Exp5 : Understand troubleshooting of PC system using flowchart Date:

**Aim:** To Understand troubleshooting of PC system using flowchart

**Theory:**

What is Trouble shooting?

Troubleshooting is the process of identifying, planning and resolving a problem, error or fault within a software or computer system. It enables the repair and restoration of a computer or software when it becomes faulty, unresponsive or acts in an abnormal way.

Troubleshooting is primarily done to keep a system or software in desired condition, specifically when it encounters or exhibits a problem. It is a systematic approach done within one or more phases depending on the complexity of a problem. Typically, the first step involves identifying what the problem is followed by coming up with a solution to counteract the problem and then implementing that solution. However, there can be more than one reason for the problem, which will require a more complex solution. An individual troubleshooting such a problem might test for different solutions to eliminate the problem or fault.

**Procedure:**

**one of the most common PC hardware problems that need troubleshooting are:**

- **Your computer won't turn on.**
- **Your computer turns on, but still doesn't work.**
- **Your computer screen freezes.**
- **Your computer has insufficient memory.**
- **You get a CMOS error.**
- **Your operating system is missing or your hard drive isn't detected.**
- **You get the blue screen of death.**

## Problem #1: Your Computer Won't Turn On

This is a common problem that often offers a simple solution.

Try plugging into different power outlets.

Is either the monitor, mouse, or keyboard the only thing not working? If so, try plugging in a different one to see if that does the job. Most of the time, replacing one of these is cheaper than attempting a repair.

Once you've completed the above steps, it's time to look at the tower.

Are the lights on in the front or back of the tower? If not, the power supply unit (PSU) may be turned off.

Next, you can open up your tower and look at the motherboard. Most have a small LED light built in to show if power is running to the motherboard. If it's turned off, you can either try using a PSU tester, or replace the PSU. Never try to open a PSU and try to repair it yourself as this is extremely dangerous.

## Problem #2: Your Computer Turns On, But Still Doesn't Work

If power is obviously flowing to the computer system and its peripherals, there may be a component issue. When you first turn on the computer, do you hear or see anything out of the ordinary? Many times the computer's Power-On Self-Test (POST) will let you know what's going on with the machine.

### Beep Codes

If you hear any beeps when your computer turns on, they can help you troubleshoot common PC hardware problems. Here's a list of beep codes

No beep but the system turns on and runs fine - Under normal circumstances, most computer systems will beep one short beep when turned on. If yours doesn't, your "beeper" may have died out.

No beep - The power supply is not plugged in or turned on. Or, the power supply is completely dead.

Steady, short beeps - The power supply may be bad or the voltages might be wrong. A replacement would usually be necessary.

Steady, long beeps - The power supply has gone bad.

Long, continuous beep - Your Random Access Memory (RAM) sticks may have gone bad. If there is more than one stick installed, try taking one out to see if the computer boots. If it does not, try the same thing with the other stick. This will tell you which stick has gone bad and you can replace or upgrade accordingly. If there is only one stick installed, you will need to replace or upgrade it to fix the problem.

One long, two short beeps - There has been a video card failure. Your first action is to try reseating the video card. This often solves the problem when the computer system is connected to projectors

because the VGA/DVI/Video cable gets moved so often that the card can be slowly unplugged. If reseating doesn't work, replace the video card.

### Problem #3: Your Computer Screen Freezes

When your computer freezes and isn't responsive to your mouse or keyboard, the first thing to do is just wait. Sometimes it will just take a few minutes for your computer to process. Then, end-task the non-responding program. If that doesn't work, turn off the computer by holding down the power button and then rebooting into Safe Mode (don't forget about saving your work first, if you can).

If you've tried all of this and your computer still won't unlock, you may be dealing with either defective hardware or a defective device driver. If this is your case, replace the defective piece immediately so it doesn't cause further damage.

Another thing you could be dealing with is a virus that is overwhelming your system. Run a virus scan, remove the virus, recover or reinstall damaged files or software, and implement the latest security software.

### Problem #4: Your Computer Has Insufficient Memory

Receiving an "insufficient memory or disk space" error message can usually be solved (at least temporarily) by closing extra windows to free up some RAM. If you've done that and the error still comes up, you can try rebooting your computer and installing the latest operating system update.

If you really don't have enough available memory and space (which can be checked in Windows 10 by pressing the Windows-R button and typing perfmon in the Open field to run the Performance Monitor), you can uninstall or delete any unused or unnecessary files, especially those of the video/music type. Your final solution is to add more RAM.

