
TR-824

SATA Host Adapter

User's Manual

Manual Rev: 1.00

Date: Nov. 2003

Model Number	Protocol	PCI Interface	Max Xfer Rate (MB/s)	Max Devices
TR-824	Serial ATA 1.0 Specification	PCI 2.3 66MHz/32bit	150	4

The designation TR-824 is used throughout this manual in reference to the features of the above model.

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CE Compliance Statement

This equipment has been tested and found to comply with the requirements set up in the council directive on the approximation of the law of member states relating to the EMC Directive 89/336/EEC, amended by 92/31/EEC & 93/68/EEC. For the evaluation regarding to the electromagnetic compatibility, the following standards were applied:

* EN 55022:1998

* EN 55024:1998

IEC 61000-4-2: 1995+A1: 1998

IEC 61000-4-3: 1995+A1: 1998

IEC 61000-4-4: 1995

IEC 61000-4-6: 1996

IEC 61000-4-8: 1993

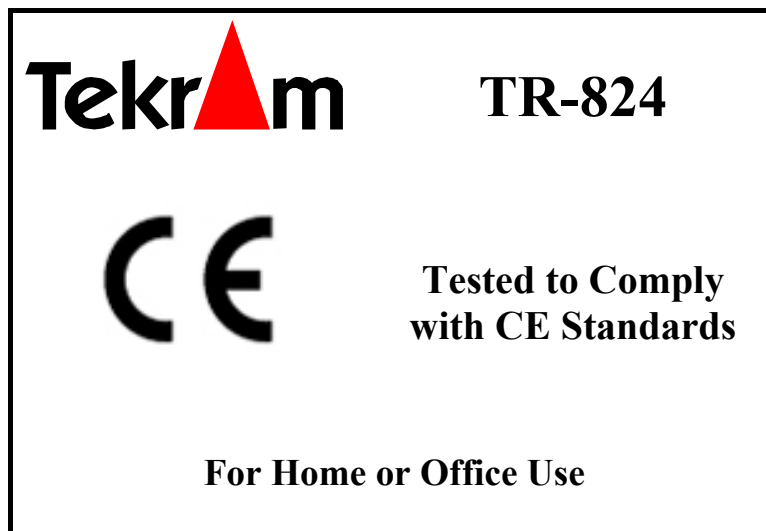


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1. INTRODUCTION

1.1 Product Overview

Thank you for purchasing Tekram TR-824 Serial ATA controller card. This controller allows you to install and enjoy the performance advantage of the new Serial ATA hard drives in your existing PC rather than spending the time, effort and money in upgrading to a brand-new system. The TR-824 is a four-channel PCI Serial ATA host adapter that can support up to four Serial ATA drives.

1.1.1 Specifications:

<i>Features</i>	Support RAID 0(striping), RAID 1(mirroring), RAID 10 <ul style="list-style-type: none"> ● Four independent SATA channels ● Support hot-swap and automatically rebuild mirror array ● Easy-to-use GUI-based software for monitoring and storage management ● Support ATAPI device ● Support driver greater than 137GB
<i>Protocol Supported</i>	Serial ATA 1.0 Specification
<i>SATA Processor</i>	Sil3114 – Silicon Image PCI to Serial ATA Controller
<i>SATA BIOS</i>	Yes (Flash)
<i>Max Transfer Rate</i>	Serial ATA Generation 1 transfer rate of 1.5GB/S
<i>PCI Interface</i>	PCI 2.3 32 bit data
<i>Max Devices</i>	4
<i>Accessory included</i>	<ul style="list-style-type: none"> ● Data Cables – 50cm *4 ● Power Cables—1pin to 2pin power cable *2 ● User’s Manual ● Driver Disk ● GUI software (included in CD)
<i>Drivers Available</i>	Windows 98 Windows ME Windows NT 4.0 Windows 2000 Windows XP Windows Server 2003 Linux
<i>Supported Devices</i>	SATA Devices: HDD, CD-ROM, CD-RW, DVD-ROM, MO, Tape...etc.

1.1.2 SATA Raid Features

- RAID 0, 1, 10
- System GUI Monitoring Utility:
 - Displays/Logs/Alerts Users to Vital RAID Set Information
 - Manages RAID Set Functions (configures, rebuilds, etc.)
- RAID Set Accommodates Multiple Size HDDs
- HDDs Function Normally When not in RAID Sets
- Adjustable Stripe Size for RAID 0
- Automatically Selects Highest Available Transfer Speed for All ATA and ATAPI Devices
- Supports:
 - UDMA up to 150MB/Sec.
 - All UDMA and PIO Modes
 - ACPI and ATA/ATAPI6

1. INTRODUCTION

1.2 RAID Explained

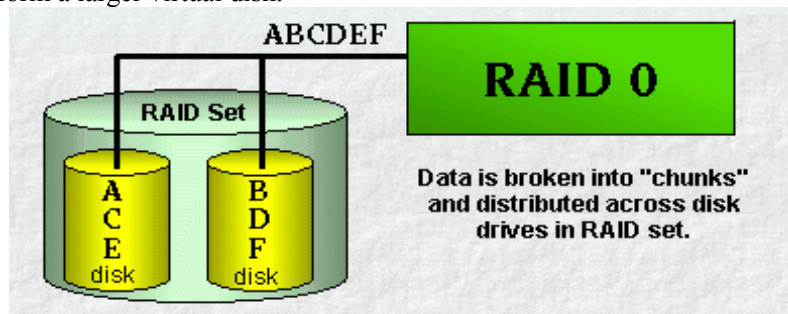
RAID - Redundant Array of Independent Disks

RAID technology manages multiple disk drives to enhance I/O performance and provide redundancy in order to withstand the failure of any individual member, without loss of data.

SATA Raid provides four popular RAID Set types, Striped (RAID 0), Mirrored (RAID 1), a combination of RAID 0 and RAID 1 (RAID 0+1), and Data Striping with Striped Parity (RAID 5) which will be supported by Tekram next generation SATA products.

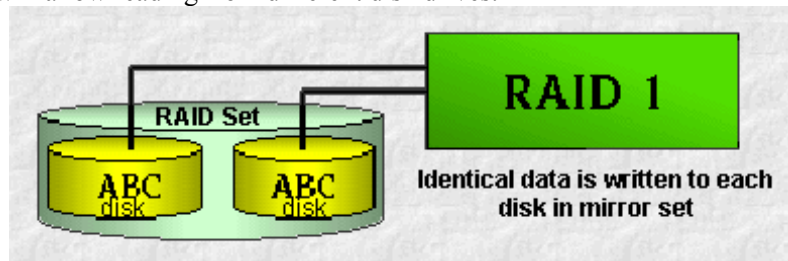
1.2.1 Disk Striping (RAID 0)

RAID 0 is a performance-oriented, non-redundant data mapping technique. While Striping is discussed as a RAID Set type, it actually does not provide fault tolerance. With modern SATA and ATA bus mastering technology, multiple I/O operations can be done in parallel, enhancing performance. Striping arrays use multiple disks to form a larger virtual disk.



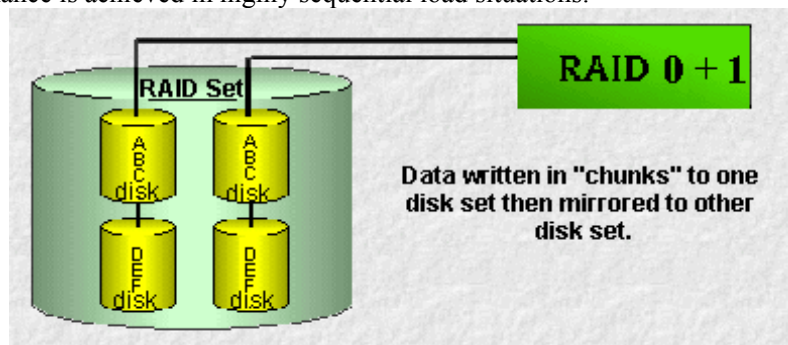
1.2.2 Disk Mirroring (RAID 1)

RAID 1 mirrors one disk drive to another. All data is stored twice on two or more identical disk drives. When one disk drive fails, all data is immediately available on the other without any impact on the data integrity – performance in degraded mode is also degraded. If multiple read requests are pending, the RAID controller will allow reading from different disk drives.



1.2.3 Combination of RAID 0 and RAID 1 (RAID 0+1)

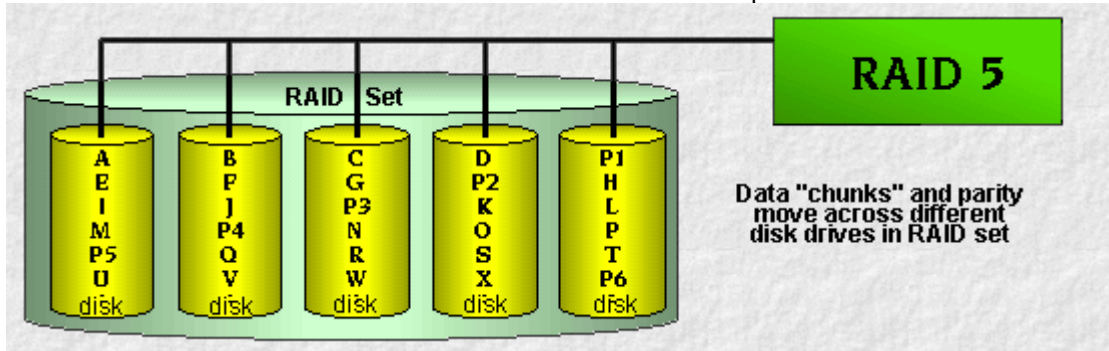
The idea behind RAID 0+1 is simply based on the combination of RAID 0 (Performance) and RAID 1 (Data Security). RAID 0+1 disk sets offer good performance and data security. Similar as in RAID 0, optimum performance is achieved in highly sequential load situations.



1. INTRODUCTION

1.2.4 Data Striping with Striped Parity (RAID 5)

The data is striped across disk drives. The parity data in a RAID 5 set is striped across all disk drives. RAID 5 is designed to handle small data blocks. This makes RAID 5 an excellent choice for multitasking, multi-user and database environments. The security provided by RAID 5 is that when one disk drive fails, all data is fully available, the missing data is recalculated from the data that is still available and the parity information. This data calculation can also be used to restore data to replaced defective disks.

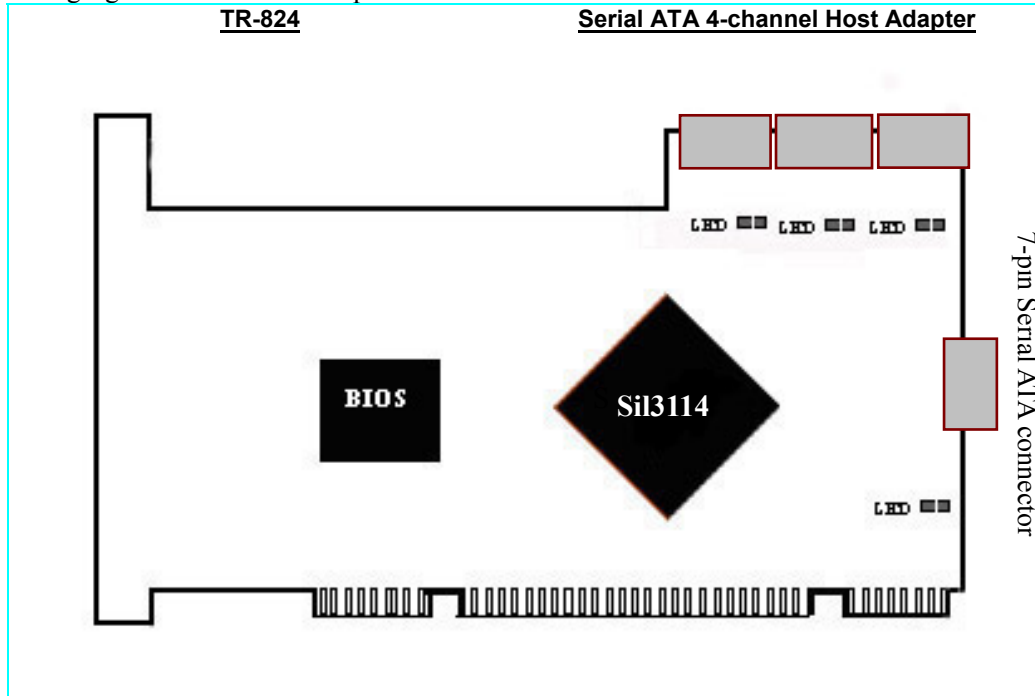


2. HARDWARE SETUP

2. HARDWARE SETUP

2.1 Board Layout

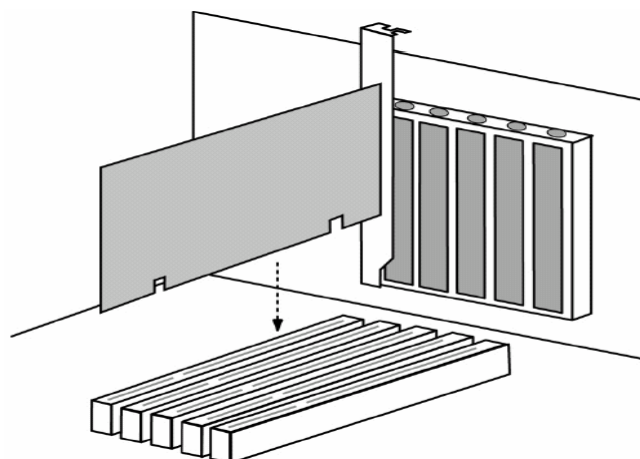
The following figures illustrate the chip and connector locations for the TR-824 PCI SATA Host Adapter.



2.2 Installing TR-824

The TR-824 Controller card fits into any available 32-bit PCI slot (must be PCI 2.2 or 2.3 compliant). It also fits the 32-bit portion of a 64-bit PCI slot, on the system's motherboard (see figure below).

1. Remove the cover of your system.
2. Remove the inside slot cover of an available PCI slot on the motherboard.
3. Install the TR-824 Controller card into the open slot. Secure the bracket to the system's frame.
4. Fasten the controller card bracket to the system case (see below).



2.3 Installing Hard Drives

The TR-824 Controller card supports up to four Serial ATA hard drives. Install all of the hard drives into the hard drive bays of your system, including their power cables.

Attach one Serial ATA data cable to each hard drive. Then attach the other ends of the cables to one of the Serial ATA ports on the TR-824 card. All of the connectors are keyed so they can only be attached one way.

Note: The TR-824 Controller card is a PCI Plug-n-Play (PnP) device. No changes are necessary in the Motherboard CMOS Setup for resources or drive types in most applications.

3. BIOS CONFIGURATION

3. BIOS CONFIGURATION

3.1 Basic BIOS screen information

After you install the TR-824 RAID Controller and HDDs in your computer and boot your system, you will see the screen that displays information about the card and HDDs installed. Press <CTRL-S> or F4 to enter RAID utility. An easy-to-use screen will appear with the following choices on the top left

Create RAID Set
Delete RAID Set
Rebuild RAID1 Set
Resolve Conflicts
Low level Format
Logical Drive Info

The top right half shows direction and guiding information.

The bottom left half of the screen displays the information of physical drives. The bottom right half lists logical drives' information.

