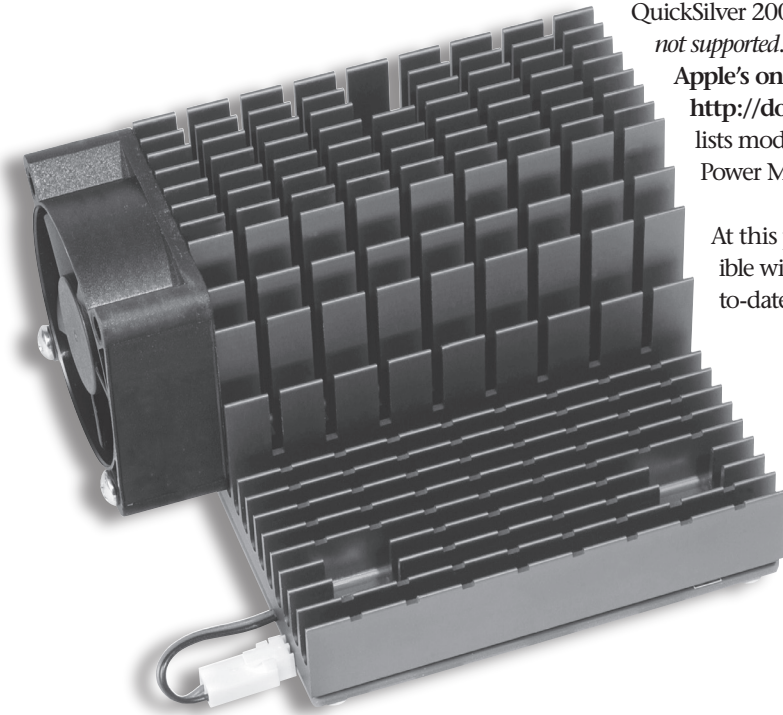


# ENCORE™/ST G4 DUET 1.7 GHz

## Dual Processor Upgrade Card for Power Mac® G4 Computers



### Power Mac and Operating System Compatibility

This Encore/ST G4 Duet processor upgrade card is compatible only with Power Mac® G4 AGP Graphics, Gigabit Ethernet, Digital Audio, QuickSilver 2001, and QuickSilver 2002 models. *Installation of this product into a Power Mac G4 Cube is not supported. If you are unsure which Power Mac model you have, refer to Apple's online support article that describes the differences at <http://docs.info.apple.com/article.html?artnum=58418>. This article lists model numbers, and describes the physical differences of the various Power Mac G4 models.*

At this printing, this Encore/ST G4 Duet processor upgrade is compatible with Mac OS® 9.2 and Mac OS X Version 10.3.5 and later. For up-to-date Mac OS compatibility information, check our web site.



**WARNING:** Some Power Mac G4 (AGP Graphics) models are incompatible with dual processor cards. If you purchased this upgrade for a Power Mac G4 (AGP Graphics) computer, be sure to read the included warning sheet for information on how to determine whether your system is compatible before you install this product.

**In order for this Encore/ST G4 Duet to operate in your system, it must have the latest Power Mac G4 firmware and Mac OS 9.2 installed. If you use Mac OS X, you must ensure that it is Version 10.3.5 or later; earlier versions are NOT compatible.** If your system does not meet these criteria, you must upgrade to the correct OS version(s) and update your system's firmware before installing this upgrade. Otherwise, your system will not operate with the Duet installed. Instructions follow.



**Support Notes:** Please familiarize yourself with the following instructions before beginning the installation. If you feel you are unable to install the computer hardware, please contact a qualified computer technician. Sonnet strongly recommends that a qualified technician perform this installation.

Before proceeding with the installation, we recommend that you backup important information on your hard drive prior to installing new hardware or software.

Encore/ST G4 Duet processor upgrades do not cause sleep issues in computers that support sleep with the original processor installed. If a computer experiences sleep issues with the original processor installed, installing this upgrade is unlikely to change that condition. In the very rare instance where a computer begins to have sleep issues after a Duet upgrade is installed, the problem is isolated to that specific card and can be resolved by replacing it.

### You Should Have

The following items should be included in your product package:

- Encore/ST G4 Duet processor upgrade card\*
- Sonnet Installer CD

The following items are required for installation:

- Medium Phillips screwdriver
- Flat blade screwdriver (only for QuickSilver installation)
- Needle-nose pliers

\* Your card may differ from what is pictured.

### Multiple Upgrade Recommendation

If you intend to perform multiple hardware upgrades to your Power Mac, we recommend that you complete the installation of the Encore/ST G4 Duet first, and then install the remaining upgrades; *complete each upgrade and test it before proceeding to the next.*



Remember to register your product online at <http://registration.sonnettech.com> to be informed of future upgrades and product releases.

Software updates and links are available from the Sonnet web site at [www.sonnettech.com](http://www.sonnettech.com). • Online support form available at <http://supportform.sonnettech.com>.

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# Install Software... FIRST

## A. ALL USERS—Install or Upgrade to Mac OS 9.2, If Necessary

This Encore/ST G4 Duet processor upgrade requires that Mac OS 9.2 be installed on your system on a writeable local hard disk (not a CD, DVD or network disk). You must boot your system from a Mac OS 9.2 system folder in order to update and/or patch the Power Mac firmware so your system can support this upgrade card. Verify the Mac OS version on your system is at least Mac OS 9.2, and then install or upgrade the OS software if necessary.

**WARNING:** When you install (or upgrade to) Mac OS 9.2 or later in an AGP Graphics, Gigabit Ethernet, or Digital Audio model, you may have to upgrade your computer's firmware as part of the software installation. Please note, the firmware installed with the Mac OS may not be the version required by the Duet. **Before installing the Encore/ST G4 Duet, you may be required to upgrade your firmware again; you MUST ensure your system is using version 4.2.8 firmware.** If your system is using an earlier version of the firmware, your system will not operate with the Duet installed.

## B. AGP Graphics, Gigabit Ethernet, and Digital Audio Users Only—Update Power Mac Firmware

If your computer is a Power Mac G4 (QuickSilver) model, skip to section C on page 2. Otherwise, before installing the Duet, you must ensure your AGP Graphics, Gigabit Ethernet, or Digital Audio system's firmware has been updated to version 4.2.8. Please note, your system may need to connect to the Internet to perform some of the steps.

1. **OS 9 users:** Select and open Apple System Profiler from the Apple Menu. Click the triangle next to Production Information, and find the Boot ROM version information (Figure 1). If it reads "\$0004.28f1", skip the rest of the steps in this section and proceed to section C on page 2. Otherwise, go to step 2.

**OS X users:** Open System Profiler or Apple System Profiler (located within the Utilities folder found in the Applications folder). Find the Boot ROM information listed in the Hardware Overview pane (Figure 2). If it reads "4.28f1", skip the rest of the steps in this section and proceed to section C on page 2. Otherwise, go to step 2.

2. Boot your system in Mac OS 9.2.x (the firmware updater will not work in OS X Classic mode). As of this writing, Apple has not made this firmware updater available as an OS X application.

3. Log on to the Internet and type the following in your browser window's address bar:  
<http://docs.info.apple.com/article.html?artnum=120068>

4. Click on the appropriate link to download the firmware (Figure 3).

5. Double-click the G4 FW Update 4.2.8.smi file icon to mount the G4 Firmware Update disk image. Double-click the G4 Firmware Update icon to open the disk image, then double-click the About G4 Firmware Update file icon. Once the read me file has opened, print it. Following the directions on the pages you printed, update the firmware on your system.

