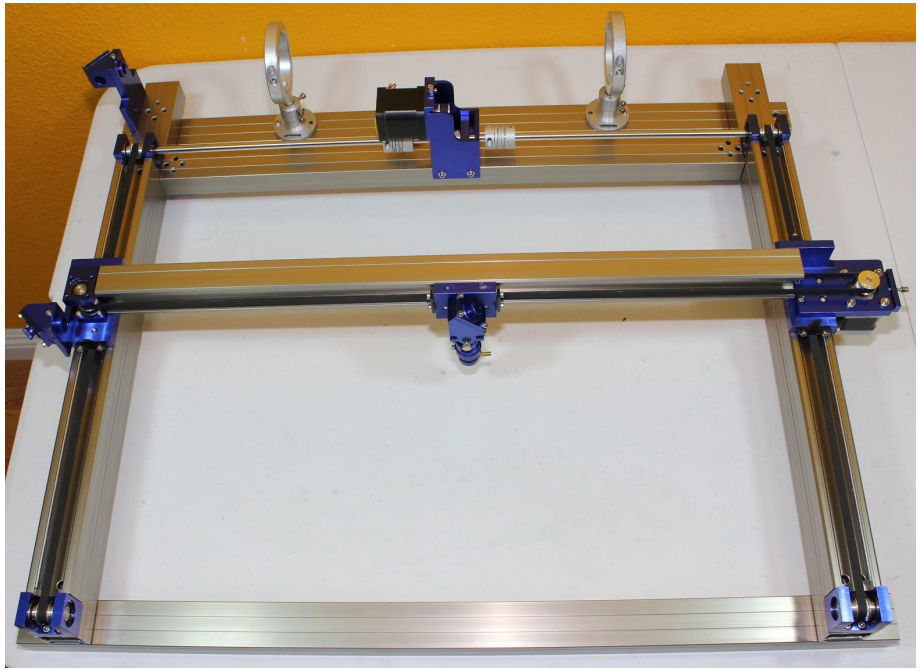
Rev. 1.0 July 2016

X-Y Stage Assembly Manual

PR 530 series

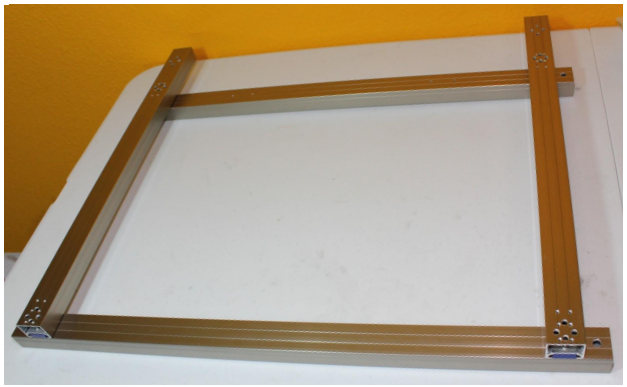
Before you begin...

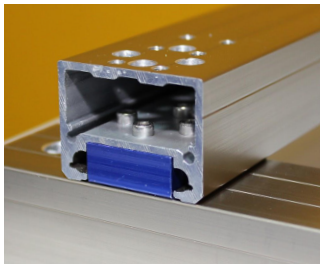
- Ensure that all parts are included and intact
- Assemble parts on top of a protective surface such as cardboard or a towel in order to prevent damaging the parts or work surface.
- Have an empty box or tray to keep the screws and smaller components in so that no parts will be lost.
- Some parts may look identical, but will have slight differences in the placement and amount of tapped holes. Ensure that the correct parts are put in the appropriate places and at the right orientation to prevent a longer assembly time.
- Do not completely tighten all screws on the frame as the assembly will need to be properly aligned later on.
- Loosen all adjustment screws before attaching belts to make adjusting tension easier.



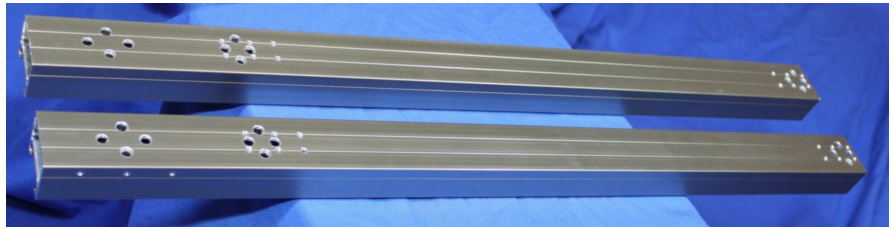
X-Y Stage Final Assembly

Step 1: Assemble the base frame.