### Problem #5: You Get a CMOS Error

The CMOS (complementary metal-oxide semiconductor) is an onboard chip that stores information ranging from the time and date to system hardware settings. If you get a CMOS alert message showing up on your screen, it's likely you need to replace the CMOS battery located on the motherboard. Remove it carefully, insert a new battery that is exactly the same as the old one, and enter the CMOS values to the defaults.

### Problem #6: Your Operating System Is Missing or Your Hard Drive Isn't Detected

If the message "Missing Operating System" shows up on your screen, there are four possibilities the problem could be (and four ways to solve it):

1. The basic input/output system (BIOS) doesn't detect Windows' hard disk, or the disk failed. If you know how, take out the hard drive and reconnect it. If that doesn't work, the hard drive's interface is forbidden or the hard drive is seriously damaged.

Restart the computer and watch for the message telling you which key to strike to go into the BIOS. The key can vary from system to system so you may need to use a search engine to find the instructions for your system. Be sure to strike the specified key as soon as you see the message.

In the BIOS highlight the hard drive and set it to "Auto". If it's still invisible, you need a hard drive repair or replacement.

2. The BIOS settings are incorrect. Set the BIOS back to Default State.

3. The Master Boot Record (MBR) is damaged or corrupted. Rebuild the MBR using either the Windows installation disk, the Windows repair disk, or a bootable partitioning tool.

4. The Windows boot file partition isn't active. Start the computer using a bootable partitioning tool. If that doesn't work, set the wrong partition to 'inactive' and activate the correct partition.

## Problem #7: The Blue Screen of Death

The blue screen of death (BSOD) appears when Microsoft Windows has an unrecoverable, critical error that causes a crash and subsequent data loss. This can be caused by the low-level software in Windows crashing.

When the BSOD occurs, the computer automatically creates a minidump file and restarts the computer. If the blue screen appears again, follow the prompts, identify and search for the error code online, and learn how to fix the problem.

Some of the common solutions are to:

Make sure your computer isn't overheating. If it is, close unused applications, check the fan is working properly, and conduct a good dusting after the computer is turned off before trying other solutions for an overheating PC.

Boot into Safe Mode before trying to fix a problem.

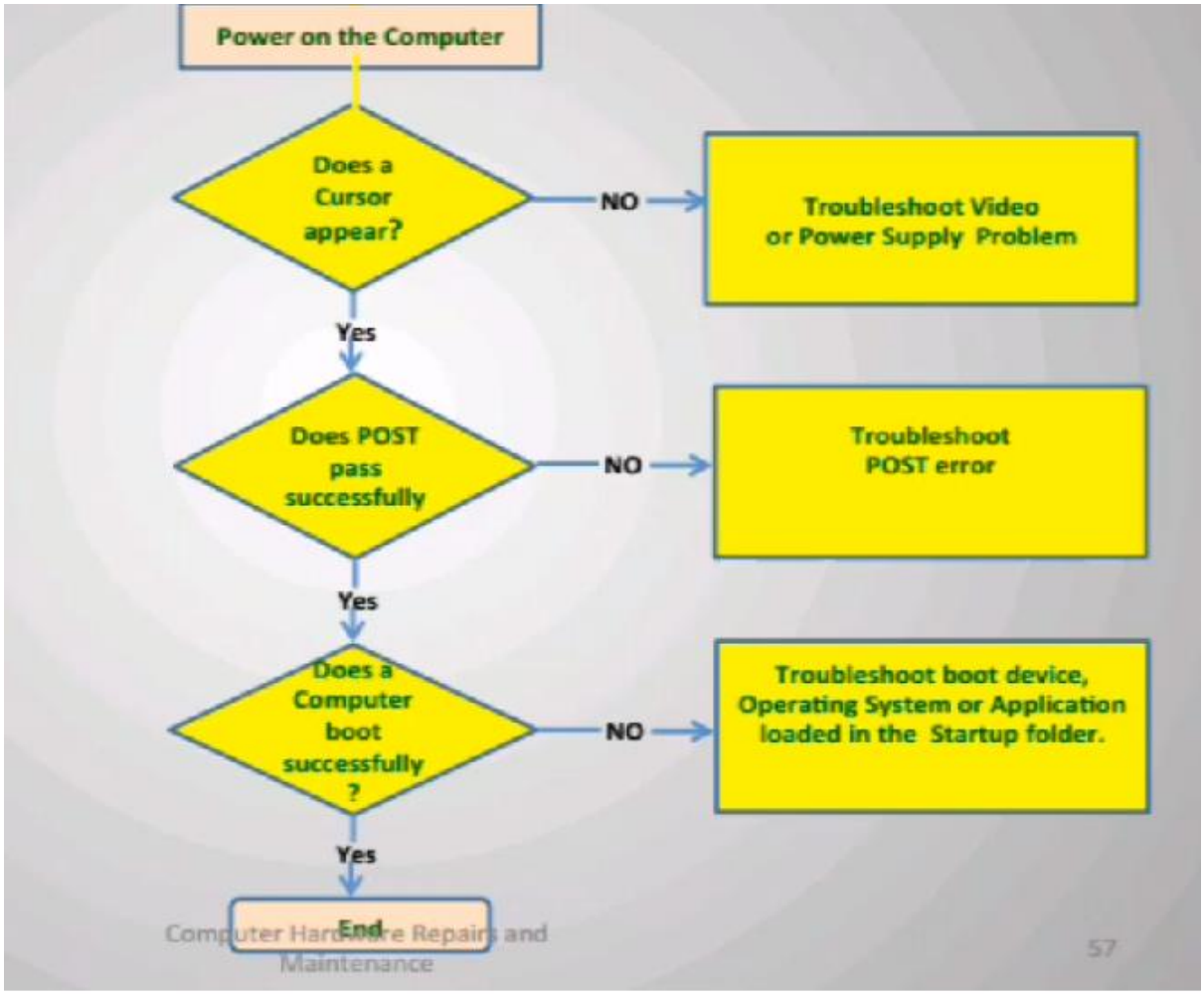
Test your hardware components and check the computer's memory for errors.