There are the command keys:

Arrows up and down are Select Keys
ESC takes the user to the previous menu
Enter selects the user's choice
Ctrl-E exits the utility

3.2 BIOS Function

3.2.1 Creating RAID Set

1. Select "Create RAID Set."
2. Choose from the list of "RAID 0", "RAID 1", RAID 10" and "SPARE DRIVE".
3. If the "RAID 0" is chosen, the utility will ask you to select how many drives for the raid0 set. You can choose from the list of numbers which is according to how many drives are connected to the computer. Then you can choose from Auto Configuration and Manual Configuration. Finally, the utility will ask "Are You Sure?" before completing the configuration.
4. If you select the second or third option, you'll be asked to choose from Auto Configuration and Manual Configuration. Finally, the utility will ask "Are You Sure?" before completing the configuration. Afterward the utility will ask "Are You Sure?" before completing the configuration.
5. If the RAID 1 set has already been built, you can choose "SPARE DRIVE" to set a hot spare drive as a backup for the existing RAID 1. The utility will ask "Are You Sure?" before completing the configuration.

3.2.2 Deleting RAID Set

1. To remove one or more RAID sets, select "Delete RAID Set."
2. Select desired set and press Y when asked "Are You Sure?"

3.3.3 Rebuilding RAID1 set

If a hard disk is damaged when running RAID 1, remove the damaged HDD, connect a workable one, rebuild the array and restore data by selecting Rebuild Mirrored set. This can be done either online or offline.

3.3.4 Resolving Conflict

When a RAID set is created, the metadata written to the disk includes drive connection information (Primary Channel, Secondary Channel). If, after a disk failure, the replacement disk was previously part of a RAID set (or used in another system), it may have conflicting metadata, specifically in reference to the drive connection information. If so, this will prohibit the RAID set from being either created or rebuilt, In order for the RAID set to function properly; this old metadata must be first overwritten with the new metadata. To resolve this, select "Resolve Conflict" and the correct metadata, including the correct drive connection information; will be written to the replacement disk.

3. BIOS CONFIGURATION

3.2.5 Low Level Format

When any of the drives fails to normally function or there is any logical error in one of the drives, you can select “Low Level Format” to resolve the problem by reverting the drive to original condition.

3.2.6 Logical Drive Info

The complete information about the logical drives will be shown on the bottom right part of the screen if this option is chosen.

4. BUILDING DRIVER DISKETTES

4. BUILDING DRIVER DISKETTES

If you do not have the Driver Diskettes, you can create them from the Driver CD. Follow these steps to create the Driver Diskettes.

1. The system BIOS must set to boot from a CD-ROM.
2. Insert the Driver CD into the CD-ROM drive. Start the driver building by booting from the CD-ROM.
Tekram SATA Adapters Driver Diskette Make Utility starts and provides several screens with choices. Follow the steps below to correctly set up the device driver for separate operating system.
3. After the Screen appears, move the highlight bar to the **TR-824** entry and press **<Enter>**.
4. The next screen queries the TR-824 support driver database and a list of supported driver is displayed. Move the highlight bar to the driver entry and press **<Enter>**.
5. The next screen will show **“Please insert a formatted diskette into drive A:!! Press any key to continue.”** Insert the formatted diskette in drive A:\ and press any key to continue.
6. The next window displays the driver-building message, **“Now is writing to Cylinder and copy the image file from the CD-ROM to Driver Diskette.”**
7. **“The Write Complete!!”** Message will show on the screen when the driver is built.

5. INSTALLING SOFTWARE DRIVERS

5.1 Windows Server 2003 Installation

5.1.1 New Windows Server 2003 Installation

The following details the installation of the TR-824 drivers while Installing Windows 2003.

1. Start the installation:
 - Floppy Install: Boot the computer with the Windows Server 2003 installation diskettes.
 - CD-ROM Install: Boot from the CD-ROM. Press <F6> when the message “**Press F6 if you need to install third party SCSI or RAID driver**” appears.
2. When the **Windows Server 2003 Setup** window is generated, press <S> to specify an Additional Device(s)
3. Insert the TR-824 driver diskette into drive A:\ and press <Enter>.
4. Choose **Tekram TR-824 SATAraid Controller for Windows XP/ Server 2003** from the list that appears on screen, and then press <Enter>.
5. The Windows Server 2003 Setup screen will appear “**Setup will load support for the following mass storage devices:**”. The list will include **Tekram TR-824 SATAraid Controller for Windows XP/ Server 2003**.

NOTE: If there are any additional devices to be installed, specify them now. When all devices are specified, continue to the next step.

7. From the Windows Server 2003 Setup screen, press <Enter>. Setup will now load all device files and then continue the Windows Server 2003 installation.

5.1.2 Existing Windows Server 2003 Installation

After installing the TR-824 card and rebooting your system, Windows Server 2003 setup will show a **Found New Hardware** dialog box. Under Windows Server 2003, “**RAID Controller**” will be displayed.

1. Insert the TR-824 driver diskette into the drive A:\.
2. Choose **install from a list or specific location** and specify to **search removable media** then press <Enter>.
3. Choose **Tekram TR-824 SATAraid Controller** from the list that appears on screen, and then press the <Enter> key.
4. If using a driver that has not been digitally signed by Microsoft, you will be asked if you want to continue the installation. Click **Continue**.
5. When the New Hardware Wizard has finished installing the TR-824 software, click **Finish**.

5.1.3 Confirming Windows Server 2003 Driver Installation

1. Right-click the **My Computer** icon and select **Manage** from the popup menu.
2. Click **Device Manager** in the menu tree.
3. Click the “+” in front of **SCSI controllers**. “**Tekram TR-824 SATAraid Controller**” should appear.

5.2 Windows XP Installation

5.1.1 New Windows XP Installation

The following details the installation of the TR-824 drivers while Installing Windows XP.

1. Start the installation:
 - Floppy Install: Boot the computer with the Windows XP installation diskettes.
 - CD-ROM Install: Boot from the CD-ROM. Press <F6> when the message “**Press F6 if you need to install third party SCSI or RAID driver**” appears.
2. When the **Windows XP Setup** window is generated, press <S> to specify an Additional Device(s)
3. Insert the TR-824 driver diskette into drive A:\ and press <Enter>.
4. Choose **Tekram TR-824 SATAraid Controller for Windows XP/ Server 2003** from the list that appears on screen, and then press <Enter>.
5. The Windows XP Setup screen will appear “**Setup will load support for the following mass storage devices:**”. The list will include **Tekram TR-824 SATAraid Controller for Windows XP/ Server 2003**.

NOTE: If there are any additional devices to be installed, specify them now. When all devices are

5. INSTALLING SOFTWARE DRIVERS

specified, continue to the next step.

7. From the Windows XP Setup screen, press <Enter>. Setup will now load all device files and then continue the Windows XP installation.

5.1.2 Existing Windows XP Installation

After installing the TR-824 card and rebooting your system, Windows XP setup will show a **Found New Hardware** dialog box. Under Windows XP, “**RAID Controller**” will be displayed.

1. Insert the TR-824 driver diskette into the drive A:\.
2. Choose *install from a list or specific location* and specify to *search removable media* then press <Enter>.
3. Choose **Tekram TR-824 SATA RAID Controller** from the list that appears on screen, and then press the <Enter> key.
4. If using a driver that has not been digitally signed by Microsoft, you will be asked if you want to continue the installation. Click *Continue*.
5. When the New Hardware Wizard has finished installing the TR-824 software, click *Finish*.

5.1.3 Confirming Windows XP Driver Installation

1. Right-click the **My Computer** icon and select **Manage** from the popup menu.
2. Click *Device Manager* in the menu tree.
3. Click the “+” in front of **SCSI controllers**. “**Tekram TR-824 SATA RAID Controller**” should appear.

5.3 Windows 2000 Installation

5.2.1 New Windows 2000 Installation

The following details the installation of the TR-824 drivers while installing Windows 2000.

1. Start the installation:
 - Floppy Install: Boot the computer with the Windows 2000 installation diskettes.
 - CD-ROM Install: Boot from the CD-ROM. Press <F6> when the message “**Press F6 if you need to install third party SCSI or RAID driver**” appears.
2. When the Windows 2000 Setup window is generated, press <S> to specify an additional device(s).
3. Insert the TR-824 driver diskette into drive A:\ and press <Enter>.
4. Choose **Tekram TR-824 SATA RAID Controller for Windows NT 4.0 and 2000** from the list that appears on screen then press <Enter>.
5. The Windows 2000 Setup window will appear again saying, “**Setup will load support for the following mass storage devices:**”. The list will include **TR-824 SATA RAID Controller for Windows NT 4.0 and 2000**.

NOTE: If there are any additional devices to be installed, specify them now. When all devices are specified, continue to the next step.

6. From the Windows 2000 Setup screen, press <Enter>. Setup will now load all device files and then continue the Windows 2000 installation.

5.2.2 Existing Windows 2000

After installing TR-824 card and rebooting your system, Windows 2000 setup will show a **New Hardware Found** dialog box. Under Windows 2000, “**RAID Controller**” will be displayed.

1. Insert the TR-824 driver diskette in drive A:\.
2. Choose *Search for a suitable driver for my device (Recommended)* from the list, then click *Next*.
3. Choose **Floppy disk drives** from the list, then click *Next*. The **Hardware Wizard** will search the diskette for updates and return the following message “**Windows found a driver for this device. A:\tr824.inf. To install the driver Windows found, click Next**”.
4. Click *Next*. The **Found New Hardware Wizard** appears when the installation is completed.
5. Remove the diskette and click *Finish* to restart the system. Windows 2000 will then restart for the driver installation to take effect.

5.2.3 Confirming Windows 2000 Driver Installation

1. Right-click the **My Computer** icon and select **Manage** from the popup menu.
2. Click *Device Manager* in the menu tree.

5. INSTALLING SOFTWARE DRIVERS)

3. Click the “+” in front of **SCSI controllers**. “**Tekram TR-824 SATARaid Controller**” should appear.

5.3 Windows ME Installation

5.3.1 New Windows ME Installation

The following details the installation of the TR-824 drivers while installing Windows ME.

1. Install the TR-824 controller card into your system.
2. Install Windows ME fully.
3. After installation, right-click on **My Computer** and select **Properties** from the popup menu.
4. In the **System** window, choose the **Device Manager** tab.
5. In the hierarchical display under Other Devices is a listing for PCI RAID Controller. Click **PCI RAID Controller** then click **Properties**.
6. In the **Properties** window, choose the **Driver** tab then choose **Update Driver** and click **Next**.
7. Choose “**Search for a better driver than the one your device is using now (recommended)**” then click **Next**.
8. Choose **Specify Location** then type “**A:\tr824.inf**” in the text box.
9. Insert the TR-824 driver diskette into the A:\ drive.
10. Click the **Next** button. A message informing you that “**Tekram TR-824 SATARaid Controller**” should appear.
11. Click **Next**, then click **Finish**.
12. When asked if you want to restart your computer, click **Yes**. Immediately remove the diskette from drive A:\.

5.3.2 Existing Windows ME Installation

The following section details the installation of TR-824 drivers on a system that has Windows ME already installed and running.

1. After installing the TR-824 controller card and configuring the hard drives, power up the system and boot.
2. The **Add New Hardware Wizard** will appear, informing you that it has found a PCI Mass Storage Controller.
3. Click **Next**, then from the generated list box, choose **Specify the location of the driver (Advanced)**.
4. Click **Next**, then from the generated choices, choose **Specify a location**.
5. Insert the TR-824 driver diskette in drive A:\.
6. Type “**A:\tr824.inf**” in the text box that appears.
7. Click **Next**. A message informing you that Windows Me has found “**Tekram TR-824 SATARaid Controller**” should appear.
8. Click **Next**, then click **Finish**. When asked if you want to restart your computer, click **Yes**. Immediately remove the diskette from drive A:\.

5.3.3 Confirming Driver Installation in Windows ME

To confirm that the driver has been properly loaded in Windows Me, perform the following steps:

1. Right-click the **My Computer** icon and select **Properties** from the popup menu.
2. Select the **Device Manager** tab.
3. Click the “+” in front of **SCSI controllers**. “**Tekram TR-824 SATARaid Controller**” should appear.

5.4 Windows NT4.0 Installation

5.4.1 New Windows NT4.0 Installation

The following details the installation of the TR-824 drivers while installing Windows NT4.0.

1. Start the system installation by booting from the Windows NT disk:
Floppy install: boot the system with the Windows NT installation diskettes.
CD-ROM disk install: boot from the CD-ROM disk and press <F6> when the message “**Setup is inspecting your computer’s hardware configuration...**” appears.
2. When the **Windows NT Setup** window is generated, press <S> to Specify an Additional Device(s).
3. Select **Other** then press <Enter>.
4. Insert the TR-824 driver diskette into drive A:\ and press <Enter>.
5. Choose **Tekram TR-824 SATARaid Controller for Windows NT 4.0 and 2000** from the list that

5. INSTALLING SOFTWARE DRIVERS

appears on screen then press <Enter>.

6. The **Windows NT Setup** window will appear again saying, “**Setup will load support for the following mass storage devices:**” The list will include **TR-824 SATARaid Controller for Windows NT 4.0 and 2000**

NOTE: If there are any additional devices to be installed, specify them now. When all devices are specified, continue to the next step.

7. From the Windows NT Setup screen, press <Enter>. Setup will now load all device files and then continue the Windows NT installation.
8. After a successful installation, the **SCSI Adapter Setup** box will show that “**the Tekram TR-824 SATARaid Controller driver has been installed**”.

5.4.2 Existing Windows NT4.0 Installation

The following section details the installation of TR-824 drivers on a system that has Windows NT4.0 already installed and running.

NOTE: Do not attach the boot drive or any other hard drive to the TR-824 controller card before completing this step.

1. From the **Start** menu, choose **Settings**.
2. From the **Settings** menu, choose **Control Panel**.
3. Double-click the **SCSI Adapters** icon. The **SCSI Adapters** dialog box appears.
4. Choose **Drivers** then click **Add**.
5. In the **Install Drivers** dialog box, click **Have Disk...**
6. When **Install From Disk** appears, insert the TR-824 driver diskette in drive A:\.
7. Type “**A:\tr824.inf**” in the text box window then click **OK**.
8. When the **Install Driver** dialog box appears, select **Tekram TR-824 SATARaid Controller** then click **OK**.
9. When the **Select SCSI Adapter Option** dialog box appears, click **Install**.
10. After a successful installation, the **SCSI Adapter Setup** box will show that “**the Tekram TR-824 SATARaid Controller has been installed**”.
11. Power off your system.
12. If you plan to move the boot drive to the TR-824 card, connect the boot drive to the card now. Then power on your system.

5.4.3 Removing the Driver from Windows NT4.0

1. From **Start**, choose **Setup** then choose **Control Panel**.
2. In **Control Panel**, choose **SCSI Adapter** then choose **Drivers**.
3. Click **Remove**.
4. After successful removal, the **SCSI Adapter Setup** box will show that “**the Tekram TR-824 SATARaid Controller has been removed**”.

5.5 Windows 98 Installation

5.5.1 New Windows 98 Installation

The following section details the installation of the TR-824 drivers while installing Windows 98.