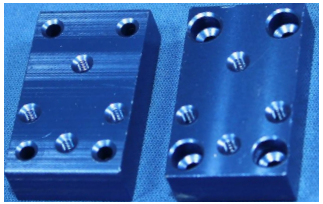




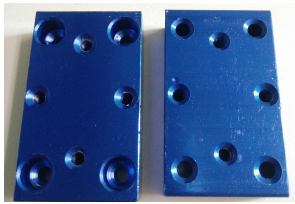
Note: only one of the two y-axis frame bars have three holes in a line. Make sure that this bar is affixed at the left side of the assembly, with the three collinear holes facing outward.



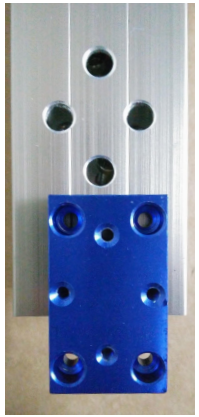
Note: the hole patterns for the front and rear attachment points are different. Make sure that diamond shaped hole patterns are in the front and the kite hole patterns are in the back.

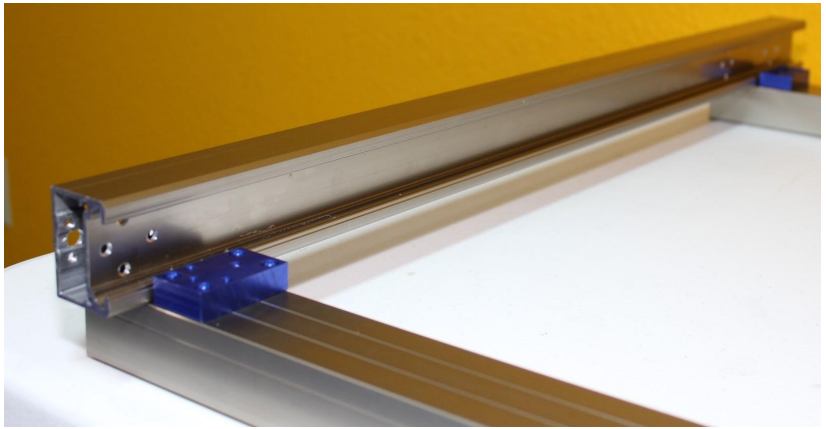


Kite Pattern
(Front)



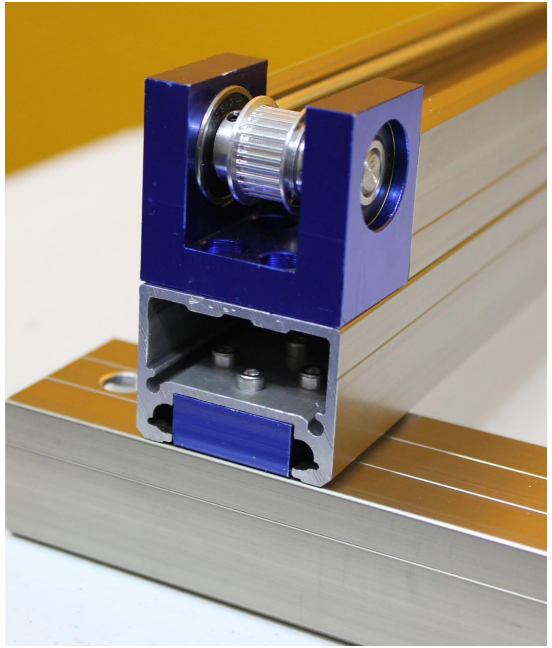
Diamond Pattern
(Rear)



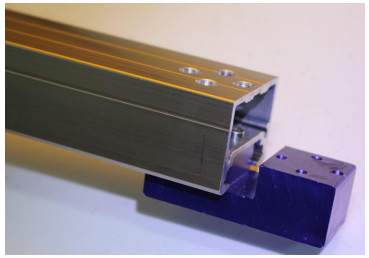


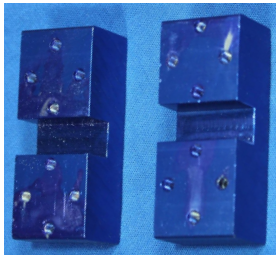
Step 2: Attach Y-axis rails and Y-axis pulleys (front) onto the Y-axis frames.

