

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 ALi M5283 IDE controller chip 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 one end of the SATA data cable to the motherboard's primary SATA connector (SATA1).
- STEP 3: Connect the other end of the SATA data cable to the primary SATA hard disk.
- STEP 4: Connect one end of the second SATA data cable to the motherboard's secondary SATA connector (SATA2).
- STEP 5: Connect the other end of the SATA data cable to the secondary SATA hard disk.
- STEP 6: Connect the SATA power cable to the SATA hard disk.

1.2 Making An SATA Driver Diskette

If you want to install Windows 2000 or Windows XP on your system while you only have SATA HDDs on your system, 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 [YN]?", 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 [YN]?

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 “ALi RAID BIOS Setup Utility” to set RAID 0 / RAID 1 /
JBOD configuration before you install the OS.

2. Guide to RAID Configurations (RAID 0 / RAID 1 / JBOD)

2.1 Introduction of RAID

This motherboard adopts ALi M5283 IDE controller chip that supports 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.

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

JBOD (Just a Bunch of Drives) is also called data spanning. It will expand the capacity of your drive and results in a useable total capacity since it will make several hard disk types configured as a single hard disk, and the hard drives are simply hooked up in series. However, JBOD will not increase any performance or data security.

2.2 RAID Configurations Precautions

1. It is recommended to use two new drives if you are creating a RAID 0 (striping) array for performance.
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.

2.3 RAID 0 Configuration

This section will guide you to configure RAID 0. To set RAID 0 configuration, please follow the instruction below to use “ALi RAID BIOS Setup Utility” for the setting of RAID 0 configuration.

STEP 1: Boot-up your computer.

STEP 2: Press <Ctrl> and <A> simultaneously to enter the main menu of “ALi RAID BIOS Setup Utility”.

RAID BIOS Setup Utility (c) 2003 ALi Corporation www.ali.com.tw

Create RAID 0 Striping for Performance

Create RAID 1 Mirroring for Reliability

Create JBOD for integrated Capacity

Stripe Size **16K**

Delete RAID Setting & Partition

Delete All RAID Setting & Partition

Rebuild RAID Array

Select Boot Drive

SPACE : Select

↑↓ : Moving Cursor

ENTER : Select & Finish

ESC : Exit

	Drive	Model	Mode	Capacity	RAID Array/Type
B Channel 1 Master	:	XXXX	XXXX	XXXX	
Channel 2 Master	:	XXXX	XXXX	XXXX	

	Capacity	RAID Type	Stripe Size	RAID Name
RAID Array A	:			
RAID Array B	:			
RAID Array C	:			

STEP 3: Move the highlight bar to the item “Create RAID 0 Striping for Performance” and press <Enter> key to activate it. A flashing “S” cursor appears at the Drive Select Menu for you to choose the first drive for RAID 0.

RAID BIOS Setup Utility (c) 2003 ALi Corporation www.ali.com.tw

Create RAID 0 Striping for Performance

Create RAID 1 Mirroring for Reliability
Create JBOD for integrated Capacity
Stripe Size 16K
Delete RAID Setting & Partition
Delete All RAID Setting & Partition
Rebuild RAID Array
Select Boot Drive

SPACE : Select
↑↓ : Moving Cursor
ENTER : Select & Finish
ESC : Exit

Select Stripe Drives

	Drive	Model	Mode	Capacity	RAID Array/Type
S	B Channel 1 Master	: XXXX	XXXX	XXXX	
	Channel 2 Master	: XXXX	XXXX	XXXX	

	Capacity	RAID Type	Stripe Size	RAID Name
RAID Array A	:			
RAID Array B	:			
RAID Array C	:			

STEP 4: Use <Space> key to choose the desired drive for RAID 0. After you select the first drive for RAID 0, the “S” cursor will stop flashing and mark out the selected drive. Then it appears another flashing cursor, “s”, for you to choose the second drive for RAID 0.

RAID BIOS Setup Utility (c) 2003 ALi Corporation www.ali.com.tw

Create RAID 0 Striping for Performance

Create RAID 1 Mirroring for Reliability
Create JBOD for integrated Capacity
Stripe Size 16K
Delete RAID Setting & Partition
Delete All RAID Setting & Partition
Rebuild RAID Array
Select Boot Drive

SPACE : Select
↑↓ : Moving Cursor
ENTER : Select & Finish
ESC : Exit

Select Stripe Drives

	Drive	Model	Mode	Capacity	RAID Array/Type
S	B Channel 1 Master	: XXXX	XXXX	XXXX	
s	Channel 2 Master	: XXXX	XXXX	XXXX	

	Capacity	RAID Type	Stripe Size	RAID Name
RAID Array A	:			
RAID Array B	:			
RAID Array C	:			

STEP 5: After two drives are properly assigned, it will appear the following message, “Data on RAID Drives will be deleted (Y/N) ?”

