This writeup is intended to show how to install a fan in a Commodore 128DCR, as well as some additional heat sinks and minor reliability tweaks. The Commodore 128D is the fabulous ne plus ultra of 8 bit computers. In Europe the regular 128D did have a fan, so Commodore was just cutting costs on the US version by deleting the fan.

I originally posted to the CBM-hackers email list to get a pointer on where to tap power for the fan. I was of course entertained to see Bil Herd's reply, expressing mild surprise: "So it shipped without a fan? When we designed it in '84 we specifically had intake vents on the front and had specified a small (mitsumi?) fan. They didn't release the D until after I was gone so I don't know what all got added/deleted." He also posted a couple links to heat sinks for video card ram, which are used by overclockers in the PC modding scene, and this turned out to be a good place to start. I made my merry way over to newegg and looked for parts that are normally the purview of overclockers. I got a ton of tiny little heatsinks that already had adhesive, and a 60mm fan that moves 10CFM at 8dba... So it can turn over the volume of the chassis about 10 times a minute and is essentially inaudible.

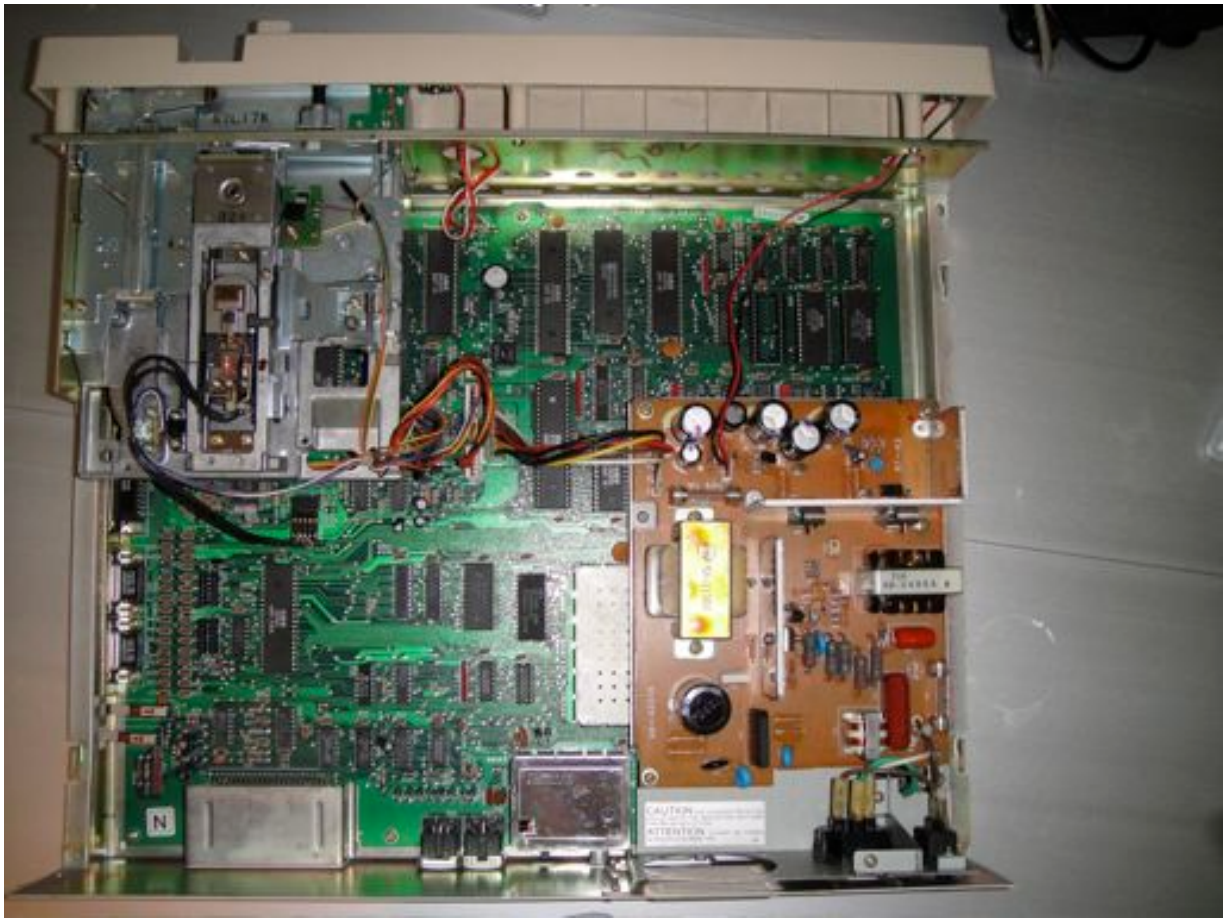
These are the parts I used:

