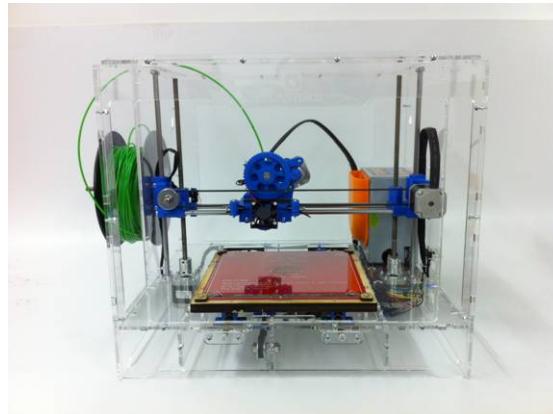




## Mendel 3D Printer Assembly

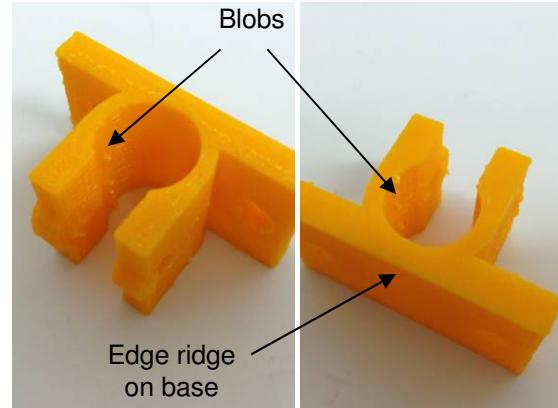


Section 5  
Y-Carriage (Bed) Assembly

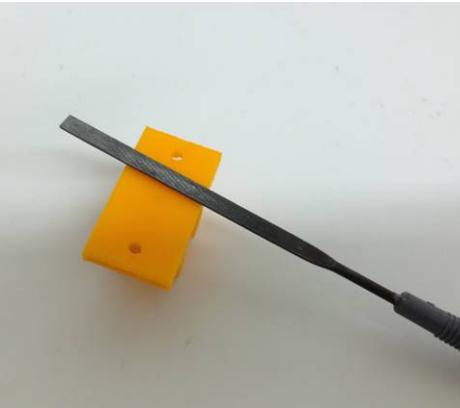
## Step 1: Cleaning Linear Bearing Holders



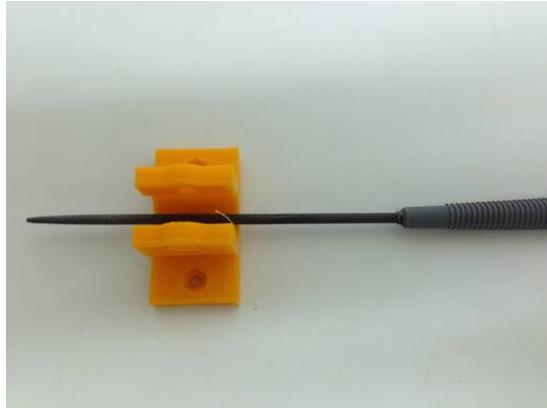
Use the 1/8" drill to clean up the base holes (2 holes per) Repeat for all 4 holders.



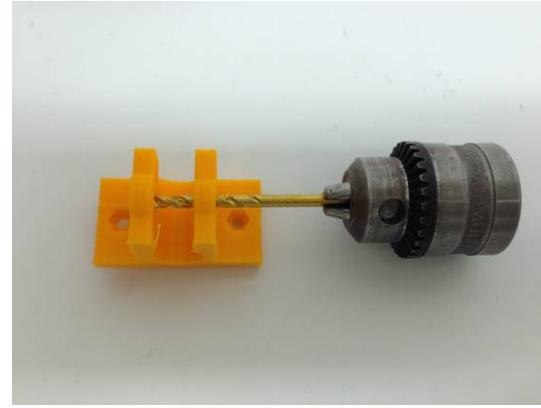
Inspect your parts for blobs or imperfections, specially on the base and the linear bearing clamp surfaces.



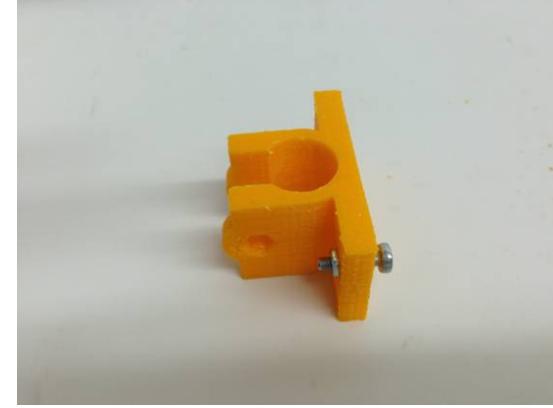
Use the flat file to remove any blobs/ridges from the base. Alternatively you could use sandpaper. Sit it flat on the table and rub the surface against it. Repeat for all 4 holders.



Use the half round file to clean up the bearing clamp from any blobs or imperfections. Alternatively you can use a 0.5" rod with sandpaper wrapped around to clean the part. Repeat for all 4 holders.



Use the 1/8" drill to clean up the clamp screw hole. Repeat for all 4 holders.



Add M3 hex nuts (2 pcs) to the nut traps on the base. Use a M3 x 12 screw to help pull the nut in position.

