

Materials Needed

- 3 screws of 2.5 inches ---- 6-32 size
- seven 6-32 nuts
- 4 cube magnets
- 4 screws of $\frac{5}{8}$ 2-56 screw
- 4 screws of $\frac{1}{2}$ 2-25 screw
- 11 2-56 nuts
- 8 washers for 2-55 screw (number 4) - may not be needed
- Acrylic parts.
- Electrical system.
- High Power Lens - Plastic Aspheric Lens - EFL = 3.30, 0.40 NA (Thorlabs part number CAY033)
- 1 low power lens - 7x - 22 mm - We use part MI120LL but are looking for direct supplier (it is 22 mm working lens diameter but 25.5 mm full diameter)

1. Glue nuts and magnets were is needed. (use wax paper method)



Put glue on the side of the holes. Just a point for every wall should be enough. Place some masking tape on the other side so the glue don't spread.



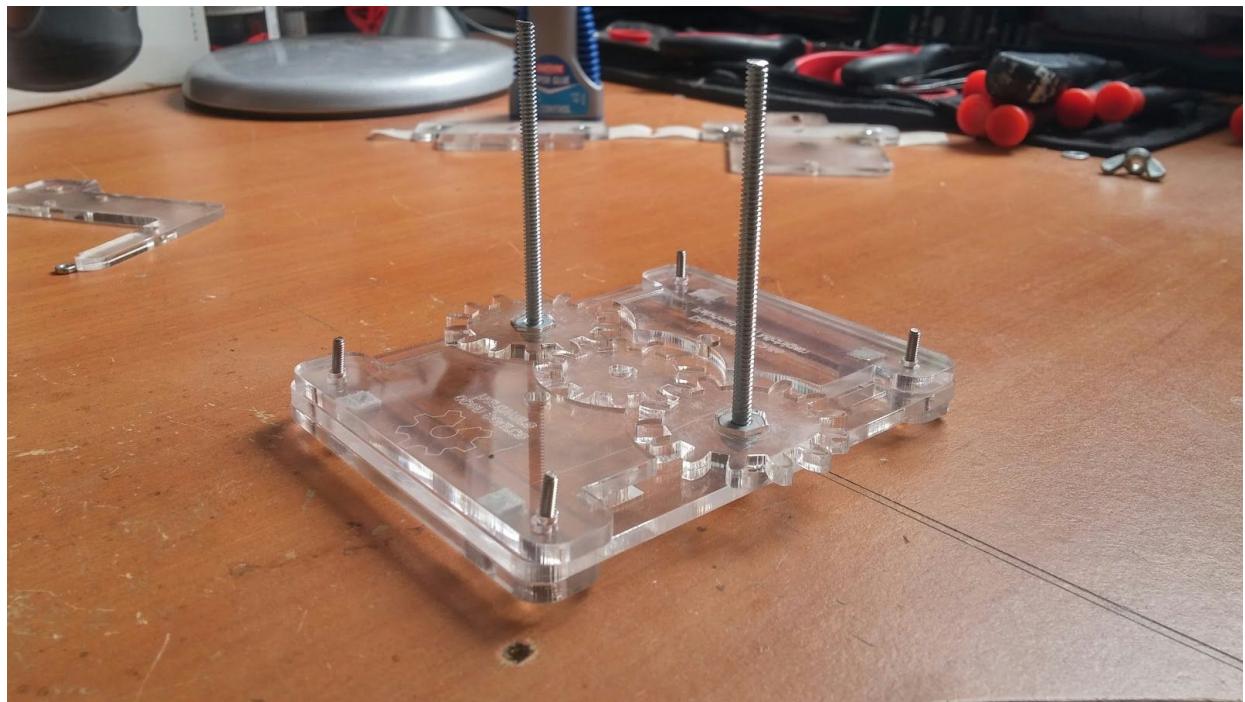
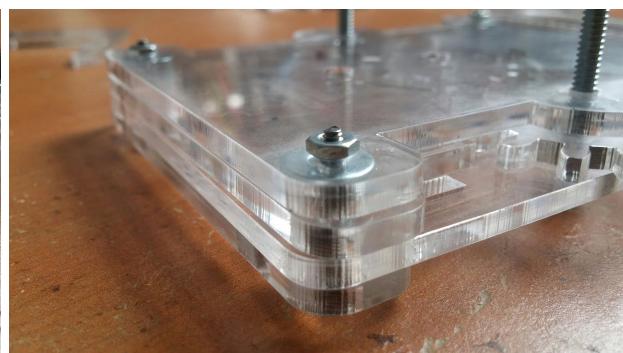
2. Put the base together. Place 2.5 inch screws in base piece and secure with superglue, as per the other BYB products.



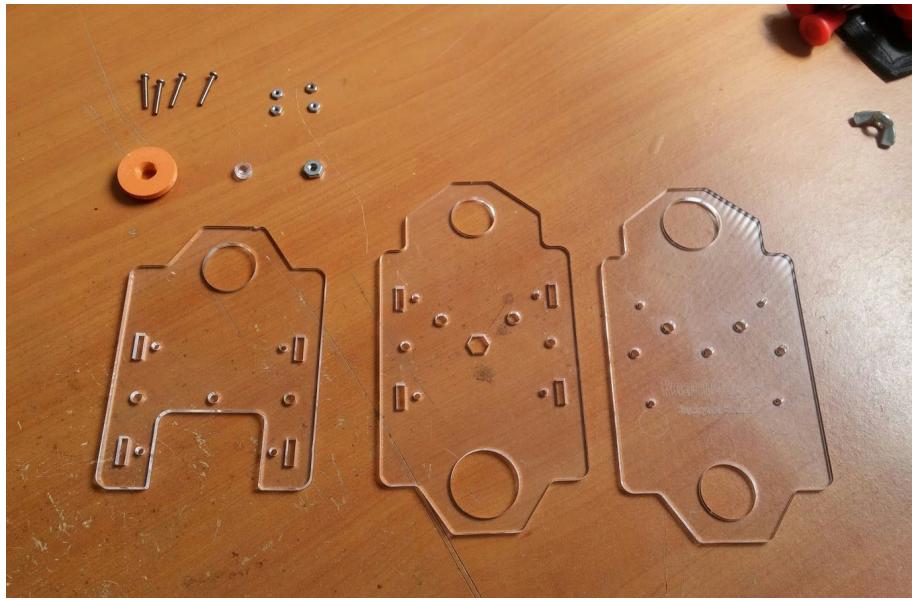
Make sure the nut is loose enough so you can spin the bolt, but not as loose so you can wobble it too much.



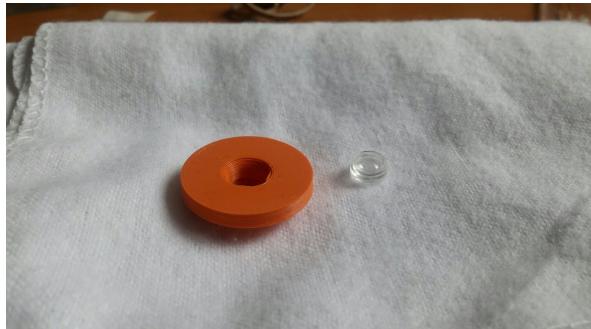
Assembly the rest of the parts. Place the moving system, washers and the top plate. Put the nuts in place and it's ready. Use $\frac{5}{8}$ screws.



3. Put together the top module.



3.1 First, mount the lens holder. Place the lens in the holder by pushing it down as shown on the picture. Be aware of the side of the lens. You may need to polish the lens holder with acetone to make it shiny and nice looking depending on the print.

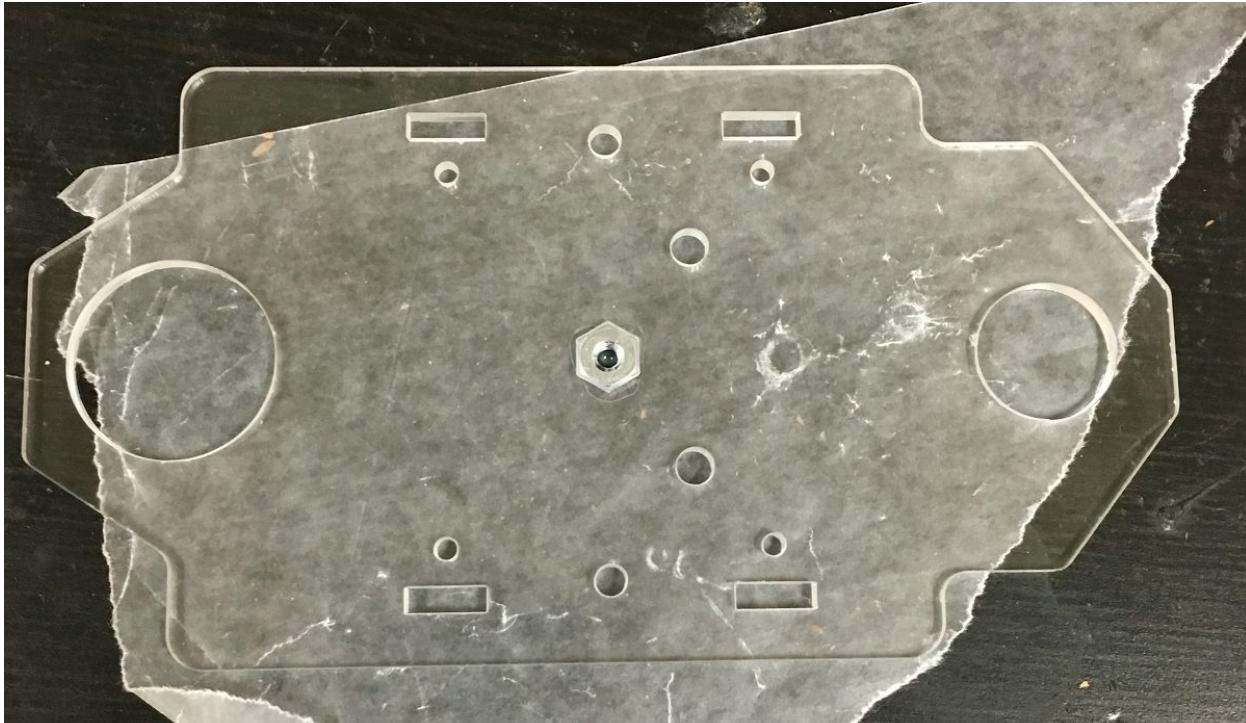


The lens must be flush with the down part of the holder.