Heat sinks (4 packs are required):
http://www.newegg.com/Product/Product.aspx?Item=N82E16835887017

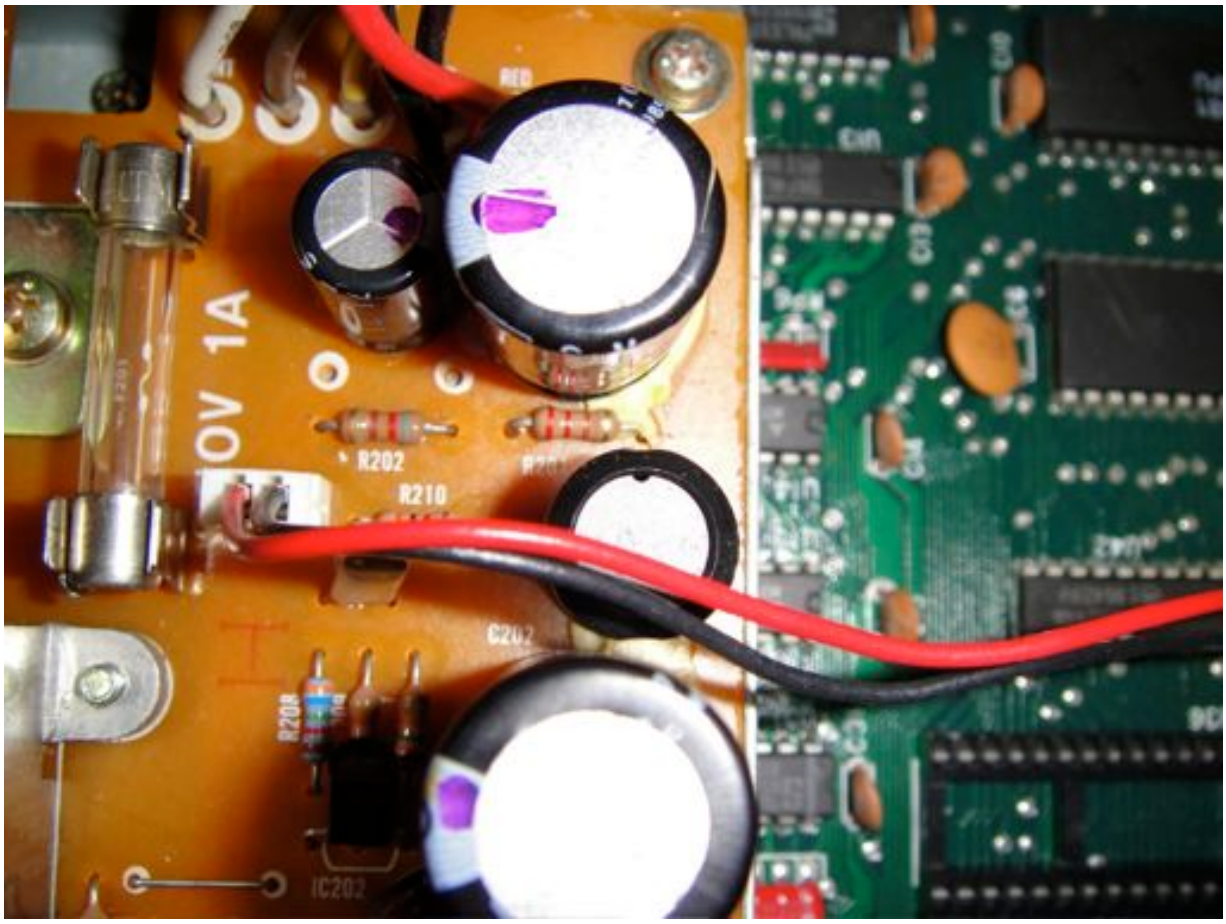
Power supply fan:
http://www.newegg.com/Product/Product.aspx?Item=N82E16835191003