Check for incorrectly installed or buggy drivers. Install updated drivers.

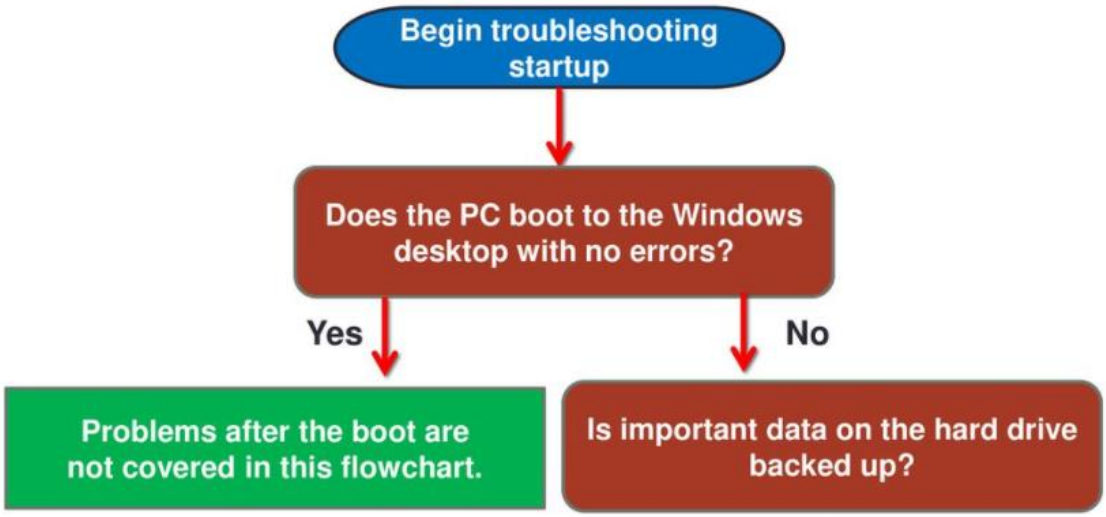
Scan for Malware that is causing the crash.

Reset or reinstall Windows.

Use System Restore to get your computer back to its previous state. If it works, you probably have a software problem on your hands.



