

HOW TO BUILD A COMPUTER – III :

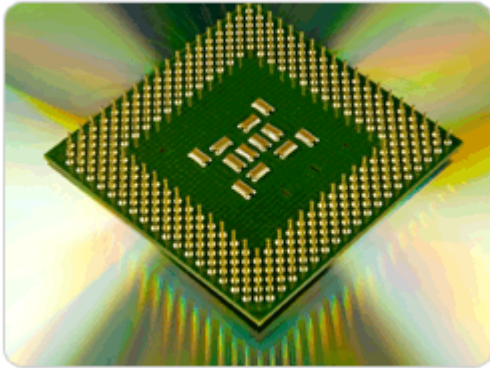
CHOOSING COMPUTER COMPONENTS

This week, we will pick up our series on how to build a computer where we left off and talk about the CPU (Central Processing Unit). So far in this series, we have covered choosing your case, power supply, CD drive, and floppy drive in Part One. Last week in Part Two, we went over choosing the hard drive, RAM, and motherboard.

This article on the CPU and CPU heat sink covers some of the most important parts of your computer. As always, the items covered in this article will be denoted in bold print in our list below. Components covered in previous articles will be denoted in italics and asterisks denote optional components.

- *Chassis/case*
- *Power supply*
- *CD drives*
- *DVD drives*
- *Floppy Drive**
- *Hard Drive(s)*
- *RAM* (random access memory)
- *Motherboard*
- **CPU** (central processing unit)
- **CPU heat sink/fan**
- **Thermal paste**
- Hard drive cable
- Floppy drive cable*
- CD/DVD drive cable
- Video card (graphics card)*
(optional if your motherboard has onboard graphics)
- Sound card* (optional if your motherboard has onboard sound)
- Monitor (display)
- Input – Keyboard/Mouse
- Speakers*
- Operating system software

CPU



Like motherboards, there are a number of different CPUs on the market. Choosing which CPU you buy depends on what you want to do with your computer and the size of your budget. High-end CPUs like the new AMD FX-62 can run you about \$1,000.00. On the other end of the AMD spectrum, you can get an AMD Sempron CPU, such as this one from Geeks.com for under \$90.00.

What's the difference? Mostly, the difference is in the speed of the processor and the number of cores the CPU chip has. A dual core processor, like the AMD FX-62 has two physical processors, or cores, inside the one chip. Two cores allows the processor to do more work and run more tasks simultaneously without making your computer run sluggishly. On the other hand, a single core processor has only one core and can't do as much work at once.

Do you need dual cores? It depends on what you will do. Gamers should go with dual cores if possible. A substantial number of developers are working on bringing multi-threaded applications and games to market. Soon, dual core processors will have a much greater advantage over single-core or traditional processors than they do today. For example, one of the patches for the game Quake 4 enables support for multi-core processors and you get much better performance.

Dual core processors benefit more users than just gamers. If you are into digital video editing or music creation on your PC, a dual core processor can help you work faster and more efficiently. On the other hand, if you only use your computer for browsing the Web, email, and the occasional word processing document, a dual core CPU may be overkill.

Intel also makes some fantastic dual core and single core processors. Both brands of processor will do the same job and both manufacturers have equivalent products. I suggest that you buy your preferred brand or compare specifications from independent reviews online, such as this one. The CPU is one of the parts you will want to spend extra cash on because it will help your system run faster and more efficiently, extending the time between upgrades. Until we get to graphics cards, assuming you have adequate RAM, the CPU is where you will see the most performance gains from your finished system.

When choosing either brand of CPU, you absolutely must keep in mind the socket type and match the CPU socket to the motherboard socket. The sockets do not interchange between manufacturers, and just because the pin pattern on the bottom of your CPU looks similar to the socket on your motherboard DOES NOT mean they are compatible. The CPU manufacturer will have the required socket clearly labeled, just as the motherboard manufacturer will have the socket on the motherboard labeled. Simply match them up for compatibility. Often, the easiest thing to do is to purchase anotherboard/CPU combo to rule out errors at this point.

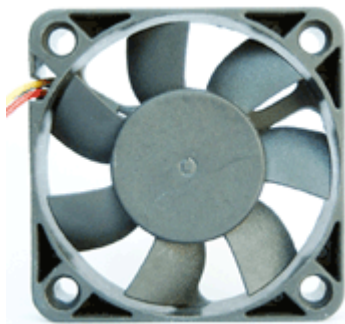
CPU Heatsink/Fan

This is an absolutely essential component of the computer. You CANNOT start your computer up without having a CPU heatsink and fan combo installed correctly. Running your computer for even a few seconds without the heatsink and fan installed can ruin your CPU due to overheating. We will go over the correct installation procedure for the CPU heatsink/fan combo in a later issue of this series.



Just like the CPU and the motherboard, the CPU heatsink/fan combo is specific to a socket type due to the required retention system. Each socket tends to have a completely different retention system, therefore requires a different heatsink. Some do interchange, but not all. Be sure to check compatibility before you buy and install your heatsink.

Many boxed retail CPU sets include the compatible heatsink and fan. However, if you buy a bulk OEM CPU, you will need to purchase the appropriate heatsink for the CPU. There are many manufacturers of heatsinks, and every one makes them a bit differently. The one thing they have in common will be the correct retention mechanism for the specified socket type.



How the heatsink/fan combo looks is irrelevant. What is important is that it fits in the case you bought. Typically, the larger the heatsink and fan, the cooler your CPU will run. Often, the cooler your CPU runs, the longer it will last and the more performance you can get out of your system. It is important to note here that advanced users and overclockers may decide to choose liquid cooling or the more exotic phase-change cooling rather than a simpler, but less effective heatsink and fan combo. Liquid cooling and phase change cooling are beyond the scope of this

series, but if there are enough requests for it, we may do a Tech Tip on the subject of exotic or out-of-the ordinary cooling systems available.

Thermal Paste

Thermal paste is also known as thermal (transfer) compound or thermal grease. There are many different brands of thermal paste on the market. If you buy a boxed CPU retail or a new heatsink/fan combo, chances are that it will come with a pad of thermal paste of some sort already applied.

Most likely, the paste pre-applied to the heatsinks will be fine for your needs. However, many PC enthusiasts go for a higher quality thermal paste such as Artic Silver. The main point here is that thermal paste of some sort is not optional. You absolutely must apply thermal paste to your CPU or risk destroying it the first time you try to boot up your new computer. Check with the manufacturer for instructions for applying the thermal paste.

Source : <http://www.geeks.com/techtips/2006/techtips-13july06.htm>