1. Install the TR-824 controller card and configure the hard drive(s), partition and format your hard drive(s), if necessary.
2. Install Windows 98 normally.
3. After installation, generate the **Start** menu and choose **Settings**.
4. From the **Settings** menu, choose **Control Panel**.
5. In the **Control Panel** window, double-click the **System** icon.
6. In the **System** window, choose the **Device Manager** tab.
7. In the hierarchical display under Other Device is a listing for **PCI RAID Controller**. Select it then click the **Properties** button.
8. Choose the **Driver** tab in the **Properties** window, choose **Update Driver** then click **Next**.
9. Choose **Search for a better driver than the one your device is using now (recommended)**, then click

5. INSTALLING SOFTWARE DRIVERS)

Next.

10. Choose *Specify Location* then type “A:\tr824.inf” in the text box.
11. Insert the TR-824 driver diskette into the A:\ drive.
12. Click the *Next* button. A message informing you “**Windows 98 has found Tekram TR-824 SATARaid Controller**” should appear.
13. Click *Next*, then *Finish*.
14. When asked if you want to restart your computer, click *Yes*. Immediately remove the diskette from drive A:\.

5.5.2 Existing Windows 98 Installation

The following section details the installation of TR-824 drivers on a system that has Windows 98 already installed and running.

1. After installing the TR-824 controller card and configuring the hard drives, power up the system and boot Windows.
2. The **Add New Hardware Wizard** will appear, informing you that it has found a PCI Mass Storage Controller.
3. Click *Next*. From the generated list box, choose *Search for best driver for your device (Recommended)*.
4. Insert the TR-824 driver diskette in drive A:\.
5. Click *Next*. From the generated choices, choose *Specify a location*.
6. Type “A:\tr824.inf” in the text box that appears.
7. Click *Next*. A message informing you that “**Windows 98 has found Tekram TR-824 SATARaid Controller**” should appear.
8. Click *Next*, then click *Finish*.
9. Click *Yes* when asked if you want to restart your computer. Be sure to eject the diskette from drive A:\.

5.5.3 Confirming Driver Installation in Windows 98

To confirm that the driver has been properly loaded in Windows 98, perform the following steps:

1. Choose **Settings** from the **Start** menu.
2. Choose **Control Panel**, then double-click the **System** icon.
3. Choose the **Device Manager** tab, then click the “+” in front of **SCSI controllers**. “**Tekram TR-824 SATARaid Controller**” should appear.

6. GUI (GRAPHIC USER INTERFACE)

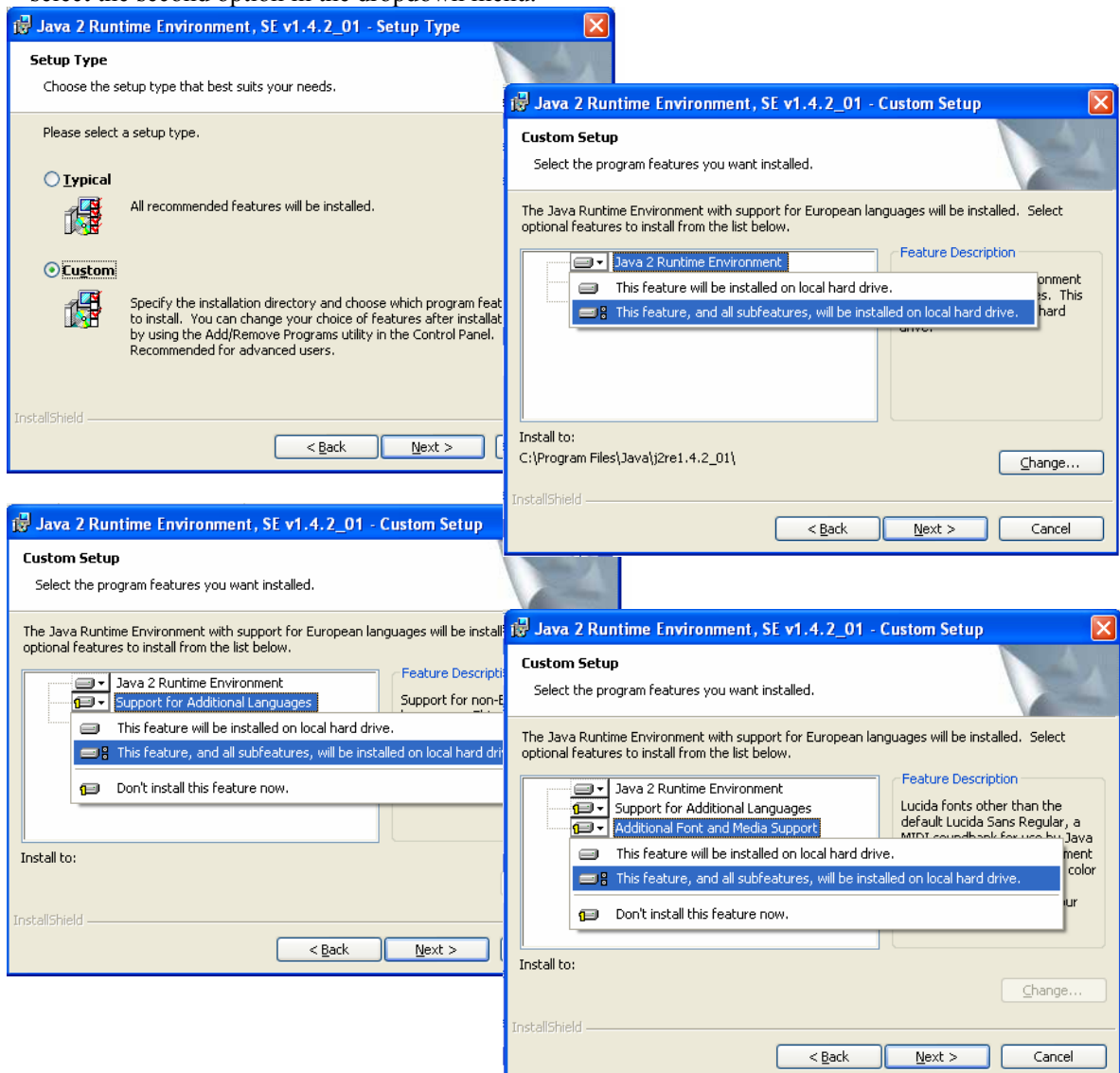
6. GUI (GRAPHIC USER INTERFACE)

GUI stands for Graphic User Interface, the GUI function offers user-friendly graphics in Windows operating systems for easy RAID array monitoring and storage management. After you install the TR-824 SATA RAID card and HDDs, create RAID arrays in BIOS configuration, execute 'FDISK' and 'format' command in DOS mode and install drivers for your operating system, you can take the following steps to install the GUI in Windows operating systems and execute GUI functions.

6.1 GUI Installation

You'd better set your screen display resolution rate as 800X600 or 1024X768 to avoid display abnormality during GUI setup.

1. After you power on your computer and bootup Windows, insert the CD into disk drive
2. Double-click on **jre.exe** under GUI directory to install Java 2 Runtime Environment. If you're installing on a non-English OS, better choose **Custom** installation to specify program features. Always select the second option in the dropdown menu.



3. Double-click on **Java SATARaid.exe** under the GUI directory after the Java2 platform installation.
4. Follow on-screen instructions to complete installation.

Note: Do NOT install in the Start Up folder. Choose the Default folder (normally Accessories or Administrative Tools or something similar).

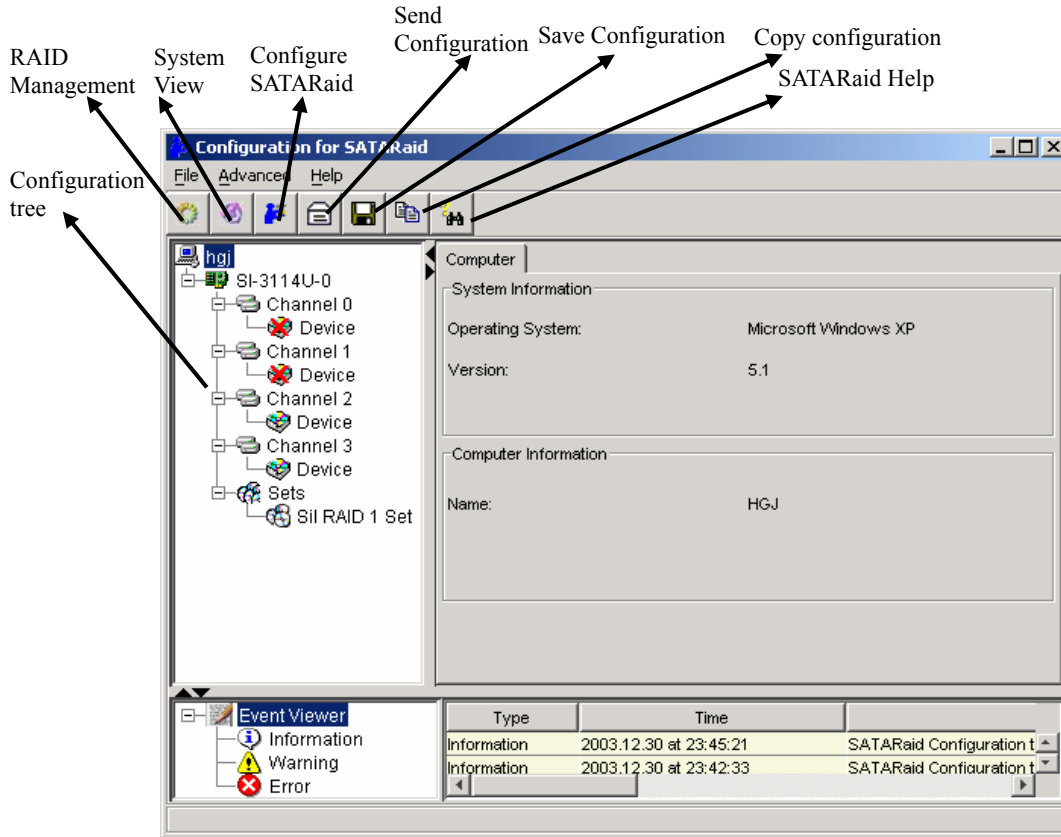
6. GUI (GRAPHIC USER INTERFACE)

6.2 Overview

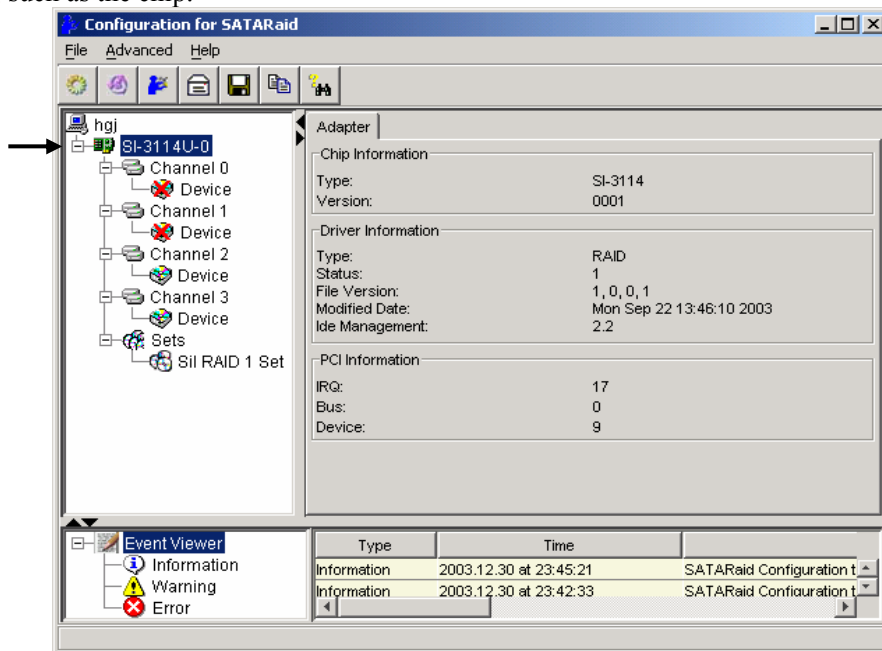
The SATA Raid GUI offers the user the ability to easily monitor your RAID Set.

To launch the GUI, simply double-click on the icon located in the bottom right hand corner of the Desktop. If the icon does not appear in the bottom right hand corner of the desktop, find where the application was saved and launch from there.

Upon launching the GUI, the first window, which identifies the computer running SATARaid, should appear similar to the following:

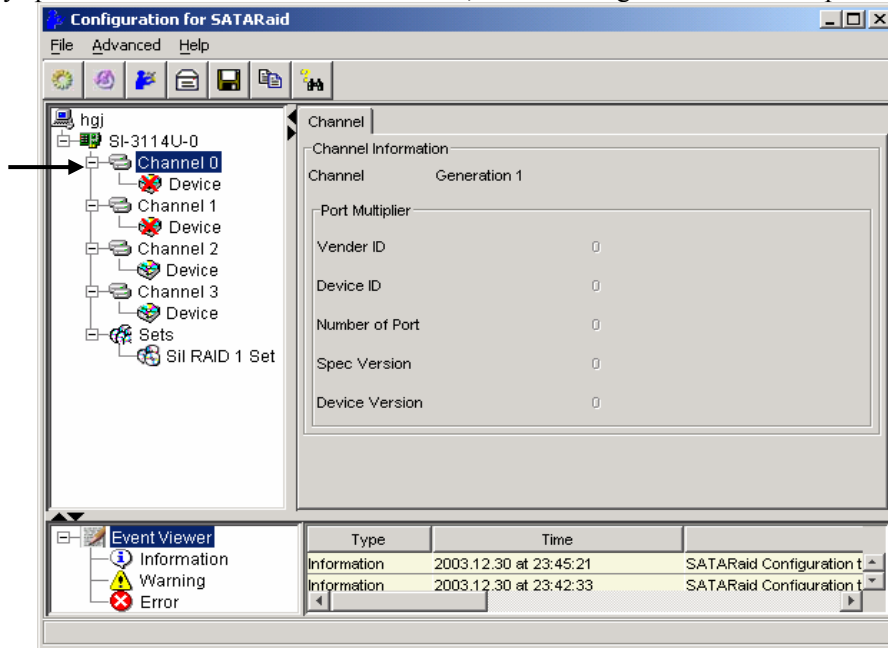


Selecting each different component in the configuration tree provides specific information for that component, such as the chip.