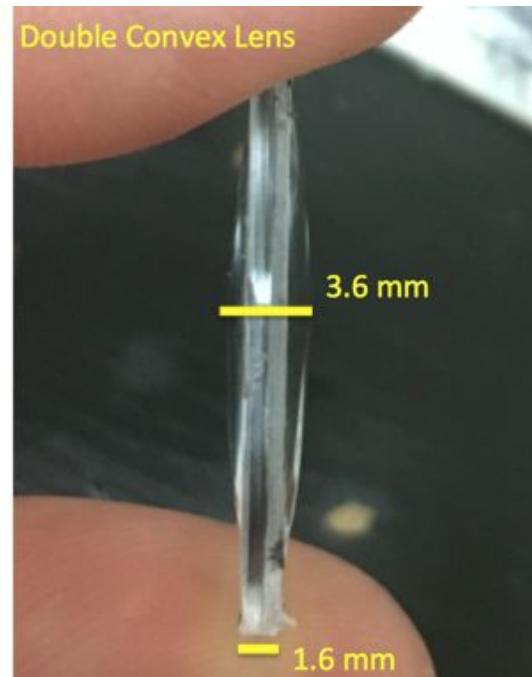
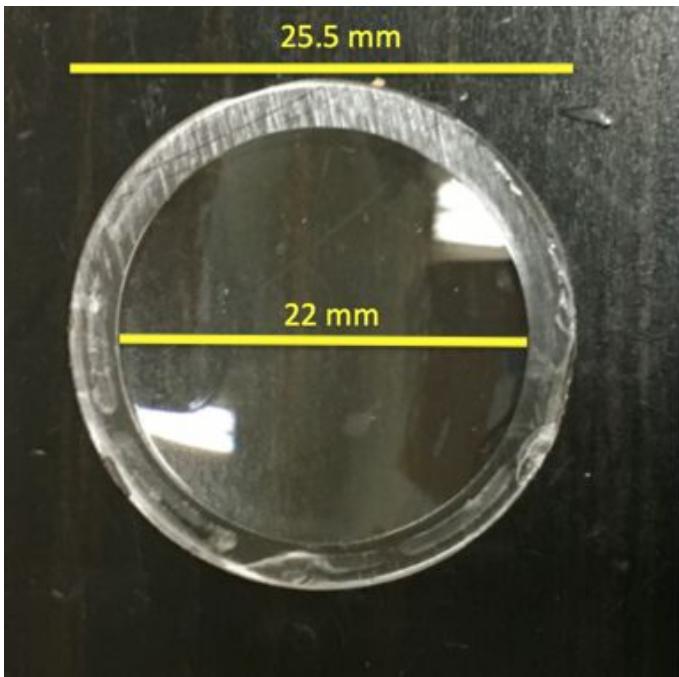


Now, place the upper plate down and stack the middle plate. You now can place the larger lense and the mounted lense. The mounted lense should require a little pressure to fit (if not, only add 1-2 drops of glue to side wall

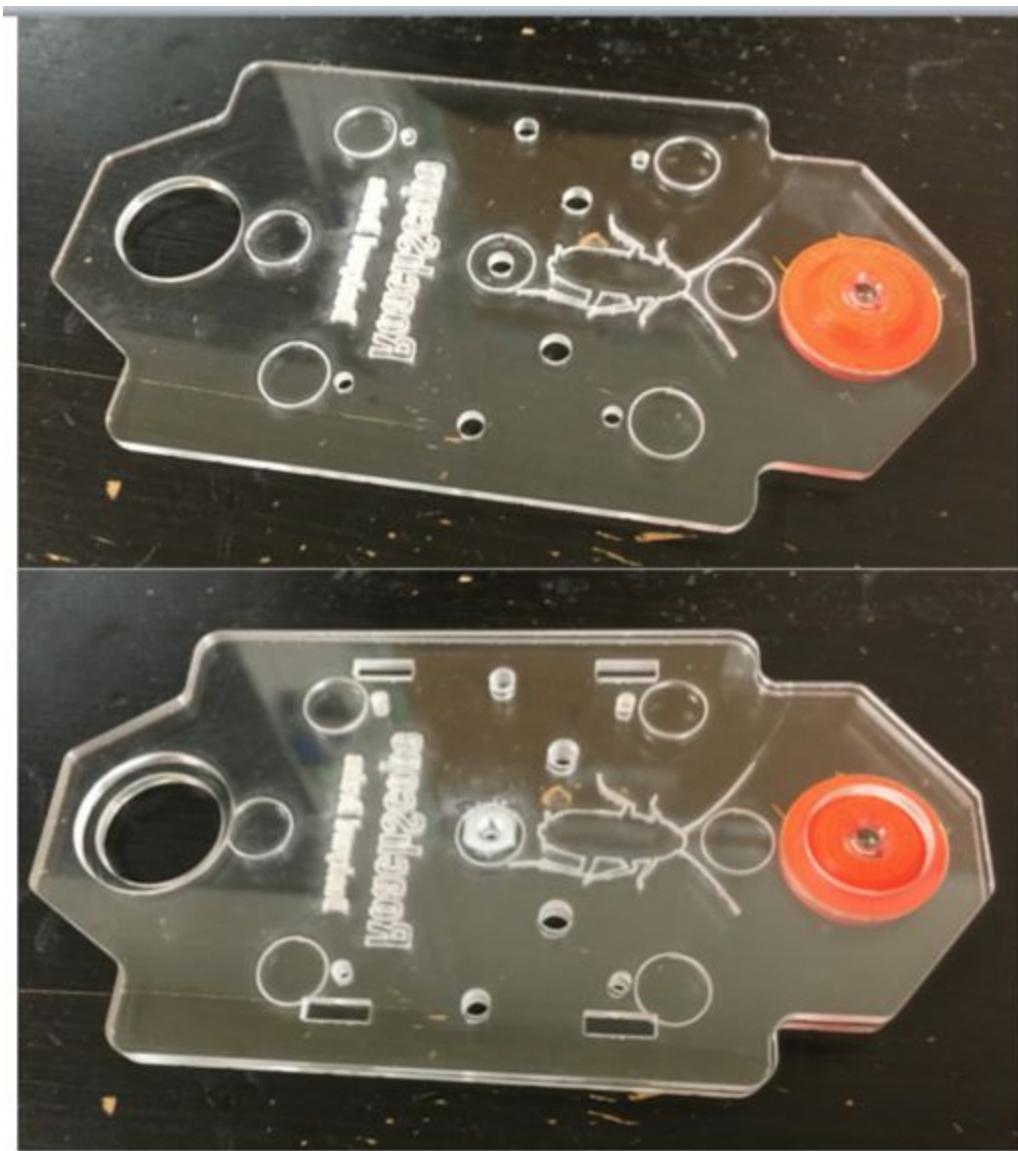
3.2 Put nut in center (glue is not necessary)



3.3 Destroy a Loupe to remove the lower power lens under we find a better solution



3.3.1 Now it is time to make the sandwich. Place the high power lens firmly in the top layer. You may need to use a rubber mallet, then, place the second layer on.



