

# Z-Cyber Speedway 133 + RAID

**User's Manual**  
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Manual Version 1.0

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Thank you for choosing Z-Cyber Speedway UDMA133 + RAID controller card. It provides you both choices of using either UDMA133 or RAID set. Please read the following installation instruction carefully before proceeding. Some points are important to note.

## **Z-Cyber Driver Installation for UDMA133 mode**

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### **1. Windows NT 4.0 and Windows 2000/XP Fresh Installation**

Follow the instructions in this section if you are performing a new installation of Windows NT 4.0 or Windows 2000/XP, and you wish to boot from a device attached to the Speedway controller.

- 1) Power off the system. Connect the hard drives to the Speedway controller and insert the controller into a PCI slot. Power up the system.
- 2) Put your Windows NT/2000/XP CD into the CD-ROM/DVD drive, or the NT/2000/XP boot diskette #1 in the floppy drive if your system cannot boot from the CD.
- 3) Press F6 for third party SCSI or driver installation at the beginning of text mode installation. Press 's' when setup asks if you want to specify an additional device, and insert the driver diskette.

If installing Windows NT 4.0, select:

*'Silicon Image PCI-0680 ATA/133 Controller for NT 4.0'*

If installing Windows 2000/Windows XP, select:

*'Silicon Image PCI-0680 ATA/133 Controller for Windows 2000/XP'*

- 4) Press 'Enter' to continue on with text mode setup.
- 5) Follow the setup instructions to select your choice for partition and file system.
- 6) After setup examines your disks, it will copy files to Windows 2000 installation folders and restart the system. The setup program will continue and finish the installation after restart.
- 7) Wait until Windows 2000 finishes installing devices, regional settings, networking settings, components, and final set of tasks, reboot the system.
- 8) See instructions in section 5 to verify controller was installed correctly.

## **2. Windows 98/98SE/ME Installation**

- 1) Power off the system. Connect the hard drives to the Speedway controller and insert it into a PCI slot. Power up the system.
- 2) After Windows is booted, it will detect the controller and prompt for driver location.
- 3) Please insert the driver diskette into A: drive.
- 4) Windows will finish the installation automatically. Reboot the computer if Windows requests.

## **3. Adding the Speedway controller to an existing Windows NT 4.0 installation**

Follow the instructions in this section to install the driver on a system already running Windows NT 4.0.

- 1) Power off the system. Insert the Speedway controller into a PCI slot. Power up the system. **(DO NOT CONNECT HARD DISK TO THE SPEEDWAY CONTROLLER AT THIS TIME)**
- 2) After OS boots up, Click 'Start'
- 3) Under 'Settings', click 'Control Panel'.
- 4) Select 'SCSI Adapters' from the Control Panel.
- 5) Select the 'Drivers' tab and click 'Add'.
- 6) Click 'Have Disk'.
- 7) Insert the driver diskette into A: and press 'Enter'.
- 8) Choose 'SiLi PCI-0680 ATA/133 Controller' and click 'OK'.
- 9) Once driver is installed completely. Power down the system and connect the hard disk to the Speedway controller. Then turn the system back on to function properly.
- 10) See instructions in section 5 to verify controller was installed correctly.

## **4. Adding the Speedway controller to an existing Windows 2000/XP/98/ME**

Follow the instructions in this section to install the driver on a system already running Windows.

1. Power off the system. Insert the Speedway controller into a PCI slot. Power up the system. **(DO NOT CONNECT HARD DISK TO THE SPEEDWAY CONTROLLER AT THIS TIME)**
2. During OS boot up, Windows will display the 'Found New Hardware Wizard'. Click 'Next'.
3. Select 'Search for a suitable driver for my device (Recommended)' and Click 'Next'.
4. Under 'Optional search locations' insure that 'Floppy disk drives' is checked.
5. Insert the driver diskette into A: and click 'Next'.
6. When the wizard indicates that it found a driver for the device click 'Next'.
7. If the 'Digital Signature Not found' dialog appears, click 'Yes' to continue installing the driver.
8. The wizard will now copy the required files to the system and start the driver. After starting the driver the wizard will display a completion dialog, click 'Finish' to exit the wizard.
9. Once driver is installed completely. Power down the system and connect the hard disk to the Speedway controller. Then turn the system back on to function properly.
10. See instructions in section 5 to verify controller was installed correctly.

## **5. Verifying controller installation.**

Follow the instructions in this section to verify that the controller was installed correctly.

For Windows 2000/XP

1. Right click on 'My Computer' icon, select 'Properties', left click on 'Hardware' tab, and then on 'Device Manager' button.
2. Double click on 'IDE ATA/ATAPI Controllers', If there is no yellow '!' or '?' in front of 'SiI PCI-0680 ATA/133 Controller', the driver is started correctly.
3. To view information about the devices attached to the controller, right click the 'SiI PCI-0680 ATA/133 Controller' and select Properties from the context menu, then select the tab labeled 'Device Info'.

For Windows NT 4.0

1. Double click on 'My Computer' icon, select 'Control Panel', click on 'SCSI Adapters' icon, 'SiI PCI-0680 ATA/133 Controller' should displayed correctly under 'Device' and 'Driver' tab.

2. To view information about the devices attached to the controller, double click on the 'Silicon Image ATA Controllers' control panel applet. Select a controller from the list at the top of the dialog. Then select a device from the 'Device Location' drop down list to view its information.

## **Z-Cyber Driver Installation for RAID**

### **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.

Z-Cyber Speedway 133 provides three RAID Set types, Striped (RAID 0), Mirrored (RAID 1), and Mirrored-Striped (RAID 0+1).

#### **Disk Striping (RAID 0)**

Striping 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 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.

This figure shows a stripe set using three disks with stripe one written to disk one, stripe two to disk two, and so forth.

#### **Disk Mirroring (RAID 1)**

Disk mirroring creates an identical twin for a selected disk by having the data simultaneously written to two disks. This redundancy provides instantaneous protection from a single disk failure. If a read failure occurs on one drive, the system reads the data from the other drive.

#### **Mirrored-Striping (RAID 0+1 also known as RAID 10)**

A Mirrored-Striped Set does just what it says, combining both Striping and Mirroring technologies to provide both the performance enhancements that come from Striping and the data availability and integrity that comes from Mirroring. When data is written to a Mirrored-Striped Set, instead of creating just one “virtual disk” as Striping would do, a second, Mirrored “virtual disk” is created as well.

### **IMPORTANT NOTE!**

**Make sure to delete any RAID Set before remove any HD from a RAID set. Failing to do so may result in data lost in future when the HD is re-use in the controller card.**

**If any HD that is currently being used in a RAID set and you need to change it to use separately on another IDE card/motherboard, you must delete the RAID set in the BIOS before disconnecting HD.**

**Failing to do so will make the RAID BIOS to detect an incomplete RAID set when the HD is reconnected. Performing any fix up procedure will result in data lost to the HD that is attached.**

## **CREATING/DELETING RAID SETS**

Creating and deleting RAID sets is a function found in the BIOS. During bootup, the following message will appear, pausing for a few moments to allow the user to choose what to do:

```
Press F3 to enter RAID utility
```

In order to properly prepare and maintain a storage system, the user needs to be aware of which drive was installed as the Primary Master, Primary Slave, Secondary Master and Secondary Slave. Identifying these drives will not only be useful because they are reported in order in the BIOS as well in the Medley GUI, but when optimizing RAID sets, it is best to use drives from different channels. It is also helpful to know which drive is which if the disk drives are not all of equal size.

### Disk Drive and Set Reporting (Numbering)

Before creating or deleting Raid Sets, it is also important to understand how each different piece of software reports both the physical disk drives and “Sets,” which could be either an independent drive or an actual RAID set consisting of two to four drives. For example, the BIOS and GUI reports the four physical disk drives as 0-3 while each Set is reported as 1-4.

“Set” numbers are assigned in the RAID utility based on the assigned disk number of the physical drives, with the lowest numbered drives being part of the lowest numbered sets.

For example, if a striped set were created with drives 1 and 2, the sets would be (the physical drive number is in the brackets):

```
Set: 1 <0>      Manufacturer Model<PM>  19541 MB
Set: 2 <1,2>    SiI Striped Set      <PS>  39081 MB
Set: 3 <3>      Manufacturer Model<SS>  19541 MB
```

If another striped set were created with drives 0 and 3, it would be:

```
Set: 1 <0,3> SiI Striped Set      <PM>  39081 MB
Set: 2 <1,2> SiI Striped Set      <PS>  39081 MB
```

Windows, on the other hand, does not report the physical disk drives, but only the Sets (even if they are representing single, independent disk drives). However, Windows calls the sets “drives.” In other words, it reports a RAID Set as a single drive of whatever size the RAID Set reports. In Windows, the numbering of each set (drive) will differ depending on which operating system is being used as well as other devices currently installed on the computer. It will almost always be different than that reported in the BIOS or Medley GUI. However, THE ORDER of the sets reported in the BIOS and Medley GUI will be maintained in Windows such that Set 1 in the BIOS will be the first drive reported in any of the Windows operating systems. Set 2 will always be the second drive, and so forth.

## Creating Striped Sets

1. As the BIOS boots, the following message will appear, pausing for a few moments to allow the user to choose what to do:

Press F3 to enter RAID utility

2. Press F3.
3. If this is the first time opening the BIOS utility, or if no RAID sets exist, something similar to the following screen will appear (note that in this example FOUR disk drives have been installed to be used as RAID sets):

```
Primary Channel:
Drive Number: 0Manufacturer Model    19541 MB
Drive Number: 1Manufacturer Model    19541 MB
Secondary Channel:
Drive Number: 2Manufacturer Model    19541 MB
Drive Number: 3Manufacturer Model    19541 MB

Set: 1 <0>      Manufacturer Model<PM>  19541 MB
Set: 2 <1>      Manufacturer Model<PS>  19541 MB
Set: 3 <2>      Manufacturer Model<SM>  19541 MB
Set: 4 <3>      Manufacturer Model<SS>  19541 MB
```

```
Press F1 to delete RAID set
Press F2 to create RAID set
Press F3 to create spare drive
Press F4 to resolve conflicts
Press <ESC> to exit RAID configuration utility
```

The name of the manufacturer and model number should actually appear. Also the size of each drive/set appears (in this example, these are 20GB drives with 19541MB space available).

4. Press F2 to create a RAID set. The following screen appears:

```
Primary Channel:
Drive Number: 0  Manufacturer Model    19541 MB
Drive Number: 1  Manufacturer Model    19541 MB
Secondary Channel:
Drive Number: 2  Manufacturer Model    19541 MB
Drive Number: 3  Manufacturer Model    19541 MB

Set: 1 <0>      Manufacturer Model<PM>  19541 MB
Set: 2 <1>      Manufacturer Model<PS>  19541 MB
Set: 3 <2>      Manufacturer Model<SM>  19541 MB
Set: 4 <3>      Manufacturer Model<SS>  19541 MB
```

```
Press F1 to create Striped set
Press F2 to create Mirrored set
```

Press F3 to create Mirrored-Striped set

Press <ESC> to exit

Your selection?

5. Choose which type of RAID set to create.

If a Striped Set is desired, press F1. The following screen appears:

Select the chunk size to be used in RAID0 set:

A=Auto Configure; 0=1k 1=2k 2=4k 3=8k 4=16k 5=32k 6=64k 7=128k  
8=256k 9=.5M

Your selection?

What is Auto Configure? Auto Configure allows the RAID utility to choose the chunk size and drives to be used in the desired RAID set. It will always choose a 64k chunk size as the default, and will always use drives from different channels if possible. Like the rest of the utility, if Auto Configure is selected, simply follow the prompts given.

6. Choose the chunk size desired (for example, press 6 for 64K chunk size). Once done, the following screen appears:

Enter the total number of drives in RAID0 set:

7. A Striped set must have between 2 and 4 drives as members. Choose the number of drives and the following screen appears (for example, choose 2):

Enter the first drive number in Striped set:

8. Choose which drives to be used in Striped set. For optimal throughput, choose drives from both channels (Primary and Secondary). After entering the first drive (for example, choose 0), the following screen appears:

Enter the second drive number in Striped set:

9. Enter the second disk drive number (for example, press 2). After all drives for the Striped set are entered, the following screen appears:

Are you sure? (Y/N)

10. Enter Y to create Striped set. The following screen appears:

Primary Channel:

Drive Number: 0 Manufacturer Model 19541 MB

Drive Number: 1 Manufacturer Model 19541 MB

Secondary Channel:

Drive Number: 2 Manufacturer Model 19541 MB

Drive Number: 3 Manufacturer Model 19541 MB

Set: 1 <0,2> SiI Striped set <PM> 39081 MB  
Set: 2 <1> Manufacturer Model<PS> 19541 MB  
Set: 3 <3> Manufacturer Model<SS> 19541 MB

Press F1 to delete RAID set  
Press F2 to create RAID set  
Press F3 to create spare drive  
Press F4 to resolve conflicts  
Press <ESC> to exit RAID configuration utility

### Creating Mirrored Sets

1. To create a Mirrored set, at the opening screen press F2. The following screen appears:

Press F1 to create Striped set  
Press F2 to create Mirrored set  
Press F3 to create Mirrored-Striped set

Press <ESC> to exit

Your selection?

2. A Mirrored set uses 2 disk drives. To create a Mirrored set, press F2. The following screen appears:

Set up Mirrored set  
Do you want automatic set up (No copy operation)? (Y/N)

3. If you want the Mirrored set created automatically, press Y and follow directions. If you wish to enter each drive and all pertinent information, press N. The following screen appears:

Enter the first drive number (source drive) in Mirrored set:

4. In a Mirrored set, the source drive needs to be EQUAL TO OR SMALLER than the destination drive. For optimal performance, the source drive and destination drive should be from different channels. After entering the source drive (for example, enter 1), the following screen appears:

Enter the second drive number (destination drive) in Mirrored set:

5. Enter the second drive (for example, enter 3). The following screen appears:

Do you want to copy from the source to destination drive? (Y/N)

What does this question mean? If the disk assigned as the source disk already has been partitioned and has data stored on it, and then a second disk is added for redundancy, the data on the source drive can be copied to the destination drive, so the disks are identical, and all subsequent data will be written to both drives as a Mirrored set.

If, however, the source disk does not have data already stored on it, answer N.

6. After answering, the following screen appears:

```
Auto-Rebuild enabled? (Y/N)
Are you sure? (Y/N)
```

7. Answer Y to create Mirrored set. The following screen appears:

```
Primary Channel:
Drive Number: 0 Manufacturer Model      19541 MB
Drive Number: 1 Manufacturer Model      19541 MB
Secondary Channel:
Drive Number: 2 Manufacturer Model      19541 MB
Drive Number: 3 Manufacturer Model      19541 MB

Set: 1 <0,2>      SiI Striped set      <PM>  39081 MB
Set: 2 <1> <3>    SiI Mirrored set     <PS>  19541 MB
```

```
Press F1 to delete RAID set
Press F2 to create RAID set
Press F3 to create spare drive
Press F4 to resolve conflicts
Press <ESC> to exit RAID configuration utility
```

Note that the size of the RAID set is still 19541 as there is only half the available space of the combined disks since the second half is used for mirroring.

The brackets around the drive numbers in a Mirrored set represent different drives statuses, such as:

```
<1> <3>      represents the status of drives 1 and 3 as current
<1> (3)      represents the status of drive 1 as current and drive 3 as rebuild
<1> [3]      represents the status of drive 1 as current and drive 3 as dropped
<1> [?]      represents the status of drive 1 as current and drive 1's mirror as missing
```

In other words:

```
<> represents a drive in a current status
()  represents a drive in a rebuild status
[]  represents a drive in a dropped status
```

For a valid Mirrored set, at least one drive must be in current status. Therefore, each of the four Mirrored sets listed above are all valid.

## Creating a Mirrored-Striped Set

1. To create a Mirrored-Striped RAID set press F2. A Mirrored-Striped set needs all four disk drives. The following screen appears:

```
Primary Channel:
Drive Number: 0 Manufacturer Model      19541 MB
Drive Number: 1 Manufacturer Model      19541 MB
Secondary Channel:
Drive Number: 2 Manufacturer Model      19541 MB
Drive Number: 3 Manufacturer Model      19541 MB

Set: 1 <0>      Manufacturer Model<PM>  19541 MB
Set: 2 <1>      Manufacturer Model<PS>  19541 MB
Set: 3 <2>      Manufacturer Model<SM>  19541 MB
Set: 4 <3>      Manufacturer Model<SS>  19541 MB
```

```
Press F1 to create Striped set
Press F2 to create Mirrored set
Press F3 to create Mirrored-Striped set
```

```
Press <ESC> to exit
```

```
Your selection?
```

2. Choose F3 and the following screen appears:

```
Select the chunk size to be used in RAID0 set:
A=Auto COnfigure 0=1k 1=2k 2=4k 3=8k 4=16k 5=32k 6=64k 7=128k
8=256k 9=.5M
Your selection?
```

3. Choose desired chunk size. The following screen appears:

```
Enter the first source drive number in Mirrored-Striped set:
```

4. To optimize throughput, have both source drives be from different channels. It also must be remembered that the total capacity of the source drives must be **LESS THAN OR EQUAL TO** the total capacity of the destination drives (for example, choose 0). The following screen appears:

```
Enter the second source drive number in Mirrored-Striped set:
```

5. For example, choose 2. The following screen appears:

```
Enter the first destination drive number in Mirrored-Striped set:
```

6. For example, choose 1. The following screen appears:

Enter the second destination drive number in Mirrored-Striped set:

7. For example, choose 3. The following screen appears:

Are you sure? (Y/N)

8. Enter "Y" to create Mirrored-Striped set. The following screen appears:

```
Primary Channel:
Drive Number: 0 Manufacturer Model      19541 MB
Drive Number: 1 Manufacturer Model      19541 MB
Secondary Channel:
Drive Number: 2 Manufacturer Model      19541 MB
Drive Number: 3 Manufacturer Model      19541 MB

Set: 1 <0,2><1,3> SiI Mirrored-Striped <PM> 39081 MB

Press F1 to delete RAID set
Press F2 to create RAID set
Press F3 to create spare drive
Press F4 to resolve conflicts

Press <ESC> to exit RAID configuration utility
```

As with Mirrored sets, the brackets around the drive numbers in a Mirrored set represent different drives statuses, such as:

<0,2> <1,3> represents the status of all four drives as current  
<0,2> (1,3) represents the status of drives 0, 2, and 1 as rebuild and drive 3 as current  
<0,2> (1,3) represents the status of drives 0 and 2 as current and drives 1 and 3 as rebuild  
<0,2> <1,3) represents the status of drives 0, 2, and 1 as current and drive 3 as rebuild  
<0,2> <1,3] represents the status of drives 0, 2, and 1 as current and drive 3 as dropped  
<0,2> [1,3] represents the status of drives 0 and 2 as current and drives 1 and 3 as dropped  
<0,2> <1,?] represents the status of drives 0, 2, and 1 as current and drive 2's mirror missing  
<0,2> [?,?] represents the status of drives 0 and 2 as current but their mirrors missing

In other words:

< > represents a drive in a current status  
( ) represents a drive in a rebuild status  
[ ] represents a drive in a dropped status

In order for a Mirrored-Striped set to be valid, at least one of the striped sets must have both drives in current status. In other words, in the example above, either <0,2> must be current or <1,3> must be current.

## Deleting RAID Sets

1. To remove one or more RAID sets, Press F1 and the following screen appears:

Enter the set number for the RAID set to be deleted  
Press <ESC> to exit

Your selection:

2. Choose the set number of the RAID set to be deleted.

Are you sure? (Y/N)

3. Answer Y to remove the RAID set. If the RAID set being deleted is a Striped set, then all of the data will be lost. If the set being deleted is a Mirrored set, then the data will remain intact and accessible on both drives.

### **Creating a Spare Drive**

After configuring a Mirrored set, it may be desirable to assign a third drive as a “spare” which can automatically replace a failed drive.

1. To create a spare drive, press F3 and the following screen appears:

Enter the drive number for the spare drive:  
Press <ESC> to exit

Your selection:

2. Choose the drive number of the drive to be designated as a spare.

Are you sure? (Y/N)

3. Answer Y and the spare drive will be created and listed as the last Set.

### **Deleting a Spare Drive**

To delete a spare drive, use the same procedure as deleting a RAID set.

### **Resolving Conflict**

When a RAID set is created, the metadata written to the disk includes drive connection information (Primary Master, Primary Slave, Secondary Master, Secondary Slave). 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, press F4, and the correct metadata, including the correct drive connection information, will be written to the replacement disk.

### **CREATING/NAMING PARTITIONS**

The creating and naming of partitions is something done within the Windows operating system. And while Windows 2000 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 than the others.

### **Windows 2000/XP 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:

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.

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, 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.

### **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.

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 which ever drive letter is desired (the lowest 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.

1. Repeat this procedure for the partition of the second and third disk.
2. Close the Data Management window by clicking on the small boxed “X” in the top right corner of the window.
3. 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.

## **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:

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, 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) appear to be formatted, right click on that partition (Section 2) and select Delete.
2. Once all disks are reporting as Free Space, right-click on each partition and select Create...
3. A Create Primary Partition window should now appear. Click OK.
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...
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.

## **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

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.

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.

Select 2 to create an extended partition and press Enter.

Once the percentage counter reaches 100%, a window explains how much space will be available in the partition. Press Enter. Then another window shows that the partition has been created. Press Esc.

FDISK is now creating a logical drive.

Once the percentage counter reaches 100% a window appears which reports the size.

Press Enter and the next window 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.

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.