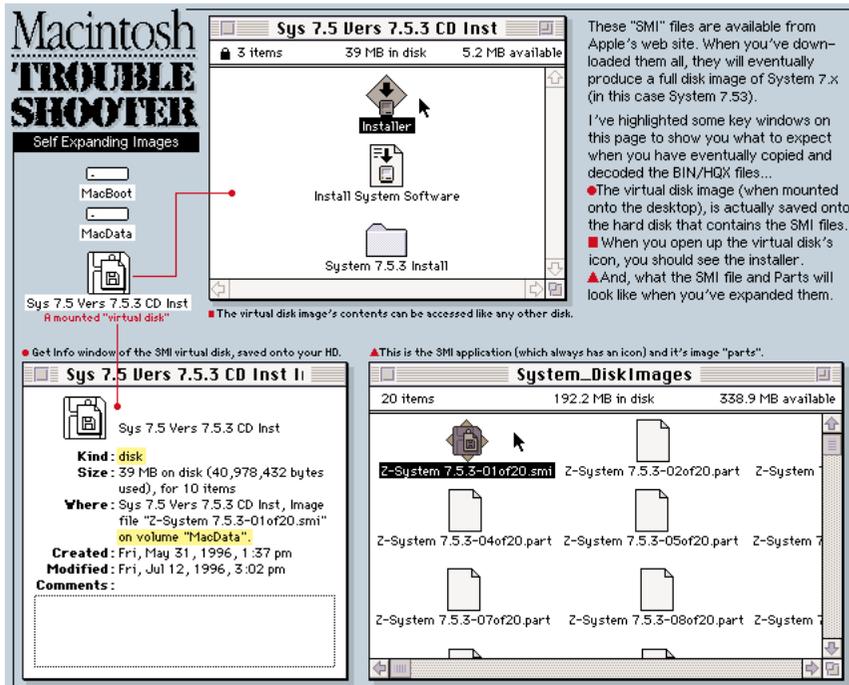
Picture 5.1 - Different types of 'Get Info..' dialogue boxes; program & document info.
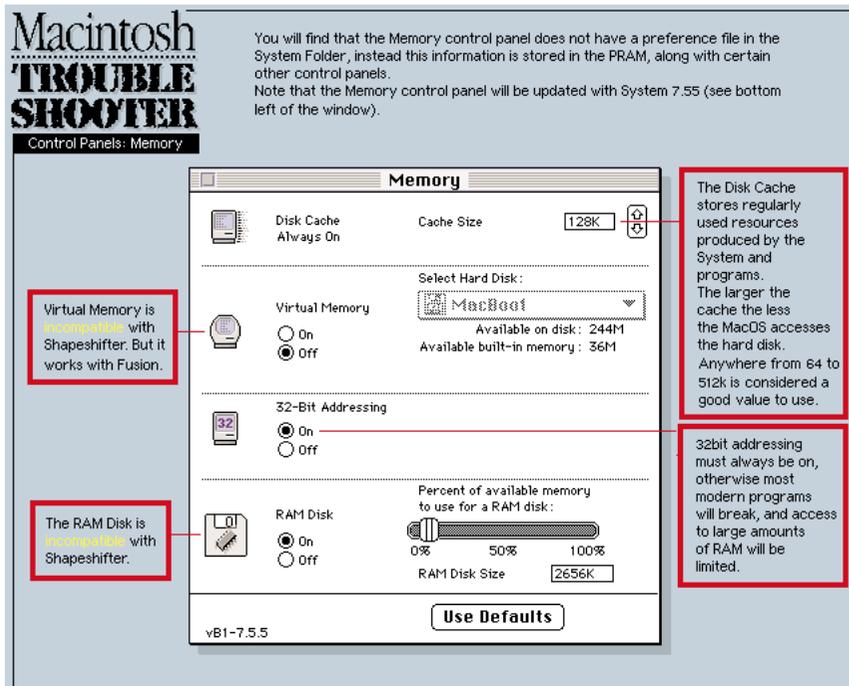
Picture 5.2 - About This Mac window.

How do I use the System 7.x "SMI" disk images, supplied on Apple's web site?

SMIs (Self Mounting [disk] Images} are real easy to use, the only thing you need to check, is that the downloaded SMI data files are not corrupted. The SMI application (usually the first disk image) will automatically verfy all files (for corrupted files) before it proceeds to mount the "virtual disk" onto the desktop. All YOU have to do, is to double click the "xxxxxx.smi" application, it will do the rest. See Picture 5.1 for what you should see when you've copied them to your Mac and when it is mounted.

Once it has mounted the System disk image onto the Mac's Desktop, you can now access this virtual disk as if it was a real disk. Just double click on the System Installer program to begin the installation of System 7.0 or 7.53.

File sizes: All 20 SMI parts = 25mb of HD space. The virtual disk = 41mb of HD space (it is saved onto the same HD as the SMI files). A full System installation = 40-55mb of HD space.

Is it possible to use the RAM Disk feature in the Memory control panel?
No, it doesn't work with emulation, certainly not with Shapeshifter anyway (not sure about Fusion).It will induce an immediate crash, and will reboot your Amiga. This could also cause Mac emulation notto work next time round.

Don't worry, the RAM Disk is switched OFF after the System is installed. See Picture 5.2.

How can I install MacOS in ShapeShifter or Fusion, if I don't have a bootable disk in the first place?
1) First, I suggest you buy a copy of System 7.53, 7.6, 8.0 or 8.1, then you can boot off the CD and install the System. Note: Only **Fusion v3.1** and **Shapeshifter v3.10** can use System 8.x.
2) You can download a bootable filedisk from: **www.blizzard.u-net.com/** - look in the "Program Archives" link for the Filedisks (for Shapeshifter & Fusion). The System Folder on each Filedisk is compatible with all 68k Amigas, and includes Stuffit Expander, so that you can decode BIN or HQX files. The

filedisks are 2 megabytes, uncompressed.
3) Or you could ask a friend for his/her disks, so that you can do a temporary installation, until you can get hold of your own copy, or unarchive those HQX/BIN files, of MacOS.
4) You can download a disk image of System 7.0 or 7.53's Disk Tools (high density floppy disk), from Apple's web site: **http://asu.info.apple.com/**
5) Any bootable disk would be preferable, such as Norton Utilities v3.5 CD or it's emergency floppy.

How come there isn't a manual for MacOS 7.5 to 8.x?
A manual came with MacOS 7.0, all other OSs are in fact updates of this - even MacOS8 could be considered an update of System 7. After all, OS8 shares a lot of its appearance and features with System 7, so therefore it doesn't really need a manual - either way, this is what Apple have done, to the annoyance of it's users. However there is on-line help, in the form of an Apple Guide, look under the **?** menu for "Macintosh Guide" in MacOS 7.5x, and under the Help menu in MacOS 8.x. Pic: AppleGuide-MacOS.gif is a typical example of a AppleGuide window.
There are other sources, such as:
1) **Books:**
   • **The Macintosh Bible** - **6th edition** (Peachit Press)
   • **Guide to Macintosh System 7.5** (Hayden)
   • **MacWorld OS7.6 Bible** (IDG Books), or
   • **The Mac OS8 Bible** (IDG Books)
2) You can buy these on-line at: **Computer Manuals'** web site: **www.compman.co.uk/as.cgi/768**
3) Download **PDF** manuals/literature files:
   • **FREE Guide.Macintosh** (freeware, from any web site) - contains a lot of useful info about MacOS.
   • **Extension Overload** (shareware), has some info on MacOS, but not much.
   • **InformINIT** (shareware), has quite a bit of info on MacOS.
4) **Apple's Tech Library** web site, it has hundreds of freely downloadable documentation, in PDF format.
      The web site is at: **www.info.apple.com/support/sitemap.html** -

then select "Apple Manuals" from the pop-up menu, this'll take you to a search web page, where you can browse or search for a particular document, by part code, title or content. Try these PDFs, they're worth a read!
   • **Macintosh Reference** (Part No: n/a, Pages: 165, Filesize: 1,171K).
   • **Mac OS 8** (Part No: U-97609-001A, Pages: 52, Filesize: 748K).
   • **Mac OS 8 Software Update** (Part No: 033-0609-A, Pages: 47, Filesize: 910K).
   • **Macintosh System 7.5 (Update Manual)** (Part No: 96608-001A, Pages: 126, Filesize: 1084K).
   • **PowerMac Emergency Handbook** (Part No: n/a).
   • **Macintosh Basics 5.0.3** (2nd edition); Filesize: 1,201K.
5) Third party web pages:
   • **www.mactimes.com/lowend/**
   • **www.webaccess.net/~mrpedri/index.html** (Both have info on 68k Macs.)

How much memory does System 7.x and System 8.x take up?
System 7.0 to 7.55 will take up between 4 and 5 megabytes of RAM - this is for an average to heavy use of system extensions, of course, it could be slightly more, depending on your System setup.
   System 8 and 8.1, will take up about 200-300% more memory than MacOS 7.x. A minimum System, that is using only 10-20 or so extensions, will take up approximately 6-8mb, while a medium to average amount of system extensions (including Control Panels) will be anywhere between 10 and 15mb of RAM!
   So, if you're thinking of installing MacOS 8 at some point, it's best to upgrade your RAM as well - I think 16mb, allocated to Mac emulation, under System 8, is the bare minimum. 32mb **or more** (total memory in your Amiga) is best for heavy Mac use. See Picture 1.2 on page 14, for a guide to memory usage on a typical Mac.

Will Mac emulation suffer from Memory Fragmentation, as real Macs do?
Yes and no. Although there will be a small amount of fragmentation (lost memory or "memory leakage"), you really shouldn't be that concerned, as the Amiga handles fragmentation very well. This means

that you can quit any program, in any sequence, at will, and you'll still have 99% of your allocated memory available. Note that, in emulation, the amount of lost memory is measured in a few kilobytes, rather than megabytes on real Macs!

Is there a utility that can display exactly what is currently in memory, for the Mac?
Yes there is. What you need, is a utility called **Memory Mapper** from Street Logic Software. This neat program, displays all programs and the System currently in use, by name and by a coloured graph, try it!

Is it possible to "de-activate" a System Folder, manually?
Yes, just place the **Finder** program in the Trashcan (you won't be able to bin it). Unfortunately you won't be able to boot-up from that partition anymore, so you'd better make sure you have a bootable disk to hand, just in case it crashes.

This is the manual version of doing a "clean install" (a feature in System 7.6 to 8.1), this can be useful, if you want to keep all your previous 3rd party extensions while a new System is installed!

AppleTalk can cause problems.
This is a hardware feature in real Macs, and may cause delays a first, especially during startup. Best to switch off AppleTalk as soon as you bootup from a newly installed System. You can do this by calling up the Chooser (in the Apple icon menu) and click on the Off button, under AppleTalk.

Which MacOSs work with ShapeShifter & Fusion?
You have a few choices, but all of them start from System 7 upwards.
• **System 7.0.**
• **System 7.01** to update it, use System 7 Tuner & Sound Manager v3.
• **System 7.1.**
• **System 7.1P, 7.1P1, 7.1P2, 7.1P3, 7.1P5, 7.1P6** (for Performas).
• **System 7.11** & **7.11 (Pro)**.
• **System 7.12** (for **PowerPC Macs** only).
• **System 7.5, 7.51, 7.52.**
• **System 7.53**, only works with ShapeShifter v3.5 and above.

• **System 7.55**, works very well with all 68k processors.
• **System 7.6/7.61**, this can be troublesome, otherwise it's alright.
• **System 8.0/8.1**, will only work with **Fusion 3.1** and **ShapeShifter 3.10**.
• **System 8.5** and above, will only work with **PowerPC Macs**.
System 7.0 & 7.01, plus all updates; 7.11, 7.51, 7.52, 7.53, 7.55, 7.61 and 8.1 can be downloaded from Apple's web site; **http://asu.info.apple.com/** - make sure you download the Update in your **language**. See the section called ROMs on page 88, for the entire list of 68k Macintoshs, and supported System versions.

How should I go about installing a new Mac System over my old one?
Installing a MacOS7.6 or 8.x: I recommend you do a "clean installation" of any radically new MacOS, eg. from Systems 7.0 to 7.5, or 7.6 to 8.0. However, you do not need to perform a clean installation for System patches, ie. System 7.5 to 7.55, all it does is upgrade the System file, Finder and some extensions.   If you're installing System 7.6 or 8.x, the installer will do all the hard work for you, but only if you select "Custom Install" or "Install new System Folder" (in Options). It simply deactivates the old System, and installs a new System8/7.6 Folder next to it.

Installing MacOS7 to 7.55 next to an old or damaged System Folder: Do not install directly into an old System folder, I strongly recommend you install it as a completely new System Folder, so that all your 3rd party extensions and control panels do not load up the first time round (some of them may be incompatible with the new OS).

Before you perform installation, you'll have to put the old System Folder into the Trashcan - but do not empty it. Then install the new MacOS onto the same hard disk as the old one, and 'bingo!', you now have a new, and upgraded System.

See Picture 5.3 on page 39, for the System 7.5x custom installation window. Pic" LINK "Installation.gif/main

Do I need an FPU for all Macintosh programs?
About 70% of 68k Macs have an FPU built-in. Most Mac software will use the FPU in some way, and may cause some programs to crash a lot.
If your Amiga doesn't have an FPU, you can download a freeware
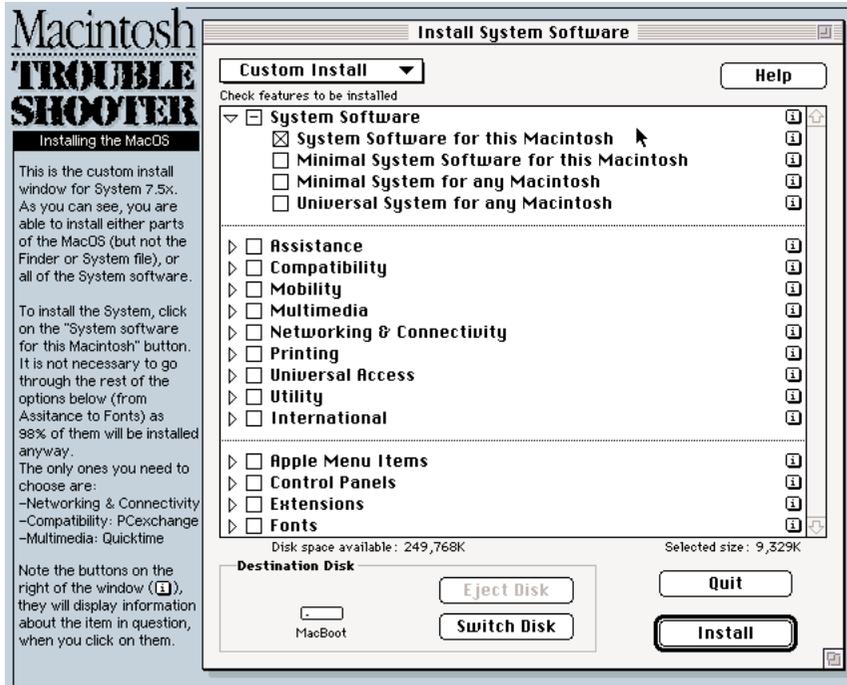
Picture 5.3 - ***System 7/5's System installation window.***

control panel called **SoftwareFPU** from the internet, this will emulate an FPU for you.

How come my Mac's System is taking up most of the memory now?
This affects older versions of 68k Amigas (68000/020EC) & all System 7 revisions. These processors can only access 24bit memory or 8mb of RAM. In order for it to automatically detect memory above 8mb, you need to open the Memory control panel and switch **32bit Addressing** to **On**, then restart the Mac, that's it.

All Macintosh Systems work with all Macs, right?
Wrong. All badges of Macintoshs are different - ROM versions are different, all Mac motherboards are different, and most Mac 68k processors are different. In order for the System to work on your Mac, you need to install a custom **System for this Macintosh**, for every version of the MacOS, from System 7.0-8.1.

Is it possible to use virtual memory or RamDoubler in Mac emulation?
Not in **any** version of ShapeShifter. But you can use the System's own virtual memory feature in Fusion, however I'm not sure whether RamDoubler works on either of those emulators, any comments?

RAM costs less these days, so i suggest you go out and buy more memory, ie. 16mb will be quite cosy on the Mac with Workbench running, this is assuming you're not going to run any large programs. If you are going to use Mac emulation for serious work, then I recommend you have at least 32mb of RAM, the more the merrier - remember, Mac programs are memory hungry beasts.

Where can I find instructions for making AppleScript scripts?
You can get a fair bit of information from Apple's extensive AppleScript web site, at; **http://www.apple.com/applescript/**

Or download a 2 megabyte PDF file; **http://developer.apple.com/techpubs/macos8/pdf/AppleScriptLanguageGuide.pdf**

Which gives the complete details on how Applescript works and what all the commands do etc.

On a different note, you may like to use a different Script editor, other than Apple's own **Script Editor**, in which case check out **Scripter** from Main Event Software (www.mainevent.com), or **Script Debugger** from Late Night Software (www.latenightsw.com).

How do I allocate more memory to a program?
Highlight the program's icon, and press Amiga+i, this will show you the 'Get Info...' window. At the bottom of this window are the memory allocation boxes. Only amend the **Preferred Memory** field, it and your figure should be bigger than the Suggested Memory number (values represent Kilobytes).

Should you need to alter a program's memory allocation parameters which is located on a CD, such as Norton's Speed Disk (a disk optimiser), then what you need is **AppSizer**. It can be downloaded from the any Mac web shareware site. It will allow you to edit the program's memory allocation.

What if I don't have a high density floppy drive, can I use disk images?
Yes you can use images, although you may find this to be inconvenient and only a short term solution, so I suggest you save up for an external high density floppy drive for your Amiga.

There are two popular Macintosh programs available at the moment, one is called **Disk Copy v6.1** from Apple, and the other is **Shrinkwrap v3.x** from Aladdin Systems - both are available from the internet. Try these sites: **www.shareware.com** (Shrinkwrap) and **www.apple.com/support/** (Disk Copy).

These two programs can create, duplicate, lock/unlock and even mount any disk image onto the Desktop, this fools the Finder into believing they are real disks! They can also create disk images of CD-ROM disks, and just about any other disk type for that matter, just make sure you have enough hard disk space.

Where can I get Adobe Type Manager (ATM)?
You can get ATM with Adobe Acrobat Reader v1 to v3.x. The latest version is v4.0.

Certain Adobe software, such as Illustrator v6/v7, and Pagemaker v5 to v6 will have a copy of ATMincluded on the CD-ROM or floppy disks. Or simply buy **ATM Deluxe**.

Note: ATM is a control panel. The Acrobat Reader installer usually installs it in it's Fonts folder.Simply place it in the Control Panels folder to make it available for System wide use.

How do I know which Mac programs are 68k compatible?
When you are about to buy any Mac software, make absolutely sure that it still supports 68k Macs. Some of the top packages are now switching over to PowerPC code only, such as **Photoshop 5, Norton Utilities v4, Freehand 8, Illustrator 8** and **System 8.5**. I suggest you ring up the retailer or look in the software house's web site for confirmation of 68k compatibility.

As for knowing which programs are PowerPC and which are 68k compatible, that's whole new ball game! To find out if it is a PPC application, is simple, just launch it. If it is PowerPC only, it will immediately display an error message, usually, error code -192, or an error message will be displayed telling you that this application is for PowerPC Macs only.

Some Mac software is often (but not always) handed to the public as a 'Fat' application - this means it has PowerPC and 68k code in the same file, so that it'll work on all Macs.

As for seeing what type of code the program uses, externally, the only way to visually tell, is either via it's filename, eg. "Quark Xpress 4.0 PPC", or via the About window/loading screen, these may display information as to whether it is 100% 68k or Fat coded.

I'm having problems with Norton Utilities 3.2 and System 7.6/8.x, is it incompatible?

Version 3.2 on it's own is not fully compatible with System 7.6x, you need to update it. Use the v3.24 updater, or use Norton v3.5, there is an updater on Symantec's web site: **www.symantec.com**.

Norton Utilities 3.5 will need to be updated to version 3.54, in order to be System 8 compliant. Search for 'updater' and this will give you a list of all updaters for all versions.

If you intend to use the HFS+ filing system, then you must not use Norton Utils. (any version upto v3.5 (all of which are 68k compatible)) on that HFS+ partition or disk, otherwise it'll destroy the disk's directory structure. However, TechTool Pro v2 will repair HFS+ disks, and it is 680x0 (CPU) compatible.

Where's the Norton Utilities 3.5 manual?

Unfortunately Norton Utilities 3.5 does not have a physical manual, however you can download a PDF (Acrobat's Portable Document File) version of Norton Utilities 3.2 manual, from:
ftp://ftp.symantec.com/public/english_us_canada/products/ norton_utilities/ver3.5_mac/updates/num-manual.pdf.hqx - this file is 6mb, and covers everything you'll need to know for v3.5.

Is it possible make floppy based install disks to work on a hard disk?

Yes, just make sure that you drag the entire disk onto the hard disk, so that all invisible files are copied also. Note that, some install disks only work from floppy disks, but it is always a good idea to make a backup copy of the disk, just in case it goes bad. This especially goes for anyone who has their only copy of the System software on floppies - make sure you have a 'master' backup copy of the whole System disk set, you'll be glad you did, believe me!

How can I optimise or defragment my Mac hard disk?

The Norton Utilities' **Speed Disk** is a good one to use, and is reasonably safe. You can defragment individual files, as well as fully optimise any Macintosh disk. However Norton 3.5 will **not** optimise HFS+ hard disks, see below for other possibilities.

Or you could do the simple trick of, copying everything off the HD, onto another HD or removable disk, rebuild it's desktop file (Amiga+Alt during startup or via Norton Disk Doctor). Then copy the files back over to the HD again, all files will be optimised and defragmented.

TIP: ALWAYS backup the hard disk, and check the disk's integrity, before optimising.

Here are some other commercial programs that available;
• **Spacemaker**: HFS to HFS+ while optimising the disk, from Total Recall Software.
• **PlusMaximiser**: Advanced HFS+ formatting software, from Alsoft.
• **PlusMaker**: HFS to HFS+ conversion, from Alsoft.
• **PlusOptimiser**: HFS/HFS+ optimiser, from Alsoft.
• **Disk Express Pro**: HFS+ optimiser with lots of features, from Alsoft (www.alsoft.com).
• **TechTool Pro 2**: It has HFS/HFS+ optimising only, however it cannot defrag individual files. It is also extremely safe to defrag/optimise (files will survive a crash during optimisation).

What else can I do to protect my disk and files?

To prevent future disasters, I recommend that you take these actions:
BACKUPS
Regular backups - I do mine every 2 weeks, of course it all depends on how often you use your Macintosh, you could do one; every day, twice a week, or even once a month. Don't forget to check the integrity of the backup, by doing a random restore of some files. This'll verify that the backup is not faulty.

I use **Retrospect Express** (Dantz), a slightly different version of it's big brother **Retrospect**. Be careful with Retrospect Express, it is very picky about SCSI termination, if it is not set correctly, the program may eject a disk from the drive and will completely freeze-up the Amiga. You'll have to switch off the computer for 10 seconds and turn it back on again, to clear the error. It may have damaged the System file and/or Finder at the same time, so have a bootable disk to hand.

I wouldn't recommend doing backups from the Amiga side, you'll corrupt all the Mac files - this due to the different filing systems in use. Instead buy one of these Mac backup programs:

Retrospect (Dantz), THE Mac backup program, supports **all** types of drives, £130. **Retrospect Express** (Dantz), only supports removable hard disks, ie. Zip drives, £30. See Picture 6.1.

DiskFit Pro/DiskFit Direct (Dantz), little brother to the Retrospect family, freeware.

Backup Mastery (ClarisMac), is a competitor to Retrospect, £100+.

Norton Backup v2 + **Fastback v3.21** (Symantec), these 2 backup utilities came with Norton Utilities v2 (Backup) and v3.1/v3.2 (Fastback) - they are not supported any more. I'm not sure if they are available to download though. See Picture 6.2 and 6.3 (page 43).

There are some shareware/freeware utilities on the Mac internet sites, but these are mainly mirroring/synchronising type backups - don't use them, they do not archive files in any way, and are susceptible to directory and file damage - not a very safe way to back up files. Shareware Backup programs: **Drag'n Back, Simple Backup, Switch Back** and **Synchronize**.

It is also a good idea to make an archive (use Stuffit for instance) or a backup of the entire System folder, so that you can replace the System file, Finder or any extensions etc, at your convenience, should any of them get damaged and need replacing - this would save you from reinstalling the full System software again.

CLEAN-UP YOUR DISKS
Do regular "clear outs" of your hard disk(s), every 3-6 months. Just sort out and bin, all that junk that accumulates on your disk(s).

Picture 6.1 - Retrospect Express's main control window.
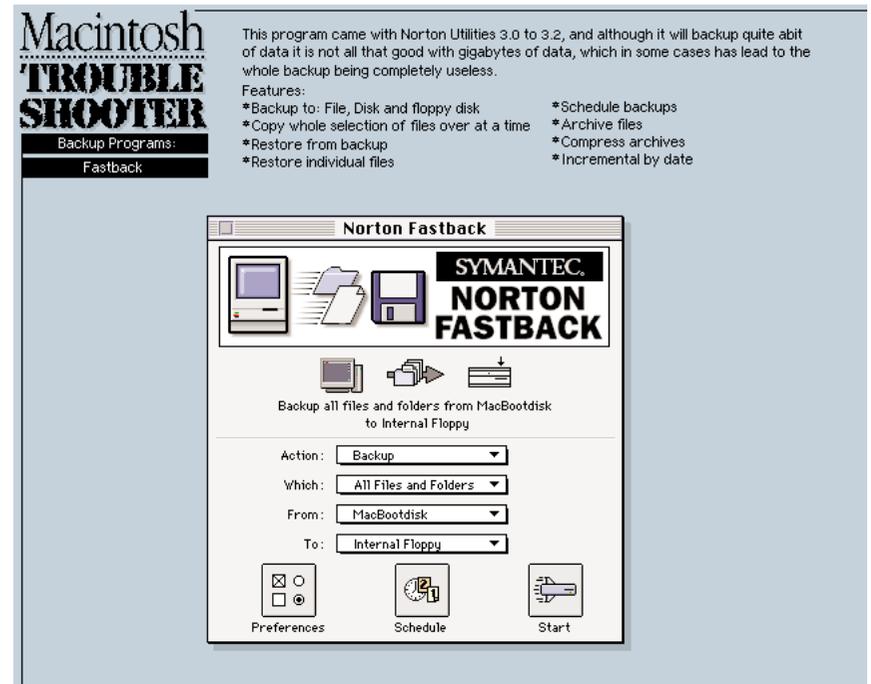
Picture 6.2 - Norton Fastback's main control window.

REGULAR CHECK-UPS & DEFRAGMENTING

Regular disk checks, use a utility such as Norton Utilities' Speed Disk, and Disk Doctor. Macintosh hard disks require a lot more attention than Amiga ones. Therefore, I recommend that you make a copy of the **Disk Tools** floppy disk that came with the System CD or disk set. Even if you don't need a bootable floppy disk (assuming you have a high density drive) create one anyway, you may need it sooner or later, trust me on this!

   You need to: Rebuild the desktop every month or so; You need to use Disk Doctor every 2-3 weeks; defragment files every couple of weeks; and a full optimisation (de-segment) of the hard disk every 3-6 months, depending on how often you create and bin files.

 Here are a few good utility programs that I can recommend:
- **Norton Utilities 3.5** (Symantec) probably one of the best on the market today. Note that **Norton 3.5's programs does not support HFS**+, and will **damage** the directory structure. See Picture 6.4.
- **Norton Utilities 4.0** (Symantec) will only work on **PowerPC Macs**.
- **TechTool Pro 2.11** (Micromat Computer Systems) a good opposite number to Norton. This version canrepair HFS+ disks, and is 68k compatible - virtually equal to Norton v4! See Picture 6.4 (page 44).
- **DiskWarrior 1.01** (Alsoft) a little known but quite impressive program (from what users say).
- **Disk First Aid** (Apple) is the official disk repair utility, it won't fix all errors. Version 8.2 (comes with MacOS 8), can repair HFS+ formatted disks, and it is 68040/060 compatible. See Picture 6.5 (page 44).

WARNING: Currently, Norton Utilities 4.0 does not work on any 68k computers, it is for **PowerPC Macs**. There **will not** be a 68k version of Norton Utilities v4, ever! So don't bother buying it.