RAID BIOS Setup Utility (c) 2003 ALi Corporation www.ali.com.tw

Create RAID 0 Striping for Performance
 Create RAID 1 Mirroring for Reliability
 Create JBOD for integrated Capacity
 Stripe Size 16K
 Delete RAID Setting & Partition
 Delete All RAID Setting & Partition
 Rebuild RAID Array
 Select Boot Drive

Data on RAID drives will be deleted (Y/N) ?

	Drive	Model	Mode	Capacity	RAID Array/Type
S B	Channel 1 Master	: XXXX	XXXX	XXXX	
s	Channel 2 Master	: XXXX	XXXX	XXXX	

	Capacity	RAID Type	Stripe Size	RAID Name
RAID Array A	:			
RAID Array B	:			
RAID Array C	:			

SPACE : Select
 ↑↓ : Moving Cursor
 ENTER : Select & Finish
 ESC : Exit

If you press <Y>, some necessary information will be written to the drives, and it will destroy the original data in the drives.

WARNING!!

Before you create RAID 0, please make sure the data in the selected drives is no longer in use.

STEP 6: After the RAID drives are created, it will appear the following message “Input RAID name (8 characters): ” for you to key in a name for the newly created array. The effective characters for an array name are <0>-<9>, <A>-<Z>, <a>-<z>, <Space> key, and underscore.

RAID BIOS Setup Utility (c) 2003 ALi Corporation www.ali.com.tw

Create RAID 0 Striping for Performance

Create RAID 1 Mirroring for Reliability
Create JBOD for integrated Capacity
Stripe Size **16K**
Delete RAID Setting & Partition
Delete All RAID Setting & Partition
Rebuild RAID Array
Select Boot Drive

Input RAID name (8 characters) : ALi_RAID

	Drive Model	Mode	Capacity	RAID Array/Type
S B Channel 1 Master	: XXXX	XXXX	XXXX	
s Channel 2 Master	: XXXX	XXXX	XXXX	

	Capacity	RAID Type	Stripe Size	RAID Name
RAID Array A	:			
RAID Array B	:			
RAID Array C	:			

SPACE : Select
↑↓ : Moving Cursor
ENTER : Select & Finish
ESC : Exit

STEP 7: After the RAID array has been successfully created, it will display the RAID array information at RAID Array List.

RAID BIOS Setup Utility (c) 2003 ALi Corporation www.ali.com.tw

Create RAID 0 Striping for Performance

Create RAID 1 Mirroring for Reliability
Create JBOD for integrated Capacity
Stripe Size **16K**
Delete RAID Setting & Partition
Delete All RAID Setting & Partition
Rebuild RAID Array
Select Boot Drive

Input RAID name (8 characters) : ALi_RAID

	Drive Model	Mode	Capacity	RAID Array/Type
B Channel 1 Master	: XXXX	XXXX	XXXX	
Channel 2 Master	: XXXX	XXXX	XXXX	

	Capacity	RAID Type	Stripe Size	RAID Name
RAID Array A	: XXXX	0	16 K	ALi_RAID
RAID Array B	:			
RAID Array C	:			

SPACE : Select
↑↓ : Moving Cursor
ENTER : Select & Finish
ESC : Exit

2.4 RAID 1 Configuration

This section will guide you to configure RAID 1. To set RAID 1 configuration, please follow the instruction below to use “ALi RAID BIOS Setup Utility” for the setting of RAID 1 configuration.

STEP 1: Boot-up your computer.

STEP 2: Press <Ctrl> and <A> simultaneously to enter the main menu of “ALi RAID BIOS Setup Utility”.