# Troubleshooting Flowchart

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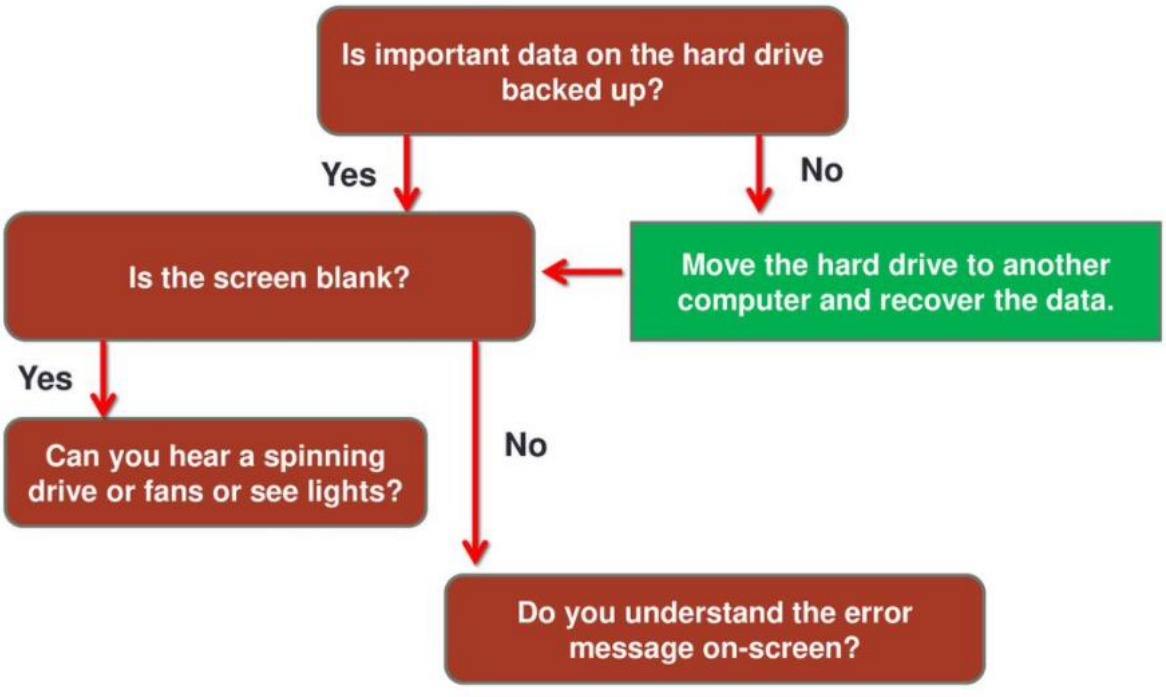

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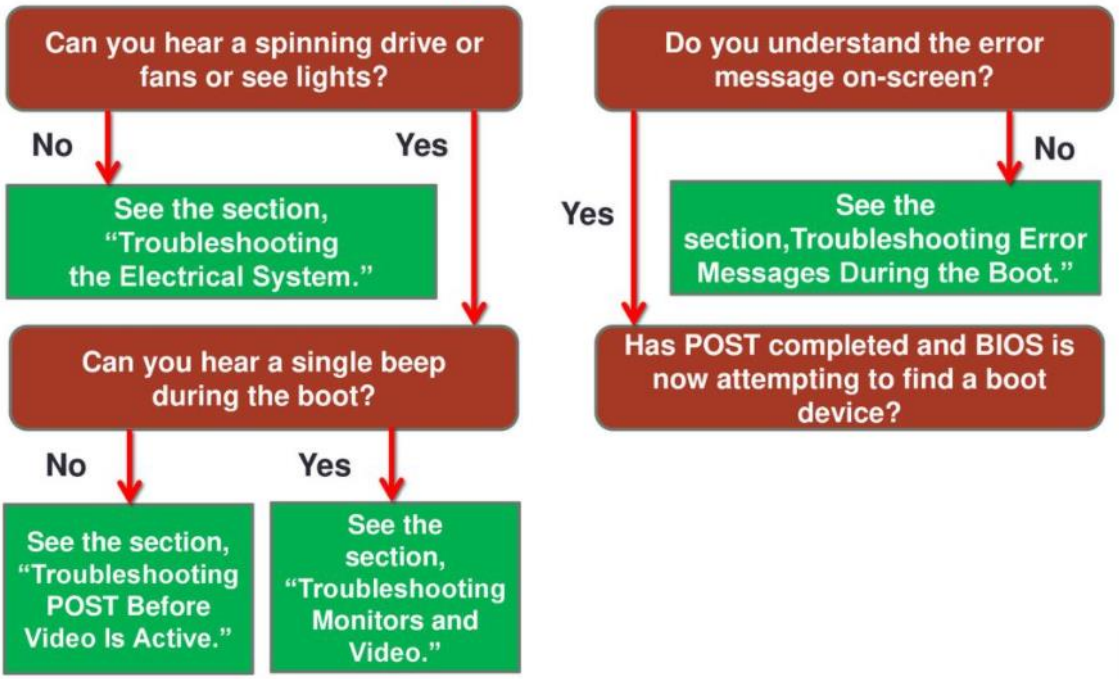


