Unit-5

Power On Self-Test

When power is turned on, POST (Power-On Self-Test) is the diagnostic testing sequence that a computer's basic input/output system (or "starting program") runs to determine if the computer keyboard, random access memory, disk drives, and other hardware are working correctly.

If the necessary hardware is detected and found to be operating properly, the computer begins to boot. If the hardware is not detected or is found not to be operating properly, the BIOS issues an error message which may be text on the display screen and/or a series of coded beeps, depending on the nature of the problem. Since POST runs before the computer's video card is activated, it may not be possible to progress to the display screen. The pattern of beeps may be a variable numbers of short beeps or a mixture of long and short beeps, depending on what type of BIOS is installed.

The patterns of beeps contain messages about the nature of the problem detected. For example, if the keyboard is not detected, a particular pattern of beeps will inform you of that fact. An error found in the POST is usually fatal (that is, it causes current program to stop running) and will halt the boot process, since the hardware checked is absolutely essential for the computer's functions.

IPL (Initial Program Load)

IPL is the first initial step of loading an operating system on a computer. A operating system contains many megabytes of code that is customized by each installation, requiring some time to load the code into the memory.

- IPL is booting the system
- It is the act of loading a copy of the operating system from disk into the processor’s real storage and executing it.

Troubleshooting

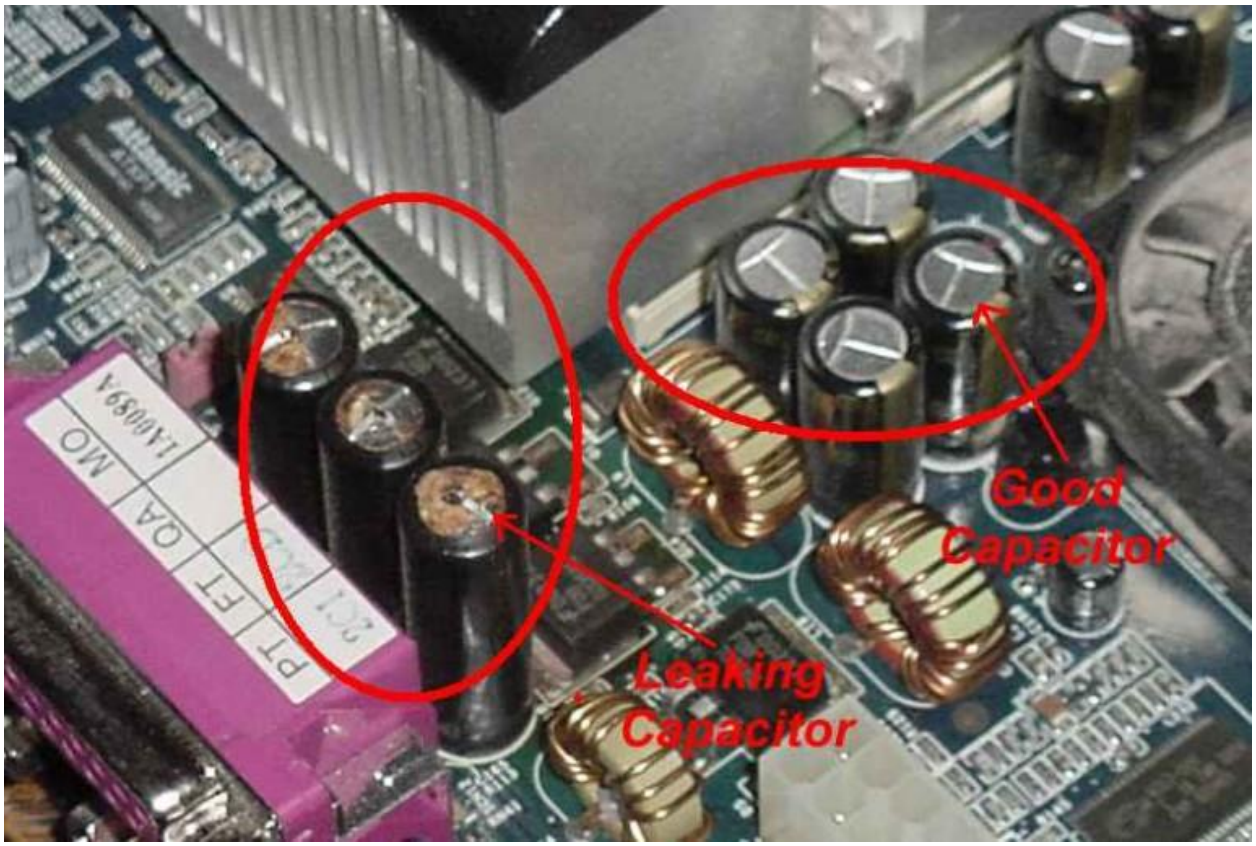
Problem Sign of Motherboard

- Motherboard doesn't recognize/show peripherals plugged in
- Peripherals will stop working for a few seconds or more
- Slow boot ups could indicate that your motherboard is going bad, though it could be other components as well.
- Computer won't recognize flash drives or monitor sometimes shows strange lines.
- Motherboard doesn't POST (Power on Self-Test).
- Burning smell or burn marks anywhere on the motherboard itself.
- Bulging or Leaking capacitors

Motherboard Troubleshooting

- Is the motherboard receiving power? Check the power supply to see if the fan is turning. If the CPU or motherboard has a fan, see if it is turning. Check voltages going from the power supply to the motherboard.
- Check the BIOS/UEFI settings for accuracy.
- Check for overheating. Power down the computer and allow the computer to cool. Power on the computer with the cover off.
- Check the motherboard for **distended capacitors**. These are small components that might appear to be bulging (expanded). If sighted, replace the motherboard as soon as possible.
- Reseat the CPU, adapters, and memory chips.
- Remove unnecessary adapters and devices and boot the computer.
- Plug the computer into a different power outlet and circuit, if possible.
- Check the CMOS battery.

- With a motherboard that has diagnostic LEDs, check the output for any error code. Refer to the motherboard documentation or online documentation for the problem and possible solution.



Keyboard

Keyboard Doesn't Do Anything

Troubleshooting a keyboard that doesn't work at all often tends to be an easy fix. Make sure the keyboard is plugged into the computer correctly. Shut down the computer first, and then unplug the keyboard from the port. Verify that it is in the correct port and then restart the computer. Not only might the keyboard have been plugged into the wrong port, but if you have a PS/2 port and the keyboard cable was inserted while the computer was turned on the computer might not have recognized the keyboard.

If you have a wireless keyboard, the first troubleshooting step to take is to try installing fresh batteries. Also, make sure the adapter for the wireless keyboard is inserted properly into the computer.