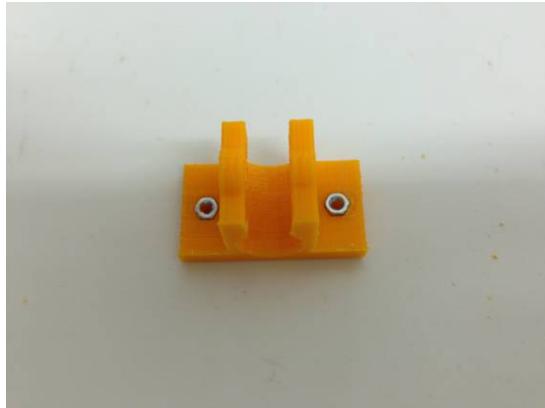
### Parts Needed:

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

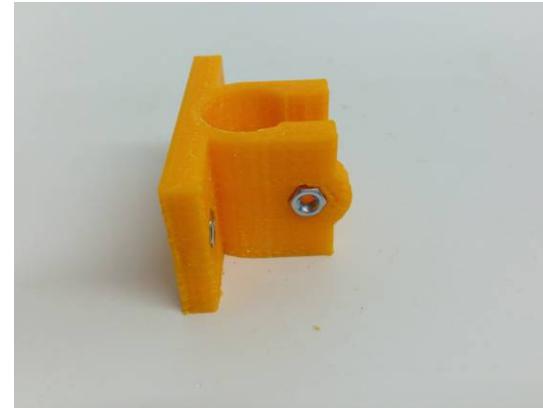
### Tools Needed:

- 1/8" drill chuck
- Flat file
- Half Round file

## Step 2: Cleaning Linear Bearing Holders (cont)



The part should look like this once the M3 Hex nuts are inserted. Repeat for all 4 holders.



Insert one more M3 nut on the clamp nut trap. Notice one side has a rounded recess for the screw head. The other side has an hexagonal recess for the nut. Repeat for all 4 holders.



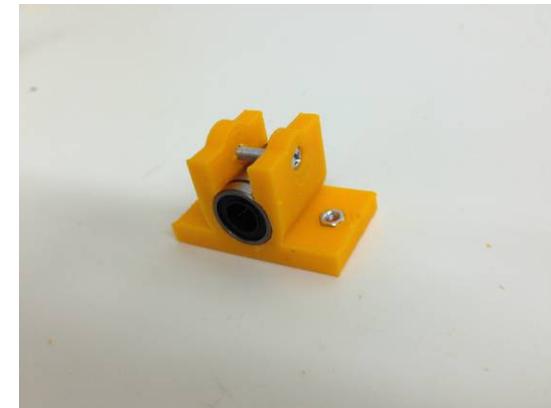
Insert linear bearing through side like so.  
Repeat for all 4 holders.



Use the oval file to clean up the bearing clamp from any blobs or imperfections. Alternatively you can use a 0.5" rod with sandpaper wrapped around to clean the part. Repeat for all 4 holders.



Insert M3 x 20mm screw to clamp linear bearing into place. Note: you want the linear bearings to stay in place but don't over tighten. Repeat for all 4 holders.



Note how the head of the screw is inside the recess.

## Step 3: Cleaning Y Belt Clamp parts

### Parts Needed:

- M3 hex nuts (2 pcs)
- M3 x 25mm screws (2 pcs)
- Y Belt Tensioner (2 pcs)
- Y Belt Channel (2 pcs)
- Y Belt Clamp (2 pcs)

### Tools Needed:

- 1/8" Drill chuck



Locate the plastic parts shown above. There should be 2 sets of them. From top to bottom: Y Belt Tensioner, Y Belt Channel, Y Belt Clamp.



Begin with the Y Belt Tensioner parts. Use the 1/8" drill chuck to clean up the center hole. Repeat for the second piece.



Use the 1/8" drill chuck to clean up the 2 side holes on the Y Belt Tensioner. Repeat for the second piece.



Insert an M3 hex nut to the nut trap on the center hole of the Y Belt Tensioner. Repeat for the second piece.



Insert an M3 x 25mm screw from the opposite side of the nut trap. Repeat for the second piece.



Continue with the Y Belt Channel. Use the 1/8" drill chuck to drill out the 2 holes on the Y Belt Channel. Repeat for the second piece.

## Step 4: Cleaning Y Belt Clamp parts (Cont.)

### Parts Needed:

- M3 x 12mm screw to help pull in the M3 nut
- M3 Hex nut (4 pcs)
- Y belt clamp (2 pcs) from previous step

### Tools Needed:

- 1/8" Drill Chuck
- Philips screwdriver



Continue with the Y Belt Clamp. Note the holes on the belt clamps have a solid layer. The solid layer was needed to lay foundation for an overhang as there is a nut trap underneath that wall.



Use the 1/8" drill chuck to drill out the solid layer



This is how it should look once drilled and cleaned.



Insert M3 hex nuts into the clamp nut traps. Screw-in an M3 x12mm screw from the other side to help press fit the nut into the nut trap.



Screw-in slowly until the nut gets in.



This is how it should look with the M3 hex nuts press fitted. Repeat for the second piece.