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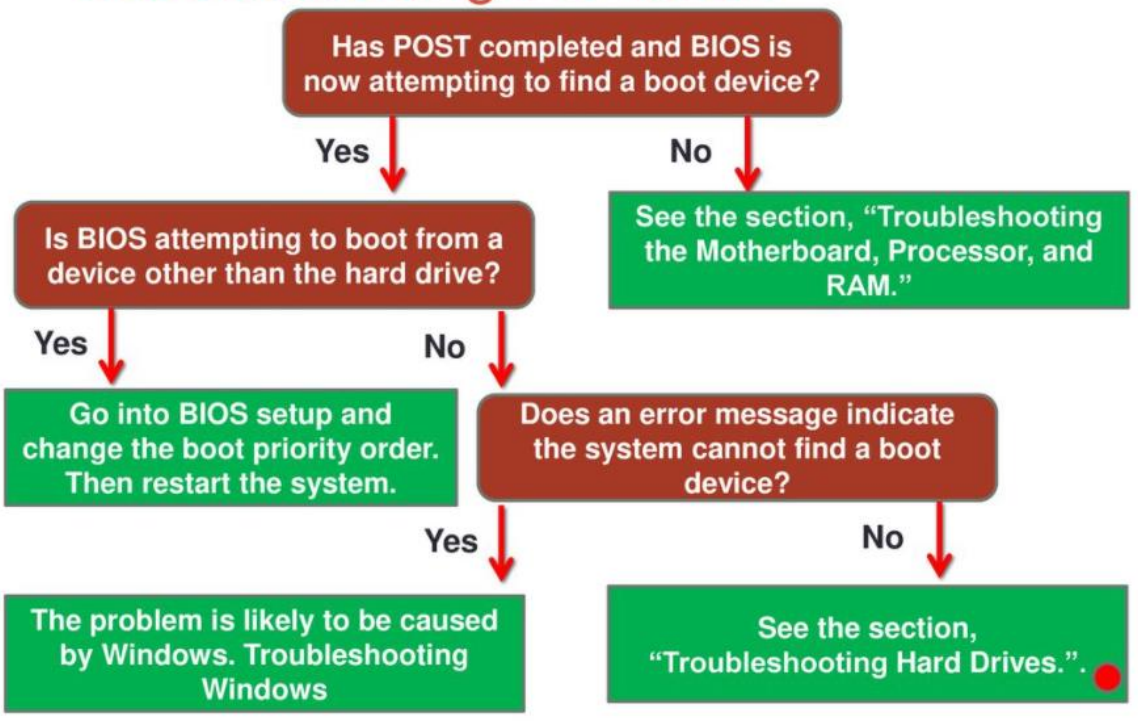

# Troubleshooting the Electrical System

- Electrical problems can:
  - Occur before or after the boot
  - Be consistent or intermittent
- Possible symptoms of electrical problem:
  - PC appears to be "dead"
  - PC sometimes locks up during booting
  - Error codes or beeps occur during booting
  - Smell burnt parts or odors
  - PC powers down at unexpected times
  - PC appears dead except you hear a whine coming from the power supply

# Troubleshooting the Electrical System

- Try these simple things first:
  - If you small any burnt part, don't turn system on
    - Find burnt up part and replace
  - If power supply is whining, don't turn system on
    - Open case and look for short or consider upgrading
    - Test power supply with a power supply tester
  - Check power cord connection and power bar it may be plugged into
  - Is power outlet controlled by wall switch? If so, turn it on
  - Are any cable connections loose?

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## Power Problems With the Motherboard

- Short might occur if a motherboard component makes improper contact with the chassis
  - Can seriously damage the motherboard
  - Check for missing/loose standoffs or loose screws
- Shorts in motherboard circuits might also cause problems
  - Look for damage on the bottom of the motherboard
  - Look for burned-out capacitors that are spotted brown or corroded

