

# **HPT374 UDMA/ATA133 RAID Controller BIOS User's Manual**

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# **Overview**

This manual is a guide for HighPoint HPT374 UDMA/ATA133 RAID controller BIOS V1.x. Refer to the following information, it will help you to configure and manage RAID in BIOS.

Contents of this manual:

1. Enter BIOS Configuration Utility
2. Create Disk Array
3. Delete Disk Array
4. Add/Delete Spare Disk
5. Set Boot Device
6. Duplicate Critical RAID 1, RAID 0/1 array
7. Rebuild Broken RAID 1, RAID 0/1 array

Appendix A. Updating Controller BIOS

### 1. Enter BIOS Configuration Utility

When the following information appears on screen during the computer is starting, press CTRL+H key to enter BIOS configuration utility.

(Note: The screen shots may be slightly different for your BIOS version.)

```
HighPoint Technologies, Inc. HPT374 BIOS Setting Utility v1.2
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Press <Ctrl><H> to run BIOS Setting Utility
Scan Devices. Please wait ...
```

The main interface of BIOS configuration utility is as below:

HighPoint Technologies, Inc. HPT374 < BIOS Setting Utility>

Main Menu

1. Create Array

2. Delete Array

3. Create/Delete Spare

4. Select Boot Disk

Help

Create a RAID array with the hard disks attached to HPT37x controller.

F1: View Array Status  
↑, ↓: Move to next item  
Enter: Confirm the selection  
ESC: Exit from the utility

Channel Status

Channel	Drive Name	Array Name	Mode	Size(GB)	Status
Channel 1 Master:	Maxtor 2H020H1		ATA/100	20.48	BOOT
Channel 1 Slave:	IBM-DTLA-307015		ATA/100	15.36	HDD1
Channel 2 Master:	ST310212A		ATA/100	10.24	HDD2
Channel 2 Slave:	Maxtor 6L040J2		ATA/100	40.96	HDD3
Channel 3 Master:	Maxtor 2H020H1		ATA/100	20.48	HDD4
Channel 3 Slave:	IBM-DTLA-307015		ATA/100	15.36	HDD5
Channel 4 Master:	ST310212A		ATA/100	10.24	HDD6
Channel 4 Slave:	Maxtor 6L040J2		ATA/100	40.96	HDD7

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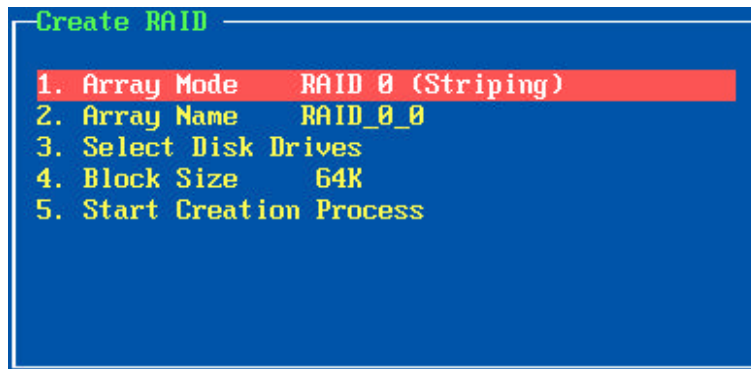
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<b>Main Menu:</b>	This column lists all currently available operation commands.
<b>Help:</b>	This column gives help information about the current selected item and the prompts on available operations.
<b>Status:</b>	This column lists all the hard disks and disk arrays connected to the adapter. When this column is activated, user can select the target device to perform a specific operation.

