

# INSTALLING THE MOTHERBOARD, CPU, HEAT SINK, FAN AND RAM

Now that we have chosen the components for building our computer, we will now go through the steps for putting it all together. Some steps have been covered in previous Tech Tips; such as installing the graphics card, power supply unit, CD/DVD drive and sound card, so we will not go into those again.

## A Housekeeping Tip

First and foremost, you really need to be aware of static electricity when building your PC. We strongly recommend that you get an antistatic wrist strap and an antistatic mat to use when doing any work with the components. A slight shock can ruin a good CPU and you might not even feel it!



## Installing the Motherboard

The first step is to get your computer case ready for the motherboard installation. There are several different methods used to secure a motherboard to the chassis. Often, you will have brass or plastic standoffs (small round, square or hex, objects usually threaded, that keep two components or boards from touching each other) that you screw to the motherboard tray of the computer case.

Check your computer case owner's manual for more information on this step of the process. Every case should have some method of showing you which position to place the standoffs to ensure compatibility with an ATX or other form factor motherboard. It is very important that you use only the correct standoffs to secure your motherboard to the chassis. If you place a standoff in the wrong position, the motherboard may still fit the case, but you could cause a short by allowing two of the power tracings on the motherboard to contact each other via the standoff, and fry your new custom computer. Once you have the standoffs placed correctly, simply use the screws supplied with the case to attach the motherboard.

## Installing the CPU

Installing the CPU is the most delicate part of the entire build process. Depending on the CPU you chose, your socket may be slightly different. However, the vast majority of commonly available CPUs currently being produced use the ZIF (zero insertion force) socket.

With a ZIF socket, if the CPU is aligned correctly with the motherboard CPU socket, it should not require any force to install the CPU. Be sure that you have the arm on the ZIF socket up to open the retention mechanism for the socket. The CPU will have a mark of some sort,

most commonly a small triangle in one corner, and the CPU socket on the motherboard will have a similar marking on one of its corners as well.

Align these two marks and gently insert the CPU into the socket. If you experience any resistance during the insertion, stop immediately and be sure that you have the CPU aligned correctly. If you are not sure how to do this consult with the motherboard manufacturer. Inserting the CPU incorrectly can damage one of the CPU pins and destroy your new CPU.



## Applying Thermal Paste



I need to make something very clear here, *thermal paste is not optional*. You absolutely must use thermal paste to attach the heat sink to the CPU. If you run your computer without thermal paste, you can ruin your CPU in just a few seconds.

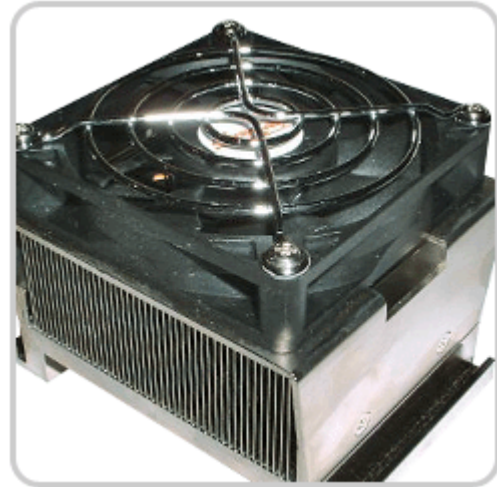
There are many manufacturers of thermal paste on the market currently and each package should have instructions on how to use it. If no instructions are included with the paste, check the manufacturer's website for more information.

If no information is available, these are some basic guide lines. Cover the entire surface of the top of your CPU with a thin coat of thermal paste after it is installed on your motherboard. After that, using a clean lint-free cloth gently wipe the thermal paste from the surface of the CPU. You will

not be able to get all the thermal paste off the top of the CPU because it will fill the little scratches and valleys on the CPU surface. Once you have done this, reapply the thermal paste in the same manner, but this time DO NOT wipe the thermal paste off. You are now ready to install the heat sink/fan combo.

### Installing the Heat Sink/Fan Combo

Heat sink and fan combos come from many different manufacturers. They will use the same retention system designed to be used with your CPU socket type. Some heat sinks come with several brackets that will work with multiple socket types. However, many heat sinks are designed to fit one socket type only. Make sure you have a compatible heat sink.



Just like the CPU, do not start your computer up without the heat sink being installed correctly. Read the instructions that came with your motherboard and your heat sink for more details on performing this step.

Once installed on the CPU socket, you will need to plug the heat sink fan into the correct fan header on your motherboard. There may be several fan headers on your board, but one should be specifically labeled for the CPU fan. Be sure you use the correct one; it is typically the fan header closest to the CPU socket.

### Installing the RAM



You will most likely be using DDR or DDR2 RAM. Note that DDR and DDR2 are not compatible and while they look very similar, they will not interchange. Your motherboard manual should explain what RAM types and RAM speeds it is compatible with.

Installing the RAM is very easy. You simply locate the RAM dimm sockets, of which there may be several on your board, open the little plastic clips and correctly align your RAM by comparing the socket shape to the shape of the RAM and snap it into place. Some RAM will

require changes to the BIOS to work at the advertised speeds; consult the RAM manufacturer for more information on how to change the BIOS to support your desired speed.

### **Conclusion**

You are now on your way to building a custom computer. If at any step along the way you run into difficulty, consult with a more experienced computer geek to alleviate the risk of damaging your newly purchased components. Building your computer is not difficult if you follow the steps, take your time and use proper electrostatic preventative procedures. Good luck and have fun! Join us next time for tips on installing the peripheral components of your computer, monitor, mouse, printer and such.

Source : <http://www.geeks.com/techtips/2006/techtips-17aug06.htm>