TEMPO™ Trio

PCI Adapter Combo Card with ATA/133, FireWire®, and USB 2.0

Quick Start Guide for Tempo Trio

Operating System Compatibility

At this printing, the Tempo Trio is compatible with Mac OS® 9.0 through OS X Version 10.3.x. **Mac OS X Version 10.2.8 or higher is required for hi-speed USB 2.0 support**. For up-to-date Mac OS compatibility information, check our web site.

You Should Have

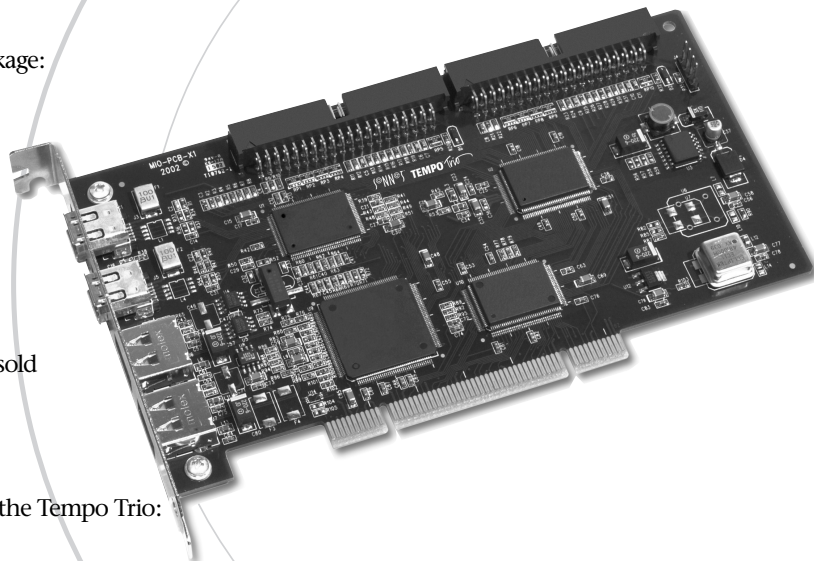The following items should be included in your product package:

• One Tempo Trio Macintosh PCI Combo Card
• One Ultra ATA Cable (supporting two internal hard drives)
• Eight screws (for mounting hard drives)

The following items may be required for installation:

• Medium Phillips screwdriver
• Small flat blade screwdriver
• Needle nose pliers
• Drive mounting brackets/carriers or drive mounting sleds (sold separately)
• One additional Ultra ATA Cable (sold separately)
• One or more power cable Y-adapters (sold separately)

You may need the following items to connect peripherals to the Tempo Trio:

• One or more FireWire (IEEE 1394) cables (sold separately)
• One or more USB cables (sold separately)
• One or more USB hubs (sold separately)

System Requirements

In addition to the hard drive(s) you will connect, the Tempo Trio requires the following in order to operate in your system:

• One available PCI slot
• One or more available drive bays (depending on configuration)
• FireWire driver software*
• USB driver software*

☎ **Support Notes:** We recommend you make a backup of important information on your system's current hard drive(s) prior to installing new hardware or software.

When handling computer products, you must take care to prevent components from being damaged by static electricity. Before opening your computer or removing parts from their packages, always ground yourself first by touching a metal part of the computer, such as a port access cover, and work in an area free of static electricity; avoid carpeted areas. Handle all electronic components by their edges, and avoid touching connector traces and component pins.

⚠ **WARNING:** If you are installing the enclosed Tempo Trio card into a system running Mac OS X Version 10.0–10.1.5, you MUST downgrade the card's ATA firmware in order for OS X to recognize any attached drive. For complete instructions, visit our web site at www.sonnettech.com/support/tempotrio.

* Depending on your operating system, you may need to install these drivers; instructions follow.

Hardware Installation Steps

Support Note: Technical knowledge may be required to gain access to the drive expansion bays in certain computer models. We recommend you first consult your computer's user manual. If you feel you are unable to install the computer hardware, contact a qualified technician.

Hardware Installation Preparation

Prior to installing the Tempo Trio and hard drives into your system, you should familiarize yourself with the parts to be installed. We also strongly recommend that you read the sections in your computer's user manual that address hard drive and PCI card installation.