Keys Don't Work

If only some of the keys on your keyboard are not working, there are a few troubleshooting steps you can try to fix this problem. The first would be to check the device status and update the keyboard's driver. Follow the same steps listed in the previous section to do so.

When the driver is updated, restart the computer and open a text editor such as Notepad. You can do so by right clicking any blank area of the computer desktop, pointing to New and selecting Text Document

Keys Don't Match

Keyboard do not match the characters that are displayed on the computer. If so, your computer may be using the incorrect language settings. To troubleshoot and fix this problem, open the Control Panel from the Start Menu and select Regional and Language Options. Go through the various tabs of the Regional and Language Options dialog box and make sure the correct language and country or region are selected. Don't forget to click Apply after making any changes.

Special Keys Don't Work

If the problem you are troubleshooting consists of keys such as the Windows key or the Shift key not working, the problem should be easy to fix. It is likely that the Sticky Keys feature was inadvertently enabled. Simply press the **Shift** key five times in a row. Sticky Keys will be turned off and your keyboard will be working properly once more.

Keyboard Problems and Solutions	
Problem	**Solution**
The keyboard is unresponsive.	• Always check the connections. Make sure they are firm and properly in their designated ports. • Keyboards are commonly connected to computers through a PS/2 connector or a USB cable. • Turn off your computer disconnect the keyboard and reconnect it. Turn the computer back on. • If your keyboard is still unresponsive, retry the following steps using a different port (for USB only). • If the above does not result in a responsive keyboard, you will need to

	contact your technology coordinator for a replacement keyboard. • If your mouse and keyboard have the same connector, make sure you did not plug the keyboard into the mouse port and vice versa. They are usually color-coded.
Keyboard keys are getting stuck or are difficult to push.	• People do not realize but cleaning your keyboard is vital to keeping your keyboard running smoothly and properly. • To start cleaning a keyboard first unplug it or turn off your computer. You may use compressed air on a computer keyboard as all kinds of dirt and dust can fall in between keys. Please read the compressed air container as it is dangerous to spray the canister while on its side as it will release extremely cold air that can damage the inner workings of your keyboard. • Then spray cleaner onto a cloth (NOT ON THE KEYBOARD ITSELF. THIS WILL ALMOST CERTAINLY BE WORSE FOR YOUR KEYBOARD). Individually rub the keys with the cloth for best results.
You want to create a keyboard shortcut for a command.	• Sticky keys are a type of shortcut developed by Microsoft that allows the user to press one key for a command that normally has you pressing 2 or more. For example: Instead of having to press three keys at once (such as when you must press the CTRL, ALT, and DELETE keys together to log on to Windows), you can press one key at a time by turning on Sticky Keys. • To turn on Sticky Keys you can press the Shift key 5 times in a row. The computer then shows a box with further instructions along with a loud "beep". • To turn it off you may press both shift keys at the same time.
Page Up/Page Down Keys Are Locked.	• Your "Scroll Lock" function may be engaged. Press the Scroll Lock Key once. Check the LED light on the keyboard to see it is off.
Letters are all in Capitals.	• Your "CAPS LOCK" key has been activated. Press the "CAPS LOCK" Key once to fix this problem. Check the LED light on the keyboard to see that it is off.

Multiples of the same letters appear when you hit the key once.	• If more than one of the same letter or number appears when you press a key once, this is called "key bounce." • One way to decrease these problems is to reduce the key repeat rate and/or repeat delay, in your computer's operating system. • This can be decreased in the "Keyboard" section of the Control Panel.

Hard Disk Drive Problems and Troubleshooting

- Virus Threat-virus attacks are occurred on Computer System .Virus attacks make system files infected and damage to hard disk.
  Solution-Antivirus is used to save our hard disk from virus attacks.
- Unexpected Computer Crashes-It can occur when
  Disk has too many bad sectors
  Spindle motor stop rotating
  Hard disk is formatted more than its limit
  Solution –update system on regular basis, change Hard disk drive after 3-4 years
- Computer fails to detect hard disk or BIOS-it occur when System does not get required power supply. Then HDD fails to spin
  Solution-UPS can be used to provide required power supply
- Manufacturing Fault-it occur when manufacturer deliver hard disk to customer without testing
  Solution-Hard disk can be replaced to manufacturer
- Heat and Dust Problem-It is commonly occur .due to heat and dust hard disk can be crashed
  Solution-ensure CPU fan is working properly.
- Electronic Failure-System BIOS will unable to detect the hard drive, Hard drive could not spin
  Solution-UPS can be used to provide required power supply
- Mechanical Failure-occur due to bad sectors or when spindle motor stop working or due to power supply. Clicking sound occur from hard disk
  Solution-Recover your data. Update your system regularly. Replace your hard disk after 3-4 years of usage

- Human Errors-occur due to human mistake for example accidently modification in registry files, system files etc.
  Solution-Recovery software is require to come out of this problem
- System does not recognize drive/Drive not ready message display/Drive not Found
  Solution-
  Check all cable connections
  Check power supply
  Try Rebooting system
- Computer will not Start-Hard drive is damaged
  Solution-check Power led first if it is blinking then hear if there is any beep sound. Determine error from beep sound if error is not shown on message
- System does not boot from hard disk
  Solution-
  Check connector between hard drive and system board. Reconnect the connectors.
  Check cable from hard disk to disk controller
  Check drive type in CMOS setup
  Format hard disk if problem continue
- Missing OS on Hard Disk
  Solution-Select correct dive type in CMOS setting

Printer Troubleshooting

Preventive Maintenance Tools

Preventive maintenanace

The act of a regularly scheduled check of the computer hardware or software to help ensure it continues to operate properly. Below is a list of some **preventive maintenance** steps you can take with your computer or computer hardware.

Computer Preventive Maintenance

- Cleaning your computer hardware.
- Downloading the latest drivers for your hardware.
- Downloading the latest updates for your computer software.
- Verifying you have the latest anti-virus protection updates on your computer.
- Running disk software utilities such as Defrag and ScanDisk on your hard drive.
- Deleting unused programs or other files on your computer.
- If you don't turn off your computer it may be good to reboot your computer every few months, unless the computer is a critical computer such as a computer server.
- **Preventive maintenance of system can be categorize in two sections mainly:** Hardware maintenance
- Software maintenance

Hardware maintenance tasks

Clean the case: Wipe the case and clear its ventilation ports of any obstructions, but don't blow dust into the PC or any of its drives. Unplug all cables attached to their connectors on the case and check for pin damage (take careful not where each cable is attached). After blowing/vacuuming the PC, plug the connectors back where they belong.

Maintain the mouse: If you have a non-optical mouse, then unscrew the ring on the bottom of the unit and remove the ball and clean plastic rollers that are inside the ball's housing. Similarly, when an optical mouse gets dirty clean its bottom protruding edges and the laser lens.

