

# IECS

**COMPUTER EDUCATION & SKILL DEVELOPMENT**

**Fully Recognised Institute of NIELIT**

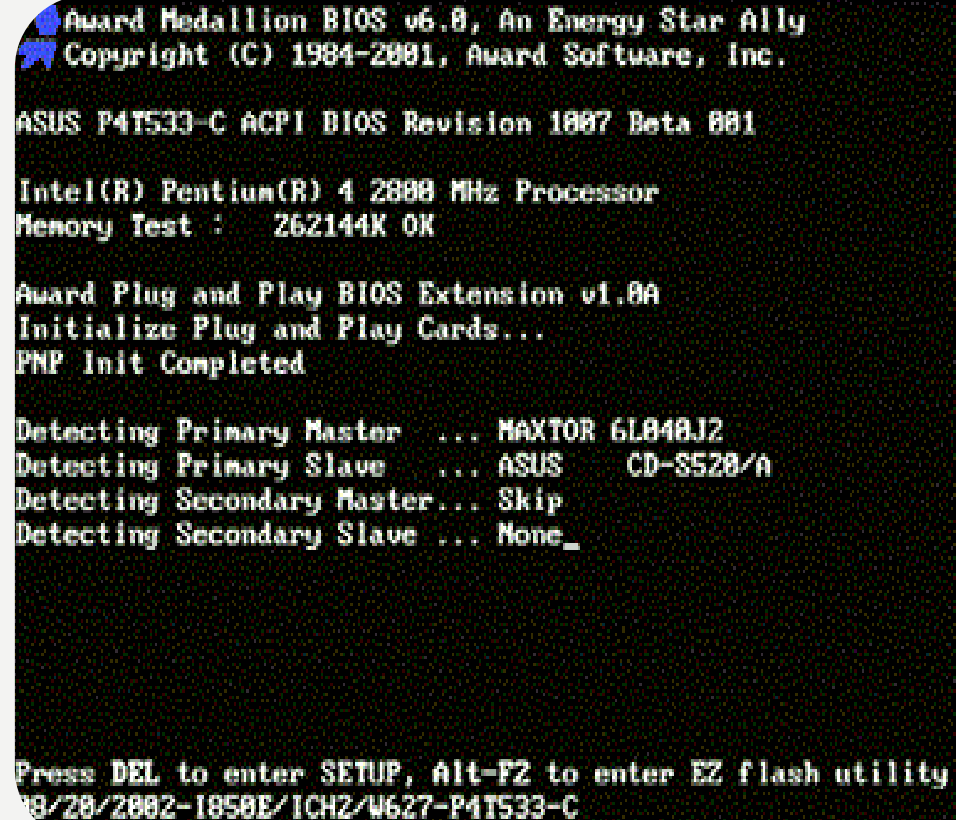
**Since 1993**

**HARDWARE (ICT) CLASS – II<sup>TH</sup>(CMOS & BIOS SETTING)**

# LAST CLASS : BOOTING

**Bootting** - Booting is the process of powering on a computer and getting into the operating system. During the boot process, the computer will perform a self diagnostic and load necessary drivers and programs that help the computer and devices communicate.

**Bootting a Computer** - Whenever you turn on your computer, the first thing you see is the BIOS software doing its thing. On many machines, the BIOS displays text describing things like the amount of memory installed in your computer, the type of hard disk and so on. It turns out that, during this boot sequence, the BIOS is doing a remarkable amount of work to get your computer ready to run



Award Medallion BIOS v6.0, An Energy Star Ally  
Copyright (C) 1984-2001, Award Software, Inc.

ASUS P4T533-C ACPI BIOS Revision 1007 Beta 001

Intel(R) Pentium(R) 4 2800 MHz Processor  
Memory Test : 262144K OK

Award Plug and Play BIOS Extension v1.0A  
Initialize Plug and Play Cards...  
PNP Init Completed

Detecting Primary Master ... MAXTOR 6L040J2  
Detecting Primary Slave ... ASUS CD-S520/A  
Detecting Secondary Master... Skip  
Detecting Secondary Slave ... None\_

Press DEL to enter SETUP, Alt-F2 to enter EZ flash utility  
09/20/2002-1050E/ICH2/W627-P4T533-C

Energy Star  
EPA POLLUTION PREVENTION



Keyboard failure  
Press F2 to Run SETUP  
Press F1 to load default values and continue

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# CMOS SETTING

# CMOS

**CMOS** - CMOS is known as **Complementary Metal Oxide Semiconductor**. This hardware is used in the motherboard. CMOS is a **memory** that store information about **BIOS settings**. It also stores information about **system date and time** as well as **hardware settings**.