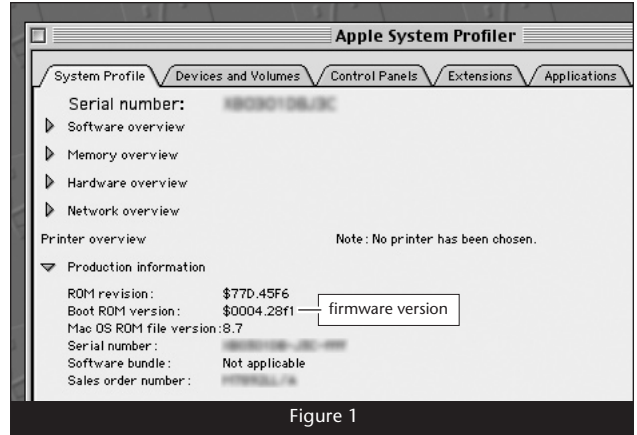


Figure 1

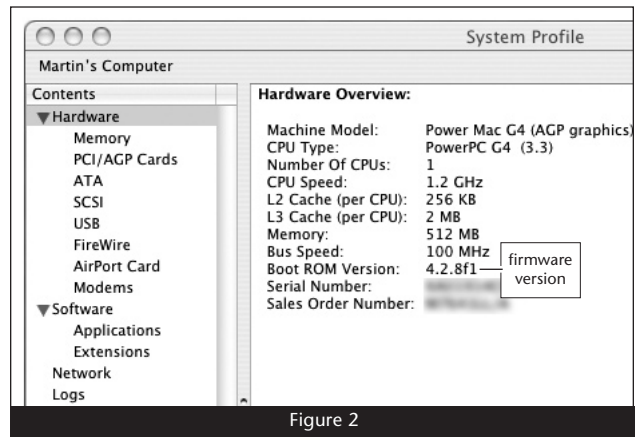


Figure 2













Language/OS Required	Release Date	Version	Read Me	Software
<b>Any English</b> Any English Mac OS 9.1 or later (but not X) is required	2001-10-18	4.2.8		 1.2 MB
<b>Français</b> French Mac OS 9.1 or later (but not X) is required	2001-10-25	4.2.8		 1.2 MB
<b>Deutsch</b> German Mac OS 9.1 or later (but not X) is required	2001-10-25	4.2.8		 1.2 MB
<b>Español</b> Spanish Mac OS 9.1 or later (but not X) is required	2001-10-25	4.2.8		 1.2 MB
<b>Italiano</b> Italian Mac OS 9.1 or later (but not X) is required	2001-10-25	4.2.8		 1.2 MB
<b>Japanese</b> Japanese Mac OS 9.1 or later (but not X) is required	2001-10-25	4.2.8		 1.2 MB

Figure 3

## Install Software... First!



**Mac OS X Alert:** Due to technical issues that arise from the operation of the latest G4 processors (used on this Encore/ST G4 Duet card) in an older system, you must use Mac OS X Version 10.3.5 or later to ensure compatibility; earlier versions of Mac OS X lack the proper processor support.

### C. ALL USERS—Install or Upgrade to Mac OS X Version 10.3.5 or Later, If Necessary

For Mac OS X compatibility, this Encore/ST G4 Duet card requires Mac OS X Version 10.3.5 or later. If you are upgrading to Mac OS X as part of this installation, or need to update Mac OS X to the latest version, do so now; complete the Mac OS upgrade, and then restart your computer.



**WARNING:** Before running the Crescendo/Encore Install application, you must ensure your system is booted in Mac OS 9.2; do not attempt to run this installer in Mac OS X (Classic mode). To switch back to OS 9.2, select System Preferences... from the Apple menu. Click on the Startup Disk icon to open the *Startup Disk* control window. Click on the Mac OS 9.2 folder you will use, and then click Restart.

### D. ALL USERS—Sonnet Software Installation

This section describes the installation of software required to support this Encore/ST G4 Duet in your computer. Please note you **MUST run the Crescendo/Encore Installer before you install this upgrade card. If you do not run the installer, your computer will not operate with the processor upgrade installed.**

1. If your system is booted in Mac OS X, switch back to OS 9.2; otherwise, skip to the next step. From the Apple menu, select System Preferences..., and then click on the Startup Disk icon. When the System Folders appear, select the Mac OS 9.2 System Folder in which you will install the Sonnet software.
2. Insert the Sonnet Installer CD into the CD-ROM drive. Double-click the *Mac OS 7-9 ONLY, not Classic* folder, and then double-click the Crescendo/Encore Install icon. By default, with "Easy Install" selected from the pop-up menu, the required software will be installed into the active System Folder on the boot drive. If this is okay, click the Install button; otherwise, select "Custom Install" from the pop-up menu for more options or to select another drive to install the software. The installer will install the appropriate software into your computer's System Folder.
3. If the installation was successful, a dialog box will appear; the program will then install a firmware patch that enables the use of the Duet in your computer. (The Sonnet firmware patch may be uninstalled. However, doing so prevents your system from working with the Duet.) Read the instructions in the dialog box, and click OK to shut down your computer.
4. Press *and hold* down the Programmer's button (the button on the right, beneath the Power button) on the front of your computer.
5. While holding down the Programmer's button, press and release the Power button on your computer or keyboard; continue to hold down the Programmer's button (for approximately eight seconds) until you hear a tone play through the speaker.
6. When the tone is heard, release the Programmer's button; the regular boot chime will play and a progress bar will appear at the bottom of your display screen. **Do not do anything with your computer until after it restarts.**
7. If an error occurred, a message will appear; you must rerun the installer. Otherwise, once the firmware update is complete and your system restarts a dialog box will appear, stating it is okay to install the Duet; click OK.
8. After your system shuts down, proceed to the hardware installation steps: If you have an AGP Graphics or Gigabit Ethernet system, go to page 3. If you have a Digital Audio system, go to page 6. If you have a QuickSilver 2001 or QuickSilver 2002 system, go to page 10.



**Support Note:** After updating your system's firmware with the Crescendo/Encore installer, you do not need to install the software located in the Mac OS X ONLY folder on the Sonnet Installer CD; that software is used for other processor upgrade cards by Sonnet.

## Installation—AGP Graphics and Gigabit Ethernet Models

This section covers the installation of the Encore/ST G4 Duet into Power Mac G4 AGP Graphics and Gigabit Ethernet models. If you are installing this product into a Digital Audio model, skip to page 6. If you are installing this product into a QuickSilver 2001 or QuickSilver 2002 model, skip to page 10.



**WARNING:** When handling computer products, take care to prevent components from being damaged by static electricity; avoid working in carpeted areas. Handle processor upgrade cards only by their edges and avoid touching connector traces and component pins. Also, avoid touching the logic board and any of its components.

### Shut Down and Open Computer

1. Shut down your Power Mac. If the computer has been on for a while, allow 20 minutes for it to completely cool before beginning the installation.
2. If you need to move the computer to a different area where you can work freely, disconnect any connected cables, move the computer, then reconnect the power cord to the computer and an electrical outlet.
3. Touch a port access cover on the back of the computer (**Figure 4**) to discharge any potentially damaging static electricity.
4. Disconnect the power cord from the computer.



**Support Note:** To avoid generating a static charge in your body, do not walk around the room until after you finish installing the Encore card and close the computer.

5. Locate the security lock at the back of the computer (**Figure 5**). If it is not already pressed in, press it in now.
6. With the right side of the case facing you, open your Power Mac by lifting the release latch and lowering the side panel away from the computer's case (**Figure 6**).

