
Contents

Chapter 1. iMac

Contents	1-2
Architecture	1-3
iMac Boards	1-4
Features 1-5	1-5
Video Features	1-6
System Software	1-7
Technologies	1-8
Open Firmware Booting	1-9
Open Firmware 3.0	1-10
3D Graphics	1-11
Mezzanine expansion slot	1-12
Connections	1-13
USB	1-14
56K Modem	1-15
Infra Red	1-16
Support Items	1-17
System Installation	1-18
Software Updates	1-19
Software Updates Table	1-21
Internet Connections	1-22
Support items	1-23
Support Notices	1-24
Service Items	1-25
Memory Expansion	1-26
POST and resetting	1-27
Power	1-28
MacTest Pro	1-29
USB Mouse	1-30
Service Notices	1-31
Disassembly	1-33
iMac Logic Board	1-34
Tools	1-35
Procedures	1-36
Display Adjustment	1-37
References on the Internet	1-39

Chapter 2. PowerBook G3 Series

Contents	2-2
Architecture	2-3
Boards and Cards	2-4
Features	2-5
Features (cont)	2-6
System Bus – definition	2-7
Bus Speeds	2-8
System Software	2-9
Keyboard	2-10
Technologies	2-11
Expansion Media Bays	2-12
DVD Video Kit	2-13
Video	2-14
Infra Red	2-15
56K Modem	2-16
Power Management	2-17
Support Items	2-18
Mac OS 8.5	2-19
Disk Drives	2-20
Software Updates	2-21
Support Notices	2-23
Service Items	2-24
Authorization	2-25
Memory Expansion	2-26
MacTest Pro	2-27
Warranty for Displays	2-28
Disassembly	2-29
Tools	2-30
Special Procedures	2-31
Top Case Assembly	2-32
Identification of Circuit boards	2-33
Service Notices	2-34
References on the Internet	2-35

Chapter 3. Power Mac G3

Contents	3-2
Architecture	3-3
Logic Board	3-4
Technologies	3-5
Open Firmware Booting	3-6
Open Firmware	3-7
Open Firmware Exercise	3-8
64 bit PCI	3-9
66 MHz PCI	3-10
USB	3-11
FireWire (IEEE 1394, iLink)	3-12
Ultra ATA	3-13
Ultra2 SCSI	3-14
SCSI Connectors	3-15
Ultra SCSI Cards	3-16
Single Ended - Differential SCSI	3-17
SCSI Termination	3-18
3D Graphics	3-19
ATI 3D RAGE 128 GL card	3-20
Fast Ethernet	3-21
Support Items	3-22
System Software	3-23
Support Issues	3-24
Software updates	3-26
Service Items	3-27
Expansion Slots	3-28
Memory Expansion	3-29
Logic Board	3-30
Logic Board LEDs	3-31
Processor Module	3-32
Disassembly	3-33
References on the Internet	3-34

Chapter 4. Mac OS 8.5.1

Agenda	4-2
Newworld	4-3
Mac OS 8.5 and 8.5.1 New features	4-5
Mac OS 8.5 Requirements	4-6
New features	4-7
Application Switcher	4-8
Appearance Manager 1.1	4-10
Apple System Profiler 2.1.1	4-11
AppleScript 1.3	4-13
ColorSync 2.6	4-15
Date & Time 8.1	4-17
Disk First Aid 8.5.1	4-18
Drive Setup 1.6	4-20
Energy Saver 2.1	4-21
File Exchange 3.0	4-22
Sherlock (Find)	4-24
Finder 8.5	4-26
Internet Control Panel 1.0	4-29
Mac OS Help	4-30
Mac OS Install	4-31
Navigation Services 1.1	4-33
Network Browser 1.0	4-34
Memory Control Panel	4-35
Mac OS 8.5.1 Update	4-36
Support Items	4-37

Chapter 5. Mac OS X Server

Key Features	5-2
Robust Core Operating System	5-3
Industry-leading web server	5-4
Powerful application server	5-5
Macintosh Workgroup Management	5-6
Scalable file services	5-7
Support Items	5-8
File System Performance	5-9
QuickTime Technology on Mac OS X	5-11
NetBooting	5-12
Directory structure	5-13
File and path names	5-14
Mac OS X	5-15

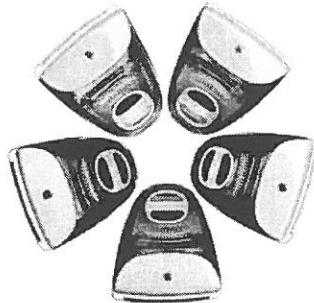
Chapter 6. Network & Communications

Contents	6-2
AppleShare IP new features	6-3
AppleShare IP and SMB support	6-4
Connecting PC's to AppleShare IP	6-5
BootP and DHCP	6-7
iMac Printers	6-8
iMac Modems	6-9
Fast Ethernet Hub Rules	6-10
Gigabit Ethernet	6-11
System Profiler version 2.1.2	6-12

Chapter 7. Studio Displays

Apple Studio Display Rev B	7-2
Overview	7-3
Install & Use	7-5
Manual Controls/On-Screen Display	7-7
Using Apple Display Software	7-8
Tracking	7-9
Issues	7-10
Studio Display 17"	7-14
Overview	7-15
External features	7-17
Serial Number	7-18
Controls	7-19
Install & Use	7-20
Using Apple Display Software	7-22
On Screen Display	7-23
Support	7-24
Apple Studio Display 21"	7-28
Overview	7-29
User Controls	7-31
Install & Use	7-32
Using the Apple Display Software	7-33
Geometry adjustment	7-34
Color adjustments	7-35
DigitalColor Meter	7-36
Support	7-37
Diagnostic adjustments	7-38
Adjust Geometry	7-39
ColorSync 2.5	7-42
ColorSync 2.6	7-43

ACSE Update 1999 iMac



iMac.
It comes in colors.

1

Notes

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Contents

- Architecture
- Technologies
- Support Items
- Service Items
- Disassembly

2

Notes

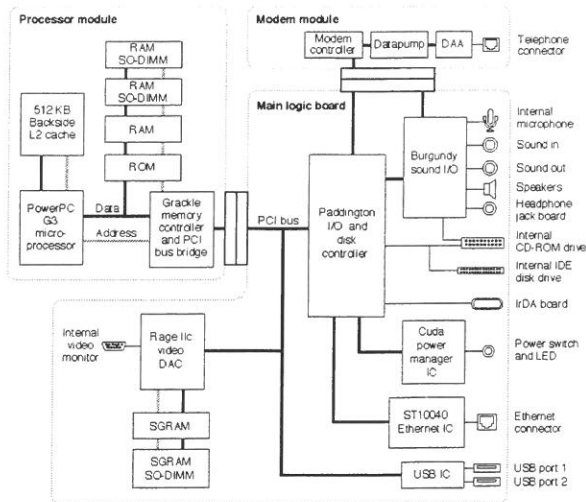
Architecture

In this chapter we will discuss

- the hardware architecture of the iMac
- the main features and specifications of the iMac
- the version of System Software needed for the iMac

Architecture

- G3
- PCI bus



Notes

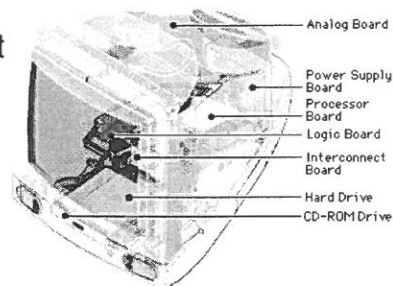
The Apple iMac computer is a new consumer-oriented desktop computer. This chapter summarizes the features of this new computer and points out issues affecting compatibility.

Features of revision A

- **Processor:** the iMac has a PowerPC G3 microprocessor running at a clock speed of 233 MHz.
- **Cache:** the iMac has a backside L2 cache consisting of 512 KB of fast static RAM. The clock speed of the backside cache is half the clock speed of the microprocessor.
- **Memory:** the iMac has two standard SO-DIMM expansion slots for SDRAM modules. The computer comes with 32 MB of SDRAM installed. RAM is expandable up to a total of 128 MB with currently available memory devices.
- **Hard disk storage:** the iMac has a built-in hard disk drive with a capacity of 4 GB.
- **CD-ROM drive:** the iMac has a built-in CD-ROM drive with 24X speed.
- **Display:** the iMac has a built-in 15-inch color monitor (13.8-inch viewable diagonal), capable of displaying the following resolutions: 640 x 480, 800 x 600, and 1024 x 768 pixels.
- **Video RAM:** the iMac comes with 2 MB of video SGRAM, which supports millions of colors at resolutions up to 800 x 600 pixels and thousands of colors at a resolution of 1024 x 768 pixels. The computer has one expansion slot for a second 2 or 4 MB SGRAM DIMM, which allows the computer to display millions of colors at a resolution of 1024 x 768 pixels.
- **Graphics acceleration:** the video circuits with ATI Rage IIC IC provide built-in 2D and 3D acceleration.
- **USB ports:** the computer has two USB ports for keyboard, mouse, and other USB devices.

iMac Boards

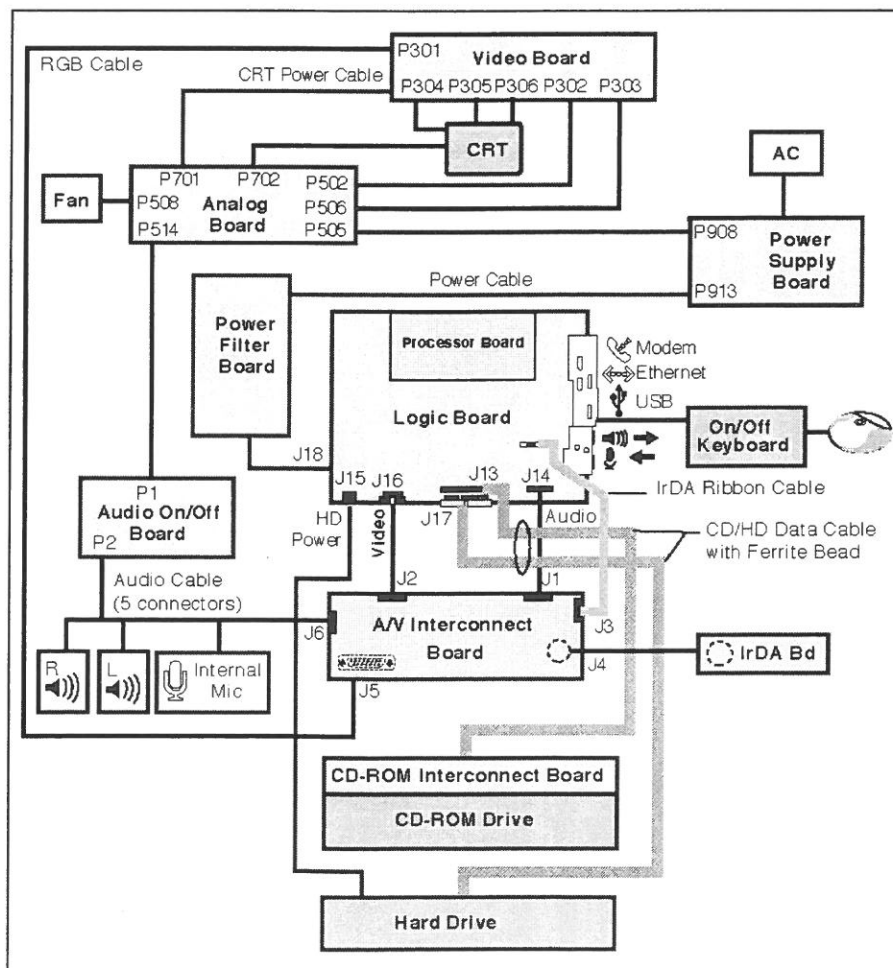
- Logic Board
- Processor Board
- Analog Board
- Audio/Video Interconnect



4

Notes

Block Diagram taken from Service Source with numbers available on the logic board.



