

# HDD Setting

## OBJECTIVES

1. Auto-detect IDE drives in CMOS.
2. Use CMOS IDE modes.
3. Learn about CD-ROM setup considerations.



Hardware

## RESOURCES

1. Marcraft 8000 Trainer
2. Windows Millennium installed

## DISCUSSION

You need to enter the BIOS's CMOS Configuration Setup program during bootup and set several parameters to match the type of HDD being installed. Before exchanging or reformatting a hard disk drive, it is always advisable to make backups of the drive's contents and record its configuration parameters.

There are certain pieces of information that should be known, and configurations that should be verified, before inserting the drive into the disk drive bay. In particular, the drive's type parameters should be verified, and its physical Drive Select or Master/Slave setting should be made. We will expand on this in Lab 7.

For some drives, this information is contained in an information booklet that comes with the drive. Other drives include this information on a sticker that is mounted on the drive itself. In these cases, it is somewhat difficult to access the information after the drive has been installed in the system unit.

Figure 4-1 depicts the relationship of the hard disk drive to the rest of the system. In addition, it shows the hard disk drive's information and control signal paths between the drives and the system board (through the signal cables).

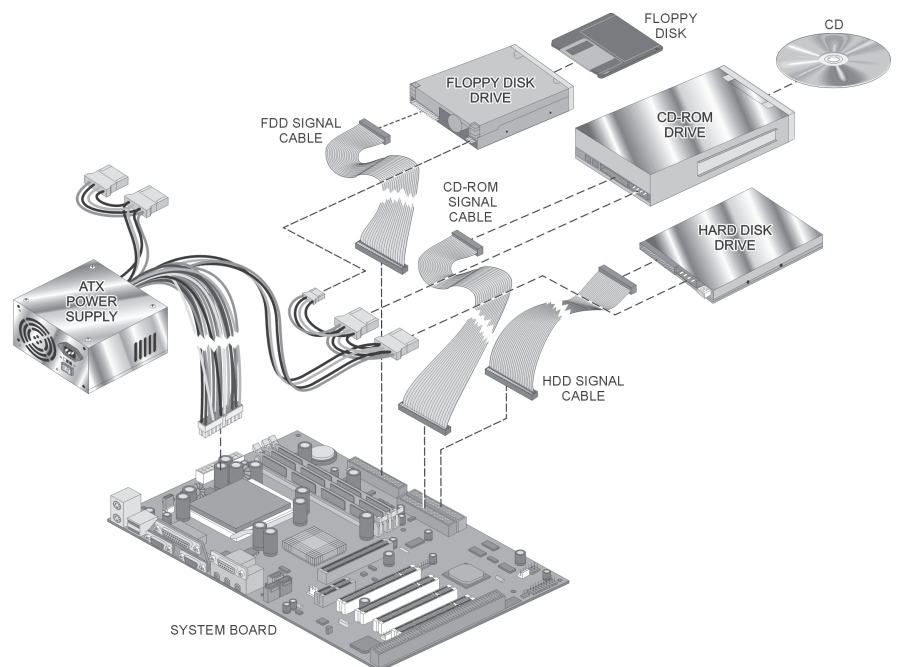
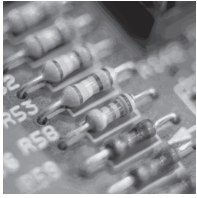


Figure 4-1: HDD-related Components

## PROCEDURE - 4



Hardware

## PROCEDURE

### 1. Auto-Detection

- Turn the computer on.
- Press reset to reboot the computer; and then press DELETE to enter CMOS setup.
- Press ENTER to go into “Standard CMOS Features”.
- Arrow down to highlight “IDE Auto-Detection”, and press ENTER. The IDE Primary Master setup is opened as shown in Figure 4-2.

CMOS Setup Utility - Copyright © 1984-2000 Award Software  
IDE Primary Master

IDE HDD Auto-Detection	Press Enter	Item Help
IDE Primary Master Access Mode	Auto Auto	Menu Level>
Capacity	41176 MB	To auto-detect the HDD's size, head... on this channel
Cylinder	19710	
Head	16	
Precomp	0	
Landing Zone	19709	
Sector	255	

Move Enter:Select +/-PU/PD:Value F10:Save ESC:Exit F1 General Help  
F5:Previous Values F6:Fail-Safe Defaults F7:optimized Defaults

Figure 4-2:  
IDE Primary  
Master Screen

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System Configuration

CPU	: AMD-K6(tm)-2	Base Memory	: 640 K
CPU ID /ucode ID	: Installed	Extended Memory	: 130048 K
CPU Clock	: 400Mz	Cache Memory	: 512 K
Diskette Drive A	: 1.44M, 3.5 in.	Display Type	: EGA/VGA
Diskette Drive B	: None	Serial Ports(s)	: 3F8 2F8
Pri Master Disk	: LBA, Mode 4, 4299MB	Parallel Ports(s)	: 378
Pri Slave Disk	: None	Bank0 DRAM Type	: EDO DRAM
Sec.y Master Disk	: CDROM, Mode 4	Bank1 DRAM Type	: None
Sec. Slave Disk	: None	Cache L2 Type	: Pipe-Burst

PCI device listing...

