

Dealing with Hard Drive Failure:
Practical Tips on What to do When Your Drive Goes Bad



By Chancer Reese

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Hard drives or more accurately hard "disk" drives are the main storage units on a computer. PC or MAC, Linux or Unix, it doesn't really matter what operating system you use, without a functioning hard drive; your computer becomes a very expensive paperweight.

This mini guide is written to list all the most common causes of hard drive failures I have personally experienced (ouch!) or fixed as a computer support technician on other people's PCs. I have also included the best recommendations (what to do now advice) I have found on how to fix the problem as quickly and affordably as possible using tools around your home or available freely on the Web.

If you have any problems using this mini-manual or have a problem this e-document doesn't cover, email me at "fixcomputers@technowasel.com" and let me know how I can help. My reputation as an honest and helpful person is important to me, so please feel free to contact me with any comments, questions or problems you may have.

Thanks!

~ Chancer Reese

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Published by: CLRCOM Computer Services,
102 Buffalo Street, Asheville, North Carolina, 28806 USA
<http://www.fixcomputerproblemsguide.com>

First Edition – April 2008

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Note: This mini-guide is optimized for viewing on a computer screen, but it is organized so you can also print it out and assemble it as a report. Since the text is optimized for screen viewing, the type is larger than usual in printed documents.

Disclaimer

This report has been written to provide information about safely repairing hard drives on Windows-based computers. It is sold with the understanding that the author and publisher are not engaged in rendering information technology services to you. If you require other expert assistance, the services of a competent professional should be sought.

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FORMAT OF THIS MINI-GUIDE:

This guide is laid out using a "By-the-Numbers" method I learned while in the military. You will be given a "Troubleshooting Checklist" for a specific problem.

Each checklist will present a "step-by-step" how-to list for you to follow that will help you correctly diagnose and isolate the problem. At the end of each checklist will be a list of "Recommended Action" steps that you should take to solve or fix the computer problem you just isolated

In addition, at the back of this guide is a "Resources" section which has more information or "live" web links to any software or hardware items mentioned in the course of this guide.

TROUBLESHOOTING HARD DRIVES

A true hard drive failure can be very upsetting since most of us store everything from resumes, family photos to our bank records on our computers. And no matter how diligently we perform our backups or how frequently, a hard drive can fail at any time.

There can be several causes for a hard drive to start misbehaving. Hard drive issues can range from loose cables, bad disk platters to corrupt boot files or infections from viruses.

I have broken down each checklist into "Hardware" failures or "Software" problems. Start with the hardware checklist first. Follow the series of steps to narrow down your problem from the usual suspects.



While these checklists can look confusing, I have worked hard to make them as simple to use as possible. Think of them as if I were standing near you telling you just what to "click next". Just follow each step and you will be fine!



If possible backup as much of the hard drive as you can!



While sections of this guide are compatible with Linux or Mac computers, it was primarily written for a basic Windows PC.

GENERAL TROUBLESHOOTING GUIDELINES:

1. Admit You Have a Problem

Admit something is wrong with your computer. You can't fix it if you keep overlooking the situation.

2. Stop...Calm Down...Don't Panic

Don't let your "feelings" carry you away. Anger, aggravation and confusion are normal when your computer goes bad. Take a deep breath and relax.

3. A Positive and Persistent Attitude Helps

A good mental attitude will help more than you will believe. Stay positive - stay focused.

4. Find Out What Happened and Take Notes

Try and remember what was happening at the time your machine went bad. Write it down - else how will you remember it?

5. Identify and Isolate the Problem

Use the Troubleshooting checklists to narrow down and isolate what when wrong.

6. Remember: Reinstall, Reconfigure or Replace

- Reinstall software
- Reconfigure hardware or device drivers
- Replace bad hardware

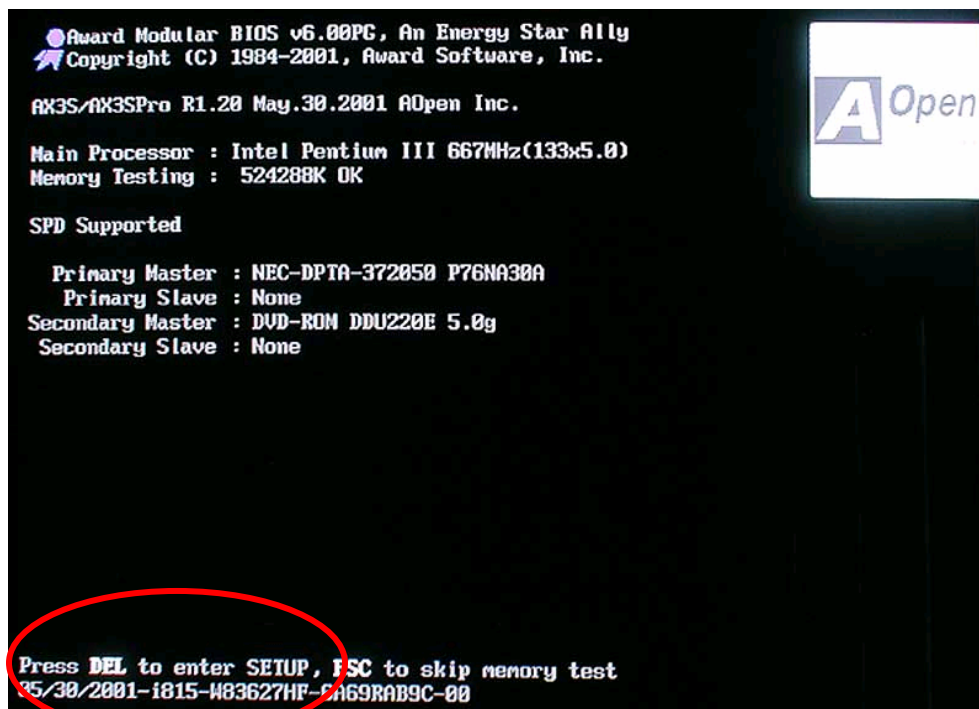
These are the only three things you ever have to do to repair any computer

7. Test, Test And Test Some More

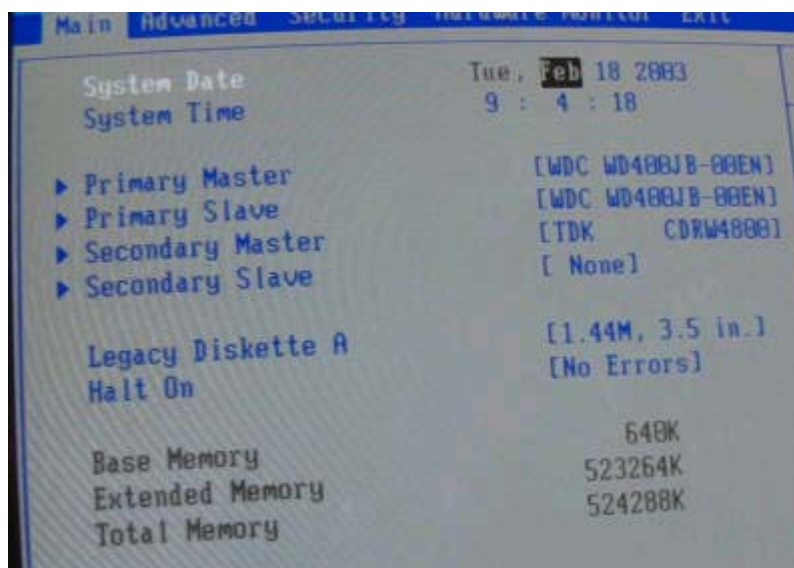
Before you close the case and throw away the receipt, power up and test everything!

Hardware Troubleshooting Checklist:

1. **First thing to do is to reboot your computer and press "F8"**. Try entering "Safe Mode". If you can't even get to this step continue to the next step.
2. **The next thing is to reboot your computer and login into the BIOS setup** to verify that the hard drive is recognized.
 - a. Restart your computer.
 - b. As your computer boots up, quickly press either the or <F2> key to enter the BIOS "Setup" program. You can also try <CTRL+ALT+ESC>, <ESC> or <F1>. If these key codes don't work contact your motherboard manufacturer to get the correct ones. But the first two keys are pretty standard these days.
 - c. If your computer tries to start Windows or hangs up, you didn't press the setup key code fast enough. Reboot and try again. You may have to try several times until you can get the timing right. Not to worry. You can't harm anything by rebooting.



d. You should enter the BIOS Setup mode which should look similar to this.



- e. Use the <TAB> key to locate Use the autodetect feature in the setup program to find and recognize the hard drive. Notice in this photo you can see 2 hard drives, both are "WDC WD488JB". One is a Primary Master and the other is a Primary Slave. A third device a rewriteable CD-ROM is seen as a Secondary Master "TDK CDRW4888"
- f. Does the BIOS setup recognize your hard drive?

- g. If the autodetect "sees" the hard drive, move on to the Software Troubleshoot checklist.
- h. If not, move to step 3.

3. Checking the connections:

- a. So now take your screwdrivers and open the computer case's side panel to see the interior. Unplug the external power cable for now. Lay the computer on its side so you can see all the components. The motherboard should now be on the "bottom"..
- b. Reconnect the monitor, keyboard and mouse if you need to. What we are going to do now is test out the cables that run from the hard drive to power supply and motherboard.
- c. Locate your hard drive. It will have a large "flat, grey, ribbon-like" 80-wire data (IDE) cable leading from it to the motherboard. See the photo below. The ink pen is pointing to the data cable and the red arrow is indicating the hard drive itself.



Also notice the red line on one side of the cable. This line indicates "Pin 1" which is very important. The red line must always match Pin 1 on the motherboard connector for your hard drive to work.

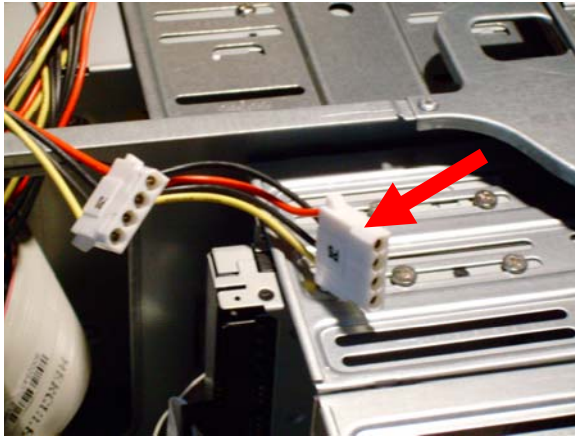


All new computers have color coded connections for the data cables. Each data (IDE) cable will have 3 molded plastic connectors: Black = master/main hard drive, Grey = the CD-ROM or second (slave) hard drive and Blue = Motherboard side.

- d. Make sure that the data cable is firmly plugged into "Pin 1" of the hard drive. Gently remove and then firmly reseal the data cable at both the motherboard (blue) and hard drive (black) connections. Be careful not to bend any of the tiny little pins.
- e. Check the IDE data cable for cracks, yellowing, breaks or being badly twisted. If damaged, you should replace it.

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- f. Plug in the external case power plug and reboot. Does it work now?
- g. If a second hard drive or CD/DVD drive is sharing the same data cable (grey), disconnect the data cable from the second drive.
- h. Reboot. Does it work now?
- i. If your hard drive still will not work, try removing and reseating the power cable from the computer power supply. The power supply cable will have 4 wires: "Red-Black-Black-Yellow" with a white plastic plug. Gently remove and then firmly push the plug back in.



- j. Reboot. Does it work now?
- k. Most power supplies have lots of extra cables. Next find a power cable not being used and switch it out with the one currently in the hard drive. Reboot. Does it work now? If not move to the next step.

4. Hard Drive Configuration:

- a. There are tiny little pins at the back of your hard drive(s) tell your motherboard if the hard drive is set to be either the main (master) or secondary (slave) device or "CS" (cable select) mode which means the cable will determine which is which.



Most hard drives have a diagram on their cover laying out the placement of its jumper pins. Verify that all the pins are in place correctly. Check out the hard drive manufacturer's support website if you are not sure.

As a general rule, if you have two devices and aren't using one drive as a master drive and the other as a slave, you should set both devices to "Cable Select" (CS) mode.



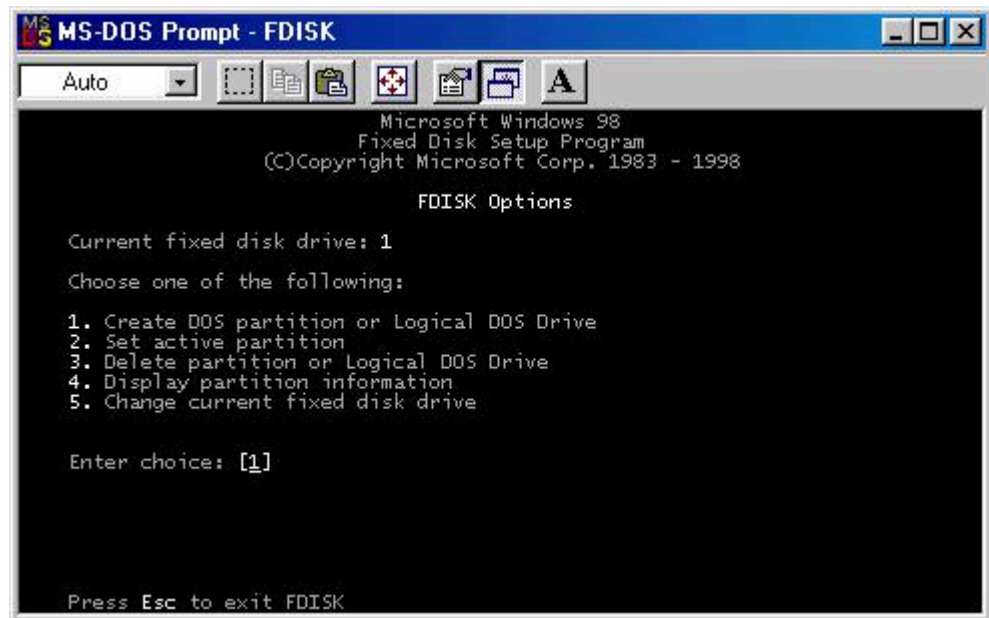
- b. Check that the hard drive jumper pins have not come loose. Just use your finger to push the pins down snug.
- c. Reboot again. Is it working?
- d. If not, replace all the power cables and IDE cables and move on to the next step.

5. Hard Drive Spin Problems: Is it moving at all?

- a. Reboot again and put your ear close to the suspect hard drive and listen carefully. Can you hear the hard drive spin up?
- b. A mild whirring sound is normal but if you hear repeated grinding, hard taps, high-pitched screeches or squeals, these are all signs of a future hard drive failure.
- c. If you can't hear any thing, place your fingers on the top of the hard drive and reboot. If the hard drive is spinning you should be able to feel a gentle and smooth vibration when the computer powers the drive.
- d. Rough vibrations may be caused by the hard drive being loose within the PC's case mounting or by its own internal disk platters going bad.
- e. Tighten the drive down and reboot. If you still feel very rough vibrations, the drive is going bad. See "Recommendations"
- f. If you can't feel/hear it spin up, (be sure it has a good power connection) then more than likely the drive is dead. See "Recommendations"
- g. If it spins up and then spins down immediately, the drive is going bad. See "Recommendations"
- h. If you can hear or feel it spinning then move to step 6.

6. Testing the Hard Drive with Utilities

- a. You can test a hard drive with a floppy boot disk, an Operating System/Restore CD or with a hard drive manufacturer's own diagnostic software.
- b. Try booting up using a Windows floppy boot disk or bootable CD.
- c. If your machine can't seem to boot from the floppy drive, go back into the BIOS Setup (step 2). Look the "BOOT" sequence section. Set your computer to boot from the "floppy" (if you have one), "CD-ROM", and then finally the "Hard Drive"
- d. The next series of step is okay to use with a Windows 98, Windows 98SE, or Windows Me machine:
 - Now put the Startup/boot disk in the floppy disk drive, restart your computer. At the prompt boot using CD-ROM support and press enter.
 - If your hard disk is larger than 512 MB, you receive the following message: "Your computer has a disk larger than 512 MB. Blah, blah.
Do you wish to enable large disk support?" Press "Y" and then press enter.
 - At the prompt "A:\", try accessing the drive directly by using the FDISK command. Press option 4, to see if you can view the drive's partition.



- If you can see the hard drive listed, move to the "Software checklist"
- If you see the error "no partition found" this is not a good thing and the drive may be DOA. See "Recommendations".

7. For Window 2000/XP you should use your Operating System or Restore CD.

- When starting your computer from a Windows 2000/XP CD you may have to select use a "Boot Menu" at startup along with changing the boot sequence in the "BIOS setup".
- At the Welcome to Setup page, press <ENTER>.
- Now if an existing Windows 2000/XP installation is detected, you will be prompted to repair it. Ignore this and press <ESC>.
- You should now see all the existing partitions and the unpartitioned space listed for each hard disk. If so then move to the "Software" checklist.
- If not then the drive is probably failed and you should see the "Recommendations".

8. Using a third party hard drive diagnostic or bootable CD.

- If you don't have access to any Windows boot disks or CDs you can use a third party hard drive utility or a boot CD.
- All of the major hard drive manufacturers make available free hard drive utility products. Go online and download one that matches your hard drive and run its diagnosis program.
- Another software utility to you can utilize is a bootable CD called Ultimate Boot CD. See Resources for the web address.
- Using either of the applications mentioned above, was the hard drive detected?
- If the drive wasn't detectable, this is sign of a hardware failure. See "Recommendations"
- If you can see the drive using a utility, this is a software issue. See the Software Checklist.

Recommendations:

- If you can't see the hard drive in BIOS using autodetect, there are hardware issues.
- If you can't access drive using a boot disk or CD, or hear it or feel it spin up the chances are good that the drive is dead.
- If the problem seems to be intermittent, remove the suspect drive and connect it to another working computer and test it.

Just unplug the IDE data and power cable from the working hard drive and plug them into suspect one. Reboot.

- If it works (boots up and spins up) in the other machine, then something in your computer's setup is causing the drive to act badly. This maybe a good time to take it to the shop.
- Replace the suspect hard drive with a known good (used) hard drive or replace it with a newly purchased one.



If you don't have any backups and you desperately need the files off your old hard drive use the following measures as a "last resort". All three methods of starting a dead drive have worked for me in the past:

- Tap it. Start gently tapping the sides of the hard drive with a screwdriver to see if its disks are stuck. Boot it up. If it runs, back up your data immediately. You may have to tap it until the backup is complete.
- Freeze it. SERIOUSLY. Place the suspect hard drive in a plastic bag and freeze it for 1-8 hours. Take the drive out of the freezer and hook up immediately. If it boots up, make a backup of all your files before it gets to room temperature. Crazy but it has worked for me twice.
- Slam it. Remove the hard drive from the case. Place it cover (label side) down in the palm of your hand. Quickly and briskly slam it down flush onto a flat surface (a clean desktop). Reconnect and reboot. I only got this method to work the one time but I got the data backed up.

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Software Troubleshooting Checklist:

Usually if a hard drive is running (spinning up when powered) and can be accessed by one the methods listed above, the problem is software related.

1. First thing to do is to reboot your computer. You are looking for BIOS or Windows error messages. BIOS screen error messages are displayed after your machine has booted up. See Resources for a list of common error messages.
2. If the computer stops at an empty, black screen immediately after the power-on self test (POST) or BIOS screen has completed then the master boot record (MBR), partition tables, boot sector, or NTLDR file may be corrupted.
3. This is a Windows Black Screen of Death. You may have picked up a boot sector virus which destroys or encrypts the Master Boot Record on your hard drive, which makes it very difficult or impossible to boot your PC. Or your Window boot files have gone bad.

Recommendations:

- Boot your computer using a boot disk or startup CD. Insert a good antivirus program and scan your hard drive.
- If after the antivirus scan has completed and all viruses/spyware have been removed, try and reboot your computer.
- If the hard drive still will not boot, especially if you are getting a Windows "Blue Screen of Death" or a BSOD or "STOP" error, you will have to reinstall your Windows operating system using the "Repair" option (to save your files and settings). Be careful, reinstalling your operating system without using the proper "repair" functions when you reinstall, you can accidentally erase all your settings and files.

Related Hard Drive Problems:

1. "I moved my old hard drive into a new machine now it won't start. What's wrong?"
 - a. If the hard drive boots up (spins up) and gets past the white on black BIOS screen messages but then gives you a Windows Blue Screen of Death (BSOD) this is more than likely a Windows license problem.
 - b. If your hard drive has a version of Windows that has an OEM (Original Equipment Manufacturers) license by removing it from the original computer you have accidentally voided the license.
 - c. An OEM version of Windows will at startup look to the motherboard for a specific serial number issued by the PC maker (Dell, HP, eMachine, etc.). Without that motherboard number, Windows will not boot properly.
 - d. If you have placed the hard drive into a machine from the same manufacturer, you may be able to do a "repair" install from your Windows CD. Windows OEM CDs will not install Windows on a non-brand (white box or custom built) PC nor on PCs from a different manufacturer.
2. "I replaced my old hard drive with a brand-new one, now it won't boot. What's wrong?"
 - a. Did you properly partition and format the new hard drive? Use the hard drive's Utility disk that came in the box to partition/format the drive. Without this, your hard drive will not boot correctly.
 - b. If you don't have a Utility disk, did you know that when you do a "clean" install of Windows, these functions will be taken care of for you? Put in your Windows CD and boot from it to use the automated partition and format functions.

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- c. Did you check the BIOS Setup to make sure the hard drive was autodetected? Did you change the boot sequence to that the hard drive boots first?
- d. Did you install an operating system like Windows?
- e. Run through the Hardware Checklist and troubleshoot any minor hardware issues you may have missed.
- f. If it turns out to be a hardware issue, return the hard drive to the store for a new replacement. While a defective brand new hard drive is rare, it is not unheard of.

Resources:

Questions, Comments or Support:

Ms. Chancer Reese, fixcomputers@technoweasel.com

TOOLS NEEDED:

A floppy boot or startup disk(s), Windows Operating System CD or Restore CD (free Windows boot disks can be found at www.bootdisk.com)

A Hard Drive Utility Diagnostic CD (software available from your hard drive's manufacturer)

1 each standard Philips head screwdriver

1 each standard Flat head screwdriver

Hard Drive Utilities:

[Seagate \(SeaTools\)](http://www.seagate.com/www/en-us/support/downloads/seatools) > www.seagate.com/www/en-us/support/downloads/seatools

Seagate has acquired the Maxtor and Quantum brand names. So use the above tool on those brands drive.

[Hitachi Drive Fitness Test](http://www.hitachigst.com/hdd/support/download.htm#DFT) > www.hitachigst.com/hdd/support/download.htm#DFT

Works on most hard drives

[Western Digital Data Lifeguard Diagnostic](http://support.wdc.com/download) > support.wdc.com/download

Will work on all WD products and some other hard drives, if a WD hard drive is primary or master

Boot Disks:

www.bootdisk.com - Boot Disks for Dos, most flavors of Windows and Linux

www.ultimatebootcd.com - Currently this version of the CD has 100 PC hardware diagnosis tools you can use to analyze your hardware.

Common BIOS beep or audio codes:

- 1 short beep - Normal POST - No problems detected
- No beep - no power, power supply, motherboard problem, disconnected CPU, or disconnected speaker
- Continuous beep - Power supply, motherboard, or keyboard problem
- Repeating short beeps - Power supply or motherboard or keyboard
- Repeating long beeps - RAM (memory stick) is unseated
- 1 long, 1 short beep - Motherboard problem
- 1 long, 2 short beeps - Video Card, Video Card Slot
- 1 long, 3 short beeps - Video Card, Video Card Slot
- 3 long Beeps - keyboard or keyboard port (motherboard problem)
- 1 beep, Blank or Incorrect Display - Monitor, Video Card, Video Card Slot

BIOS Screen Error Messages

The following messages are examples of messages including errors detected by the BIOS during POST and a description of what they mean and/or what you may do to correct the error.

BIOS ROM checksum error - System halted	The checksum of the BIOS code in the BIOS chip is incorrect, indicating the BIOS code may have become corrupt. Contact your system dealer to replace the BIOS.
CMOS battery failed	The CMOS battery is no longer functional. Contact your system dealer for a replacement battery.
CMOS checksum error - Defaults loaded	Checksum of CMOS is incorrect, so the system loads the default equipment configuration. A checksum error may indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.
CPU at nnnn	Displays the running speed of the CPU.

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Display switch is set incorrectly	The display switch on the motherboard can be set to either monochrome or color. This message indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, and then either turn off the system and change the jumper, or enter Setup and change the VIDEO selection.
Press ESC to skip memory test	The user may press Esc to skip the full memory test.
Floppy disk(s) fail	Cannot find or initialize the floppy drive controller or the drive. Make sure the controller is installed correctly. If no floppy drives are installed, be sure the Diskette Drive selection in Setup is set to NONE or AUTO.
HARD DISK initializing Please wait a moment	Some hard drives require extra time to initialize.
HARD DISK INSTALL FAILURE	Cannot find or initialize the hard drive controller or the drive. Make sure the controller is installed correctly. If no hard drives are installed, be sure the Hard Drive selection in Setup is set to NONE.
Hard disk(s) diagnosis fail	The system may run specific disk diagnostic routines. This message appears if one or more hard disks return an error when the diagnostics run.
Keyboard error or no keyboard present	Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are pressed during POST. To purposely configure

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the system without a keyboard, set the error halt condition in Setup to HALT ON ALL, BUT KEYBOARD. The BIOS then ignores the missing keyboard during POST.

Keyboard is locked out - Unlock the key	This message usually indicates that one or more keys have been pressed during the keyboard tests. Be sure no objects are resting on the keyboard.
Memory Test:	This message displays during a full memory test, counting down the memory areas being tested.
Memory test fail	If POST detects an error during memory testing, additional information appears giving specifics about the type and location of the memory error.
Override enabled - Defaults loaded	If the system cannot boot using the current CMOS configuration, the BIOS can override the current configuration with a set of BIOS defaults designed for the most stable, minimal-performance system operations.
Press TAB to show POST screen	System OEMs may replace the Phoenix Technologies' AwardBIOS POST display with their own proprietary display. Including this message in the OEM display permits the operator to switch between the OEM display and the default POST display.
Primary master hard disk fail	POST detects an error in the primary master IDE hard drive.

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Primary slave hard disk fail	POST detects an error in the secondary master IDE hard drive.
Resuming from disk, Press TAB to show POST screen	Phoenix Technologies offers a save-to-disk feature for notebook computers. This message may appear when the operator re-starts the system after a save-to-disk shut-down. See the Press Tab & message above for a description of this feature.
Secondary master hard disk fail	POST detects an error in the primary slave IDE hard drive.
Secondary slave hard disk fail	POST detects an error in the secondary slave IDE hard drive.

Source: <http://www.phoenix.com>

About the Author



Chancer Reese works with home computer users and small office workers, who are tired of losing money and sick of struggling with constant computer headaches.

Ms. Reese is a CompTIA certified A+ and Network+ computer professional with over 18 years of personal computer experience.

For feedback, support, compliments or complaints, please contact her at fixcomputers@technoweasel.com

To learn more about how to understand and use computer technology better, visit <http://www.fixcomputerproblemsguide.com>