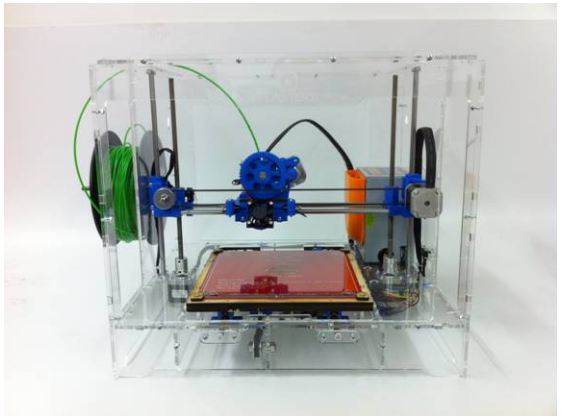
PLASTIBOT®

Build Your Own 3D Printer!

Mendel 3D Printer Assembly



Appendix B

Heated Bed Modification

Revision 3.6

Purpose of Modification

The Heated Bed modification described below allows for faster heat up times for the heated bed.

The original Heated Bed design takes more than 15 minutes to reach 90 Deg Celsius.

This modification allows for the Heated Bed to reach 90 Deg Celsius in 6 minutes or less.

Step 1: Removing the old bed design.

Note: All parts being removed (except for the plywood shield and M3 x 16 screws) are re-used to build the new bed.

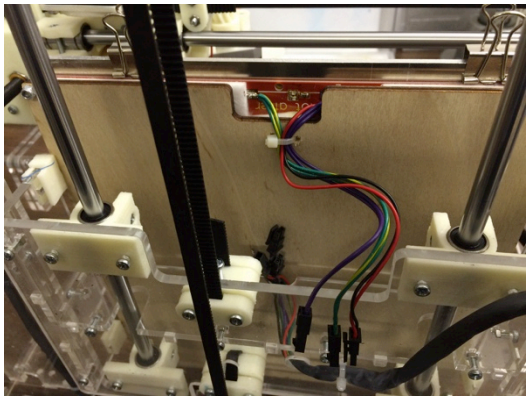
Parts Needed:

- None

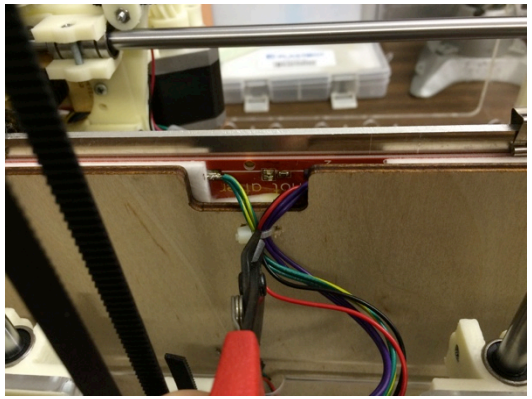
Tools Needed:

- Wire clippers
- Philips screwdriver

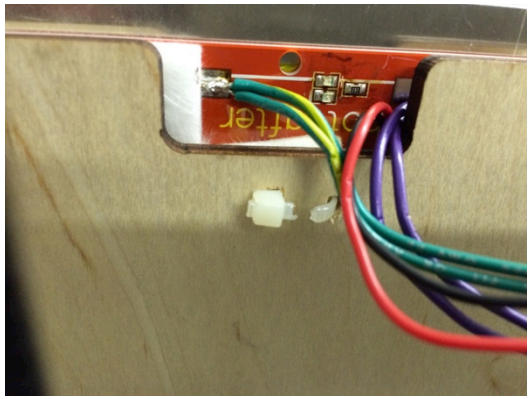
Rotate your printer so that the bottom is facing you.



Disconnect the heated bed wires.