### Remove Heat Sink

Locate the processor heat sink on the logic board (**Figure 7**); your heat sink may appear different from what is pictured. Using caution to avoid touching the processor card and the logic board, grasp one of the clips securing the heat sink with needle-nose pliers, between the heat sink and processor card. Pull down and away to unhook one side of the clip from the processor card (**Figure 7**). Push the clip away from you to unhook it from the other side. Repeat these steps with the other clip. Once the clips have been unhooked, gently lift the heat sink and clips away from the processor and set them aside, but not on the logic board.

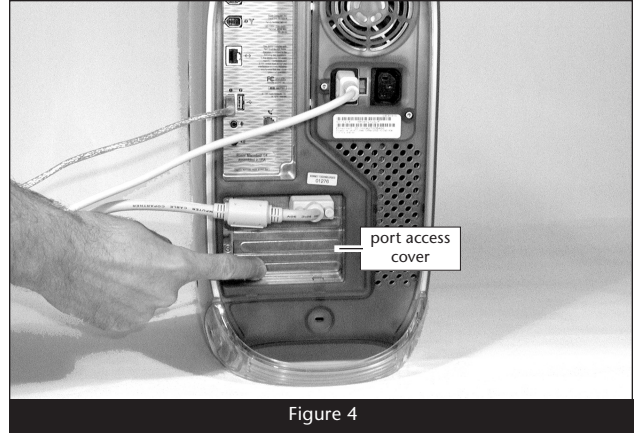


Figure 4



Figure 5

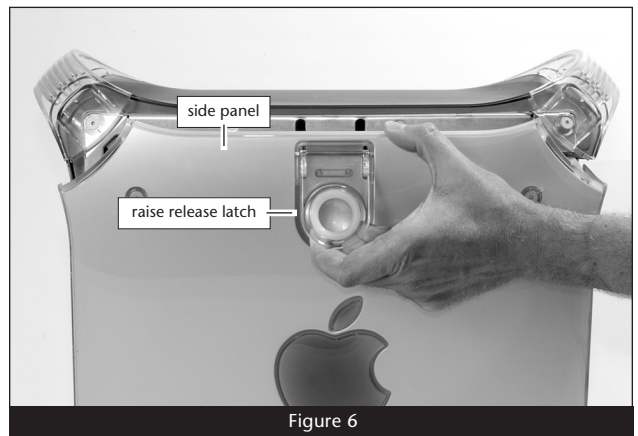


Figure 6

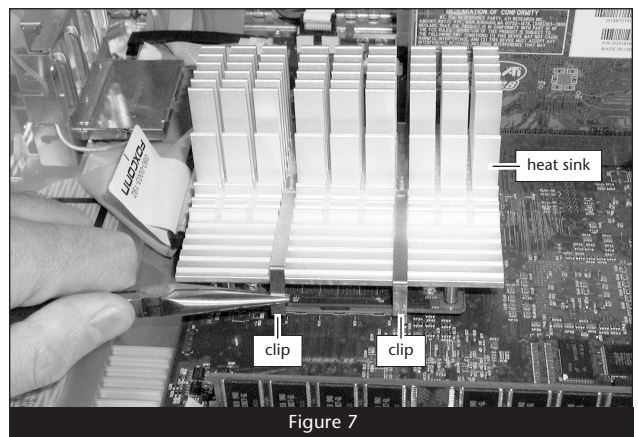


Figure 7

## Installation—AGP Graphics and Gigabit Ethernet Models

### Remove Processor Card

Remove the three screws securing the processor card to the logic board (Figure 8). Grasping its edges, gently lift one edge of the processor card to separate it from the logic board, and then carefully lift it straight up and away.

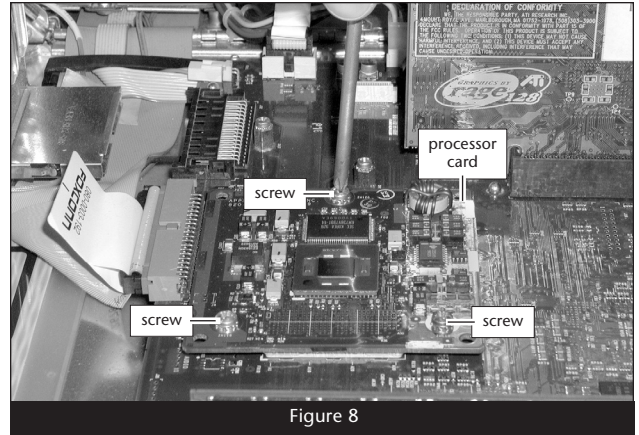


Figure 8

### Install Encore/ST G4 Duet Processor Upgrade Card

1. Remove the Encore/ST G4 Duet processor upgrade card from its anti-static package; make sure to handle the card by its edges (Figure 9); your card may differ from what is pictured.

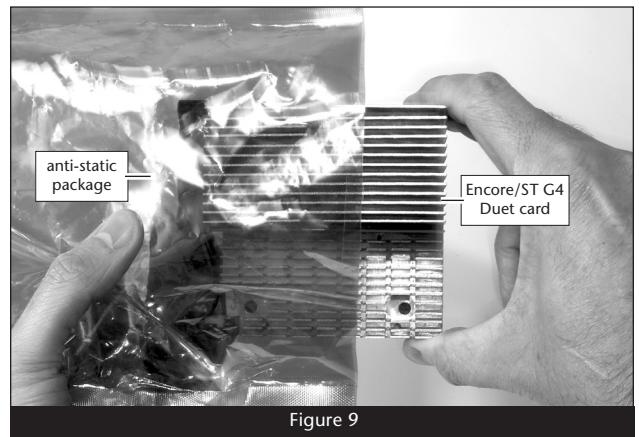


Figure 9

2. Carefully remove the cap covering the connector on the bottom of the Duet card (Figure 10), and then place the cap on the original processor card's connector.
3. Place the processor card you removed from the computer into the anti-static package, and then store it, the original heat sink, heat sink clips, and the screws you removed in a safe place.

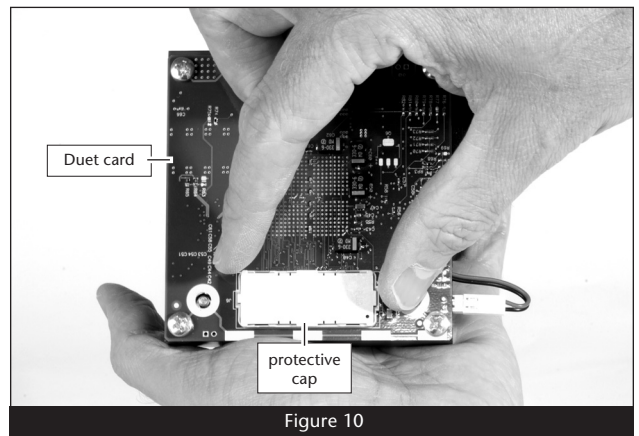


Figure 10

4. Align the connector on the bottom of the Duet card with the connector on the logic board (Figure 11), and then set the card down on top of the three threaded posts (not shown). Make sure the connectors are lined up, then, grasping the Duet card by its heat sink, gently press it straight down until the connectors snap together. Verify the connectors are completely coupled by gently pulling up on the edges of the Duet board; the board should remain firmly in place.

