My ET9000 Cooling modification

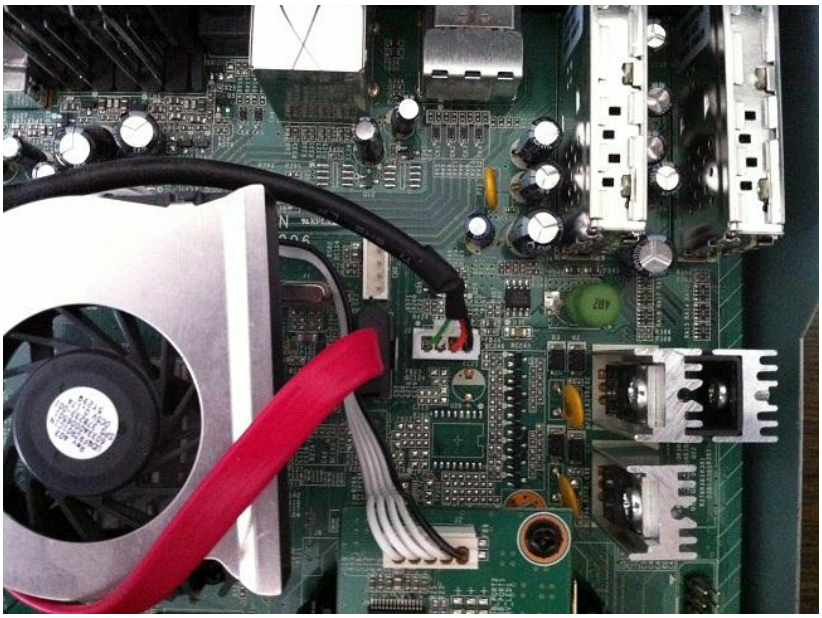
Written by BB2000 © 2011 (Member: www.sat4all.com)

The final result after modification.

Just as a lot of people, I noticed the very high temperature of my Clarke Tech ET9000, also known as Extrend. Because of this problem and the fact that I want to place the tuner in my stereo cabinet, I felt the need to modify the tuner first.

I have seen a lot of people doing modifications with one or sometimes two fan's, but none of them filled in the need regarding optimal cooling of CPU, TUNERS, Voltage regulators and Power supply, keeping the voltage use by the fans low and the noise down. To challenge this all, I started modifying my ET9000.

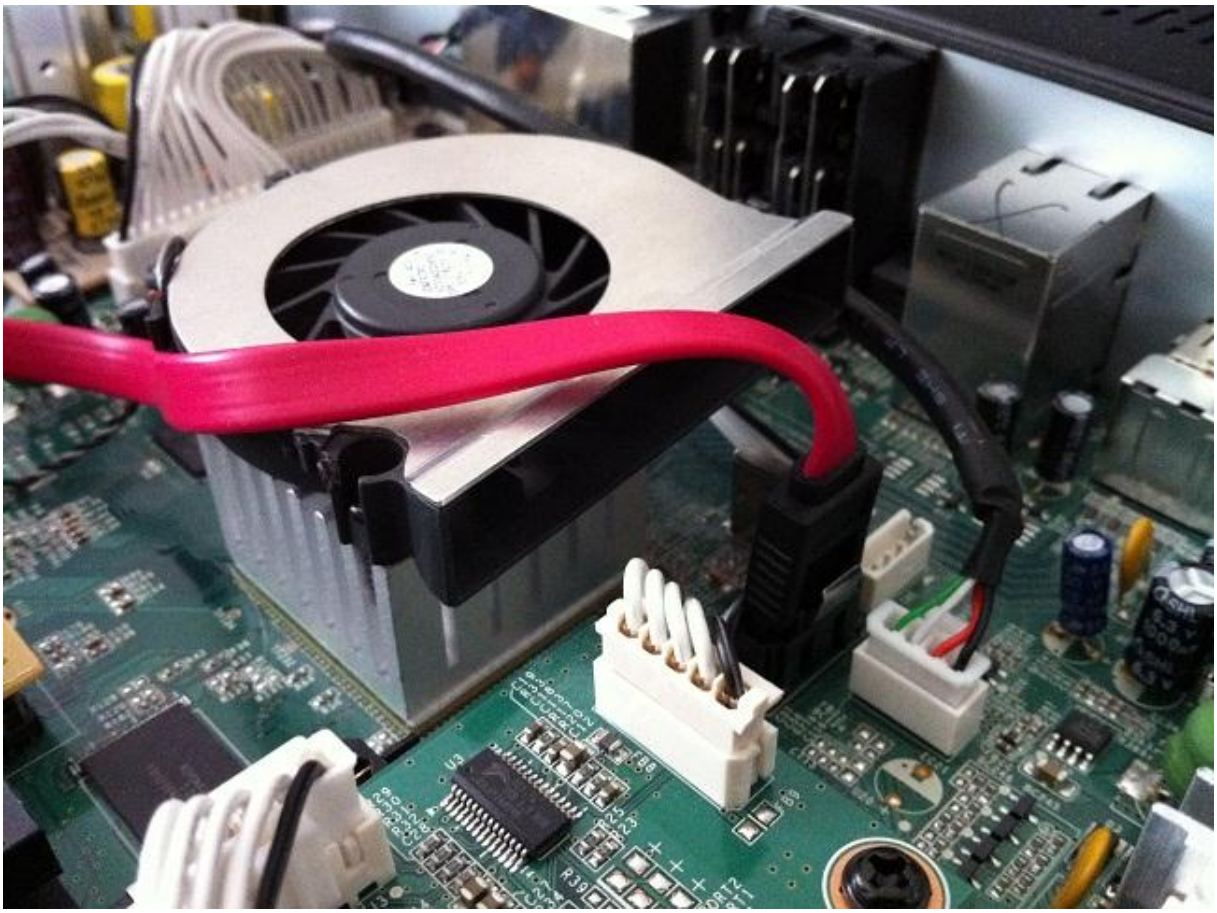
The following pages show the result of my modifications.