VIRUS CHECKS

Get a good and updated virus checker program, these are commercial;
- **Norton AnitiVirus** from Symantec.
- **Antivirus** from Dr Soloman.
- **Virex** from Datawatch.
- **VirusScan** from McAfee (shareware).
- **Disinfectant 3.71** is freeware, but it was discontinued in July 1998.
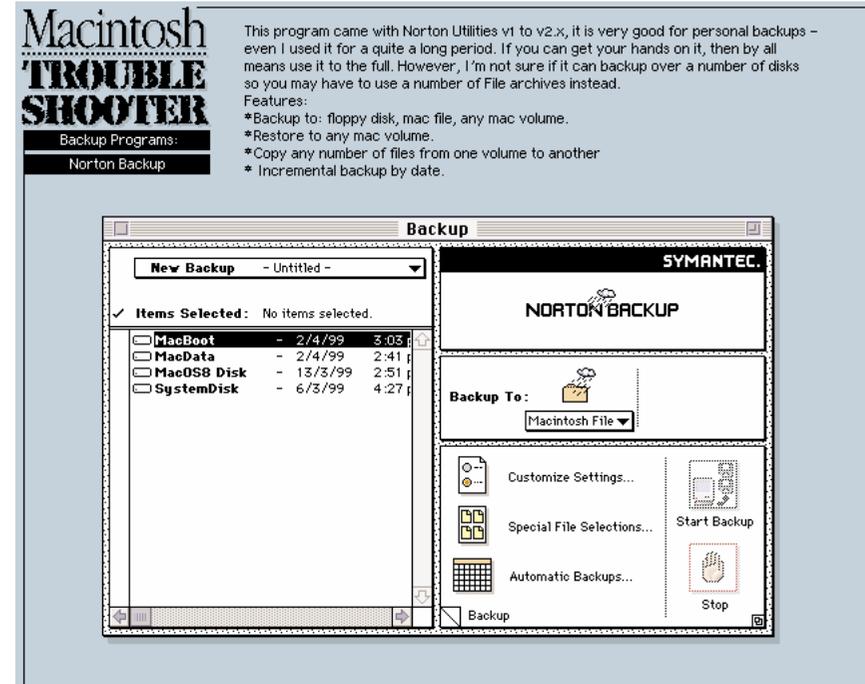
Picture 6.3 - *Norton Backup's main control window.*
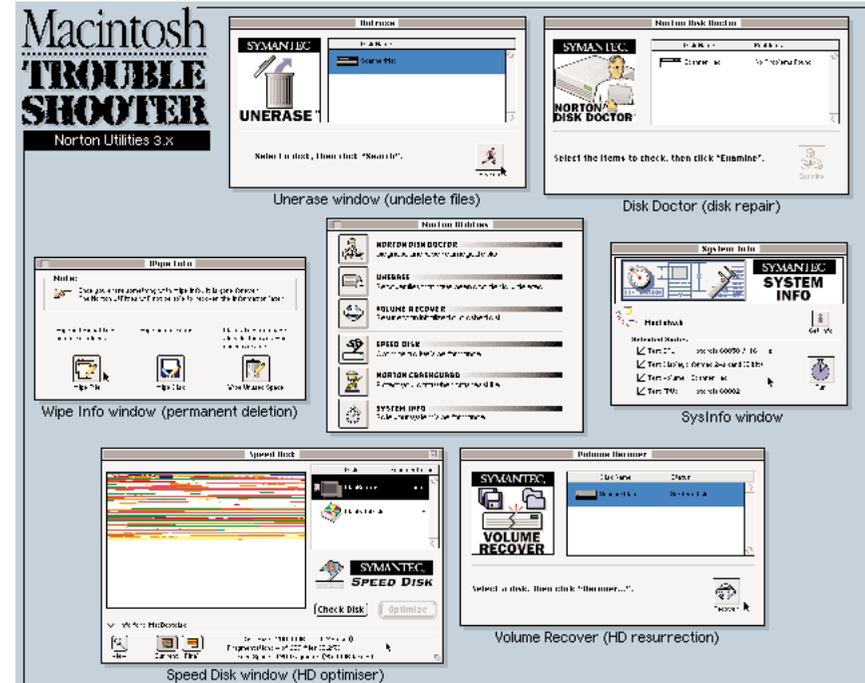
Picture 6.3 - *Norton Utilities 3.5 features.*
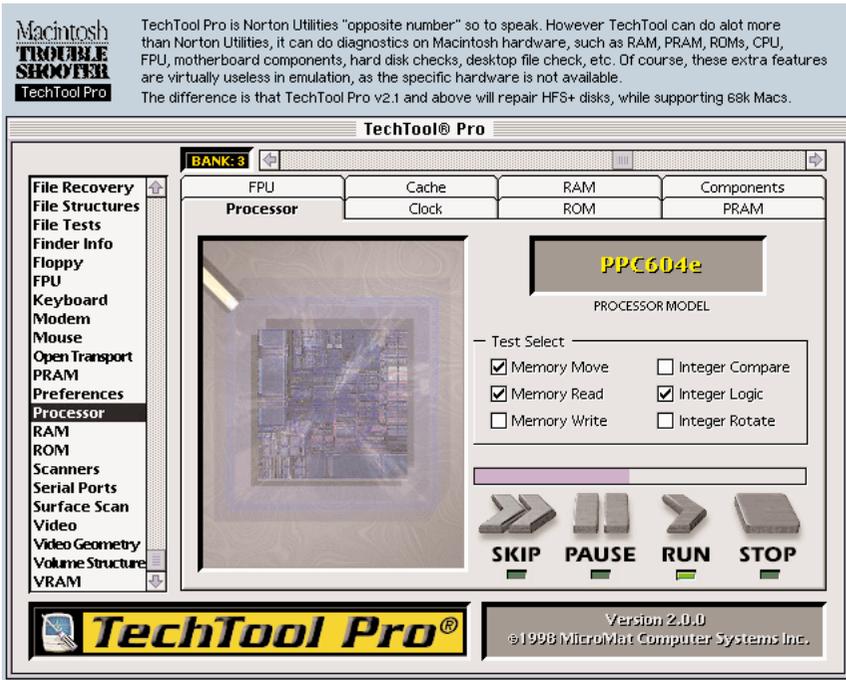
Picture 6.4 - TechTool Pro's main control window.
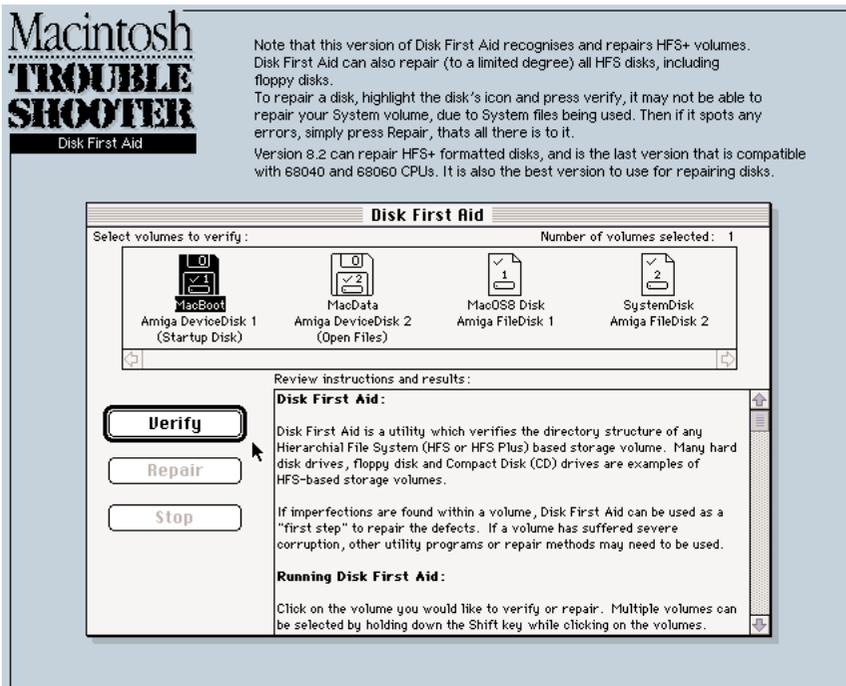
Picture 6.5 - Disk First Aids' main control window.

Scan all files, and especially programs, you download from the internet FIRST, before you launch it.

RECOVERING DELETED FILES
Make sure Filesaver (or similar feature) is running at all times, because not only does it track deleted files, it also makes a copy of the hard disk's directory. Volume Recover uses this info if the disk's directory is totally trashed. Its either that or reformat your hard disk! The only alternative to Filesaver is to do regular (daily/weekly) backups, which you should have done anyway.

ABOUT FORMATTING HARD DISKS
You're better off with two Mac partitions rather than a large one (preferably with a System Folder on each one), because if one goes belly up, you have another unaffected hard disk.

You only need to low-level format your Mac hard disk **once**, ignore what other people say, ie. "formatting your HD every year is a good thing" - because it is completely wrong. Except for repartitioning the hard disk.

Use the MacOS, to format hard disks, via the **Erase Disk** option in the Finder's Special menu. Also, if you connect another SCSI hard disk, it should automatically be detected, and will ask you whether you want to format it.

For removable hard disks, use the Macintosh driver supplied with the drive, or download it from the manufacturer's web site.

What other disk management/repair programs are there, other than Norton Utilities?
Some commercial programs that are **68k** compatible:
• **TechTool Pro 2.1** (Micromat Computer Systems), is a full Mac diagnostic suite.
• **Hard Disk Toolkit** (FWB), supports all hard disk models and has loads of operation features.
• **RAID Toolkit** (FWB), a good, software based, hard disk RAID solution - supports HFS+.
There are other software publishers out there, who make hard disk utilities for the Macintosh, try these company's web pages for more

info; **MacPeak, Corel** and **Clarismac**. Their web addresses are in the Useful Mac Software section on page 93.

What should I do to protect my Mac's System?
Well, you should make an archive of the entire System Folder, with a common Macintosh compression program, such as Stuffit, Compact Pro, Disk Doubler or ZipIt (pkZip compatible). So if anything disastrous should happen to your System, you can at least de-archive the System and/or Finder files, straight away without worrying about virus infection or a total System installation.

Second thing to do, is buy a decent anti-virus program, see above.

2 or 3 Tunes
This is a HyperCard virus, it plays three German folk tunes when launched. The virus can cause system crashes.

AIDS
Aids infects application and system files, with no intentional damage. Aids is a nVIR B strain.

Aladin
Close relative of Frankie (see below).

ANTI
This virus changes program code, therefore causes applications to crash a lot. Can't spread under System 7.x, or System 6 under MultiFinder.
Strains: **Anti-A, Anti-Ange, Anti-B, Anti-Variant**.

Antibody
Is a HyperCard virus and causes no damage. It checks for the MerryXmas virus, and then deletes it from all stacks.

AppleScript Trojans
AppleScript trojan viruses can be **extremely destructive**, they are to be treated like a program, if you run such a program which is alien to you, you may invoke a hard disk initialisation or it may go through all of your files and scramble it's Type and Creator codes. This type of virus is very easy to create and even easier to be undetected. AppleScripts should be downloaded only from known trusted sources. It is nigh impossible for an average person to know what any given compiled script will do.

AutoStart 9805
The AutoStart virus is a "worm", and it spreads via any HFS disk. Worms are self contained programs that replicate themselves at will.

Some are destructive, overwriting certain files with random data.
Symptoms: Perhaps the most noticeable symptom of the worms is that an infected system will lock up and have unexplained delays and disk activity every 6, 10, or 30 minutes.
Certain file types will have been damaged or deleted:

- **Autostart 9805** will overwrite files ending with **data, cod** or **csa** that are over 100 bytes.
- **Autostart 9805**-**E** will write over some image files with random data, these are; JPEG, TIFF and EPSF picture files, only if they are bigger than 10,424 bytes.
- **Autostart 9805**-**F** will delete files ending with **.data, .cod, .csd** that are over 100 bytes, and **.dat** files that are over 2,063,232 bytes (total of the data & resource forks). It only infects PPC Macs, it is **incompatible with 68K Macs**.

Strains: **Autostart 9805**-**B, Autostart 9805**-**C & D** (are really Autostart worm killers), **Autostart 9805**-**E, Autostart 9805**-**F**.
Autostart (invisible) Extensions/apps to look out for: **DB** or **BD**, and **Desktop Print Spooler** or **Desktop Printr Spooler**.

Blink
Is a non-destructive Hypercard virus, which spreads to other Hypercard stacks, starts on January'99.

CDEF
This virus infects the desktop file and any mounted floppy disks. It causes system crashes and strange behaviour. System 7 can eradicate the virus simply by rebuilding the Desktop file, it is NOT necessarily immune to this virus.

ChinaTalk Trojan
ChinaTalk Trojan disguises itself as a "female MacinTalk sound driver". This is a **very destructive virus**, it deletes the directories of all mounted hard drives and floppy disks.

CLAP
A nVIR variant that fools Disinfectant to avoid detection (Disinfectant 3.6-3.7 recognizes it).

CODE 1
Infects applications and system files. If the hard disk's name changes to "Trent Saburo" then you are infected and causes system crashes and some damage.

CODE 252
Infects the system file and then all applications. If you are infected, it displays a message, "You are infected with a virus. Ha Ha Ha. Now Erasing all disks. Ha Ha Ha (Click to continue)". **The virus does NOT erase disks**. It can crash System 7 and damage files, but doesn't spread beyond the System file.
Alias: **D-Day Virus**.

CODE 32767
Once a month, it tries to delete documents. These are the times it will activate itself, for an hour each time; Jan 6th 9am, Feb 9th 10am, Mar 12th 11am, Apr 5th 12pm, May 16th 1pm, June 18th 2pm, July 5th 3pm, Aug 4th 4pm, Sept 1st 5pm, Oct 20th 6pm, Nov 15th 7pm, Dec 18th 8pm. This is a **destructive virus**.

Code 9811
Hides applications, replacing them with garbage files named ie. 'FIDVCXWGJKJWLOI'. It also produces a desktop covered with electronic worms, and also displays the message "You have been hacked by the Pretorians."

CPro Trojan
CPro disguises itself as an update to Compact Pro (a compression program). This is a **very destructive virus**, it formats all hard disks and floppy disks.

Dukakis
This is a HyperCard virus. It quickly spreads to other Hypercard docs, then displays the message "Dukakis for President" and deletes itself.

Excel Macro Viruses
Strains: **Laroux** (quite harmless), **Xtras.A**.

Flag
Unrelated to WDEF A and B, but was given the name WDEF-C in some anti-virus software. Not intentionally damaging but when spreading it overwrites any existing WDEF resource of ID:0, an action which might damage some files.

FontFinder
Supposed to lists fonts used in a document, but actually deletes folders.

Frankie
This virus infects Macintosh emulators. When activated, it draws a bomb and then displays: "Frankie says: No more piracy!", then causes a crash. Alias: **Aldus**.

Fuck
Infects application and System files. No intentional damage (nVIR B strain).

HC 9507
This infects HyperCard docs only. Once infected, the virus spreads to other randomly chosen Hypercard docs. It causes the screen to fade in and out, and the word pickle is typed automatically, or a system freeze/shutdown.

HC 9603
Infects HyperCard docs. The virus does not cause any damage.

Independance Day
It attempts to be destructive, but fortunatelitis not well enough written to be more than a nuisance.

INIT 17
Displays message "From the depths of Cyberspace" the first time it is triggered. INIT17 infects the System file immediately and then all applications. It can cause file damage and system crashes due to accidental damage, especially on 68K Macs.

INIT 1984
Infects system extensions (INITs). It is activated on Friday 13th. It is a **very destructive virus**. It damages files by changing filenames and it's file Type & Creator to random characters, on any System 6/7 Mac.

INIT 29
INIT 29 infects System files. It infects data files as well as programs, infected data files do not spread the virus. This devious virus also tells you to unlock locked disks by saying it needs minor repairs, then promptly infects it. The virus does not do intentional damage, though it can cause printing problems, system crashes.
Strains: **INIT 29A, INIT 29B**.

INIT 9403
Infects the Finder and other applications/files, and then attempts to ERASE the system disk and other mounted hard disks. This is a **very destructive virus**.
Alias: **SysX**.

INIT 9403 Trojan
This trojan horse, disguises itself as an application called RamDoubler. It also appears in some other applications.

INIT M
The INIT-M virus, is a **very destructive virus** that spreads applications, system extensions, documents and preference files. It rename files and folders with random text, changes the creation/modification dates, and scrambles the file creator/type information, it is triggered on Friday the 13th. A dead give away is a preference called "FSV Prefs". This virus infects System 7 or above. Alias: **MindCrime virus**.

Laroux
This is an Excel macro virus. It creates a hidden, blank worksheet in infected documents, but it is not destructive.

MacMag

Is a HyperCard stack, it disguises itself as a program called New Apple Products and infects the System file, on Hard Disks and floppies. Set to trigger and self-destruct on March 2nd, 1988, so it is rarely found.
Strains: **Aldus, Brandow, Drew, Peace**.

Macro Viruses

Many of these only infect the application's files - however, some can do other damage. Be extra vigilant with Microsoft products, ie. MS Word and MS Excel - although they can infect any application that uses macros. Also note that it is unlikely that a macro can activated on a different word processor, as the macro language will mostly be different, therefore rendering the macro virus useless. However I'm not sure whether docs created on one platform and transferred to the Mac (PC to Mac for instance), using the same creator program, will infect your Mac?!

MBDF

This one infects the system, finder and any applications. It does not damage, but it may cause regular system and program crashes. It spreads under System 6 and 7. These 3 games "Tetracycle", "10 Tile Puzzle" and "Obnoxious Tetris" contain this Trojan virus.
Strains: **MBDF A, MBDF B**.

MDEF

These viruses are not malicious in intent, but can cause system crashes and other unexplained behaviour. An infected program may have garbled pull-down menus.
Strains: **MDEF A, MDEF B, MDEF C, MDEF D**.
Aliases: **Garfield** (MDEF A), **Top Cat** (MDEF B).

MDEF-E & MDEF-F

Are simple and benign viruses. They infect applications and system files, and do not cause intentional file damage.

Merry XMas

The Merry Xmas virus infects HyperCard docs and has several strains. This virus can cause irreparable damage to Hypercard docs by adding or deleting scripts. Delete infected docs instead of repairing them, where ever possible.

Mosaic Trojan

Is a program that is supposed to display graphics, but actually mangles directory structures.This is a **very destructive virus**.

nVIR Family

This virus infects the System file and applications. If MacinTalk is installed in your System folder, your computer will occasionally say "Don't Panic" or it may beep unexpectedly. It can also cause programs and the System to crash. **Some strains are destructive**.
Strains: **AIDS, Fuck, Hpat, J-nVIR, Jude, MEV, MODM, nCAM, nFlu, nVIR A/B/C, prod, zero**.

NVP & NVP Trojan

When launched, the NVP virus stops these letters "a,e,i,o,u" from being typed. NVP does not attempt to spread to other files.

Peace

The Peace Virus, is introduced by a HyperCard doc called New Apple Products. This virus infects and spreads to system files only. It displays a peace message on March 2, 1988. The virus then self-destructs, no damage is done.

Scores

This virus spreads rapidly to all applications every time the Mac is restarted. There is one tell tale sign that Scores is on your Mac, it changes the Note Pad and Scrapbook files, to dog-eared icons. Scores causes system crashes and other abnormal problems, especially when printing.
Strains: **Eric, San Jose Flu, NASA, VULT**.

SevenDust
A family of four viruses which spread both through MDEF resources and a System extension created by those resources. Three of these viruses cause no other damage. On the sixth day of the month, one may erase all non-application files on the current volume.
Strains: **SevenDust A, SevenDust B, SevenDust C, SevenDust D, SevenDust E, SevenDust F**.
Also known as: **666, MDEF 9806 A, MDEF 9806 B, MDEF 9806 C, MDEF 9806 D**.

Steroid Trojan
Control Panel - claims to improve QuickDraw speed, but actually destroys the directory structure of our hard disk. This is a **very destructive virus**.

T4
Was in a game called GoMoku (v2/2.1), on the internet. It is a **destructive virus**, it causes significant damage to the system file, extensions and applications. Resulting in an unbootable Mac, and unusable programs.
Strains: **T4 A, T4 B, T4 C**.

T4-D
It deletes files other than the System file from the System Folder, and documents. **This is a very destructive virus**.

Tetricycle Trojan
This virus hides in a game called Tetricycle. When it is launched, it infects the System, Finder and any applications. It causes System file and program damage.

Virus Info
This trojan virus disguises itself as a program which claims to provide virus info, but when launched, will destroys the directory of your hard drive. This is a **very destructive virus**.

WDEF
The WDEF virus spreads in System 6 via the Desktop file. It does not damage data files, but it can cause frequent System crashes. System 7 Desktop files are relatively immune to WDEF, only if you rebuild the desktop regularly.
Strains: **WDEF A, WDEF B**.

ZUC
ZUC and it's strains, infects applications and displays the annoying symptom of controlling the movement of the cursor on your screen. Once the infection reaches the Finder file, the computer becomes virtually unusable.
Strains: **ZUC A, ZUC B, ZUC C**.

SYSTEM ERROR CODES

See 'Error Codes in Detail' on page 58, for a more comprehensive description of Codes +1 to +30.

There are a few small applications that you can download from any Mac web, ones that I find very useful are: **System Errors, Easy Errors** and **Apple Error Codes '98**. You may also find, to a limited degree, that **Extension Overload** and **InformINIT**, also cover some Mac error codes.

SYSTEM ERRORS (POSITIVE NOS.)

Error Code & Error Name	Error Description
1 dsBusError	Bus error.
2 dsAddressErr	Address error.
3 dsIllInstErr	Illegal instruction error.
4 dsZeroDivErr	Zero divide error.
5 dsChkErr	Check trap error.
6 dsOvflowErr	Overflow trap error.
7 dsPrivErr	Privilege violation error.
8 dsTraceErr	Trace mode error.
9 dsLineAErr	Line 1010 trap error.
10 dsLineFErr	Line 1111 trap error.
11 dsMiscErr	Miscellaneous hardware exception error (code that does'nt exist).
12 dsCoreErr	Unimplemented core routine error.
13 dsIrqErr	Uninstalled interrupt error.
14 dsIOCoreErr	IO Core Error.
15 dsLoadErr	Segment Loader Error.
16 dsFPErr	Floating point error.
17 dsNoPackErr	Package 0 not present [List Manager].
18 dsNoPk1	Package 1 not present [Reserved by Apple].
19 dsNoPk2	Package 2 not present [Disk Initialization].
20 dsNoPk3	Package 3 not present [Standard File].
21 dsNoPk4	Package 4 not present [Floating-Point Arithmetic].
22 dsNoPk5	Package 5 not present [Transcendental Functions].
23 dsNoPk6	Package 6 not present [International Utilities].
24 dsNoPk7	Package 7 not present [Binary/Decimal Conversion].
25 dsMemFullErr	Out of memory!
26 dsBadLaunch	Can't launch file.
27 dsFSErr	File system map has been trashed.
28 dsStknHeap	Stack has moved into application heap.
30 dsReinsert	Request user to re-insert off-line volume.
31 dsNotThe1	.Not the disk I wanted (obsolete).
33 negZcbFreeErr	ZcbFree has gone negative.
40 dsGreeting	Welcome to Macintosh greeting.
41 dsFinderErr	Can't load the Finder error.
42 dsBadStartupDisk	Unable to mount boot volume (obsolete).
43 dsSystemFileErr	Can't find System file to open (obsolete).
51 dsBadSlotInt	Unserviceable slot interrupt.
81 dsBadSANEopcode	Bad opcode given to SANE Pack4.
83 dsBadPatchHeader	SetTrapAddress saw the "come-from" header.
84 menuPrgErr	Happens when a menu is purged.
85 dsMBarNFnd	SysErr - cannot find MBDF.
86 dsHMenuFindErr	SysErr - recursively defined HMenus.
87 dsWDEFnFnd	Could not load WDEF.
88 dsCDEFnFnd	Could not load CDEF.
89 dsMDEFnFnd	Could not load MDEF.
90 dsNoFPU	FPU instruction executed, but machine has no FPU.
98 dsNoPatch	Can't patch for particular Model Mac.
99 dsBadPatch	Can't load patch resource.
101 dsParityErr	Memory parity error.
102 dsOldSystem	System is too old for this ROM.
103 ds32BitMode	Booting in 32-bit on a 24-bit system.
104 dsNeedToWriteBootBlocks	Need to write new boot blocks.
105 dsNotEnoughRAMToBoot	Need at least 1.5MB of RAM to boot 7.0.
20000 dsShutDownOrRestart	User choice between ShutDown and Restart.
20001 dsSwitchOffOrRestart	User choice between Switch off or Restart.
20002 dsForcedQuit	Allow the user to ExitToShell, return if Cancel.
32767 dsSysErr	General system error (catch-all used in DSAT).

GENERAL SYSTEM ERRORS

0 noErr	0 for success.
-1 qErr	Queue element not found during deletion.
-2 vTypErr	Invalid queue element.
-3 corErr	Core routine number out of range.
-4 unimpErr	Unimplemented core routine.
-5 SlpTypErr	Invalid queue element.
-8 seNoDB	No debugger installed to handle debugger command.

COLOUR MANAGER ERRORS

-9 iTabPurgErr	From Color2Index/ITabMatch.
-10 noColMatch	n/a
-11 qAllocErr	From MakeITable.
-12 tblAllocErr	n/a
-13 overRun	n/a
-14 noRoomErr	n/a
-15 seOutOfRange	From SetEntry.
-16 seProtErr	n/a
-17 i2CRangeErr	n/a
-18 gdBadDev	n/a
-19 reRangeErr	n/a
-20 seInvRequest	n/a
-21 seNoMemErr	n/a

I/O SYSTEM ERRORS

-17	controlErr	Driver can't respond to Control call.
-18	statusErr	Driver can't respond to Status call.
-19	readErr	Driver can't respond to Read call.
-20	writErr	Driver can't respond to Write call.
-21	badUnitErr	Driver reference number doesn't match unit table.
-22	unitEmptyErr	Driver reference number specifies NIL handle in unit table.
-23	openErr	Requested read/write permission doesn't match driver's open permission or attempt to open RAM serial driver failed.
-24	closErr	Close failed, or permission to close .MPP driver was denied.
-25	dRemovErr	Tried to remove an open driver.
-26	dInstErr	DrvrInstall couldn't find driver in resources, or abort error.
-27	abortErr	IO call aborted by KillIO.
-28	notOpenErr	Couldn't rd/wr/ctl/sts cause driver not opened.
-29	unitTblFullErr	Unit table has no more entries.
-30	dceExtErr	DCE extension error.

FILE SYSTEM ERRORS

-33	dirFulErr	Directory full.
-34	dskFulErr	Disk full.
-35	nsvErr	No such volume, or volume not found.
-36	ioErr	I/O error.
-37	bdNamErr	Bad file name; there may be no bad names in the final system!
-38	fnOpnErr	File not open.
-39	eofErr	End of file, or no additional data in the format.
-40	posErr	Tried to position to before start of file (r/w).
-41	mFulErr	Memory full (open) or file won't fit (load).
-42	tmfoErr	Too many files open.
-43	fnfErr	File/Folder/Edition container/Target not found.
-44	wPrErr	Disk is write-protected; Volume is locked through hardware.
-45	fLckdErr	File is locked, or publisher writing to an edition.
-46	vLckdErr	Volume is locked through software.
-47	fBsyErr	File is busy (delete); Section doing I/O.
-48	dupFNErr	Duplicate filename (rename); File found instead of folder.
-49	opWrErr	File already open with write permission.
-50	paramErr	Error in user parameter list.
-51	rfNumErr	Reference number invalid.
-52	gfpErr	Get file position error.
-53	volOffLinErr	Volume is off line.
-54	permErr	Permission error on file open, or software lock on file.
-55	volOnLinErr	Drive volume already on-line at MountVol.
-56	nsDrvErr	No such drive (tried to mount a bad drive number).
-57	noMacDskErr	Not a Macintosh disk (signature bytes are wrong).
-58	extFSErr	.External file system, file system identifier is non-zero.
-59	fsRnErr	File system internal error: during rename the old entry was deleted but could not be restored.
-60	badMDBErr	Bad master directory block.
-61	wrPermErr	Write permission error.

FONT MANAGER ERRORS

-64	fontDecError	Error during font declaration.
-65	fontNotDeclared	Font not declared.
-66	fontSubErr	Font substitution occurred.

DISK ERRORS

-64	lastDskErr	Last disk error.
-64	noDriveErr	Drive not installed.
-65	offLinErr	Read/write requested for an off-line drive.
-66	noNybErr	Couldn't find 5 nibbles in 200 tries.
-67	noAdrMkErr	Couldn't find valid address mark.
-68	dataVerErr	Read verify compare failed.
-69	badCksmErr	Address mark checksum didn't check.
-70	badBtSlpErr	Bad address mark bit slip nibbles.
-71	noDtaMkErr	Couldn't find a data mark header.
-72	badDCksum	Bad data mark checksum.
-73	badDBtSlp	Bad data mark bit slip nibbles.
-74	wrUnderrun	Write under-run occurred.
-75	cantStepErr	Step handshake failed.
-76	tk0BadErr	Track 0 detect doesn't change.
-77	initIWMErr	Unable to initialise IWM.
-78	twoSideErr	Tried to read second side on a one sided drive.
-79	spdAdjErr	Unable to correctly adjust disk speed.
-80	seekErr	Track number wrong on address mark.
-81	sectNFErr	Sector number never found on a track.
-82	fmt1Err	Can't find sector 0 after track format.
-83	fmt2Err	Can't get enough sync.
-84	verErr	Track failed to verify.
-84	firstDskErr	First disk error.

SERIAL PORTS, PRAM/CLOCK

-85	clkRdErr	Unable to read same clock value twice.
-86	clkWrErr	Time written did not verify.
-87	prWrErr	Parameter RAM written didn't read-verify.
-88	prInitErr	InitUtil found the parameter RAM uninitialised.
-89	rcvrErr	SCC receiver error (framing, parity, OR).
-90	breakRecd	Break received (SCC).