- CMOS is a **battery** used in the motherboard. CMOS battery lifetime is **10 years** in a proper environment.
- Therefore, **CMOS is a battery as well as memory**. CMOS and BIOS work together in a computer system.

## History :

- The **Motorola 146818 chip** was the first **RTC** and CMOS RAM chip to be used in early IBM computers.
- It capable of storing a total of 64 bytes of data.
- The system clock used 14 bytes of RAM, additional 50 bytes for storing system settings.
- Today, most computers have moved the settings from CMOS and integrated them into the
- Southbridge or Super I/O chips.
- It also lies in digital cameras.



# MAIN FUNCTIONS OF CMOS

1. In computer, the CMOS controls a variety of functions.
2. The CMOS battery stores the system time and settings that must be loaded when turn the system on.
3. If the battery fails, the system settings, date, and time will not be saved when the computer is turned off until it has been replaced.
4. A few additional settings are stored by the system.
5. The CMOS battery allows these settings to be loaded into system memory when the computer boots.
6. Sometimes the computer's power supply fires up.
7. Suddenly the CMOS runs a series of checks to make sure the system is functioning properly.
8. These checks contain counting up random access memory (RAM).
9. This delays boot time.
10. Therefore some people disable this feature in the CMOS settings.
11. If installing new RAM it is better to enable the feature until the RAM has been checked.
12. It controls the Power on Self Test (POST).
13. Once POST has completed, CMOS runs through its other settings.
14. Hard disks and formats are detected.
15. It is checked with Redundant Array of Independent Disk (RAID) configurations.



# ENTER THE CMOS SETUP

## Enter the CMOS setup :

- To access CMOS setup on a personal computer, a computer user presses a key as the computer is starting.
- The key to press can vary, depending on the computer manufacturer, but is often the F1, F2 or Delete key.
- The system documentation identifies the appropriate key.
- It will take him into the CMOS or BIOS setup screen.
- Once in CMOS setup, the method for changing the settings often depends on the BIOS manufacturer.
- You may use the arrow keys along with the Enter key to select categories and change their values.

## Tasks of CMOS settings :

- CMOS settings control basic system information such as the system date and time, the boot sequence, computer memory, installed devices, security information and power management.
- The boot sequence indicates the order of drives on which the computer looks for information to start the operating system.
- Security information includes passwords for accessing the computer.
- Power Management options allow users to conserve energy by letting the computer switch to a low power state after a specified amount of time.

▶ **Standard CMOS Features**

▶ Advanced BIOS Features

▶ Advanced Chipset Features

▶ Integrated Peripherals

▶ Power Management Setup

▶ PnP/PCI Configurations

▶ PC Health Status

▶ Frequency/Voltage Control

Load Fail-Safe Defaults

Load Optimized Defaults

Set Supervisor Password

Set User Password

Save & Exit Setup

Exit Without Saving

Esc : Quit

↑ ↓ → ← : Select Item

F10 : Save & Exit Setup

Time, Date, Hard Disk Type...

# RESETTING CMOS

**Resetting CMOS is a troubleshooting tip for some problems. You can use three easiest steps to reset a CMOS.**

- The first method, you need to enter in BIOS setup utility. Inside the BIOS setup utility, you can find Reset BIOS setting or Setup default to load factory default value.
- The second method, you can remove the CMOS from the motherboard and wait for few minutes. By removing CMOS from motherboard you can reset the CMOS data. After a few minutes place the CMOS on the motherboard properly.
- The third method, find the CMOS jumper on the motherboard. Near the jumper, you can find some text like CLEAR, PASSWORD, CLRPWD, etc. By changing the jumper position properly, you can reset your CMOS settings.



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# BIOS SETTING

# BIOS SETUP UTILITY

Main

Ai Tweaker

Advanced

Power

Boot

Tools

Exit

## Boot Settings

- ▶ Boot Device Priority
- ▶ Hard Disk Drives
- ▶ Boot Settings Configuration
- ▶ Security

Specifies the Boot Device Priority sequence.