Bus No.	Device No.	Func. No.	Vendor/Device	Class	Device Class	IRQ
0	2	1	10B9 5219	0101	IDE Controller	14
0	3	0	1013 00B8	0300	Display Controller	NA
0	4	0	10EC 8139	0200	Network Controller	11

Verifying DMA Pool Data .....

Figure 4-3: System Configuration Screen

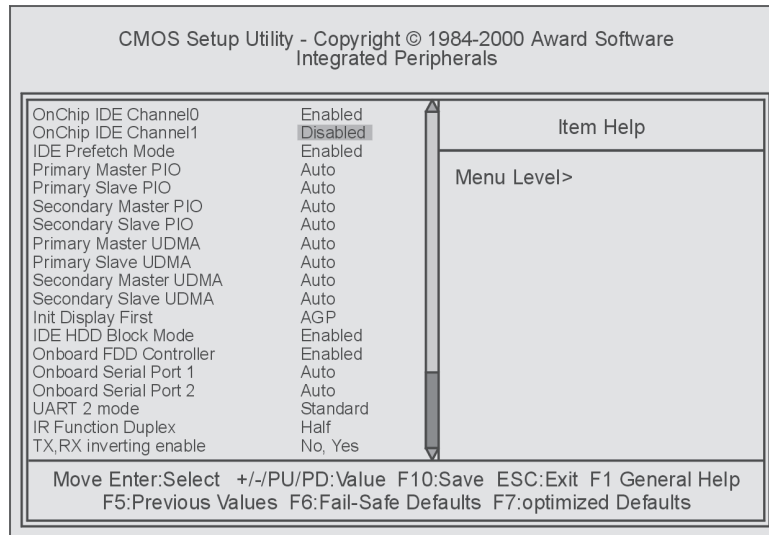
- Press the ENTER key to begin the auto-detection process.
- Press the ESC key twice to access the main menu and then use the ARROW keys to highlight “Integrated Peripherals”.
- Press the ENTER key.
- Make sure the On-Chip IDE Channel 0 and Channel 2 are both enabled, and press the ESC key.
- Press F10, Y, and ENTER to save and exit CMOS. The computer will reboot.

### 2. Check configuration

- Press the PAUSE key on the keyboard at the System Configuration Box. See Figure 4-3.
- On the bottom of the screen under Device Class find IDE Controller.
- Write down the IRQ(s) that it is using in Table 4-1; press SPACE.
- Press CTRL+ALT+DELETE to reboot the computer.

### 3. Disable 2nd channel IDE (1)

- a. Press DELETE to enter CMOS when prompted.
- b. Arrow over to Integrated Peripherals and press ENTER.
- c. Arrow down to On-Chip IDE Channel 1. See Figure 4-4.



**Figure 4-4:**  
**Integrated Peripherals**  
**Screen**

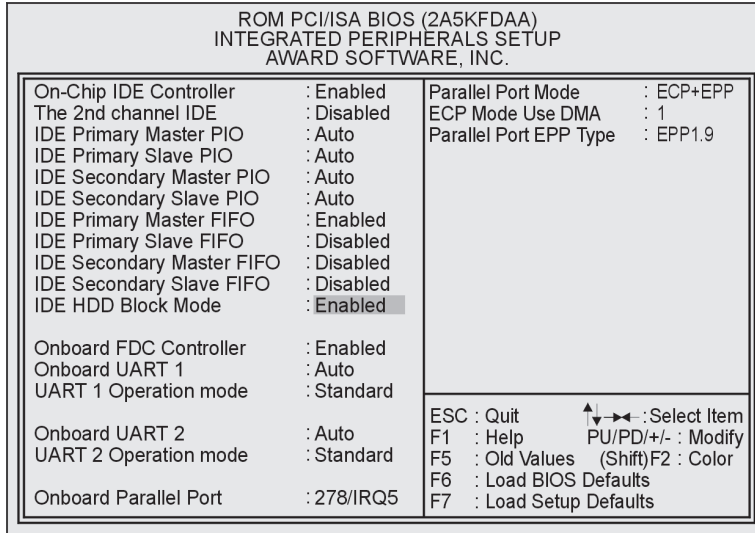
- d. Press PAGE DOWN to disable it.
- e. Press ESC to return to the Main menu.
- f. Press F10, Y, and ENTER to save and exit CMOS.

### 4. Enable 2nd channel IDE

- a. Press pause on the System Configuration Box.
- b. Write down what IRQ(s) the IDE Controller is using now in Table 4-2.
- c. Press SPACE.
- d. Press CTRL+ALT+DELETE immediately.
- e. Press DELETE to enter CMOS when prompted.
- f. Go into the Integrated Peripherals screen again and enable the 2nd channel IDE.
- g. Arrow down to the IDE Primary Master PIO and press PAGE DOWN.
- h. Write down all selections in Table 4-3.
- i. Set it back to Auto.