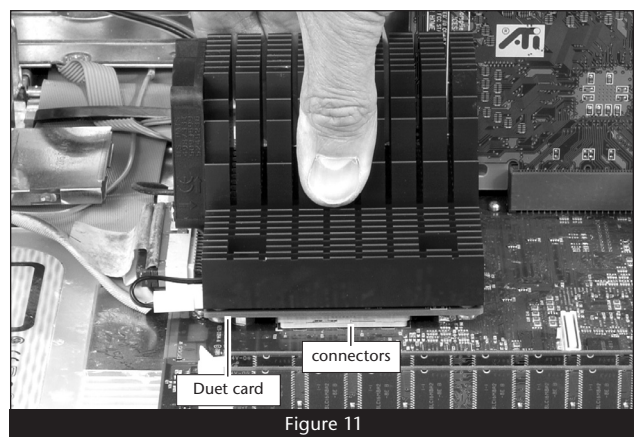


Figure 11

## Installation—AGP Graphics and Gigabit Ethernet Models

5. Making sure the Duet card's captive screws are engaged properly in the threaded posts, tighten each of the three screws and secure the card snugly to the logic board; **do not overtighten the screws** (Figure 12).



**WARNING:** When your computer is operating, the Duet's heat sink will become VERY hot to the touch; take care to not touch the heat sink, or you may get burned.

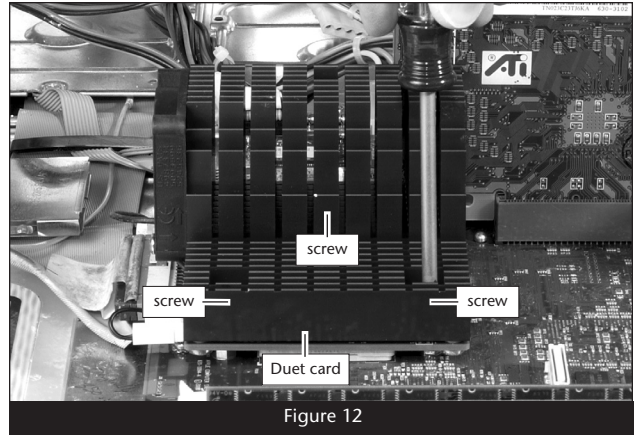


Figure 12

### Close Computer

1. Raise the side panel back into place (Figure 13).
2. Return the computer to your computing area if necessary, and reconnect the power cord and peripheral cables to the computer.

### Turn On Computer

Turn on your Power Mac; your accelerated machine should boot normally.

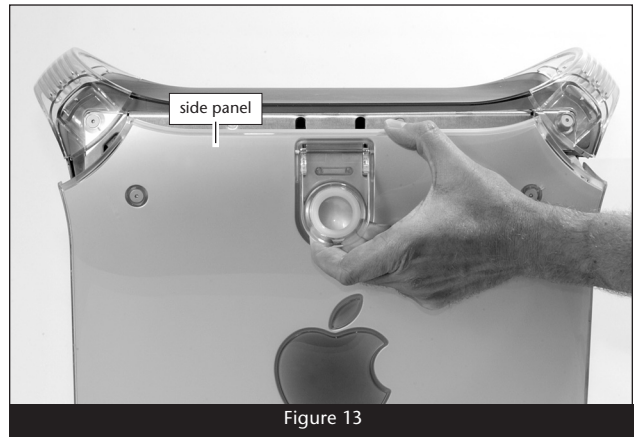


Figure 13

## Installation—Digital Audio Models

This section covers the installation of the Encore/ST G4 Duet into Power Mac G4 Digital Audio models (back panel appears like Figure 15). If you are installing this product into an AGP Graphics or Gigabit Ethernet model, go back to page 3. If you are installing this product into a QuickSilver 2001 or QuickSilver 2002 model, skip to page 10.



**WARNING:** When handling computer products, take care to prevent components from being damaged by static electricity; avoid working in carpeted areas. Handle processor upgrade cards only by their edges and avoid touching connector traces and component pins. Also, avoid touching the logic board and any of its components.

### Shut Down and Open Computer

1. Shut down your Power Mac. If the computer has been on for a while, allow 20 minutes for it to completely cool before beginning the installation.
2. If you need to move the computer to a different area where you can work freely, disconnect any connected cables, move the computer, then reconnect the power cord to the computer and an electrical outlet.
3. Touch a port access cover on the back of the computer to discharge any potential damaging static electricity (**Figure 14**).
4. Disconnect the power cord from the computer.



**Support Note:** To avoid generating a static charge in your body, do not walk around the room until after you finish installing the Encore card and close the computer.

5. If present, remove the two indicated screws from the back plate of the computer (**Figure 15**). Otherwise, go to step 6.
6. Locate the security lock at the back of the computer (**Figure 16**). If it is not already pressed in, press it in now.
7. With the right side of the case facing you, open your Power Mac by lifting the release latch and lowering the side panel away from the computer's case (**Figure 17**).

