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Hardware

This section covers peripherals and component of PC excluding scanner.

1. Motherboard

The motherboard has been an integral part of most personal computers. A motherboard is a multi-layered printed circuit board. Copper circuit paths called traces that resemble a complicated roadmap carry signals and voltages across the motherboard. Layered fabrication techniques are used so that some layers of a board can carry data for the BIOS, processor and memory buses while other layers carry voltage and ground returns without the paths short-circuiting at intersections. The insulated layers are manufactured into one complete, complex sandwich. Chips and sockets are soldered onto the motherboard.

Troubleshooting

The following diagnostic steps rely on "beep codes" generated by the PC speaker. It is vital to make certain that the PC speaker is connected and is functional.

The motherboard's BIOS setting should also be kept on default – Since BIOS setting is inaccessible because the system is not able to boot, remove the battery on the motherboard momentarily (3 sec.) and place it back in. Or alternatively, use the "Clear CMOS" jumper on the motherboard.

1. Power off - Remove any/all video adapter - power back on.

Diagnosis**:** If boot failure is caused by the video adapter, then the system should generate 8 beeps.

Solution: Replace video adapter. Some motherboards don't generate this beep code. In such case, try another video adapter, preferably a PCI version because, there is only one AGP slot and several PCI slots. If the video failure is due to a faulty slot instead of the video card, another AGP video adapter would just fail again without producing any possible conclusive result.

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If no beep code has been produced then,

2. Power off - Remove any/all RAM modules – Power back on.

Diagnosis: If boot failure is caused by the memory subsystem of the motherboard or faulty RAM modules, then the system should generate continuous low-tone long beeps.

Solution: Using only one single module and place it in a different slot.

If this fails, try all other memory slots with each module. If different module solves the problem, then replace the memory module. (If this solves the problem, motherboard should still be replaced with the reason of bad memory slot(s)) If more than 1 memory module is being used and each works fine by itself, then you have a memory compatibility problem. Solution is to use only 1 module or find compatible modules.

If no beep code has been produced then,

3. Power off – Remove the CPU – Power back on.

Diagnosis**:** The system should generate the same kind of continuous beeps as described above. This failure indicates either a faulty CPU or a faulty CPU socket on the motherboard.

Solution: Try installing a known working CPU for testing purpose. If this solved the problem, replace the faulty CPU. If the motherboard still fails, replace the motherboard.

If still no beep code has been produced, replace the motherboard.

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2. Microprocessor

A microprocessor -- also known as a CPU or central processing unit -- is a complete computation engine that is fabricated on a single chip.

A microprocessor executes a collection of machine instructions that tell the processor what to do. Based on the instructions, a microprocessor does three basic things:

⇨ Using its ALU (Arithmetic/Logic Unit), a microprocessor can perform mathematical operations like addition, subtraction, multiplication and division. Modern microprocessors contain complete floating point processors that can perform extremely sophisticated operations on large floating point numbers.

⇨ A microprocessor can move data from one memory location to another.

⇨ A microprocessor can make decisions and jump to a new set of instructions based on those decisions.

The CPU does internal action faster than any external action. Such as numeric calculation or moving data form one internal area to another, is faster then loading data from memory or storing data to memory.

The external speed is called the system bus frequency and the internal speed is called the processor core frequency.

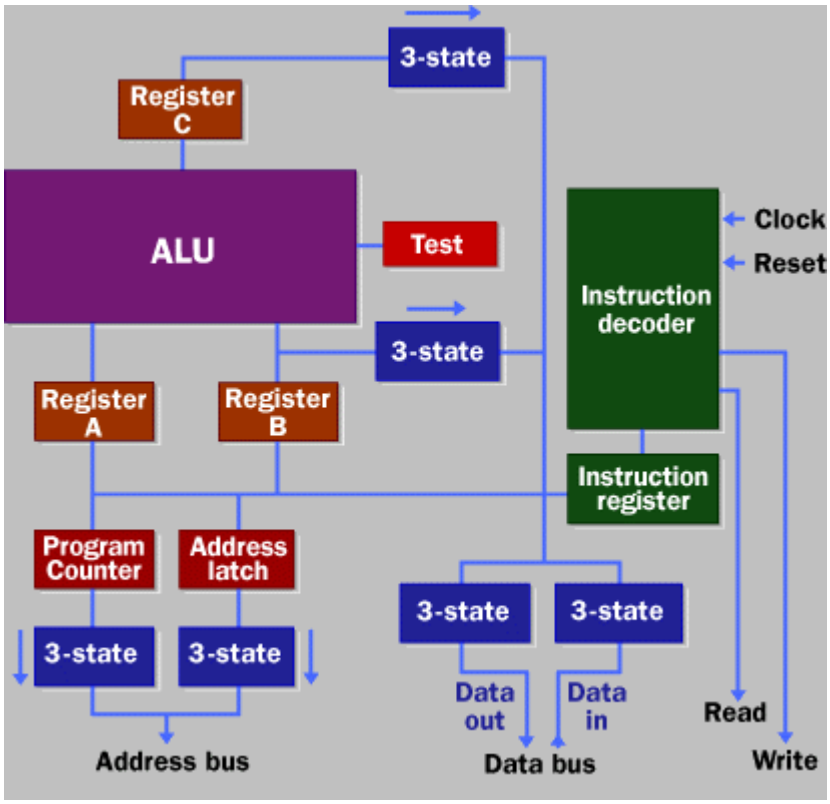

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Figure 1 Block diagram of Microprocessor

This microprocessor has:

⇨ An address bus (that may be 8, 16 or 32 bits wide) that sends an address to memory.
⇨ A data bus (that may be 8, 16 or 32 bits wide) that can send data to memory or receive data from memory.
⇨ An RD (read) and WR (write) line to tell the memory whether it wants to set or get the addressed location.
⇨ A clock line that lets a clock pulse sequence the processor.
⇨ A reset line that resets the program counter to zero (or whatever) and restarts execution.
The number of transistors available has a huge effect on the performance of a processor.

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3. Hard Disk Drive

The computer stores information that is permanent, on the Hard Disk platter. The Hard Disk is sealed in the Hard Disk Drive. The disc is made from aluminium with coating of magnetic material such as ferric oxide or chromium oxide. The Hard Disk Drive is very sensitive to shock and electrostatic discharge.

General

Data is stored on the surface of a platter in sectors and tracks. Tracks are concentric circles, and sectors are pie-shaped wedges on a track with magnetic marking and an ID number, Sectors have a sector header and an error correction code (ECC). In modern drives, sectors are numbered sequentially. A typical track is shown in yellow; a typical sector is shown in blue. A sector contains a fixed number of bytes –for example, 256 or 512. Either at the drive or the operating system level, sectors are often grouped together into clusters.

The process of low-level formatting a drive establishes the tracks and sectors on the platter. The starting and ending points of each sector are written onto the platter. This process prepares the drive to hold blocks of bytes. High-level formatting then writes the file-storage structures, like the file-allocation table, into the sectors. This process prepares the drive to hold files.