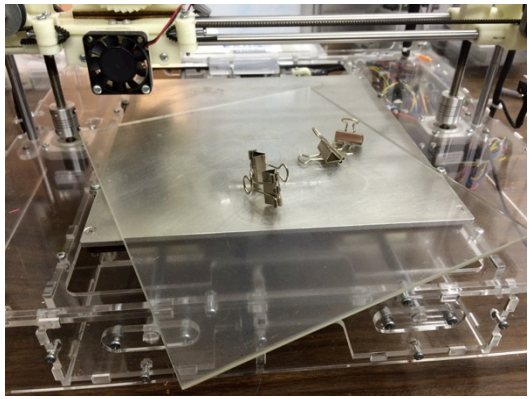


Use the wire clippers to cut the stress relief zip tie holding the wires.



Pull the wires out of the zip tie.

Flip the 3D printer back to its stand up position.



Remove binder clips and glass.

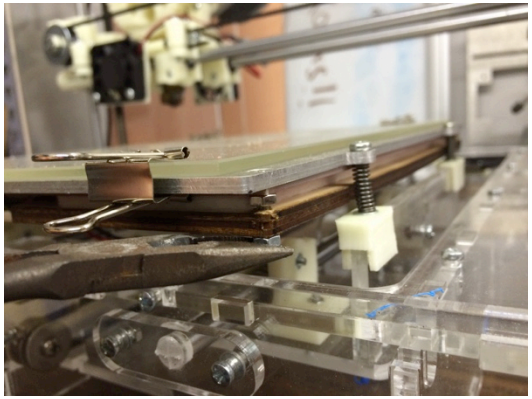
Step 2: Removing the old bed design (Cont'd)

Parts Needed:

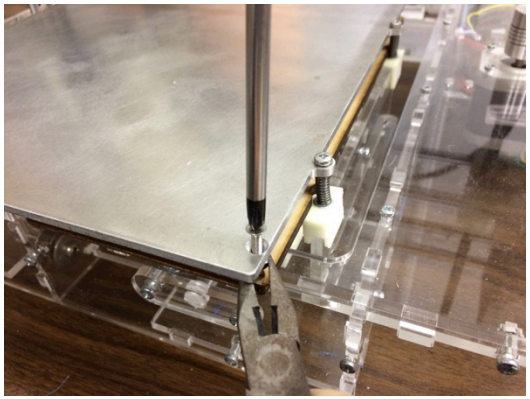
- None

Tools Needed:

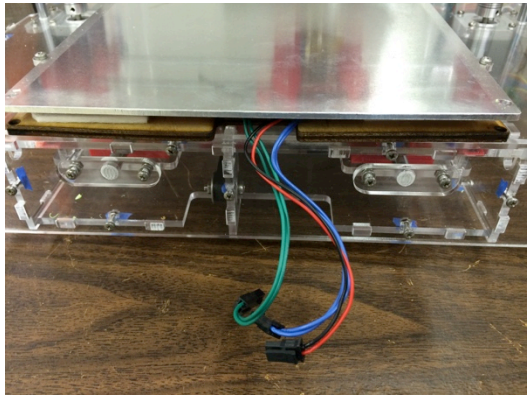
- Nose pliers
- Phillips screwdriver



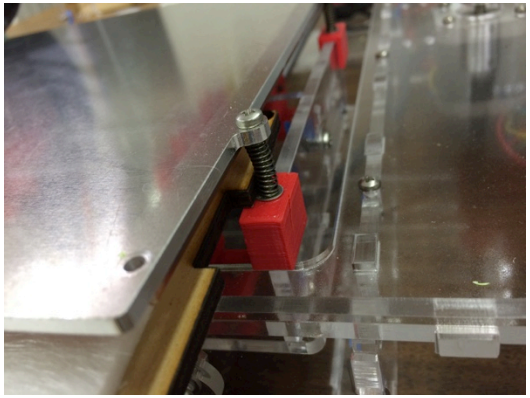
Remove the M3 locknuts using nose pliers. The screws won't turn because f the intermediate nut, so unscrew nut using the nose pliers. Repeat for all 4 corners.



