

The 'Boot Up' Process

IN THIS GUIDE

This guide describes the boot up process for a computer. Any breakdown in the process will prevent a PC from functioning. It is therefore useful to understand the process should you find yourself dealing with a 'boot' failure.

File: 02_004 Boot up process

Rev: 4.0 For Beginners

PDF version (334kb)

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American Megatrends Released: 12/03/2002 Homemicro ©
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A6712VMS V1.6 120302

AMD Athlon(tm) XP 2000+
Checking NVRAM..
524288KB OK
DRAM Clock= 333MHz, SDRAM CAS Latency= 2.5
DEL:Setup F11:Boot Menu F12:Network boot TAB:Logo
Auto-Detecting Pri Master...ATAPI CDROM
Auto-Detecting Pri Slave...ATAPI CDROM
Auto-Detecting Sec Master...IDE Hard Disk
Auto-Detecting Sec Slave...Not Detected
Pri Master: 1.04 LG DVD-ROM DRD-8120B
Pri Slave: 1.02 HL-DT-ST GCE-8400B
Sec Master: 17.07W17 WDC WD600JB-00CRA1
Ultra DMA Mode-5, S.M.A.R.T. Capable but Disabled
```

A typical boot up screen

In the screen shot above you can see the following:

1. The BIOS identity/ version is displayed (A6712VMS V1.6)
2. The CPU has been detected as an AMD XP2000+
3. Memory has been checked and 512MB/ 333MHz DDR is installed (524288÷1024=512)
4. The IDE slots have been checked and connection configuration determined
5. The Drive devices connected have been identified as a DVD, CD-RoM (GCE-8400B is known to be the CD part number) and a Hard Drive (WD600JB... is known to be the hard drive part number).

When you boot (start) your computer it performs a Power On Self Test or POST which is a test that is performed each time ensuring that it meets the necessary system requirements before booting up. Each time the computer boots up the computer must past the POST.

The following checks occur at the POST:

1. The Power Supply is checked to ensure it is turned on and that it releases its reset signal.
2. The CPU must exit the reset status mode and thereafter be able to execute instructions.
3. The BIOS must be readable.

4. The BIOS checksum must be valid, meaning that it must be readable.
5. The CMOS must be accessible for reading.
6. The CMOS checksum must be valid, meaning that it must be readable.
7. The CPU must be able to read all forms of memory such as the memory controller, memory bus, and memory module
8. The first 64KB of memory must be operational and have the capability to be read and written to and from, and capable of containing the POST code.
9. The I/O bus / controller must be accessible.
10. The I/O bus must be able to write / read from the video subsystem and be able to read all video RAM.

In most PCs the BIOS has 4 main functions:

POST - Test computer hardware insuring hardware is properly functioning before starting process of loading Operating System.

Bootstrap Loader - Process of locating the operating system. If capable Operating system located BIOS will pass the control to it.

BIOS - Software / Drivers which interfaces between the operating system and your hardware. When running DOS or Windows you are using complete BIOS support.

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