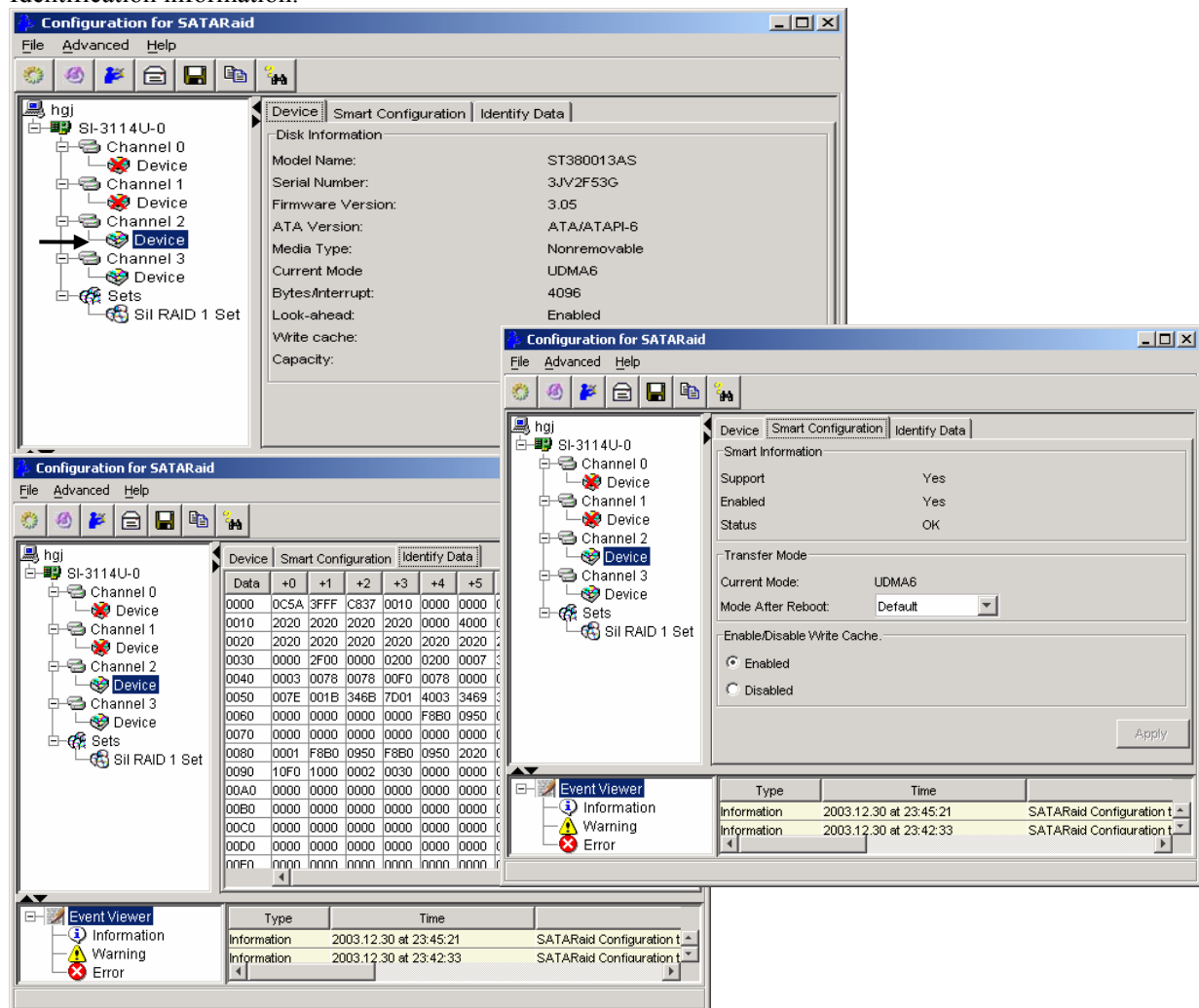


6. GUI (GRAPHIC USER INTERFACE)

Selecting any specific channel from the four channels, the following information is reported:

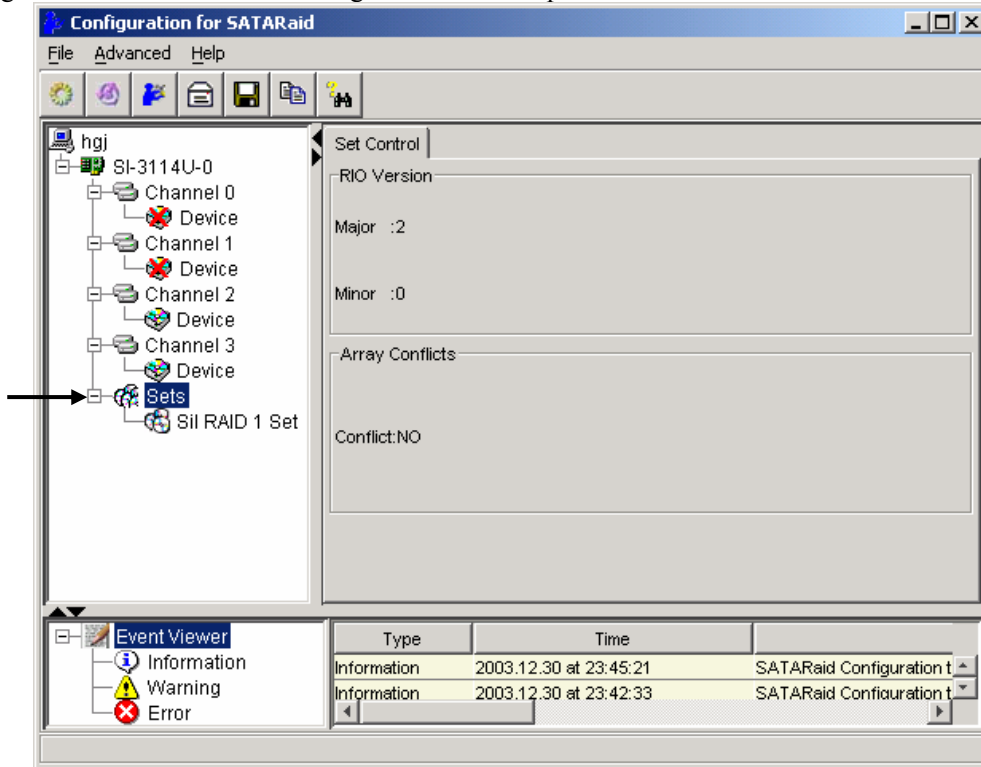


Selecting a specific drive reports all relevant information to that drive, including Configuration and Disk Identification information.

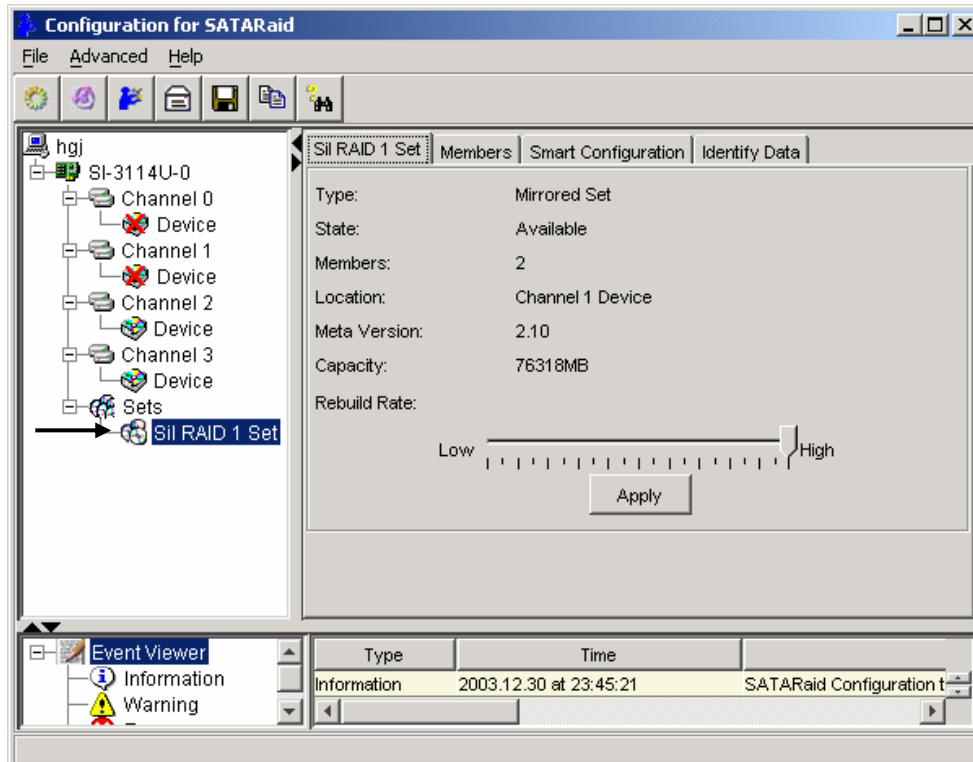


6. GUI (GRAPHIC USER INTERFACE)

Selecting Sets lists the Sets in the configuration tree and provides information on RIO Version:



By selecting a specific RAID set, such as Set 1, the type of RAID set, the number of members and capacity is reported.

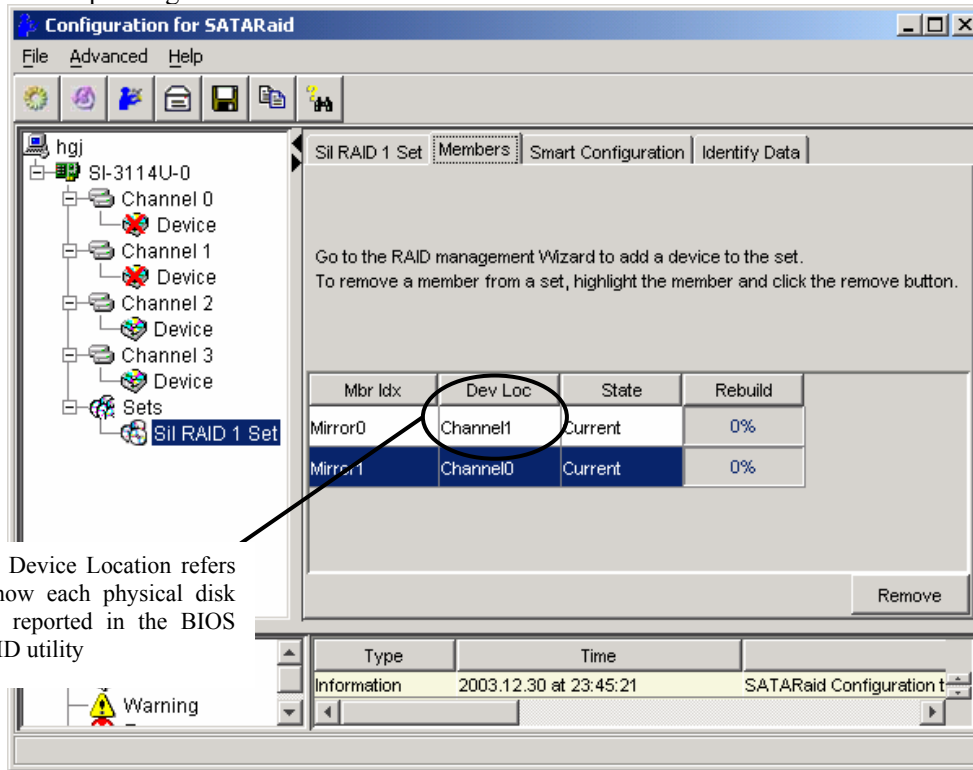


The Members tab of this window reports the device identification (corresponding with the information in the BIOS) and the State of each device.

Besides reporting information, the Members tab of a Mirrored set allows the user to remove a specific

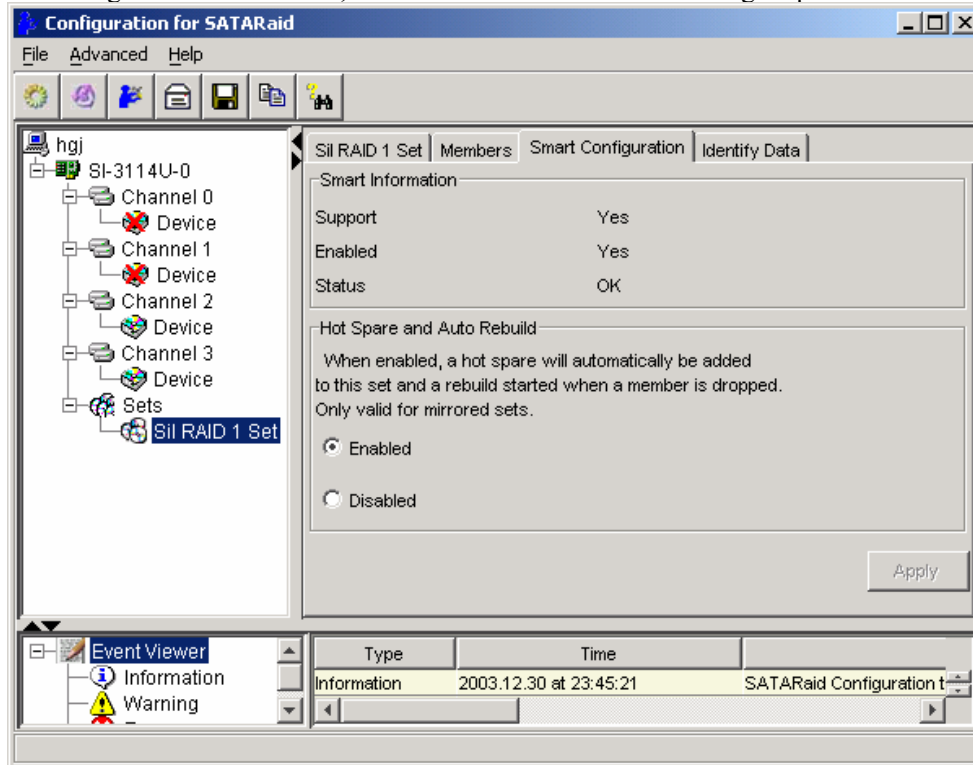
6. GUI (GRAPHIC USER INTERFACE)

drive from that set, as well as add a designated Spare drive to a Mirrored set that has experienced a disk failure. A drive can NOT be removed from a Striped set as this would destroy all data. Note that when a Mirrored Set is first created, the State of the “destination” drive may report as Rebuild for as much as 30-90 minutes depending on the size of the disk.

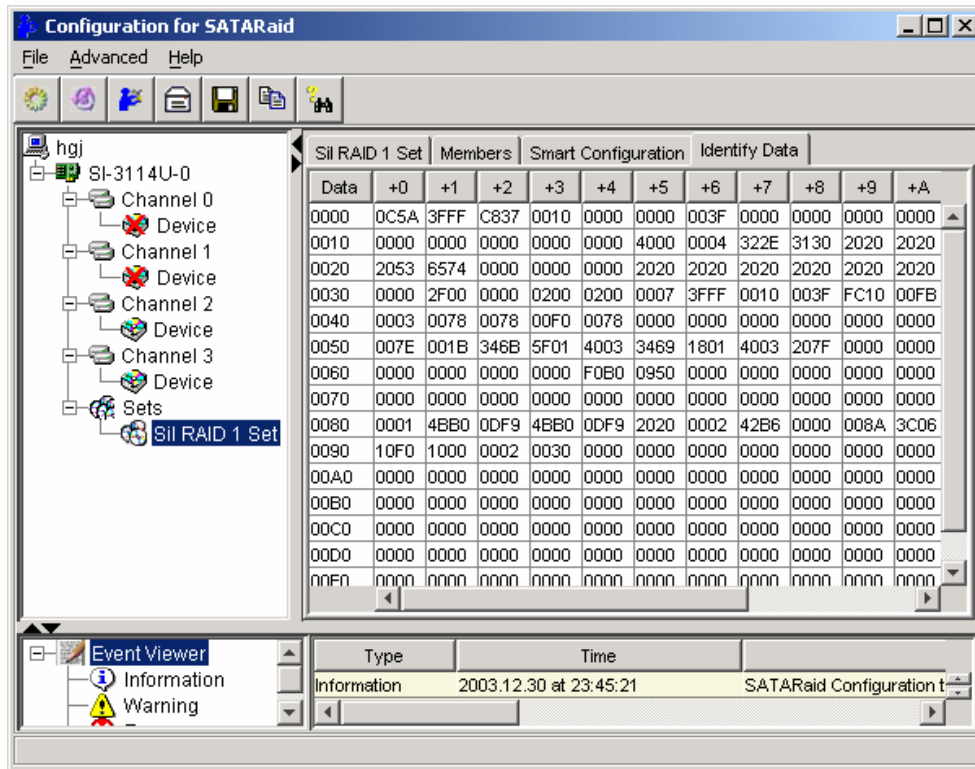


The Device Location refers to how each physical disk was reported in the BIOS RAID utility

SMART and Configuration information, as well as Data Identification are again provided for each Set.