Features

- 233 or 266 MHz PowerPC 750
- 512 KB Backside L2 Cache
- 32 MB RAM
- 4 GB (rev. A/B) or 6 GB (rev. C) Hard Drive
- USB

5

Notes

Features (continued)

- Modem: the computer has a built-in modem with 56 Kbps data rate.
- Ethernet: the computer has a built-in Ethernet port for 10Base-T and 100Base-TX operation with an RJ-45 connector.
- Infrared link: the computer has an IrDA infrared link capable of transferring data at up to 4 Mbits per second.
- Sound: the computer has a built-in microphone and two stereo speakers as well as line-level stereo input and output jacks and two stereo headphone jacks.
- Keyboard: the Apple USB keyboard is a new design that functions as a USB device. The keyboard includes function keys and inverted-T cursor motion keys. It also doubles as a bus-powered USB hub with two USB ports.
- Mouse: the Apple USB mouse is a new design that functions as a USB device
- Size and weight: the iMac is 39.5 cm (15.8 inches) high, 38.0 cm (15.2 inches) wide, and 44.0 cm (17.6 inches) deep; it weighs 17.3 kg (38.1 pounds).

iMac 266

iMac 266MHz is the third revision of the iMac product line. It features:

- a 266MHz processor card.
- 6Gb IDE Hard Drive.
- 5 colors (Grape, Blueberry, Strawberry, Lime, Tangerine).
- The IrDa card has been removed.
- It ships with Mac OS 8.5.1.
- Drivers for IOmega USB ZIP drive and Imation SuperDrive are preinstalled.
- Games Sprockets games controller is preinstalled.
- The MDK game is no longer in the bundle.
- The Mezzanine slot has been removed from the logic board.

Video Features

- Revision A
 - ATI Rage IIc (2MB, upgradable to 6 MB)
 - Mac OS 8.1
- Revision B/C
 - ATI Rage Pro Turbo (6MB, not upgradable)
 - Mac OS 8.5/8.5.1
- 3D acceleration if VRAM is 6 MB



6

Notes

More information

ATI info at <http://www.atitech.com/technology/hardware/chiptech.html>

<http://til.info.apple.com/techinfo.nsf/artnum/n58166> (differences between rev. A and B)

<http://www.info.apple.com/info.apple.com/te/training/overviewimac/Overview/overview1.html> (Overview (part of online training) of all iMac revisions.)

The Rev. B iMac comes loaded with Mac OS 8.5, and the ATI Rage Pro Turbo graphics controller with 6MB of video RAM for increased graphics performance. Adobe PageMill 3.0 has been added, allowing you to easily create and manage you own Internet web pages.

The following table compares the two iMac models:

iMac	M6709LL/A	M6709LL/B
System Software	Mac OS 8.1	Mac OS 8.5
Graphics Controller	ATI Rage IIc	ATI Rage Pro
Reset Procedure	Reset Button on Side	Front Power Button
Modem Firmware	2.1	2.2
Standard SGRAM	2 MB Built-in	2 MB Built-in + 4 MB DIMM
Maximum RAM Supported	128MB	256MB

System Software

- Mac OS 8.1
 - iMac System Enabler 462
- Mac OS 8.5.x
- ROM is loaded into RAM
 - RAM is faster than ROM
 - System Software takes ~3 MB more memory



Notes

System Software

The iMac has newly designed system software that provides Open Firmware booting and Mac OS ROM in RAM.

The Apple iMac computer is different from previous Macintosh computers in that it has no single, large ROM that contains the toolbox software, the 68K emulator, hardware initialization, and the nanokernel. A small ROM provides hardware initialization functions and provides a mechanism for loading the Mac OS Toolbox ROM image into RAM. The new software architecture that is centered around ROM-in-RAM and its ramifications has been given the code name NewWorld.

Hardware-specific code that executes the computer's start-up activities resides in firmware (ROM). This code is fitted onto one ROM called the Boot ROM. The Boot ROM includes the hardware-specific code and tables needed to start up the computer, to load an OS, and to provide common hardware access services. All higher level software resides somewhere else. For now, think of it residing in what has historically been known as the Mac OS ToolBox ROM, but with much of the old hardware-specific code moved into the Boot ROM. As before, the ToolBox ROM can still be augmented by Enablers, the System file, and extensions.

Prior to the iMac, all Macintosh computers required a ROM component that contained the Mac OS Toolbox software. The NewWorld approach sidesteps this requirement by copying an image of the Mac OS ToolBox into RAM before the Mac OS begins operation. The area of RAM that contains the ToolBox image is excluded from the available memory space in RAM, and is marked as read-only. Once the Mac OS begins to operate, a ToolBox image in RAM and an actual ToolBox ROM behave in the same way.

The ToolBox ROM image is contained in a new file, named "Mac OS ROM", that is stored in the System Folder. The ToolBox ROM image is exactly the same as it would be if it were an actual ToolBox ROM, containing the ToolBox software, the kernel software, and the 68K emulator.

More information

http://developer.apple.com/techpubs/hardware/Developer_Notes/Macintosh_CPUs-G3/iMac/iMac_frame_set.htm



Technologies

Notes

Technologies

In this chapter we will discuss:

- Open Firmware booting
- 3D Graphics
- Mezzanine expansion slot
- Connections
 - USB
 - 56K Modem
 - Infra Red

Open Firmware Booting



Mac OS ROM

- Old ROM is now split into two parts:
 - Boot ROM (~1MB)
 - Mac OS ROM file in System Folder (~3 MB)
- Open Firmware
 - 'Mini OS' for initializing the Mac, independent of the OS to be loaded
 - Device Tree

```
Open Firmware, 1.0.5
To continue booting the Mac OS type:
BYE<return>
To continue booting from the default boot device type:
BOOT<return>
ok
```

9

Notes

Open Firmware: Definitions

Open Firmware is the process that controls the microprocessor after hardware initialization and diagnostics have been performed, but before control is passed to the main Operating System. Among other things, it is responsible for building the device tree and probing the expansion slots for I/O devices. Open Firmware queries PCI devices for their address space needs and dynamically assigns this space to each device. It is during this probing process that each device and motherboard ASIC is given a node in the device tree. Open Firmware drivers are special device drivers that operate in the Open Firmware pre-boot environment, and, unlike most drivers, are processor-independent, which means that they will work with any type of CPU—Intel, PowerPC, Alpha, SPARC—provided the host computer supports Open Firmware.

Nodes, which are also called **packages**, contain **properties** and **methods**. Properties are attributes that describe the hardware and driver. **Methods** work in much the same way as subroutines or procedures. The hardware and software engineer can use the Open Firmware user interface to debug their devices and drivers respectively. See *Technote 1044, Understanding PCI Expansion Choices for Mac OS 8, Part III of the Open Firmware Technote Series*, for details about properties and methods for various devices.

Forth is the human interface language to Open Firmware and the device tree. If you're a board designer, you'll want to read and write registers on your device directly, and, therefore, must be able to move through all of the device tree and to insert and delete words, etc. The driver writer has similar needs and must also build an **FCode** representation of the driver properties and methods. If the device contains a boot driver, that driver must be debugged with the Open Firmware user interface.

A **boot driver** is written in Forth, then tokenized into FCode and debugged from the interface. This form of driver is used during the earliest stages of the boot process before an operating system is available. Typical boot drivers are display, keyboard, network, and block drivers, but are not limited to these.

The Open Firmware user interface, therefore, as specified by the **IEEE1275-1994 Specification**, is required to allow board designers and driver writers access to their hardware and software to build and debug their expansion device project.

More Information

Technotes: <http://developer.apple.com/technotes/tn/tn1044.html> , [tn1062.html](http://developer.apple.com/technotes/tn/tn1062.html) and [tn1061.html](http://developer.apple.com/technotes/tn/tn1061.html)

Open Firmware Home page: <http://playground.sun.com/1275/home.html>

Open Firmware user guide: <http://www.linuxppc.org/userguide/of.html>

Open Firmware 3.0

- Used since PCI PowerMac
- CHRP compliant (3.0)
- Boot process iMac
 - POST
 - Open Firmware, device tree
 - Toolbox ROM image file, PRAM into reserved RAM
 - Start nanokernel
 - Start 68K emulator
 - Boot Mac OS

10

Notes

NewWorld Boot Process 5

The following is a high-level overview of the execution path take when a NewWorld-based computer boots.

1. The POST code runs (preliminary diagnostics, boot beep, initialization, and setup), with possible intervention in the Mini Nub.
2. Open Firmware initializes and begins execution, including the building of the device tree and the interrupt trees;
3. Open Firmware loads the Toolbox image file, based on defaults and NV-RAM settings;
4. Open Firmware executes the Forth script in the bootinfo file, which contains instructions to read both the Trampoline code and the compressed ToolBox ROM Image and give them a temporary place in memory;
5. The Forth script transfers control to the Trampoline code, which functions as the transition between Open Firmware and the start of the Mac OS execution;
6. The Trampoline code decompresses the ToolBox ROM Image, gathers information about the system from Open Firmware, creates data structures based on this information, terminates Open Firmware, and rearranges the contents of memory to an interim location in physical memory space;
7. The Trampoline code transfers control to the HardwareInit routine in the ToolBox ROM Image;
8. The HardwareInit routine copies data structures to their correct places in memory, and then calls the NanoKernel;
9. The NanoKernel fills in its data structures and then calls the 68K Emulator;
10. The 68K Emulator initializes itself, then transfers control to the startup initialization code;
11. The startup initialization code begins execution, initializing data structures and Managers and booting the Mac OS.

