

# CIS 100: BIOS and MOBO Install

Fall 2008

# Key things about Mobos

- Size vs. Case
- Distance and cabling
- Compatibility for OS
- Processor Type
- Chipset Type
- Features
  - SATA connectors
  - Video, Audio
  - ?
- Reputation

# Buying mobos

- Decide what processor you want
- Decide what OS you want
- Decide what features you need/want
- Consider what you can afford
- Examine the website of the company for both usability and availability of drivers

# What is a BIOS

- Basic Input/Output System
- The lowest level set of functions in the hardware
- This is stored on chips on the mobo.
- It has a POST (power on self test) operation that initially tries to test everything on the mobo. This includes memory, chips, the CPU etc.
- Different mobos have different levels of post.

# POST Codes

1-1-3	Your computer can't read the configuration info stored in the CMOS. Replace the motherboard.
1-1-4	Your BIOS needs to be replaced.
1-2-1	You have a bad timer chip on the motherboard. You need a new motherboard.
1-2-2	The motherboard is bad.
1-2-3	The motherboard is bad.
1-3-1	You'll need to replace the motherboard.
1-3-3	You'll need to replace the motherboard.
1-3-4	The motherboard is bad.
1-4-1	The motherboard is bad.
1-4-2	Some of your memory is bad.
2--_	Any combo of beeps after two means that some of your memory is bad, and unless you want to get real technical, you should probably have the guys in the lab coats test the memory for you. Take it to the shop.
3-1_	One of the chips on your motherboard is broken. You'll likely need to get another board.
3-2-4	One of the chips on your motherboard that checks the keyboard is broken. You'll likely need to get another board.
3-3-4	Your computer can't find the video card. Is it there? If so, try swapping it with another one and see if it works.
3-4_	Your video card isn't working. You'll need to replace it.
4-2-1	There's a bad chip on the motherboard. You need to buy another board.
4-2-2	First check the keyboard for problems. If nothing, you have a bad motherboard.
4-2-3	Same as 4-2-2.
4-2-4	One of the cards is bad. Try yanking out the cards one by one to isolate the culprit. Replace the bad one. The last possibility is to buy another motherboard.
4-3-1	Replace the motherboard.
4-3-2	See 4-3-1
4-3-3	See 4-3-1
4-3-4	Time of day clock failure. Try running the setup program that comes with the computer. Check the date and time. If that doesn't work, replace the battery. If that doesn't work, replace the power supply. You may have to replace the motherboard, but that is rare.
4-4-1	Your serial ports are acting up. Reseat, or replace, the I/O card. If the I/O is on the motherboard itself, disable them with a jumper (consult your manual to know which one) and then add an I/O card.
4-4-2	See 4-4-1, but this time is your Parallel port that's acting up.
4-4-3	Your math coprocessor is having problems. Run a test program to double-check it. If it is indeed bad, disable it, or replace it.
Low 1-1-2	Your motherboard is having problems
Low 1-1-3	This is an Extended CMOS RAM problem, check your motherboard battery, and motherboard.

# POST Codes

- These are beeps or buzzes that come out of the mobo speaker to try and alert you to low level problems. You have to have a basic speaker attached to the mobo for this to work.
- Every bios has different codes and these are just examples. You will have to look up your bios codes for your mobo bios.
- Typically, the bios is listed during the boot up process. You need to know this and the version.

# What else bios does

- Most modern bios have an interface which can be reached by pressing some key during the boot process.
  - del
  - f1
  - ??
- Watch on the screen to see what it is.

# BIOS Management

- The bios will control all sorts of things.
- For our purposes there are several key things we want to manage:
  - 1) System Health.
    - When you first boot up your machine, check the temperature being reported from the CPU. Monitor this for at least 15 minutes to see if the temps are in the 20-55C range. If it is greater than 55C shut the machine down. You probably have a problem with the heat sink.

# BIOS Management

- 2) Boot process
  - You want to define the boot up devices.
  - Typically you want:
    - CD/DVD
    - Hard Drive

# Flashing BIOS

- Most bios are now written to EPROM rather than ROM (eraseable read only memory).
- This means you can use a flash tool to upgrade the bios.
- Upgrade the bios when:
  - 1) Your version is a major version behind (or more)
    - e.g. current is 3.0.14.151 and you are 1.1.7.19
  - 2) You are experiencing some sort of issue that is listed in the fixes (you have to read the material).
  - 3) The mobo site or the bios site recommends the update.

# Danger

- If you fry the bios while flashing, you will likely need a new mobo.
  - This can result from power failures or sudden shutdown during the process.
  - Personally, most modern mobos have update tools that run in windows. This is the easiest way to flash the bios and likely the safest.

# Two other main controllers

- Northbridge
  - Typically controls memory and video components.
- Southbridge
  - Typically controls
    - BUS
    - clock
    - power
    - usb
    - etc.

# Before you install

- First map out all the connectors. It's a lot easier to do this with the motherboard out.
- Check the docs for any jumpers you might need to set.
- In particular map out the case connectors since they are often hard to figure out.

# Installing a mobo

- You need:
  - offsets
  - screwdriver
  - mobo screws
  - bezel

# First it is a good idea to mark the offset locations on the mobo tray

- I usually do this with a sharpie pen or you can do it with your eyes.
- Once you have done this, put an offset in each location.
- Only use nylon spacers if you have no other approach.

# Tray



# Put in the bezel (CAUTION)



# Bezel Notes

- The bezel has some little tabs that may have to be broken off using metal fatigue. Check it with the mobo.
- NOTE: When you install the mobo later, it has to be inserted at an angle tilt down and then lower the back to get it to fit into the bezel.

# Now

- Check to see if all the holes line up by placing the mobo in the case and just eyeball it.
- Take a screw and an offset and check it for fit.
- IF all seems well, tilt the motherboard with the end near the bezel down and slide into the bezel, then lower the back end into place. You will likely have to press on the back a bit to push it forward to line up the holes.
- Do the center hole first and then alternate the outer ones. Make sure the screws fit and don't force them.

# Follow up

- Connect the case connectors. You may want to do some quick checks to see if there are conflicts with wires, memory or other features that will require you to put something else in first.