APPLETALK ERRORS

-91	ddpSktErr	Error opening socket, or invalid address or table is full.
-92	ddpLenErr	Data length too big.
-93	noBridgeErr	No network bridge for non-local send.
-94	lapProtErr	Error in attaching/detaching protocol.
-95	excessCollsns	Hardware error [excessive collisions on write].
-97	portInUse	Driver Open error code (port is in use).
-98	portNotCf	Driver Open error code (parameter RAM not configured for this connection).

MEMORY MANAGER ERRORS

-99 memROZErr   Hard error in ROZ.
-99 memROZError   Hard error in ROZ.
-99 memROZWarn   Soft error in ROZ.

SCRAP MANAGER ERRORS

-100 noScrapErr   No scrap exists error.
-102 noTypeErr   Format not available, or no object of that type in scrap.

MEMORY ALLOCATION ERRORS

-108 memFullErr   Ran out of memory, or not enough room in heap zone.
-109 nilHandleErr   GetHandleSize fails on baseText or substitutionText, NIL master pointer, handle was NIL in HandleZone or other.
-110 memAdrErr   Address was odd, or out of range.
-111 memWZErr   Attempted to operate on a free block; GetHandleSize fails on baseText or substitutionText, or WhichZone failed (applied to free block).
-112 memPurErr   Trying to purge a locked or non-purgeable block.
-113 memAZErr   Address in zone check failed.
-114 memPCErr   Pointer Check failed.
-115 memBCErr   Block Check failed.
-116 memSCErr   Size Check failed.
-117 memLockedErr   Trying to move a locked block (MoveHHi).

HFS ERRORS

-120 dirNFErr   Directory not found.
-121 tmwdoErr   No free WDCB available.
-122 badMovErr   Move into offspring error.
-123 wrgVolTypErr   Not an HFS volume or operation - not supported for MFS (obsolete).
-124 volGoneErr   Server volume has been disconnected.
-125 updPixMemErr   Insufficient memory to update a pixmap.
-127 fsDSIntErr   Internal file system error.

MENU MANAGER ERRORS

-126 dsMBarNFnd   System error code for - MBDF not found.
-127 dsHMenuFindErr Couldn't find HMenu's parent in MenuKey.
-128 userCanceledErr User cancelled an operation.

HFS FILE ID ERRORS

-130 fidNotFound   No file thread exists.
-131 fidNotAFile   Directory specified; it is not a file.
-132 fidExists   File ID already exists.

COLOUR QUICKDRAW AND COLOUR MANAGER ERRORS

-145 noMemForPictPlaybackErr   No memory available to playback a picture/movie.
-147 rgnTooBigError Region too big or complex.
-148 pixMapTooBigErr Pixel map record pixelmap is too large.
-149 nsStackErr   Not enough stack space for the necessary buffers "OR".

-150 cMatchErr   Color2Index failed to find an index.
-151 cTempMemErr   Failed to allocate memory for temporary structures.
-152 cNoMemErr   Failed to allocate memory for structure.
-153 cRangeErr   Range error on colorTable request.
-154 cProtectErr   ColorTable entry protection violation.
-155 cDevErr   Invalid type of graphics device.
-156 cResErr   Invalid resolution for MakeITable.
-157 cDepthErr   Invalid pixel depth.
-158 cParmErr   Invalid parameter.

RESOURCE MANAGER ERRORS (OTHER THAN I/O)

-185 badExtResource Extended resource has a bad format.
-186 CantDecompress Resource bent ("the bends") can't decompress a compressed resource.
-188 resourceInMemory Resource already in memory.
-189 writingPastEnd Writing past end of file.
-190 inputOutOfBounds Offset or count out of bounds.
-192 resNotFound   Resource not found.
-193 resFNotFound   Resource file not found.
-194 addResFailed   Add Resource failed.
-195 addRefFailed   Add Reference failed.
-196 rmvResFailed   Remove Resource failed.
-197 rmvRefFailed   Remove Reference failed.
-198 resAttrErr   Attribute inconsistent with operation.
-199 mapReadErr   Map inconsistent with operation.

SOUND MANAGER ERRORS

-200 noHardware   No hardware support for the specified synthesizer.
-201 notEnoughHardware No more channels for the specified synthesizer.
-203 queueFull   No room in the queue.
-204 resProblem   Problem loading the resource.
-205 badChannel   Channel is corrupt or unusable [invalid channel queue length].
-206 badFormat   Resource is corrupt (handle to 'snd' resource was invalid).
-207 notEnoughBufferSpace   Insufficient memory available.
-208 badFileFormat File is corrupt or unusable, or not AIFF or AIFF-C.
-209 channelBusy   Channel is being used for a PFD already.
-210 buffersTooSmall Cannot operate in the memory allowed.
-211 channelNotBusy Channel not currently used.
-212 noMoreRealTime Not enough CPU time available.
-213 badParam   A parameter is incorrect.
-220 siNoSoundInHardware   No sound input hardware available.
-221 siBadSoundInDevice   Invalid index for SoundInGetIndexedDevice.
-222 siNoBufferSpecified   No buffer specified.
-223 siInvalidCompression   Invalid compression type.
-224 siHardDriveTooSlow   Hard drive too slow to record.
-225 siInvalidSampleRate Invalid sample rate.
-226 siInvalidSampleSize Invalid sample size.
-227 siDeviceBusyErr Sound input device is busy.
-228 siBadDeviceName Invalid device name.

-229	siBadRefNum	Invalid reference number.
-230	siInputDeviceErr	Input device hardware failure.
-231	siUnknownInfoType	Driver returned invalid info type selector.
-232	siUnknownQuality	Invalid quality selector returned by driver.

MIDI MANAGER ERRORS

-250	midiNoClientErr	No client with that ID found.
-251	midiNoPortErr	No port with that ID found.
-252	midiTooManyPortsErr	Too many ports already installed in the system.
-253	midiTooManyConsErr	Too many connections made.
-254	midiVConnectErr	Pending virtual connection created.
-255	midiVConnectMade	Pending virtual connection resolved.
-256	midiVConnectRmvd	Pending virtual connection removed.
-257	midiNoConErr	No connection exists between specified ports.
-258	midiWriteErr	Couldn't write to all connected ports.
-259	midiNameLenErr	Name supplied is longer than 31 characters.
-260	midiDupIDErr	Duplicate client ID.
-261	midiInvalidCmdErr	Command not supported for port type.

NOTIFICATION MANAGER ERROR

-299	nmTypErr	Invalid queue Type - must be ORD(nmType).

START MANAGER ERRORS

-290	smSDMInitErr	SDM could not be initialized.
-291	smSRTInitErr	Slot Resource Table could not be initialized.
-292	smPRAMInitErr	Slot Resource Table could not be initialized.
-293	smPriInitErr	Cards could not be initialized.
-300	smEmptySlot	No card in slot.
-301	smCRCFail	CRC check failed for declaration data.
-302	smFormatErr	FHeader Format is not Apple's.
-303	smRevisionErr	Wrong revision level.
-304	smNoDir	Directory offset is Nil.
-305	smDisabledSlot	This Slot is disabled.
-306	smNosInfoArray	No sInfoArray. Memory Mgr error.
-307	smResrvErr	Fatal reserved error. Reserved field <> 0.
-308	smUnExBusErr	Unexpected BusError.
-309	smBLFieldBad	ByteLanes field was bad.
-310	smFHBlockRdErr	Error occurred during _sGetFHeader.
-311	smFHBlkDispErr	Error occurred during _sDisposePtr (dispose of FHeader block).
-312	smDisposePErr	Dispose Pointer error.
-313	smNoBoardsRsrc	No Board sResource.
-314	smGetPRErr	Error occurred during _sGetPRAMRec (See SIMStatus).
-315	smNoBoardId	No Board Id.
-316	smIntStatVErr	The InitStatusV field was negative after primary or secondary init.
-317	smIntTblVErr	An error occurred while trying to initialize the Slot Resource Table.
-318	smNoJmpTbl	SDM jump table could not be created.
-319	smBadBoardId	BoardId was wrong, re-init the PRAM record.
-320	smBusErrTO	BusError time out.
-330	smBadRefId	Reference Id not found in List.
-331	smBadsList	Bad sList: Id1<Id2<Id3, format is not followed.

-332	smReservedErr	Reserved field not zero.
-333	smCodeRevErr	Code revision is wrong.
-334	smCPUErr	Code revision is wrong.
-335	smsPointerNil	LPointer is nil {from sOffsetData, if this error occurs, check sInfo record for more information).
-336	smNilsBlockErr	Nil sBlock error (Don't allocate and try to use a nil sBlock).
-337	smSlotOOBErr	Slot out of bounds error.
-338	smSelOOBErr	Selector out of bounds error.
-339	smNewPErr	NewPtr error.
-340	smBlkMoveErr	BlockMove error.
-341	smCkStatusErr	Status of slot = fail.
-342	smGetDrvrNamErr	Error occurred during _sGetDrvrName.
-343	smDisDrvrNamErr	Error occurred during _sDisDrvrName.
-344	smNoMoresRsrcs	No more sResources.
-345	smsGetDrvrErr	Error occurred during _sGetDriver.
-346	smBadsPtrErr	Bad pointer was passed to sCalcsPointer.
-347	smByteLanesErr	NumByteLanes was determined to be zero.
-348	smOffsetErr	Offset was too big (temporary, should be fixed).
-349	smNoGoodOpens	No opens were successful in the loop.
-350	smSRTOvrFlErr	SRT over flow.
-351	smRecNotFnd	Record not found in the SRT.

DEVICE MANAGER SLOT SUPPORT ERRORS

-360	slotNumErr	.Invalid slot error.
-400	gcrOnMFMErr	GCR format on high density media error.

EDITION MANAGER ERRORS

-450	editionMgrInitErr	Edition manager not inited by this application.
-451	badSectionErr	Not a valid section record.
-452	notRegisteredSectionErr	Not a registered section record.
-453	badEditionFileErr	Edition file is corrupt.
-454	badSubPartErr	Cannot use sub parts in this release.
-460	multiplePublisherWrn	Pub already registered for container.
-461	containerNotFoundWrn	Couldn't find editionContainer now.
-462	containerAlreadyOpenWrn	Container is open by this section.
-463	notThePublisherWrn	Different pub last wrote that container.

SCSI MANAGER ERRORS

-470	scsiBadPBErr	Invalid field(s) in the parameter block.
-471	scsiOverrunErr	Attempted to transfer too many bytes.
-472	scsiTransferErr	Write flag conflicts with data transfer phase.
-473	scsiBusTOErr	Bus error during transfer.
-474	scsiSelectTOErr	"scsiSelTO" exceeded (selection failed).
-475	scsiTimeOutErr	"scsiReqTO" exceeded.
-476	scsiBusResetErr	The bus was reset, so your request was aborted.
-477	scsiBadStatus	Non-zero (not "Good") status returned.
-478	scsiNoStatusErr	Device did not go through a status phase.
-479	scsiLinkFailErr	Linked command never executed.
-489	scsiUnimpVctErr	Unimplemented routine was called SysErrs used instead.

SYSERRS USED INSTEAD OF INLINE $A9FF & $ABFF
-490   userBreak   User debugger break.
-491   strUserBreak   User debugger break - display string on stack.
-492   exUserBreak   User debugger break - execute commands on stack.

QUICKDRAW ERROR
-500   rgnTooBigErr   Bitmap would convert into a region greater than 64 KB.

TEXT EDIT ERROR
-501   teScrapSizeErr   Scrap item too big for text edit record.

OPERATING SYSTEM ERROR
-502   hwParamrErr   Bad selector for _HWPriv.

PROCESSES ERRORS
-600   procNotFound   No eligible process with specified process serial number.
-601   memFragErr   Not enough room to launch application with special requirements.
-602   appModeErr   Memory mode is 32-bit, but application is not 32-bit clean.
-603   protocolErr   App made module calls in improper order.
-604   hardwareConfigErr   Hardware configuration not correct for call.
-605   appMemFullErr   Application size is not big enough for launch.
-606   appIsDaemon   Application is BG-only, and launch flags disallow this.
-607   bufferIsSmall   Buffer is too small.
-608   noOutstandingHLE   No outstanding high-level event.
-609   connectionInvalid   Connection is invalid.
-610   noUserInteractionAllowed   Attempted Post High Level Event from background and no session yet established Memory Dispatch Errors.

MEMORY DISPATCH ERRORS
-620   notEnoughMemoryErr   Insufficient physical memory.
-621   notHeldErr   Specified range of memory is not held.
-622   cannotMakeContiguousErr   Cannot make specified range contiguous.
-623   notLockedErr   Specified range of memory is not locked.
-624   interruptsMaskedErr   Called with interrupts masked.
-625   cannotDeferErr   Unable to defer additional user functions.

DATABASE ACCESS (PACK 13) ERRORS
-800   rcDBNull   The data item was NULL.
-801   rcDBValue   Data available or successfully retrieved.
-802   rcDBError   Error executing function.
-803   rcDBBadType   Next data item not of requested data type.
-804   rcDBBadCol   Function timed out.
-805   rcDBBreak   Query currently executing.
-806   rcDBExec   Session ID is invalid.
-807   rcDBBadSessID   Invalid session number.
-808   rcDBBadSessNum   Couldn't find the specified database extension, or error occurred inopening database extension.
-809   rcDBBadDDEV   The database extension does not support asynchronous calls.
-810   rcDBCancel   Invalid parameter block specified.

-811   rcDBAsyncNotSupp   There is no handler for this data type installed for the current application.
-812   rcDBBadAsyncPB   n/a
-813   rcDBNoHandler   The InitDBPack function has not yet been called.
-814   rcDBWrongVersion   The wrong version was called.
-815   rcDBPackNotInited   Pack not inited.
-816   rcDBStatusCancel   Status was cancelled.

HELP MANAGER ERRORS
-850   hmHelpDisabled   Help balloons are not enabled.
-851   hmResNotFound   Help Manager resource not found.
-852   hmMemFullErr   Help Manager, memory full error.
-853   hmBalloonAborted   Because of constant cursor movement, help balloon wasn't displayed.
-854   hmBadHelpData   Balloon Menu and item are same as previous menu and item.
-855   hmHelpManagerNotInited   Help menu not set up.
-856   hmBadSelector   Help Manager has a bad selector.
-857   hmSkippedBalloon   No balloon content to fill in.
-858   hmWrongVersion   Wrong version of Help Manager resource.
-859   hmUnknownHelpType   Help message record contained a bad type.
-860   hmCouldNotLoadPackage   Help Manager could not load package.
-861   hmOperationUnsupported   Bad method parameter.
-862   hmNoBalloonUp   No balloon showing.
-863   hmCloseViewActive   User using CloseView won't let you remove balloon.

APPLETALK - PPC TOOLBOX ERRORS
-900   notInitErr   PPC Toolbox has not been initialized yet.
-902   nameTypeErr   Invalid or inappropriate locationKindSelector in location name.
-903   noPortErr   Invalid port name; Unable to open port or bad port reference number.
-904   noGlobalsErr   System unable to allocate memory, critical error.
-905   localOnlyErr   Network activity is currently disabled.
-906   destPortErr   Port does not exist at destination.
-907   sessTableErr   PPC Toolbox is unable to create a session.
-908   noSessionErr   Invalid session reference number.
-909   badReqErr   Bad parameter or invalid state for this operation.
-910   portNameExistsErr   Another port is already open with this name.
-911   noUserNameErr   User name unknown on destination machine.
-912   userRejectErr   Destination rejected the session request.
-913   noMachineNameErr   User hasn't named his Macintosh.
-914   noToolboxNameErr   A system resource is missing, not too likely.
-915   noResponseErr   Unable to contact application.
-916   portClosedErr   The port was closed.
-917   sessClosedErr   The session has closed.
-919   badPortNameErr   PPC port record is invalid.
-922   noDefaultUserErr   User has not specified owner name in Sharing Setup control panel.
-923   notLoggedInErr   Default user reference number does not yet exist.
-924   noUserRefErr   Unable to create a new user reference number.
-925   networkErr   An error has occurred in the network.

-926	noInformErr	PPCStart failed because target program did not have an inform pending.
-927	authFailErr	User's password is wrong.
-928	noUserRecErr	Invalid user reference number.
-930	badServiceMethodErr.	Service method is other than ppcServiceRealTime.
-931	badLocNameErr	Location name is invalid.
-932	guestNotAllowedErr	Destination port requires authentication.

APPLETALK - NBP ERRORS

-1024	nbpBuffOvr	Buffer overflow in LookupName.
-1025	nbpNoConfirm	Name not confirmed on ConfirmName.
-1026	nbpConfDiff	Name confirmed at different socket.
-1027	nbpDuplicate	Duplicate name exists already.
-1028	nbpNotFound	Name not found on remove.
-1029	nbpNISErr	Error trying to open the NIS.

ASP ERRORS (XPP DRIVER)

-1066	aspBadVersNum	Server cannot support this ASP version.
-1067	aspBufTooSmall	Buffer too small.
-1068	aspNoMoreSess	No more sessions on server.
-1069	aspNoServers	No servers at that address.
-1070	aspParamErr	Parameter error.
-1071	aspServerBusy	Server cannot open another session.
-1072	aspSessClosed	Session closed.
-1073	aspSizeErr	Command block too big.
-1074	aspTooMany	Too many clients (server error).
-1075	aspNoAck	No Ack on attention request (server error).

APPLETALK - ATP ERRORS

-1096	reqFailed	Request to contact router failed: retry count exceeded.
-1097	tooManyReqs	Too many concurrent requests.
-1098	tooManySkts	Too many concurrent responding-sockets.
-1099	badATPSkt	Bad ATP-responding socket.
-1100	badBuffNum	Bad response buffer number specified.
-1101	noRelErr	No release received.
-1102	cbNotFound	Control Block not found; no pendingasynchronous calls.
-1103	noSendResp	AddResponse issued without SendResponse.
-1104	noDataArea	No data area for request to MPP.
-1105	reqAborted	ERdCancel function called for ERead [SendRequest aborted by RelTCB].

DATA STREAM PROTOCOL - DSP DRIVER ERRORS

-1273	errOpenDenied	Open request denied by recipient.
-1274	errDSPQueueSize	Send or receive queue is too small.
-1275	errFwdReset	Read terminated by forward reset.
-1276	errAttention	Attention message too long.
-1277	errOpening	Attempt to open connection failed.
-1278	errState	Bad connection state for this operation.
-1279	errAborted	Request aborted by dspRemove or dspClose function.
-1280	errRefNum	Bad connection reference number.

HFS ERRORS

-1300	fidNotFound	File ID not found [No file thread exists].
-1301	fidExists	File id already exists.
-1302	notAFileErr	Specified file is a directory.
-1303	diffVolErr	Files on different volumes.
-1304	catChangedErr	Catalog has changed and CatPosition may be invalid.
-1305	desktopDamagedErr	The desktop database has become corrupted - the Finder will fix this, but if your application is not running with the Finder, use DTReset or DTDelete.
-1306	sameFileErr	Can't exchange a file with itself.
-1307	badFidErr	File ID is dangling or doesn't match file number.
-1308	notARemountErr	If _Mount allows only remounts & doesn't get 1.

APPLEEVENT ERRORS

-1700	errAECoercionFail	Data could not be coerced to the requested description type.
-1701	errAEDescNotFound	Description record was not found.
-1702	errAECorruptData	Data in an Apple event could not be read.
-1703	errAEWrongDataType	Wrong description type.
-1704	errAENotAEDesc	Not a valid description record.
-1705	errAEBadListItem	Operation involving a list item failed.
-1706	errAENewerVersion	Need a newer version of the Apple Event Manager.
-1707	errAENotAppleEvent	Event is not an Apple event.
-1708	errAEEventNotHandled	Event wasn't handled by an Apple event handler.
-1709	errAEReplyNotValid	AEResetTimer was passed an invalid reply.
-1710	errAEUnknownSendMode	Invalid sending mode was passed.
-1711	errAEWaitCanceled	User cancelled out of wait loop for reply or receipt.
-1712	errAETimeout	AppleEvent timed out.
-1713	errAENoUserInteraction	No user interaction allowed.
-1714	errAENotASpecialFunction	Wrong keyword for a special function.
-1715	errAEParamMissed	Handler did not get all required parameters.
-1716	errAEUnknownAddressType	Unknown Apple event address type.
-1717	errAEHandlerNotFound	No handler found for an Apple event or a coercion.
-1718	errAEReplyNotArrived	Reply has not yet arrived.
-1719	errAEIllegalIndex	Not a valid list index.

APPLETALK - ATP ERRORS

-3101	buf2SmallErr	Buffer too small.
-3102	noMPPErr	No MPP error.
-3103	ckSumErr	Check sum error.
-3104	extractErr	Extraction error.
-3105	readQErr	Read queue error.
-3106	atpLenErr	ATP length error.
-3107	atpBadRsp	ATP bad response error.
-3108	recNotFnd	Record not found.
-3109	sktClosedErr	Socket closed error.

PRINT MANAGER W/LASERWRITER ERRORS

-4096	n/a	No free Connect Control Blocks available.
-4097	n/a	Bad connection reference number.
-4098	n/a	Request already active.

-4099	n/a	Write request too big.
-4100	n/a	Connection just closed.
-4101	n/a	Printer not found, or closed.

FILE MANAGER EXTENSIONS ERRORS

-5000	accessDenied	Incorrect access for this file/folder.
-5006	DenyConflict	Permission/Deny mode conflicts with the current mode in which this fork is already open.
-5015	NoMoreLocks	Byte range locking failure from Server.
-5020	RangeNotLocked	Attempt to unlock an already unlocked range.
-5021	RangeOverlap	Attempt to lock some of an already locked range.

AFP ERRORS (XPP DRIVER)

-5000	afpAccessDenied	AFP access denied.
-5001	afpAuthContinue	AFP authorization continue.
-5002	afpBadUAM	AFP bad UAM.
-5003	afpBadVersNum	AFP bad version number.
-5004	afpBitmapErr	AFP bit map error.
-5005	afpCantMove	AFP can't move error.
-5006	afpDenyConflict	AFP deny conflict.
-5007	afpDirNotEmpty	AFP directory not empty.
-5008	afpDiskFull	AFP disk full.
-5009	afpEofError	AFP End-of-File error.
-5010	afpFileBusy	AFP file busy.
-5011	afpFlatVo	AFP flat volume.
-5012	afpItemNotFound	AFP item not found.
-5013	afpLockErr	AFP lock error.
-5014	afpMiscErr	AFP misc error.
-5015	afpNoMoreLocks	AFP no more locks.
-5016	afpNoServer	AFP no server.
-5017	afpObjectExists	AFP object already exists.
-5018	afpObjectNotFound	AFP object not found.
-5019	afpParmErr	AFP parameter error.
-5020	afpRangeNotLocked	AFP range not locked.
-5021	afpRangeOverlap	AFP range overlap.
-5022	afpSessClosed	AFP session closed.
-5023	afpUserNotAuth	AFP user not authorized.
-5024	afpCallNotSupported	AFP call not supported.
-5025	afpObjectTypeErr	AFP object type error.
-5026	afpTooManyFilesOpen	AFP too many files open.
-5027	afpServerGoingDown	AFP server going down.
-5028	afpCantRename	AFP can't rename.
-5029	afpDirNotFound	AFP directory not found.
-5030	afpIconTypeError	AFP icon type error.
-5031	afpVolLocked	Volume is Read-Only.
-5032	afpObjectLocked	AFP Object is M/R/D/W inhibited.
-5033	afpContainsSharedErr	Folder being shared has a shared folder.
-5034	afpIDNotFound	ID not found.
-5035	afpIDExists	ID exists.

-5036	afpDiffVolErr	Different volume error.
-5037	afpCatalogChanged	Catalog changed.
-5038	afpSameObjectErr	Same object error.
-5039	afpBadIDErr	Bad ID error.
-5040	afpPwdSameErr	Same password on a mandatory password change.
-5041	afpPwdTooShortErr	Password being set is too short.
-5042	afpPwdExpiredErr	Password being used is too old.
-5043	afpInsideSharedErr	Folder being shared is in a shared folder.
-5044	afpInsideTrashErr	Folder being shared is in the trash folder.

SYSENVIRONS ERRORS

-5500	envNotPresent	SysEnvirons trap not present - returned by glue.
-5501	envBadVers	Version non-positive.
-5502	envVersTooBig	Version bigger than call can handle.

GESTALT ERRORS

-5550	gestaltUnknownErr	Gestalt doesn't know the answer.
-5551	gestaltUndefSelectorErr	Undefined code was passed to Gestalt.
-5552	gestaltDupSelectorErr	Tried to add entry that already existed.
-5553	gestaltLocationErr	Gestalt function not in system heap.

LASERWRITER DRIVER ERRORS

-8132	n/a	Manual Feed time out.
-8133	n/a	General PostScript Error.
-8150	n/a	No LaserWriter chosen.
-8151	n/a	Version mismatch between LaserPrep dictionaries.
-8150	n/a	No LaserPrep dictionary installed.
-8160	n/a	Zoom scale factor out of range.

PICTURE UTILITIES ERRORS

-11000	pictInfoVersionErr	Wrong version of the PictInfo structure.
-11001	pictInfoIDErr	Internal consistency check is wrong.
-11002	pictInfoVerbErr	The passed verb was invalid.
-11003	cantLoadPickMethodErr	Unable to load the custom pick proc.
-11004	colorsRequestedErr	The number of colours requested was illegal.
-11005	pictureDataErr	The picture data was invalid.

POWER MANAGER ERRORS

-13000	pmBusyErr	Pmgr never ready to start handshake.
-13001	pmReplyTOErr	Timed out waiting for reply.
-13002	pmSendStartErr	During send, pmgr did not start handshake.
-13003	pmSendEndErr	During send, pmgr did not finish handshake.
-13004	pmRecvStartErr	During receive, pmgr did not start handshake.
-13005	pmRecvEndErr	During receive, pmgr did not finish handshake.

MAC TCP

-23000	ipBadLapErr	Bad network configuration.
-23001	ipBadCnfgErr	Bad IP configuration error.
-23002	ipNoCnfgErr	Missing IP or LAP configuration error.

-23003	ipLoadErr	Error in MacTCP load.
-23004	ipBadAddr	Error in getting address.
-23005	connectionClosing	Connection in closing.
-23006	invalidLength	Invalid length.
-23007	connectionExists	Request conflicts with existing connection.
-23008	connectionDoesntExist	Connection does not exist.
-23009	insufficientResources	Insufficient resources to perform request.
-23010	invalidStreamPtr	Invalid stream Ptr.
-23011	streamAlreadyOpen	Stream already open.
-23012	connectionTerminated	Connection terminated.
-23013	invalidBufPtr	Invalid buffer Ptr.
-23014	invalidRDS	Invalid RDS.
-23014	invalidWDS	Invalid WDS.
-23015	openFailed	Open failure.
-23016	commandTimeout	A command timed out.
-23017	duplicateSocket	Duplicate socket error.
-23030	ipOpenProtErr	Can't open new protocol, table full.
-23031	ipCloseProtErr	Can't find protocol to close.
-23032	ipDontFragErr	Packet too large to send without fragmenting.
-23033	ipDestDeadErr	Destination not responding.
-23034	ipBadWDSErr	Error in WDS format.
-23035	icmpEchoTimeoutErr	ICMP echo timed-out.
-23036	ipNoFragMemErr	No memory to send fragmented packet.
-23037	ipRouteErr	Can't route packet off-net.
-23041	nameSyntaxErr	Name has a syntax error.
-23042	cacheFault	Cache not working properly.
-23043	noResultProc	No result Proc.
-23044	noNameServer	No name has been specified for the Server.
-23045	authNameErr	Author name is wrong.
-23046	noAnsErr	No answer error.
-23047	dnrErr	Dnr error.
-23048	outOfMemory	Out of memory.

FONT MANAGER ERRORS

-32615	fontNotOutlineErr	Bitmap passed, routine does outlines only.

PRIMARY OR SECONDARY INIT CODE ERRORS

-32768	svTempDisable	Temporarily disable card but run primary init.
-32640	svDisabled	Reserve -32640 to -32768 for Apple temp disables.

THESE ARE FAIRLY OBSCURE ERRORS

INTERNAL FILE SYSTEM ERRORS

1	chNoBuf	No free cache buffers (all in use).
2	chInUse	Requested block in use.
3	chnotfound	Requested block not found.
4	chNotInUse	Block being released was not in use.
16	fxRangeErr	File position beyond mapped range.
17	fxOvFlErr	Extents file overflow.

32	btnotfound	Record not found.
33	n/a	Record already exists.
34	n/a	No available space.
35	btnoFit	Record doesn't fit in node.
36	btbadNode	Bad node detected.
37	btbadHdr	Bad BTree header record detected.
48	cmnotfound	CNode not found.
49	cmexists	CNode already exists.
50	cmnotempty	Directory CNode not empty (valence = 0).
51	cmRootCN	Invalid reference to root CNode.
52	cmbadnews	Detected bad catalog structure.
53	cmFThdDirErr	Thread belongs to a directory not a file.
54	cmFThdGone	File thread doesn't exist.
64	dsBadRotate	Bad BTree rotate.