3.3.2 Insert the low power lens (you may need to clean off black plastic residue).



3.3.3 Place the third layer on.



3.3.4 Fasten with $\frac{1}{2}$ inch 2-56 fasteners.

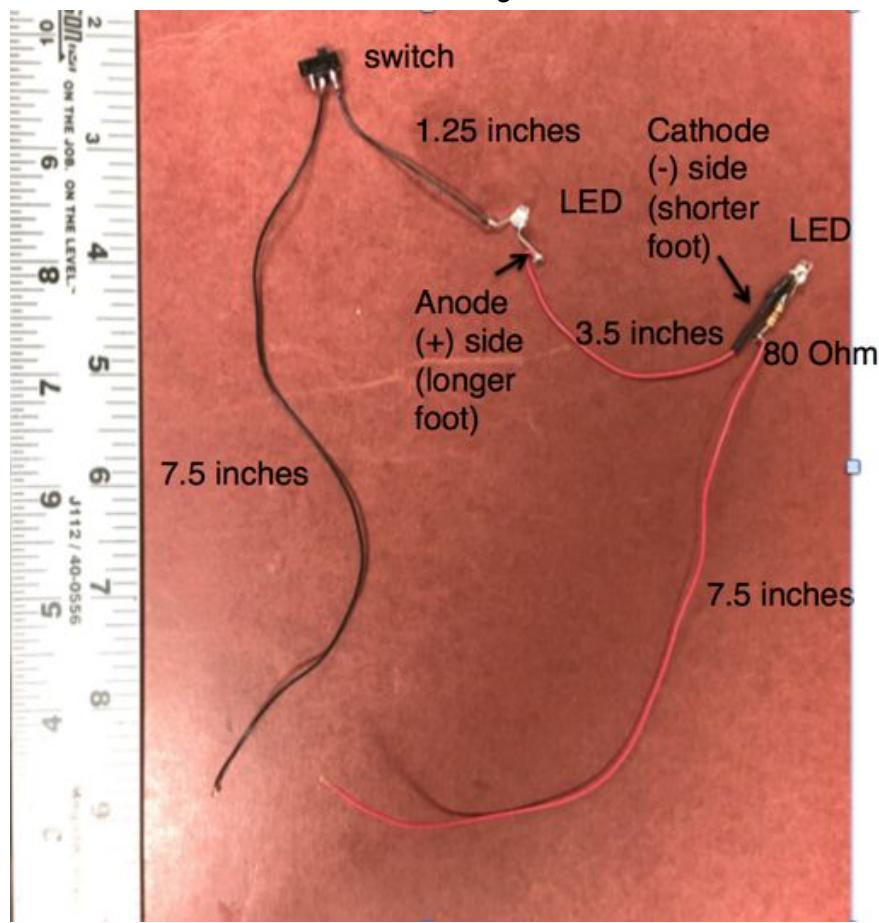


4. Assemble the electric system. You'll need:

- 80 Ohm resistor.
- 2 LED 3mm white.
- Switch SPDT micro.
- Battery Snap Connector
- Wire.
- Thermo Tube.



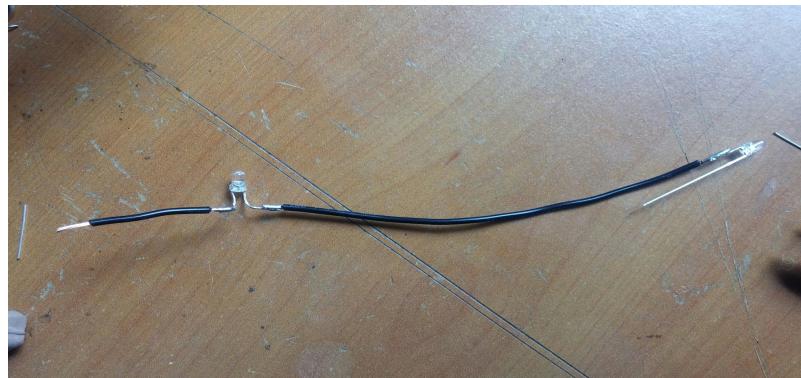
You will be making this:



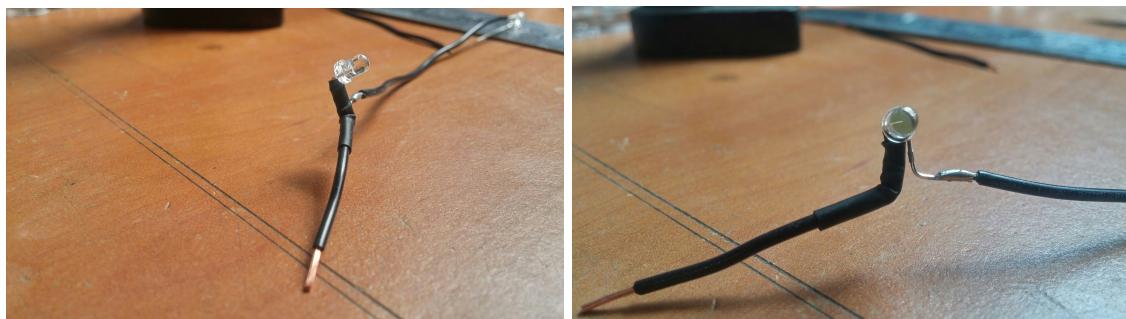
Bend one of the LED's as shown below. You can use one of the plates of the platform as a model for the bend.



Solder the two LEDs with the 3.75 wire. You must unite the positive pole of the first LED with the negative pole of the second (series connection). Place the 1.25 wire at the end of the second LED.



You'll need to put some thermo tube to isolate the second LED's connectors from one another.



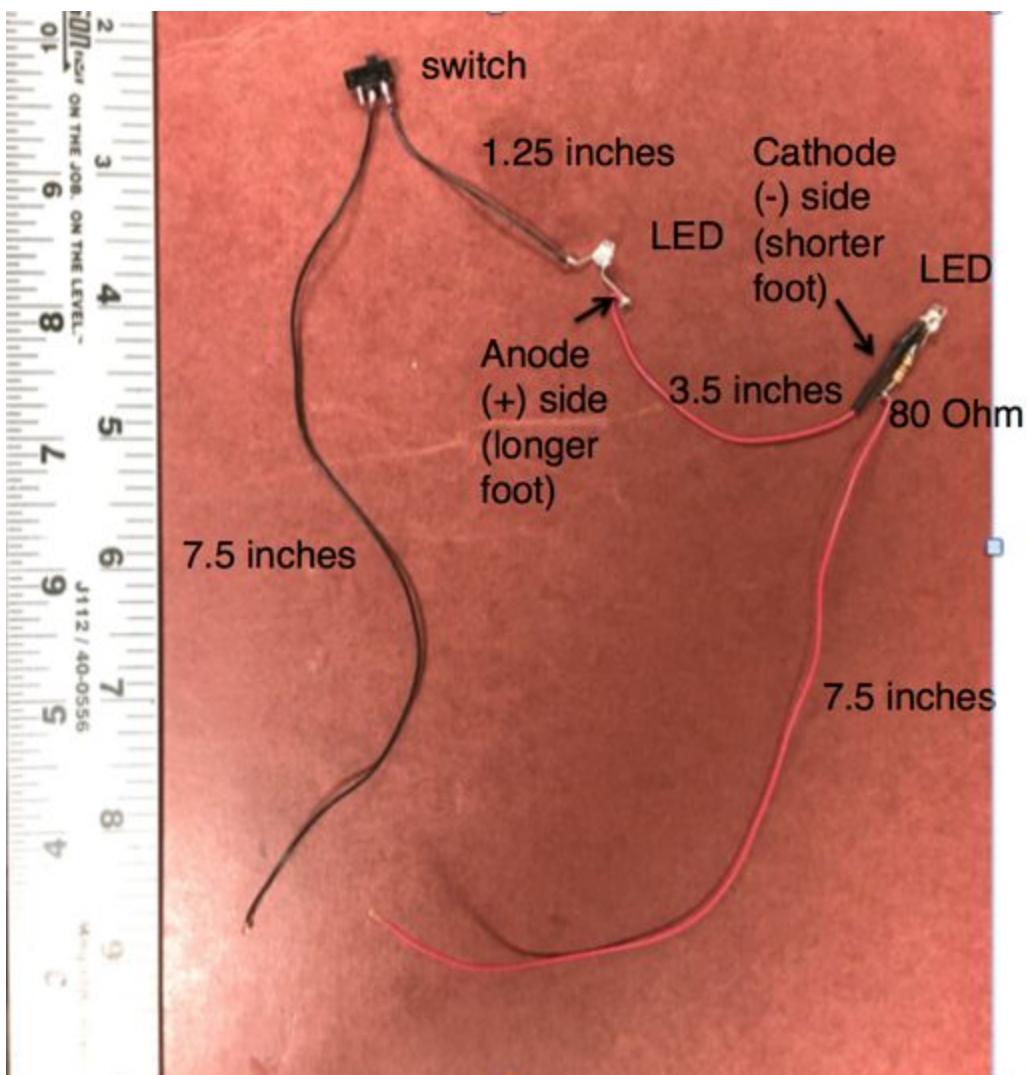
Solder to the side switch as shown. Solder the 2.5 inch wire to the middle of switch. Add thermo tube.