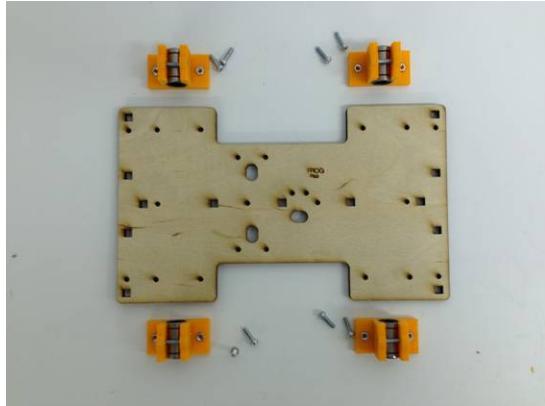
## Step 5: Frog Assembly

### Parts Needed:

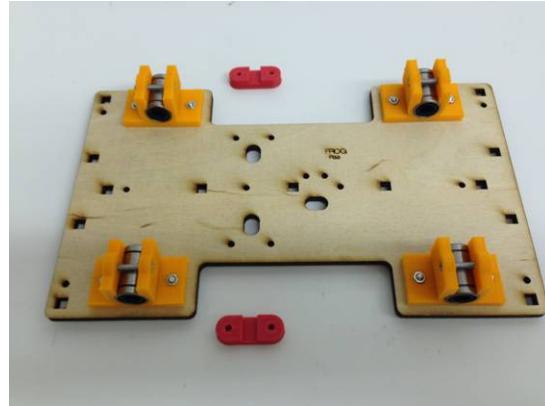
- M3 x 12mm screws (8 pcs)
- M3 x 30mm screws (4 pcs)
- Laser Cut – frog plate
- Y LM8UU Holders (4 pcs)
- Y Belt Clamp parts (2 sets)

### Tools Needed:

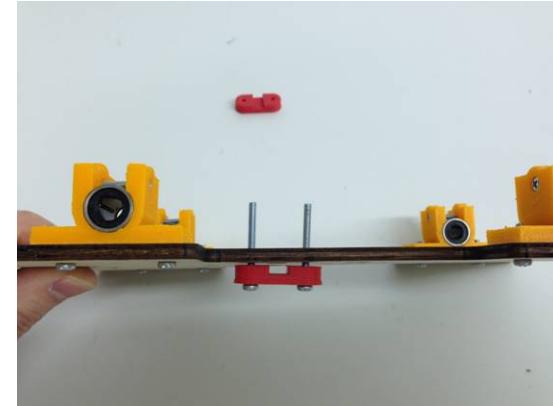
- Philips screwdriver



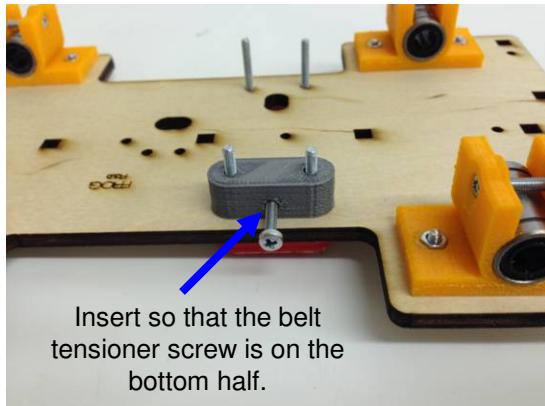
Use M3 x 12mm screws (8 pcs) to attach the linear bearing holders to the Frog. Make sure the engraving on the Frog plate is facing up and position the linear bearings clamps so that the screw heads (not the nuts) are facing the inside



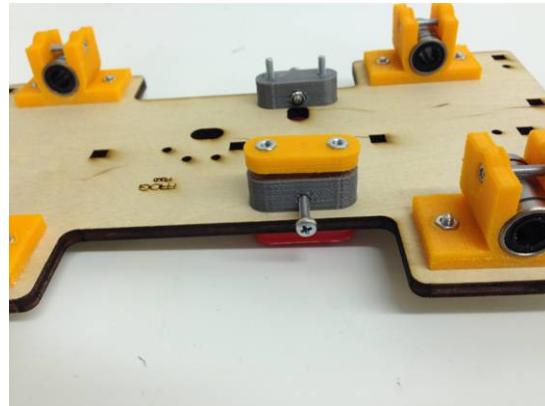
This is how it should look with the linear bearing holders installed. Now locate the belt clamp channels (pieces shown in red)



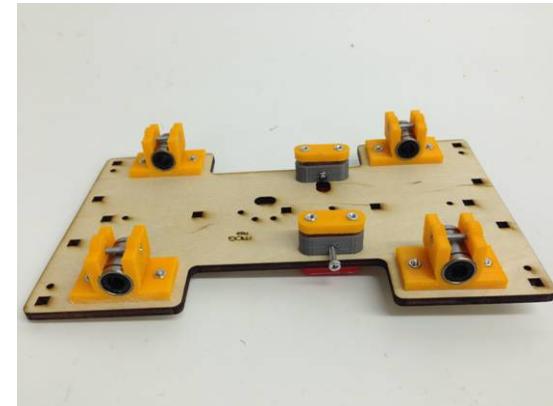
Insert two M3 x 30mm screws thru the belt clamp channel and then from underneath the frog as shown. Repeat for the other side.



Insert the Y Belt Tensioner with the screw head facing towards you. Ensure the Y belt tensioner screw is on the bottom half when the part gets inserted as pointed on the picture above



Insert the second Y Belt Tensioner on the opposite side. Then Insert the Y Belt Clamp (part shown in orange) and screw in a couple of turns to keep the clamp assembly attached..



Finally Insert the second Y Belt Clamp on the opposite side and screw in a couple of turns as well. This is how it should look.