RAID BIOS Setup Utility (c) 2003 ALi Corporation www.ali.com.tw

Create RAID 0 Striping for Performance

Create RAID 1 Mirroring for Reliability

Create JBOD for integrated Capacity

Stripe Size 16K

Delete RAID Setting & Partition

Delete All RAID Setting & Partition

Rebuild RAID Array

Select Boot Drive

SPACE : Select

↑↓ : Moving Cursor

ENTER : Select & Finish

ESC : Exit

	Drive	Model	Mode	Capacity	RAID Array/Type
B	Channel 1	Master	: XXXX	XXXX	XXXX
	Channel 2	Master	: XXXX	XXXX	XXXX

	Capacity	RAID Type	Stripe Size	RAID Name
RAID Array A	:			
RAID Array B	:			
RAID Array C	:			

STEP 3: Move the highlight bar to the item “Create RAID 1 Mirroring for Reliability” and press <Enter> key to activate it. A flashing “M” cursor appears at the Drive Select Menu for you to choose the first (source) drive for RAID 1.

RAID BIOS Setup Utility (c) 2003 ALi Corporation www.ali.com.tw

Create RAID 0 Striping for Performance
Create RAID 1 Mirroring for Reliability
 Create JBOD for integrated Capacity
 Stripe Size 16K
 Delete RAID Setting & Partition
 Delete All RAID Setting & Partition
 Rebuild RAID Array
 Select Boot Drive

SPACE : Select
 ↑↓ : Moving Cursor
 ENTER : Select & Finish
 ESC : Exit

Select Mirror Drives

	Drive	Model	Mode	Capacity	RAID Array/Type
M	B Channel 1 Master	: XXXX	XXXX	XXXX	
	Channel 2 Master	: XXXX	XXXX	XXXX	

Capacity RAID Type Stripe Size RAID Name

RAID Array A :
 RAID Array B :
 RAID Array C :

STEP 4: Use <Space> key to choose the desired drive for RAID 1. After you select the first drive for RAID 1, the “M” cursor will stop flashing and mark out the selected drive. Then it appears another flashing cursor, “m”, for you to choose the second (target) drive for RAID 1.

RAID BIOS Setup Utility (c) 2003 ALi Corporation www.ali.com.tw

Create RAID 0 Striping for Performance
Create RAID 1 Mirroring for Reliability
 Create JBOD for integrated Capacity
 Stripe Size 16K
 Delete RAID Setting & Partition
 Delete All RAID Setting & Partition
 Rebuild RAID Array
 Select Boot Drive

SPACE : Select
 ↑↓ : Moving Cursor
 ENTER : Select & Finish
 ESC : Exit

Select Mirror Drives

	Drive	Model	Mode	Capacity	RAID Array/Type
M	B Channel 1 Master	: XXXX	XXXX	XXXX	
m	Channel 2 Master	: XXXX	XXXX	XXXX	

Capacity RAID Type Stripe Size RAID Name

RAID Array A :
 RAID Array B :
 RAID Array C :

STEP 5: After two drives are properly assigned, it will appear the following message, "Create RAID 1 (Y/N) ?"

RAID BIOS Setup Utility (c) 2003 ALi Corporation www.ali.com.tw

Create RAID 0 Striping for Performance
Create RAID 1 Mirroring for Reliability
 Create JBOD for integrated Capacity
 Stripe Size 16K
 Delete RAID Setting & Partition
 Delete All RAID Setting & Partition
 Rebuild RAID Array
 Select Boot Drive

SPACE : Select
 ↑↓ : Moving Cursor
 ENTER : Select & Finish
 ESC : Exit

Create RAID 1 (Y/N) ?

	Drive	Model	Mode	Capacity	RAID Array/Type
M B	Channel 1 Master	: XXXX	XXXX	XXXX	
m	Channel 2 Master	: XXXX	XXXX	XXXX	

	Capacity	RAID Type	Stripe Size	RAID Name
RAID Array A	:			
RAID Array B	:			
RAID Array C	:			

If you press <Y>, some necessary information will be written to the drives, and it will destroy the original data in the drives.

WARNING!!

It is recommended to use new drives to create RAID 1. If the existing drive is to be used, backup all the necessary data before you create RAID 1.

STEP 6: After the RAID drives are created, it will appear the following message "Input RAID name (8 characters): " for you to key in a name for the newly created array. The effective characters for an array name are <0>-<9>, <A>-<Z>, <a>-<z>, <Space> key, and underscore.