1. Identify the connectors on the included Ultra ATA cable as shown in **Figure 1**; the host connector plugs into the Tempo Trio card, while the master and slave connectors plug into the hard drives.

2. Remove the hard drive from its packaging.

3. Locate the jumper block on your hard drive. **Figure 2** shows the two most common jumper block locations.

Support Note: Most hard drives are factory preset for use as a single or master drive. To change the setting, you will need to reconfigure the hard drives' jumpers. Be sure the jumpers are configured properly, otherwise, your computer may not boot, or your new drives may not be recognized.

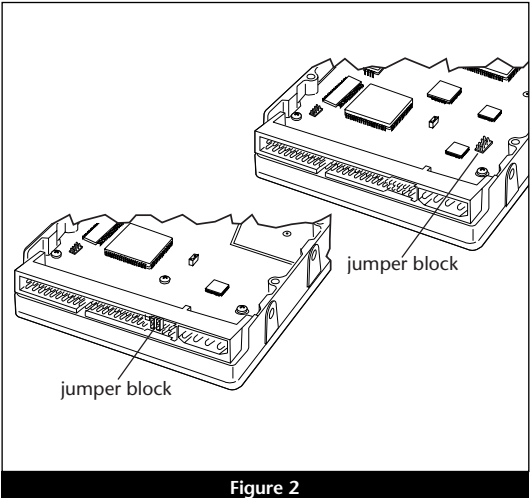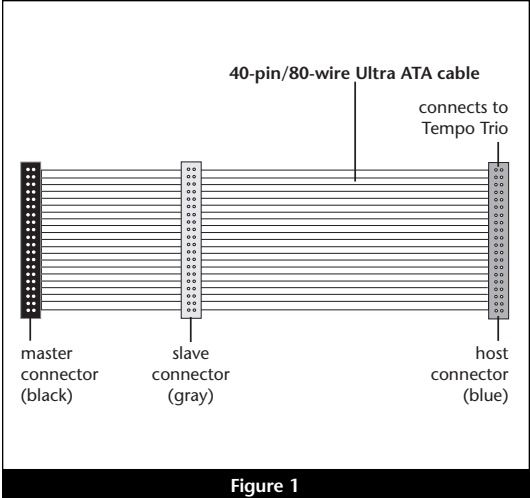### Tempo Trio Card and Hard Drive Installation Steps

This section covers the installation of the Tempo Trio card, and the configuration and installation of one or more hard drives into your system.

1. Shut down your computer.

2. Open your computer to access the expansion card area (PCI slots) and drive bay(s); refer to your computer's user manual for specific information.

Support Note: Refer to the hard drive user's manual for jumper setting information specific to your drives. Alternately, you may find jumper setting information printed on your hard drives' labels. Make sure the drives are oriented the same way as the illustration before moving jumpers.

3. Configure the hard drives' jumpers as follows:

• When installing **one drive**, you must set its jumpers to the single setting when available, or the master setting when not **(Figure 3)**. When connecting **two drives** to the supplied Ultra ATA cable, you must set the jumpers on one drive to the master setting, and to the slave setting on the other **(Figure 3)**.

• When installing **two drives** connected to **two Ultra ATA cables**, you must set the jumpers on each drive to the single setting when available, or the master setting when not **(Figure 3)**. When connecting **three or four drives** to **two Ultra ATA cables**, you must set the jumpers on two drives to the master setting, and to the slave setting on the other drive(s) **(Figure 3)**.

40-pin/80-wire Ultra ATA cable

connects to Tempo Trio

master connector (black)

slave connector (gray)

host connector (blue)

Figure 1

jumper block

jumper block

Figure 2

Drive Jumper Settings

	One Cable	Two Cables
One Drive	single (or master)	—
Two Drives	master, slave	master (or single), master (or single)
Three Drives	—	master, master, slave
Four Drives	—	master, master, slave, slave

Figure 3

Hardware Installation Steps

4. Install the hard drives into the drive expansion bays. (Depending on your computer model, mounting brackets/carriers or mounting sleds may be required to install your hard drives. Refer to your computer's user manual.)