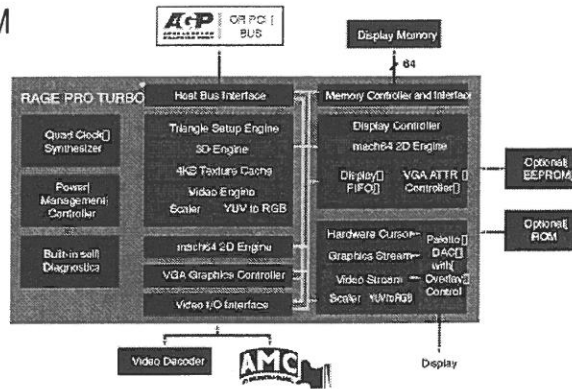
All functions found in the old ToolBox ROM are present in the NewWorld boot process, but occur at different times and places. To accomplish this, the code in the ToolBox ROM Image and POST is simplified, while the Trampoline code addresses the new functionality.

More Information

http://service.info.apple.com/secure/technical.resources/training/service_imac/Support/support5.html

3D Graphics

- QuickDraw 3D acceleration
- Used by games, not by the Finder
- 6 MB VRAM



Notes

3D Graphics acceleration

If the Video Memory is 6MB, 3D acceleration is turned on automatically.

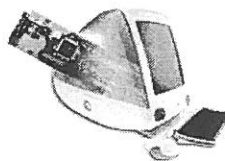
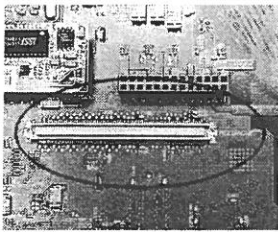
Increasing the size of the installed video RAM from 2 MB to 4 or 6 MB increases the maximum color depth available at the highest monitor resolutions. Any additional video RAM that is not used for the current display mode is available to QuickDraw 3D applications for more data storage (such as textures), which results in faster 3D graphics performance. A more detailed explanation of video RAM and QuickDraw 3D graphics performance can be found in Chapter 5 of the Power Macintosh 5500/6500 Developer Note, where the use of the video frame buffer for front frame buffer, back frame buffer, optional Z buffer, and available texture memory are described.

More Information

<http://www.atitech.com/technology/hardware/chiptech.html>: ATI Chip technology

Mezzanine expansion slot

- Similar to personality slot in desktop G3?
- Not the PC Mezzanine technology
- iPowerRAID card from Formac adds SCSI
- *No longer in iMac 266*



12

Notes

iMac secret slot unmasked By Cameron Crotty (MacWeek)

The iMac is a great little machine, but forget about expansion opportunities—unless you're Apple, that is. According to sources, Apple plans to use a slot labeled "Mezzanine" on the underside of the iMac's motherboard to expand the functionality of future iMacs.

The 160-pin slot—called a Perch slot internally at Apple—is located on the underside of the iMac's motherboard (see illustration), and sources say the slot is electrically identical to the personality slot found in desktop G3 Power Macintoshes. The personality slot is essentially a modified PCI slot and is suitable for high-bandwidth applications; Apple's latest use for the Power Mac personality slot is an MPEG-2 decoder card for watching DVD Video.

Buried as it is in the guts of the iMac, it's unlikely that the average consumer would accidentally discover the Perch slot. The only clue to the slot's existence is a blank space on the iMac's port panel where a hole has been cut in the case and then covered with a metal panel.

There is no mention of the slot in the iMac's developer tech notes; sources said that Apple has refused to disclose any information to curious developers. Furthermore, the company has reportedly warned expansion companies not to create products that used the Perch slot. When MacWEEK contacted Apple, a spokeswoman said that the slot was "intended for Apple's internal use," and that the port is not open for third-party development.

The Mezzanine label on the motherboard and the physical appearance of the slot has led some to speculate that the slot follows the PCI Mezzanine Card (PMC) specification. While the Perch slot uses the PCI electrical connections like PMC, the PMC standard specifies up to four separate 64-pin connectors. So the iMac Mezzanine slot is different

More information

<http://macweek.zdnet.com/1232/mezzanine.html>

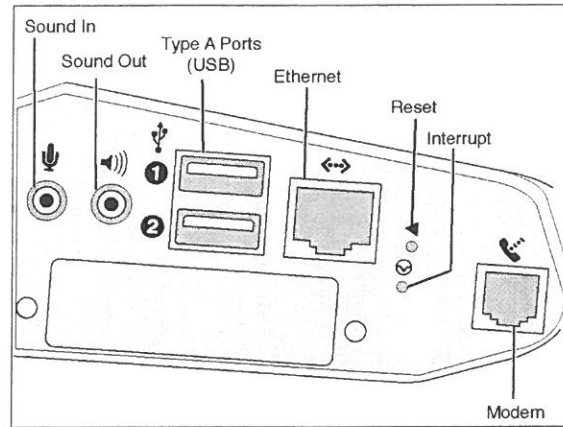
<http://www.vonktrading.nl/ipowerraid.html> (In Dutch)

<http://www.formac.com/francais/pages/stockage/Cipowerraid.HTML> (in French)

<http://www.macprof.com/imace/archives/imacemezz.html> (info from MacProf in Italy)

<http://til.info.apple.com/techinfo.nsf/artnum/n58210> : iMac 266 no mezzanine slot

Connections



13

Notes

Connections

The iMac has four interfaces for connecting other devices or computers:

- USB
- (Fast)Ethernet
- 56K modem port
- Infra Red

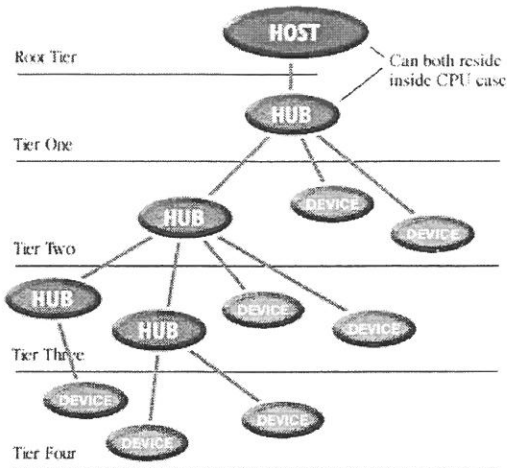
That means that some common Mac interfaces are NOT available in the standard configuration:

- SCSI
- Serial/Geoport/modem port
- ADB
- LocalTalk

Some third-party developers sell adaptor kits for these interfaces. Check the iMac web site for more information.

USB

- 12 Mbit/s (1.5)
- 127 devices
- Hot pluggable
- Max 5m & 5 hubs
- *Exercise below*



Notes

USB Connectivity Rules

These are the rules for USB connectivity:

- The maximum number of devices that can be connected to a single USB hub is 127 devices. (Note: A keyboard with a built-in trackball counts as two devices.)
- The maximum number of tiers allowed is six. This can be tricky to track sometimes, since hubs can be hidden in CPU cases, displays, keyboards, etc.
- Bus-powered hubs cannot be connected to bus-powered hubs due to power limitations. A keyboard with an internal hub is a good example of a bus-powered hub
- The maximum cable length allowed for 12 Mbps devices is 5 m, and this cable must be shielded. The maximum cable length allowed for 1.5 Mbps devices is 3 m; the cable is typically unshielded.

• More Information

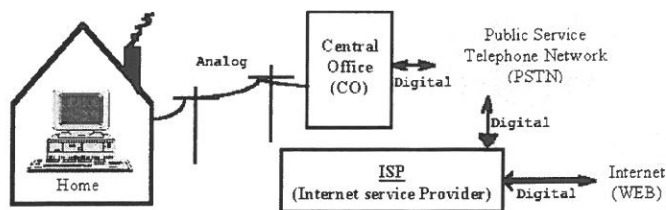
- <http://developer.apple.com/dev/usb/>

• Exercise

- **Required:** iMac or G3 B&W and a second USB keyboard, mouse, Studio Display 21, etc.
- **Purpose:** observing the hot pluggability of USB and learning that many devices have built-in hubs.
- 1 With the standard configuration, open the Apple System Profiler (ASP) to check USB devices.
- 2 Observe how the devices are connected to the master hub; also observe that the keyboard has a built-in hub.
- 3 Connect the second Keyboard and/or mouse to the first keyboard.
- 4 Notice that you can use it right away.
- 5 Check the USB device tree in ASP (use update devices and volumes menu) and observe the numbers and IDs of each device.
- 6 Disconnect the second keyboard and reconnect it to the second port on the back of the iMac.
- 7 Check the USB devices in ASP and observe the changes in the device tree and the numbers/IDs while all devices continue to function.

56K Modem

- 56Kbits/s max
- V.90 standard
 - V.90 includes 56Kflex and X2 technologies
- 56K only possible if ISP has appropriate technologies
 - V.34 script for better connections if ISP is not using 56K



Notes

Modem Overview

The iMac has an internal V.90 modem that supports K56flex and slower connections. The modem uses an internal hardware-based Digital Signal Processor. Apple provides V.90 protocols in the modem, giving you the maximum level of telecommunications compatibility. This modem has flashable ROMs for future upgrades.

The iMac's modem does not offer speakerphone capabilities but does allow you to send and receive faxes. FaxSTF software is included with the iMac to facilitate faxing. The iMac is incompatible with any current version of Apple Telecom software and the telecommunications software drivers that have been used with previous Macintosh computers. However, iMac is compatible with connectivity software such as AppleTalk Remote Access 3 or OT/PPP.

V.90

By viewing the public switched telephone network as a digital network, V.90 technology is able to accelerate data downstream from the Internet to your computer at speeds of up to 56Kbps *. Therefore, V.90 technology is different from other current standards, because it digitally encodes downstream data instead of modulating it as analog modems do. The data transfer is asymmetrical, so upstream transmissions (mostly keystroke and mouse commands from your computer to the central site, which require less bandwidth) continue to flow at the conventional rates of up to 33.6Kbps. In other words, upstream data (data sent from your modem) is sent as an analog transmission that mirrors the V.34 standard. Only the downstream data transfer takes advantage of the high speed V.90 rates.

Here is a list with the standards and a short description of each:

- V.90 - The official 56Kbps modem standard
- X2 - 3COM's proprietary 56Kbps modem standard
- K56flex - Rockwell's proprietary 56Kbps modem standard
- V.34+ - Official 33.6Kbps modem standard
- V.34 - Official 28.8Kbps modem standard

Do not confuse the above standards with other protocols such as V.42 and V.42bis. V.42 and V.42bis provide data compression and error correction for the modem signal. These protocols affect the quality of the connection, but not necessarily its speed.