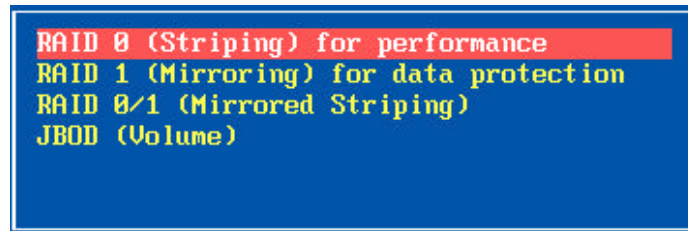
### 2. Create Disk Array

Follow these steps to create a disk array:

1. Within the **Menu** column of main interface, use the 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, see below:

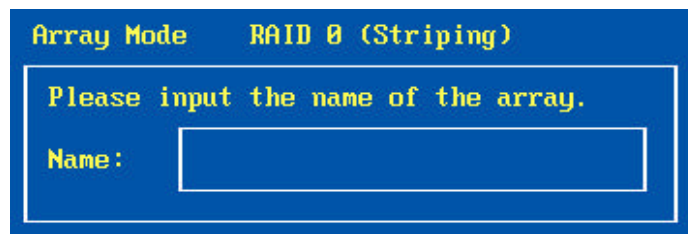


Just highlight the target array mode that you want to create, and then press ENTER to confirm the selection;

If user selected RAID 1 array, then an option list will popup to enable user selecting **Duplication** or **Create Only**. **Duplication** will let BIOS reserve the data on source disk (the first selected disk) and copy them onto the mirrordisk (the second selected disk) when creating mirror array; But **Create Only** will let BIOS destroy all data on all the selected disks and create a clean mirrorarray without any data on it.

*(Creation steps may be different depending on what array mode has been selected)*

3. Within the **Menu** column of main interface, use the arrow key to highlight the **Array Name**, and then press ENTER. Then the array name dialogue box will appear, see below:



Just type in the name that you want to name the array, then press ENTER to continue;

4. Within the **Menu** column of main interface, use the arrow key to highlight the **Select Disk Drives** and press ENTER, the **Status** column will be activated, see below:

Channel Status						
	Channel	Drive Name	Array Name	Mode	Size(GB)	Status
( )Channel	1 Master:	Maxtor 2H020H1		ATA/100	20.48	BOOT
( )Channel	1 Slave:	IBM-DTLA-307015		ATA/100	15.36	HDD1
( )Channel	2 Master:	ST310212A		ATA/100	10.24	HDD2
( )Channel	2 Slave:	Maxtor 6L040J2		ATA/100	40.96	HDD3
( )Channel	3 Master:	Maxtor 2H020H1		ATA/100	20.48	HDD4
( )Channel	3 Slave:	IBM-DTLA-307015		ATA/100	15.36	HDD5
( )Channel	4 Master:	ST310212A		ATA/100	10.24	HDD6
( )Channel	4 Slave:	Maxtor 6L040J2		ATA/100	40.96	HDD7

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Just highlight the target disks that you want to use and press ENTER to select them respectively;

After all disks have been selected, press ESC to go back to the creation steps menu;

5. If user selected a RAID 0 or 0/1 array in step 2, then now, user needs to select a block size for the array. Within the **Menu** column of main interface, use the arrow key to highlight the **Block Size** and press ENTER, then select a block size from the popup list, see below;

RAID 0 (Striping)			
1. Array Mode	RAID	2M	
2. Array Name	RAID	1M	
3. Select Disk Drives	512K		
4. Block Size	64K	256K	
5. Start Creation Pro	128K		
	64K		
	32K		
	16K		

6. Within the **Menu** column of main interface, use the arrow key to highlight the **Start Creation Process** and press ENTER, then some warning messages will appear, see below:

RAID 0 (Striping)			
1. Array Mode	RAID 0 (Striping)		
2. Array Name	RAID_0_0		
3. Select Disk Drives			
4. Block Size	64K		
5. Start Creation Process			

WARNING: All data on the selected disks will be deleted. Continue? Press Y/N

Please pay attention to the warning message, and then press Y to finish the creation, or press N to cancel the creation.

*(The warning message may be different depending on what array mode that user is creating)*

### Warning:

Please pay attention to the warning message at Step 6:

Creating a RAID 0 array, JBOD array or RAID 0/1 array will destroy all data on all the selected disks.

When creating mirror array, Duplication operation will reserve the data on source disk (the first selected disk) and copy them onto the mirror disk (the second selected disk); But Create Only operation will destroy all data on all the selected disks and create a clean mirror array without any data on it.