SLOT DECLARATION ROM MANAGER ERRORS

1	siInitSDTblErr	Slot int dispatch table couldn't be initialized.
2	siInitVBLQsErr	VBLqueues for all slots couldn't be initialized.
3	siInitSPTblErr	Slot priority table could not be initialized.
10	sdmJTInitErr	SDM Jump Table could not be initialized.
11	sdmInitErr	SDM could not be initialized.
12	sdmSRTInitErr	Slot Resource Table could not be initialized.
13	sdmPRAMInitErr	Slot PRAM could not be initialized.
14	sdmPriInitErr	Cards could not be initialized.

HD20 DRIVER ERRORS

16	wrtHsLw	HSHK low before starting.
17	wrtHSLwTO	Time out waiting for HSHK to go low.
19	wrtHSHighTO	Time out waiting for HSHK to go high.
32	rdHsHi	HSHK high before starting.
33	rdSyncTO	Time out waiting for sync ($AA) bye.
34	rdGroup to	Time out waiting for group.
36	rdHoffSyncTO	Time out waiting for sync after hold off.
37	rdHsHiTO	Time out waiting for HSHK high.
38	rdChksumErr	Checksum error on response packet.
48	invalidResp	First byte in response packet was wrong.
49	sqncNumErr	Sequence number in response packet was wrong.
50	dNumberErr	Drive number in response packet was wrong.
64	noResp	No response packet ever received.

SCSI MANAGER ERRORS

2	scCommErr	Communications error (operations timeout).
3	scArbNBErr	Arbitration failed during SCSIGet Bus busy.
4	scBadparmsErr	Bad parameter or TIB opcode.
5	scPhaseErr	SCSI bus not in correct phase for operation.
6	scCompareErr	SCSI Manager busy with another operation when SCSIGet was called.
7	scMgrBusyErr	SCSI Manager busy with another operation when SCSIGet was called.

8	scSequenceErr	Attempted operation is out of sequence, eg. calling SCSISelect before doing SCSIGet.
9	scBusTOErr	Bus timed out before data ready on SCSIRBlind and SCSIWBlind.
10	scComplPhaseErr	SCSIComplete failed – bus not in Status phase.

CONNECTION MANAGER ERRORS

-1	cmGenericError	n/a
0	cmNoErr	n/a
1	cmRejected	n/a
2	cmFailed	n/a
3	cmTimeOut	n/a
4	cmNotOpen	n/a
5	cmNotClosed	n/a
6	cmNoRequestPending	n/a
7	cmNotSupported	n/a
8	cmNoTools	n/a
9	cmUserCancel	n/a
11	cmUnknownError	n/a

FILE TRANSFER MANAGER ERRORS

-1	ftGenericError	n/a
0	ftNoErr	n/a
1	ftRejected	n/a
2	ftFailed	n/a
3	ftTimeOut	n/a
4	ftTooManyRetry	n/a
5	ftNotEnoughDSpace	n/a
6	ftRemoteCancel	n/a
7	ftWrongFormat	n/a
8	ftNoTools	n/a
9	ftUserCancel	n/a
10	ftNotSupported	n/a
11	ftUnknownError	n/a

TERMINAL MANAGER ERRORS

-1	tmGenericError	n/a
0	tmNoErr	n/a
1	tmNotSent	n/a
2	tmEnvironsChanged	n/a
7	tmNotSupported	n/a
8	tmNoTools	n/a
11	tmUnknownError	n/a

COMMON ERRORS IN MORE DETAIL

These error codes are often, confusingly, referred to as a Type X Error codes, eg. a type 3 error.

1 - **Bus Error**
The computer tried to access memory that doesn't exist. You can get this error on almost any Macintosh. If one of these computers tried to access one or more bytes beyond the total number of bytes in RAM, you see a bus error.

2 - **Address Error**
The Motorola 68000 microprocessor can access memory in increments of one byte (8 bits), one word (16 bits), or one long word (32 bits). The microprocessor can access a byte of information at an odd or even memory address. But it must access a word or long word at an even memory address. So, when the microprocessor attempts to read or write a word or long word at an odd address, you see this error. Since that's a 50/50 proposition when running random code, this one shows up quite often.

3 - **Illegal Instruction**
If the computer tries to execute an instruction that isn't in its vocabulary, you see this error code. It's less likely than error 02, but still very common.

4 - **Zero Divide Error**
This error occurs if the CPU divides two numbers, and the divisor is zero.

5 - **Range Check Error**
An instruction is used to check if a number is within a certain range, if not, this error is displayed.

6 - **Overflow Error**
An overflow condition results if a generated number is too big for its allotted space.

7 - **Privilege Violation**
The 68000 runs in Supervisor or User mode. The Macintosh should always be in Supervisor mode as some instructions can only be used in this mode, but sometimes it is placed in User mode. This error results if an Supervisor instruction was run in User mode.

8 - **Trace Mode Error**
A programmer can use a runtime debugger while in Trace mode. This allows tracing through a program one instruction at a time. You see this error if a debugger isn't installed and the 68000 is accidentally placed in Trace mode.

9 & 10 - **Line 1010 & 1111 Trap**
There are many routines in the Macintosh ROM that can be called by placing instructions in a program that aren't in the 68000's vocabulary. When the CPU encounters such an instruction, it looks it up in the instruction table. If it finds that there's no entry for the instruction, you see one of these errors.

11 - **Miscellaneous Hardware Exception Error**
A Type 11 error is listed as a hardware exception error. However, Type 11 errors are more general in nature, and usually have nothing to do with hardware problems - it more likely a software instruction trying to do something that the hardware cannot do. You may see more Type 11 errors on a Power Macintosh computer because of problems with the software-based 68k emulation.

12 - **Unimplemented Core Routine**
A programmer might set breakpoints in parts of a program to inspect for errors. If a debugger isn't installed when a breakpoint occurs, you see this error code.

13 - **Uninstalled Interrupt**
The Macintosh uses an interrupt to identify when devices like keyboards and disk drives need service. Routines must be available in memory to tell the computer how to service the device. If those routines aren't available, you see this error.

15 - **Segment Loader Error**
The segment loader is responsible for loading a needed program allocated segment into RAM. If the segment loader can't do this, you'll see this error.

17-24 - **Missing Packages 0-7**
If you get these errors, you probably have a damaged System file. Error codes 15, 16, 26, 27, 30, and 31 also come up when the System file is damaged.

25 - **Memory Full Error**
You've run out of RAM!

26 - **Bad Program Launch**
The application could not be executed.

28 - **Stack Ran into Heap**
This is a memory related error, basically it was trying to use memory that is already in use.

27,30-31
See Missing Packets.

I've supplied this section for your benefit, so that you can better understand how MacOS works and what to expect, so that future problems can be avoided, or handled with some confidence.
This section lists all standard Control Panels, Extensions, Libraries, System Enablers and all thefolders and files installed into the System Folder.

This section covers:

MACINTOSH FILING SYSTEMS

What's the difference between HFS and HFS+ filing systems? Can I use HFS+?

Hierarchical Filing System (HFS) is a 12 year old filing system, it allows only a limited number of blocks (65,536) you can have on a partition. I suggest you create multiple partitions from any hard disk above 1 gigabyte, because you will only be wasting valuable disk space, due to large block sizes. See the table below.

Estimated Block Sizes in Relation to the Size of HFS Standard Partitions
(In increments of 0.5k for every 31mb, and +16k for every gigabyte.)

Partition Size	Block Size	Partition Size	Block Size
0mb - 31mb	= 0.5k	1.0gig - 1.5gig	= 16-24k
32mb - 64mb	= 1k	1.5gig - 2.0gig	= 24-32k
65mb - 95mb	= 1.5k	2.0gig - 3.0gig	= 32-48k
96mb - 255mb	= 2-4k	3.0gig - 4.0gig	= 48-64k
256mb - 511mb	= 4.5-8k	4.0gig - 9.0gig	= 64-144k
512mb - 1023mb	= 8.5-16k	9.0gig - 18.0gig	= 144-288k

HFS+ or HFS Extended was made to extend the number of blocks, particularly for very large hard disks (1gig+). It now allows for hundreds of millions of blocks to be used. The default System block allocation is as follows:
- A 10-250 megabyte partition will have a 0.5k block size.
- A 250-999 megabyte partition will have either a 1k or 2k block size.
- 1 gigabyte up to 2 terrabyte (2000gig) partitions will have a 4k block size.

The advantage of using HFS+ is obvious, quite a lot of disk space will be reclaimed. This depends on the size of the hard disk, 1 gigabyte drive and above will see the most gains in saved space. Apple have added other advanced features to the new filing system, that are not accessible via System 8.1 at the moment, but should be in later revisions of the operating system.

The advantages of HFS+:
- Much more efficient use of disk space on 1gig+ hard disks.
- 68040/060 Macs can read/write to HFS+ disks.
- A server with a large capacity HFS+ formatted disk can be accessed by **any** Mac, with **any** System version.
- The user can define the allocation block size, but only with some commercial formatting software, eg. 0.5-2k (under 500mb only), 4k, 8k or even 16k if you want.
- The maximum partition size is **at least** 2 terabytes, or 2000 gigabytes.
- The maximum number of files you can have on a partition is **at least** 250,000.
- It uses disk space much more efficiently, especially with small files.
- Additional, built-in features of HFS+ will come available with later versions of PPC System software, eg. MacOS 8.5.

The disadvantages of HFS+:
- Only **PowerPC** and **68040/060** Amigas and Macs can use HFS+.
- You will have to reformat/optimise&format your hard disk.
- 68k Macs cannot startup from a HFS+ volume, it will fail to boot.
- HFS+ will not format any partition below 32mb.
- It requires the Text Encoding **Convertor** system Extension, and the Text Encoding data folder.
- There are only a few repair packages which can repair and optimise HFS+ formatted disks.
- Only System 8.1 is capable of recognising HFS+ disks.

Currently, I know of only these repair utilities that are compatible with HFS+:
- TechTool Pro2 (commercial).
- Disk First Aid v8.2 (on System 8.1 CD, or via the 8.1 updater).
- Norton Utilities v4.0 (commercial) - **for PowerPC Macs only.**
- Look in **Useful Software** for references to HFS+ formatters & optimisation programs (there are 4).

Don't use...
- Any version of Norton Utilities from v1 to v3.52, they **will damage** a HFS+ disk. Norton Fix - repairs any damage caused by Norton Disk Doctor 3.5. Free from any Mac internet site.

HOW FILES WORK IN MacOS

File Characteristics
Like the Amiga, the Macintosh uses flags or settings for individual files, however these flags are totally different to the Amiga's standard set, and less accessible. So I will go through all of them, and explain what each one does. An asterisk (*) next to the title means that this particular flag can be switched on or off at will, without doing any damage to the file in question. Most of these should not to be tinkered with, as they may cause untold damage. Experiment with a copy of the file if you must change something. The description tells you what happens when you activate it:

ON DESK; System 6 users only. Means that the file is on the desktop.

*__INVISIBLE__; Means it will not be displayed in the Finder or in Open/Save dialogue boxes.
Usually programs or the System creates these invisibles because they are important, and it doesn't want the user to bin or alter it.

BUNDLE; The icon for this item, is stored in it's resource fork. This applies mainly to all programs and most of it's data/library files.

STATIONERY; Makes this document into a stationery file, which can be opened and it's contents loaded into an untitled window, rather like a template.

ALWAYS SWITCH LAUNCH; System 6 users only. It switches to the System file to the disk where the application is located.

SHARED; The program can now be shared over a network.

INITED; The Finder recognises it as a special kind of file (eg. a control panel) and assigns it to a location on the disk or desktop, ie. if dragged over the top of the System folder, it'll know which folder it goes in.

ALIAS; Marks this as a standard Alias file (do not tick if it is a data file, it might destroy all data in it).

NO INITS; This will prevent a System extension from loading at boot-up.

NAME LOCKED; The file & it's filename cannot be changed.

CUSTOM ICON; Indicates that this file has it's own custom icon.

TYPE & CREATOR CODES
A **Type** code tells you what file type it is, for example; a GIFf Type is an image file, a WRD6 Type is a MS Word6 document, and an APPL Type is always used for executable programs.
   This is the most critical half of these two codes, because if it displays "????", then there is no way to tell what type of file it is. Unless you have a shareware program called **Type/Creator Database**, this lists all known file Types.
   The **Creator** code tells the MacOS which program this file or document belongs to. This makes it possible for you to automatically load-up the application when you double click on an icon. That is, IF you have the program on your hard disk. Look in the section called Jargon, on page 98, for more info on the Desktop file. See Picture 7.1.

Data & Resource Forks, the Building Blocks of Mac Files
What the heck are these, you may say? These are the two building blocks that make a Mac file or program - they are similar to the Amiga's xxx.info and xxx files. The xxx equals the Data fork, and xx.info equals the Resource fork, in principle.
   Basically the Data fork holds all data, ie. pictures, text and other data, while the Resource fork holds vital Finder and application information, ie. icon image, Finder flags, all program code, and accompanying program graphics.
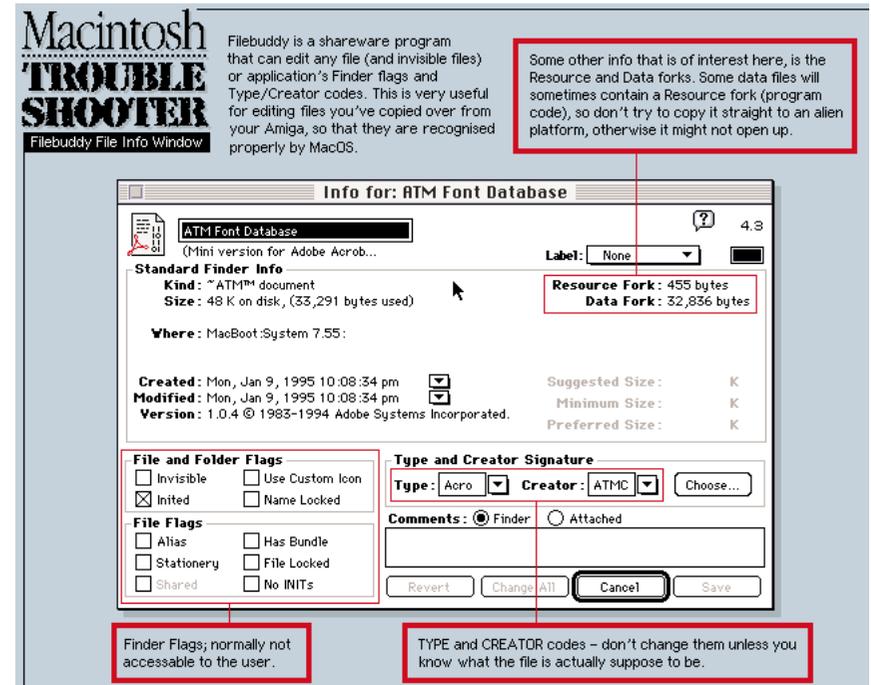
Picture 7.1 - A typical file with it's Finder flags

THE FINDER

The Finder is like Workbench, it manages the Mac environment. The Mac "environment" is actually known as **The Desktop**, this is where all disk, file and folder management takes place.

The **Desktop File is managed** by the Finder, and is a type of database, it stores; all icon positions,and remembers what each file's icon should look like, from the applications stored on your hard disks.

Invisible Folders & Files

On all Mac volumes, you'll find (with the necessary utility) a number of invisible files and folders, whatever you do, **do not delete or edit** them in any way, as this may invalidate your hard disk and cause an untold amount of hassle for yourself. These are the files/folders in question;
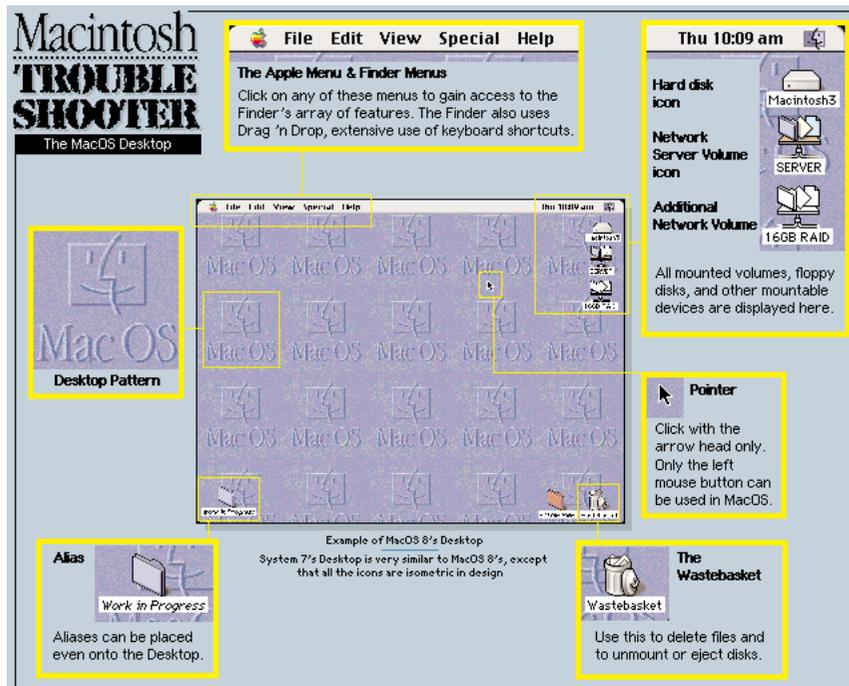
Picture 8.1 - This picture shows you all the elements that make up the Finder's Desktop.

INVISIBLE FOLDERS

Trash; Contains the files you place in the Wastebasket. If you see this on a networked volume, it'll have a belt round it (locked), it makes sure any files (from that hard disk) you've placed into your Wastebasket, is actually put into it's own Trash folder.

Desktop Folder; Contains all icons that have been placed on the Desktop's background.

[]|[]|[]Move&Rename; A special temparory folder for files that were in the middle of being edited (filename) or moved to a different location, but crashed before it could be completed.

Temporary Items; Contains any temporary files created by programs. These temporary files are often deposited in the Wastebasket after a crash and reboot. They are mostly useless and unopenable, and so are safe to bin.

INVISIBLE FILES

Desktop DB & **Desktop DF**; Contains the icon association database file. This makes sure that all files on your hard disk have the correct icons.

OpenFolderListDF; Makes a note of the opened folders that were displayed when you shutdown or restarted, so that it can display those folders again when the Finder is reloaded.

Icon; Is the custom icon used on a folder or disk's icon (usually found in that folder's or disk's root directory).

Shutdown Check; Is a file that tells the MacOS, that the Mac didn't shutdown correctly.

THE FINDER'S MENUS

The following menus are taken from System 7.5x. MacOS 8.x's extra menus follows afterwards...

THE APPLE (icon) MENU
About This Macintosh... - Displays the current programs in memory, what System version you're currently using, the amount of free RAM, and whether virtual memory is in use. See Picture 8.2.
Automated Tasks - Is a folder that contains executable Apple Scripts, for Finder operations.
Calculator - A useful little GUI based calculator.
Chooser - The network and printer selector interface.
Control Panels - Is an alias of the Control Panels folder in the System Folder, for easy access.
Find File - A Find utility. This can also be accessed via the Finder's File menu.
Jigsaw Puzzle - A simple puzzle game.

Picture 8.2 - About This Macintosh windows from System 7.x & 8.x.

Key Caps - Displays all characters of a highlighted font (selected from the menu). Just press any key combination, ie. Apple+Control, and further "hidden" characters will shown.
Note Pad - This is very simple text input program, mainly for reminders etc.
Scrapbook - A useful utility for storing text, sounds and picturesm just cut and paste into it.
Stickies - Is a utility that places little notes on the screen to help you remember things.
•**Shutdown** - Another way to shutdown the Mac.

THE "FILE" MENU
New Folder - Creates a new folder with the default name "untitled folder".
Open - This is pretty much a universal command, to open: folders, launch files or programs.
Print - The Print command allows you to print out the contents of the selected folder.
Close Window - Simply enables you to put away an open folder - a useful key command: Apple + W.
Get Info... - Select any icon, folder or disk, and this will display information about it, such as (for a file) it's last modified date, filesize, program creator, disk space used.
Sharing - Allows you to "Share" over a network, eg. everything in a folder(s) or even whole disks.
Duplicate - Makes a copy of the icon/folder/disk you've just highlighted.
Make Alias - Creates a pointer file to absolutely anything you like, from documents to disks.
Put Away - Allows you to either: eject a disk, or put an icon (from the desktop) back into it's original folder, or root directory - eg. from your wastebasket back into a network volume.
Find - This useful feature allows you to do fast searchs of any local or networked volumes.
Find Again - If you could'nt find a file the first time, select this to go back to your original find settings.
Page Setup... - Displays the print settings of the currently selected

printer driver. To be used inconjunction with the Print menu.
Print Desktop... - Output a graphic dump of the Desktop in it's current state.

THE "EDIT" MENU

Undo - Resets what you just did (x1 undo only).
Cut - Copy the item, then clear that selected item.
Copy - Makes copy of the selected item (text, sound or picture) into memory. Cut and Copy can be used just about at any time, and in Save/Open dialogue boxes.
Paste - Takes the current item that was last copied or cut, and places it at the cursor's current position.
Clear - Erases the highlighted item or text, and does not copy it.
Select All - Highlights all text, or icons & folders in a folder or disk.
Show Clipboard - Displays the contents of what was last Copied or Cut, currently in memory.

THE "VIEW" MENU

by Small Icon - Displays all files in a folder as small icons.
by Icon - Displays all files as in a folder as normal sized icons.
by Name - Lists all files in that folder by filename, alphabetically (includes a small icon).
by Kind - Lists all files in that folder by file type, and then in alphabetical order.
by Date - Lists all files in that folder by it's modified date.
by Size - Lists all files in that folder by filesize, from largest to smallest.

THE "LABEL" MENU

Labels can be applied to all icons and folders. The purpose of Labels is to enable you to keep tabs on certain files, or to differeniate between them. Listed as: **Essential** [orange], **Hot** [red], **In Progress** [magenta], **Cool** [cyan], **Personal** [blue], **Project1** [green], **Project2** [brown].

THE "SPECIAL" MENU

Clean Up Desktop - Relocates all icons into a default icon grid.
Empty Wastebasket - Deletes all files and folders held in the Trashcan.
Eject Disk - Ejects the highlighted disk - you cannot eject disks

manually, MacOS has to get shot of it first (from the desktop), otherwise you'll freeze the Mac. Note that in Shapeshifter, a little "1" character flashes on and off on the righthand side of the menu bar, when you've dragged the disk's icon to the wastebasket, indicating that it is safe to manually eject the floppy disk.
Erase Disk... - Formats any alien disk format to MacOS's HFS or HFS+, or if you have PCExchange loaded, it'll let you format floppies disks as PC DOS or Mac formatted disks. Note: if the disk is already Mac formatted, it will only create a new directory structure, in other words a "quick" format.
Restart - Reboots the Mac, the System will then reload.
Shutdown - This command quits all applications, and ends MacOS emulation.

THE HELP ("?" icon) MENU [righthand side]
About AppleGuide - Is the Mac's help system, press the Help key to display the AppleGuide for the currently used program, as Picture 8.3,
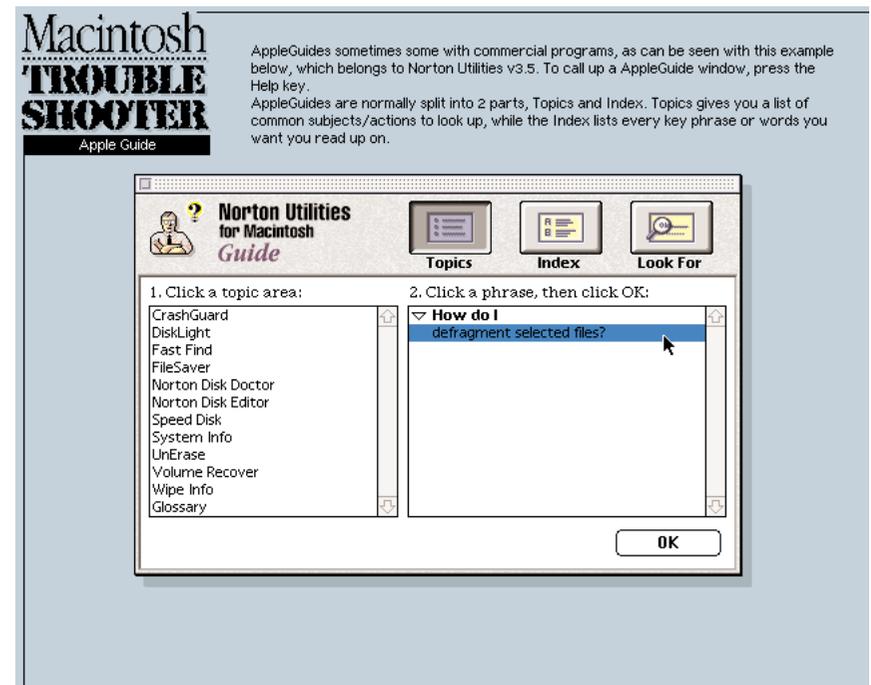

Picture 8.3 - An example of System 7.5xs help window, called AppleGuide.

or the Finder, as shown by Picture 8.4.

Show Balloons - When selected, this will display little speech bubbles with descriptive text when the pointer is placed over any icon or menu in the Finder environment.

Macintosh Guide - Is a help file for the whole of the Finder. This AppleGuide file must be in the extensions folder in order to gain access to it from this menu.

Shortcuts - Is another AppleGuide file (must be in extensions folder to enable it) that listsuseful keyboard shortcuts when using the MacOS.
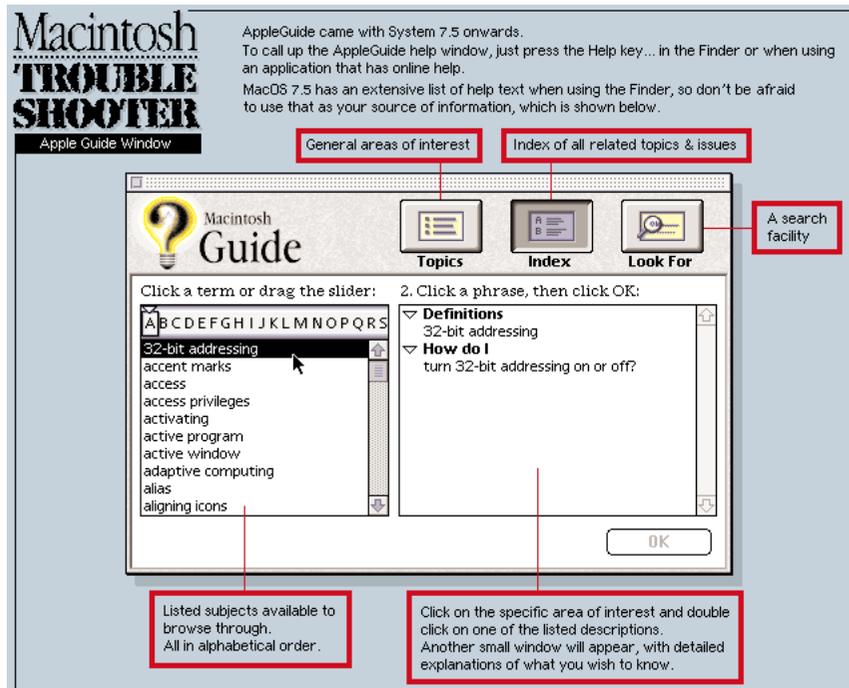
Picture 8.4 - *The AppleGuide for the Finder & MacOS.*

THE APPLICATIONS {Finder/program icon) MENU [righthand side]

Hide Finder - This will hide all open windows and transfer you to the last used program in RAM.

Hide Other - This will hide all other programs from view, except the last one you just used.

Show All - Displays every programs' elements, eg. floating palettes.

Finder - Is always listed in this second half of the menu. It is an application afterall!

[Application Name & Icon] - All programs loaded into RAM are listed in here, for easy access.

MacOS 8.x's EXTRA MENUS

THE "FILE" MENU

Move to Wastebasket - Immediately moves the selected icon to the bin.

Label - This is where the Labels menu from System 7.x, is now located.

Show Original - Displays the Alias's original item's location.