Keep your keyboard neat: Turn the keyboard upside down and shake it to clear the dirt from between the keys. You can also give it an air blow.

Keep your monitor Clean: Gently clean the screen with a standard glass cleaner, such as Glint, and a cloth.

Check your power protection: Always use surge protector rather putting the power connectors directly into wall outlets. Surge protectors prevent electrical surges from destroying hard drives and erasing data.

Clean your CD and DVD media: Gently wipe each disc with a moistened, soft cloth. Never wipe a disc in a circular motion.

Clean the CD / DVD-ROM drive: Clean the laser. One can use cleaning media for this purpose. Many vendors provide cleaning media for CD and DVD ROM.

Give your system an Air Blow: Give the system an air blow about every 4-6 weeks so that all the ventilation and fans become tidy. That will let the fans exhaust the heat properly.

Change of CMOS: If your system is 4-5 years old, then it is recommended to change your CMOS battery or you can do it when the system asks to do so. This will enable your system to remember the BIOS settings like of Raid controller and etc. which are very crucial.

Swipe the RAMS and Cards: Gently wipe the dust from the RAM and from all other cards by using an eraser and Tissue paper or you can also use old tooth brush to wipe the dust in between the circuit

Periodic Checkups of HDD: Check the hard drive status by using Scandisk, Chkdsk

Hardware Upgrades: Proactively upgrade the hardware by forecasting the upcoming needs OR upgrade your hardware to meet at least the minimum software requirement before installation of any software.

Software Maintenance

Firmware Update: Check the vendor's website every now and then for latest firmware version for the system. It is recommended to upgrade the firmware if the vendor suggests it as a critical update or the system is generating issues.

Driver Update: Always keep the system up to date with latest drivers from vendor's website so the system can work most efficiently.

Windows Service Pack Upgrades: Check the vendor's website time to time for latest service packs of Windows and update the systems with it.

Windows Update: Updating the service pack alone does finish the task -- one should download and install the Windows updates time to time. So the system becomes updated with latest fixes, malicious software removal tool and etc.

Get rid of Temporary files: If the system has multiple profiles on it and is exposed to the Internet very frequently, then it will contain temporary files that occupy lots of disk space and can sometimes cause slow performance. So periodically empty all the temporary Internet files, files in Recycle Bin, C:\Windows\Temp,

Delete .zip files: Users unzip files on their system and leave the zip files which occupy the space on disk. They are typically large. You should delete the ones that you won't need.

Remove Old Programs: Periodically remove all unnecessary programs, like games, old versions of same utilities / software and etc. For un-installation one can use windows add/remove program utility

Registry cleaning: Adding and removing system components leaves orphaned entries in the Windows Registry. This can cause slow system startup and can slow system performance. So, you should run a registry cleaner periodically. Some registry cleaning tools are

RegistryDrill)

RegistryCleaner

Removal of duplicate files: Users mostly create multiple copies of same files to avoid so by removing them one should save lots of space

Check System Performance setting: Always set the system for "Best performance." For this, right-click **My Computer** and choose **Properties**. Click **Advanced**, and then choose the **Settings** button under **Performance**. Now select “Adjust for best performance”.

[Note:] The above advice applies to systems that are running more slowly than expected. It disables some features that you might really like and that might not be causing any problems. In most cases, the "Let Windows choose..." option will make an intelligent blend of settings that are right for your system.

Startup Programs: Remove all unnecessary programs from startup. For this, on Start > Run > type **msconfig** now move on to the **Startup** tab and uncheck all unnecessary programs.

Anti-virus update: Always keep your anti-virus up-to-date with latest definitions.

Anti-spyware & Anti-malware: Today viruses are not the only risk, so keeping up-to-date with antispyware and antimalware enables system work more effectively & efficiently.

Data Placement: It's a good idea to place data on secondary partition (or secondary hard disk) and put its shortcut on the desktop for easy access. This will also make system faster as C: drive will be used mainly for installed applications and it may also make it easier to recover data in case of HDD crash. Also place important data on file servers and on Home directories to be on safe side.

Data Backup: Always schedule periodical data backup. That will minimize risk in case of any mishap.

Troubleshooting Tools

Hand Tools

1. **Screwdriver:** Used to tighten or loosen screws.
2. **Needle-nose pliers:** Used to hold small parts.
3. **Wire cutters:** Used to strip and cut wires.
4. **Tweezers:** Used to manipulate small parts
5. **Flashlight:** Used to light up areas that you cannot see well.
6. **Wire stripper:** A wire stripper is used to remove the insulation from wire so that it can be twisted to other wires or crimped to connectors to make a cable.

Cleaning Tools

- **Soft cloth:** Used to clean different computer components without scratching or leaving debris

- **Compressed air:** Used to blow away dust and debris from different computer parts without touching the components
- **Cable ties:** Used to bundle cables neatly inside and outside of a computer
- **Parts organizer:** Used to hold screws, jumpers, fasteners, and other small parts and prevents them from getting mixed together

Diagnostic Tools

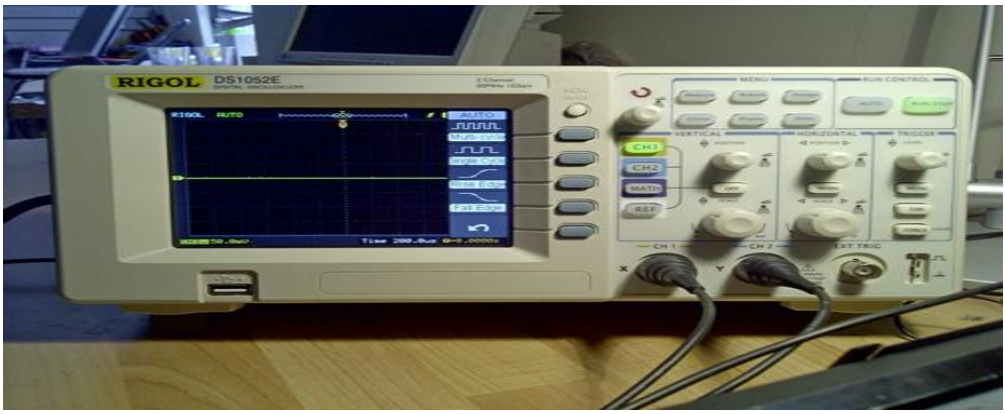
Diagnostic tools are used to test and diagnose equipment. Diagnostic tools include the following:

- A digital multimeter, as shown in Figure , is a device that can take many types of measurements. It tests the integrity of circuits and the quality of electricity in computer components. It measure AC/DC voltage, resistance and current in an electric circuit. A digital multimeter displays the information on an LCD or LED.