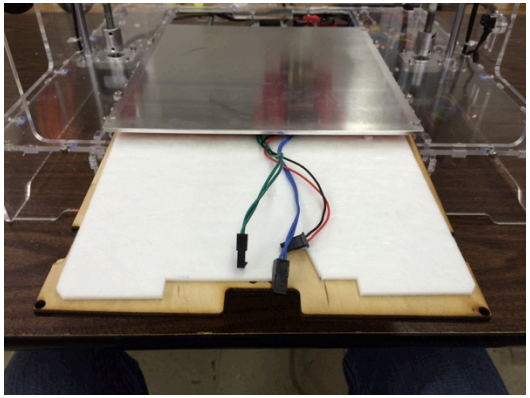
Use nose pliers to hold the intermediate M3 nut, and using the screwdriver unscrew and remove the screw . Repeat for 3 other corners.



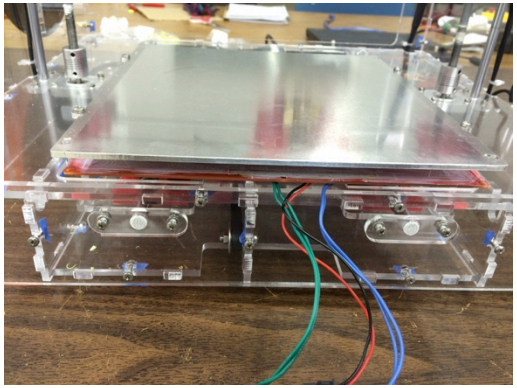
This is how it should look after removing all 4 corner screws. Note how the plywood shield and fiberglass insulation are lose. Make sure you pull forward the bed wires as shown.



Pull the plywood shield out making sure it is on top of the frog brackets (red plastic pieces on the picture) Otherwise the shield won't come out. It is normal for the plywood to push a bit against the springs.



Both the plywood shield and fiberglass insulation should come out with a little bit of resistance caused by friction with the springs. In some cases the PCB heater may come out as well.



If the PCB Heater doesn't come out, that means you have one of the few PCBs that were coated with Silicon Grease to help with Heat transmission. Use a spatula to pry between the Aluminum plate and the PCB heated bed.

Step 3: Cleaning the PCB Heater

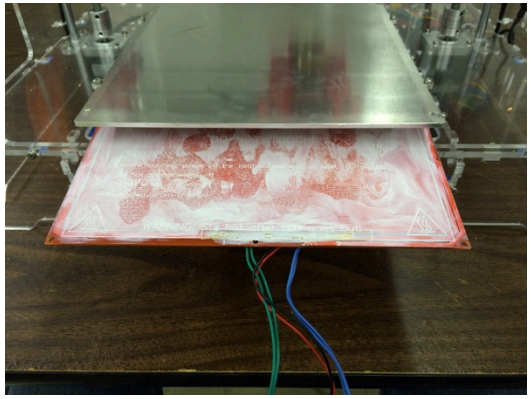
Parts Needed:

- Lots of paper tissue

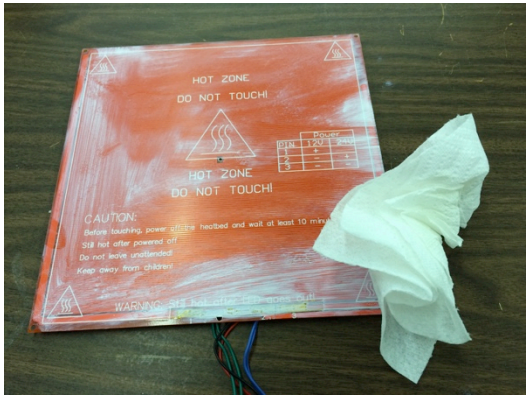
Tools Needed:

- Your hands.

Note: Some machines and kits shipped with a white PCB Heater that has an aluminum finish on the opposite side. If your PCB Heater is not as shown below please stop and contact us for further instructions.