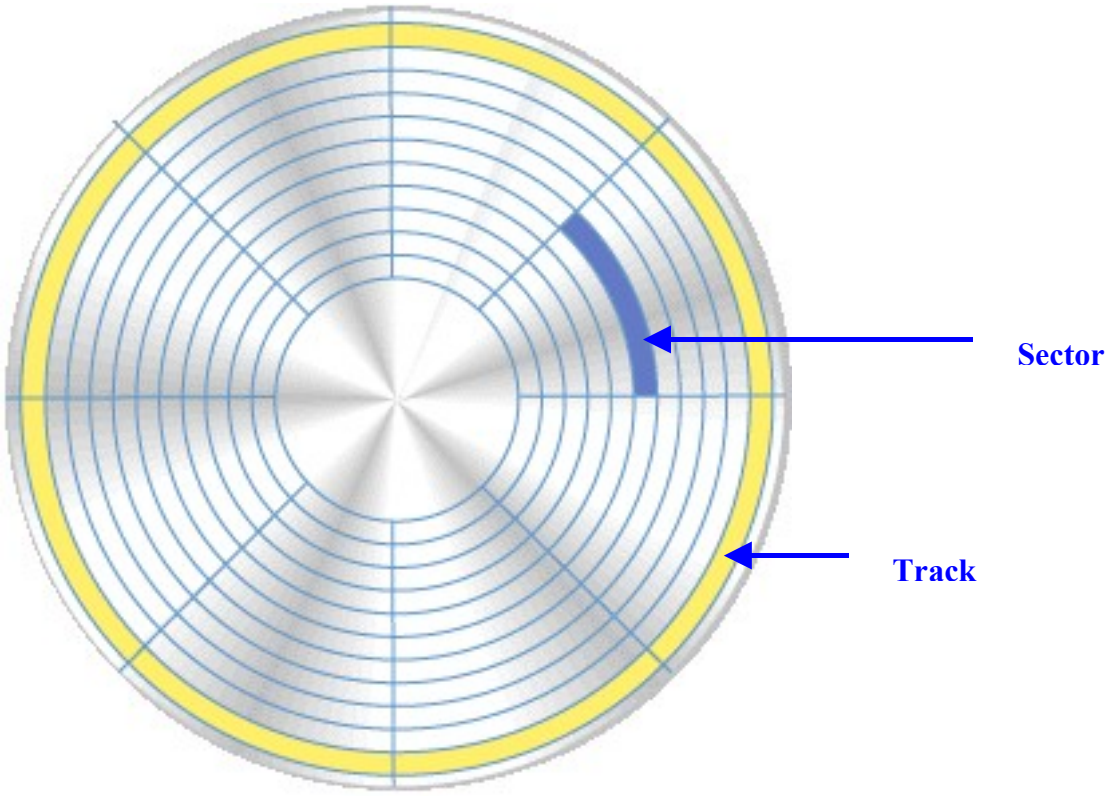

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Figure 2 Hard Disk

Cylinder:

A group of tracks with the same radius is called a cylinder.

Data addressing:

There are to methods for Drive's data addressing: CHS (cylinder-head-sector) and LBA (logical block address). CHS is used on most IDE drives, while LBA is used on SCSI and Enhanced IDE (EIDE) drives.

Cluster:

In a computer system, a cluster is a group of servers and other resources that act like a single system and enable high availability and, in some cases, load balancing and parallel processing. In personal computer storage technology, a cluster is the logical unit of file storage on a hard disk; it's managed by the computer's operating system. Any file stored on a hard disk takes up one or more clusters of storage. A file's clusters can be scattered among different locations on the hard disk.

Inside the Hard Disk

The Hard Disk is a very fragile device. The entire Hard Disk must be manufactured to a high degree of precision due to the extreme miniaturization of the components, and the importance of the Hard Disk's role in the PC. The main part of the disk is isolated from outside air to ensure that no contaminants get onto the platters, which could cause damage to the read/write heads.

1. The Disk- the platter is placed in side the base casting that is made of metal.
2. The Disk and Head assembly is protected by the thin metal cover.
3. Getting power from the DC input of 12V, the spindle motor gives spin to the disc and the head is place over the location by the actuator to write to or to read from the disc ad per request.
4. While the disc is rotating it generates shocks which can cause disk crash. So the base casting is mounted on the frame using shock mount.
5. The heads are mounted on the end of the actuator arm or E Block which actually performs the Write/Read operation. While writing or reading the heads does not touch the platter but it flies over the disc. This makes the disc of long life and the risk of wear out of the magnetic material, by which the disk is coated, is completely eliminated.

6. The signals of write/r3ead request are carried by the printed circuit cable to the actuator. The signals come from the I/O connector located on the printed circuit board inserted in to the expansion slot or on the main board.

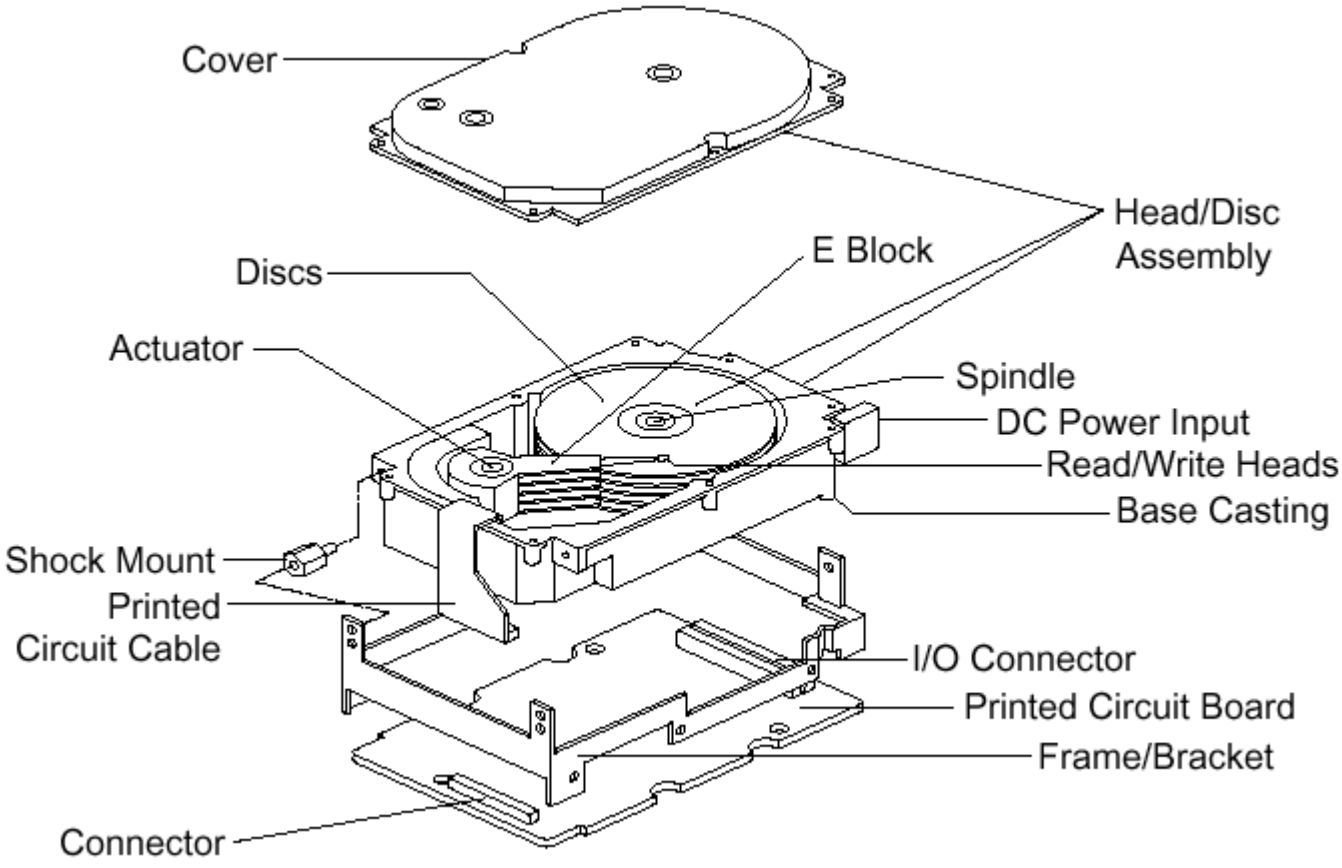

Figure 3 Hard Disk assemblies

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The figure below shows the component.