5. Using only the supplied Ultra ATA cable, you may connect one or two drives. If you are connecting two or more drives to two Ultra ATA cables, skip to the next step; otherwise, connect the drives as follows:

- When connecting *one drive*, plug in the Ultra ATA cable's master (black) connector to it **(Figure 4)**.

- When connecting *two drives*, connect the Ultra ATA cable's master (black) connector to the drive with jumpers set in the master setting; connect the slave (gray) connector to the drive with jumpers configured in the slave setting **(Figure 4)**.

6. Using two Ultra ATA cables, you may connect two, three, or four drives; connect them as follows:

- When connecting *two drives*, plug the Ultra ATA cables' master (black) connectors into the drives **(Figure 5)**.

- When connecting *three or four drives*, connect the Ultra ATA cables' master (black) connectors to the drives with jumpers set in the master setting; connect the slave (gray) connectors to the drives with jumpers set in the slave setting **(Figure 5)**.

7. Locate the 4-pin power connector plugged into your computer's existing hard drive. You should find at least one extra power connector near the existing drive; if you have installed only one new drive, plug the extra power connector into it. If you have installed more than one new drive, or there are no additional power connectors, you must use power cable Y-adapters (sold separately). **Verify the connectors are plugged in securely**.

8. Locate an available PCI slot inside your computer and remove its port access cover, if present, from the rear of the computer.

9. Remove the Tempo Trio card from its packaging.

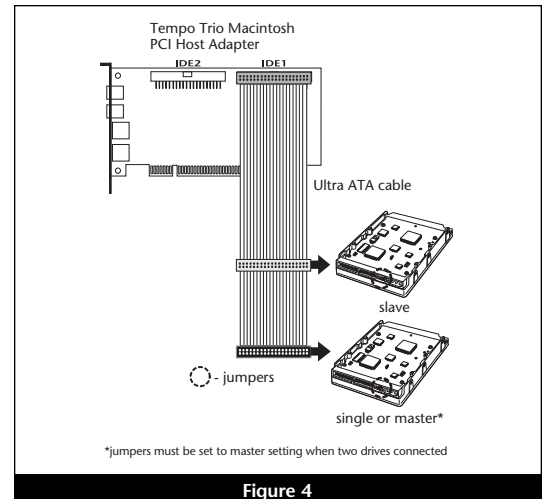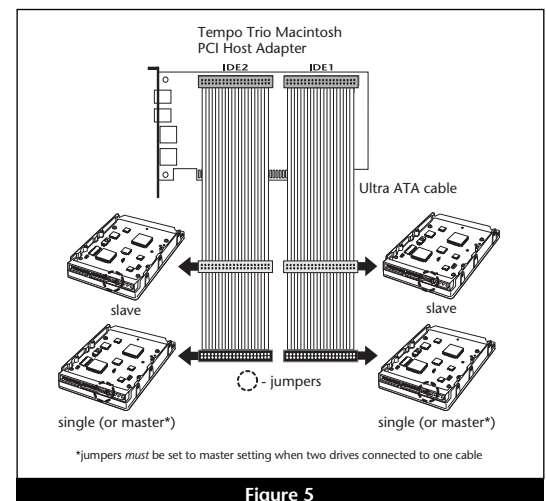**10.** Install the Tempo Trio into the PCI slot; **make sure the card is firmly seated and secured**.

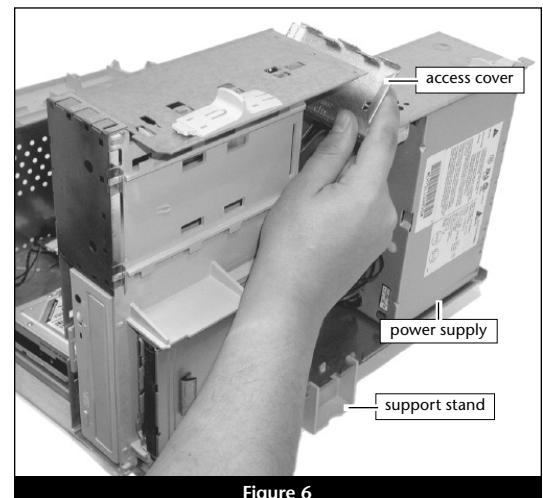**Support Note: Power Macintosh 7200, 7300, 7500, 7600 and G3 Desktop users must remove the access panel on the main chassis** to route the Ultra ATA cables from the drives to the Tempo Trio. *You may need tools to perform this procedure.* To remove the access panel, first unlock and tilt up the internal assembly; remember to lower the assembly support stand. Next, firmly twist the top edge of the panel forward toward the power supply, then lift the panel out **(Figure 6)**. Save the panel in case you ever need to use it again.