6. GUI (GRAPHIC USER INTERFACE)

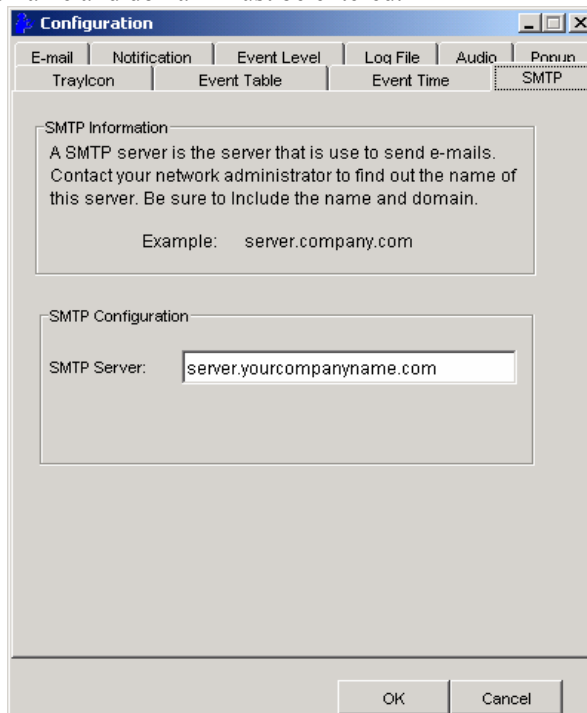


6.3 GUI Configuration Menu

By clicking on the toolbox icon in the top left of the SATA Raid GUI window, or right-clicking on the conductor icon in the bottom right of the computer screen (with other start-up icons), the user may configure SATA Raid including customizing the settings for SMTP, E-mail, Notification, Event Level, Log File, Audio, and Popup.

SMTP

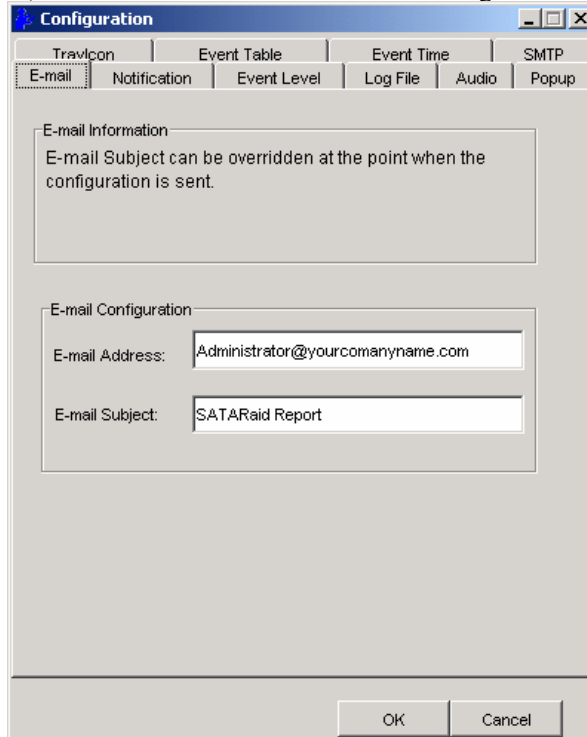
The SMTP server is the server that is used to send e-mails. Normally, the network administrator knows what this name is. Both the name and domain must be entered.



6. GUI (GRAPHIC USER INTERFACE)

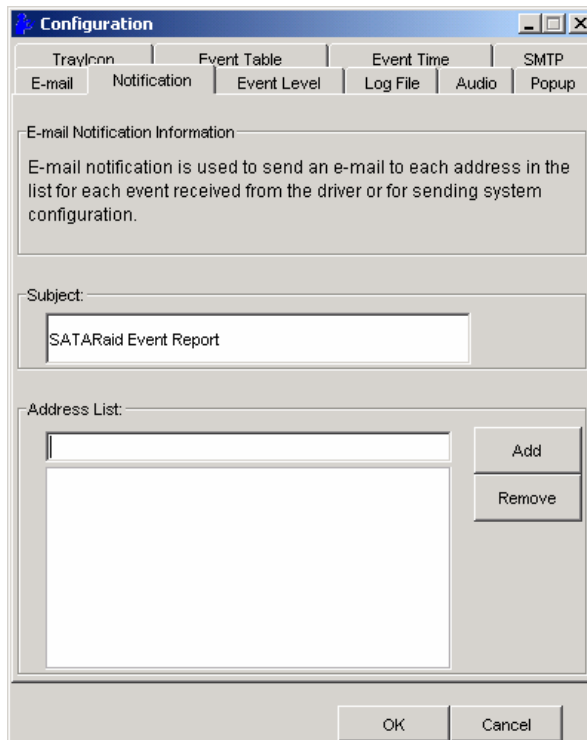
E-Mail

The current SATARaid configuration may be sent via e-mail. Using the e-mail tab in the SATARaid Configuration Menu, the user may set the default e-mail address and subject line where the configuration would be sent. This, however, can be overridden at the time of sending the email.



Notification

When different types of events occur, SATARaid may be configured to send notices to assigned individual e-mail addresses. Using the Notification tab, all e-mail addresses desired to receive the notices may be entered.



6. GUI (GRAPHIC USER INTERFACE)

Event Level

There are different types of e-mail notifications that may be sent which are set with the Event Level tab. The different levels are:

Disable - No event logs will be sent.

Information - The following events will be sent:

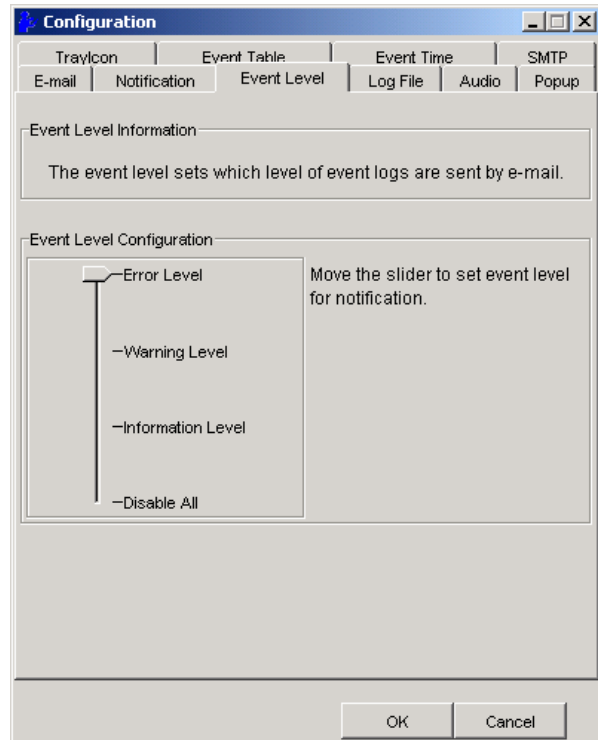
- Information
- Warnings
- Errors

Warning - The following events will be sent:

- Warnings
- Errors

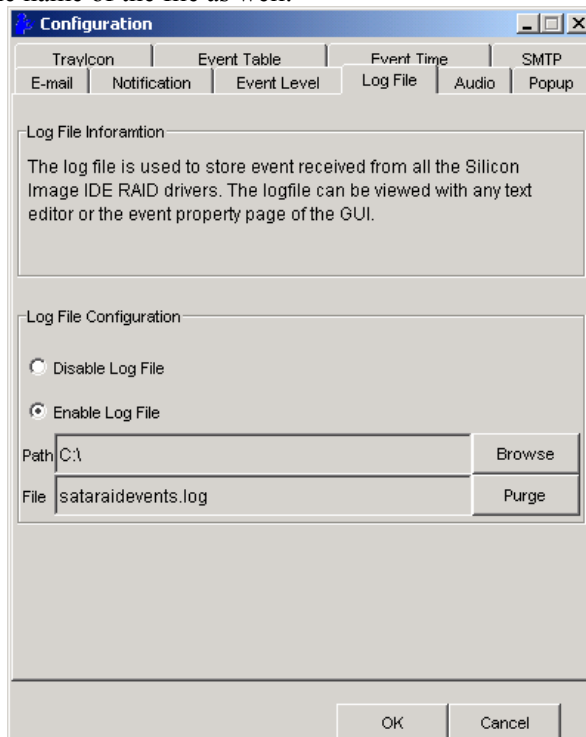
Error - The following events will be sent:

- Errors



Log File

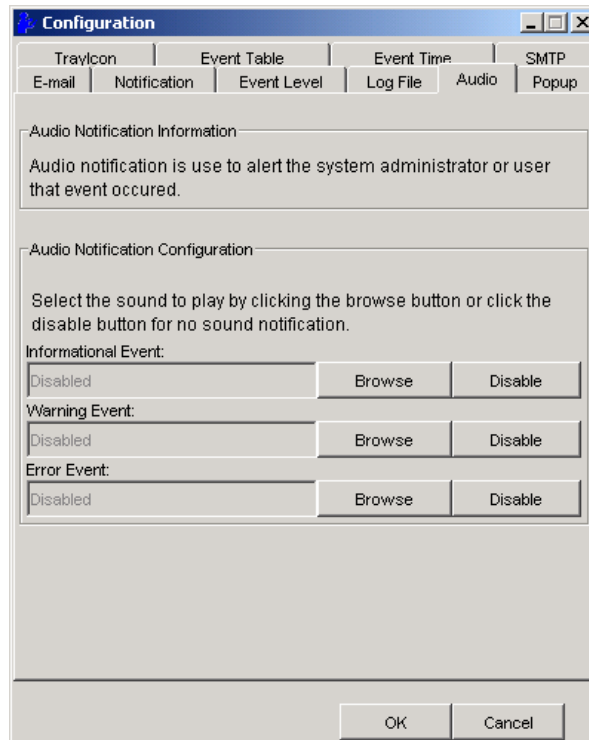
The log file is used to store event information received from all the Silicon Image RAID drivers. The log file is a text file and can be viewed with Notepad or SATARaid. Use the Log File tab to set where the log file should be stored and the name of the file as well.



6. GUI (GRAPHIC USER INTERFACE)

Audio

The user may set different audio alerts for the different levels of events.



Popup

The popup window is a visual notification that an event occurred. The popup window can be disabled or set to popup for only certain event levels. The different levels are:

Disable - No popup will occur.

Information - The popup window will be Displayed for the following events:

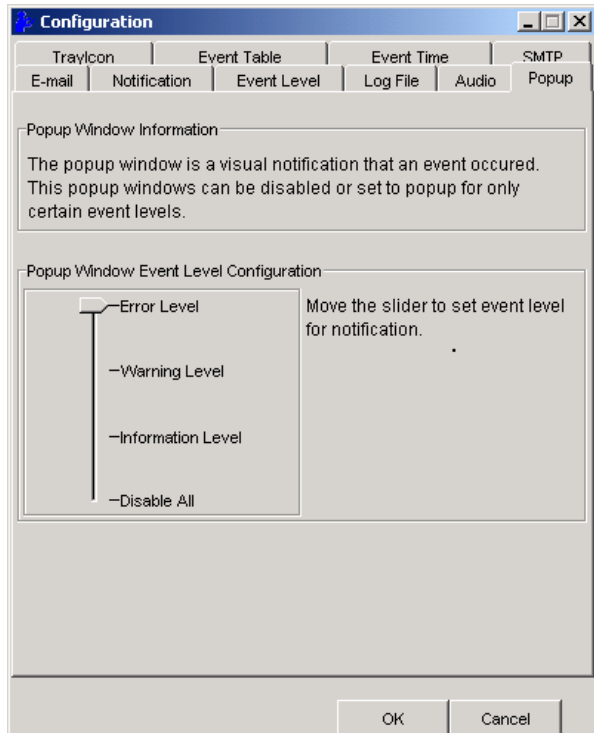
- Information
- Warnings
- Errors

Warning - The popup window will be displayed for the following events:

- Warnings
- Errors

Error - The popup window will be displayed for the following events

- Errors



6. GUI (GRAPHIC USER INTERFACE)

TrayIcon

There are different levels of events that tray icon may blink for. The different levels are:

Disable – The tray icon will blink for no event.

Information - The tray icon will blink for the following events:

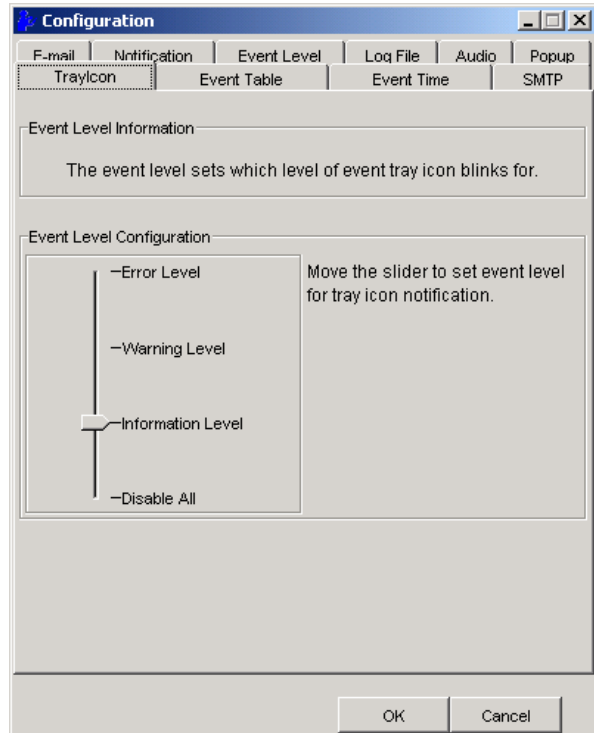
- Information
- Warnings
- Errors

Warning - The tray icon will blink for the following events:

- Warnings
- Errors

Error – The tray icon will blink for the following event:

- Errors



Event Table

There are different levels of events that may be Shown in the event table:

Disable – No event will be shown in the event table.