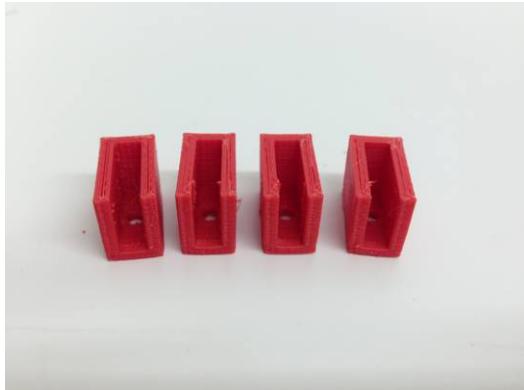
## Step 6: Cleaning the Frog Brackets

### Parts Needed:

- Laser Cut – side Support (2 pcs)
- Frog Brackets (4 pcs)

### Tools Needed:

- 1/8" Drill Chuck
- Flat file



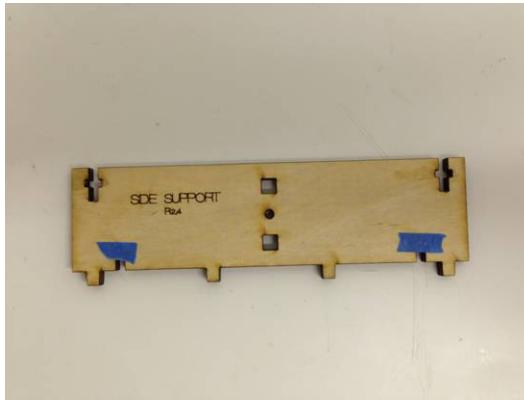
Locate the Frog Brackets (4 pcs)



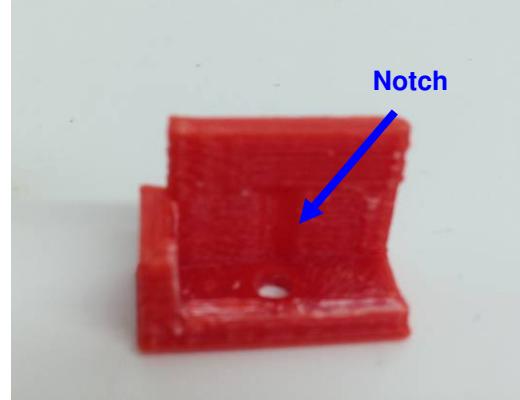
Clean out the hole on the Frog Bracket using a 1/8" drill.



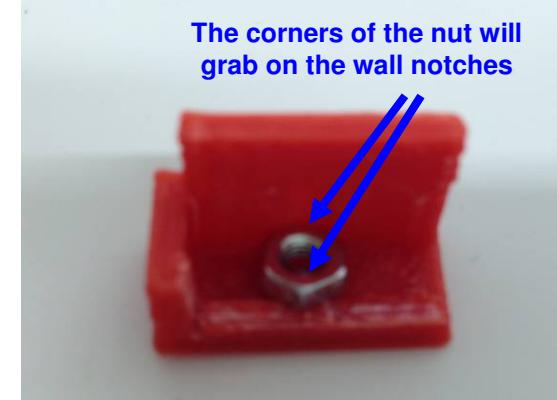
Use a Flat file to clean any blobs on the internal walls



Note how the two T-Slots on the top of the side supports are longer. The Frog Brackets will slide in and fasten the M3 nut in position. I'll explain in more detail in the next couple pictures. For now, just make sure there is no tape on the top T-Slots.



This is the same Frog Bracket as above but with one of the side walls removed for illustration purposes. Notice how there is a notch on the side wall. That notch is intended to grab the corner of the M3 nut



The corners of the nut will grab on the wall notches

Here is the same picture with the M3 nut added for reference.

## Step 7: Assembly of Frog Brackets

### Parts Needed:

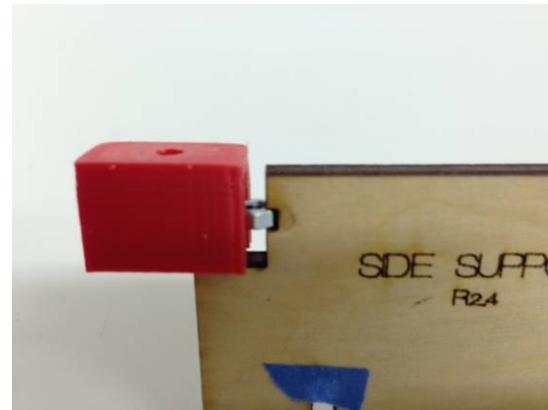
- M3 Hex nuts (4 pcs)
- Laser Cut – side supports (2 pcs)
- Frog Brackets (4 pcs)

### Tools Needed:

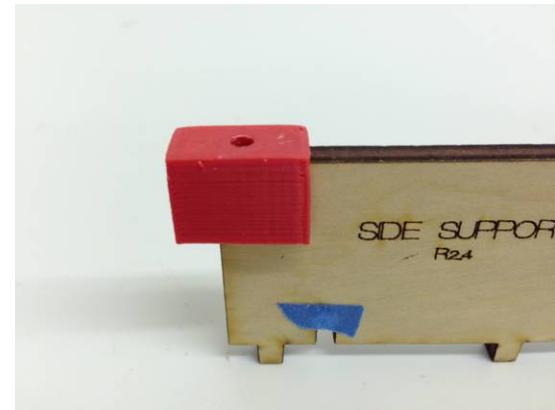
- your hands



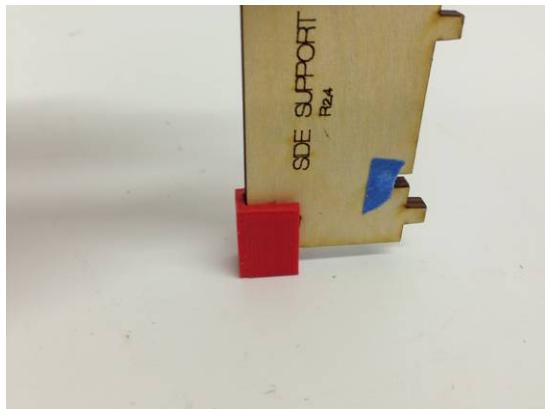
Ok, let's proceed to assemble the Frog Brackets. Take an M3 Hex nut and put it on the T-Slot. Make sure there is no tape on either side.