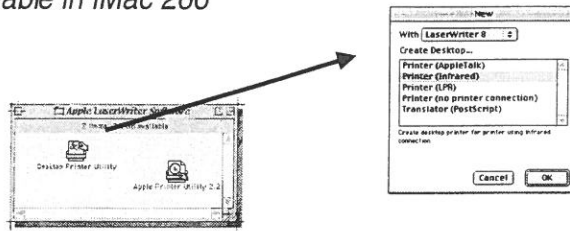
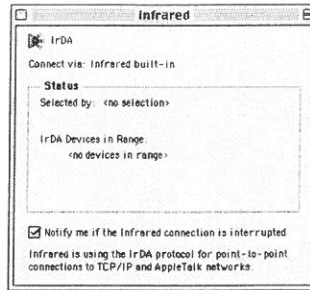
More Information

<http://www.v90.com/>

[http://til.info.apple.com/techinfo.nsf/artnum/n24482;56Kbps Modems: Getting The Fastest Connection](http://til.info.apple.com/techinfo.nsf/artnum/n24482;56Kbps%20Modems:Getting%20The%20Fastest%20Connection)

Infra Red

- IrDA 4 Mbit/s
- IRTalk NOT supported
- IR Printing
 - Use Desktop Printer Utility
- *Not available in iMac 266*



16

Notes

IR

For infrared options to work, there are three drivers that must be present in the Control Panels or Extensions folders:

- Infrared Control Panel
- IrDALib Extension
- IrLanScannerPPC Extension

The control panel and the extensions are usually installed by default. If they are not present or have been disabled, you will not be able to make infrared connections with a PowerBook.

More Information

<http://til.info.apple.com/techinfo.nsf/artnum/n20928> Macintosh Infra Red: is it IRDA compatible?

<http://til.info.apple.com/techinfo.nsf/artnum/n258012> iMac: Infra Red communications

<http://til.info.apple.com/techinfo.nsf/artnum/n30861> (PowerBook: Printing to an IrDA Printer)

<http://www.irda.org>

<http://til.info.apple.com/techinfo.nsf/artnum/n58209> iMac 266 no IrDA support



Support Items

Notes

Support Items

In this chapter we will discuss:

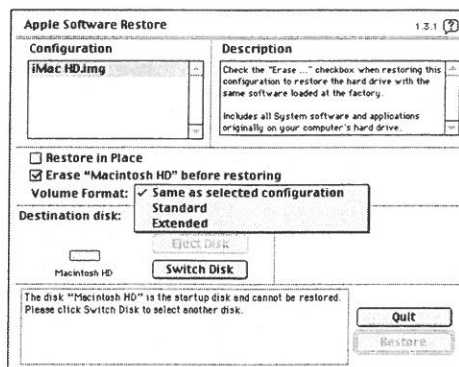
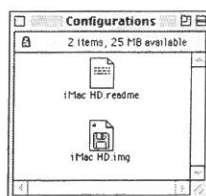
- System Software installations
- Software updates
- Internet connections
- Support Items
- Support notices

System Installation

- System Software CD
 - Separate installations possible
- iMac Restore CD
 - iMac HD image
 - Fast!!



Apple Software Restore



Notes

Apple Software Restoration

The iMac comes with two CDs that allow you to reinstall system software. Each CD is bootable.


- **iMac System Software CD** - This CD contains installation files that will reinstall the iMac version of the Mac OS. To reinstall the system software, use the Installer application and follow the standard Mac OS 8.1 installer procedures. Installers for utilities and bundled applications are also present on this CD.
- **iMac Restore CD** - The Restore CD contains an image of the iMac hard disk as it was shipped to you. A utility called Apple Software Restore allows you to restore the hard disk to that configuration. The Restore utility has a number of options to control any formatting of the hard disk and the saving of data and applications before the Restore utility is used. Read the Restoring iMac Software text file to understand how to prevent accidental data loss.

To restore the iMac hard disk:

- Start the system with the Restore CD in the CD drive while pressing and holding down the C key. This action causes the computer to boot from the CD-ROM instead of the hard disk. You will see that the CD icon is then located above the hard disk icon on the desktop in the Finder.
- Double-click on the CD icon and double-click on the Apple Software Restore icon (as shown on the slide).
- Finally, there is a folder on the Restore CD called Configurations. This folder contains a disk image file which includes all the iMac's software that the Apple Software Restore utility copies to the hard disk during restoration.

Software Updates

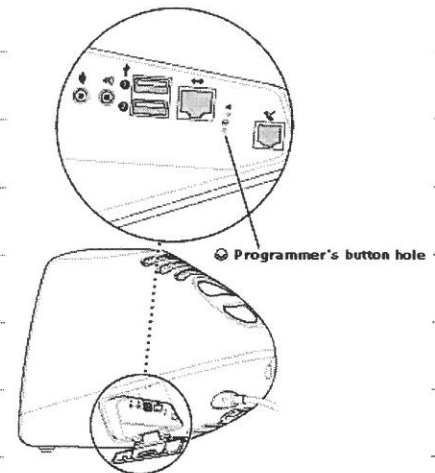
- iMac Firmware Update
 - Already installed in rev. C
 - Rev. B : press interrupt button with paperclip while restarting
- iMac Update 1.1
 - Updates Mac OS ROM file
 - Improves USB support for 8.5
 - Included in rev. C (8.5.1)

 Your iMac's firmware needs to be updated. Click Update to restart your iMac and update its firmware. A progress bar will appear at the bottom of the screen as the update takes place. After your iMac starts up, the PRAM is reset and you may need to reset some of your iMac preferences. (For more information, see Mac OS Help.)

Cancel Update

<p>▼ Production information</p> <p>ROM revision: \$77D.44F1 Boot ROM version: 3.0.f8 Mac OS ROM file version: 1.1 Serial number: SG8348EUDFN Software bundle: Not applicable</p> <p>Mac OS 8.1, no update</p>	<p>▼ Production information</p> <p>ROM revision: \$77D.44F3 Boot ROM version: 3.0.f3 Mac OS ROM file version: 1.1.2 Serial number: SG8358LEDNFN Software bundle: Not applicable</p> <p>Mac OS 8.5.1, firmware update, iMac Update 1.1</p>
---	---

19



Notes

iMac Firmware Update

The iMac Firmware Update should be installed on all iMacs to prevent problems when starting up the computer. To upgrade iMac firmware, read the instructions in the Read me file.

Note: After you upgrade the firmware, the PRAM is reset and you may need to reset some of your iMac preferences. On some iMacs, you need to press the Interrupt button (the lower hole) with a paperclip while restarting.

iMac Update 1.1

Based on customer and developer feedback, Apple has made improvements to its USB software for iMac customers. The iMac Update 1.1 includes these new improvements and those previously released in iMac Update 1.0. This update improves the iMac's ability to identify USB devices when starting up, improves the startup time when many USB devices are connected, and enables new USB solutions. You don't have to install iMac Update 1.0 before you install iMac Update 1.1.

Who needs the iMac Update?

Apple recommends that every iMac (rev. A/B) customer install this update. Only iMac customers that use additional USB devices, other than the Apple USB keyboard and Apple USB mouse included with their iMac, are likely to notice the USB improvements after installation. The iMac Update 1.1 will replace the Mac OS ROM file in the System Folder with an updated version.

Before you install:

- Your iMac must have Mac OS 8.5 or later already installed.
- The iMac Firmware Update must be installed.

If you haven't installed the iMac Firmware Update, the iMac Update 1.1 will not install.

Check the result with ASP 2.1.2

Using Apple System Profiler 2.12 you can see the differences between the updates (screenshots at the bottom of the slide).

Software Updates

- iMac CD Update
 - Solves vibration issue
- Z-Modem Update 1.3
 - Superseded by Modem Updater 1.3.5

20

Notes

iMac CD Firmware Update 1.0

The iMac CD Firmware Update reduces the amount of vibration caused by certain CDs in the internal CD-ROM drive.

Modem update

See relevant pages of Internet connections.

Software Updates Table

Update Name	Required for				Localized version of update required for localized Mac OS	Notes
	Rev. A iMac running MacOS 8.1 (M6709x/A)	Rev. A iMac upgraded to MacOS 8.5 (M6709x/A)	Rev. B iMac	1999 iMac 266 (Colors)		
iMac Update 1.0	Yes	No	No	No	Yes	1
iMac v.34 Only Modem Script	Perhaps	Perhaps	No	No	No	2
Apple Modem Updater 1.3.5 or Z-1.3	Yes	Yes	Perhaps	No	Yes	3
iMac CD Update	Yes	Yes	Perhaps	No	No	4
Mac OS 8.5.1 Update	No	Yes	Yes	No	Yes	5
iMac Firmware Update	Yes	Yes	Yes	No	No(8)	6
iMac Update 1.1	No	Yes	Yes	No	Yes(8)	7,9

21

Notes

Notes

1. The contents of the iMac update 1.0 have been incorporated into Mac OS 8.5. You will not need to install this update on any M6709x/B (Rev. B) iMac, or on any original iMac which has been upgraded to Mac OS 8.5 in any language.
2. This file is only needed if you are having difficulty making and maintaining modem connections. It is installed by the Mac OS 8.5 that ships with the Rev. B iMac. It is not part of the retail Mac OS 8.5 package.
3. In early versions of the Rev. B iMac, the modem did not have the version 2.2 firmware installed. Because of this, you should run the modem updater located in the CD Extras folder of the System Software CD bundled with iMac.
4. This is similar to Note 3 above. Early versions of the Rev. B iMac CD-ROM drives will not have the firmware update installed. The iMac CD Update needs to be downloaded from the **Apple Software Updates** site and is not on any CD that ships with the updated iMac.
5. Apple recommends all Mac OS 8.5 owners install this update.
6. Apple recommends all iMac owners install this update.
7. Customers outside the United States should use the localized version of the update to ensure proper operation.
8. Localized versions of the installation instructions are available. Check Apple Software updates for availability.
9. The iMac Update 1.1 requires Mac OS 8.5 or 8.5.1 and that the iMac Firmware Update has been installed. **If you have an original iMac running Mac OS 8.1, you cannot use the iMac Update 1.1.**

More Information

<http://til.info.apple.com/techinfo.nsf/artnum/n58174> iMac: When to Install Available Updaters.