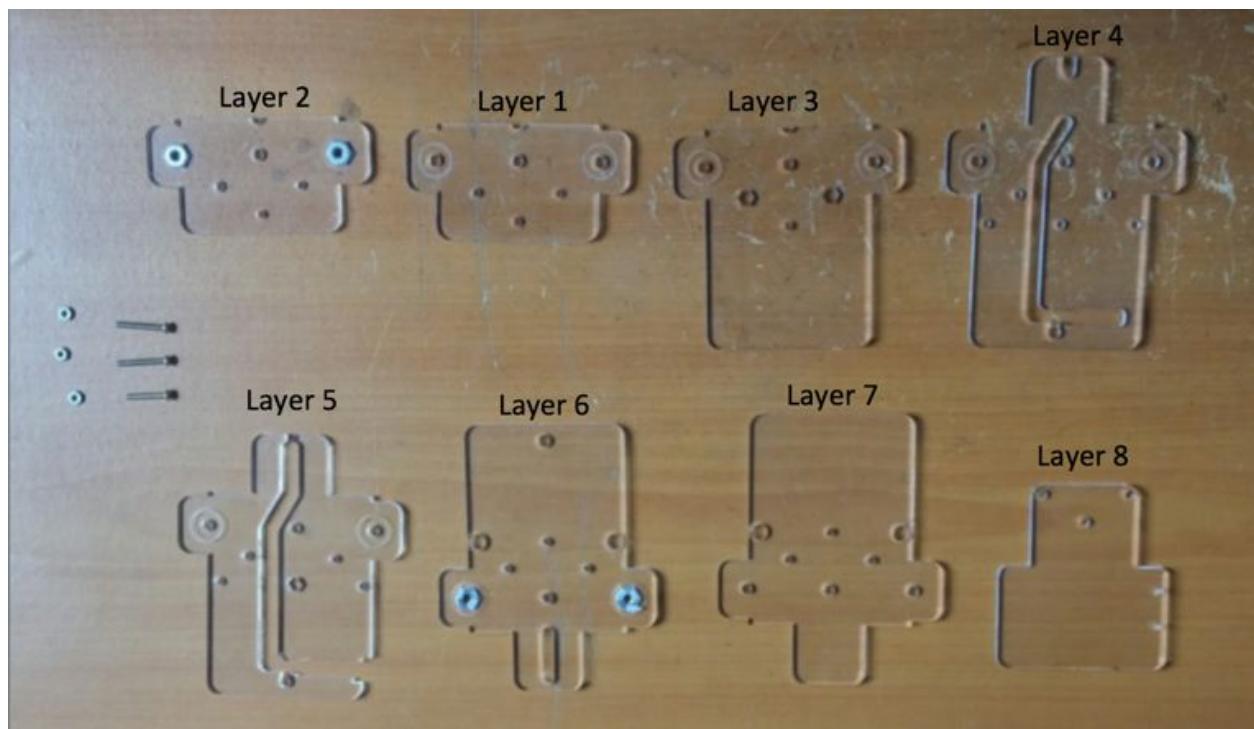
Solder the resistor to the negative part of the first LED.



Place some termo tube on the resistor and the LED's connector for isolation purposes. Finish the Remaining wires per the original illustration (also on next page)

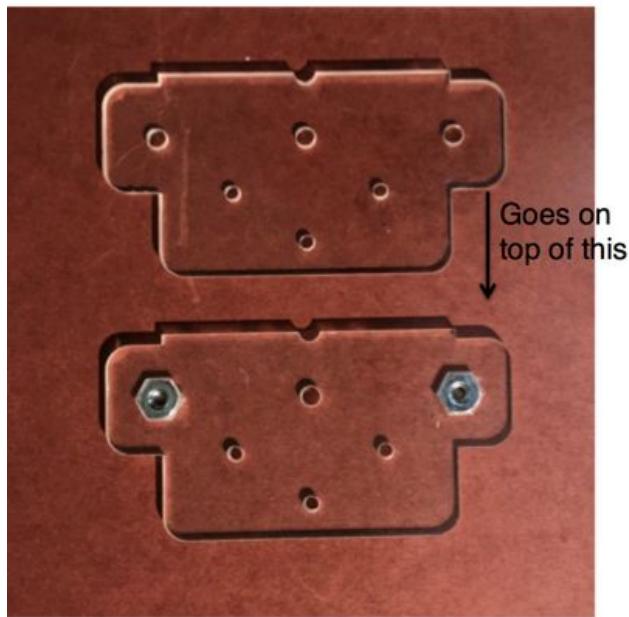


5. Assemble the platform. - This is the most difficult part of the assembly



Get together the first plates of the platform. These are the “snake parts” -
You should also place the 2-56 nut in the hole and 2-56 screws to keep it all aligned