Take one of the Frog Brackets and slide it in until it touches the M3 nut corners.



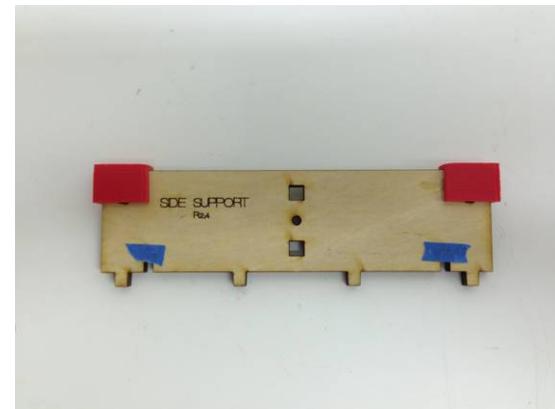
Continue sliding in. You may need a little bit of force to go over the nut corners.



Take the Side support so that the Frog Bracket sits on the table surface. Align the Frog Bracket with the side support then push down until the Frog Bracket notch snaps into place on the nut corners.



This is how it should look. Notice how it is flush to the corner sides.



Repeat for the other corner and then for the other side support.

## Step 8: Bed Support Assembly

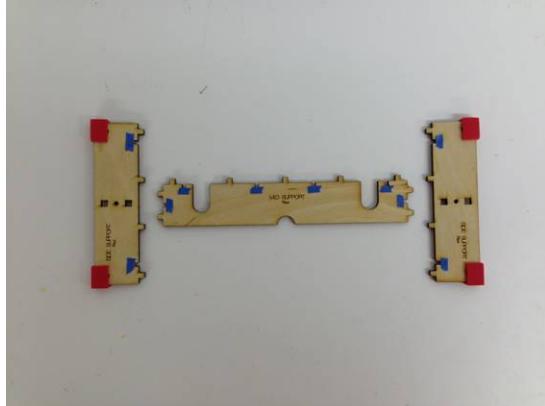
**Note:** The color of the Frog Brackets has been changed from Red to Blue to differentiate from the other plastic parts being added on this step.

### Parts Needed:

- M3 x 12mm screws (10 pcs)
- M3 Hex nuts (10 pcs)
- Laser Cut – side (2 pcs) and middle supports
- Frog Assembly

### Tools Needed:

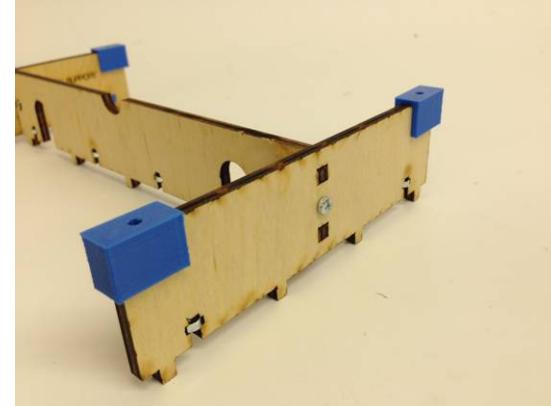
- Philips screwdriver



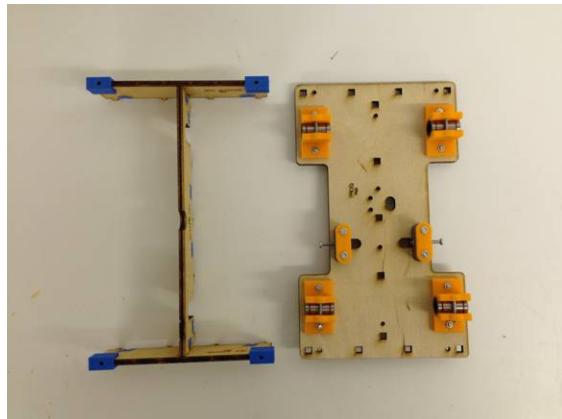
Insert hex nuts on the locations marked with blue tape.



Assembly the supports as shown with all tabs facing down



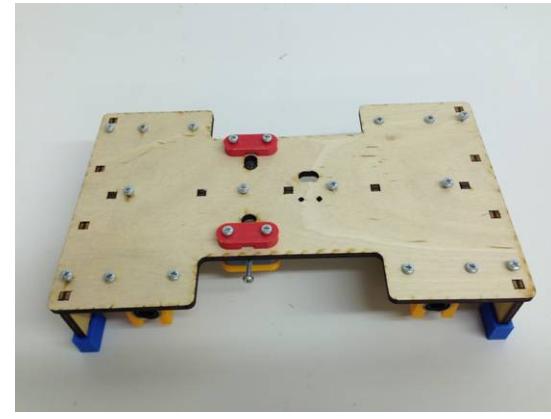
Insert screws on the sides where they connect to the middle support and screw in but don't tighten yet.



Align supports to frog assembly as shown and mount on top. Some of the tabs may need alignment to fit in.



This is how it should look. Notice there are no tabs on the supports facing you.