De-soldering Tweezers. This device is fairly new, but it extremely useful. Tweezers are usually a part of a soldering station kit, but I usually separate them. As you get more familiar with the

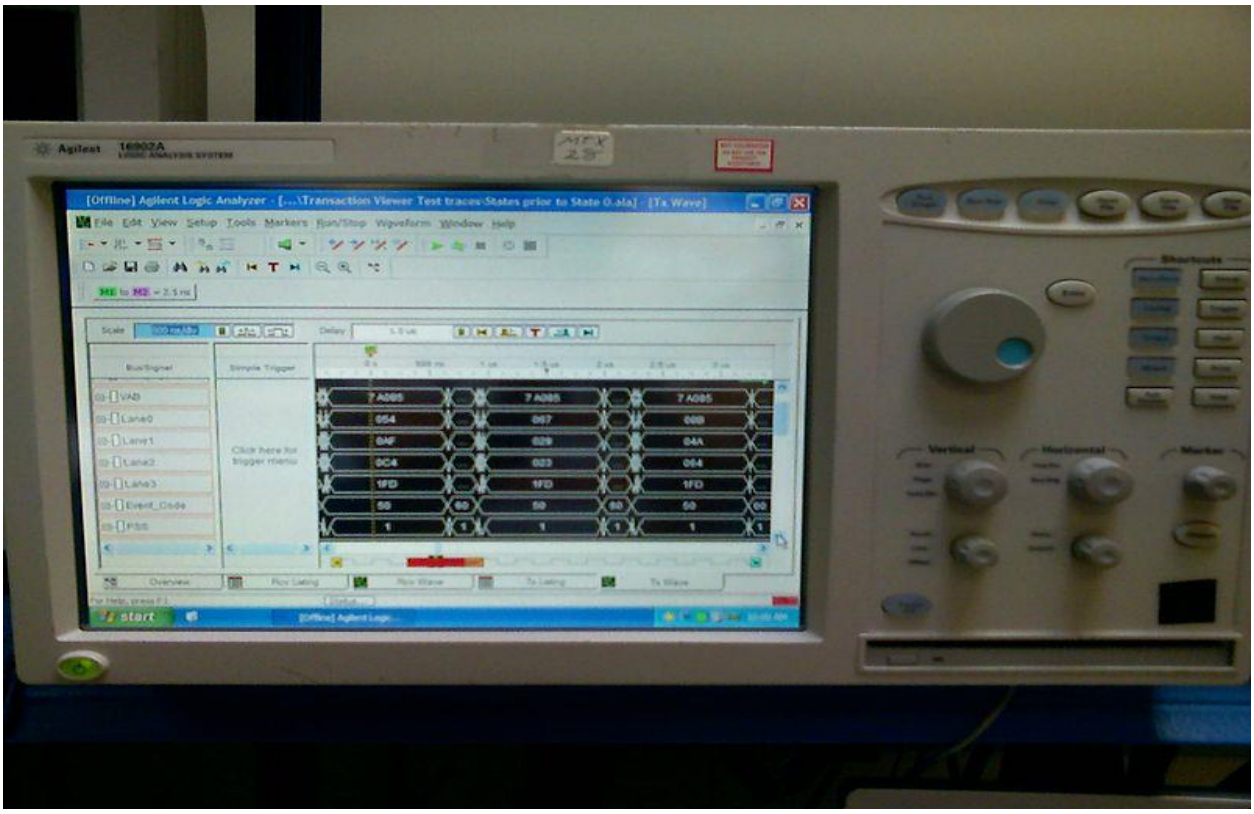
motherboard and electronic components, you will find tweezers necessary in order to replace components like SMD capacitors, diodes, or resistors.

Oscilloscope. It is used to repair computer repair. It would be very difficult to diagnose certain faults without it. Particularly, in terms of dried out capacitors with no external signs of leakage. It is used to observe change of electrical signal over time such that voltage and time describe a shape which is continuously graphed against a calibrated scale. Used in science, medicine,



A **logic analyzer** is an electronic instrument that captures and displays multiple signals from a digital system or digital circuit. A logic analyzer may convert the captured data into timing

diagrams, protocol decodes, state machine traces, assembly language, or may correlate assembly with source-level software. Logic Analyzers have advanced triggering capabilities, and are useful when a user needs to see the timing relationships between many signals in a digital system



Logic Probe

Logic probe basics

A logic probe is able to give an indication of the logic state of a line carrying a digital signal The logic probe indicates whether there is a logic state "1" or "0", normally using an LED as the indicator. Often the LED on the logic probe will use different colors to indicate different states.

Logic probe tester advantages and disadvantages

As with any item of test equipment, there are advantages and disadvantages to the use of a logic probe.

Logic probe advantages -

- ***Low cost:*** A logic probe does not contain much circuitry, and the display is very rudimentary. Therefore the cost of manufacture is very low.
- ***Ease of use :*** To use a logic probe typically requires the connection of power leads and then connecting the probe to the required point on the circuit.

Logic probe disadvantages -

- ***Very rough measurement:*** The nature of the logic probe means that only an indication of the presence of a logic signal can be detected.
- ***Poor display:*** A logic probe only uses a few LEDs to indicate the nature of the logic signal. As a result, little information can eb displayed about the nature of the logic signal that is detected.

Logic Pulser

LOGIC PULSERS Another extremely useful device for **troubleshooting logic** circuits is the **logic pulser**. It is similar in shape to the **logic** probe and is designed to inject a **logic** pulse into the circuit under test.