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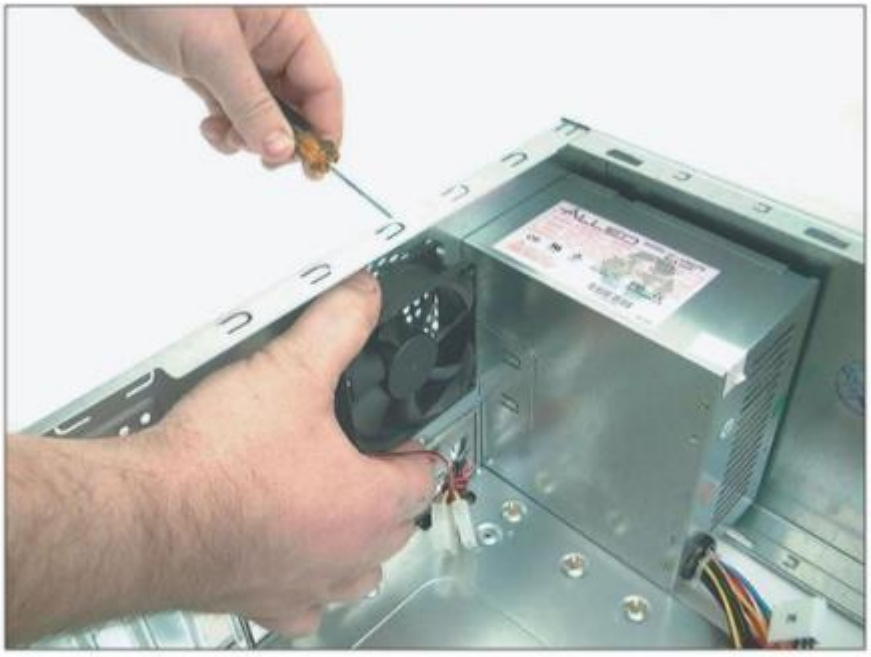
## Problems With Overheating

- Things to do to solve overheating:
  - If system hangs, go into BIOS setup and find the CPU screen that reports temperature (should not exceed 38 degrees C)
  - Use compressed air, a blower, or antistatic vacuum to remove dust from the power supply and vents
  - Check airflow inside the case to see if fans are running (may need to replace a fan)
  - Install extra fans if case will hold them
  - Can the side of the case hold a chassis air guide that guides air to the processor? If so, install one



Dust in the cooler fan can cause the fan to fail and the processor to overheat





Install one exhaust fan on the rear of the case to help pull air through the case

| Beeps During POST | Description |
|---|---|
| One short beep or no beep | The computer passed all POST tests |
| 1 long and 2 short beeps | Award BIOS: A video problem, no video card, bad video memory<br>Intel BIOS: A video problem |
| Continuous short beeps | Award BIOS: A memory error<br>Intel BIOS: A loose card or short |
| 1 long and 1 short beep | Intel BIOS: Motherboard problem |
| 1 long and 3 short beeps | Intel BIOS: A video problem |
| 3 long beeps | Intel BIOS: A keyboard controller problem |
| Continuous 2 short beeps and then a pause | Intel BIOS: A video card problem |
| Continuous 3 short beeps and then a pause | Intel BIOS: A memory error |
| 8 beeps followed by a system shutdown | Intel BIOS: The system has overheated |
| Continuous high and low beeps | Intel BIOS: CPU problem |

Common beep codes and their meanings for Intel and Award BIOS

| Error Message Before Windows Starts | Meaning of the Error Message |
|---|---|
| CMOS battery low | The CMOS battery needs replacing. |
| CMOS checksum bad | CMOS RAM might be corrupted. Run BIOS setup and reset BIOS to default settings. If the problem occurs again, try flashing the BIOS. |
| Memory size decreased | Startup BIOS recognized that the amount of installed RAM is less than that of the previous boot. A memory module might be bad. Begin troubleshooting memory. |
| Processor thermal trip error | The processor overheated and the system has restarted. |
| Intruder detection error | An intrusion detection device installed on the motherboard has detected that the computer case was opened. |
| Overclocking failed. Please enter setup to reconfigure your system. | Overclocking should be discontinued. However, this error might not be related to overclocking; it can occur when the power supply is failing. |
| No boot device available<br>Hard drive not found<br>Fixed disk error<br>Invalid boot disk<br>Inaccessible boot device or drive<br>Invalid drive specification | Startup BIOS did not find a device to use to load the operating system. Make sure the boot device priority order is correct in BIOS setup. Then begin troubleshooting the hard drive. |
| Missing BOOTMGR<br>Missing NTLDR<br>Missing operating system<br>Error loading operating system | The Windows program needed to start Windows is missing or corrupted. This program is called the OS boot manager program. |



Error messages that occur before Windows starts


Source: Microsoft Windows 7

A Windows error early in the boot that is related to software

Conclusion: