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# **Guide to SATA Hard Disks Installation and RAID Configuration**

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# **1. Guide to SATA Hard Disks Installation**

## **1.1 Serial ATA (SATA) Hard Disks Installation**

This motherboard adopts VIA VT8237 southbridge chipset that supports Serial ATA (SATA) hard disks. You may install SATA hard disks on this motherboard for internal storage devices. This section will guide you to install the SATA hard disks.

STEP 1: Install the SATA hard disks into the drive bays of your chassis.

STEP 2: Connect the SATA power cable to the SATA hard disk.

STEP 3: Connect one end of the SATA data cable to the motherboard's SATA connector.

STEP 4: Connect the other end of the SATA data cable to the SATA hard disk.

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## 1.2 Making An SATA Driver Diskette

If you want to install Windows 2000 or Windows XP on your SATA HDDs, you will need to make an SATA driver diskette before you start the OS installation.

STEP 1: Insert the ASRock Support CD into your optical drive to boot your system. (Do NOT insert any floppy diskette into the floppy drive at this moment!)

STEP 2: During POST at the beginning of system boot-up, press <F11> key, and then a window for boot devices selection appears. Please select CD-ROM as the boot device.

STEP 3: When you see the message on the screen, "Do you want to generate Serial ATA driver diskette [Y/N]?", press <Y>.

STEP 4: Then you will see these messages,

**Please insert a diskette into the floppy drive.**

**WARNING! Formatting the floppy diskette will lose ALL data in it!**

**Start to format and copy files [Y/N]?**

Please insert a floppy diskette into the floppy drive, and press <Y>.

STEP 5: The system will start to format the floppy diskette and copy SATA drivers into the floppy diskette.

Once you have the SATA driver diskette ready, you may start to install Windows 2000 / Windows XP on your system directly without setting the RAID configuration on your system, or you may start to use "VT8237 SATA RAID BIOS" to set RAID 0 / RAID 1 / JBOD configuration before you install the OS. You may also set the RAID configuration by using "VIA RAID Tool" in Windows environment. Please refer to the document in the Support CD, "Guide to VIA RAID Tool", which is located in the folder at the following path:

.. \ **VIA RAID Tool**

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## 2. Guide to RAID Configurations

### 2.1 Introduction of RAID

This motherboard adopts VIA VT8237 south bridge chipset that integrates RAID controller supporting RAID 0 / RAID 1 / JBOD function with two independent Serial ATA (SATA) channels. This section will introduce the basic knowledge of RAID, and the guide to configure RAID 0, RAID 1, and JBOD settings.

#### RAID

The term "RAID" stands for "Redundant Array of Independent Disks", which is a method combining two or more hard disk drives into one logical unit. For optimal performance, please install identical drives of the same model and capacity when creating a RAID set.

#### RAID 0 (Data Striping)

RAID 0 is called data striping that optimizes two identical hard disk drives to read and write data in parallel, interleaved stacks. It will improve data access and storage since it will double the data transfer rate of a single disk alone while the two hard disks perform the same work as a single drive but at a sustained data transfer rate.

#### **WARNING!!**

Although RAID 0 function can improve the access performance, it does not provide any fault tolerance. Hot-Plug any HDDs of the RAID 0 Disk will cause data damage or data loss.

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## **RAID 1 (Data Mirroring)**

RAID 1 is called data mirroring that copies and maintains an identical image of data from one drive to a second drive. It provides data protection and increases fault tolerance to the entire system since the disk array management software will direct all applications to the surviving drive as it contains a complete copy of the data in the other drive if one drive fails.

## **JBOD (Spanning)**

A spanning disk array is equal to the sum of all drives. Spanning stores data onto a drive until it is full then proceeds to store files onto the next drive in the array. When any member disk fails, it will affect the entire array. JBOD is not really a RAID, and it does not support fault tolerance.

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## 2.2 RAID Configurations Precautions

1. Please use two new drives if you are creating a RAID 0 (striping) array for performance. It is recommended to use two SATA drives of the same size. If you use two drives of different sizes, the smaller capacity hard disk will be the base storage size for each drive. For example, if one hard disk has an 80GB storage capacity and the other hard disk has 60GB, the maximum storage capacity for the 80GB-drive becomes 60GB, and the total storage capacity for this RAID 0 set is 120GB.
2. You may use two new drives, or use an existing drive and a new drive to create a RAID 1 (mirroring) array for data protection (the new drive must be of the same size or larger than the existing drive). If you use two drives of different sizes, the smaller capacity hard disk will be the base storage size. For example, if one hard disk has an 80GB storage capacity and the other hard disk has 60GB, the maximum storage capacity for the RAID 1 set is 60GB.
3. Please verify the status of your hard disks before you set up your new RAID array.

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## 2.3 BIOS Configuration Utility

### 2.3.1 Enter BIOS Configuration Utility

After the system powers on, the following information will appear on the screen. Press 'Tab' key to enter BIOS configuration utility.

```
VIA Technologies, Inc. VIA Serial ATA RAID BIOS Setting Utility v1.00
Copyright (C) VIA Technologies, Inc. All Right reserved.

Scan Devices. Please wait...
Press < Tab > key into User Window!
Channel 0 Master: IC35L040AVVA07-0
Channel 1 Master: IC35L040AVVA07-0
```

The main interface of BIOS configuration utility is as below:

```
VIA Tech. V18237 SATA RAID BIOS Ver 2.01
```

<ul style="list-style-type: none"><li>▶ Create Array</li><li>▶ Delete Array</li><li>▶ Create/Delete Spare</li><li>▶ Select Boot Array</li><li>▶ Serial Number View</li></ul>	<p>Create a RAID array with the hard disks attached to VIA RAID controller</p> <p>F1 : View Array/disk Status ↑↓ : Move to next item Enter: Confirm the selection ESC : Exit</p>																		
<table border="1"><thead><tr><th>Channel</th><th>Drive Name</th><th>Array Name</th><th>Mode</th><th>Size(GB)</th><th>Status</th></tr></thead><tbody><tr><td>Serial_Ch0</td><td>Master IC35L040AVVA07-0</td><td></td><td>SATA</td><td>38.34</td><td>Hdd</td></tr><tr><td>Serial_Ch1</td><td>Master IC35L040AVVA07-0</td><td></td><td>SATA</td><td>38.34</td><td>Hdd</td></tr></tbody></table>	Channel	Drive Name	Array Name	Mode	Size(GB)	Status	Serial_Ch0	Master IC35L040AVVA07-0		SATA	38.34	Hdd	Serial_Ch1	Master IC35L040AVVA07-0		SATA	38.34	Hdd	
Channel	Drive Name	Array Name	Mode	Size(GB)	Status														
Serial_Ch0	Master IC35L040AVVA07-0		SATA	38.34	Hdd														
Serial_Ch1	Master IC35L040AVVA07-0		SATA	38.34	Hdd														

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### 2.3.2 Create Disk Array

1. Within the main interface, use the up and down arrow key to highlight the **Create Array** command and press <Enter> to call out the list of creation steps.



2. Highlight the **Array Mode** and press <Enter>, then a list of array modes will appear. Just highlight the target array mode that you want to create, and press <Enter> to confirm the selection.





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3. There are two methods to create a disk array. One method is “**Auto Setup**”, and another is “**Select Disk Drives**”. Select “**Auto Setup**” to allow BIOS to select the disk drives and create array automatically. Select “**Select Disk Drives**” to let user select the array drives manually. When using **Select Disk Drives** method, the channel column will be activated. Just highlight the target drives that you want to use and press <Enter> to select them respectively. When all drives have been selected, press <Esc> to go back to the creation steps menu.

```
VIA Tech. VT8237 SATA RAID BIOS Ver 2.01
```

<pre>▶ Auto Setup For Performance ▶ Array Mode RAID 0 (Striping) ▶ Select Disk Drives ▶ Block Size 64K ▶ Start Create Process</pre>	<pre>Create a RAID array with the hard disks attached to VIA RAID controller  F1  : View Array/disk Status ↑↓  : Move to next item Enter: Confirm the selection ESC : Exit</pre>																		
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[ ]Serial_Ch1 Master	IC35L040AVVA07-0		SATA	38.34	Hdd														

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### Create RAID 0

If RAID 0 array is selected in step 2, user can also select a block size for the array. Use the arrow key to highlight the "Block Size" and press <Enter>. Then the list of available block size will popup. The block size can be selected from 4K to 64K Bytes.



Use the arrow key to highlight the **Start Create Process** and press <Enter>, then a warning message will appear. Press **Y** to finish the creation, or press **N** to cancel the creation.

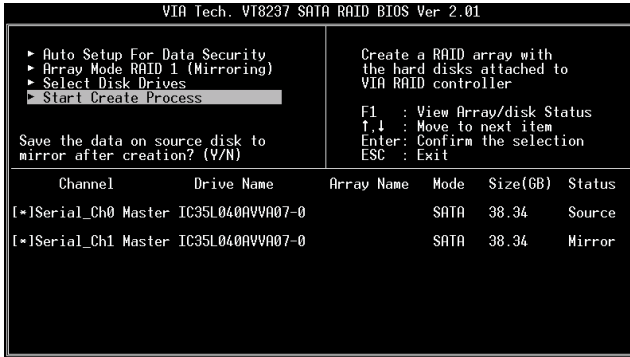
#### Important note:

The content of the hard drive will be destroyed after array creation.

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### Create RAID 1

The data on disk drives will be destroyed if user uses “**Auto Setup**” to create RAID 1. But you can reserve the data on source drive if you use “**Select Disk Drives**” to select the source and the mirror drive.



Press “y” to copy data of source to mirror drive. There is a limitation when using this feature. The capacity of mirror drive must be greater or equal to the source drive; otherwise the RAID 1 can’t be created and a error message will appear: “Error: mirror’s size is smaller than source!!! Press ESC return”. If user does not want to duplicate data, the data on the source and the mirror drive will be destroyed.

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## Create JBOD

The data on disk drives will be destroyed if user uses “**Auto Setup**” to create a JBOD. However, you can reserve the data on the first disk drive of a JBOD array if you use “**Select Disk Drives**” to select disk drives



The data on the first disk drive will be reserved and the other disk drives in JBOD will be expanded behind the first disk drive and become free space.

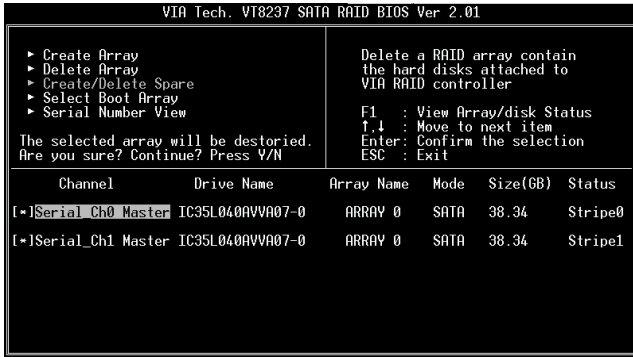
Expand Span (JBOD) Array function is not available if VT8237 only supports 2 SATA ports.

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### 2.3.3 Delete Disk Array

User can delete a specific RAID that has been created. Following are the steps to delete a created disk array.

1. Use arrow key to highlight **Delete Array** item in main menu interface, and press <Enter>. The channel column will be activated.
2. Use arrow key to highlight the target disk drive and press <Enter>. A warning message will appear. Press Y to delete a specific array or press N to cancel.



Delete a disk array will destroy all the data on the disk array except RAID 1. When a RAID 1 is deleted, the data on these two hard disk drives will be reserved and become two normal disks.

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### 2.3.4 Select Boot Array

User can select a disk array as boot device if user wants to boot operating system from an array. Boot disk array may not be selected if user does not boot the Operating System from the disk array. Use the arrow key to highlight the "Select Boot Disk" item then press <Enter>. The channel column will be activated. Just use arrow key to highlight the target disk array then press <Enter>. If user select a disk array that has a boot mark and press <Enter>, then its boot setting will be canceled.