Current Tracer

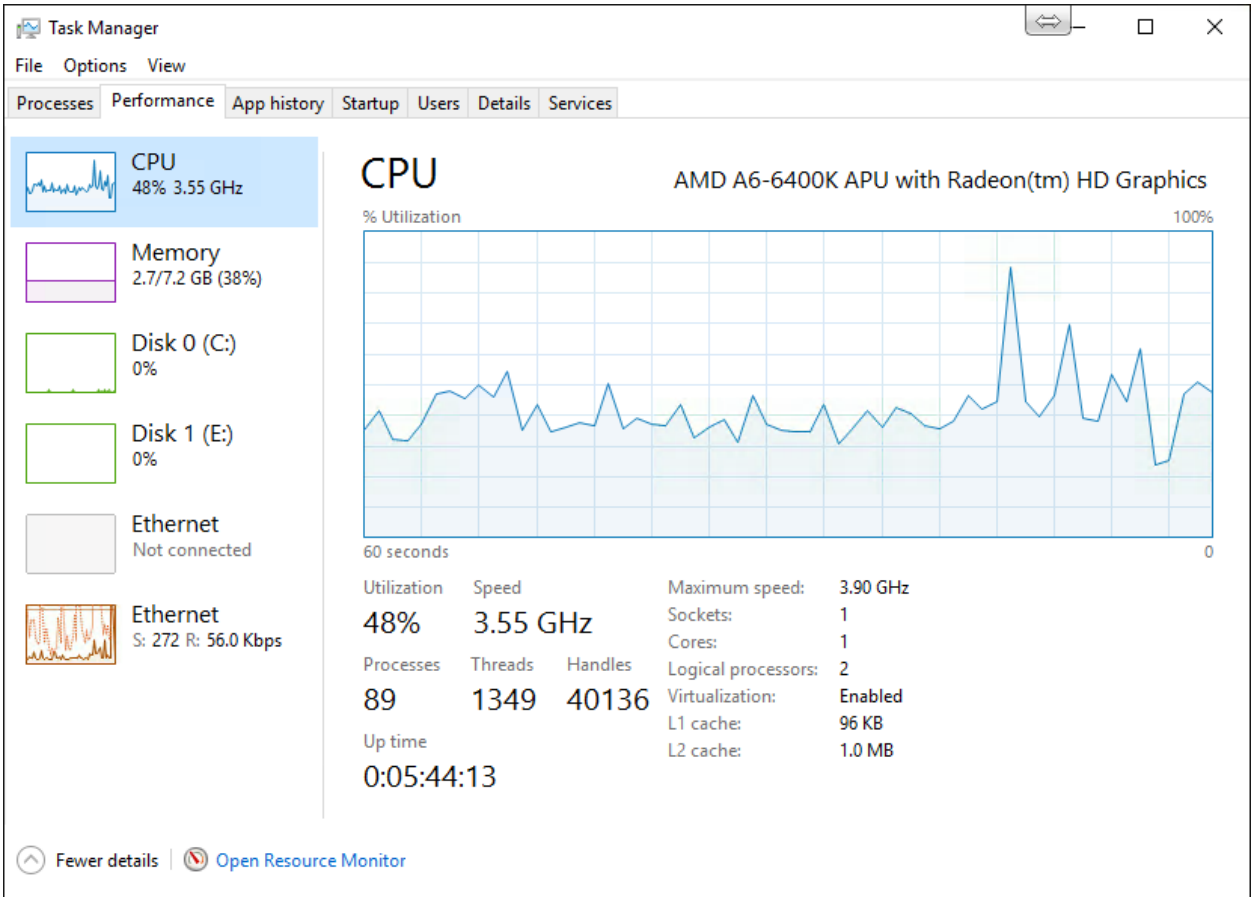
It is a hand held tool which detects current flow in electronics circuits. It is used to distinguish a wire in a bundle of wires and is also used to locate the end of an open ended conductor. The second sensor is the differential electric field sensor, which is used to determine the location and direction of an open end conductor that is located above ground. The third sensor is an inductive sensor that determines the location and direction of the conductor that is carrying the current and it includes an open-ended conductor, which is below ground.

Diagnostic Software

MemTest

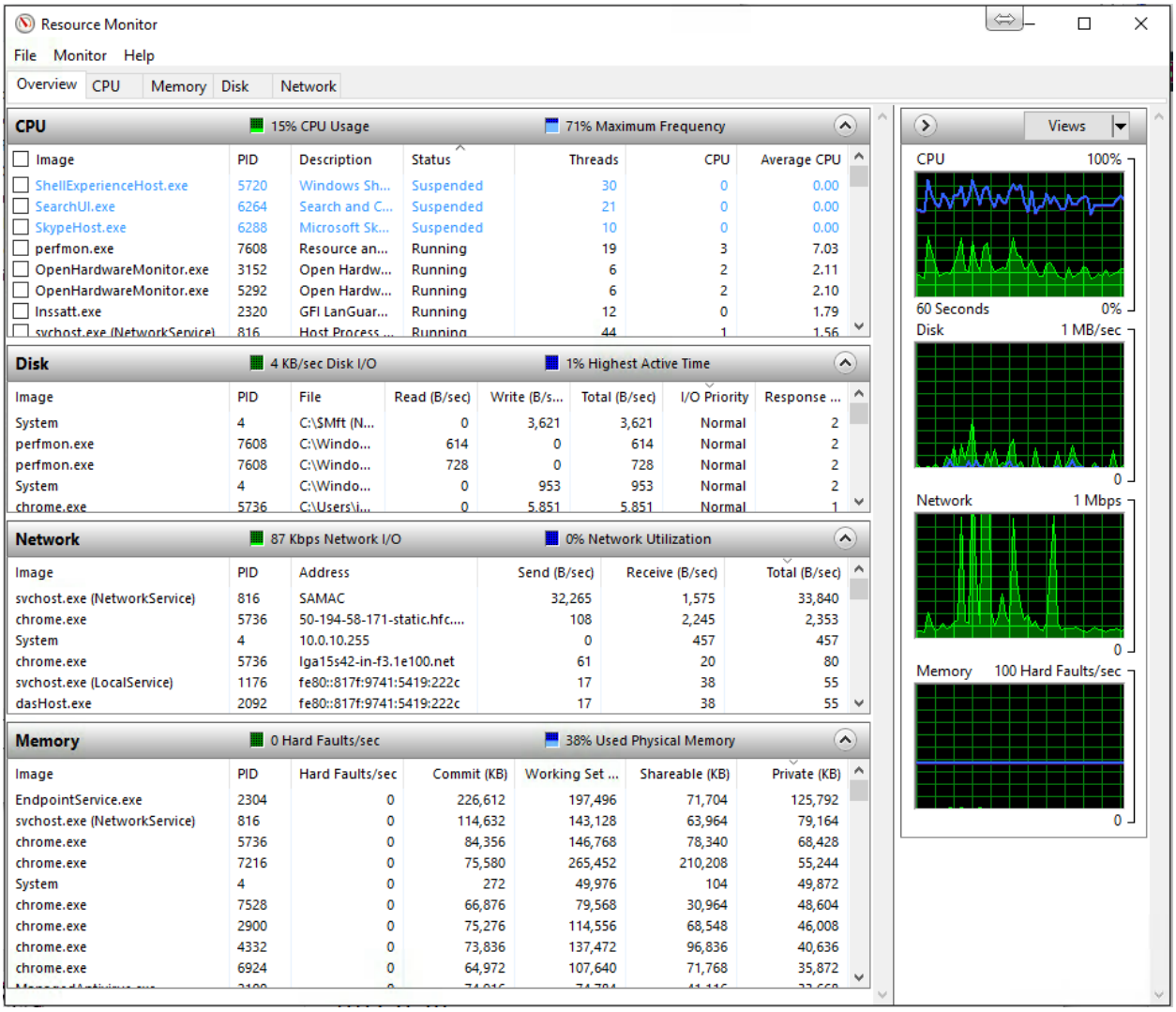
Memtest86+ is an open source program. It is used to test RAM for errors. It supports booting from both UEFI and BIOS systems. The program creates test patterns and reads the written data to check for errors. Depending on the memory installed on the computer, the memory tests can run for a few minutes or a few hours.