Information - The event table will show the following events:

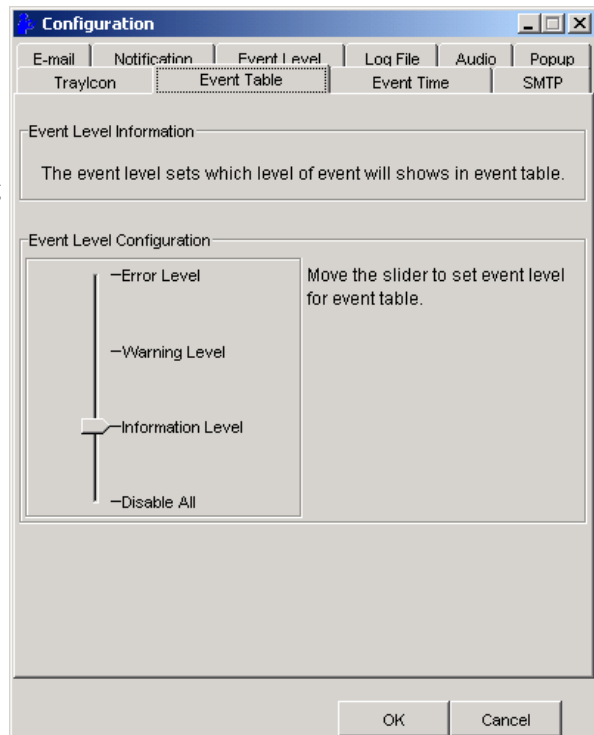
- Information
- Warnings
- Errors

Warning - The event table will show the following events:

- Warnings
- Errors

Error – The event table will show the following event:

- Errors



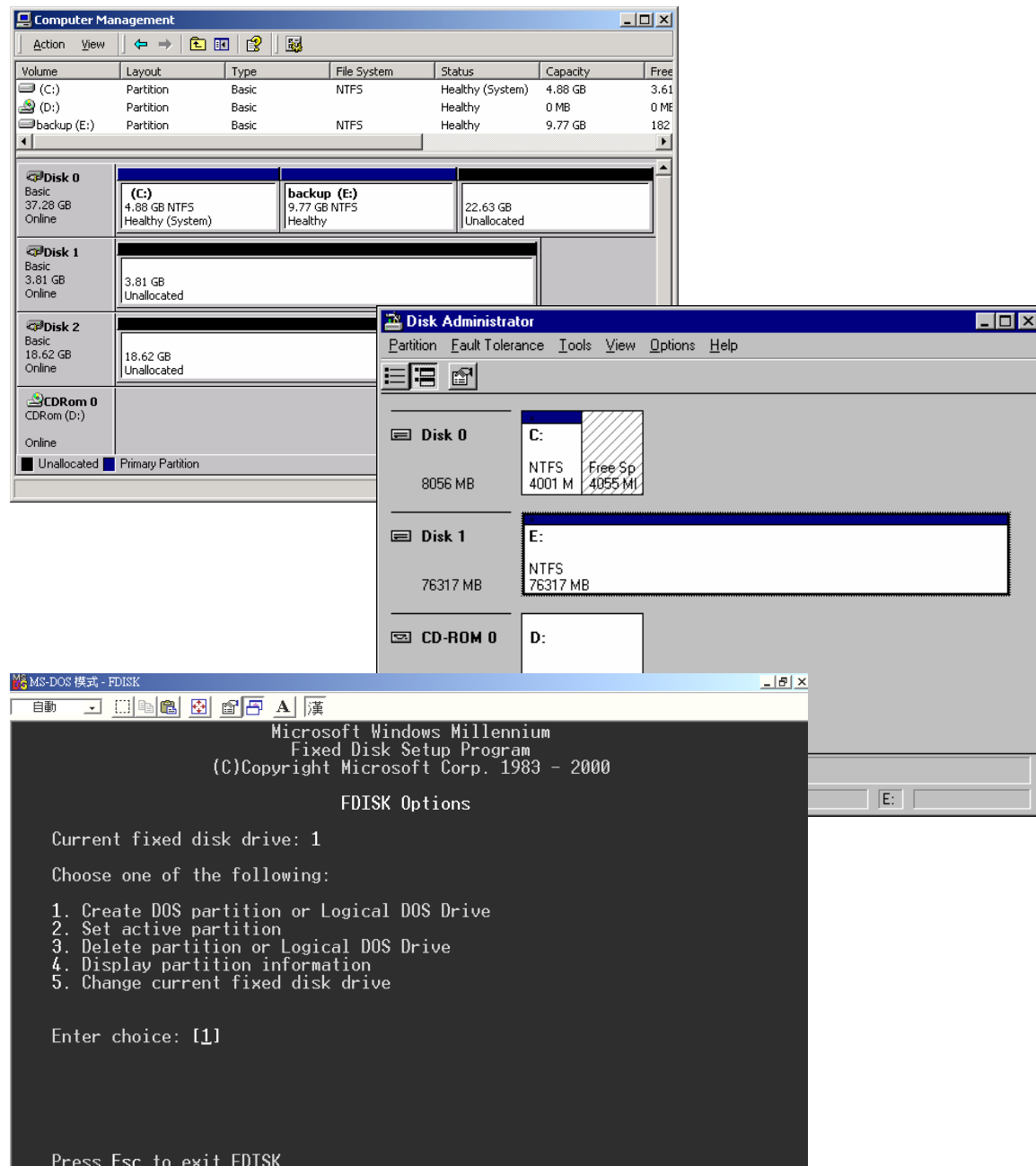
Event Time

You can set a proper fixed time interval when the System will monitor the controller.

7. CREATING/NAMING PARTITIONS

7. CREATING/NAMING PARTITIONS

The creating and naming of partitions is something done within the Windows operating system. And while Windows 2000/XP/2003 and Windows NT both use the Disk Management window, there are enough nuances that make it important to follow the procedure specifically for the appropriate operating system. The procedure for Windows 98/Me is significantly different from the others.

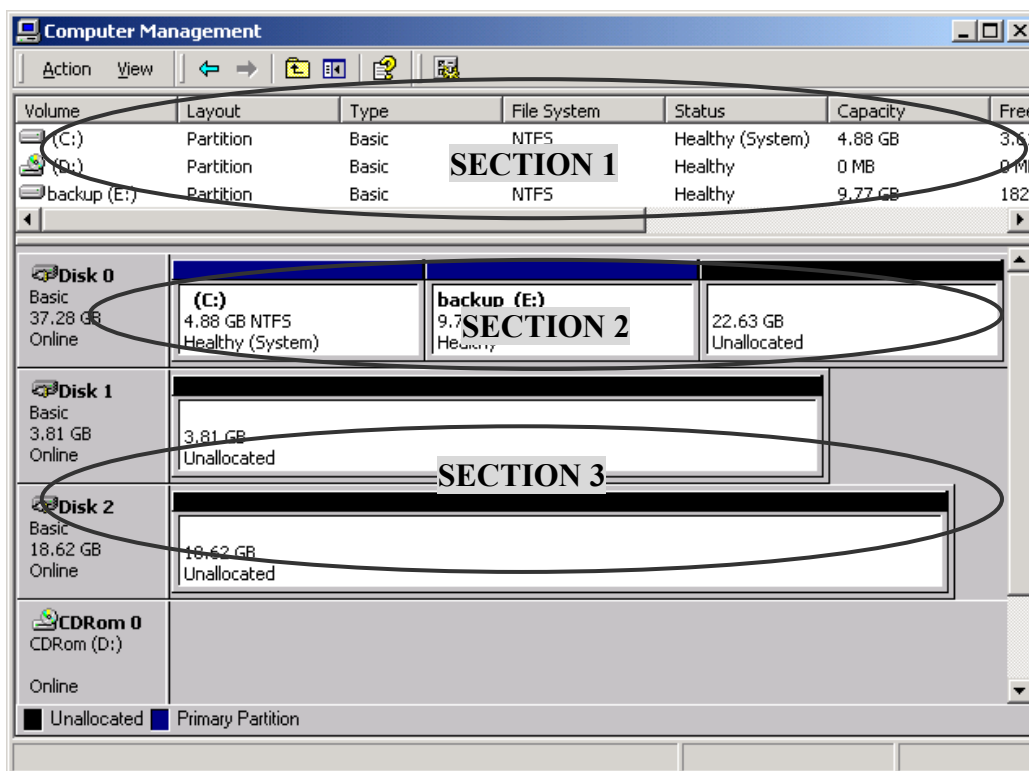


7.1 Windows 2000/XP/2003 Operating System

Before creating any partitions, RAID sets must first be created/dissolved using the BIOS RAID Utility. Once completed, continue booting Windows.

Once Windows is running, open the Disk Management window located at: Control Panel --Administrative Tools--Computer Management--Storage Disk Management
Something similar to the following window should appear:

7. CREATING/NAMING PARTITIONS



This window has three main sections:

SECTION 1: System listing of all formatted and available disks/RAID Sets.

SECTION 2: Report of physical connection of disks/RAID Sets.

SECTION 3: Report of partition status, disk letter, and volume name.

7.1.1 Initial Window

In **SECTION 2**, every disk should report as:

Basic

Disk Size (the actual available disk space will be reported here)

Online

Instead of “Basic,” a disk may also report as either “Unknown” or “Dynamic.”

If the disk reports as “Unknown”, right-click on the disk (**SECTION 2**) and click on **Write Signature**.

At this point, a window will appear with the disk in question (all “Unknown” disks may appear in this window). Make sure the box next to each disk is checked, and then click **OK**.

The disk should now report as “**Basic**.”

If a disk reports as “**Dynamic**,” right-click on **SECTION 2** of that disk, and click on “Return disk to Basic...” Within seconds the disk should report as **Basic**.

7.1.2 Creating Partitions

In **SECTION 2**, the disk order corresponds directly to the order the Sets appear in the BIOS. Therefore, the first Unallocated Partition represents Set 1, and so on.

1. At this point, there should be three disks with Unallocated partitions. Right-click on the partition of the first disk and click on “Create Partition.” The “Create Partition Wizard” should appear.
 1. The first window is an introductory window to the Wizard. Click **Next**.
 2. The second window designates the partition as a primary partition. Click **Next**.
 3. The third window designates the partition size. Since this is a Striped RAID set, utilizing 2 disk drives, the size of the partition should be approximately double the size of a single disk drive (assuming all disks are of identical size). Click **Next**.
 4. The fourth window designates the drive letter of the partition.
 5. The fifth window allows the user to label the volume name, and choose the type of formatting to take place upon the creation of the partition. Choose whichever drive letter is desired (the lowest

7. CREATING/NAMING PARTITIONS

possible value is automatically entered), name the volume whatever is desired (suggestions being something generic such as STRIPED SET or something specific to use such as FINANCIAL, CRITICAL, MISCELLANEOUS, etc.) then check the box next to “quick format.” Click **Next**.

6. The sixth window is a summary window listing all of the selections made. Click **Finish**. Depending on the size of the disk drive(s) included in the partition, the partition should change from “Unallocated” to “Healthy” with its name and drive letter reported as well in a matter of minutes or less. Do not attempt to create a partition for the next disk until the disk currently being formatted is complete and reports **Healthy**.

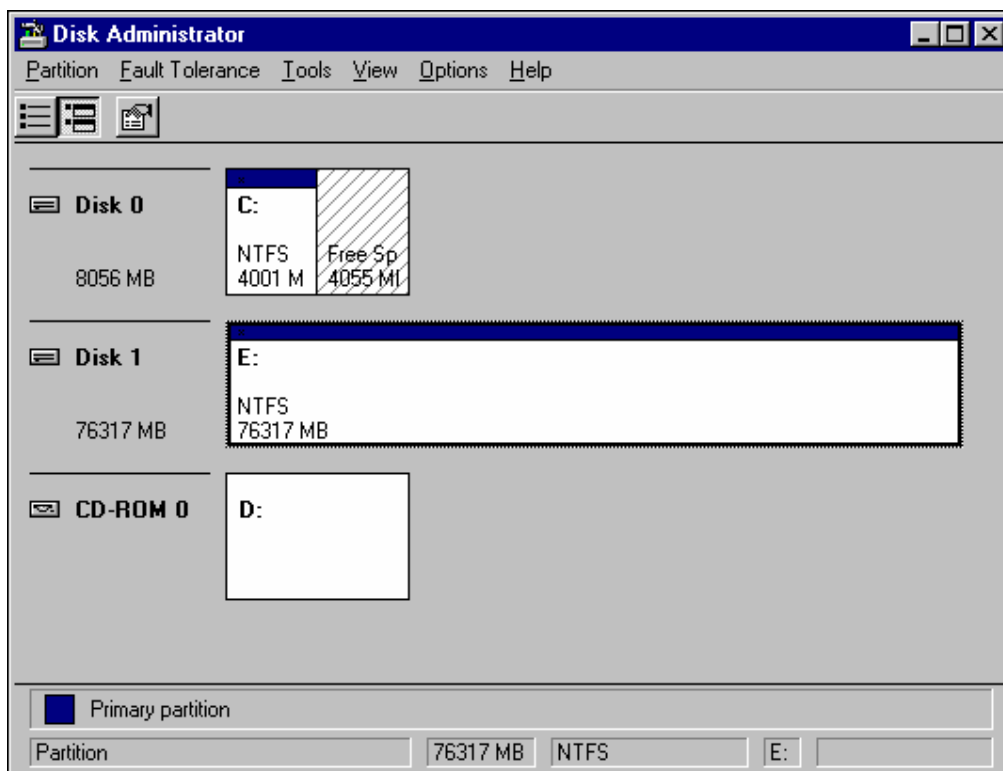
Also note that once the disk reports Healthy, it appears in the listing in **SECTION 1** with all of its pertinent information as well.

2. Repeat this procedure for the partition of the second and third disk.
3. Close the Data Management window by clicking on the small boxed “X” in the top right corner of the window.
4. Click on the “My Computer” icon on the Desktop. The three new drives should now be visible and properly named. Data may now be stored to each of these disks if desired.

7.2 Windows NT Operating System

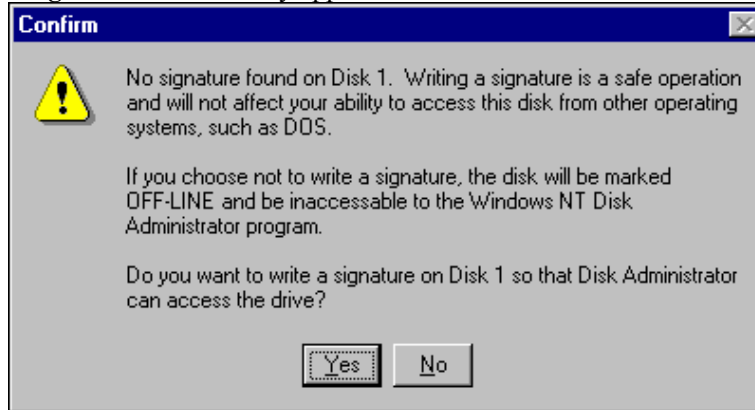
Before creating any partitions, RAID sets must first be created/dissolved using the BIOS RAID Utility. Once completed, continue booting Windows.