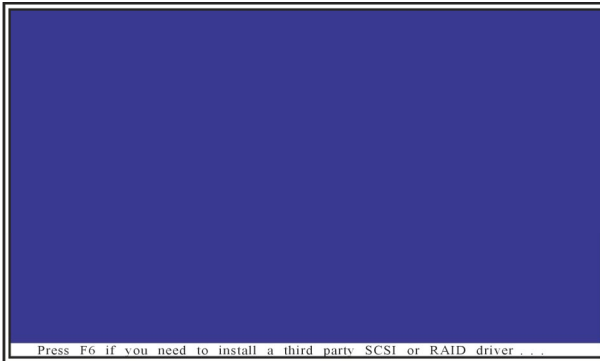
VIA Tech. VT8237 SATA RAID BIOS Ver 2.01

<ul style="list-style-type: none"><li>▶ Create Array</li><li>▶ Delete Array</li><li>▶ Create/Delete Spare</li><li>▶ Select Boot Array</li><li>▶ Serial Number View</li></ul>	Set/Clear bootable array				
	F1 : View Array/disk Status ↑,↓ : Move to next item Enter: Confirm the selection ESC : Exit				
Channel	Drive Name	Array Name	Mode	Size(GB)	Status
[*]Serial_Ch0 Master	IC35L040AVVA07-0	ARRAY 0	SATA	38.34	Boot
[*]Serial_Ch1 Master	IC35L040AVVA07-0	ARRAY 0	SATA	38.34	Boot

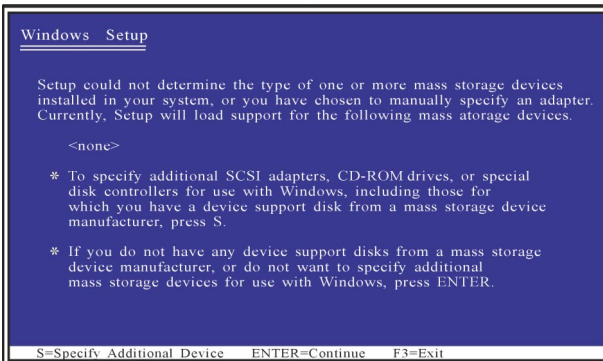
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### 3. *Installation of Windows 2000 / Windows XP*

For the installation of Windows 2000 or Windows XP, please insert Windows 2000 or Windows XP CD into the optical drive. Then remove the floppy diskette, and reboot the system. At the very beginning, you will see the message at the bottom of the screen, "Press F6 if you need to install a third party SCSI or RAID driver...."

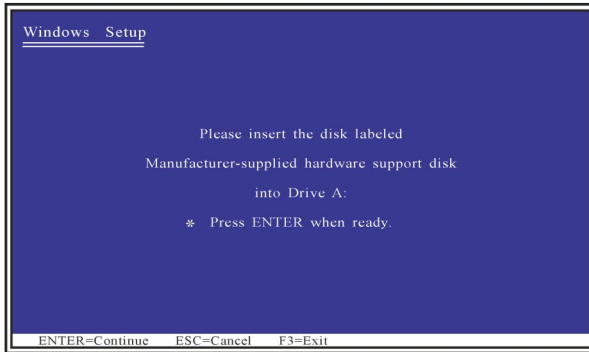


At this moment, please press <F6> key and the following information will appear.

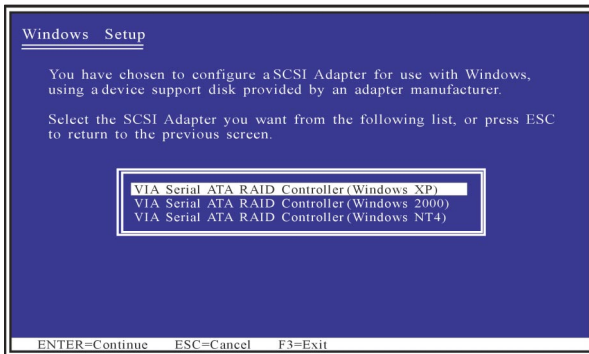


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Please press <S> key to install the SATA driver diskette that you previously made. You will see the instruction as followed.



After inserting the SATA HDD driver diskette and pressing <Enter> key, you will see the different versions of the SATA HDD drivers for you to install. Please use arrow keys to move the highlight bar to make your selection according to the OS you use.



When the installation of the SATA HDD drivers is complete, please continue to follow the instructions of Windows 2000 or Windows XP for the proper installation.