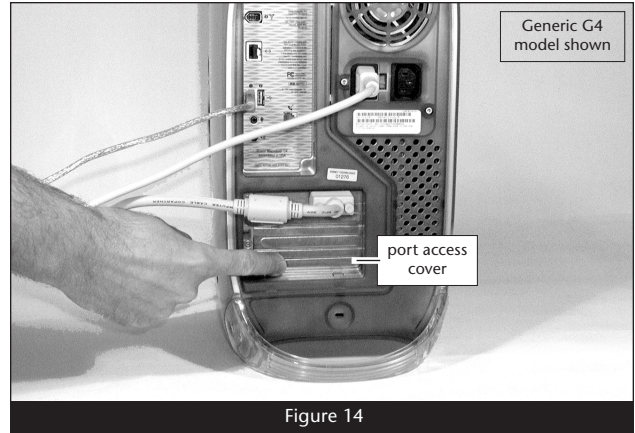


Figure 14

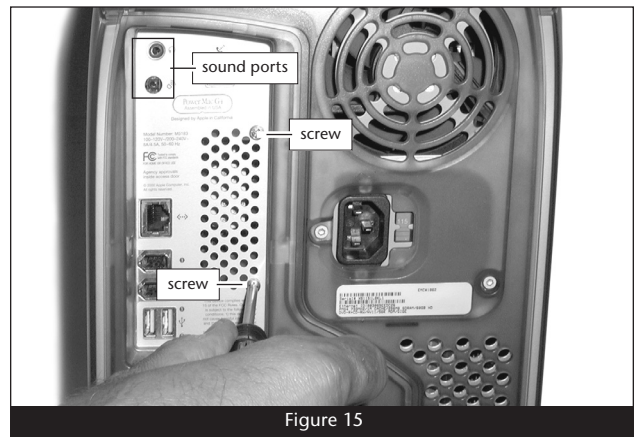


Figure 15

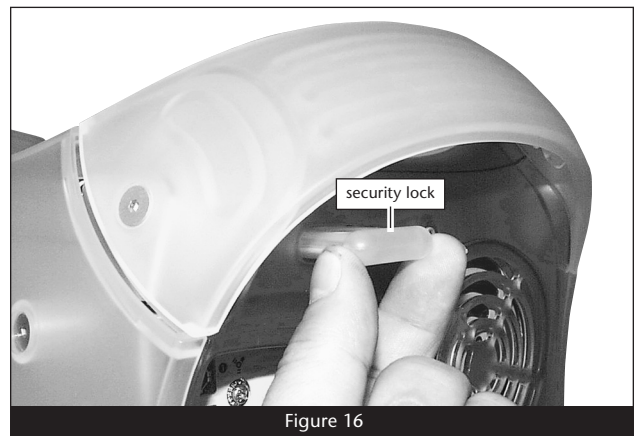


Figure 16

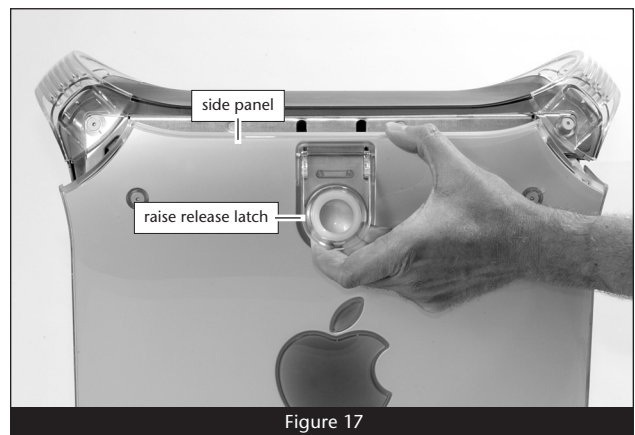


Figure 17

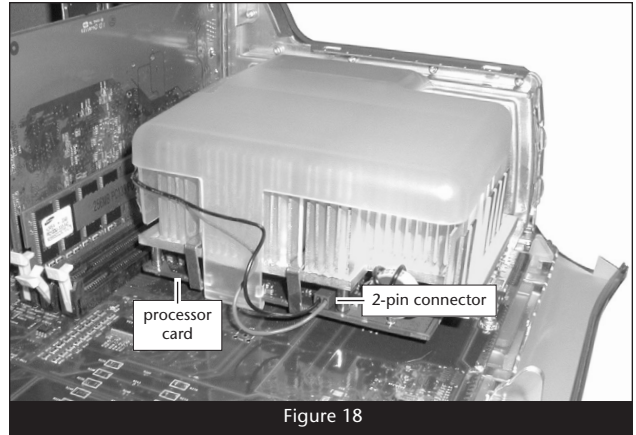


## Installation—Digital Audio Models

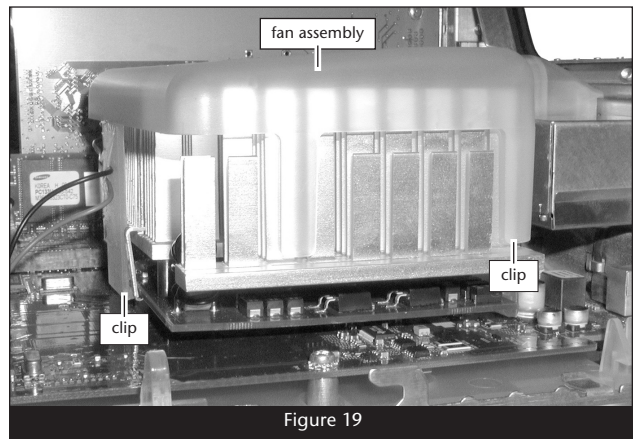
### Remove Fan Assembly

This section covers the removal of the fan assembly found on some Digital Audio models. If your machine does not have a fan assembly covering the processor heat sink, skip to “Remove Heat Sink” below.

1. Locate and carefully disconnect the 2-pin connector from the processor card (Figure 18).

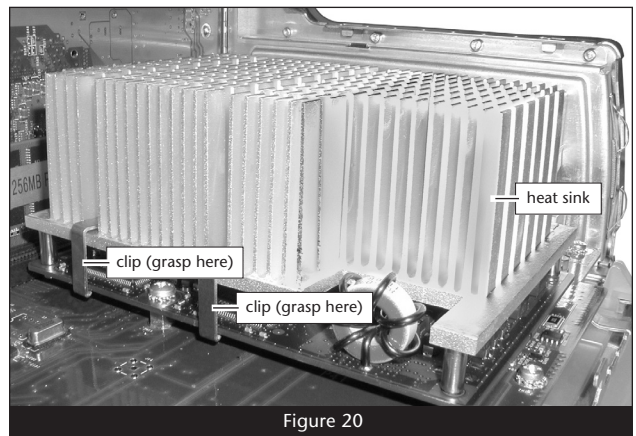


2. Unlatch the fan assembly's clips from the processor card and the heat sink, then lift the fan assembly out of the case and set it aside (Figure 19).



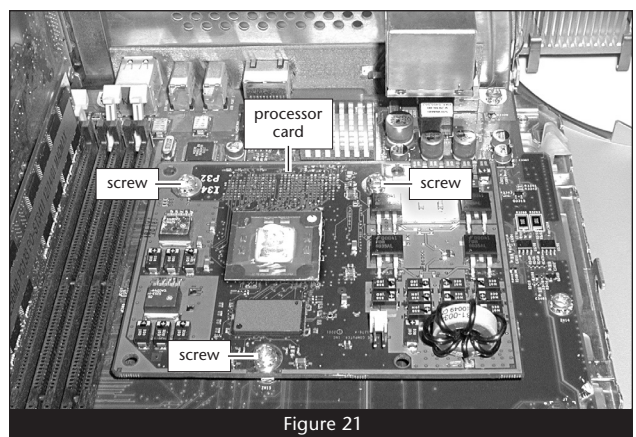
### Remove Heat Sink

Locate the clips securing the processor heat sink to the processor card (Figure 20); your heat sink may appear different from what is pictured. Using caution to avoid touching the processor card and the logic board, grasp one of the clips securing the heat sink with needle-nose pliers, between the heat sink and processor card. Pull down and away to unhook one side of the clip from the processor card (Figure 20). Push the clip away from you to unhook it from the other side. Repeat these steps with the other clip. Once the clips have been unhooked, gently lift the heat sink and clips away from the processor and set them aside, but not on the logic board.



### Remove Processor Card

Remove the three screws securing the processor card to the logic board (Figure 21). Grasping its edges, gently lift one edge of the processor card to separate it from the logic board, and then carefully lift it straight up and away.



## Installation—Digital Audio Models

### Install Encore/ST G4 Duet Processor Upgrade Card

1. Remove the Encore/ST G4 Duet processor upgrade card from its anti-static package; make sure to handle the card by its edges (Figure 22); *your card may differ from what is pictured.*
2. Carefully remove the cap covering the connector on the bottom of the Duet processor card (Figure 23), and then place the cap on the original processor card's connector.
3. Place the processor card you removed from the computer into the anti-static package, and then store it, the original heat sink, heat sink clips, the screws you removed, and the fan assembly in a safe place.
4. Align the connector on the bottom of the Duet card with the connector on the logic board (Figure 24), and then set the card down on top of the three threaded posts. Make sure the connectors are lined up, then, grasping the Duet card by its heat sink, gently press it straight down until the connectors snap together. Verify the connectors are completely coupled by gently pulling up on the edges of the Duet board; the board should remain firmly in place.
6. Making sure the Duet's captive screws are engaged properly in the threaded posts, tighten each of the three screws and secure the card snugly to the logic board; **do not overtighten the screws** (Figure 25).



**WARNING:** When your computer is operating, the Duet's heat sink will become VERY hot to the touch; take care to not touch the heat sink, or you may get burned.