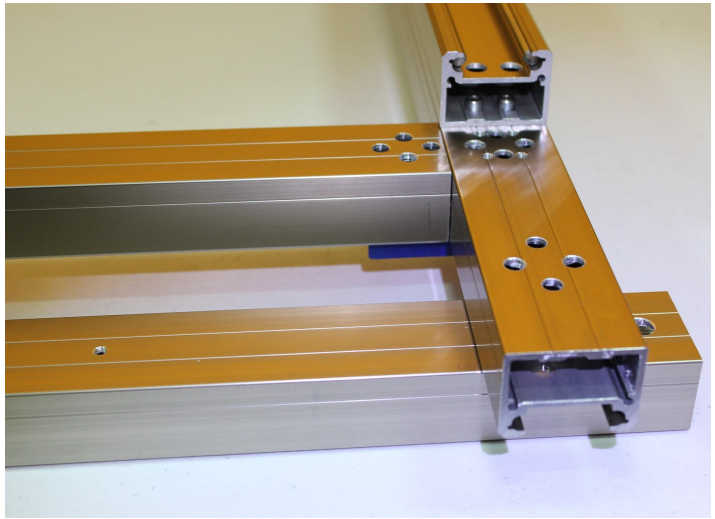
Do not screw in pulleys yet, since the slide blocks will be inserted into the rails later.