11. Route the Ultra ATA cable(s) to the Tempo Trio card; avoid the processor's heat sink and make sure the cables will not get crushed or pinched by any part of the case when the computer is reassembled.

Tempo Trio Macintosh PCI Host Adapter
IDE2 IDE1
Ultra ATA cable
slave
- jumpers
single or master*
*jumpers must be set to master setting when two drives connected

Figure 4

Tempo Trio Macintosh PCI Host Adapter
IDE2 IDE1
Ultra ATA cable
slave   slave
- jumpers
single (or master*)   single (or master*)
*jumpers *must* be set to master setting when two drives connected to one cable

Figure 5

access cover
power supply
support stand

Figure 6

Hardware Installation Steps

12. Attach the Ultra ATA cables' host (blue) connectors to the Tempo Trio card.

13. Check the cable connections; **make sure all cables are properly connected to the Tempo Trio and the hard drives**.

📞 **Support Note:** If your computer has an original internal SCSI hard disk drive, and you disconnect it when you install the Tempo Trio and one or more drives, **you must terminate the SCSI chain properly; installation of a SCSI terminator connector may be required**. Failure to properly terminate any SCSI chain may result in system freezes and errors. Consult your computer's user guide or a qualified technician for more information.

14. Close your computer and carefully replace its cover; be very careful not to crimp the cables.

Drive Formatting Steps

⚠️ **WARNING:** Hard drives attached to the Tempo Trio will not mount (appear on the desktop) until they have been formatted; this includes drives with data on them, previously used in other computers. Please be aware that **formatting a drive erases any data present**.

Drive Formatting—Mac OS 8.0 through OS 9.x
This section describes the process of formatting (initializing) hard drives connected to the Tempo Trio using Apple Drive Setup under Mac OS 8.0–9.x. The Drive Setup application is installed during the Mac OS installation process and is usually located in the Utilities folder on the hard drive containing your active System Folder. If you wish to format your drives with Disk Utility under Mac OS X, please skip to the next section.

1. Turn on your computer.

2. Open Drive Setup **(Figure 7)**.

📞 **Support Note:** IDE hard drives attached to the Tempo Trio will register as SCSI devices to the computer under Mac OS versions prior to OS X. For example, in **Figure 7** the newly installed hard drive appears as <not initialized> under Volume Name(s) and SCSI under Type.

3. At this point, you may optionally choose to partition each drive to create smaller "virtual" drives to store and retrieve data faster and more efficiently; in the Drive Setup menu bar, select Functions: Volume Settings… Partition, and set up the partitions. When ready, select the drive listed as <not initialized>, then click Initialize… to format each of the unmounted drives **(Figure 7)**. For drives larger than 2 GB, you should format them as Mac OS Extended to take full advantage of their storage capacity.

4. Name each drive or volume once it has been initialized; each volume will appear on the desktop as a single "virtual" drive **(Figure 8)**. You can now use your drive(s).
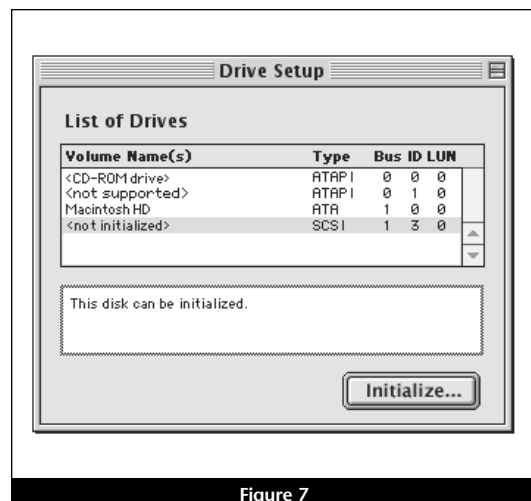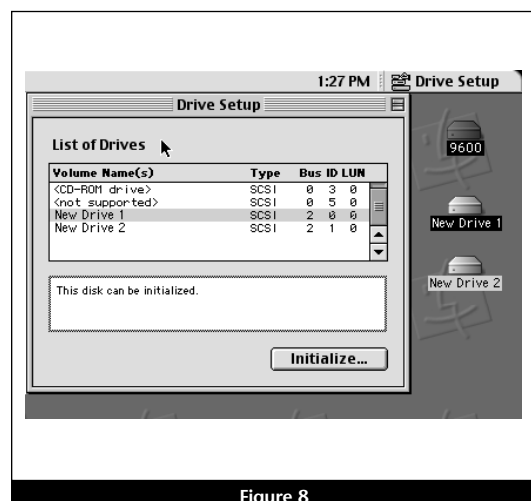
Figure 7