A virtual floppy disk drive (Floppy Drive B:) may appear when you set the CD-ROM drive as the first boot device.

↔ Select Screen  
↑↓ Select Item  
Enter Go to Sub Screen  
F1 General Help  
F10 Save and Exit  
ESC Exit

# BIOS

**BIOS** - BIOS is known as the **Basic Input Output System**. It is a software located on the motherboard. Manufacturer saved BIOS software inside the **BIOS ROM** or **BIOS IC** or **BIOS chips**.

- BIOS is a software.
- BIOS ROM or BIOS IC, or BIOS chips is hardware.
- The BIOS helps to boot your computer. BIOS instructions are responsible for the POST (Power On Self-Test) during booting. During POST it checks all the hardware that connected with the motherboard.
- You can hear single beep sound as a confirmation message that POST is performed successfully. There is no problem with your computer. More than one beep or continuous long beep means some issues in your computer.
- If the computer does not pass the POST, it indicates by a combination of beep sound.
- It contain instructions and setup for how the system should boot and how it operates.

# BIOS CONFIGURATION

You can have different BIOS configuration options from the BIOS menu. Some common configurations are

1. Change the date and time.
2. Load BIOS setup default.
3. Change the boot order.
4. Create a BIOS password.
5. Enable or disable RAID.
6. Change hard drive settings.
7. Enable or disable the POST.
8. Enable or disable on-board USB.
9. Change power on settings.
10. View system and CPU temperature.
11. Enable or disable ACPI.
12. Enable or disable on-board Audio.
13. View FAN speed.

# THE FOUR MAIN FUNCTION OF BIOS

## **POST:**

- Test the computer hardware and make sure no errors exist before loading the operating system.

## **Bootstrap Loader :**

- Locate the operating system.
- If a capable operating system is located, the BIOS will pass control to it.

## **BIOS drivers:**

- Low level drivers that give the computer basic operational control over your computer's hardware.

## **BIOS or CMOS Setup:**

- Configuration program that allows you to configure hardware settings including system settings such as computer passwords, time, and date.

# BOOT SECTORS

1. All disks and hard drives are divided into small sectors. The first sector is called the boot sector and contains the Master Boot Record (MBR).
2. The MBR contains the information concerning the location of partitions on the drive and reading of the bootable operating system partition.
3. During the boot up sequence on a DOS based PC, the BIOS searches for certain system files, IO.SYS and MSDOS.SYS.
4. When those files have been located, the BIOS then searches for the first sector on that disk or drive and loads the needed Master Boot Record information into memory.
5. The BIOS passes control to a program in the MBR which in turn loads IO.SYS.
6. This latter file is responsible for loading the remainder of the operating system.
7. There are two kinds of boot sectors volume boot records and master boot records.
8. Boot sector is responsible for the further boot process of the system.
9. It has length of 512 bytes.
10. The first 446 bytes are the primary boot loader.

# TASKS OF BOOT SECTORS

## Tasks of Boot Sectors :

- Boot sectors check the Operating system and hardware components are working properly.
- It will ensure a computer to successfully boot and its BIOS.
- Sometimes failure occurs among any one of these components.
- Then it will likely result in a failed boot sequence.

## Boot Sector Virus :

- A boot sector virus is one that infects the boot sector of a floppy disk or hard drive.
- Boot sector viruses can also infect the MBR.
- The first PC virus in the wild was Brain, a boot sector virus that exhibited stealth techniques to avoid detection.
- Brain also changed the volume label of the disk drive.

# HOW TO OPEN BIOS UTILITY ?

1. We don't have any fixed key to access or open the BIOS menu or utility. This is depending on the manufacturer. Some commons keys to enter BIOS utility are F1, F2, F10, Delete, Esc, etc.
2. First, start your computer. If your computer is already running restart the computer. And, check your computer screen which buttons need to press to open BIOS.
3. Second, press the key to open BIOS before loading the OS. If OS is loaded than again restart the computer and proceed.
4. Important, BIOS utility can open during POST only.

**CMOS, BIOS :** CMOS and BIOS work together. All the BIOS configuration settings are saved automatically inside the CMOS.



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# THANK'S

## NEXT CLASS (NETWORKING)