Step 3: Attach Y-axis motor bar onto frame

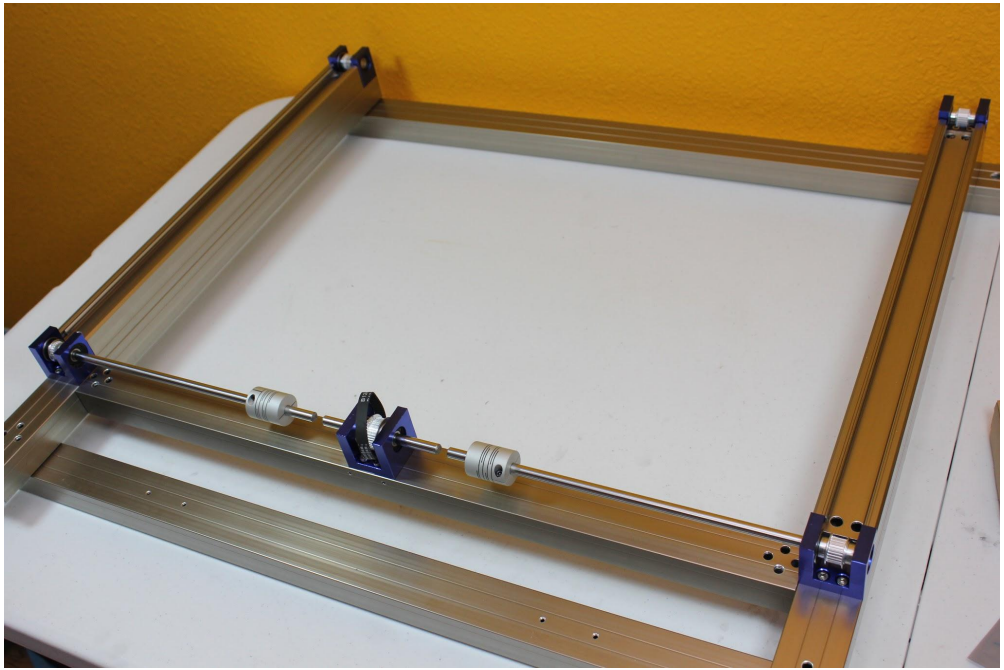




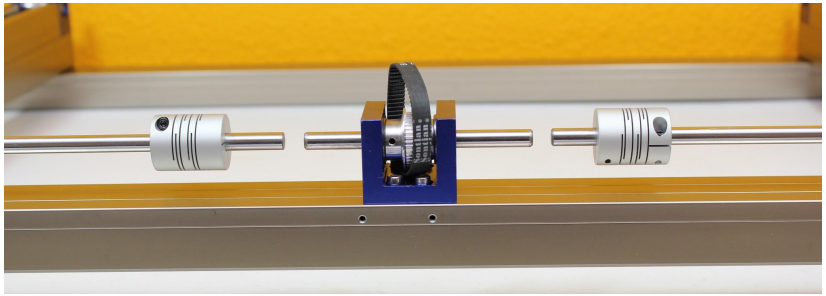


Note: One end of the mounting brackets is slightly wider than the other . The wider end will attach to the Y-axis motor bar, while the narrower end attaches to the Y-axis frame bar.

Step 4: Slip axial couplers onto rear y-axis pulley shafts (rear) and attach pulleys onto frame. Attach Y-axis gear reduction box.



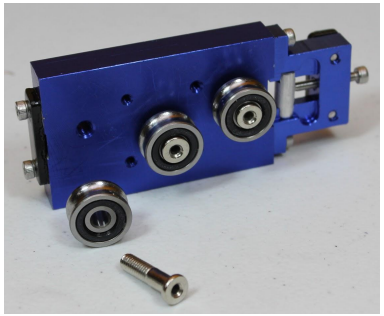
Note: The distances between the pulley shafts should be equal. If not, remove the y-axis gear reduction box and rotate 180°

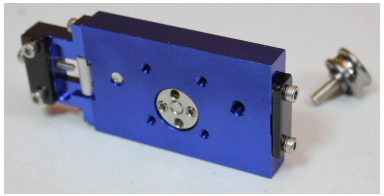


Do not tighten couplers or connect shafts yet. Doing so will affect the alignment and tension of the belts. Shafts will be connected after the belts are attached and tightened.

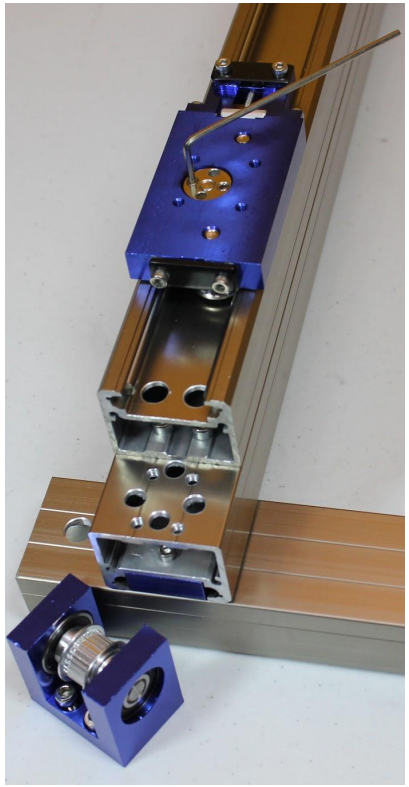
Step 5: Assemble Y-axis slide blocks and place into Y-axis rails

Note: The inner ring of the bearings will stick out further on one side. This side will face towards the slide blocks.





Y-axis Slide Block

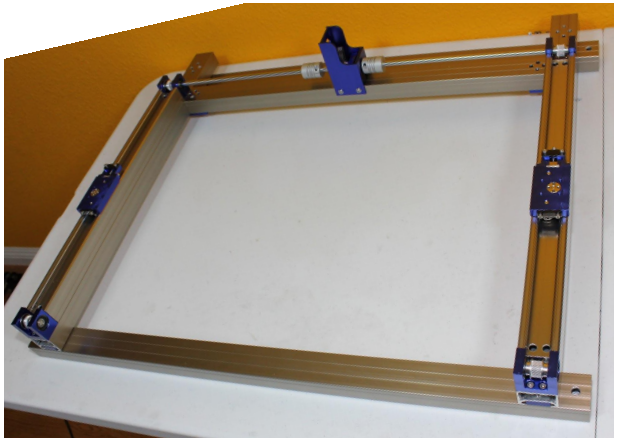


To tighten guide wheels, use the 2.5mm allen key to tighten the screw on the underside of the wheel while using one of the other two allen keys to pull on the wheel from the top so that the offset center hole moves closer to the rail. This moves the guide wheel towards the rail and ensures a tight fit.