Internet Connections

- Remote Access
 - Replaces PPP
- iMac V.34 modem script
 - 33k6 max; may solve connection issues
- Modem Updater Z-1.3
 - Better V.90 support
 - 1.3: Z, US, GE, UK, F versions
 - 1.3.5 for US only
 - iMac and Pwb G3 Series
- Special Internet Setup Assistant

22

Notes

Modem Updater 1.3

The Apple Modem Updater will update the modem in the iMac as well as the modem in the PowerBook G3 Series (both the K56flex-only modem shipping in earlier PowerBook G3 Series and the V.90 compliant modem currently shipping in the PowerBook G3 Series). The updater installs version 2.2 of the Rockwell firmware which contains the latest versions of both the V.90 and the K56flex protocols. The modems can use either the K56flex or V.90 protocols and will automatically negotiate with the service provider to use the appropriate one.

Modem Updater 1.3.5 (US Only)

The Apple Modem Updater will update all modems in the iMac and the PowerBook G3 Series computers (both the K56flex-only modem shipping in earlier PowerBook G3 Series and the V.90 compliant modem currently shipping in the PowerBook G3 Series). The updater installs version 2.2 of the Rockwell firmware which contains the latest versions of both the V.90 and the K56flex protocols. The modems can use either the K56flex or V.90 protocols and will automatically negotiate with the service provider to use the appropriate one. The modem scripts have been revised to properly reflect the new V.90 connection speeds, and to resolve a European blind dialing issue. This software bundle contains: new modem firmware for the internal 56K modem, new modem scripts (CCL's), new PowerBook G3 Series Modem extension. The new PowerBook G3 Series Modem extension resolves several known issues. These include: modem power-off issue: resolves a modem power down issue (resulting in battery drain during PowerBook G3 sleep), if the PowerBook G3 Series computer is manually put to sleep before the modem has been shut down for 30 seconds; modem 'popping' sound: resolves an audible pop when the modem is being powered on or off.

Support items

- Forced restart
 - If cmd-ctrl-power fails
 - Reset button (rev. A)
 - Press front power button (rev. B and C)
 - Disconnect power cord
- Fan is thermally controlled

23

Notes

Forcing a Restart

If holding down the Command, Control and Power keys fails to restart the iMac after the system crashes or freezes, you can force a restart with one of the following methods:

- Rev. A
 - First, try inserting a straightened paper clip in the reset button hole. (Open the I/O door on the side of the iMac. The reset button hole is the top hole located between the Ethernet and modem ports. It is marked with a triangle symbol.)
- Rev. B and C: press the front power button.
- If the reset button method doesn't work, try the following:
 - 1 Unplug the power cord.
 - 2 Wait at least 30 seconds and then reconnect the power cord.
 - 3 Restart the iMac by pressing the power button on either the keyboard or the front of the computer.

Support Notices

- SuppN98 33 - iMac modem connector
 - Secondary devices not working correctly
- SuppN98 32 - iMac support information on the internet
 - Many interesting links
 - <http://support.info.apple.com/support/iMac/index.html>
- SuppN99 01 - iMac rev/b and restore CD
 - Dutch iMac only: restore from CD fails with error -46
 - Do not use option 'erase before restore'

24

Notes

SuppN98 33 - iMac modem connector

Early reports indicate that additional Telecom devices connected to iMac modem cables may not work. Countries affected by this issue include France, Italy, Holland, Belgium, Norway, Finland, Denmark, Sweden and Germany.

The iMac modem cable comprises of a RJ11 male to RJ11 male cable and a RJ11 female to local phone connector adaptor, to facilitate the connection of an additional Telecom device such as a phone, answering machine or fax machine. When a device is connected, it's not working properly.

Workaround: In order for customers to continue using their phone and other Telecom devices, the following workaround is advised:

Use of Telecom devices in parallel, so customers intending to use the iMac in conjunction with their phone should be advised to either invest in a mechanical or electronic switch which is in accordance with the local approval specification. (Parallel connector) or disconnect the iMac whenever it is not used in order to allow the phone to work with the device again.

Solution: Apple is currently working on a solution for the customer. When more information is available, you will be informed with a support notice.

SuppN98 32 - iMac support information on the internet

Apple iMac support web page. A lot of iMac information is combined on the iMac support page.
<http://support.info.apple.com/support/iMac/index.html>

Selection of third party iMac sites. A lot of third-party vendors have created their own dedicated iMac information web sites:

- <http://www.mactimes.com/iMac/>
- <http://imac.macguys.com/>
- <http://www.iMac2Day.com/>
- <http://www.geocities.com/SiliconValley/Hills/6639/>
- <http://www.usbstuff.com>

SuppN99 01 - iMac rev/b and restore CD

When using the Dutch iMac Rev. B restore CD (N691-2090) on a Rev. B iMac (M6709N/B), the erase process does NOT function correctly if the "erase before restore" check box is selected. Attempting to do so will result in the "Apple Software Restore" application returning the dialog "De volume informatie kon niet worden gekopieerd. -46". After you press "OK" you then get the following message "Het terugzetten van bestanden is mislukt. Het volume "Macintosh HD" is wellicht onbruikbaar." The work-around is to use Drive Setup to initialize the Hard Drive prior to installing or restoring WITHOUT the "erase before restore" option selected.



Service Items

Notes

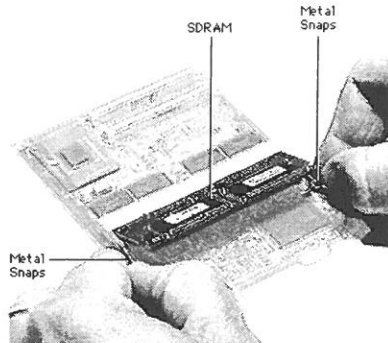
Service items

In this chapter we will discuss:

- Memory expansion of RAM and VRAM
- Resetting the iMac
- Power
- USB Mouse
- Disassembly
- Service Notices
- Service Tools required
- Special Procedures for adjusting the display

Memory Expansion

- Lower Slot (32 MB standard)
 - 1.5" SO-DIMM
- Upper Slot (empty),
 - 2.0" SO-DIMM
- Max. 128 MB
 - May be more if larger SO-DIMMs become available
- VRAM
 - 2 or 4 MB extra



26

Notes

Memory Specifications

Total RAM capacity is 128 MB if currently available devices are used and is limited by the space available for the SO-DIMMs. The bottom slot can accommodate a 1.5-inch SO-DIMM. The top slot can accommodate a 2.0-inch SO-DIMM. Future devices with higher densities may allow expansion beyond the current 128 MB limit.

RAM expansion SO-DIMMs for the iMac must use SDRAM devices. If the user installs an SO-DIMM that uses EDO or SGRAM devices, the computer will beep two times when the user attempts to restart the computer.

SDRAM Devices

The SDRAM devices used in the RAM expansion modules must be self-refresh type devices for operation from a 3.3-V power supply. The speed of the SDRAM devices must be 100 MHz or greater, corresponding to a cycle time of 10 ns or less. The devices are programmed to operate with a CAS latency of 3. At that CAS latency, the access time from the clock transition must be 7 ns or less. The burst length must be at least 4 and the minimum clock delay for back-to-back random column access cycles must have a latency of 1 clock cycle.

Video RAM Expansion

The iMac includes 2 MB of SGRAM for video on the main logic board. The video RAM can be expanded up to 6 MB with an additional 2 or 4 MB of SGRAM on a 144-pin SO-DIMM (small outline dual inline memory module).

The devices on the DIMM must be 3.3-V SGRAM devices. The speed of the SGRAM devices must be 100 MHz or greater, corresponding to a cycle time of 10 ns or less. The 100 MHz/10ns SGRAM SO-DIMM specification provides suitable margins for compatibility with the iMac architecture.

POST and resetting

- POST only at cold boot
 - 1 beep : no RAM
 - 2 beeps : EDO Ram installed
 - 3 beeps : no RAM banks passed test
 - 4 or 5 beeps : bad checksum for bootROM
- CUDA Chip
 - Reset button
- Reset Logic Board
 - Solves many system problems
 - Remove battery for 10 minutes

27

Notes

Power On Self Test (POST)

The Cuda Chip

The Cuda is a microcontroller chip. Its function is to

- Turn the system power on and off
- Manage system resets from various commands
- Maintain parameter RAM (PRAM)
- Manage the real-time clock

Many system problems can be resolved by resetting the Cuda chip. (The Cuda reset button is located on the back edge of the logic board between the modem port and the processor module. If you continue to experience system problems, refer to "Resetting the Logic Board" later in this chapter.)

Resetting the Logic Board

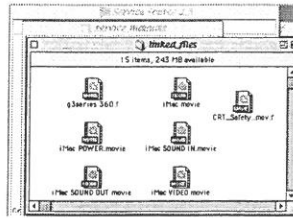
Resetting the logic board can resolve many system problems (see the Symptom/Cure tables for examples). Whenever you have a unit that fails to power up, you should follow this procedure before replacing any modules.

1. Unplug the computer.
2. Disconnect the cable that runs from the power supply to the power filter board on the bottom side of the logic board/mass storage chassis.
3. Press the Power On button on the front of the unit.
4. Remove the logic board/mass storage chassis from the unit.
5. Remove the battery from the logic board.
6. Wait at least 10 minutes before replacing the battery.
7. Make sure the battery is installed in the correct +/- direction.
8. Reassemble the computer and test the unit.

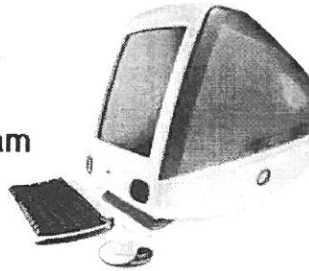
Note: This procedure resets the computer's PRAM. Be sure to check the computer's time/date and other system parameter settings afterwards.

Power

- Fuse on Power Supply Board
- Voltage check procedure
- On Service Source CD in linked_files
 - Power Flow
 - Sound
 - Video



iMac Power Flow Diagram



28

Notes

Service Source CD

In the iMac file on the Service Source CD you will find references to these movies.

Power Supply Board Fuse

There is a fuse on the AC line on the power supply board (at F901) that can be replaced if the computer has no power. (Refer to the "No Power" symptom for a full troubleshooting scenario.) Before replacing the fuse, you should do a continuity test with an ohm meter. If the ohm meter registers "0", the fuse is good. If the meter registers "infinite," the fuse should be replaced. Refer to "Testing for Power" later in this chapter for instructions on how to check the power supply board fuse. Refer to "Logic Board" in the Disassembly chapter to locate the fuse on the power supply board.