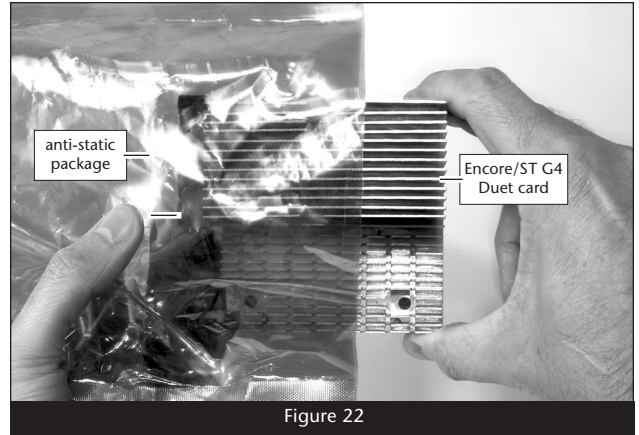


Figure 22

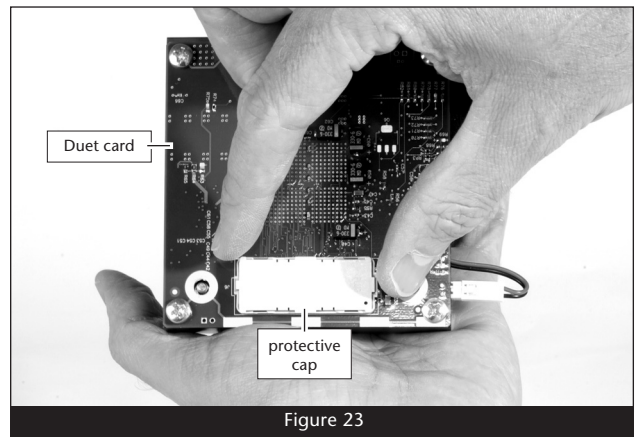


Figure 23

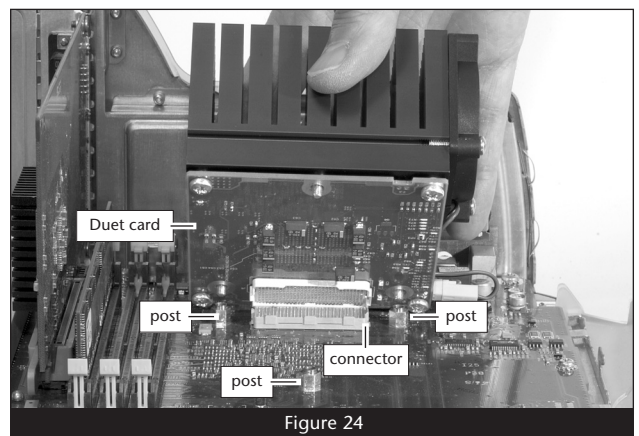


Figure 24

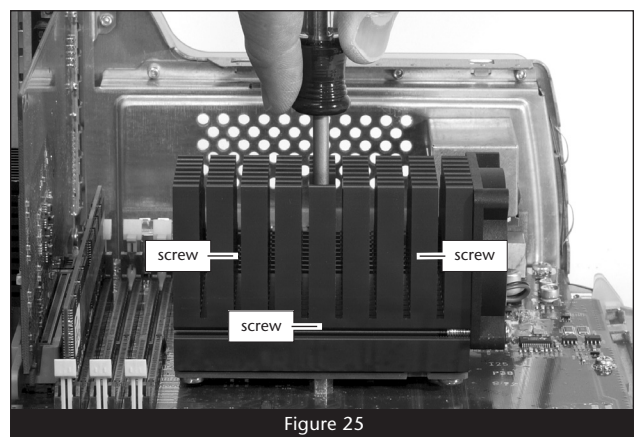


Figure 25

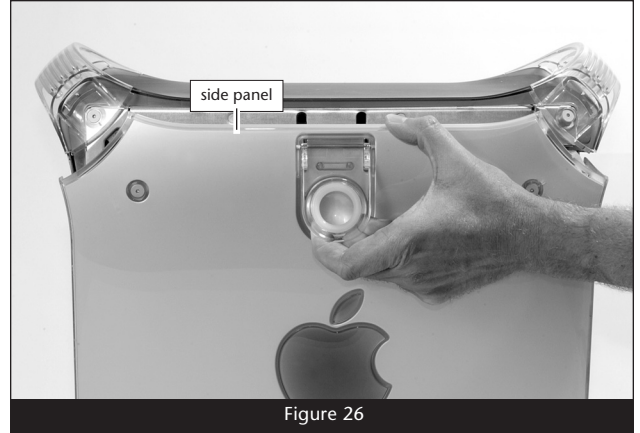
## Installation—Digital Audio Models

### Close Computer

1. Raise the side panel back into place (Figure 26).
2. Return the computer to your computing area if necessary, and reconnect the power cord and peripheral cables to the computer.

### Turn On Computer

Turn on your Power Mac; your accelerated machine should boot normally.



## Installation—QuickSilver 2001 and 2002 Models

This section covers the installation of the Encore/ST G4 Duet into Power Mac G4 QuickSilver 2001 and QuickSilver 2002 models. If you are installing this product into an AGP Graphics or Gigabit Ethernet model, go back to page 3. If you are installing this product into a Digital Audio model, go back to page 6.



**WARNING:** When handling computer products, take care to prevent components from being damaged by static electricity; avoid working in carpeted areas. Handle processor upgrade cards only by their edges and avoid touching connector traces and component pins. Also, avoid touching the logic board and any of its components.

### Shut Down and Open Computer

1. Shut down your Power Mac. If the computer has been on for a while, allow 20 minutes for it to completely cool before beginning the installation.
2. If you need to move the computer to a different area where you can work freely, disconnect any connected cables, move the computer, then reconnect the power cord to the computer and an electrical outlet.
3. Touch a port access cover on the back of the computer to discharge any potential damaging static electricity (Figure 27).
4. Disconnect the power cord from the computer.

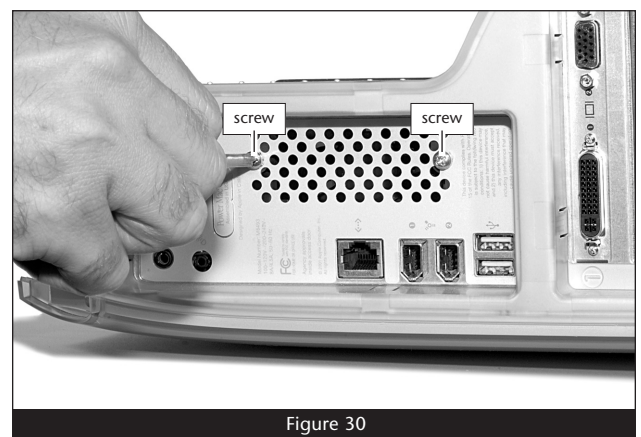
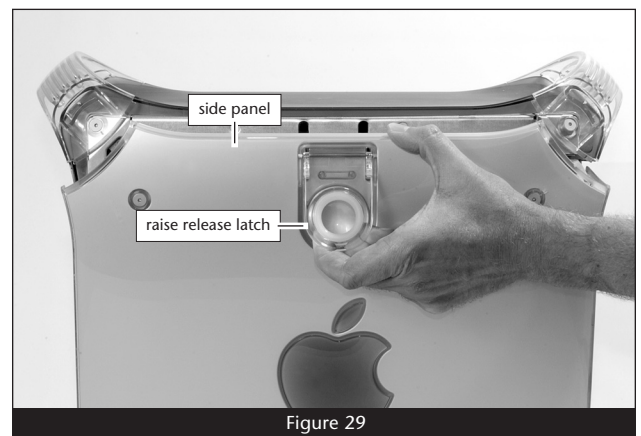
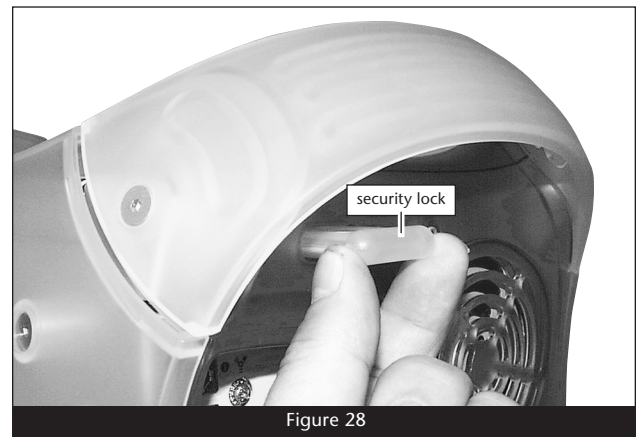
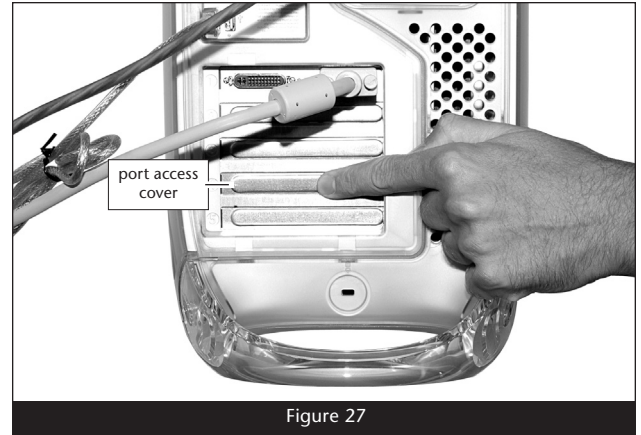