THE "EDIT" MENU

Preferences... - This is the Finder preferences window. It contains Font size, Sring Loaded Folder switch, Label names, icon spacing and Simple Finder settings. See Picture 8.5.
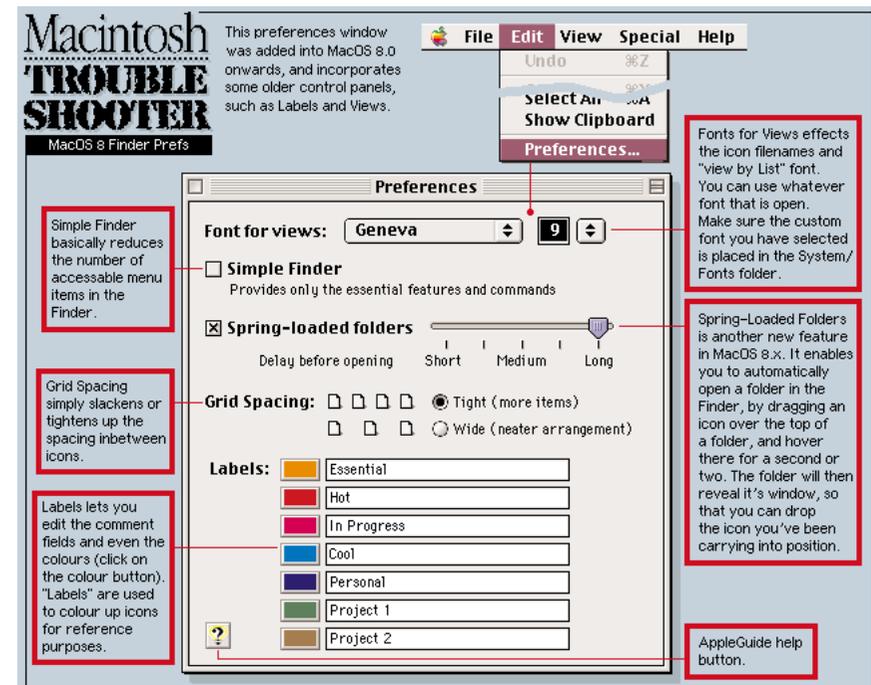
Picture 8.5 - *The Finder's preference window in System 8.0 to 8.1.*
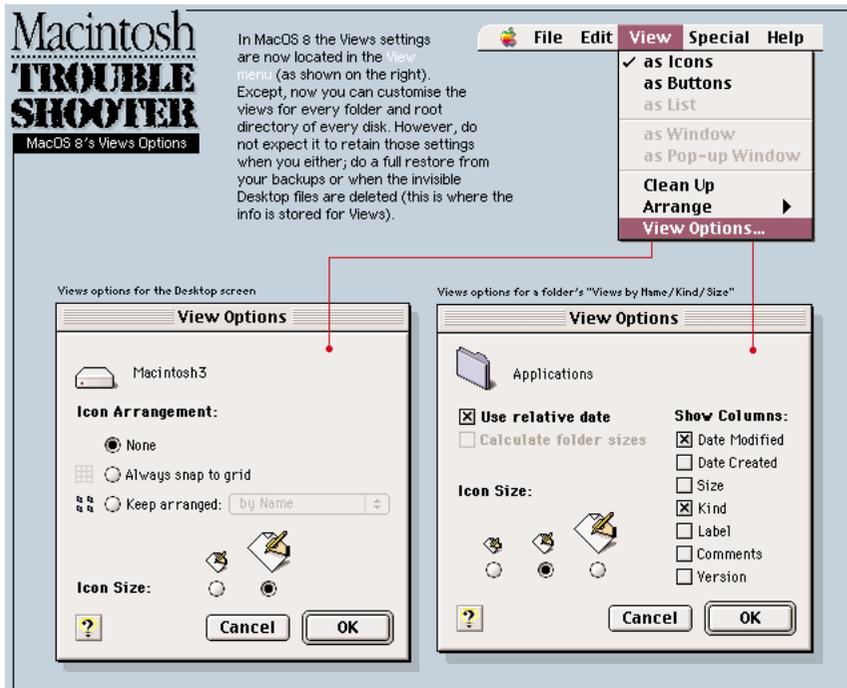
*Picture 8.6 - **The View Options has two types of options depending on whether it is a folder or the Desktop itself.***

THE "VIEW" MENU

as Icon - Displays all files as in a folder as icons.

as Buttons - Lists all files in that folder by filename, alphabetically (includes a small icon).

as List - Lists all files in that folder by file type, and then in alphabetical order.

as Window - Reverts a Popup Window back to a normal folder.

as Popup Window - Makes that folder into a special pop-up folder, that is always on the Desktop.

Cleanup - Relocates all icons into a default icon grid.

Arrange - Displays a sub-menu, which lists the number of different ways a list can be sorted: by Date Modified; by Date Created; by Size; by Kind; by Label.

View Options... - Allows you to customise the icon and list views in any window. See Picture 8.6.

THE "SPECIAL" MENU

Erase Disk - In MacOS 8.1, you can now format a disk with the new HFS+ format.

THE "HELP" MENU

About Help - Displays an AppleGuide explaining how Apple's Help System works.

Help - Displays the AppleGuide Help file for the current program (inc. the Finder).

I've listed most of the standard System components that'll be installed (from MacOS 7.53 to 7.6) and what they do exactly, these are; **Control Panels (below), Extensions (p75), Libraries (p84), System Enablers (p87)** and loose items in the **System Folder (p85).** Some of these extensions and control panels may not be available on an Amiga but they are usually installed anyway - I've highlighted these in bold.

There are two excellent self viewing documents which explains every single System component in detail, and they're called **Extension Overload** and **InformINIT**. Both cover Systems 7.x to 8.x, and include all of Apples's standard System files and most known third party extensions and control panels - both have very useful additional info concerning: Libraries, Enablers and other types of files.

STANDARD APPLE CONTROL PANELS

What is a control panel? A control panel is a small piece of software that allows you to customise certain settings that meet your needs. For example, you can change the pattern or colour of your computer's desktop using the Desktop Patterns control panel.

Depending on the type of computer you have and the System version you`re using, the contents of your Control Panels folder may vary. You might also have control panels that were added by third-party applications. You can see a complete detailed list of all Apple control panels in the "Macintosh Guide" via the "?" menu, or press the Help key (only in System 7.5 or later).

Appearance (MacOS 8 only)
Controls how the MacOS 'looks', this is also where you can add 'themes' to the GUI, as displayed in *Picture 9.1 and 9.2.*
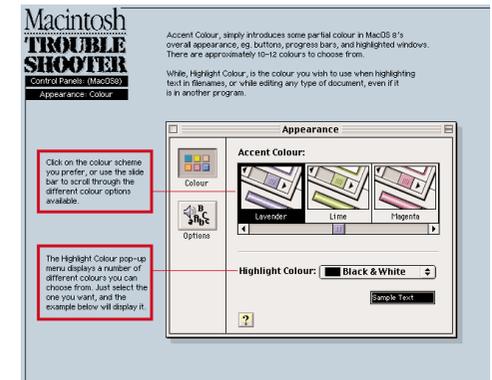
Apple Menu Options
Provides hierarchical sub-menus in the Apple Menu. *See Picture 9.3.*
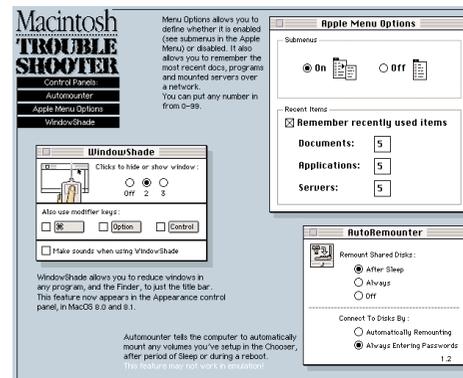
AppleTalk
You can specify AppleTalk settings (such as connection port and zone) for use with Apple's Open Transport networking. *See Picture 9.4.*
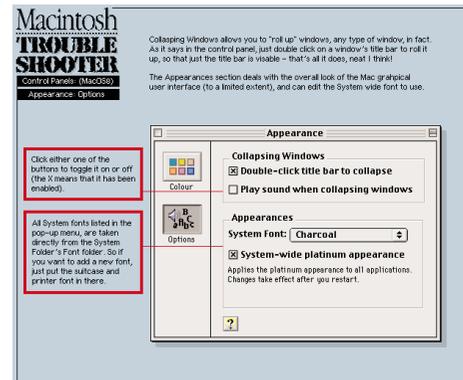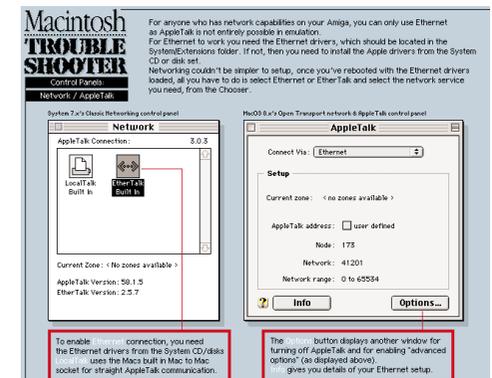

Picture 9.1 - Appearance control panel-displaying the Options screen.

Picture 9.2 - Appearance control panel-displaying the Colour screen

Picture 9.3 - The Apple Menu Options, Auto-Remounter & Window Shade control panels.

Picture 9.4 - AppleTalk & Network control panels.

At Ease Setup
Allows you to start up your Mac in a simple, configurable launcher, which replaces the standard Finder.

ATM
Makes your Type 1 fonts look sharp and clear at any point size, both on your screen and on paper. Improves the output of QuickDraw printers, such as the ImageWriter and StyleWriter series. *See Picture 9.6, on page 69.*
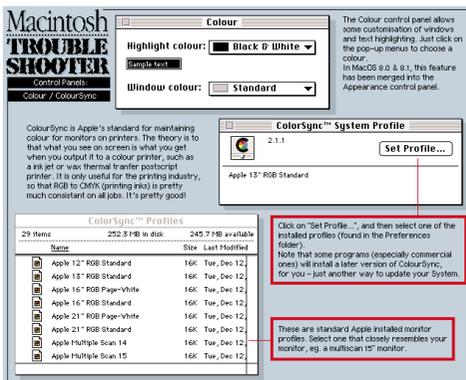
ATM GX
For displaying smooth QuickDrawGX fonts. Apple no longer supports QuickDrawGX features.
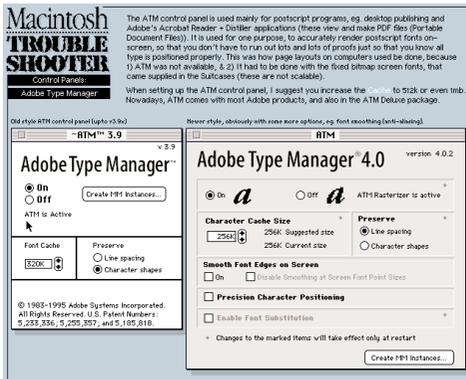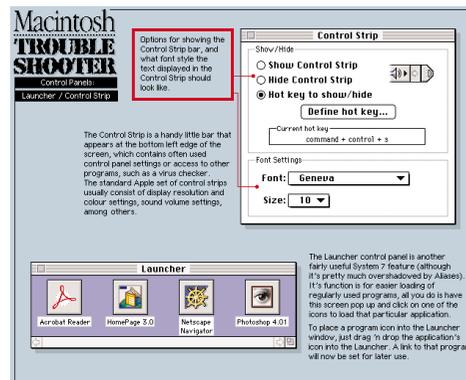
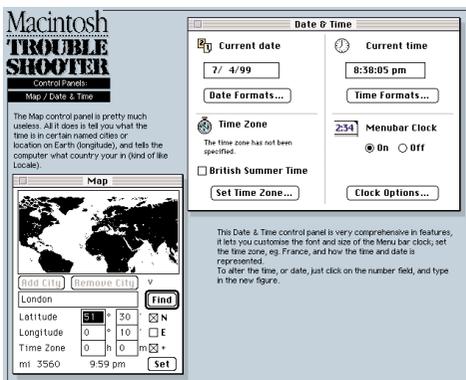*Picture 9.5 - Adobe Type Managere control panel- versions 3.9 and 4.0.*
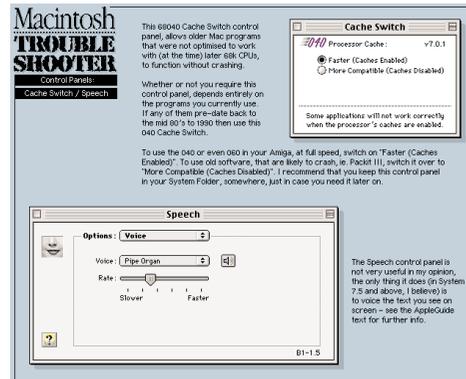
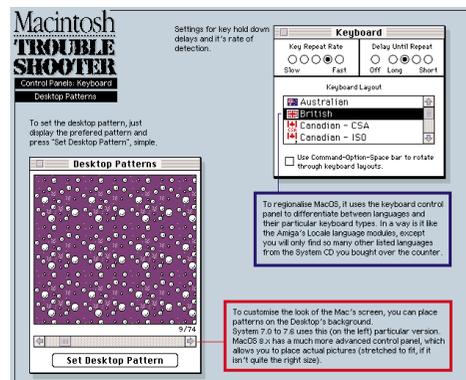*Picture 9.6 - The 040 Cache Switcher & Speech control panels.*

Picture 9.7 - The Colour & ColourSync control panels.

Picture 9.8 - Control Strip & Launcher control panels.

Picture 9.9 - Date + Time & Map control panels.

Picture 9.10 - Desktop Patterns & Keyboard control panels.

AutoRemounter

Allows remounting of volumes after waking from sleep, on Powerbooks. It also works on desktop Macs, to remount shared disks instead of using the AppleShare "mount on startup" option. *See Pic:ture 9.3 on page 68.*

Cache Switch

For 68040/680LC40 Macs only. Allows you to turn off the 68040 processor caching for compatibility with older applications. *See Picture 9.6.*

Colour

You can set the colour of highlighted text and window borders. *See Picture 9.7.*

CloseView

You can magnify your computer display for easier viewing.

ColourSync System Profile

Part of the ColourSync system that provides consistent colour across various types of equipment (printers, scanners, monitors, and so on). In the control panel, you can view and select ColourSync profiles for the types of equipment you use. *See Picture 9.7.*

Control Strip

You can display or hide the Control Strip, and specify a font for Control Strip menus. With the Control Strip, you can control a variety of settings directly from your desktop, such as sound volume, monitor resolution, file sharing, and so on. *See Picture 9.8.*

Date & Time

You can set the date, time, and time zone on your computer. You can also set how dates and times are displayed. *See Picture 9.9.*

Desktop Patterns

You can change the pattern or colour of your computer's desktop. *See Picture 9.10.*

Desktop Pictures

This control panel replaces Desktop Pictures in MacOS 8.x. This time not only can you select a pattern for the Desktop, but you can also place an image onto Desktop. *See Picture 9.11 and 9.12.*

Easy Access

Provides keyboard enhancements, and easier mouse input, and audio/visual feedback on keyboard entries for people with disabilities.

Editor Setup

You can specify which OpenDoc parts to use for different kinds of file formats. System 7.6-8.1 only.

Extensions Manager

You can turn your computer's system extensions on or off. Extensions include items in the Extensions folder, control panels, and other startup programs in the System Folder. *See Picture 9.13.*

File Sharing Monitor

When file sharing is turned on, this control panel displays a list of users who are connected to your computer. **Only available on networked Amigas.** *See Picture 9.14.*

General Controls

You can set various options, including desktop hiding, Launcher visibility at startup, folder protection to prevent folders and files from being deleted, insertion point blinking rate, menu selection blinking, and the default folder that appears in the Save dialogue box. *See Picture 9.15.*
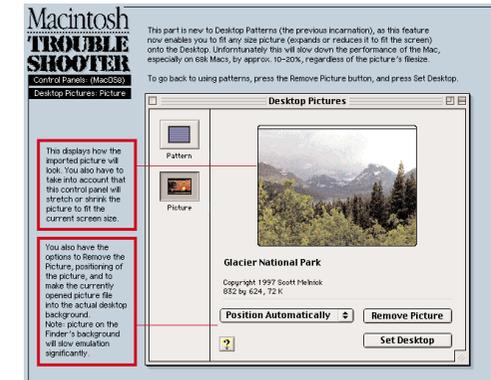
Keyboard

You can set the repeat rate and delay before repeat for your keyboard. Also lets you switch keyboard layouts. *See Picture 9.10, on page 69.*
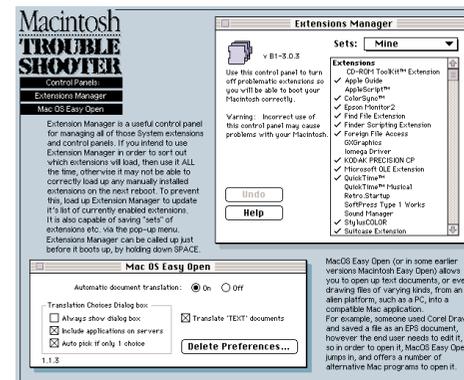
Labels

You can customize the colour and text of icon labels. *See Picture 9.16.*
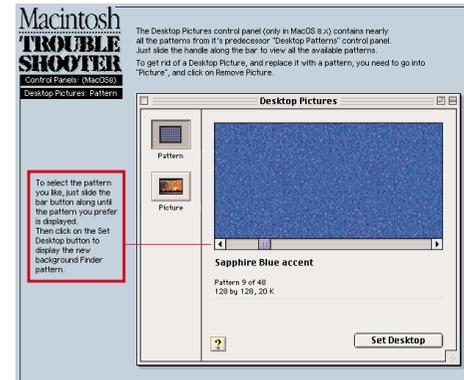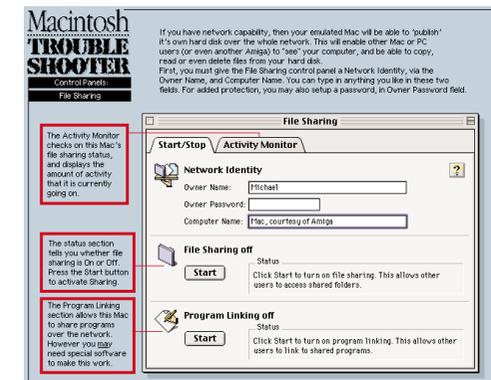

Picture 9.11 - Desktop Pictures control panel- displaying the Patterns screen.
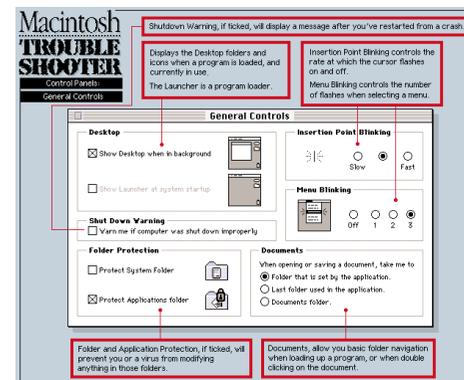

Picture 9.12 - Desktop Pictures control panel- displaying the Picture screen
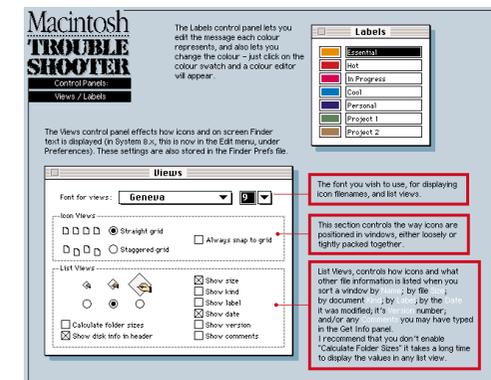

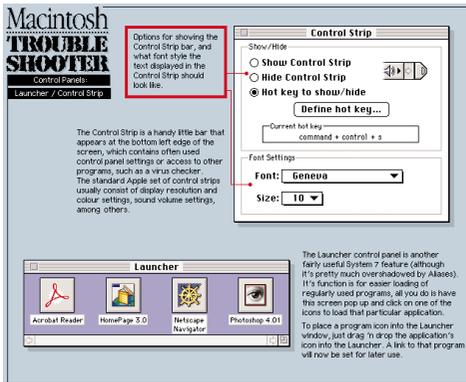*Picture 9.13 - Extension Manager Options control panel.*

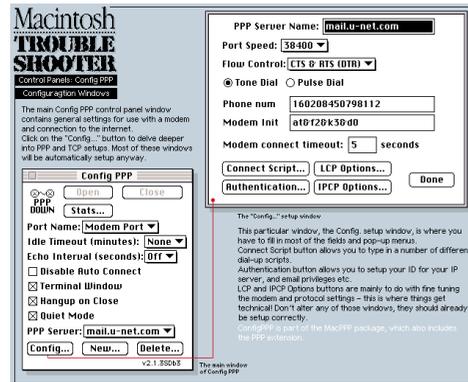*Picture 9.14 - File Sharing control panel.*

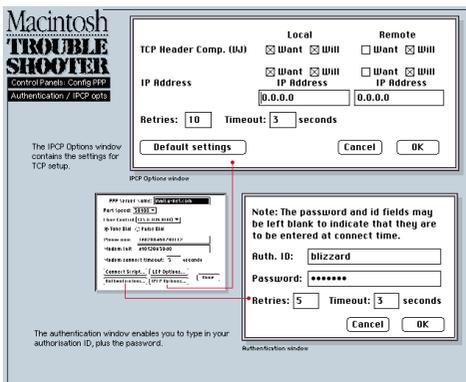*Picture 9.15 - General Controls Options control panel.*
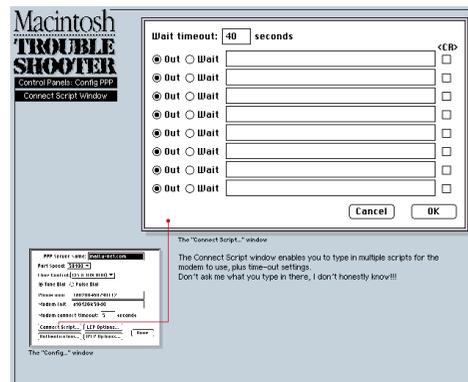

Picture 9.16 - Labels and Views control panels.

Picture 9.17 - *Appearance control panel-displaying the Options screen.*
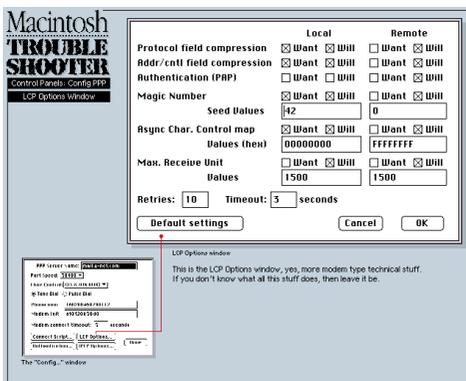

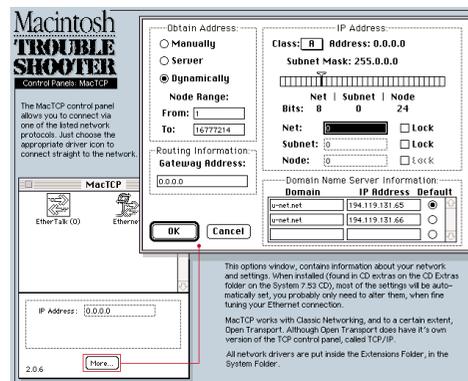**Picture 9.18** - *MacPPP's Config control panel - main control window.*

Picture 9.19 - *MacPPP's Config control panel - the IPCP Options and Authentication windows.*

Picture 9.20 - *MacPPP's Config control panel - the Command Script window.*

Picture 9.21 - *MacPPP's Config control panel - PPP setup window.*

Picture 9.22 - *MacTCP control panel.*

Launcher

You can open the Launcher window, where you can easily find and open programs. You can add items to the Launcher by placing an alias to your favourite applications, files, or folders in the Launcher Items folder in the System Folder. *See Picture 9.17.*

Mac OS Easy Open/Macintosh Easy Open

Allows you to select the way a Mac or DOS/Windows file is translated/opened when you don't have the application that created it. *See Picture 9.13, on page 69.*

MacIPX

Used with the MacIPX network extensions to provide support for the MacIPX network protocol.

MacPPP

Is System 7.5x's PPP control panel for connecting the modem to the internet. This control panel can be found on the System 7.53 or 7.6 CD, it is actually called Config PPP, and is relatively easy to set-up despite the number of options screens available for you to fine tune. It also comes with a PPP system extension, which you manually drop into the Extensions folder. *See Picture 9.18, 9.19, 9.20 and 9.21.*

MacTCP

Used to configure and connect to TCP/IP-based networks, either locally or dial-up. Replaced by the TCP/IP control panel under Open Transport. *See Picture 9.22.*

MacTCP DNR

This file, which is loose in your system folder. DNR (Domain Name Resolver) contains part of the information needed by TCP/IP applications.

Map

You can locate popular cities around the world, and display longitude and latitude coordinates and local time. Lets you set the location of your computer. *See Picture 9.9, on page 69.*

Memory
Lets you control settings such as virtual memory, disk cache size, the Modern Memory Manager, RAM disks and 24-bit/32-bit addressing switch. *See Picture 9.23.*

Monitors
Allows you to configure your monitors; no. of colours/greys, resolution, main monitor on multiple monitor systems for non-PCI Macs and the 7200 series PCI Macs. *See Picture 9.24.*

Monitors & Sound (MacOS 8 only)
A combined control panel that replaces the separate Sound and Monitors control panels. *See Picture 9.25, 9.26 and 9.27.*

Mouse
You can set the tracking speed and double-click speed for your mouse. *See Picture 9.24.*

Network
Used to choose the type of network in Systems 7.0-7.1x. Replaced by the AppleTalk control panel under Open Transport. *See Picture 9.4, on page 68.*

Numbers
You can control how numbers and currencies are displayed on your computer (for example, where decimal points appear). *See Picture 9.28.*

PC Exchange
Allows your computer to read files from ProDOS and MS-DOS disks. You can specify the Mac OS application program used to open a DOS document. You can also use SyQuest and Bernoulli disks on your desktop. *See Picture 9.29, on page 73.*

QuickTime Settings
This changes the preferences for QuickTime 2.5.You can set options for MIDI instruments, and set a CD to play automatically when inserted.
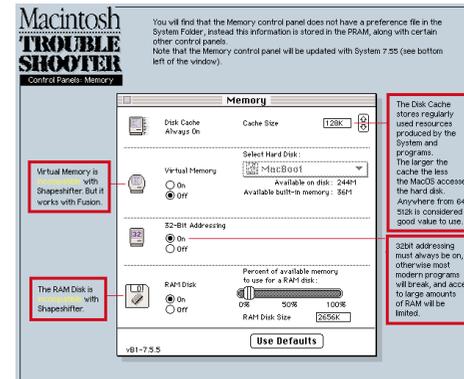
Picture 9.23 - Memory control panel.
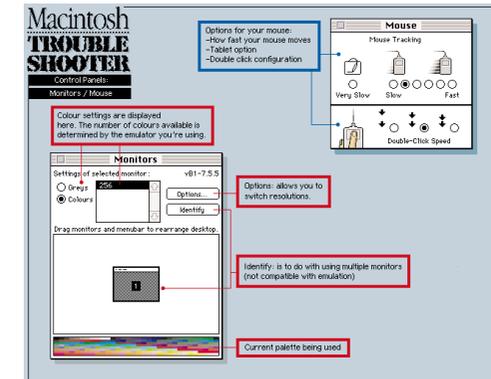
Picture 9.24 - Monitors and Mouse control panel.
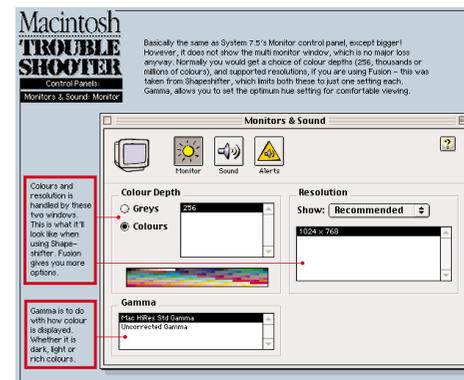
Picture 9.25 - Monitors & Sound control panel - monitor setup.
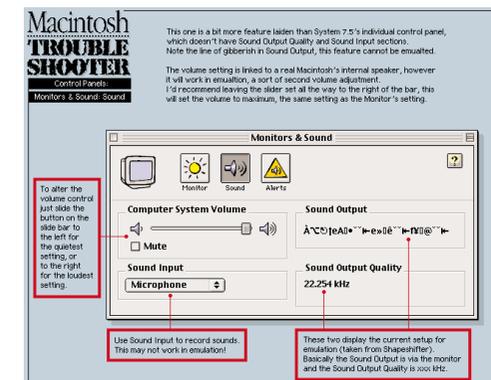
Picture 9.26 - Monitors & Sound control panel - sound setup.
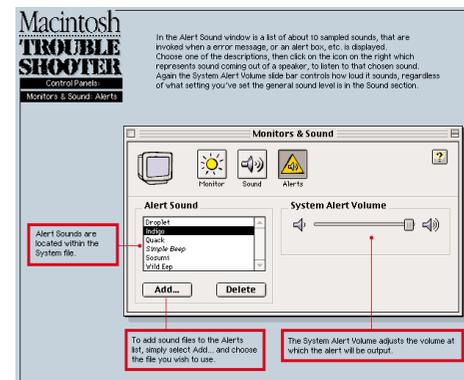
Picture 9.27 - Monitors & Sound control panel - alerts setup.
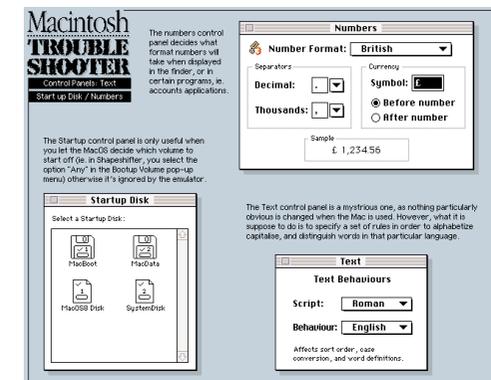
Picture 9.28 - Numbers, Text and Startup Disk control panels.
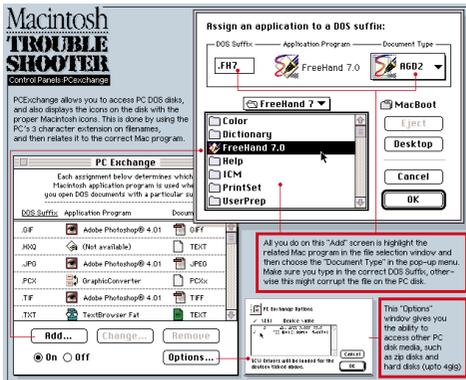
Picture 9.29 - *PCExchange control panel.*
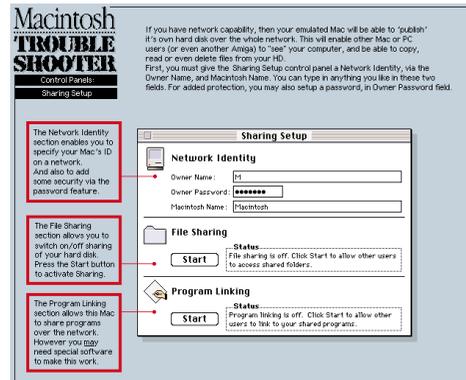
Picture 9.30 - *Sharing Setup control panel.*
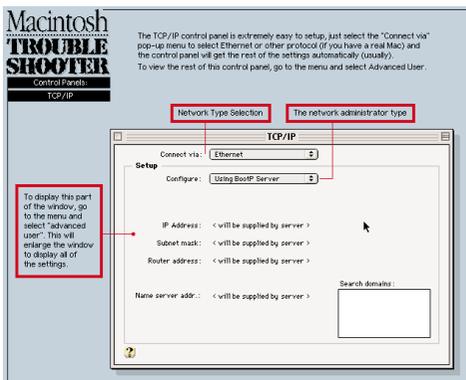
Picture 9.31 - *TCP/IP control panel.*

Picture 9.32 - *Users & Groups control panel.*

Sharing Setup
You can set file sharing options and specify a network name for your computer. **Only available on networked Amigas.** *See Picture 9.30.*

Sound
You can set the alert sound and volume and specify a sound input and sound output source for your computer. On PowerPC-based computers with PCI slots, this control panel is replaced by the Monitors and Sound control panel.