This picture shows the extension of one of the heat sinks

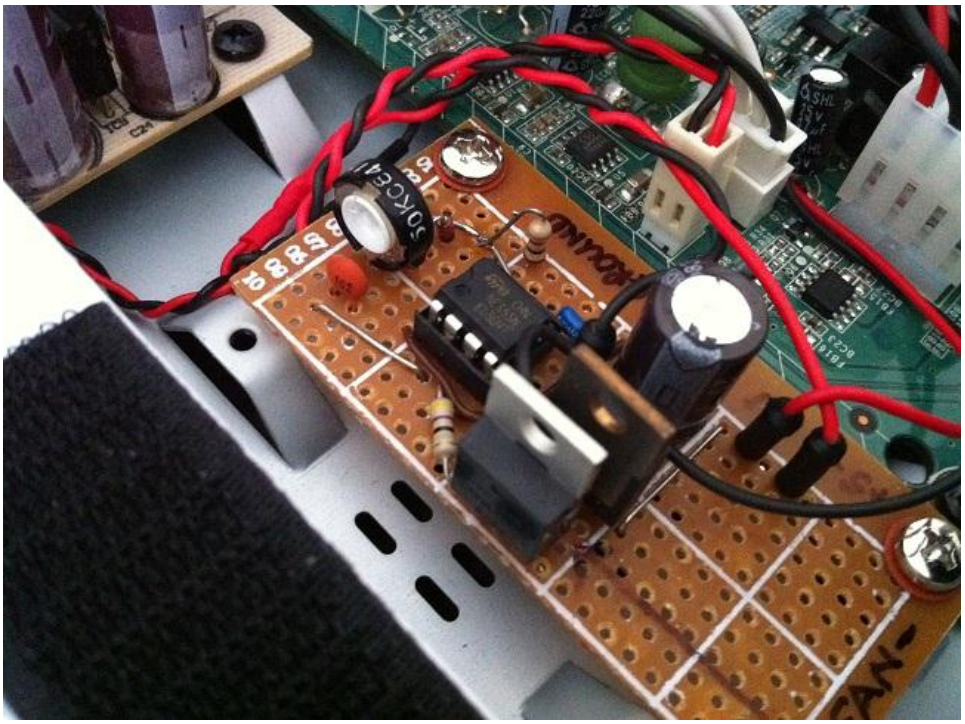
Another close-up of the heat sink extension.

The old 5 volt Acer laptop fan (Tip: Look on eBay) cools the CPU by pulling up cooler air. In the same time the fan cools down the tuner units and heat sinks in front of the picture.



