



# SCSI BIOS Configuration Utility

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## Introduction

The SDMS™ SCSI BIOS is bootable ROM code that manages SCSI hardware resources. It is specific to a family of LSI Logic SCSI controllers or processors. The SCSI BIOS integrates with a standard system BIOS, extending the standard disk service routine provided through INT13h.

During the boot time initialization, the SCSI BIOS determines if there are other hard disks, such as an IDE drive, already installed by using the system BIOS. If there are, the SCSI BIOS maps any SCSI drives it finds behind the drive(s) already installed. Otherwise, the SCSI BIOS installs drives starting with the system boot drive. In this case, the system boots from a drive controlled by the SCSI BIOS. For 4.05 versions and higher, LSI Logic supports the BIOS Boot Specification (BBS). Refer to "Boot Initialization with BIOS Boot Specification," which discusses selecting boot and drive order.

Note: To update the BIOS, follow the instructions in the [SDMS Host Adapter Flash Utility](#) file.

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## Features

The SDMS SCSI BIOS supports these features:

- Configuration for up to 256 adapters-any 4 can be chosen for INT13 (boot ROM) support
- All LSI53C8XX devices including LSI53C895A
- LSI53C1010 device
- SPI-3 Parallel Protocol Request (PPR)
- Domain Validation

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## Boot Initialization with BIOS Boot Specification

The SCSI BIOS provides support for the BIOS Boot Specification (BBS), which allows you to choose which device to boot from by selecting the priority.

To use this feature, the system BIOS must also be compatible with the BBS. If your system supports the BBS, then you will use the system BIOS Setup Menu to select the boot and drive order. In the system BIOS setup, the Boot Connection Devices Menu appears with a list of available boot options. Use that menu to select the device and rearrange the order. Then exit to continue the boot process.

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## CD-ROM Boot Initialization

The SCSI BIOS supports boot initialization from a CD-ROM drive. There are five types of emulation:

- No emulation disk
- Floppy 1.2 Mbyte emulation disk
- Floppy 1.44 Mbyte emulation disk
- Floppy 2.88 Mbyte emulation disk
- Hard disk emulation

The drive letter for the CD-ROM is assigned based on the type of emulation. For example, if a 1.44 Mbyte floppy emulation CD-ROM were loaded, then the CD-ROM drive would become the designated A: drive, and the existing diskette drive would become drive B:.

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## Using the SCSI BIOS Configuration Utility

This section provides the menu formats and user inputs available to inform all users about this utility prior to running it. All SCSI BIOS Configuration Utility screens that display the various menus are partitioned into fixed areas. Here is an example:

<b>Header Area</b>
<b>Menu Area</b>
<b>Main Area</b>
<b>Footer Area</b>

The descriptions of each area are provided below.

### Header Area

This area provides static information text, which is typically the product title and version.

## Menu Area

This area provides the current Main Area's Menu, if any. This area has a cursor for menu item selection.

## Main Area

This area provides the data being presented. It has a cursor for item selection, horizontal scrolling, and vertical scrolling. The horizontal and vertical scroll bars appear here.

## Footer Area

This area provides static general help text information. The user accesses specific information using the options available in the footer area as described below.

## User Inputs

Throughout the graphical user interface provided with this configuration utility, all selections that are not permissible are grayed out. The function keys that can be used are: F1 and F2.

F1 = Help

Use this function key to obtain context-sensitive help for the cursor-resident area.

F2 = Menu

Use this function key to set cursor context to the menu selection area, select a menu item, and press **Enter**.

Use arrow keys (up, down, left, right) to position the cursor and select an item.

Use the Home/End keys to select an item.

Use the numeric keypad "+" or "-" keys to change an item. Items with values in brackets ( [ ] ) are modifiable to its next relative value.

Press **Esc** to abort or exit from this utility. **Esc** aborts the current context operation and/or exits from the current menu. User confirmation is solicited as required.

Press **Enter** to execute an item's associated function. Items shown between "< >" are executable.

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## Starting the SCSI BIOS Configuration Utility

- [Main Menu](#)
- [Boot Adapter List](#)
- [Global Properties](#)
- [Adapter Properties](#)
- [Device Properties](#)

If you have SCSI BIOS version 4.XX, and it includes the SCSI BIOS Configuration Utility, you can change the default configuration of your SCSI host adapters. You may decide to

alter these default values if there is a conflict between device settings or if you need to optimize system performance.