Flip over the assembly and insert 8 M3 x 12mm screws on the locations marked with blue tape and tighten including the 2 screws on the sides previously installed

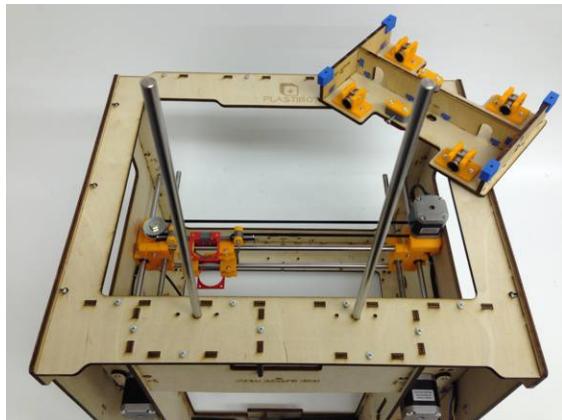
## Step 9: Mounting the Bed Support Assembly to the Frame Assembly

### Parts Needed:

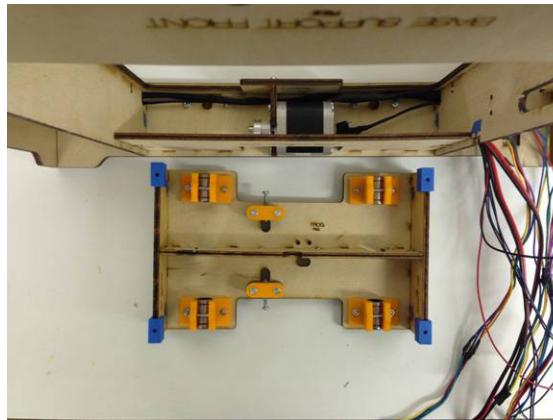
- Y-smooth-rods (2 pcs)
- Bed Support Assembly
- Frame Assembly

### Tools Needed:

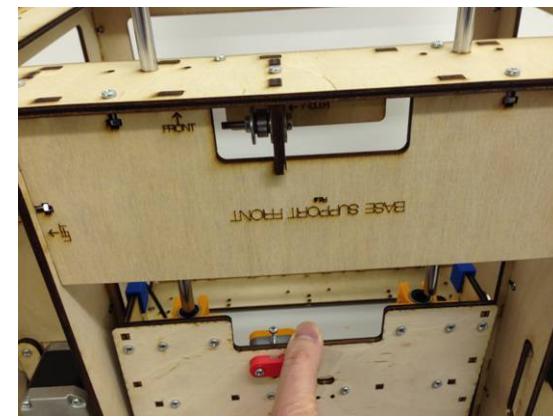
- your hands



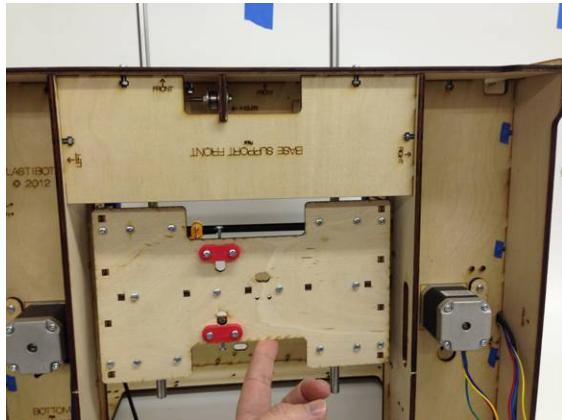
Insert smooth rods (the longest ones in the kit) as shown.



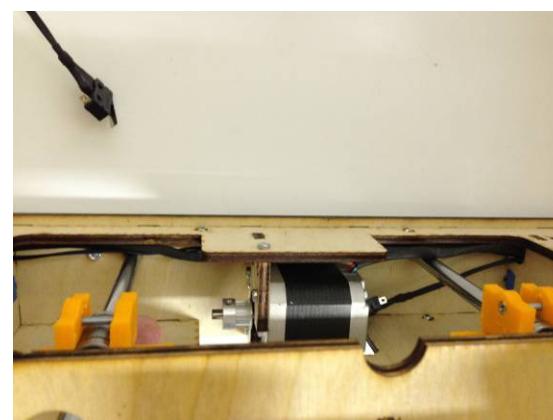
Position the Frog Assembly so that the belt clamps are on the same side as the motor pulley.



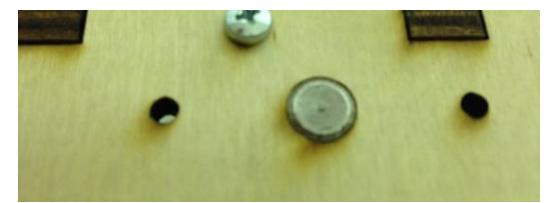
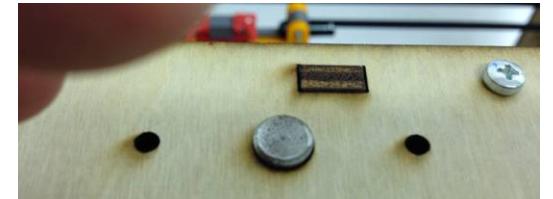
Position the Frog Assembly so that the bearing holders are facing towards the inside of the machine.



Insert the smooth rods into the linear bearings one at a time. Keep the bearings as parallel as possible to the rods to avoid popping out steel balls from inside the linear bearings.



Align the smooth rods to the holes on the back panel and press fit them. Make sure the wires are sandwiched between the smooth rod and the bottom panel.



The end of the rods should be flush to the front panel as in the bottom picture or just a bit raised as on the top picture. IF they are not you probably need to press fit a bit more.

## Step 10: Mounting the Bed Support Assembly to the Frame Assembly

### Parts Needed:

- M3 x 12mm screws (4 pcs)
- M3 Hex nuts (4 pcs)
- Laser Cut – rod caps (2 pcs)
- Frame Assembly

### Tools Needed:

- Philips screwdriver
- round file



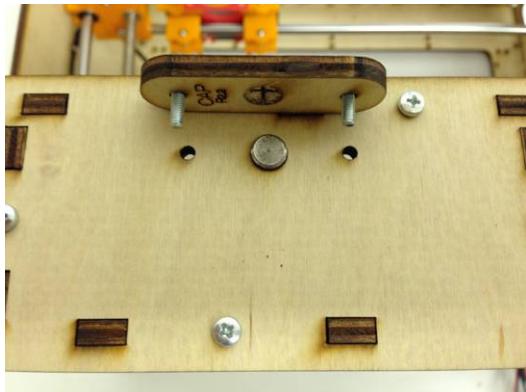
Locate the Rod end Caps. Note there are 2 kinds: flat and carved. You will need one or another depending if the rod end sticks out or not.



If the smooth rod sticks out on the picture before, you will need a carved cap. Use the round file to remove the charcoal.



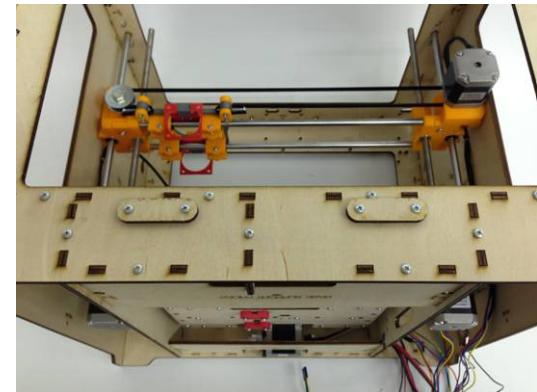
This is how it should look once you remove the charcoal. Remove as deep as needed to accommodate the raised rod end. Repeat for the other rod.



Insert 2 M3 x 12mm screws to the end caps. Repeat for the other end cap



Insert the end caps on the holes next to the smooth rods.



Screw in M3 nuts from the other side to secure the rod caps in place.

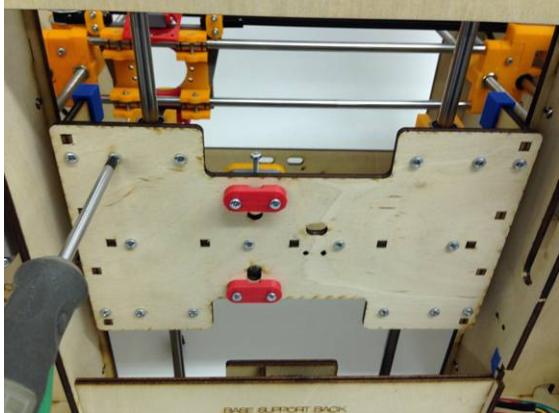
## Step 11: installing the Timing Belt

### Parts Needed:

- Y-belt
- Frame Assembly

### Tools Needed:

- Philips screwdriver



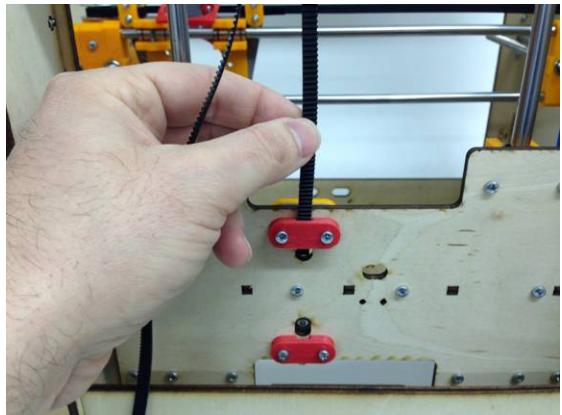
Loosen up the screws (8 total) for all 4 bearing holders, move the frog assembly up and down so that they self align and tighten the screws again. The carriage should run smooth now.



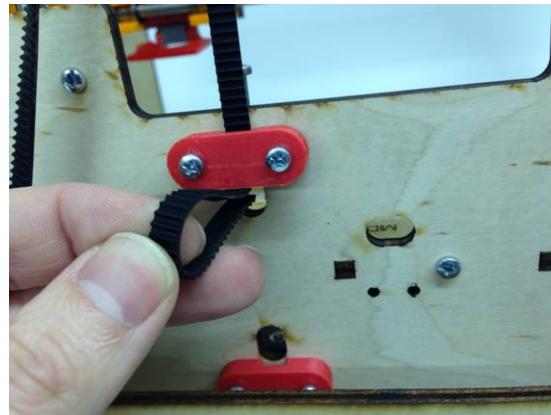
Locate the Timing Belt.



Insert the end around the Y-idler as shown.  
The teeth of the Timing Belt should face inward.



Insert belt thru belt channel.



Take the end of the belt and pull about 1" so that you are able to u-turn it as shown on the next picture



Insert the end between the belt socket and belt clamp

## Step 12: Installing the Y-Belt – cont.

### Parts Needed:

- Y-belt
- Frame Assembly

### Tools Needed:

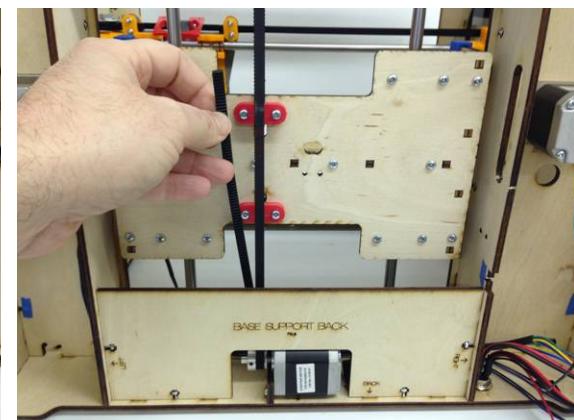
- Philips screwdriver



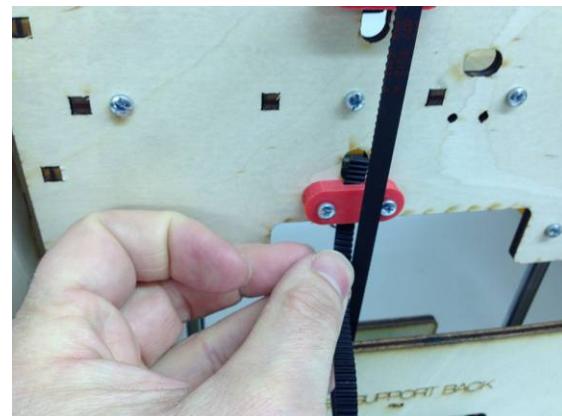
Tighten both screws on the belt clamp assembly