Once Windows is running, open the Disk Administrator window. The Disk Administrator window is located at: Start Programs Disk Administrator (Common)
Something similar to the following window should appear:

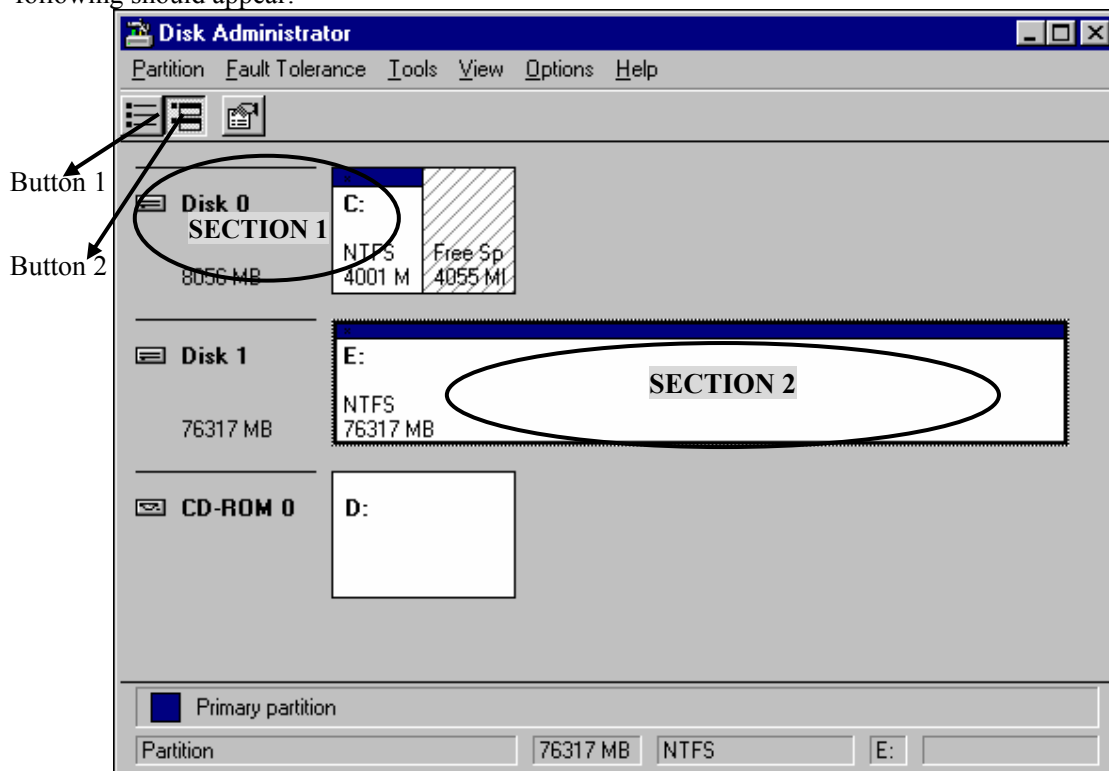


7. CREATING/NAMING PARTITIONS

However, this **Write Signature** window may appear first:



If so, answer **YES** for each disk reported with no signature found. Afterwards, something similar to the following should appear:



Button 1 opens the Disk Administrator Volumes window, which lists the recognizable Volumes, their capacity, free space, type of format, etc.

Button 2 opens the Disk Configuration window (shown above), detailing all disks (or RAID Sets), partitions, and allows the user to format and name each partition and volume.

Section 1 reports the size of each disk (or RAID Set).

Section 2 reports on each partition, and allows the user to format or delete partitions.

Creating Partitions

1. If any disk (besides the SYSTEM DISK) appears to be formatted, right-click on that partition (Section 2) and select **Delete**.
2. Once all disks are reported as Free Space, right-click on each partition and select **Create...**
3. A **Create Primary Partition** window should now appear. Click **OK**.

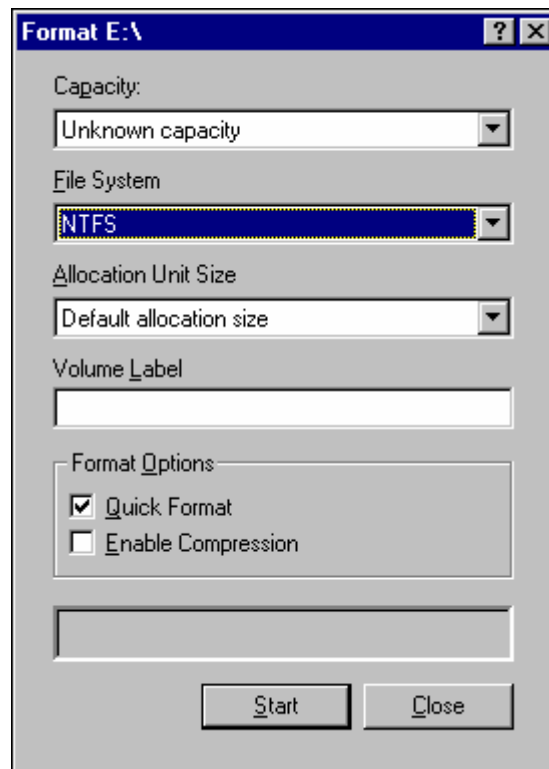
WARNING: Be sure to identify the System Disk, that which has the Operating System installed on it. This disk should always report correctly. **NEVER CHANGE OR DELETE THIS DISK OR PARTITION.**

7. CREATING/NAMING PARTITIONS

4. Click **Confirm**.
5. Repeat this step for each disk.
6. Now, right-click on the first disk and select **Mark Active**.
7. A window will appear stating that this will take place on the next reboot. Click **OK**.
8. Repeat this step for each disk.
9. Close window. Confirm saving changes. Click **Yes**.

10. Disk Administrator will report that the disks were updated successfully. Click **OK**.
11. Re-open **Disk Administrator**.
12. Right-click on the first disk (this should now be the Striped Set).
13. Select **Format...**

Something similar to the following window should appear:



14. While **Capacity** cannot be changed, make sure that **File System** has **NTFS** selected, don't change **Default Allocation Size**, and since it is the Striped Set that is being formatted, enter **Striped Set** for **Volume Label**. Make sure that **Quick Format** is selected as the **Format Option**.
15. Repeat this procedure for the other two disks, but name them something else.
16. Close **Disk Administrator** and open **My Computer** (icon should be on Desktop).
17. The new disks should now appear in **My Computer** window.
18. Close all windows and applications and **Restart** computer.

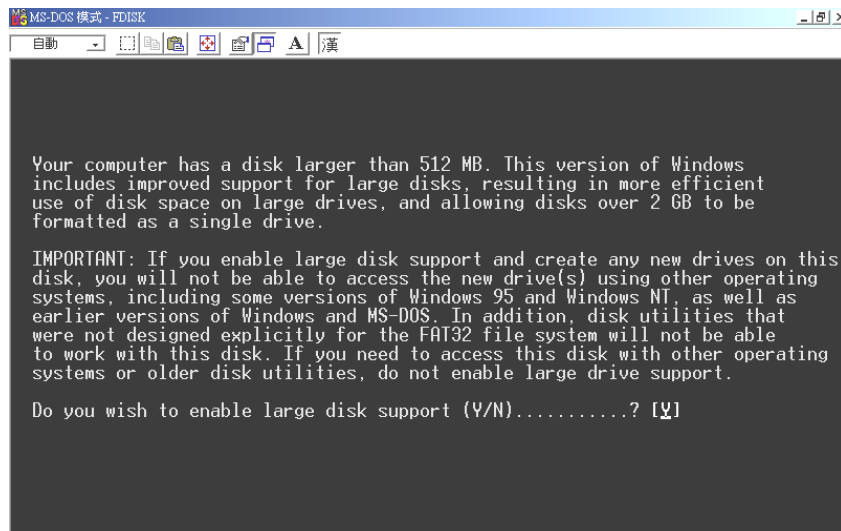
7.3 Windows 98/Me Operating System

Windows 9x does not have a Disk Administrator or Disk Management window. Instead, after creating RAID sets using the BIOS RAID utility and booting Windows, start fdisk by:

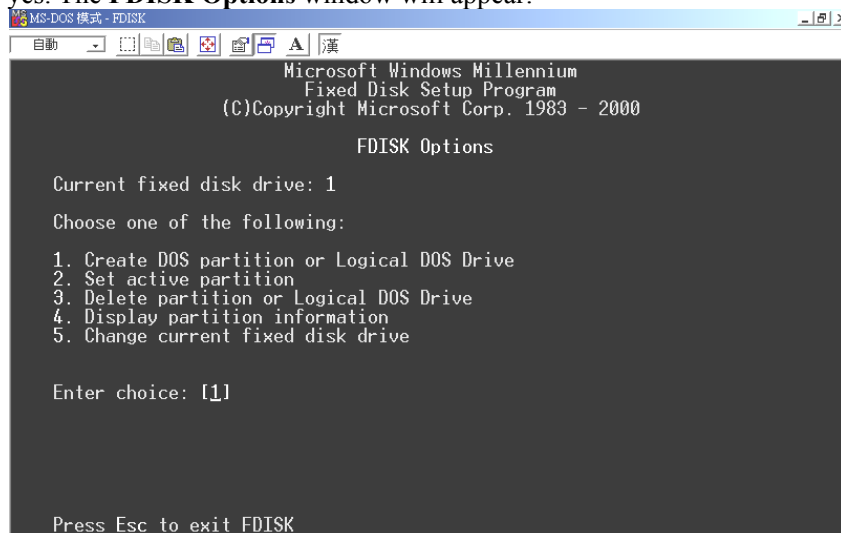
1. Click on the **START** button
2. Select **Run...**
3. Type **fdisk**
4. Click **OK**

The following window will probably appear:

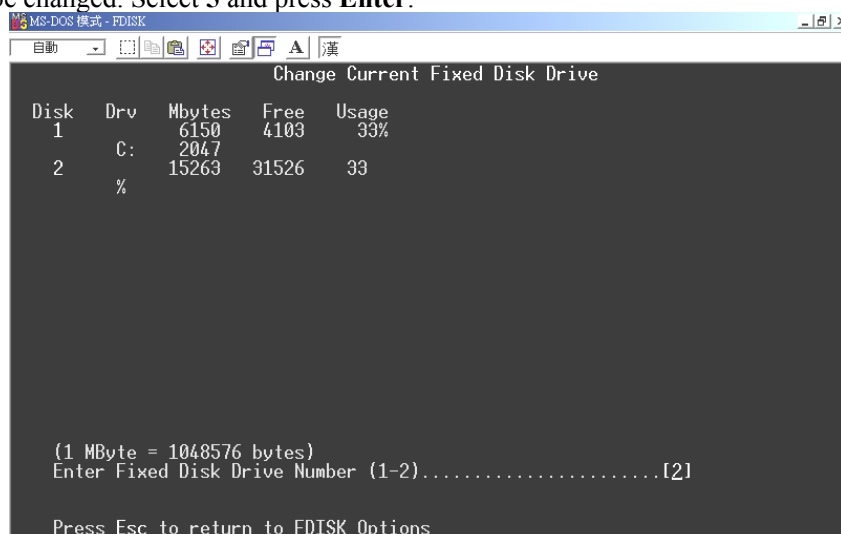
7. CREATING/NAMING PARTITIONS



Press **Enter** for yes. The **FDISK Options** window will appear:



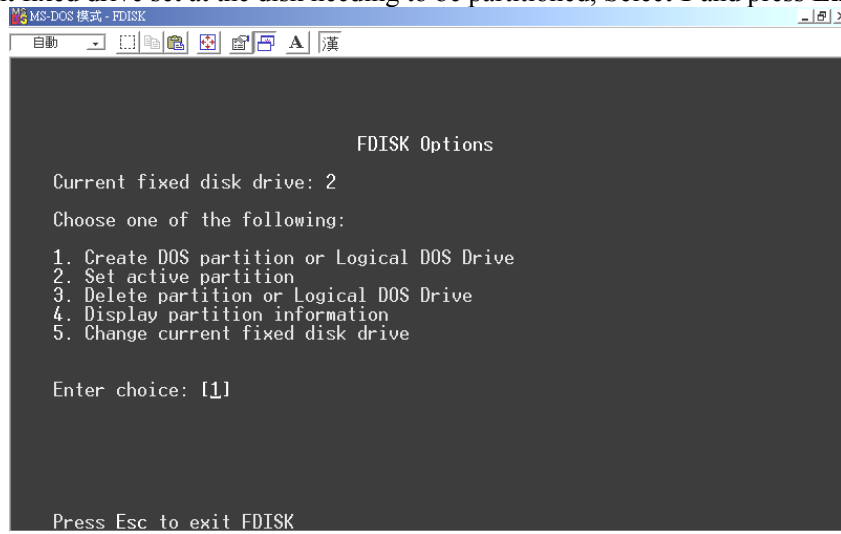
The Current Fixed Drive will be the System Drive (normally C:\). In order to create partitions, the fixed drive needs to be changed. Select **5** and press **Enter**.



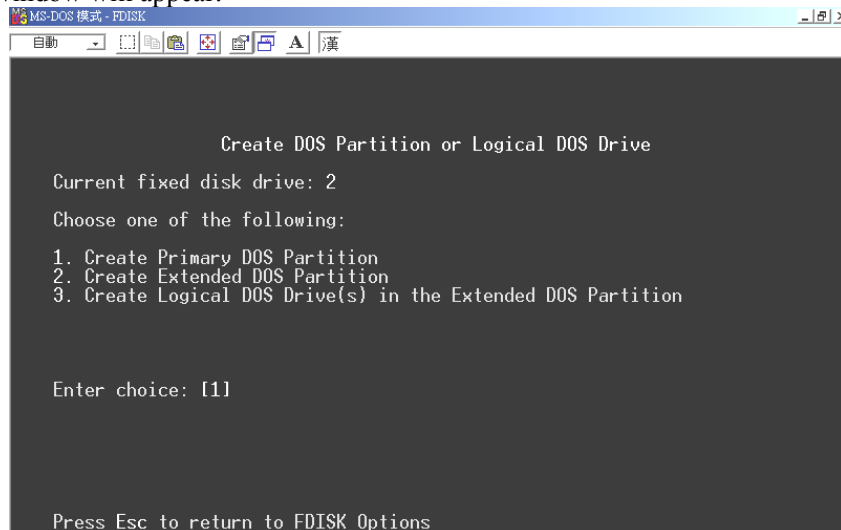
7. CREATING/NAMING PARTITIONS

Enter the disk number to partition and press **Enter**.

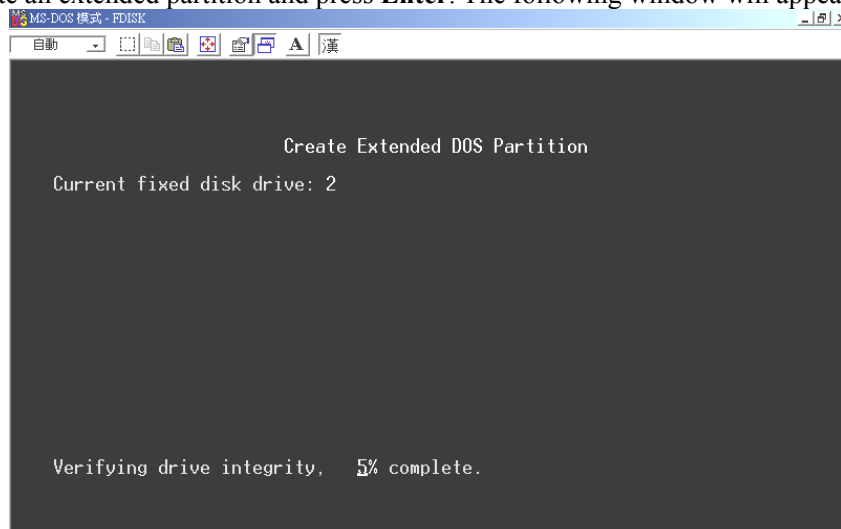
With the Current fixed drive set at the disk needing to be partitioned, Select **1** and press **Enter**.