Make sure that slide blocks are secured tightly enough so that there is no play, but not so tight that they cannot slide down rails on their own when the frame is tilted.

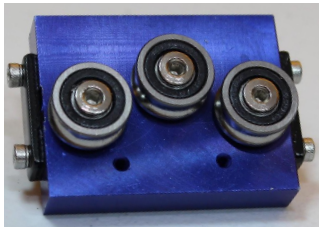
Tightening only the screw on the underside of the wheel prevents it from rolling. The two setscrews on top must be used to tighten the wheel while still allowing them to spin freely.

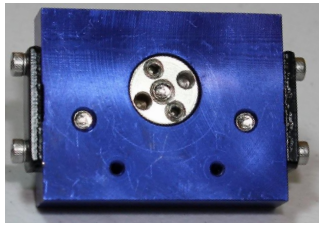
Y- axis pulleys may now be screwed in



Step 6: Assemble X-axis slide block and place into X-axis rail. Then assemble X-axis bar onto Y-axis slide blocks

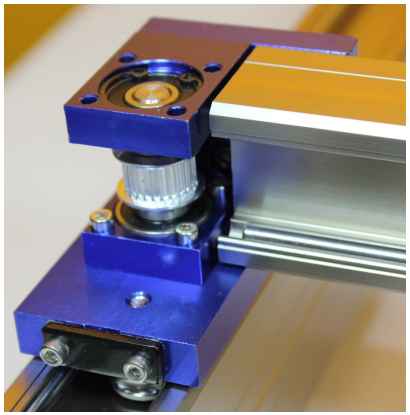
Note: The laser head mount may come pre-assembled onto the X-axis slide block. The laser head mount will need to be removed in order to gain access to the guide wheel adjustor and properly secure the slide block onto the rail. This procedure is the same as in the previous step. *Make sure that the slide block is oriented in the right position!!*

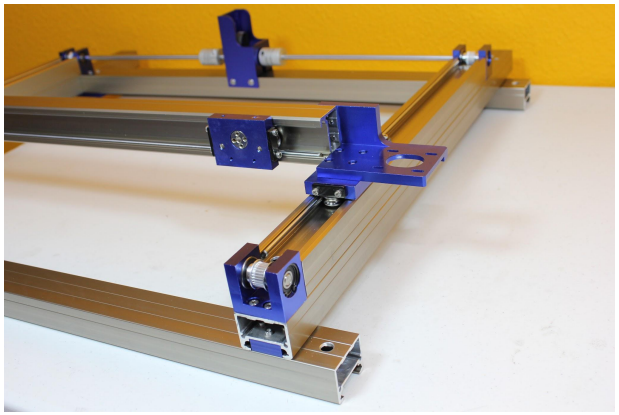




X-axis slide block This way up ↑

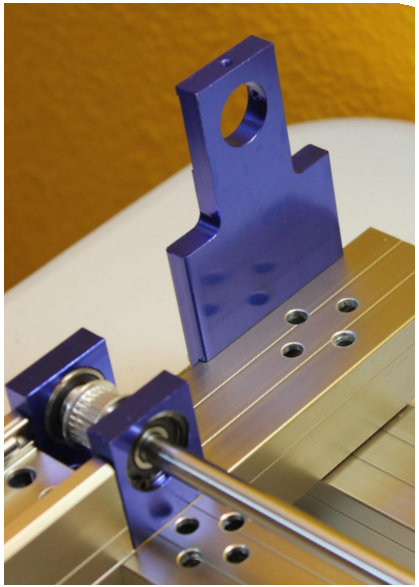
Attach X-axis pulley onto the left end and the X-axis motor mount on the right end of the bar. Then attach onto Y-axis slide blocks. These may need to be realigned later