**Support Note:** To avoid generating a static charge in your body, do not walk around the room until after you finish installing the Encore card and close the computer.

5. Locate the security lock at the back of the computer (Figure 28). If it is not already pressed in, press it in now.
6. With the right side of the case facing you, open your Power Mac by lifting the release latch and lowering the side panel away from the computer's case (Figure 29).

### Remove Fan Assembly


1. With the back of the computer facing you, remove the two indicated screws (Figure 30).




## Installation—QuickSilver 2001 and 2002 Models

2. Locate and carefully disconnect the 2-pin fan power connector from the logic board, and then lift out the fan assembly (Figure 31).

### Remove Heat Sink

 **Support Note:** The following steps address the removal of your system's processor card heat sink. Please note, the dual processor heat sink is pictured, but the procedure to remove the single processor heat sink is identical.

 **WARNING:** Verify that the power cord is disconnected from your Power Mac before you remove the heat sink and processor card. The original processor card is secured to the logic board with four screws, one of which carries +12V and could spark if it is grounded when the system is on.

With the front of the computer facing you, locate the clips securing the heat sink to the processor card (Figure 32). Carefully insert a flat blade screwdriver between the right clip and the edge of the heat sink; **do not touch the edge of the processor card**. Using extreme caution, press down on the edge of the clip with needle-nose pliers, and twist the screwdriver to unhook one side of the clip from the processor card (Figure 32). Repeat the procedure on the other side of the clip. Repeat these steps with the left clip. Once the clips have been unhooked, gently lift the heat sink and clips away from the processor card and set them aside, but not on the logic board.

### Remove Processor Card

1. Remove the four screws securing the processor card to the logic board (Figure 33).
2. Grasping its edges, gently lift one edge of the processor card to separate it from the logic board, and then carefully lift it straight up and away (Figure 34).

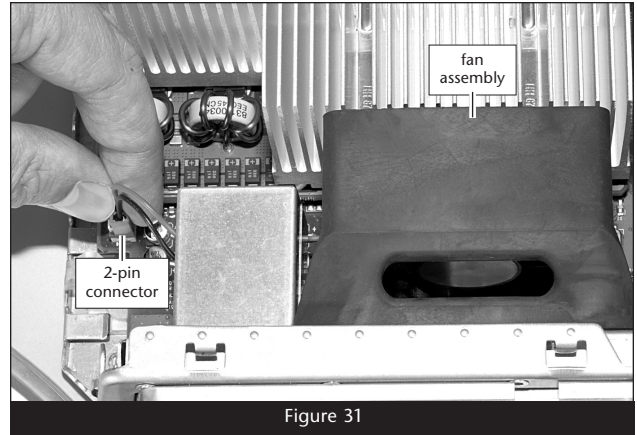


Figure 31

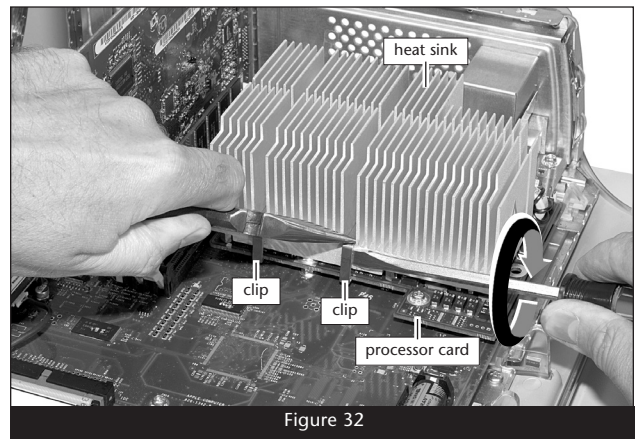


Figure 32

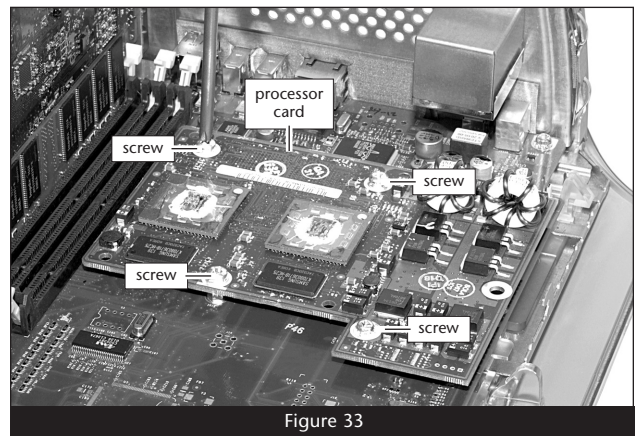


Figure 33

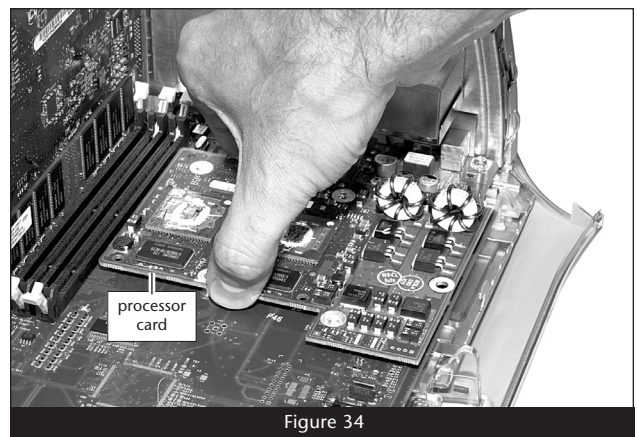
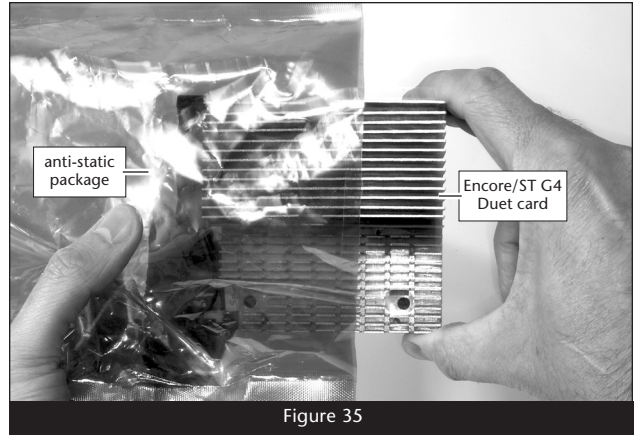