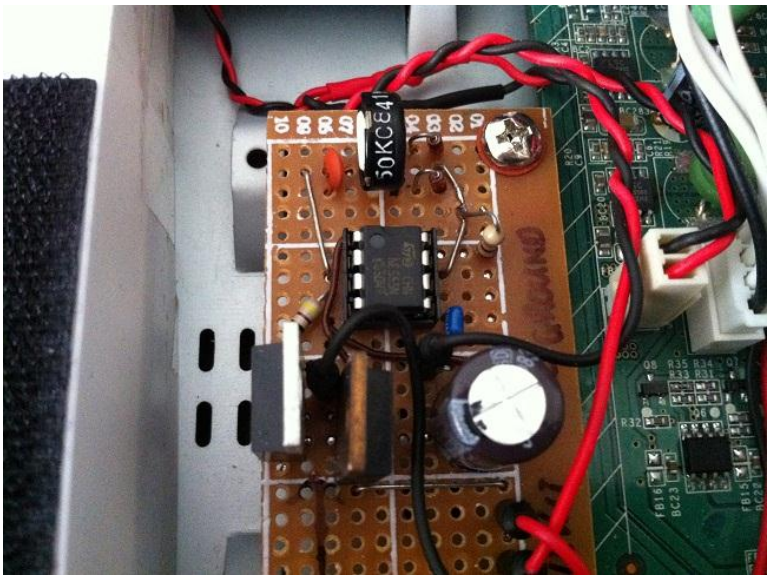
Sadly enough, the SATA cable partially blocks the airflow. Notice that that the cooling fan is connected on the heat sink with just one parker.

Another picture from the top view.



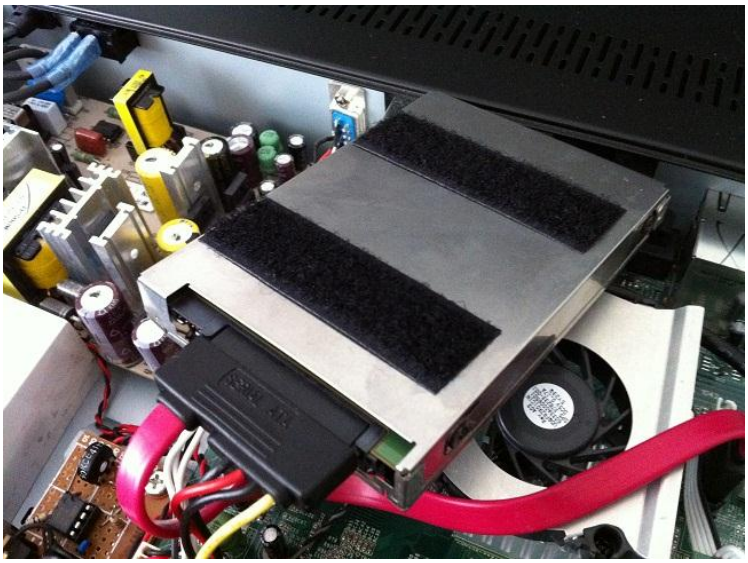
To control the fan speed, I build a motor control (source/credits: http://www.circuitsonline.net/schakelingen/17/modelbouw/motorregeling.html), which makes it possible to adjust (black trimmer) the right speed for the fan and so being in control of the noise/sound/airflow, the fan will produce.

I also thought about temperature control, but this was in my opinion not an option, this because you're not in control of the maximum fan speed. Also, the temperature regarding the tuners and CPU is almost the same when fully operational or in standby mode (standby means that you don't see anything on your TV screen but, regarding the ET9000 still being operational for the most part and still producing a lot of heat). The Fan Control Plugin for the ET9000 is used to shut down the cooling fan in Deep Standby.

