



COMPUTER COOLING TIPS

PART ONE

Tech Tip 51 - Computer Cooling Tips, Part I

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Heat. We all love the heat during the summer, lounging out by the pool or basking in the sunlight on the beach. But heat can be deadly, especially to your costly computer components.

This week we are going to talk about the basics of cooling your computer system and its components.

1. Why Is It So Hot In There?



Computers are built out of many digital circuits. These circuits are constantly switching state; i.e., when doing calculations. Heat is a byproduct of these calculations. Computer chips, central processing units (CPUs), and graphic processing units (GPUs) are getting more powerful every day. With newer technology comes faster processing. Faster processing leads to more heat being generated. Without proper heat dissipation, your CPU [<http://www.geeks.com/details.asp?invtid=ADA3700AEP5AR-N&cat=CPU>] can be damaged beyond repair.

2. Going Down the (Heat) Sink

The first line of defense in this war against heat is a heat sink. It's just a big chunk of metal that dissipates heat from your CPU and spreads it out across its surface. The idea is to spread the heat to a larger surface area and let the air pick up the heat and whisk it away.

The surface area of a heat sink is created by many fins. The traditional heat sink is made of aluminum and has many parallel fins. Aluminum can be easily extruded with straight parallel fins. The problem with this design is that air can only move through the fins in one direction, creating a problem for air flow within a computer case.

Newer heat sink designs are becoming far more intricate. Engineers are finding creative and aesthetically pleasing designs to help dissipate heat more efficiently.

3. The Secrets to Making Heat Sinks Work

The majority of CPU coolers use a simple aluminum heat sink because it is inexpensive and a good conductor of heat. It is imperative that the heat sink be seated properly on the CPU. Any resistance to thermal transfer could allow the CPU to overheat.

A copper heat spreader for that critical center part of the heat sink is a good choice to aid in CPU cooling. This is a flat piece of copper sandwiched between the top of the CPU and the bottom of the aluminum heat sink. The copper heat spreader helps to dissipate the heat from the CPU immediately to a larger surface area.



Whether you decide to use a heat sink with a copper heat spreader or not, you will need to use thermal grease. [<http://www.geeks.com/details.asp?invtid=TG-ST700&cat=CPU>]. Because of its thermal conductivity and low resistance, thermal grease is essential to proper CPU cooling.

Thermal grease needs to be applied between the CPU and the heat sink, (or copper heat spreader), in a very thin and even film. When applying the thermal grease, be careful not to apply too much. Clamp the heat sink down to the motherboard and then remove the heat sink. Check to see if any thermal grease has squeezed off the CPU and wipe off any excess.

4. From the Sink to the Air



Now that we have moved the heat from the CPU to the heat sink, we face the problem of moving the heat from the surface of the heat sink to the air inside your computer case. If we just let it sit there, the air around the heat sink gets hot and won't let any more heat escape. The answer to that problem is simple – a fan to blow the hot air away from the heat sink to let cooler air in.

Almost all model CPUs require a CPU cooler [<http://www.geeks.com/details.asp?invtid=CF460S13-N&cat=FAN>] with a fan to operate safely. The fan mounted on top of the heat sink blows cool air onto the fins of the heat sink. Be certain to get a CPU cooler to match the type of CPU in your computer because the mounting configurations are different between brands and models.

5. Deadly Dust Bunnies

We all know they are there, collecting quietly in the most in places. Those dust bunnies just seem to collect everywhere. Unfortunately, they will collect on your fan blades and heat unattended, they can build up and clog the fan motor result



operation and increased heat on your CPU.

Regrettably, we cannot spray a cleaning agent and wipe away the dust. We all know that liquids and electronics don't mix! But how do we clean the dust out and maintain an efficient cooling system? Get a hold of a mini vacuum cleaner [<http://www.geeks.com/details.asp?invtid=KBC-1B&cpc=SCH&srm=0>] and simply suck those deadly dust bunnies away!

I recommend you clean your system out regularly. While cleaning your CPU and heat sink, it wouldn't be a bad idea to clean the fan blades on your power supply too.

6. What About the GPU?



The GPU on your video card is another hotspot. With the high demands on the GPU from 3-dimensional games, art programs and other software, your video card is susceptible to heat damage. Most newer video cards will have a heat sink and fan already installed, so be diligent and keep this clean as well.

Another option to keep your video card running efficiently is to add heat sinks

[<http://www.geeks.com/details.asp?invtid=CK5000&cpc=SCH&srm=0>] to the RAM modules. These will work in the same manner as the heat sink on your CPU and GPU.

7. Cool Casing

Now that we have the heat removed from our CPU and our video card, how can we get rid of the hot air inside our computer case? One item you may want to consider is a thermal vent [<http://www.geeks.com/details.asp?invtid=THERM-ALHOOD-II&cpc=SCH&srm=0>]. This works just like the venting on your dryer. You should also think about adding some case fans [http://www.geeks.com/products_sc.asp?cat=372] to purge that hot air out of your case.



Proper cooling is essential to a long computer life. But how do you know that your fans are doing their jobs? Adding a case fan controller [<http://www.geeks.com/details.asp?invtid=CW-SV&cpc=SCH&srm=0>] is a great start. Now you will be able to keep track of specific temperatures as well as control the fan speeds on your primary components.



8. Heat is Hard on Hard Drives

One often overlooked hotspot in a computer is the front of the case where your hard drive is installed. A great way to keep your hard drives running cooler is to install a hard drive cooler. [<http://www.geeks.com/details.asp?invtid=SIL-DUALHDDFAN&cpc=SCH&srm=0>]. This twin fan cooler mounts to your hard drive and is easily powered by connecting to your power supply.

Most cases will have a fan mount option for a 3-inch fan at the bottom of the front panel of the case. This is a great place to add proper air circulation within your case and will help to cool your hard drives also.

Final Words

Our computers have cost us our hard-earned dollars. We save up to buy the very best and we expect reliable performance. But, just like a car, a computer requires proper maintenance. Keep them cool and clean and they'll last you a lifetime. Ignore them and you they will start costing you more in the long run. Be cool and keep it cool!