Figure 8

Drive Formatting Steps

Drive Formatting—Mac OS X
This section describes the process of formatting (initializing) hard drives connected to the Tempo Trio using Disk Utility under Mac OS X Version 10.1; the process under Versions 10.2 and 10.3 is similar. The drive formatting utility is installed during Mac OS X installation and is located in the Utilities folder (within the Applications folder) on your OS X volume.

1. Turn on your computer.

2. During the boot process under Mac OS X, you may see an information window appear stating "You have inserted a disk containing no volumes that Mac OS X can read." If this message appears, click the Initialize… button to launch Disk Utility **(Figure 9)**.

Figure 9

3. If you have not already done so, open Disk Utility **(Figure 10)**. Note that all attached drives appear in the Information window, regardless of being formatted or not.

> **Support Note:** IDE hard drives attached to the Tempo Trio will register as ATA devices to the computer under Mac OS X. For example, in **Figure 10**, the Connection Bus for the newly installed hard drive is listed as ATA.

4. Select the drive you want to format by single-clicking the drive symbol or the "name" of the drive **(Figure 10)**. In the *Information* window, the drive capacity and Connection ID (Master or Slave) is listed.

Figure 10

5. Click on the Partition tab **(Figure 11)**. When the *Partition* window appears, click on the drop down menu beneath "Volume Scheme:" and select a number of partitions for the volume; you may optionally choose to partition each drive to create two or more smaller "virtual" drives to store and retrieve data faster and more efficiently. For drives larger than 2 GB, you should format them as Mac OS Extended to take full advantage of their storage capacity. If you intend to use Mac OS 9.x, check the Install Mac OS 9 Disk Drivers check box. Click OK (or Partition if you are using Mac OS X Version 10.2).
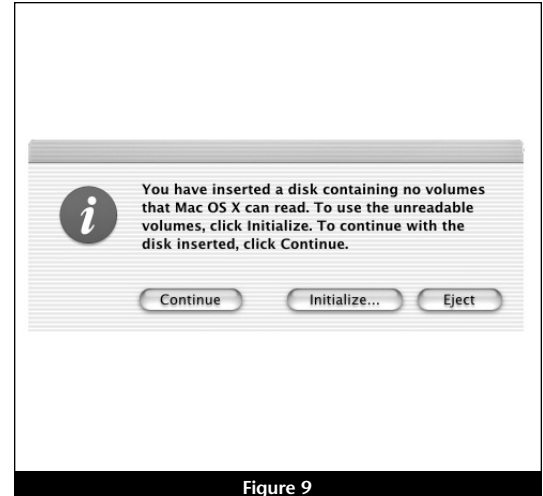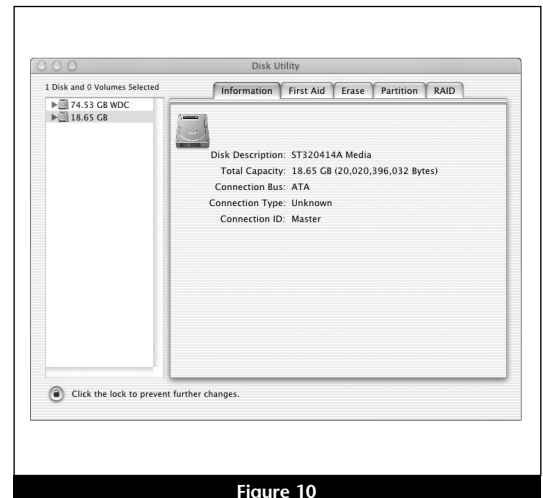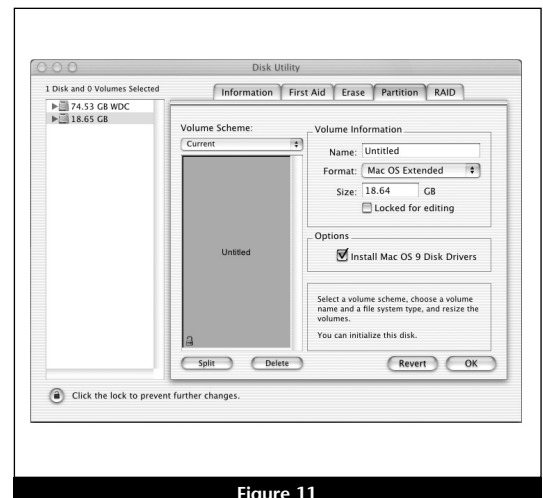

Figure 11

Drive Formatting Steps

6. Name each volume; after formatting, each will appear in the *Finder* window as a drive. Once you have made your name and partition choices, click OK (**Figure 12**).

7. When the *Warning* window appears, click the Partition button (**Figure 12**). If necessary, repeat steps 4–6 to partition other drives connected to the Tempo Trio. When partitioning and formatting are complete, close the Disk Utility application; you can now use your drive(s).

FireWire and USB Driver Installation Steps

The Tempo Trio requires that FireWire and USB drivers be installed in your system to enable the FireWire and USB ports. Locate the following section that applies to your system for information and instructions.

Support Note: Many peripherals require their own drivers and application software to operate or have full functionality. The Apple drivers already installed, or that you are about to install, in your system provide only limited support for some items. You should also install software included with the device, or available to download from the device manufacturer's web site. Check the peripheral's user's manual for information about necessary software.

Mac OS X Version 10.2.8 and Higher
Mac OS X Versions 10.2.8 and higher support hi-speed USB 2.0, USB 1.1 and FireWire (400) without additional drivers; your installation is complete.

Mac 9.2 through OS X Version 10.2.6
The drivers that enable the Tempo Trio to support FireWire (400), and the drivers that enable it to support all USB devices at USB 1.1 speeds are installed automatically when you upgrade your Mac operating system software to 9.2 through OS X Version 10.2.6; your installation is complete.

Mac OS 9.1.x (Existing Installation)
Complete these steps only if you installed Mac OS 9.1 before installing the Tempo Trio. Please note, *if your system has built-in USB and FireWire ports, you may skip these steps; your installation is complete.*

1. Insert the Mac OS 9.1 CD into your computer's CD-ROM drive. In the finder menu, select Special: Restart, then immediately press and hold down the C key on your keyboard until your system restarts and the *Welcome to Mac OS* screen appears.

2. Double-click the Mac OS Install application icon. In the *Select Destination* window, click the Select button. Proceed through the next several screens until you reach the *Install Software* window. Click the Customize button. In the *Custom Installation and Removal* window, deselect all the Software component check boxes (click on each check or dash until the box is empty), except Mac OS 9.1. Click the pop-up menu to the right of Mac OS 9.1. Change from "Recommended Installation" to "Customized Installation." The *Select Mac OS 9.1 Features to Install* window will appear shortly.

3. Change "Recommended Installation" to "Customized Installation" from the pop-up menu. Deselect all the feature check boxes except "Network and Connectivity." Click the arrow next to "Network and Connectivity" to view the features. Deselect all the features except "FireWire" and "USB Adapter Card Support". Click OK, Start, then Continue to complete the installation. After the software is installed, quit the Mac OS Install application and restart your computer from the hard drive where Mac OS 9.1 is installed; your installation is complete.

Figure 12

FireWire and USB Driver Installation Steps

Mac OS 9.1.x (Upgrade from Lower Mac OS Version)
Complete these steps only when upgrading your system to Mac OS 9.1 from a lower Mac OS version; FireWire and USB driver software will be installed automatically. Please note, *if your system has built-in USB and FireWire ports, you may skip these steps; your installation is complete.*

1. Insert the Mac OS 9.1 CD into your computer's CD-ROM drive. In the finder menu, select Special: Restart, then immediately press and hold down the C key on your keyboard until your system restarts and the *Welcome to Mac OS* screen appears.