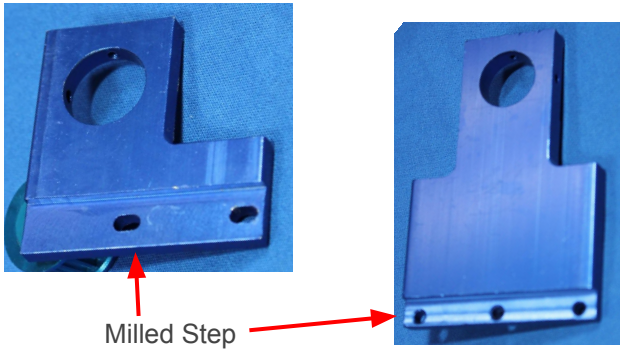


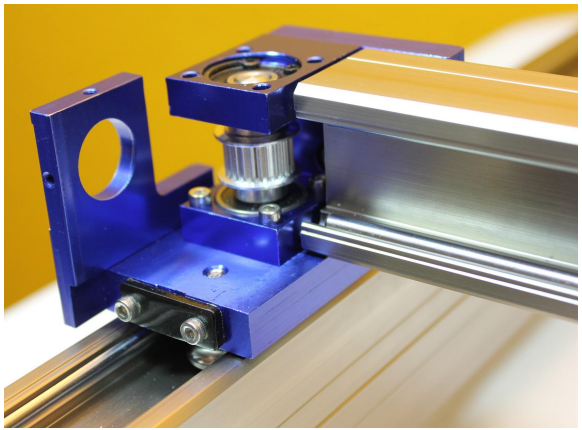


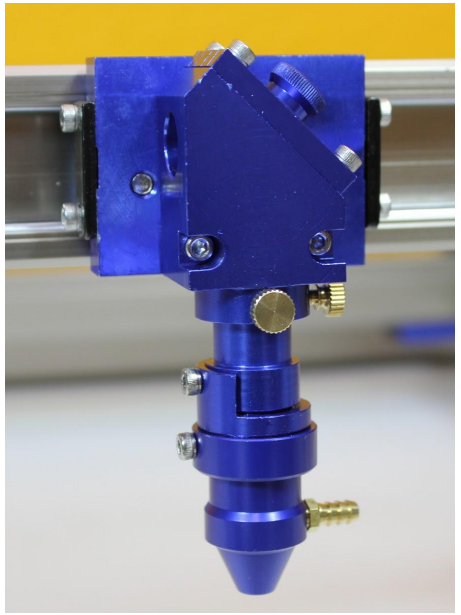
Step 7: Attach mirror mounts and laser head.

Note: Make sure that the correct side of the mirror mounts are facing into the attachment points. The side with a milled step should face inward





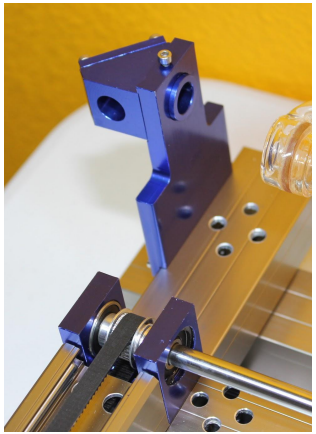


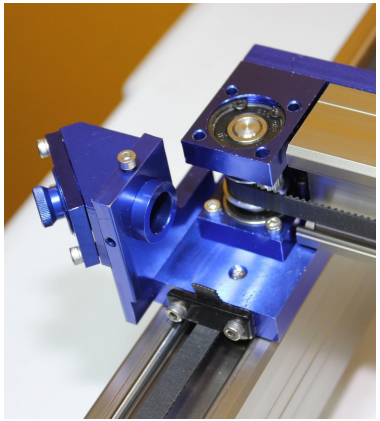


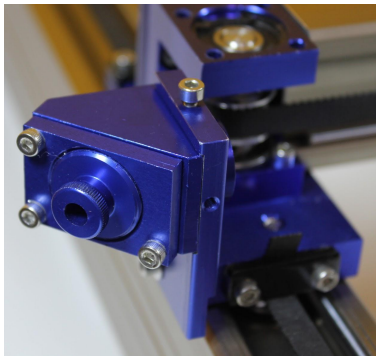
Reattach laser head after properly securing slide block

Step 8: Attach mirror holders onto mirror mounts and attach laser tube mounts onto the rearmost bar.