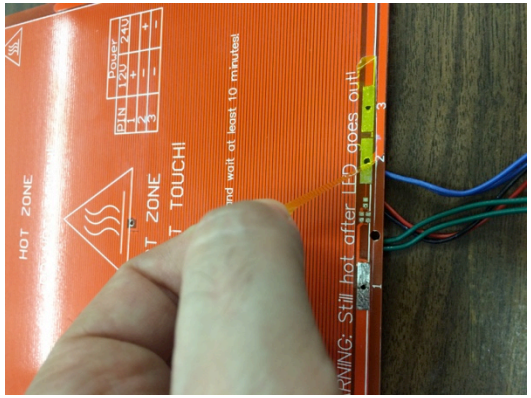


Pull out the PCB Heated bed



If you are one of the lucky ones with a silicon grease bed, remove all of the silicon grease using paper towels.

This is how it should look after removing all the silicon grease.



Remove the kapton tape that was insulating the wire terminals.

Step 4: Installing plastic corners

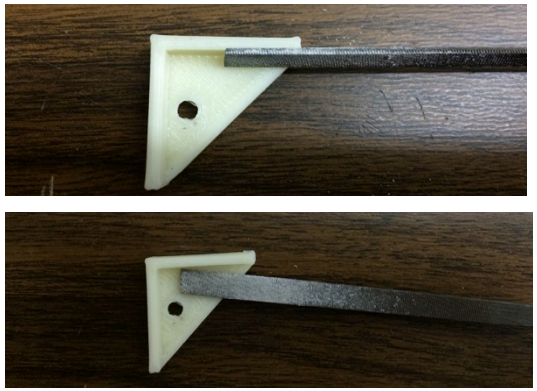
Note: The plastic corner parts need to be printed using ABS plastic. Do not print them using PLA as PLA starts getting soft at 90 deg. Celsius.

Parts Needed:

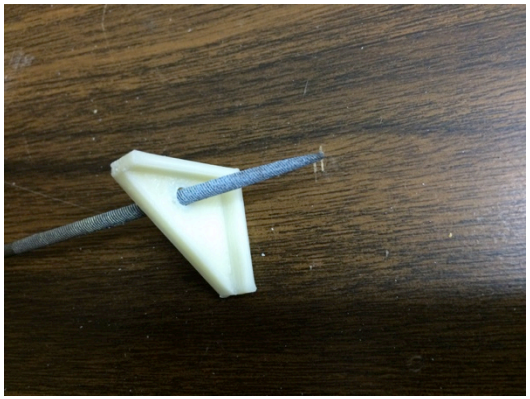
- M3 x 12 screw (4 pcs) - new
- M3 std nuts (4 pcs) - re-use
- 3D printed ABS corners (4 pcs)

Tools Needed:

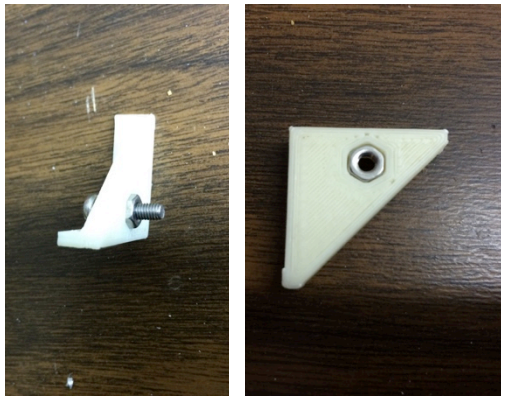
- Phillips screwdriver
- Flat file
- Round file



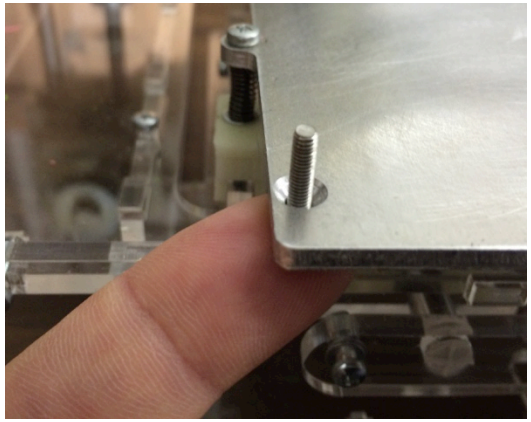
Use a flat file to smooth the inner walls of the plastic corner.