Speech
You can set options for hearing text read aloud by the computer. If you have Speakable Items software and a PlainTalk-compatible microphone, you can set options for giving spoken commands to the computer. Works on all Macintosh 660AV and 840AV computers. Also works on all computers with PowerPC microprocessors. *See Picture 9.6, on page 69.*

Startup Disk
Select the disk you want to start up your computer (it must have a compatible System Folder on it). *See Picture 9.28, on page 72.*

TCP/IP
You can specify TCP/IP settings for use with Apple's Open Transport networking. *See Picture 9.31.*

Text
You can select from the text features for the script systems installed on your computer. *See Picture 9.28, on page 72.*

Users & Groups
Specifies who can access your computer's hard disk when file sharing is turned on. **Only available on networked Amigas.** *See Picture 9.32.*

Views
You can customize how information is displayed in Finder windows. Note: Can be found in the Edit menu under "Preferences" in System 8 to 8.1. *See Picture 9.16, on page 70.*

WindowShade
Specifies whether to hide a window by clicking on its title bar. Note: Can be found in the Edit menu under "Preferences" in System 8 to 8.1. *See Picture 9.3, on page 68.*

OTHER CONTROL PANELS
Some of these Control Panels (CP) may have been installed with the "standard set" of control panels. 99% of these will not apply to you, or simply won't work (it'll give an error message if you try to double click on an incompatible CP), so you can safely bin most of them.

AppleCD Speed Switch
From System 7.1. Allows you to switch between "standard" or "faster" speed. It is integrated into CD Software 5.0.

AppleShareSetup
Allows you to change many of the AppleShare parameters.

AppleTalk Options
Part of the Open Transport package, but not installed automatically. It allows a user to suppressunwanted router-related alerts.

AppleVision Setup
For PCI Macs; after upgrading to System 7.5.3, this Control Panel should be eliminated. All of its functionality will be incorporated into the Monitors & Sound control panel.

Auto Power On/Off
Allows your Mac to automatically shut down after a specified idle time, reboot after a power failure, and/or start up or shut down at a certain times.

Button Disabler
Allows you to disable the volume, brightness etc. buttons on the front of certain computer models, ie. the LC/Performa 500 series Macs.

CPU Energy Saver
Allows you to turn your Mac off at a specific time or after a specified amount of idle time.

DOS Compatibility Software Update / PC Setup
Used by Macs with the DOS Compatibility Card.

Energy Saver
Allows you to put your external monitor into sleep mode after a specified idle time. It only works with Macs that have the built-in video, it also requires an Energy Star compliant monitor. **Compatible with PCI based PowerMacs only.**

LaserWriter Bridge
Open Transport-compatible version of LaserWriter Bridge and LocalTalk Bridge. Allows you to use LocalTalk printers and access LocalTalk networked Macs over an Ethernet or TokenRing network.

LocalTalk Bridge
Allows you to bridge Ethernet and LocalTalk networks.

MODE32
Under System 7, gives the Mac II, IIx, IIcx, or SE/30 the ability to run in 32-bit addressing mode. With 32-bit addressing on, your Mac can take advantage of more than 8MB of RAM. Under System 7.5, a new version of MODE32 was released. You MUST use MODE32 7.5 if you are running System 7.5. **This CP is not necessary for Mac emulation on Amigas** - **32 bit addressing is guaranteed.**

Network Time
If you are on a network with a Time Server, this control panel checks the server and synchronizes your Mac's clock.

Pasword Security
Used on portable Macs only, and will not work in emulation anyway. Allows you to lock-out the Mac's hard disk, so that thieves cannot use the computer.

PC Setup
Used by Macs with the 610 PC and DOS Compatibility Cards, and is replaced by the DOS Compatibility Software Update 1.5.

Performa
Included with Performa models running System 7.1P. Provides functionality similar to the General Controls control panel.

Power Macintosh Card + 601 Processor Upgrade
Allows the use of a PowerPC accelerator on a real Mac. Cannot work in emulation.

ScriptSwitcher
Provides a quick way to automatically switch the primary script system resources in your System software.

Serial Switch
Provides compatibility for some applications that use the printer or modem port. You can set the serial port option to Faster or More Compatible. **Works on Macintosh IIfx and Macintosh Quadra 950 computers only.**

Token Ring
Under Open Transport, works with the AppleTalk control panel to allow access to a Token Ring network.

Trackpad
Used on portable Macs only. It controls the trackball, for speed control and button use.

STANDARD APPLE EXTENSIONS
What is an Extension? An Extension is a small file that changes how your computer operates. Unlike a control panel, you typically do not have any direct interaction with an Extension. An Extension makes the appropriate changes when you start your computer and remains active until you shutdown your computer.
 Depending on the type of computer you have, the contents of your Extensions folder may vary. You might also have extensions that were added by third-party applications.
   To disable an Extension, simply take it out of the Extension Folder and put it in a folder called "Extensions (disabled)", this can be placed in the System Folder, don't worry, no Extension will be loaded from this particular folder. You can also use the Extension Manager control panel to do the same thing.
   Other types of extensions are actually Libraries, these are often used by many applications or system components. It is usually a good idea not to turn off libraries, otherwise it may cause some programs not to load up. Some of the more common ones are listed in the Libraries link below.
   See the next section called Odd Extensions for extensions that the installer placed in your system that you may not need.

EM Extension
Works with the Extensions Manager control panel, which lets you specify which extensions are turned on when you start your computer.

About Apple Guide
Provides information about how to use Apple's on-screen help system.

ADSP
AppleTalk Data Stream Protocol, provides networking protocol under pre-7.0 systems. More specifically, it provided data flow and full duplex data delivery over a network. However, in order for the benefits to be realized, both Macs had to be running this extension.

AppleCD Audio Player Guide
Provides step-by-step instructions for using the AppleCD Audio Player.

Apple CD-ROM
Enables your computer to use an Apple CD-ROM drive.

Apple Color SW Pro CMM
Contains colour-matching information used by ColorSync 2.0 to maintain consistent colour between documents.

AppleGuide
Enables your computer to use Apple's on-screen help system. You can access Macintosh Guide from the ? menu (the help menu is on the right hand side of the menu-bar), whilst in the Finder. This feature can only be found in Systems 7.5 to 8.1.

AppleGuide Additions:
-AppleVision Guide Additions
-AV Guide Additions
-Energy Saver Guide Additions
-Monitors & Sound Guide Additions
-Network Guide Additions
-Open Transport Guide Additions
-Speech Guide Additions
-Video Guide Additions
    Adds step-by-step instructions for using features specific to a program, MacOS, or control panel.

Apple Multimedia Tuner
Enhances QuickTime 2.0 and Sound Manager 3.0. Once you upgrade to QuickTime 2.1 and Sound Manager 3.1, or System 7.5.3/Update 2.0, this is no longer necessary.

Apple Photo Access
Part of the CD-ROM software, and is needed for viewing Kodak PhotoCDs.

AppleScript
Enables automation of repetitive tasks in applications that support it. Some programs, ie. Apple on-screen help, require AppleScript to work.

AppleShare
Gives you access to shared disks on the network. Systems 7.6 through to 8.1 uses a later version of AppleShare that is incompatible with ShapeShifter up to v3.10.

Audio CD Access
Lets you play audio CDs on your internal or external CD-ROM drive. Requires the AppleCD Audio Playeror equivalent application to control the audio CD.

Clipping Extension
Lets you use the drag-and-drop feature to create clipping files on your desktop.

Color Picker
Creates a standard colour selection interface for all applications.

Color SW 2000 Series CMM
Colour-matching information used by ColorSync to maintain consistent colour between documents printed on a Color StyleWriter 2000 series printer and other colour devices.

ColorSync
Matches colours on your display with the closest matching colours on your printers, scanners, and otherdevices.

Desktop Printer Extension/Desktop Printer Spooler/Desktop PrintMonitor
All three of these files are necessary for the desktop printing feature to work. (With desktop printing, you can print documents by dragging their icons to printer icons.)

Dragging Enabler/Drag Enabler
Provides Drag Manager support under System 7.0 and 7.1. When used with the Macintosh Drag and Drop extension, provides inter-application drag and drop support under System 7.1. Integrated into the Finder under System 7 Pro and later.

Energy Saver Extension
Used in conjunction with the Energy Saver Control Panel. Sends the Mac to sleep.

Ethertalk Phase 2
Lets you connect your computer to an Ethernet network.

File Sharing Extension
Enables your computer to share files and folders with other computers on your network.

Find File Extension
Lets you search for files and view the results in a single window. If you turn off this extension and choose Find from the File menu, you'll get the System 7.1 Find dialogue box instead of Find File.

Finder Help
Provides Balloon Help support for the Finder.

Finder Scripting Extension
Allows you to use AppleScript to automate tasks in the Finder.

Foreign File Access
Enables your computer to work with CD-ROM discs whose contents don't use the standard Mac OS file system (for example, ISO 9660 or High Sierra formats).

Global Guide Files folder
Contains files used by the on-screen help system. Some of these files may be used to provide help morethan one application.

High Sierra File Access
Part of the CD-ROM software that lets you view CDs with High Sierra file systems.

Installer Cleanup
This is put in the System Folder after a OS is installed. All it does is to

make sure that the installation process was successful and that everything was installed in the proper place. You must allow it to load on the next restart so that it can take care of any files that were left behind after the installation. It should then disappear.

ISO 9660 File Access
Part of the CD-ROM software that lets you view CDs with ISO 9660 file systems.

LaserWriter 8
A PostScript level II print driver that enables your computer to print documents on a PostScript printer connected to an AppleTalk network.

Mac OS Guide
Contains step-by-step instructions for working in the Finder. You access Mac OS Guide from the Guide (question mark) menu when the Finder is active.

MacinTalk 3
Lets your computer read text documents in human-like voices.

MacinTalk Pro
Lets your computer read text documents in human-like voices. Older computers (with 68030 or 020 processors) should use MacinTalk 3 instead.

Macintosh Drag/Drag&Drop Extension
Provides Drag and Drop support under Systems 7.0.x and 7.1.x. These two files are still installed by numerous software packages, such as Now Utilities and ccMail, for universal compatibility, but are not needed under System 7.5 and later.

MacIPX AppleTalk/MacIPX TCP/IP/MacIPX Token Rink
These are network drivers which support the MacIPX protocol over the respective network type (ie. AppleTalk, TCP/IP or Token Ring).

MacTCP Token Ring Extension
Allows you to use the TCP/IP protocol over a Token Ring network.

Mailbox Extension
Supports your PowerTalk mailbox. Enables the Mailbox icon to appear on your desktop.

My Speech Macros
Supports the Speech Macro Editor.

Network Extension
Lets you set Personal File Sharing from the Finder.

Printer Descriptions
This folder contains printer description files (PDFs) for most of Apple's laser printers.

Printer Driver Extensions
These are extensions which allow access/connection to various types of networks, services, printers, etc. using the Chooser. They do not take up any RAM when the System has booted-up. Most of these (99.9%) can be deleted out of the Extensions folder, it is highly likely you won't have any of these printers.
AppleTalk ImageWriter
Color SW 1500 (SW=StyleWriter)
Color SW 2200
Color SW 2400
Color SW 2400
Color SW 2500
Color SW Pro
Color SW Pro GX (GX=QuickDraw GX compatible)
ImageWriter
ImageWriter GX
ImageWriter LQ GX
Laserwriter 8.x (general purpose postscript II compatible printer driver)
LaserWriter 300 & LaserWriter 300/LS
LaserWriter 300 GX

LaserWriter GX
LaserWriter IISC GX
LW 300/LS GX
LW Select 310
Personal LaserWriter SC
Portable StyleWriter
StyleWriter 1200
StyleWriter GX

Printer Share/Printer Share GX
Provides the ability to share non-network printers (for example, the StyleWriter II) across a network.

PrintMonitor
This application allows you spool your print jobs to any printer.

PowerTalk Extension
Supports PowerTalk services. Includes information used by the PowerTalk key chain.

PowerTalk Manager
Manages your PowerTalk mailbox and services.

QuickDraw GX
QuickDraw GX is a specialist (no longer supported) printing system. Note that if this extension is installed, you must have GX-compatible printer drivers. If you have this extension installed, non-GX drivers will not even show up in the Chooser.

Printer Description
This folder contains Postcript2 printer description files or PPDs, and includes PPDs for most of Apple's own printers.

QuickTime
Provides built-in multimedia support for applications.

QuickTime PowerPlug
Provides native support of QuickTime for PowerPC-based computers when used in combination with QuickTime 2.x.

QuickTime Musical Instruments
Supports 30 Roland Standard MIDI sound samples that can be accessed by QuickTime applications with no additional MIDI equipment.

Scripting Additions
Extends the AppleScript language with special features, such as finding the date or time of day. With scripting additions installed, AppleScript acts as if these features are part of the language. Scripting additions are required only when a script uses them.

Serial (Built-In)
Used by Open Transport to allow access to the built-in serial port on your computer.

Shared Library Manager
Provides native support for Open Transport.

Shortcuts
Explains common keyboard equivalents and other shortcuts to use in the Finder. You can access Shortcuts in the Guide (question mark) menu when the Finder is active.

SimpleText Guide
Provides step-by-step instructions for using SimpleText. You can access the SimpleText Guide from the Guide (question mark) menu, after you open SimpleText.

SOMobjects for Mac OS
Used by OpenDoc.

Speech Manager
Provides text-to-speech capabilities.

SR Monitor
Used to monitor and interpret speech.

Startup Tuner
Ensures correctly starting up from the disk selected in the Startup Disk control panel.

System 7 Tuner
For System 7.0, and comes on the System Tune-Up disk. It provided better memory management for the initial release of System 7.

SystemAV
Used for audio-video input. Required by the Monitors & Sound control panel.

System Speech Rules
Supports voices and speech dialects.

Thread Manager
Thread Manager is an addition to the Macintosh Toolbox that enables concurrent programming for real multi-tasking within an application. Supports cooperative and pre-emptive threads of execution at the application level, but not at the system level. It has been incorporated into System 7.5 onwards.

TokenTalk Phase 2
Used by the Apple Token Ring card.

TokenTalk Prep
Provides driver support for TokenTalk Phase II.

Tutorial Items
Provides instructions for learning basic skills on your computer. You can access the tutorial from the Guide (question mark) menu when the Finder is active.

Video Out Default (PAL)
Used by the Apple Video Player. On the standard U.S. System, the default video-out for the Apple Video Player is NTSC. Outside of the US, the standard video format is PAL - this extension changes the Apple Video Player default to PAL.

Video Startup
Used by the Apple Video Player.

Voices folder
Contains voices for use by Speech/ PlainTalk/ Text-to-Speech.

WorldScript Power Adapter
Supports language kit software on PowerPC-based computers. However, computers that use the Roman alphabet (English and French, for example), can still take advantage of performance and stability enhancements provided by the WorldScript Power Adapter.

OTHER EXTENSIONS
These will probably not be installed on later System OSs, eg. 7.5 to 8.1, although it depends entirely on the MacOS you are running, the processor, and any added hardware, such as; a CD-ROM drive, Ethernet, SCSI etc. 99% of these will not apply to you, so you can safely bin them.

A/ROSE
Allows communication between your computer's main logic board and NuBus cards that run the Apple Real-Time Operating System. Examples of such NuBus cards include the Apple Token Ring 4.16 NB card and the Apple Serial NB card.

ADBReInit
ADB is a port on the Mac, which you use to plug in the keyboard and mouse. The ADBReInit extension prevents memory from being moved at interrupt time, which could cause the some PowerBook and Quadra models to hang or crash.

Extraneous AppleGuide Additions:
PB 500 Upgrade Guide Additions, PB 190 Upgrade Guide Additions, PB 2300 Upgrade Guide Additions, PB 5300 Upgrade Guide Additions, PowerBook Guide Additions
Adds step-by-step instructions for using features specific to Powerbook Macintoshs.

Apple Built-In Ethernet/Apple Ethernet NB
A driver for the built-in Ethernet port on Nubus-based Macs.

Apple Event Manager
Allows applications (including the Finder) to send commands to other applications (again, including the Finder). For example, in InformINIT, when you click on the little "IE" AND "NN" buttons, InformINIT sends an Apple Event to Netscape telling it to go to the URL listed. This file is incorporated into the AppleScript extension with System 7.5 and above.

AppleTalk ImageWriter
Enables your computer to print documents on a networked ImageWriter II.

AppleVision
Only used for support of AppleVision monitors only.

AudioVision
Part of the AudioVision 14" monitor software package. Only needed on pre-7.5 systems.

Assistant Toolbox
This is the base extension for AutoRemounter. AutoRemounter works on Macintosh PowerBook computers and allows file synchronisation, battery management, and easy mobile computing. It also provides support for a persistent RAM disk and deferred printing. This extension may conflict with the LaserWriter Select 310 printer software to block printing. A solution is to turn off background printing in the Chooser.

At Ease 7.5 Layer Patch
Fixes a crash when using At Ease, and the Show Desktop box is unchecked in the General Controls control panel.

At Ease Startup
Forces your Mac to start up with the At Ease instead of the standard Mac Finder.

AV Setup
Used to control AppleVision displays.

Caps Lock
Provides a visual indication of the state of the Caps Lock key on a Macintosh PowerBook. When Caps Lock is turned on, an Up arrow appears in the menu bar next to the Guide (?) menu. (Not needed on Macintosh PowerBook 500 series computers.)

CFM Update
Installed by older versions of QuickDraw 3D. CFM stands for Code Fragment Manager.

DAL
Enables network activity using Data Access Language, formerly called CL/1.
   Data Access Language is Apple's client/server protocol for remote data access and is based on ANSI standard SQL (Structured Query Language). DAL is optimised to provide decision-support applications with uniform access to data, regardless of the different brands of databases, the different host platforms, or the different types of networks.

Desktop Printer Menu
Creates a menu bar which allows you to change to a different printer without having to use the Chooser.

Display Enable
Provides multiscan/multisync support, especially for AppleVision monitors. Adds functionality to Energy Saver, and to the Monitors control strip module by allowing you to switch resolutions on-the-fly.

DoubleTrouble
For use under pre-System 7.5 systems. When using a debugging utility, the DoubleTrouble extension will break into the debugger to alert you whenever the code in a project attempts to free a "handle" that has already been freed. An unsupported Apple extension. NOTE: do not use this extension with System 7.5 or later. It is intended only for pre-7.5 use.

Ethernet (Built-In)
Used by Open Transport to allow access to the built-in Ethernet port on on PCI Macs. Not to be confused with the Apple Built-In Ethernet extension.

EthertalkPrep
On older systems, worked with Ethertalk Phase 2 to establish and maintain Ethernet connections. No longer needed under 7.5.3.

FontSize Patch
Fixes problems with font corruption when using the Asian language kits under System 7.5.3 and later.

Frontmost Extension
Frontmost comes with the full AppleScript commercial product, it allows you to create sophisticated user interfaces for AppleScript applications. It also acts as a run-time assistant for projects saved as miniature applications.

GetInfo
For use only under System 7.0. Provides extra information about files which depend on other files by modifying the Get Info... box. Only works with applications that use QuickTime.

Graphics Accelerator
Provides video acceleration for PCI Macs using an ATI video card.

Hardware System Update 1.0/2.0/3.0
System 7.1 Updates. Provided numerous system-level improvements. This file was not designed for use on Performa models. Version 2.0 adds further improvements and overall stability, while version 3.0 increases reliability and performance, even further. AV Systems already have these improvements in their ROMs.

IIci/IIsi Monitors
Describes the capabilities of the built-in video card for the Macintosh IIci and IIsi. If you remove this file, your computer can still use the video card and you can still select the number of colours displayed on your monitor, but monitor options (such as gamma settings) may not be available.

InLine Filter
Helps AppleScript and PlainTalk Speech Recognition work together. Allows Worldscript users to type scripts "in-line" instead of to a separate text file.

Insomnia
Created for Apple PowerBooks to keep them from falling asleep.

LC Monitors Extension
Adds functionality to the Monitors control panel for LC series Macs.

Letterhead
Is part of the QuickDraw GX package, this extension enables the Letterhead paper type option in the Page Setup window of all GX compatible applications.

LocalTalk DMA
Is part of the obscure System 7.5.3 Revision 2.1, this file fixes a bug with transferring files over LocalTalk on Performa 6400/180 and 6400/200 computers. This fix is included in the System 7.5.5 Update.

MIDI Manager
Enables Apple's MIDI Management system.

Modem Scripts
A folder which contains the modem descriptions/scripts used by OT/PPP and Apple Remote Access to communicate with your modem.

Mount IDE Drive
Allows Macs with IDE hard drives to mount these drives when the Mac is booted from another disk or device.

N-Up Printing
Part of the QuickDraw GX package, this extension allows you to print more than one page on a single sheet of paper by dividing the page into smaller sections and reducing the printing size. Up to 16 pages can be printed on a single 8.5x11 sheet.

Network Launch Fix
On 68040 Macs, fixed a bug when launching applications over a network. Incorporated into system 7.5 and later.

PC Net Exchange
Works with the PC Exchange control panel to help Mac users share DOS/Windows files over an AppleTalk network with users of the AppleShare Client for Windows software.

Printer Selector
Under LaserWriter 8.4 and above, this adds a menu of configured printers to your menu bar for quick printer switching.

ProDOS File System
Allowed pre-7.5 Macs to recognize ProDOS/Apple IIe disks. Incorporated into PC Exchange 2.0.2 and later, and is incompatible with System 7.5.x.

PowerBook Monitors Extension
Describes the PowerBook built-in display. If you remove this file, your

computer can still use the PowerBook video card and you can still select the number of colours your screen can display, but certain options (such as gamma settings) may not be available.

PowerPC Monitors Extension
Supports Apple's AudioVision 14 monitor.

Quadra AV Monitors Extension
Describes the capabilities of the built-in video card for the Macintosh Quadra and Centris AV computers. If you remove this file, your computer can still use the video card and you can still select the number of colours displayed on your monitor, but monitor options (such as gamma settings) may not be available.

Quadra Monitors Extension
Describes the capabilities of the built-in video card for the Macintosh Quadra and Macintosh Centris computers. If you remove this file, your computer can still use the video card and you can still select the number of colours displayed on your monitor, but monitor options (such as gamma settings) may not be available.

Scanner
Is a driver for all Apple scanners (including 3rd party compatible scanners).

SCSI Manager
Version 4.3 is incorporated into the System under System 7.5.3 and later. On earlier systems, this is a SCSI driver upgrade extension for all (real) Macintoshs, with in-built SCSI.

SCSI Update
Included with the AppleShare IP 5.0 beta. Updates the SCSI Manager to allow asynchronous access on machines that don't already support it, such as 680x0 machines and early PowerMacs. The new SCSI Manager is required for products such as the Advanced Driver Toolkit from Dantz for accessing Digital Linear Tapes from within Retrospect.

SerialDMA v2.02
Is a driver update for DMA chips for PPC and 68040 Macs. Serial DMA is now incorporated into the System file from System 7.5.3 onwards.

Sound Manager
Sound Manager 3.2 was incorporated into the System in System 7.5.3, and included asynchronous sound playback. Version 3.2.1 is part of the QuickTime 2.5 package and provides even better low-memory performance and better multi-channel sound via a new sound clock component. Sound Manager 3.2.1 is built into the System file under 7.6.

Startup Tuner
Part of the System 7.5.3 revision, fixes a problem with the Startup Disk control panel where the Mac (on selected models) may not startup from the selected disk. Not necessary for System 7.5.5 and later.

Stationary
Part of the QuickDraw GX package, this extension enables the Stationary paper type option in the Page Setup.. window of compatible applications.

TokenTalk Phase 2
Driver used by the Apple Token Ring card and the Network/AppleTalk control panels.

Video Startup
Provides support for the Apple Video Player; needed to use the AVP.

WindowPicker
Older, unsupported utility which provides the ability to bring any open window to the front via a pop-up menu and/or arrow keys.

Shutdown Items enabler
Provides support for the Shutdown Items folder under System 7 Pro.

LIBRARIES

Shared libraries are modules of data/code that is used by many applications. They are loaded only when needed, and not during boot-up. They must be placed either, in the Extensions folder (if copied there by the installer) or in the same folder as the program. Libraries often appear in Systems 7.5 to 8.1.

AppleScriptLib
Provides native support for AppleScript on PowerPC-based computers.

ColorSyncLib 68k
Code Fragment Manager file for the ColourSync software.

DisplayLib
Provides backwards compatibility for Display Manager 2.0 functionality on pre-7.5 systems. The Display Manager allows users and applications to dynamically change the arrangement and display modes of monitors attached to the computer.

DragLib
It is a drag and drop support library which is incorporated into the Macintosh Drag and Drop extension. Included in the System software under System 7.5+.

Game Sprockets:
DrawSprocketLib, GoggleSprocketLib, InputSprocketLib, NetSprocketLib, SoundSprocketLib
The game sprocket system was developed as a way for game developers to directly access certain features of the System software, such as networking, video and audio, and also to provide added game-oriented functionality to these areas. The individual sprocket modules provide shared library support for their respective features.

ColorSyncLib68K, NuDragLib.slb, NuQuickTimeLib.slb, NuThreadsLib.slb, NuTranslationLib.slb, QuickDraw GX Enabler
These files are 68K shared libraries which work with the CFM-68K Runtime Enabler extension. They are loaded by the CFM-68K Runtime Enabler extension if a CFM68K based application needs them.

ObjectSupportLib
Provides services to allow applications to send, receive and exchange Apple Events that conform to the object model as well as implementing the Open Scripting Architecture object model.
No longer required in System 8.x.

OpenDoc Libraries folder
Contains code libraries and other files that enable OpenDoc technology.

Open Tpt AppleTalk Library
Used by Open Transport for the AppleTalk communication protocol.

Open Tpt Internet Library
Used by Open Transport for the TCP/IP communication protocol.

Open Transport Library
Used by Open Transport.

OpenTptAppleTalkLib
Used by Open Transport for AppleTalk communication protocol.

OpenTptInternetLib
Used by Open Transport for the TCP/IP communication protocol.

OpenTransportLib
Used by Open Transport.

PrintingLib
Provides shared library support for the LaserWriter 8.4.x software. Needed for 68k Macs and PowerMacs.

A STANDARD SYSTEM FOLDER

Depending on the type of computer you have, the contents of the System Folder may vary. You might also have items or folders that were added by third-party applications.

Finder
Displays the desktop area, where you work with files and disks, and keeps track of your files.

Apple Menu Items folder
When you place an item (folder, application, or document) in this folder, it appears in the Apple menu. To create submenus, place folders inside the Apple Menu Items folder.

Clipboard
Temporarily stores the last item you cut or copied from a document.

Control Panels folder
Contains individual control panels. You use control panels to adjust your computer's settings. See the "About the Control Panels" document in the Apple Extras folder for more information.

Control Strip Modules folder
Contains modules used by the Control Strip control panel.

Editors
Contains OpenDoc part editors. Editors provide functionality to OpenDoc parts, but you don't work with editors directly. To use an editor to create a document, double-click the editor's stationery icon. Your stationery icons are probably located in the Stationery folder on your hard disk.