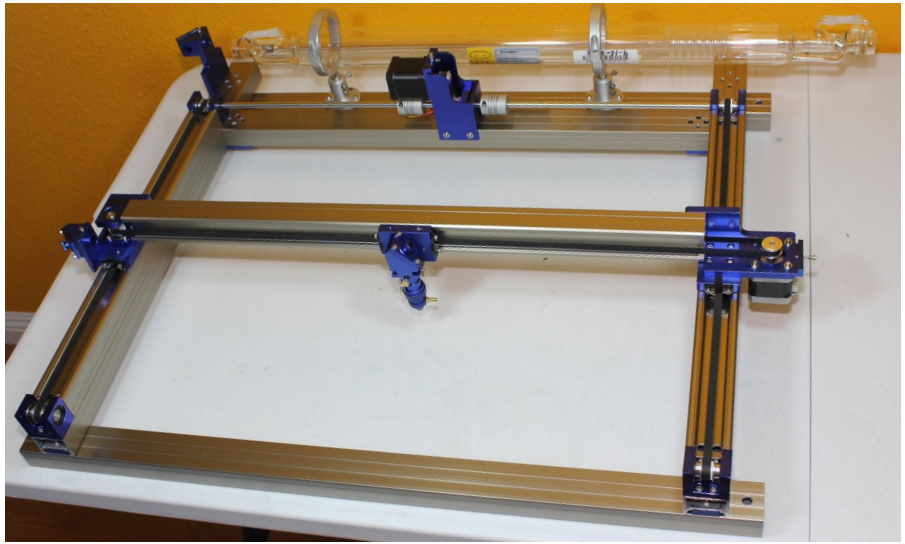
Note: Mirror mounts may come already attached to mirror mounts. In which case, this step is not necessary. Mirror holders are identical. *Make sure that the mirror holders are facing the correct direction!!*





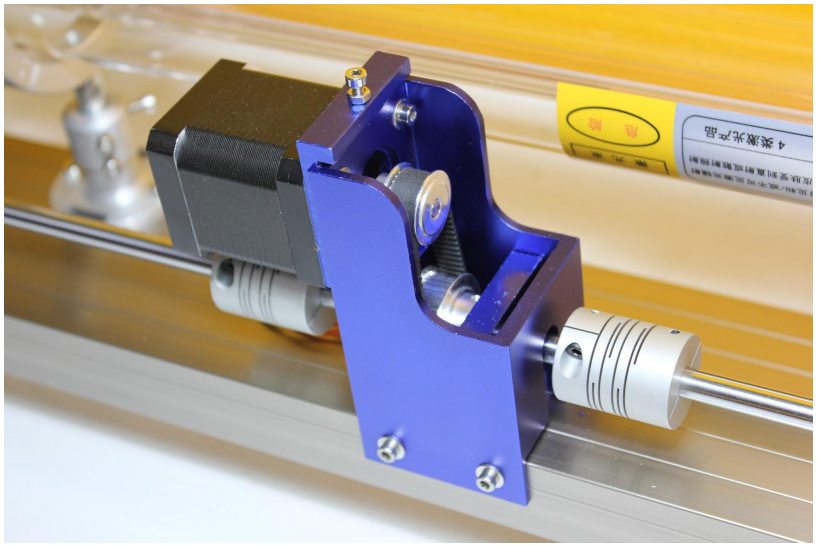


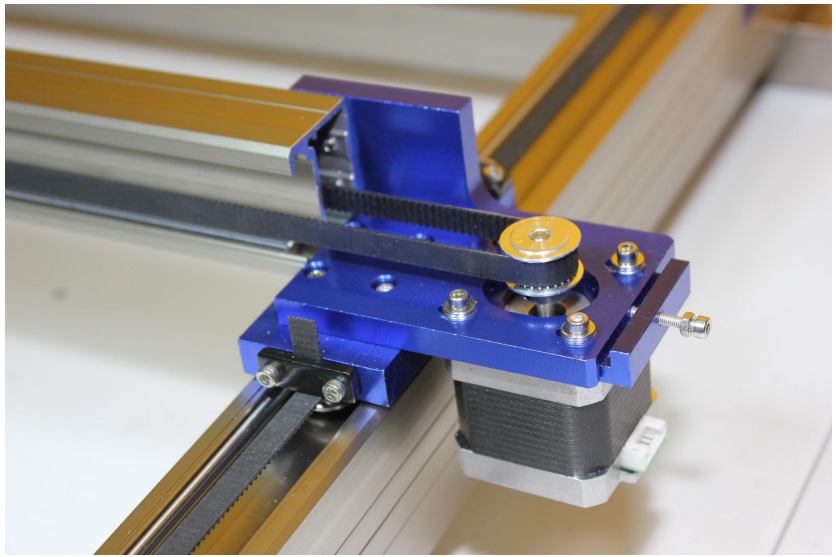
Make sure that the screws are screwed through the elongated holes. This is so that the laser tube can be adjusted during the alignment of the laser.