Thermal paste:
http://www.newegg.com/Product/Product.aspx?Item=N82E16835100009

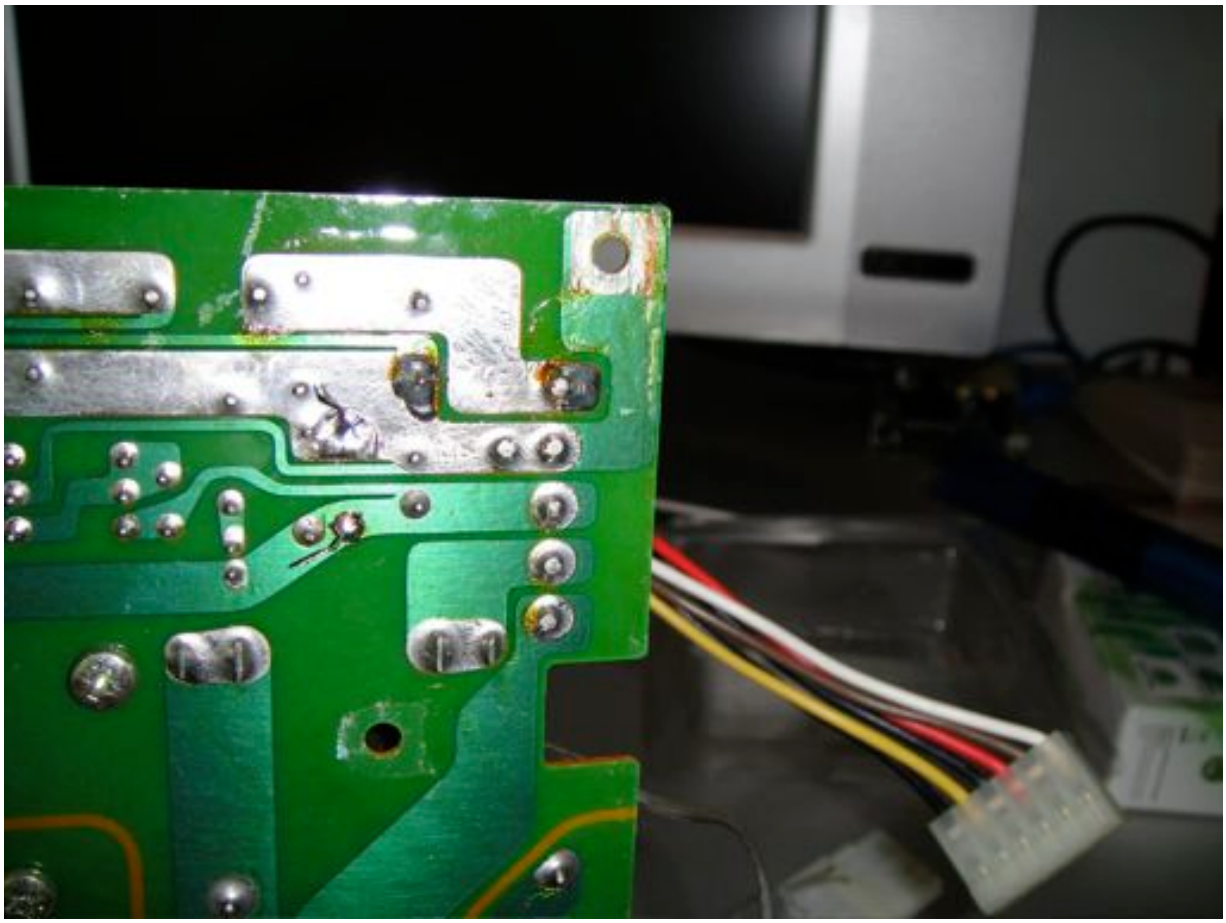
Here's how the mod goes down:



Unmodified guts. You can see where the fan should be in the lower right, the holes are pre-drilled for mounting a 60mm fan. There are no normal heat sinks on any of the chips, but that metal box under the power supply has two chips in it that are coupled to the box with springs to use the box as a heat spreader.