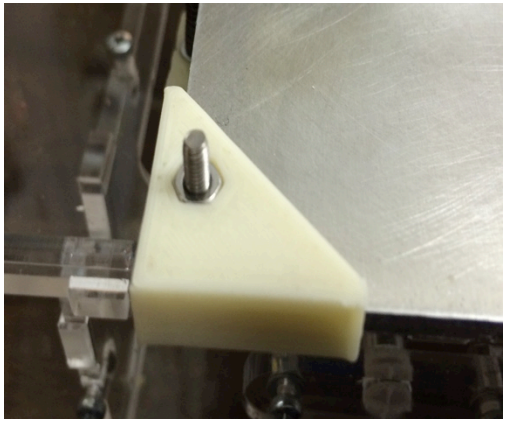
Use a round file to clean up the hole



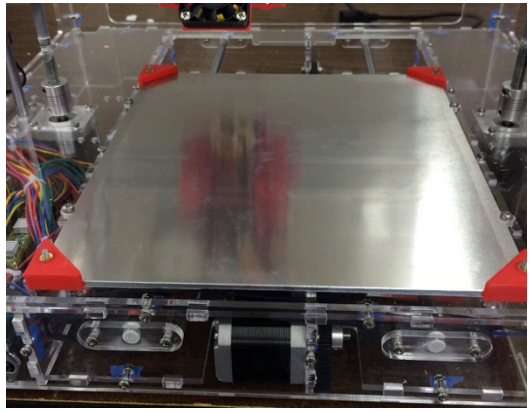
Insert the Standard M3 nuts you removed previously into the corner nut traps using M3 x 12 screws to help pull them into the nut trap. Remove the M3 x 12 screw once nut is inserted



Insert M3 x 12 screws from underneath on the 4 corner holes of the aluminum plate.



Screw the M3 x 12 screws into the plastic corners nuts. Tighten all the way.



This is how it should look after you are done installing all 4 corners.

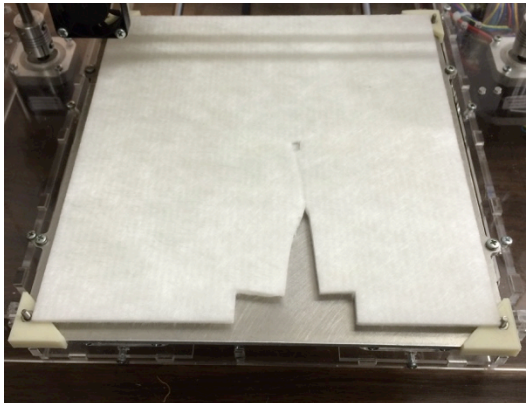
Step 5: Installing the fiberglass insulation

Parts Needed:

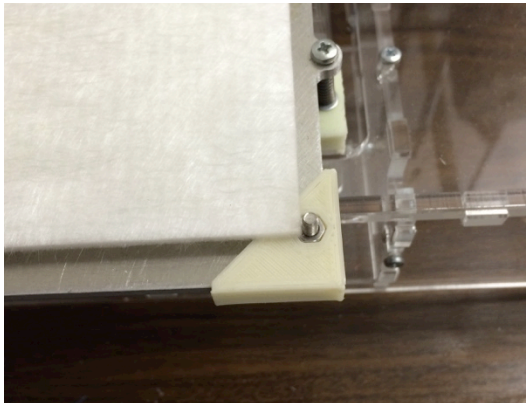
- Fiber Glass insulation (re-use).