Step 9: Attach X-axis motor mount onto one end of the X-axis rail. Then, attach one stepper motor to each motor mount.

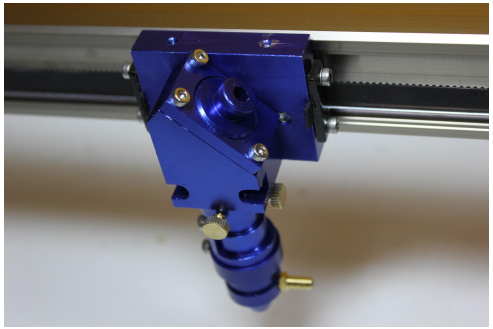
Make sure that the Y-axis motor mount faces the correct way. Loop belt around gears. Belt tension may be adjusted using the adjustment screw on the top of the Y-axis motor mount and the right end of the X-axis motor mount.

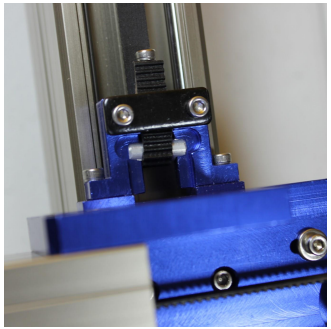


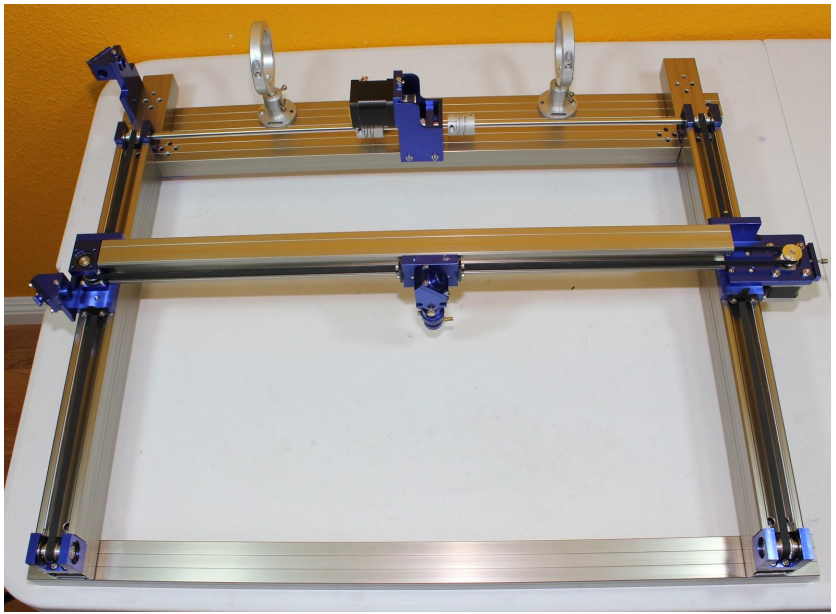


Step 10:Attach belts for each rail

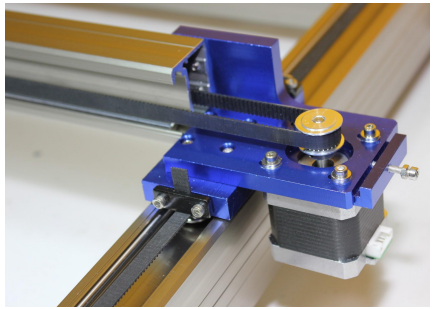
Pull belts as tightly as possible when attaching to slide blocks to minimize slack as much as possible. Leave at least one inch extra length of belt in case of future adjustments.







Belts must be looped THROUGH the rail bars.



Step 11: Aligning the Rails

Slide the X- axis bar up and down the rails and observe if both ends touch the pulleys at the same time. If they do, then the X-axis rails are aligned. If they do not, adjust the frame and slowly begin tightening all of the screws one at a time, while checking that the rails stay aligned. Also make sure that the Two Y-axis belts have the same tension. Once rails are aligned and the belts are tightened, the shaft couplings may be secured.