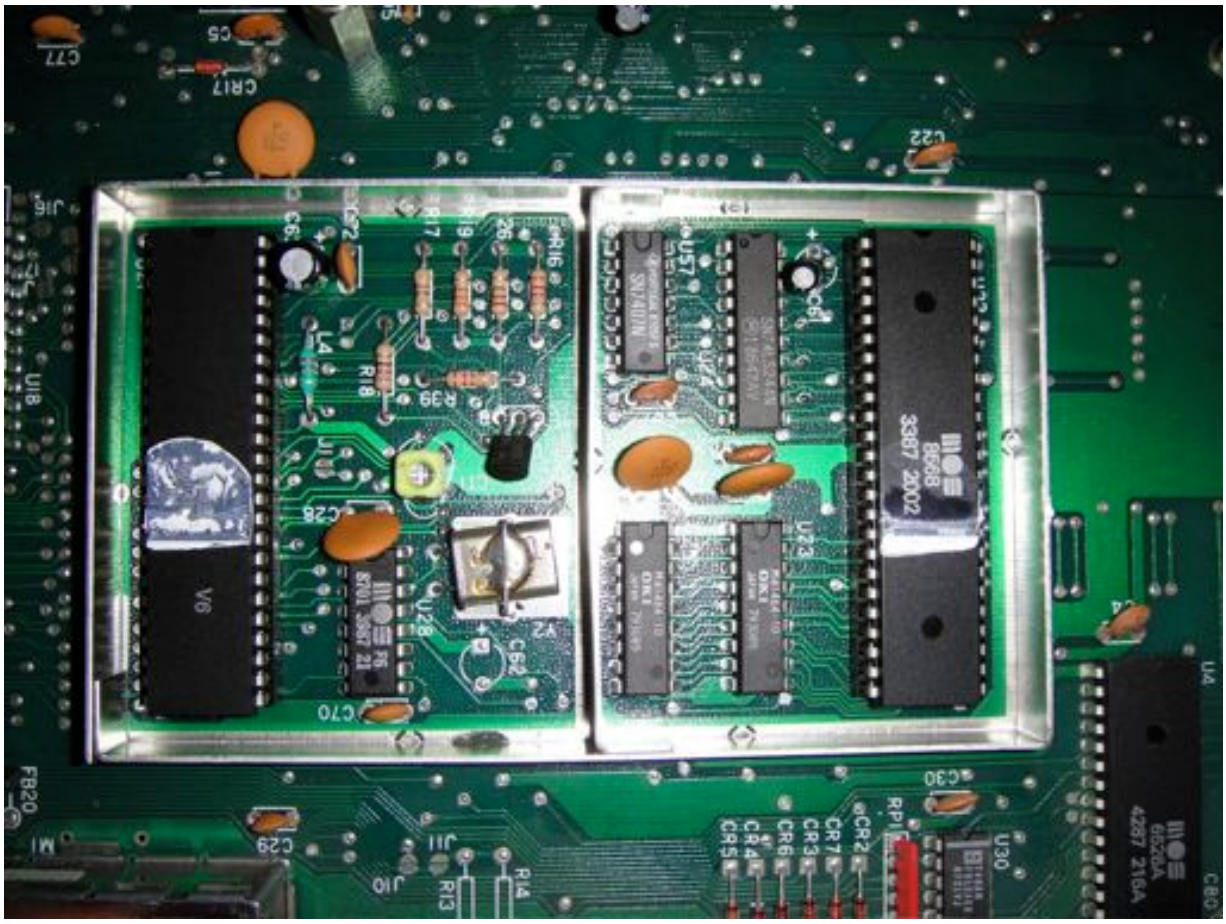


The two white holes above R202 are where the fan was attached on the Europe model, so that is a convenient place to tap 12V to add a fan.