## 3. Delete Disk Array

Follow these steps to delete a disk array:

1. Within the **Menu** column of main interface, use the arrow key to highlight **Delete Array** item, and then press ENTER, then the **Status** column will be activated, see below:

Channel Status						
	Channel		Drive Name	Array Name	Mode	Size(GB) Status
( )	Channel 1	Master:	Maxtor 2H020H1	RAID_0_0	ATA/100	20.48 HDD0
	Channel 1	Slave:	IBM-DTLA-307015	RAID_0_0	ATA/100	15.36 Hidden
	Channel 2	Master:	ST310212A	RAID_0_0	ATA/100	10.24 Hidden
	Channel 2	Slave:	Maxtor 6L040J2	RAID_0_0	ATA/100	40.96 Hidden
( )	Channel 3	Master:	Maxtor 2H020H1	RAID_0_1	ATA/100	20.48 HDD1
	Channel 3	Slave:	IBM-DTLA-307015	RAID_0_1	ATA/100	15.36 Hidden
	Channel 4	Master:	ST310212A	RAID_0_1	ATA/100	10.24 Hidden
	Channel 4	Slave:	Maxtor 6L040J2	RAID_0_1	ATA/100	40.96 Hidden

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highlight the target disk array and then press ENTER to delete it;

(User can select a disk array by selecting its first member disk)

2. Then a warning message will appear as below:

Main Menu	
1. Create Array	
2. Delete Array	
3. Create/Delete Spare	
4. Select Boot Disk	
WARNING: All data on the array will be deleted	
Continue? Press Y/N	

Pay attention to the warning message, and then press Y to delete the selected disk array, or press N to cancel.

**Warning:**

Deleting a disk array will destroy all the data on the disk array.

## 4. Add/Delete Spare Disk

A spare disk is used to replace a failed disk in a RAID 1 or RAID 0/1 array. You can specify one or more disks as spare disk. Follow these steps to add or delete a spare disk:

1. Within the **Menu** column of main interface, use the arrow key to highlight **Create/Delete Spare** item and press ENTER, then the **Status** column will be activated, see below:

Channel Status						
	Channel	Drive Name	Array Name	Mode	Size(GB)	Status
	Channel 1 Master:	Maxtor 2H020H1	RAID_1_0	ATA/100	20.48	Hidden
( )	Channel 1 Slave:	IBM-DTLA-307015		ATA/100	15.36	HDD0
	Channel 2 Master:	ST310212A	RAID_1_0	ATA/100	10.24	HDD1
( )	Channel 2 Slave:	Maxtor 6L040J2		ATA/100	40.96	HDD2
( )	Channel 3 Master:	Maxtor 2H020H1		ATA/100	20.48	HDD3
( )	Channel 3 Slave:	IBM-DTLA-307015		ATA/100	15.36	HDD4
( )	Channel 4 Master:	ST310212A		ATA/100	10.24	HDD5
( )	Channel 4 Slave:	Maxtor 6L040J2		ATA/100	40.96	HDD6
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Just use the arrow key to highlight the target disk and press ENTER to add it into the array, or highlight a spare disk and press ENTER to remove it from the spare pool.

2. After a disk is added into the spare pool, its status will be marked as **Spare**, see below:

Channel Status						
	Channel	Drive Name	Array Name	Mode	Size(GB)	Status
	Channel 1 Master:	Maxtor 2H020H1	RAID_1_0	ATA/100	20.48	Hidden
	Channel 1 Slave:	IBM-DTLA-307015		ATA/100	15.36	HDD0
	Channel 2 Master:	ST310212A	RAID_1_0	ATA/100	10.24	HDD1
	Channel 2 Slave:	Maxtor 6L040J2		ATA/100	40.96	Spare
	Channel 3 Master:	Maxtor 2H020H1		ATA/100	20.48	Spare
	Channel 3 Slave:	IBM-DTLA-307015		ATA/100	15.36	HDD2
	Channel 4 Master:	ST310212A		ATA/100	10.24	HDD3
	Channel 4 Slave:	Maxtor 6L040J2		ATA/100	40.96	HDD4
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**Warning:**

Adding a spare disk into the mirror array will destroy all the data on that disk.



## 5. Set Boot Device

Follow these steps to select a disk or disk array as boot device:

1. Within the **Menu** column of main interface, use the arrow key to highlight **Select Boot Disk** item, and then press ENTER; then the **Status** column will be activated, see below:

Channel Status						
	Channel	Drive Name	Array Name	Mode	Size(GB)	Status
	Channel 1 Master:	Maxtor 2H020H1	RAID_1_0	ATA/100	20.48	Hidden
( )	Channel 1 Slave:	IBM-DTLA-307015		ATA/100	15.36	HDD0
( )	Channel 2 Master:	ST310212A	RAID_1_0	ATA/100	10.24	HDD1
	Channel 2 Slave:	Maxtor 6L040J2		ATA/100	40.96	Spare
	Channel 3 Master:	Maxtor 2H020H1		ATA/100	20.48	Spare
( )	Channel 3 Slave:	IBM-DTLA-307015		ATA/100	15.36	HDD2
( )	Channel 4 Master:	ST310212A		ATA/100	10.24	HDD3
( )	Channel 4 Slave:	Maxtor 6L040J2		ATA/100	40.96	HDD4
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Just use the arrow key to highlight the target disk or disk array, then press ENTER to select it as boot device.

If user select a disk or disk array which has a boot mark and press ENTER, then its boot setting will be canceled.

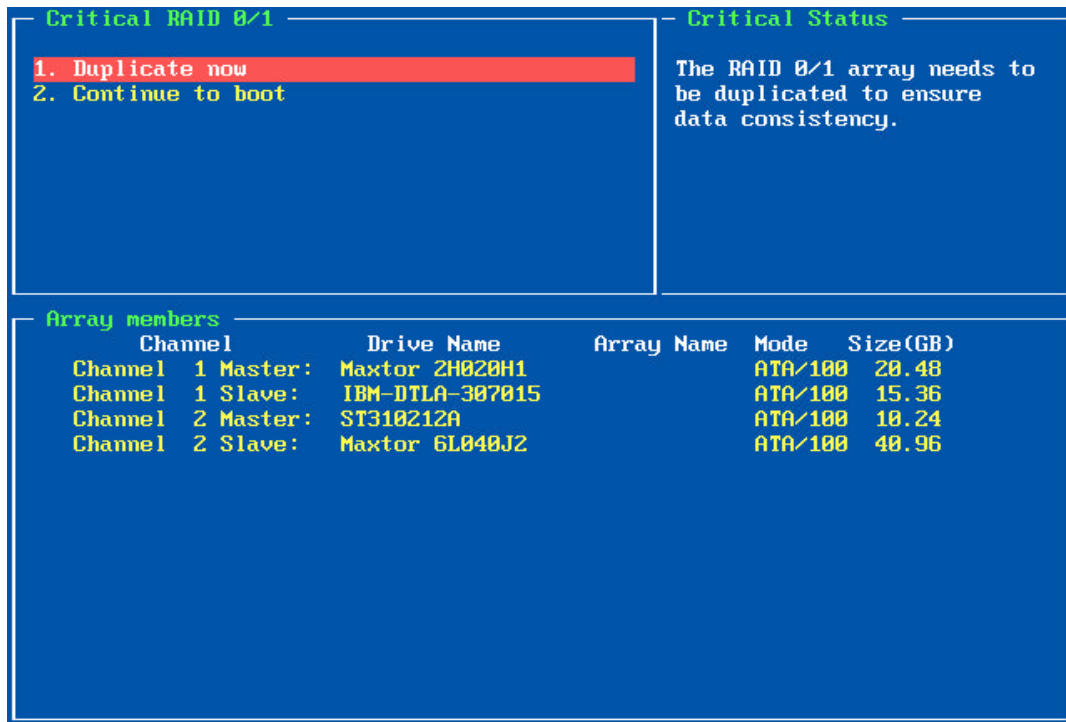
2. After the disk or disk array is selected, its status will be marked as **BOOT**, see below:

Channel Status						
	Channel	Drive Name	Array Name	Mode	Size(GB)	Status
	Channel 1 Master:	Maxtor 2H020H1	RAID_1_0	ATA/100	20.48	Hidden
	Channel 1 Slave:	IBM-DTLA-307015		ATA/100	15.36	HDD1
	Channel 2 Master:	ST310212A	RAID_1_0	ATA/100	10.24	BOOT
	Channel 2 Slave:	Maxtor 6L040J2		ATA/100	40.96	Spare
	Channel 3 Master:	Maxtor 2H020H1		ATA/100	20.48	Spare
	Channel 3 Slave:	IBM-DTLA-307015		ATA/100	15.36	HDD2
	Channel 4 Master:	ST310212A		ATA/100	10.24	HDD3
	Channel 4 Slave:	Maxtor 6L040J2		ATA/100	40.96	HDD4
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## 6. Duplicate Critical RAID 1, RAID 0/1 array

When booting computer, if BIOS detect a RAID 1 or RAID 0/1 array duplication has been canceled or any reasons that may cause the inconsistency between user data and backup data on the disk array, then the disk array will be marked as critical status, and BIOS will automatically prompt user to duplicate the RAID 1 or RAID 0/1 array to make the backup data consist with the user data again, see below:



Just select **Duplicate Now** to duplicate, or select **Continue to Boot** to skip.

If user selects **Continue to Boot**, user still can duplicate the array after booting into the OS.

## 7. Rebuild Broken RAID 1, RAID 0/1 array

When booting computer, if BIOS detects one member disk of RAID 1 or RAID 0/1 array is failed, the array will be marked as broken status.

If BIOS detects a RAID 1 or RAID 0/1 array is broken, and there is a spare disk can be used to rebuild the broken array, then BIOS will automatically use the spare disk to rebuild the broken array. See below:

### Auto Rebuild

A spare disk is found.  
Automatic re-build is started.  
Wait ....

Duplicating ...

99%

### Critical Status

To abort the process press the ESC key.

### Remaining members of the failed array

Channel	Drive Name	Array Name	Mode	Size(GB)
Channel 2 Master:	ST310212A		ATA/100	10.24
Channel 1 Master:	Maxtor 2H020H1		ATA/100	20.48
Channel 1 Slave:	IBM-DTLA-307015		ATA/100	15.36

If BIOS detects either a RAID 1 or RAID 0/1 array is broken, but no spare disk can be used to rebuild, then BIOS will prompt users with a few operations to solve the problem, see below:

### Broken RAID 0/1

- 1.Power off and replace the failed drive
- 2.Destroy the RAID 0/1
- 3.Hide the broken array and continue to boot
- 4.Choose replacement drive and rebuild

### Critical Status

The mirrored striping of the RAID 0/1 has failed or is not responding. The array is still functional, but fault tolerance is disabled.

### Remaining members of the failed array

Channel	Drive Name	Array Name	Mode	Size(GB)
Channel 2 Master:	ST310212A		ATA/100	10.24
Channel 1 Master:	Maxtor 2H020H1		ATA/100	20.48
Channel 1 Slave:	IBM-DTLA-307015		ATA/100	15.36

### 1. Power off and replace the failed drive

This command enables user to power off the computer and replace the failed disk with a good one. If your computer does not support APM, you must turn off your computer manually. After replacement, user can boot into BIOS and select the **3. Choose replacement drive and rebuild** to rebuild the broken array.

### 2. Destroy the mirroring relationship

This command enables user to cancel the broken array's data mirroring relationship. For broken RAID 1 array, the data on the remained normal disk will be reserved after the destroy operation. For broken RAID 0/1 array, all data on the array will be lost after destroy operation!

### 3. Choose replacement drive and rebuild

This command enables user to select an already-connected disk to rebuild the broken array and replace the data to that disk.

1. After chosen this command line, the **Status** column will be activated, see below:

**Broken RAID 0/1**  
  
1.Power off and replace the failed drive  
2.Destroy the RAID 0/1  
3.Hide the broken array and continue to boot  
4.Choose replacement drive and rebuild

**Critical Status**  
  
The mirrored striping of the RAID 0/1 has failed or is not responding. The array is still functional, but fault tolerance is

**Remaining members of the failed array**

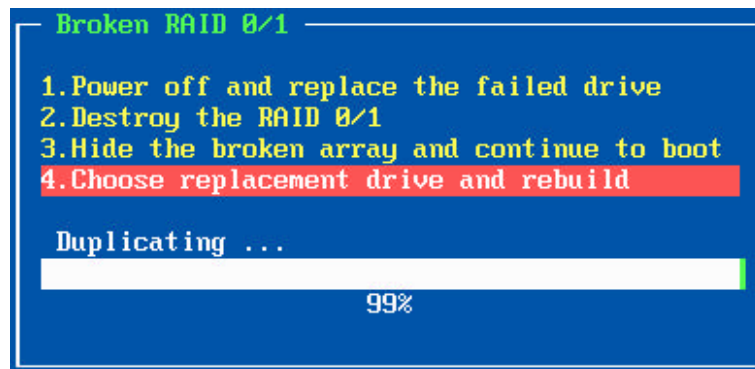
Channel	Drive Name	Array Name	Mode	Size(GB)	
Channel 1 Master:	Maxtor 2H020H1		ATA/100	20.48	HDD0
Channel 1 Slave:	IBM-DTLA-307015		ATA/100	15.36	Hidden
Channel 2 Master:	ST310212A		ATA/100	10.24	HDD0
( )Channel 2 Slave:	Maxtor 6L040J2		ATA/100	40.96	HDD1
( )Channel 3 Master:	Maxtor 2H020H1		ATA/100	20.48	HDD2
( )Channel 3 Slave:	IBM-DTLA-307015		ATA/100	15.36	HDD3
( )Channel 4 Master:	ST310212A		ATA/100	10.24	HDD4
( )Channel 4 Slave:	Maxtor 6L040J2		ATA/100	40.96	HDD5

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Just highlight the target disk and press ENTER to select it.

**Warning: All data on the selected disk will be destroyed.**

2. Next, BIOS will duplicate data onto the newly added disk. See below:



User can press ESC to cancel the duplicating process at anytime.

**4. Continue to Boot**

This command will let BIOS to skip the problem and boot into OS.

### Appendix A. Updating Controller BIOS

The HighPoint controller BIOS load utility (load.exe) is used to flash BIOS for HighPoint HPT3xx ATA adapters. For HighPoint controllers integrated on motherboards, please contact the hardware vendor to update the BIOS.

#### Usage

The load.exe must run under pure DOS environment. It cannot run in a Windows DOS box. You should boot from a DOS floppy without any device drivers.

The following command line is used to launch the load utility.

**load [options] [filename]**

The utility will search for all matching controllers on the system and prompt to flash each BIOS by default.

#### Command line parameters

##### filename

Specifies the file name of the BIOS image.

##### Options:

**/Q**

Silent mode. The program will not prompt for you to confirm the flashing process.

**/V**

Verbose mode. The program will show more detailed information about the flashing process.

**/S <bus>**

Only search adapters on specified PCI bus. <bus> specifies the PCI bus number (a value from 0 to 255).

**/D <device>**

Only search adapters for specified PCI device number. <device> specifies the PCI device number (a value from 0 to 31).

**/C**

Configure BIOS parameters before updating EEPROM. This option is only available for HPT controller BIOSes that have configurable BIOS parameters.

**/B <address>**

This option is for advanced users only. When flashing the EEPROM, the utility will map its space to a 32-bit physical address. On most systems, the address is determined automatically. If the utility fails, you can try to specify an address by this option. <address> is a HEX number in the form 0XXXXXXXX.

**/E <address>=<value>[,<address>=<value>...]**

This option is for advanced users only. You can use this option to patch BIOS <address> and <value> specify the offset in BIOS image and DWORD data value to be set.