5.1 Place the first two layers



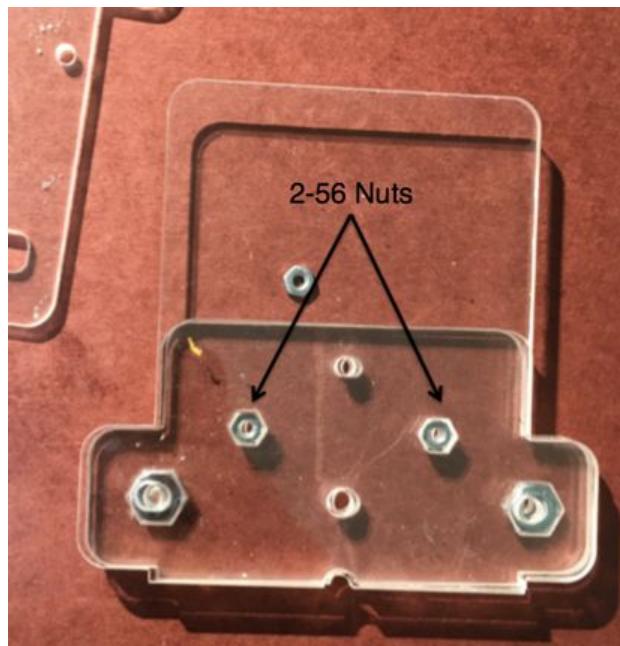
5.2 Place the third layer



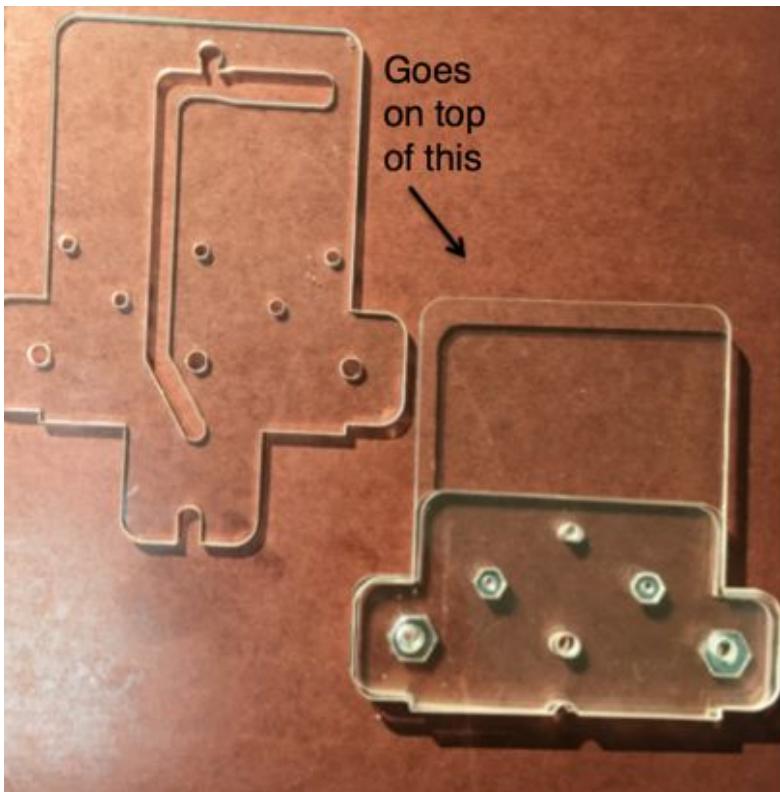
To Make This



5.3 Insert 2-56 nuts in the appropriate holes



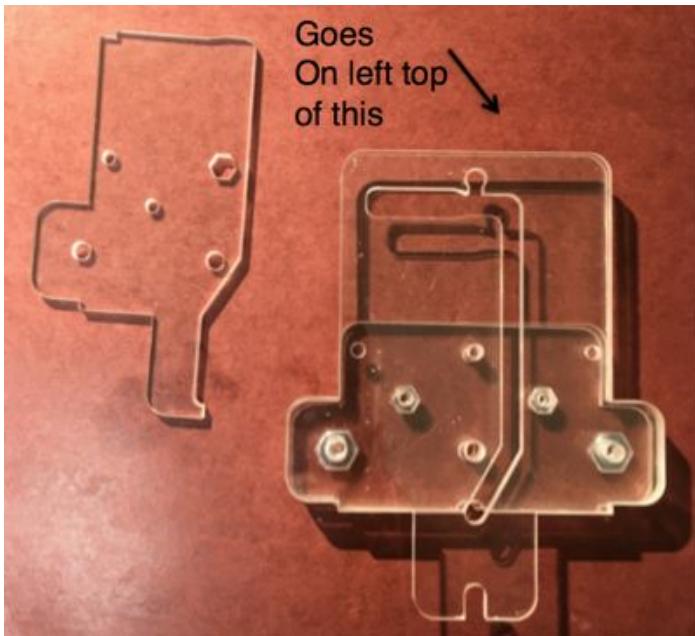
5.5 Place the 4th Layer



To Make This



5.6 Install Left side of 5th layer.



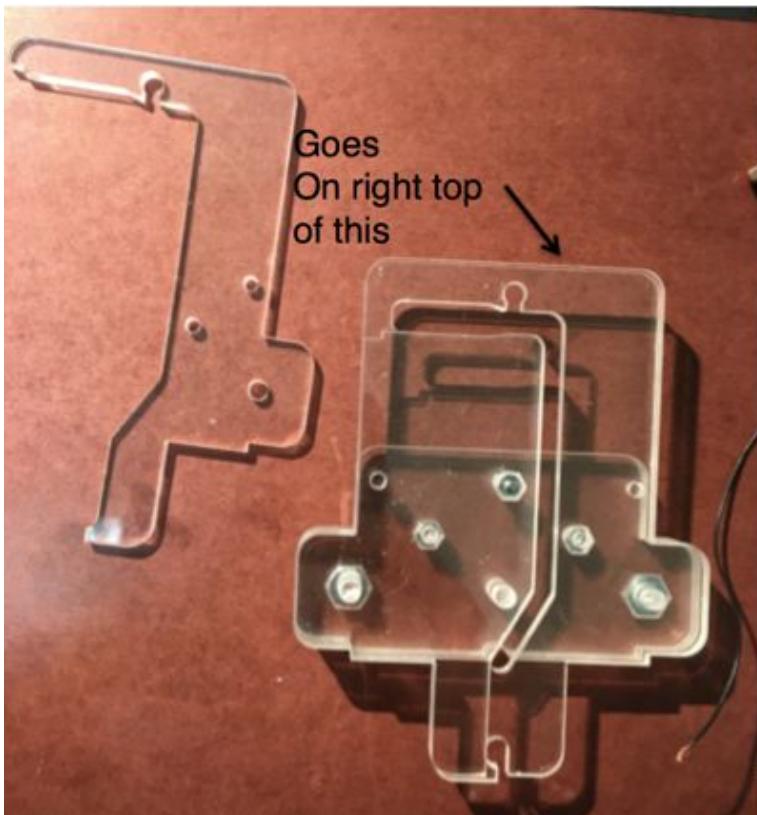
To Make This



5.65 also add 2-56 nut to center, and $\frac{5}{8}$ fastener from the bottom



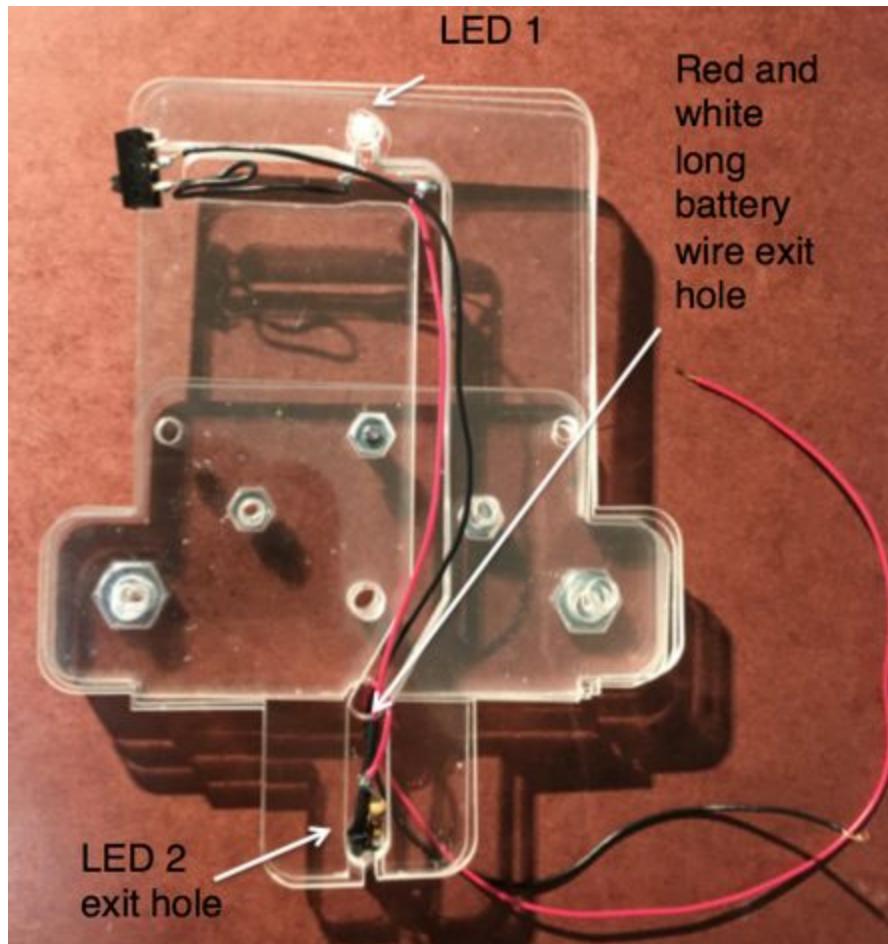
5.7 Install Right side of 5th layer



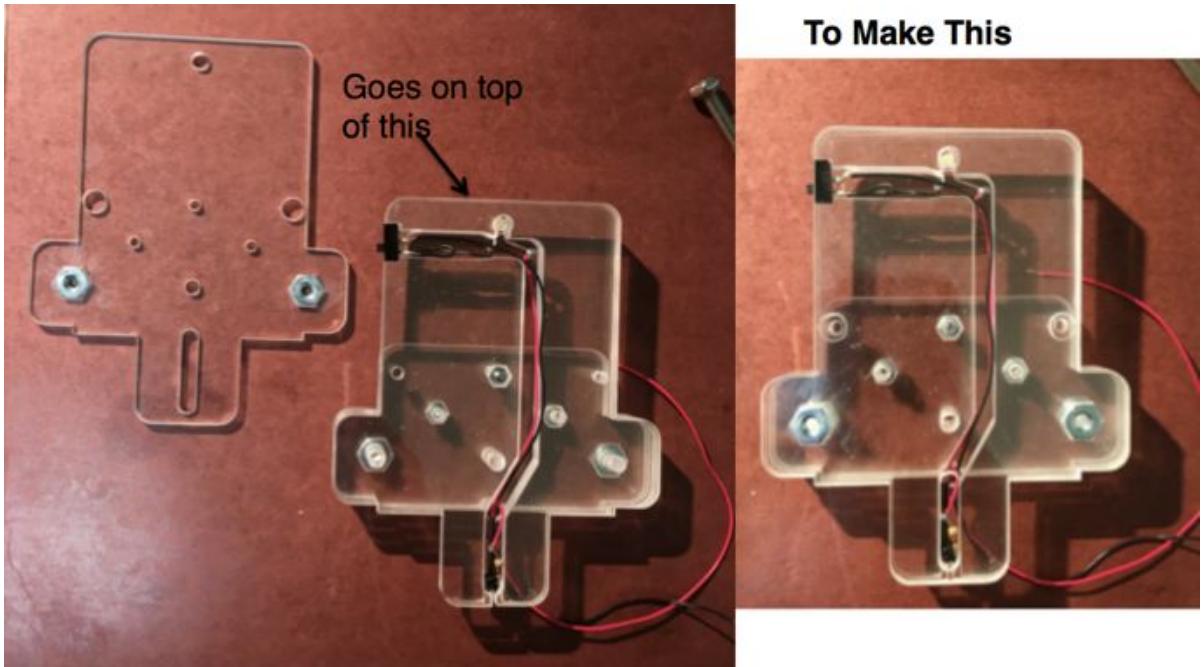
To Make This



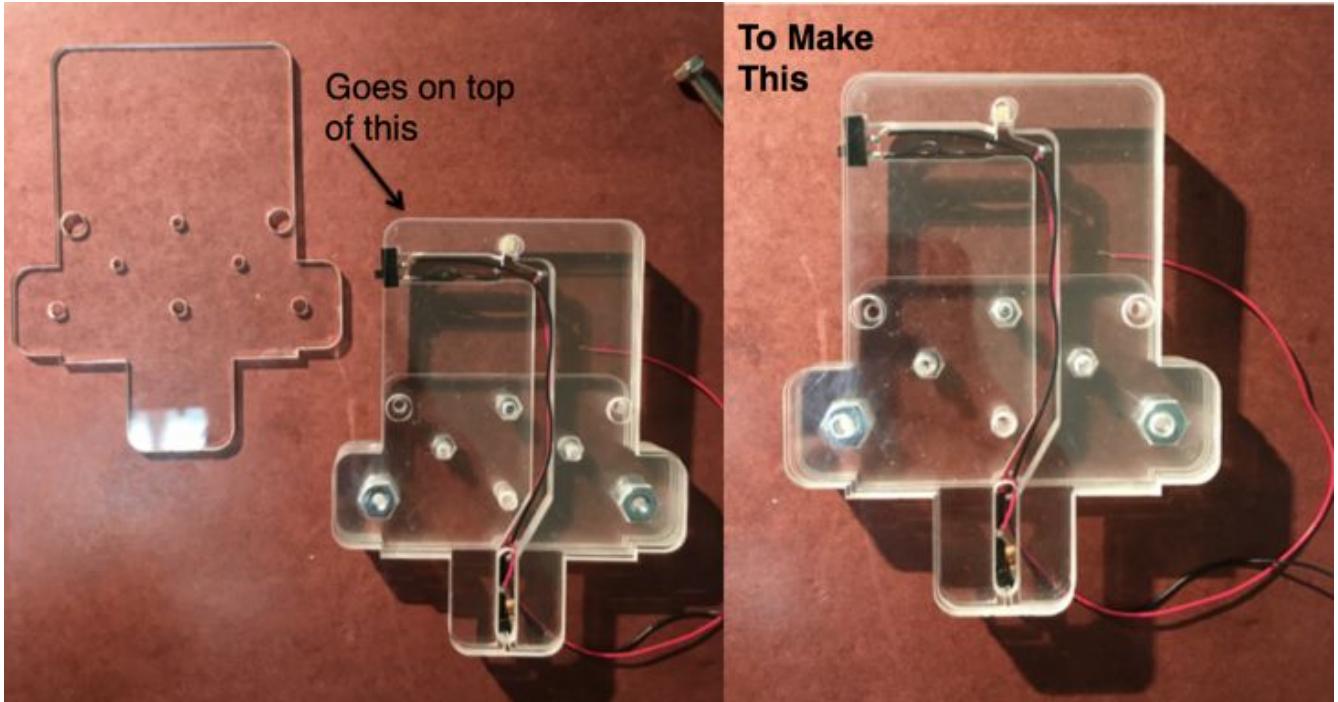
5.8 Install Wires Harness you build previously. This can be difficult at first but becomes easier after 2 times.