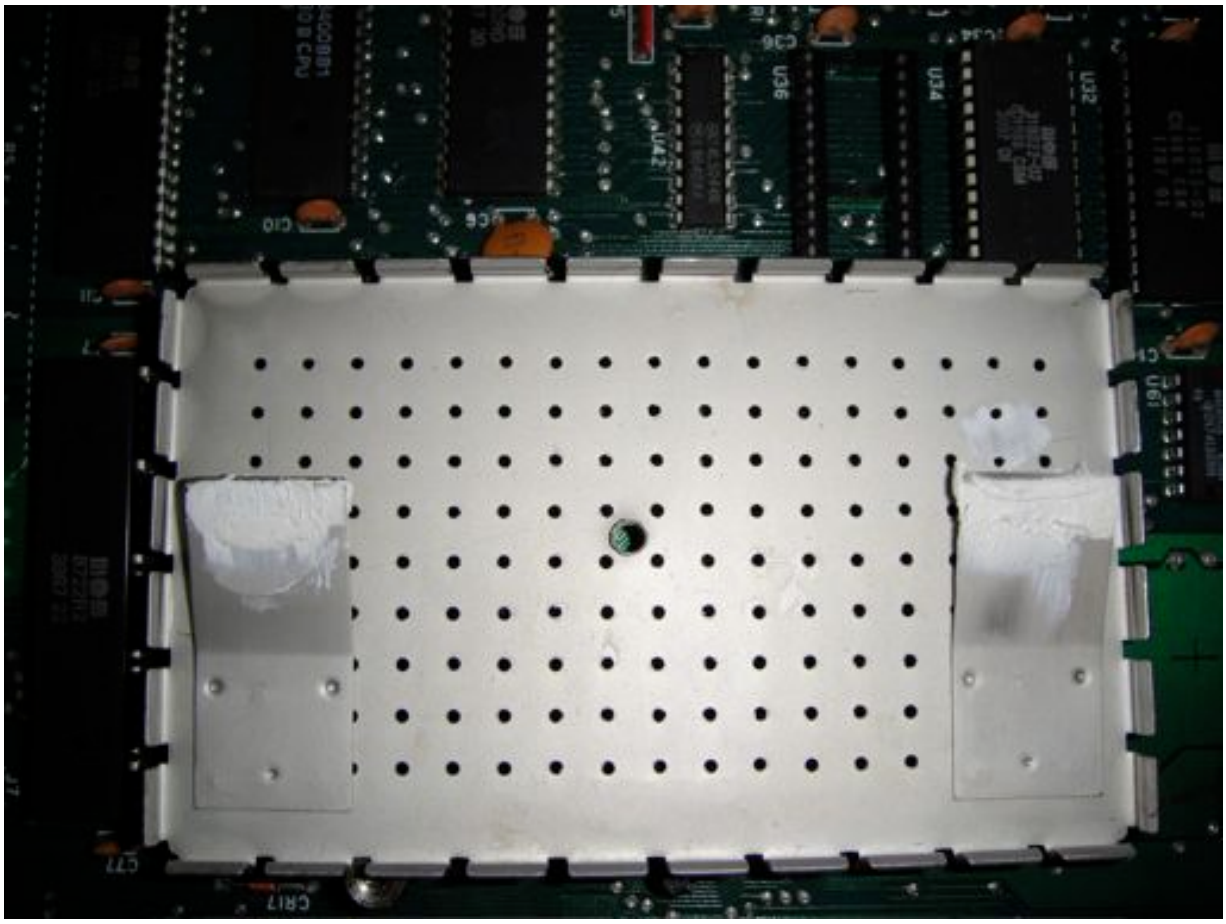


Here you can see I've soldered on the leads for the 12V fan. Note that the silenx fan I chose is polarity sensitive, and will not rotate at all if the polarity is reversed, so if you are using a similar fan be sure to test prior to reassembly. Finding the upper hole through the solder-covered trace requires just a bit of effort. I used a spring loaded plunger style solder sucker to open the hole for the fan wire.