RAID BIOS Setup Utility (c) 2003 ALi Corporation www.ali.com.tw

Create RAID 0 Striping for Performance
Create RAID 1 Mirroring for Reliability
 Create JBOD for integrated Capacity

Stripe Size **16K**

Delete RAID Setting & Partition
 Delete All RAID Setting & Partition
 Rebuild RAID Array
 Select Boot Drive

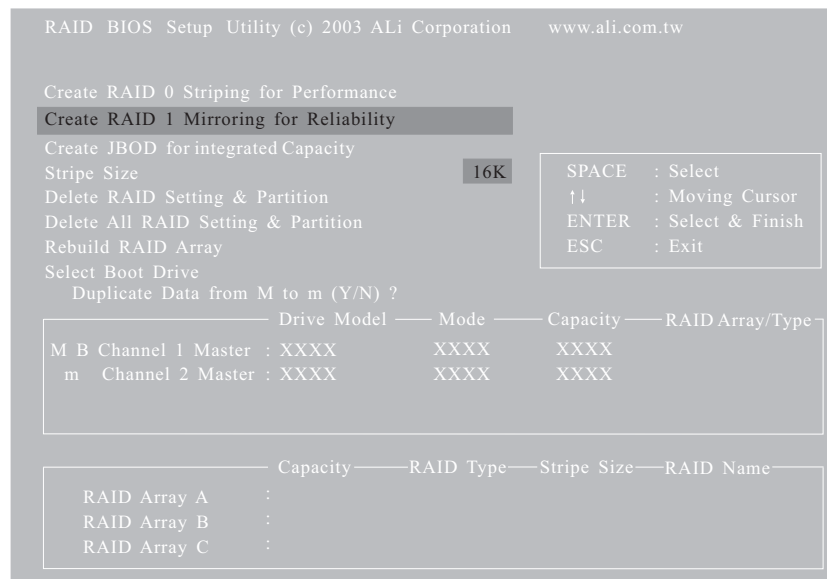
Input RAID name (8 characters) : ALi_RAID

	Drive Model	Mode	Capacity	RAID Array/Type
M B Channel 1 Master	: XXXX	XXXX	XXXX	
m Channel 2 Master	: XXXX	XXXX	XXXX	

	Capacity	RAID Type	Stripe Size	RAID Name
RAID Array A	:			
RAID Array B	:			
RAID Array C	:			

SPACE : Select
 ↑↓ : Moving Cursor
 ENTER : Select & Finish
 ESC : Exit

STEP 7: Then you will see the following message: “Duplicate Data from M to m (Y/N) ?” that asks to do drive copy. The source drive is indicated by “M”, while the target drive is indicated by “m” in Drive Select Menu. Pressing <Y> will duplicate the data in source drive to the target drive. Make sure the source drive is the correct one. If you press <N>, it will create mirror only, and the data is inconsistent in two drives.



The process status bar will show up during the duplication process.

WARNING!!

Before you duplicate RAID 1 Array, please make sure the data in the target drive is no longer in use.

STEP 8: After the RAID array has been successfully created, it will display the RAID array information at RAID Array List.

RAID BIOS Setup Utility (c) 2003 ALi Corporation www.ali.com.tw

Create RAID 0 Striping for Performance
Create RAID 1 Mirroring for Reliability
 Create JBOD for integrated Capacity
 Stripe Size **16K**
 Delete RAID Setting & Partition
 Delete All RAID Setting & Partition
 Rebuild RAID Array
 Select Boot Drive

SPACE	: Select
↑↓	: Moving Cursor
ENTER	: Select & Finish
ESC	: Exit

	Drive	Model	Mode	Capacity	RAID Array/Type
B Channel 1 Master	:	XXXX	XXXX	XXXX	
Channel 2 Master	:	XXXX	XXXX	XXXX	

	Capacity	RAID Type	Stripe Size	RAID Name
RAID Array A	: XXXX	1		ALi_RAID
RAID Array B	:			
RAID Array C	:			

2.5 JBOD Configuration

This section will guide you to configure JBOD. To set JBOD configuration, please follow the instruction below to use “ALi RAID BIOS Setup Utility” for the setting of JBOD configuration.

STEP 1: Boot-up your computer.

STEP 2: Press <Ctrl> and <A> simultaneously to enter the main menu of “ALi RAID BIOS Setup Utility”.