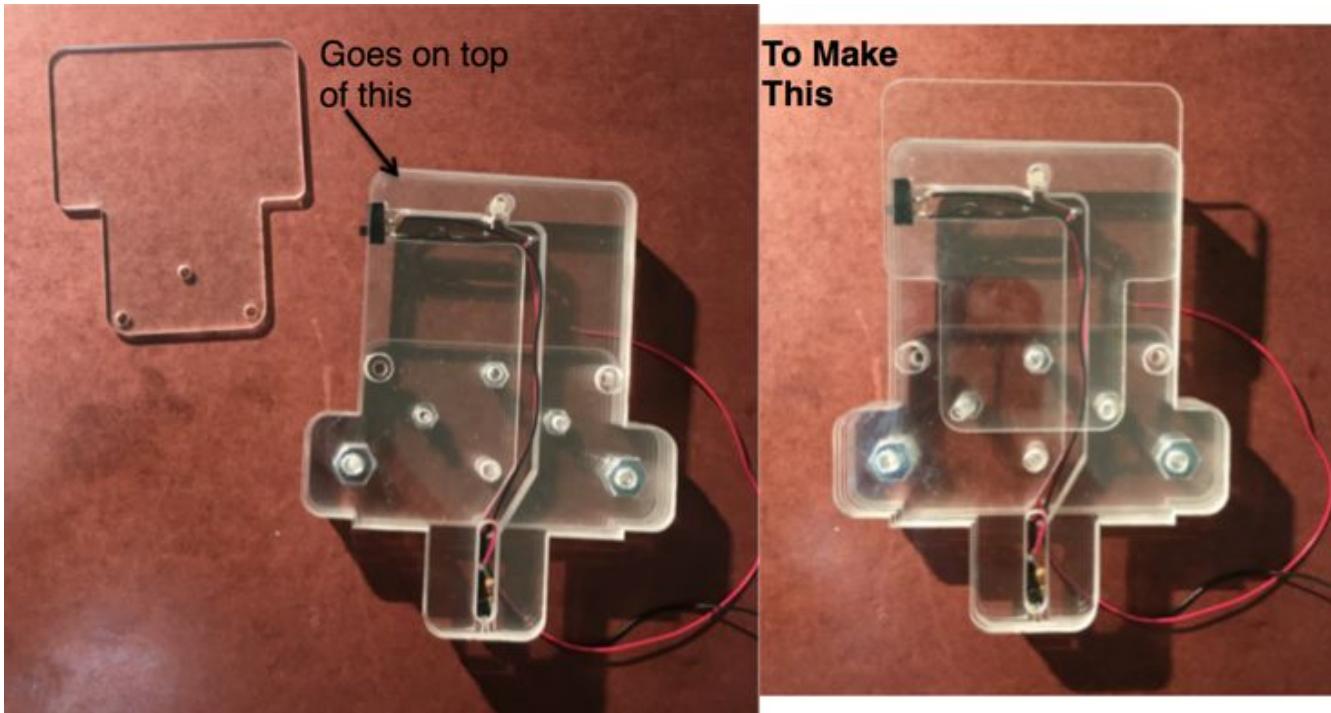
5.9 Install 6th layer



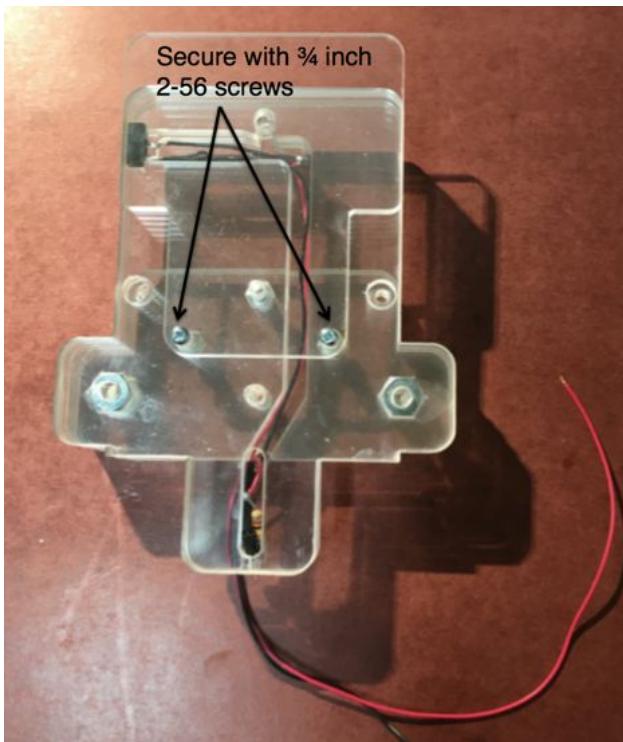
5.10 Install 7th layer



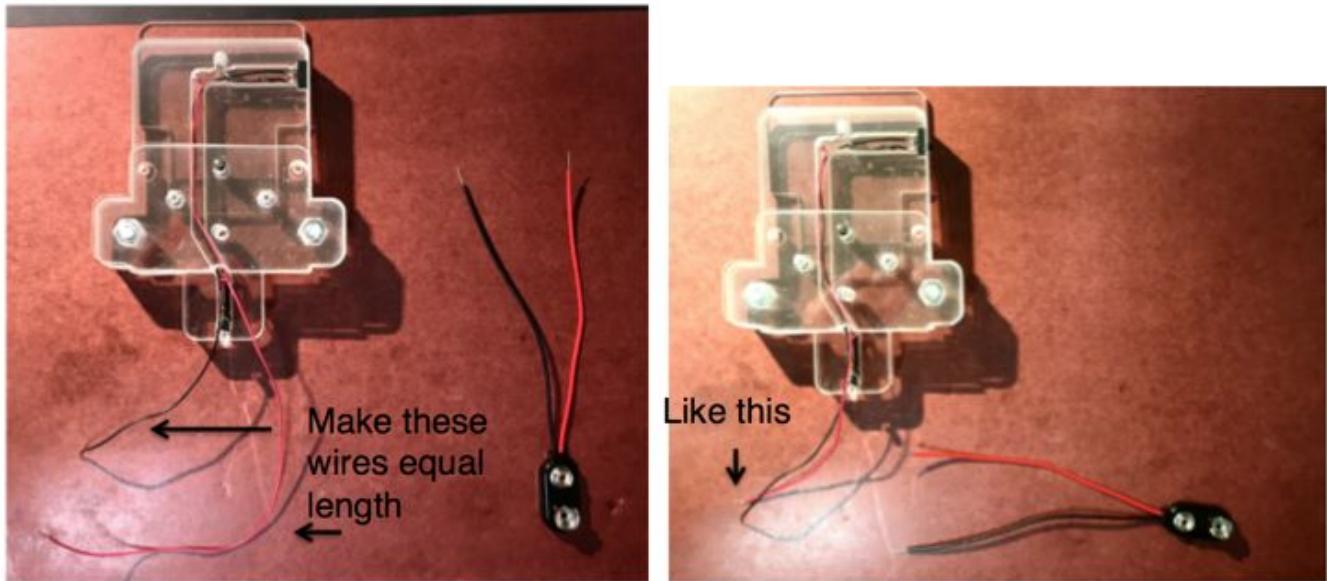
5.11 Install 8th and final layer



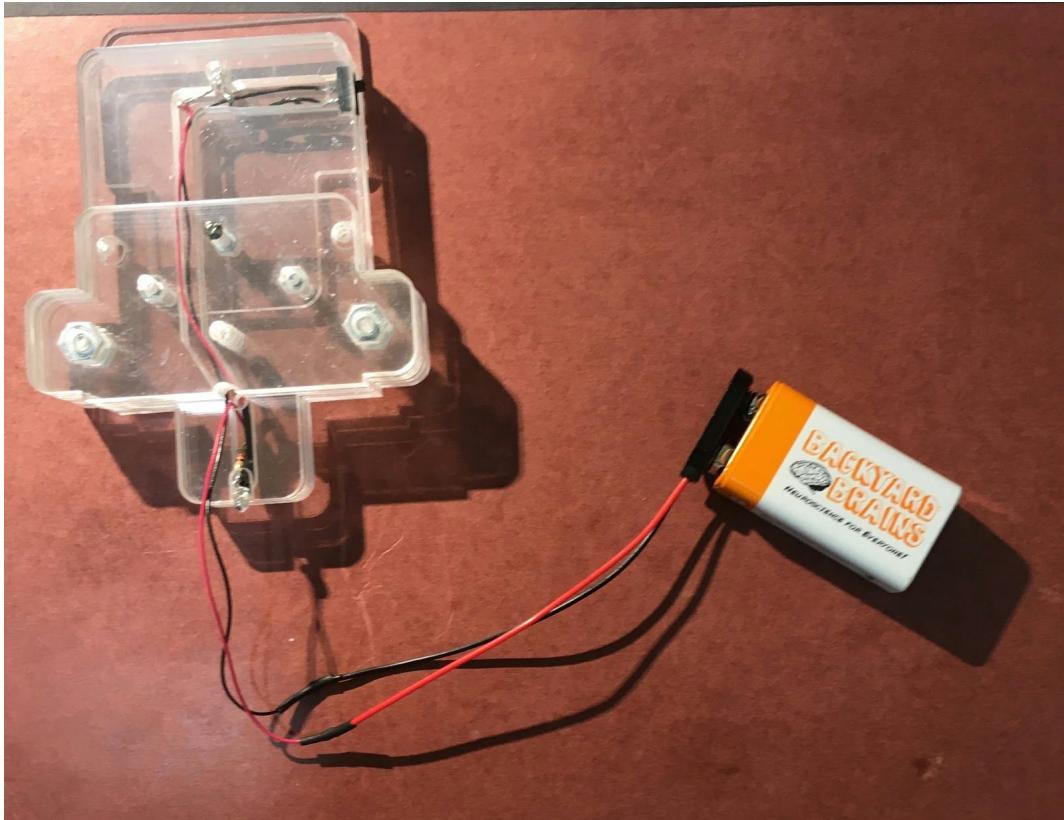
5.11 Fasten Everything with two $\frac{3}{4}$ inch 2-56 screws



5.12 Make Battery Cables Equal Length)

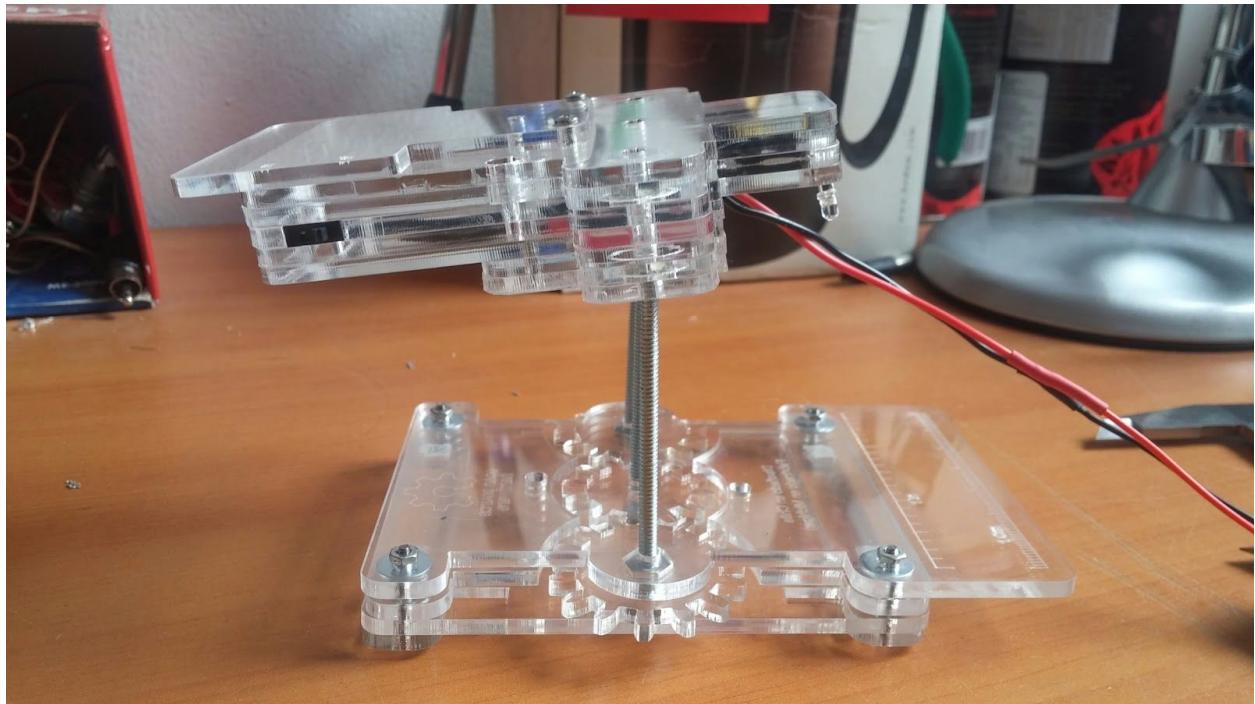