The following window will appear:

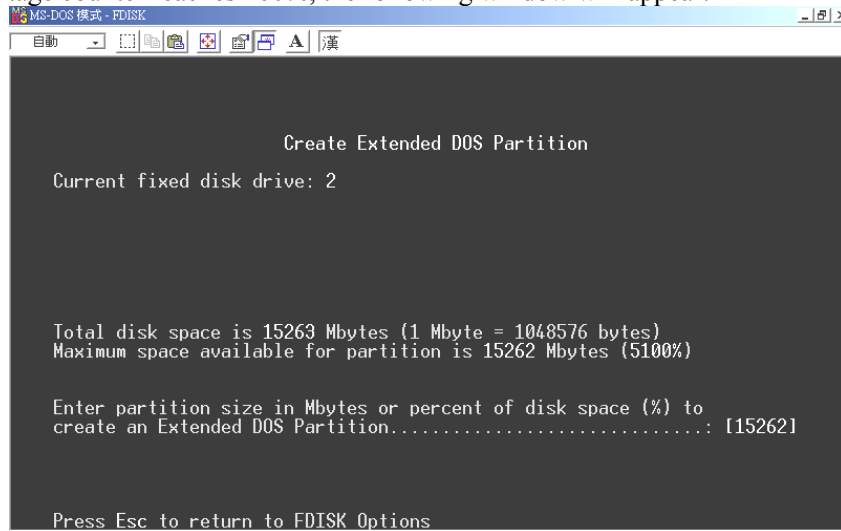


Select **2** to create an extended partition and press **Enter**. The following window will appear:



7. CREATING/NAMING PARTITIONS

Once the percentage counter reaches 100%, the following window will appear:



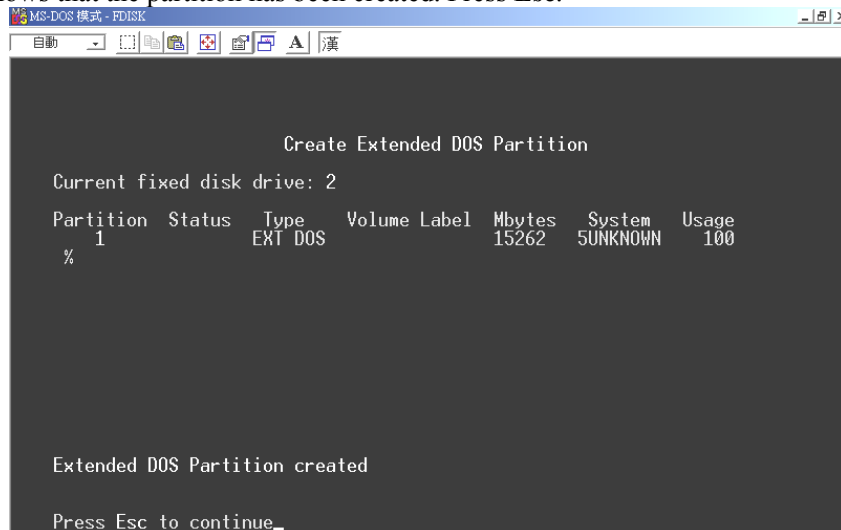
```
MS-DOS 模式 - FDISK
自動
Create Extended DOS Partition
Current fixed disk drive: 2

Total disk space is 15263 Mbytes (1 Mbyte = 1048576 bytes)
Maximum space available for partition is 15262 Mbytes (5100%)

Enter partition size in Mbytes or percent of disk space (%) to
create an Extended DOS Partition.....: [15262]

Press Esc to return to FDISK Options
```

This window explains how much space will be available in the partition. Press **Enter**. This window shows that the partition has been created. Press **Esc**.



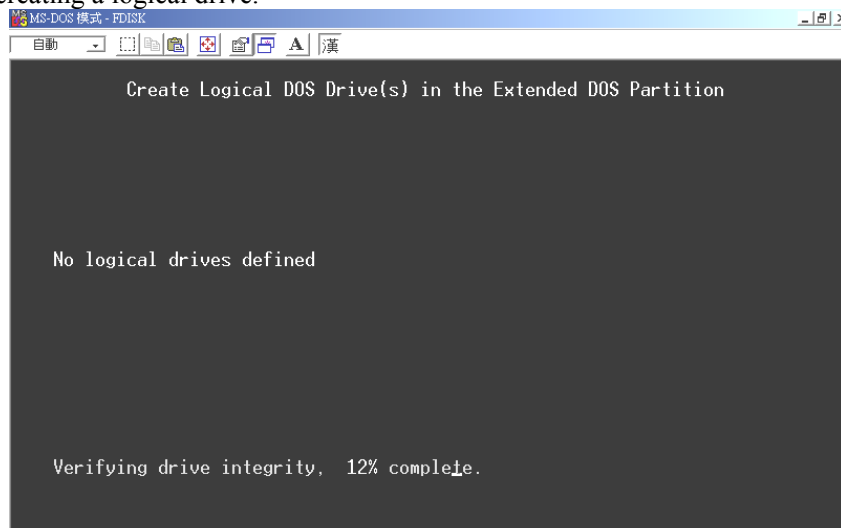
```
MS-DOS 模式 - FDISK
自動
Create Extended DOS Partition
Current fixed disk drive: 2

Partition  Status  Type  Volume Label  Mbytes  System  Usage
  1          %     EXT DOS                    15262  SUNKNOWN  100

Extended DOS Partition created

Press Esc to continue_
```

FDISK is now creating a logical drive.



```
MS-DOS 模式 - FDISK
自動
Create Logical DOS Drive(s) in the Extended DOS Partition

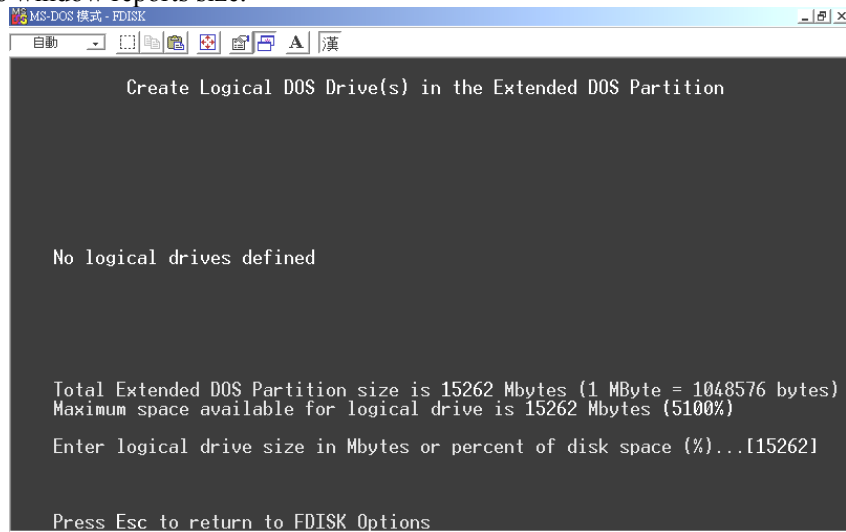
No logical drives defined

Verifying drive integrity, 12% complete_
```

7. CREATING/NAMING PARTITIONS

Once the percentage counter reaches 100% the following window appears:

Once again, this window reports size.



```
MS-DOS 模式 - FDISK
自動 [F1] [F2] [F3] [F4] [F5] [F6] [F7] [F8] [F9] [F10] [F11] [F12] [A] [漢]

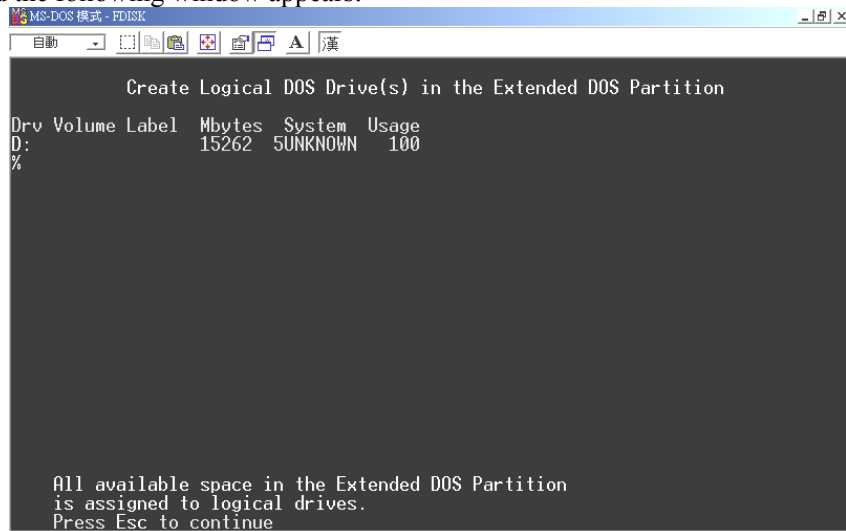
Create Logical DOS Drive(s) in the Extended DOS Partition

No logical drives defined

Total Extended DOS Partition size is 15262 Mbytes (1 MByte = 1048576 bytes)
Maximum space available for logical drive is 15262 Mbytes (5100%)
Enter logical drive size in Mbytes or percent of disk space (%)...[15262]

Press Esc to return to FDISK Options
```

Press **Enter** and the following window appears:



```
MS-DOS 模式 - FDISK
自動 [F1] [F2] [F3] [F4] [F5] [F6] [F7] [F8] [F9] [F10] [F11] [F12] [A] [漢]

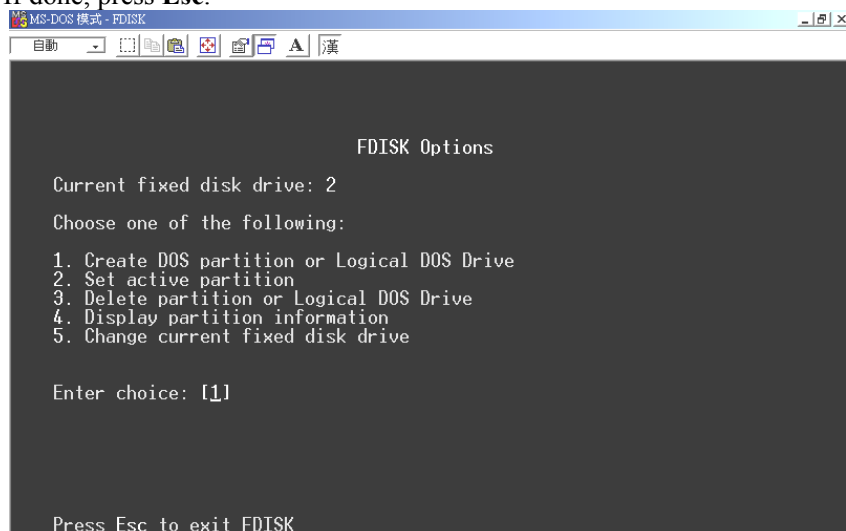
Create Logical DOS Drive(s) in the Extended DOS Partition

Drv Volume Label Mbytes System Usage
D: 15262 SUNKNOWN 100
%

All available space in the Extended DOS Partition
is assigned to logical drives.
Press Esc to continue
```

This window now shows the drive and its drive letter and size. Press **Esc**.

If another drive (RAID set) needs to be partitioned, repeat the process, starting by changing the fixed disk drive (Press **5**). If done, press **Esc**.



```
MS-DOS 模式 - FDISK
自動 [F1] [F2] [F3] [F4] [F5] [F6] [F7] [F8] [F9] [F10] [F11] [F12] [A] [漢]

FDISK Options

Current fixed disk drive: 2

Choose one of the following:

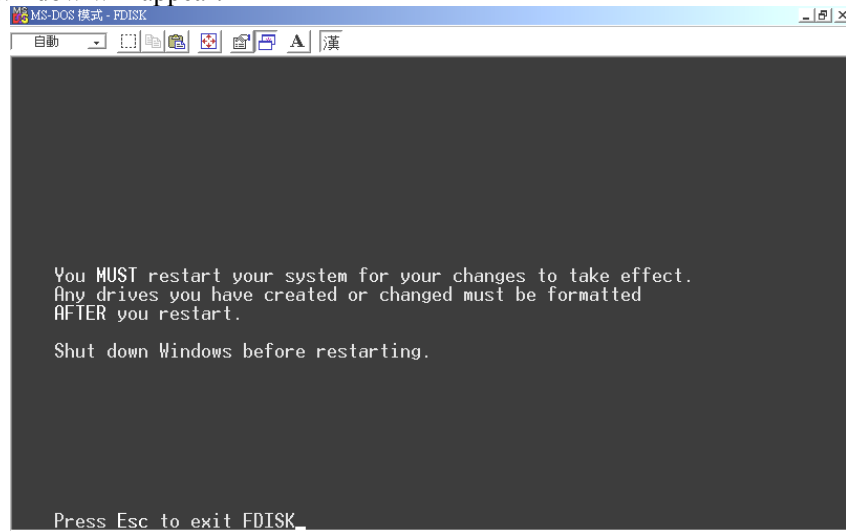
1. Create DOS partition or Logical DOS Drive
2. Set active partition
3. Delete partition or Logical DOS Drive
4. Display partition information
5. Change current fixed disk drive

Enter choice: [1]

Press Esc to exit FDISK
```

7. CREATING/NAMING PARTITIONS

The following window will appear:



This window is a reminder to **RESTART** the computer.

After restarting the computer, and booting Windows 9x, double-click on the **My Computer** icon.

Right-click on each new drive and select **Format**.

Only a **FULL** format will be accepted at this point. Select Full Format, enter the Label Name for the drive or RAID set (if desired) and click **OK**.

Once the drive has been formatted, repeat for each new drive. The new drives should now be ready to be used.

8. TROUBLESHOOTING TIPS

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The following tips are general troubleshooting procedures:

1. Check that the TR-824 RAID Card is seated evenly all the way into the PCI slot.
2. Check that the PCI expansion slot is 5V and compliant with PCI 2.3 or previous version and supports Bus Mastering.
3. Check that TR-824 Raid Card is detected during booting by looking for the BIOS message from the screen. If it is not detected, try to move to another free PCI slot.
4. Check all ATA cables and power cables are connected properly.
5. Accessories Included:
 - TR-824
 - Data Cable x 4
 - Power Cable x 2
 - User's Manual
 - Driver CD
 - GUI Software

9. TECHNICAL SUPPORT GUIDE

Tekram Technical Support provides several support options for our users to access information and updates. We encourage you to use one of our electronic services, which provide product information updates with the most efficient service and support.

Be sure to have the following information available when contacting us:

- Product model and serial number
- BIOS and driver version numbers
- A description of the problem/situation
- System configuration information, including: mainboard and CPU type, hard drive models(s), ATAPI drives & devices, and other controllers.

Technical Support Services

Website Support

Taiwan <http://www.tekram.com.tw>
Mainland China <http://www.tekram.com.cn>
US <http://www.tekram.com>
Europe <http://www.tekram.de>

E-mail Support

Taiwan sales@tekram.com.tw
Mainland China techsupport@tekram.com.cn
US sales@tekram.com
Europe technical-support@tekram.de

FCC Compliance Statement

This equipment has been tested and found to comply with limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in residential installations. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television equipment reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Move the equipment away from the receiver
- Plug the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/television technician for additional suggestions

Only equipment certified to comply with Class B should be attached to this equipment, and must have shielded interface cables.

The FCC requires the user to be notified that any change or modifications to the equipment by the user not expressly approved by the grantee or manufacturer could void the user's authority to operate such equipment.

This device complies with Part 15 of the FCC rule. Operation is subjected to the following two conditions: 1) This device may not cause harmful interference and 2) This device must accept any interference received, including interference that may cause undesired operation.