2. Double-click the Mac OS Install application icon. In the *Select Destination* window, click the Options button and click the Perform Clean Installation check box that appears in the subsequent screen. Click the Select button. Proceed through the next several screens until you reach the *Install Software* window. Click OK, Start, then Continue, and complete the installation. After the software is installed, quit the Mac OS Install application and restart your computer from the hard drive where Mac OS 9.1 is installed; your installation is complete.
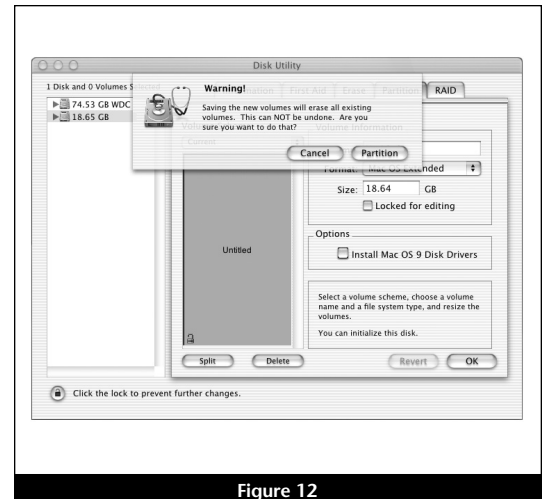
Mac OS 9.0.x (Existing Installation)
If Mac OS 9.0.x is installed in your computer, you must download and install the appropriate FireWire and USB driver software. Please note, *if your system has built-in USB and FireWire ports, you may skip these steps; your installation is complete.*

1. Turn on your computer.

2. Log on to the Internet and type in www.sonnettech.com/support/tempotrio. Locate and click on the link for FireWire and USB drivers, read the information on the page, then click on each link to download both drivers.

3. Install the drivers, then restart your computer from the hard drive where Mac OS 9 is installed; your installation is complete.

Mac OS 9 (Upgrade from Lower Mac OS Version)
Complete these steps only when upgrading your system to Mac OS 9.0 from a lower Mac OS version.

1. Insert the Mac OS 9 CD into your computer's CD-ROM drive. In the finder menu, select Special: Restart, then immediately press and hold down the C key on your keyboard until your system restarts and the *Welcome to Mac OS* screen appears.

2. Double-click the Mac OS Install application icon. In the *Select Destination* window, click the Options button and click the Perform Clean Installation check box that appears in the subsequent screen. Click the Select button. Proceed through the next several screens until you reach the *Install Software* window. Click OK, Start, then Continue, and complete the installation. After the software is installed, quit the Mac OS Install application and restart your computer from the hard drive where Mac OS 9 is installed.

3. Log on to the Internet and type in www.sonnettech.com/support/tempotrio. Locate and click on the link for FireWire and USB drivers, read the information on the page, then click on each link to download both drivers.

4. Install the drivers, then restart your computer from the hard drive where Mac OS 9 is installed; your installation is complete.

Tempo AV Tool Control Panel Installation and Use

Support Note: The Tempo AV Tool Control panel operates only under Mac OS 8.0 through OS 9.x, and only in the following computers: Power Macintosh 7200, 7215, 7220, 7300, 7500, 7600, 8200, 8500, 8515, 8600, 9500, 9515, and 9600, Workgroup Server 7250, 7350, 8550, and 9650, PowerCenter, PowerCenter Pro, PowerCurve, PowerTower, PowerTower Pro, PowerWave, UMAX J700, and S900. Attempted use of the Tempo AV Tool Control Panel in an unsupported system will result in an error message.

What is the Tempo AV Tool?

The Tempo AV Tool is a control panel which optimizes the playback of audio and video files from drives attached to the Tempo Trio, and eliminates the video artifacts and audio stuttering common to other PCI host adapters installed in pre-G3 Power Macintosh and Macintosh clone computers.

This tool is offered free of charge, and may be downloaded at www.sonnettech.com/downloads/adapter_sw.html#tempoav.