Extensions folder
Contains individual extensions that modify the operation of your computer. Unlike a control panel, an extension works automatically, without your intervention.
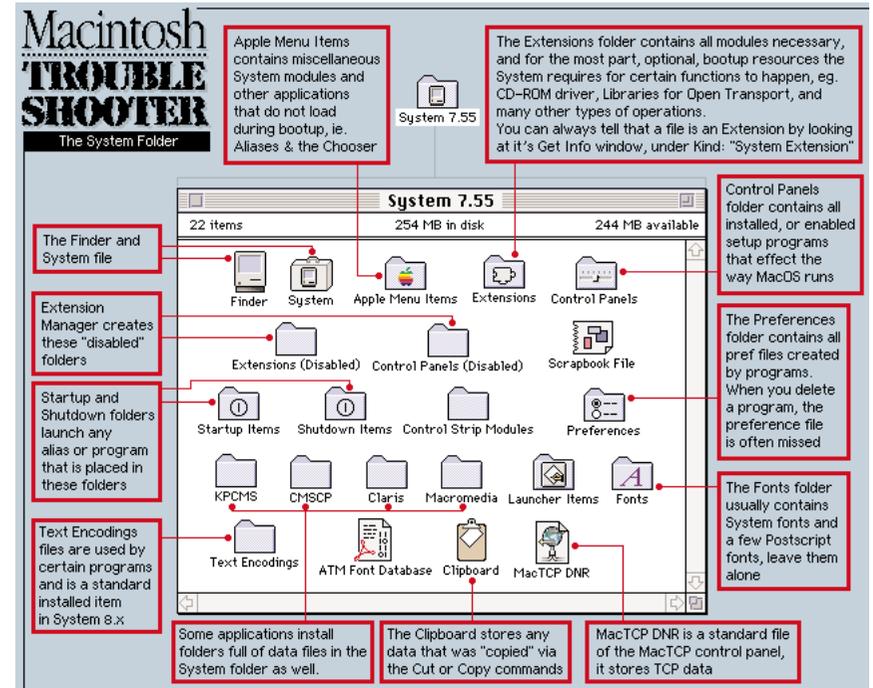
Picture 9.33 - MacOS 7.x system folder..
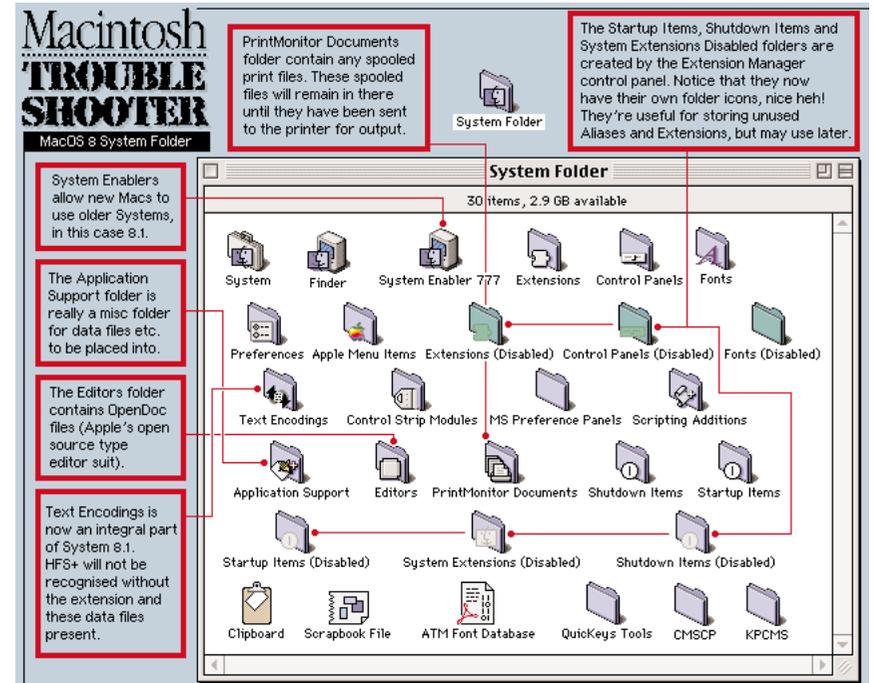
Picture 9.34 - MacOS 8.x system folder..

Fonts folder
Contains font suitcases or individual font files. You can place up to 128 suitcase or font files in this folder. PostScript fonts are not included in the 128 file limit. Font suitcases can hold any number of font files, up to a limit of 16 MB. See page 16-17, for more info on Macintosh fonts.

Launcher Items folder
Contains files, folders, and applications that appear in the Launcher window.

Macsbug
A debugger used by programmers to help diagnose problems with programs, extensions, and so on. Unless you're programming, you don't need Macsbug.

Preferences folder
Contains preferences files created by individual applications. A preference file determines application settings.

PrintMonitor Documents folder
Stores all spooled print documents waiting to be printed.

Scrapbook
Stores items placed in the Scrapbook (the Scrapbook is available in the Apple menu).

Shutdown Items folder
Contains applications or scripts that run automatically when you shut down your computer. You can add or remove items from this folder.

Startup Items folder
Contains applications or scripts that run automatically when you start your computer. You can add or remove items from this folder.

System Enabler xxx
Is an System updater file, that makes a **specific** Macintosh work with older System software, ie. System 7.1x with a Power Mac 7500. See page 87 for further details.

System file
Contains some system-wide resources, such as sounds and keyboard layouts.
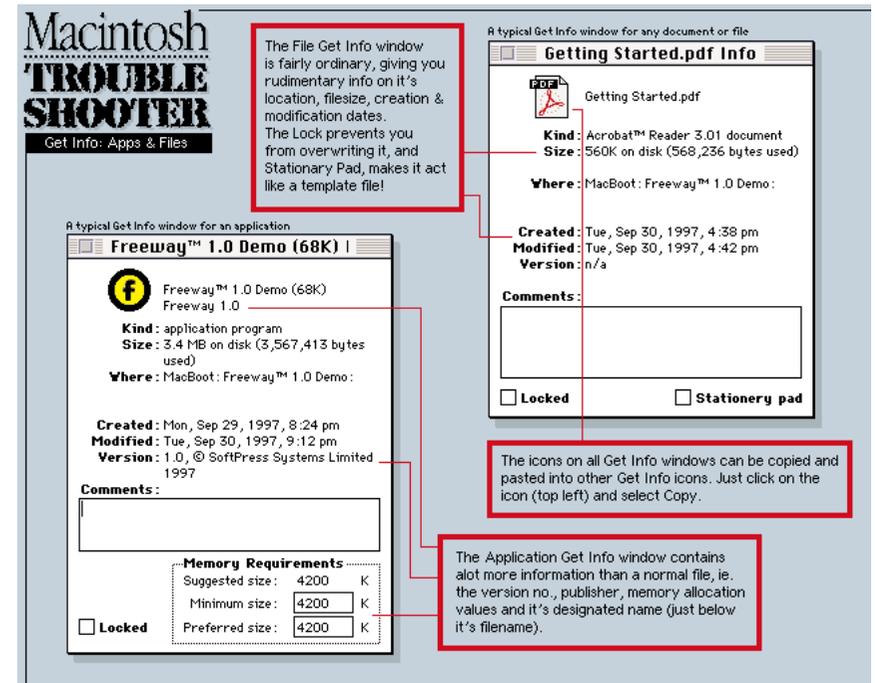
Picture 1.1 - Different types of 'Get Info..' dialogue boxes; program & document info.

SYSTEM ENABLERS

What are Enablers?

In the past, when Apple released new computers, the system software was revised. To get around this problem, system enablers were written which contain information necessary for newer computers to start up. All Apple computers released since system software 7.1 (September 1992) require a system enabler to start up. If you have System 7.5 upwards, then you will not require an Enabler (it is built into the System file).

Will I need it for Mac emulation?

Very unlikely, except maybe for Systems 7.0 to 7.11 (Pro) - this is because ShapeShifter and Fusion makes your Amiga think it is a Quadra or MacIIci in emulation mode (depending on the version of SS/Fusion you are using). You're better off reading the docs that came with the emulator, to confirm any queries you might have.

TABLE OF 680x0 MAC SYSTEM ENABLERS

Macintosh	Enabler	Current Version	Note
Centris 610	System Enabler 040	1.1	D
Centris 650	System Enabler 040	1.1	D
Centris 660AV	System Enabler 088	1.2	D
Colour Classic	System Enabler 401	1.0.5	D
Macintosh IIvi	System Enabler 001	1.0.1	D
Macintosh IIvx	System Enabler 001	1.0.1	D
Macintosh LC III	System Enabler 003	1.1	D
Macintosh LC 475	System Enabler 065	1.2	D
Macintosh LC 520	System Enabler 403	1.0.2	D
Macintosh LC 550	System Enabler 403	1.0.2	D
Macintosh LC 575	System Enabler 065	1.2	D
Macintosh LC 630	System Enabler 405	1.0	D
PowerBook 150	PowerBook 150 Enabler	1.1	D
PowerBook 160	System Enabler 131	1.0.3	A
PowerBook 165	System Enabler 131	1.0.3	A
PowerBook 165c	System Enabler 131	1.0.3	A
PowerBook 180	System Enabler 131	1.0.3	A
PowerBook 180c	System Enabler 131	1.0.3	A
PowerBook 190	PowerBook 5300/2300/190 Enabler	1.2.4	E
PowerBook 520	PowerBook 500 Series Enabler	1.0.2	D
PowerBook 520c	PowerBook 500 Series Enabler	1.0.2	D
PowerBook 540	PowerBook 500 Series Enabler	1.0.2	D
PowerBook 540c	PowerBook 500 Series Enabler	1.0.2	D
PowerBook 5300	PowerBook 5300/2300/190 Enabler	1.2.4	E
PowerBook Duo 210	PowerBook Duo Enabler	1.0	B
PowerBook Duo 230	PowerBook Duo Enabler	1.0	B
PowerBook Duo 250	PowerBook Duo Enabler	1.0	B
PowerBook Duo 270c	PowerBook Duo Enabler	1.0	D
PowerBook Duo 280	PowerBook Duo Enabler	2.0	C
PowerBook Duo 280c	PowerBook Duo Enabler	2.0	C
PowerBook Duo 2300	PowerBook 5300/2300/190 Enabler	1.2.4	E
Quadra 605	System Enabler 065	1.2	D
Quadra 610	System Enabler 040	1.1	D
Quadra 630	System Enabler 405	1.0	D
Quadra 650	System Enabler 040	1.1	D
Quadra 660AV	System Enabler 088	1.2	D
Quadra 800	System Enabler 040	1.1	D
Quadra 840AV	System Enabler 088	1.2	D
Macintosh TV	System Enabler 404	1.0	D
Performa 600	System Enabler 304	1.0.1	D,F
Performa 450,460,466/7	System Enabler 308	1.0	D
Performa 475,476,575,577/8	System Enabler 364	1.1	D
Performa 550,560	System Enabler 332	1.1	D
Performa 630,635CD	System Enabler 405	1.0	D

Notes

A - System Enabler 131 replaces System Enabler 111 and System Enabler 121.

C - Requires System Software 7.1.1 or later. System Software 7.1.1 and PowerBook Duo Enabler 2.0 ship with the PowerBook Duo 280 and 280c.

D - No system enabler is required for this Macintosh under System 7.5 or later.

E - Requires System Software 7.5.2 or later.

F - The Performa 600 requires System Enabler 304 to run Performa System Software (7.1Px) and Macintosh System Enabler 001 to run Macintosh System Software (7.1).

68K MACINTOSH ROMs & SUPPORTED MacOSs

Listed below is the entire range of 68K Macintoshs. I've also included; the MacOSs that will work with each Mac, from System 7.0 upwards (see the KEY for details); which processor was used; and what ROM was used on that particular Mac (incomplete).

Note the stars (*) next to the Mac's name, this means that this ROM will **not** be compatible with ShapeShifter or Fusion. Fusion accepts 256k, 512k and 1mb ROMs, while ShapeShifter will only accept 512k and 1mb ROMs.

Note, that I've listed the memory addressing "bit" capability of the Mac.. if you got a ROM from a 24bit Mac, it **will not** cause a problem with memory addressing in emulation, this is handled by ShapeShifter or Fusion.

Compatibility guidelines;
1) Use 512k or 1mb ROMs for System 7.5 and above.
2) Use 1mb ROMs for 68040 or 68060 Amigas, and when you want to use System 8.x.

THIS LIST CONTAINS SYSTEM VERSION COMPATIBILITY INFO FOR "REAL" MACINTOSHS, THIS DOES NOT MEAN THAT IT EFFECTS EMULATION IN THE SAME WAY. -MOST-ROMs AND SYSTEMS LISTED, WILL WORK IN EMULATION, HOWEVER THERE IS NO GUARANTEE THAT THEY WILL WORK WITH ALL AMIGA SETUPS!

To find more information on 68k Macintosh specs, go to page 93.

Macintosh Model	ROM ID	ROM size	CPU/Mhz	Bit?	Supported Systems
DESKTOP MACS					
Macintosh 128K*	$0000	64k	68000/8	24bit	7.01P only
Macintosh 512K*	$0000	64k	68000/8	24bit	Systems 1.0-6.08 only
Macintosh 512Ke*	$0075	128k	68000/8	24bit	Systems 1.0-6.08 only
Macintosh XL*	n/a	16k	68000/5	24bit	MacWorks System
Macintosh Plus*	$0075	128k	68000/8	24bit	1,2,4,B
Macintosh SE	$0276	256k	68000/8	24bit	A,B
Macintosh SE FDHD	$037A	256k	68000/8	24bit	A,5a,B
Macintosh SE/30	$0178	256k	68030/16	24bit	A,B
Macintosh Classic	$0276	512k	68000/8	24/32bit	A,B
Macintosh Classic II	$067C	512k	68030/16	24/32bit	2,4,5,7,10,11,C
Macintosh Colour Classic	$067C	1mb	68030/16	24/32bit	4,5,B,C
Macintosh Colour Classic II	$067C	1mb	68030/33	24/32bit	4,B,C
Macintosh II	$0178	256k	68020/16	24bit	A,B
Macintosh IIx	$0178	256k	68030/16	24bit	A,B
Macintosh IIcx	$0178	256k	68030/16	24bit	A,B
Macintosh IIci	$067C	512k	68030/25	24/32bit	A,B,C
Macintosh IIsi	$067C	512k	68030/20	24/32bit	A,B,C
Macintosh IIvi	$067C	1mb	68030/16	24/32bit	4,5,A,B,C
Macintosh IIvx	$067C	1mb	68030/32	24/32bit	4,5,A,B,C
Macintosh IIfx	$067C	512k	68030/40	24/32bit	A,B
Macintosh LC	$067C	512k	68020/16	24/32bit	A,B
Macintosh LC II	$067C	512k	68030/16	24/32bit	2,4,5,B,C
Macintosh LC III	$067C	1mb	68030/25	24/32bit	4,5,B,C
Macintosh LC III+	$067C	1mb	68030/33	24/32bit	4,5,B,C
Macintosh LC 475	$067C	512k/1mb	68LC040/50	24/32bit	4,5,B,C,D
Macintosh LC 520	$067C	1mb	68030/25	24/32bit	4,5,B,C
Macintosh LC 550	$067C	1mb	68030/33	24/32bit	4,5,B,C
Macintosh LC 575	$067C	1mb	68LC040/66	24/32bit	4,5,B,C,D
Macintosh LC 580	$067C	1mb	68LC040/66	32bit	B,C,D
Macintosh LC 630	$067C	1mb	68LC040/66	32bit	6f,B,C,D
Macintosh LC 630 DOS	$067C	1mb	68LC040/66	32bit	8,10,11,C,D
Macintosh TV	$067C	1mb	68030/32	24/32bit	4,5,B,C
Macintosh Performa 200	$067C	512k	68030/16	24/32bit	3,4,6a-6e,B,C
Macintosh Performa 250	$067C	1mb	68030/16	24/32bit	4,5,B,C
Macintosh Performa 275	$067C	1mb	68030/33	24/32bit	4,B,C
Macintosh Performa 400	$067C	512k	68030/16	24/32bit	3,4a,6a-6e,B,C
Macintosh Performa 405	$067C	512k	68030/16	24/32bit	4,4a,6a-6e,B,C
Macintosh Performa 410	$067C	512k	68030/16	24/32bit	6c-6e,B,C
Macintosh Performa 430	$067C	512k	68030/16	24/32bit	6b-6e,B,C
Macintosh Performa 450	$067C	1mb	68030/25	24/32bit	6b-6e,B,C
Macintosh Performa 460	$067C	1mb	68030/33	24/32bit	6c-6e,B,C

Macintosh Model	ROM ID	ROM size	CPU/Mhz	Bit?	Supported Systems
Macintosh Performa 466	$067C	1mb	68030/33	24/32bit	6c-6e,B,C
Macintosh Performa 467	$067C	1mb	68030/33	24/32bit	6c-6e,B,C
Macintosh Performa 475	$067C	1mb	68LC040/50	24/32bit	6c-6e,B,C,D
Macintosh Performa 476	$067C	1mb	68LC040/50	24/32bit	6c-6e,B,C,D
Macintosh Performa 520	$067C	1mb	68030/25	24/32bit	4,5,B,C
Macintosh Performa 550	$067C	1mb	68030/33	24/32bit	6c-6e,B,C
Macintosh Performa 560	$067C	1mb	68030/33	24/32bit	6d-6e,B,C
Macintosh Performa 575	$067C	1mb	68LC040/66	24/32bit	6e,B,C,D
Macintosh Performa 577	$067C	1mb	68LC040/66	24/32bit	6e,B,C,D
Macintosh Performa 578	$067C	1mb	68LC040/66	24/32bit	6e,B,C,D
Macintosh Performa 580cd	$067C	1mb	68LC040/66	32bit	B,C,D
Macintosh Performa 588cd	$067C	1mb	68LC040/66	32bit	B,C,D
Macintosh Performa 600/600cd	$067C	1mb	68030/32	24/32bit	4a,6a-6e,B,C
Macintosh Performa 630/630cd	$067C	1mb	68LC040/66	32bit	6f,B,C,D
Macintosh Performa 630cd DOS	$067C	1mb	68LC040/66	32bit	8,10,11,C,D
Macintosh Performa 631cd	$067C	1mb	68LC040/66	32bit	8,10,11,C,D
Macintosh Performa 635cd	$067C	1mb	68LC040/66	32bit	6f,B,C,D
Macintosh Performa 636/636cd	$067C	1mb	68LC040/66	32bit	6f,B,C,D
Macintosh Performa 637cd	$067C	1mb	68LC040/66	32bit	6f,B,C,D
Macintosh Performa 638cd	$067C	1mb	68LC040/66	32bit	6f,B,C,D
Macintosh Performa 640cd DOS	$067C	1mb	68LC040/66	32bit	8,10,11,C,D
Macintosh Centris 610	$067C	1mb	68LC040/40	24/32bit	4,5,B,C,D
Macintosh Centris 650	$067C	1mb	68040/50	24/32bit	4,5,B,C,D
Macintosh Centris 660av*	$077D	2mb	68040/50	32bit	4,5,B,C,D
Macintosh Quadra 605	.$067C	512k/1mb	68LC040/50	24/32bit	4,5,B,C,D
Macintosh Quadra 610/610 DOS	$067C	1mb	68040/50	24/32bit	4,5,B,C,D
Macintosh Quadra 630	$067C	1mb	68040/66	32bit	6f,B,C,D
Macintosh Quadra 650	$067C	1mb	68040/66	24/32bit	4,5,B,C,D
Macintosh Quadra 660av*	$077D	2mb	68040/50	32bit	4,5,B,C,D
Macintosh Quadra 700	$067C	1mb	68040/50	24/32bit	2,4,5,B,C,D
Macintosh Quadra 800	$067C	1mb	68040/66	24/32bit	4,5,B,C,D
Macintosh Quadra 840av*	$077D	2mb	68040/80	32bit	4,5,B,C,D
Macintosh Quadra 900	$067C	1mb	68040/50	24/32bit	2,4,5,B,C,D
Macintosh Quadra 950	$067C	1mb	68040/66	24/32bit	2,4,5,B,C,D

PORTABLE MACS

Macintosh Model	ROM ID	ROM size	CPU/Mhz	Bit?	Supported Systems
Macintosh Portable	$0378	256k	68000/16	24bit	A,B
Macintosh PowerBook 100	$067C	256k	68000/16	24bit	2,4,5,B
Macintosh PowerBook 140	$067C	1mb	68030/16	24/32bit	2,4,5,B,C
Macintosh PowerBook 145	$067C	1mb	68030/25	24/32bit	2,4,5,B,C
Macintosh PowerBook 145B	$067C	1mb	68030/25	24/32bit	4,5,B,C
Macintosh PowerBook 150	$067C	1mb	68030/33	32bit	5a,B,C

Macintosh Model	ROM ID	ROM size	CPU/Mhz	Bit?	Supported Systems
Macintosh PowerBook 160	$067C	1mb	68030/25	24/32bit	4,5,B,C
Macintosh PowerBook 165/165c	$067C	1mb	68030/33	24/32bit	4,5,B,C
Macintosh PowerBook 170	$067C	1mb	68030/25	24/32bit	2,4,5,B,C
Macintosh PowerBook 180/180c	$067C	1mb	68030/33	24/32bit	4,5,B,C
Macintosh PowerBook 190*	$077D	2mb	68LC040/66	32bit	9,10,11,C,D
Macintosh PowerBook 190cs*	$077D	2mb	68LC040/66	32bit	9,10,11,C,D
Macintosh PowerBook Duo 210	$067C	1mb	68030/25	24/32bit	4,5,B,C
Macintosh PowerBook Duo 230	$067C	1mb	68030/33	24/32bit	4,5,B,C
Macintosh PowerBook Duo 250	$067C	1mb	68030/33	24/32bit	4,5,B,C
Macintosh PowerBook Duo 270c	$067C	1mb	68030/33	24/32bit	4,5,B,C
Macintosh PowerBook Duo 280	$067C	1mb	68LC040/66	24/32bit	5a,B,C,D
Macintosh PowerBook Duo 280c	$067C	1mb	68LC040/66	24/32bit	5a,B,C,D
Macintosh PowerBook 520/520c	n/a	.2mb	68LC040/50	32bit	5a,B,C,D
Macintosh PowerBook 540/540c*	n/a	.2mb	68LC040/66	32bit	5a,B,C,D
Macintosh PowerBook 550c*	$067C	2mb	68040/66	32bit	B,C,D

SERVER MACS

Macintosh Model	ROM ID	ROM size	CPU/Mhz	Bit?	Supported Systems
WorkGroup Server 60	$067C	1mb	68040/40	24/32bit	4,8,10,11,C,D
WorkGroup Server 60/50mhz	$067C	1mb	68040/50	24/32bit	4,8,10,11,C,D
WorkGroup Server 80	$067C	1mb	68040/66	24/32bit	4,8,10,11,C,D
WorkGroup Server 95	$067C	1mb	68040/66	24/32bit	B,C,D (unsure)

KEY *(to system versions)*

Individual System Versions - **Key**

1	System 7.0
2	System 7.01
3	System 7.01P
4	System 7.1
4a	System 7.1P
5	System 7.11 (Pro)
5a	System 7.11
6a	System 7.1P1
6b	System 7.1P2
6c	System 7.1P3
6d	System 7.1P5
6e	System 7.1P6
6f	System 7.12P
7	System 7.5
8	System 7.51
9	System 7.52
10	System 7.53
11	System 7.55
12	System 7.6
13	System 7.61
14	System 8.0
15	System 8.1

Group System Versions - **Key**

A	System 7.0,7.01,7.1,7.11(Pro)
B	System 7.5,7.51,7.53,7.55
C	System 7.6 & 7.61
D	System 8.0 & 8.1

Other - **Key**
DOS DOS Compatible card
* ROM not compatible with SS & Fusion
n/a ROM ID not available

USEFUL KEYBOARD SHORTCUTS

Keyboard Key Names & the Amiga's Equivalent:
Apple = Amiga's "A" keys
Option = Alt keys   (all other keys are literally named the same)
Power key = Is only available on Macintosh keyboards - there's no Amiga equivalent.

ACTION KEYS, WHEN BOOTING-UP

Apple + Option + p + r
Deletes the contents of the PRAM memory file.
[Hold down at the very beginning of bootup.]

Shift
Disables all non-essential System extensions.
[Hold down when the Happy Mac screen appears.]

Spacebar
Calls up the Extensions Manager control panel.
[Hold down this key on the Happy Mac screen until the Extensions enabler screen appears.]

Apple + Option + Shift + Backspace Delete
Bypass the internal hard disk, and startup from a different System Folder. [Hold down at the very beginning of bootup.]

Apple + Option + Escape
Force quits any application/program.
[Press and hold all at once; anytime a program appears to freeze-up or crash.]

Apple + Option
Rebuild the Desktop File.
[Hold both keys just before the last extensions load up during startup. A dialogue box will appear, asking you whether you to rebuild for every locally mounted disk.]

Apple
Disables virtual memory upon loading the Finder.
[Hold down, right through the startup sequence]

ACTIONS & SHORTCUTS, WHILE IN THE FINDER
File & Icon Management - Shortcuts

Apple + Option + Escape
Force quit any current program.
[Hold all keys down until a dialogue is displayed, this shows options for you to either: Quit the program or Restart the Mac]

Shift + Cleanup [menu]
Cleanup just the selected icons.
[Highlight the icons, then press & hold the key and select the menu item]

Option + Shift + Cleanup [menu]
Sort and clean up selected icons.
[Highlight the icons, then press & hold the keys and select the menu item]

Return or **Enter**
Edit the icon's filename.
[Select one icon and press Return/Enter key]

Cancels a drag and drop operation.
[Drag icon(s) over the menu bar and release the mouse button]

Tab
Select the next icon.
[Press the Tab key once or multiple times]

Shift + Tab
Select the previous icon.
[Press the Tab key once or multiple times]

All Arrow Keys
Select an icon that's nearby.
[Press any arrow key once or multiple times]

Shift + Click left mouse button
Select multiple icons.
[Press and hold the Shift key, then select each and every icon you need]

Click on the Desktop's Background
Unselect icons and folders.
[Click the left mouse button once]

Option + click on Close Gadget [on window]
Closes all open windows and folders.
[Press key first and then the mouse button]

Apple + drag window
Move window without making it active.
[Press key first and then drag the window]

Option + double click on: app/icon/folder
Automatically closes the window which contains the app/icon/folder
you double clicked. Then it opens/launchs the icon you double clicked.
[Press the Option key then double click on the application's/
folder's/doc's icon]

Option + Empty Wastebasket [menu]
Skips the trash warning dialogue box.
[Hold the key down while you select the menu item]

Apple + Option + Tab
Automatically erases a disk when inserted.
[Hold both keys down when inserting the disk]

Control + click
Displays a contextual menu anywhere on screen. System 8.x only.
[Hold the Ctrl key & select the option you require, from the menu]

Option + click the window close gadget
Closes all open folder windows.
[Hold the option key, then click the gadget]

Option + drag icon
Copies the icon(s) into a different folder or location, leaving the
original still in place.
[Hold the option key, then click & drag the icon over the folder you
want it duplicated to, and release the mouse button]

Apple + Option + drag icon
Creates an alias of the icon/folder/disk.
[Hold all keys, then drag & release mouse button]

Apple + window title bar
Displays the folder's full path on the disk.
[Hold key & click on the folder name in the window's title bar, a pop-
up menu will appear]

Apple + Shift + 3
A snapshot of the current Mac screen will be saved onto the desktop of
the startup disk.
[Hold all keys until you hear a crunching sound, then the image will
be saved]

Apple + Shift + 4
This enables you to take a snapshot of any part of the Mac's screen.
[Hold all keys down, then use the mouse to click and drag a rectangle
round the area you wish to save, and release the mouse button]

Apple + Shift + Capslock + 4
A snapshot of any active window.
[Hold all the keys down, release them and use the mouse to click on
the window you want]

Apple + . (full stop)
Cancel current operation, this is equivalent to pressing the cancel button in a window. You may also use this key combo to cancel a disk request window.
[Hold both down until the operation is cancelled]

Return or **Enter**
Equivalent to clicking the OK button in a window. This also applies to all 'default' highlighted buttons (with extra thick border round it).
[Just press the Return/Enter key once]

Save/Load Window Shortcuts:

Apple + . [or] **Escape**
Cancels the save/load/overwrite dialogue box.
[Press both keys together, until the window disappears]

Apple + d
Moves to the Desktop level, in the file requester window.
[Press both keys together]

Selects the first file that begins with those letters.
[Type in the first 1-4 letters of the file]

Apple + UP arrow key
Move down to the previous folder, in the file requester window.
[Press both keys together]

UP or DOWN arrow keys
Select the previous or next filename.
[UP=previous file, DOWN=next file]

Return or **Enter**
Open the selected file. Or select the bolder outlined button, which is usually; Replace, Open or Cancel.
[Press key once]

Apple + n
Create a new folder. This only works in the Save dialogue box).
[Press both keys together, until a dialogue box shows, for you to rename the folder]

Apple + n
Selects the "No" button in the "Do you want to save this document" dialogue only.
[Press both keys together, until the No option is selected]

Tab
Toggle between the Filename field and the File List window (highlighted with a bolder border).
[Press once to switch between fields]

FOR THOSE WHO USE REAL MACINTOSHS

Ejects a floppy disk.
[Hold down the mouse button, right at the beginning of the bootup sequence, until it ejects the undesirable disk]

Apple + Option + Shift + Power key or **Power key twice**
Gives you the option to Restart or Shutdown the Mac via a dialogue box.
[Press and hold all keys for 1-2 seconds, or press Power key twice in quick succession]

Apple + Control + Power key
Immediately restarts the Mac.
[Press and hold all keys for 1-2 seconds]

Interesting System 7.x information
- HFS is limited to 65,536 files for any partition or removable hard disk.
- HFS limits filenames to 31 characters.
- HFS does not allow these characters in filenames; ":" & ";".
- The max. number of fonts you can have open at any one time, is 128.
- The maximum number of files that can be opened at once is 346.
- The maximum number of items you can have in the Apple Menu is 50.
- The maximum amount of RAM that can be allocated to any program is 99,999k (100mb).
- To move the Control Strip in the Finder, press Alt and drag with the left hand edge of the Control Strip gadget.
- PC Exchange (upto version 2.1) will only recognise PC formatted disks upto 1gig.