Tools Needed:

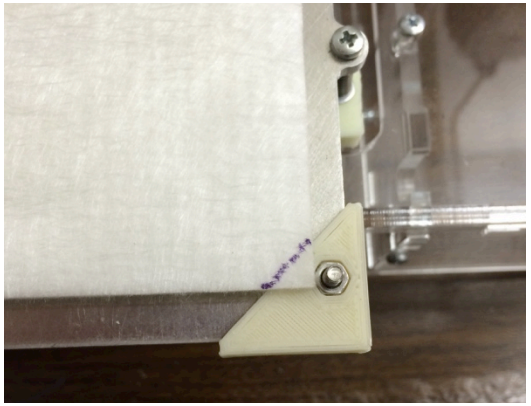
- Scissors



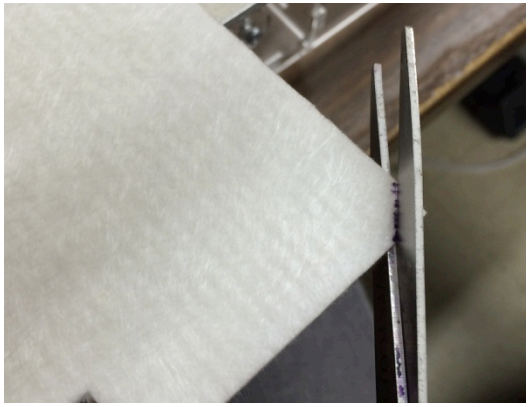
Place the fiberglass insulation on top of the 4 corners. Make sure the notch for the thermistor is facing up and the cutout is facing towards the front.



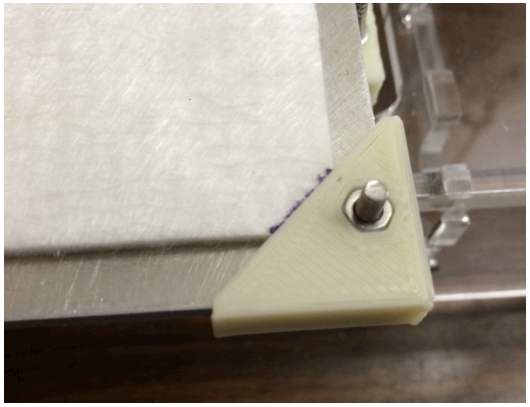
Use the 4 screws as reference to center the fiberglass.



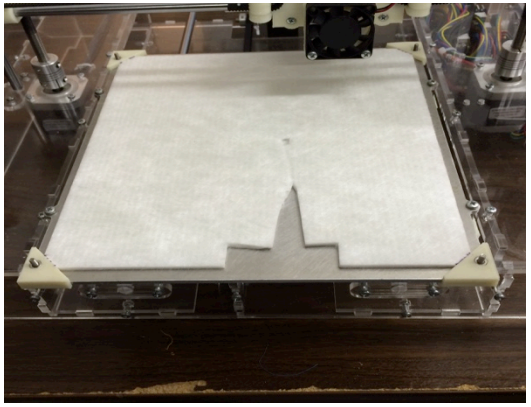
Use a sharpie to mark where to cut the insulation on each corner.



Use scissors to cut the corners of the fiberglass insulation on the previously marked places.



Place the fiberglass insulation on top of the aluminum plate. Note how it now seats flat because of trimming the corners.