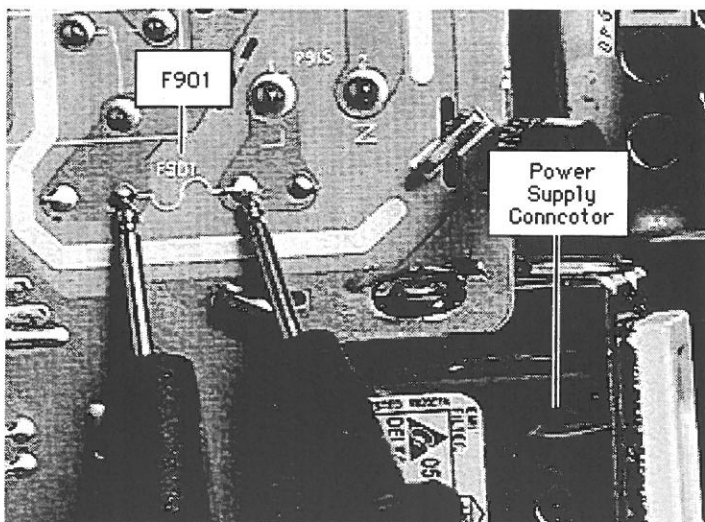
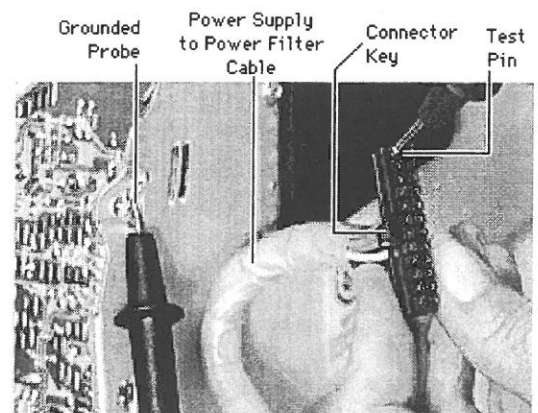


Figure 1: Testing the Power Supply Board Fuse



Testing for Power at the Power Supply to Power Filter Cable

MacTest Pro

- Power Macintosh Test Vol. 5 (v2.0) required with:
 - ATIVIDEO
 - DiagFPU
 - DiagUSB
 - DiagModem
 - DiagSound
 - DiagPaddingtonEnet
- Boot from MacTest Pro CD (SSCD November)
- MacTest Pro CD (SSCD January) is best

29

Notes

Power Macintosh Tests Vol 5 v2.0

The "Power Macintosh Tests Vol. 5" test module makes use of special applications (named "ATIVIDEO", "DiagFPU", "DiagUSB", "DiagModem", "DiagSound", and "DiagPaddingtonEnet") to perform video, floating point, USB, modem, sound, and Ethernet tests on iMac computers. In order to use these applications, they must be located in the Test Modules folder. If these applications are not placed in the Test Modules folder, the respective test option will not be available (grayed out) in the setup window for "Power Macintosh Tests Vol. 5", and that particular test cannot be performed.

MacTest Pro CD with SSCD November contains:

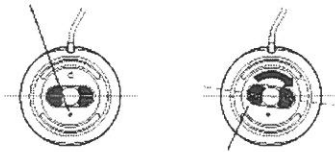
- Mac OS 8.1
- MacTest Pro 1.0.6
- Power Macintosh Test Vol 5 (v1.0)

MacTest Pro CD with SSCD March contains:

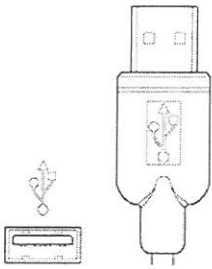
- Mac OS 8.5.1
- MacTest Pro for G3 v1.0
- Power Macintosh Tests (G3)(v1.0)

USB Mouse

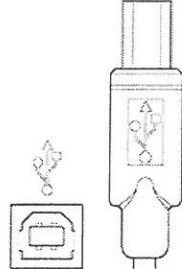
- Disassembly



Type A Connector
Plugs into USB Hubs



Type B Connector
Plugs into USB Devices



30

Notes

Unlocking the Apple USB Mouse

The Apple USB mouse can be locked so that the ball cannot be removed. To lock the mouse, insert a straightened paper clip into the hole on the inner plastic ring and press down on the paper clip while you turn the ring clockwise. Turn the ring over a very short distance until it stops. When the ring clicks into a position where it is at a slight angle to the rest of the mouse, the mouse is locked (as shown in the illustration on the following page). Insert a straightened paper clip into the hole. The mouse ring is locked when the ring clicks into a position where it is at a slight angle to the rest of the mouse. To unlock the mouse, reverse this procedure.

Service Notices

- ServN98 53 - iMac logic board and processor card revisions
 - Like-for-Like exchange
 - Not Compatible
- ServN99 05 - iMac color
 - Updated ServN98 53 with table (see below)
- ServN99 12 - iMac 266MHz Service Parts
 - List of available service parts; some are US only

31

Notes

ServN98 53 - iMac logic board and processor card revisions

There are two revisions of the iMac logic board and the iMac processor card which are NOT interchangeable and **MUST BE REPLACED LIKE-FOR-LIKE**. Please use the information provided below to identify and order/return the appropriate card versions.

Logic board versions:

661-2061 Logic board: used in iMac with product serial numbers ending with DFN or DFP; in combination with processor card 661-2077; logic board bar code serial number ends with either CVK_, ELO_ or EPU_; contains ATI Rage IIC video chip.

661-2113 Logic board: used in iMac with product serial numbers ending with EUL or EW2; in combination with processor card 661-2112; logic board bar code serial number ends with EQD_; contains ATI Rage Pro video chip

	iMac 233MHz rev.A product	iMac 233MHz rev.B product	iMac 266MHz rev.C product
Finished Goods configurations with modem	M6709_A Product Serial number ending with: DFN	M6709_B Product Serial number ending with: EUL, EW2, FNH	M7345_A - M7389_A - M7390_A - M7391_A - M7392_A - Product Serial Number ending with: FLP, FMQ, FMR, FMB, FMT
Finished Goods configurations without modem	M6711_A Product Serial number ending with: DFP	none	none
Main logic board Service Module	Module P/N: 661-2061 Module Bar code number ending with: CVK_, ELO_, EPU_	Module P/N: 661-2113 Module Bar code number ending with: EQD_	Module P/N: 661-2113 Module Bar Code number ending with: EQD_ Original Finished Good product logic board bar code ending with: F88 <small>that card has NO mezzanine slot nor LBA connector.</small>
Processor card Service Module	Module P/N: 661-2077 Module Bar code number ending with: D88_	Module P/N: 661-2112 Module Bar code number ending with: ERP_	Module P/N: 661-2165 Module Bar Code number ending with: F7Z_

ServN99 12 - iMac 266MHz Service Parts

The iMac 266MHz Service Introduction Plan will be updated with the above information and published on Europe Service Source (online and CD).

Notes___ The following Service Part Numbers, mentioned in the Service Parts Database on Europe Service Source Online, are NOT currently used on iMac 266MHz products in Europe, so are NOT available for ordering:

Service P/N	Description	
661-1 32	Hard Drive, 4GB, IDE, 3.5	922-3 63 Cable, LED
661-2 18	Hard Drive, 6GB, IDE	922-3 64 Cable, Audio, 5Connector
661-2 16 61-2 06	CD-ROM Drive, 24X	922-3 65 Cable, Power Supply
661-2 09	SDRAM, SODIMM, 32MB, 100MHz	922-3 66 Gasket, Cable, Rubber, Pkg of 5
661-2 00	Board, Analog Video	922-3 67 Frame, CRT, Bottom
661-2 01	Board, Power Supply	922-3 60 Screw PH, 35X5X1 4 PAN, Pkg of 10
661-2 04	Modem, 56K, Internal, Europe/Australia	922-3 64 Screw Pan #mm, Crest Cup, Pkg. of 10
661-2 13	BOARD, LOGIC, Rev	922-3 67 Screw CD bezel to CD
661-2 65	CD, FPC, 266MHz	922-3 68 Screw Pan M2X6MM, Crest Cup, Pkg of 10
076-0 76	I/O Panel Kit	922-3 69 Screw M2.5X6MM Philips Pkg of 10
076-0 77	Speaker Kit, Left and Right	922-3 60 Screw Pan 440X25, Pkg of 10
076-0 78	Heat sink Kit	922-3 65 Screw MB 5X6X8MM PAN Pkg of 10
076-0 73	Shield Kit, CPU	922-3 66 FUSE, 6.3A250V, TIME LAG, PK5
076-0 74	Screw Cover Kit, Left and Right, Pkg. of 2	922-3 69 GASKET, MICROPHONE, IMAC, PKG/ 4
076-0 70	Kit, Rip Foot w/Clips BB	922-3 69 Door, I/O Rev. 2
076-0 71	Kit, Rip Foot w/Clips SB	922-3 70 Panel Front, Lower, BB
076-0 72	Kit, Rip Foot w/Clips GP	922-3 71 Bd, Audio/Video, w/ Shield Panel
076-0 73	Kit, Rip Foot w/Clips TG	922-3 72 Cover, Access Lower, BB
076-0 74	Kit, Rip Foot w/Clips LM	922-3 73 Housing Top Rear, BB
520-0 34	Battery Holder	922-3 74 Bezel, Outer, BB
742-0 09	Battery, Lithium	922-3 75 Housing Bottom, rear, BB
922-2 24	Screw SEMS6-32X25 (Pkg of 10)	922-3 76 Bezel, CD, BB
922-3 56	Fan with Bracket	922-3 79 Housing Top Rear, SB
922-3 58	Board, Power/Headphone	922-3 80 Housing Top Rear, GP
922-3 54	Board, Filter Power	922-3 81 Housing Top Rear, TG
922-3 57	Foot Rubber, Pkg. of 4	922-3 82 Housing Top Rear, LM
922-3 59	Microphone	922-3 83 Bezel, Outer, SB
922-3 56	Chassis, logic Board/Mass Stage	922-3 84 Bezel, Outer, GP
922-3 59	Board, Audio/Video Interconnect with Shield	922-3 85 Bezel, Outer, TG
922-3 50	Cable, Audio, Interconnect to Logic Board	922-3 86 Bezel, Outer, LM
922-3 51	Cable, Video, Interconnect to Logic Board	922-3 87 Panel Front, Lower, SB
922-3 53	Cable, Hard Drive Power	922-3 88 Panel Front, Lower, GP
922-3 54	Cable, Data, Hard Drive/CD	922-3 89 Panel Front, Lower, TG
922-3 60	Power Cord, Europe	922-3 90 Panel Front, Lower, LM
922-3 61	Power Cord, UK	922-3 91 Cover, Access Lower, SB
922-3 62	Power Cord, Denmark	922-3 92 Cover, Access Lower, GP
922-3 64	Power Cord, Swiss	922-3 93 Cover, Access Lower, TG
922-3 67	CRT Assembly, Northern Hemisphere	922-3 94 Cover, Access Lower, LM
922-3 60	Frame, CRT, Top	922-3 95 Bezel, CD, SB
922-3 61	Screw Philips, Self Tapping, Pkg. of 10	922-3 96 Bezel, CD, GP
922-3 62	Screw Philips, Machine, Pkg. of 10	922-3 97 Bezel, CD, TG
922-3 63	Screw Philips, Self Tapping with Washer, Pkg. of 10	922-3 98 Bezel, CD, LM
922-3 64	Screw Philips, Machine, Small, Pkg. of 10	922-3 27 Mouse, USB, BB
922-3 65	Bezel, Inner, Front	922-3 83 MOUSE, USB, SB
922-3 66	Carrier, Hard Drive	922-3 84 MOUSE, USB, GP
922-3 67	Screw Locks, Pkg. of 6	922-3 85 MOUSE, USB, TG
922-3 68	Ball, Mouse, Pkg. of 5	922-3 86 MOUSE, USB, LM
922-3 69	Retainer, Mouse	*92 2372 Keyboard, USB, BB *Country flavour
922-3 60	Standoff Modem, Locking 10mm, Pkg. of 10	*92 2379 Keyboard, Apple, USB, SB, *Country flavour
922-3 61	Grounding Wire, CRT	*92 2380 Keyboard, Apple, USB, GP, *Country flavour
922-3 62	Cable, Video, RGB	*92 2380 Keyboard, Apple, USB, TG, *Country flavour
		*92 2380 Keyboard, Apple, USB, LM *Country flavour