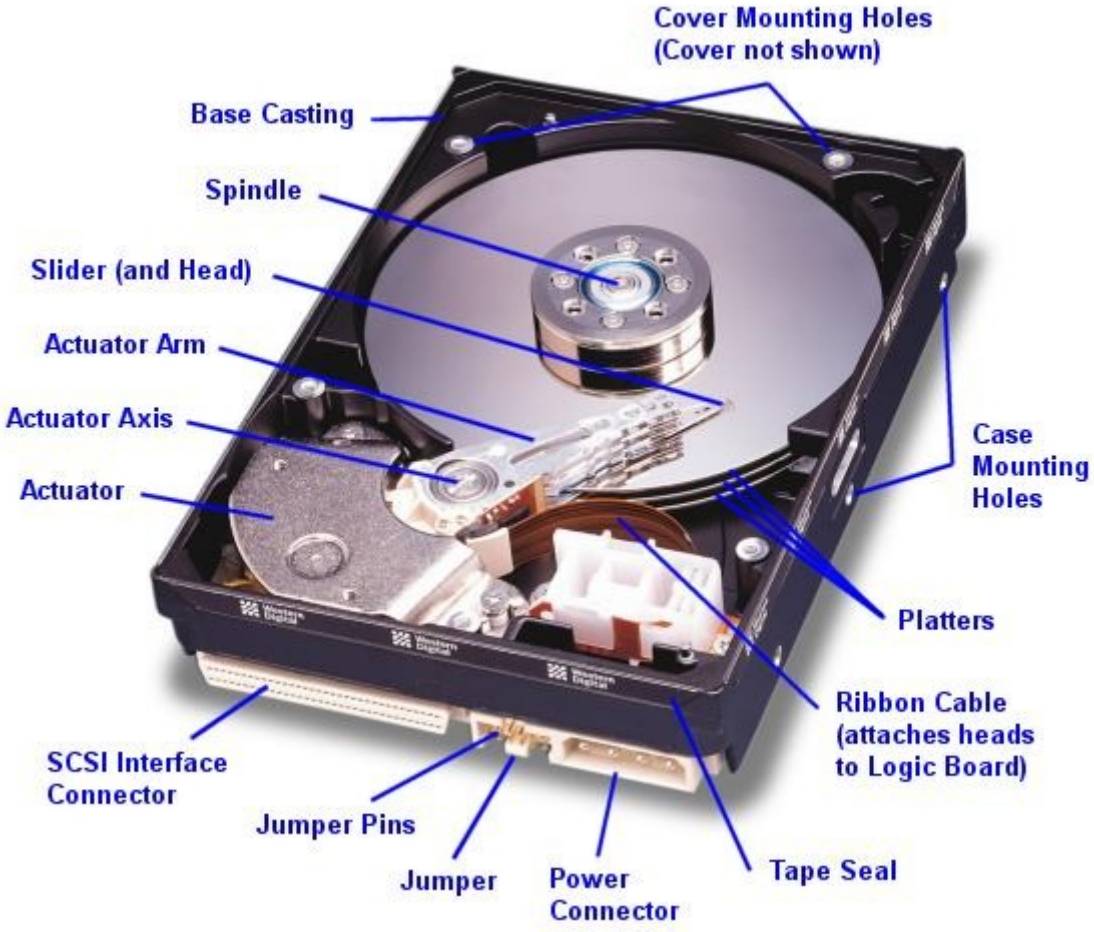

Figure 4 Inside Hard Disk Drive

Installation

1. Turn off the computer, unplug the external cables, and open computer cover. Mount the Hard Disc in the designated place in the computer.
2. Connect 40 pin interface cable and power cable. Make sure that the directions of the cables are correct and match the shape of the receptacles when connecting cables. Incorrect cable connection may damage the Hard Disk Drive.
3. Making Computer Detect the new Device.

Run the CMOS (BIOS) set-up program to detect the new Hard Disk Drive.

I. Go into CMOS screen during the booting of the computer.

II. Make the computer detect the Hard Disk.

A) If the computer supports IDE HDD Auto Detection, the Hard Disk Drive will automatically be detected.

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B) If the computer does not support auto detect, go into the User Define Mode and by referring written information on the Hard Disk Drive, set the correct settings for Cylinder, Head, and Sector and if some BIOS must be, set the HDD Mode to LBA.
C) Save the changed details and exit.

4. Partitioning and formatting the Drive.

There are two types of formatting: High Level and Low Level.

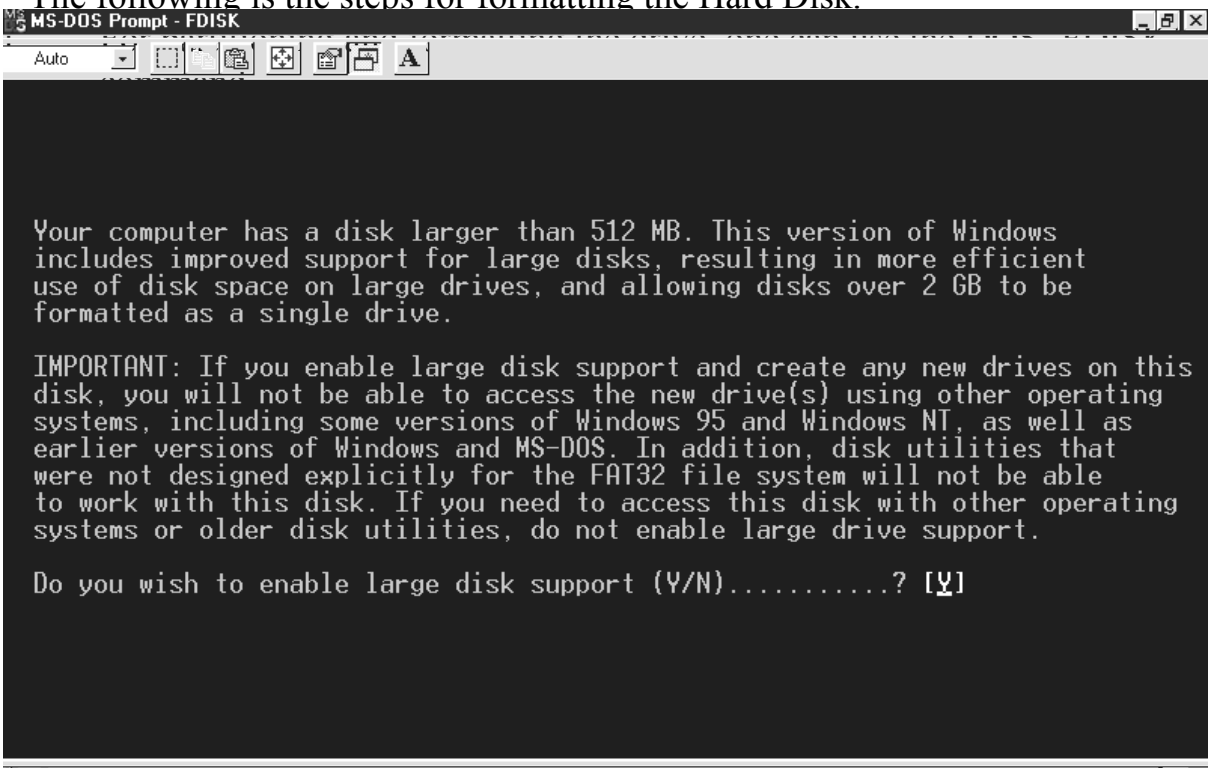
High Level Formatting

It is a formatting method that initializes portions of the hard disk and creates the file system structures on the disk, such as the master boot record and the file allocation tables. High-level formatting prepares drive partitions for the operating system by creating a root directory, from which all other subdirectories could be created, and creating a File Allocation Table (FAT), which keeps track of all information on the disks and all the relationships between different pieces of information.

Low Level Formatting

It is a formatting method that creates the tracks and sectors on a hard disk. Low-level formatting creates the physical format that dictates where data is stored on the disk. At this stage, the drive is being physically divided into tracks and sectors. Low-level formatting stays unchanged for the entire life of the drive unless the drive is re-formatted. A low-level format is also called a physical format.

The following is the steps for formatting the Hard Disk.



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III. On the next screen, there are four option displayed. Each of which is self explaining.

A) Create partitions:
FDISK allows creating a primary DOS partition or logical DOS volumes. To create a logical DOS volume you must of course first create an extended DOS partition, since the logical are contained within the extended partition.

B) Set active partition:
This makes the primary partition on boot disk active, so that it can boot.

C) Delete a partition:
This will delete partitions. This is the only way to change the size of a partition in FDISK: delete the old one and create a new one with the new size.

D) Display the partition information:
This will first show the primary and extended partitions and then ask to see the logical drives within the extended partition.

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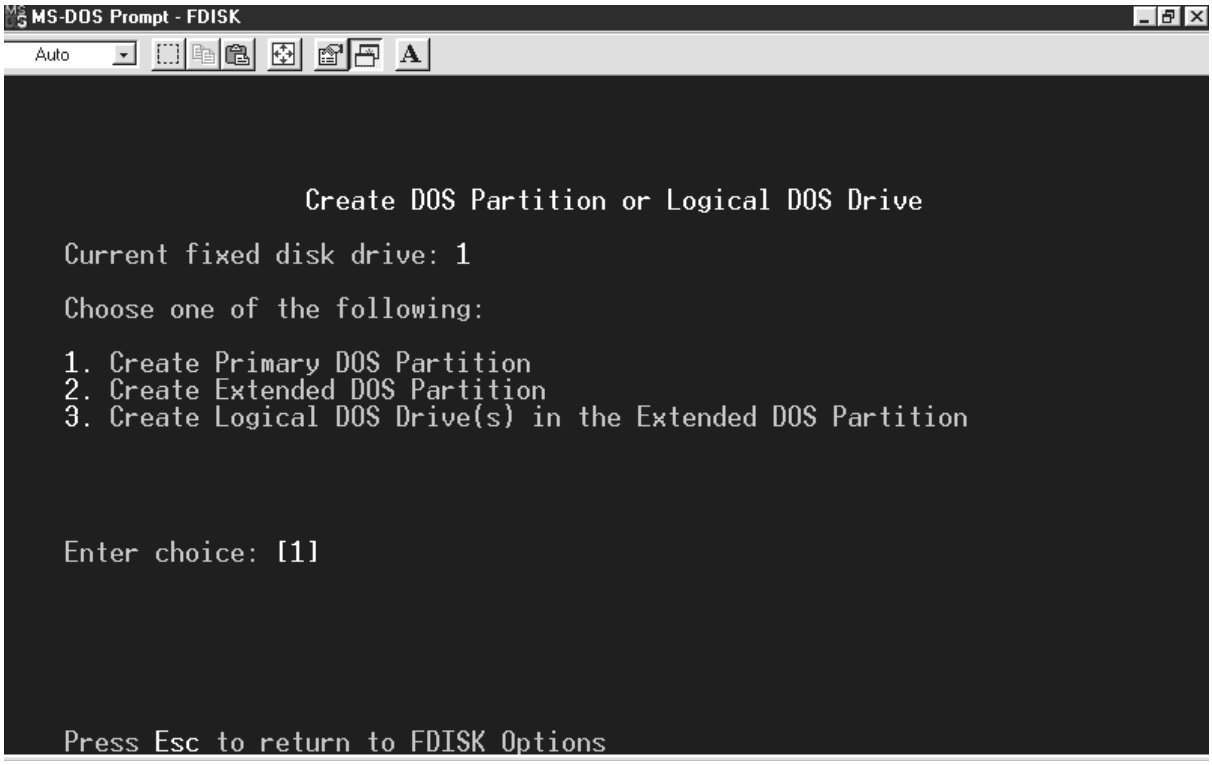

These steps will create partition on the Hard Disk and format it, but it takes lots of time. Formatting can also be done from windows by selecting the drive and selecting the 'format' command from file menu. There are many tools available that reduce the partitioning and formatting time.

Trouble shooting

1. **A message appears 'system boot failure, press any key when ready'**

⇨ Go the BIOS setup and auto detects the hard disk.
⇨ Load BIOS default settings.
⇨ Restart the computer and the computer will start normally.
⇨ If still message appears then check the both the power and data cable of hard disk.

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⇨Make a bootable floppy and boot the system and then transfer the system to the hard disk by typing ‘sys c:’ on the command prompt.

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4. Floppy Disk Drive

A soft, magnetic disk is called floppy because it flops if you wave it (at least, the 5¼-inch variety does). Unlike most hard disks, floppy disks (often called floppies or diskettes) are portable, because it can be removed from the disk drive. Disk drives for floppy disks are called floppy drives.

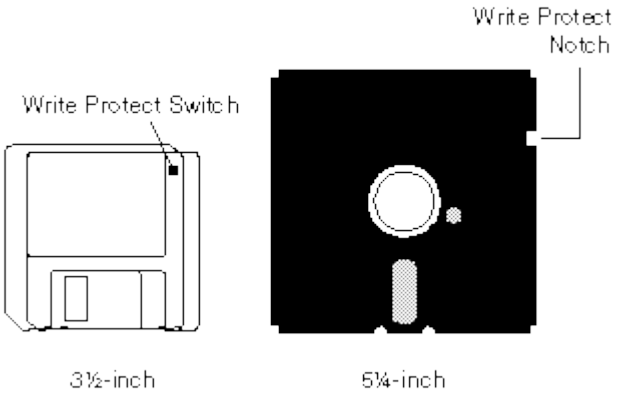

Figure 5 Floppy Disks

A floppy disk is made from a thin piece of plastic coated with a magnetic material on both sides. The tracks are arranged in concentric rings so that the software can jump from "file 1" to "file 19". The diskette spins like a record and the heads move to the correct track, providing what is known as direct access storage.

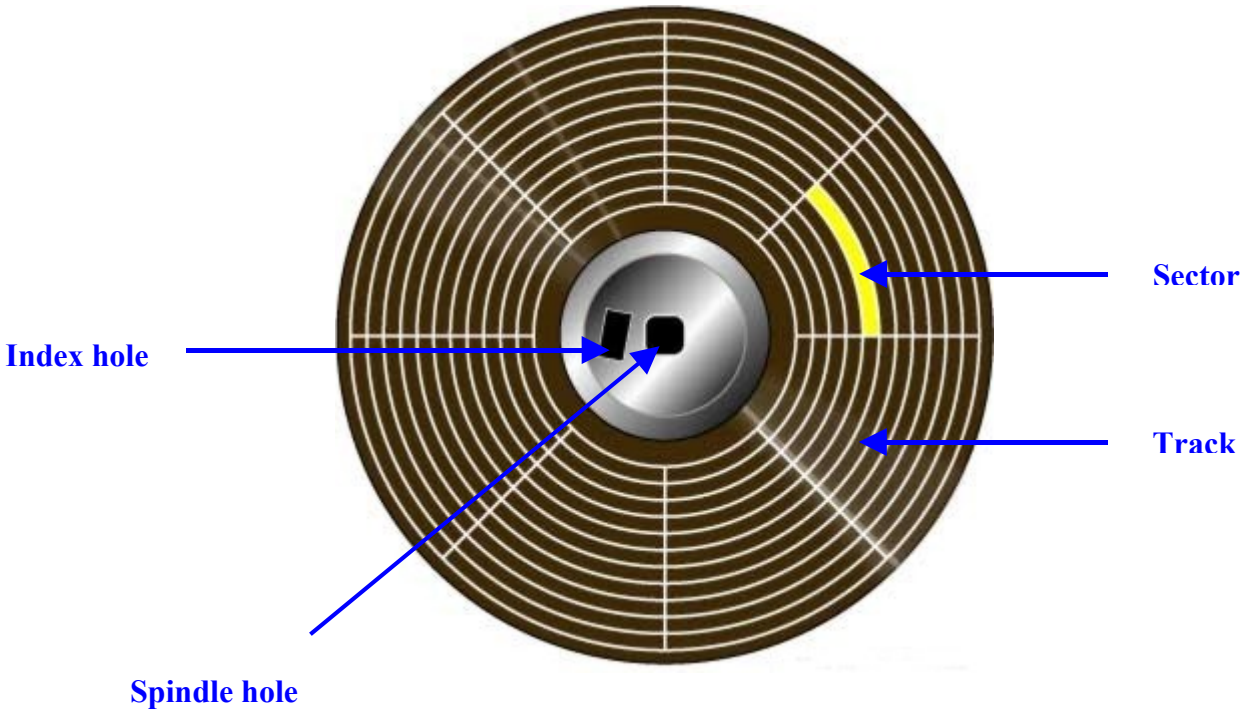

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Figure 6 Disk-storage in the floppy disk

5.CD Drive

General

A CD is a fairly simple piece of plastic. Most of a CD consists of an injection-molded piece of clear polycarbonate plastic. The CD Drive has the job of finding and reading the data stored as bumps on the CD. Considering how small the bumps are, the CD Drive is an exceptionally precise piece of equipment. The drive consists of three fundamental components:

A drive motor spins the disc. This drive motor is precisely controlled to rotate between 200 and 500 rpm depending on which track is being read.

A laser and a lens system focus in on and read the bumps.

A tracking mechanism moves the laser assembly so that the laser's beam can follow the spiral track. The tracking system has to be able to move the laser at micron resolutions.

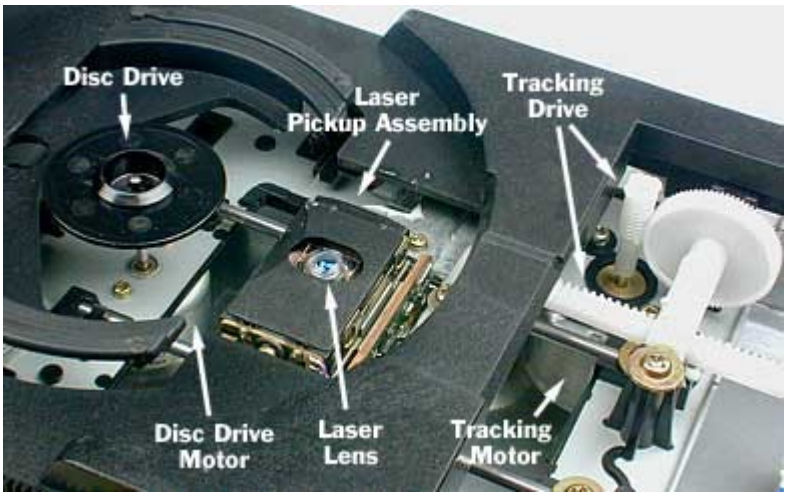

Figure 7 Inside the CD Drive

The fundamental job of the CD Drive is to focus the laser on the track of bumps.

Troubleshooting

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The types of problems found in a CD player can be classified into several categories:

⇨ Mechanical problems such as dirt, lack of lubrication, wear, worn-out rubber parts, dirty switches, or physical damage can all cause failure with CD-ROMS.

⇨ Electrical Adjustments; coarse tracking, fine tracking, focus, laser power.

⇨ Power problems such as lack of 12volt or 5 volt input, or failure of the power supply can be repaired.

⇨ Bad connections such as broken solder on the pins of components that are stressed like limit or interlock switches, or audio or power jacks, internal connectors that need to be cleaned and reseated, broken traces on flexible cables, or circuit board damage due to a fall all can cause failures of CD-ROMS.

⇨ Electrical Component Failure such as a power surge or a lightning strike may damage components in the power supply.

Some common problems are stated below.

1. CD-ROM is totally dead.

Possible causes:

1. Bad DC voltage connector from power supply.
2. Bad connections or faulty component in power supply or blown fuse.
3. Defective microcontroller.

2. CD-ROM is operational but there is no display or partial display.

Possible causes:

1. Burned out back-light bulb.
2. Bad connections to display panel (totally dead or erratic).
3. Bad solder connections on display panel.
4. Bad power supply.

3. CD-ROM ignores you.

Possible causes:

1. Bad connections to one or more buttons or sets of buttons.
2. Microcontroller failed to reset properly.
3. Missing/bad voltages from power supply.
4. Defective microcontroller or other logic.

4. Drawer does not open or close.

Possible causes:

1. Worn, stretched, oily, flabby, belt.
2. Dirty mechanism or gummed up lubrication.
3. Stripped gear or other mechanical damage.

4. Defective motor or bad connections to motor.
5. Bad drawer/eject button.
6. Missing/bad voltages from power supply.
7. Defective microcontroller or other logic

5. Drawer operation is erratic.

Possible causes:

1. Dirty senses switch contracts or bad connections.
2. Worn, stretched, oily, flabby, belt.
3. Dirty mechanism or gummed up lubrication.
4. Defective motor or bad connections to motor.
5. Stripped gear or other mechanical damage.
6. Missing/bad voltages from power supply.
7. Defective microcontroller or other logic.

6. Drawer does not close (or open) completely.

Possible causes:

1. Worn, stretched, oily, flabby, belt.
2. Dirty mechanism or gummed up lubrication.
3. Foreign object like toy, rock, or runaway disc blocking drawer.
4. Stripped gear or other mechanical damage.
5. Gear timing is messed up.

7. Spindle table loose or sticks to clamper upon eject.

Possible causes:

1. Set screw loosened or glue failed holding spindle to motor shaft.
2. Parts of spindle table broke.

8. Intermittent or erratic operation.

Possible causes:

1. Dirty, scratched, or defective disc.
2. Dirty lens.
3. Extended length discs too long for player.
4. Loading (mechanical) not completed reliably.
5. Bad connections including missing/erratic optical deck shield.
6. Cracks in ribbon cable to optical pickup.
7. Dirty drawer or limit switches.
8. Power supply or logic problems.
9. External interference.

9. CDROM drive overheats.

Possible causes:

1. Excessive ambient temperature - sauna or hot stereo components.
2. Failing/marginal part in power supply, logic, or optical pickup.

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10. Operation is poor or erratic when cold:

Possible causes:

1. Gummed up grease or dirt inhibiting movement until warm.
2. Condensation on optical components due to temperature change.
3. Bad connections or dirty contacts affected by temperature.

11. Disc is not recognized displaying 'disc', 'error', etc.

Possible causes:

1. Disc loaded upside-down.
2. Transportation lock engaged.
3. Dirty, scratched, or defective disc.
4. Dirty or damaged objective lens.
5. Loading (mechanical) not completed reliably.
6. Damaged lens suspension or damaged lens cover preventing free movement.
7. Dirt, gummed up lubrication, or damage in sled drive mechanism.
8. Dirty/defective limit switch or sensor.
9. Defective spindle motor.
10. Spindle table height incorrectly set.
11. Bad component in optical pickup.
12. Cracks in ribbon cable to optical pickup.
13. Need to adjust servo (or less likely, optical) alignment.
14. Faulty power supply, electronics, or control logic.
15. Bad connections including missing/erratic optical deck shield.
16. External interference.

12. **Disc spins in wrong direction or over speeds and is never recognized.**

Possible causes.

1. Disc loaded upside-down.
2. Dirty, scratched, or defective disc.
3. Dirty or damaged objective lens.
4. Tracking or CLV servo out of adjustment or faulty.
5. Bad component in optical pickup.
6. Microcontroller or control logic problems.
7. Bad connections or defective ribbon cable to optical pickup.

13. Pickup attempts to reset past inner track.

Possible causes:

1. Dirty or defective limit switch, bad connections to it, or its electronics.
2. Broken parts preventing limit switch from being activated.
3. Tracking servo out of adjustment or faulty.
4. Microcontroller or logic problems.

14.Seek operations take too long or fail to complete.

Possible causes:

1. Dirty, scratched, or defective disc.
2. Transportation lock engaged.
3. Dirty or damaged objective lens, suspension, obstruction, etc.
4. Tracking or CLV servo out of adjustment or faulty.
5. Mechanical problems with sled movement.
6. Faulty sled motor or drive IC.
7. Faulty control logic.
8. Bad flex cable to optical pickup.

15. Search, seek, or play starts correctly, then loses time or position.

Possible causes:

1. Dirty, scratched, or defective disc.
2. Dirty or damaged objective lens, suspension, obstruction, etc.
3. Tracking or PLL servo out of adjustment or faulty.
4. Stuck button.
5. Defective sled motor drive IC.
6. Faulty control logic.

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16.Playback gets stuck (rapid repeat).

Possible causes:

1. Dirty, scratched, or defective disc.
2. Dirty or damaged objective lens, suspension, obstruction, etc.
3. Dirt, gummed up lubrication, or damage in sled drive mechanism.
4. Transportation lock engaged.
5. Need for servo alignment.

17.Player gets stuck at approximately same time on multiple discs.

Possible causes:

1. Dirt, gummed up lubrication, or damage in sled drive mechanism.
2. Sled reaching mechanical stop with extended length (>74 minute) disc.
3. Transportation lock engaged.
4. Need for servo alignment.
5. Defective spindle motor.

18.Various tracking problems on portions of discs:

Possible causes:

1. Dirty, scratched, or defective disc.
2. Faulty spindle motor.
3. Misalignment of spindle table and sled track.
4. Need for CLV adjustment.

19.Repetitive noise at disc rotation rate.

Possible causes:

1. Dirty, scratched, or defective (possibly warped) disc.
2. Dirty or damaged objective lens, suspension, obstruction, etc.
3. Loose spindle or foreign material on spindle table.
4. Disc not firmly clamped.
5. Bent spindle.
6. Excessive spindle run out due to worn bearing.
7. Need for servo alignment.
8. Weak laser or other component in optical pickup.

20. Audio muting, noise, or distortion.

Possible causes:

1. Dirty contacts on RCA jacks on CD player or amp.
2. Bad connections to RCA jacks.
3. Dirty/defective muting relay contacts.
4. Defective components in the analog circuitry (final filter, muting, amp).
5. Faulty power supply (for audio circuits if used).
6. Dirty controls (probably on amp unless problem is with the headphones).

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6.Power supply

In a personal computer (PC), the power supply is the metal box usually found in a corner of the case. The power supply is visible from the back of many systems because it contains the power-cord receptacle and the cooling fan.

Power supplies, often referred to as "switching power supplies", use switcher technology to convert the AC input to lower DC voltages. The typical voltages supplied are:

- ⇨ 3.3 volts
- ⇨ 5 volts
- ⇨ 12 volts

Power Supply Problems

The PC power supply is probably the most failure-prone item in a personal computer. It heats and cools each time it is used and receives the first in-rush of AC current when the PC is switched on. Typically, a stalled cooling fan is a predictor of a power supply failure due to subsequent overheated components. All devices in a PC receive their DC power via the power supply.

A typical failure of a PC power supply is often noticed as a burning smell just before the computer shuts down. Another problem could be the failure of the vital cooling fan, which allows components in the power supply to overheat. Failure symptoms include random rebooting or failure in Windows for no apparent reason.

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7. Modem

General

A modem is communication device which exchange information via internet. It is either connected by telephones line or leased lines.

Modem is abbreviation of 'Modulator – Demodulator'. It modulates the signal goes from the computer and demodulates the signal coming to the computer. The modem may be internal or external. An internal modem is inserted into the PCI slot which gets power from the computer and the external modem is just like a small box placed on the desk and has its own power cord.

Installation

Installation of external modem:
Before installing the modem turn off the computer.

1. If desired, connect the cable from telephone to the back of the modem.
2. Connect the telephone line to the back of the modem. Then connect the telephone line to the telephone jack on the wall.
3. Connect the serial cable to the back of the modem. Then connect the serial cable to a serial port at the back of the computer.
4. Connect the power cable to the back of the modem then plug the power cable into an electrical outlet.

Installation of internal modem:

1. Turn off the computer and open the cover of system case.
2. Find out the slot where the card will be installed and insert the card into it.
3. The computer will automatically detect the modem. If it doesn't, driver should be manually installed. It is depends on the needs of the user, choosing between an internal and external modem.

Trouble shooting

1. The modem performing poorly.

⇨ The driver for the modem may be a wrong one for that type.
⇨ Reinstall the driver. It will certainly eliminate the problem.

2. **The modem can't establish the connection.**

⇨ Check the username and password.
⇨ Make sure that the telephone cable is connected properly.
⇨ If the pulse dialling is not supporting then change it with tone dialling.

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⇨ Uncheck the check box against the ‘wait for dial tone.’

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3. The modem is operating very slowly.

⇨ It may be possible that there is a traffic at the server-end and it can't response the request made by the user.

⇨ The quality of the line may be poor.

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8. LAN CARD

General

LAN card – Network Interface Card physically connects a computer to a network and controls the flow of information between the computers and the network.

Installation

Before installing a NIC, turn off the computer, unplug the power cable and remove the cover form the computer case. NICs can be of different configuration, such as, speed, connection port.

1. Remove the cover for the expansion slot where the card will be installed. The cover is usually held in place by small screw.
2. Place the network interface card in the expansion slot. Press down firmly and evenly across the top of the card until it is securely inserted.
3. Secure the network interface card to the computer case using a small screw. Then replace the cover on the computer case.
4. Plug the network cable into the network interface card at the back of the computer.
5. Finally, install the driver for the card.

Cable

Two most popular types of network cable are coaxial and twisted pair. Coaxial cable is similar to television cable. It is inexpensive and easy to work with. Twisted pair cable is similar to telephone cable and is less expensive then coaxial cable. The coax- short for coaxial, uses the BNC and the twisted pair uses the RJ-45 connector.

The network interface card must be compatible with the type of cable. Some network cards have two ports for both cables.

Troubleshooting

1. The network is not accessed.

⇨ Check the software installed for the card into the device manager by opening the property page of the ‘My computer’. Reinstall the driver.

⇨ Press ‘F5’ key to know the system that something is changed.

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2. There are no any computers in the 'Network neighbourhood list'.

⇨ Double click the 'Network neighbourhood' icon on the desktop.
⇨ Check the resulting list for computer.
⇨ Click the 'Entire network' icon.
⇨ Check the workgroup and the network component installed.
⇨ Check the protocol and client for network.
⇨ The cable may be not connected properly.
⇨ Restart the computer, it may solve the problem.

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9.Keyboard

General

The keyboard is most useful part of the computer. It can not be thought the computer without the keyboard. It is used in most application as an input device. The keyboard is an integral part of the computer.
Below is a picture of a typical keyboard.

Figure 8 Key board

If the keyboard is not connected, it will generate an error at the start-up. So plug in the keyboard connector properly.
Be sure that the pins in the connector to the computer should not bend if it is a PS/2 connector.

Troubleshooting

1. "Keyboard Not Found" Message
⇨The keyboard is not plugged into the computer securely. Unplug it and plug it back in and the problem should go away.
2. Key Is Stuck
⇨If a key does not work or is stuck in the down position, try to remove it with a CPU "chip puller" tool. These simple "L" shaped tools are great at pulling out keys. Once the stuck key pulled out; try to stretch the spring to "reanimate" its action.

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3. Computer Isn't Taking Inputs From Keyboard

⇨ Ensure that the keyboard is plugged into the keyboard jack and not into the mouse jack. If the keyboard was unplugged, plug it back in and reboot the computer.

⇨ If the keyboard still doesn't work on boot-up, power down the computer and try to borrow a friend's known-good keyboard for troubleshooting. Plug the new keyboard up and boot up the computer. If the new keyboard works, the old keyboard is bad and needs to be replaced.

⇨ If the known-good keyboard doesn't work, check the BIOS to make sure it sees the keyboard. It should say, "Installed." If the BIOS recognizes the keyboard, then the problem must be in the keyboard port.

4. Keyboard is plugged into Mouse Port

⇨ Many mice and keyboards today use a PS/2 connector. If the keyboard is plugged into the mouse port (or vice versa), follow the below steps.

⇨ Shut down the computer and plug the keyboard into the keyboard port. The keyboard port is usually marked with a "keyboard" symbol. Plug the mouse into the mouse port (usually marked with a mouse symbol).

⇨ Reboot the computer; the keyboard should work now. If keyboard doesn't work, check the BIOS to make sure the BIOS recognizes the keyboard.

⇨ If the BIOS recognizes the keyboard but it still doesn't work, certainly the problem with the keyboard port

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10.Mouse

General

A mouse is pointing device which selects and moves the item on the screen. The main goal of any mouse is to translate the motion of the hand into signals that the computer can use. It should not be connected in the same looking keyboard connector.

Figure 9 A typical mouse

Troubleshooting

1. **The pointer on the screen is not moved as the mouse is moved.**

⇨ Clean up the mouse ball.
⇨ Check the cable is connected properly and not connected in the keyboard port.
⇨ Reboot the system.
⇨ Open the device manager and check whether the driver for mouse is missing. Reinstall the driver.
⇨ Try this mouse on a working system.
⇨ Try the mouse from working system.

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11.Monitor

General

A monitor is an output device which displays what's going on in the system.
There are many types of monitors such as CRT, LCD, PLASMA PANEL, and LED. Each accommodates different technology.

Installation

1. Most monitors come with a tilt-and-swivel base that lets you adjust the angle of the screen and reduce glare from overhead lighting. If necessary attach the base to the monitor.
2. If necessary, connect the monitor cable to the back of the monitor. The monitor cable is permanently attached on some monitors.
3. If necessary, connect the power cable to the back of the monitor, the power cable is permanently attached on some monitors.
4. Connect the monitor cable to the monitor port at the back of the computer. The monitor port is usually located on the video card.

Troubleshooting

1. The monitor is not working properly.
⇨ Check both the power and data cable connected properly.
⇨ Change the resolution and colours.
⇨ Check the refresh rate of the display adapter.
2. The screen is discoloured or it can't display the text's\image's real colour.
⇨ There is a pin or two of the data cable may be bent.
⇨ One of the primary colours may be missing. Use the control button on the monitor.
3. In some area of the monitor, the colours are spread.
⇨ There must be any magnetic field around the monitor. Remove the magnetic device which causes the problem. it may be speaker, radio, etc.
⇨ Use the degauss function from the controls of monitor.
4. There is no display at all.
⇨ Check the all cables related to monitor.
⇨ Check the monitor is on.

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⇨ Check whether the system gets the power.
⇨ Check the display adapter and press it.
⇨ Check the Li battery on the motherboard.
⇨ Check the CPU-Fan is revolting. Some time this also caused the problem.

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Software

The software is a program that defines how the hardware resources are used. It is just a set of instruction. In this section, the installation of the software is described.

Installation of Software

Most of the softwares are use the setup.exe file for installation which carries the list of the files to be installed and that files themselves. After installation the software is listed in the program file in the start menu of Windows operating system and is registered to the Windows with its libraries. These library files are listed in the registry of the OS.

Installing Driver for Hardware

Whenever the OS finds new hardware, it finds the software for it; if it can't then it asks to the user for softwares. Generally these softwares are on the CDs or Floppy. CD has a file called auto run which automatically open the 'Installshield' wizard of the Windows. Manually installation of the software for hardware is also allowed.

Uninstalling Software

It is better to remove the items that are no longer needed. If it is a file or folder then it can be deleted but the software needs to be uninstalled from the system.
To uninstall software:
⇨ Click on the start button on the task bar.
⇨ Select 'Settings', 'Control Panel' and a window will open having many different icons and text beneath it.
⇨ Select 'Add/Remove Program' icon.
⇨ On the 'Install/Uninstall' tab there is a list of installed software. Select the software to be uninstalled. And press 'Add/Remove' button.
⇨ And let the system do its work.

Removing file from the registry

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It happens sometime that an error appears automatically stating that the 'filename. Extension' is not found. To remove this error the file should be deleted from the registry. The steps are:

Click start button and choose 'Run'. A small window will appear having a text box and three buttons.

Write 'RegEdit'. This will open registry editor.

⇨ Select 'find' from edit menu or press 'Ctrl+F5' to invoke find window.

⇨ Write 'filename. Extension' and press enter. Follow this step until the all files are removed.

Disk Cleanup

There are so many unnecessary files and folders occupy some disk space. It can affect the performance of the system. So it is better to remove it. To clean these files and folders follow below procedure:

⇨ Open 'My Computer'. There are local and removable drives displayed.

⇨ Select the any local drive and go to the property page.

⇨ On the 'General' tab there is button having caption 'Disk cleanup', just click on it.

⇨ After that click on only 'Ok' and 'Yes'.

⇨ System will get little bit but important space.

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BIOS

General

On x86-based computers, the set of essential software routines that test hardware at start-up, start the operating system, and support the transfer of data among hardware devices. The BIOS is stored in read-only memory (ROM) so that it can be executed when you turn on the computer. Although critical to performance, the BIOS is usually invisible to computer users. The information about hardware, connected to the computer, is stored in the battery powered chip called CMOS.
The following is the trouble shooting for BIOS.

1. How to clear CMOS?
Solution:

If the board has a clear CMOS jumper then clear the CMOS using this jumper. If board doesn't have such jumper then takes off the on-board battery to leak voltage to clear CMOS. The steps are explained below.

1. Turn off power.
2. Disconnect the power cord from motherboard.
3. Take out the battery gently and put it aside for about 10 minutes.
4. Re-install the battery to the battery holder.
5. Connect the power cord to motherboard again and turn on the power.
6. Press Del to enter BIOS and load Fail-Safe Defaults.
7. Save the changes and reboot the system.

An alternative way to these steps is,
Turn on the power and press 'F' and 'J' simultaneously. This will clear the CMOS.

Some settings are hidden, press "Ctrl+F1" to search the advanced option window.

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Virus

General

A Computer virus is a destructive program that can crash the system. There are three most common types of destructive computer programs are the Trojan horse, Logic bomb and the worm. The virus may be a memory resident waiting to be activated. Virus can corrupt the boot record and makes any application to malfunctioning. Some viruses affect the .exe and .com files.

The virus can be spread by reading files from infected floppy or downloading files from the internet. Once activated, it will start to infect other system files and application files and the important data may be lost. Some viruses target some specific application and affects overall performance of the system.

Virus Removing tools

The virus can be cleaned from the system by using some virus removing tools.

These tools can remove lots of viruses. It is a just another application, occupying some disk space and monitoring the system all the time system is on. Some tools monitor the e-mail and downloaded file from the internet, this called firewall.

The virus removing programs have special instruction written in some script which checks the entire file and finds some danger words such as ‘Format’, ‘Delete’.

Removing virus

Virus removing process is easiest one. The process is described below.

⇨ Open the virus removing application.

⇨ Finds out the system scan and begin the scan.

It also allows checking individual file, folder and drive.

⇨ Right click on the file, folder or drive to be checked.

⇨ Click on the ‘Scan with VirusRemove’. And the scanning is started.

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Installing Operating System

Every computer has its own operating system to work. No one system can work without any OS excepting those in Owen, AC etc. The computer application needs to work in certain environment. The OS provides this environment and allow the application program to do its work.

There are many OSs available such as Windows, OS/2, Macintosh, DOS and the most secure Linux. The Windows OS is more user-friendly than other. It is used widely in particularly in India. But now the Linux wind is blowing.

The OS is too needed to install in the system just as any other software but is takes more time and employing different method. Let's have a look at the installation of Windows like OS.

⇨The first thing required in OS installation that the hard disk should be formatted. Some OSs cover this in its installation. The steps are:

⇨If the OS can do disk formatting then insert the media into the CD-drive and boot the system on the CD. When the system is reset there will be three option, they are:

1. Start computer with CD-Drive support.
2. Start computer without CD-drive supports.
3. View the Help file.

⇨Select first choice and press enter. The command prompt is displayed with letter A:. Open the CD by changing the drive, generally D:. Then the formatting process will start asking the size of each partition. When this over the Installation will start and ask for some information from the user such as Name, Computer Name, Work Group and for the authentication, the serial no. of the pack displayed on the package.

⇨Now, its times to install necessary driver for hardware attached to the system. Every mother board has its own driver package on CD. Run this package.

⇨Install necessary softwares.

⇨When the Windows will start, the most familiar, desktop will be displayed showing some icons. The desktop is highly customized.

⇨If the OS doesn't format the hard disk automatically, formatting has to be done from command prompt or using some formatting tools.

⇨The all Window like OS employee same installation process, having different installation time.

⇨The most known Windows OSs are Window95, Window98, Window2000, WindowXP, Window2003 server and latest Longhorn.

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General troubleshooting

1. No display and no beeps are heard

⇨ The first thing to check is the power supply and make sure the power cable is securely plugged in. Check the power LED of the motherboard. If this LED lights and the drives spin up then the power supply will usually be good.

⇨ Next, inspect the CPU. A loose or missing or wrong voltage type CPU will cause the motherboard not to function.

⇨ If the HDD cable supports Ultra DMA 66/100, please make sure the blue connector was connected to motherboard's IDE port.

⇨ Next, eliminate the possibility of interference by a bad or improperly set up I/O card by removing all card except the video card. The system should at least power up and wait for a drive time-out. Insert the cards back into system one at a time until the problem happens again. When the system does nothing, the problem will be the last I/O card that was put in.

2. No display and there is one long beep to continue.

⇨ Try reseating the memory module first. If the error still occurs, replace the memory module with known good one.

3. No display and there are one long and three short beeps to continue.

⇨ Try reseating the video card first. If the error still occurs, replace the video card with known good one.

4. CMOS checksum error message is shown on screen.

⇨ Check the CMOS jumper whether it is set as normal operation. If yes, the error may have been caused by a weak battery. Check the battery and replace if necessary.

5. Floppy disk(s) fail (40) message is shown on screen and Floppy disk light stays on.

⇨ The orientation of Floppy cable was not connected correctly. Please re-connect it and make sure the pin 1 on the Floppy disk corresponds with pin 1 on the Floppy cable connector.

6. Does not boot from hard disk drive, can be booted from floppy disk drive.

⇨ Check cable running from disk to disk connector. Make sure both ends are securely plugged in.

⇨ Check the drive type in the Standard CMOS Setup. The Auto mode is recommended.

7. How to recover corrupt BIOS?

⇨ Turn on any motherboard with AWARD BIOS.

⇨ Replace the original BIOS ROM with the bad one with screw drive.

⇨ Type AWDFLASH FILENAME.BIN then press Enter key. Where filename. Bin is BIOS file of the motherboard and follow the prompts to upgrade the BIOS.

⇨ After the BIOS is upgraded; re-install the BIOS ROM to the motherboard.

8. 'The system is out of frequency'

⇨ The display settings may be changed.

⇨ Reset the computer holding the F8 key.

⇨ Select 'Safe Mode' from displayed menu.

⇨ Open the property page of the desktop by clicking right mouse button or pressing 'Shift + F10'.

⇨ Go to the setting tab and change the colors to 16 color and screen are to 640*480.

⇨ Reboot the system in normal mode.

⇨ If necessary, change the refresh rate of the display adapter.

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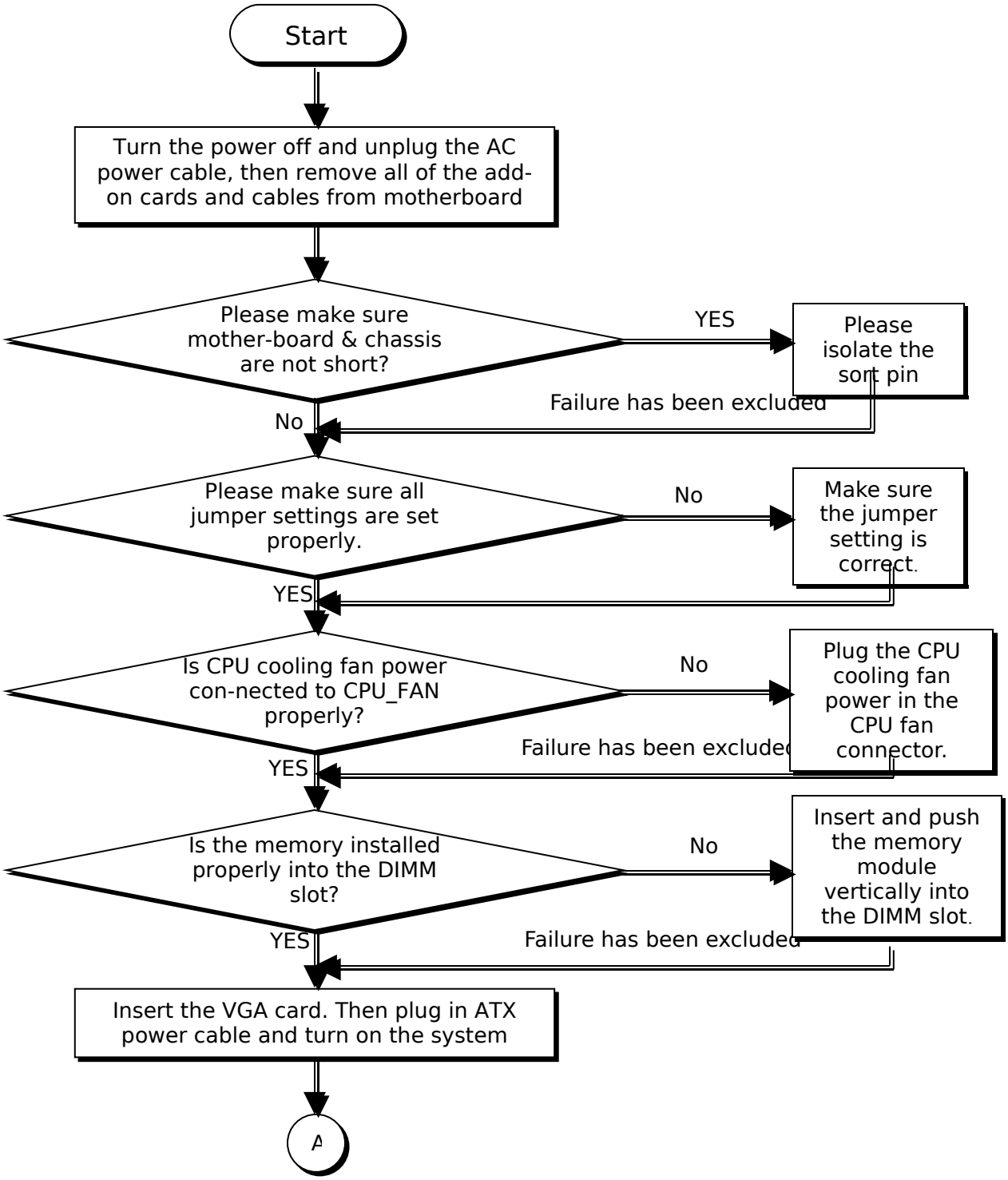
Start-up Troubleshooting

The following flow chart troubleshoots the start-up problems.



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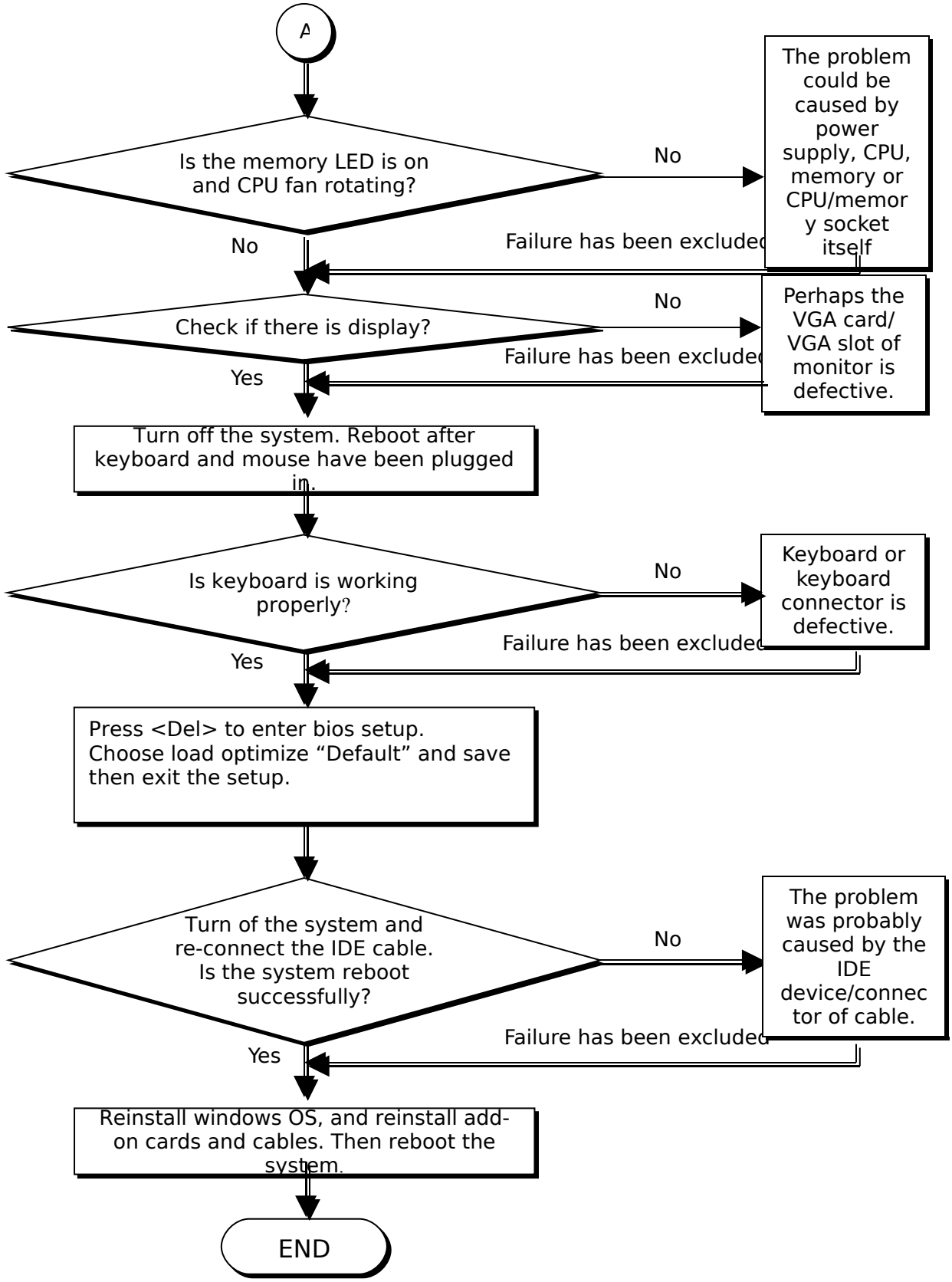

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If this doesn’t solve the problem please contact the hardware vender.

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Preventive Maintenance and Problem Prevention

⇨ Always make sure to back up the data or files. The more important the file, the more often it should be backed up, i.e., saved to the network H or P drives. It is much safer to back up to a network drive than a floppy. Floppies are only intended for temporary data storage. Items saved to a network drive can be restored; because of back-up systems already place. Floppies, when they go bad, cannot.

⇨ Don't hit, knock, or disturb the CPU (central processing unit or main box), especially when it is turned on. Remember, the hard-drive disk inside is spinning at thousands of rpm. When jiggled, data can be damaged or lost.

⇨ Never delete a file unless you created it or you know what the file does. The rule of thumb is "if you don't know what it does, keep it."

⇨ Always use the "Shut Down" command in the start menu to turn your PC off.

⇨ Always wait; at least, ten seconds before turn the PC back on again.

Shorter cables are better whether they are printer, monitor, mouse, keyboard, or network cables. The farther the signal has to go, the more likely the signal will be degraded (get weaker). Stronger is better.

⇨ Peripherals, like printers and scanners, should be the first items turned on and the last items turned off.

⇨ Don't cover up or place objects on top of the monitor or the PC. They have vents that allow air circulation and cooling. If blocked, the PC or monitor may overheat. This may cause damage to the PC or monitor.

⇨ Don't set up the PC any where that gets direct sunlight. This could cause the PC to overheat which can damage it.

⇨ Do not clean the monitor while it is turned on. Turn off the monitor and wait five minutes before you clean it. Otherwise, the static electricity build-up may damage one of the delicate components inside.

⇨ When plugging in or unplugging cables, always make sure that the CPU is turned off.

⇨ Be patient. The computer may appear to be frozen, but it may be processing. Some days, especially if network traffic is high, processes can run more slowly.

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