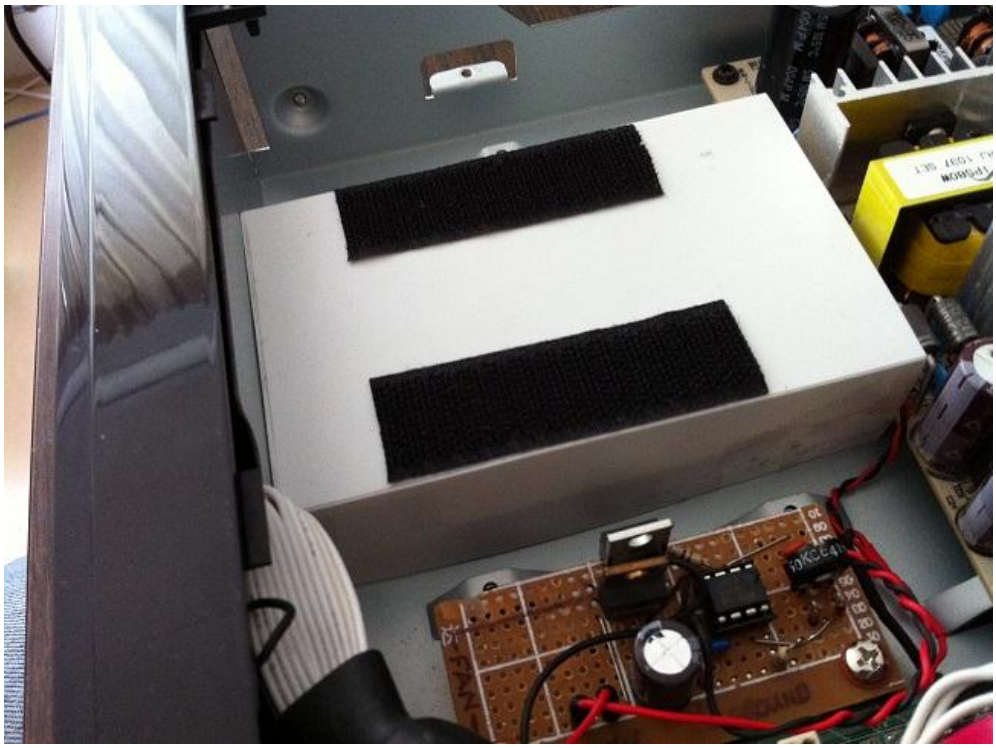


On top of the picture you see the 50K trimmer for adjusting the fan speed.

Another modification I did, was making a plastic box to control the airflow which comes from the fan under it. For the modification, the hard drive frame had to go. The goal for this modification was, to optimize the airflow of cool air to the power supply. The hard disk you see on top of the white box doesn't need to be actively cooled (for example, these disks are built in laptops without any cooling at all.) The hard disk is fitted in an old laptop frame and connected with velcro tape, this makes it very easy to remove the hard drive when needed.

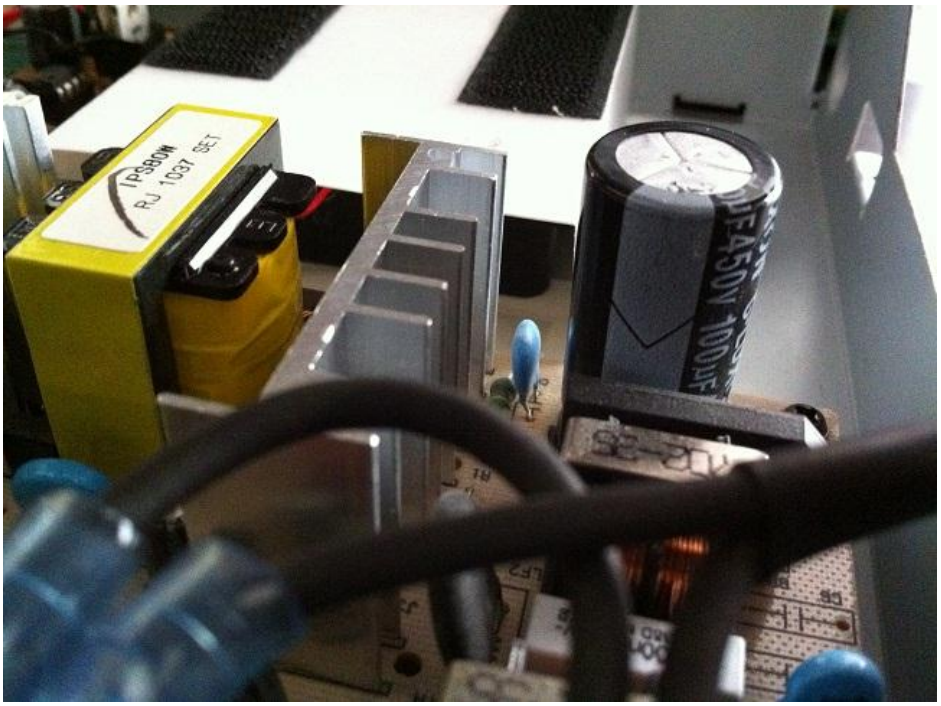


The hard drive in its frame with velcro tape on the bottom of the hard disk frame.