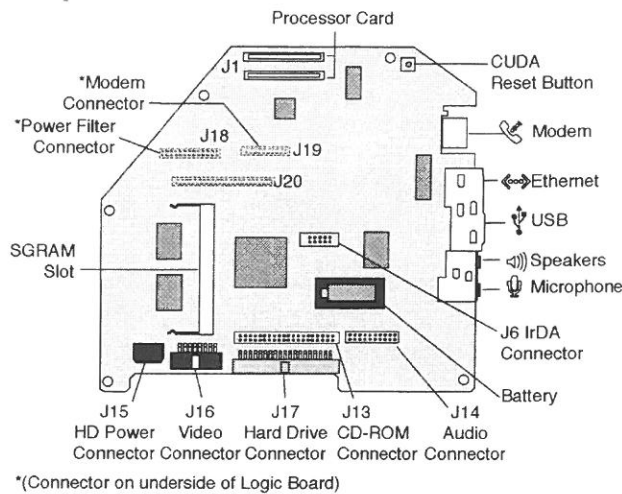
The iMac 266MHz Service Introduction Plan will be updated with the above information and published on Europe Service Source (online and CD).

Disassembly

33

Notes

iMac Logic Board



Notes

Repair Issues

This section lists some of the common issues that may not be apparent when taking the iMac apart. Always use the Service Source as a master guide for disassembly.

- Four screws must be removed to access the iMac Main Board Can (NOT three as listed in some sources).
- The iMac CD-ROM will have similar issues as PowerBook G3 Series low-profile CD-ROM drives; noise and vibration issues will be the same as PowerBook CD drives.
- The CD-ROM uses a micro-IDE connector and the IDE hard disk uses a standard IDE connector. These are NOT interchangeable.
- Inserting the Power Filter Board off center or crooked might damage the board.
- For easier installation when installing the modem, clip the modem into the standoff and then plug the modem into the slot.

Plastics Issues

The plastics of the iMac should NEVER be cleaned with any alcohol-based or powder-based cleaning agents. Using these on the iMac plastics will discolor and scratch the plastics. Scratches and blemishes which are not present out of the box will not be covered under warranty.

Use care when removing plastic standoffs in the iMac. An easy way to remove them is to use a pair of needle nose pliers to squeeze the tip of the standoff and then slowly push it out of the board. If care is not taken when removing standoffs, components around the standoff may become damaged.

Tools

- Spring hook removal tool
- Plastic screwdriver
- Jewelers Phillips screwdriver, size 00 mm
- CRT discharge tool
- Nut driver or pliers
- Phillips screwdriver
- For display adjustment
 - Light meter
 - Display Adjustment Utility 2.0

35

Notes

Tools

The following tools are recommended for the procedures described in this chapter:

- Spring hook removal tool (922-1547) to remove the processor card
- Plastic screwdriver (922-3504) to release tabs on plastic housing
- Jeweler's Phillips screwdriver, size 00 mm to remove CD-ROM bezel
- CRT discharge tool
- Nut driver or pliers to remove thumbscrews on the audio/video interconnect board
- Needlenose pliers
- Phillips screwdriver
- ESD mat

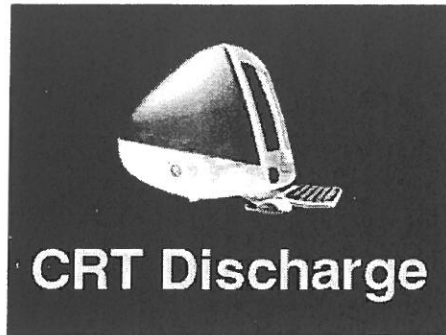
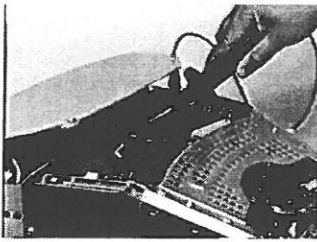
Display Adjustment Utility v2.0

Earlier versions of the Display Adjustment Utility would prevent the sub-brightness, sub-contrast, and color cutoff adjustments from being saved properly. This would prevent you from properly setting the "Cutoff" and "White Balance" on the iMac.

Apple has released a new version of the Display Adjust Utility that corrects the issues with previous versions of the utility. Service Providers should discontinue using Display Adjustment Utility v1.1 immediately and download Display Adjustment Utility v2.0 from the Service Diagnostics web site.

Procedures

- CRT Discharge
- Display Adjustment



36

Notes

See movie on Service Source CD at the following location:

file:///CD1/Service_Admin_Programs/Safety_instructions/crt_safety_mov

Display Adjustment

- Required
 - Display Adjustment Utility 2.0
 - Needs QuickTime 2.5
 - v1.1 issue: settings not saved
 - Display Service Utility 4.2.1
 - Light meter
- Select 640 x 480 resolution

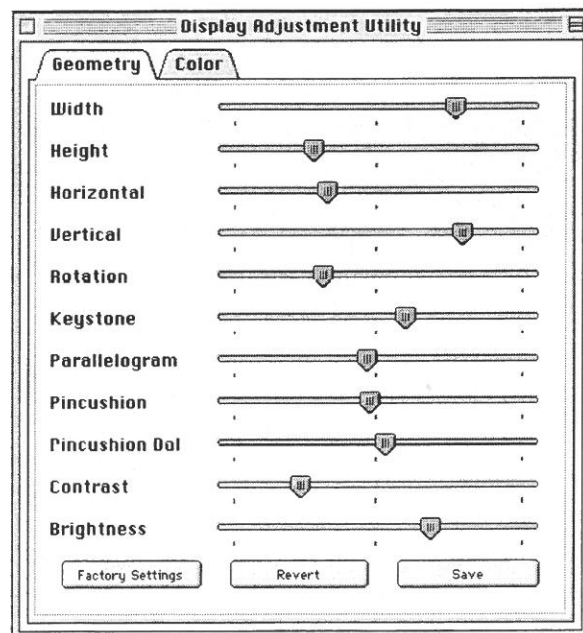
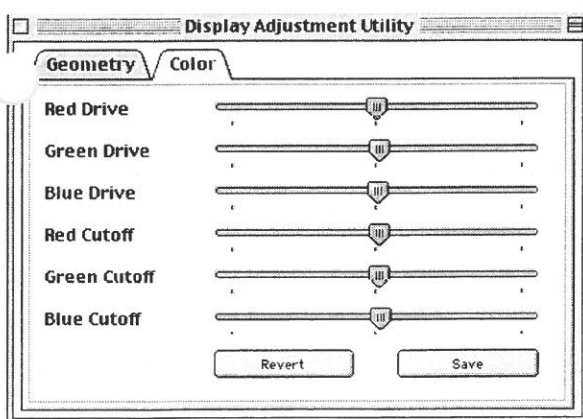
37

Notes

Display Adjustment Utility

Be sure to use the 2.0 version, since the previous version did not save the settings.

You also need the Display Service Utility to show the different screens as gray bars, focus, etc.



Display Adjustment

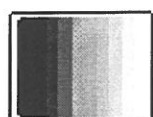
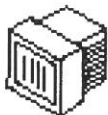
- Geometry
- Cutoff
 - Gray bar
- White Balance
 - All white screen; light meter
- Focus
 - Flat-head plastic tool

38

Notes

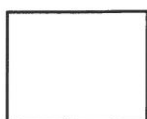
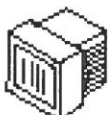
Display Service Utility

Run
Display Service
Utility

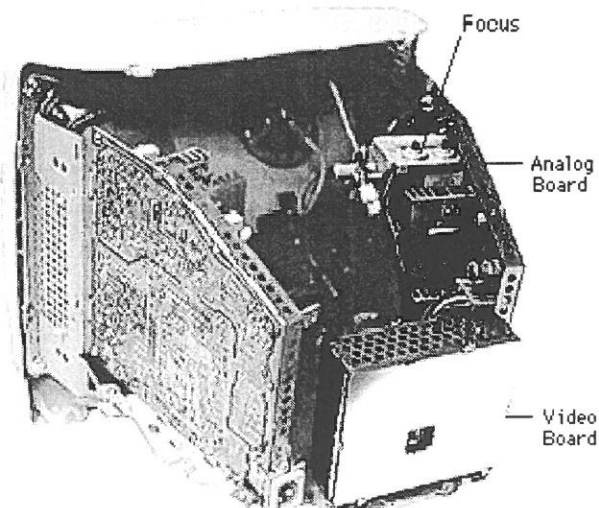


Gray Bar
Test Pattern

Run
Display Service
Utility



All-White Screen



Focus

- 1 Run Display Service Utility to display the Focus test pattern.
- 2 Using a flat-head plastic adjustment tool, adjust the focus control on the flyback transformer until the Focus test pattern reaches the best center-of-screen performance.

References on the Internet

- http://www.lai.nl/html/lkc_references.html
- <http://www.apple.com/imac/>
- <http://www.apple.com/imac/usbindex.html>
- http://service.info.apple.com/secure/technical.resources/training/service_imac/index.html
- <http://www.info.apple.com/info.apple.com/te/training/overviewimac/index.html>

39

Notes

http://www.lai.nl/html/lkc_references.html

Our page with links used in this presentation.

<http://www.apple.com/imac/>

Apple's page with iMac info.