Windows Performance Monitor



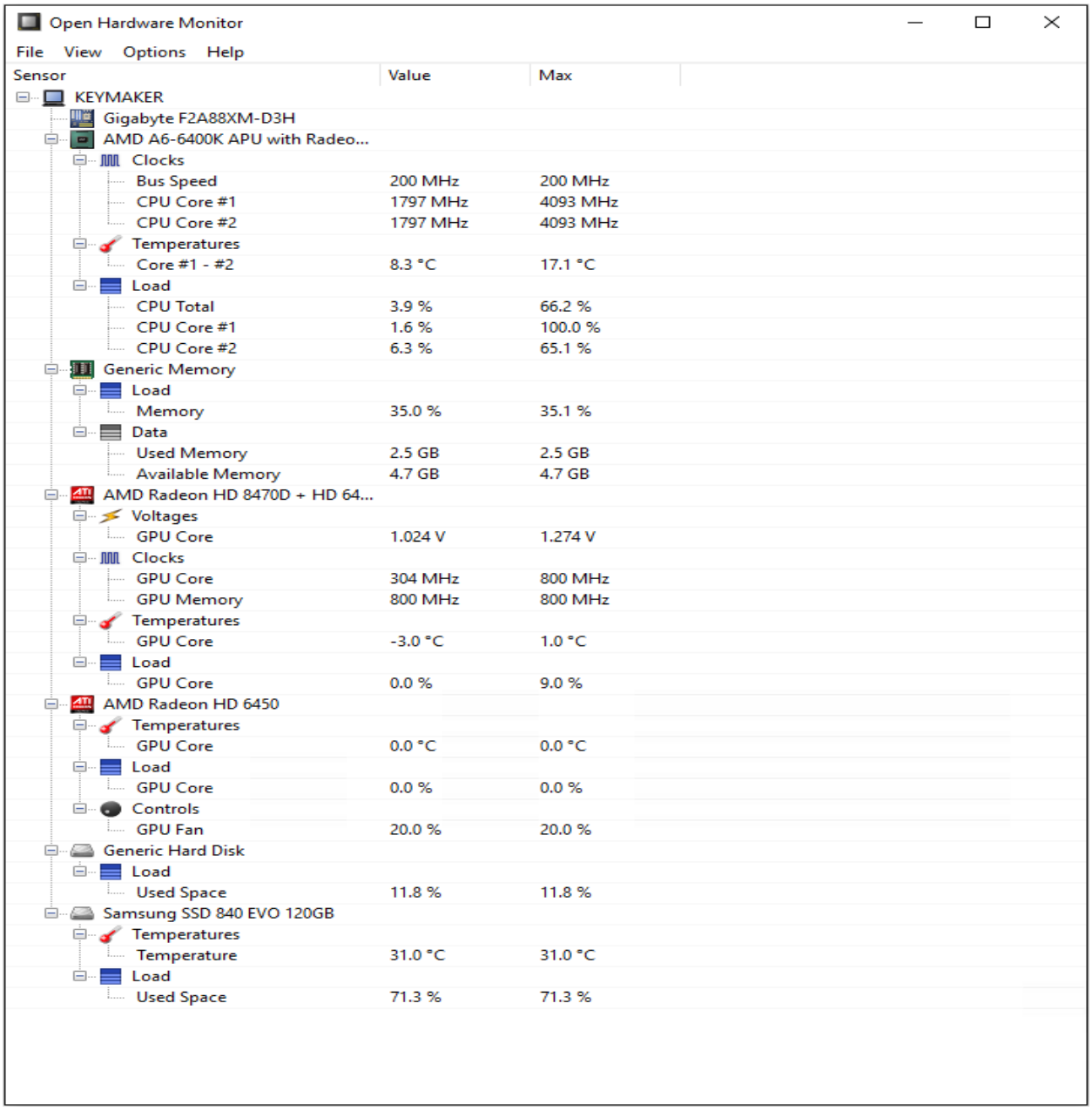
The performance monitor gives you a quick view of vital information related your computer's hardware. From here, you can check out your CPU, Memory, Disk info and Ethernet information. You can use Performance Monitor to examine the effects of your running applications in both real time and by collecting data to check out for later analysis.

Windows Resource Monitor



It is better suited for tracking individual aspects of CPU, Network, memory and disk usage. This tool gives you an in depth look at what processes are affecting your CPU, how much memory is being used what is using it, individual process disk activity and network information like current TCP connections and what processes are listening on what port.

Open Hardware Monitor



Open Hardware Monitor is a free open source application that runs on Windows and Linux systems. This diagnostic tool monitors your computers temperature sensors, fan speeds, voltages, load and clock speeds. If your computer is shutting down by itself, hanging or crashing, this tool can come in real handy by telling you that your system is overheating or the fans aren't working properly.

hddscan

It is a disk drive diagnostic tool.HDD Scan is available free to download.it can check storage devices including USB drives for bad sectors. It also shows temperature of the disk.it is very helpful to get alert before disk drive get damaged. HDDScan is completely portable, you can use it without installing this on your computer. HDDScan can run tests against devices like PATA, SATA, SCSI, USB, FireWire, or SSD connected hard drives to check for errors and show SMART attributes. You can also use HDDScan to start or stop the spindle of various types of hard drives and identify information such as the serial number, firmware version, supported features, and model number.

HDDScan Pros & Cons

There aren't many disadvantages to this hard drive testing program:

Pros:

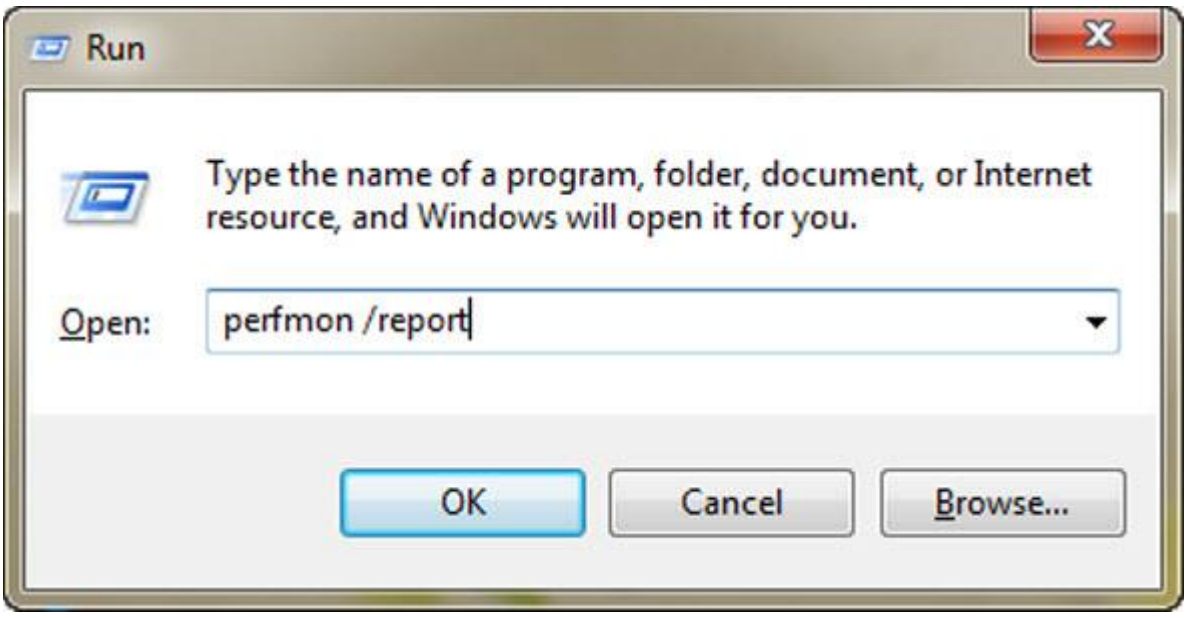
- Scans many different types of storage devices
- Not difficult to use
- SMART reports can be saved to a file like TXT file
- Command line support
- Doesn't need to be installed (portable)

Cons:

- Only runs on Windows operating systems
- No option to install it to your computer
- No built-in tips, descriptions, or help documents

Resource & Performance Monitor

Both of these operating systems have a built-in diagnostic tool you might not have ever known about. To access the Resource and Performance Monitor, simply hold down your Windows key and press the letter **R**. A new window will open and you can type in the command ***perfmon /report***, then click on *OK*.



If you want to see how your computer performs while using a certain set of apps and programs, make sure to open them now, so the graphs will take note of their impact on your system's resources. By default, the graph shown by *Performance Monitor* measures *Processor* time, which is the amount of time that the processor is busy working on running active programs (shown in percentages). This gives you a basic measure of how hard your processor is working.

This graph can be customized with additional columns and several other options. For a more in depth analysis, you can add counters to the graph that will detail other data. To do this, hit the green plus sign above the graph.

Defraggler

Defraggler is a small utility for computers running Microsoft Windows that lets you defrag hard drives on your system. Defraggler is a quick, safe way to speed up your PC. Defraggler speeds up your computer by placing all the parts of a file on the same section of the hard drive. When Windows goes to access that file, it only has to look in one area of the drive, which speeds things up.

Defraggler also attempts to move all of your files to the start of the hard drive, which makes them faster to access.

Defraggler Pros:

- Clean up your hard drive by defragging it
- Defrag an entire drive, a folder, or one or more individual files
- Defragment the free space on your drive by gathering all the free areas into a single large free space
- Speed up your PC by placing pieces of files together
- Run from a USB drive
- Defragment drives sequentially (ctrl click the drives and press Defrag)
- Defragment RAID drives

Defraggler Cons:

- Defraggler can't defragment multiple drives at once.

Common Computer Problems and Solutions

1) BIOS Problems

a) CMOS battery Error, Press F1 to Continue

This error occurs frequently for every 1-2 years. This is because there will be a CMOS button cell of 3V, present in the motherboard. This cell is used to keep your system time accurate even when the system is switched OFF. These batteries have a lifetime of 1-3 years depending on the manufacturer guarantee and the usage of the system. If the system is used rarely, then the life time of the battery is very less, as it should power up the CMOS even when the system is switched OFF and vice versa when is used for long time.

Solution: So to solve this problem just replace with a New Button Cell Battery of 3V.

b) When you change a setting in the BIOS, the system goes blank, but the Monitor Power LED keeps on Blinking

When you change some settings in the BIOS, and after you save the settings and Exit from BIOS, the system does not boot and the monitor power LED just keeps on blinking. This is because the setting u have made does not match the hardware present in the motherboard, i.e. the clock speed of the motherboard is incompatible with the external hardware that are connected to it like the RAM, Processor etc.

Solution: So to solve this problem just reset the BIOS by taking of the CMOS button cell of 3V for 5-10 sec and replace it again or just reset the BIOS by the jumpers (resetting means take of the jumper, switch on the system and again switch off the system and replace the jumper) present on the motherboard (as RESET CMOS/BIOS), a detailed jumper reset of BIOS will be given on the manual of motherboard.

2) Processor Problems

a) Blank Screen & no display in the Monitor, but the Monitor Power LED blinks

This may be due to the problem of ram and processor. But if it concerned to Processor then the processor must have burned internally or malfunctioning. Sometime even the processor has not been placed properly on the socket of processor.

Solution: First remove the processor from the motherboard clean the pins and socket. Replace the processor on the socket. If the problem persists again then the processor will be damaged, normally this problem occurs due to overheating of the processor.

Then replace with a new processor, as the processor cannot be repaired even by the manufacturer. If you have a guarantee then exchange for a new one.

b) Processor gets heated up very soon

This is because the Processor Fan which is present on the Top of the Processor will be not running at the default speed or the Fan may be completely not running.

Solution: If the Processor fan is malfunctioning then just replace it with a new fan which is available with a package of heat sink. If the fan is good, but it is not running, then change the power pin of the fan which is present on the motherboard as sys1 or sys2 it varies according to the motherboard manufacturer.

3) RAM Problems

a) System beeps twice every 2-3 seconds & has a blank screen

This is because the RAM or other PCI cards may be damaged due to high voltages or due to anti shock of the system. Or the RAM may have fitted very loosely on the slot of RAM.

Solution: Remove the RAM clean the pins of the RAM with a soft cloth, replace it again on the RAM slot of DIMM1. If the problem occurs again then just replace it on other RAM slot of DIMM2 if u have more slots then just repeat this process. Even though this problem is not solved then the RAM has been damaged, you have to buy a new RAM.

Or just check up the PCI Cards whichever is present on the slot. It may have been damaged or may have fitted very loosely on the PCI slots.

b) Not showing the correct memory in the BOOT up Screen or in the system properties of Windows

This is because the RAM memory may have been shared to the VGA Memory.

Solution: Go to BIOS change the VGA Share to 8MB or 16MB which ever is lower according to your motherboard manufacturer. By default there should be some VGA share memory you cannot completely disable it to 0MB, until and unless you have an AGP (Accelerated Graphic Card) Card.

c) Speed up your system booting

To speed up your system booting, go to BIOS screen in the Advanced Settings tab & change the POST Setting to ENABLE or YES whichever is specified by your motherboard manufacturer.