Figure 34

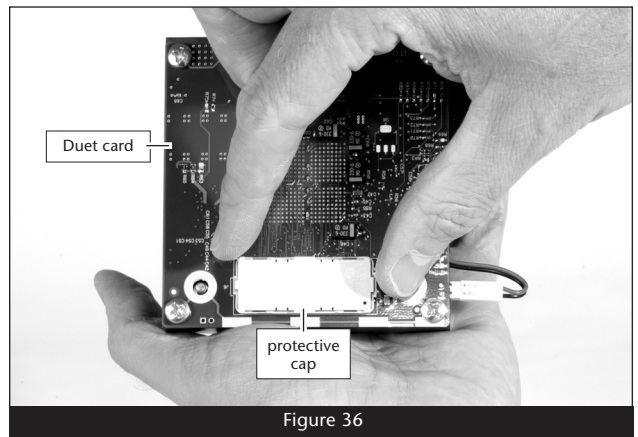
## Installation—QuickSilver 2001 and 2002 Models

### Install Encore/ST G4 Duet Processor Upgrade Card

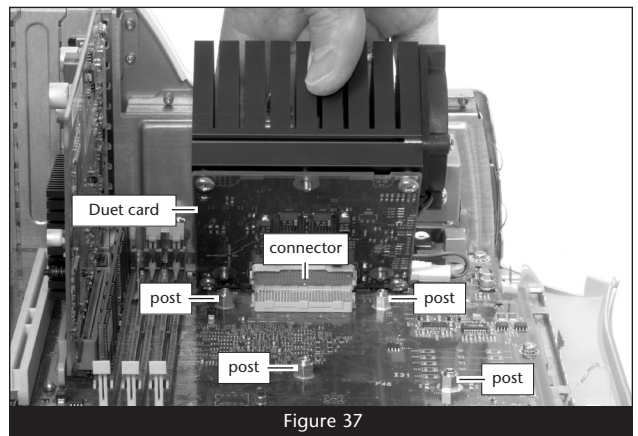
1. Remove the Encore/ST G4 Duet processor upgrade card from its anti-static package; make sure to handle the card by its edges (Figure 35); *your card may differ from what is pictured.*



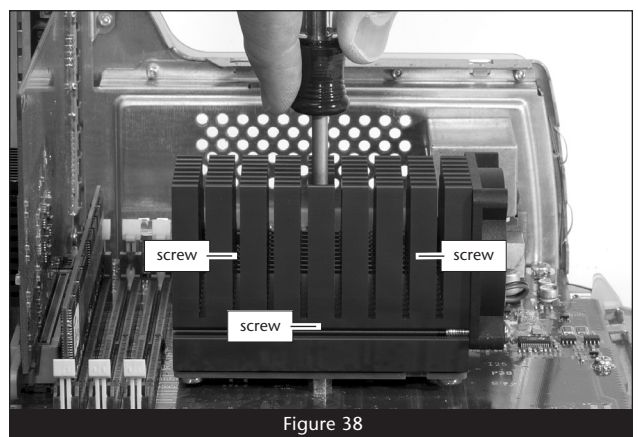
2. Carefully remove the cap covering the connector on the bottom of the Duet card, and then place the cap on the original processor card's connector (Figure 36).
3. Place the processor card you removed from the computer into the anti-static package, and then store it, the original heat sink, heat sink clips, the screws you removed (except the one with the lock washer), and the fan assembly in a safe place.



4. Align the connector on the bottom of the Duet card with the connector on the logic board (Figure 37), and then set the card down on top of the three threaded posts. Make sure the connectors are lined up, then, grasping the Duet card by its heat sink, gently press it straight down until the connectors snap together. Verify the connectors are completely coupled by gently pulling up on the edges of the Duet board; the board should remain firmly in place.



5. Making sure the Duet's captive screws are engaged properly in the threaded posts, tighten each of the three screws and secure the card snugly to the logic board; **do not overtighten the screws** (Figure 38).



**WARNING:** When your computer is operating, the Duet's heat sink will become VERY hot to the touch; take care to not touch the heat sink, or you may get burned.

## Installation—QuickSilver 2001 and 2002 Models

### Reinstall Fan Assembly and Close Computer

1. Place the fan assembly between the Duet card's heat sink and the back panel of the computer, against the modem filter (Figure 39). Carefully plug in the fan's 2-pin connector to the connector on the logic board.
2. With the back of the computer facing you, secure the fan assembly to the back plate of the computer with the two screws you removed previously (Figure 40).
3. Raise the side panel back into place (Figure 41).
4. Return the computer to your computing area if necessary, and reconnect the power cord and peripheral cables to the computer.

### Turn On Computer

Turn on your Power Mac; your accelerated machine should boot normally.

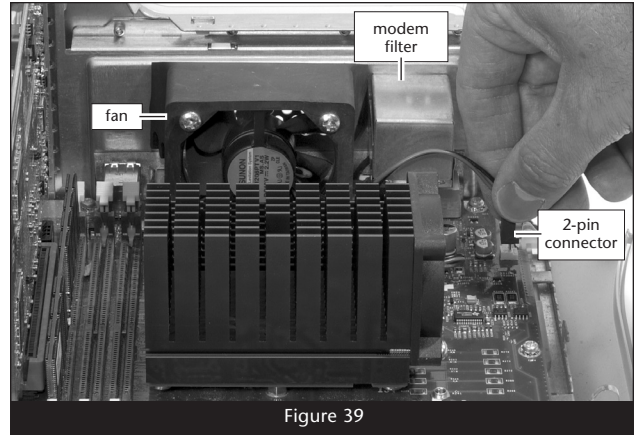


Figure 39

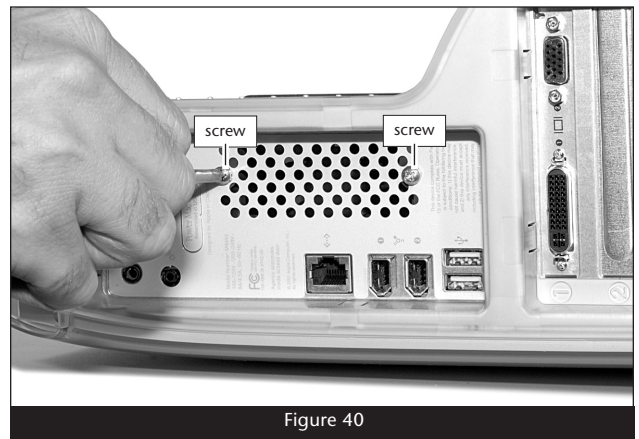


Figure 40

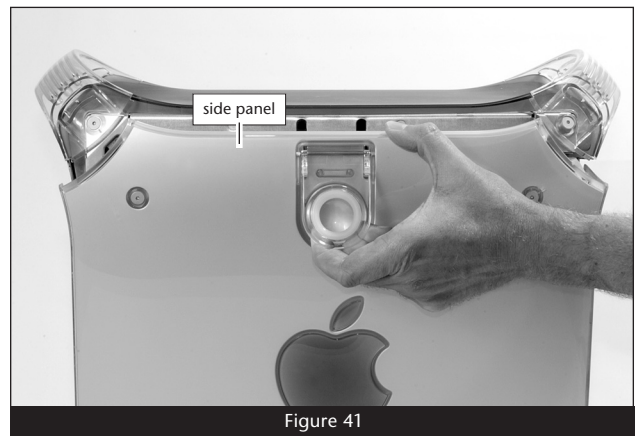


Figure 41