RAID BIOS Setup Utility (c) 2003 ALi Corporation www.ali.com.tw

Create RAID 0 Striping for Performance

Create RAID 1 Mirroring for Reliability

Create JBOD for integrated Capacity

Stripe Size 16K

Delete RAID Setting & Partition

Delete All RAID Setting & Partition

Rebuild RAID Array

Select Boot Drive

SPACE : Select

↑↓ : Moving Cursor

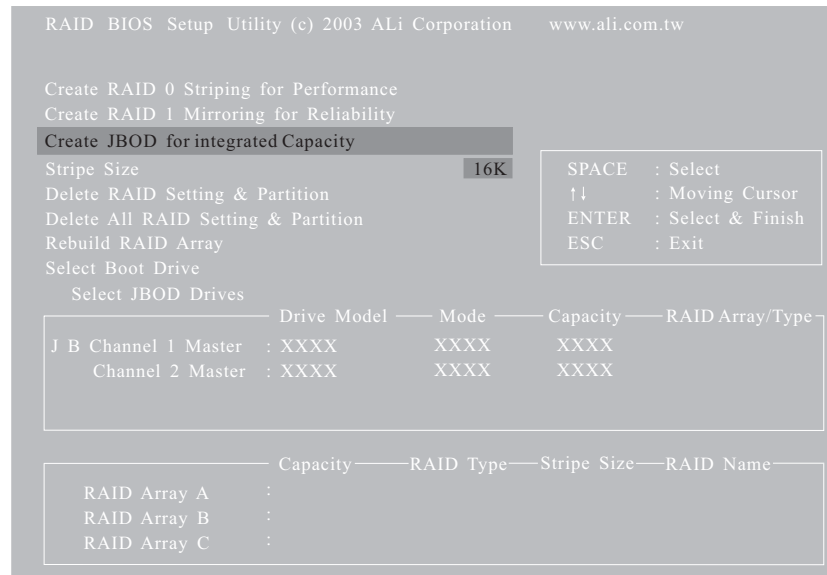
ENTER : Select & Finish

ESC : Exit

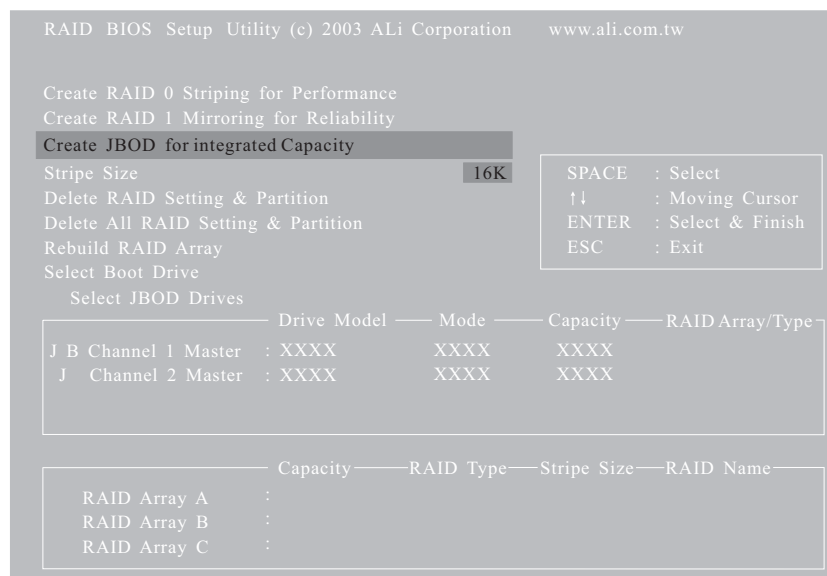
	Drive	Model	Mode	Capacity	RAID Array/Type
B Channel 1 Master	:	XXXX	XXXX	XXXX	
Channel 2 Master	:	XXXX	XXXX	XXXX	

	Capacity	RAID Type	Stripe Size	RAID Name
RAID Array A	:			
RAID Array B	:			
RAID Array C	:			

STEP 3: Move the highlight bar to the item “Create JBOD for integrated Capacity” and press <Enter> key to activate it. A flashing “J” cursor appears at the Drive Select Menu for you to choose the first drive for JBOD.



STEP 4: Use <Space> key to choose the desired drive for JBOD array. After you select the first drive for JBOD, the “J” cursor will stop flashing and mark out the selected drive. Then it appears another flashing cursor, “J”, for you to choose the second drive for JBOD.



STEP 5: After two drives are properly assigned, it will appear the following message, “Data on RAID Drives will be deleted (Y/N) ?”

RAID BIOS Setup Utility (c) 2003 ALi Corporation www.ali.com.tw

Create RAID 0 Striping for Performance
Create RAID 1 Mirroring for Reliability
Create JBOD for integrated Capacity

Stripe Size **16K**

Delete RAID Setting & Partition
Delete All RAID Setting & Partition
Rebuild RAID Array
Select Boot Drive

SPACE : Select
↑↓ : Moving Cursor
ENTER : Select & Finish
ESC : Exit

Data on RAID drives will be deleted (Y/N) ?

	Drive Model	Mode	Capacity	RAID Array/Type
J B Channel 1 Master	: XXXX	XXXX	XXXX	
J Channel 2 Master	: XXXX	XXXX	XXXX	

	Capacity	RAID Type	Stripe Size	RAID Name
RAID Array A	:			
RAID Array B	:			
RAID Array C	:			

If you press <Y>, some necessary information will be written to the drives, and it will destroy the original data in the drives.

WARNING!!

Before you create JBOD, please make sure the data in the selected drives is no longer in use.

STEP 6: After the RAID drives are created, it will appear the following message “Input RAID name (8 characters): ” for you to key in a name for the newly created array. The effective characters for an array name are <0>-<9>, <A>-<Z>, <a>-<z>, <Space> key, and underscore.

```

RAID BIOS Setup Utility (c) 2003 ALi Corporation    www.ali.com.tw

Create RAID 0 Striping for Performance
Create RAID 1 Mirroring for Reliability
Create JBOD for integrated Capacity
Stripe Size                                     16K
Delete RAID Setting & Partition
Delete All RAID Setting & Partition
Rebuild RAID Array
Select Boot Drive
Input RAID name (8 characters) : ALi_RAID

Drive Model  Mode  Capacity  RAID Array/Type
J B Channel 1 Master : XXXX      XXXX      XXXX
J  Channel 2 Master : XXXX      XXXX      XXXX

Capacity  RAID Type  Stripe Size  RAID Name
RAID Array A :
RAID Array B :
RAID Array C :
  
```

STEP 7: After the RAID array has been successfully created, it will display the RAID array information at RAID Array List.

```

RAID BIOS Setup Utility (c) 2003 ALi Corporation    www.ali.com.tw

Create RAID 0 Striping for Performance
Create RAID 1 Mirroring for Reliability
Create JBOD for integrated Capacity
Stripe Size                                     16K
Delete RAID Setting & Partition
Delete All RAID Setting & Partition
Rebuild RAID Array
Select Boot Drive

Drive Model  Mode  Capacity  RAID Array/Type
B Channel 1 Master : XXXX      XXXX      XXXX
  Channel 2 Master : XXXX      XXXX      XXXX

Capacity  RAID Type  Stripe Size  RAID Name
RAID Array A : XXXX      JBOD      16K      ALi_RAID
RAID Array B :
RAID Array C :
  
```

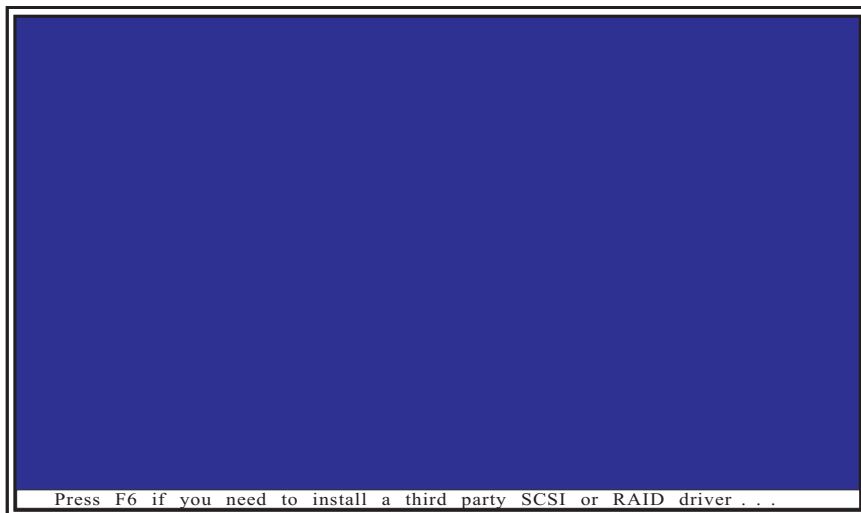
3. Installation of Windows 2000 / Windows XP

If you want to install Windows 2000 or Windows XP on your system while you only have SATA HDDs on your system, you will need to make an SATA driver diskette (see page 2 to page 3 for details) before you start the OS installation. If you prefer not to use RAID function, you may start to install Windows 2000 / Windows XP once you have the SATA driver diskette ready. If you want to use RAID function, you need to set the RAID configuration (see page 4 to page 19) before you install Windows 2000 / Windows XP.

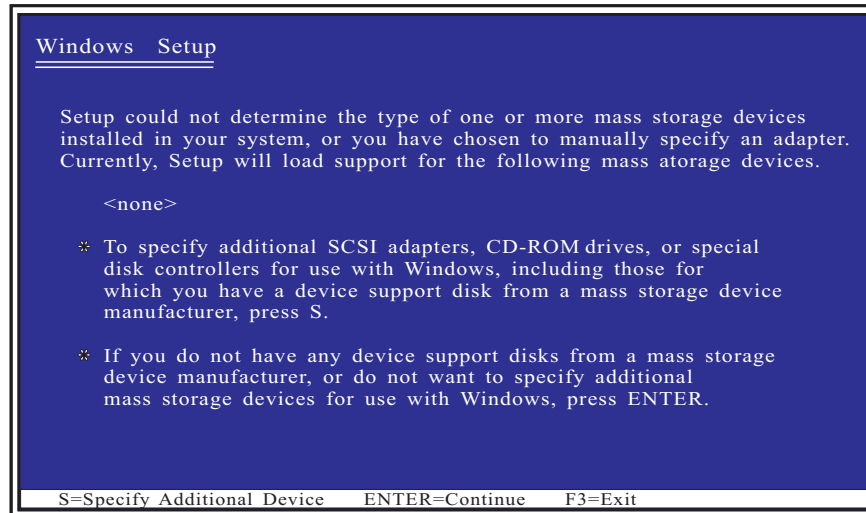
For the installation of the SATA drivers while installing Windows 2000 or Windows XP, please follow the instruction below.

STEP 1: Insert Windows 2000 or Windows XP CD into the optical drive.

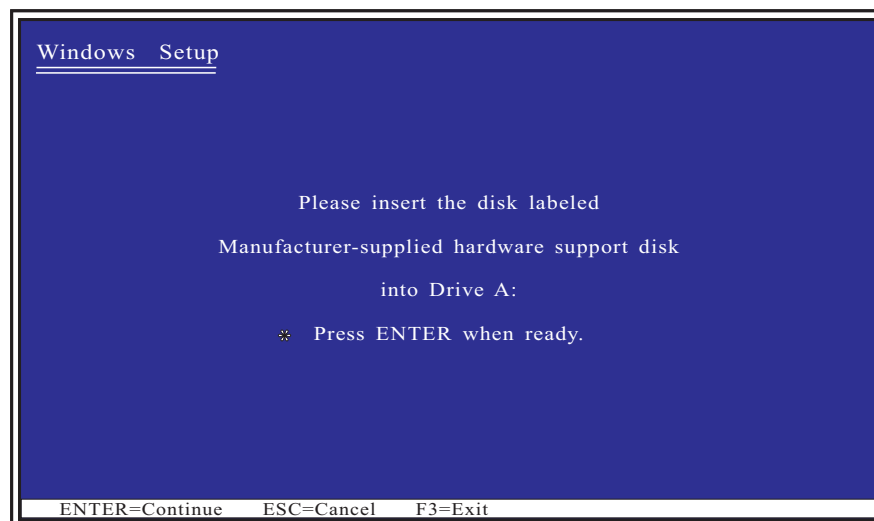
STEP 2: Remove the floppy diskette, and reboot the system. When you start the installation, press <F6> once you see the message at the bottom of the screen, "Press F6 if you need to install a third party SCSI or RAID driver".



STEP 3: When the Windows 2000 / Windows XP Setup window is generated, press <S> key to specify an Additional Device(s).



STEP 4: Insert the SATA driver into drive A: and press <Enter>.



STEP 5: Choose one of the following items:

“M5283 SATA RAID Controller (WinNT 4.0)”

“M5283 SATA RAID Controller (Win2000)”

“M5283 SATA RAID Controller (Windows XP)”

and press <Enter> key.



STEP 6: Please wait until the Setup finishes loading driver files. After setup recognizes the driver for M5283 and shows the following prompt, you may press <Enter> to continue with the OS installation. You may press <S> if you need to specify any additional devices to be installed, or pressing <F3> to exit the OS installation.