4) Hard Disk Problems

a) Hard disk Crash

The hard disk crashes due to high voltages from the SMPS or due to the improper partitioning of the hard disk.

Solution: Protect the system form an UPS or Backup Power, these internally contains a regulators & surge protectors which gives a stable power supply to the system.

Or Re-Partition the Hard disk to bring it back to normal condition if and only when the hard disk is not burned or not having a physical damage.

b) Hard disk making a noise

This is because the spindle of the hard disk may have come out the boundary of the disks and hitting the chassis of the hard disk. These are present inside the hard disk. This are caused due to the high voltages or spikes from SMPS.

Solution: Service the hard disk at a recognized service center of that particular company. Before you lose any important data.

c) System disk failure cannot find boot device

This is because the IDE cable/BUS may be fitted very loosely or the power cable may be fitted loosely. Or there may be a wrong setting done in the BIOS.

Solution: Remove the IDE BUS connected to the hard disk and fit the BUS, so that the RED painted cable on the BUS should connect to the Pin 1 as specified by the manufacturer both on the motherboard and hard disk.

And fit the Power cable to Power Pin of the Hard Disk, such that the direction of the RED wire of the power cable should see the RED pin of the BUS Cable.

If this doesn't resolve then check the BIOS, go to the Advanced Setting and change the Boot Sequence/Priority as

First boot device – HDD

Second boot device – Floppy

Third boot device – CD ROM

Boot Other Device – Enable

Or just change it to Reset to Default Settings & Save and Exit.

Even though the problem is not solved then check the Hard Disk Crash topic.

d) How to format a drive in DOS/Windows mode

To partition is DOS mode First change the First Boot Device in BIOS as CD ROM or Floppy which is specified in the Hard Disk Crash Topic.

Then boot the system by a Bootable CD ROM or Floppy which ever you have.

Then type the command in the DOS mode as FORMAT C: /S or whichever drive u want. Here /S command copies the system files after formatting, so that you don't need a bootable floppy. If u gives FORMAT C: /S/Q it does a fast formatting but it is no recommended.

To format a drive in Windows mode right click the unformatted drive. You will get a link as FORMAT. Click that and select which ever format you want to do for example: FAT 32, NTFS.

And click as Start it takes some time to format depending on your system speed and hard disk performance.

e) How to detect a hard disk crash before it occurs

The best way to detect a hard disk crash before it occurs is through enabling a setting that is present in the BIOS.

Solution: Go to BIOS setting by continuously pressing the DEL or F8 button. Then go to the Advance Setting Screen and change the

SMART Hard Disk option – Enable or Yes.

And go to Windows and Enable the Smart Monitoring in the 3rd Party Software's provided by the motherboard manufacturer.

One of them is Symantec System Monitoring Tools.

But the only problem in this is, it reduces the system performance. As it will be monitoring the hard disk.

5) Motherboard

a) Frequently Motherboard burns

These motherboard burns are due to the fluctuations in the Input Voltages.

The only solution to this problem is to install a Stabilizer or the best thing is use an UPS (Uninterruptible Power Supply) it protect both motherboard and hard disk by burning out.

b) Motherboard getting heated up

The common problem of motherboard getting heated up is due to insufficient air supply to the AT/ATX cabinet of the system.

This can be overcome by installing a System Fans. How much ever fans you install it is too good to the system. And it keeps the internal hardware's of the system very cool. So that you don't get any serious problems to the Hardware's.

Laymen Check in Computer Troubleshooting

Some types of problems can be quickly resolved by adopting few shortcuts rather than systematic approach.these are known as laymen checks seven these approaches can be used by non-technical person. Common laymen checks are

- Is AC power plug connected?
- Is AC power switch on?
- Is SMPS switch on?
- Is SMPS fan rotating?
- Are SMPS dc connectors mounted on motherboard?
- Is monitor power switch on?
- Is monitor brightness and contrast control is maximum?
- Is monitor cable to display adapter connected?
- Does the LED on floppy drive glow?
- Is the speaker click heard?
- Are there speaker beeps?
- Are all necessary boards present?
- Are the DIP switch settings ok?
- Is the Printer power on?

- Is the printer cable connected?
- Is the keyboard connected?
- Is the HDD connected?
- Are both hard disk cables connected?

Laser Printer Problems

S.No.	Fault	Trouble Source	Solution
1	Light Image	1.Defective Toner cartridge 2.Adjustment of Print intensity control? 3.Dirty corona wire?	1.Replace Cartridge, 2.adjust print intensity control, 3.clean corona wire else replace it
2	Dark Image	1.Defective Toner cartridge 2.Adjustment of Print intensity control? 3.Dirty corona wire?	1.Replace Cartridge, 2.adjust print intensity control, 3.clean corona wire else replace it
3	Smudges	Dirty parts: drum,belt,rollers	Clean and replace relevant parts
4	Distortion in image	Defective drive motor or scanner	Check and replace
5	White or black stripes	Fuser	Check and replace

Ink Jet printer Problem

No	Fault	Problem Source	Solution
1	Characters are faint or light	1.inkjet is clogged	1.clean the head

		Wrong typs of paper	2.use recommended paper
2	White lines	1.inkjet is clogged 2.circuit cut in wiring 3.fault in driver circuit	1.clean the head 2.check resistance continuity 3.replace /repair the driver board
3	Broken lines	1.short circuit in head wiring 2.Fault in driver circuits	1.replace/repair the driver board 2.replace the head

Dot matrix printer troubleshooting

No.	Fault	Fault Source	Solution
1	Printer does not work/dead printer	1.AC input voltage improper	1.check ac voltage
2.	Carriage moves to the right after power on	Printer Mechanism	Check the Printer mechanism
3	Does not Print during self-test	1.Loose connections in the print head cable 2.Loose connection in the connector/cable between the printer	1.check the print head cable 2.check the connectors and cables 3.debug printer electronics

		electronics and printer mechanism 3.Problem in printer electronics	
4	Missing dots during printing	1.Broken dot wire 2.Head coil open 3.loose connection in the head cable 4.fault in printer electronics	1.Replace print head 2.clean print head 3.Troubleshoot the printer electronics
5	No paper feed	1.Dust inside gears 2.Release lever in the wrong position 3.fault in printer mechanism 4.Defective paper feed motor	1.Clean Dust 2.Check and place release lever in the right position 3.Diagnose the fault 4.Chcek feed motor or replace feed motor
6	Power off condition	1.Fault in printer 2.fault in carriage motor	1.Diagnose the fault 2.check motor coil or replace carriage motor