5.13 And solder battery connector to finish up. Use heat shrink to make look nice. All done!

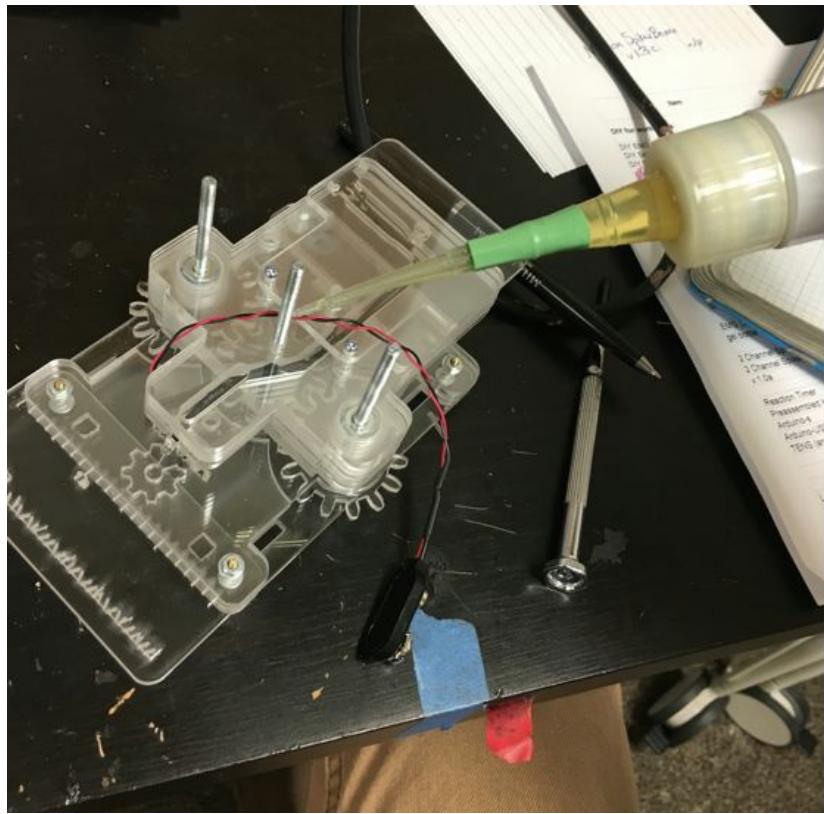


6. Mounting of the platform.

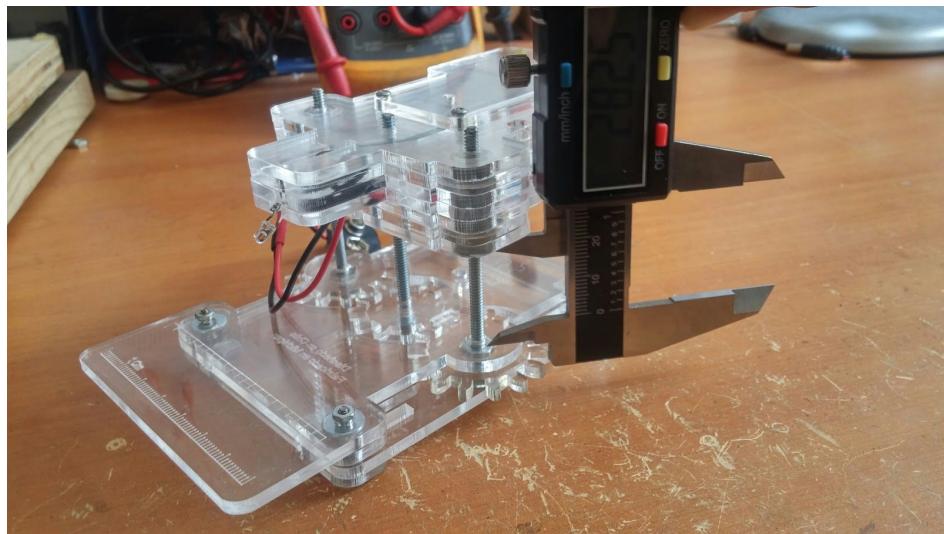
Place the platform on the nuts and turn the gear so the bolt turns into the nut inside. Be sure that the center bolt is in place before you do this. You should ensure a screw goes in easily before installing on base (oil may help)



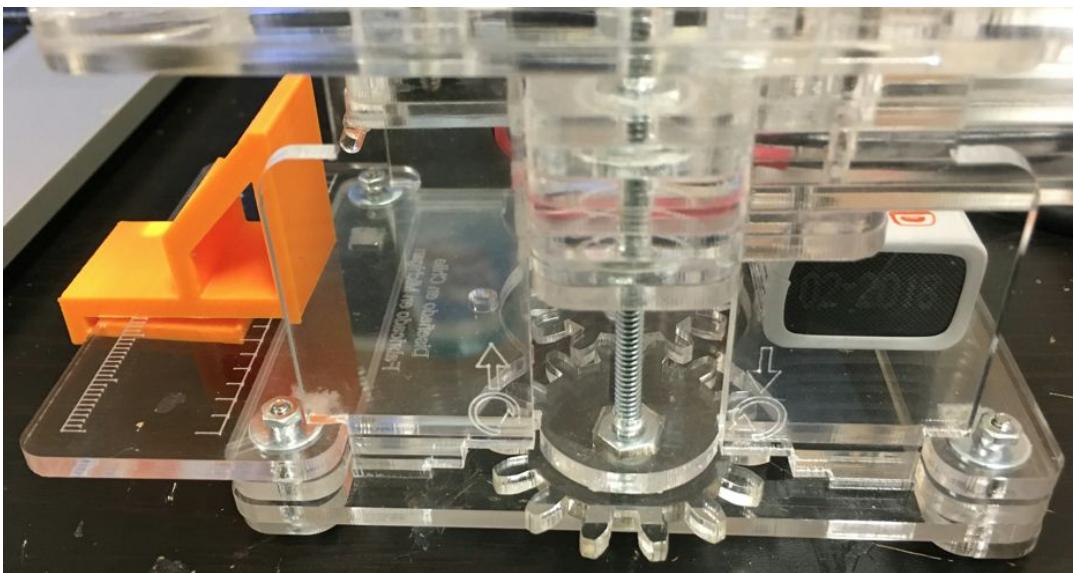
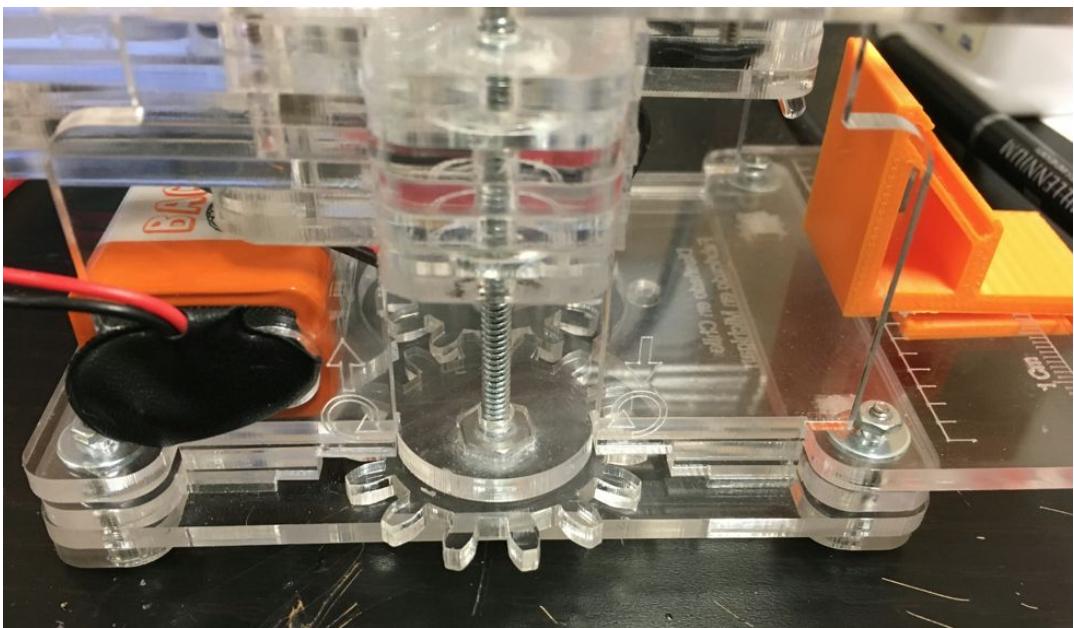
Adding oil to all moving parts will make operation smoother. Avoid adding oil directly to teeth on gears, so humans don't get oily fingers during operation.



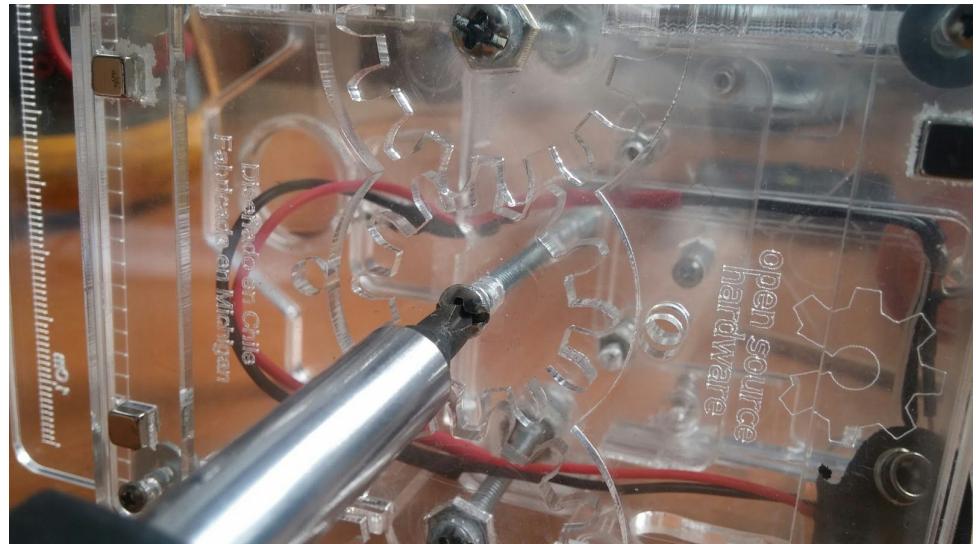
Keep turning until the end of the bolts comes out the other end. You should measure the distance between the platform and the base of the microscope to make sure the platform is aligned.



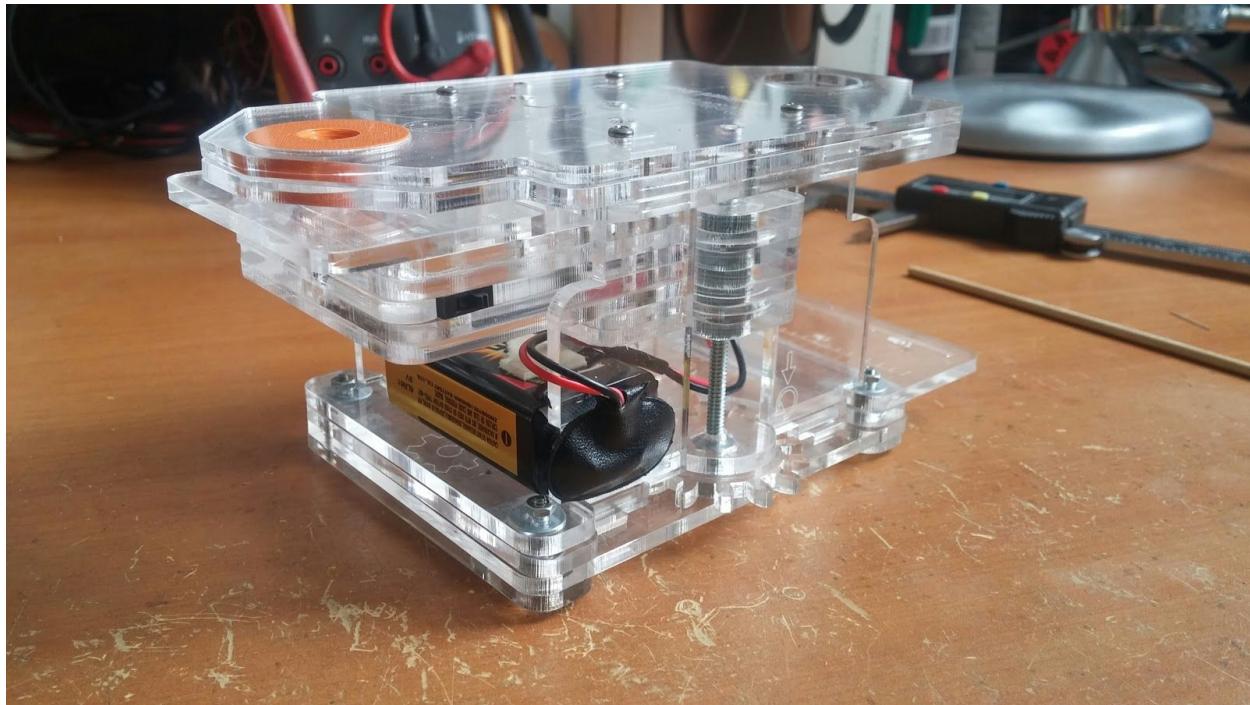
Once the platform is on position and aligned, place the side plates on the base.
Be aware that the signals on the plates are on the outside.



Finally, put the top module on and screw all together.



This is how everything must look like when it's finished.



Test Image Quality and Focus using Slides