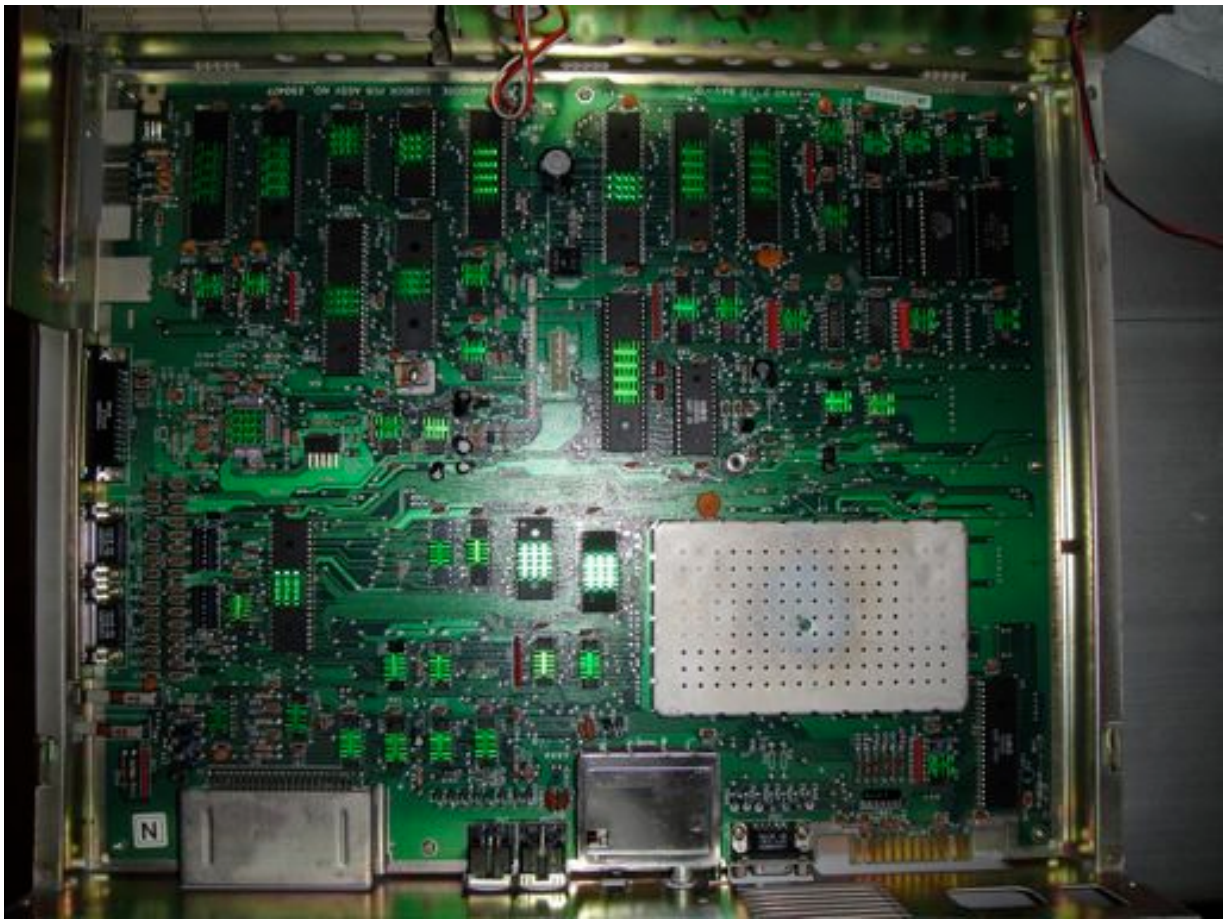
The fan is installed and wired in, and I was able to run the wires under the power supply board for a clean look. The fan comes with elastic silicone rubber grommets for mounting, so I bored out the original holes to 3/16" using a drill and used the rubber grommets to secure the fan. This keeps the fan mechanically isolated from the chassis so there is no induced chassis vibration. If you choose to drill as I did, be sure to remove the power supply from the case so that metal filings will not end up in the power supply or the main chassis.



Here are those two chips in the metal cage. The cage is easily removed by pulling up on it with moderate force, you can start at one side and then do the other. The heat sink paste was still pliable after 23 years, but it was all spread to one side, so I wiped it off and replaced it with Arctic Silver Ceramique thermal compound. I considered leaving the top off and attaching larger heat sinks directly, but it looked like this was a deliberate faraday cage on these chips and this is a lot of exposed surface area for heat dissipation. I figure the original engineers designed it this way for a reason.



Heat sink grease refreshed on the metal clips.



And here you can see my glorious overkill of heat sinks (there are a few more to go obviously but I didn't get a picture). As you can see I went completely off the rails and heat sink'd even the stupid little 16 pin chips that almost certainly do not need it. I tried to orient the heat sinks so that the most efficient airflow direction was towards the newly installed exhaust fan. I seriously doubt that makes a difference, but it appealed to me in the spirit of how ridiculous this project is in the first place. These heat sinks have a fairly strong adhesive backing on them from 3M, and are not easy to reorient once they are stuck to the chips (thought twisting them forcefully removes them fairly cleanly). I used the same type of heat sinks for my SX-64 reliability/tweaks and have not had a problem with them working loose.

BTW, while they were exposed, I used a pencil eraser to clean up the edge connectors on the board. This is also a good time to install the 128D/1571 JiffyDOS chip pair. I don't like cutting holes in vintage hardware, so for me the switch is run to the tape drive edge connector area.