You can see the version number of your SCSI BIOS in a banner displayed on your computer monitor during boot. If the utility is available, the following message also appears on your monitor:

*Press Ctrl-C to start SCSI BIOS Configuration Utility...*

This message remains on your screen for about five seconds, giving you time to start the utility. If you decide to press `Ctrl-C`, the message changes to:

*Please wait, invoking SCSI BIOS Configuration Utility...*

After a brief pause, your computer monitor displays the Main Menu of the SCSI BIOS Configuration Utility.

To make changes with this menu-driven utility, one or more LSI Logic SCSI host adapters must have NonVolatile Random Access Memory (NVRAM) to store the changes.

The following messages may appear during the boot process:

1. *Adapter removed from boot order, parameters will be updated accordingly!* appears when an adapter is removed from the system or relocated behind a PCI bridge.
2. *Configuration data invalid, saving default configuration* appears if the information that is stored in NVRAM is not valid.
3. *Found SCSI Controller not in following Boot Order List, to add: Press Ctrl-C to start SCSI BIOS Configuration Utility...* appears when less than four adapters are in the boot order and more adapters exist than are shown.

**IMPORTANT:** The SCSI BIOS Configuration Utility is a powerful tool. If, while using it, you somehow disable all of your controllers, pressing `Ctrl-A` (or `Ctrl-E` on version 4.04 or later) after memory initialization during reboot allows you to re-enable and reconfigure. Also, if the system locks up due to NonVolatile Storage (NVS), press `Ctrl-N` to bypass the BIOS in order to reflash the host adapter card.

**Note:** The BIOS *cannot* control all the devices detected by this configuration utility. Devices such as tape drives and scanners require that a device driver specific to that peripheral be loaded.

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## Main Menu

When the LSI Logic SCSI BIOS Configuration Utility is invoked, the Main Menu appears. This menu displays a scrolling list of up to 256 LSI Logic PCI to SCSI host adapters in the system and information about each of them.

To select an adapter, use only the arrow keys. To view and modify the selected adapter's properties and gain access to the attached devices, press **Enter**.

Only adapters with **LSI Logic Control** enabled can be accessed. Adapters without NonVolatile Memory (NVM) will show default settings and cannot be changed. When you

select an adapter and press **Enter**, the adapter's SCSI bus is scanned and the Adapter Properties Menu (which is described later) appears. Here is an example of the Main Menu.

```

LSI Logic SDMS (TM) PCI SCSI Configuration Utility                                Version  PCI-4.XX.00
<Boot Adapter List>  <Global Properties>

LSI Logic Host Bus Adapters

   Adapter      PCI Bus  Dev/ Func  Port      IRQ      NVM      Boot Order  LSI Logic
                        Number
<53C896        0        98>      FC00      9        Yes       2          Enabled
<53C896        0        88>      F800     10        Yes       1          Enabled
<53C1010       0        90>      F400     11        Yes       3          Disabled

F1 = Help          ↑↓←→ = Select Item      -/+ = Change [Item]
Esc = Abort/Exit  Home/End = Select Item  Enter = Execute <Item>
  
```

The next table lists the fields and their descriptions:

FIELDS	DESCRIPTIONS																	
Adapter	Indicates the specific family of LSI Logic Host Adapters.																	
PCI Bus	Indicates the PCI Bus number (range 0x00 - 0xFF, 0 - 255 decimal) assigned by the system BIOS to an adapter.																	
Dev/Func	Indicates the PCI Device/Function assigned by the system BIOS to an adapter.																	
	An 8-bit value is mapped as follows:																	
	<table border="1"> <tr> <td>Bit #</td> <td>7</td> <td>6</td> <td>5</td> <td>4</td> <td>3</td> <td>2</td> <td>1</td> <td>0</td> </tr> <tr> <td></td> <td colspan="5">Bits 7-3: Device (range 0x00 - 0x1F, 0-31 decimal)</td> <td colspan="3">Bits 2-0: Function (range 0-7)</td> </tr> </table>	Bit #	7	6	5	4	3	2	1	0		Bits 7-3: Device (range 0x00 - 0x1F, 0-31 decimal)					Bits 2-0: Function (range 0-7)	
Bit #	7	6	5	4	3	2	1	0										
	Bits 7-3: Device (range 0x00 - 0x1F, 0-31 decimal)					Bits 2-0: Function (range 0-7)												
Port Number	Indicates the I/O Port Number that communicates with an adapter, which is assigned by the system BIOS.																	
IRQ	Indicates the Interrupt Request Line used by an adapter, which is assigned by the system BIOS.																	
NVM	Indicates whether an adapter has NVM associated with it. An adapter's configuration is stored in its associated NVM. NVM can refer to NVRAM that is resident on a host adapter or to system NVS.																	
Boot Order	Indicates the relative boot order (0-3) of an adapter. The SCSI BIOS traverses up to four adapters in the specified order in search of bootable media. To modify this field, access the Boot Adapter List Menu.																	
LSI Logic Control	Indicates whether an adapter is eligible for LSI Logic software control or is reserved for control by non-LSI Logic software.																	

Below the header area, the **Boot Adapter List** and **Global Properties** options are available for you to configure their host adapters. The **Boot Adapter List** option allows selection and ordering of boot adapters. The **Global Properties** option allows changes to global scope settings. See the sections on [Boot Adapter List](#) and [Global Properties](#) below for more detailed information.

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## Boot Adapter List

The **Boot Adapter List** option shows the adapter boot order. It specifies the sequence in which adapters will boot when more than one LSI Logic adapter is in a system. Up to four of the total adapters in a system may be selected as bootable. The cursor must be on the adapter select list to add or remove an adapter.

To add an adapter to the boot list, press **Insert** while on the Boot Adapter List. Use the arrow keys to select the desired adapter and press **Enter** to add it to the end of the Boot Adapter List.

To remove an adapter from the boot list, press **Delete** while on the desired adapter in the Boot Adapter List. Here is an example of the Boot Adapter List Menu:

### LSI Logic SDMS (TM) PCI SCSI Configuration Utility

Version PCI-4.XX.00

#### Boot Adapter List

Insert = Add an adapter

Delete = Remove an adapter

Adapter	PCI Bus	Dev/ Func	Boot Order	Current Status	Next Boot
<53C896	0	88>	[0]	On	[On]
<53C896	0	90>	[1]	On	[On]
<53C1010	0	98>	[2]	Off	[Off]

F1 = Help

↑↓←→ = Select Item

-/+ = Change [Item]

Esc = Abort/Exit

Home/End = Select Item

Enter = Execute <Item>

The next table lists the fields and their descriptions:

FIELDS	DESCRIPTIONS																	
Adapter	Indicates the specific family of LSI Logic Host Adapters.																	
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Bit #	7	6	5	4	3	2	1	0										
	Bits 7-3: Device (range 0x00 - 0x1F, 0-31 decimal)					Bits 2-0: Function (range 0-7)												
Boot Order	Indicates the relative boot order (0-3) of an adapter. Use the numeric keypad - or + keys to change an item.  - key: decreases an adapter's relative boot order.  + key: increases an adapter's relative boot order.																	
Current Status	Indicates whether an adapter in the boot list was enabled during the most recent boot. Disabled adapters and their attached devices are ignored by the SCSI BIOS, although they are still visible to the configuration utility.																	

Next Boot	Indicates whether to enable an adapter upon the next boot. The SCSI BIOS ignores disabled adapters and their attached devices although they are still visible to the configuration utility.
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## Global Properties

The **Global Properties** option allows you to pause if an alert message has been displayed, to set Display and Video modes, negotiate with devices, and support interrupts. Here is an example of the Global Properties Menu:

**LSI Logic SDMS (TM) PCI SCSI Configuration Utility** **Version PCI-4.XX.00**

Global Properties

```

Pause When Boot Alert Displayed      [Yes]
Boot Information Display Mode         [Verbose]
Negotiate with devices                [Supported]
Video Mode                            [Color]
Support Interrupt                     [Hook interrupt, the Default]

```

<Restore Defaults>

F1 = Help	↑↓←→ = Select Item	-/+ = Change [Item]
Esc = Abort/Exit	Home/End = Select Item	Enter = Execute <Item>

The next table lists the fields and their descriptions:

FIELDS	DESCRIPTIONS
Pause When Boot Alert Displayed	Indicates whether to pause for user acknowledgement after displaying an alert message during boot. The Boot Alert setting can be either <i>No</i> or <i>Yes</i> .  To continue after displaying a message, specify <i>No</i> . To wait for any key after displaying a message, specify <i>Yes</i> .
Boot Information Display Mode	Specifies the information display mode of the BIOS during boot. It controls how much information about adapters and devices are displayed during boot. The display mode setting can be either <i>terse</i> or <i>verbose</i> .  To display minimum information, specify <i>terse</i> mode. To display detailed information, specify <i>verbose</i> mode.
Negotiate with devices	This option sets the default value for synchronous and wide negotiations with specified devices. Options are: <i>All</i> , <i>None</i> , or <i>Supported</i> .
Video Mode	Specifies the default video mode for the SCSI BIOS Configuration Utility. The video mode setting can be either <i>color</i> or <i>monochrome</i> . The monochrome setting enhances readability on a monochrome monitor.
Support Interrupt	Specifies Interrupt 40 (usually required) can be disallowed.

<Restore Defaults>	Press <i>Enter</i> to obtain default settings.
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## Adapter Properties

The **Adapter Properties** option allows you to view and modify adapter settings. It also provides access to an adapter's device settings. Here is an example of the Adapter Properties Menu:

<b>LSI Logic SDMS (TM) PCI SCSI Configuration Utility</b>		<b>Version PCI-4.XX.00</b>
Adapter	PCI DEV/ Bus FUNC	
53C1010	0 A0	
<Device Properties>		
	SCSI Parity	[Yes]
	Host SCSI ID	[7]
	SCSI Bus Scan Order	[Low to High (0..Max)]
	Removable Media Support	[None]
	CHS Mapping	[SCSI Plug and Play Mapping]
	Spinup Delay (Secs)	[2]
	Secondary Cluster Server	[No]
	Termination Control	[Auto]
<Restore Defaults>		

F1 = Help	↑↓←→ = Select Item	-/+ = Change [Item]
Esc = Abort/Exit	Home/End = Select Item	Enter = Execute <Item>

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The next table lists the fields and their descriptions:

FIELDS	DESCRIPTIONS
<Device Properties>	Select this item and press <i>Enter</i> to view and modify device properties.
SCSI Parity	Indicates whether SCSI Parity is enabled for an adapter. When disabled, it is also necessary to disable disconnects for all devices, as parity checking for the reselection phase is not disabled. If a non-parity generating device disconnects, its operation will never complete because the reselection fails due to parity error.
Host SCSI ID	Indicates the SCSI identifier of an adapter [0-7] or [0-15]. It is recommended that this field be set to the highest priority SCSI identifier, which is 7.
SCSI Bus Scan Order	Indicates the order in which to scan SCSI identifiers on an adapter. Changing this item will affect drive letter assignment(s) if more than one device is attached to an adapter.

Removable Media Support	<p>Specifies the removable media support option for an adapter. Three settings are allowed: <i>None</i>, <i>Boot Drive Only</i>, and <i>With Media Installed</i>.</p> <p><i>None</i> indicates no removable media support.</p> <p><i>Boot Drive Only</i> provides removable media support for a removable hard drive if it is first in the scan order.</p> <p><i>With Media Installed</i> provides removable media support regardless of the drive ordering.</p>
CHS Mapping	<p>Defines how the Cylinder Head Sector (CHS) values are mapped onto a disk without pre-existing partition information. Two settings are allowed: <i>SCSI Plug and Play Mapping</i> and <i>Alternate CHS Mapping</i>.</p> <p><i>SCSI Plug and Play Mapping</i> automatically determines the most efficient and compatible mapping.</p> <p><i>Alternate CHS Mapping</i> utilizes an alternate, possibly less efficient mapping that may be required if a device is moved between adapters from different vendors.</p> <p><b>Caution:</b> Neither of these options has any effect after a disk has been partitioned using the <code>FDISK</code> command. To change the CHS Mapping on a partitioned disk, use <code>FDISK</code> to delete all partitions. Then reboot the system to clear memory or the old partitioning data will be reused, thus nullifying the previous operation. Use care to ensure that the correct disk is the target of an <code>FDISK</code> command.</p>
Spinup Delay (Secs)	<p>Indicates the number of seconds to wait between spinups of devices attached to an adapter. Staggered spinups will balance the total electrical current load on the system during boot. The default value is 2 seconds with choices between 1 and 10 seconds.</p>
Secondary Cluster Server	<p>Indicates whether an adapter has one or more devices attached that are shared with one or more other adapters and therefore, the SCSI BIOS should avoid SCSI bus resets as much as possible.</p> <p>This option allows you to enable an adapter to join a cluster of adapters without doing any SCSI bus resets. This is a requirement for Microsoft Cluster Server. The default value is <i>No</i> with an alternate option of <i>Yes</i>.</p>
Termination Control	<p>Indicates whether an adapter has automatic termination control, and if so, its current status. Two settings are allowed: <i>Auto</i> and <i>Off</i>.</p> <p><i>Auto</i> means that the adapter can automatically determine whether it should enable or disable its termination.</p> <p><i>Off</i> means termination on the adapter is off and the devices at the ends of the SCSI bus must terminate the bus.</p>
<Restore Defaults>	<p>Press <i>Enter</i> to obtain default settings.</p>

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## Device Properties

The **Device Properties** option allows you to view and update individual device settings for an adapter. Changing a setting for the host device (for example, SCSI ID 7) changes the setting for all devices. When accessing this menu online, use the scroll indicator to display all fields that are contained in this menu. The example for the Device Properties Menu is

broken down into two tables.

**LSI Logic SDMS (TM) PCI SCSI Configuration Utility**

**Version PCI-4.XX.00**

Device Properties

SCSI ID	Device Identifier	MB/sec	MT/sec	Data Width	Scan ID	Scan LUNs > 0	Disconnect
0	-	[80]	[40]	[16]	[Yes]	[Yes]	[On]
1	-	[80]	[40]	[16]	[Yes]	[Yes]	[On]
2	NEC CD-ROM Drive	[80]	[40]	[16]	[Yes]	[Yes]	[On]
3	Seagate ST31055N	[80]	[40]	[16]	[Yes]	[Yes]	[On]
4	-	[80]	[40]	[16]	[Yes]	[Yes]	[On]
5	-	[80]	[40]	[16]	[Yes]	[Yes]	[On]
6	-	[80]	[40]	[16]	[Yes]	[Yes]	[On]
7	53C1010	[80]	[40]	[16]	[Yes]	[Yes]	[On]
8	-	[80]	[40]	[16]	[Yes]	[Yes]	[On]
9	-	[80]	[40]	[16]	[Yes]	[Yes]	[On]
10	-	[80]	[40]	[16]	[Yes]	[Yes]	[On]
11	-	[80]	[40]	[16]	[Yes]	[Yes]	[On]
12	-	[80]	[40]	[16]	[Yes]	[Yes]	[On]
13	-	[80]	[40]	[16]	[Yes]	[Yes]	[On]
14	-	[80]	[40]	[16]	[Yes]	[Yes]	[On]
15	-	[80]	[40]	[16]	[Yes]	[Yes]	[On]

<< Scroll Indicator >>

F1 = Help	↑↓←→ = Select Item	-/+ = Change [Item]
Esc = Abort/Exit	Home/End = Select Item	Enter = Execute <Item>

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**LSI Logic SDMS (TM) PCI SCSI Configuration Utility**

**Version PCI-4.XX.00 (cont'd)**

Device Properties

SCSI ID	Device Identifier	SCSI Timeout	Queue Tags	Boot Choice	Format	Verify	Restore Defaults
0	-	< 10 >	[On]	[No]	<Format>	<Verify>	<Defaults>
1	-	< 10 >	[On]	[No]	<Format>	<Verify>	<Defaults>
2	NEC CD-ROM Drive	< 10 >	[On]	[No]	<Format>	<Verify>	<Defaults>
3	Seagate ST31055N	< 10 >	[On]	[No]	<Format>	<Verify>	<Defaults>
4	-	< 10 >	[On]	[No]	<Format>	<Verify>	<Defaults>
5	-	< 10 >	[On]	[No]	<Format>	<Verify>	<Defaults>
6	-	< 10 >	[On]	[No]	<Format>	<Verify>	<Defaults>
7	53C1010	< 10 >	[On]	[No]	<Format>	<Verify>	<Defaults>
8	-	< 10 >	[On]	[No]	<Format>	<Verify>	<Defaults>
9	-	< 10 >	[On]	[No]	<Format>	<Verify>	<Defaults>
10	-	< 10 >	[On]	[No]	<Format>	<Verify>	<Defaults>

11	-	< 10 >	[On]	[No]	<Format>	<Verify>	<Defaults>
12	-	< 10 >	[On]	[No]	<Format>	<Verify>	<Defaults>
13	-	< 10 >	[On]	[No]	<Format>	<Verify>	<Defaults>
14	-	< 10 >	[On]	[No]	<Format>	<Verify>	<Defaults>
15	-	< 10 >	[On]	[No]	<Format>	<Verify>	<Defaults>

<< Scroll Indicator >>

F1 = Help	↑↓↔ = Select Item	-/+ = Change [Item]
Esc = Abort/Exit	Home/End = Select Item	Enter = Execute <Item>

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The next table lists the fields and their descriptions:

FIELDS	DESCRIPTIONS
SCSI ID	Indicates the device's SCSI Identifier.
Device Identifier	Indicates the ASCII device identifier string extracted from the device's inquiry data.
MB/sec	Specifies the maximum synchronous data transfer rate in megabytes per second.
MT/sec	Specifies the maximum synchronous data transfer rate in mega transfers per second.
Data Width	Specifies the maximum data width in bits.
Scan ID	<p>Indicates whether to scan for this SCSI identifier at boot time. This item can be used to ignore a device and to decrease boot time by disabling the inquiry to unused SCSI identifiers.</p> <p>Set this option to <i>No</i> if there is a device that you do not want to be available to the system. Also, on a bus with only a few devices attached, you can speed up boot time by changing this setting to <i>No</i> for all unused SCSI IDs.</p>
Scan LUNs > 0	<p>Indicates whether to scan for LUNs greater than zero for a device. LUN 0 is always queried. This option should be used if a multi-LUN device responds to unoccupied LUNs or if it is desired to reduce the visibility of a multi-LUN device to LUN 0 only.</p> <p>Set this option to <i>No</i> if you have problems with a device that responds to all LUNs whether they are occupied or not. Also, if a SCSI device with multiple LUNs exists on your system but you do not want all of those LUNs to be available to the system, then set this option to <i>No</i>. This will limit the scan to LUN 0.</p>
Disconnect	Indicates whether to allow a device to disconnect during SCSI operations. Some (mostly newer) devices run faster with disconnect enabled, while some (mostly older) devices run faster with disconnect disabled.

SCSI Timeout	<p>Specifies the maximum amount of time [0-9999] in seconds to wait for a SCSI operation to complete.</p> <p>Since timeouts provide a safeguard that allows the system to recover should an operation fail, it is recommended that a value greater than zero be used. A value of zero allows unlimited time for an operation to complete and could result in the system hanging (waiting forever) should an operation fail.</p>
Queue Tags	<p>Indicates whether to allow the use of queue tags for a device. Currently the BIOS does not use queue tags. This item specifies queue tag control to higher level device drivers.</p>
Boot Choice	<p>Indicates whether this device may possibly be selected as the boot device. This option is only applicable to devices attached to adapter number zero (in the boot list) on non-BBS systems. It provides primitive BBS flexibility to non-BBS systems.</p>
Format	<p>Allows low-level formatting on a disk drive if enabled. Low-level formatting will completely and irreversibly erase all data on the drive. To low-level format a device, press <i>Enter</i>.</p> <p><b>Note:</b> Formatting will default the drive to a 512-byte sector size even if the drive had previously been formatted to another sector size.</p>
Verify	<p>Allows verification of all sectors on a device and reassigns defective Logical Block Addresses (LBAs) if enabled. To verify all sectors, press <i>Enter</i>.</p>
<Restore Defaults>	<p>Press <i>Enter</i> to obtain default settings.</p>

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## Exiting the SCSI BIOS Configuration Utility

Since some changes only take effect after your system reboots, you **must** exit from this configuration utility properly. To exit, press **Esc** and respond to the verification prompts that follow.

**IMPORTANT:** If you reboot the system without properly exiting from this utility, some changes may not take effect.

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