Where do I find the full specs for the whole Macintosh range...
Go to this FPT page (below), you will need to download two files:
ftp://ftp.info.apple.com/Apple_Support_Area/Apple_Software_Upd ates/English-North_American/Macintosh/Utilities/Apple_Spec/
Apple_Spec_8-98.smi.bin and **Apple_Spec_app.smi.bin**

The file is a Filemaker Pro3 document, so you'll need the accompanying viewer program if you do not own Filemaker. Both files are in the same web page.

Apple also has the above information in it's web pages. Use this web address to go direct to it:
http://support.info.apple.com/applespec/applespec.taf
and at
http://www.info.apple.com/info.apple.com/applespec/applespec.taf

Some good & very reasonable mail-order companies in the UK:
Camelot - Tel: 0171 383 2727
Dabs Direct - www.dabs.com - Tel: 0800 68000 (sales freephone)
Computer Warehouse - www.cwonline.co.uk - Tel: 0181 400 1234
MacWarehouse - www.macwarehouse.co.uk - Tel: 0800 181 332 (sales freephone)

COMMERCIAL SOFTWARE

Adobe Type Manager Deluxe
  On-screen font render [Adobe - www.adobe.com].
Anti-virus
  Anti-virus program [Dr Solomans - www.drsoloman.com].
Anubus Plus 3.0
  Disk manager HFS/HFS+ [ClarisMac - www.clarismac.com].
BackupMastery
  Backup package [ClarisMac - www.clarismac.com].
CD Autocache
  CD-ROM driver [ClarisMac - www.clarismac.com].
CD-ROM Toolkit
  CD-ROM management [FWB - www.fwb.com].
Charismac RAID
  RAID management software [ClarisMac - www.clarismac.com.
Conflict Catcher
  Extension conflict catcher [Cassidy - www.cassidy.com].
DiskFit
  Very cheap backup utility [Dantz - www.dantz.com].
Disk Doubler
  Compression/archive creation [Symantec - www.symantec.com].
Disk Express Pro
  Advanced HFS+ optimiser [Alsoft - www.alsoft.com].
DiskWarrior
  Disk repair utility [Alsoft - www.alsoft.com].

Fastback
  Backup util, came with NU v3 [Symantec - www.symantec.com].
FileGuard
  Disk/data security utility [Highwire].
Hard Disk ToolKit
  Disk management utilities [FWB - www.fwb.com].
MacLink+/Pro
  Text file converter [Dataviz - www.dataviz.com].
MarkzTools2
  Quark Xpress doc repairer [Markzware - www.markzware.com].
Master Juggler
  Font manager program [Alsoft - www.alsoft.com].
Norton Backup
  Backup util, came with NU v2 [Symantec - www.symantec.com].
Norton DiskLock
  Disk/data security utility [Symantec - www.symantec.com].
Norton Utilities 3.5 CD
  Disk repair utility [Symantec - www.symantec.com].
PKzip (available for PC & Mac)
  Compression/archive creation [PKware Inc - www.pkware.com].
Plus Maximiser
  Enhances System HFS+ formatting [Alsoft - www.alsoft.com].
PlusMaker
  HFS to HFS+ converter [Alsoft - www.alsoft.com].
PlusOptimiser
  HFS/HFS+ disk optimiser [Alsoft - www.alsoft.com].
PowerPrint v4
  Parallel printer driver [Infowave - www.infowave.com].
Private File
  Disk/data security utility [Aladdin Systems - www.aladdinsys.com].
RAID Toolkit
  RAID0/1 hard disk manager [FWB - www.fwb.com].
Ram Doubler
  RAM expander [Connectix - www.connectix.com].
Rapid-CD
  CD-ROM driver [Insignia Solutions - www.insignia.com].

RapidCD
  CD-ROM driver [MacPeak - www.macpeak.com].
Remus
  RAID management software [Adaptec - www.adaptec.com].
Retrospect / Retrospect Express
  THE Mac backup program [Dantz - www.dantz.com].
SAM Anti-Virus
  Anti-virus program [Symantec - www.symantec.com].
SCSI CD Driver
  CD-ROM driver [Corel - www.corel.com].
Spacemaker
  HFS-HFS+ converter [Total Recall - www.spacemaker.recallusa.com].
Stuffit Deluxe
  Archive creator [Aladdin Systems - www.aladdinsys.com].
StyleScript
  Postscript for inkjets [Infowave - www.infowave.com].
Suitcase
  Font manager program [Symantec - www.symantec.com].
TechTool Pro2
  Disk repair [Micromat Computer Systems - www.micromat.com].
Toast CD-ROM Pro / Toast3.5
  CD burning utility [Adaptec - www.adaptec.com].
Virex
  Anti-virus program [Datawatch - www.datawatch.com].

SHAREWARE SOFTWARE

AppSizer
  Memory allocator utility {Michael Peirce - any shareware site].
Chucks Printer Driver
Epson/HP b&w printer driver [Charles Rentmeesters - any site].
Compact Pro
  Compression/archive creation [Bill Goodman - any shareware site].
Data Rescue
Recovers data from initialised HDs [www.wildbits.com/rescue].
Default Folder
  Open/save folder navigator [St.Clair Software - any shareware site].

Dos2mac
Removes unwanted characters from PC text [T.Sourbier - any site].
Extension Overload
Extension info database [Peter Lewis - any shareware site].
FileBuddy
File flag/type editor [Lawrence Harris - any shareware site].
FileTyper
File flag/type editor [any shareware site].
Font Manager
Font manager program [Ed Hopkins - any shareware site].
GraphicConverter
Multi image format converter [Lemke Software - any shareware site].
InformINIT
Extension info database [Don Frakes - any shareware site].
Scripter
An AppleScript editor [Main Event Software - www.latenightsw.com].
Script Debugger
An AppleScript editor [Late Night Software - www.mainevent.com].
Snitch
File flag/type editor [Mitch Jones - any shareware site].
Shrinkwrap
Disk image mounter/creator [Aladdin Systems - any shareware site].
Stuffit Lite
Archive creator [Aladdin Systems - any shareware site].
TTconverter
PC truetype font converter [Chris Reed - any shareware site].
Type/Creator Database
Type codes database [Ilan Szekely - any shareware site].
ZipIt
Compression/archive creation [Softlock - any shareware site].

FREEWARE SOFTWARE

Apple Error Codes'98
Explains System error codes [Apple Tech Info Lib - www.apple.com].
Binhex 4 & 5
HQX encoder/decoder [Yves Lempereur - any shareware site].

DD Expand
DiskDoubler archive expander [Symantec - any shareware site].
Disk Copy
Disk image mounter/creator [Apple - www.apple.com/support].
DiskFit Direct
Comes on Mac Zip Tools disk [Dantz - www.dantz.com].
Disinfectant 3.7
Anti-virus program [John Norstad - any shareware site].
Easy Errors 1.2
Explains error codes [Dave Rubinic - any shareware site].
FreePPP
PPP internet driver [S.Dagley & R.Reynolds - any shareware site].
LHA Expander
LHA archive expander [Masanori Sekino - any shareware site].
MacGZip
Expands: .gz, .z, .taz, .tgz [SPD Soft - any shareware site].
Memory Mapper
Shows exactly what is currently using memory.
[Street Logic Soft - www2.connectnet.com/~stlogic/].
Packit
Archive creator [any shareware site].
SoftwareFPU
FPU emulator [J.Neil & Associates - any shareware site].
Stuffit Expander 5.0
.sit, .cpt, .hqx, .bin expander [Aladdin Systems - any shareware site].
System Errors
Explains error codes [Bill Steinberg - any shareware site].
System 7.0 & 7.53
Free System software [Apple Computers - asu.info.apple.com/]!
Text Browser
Text doc viewer [John Lamb - any shareware site].
Zip Tools
Zip & Jazz drivers/tools [Iomega - www.iomega.com].

SHAREWARE/FREEWARE & INFO FROM THE INTERNET

All these sites have been tested, and they work!

Macintosh Shareware & Information Sites

http://www.macalliance.com/	Mac community site.
http://sharewarestation.com/	Large shareware site.
http://www.zdnet.com/mac/	Good selection of shareware here.
http://www.filez.com/	Millions of Mac files to be had.
http://www.versiontracker.com/	Hosts every software update for Macs.
http://cdrom.amug.org/http/bbs/files.html	Mac version of the Aminet.
http://www.macfaq.com/	FAQs, vendors, links and much more.
http://www.macville.mac-mania.com/	Guide to Mac sites.
http://www.MacintoshOS.com/	Great for Mac info, shareware and more.
http://www.macfixit.com/	A Mac troubleshooter web site (not mine).
http://www.Macreviewzone.com/	Reviews on Mac software.
http://www.macupdate.com/	The LARGEST shareware site in the world.
http://www.shareware.com/	General Mac shareware site.
http://www.download.com/Mac/FrontDoor/	Links to other shareware sites.
http://www.maccentral.com/	General Mac shareware site.
http://www.hyperactive.lcs.mit.edu/	Very large shareware & freeware site.
http://wwwhost.ots.utexas.edu/	Very large shareware & freeware site.
http://www.happypuppy.com/	Loads of games.
http://www.jumbo.com/pages/mac/	Large shareware site.
http://www.MacintoshOS.com/	Everything for Macintosh at this site.
http://www.ap.net/download/	The Macintosh Shareware Source.
http://www.macorchard.com/	Up-to-date Mac internet software.
http://www.gamesdomain.com/	Huge site, endless supply of info.
http://www.pixi.com/~schizo/	The latest in 68k Mac games.
http://www.macsites.com/	Guide to Macintosh sites.
http://www.Macreviewzone.com/	Mac related reviews.
http://micros.hensa.ac.uk/platforms/mac.html	Large shareware site.
http://www.macresource.com/	News, views, updated regularly.
http://www.macintouch.com/	Get intouch with Mac news!
http://www.macnn.com/	More news for Mac users.
http://www.versiontracker.com/	Lists all the latest software updates.
http://www.macformat.com/	Macintosh magazine, lots of info & reviews.
http://www.macuser.com/	Mac magazine, last 18 months of reviews.

FTP Sites with many Mac files, and regularly updated

ftp://VOLftp.tin.it/pub/mac/
ftp://ShadowMAC.org/pub/
ftp://www.cdrom.com/

Apple's Support & Development FTP Sites

ftp://ftp.apple.com/dts/	Apple software.
ftp://ftp.apple.com.au/pub/	Apple software for Macs & Newtons.
ftp://ftp.info.apple.com/Apple.Support.Area/	Apple software.
ftp://ftp2.info.apple.com/Apple.Support.Area/	Apple software - alternative2.
ftp://ftp3.info.apple.com/Apple.Support.Area/	Apple software - alternative3.
ftp://ftp.info.euro.apple.com/Apple.Support.Area/	Apple software (Europe).
http://www.apple.com/support/	Apple software & updates centre.
ftp://mirror.apple.com/mirrors/	Software updates +mirrors of other sites.

FTP Mirror/Shadow Archive Sites

ftp://cnuce-arch.cnr.it:21/pub/micros/motorola/mac/	Limited software selection.
ftp://f.ms.uky.edu/pub/mac/	Quite a abit of software.
ftp://fiesta.tsc.udel.edu/pub/mac/	Apple System software & updaters.
ftp://ftp.agt.net/pub/info-mac/	Large mirror site.
ftp://ftp.auckland.ac.nz/pub/mac/	Large mirror site.
ftp://ftp.ausom.net.au/pub/mirrors/info-mac/	Large mirror site.
ftp://ftp.bitcon.no/pub/mac/info-mac/	Large mirror site.
ftp://ftp.calvacom.fr/pub/mac/info-mac/	Large mirror site.
ftp://ftp.cdrom.com:21/.3/mac/umich/	See [www.cdrom.com] above.
ftp://ftp.center.osaka-u.ac.jp/info-mac/	Large Japanese mirror site.
ftp://ftp.chem.sci.osaka-u.ac.jp/pub/mac/	Another large Japanese mirror site.
ftp://ftp.circa.ufl.edu/pub/software/mac/	Large mirror site.
ftp://ftp.cs.tu-berlin.de/pub/mac/info-mac/	Large mirror site.
ftp://ftp.epix.net:21/apple/Macintosh/	Up-to-date software only.
ftp://ftp.euro.net:21/d3/info-mac/	Large mirror site.
ftp://ftp.hawaii.edu/mirrors/info-mac/	Large mirror site.
ftp://ftp.iij.ad.jp:21/pub/mac/umich/	Small mirror site.
ftp://ftp.ims.ac.jp/pub/mac/info-mac/	Large mirror site.
ftp://ftp.informatik.rwth-aachen.de/pub/info-mac/	Large mirror site.
ftp://ftp.inter.spin.ad.jp/pub/Mac/Merit.mirror/	Medium-sized mirror site.
ftp://ftp.is.co.za/info-mac/	Large mirror site.
ftp://ftp.uu.net/systems/mac/info-mac/	Large mirror site.
ftp://sunsite.anu.edu.au:21/mnt/disk3/info-mac/	Large mirror site.
ftp://sunsite.doc.ic.ac.uk/packages/info-mac/	Large mirror site (UK).
ftp://newton.sys.uea.ac.uk/Newton_Archive/	Mirrors of 13 Newton & Apple sites.

MACINTOSH JARGON

ADB (port)
The ADB (Apple Desktop Bus), is a cable/port standard on most Macs. It allows you to connect the keyboard and mouse, via through connectors.

Alias
Is a special file which points to the location of the original file/folder/disk. If you launch an alias, it will open the original file, folder or disk window instead. If you bin an alias, it will NOT delete the original.

Allocated Memory
The Macintosh Operating System is pretty dumb when it comes allocating memory for applications/programs, it doesn't have any Memory Management features at all. So the user has to manually set the preferred amount of memory. It may be necessary for you to bump up the size of most of your regularly used software, particularly if they are memory intensive, such as image processing packages.

  To view its settings, find the application's icon in the Finder, then press Amiga+i, this will display the Get Info window. It should have a standard preset number already, however you can alter the number in the Preferred Size box, but don't touch the Minimum Size. The number is in kilobytes. The maximum limit is 99,999k (don't use commas ",").

Apple Events
Is the message language of System 7.5's Interapplication Communications Technology (IAC), used by programs to communicate with other programs. It allows them to share data and commands. Applescript can use Apple Events to control the scriptable Finder and many applications.

Apple Menu
This menu is accessed via the multi-coloured Apple logo icon, on the top left of the menu bar. It's purpose is to allow easy access to utilities/programs and control panels. You can also place as many aliases of programs, in here as you like, for easy access.

AppleGuide
Is Apple's interactive help system, built into System 7.5 upwards. It can be accessed via the "?" icon on the top right of the menu bar, or by pressing the Help key. If you have enabled the AppleGuide extension, then you can access all help guides, including Macintosh Guide, which is the Finder's help file - both located in the Extensions folder.

AppleScript
Apple's system level scripting software. It is like AREXX, and provides a way of automating complex or tedious tasks. You can even customise some user operations as well, see the "Automated Tasks" folder that is often installed into the Apple Menu Folder.

AppleTalk
Is Apple's standard Macintosh network and printer communication language. It was the main and only standard on all MacOS's up to System 7.55.

  Classic Networking, as it is now called, only allowed the use of AppleTalk as main network protocol, no other protocol could be used. For instance, Ethernet is converted into Ethertalk, which is an AppleTalk variant, before it is sent over the network.

Application
This term is just another desciptive word for "program" (executable computer code).

ATM
Stands for Adobe Type Manager. This is a control panel that renders postscript type on-screen so that it's shape is always smooth. Before ATM was conceived, all type was rendered using the bitmap screen font sizes (from the Suitcase file), this generated very pixelised looking type, and was no good for typesetters and designers - they couldn't see what it would truely look like, not without printing it out.

Bombed!
Is a common saying with Mac users. People usually say "My Mac just bombed!", when a System Error message appears, simply because this window displays a little icon of a bomb with a lit fuse on it.

Clipboard
The Mac uses the Clipboard file (in the System Folder) to store data that has been copied or cut into memory. However, the data is lost when you restart or shutdown Mac emulation.

Clipping File
This is the product dragging the on-screen selection, be it a peice of text, sound or image, from an application onto the Finder, which immediately creates a Clipping file. This is only possible with drag'n drop capable applications.

Contextual Menus
Was introduced in System 8.0, and allows you to call up a little menu (whilst in the Finder) containing all the most common actions you are likely to use. It works only if you highlight an icon, window or disk, and then pressing the Control key and drag to the menu item - anywhere on screen.

Control Panels
Are part of the System folder, they are used to setup your Mac to how you want. This could be anything from the monitor resolution, colour, networks and various other Finder behaviour. All of them can be customised by the user.

Defaulted Icons
Means that the Desktop File (see below) for that Mac volume has become corrupted, and so, all icons on that disk have now assumed the System File's own standard set of default icons, namely a dog eared page icon (represents all data and document files), a rotated square with a hand pointing to it (represents any executable application), and default icons for System files, eg. Extensions, Control Panels, Control Strips and preference files.

You will also see a dog-eared icon of a document, if you do not have the program that created that file, such as a MS Word 98 formatted file.

Desk Accessories (DAs)
DAs are mini-programs that are usually located in the Apple Menu, such as the Calculator, the Chooser, the Scrapbook or Key Caps.

Disk Drivers
Like PCs, Macs use drivers for its hard disks, whether its formatted via the Finder or another utility, it places its info onto the disk for basic operational functions.

Amigas emulating a Macintosh don't necessarily need Mac based drivers (especially ShapeShifter), because the partition has been setup via the Amiga side already. The only thing disk management utilities would do, is to increase the disk's performance through caching.

Desktop (the)
The desktop contains the menubar, disk icons, background pattern, the trashcan and any icons you may have left "lying around" - it is basically the Finder's work space for organising icons and windows.

Desktop File
Is a disk based database for keeping information on icon and window positions, and what icons are used on which file or program. Without the Desktop file, all icons would revert to the System file's generic icon collection.

Disk Cache (Memory Control Panel)
This setting uses a portion of RAM to store frequently used data, and also helps your programs to run faster. Many Mac users, use the "32k for every megabyte of memory" calculation to figure out how much it should be, personally I use a standard 256k, 512k or 1024k value, of course this depends largely on how much memory you have available. The absolute minimum is approximately 32k.

Drag & Drop
This feature was introduced in System 7.1, it enables you to drag any document item, be it a; bit of text, a picture, a movie or sampled sound, and literally drag and drop it either onto another document or onto the Desktop. The item that was dropped onto the Destop, is called a Clipping.

EtherTalk
Is a AppleTalk version of the Ethernet protocol (not true Ethernet TCP/IP protocol) for use on the high speed network standard.

Extensions
Are part of the System folder, they add specific resources to the Operating System, such as libraries, CD filing system data, System enhancements etc.

File Type
This is the MacOS's way of deciphering what files are what. It recognises what each file is, by it's CREATOR code (for icons) and it's file TYPE code (for the data it holds). Example; an executable program always has a APPL Type code, while a ASCII text file will have a TEXT Type code. All Creator and Type codes use upper and lower case characters, numbers, and even symbols.

Finder
Manages the Desktop environment, it is similar to the Amiga's Workbench.
   When the Finder is placed in a folder, it "blesses" the folder with the familiar System folder icon, to show you that this is the active System for this disk.

Firmware
This is the software or individual program modules, that are built into the Mac's ROM. Sometimes you can get Firmware updates (downloaded from Apple's web pages) to supplement the ROM. Apple's iMac and the blue & white G3 computers use Firmware updates.

Flashing "?" Disk Screen
This grey screen with a disk and a flashing question mark on it, immediately appears when the computer cannot find a valid System Folder to boot from. Macs can boot from; floppy disks, CD-ROMs or hard disks. Sometimes, even when you have inserted a bootable disk into the Mac, it may reject it, and still show the flashing question mark screen - this means that the disk you inserted is also invalid or non-bootable for your model of Macintosh. It may have a System folder on the disk, but the computer doesn't recognise it, because the System folder itself isn't been "blessed" with the normal System folder icon - this is because there is no recognisable Finder and/or System file in it.

Flashing "X" Disk Screen
This grey screen with a disk and a flashing "X" on it, immediately appears when the computer tries to boot from an invalid System Folder. An invalid System, is one that was created for a different model of Macintosh - you see, each System file is built (during the installation process) specifically for that particular Macintosh, and cannot work on a different make of Mac. Or, that System is so corrupted that it is now invalid, as a bootable volume.

Forks
This term refers to the Resource and Data Forks, these make up all Mac files. Most files comprise of 2 forks, however each fork is stored on disk as individual files. You will not be able to see them ordinarily in MacOS, unless you use a file editor, such as ResEdit.
   The Resource Fork contains program code and graphics, and icons, while the Data Fork contains any data, text or graphics for documents.

Happy Mac Screen
This screen always appears right at the beginning of the System startup. It is a grey screen with a little pic of a smiling Classic Macintosh in the center. This indicates that all is well with the Mac (computer diagnostics are Ok, and the System Folder is OK) - in emulation, all this means is that emulation is give a green light for booting up. Whether it does is a different matter!

Hard Disk Driver
Is the bit of information stored in the Rigid Disk Block, on a hard disk - all Mac hard disk formatting programs create this so called "driver" when it initialises the disk.

   You can see which driver has been used for any disk, by highlighting the hard disk icon and pressing Amiga+i, for the Get Info window. Look in the "Where" field, and it will give some details of where the disk is on the SCSI or IDE chain and the version of the driver that was used. In emulation, the main boot disk is called an AmigaDevice or AmigaFileDisk.

HFS & HFS+ (Hierarchical Filing System)
HFS/HFS+ is the Macintosh's only, filing system for hard disks. HFS Standard, as Apple likes to call it, was originally created for small (20 to 500mb) hard disks, and is limited by the number of blocks it can have on any partition. Meanwhile, HFS+/HFS Extended, is an improved version, allowing smaller block sizes for very large hard disks (1gig upwards), performance increase and better error handling.

Hypercard
Is rather like the AmigaGuide file, except Hypercard docs can contain pictures. However you need a Hypercard viewer or the Hypercard program to view them.

INITs
Stands for System extension, a loadable file during bootup. It could either be an Extension or Control Panel, since these are the only types of files that are loaded whenever you boot a Macintosh.

Initialise
This term refers to high level formatting of a hard disk, usually via the Finder or utility.

LocalTalk
Is a network port on real Macintosh computers, it is used for linking Macs together.

LUN
Stands for Logical Unit Number - it is a number used to uniquely identify and address a subsystem of a SCSI device. Usually it is not necessary to set the LUN, since most SCSI devices are single units. A SCSI peripheral that has LUNs are optical disk/CD-ROM jukeboxes, and mutliple custom hard disk tower RAID systems, all these have many drives in a single case.

MacBinary
Is an archive file type, but with no compression. It is similar to HQX, except that it is not ASCII encoded, instead it combines the two forks (resource & data) into one file. This makes the Mac file safe from corruption when it is transfered over to alien filing systems, ie. PC or Amiga formats.

MacOS
Stands for "Macintosh Operating System", ie. System 7.5 or System 8.1.

Open Transport
Supersedes the AppleTalk standard, it is much faster, and allows you to use different types of network protocols. It will allow you to change from one network to another, very quickly, and it allows you to use different types of network, simultaneously.

NU-Bus
Is an old expansion slot type, used in all 68k Macs and some early PowerPC Macs.

PC Exchange
Is a control panel that helps you to mount any PC formatted floppy disk (high density or 720mb double density disks only) and any PC SCSI removable hard disk, ie. CD & Zip disks, via the Options button.

   It also creates Mac icons for PC files with a 3 character extension. It can only do this if you setup PC Exchange to associate a Mac file type with the correct PC file naming convention, ie. GRAPHIC.TIF, means that this is a TIFF file, therefore you can use any Mac image handling

program. If it is a specific file type, ie. an Excel document, then you associate it with your Mac version, eg. Macintosh Excel.

PC Exchange already shows you an example in its window, .TXT = Simpletext = TEXT.

PICT
PICT is Apple's standard image file format. It is capable of holding 2-24bit colour pictures, as either bitmap or outline graphics (object orientated drawings).

Power Macintosh
Refers to the PowerPC (PPC) range of Macintoshs, that are currently being sold today. PowerPCs are RISC (Reduced Instruction Set Computer) based CPUs, these are capable of extremely high speeds.

PPD
Stands for Postscript Printer Description file, this can only be used with Postscript printer drivers, such as Laserwriter 8. They usually live in the Printer Descriptions folder, in the System: Extensions folder.

PRAM
Stands for Parameter RAM - this a tiny bit of memory that stores vital information, when you shutdown the Mac, ie. the Startup Disk Control Panel setup and some other bits of info the System needs. Sometimes, this memory gets corrupted, so what you do is, you "zap the PRAM" - delete it's contents by a keyboard combination, see Keyboard Shortcuts on page 90, for more info.

RAID
RAID stands for Redundant Array of Independent Disks. It is a way of linking several drives together so that they behaved and appeared as one large capacity drive.

There are a few options for setting up a RAID array. The two most common (range from RAID0 to RAID5) options are RAID Level 0 (Striping) and RAID Level 1 (Mirroring).

Striping increases data throughput to and from the member drives, by using all the drives to split up the file over all member drives.

Mirroring uses dedicated hard disk members to simultaneously write files to both disks, basically making a backup of the main server RAID disk.

To find out more on RAID technology, there is a FAQ on FWB's web site: www.fwb.com.

Sad Mac Screen
When you have a very hard crash, or something on the SCSI chain is not co-operating with the Mac, this screen will appear right at the beginning of the start-up proceedure. The screen will be black, with two lines of white hexadecimal code under a little pic of a classic Mac with it's eyes crossed and mouth turned down, in the center of the screen. This hex code is produced by a real Mac's internal diagnostic routines, should something in hardware prove fatal. However this will never happen in emulation, simply because Amigas have a totally different hardware design, and therefore cannot be diagnosed, and so this is skipped in emulation.

Screen Font
A screen font is a bitmap image of a font at a particular size (usually 9,10,12,14,18,24). These files normally live inside a Suitcase, along with other styles of that specific font family, ie. roman, italic, bold or bold-italic.

SCSI
Small Computer System Interfaces - is an industry standard interface for plugging in many peripherals onto a single computer, by daisy chaining them. There are currently three versions: SCSI1, SCSI2 & SCSI3 - and some very fast off-shoots: Wide SCSI, Ultra SCSI & Ultra Wide SCSI.

SMIs (Self Mounting Images)
SMIs are really a special kind of disk image, it always has a application with a filename prefix of ".smi", this program will load all the "parts" and merge them together to create a fully accessible "virtual" disk on your desktop.

Stuffit
Stuffit is probably the most common compression type on Macs at the moment. It is commercially available as Stuffit Deluxe, also appears on the internet as a shareware program called Stuffit Lite. All Stuffit files appear with a 3 character dot extension ".sit".

Suitcase
Is a special type of folder, which only allows one type of system resource to be stored in them, such as screen fonts (including Truetype), keyboard layouts, sounds and desk accessory files.

System Bomb
Refers to a Mac system error message, because it shows a little bomb with a lit fuse next to the message. The Macintosh is also famous for giving very uninformative error messages, ie. "An Error of Type -11 has occurred!".

System File
This looks like a suitcase file, but in actual fact it contains the Operating System resources (libraries, drivers, generic icons, program code etc.) needed for your particular Mac to work.

The System Folder
Contains all the elements that the MacOS needs to operate correctly. You could take out all of the folders and extraneus files in the folder if you like, except the System, Finder and any System Enabler files, and it will still work.
  Usually this folder contains: the System file, the Finder program, Extensions folder, Control Panels Preferences folder, Startup Items Folder, Shutdown folder by default.

TrueType
Was introduced by Apple in 1990, just before System 7 was made available, it is a scalable font format that can be used at the System-wide level, and is mainly used for display and printing purposes. The only pratical difference between TrueType and Postscript fonts, is that you cannot print Truetype fonts that have been rotated or have any special effects applied to them.

Type 1 Fonts
Are postscript outline font files, based on Adobe's Type1 format.