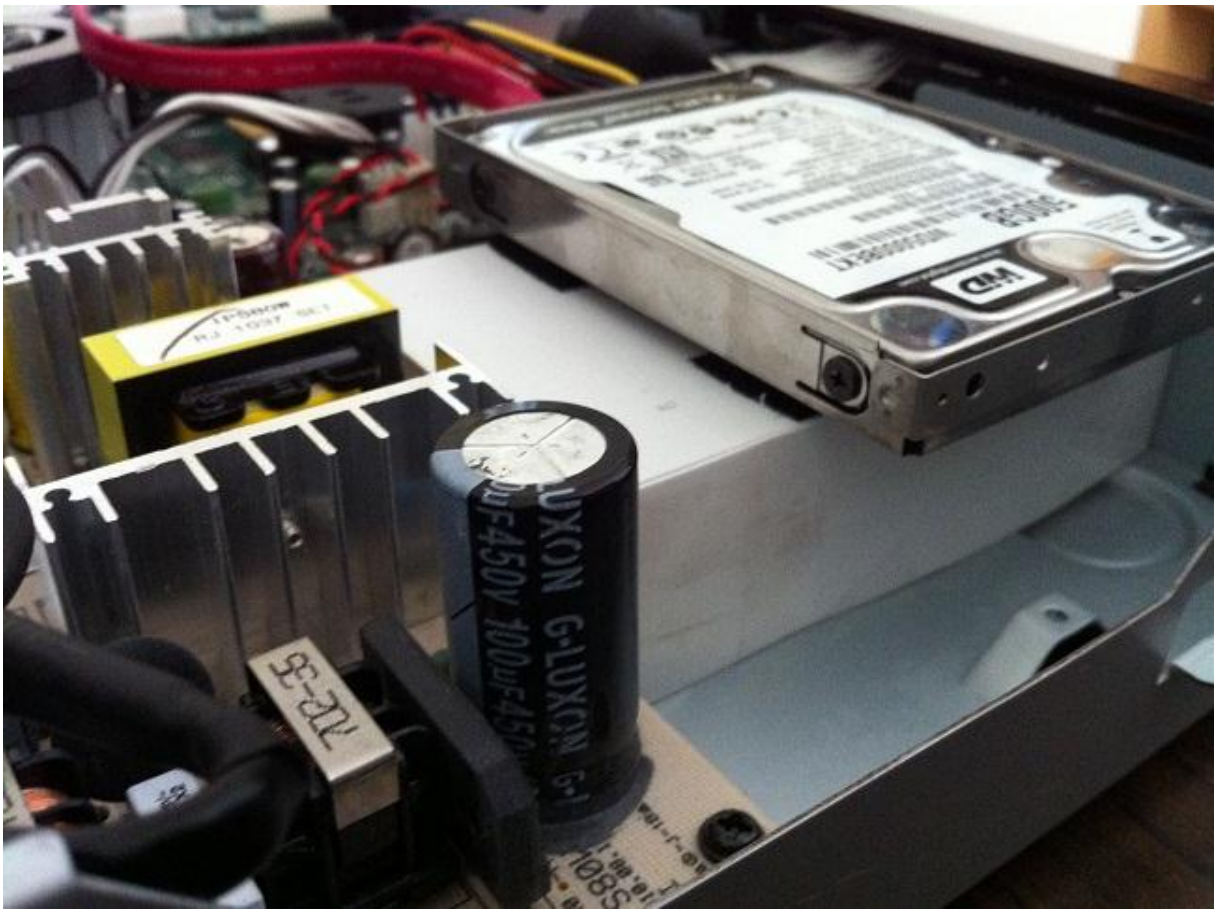


This is the plastic box which leads the air to the heat sinks of the power supply. On top of the box you see the Velcro tape. In front of the box the motor control for the fan on the Heat sink of the CPU.

The fan I used, which is under the box, is a 7 volt fan, coming from an old PlayStation II. The fan is not connected to the motor control because it's an ultra-low noise fan and already running on a lower voltage than its default value (5 volt vs 7 volt). Both the motor control and PlayStation fan get there 5 volt from the fan connector on the ET9000 motherboard.



If you take a good look at the picture, you can see the fan in the box ☺



Jet, another picture with the hard disk on top of the white box.

The end result is a well cooled and almost silent ET9000 and a very happy owner!!