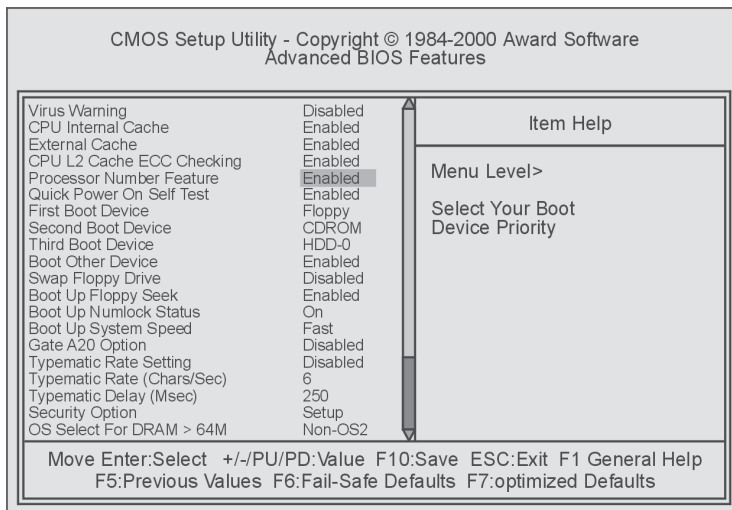
These selections are for different supported modes that hard drives offer. The standard mode is 4. Since most CMOS settings auto-detect, there is no need to do anything with these settings. The only reason to modify them would be if a hard drive from an older system were installed into a newer system. The older system would have partitioned and formatted the drive in mode 1, for instance. In order for the new computer to recognize it, it would have to force mode 1 or repartition and format the drive. All the information on the hard drive would be lost.

## PROCEDURE - 4



**Figure 4-5: Integrated Peripherals Screen (Different Selections)**

*NOTE: Some systems can have trouble running disks in block mode, even if they are supposed to allow it. You may have better luck with the drive or system if it is disabled.*



**Figure 4-6: Advanced BIOS Features Screen**

### 5. Other HDD Options

- a. Arrow down to IDE HDD Block Mode; press PAGE DOWN to see the different selections. See Figure 4-5.

Some BIOS offer an option called "block mode". Block mode is a performance enhancement that allows the grouping of multiple read or write commands over the IDE/ATA interface so that they can be handled on a single interrupt.

Interrupts are used to signal when data is ready to be transferred from the hard disk; each one interrupts other work being done by the processor. Newer drives, when used with supporting BIOS, allow you to transfer as many as 16 or 32 sectors with a single interrupt. Since the processor is being interrupted much less frequently, performance is much improved, and more data is moving around with less command overhead, which is much more efficient than transferring data one sector at a time.

- b. Select enabled.
- c. Press ESC to exit the Main menu.
- d. Arrow over to the Advanced BIOS Features Setup and press ENTER.
- e. Arrow down to First Boot Device. See Figure 4-6.
- f. Press PAGE DOWN and write all the selections into Table 4-4.
- g. Select "Floppy" for the First Boot Device.
- h. Select "HDD-0" for the Second Boot Device.
- i. Select "HDD-1" for the Third Boot Device.

The EIDE interface has been redefined from IDE to allow faster transfer rates as well as to handle more storage capacity and to control non-hard drive units, such as a tape drive or a CD-ROM drive. The EIDE interface is often described as ATAPI (AT Attachment Peripheral Interconnect) or Fast ATA (Fast AT Attachment). ATA-2 is the latest version.

Most new operating systems now come with a bootable CD-ROM. Table 4-4 shows how it would be very easy to make the CD-ROM the first boot device so that you can install the operating system without a bootable floppy disk. The ATAPI interface became the industry-wide standard of the EIDE controller, allowing CD-ROM drive manufacturers to build in ATAPI-compliant drives so that software drivers are not necessary. Without this interface bootable CD's would not have been possible.

- j. Press ESC to return to the Main menu.
- k. Press F10, Y, and ENTER to save and exit CMOS.

TABLES

Table 4-1

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Table 4-2

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Table 4-3

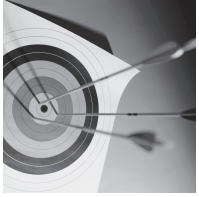
Available Selections for the IDE Primary Master PIO		

Table 4-4

Available Selections for the Boot Sequence	

## PROCEDURE - 4

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### Feedback

## LAB QUESTIONS

1. Where should you look to find hard drive parameters?
2. Does your BIOS offer block mode?
3. What has made bootable CD's possible?
4. Is it possible to boot from a Zip disk?
5. How would you change your boot sequence to boot from the floppy drive?