This is how the fiber glass insulation should look with the corners trimmed and properly sitting on the aluminum plate

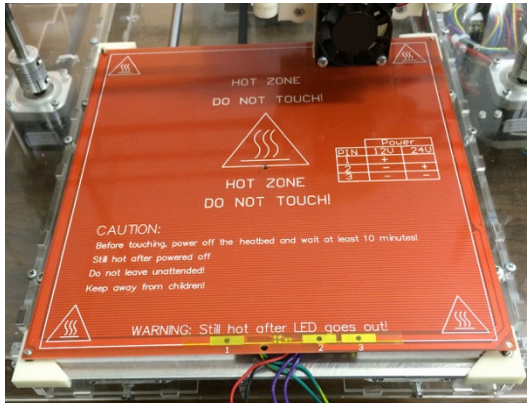
Step 6: Installing the PCB heater

Parts Needed:

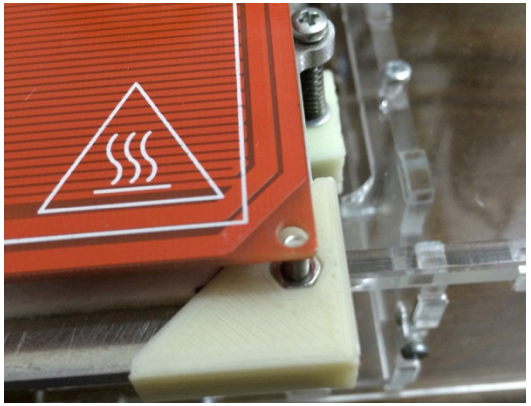
- PCB Heater (re-use)
- M3 hex lock nuts (4 pcs) (re-use)

Tools Needed:

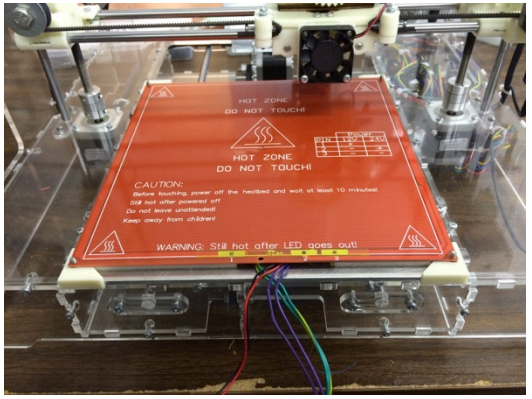
- Phillips screwdriver
- Nose pliers
- exacto knife



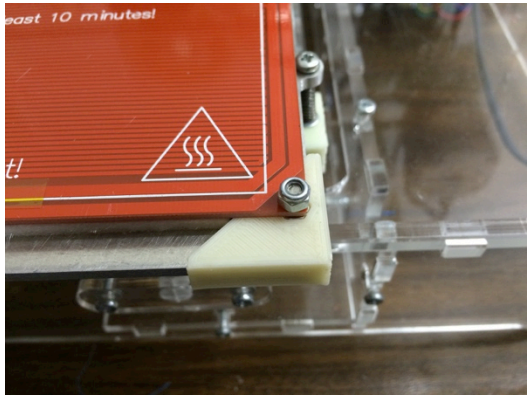
Place the PCB heater on top of the 4 corners screws.



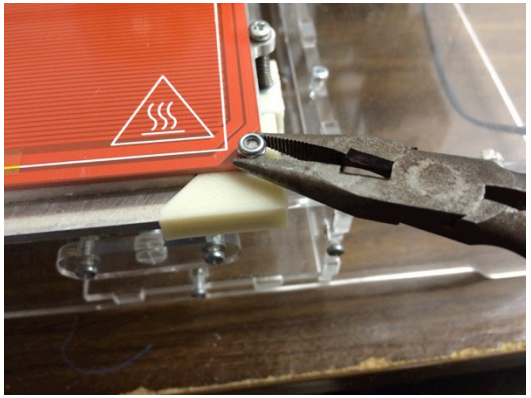
There is a good chance the PCB holes won't align to the screws and one or two of them will not go in. If that is the case, loosen all 4 corner screws about 1 turn to let them wiggle a bit.