Install Tempo AV Tool Control Panel

1. Decompress the Tempo AV Tool file you downloaded from Sonnet.

2. Click on and drag the Tempo AV Tool Control Panel to your active System Folder, and then release the mouse button. When the dialog box appears, click OK; the Tempo AV Tool Control Panel will be placed in the Control Panels folder.

Use the Tempo AV Tool Control Panel

Only use the Tempo AV Tool if you are experiencing problems with audio or video playback from a drive connected to the Tempo Trio. The Tempo AV Tool resolves playback issues by slowing down the data transfer from drives connected to the Tempo Trio to better match your legacy Macintosh bus and processing limitations.

1. Click on the Apple Menu: Control Panels and select Tempo AV Tool; the Tempo AV Tool control panel window will open **(Figure 13)**.

2. Click on a radio button to make your selection, then close the window.

Note: If your initial selection does not remedy your playback issue, try other settings on the list until all options are exhausted; different file formats can exhibit different behaviors. The Tempo AV Tool cannot address video playback issues related to insufficient or underpowered video support.
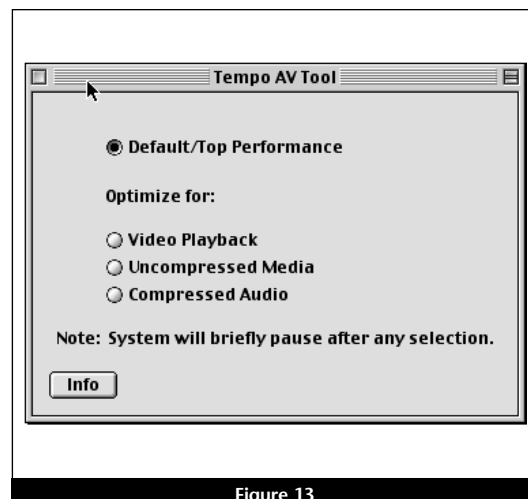

Figure 13

Using FireWire and USB Devices With The Tempo Trio

Known Issues and Advice

FireWire and USB interfaces have many technological advantages over older interfaces such as ADB and SCSI, not the least of which is hot-plugging capability. However, there are some limitations you should be aware of, and some advice we have listed here. Refer to the peripheral manufacturers' web sites and user's guides for more specific information.

• While USB keyboards and mice are compatible with Tempo Trio, certain functions cannot be supported on pre-G3 machines; this is an Apple ROM issue and not a problem with the Sonnet Tempo Trio. Because pre-G3 Macintosh computers were built before Apple added onboard USB support, certain features, including keyboard startup, wake from sleep (by pressing a key or moving the mouse), and others, will not work. We recommend that you keep an ADB keyboard and mouse connected to your system to support such functionality.

• **Many peripherals require additional drivers and application software to operate or have full functionality**. Software should be included with the device, or available to download from the manufacturer's web site. Check the peripheral's user's manual for information about necessary software.

• Disconnecting USB or FireWire peripherals (including external storage devices, cameras, memory card readers, printers, etc.) while they are transferring or receiving data, may result in damage to the file(s) being transferred or cause your system to hang.

• Always unmount a drive from the desktop before disconnecting it from its cable or the Tempo Trio card.

• Do not forget to connect external power supplies to the peripherals that require them. Although many peripherals may draw power directly from the Tempo Trio card, other devices require an external power source.

• When a USB 2.0 peripheral is connected to a USB 1.1 peripheral, which is in turn connected directly to the Tempo Trio, the USB 2.0 peripheral will operate at USB 1.1 speeds. Keep USB 2.0 and USB 1.1 devices connected separately.

• Should you need to connect USB 2.0 peripherals to a hub, be sure to use a USB 2.0 hub; USB 2.0 peripherals connected to a standard USB hub will operate at USB 1.1 speed.

• When the Tempo Trio is installed in a pre-G3 Macintosh computer, connected FireWire drives cannot be used as the system startup (boot) drive.

• When transferring data from a digital video camera using a FireWire port on the Tempo Trio, we do not recommend using another FireWire device at the same time.

• Do not connect FireWire devices in a loop, nor terminate a FireWire chain; there are no terminators or ID settings required for any FireWire device.