<http://www.apple.com/imac/usbindex.html>

Apple's page with USB products for iMac.

http://service.info.apple.com/secure/technical.resources/training/service_imac/index.html

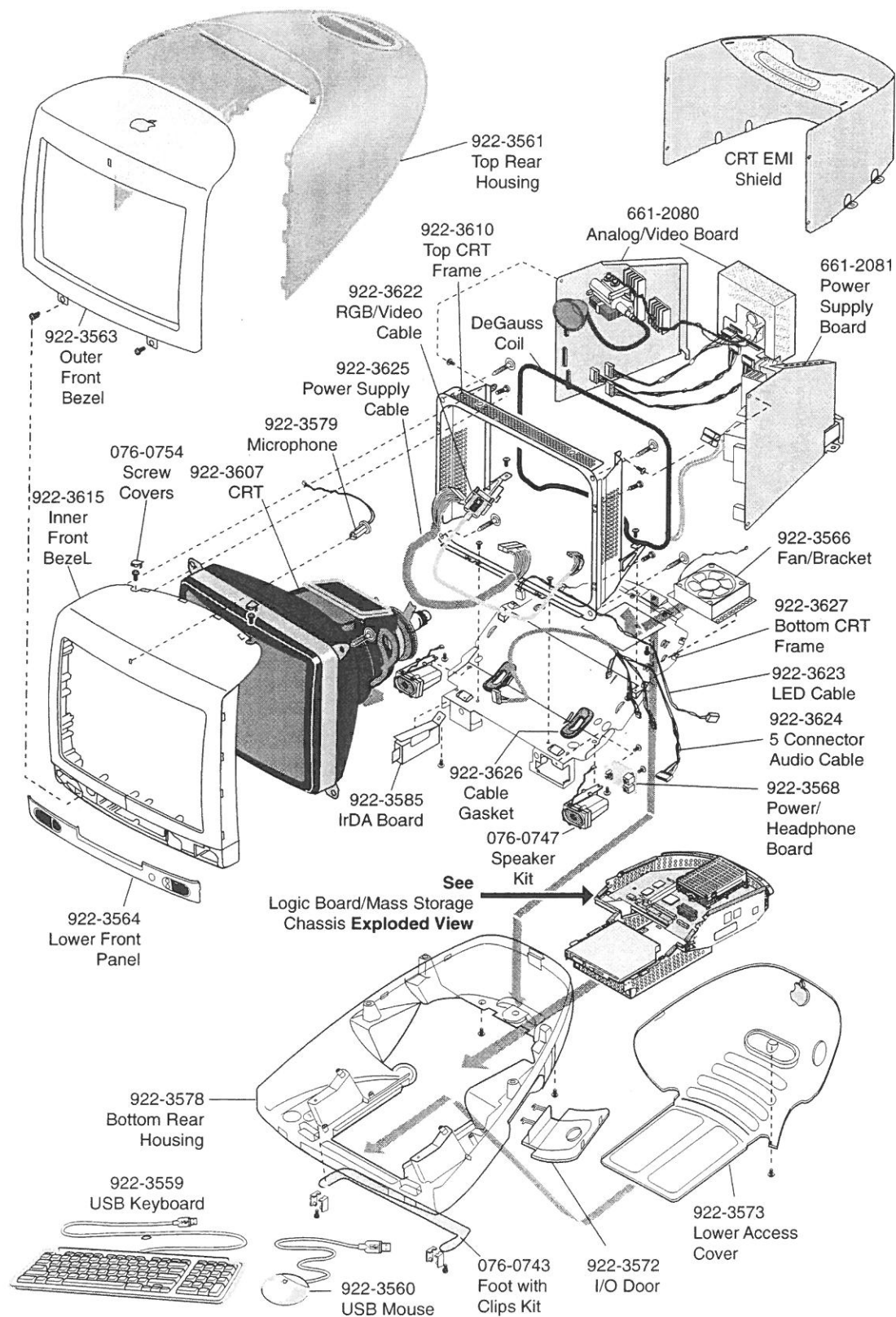
Apple's page with iMac service information (online training course) Need password for service source online!

<http://www.info.apple.com/info.apple.com/te/training/overviewimac/index.html>

Apple's page with iMac technical information (online training course). This course is less technical than the online course on the Service Source Online.

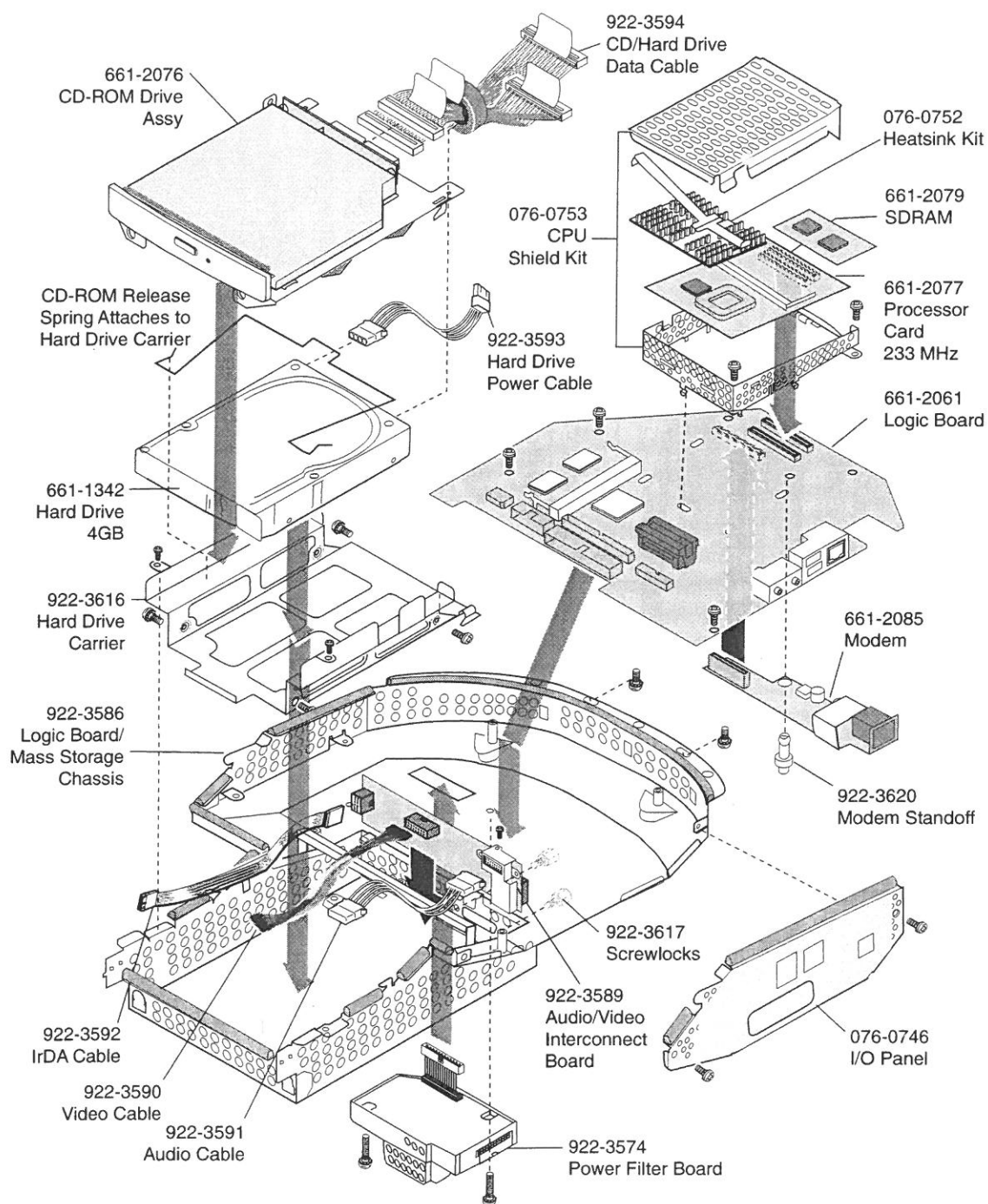


iMac Exploded View




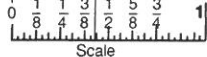
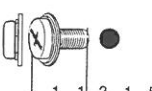
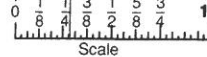

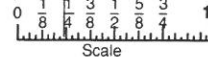

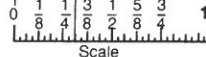
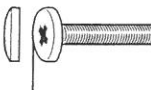
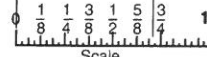
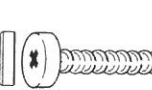

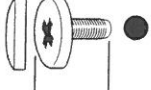

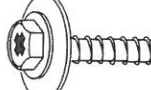
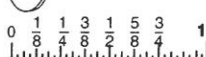
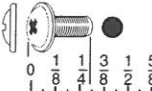
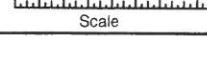
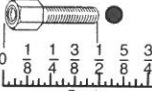
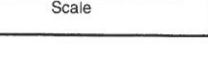

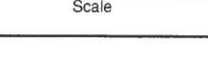
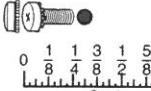
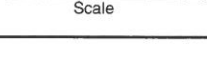


Logic Board/Mass Storage Chassis Exploded View





iMac Screw Matrix

<p>922-3645 Can to CRT Chassis w/lock washer (2) Can Cable Clip w/lock washer (1)</p>   <p>Scale</p>	<p>922-3638 w/washer Logic Board (5) HDCarrier to Can (2) Interconnect Board Shield to Can (1) Cable Bracket to Can (1)</p>   <p>Scale</p>	<p>922-3639 I/O Panel (2)</p>   <p>Scale</p>	<p>922-2224 HDA Carrier to HDA (4)</p>   <p>Scale</p>
<p>922-3634 Power Filter (2)</p>   <p>Scale</p>	<p>922-3611 Bottom Housing (4) Front outer Bezel (2) Top Rear Housing (2) CRT chassis to Inner Bezel (4)</p>   <p>Scale</p>	<p>922-3612 Bottom Housing (4)</p>   <p>Scale</p>	<p>922-3613 CRT to CRT Chassis to Inner Bezel(4)</p>   <p>Scale</p>
<p>922-3614 Speakers (1) ea, Fan (2) Headphone Board (2) Power Supply Board (3) Analog Board (3) CRT lower Chassis (4) Video Cable Bracket to CRT lower Chassis (1) CRT EMI Shield (10)</p>   <p>Scale</p>	<p>922-3617 RearUnderside of Can to Interconnect Board screwlock (2)</p>   <p>Scale</p>	<p>922-3637 CD Bezel to CD-ROM (microScrew)</p>   <p>Scale</p>	<p>922-3640 IRDA Connector underside of can (1)</p>   <p>Scale</p>