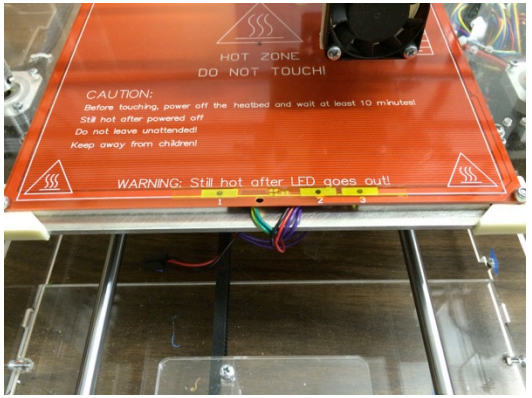
Insert then PCB on all 4 corners, then tighten back the corner screws. Check center of PCB for bow caused by missalignment of fiberglass notch and thermistor. Use exacto knife to widen notch.



Screw in by hand the 4 lock nuts previously removed until they reach the nylon and cannot turn by hand any longer.



Use nose pliers to finish tightening the lock nuts. Do not over tight.



Bend the wires in as shown. Don't forget to remove the kapton tape from the terminals as I did before taking this pictures ☺

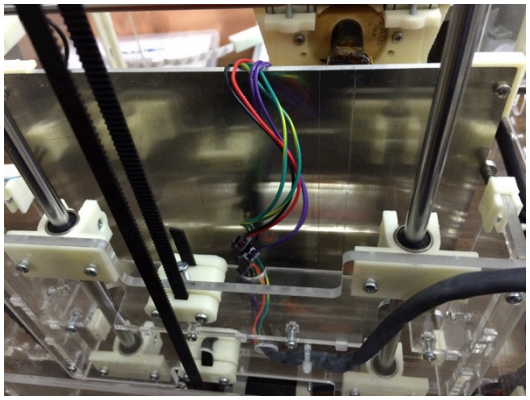
Step 7: Re-connecting and installing glass.

Parts Needed:

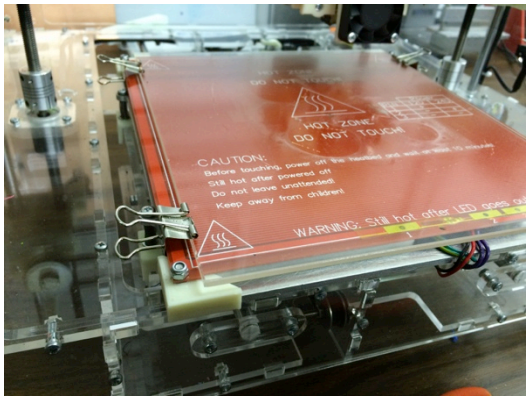
- Y Linear bearing holders (4 pcs)
- M3 hex nuts (12 pcs)
- M3 x 12 screw (1 pc) to help pull in the M3 nuts

Tools Needed:

- 1/8" drill chuck
- Flat file
- Half Round file
- exacto knife.

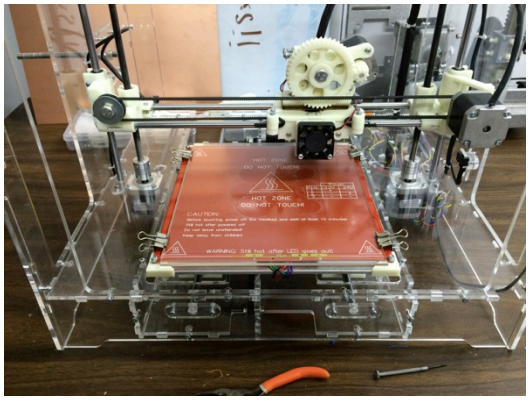


Re-connect your heated bed wires.



Put glass on top of PCB heater and secure with binder clips from the sides. It is normal for the PCB to have a slight bow on the center. The glass will flatten it out.

If the bow in the center is substantial, it may be caued by missalignment between the notch on the fiberglass and thermistor. In that case and you will have to carve out a wider notch using an exacto knife.



This is how it should look.

Adjust your Z-Origin as per step 14 of the Tunning Up instructions.

Your bed should have stayed leveled through the modification process. Nevertheless feel free to do step 13 of the Tunning Up instructions to verify.