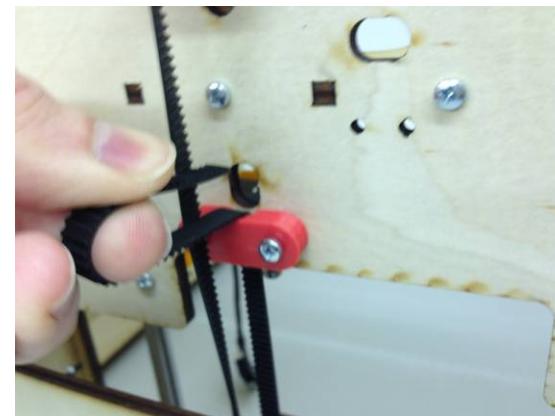
Pull the other end of the Y-belt towards the Y-motor pulley



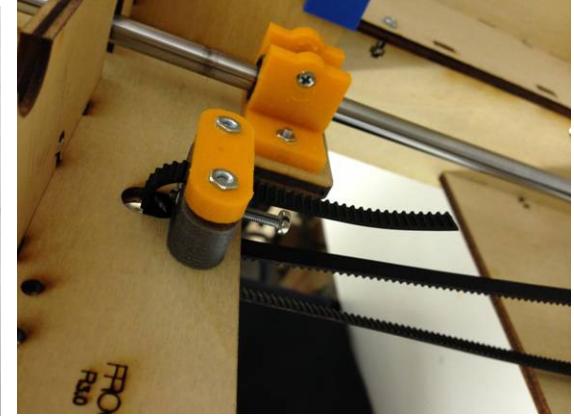
Wrap around the pulley



Pull the end towards the belt clamp assembly.



Insert belt on the belt channel.



U-turn the belt and insert between belt socket and belt clamp

## Step 13: Installing Heated Bed wiring.

**NOTE:** The Heated Bed is an option purchased separately. If you didn't order the Heated Bed, there is no Wire Harness to install and your Bed will lack the Heater board. You still need to mount the Aluminum Bed as shown on the next slide thou.

### Parts Needed:

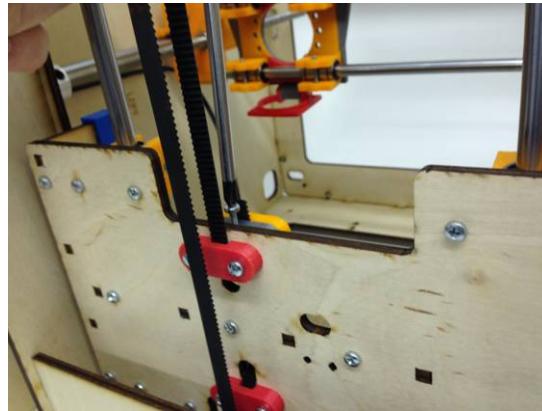
- Bed wire harness
- Frame Assembly
- zip tie (2 pcs)

### Tools Needed:

- Philips screwdriver



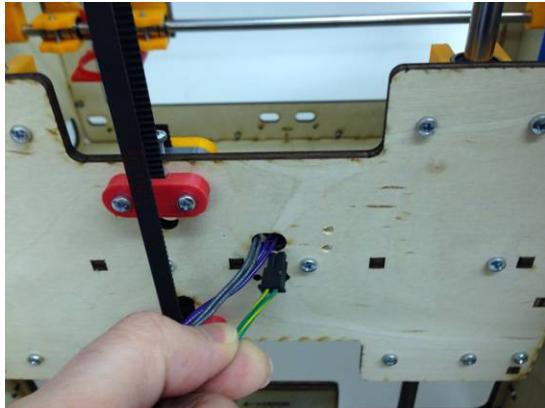
Fasten belt by screwing the 2 screws on the belt clamp assembly.



Finally, adjust tension on the belt by turning screws on the belt socket as shown.



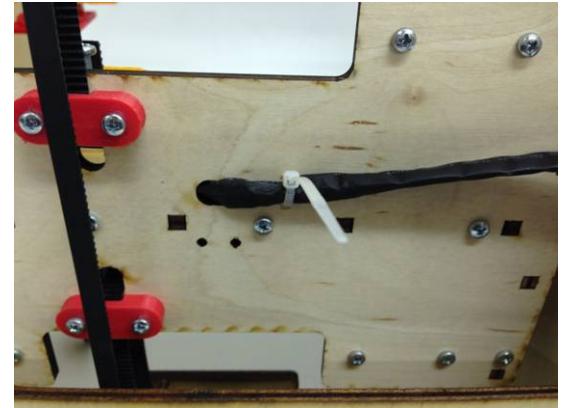
Locate the Bed Wire Harness.



Insert the side of the wire harness that has 3 connectors into the frog slot.



Insert zip tie on the frog small holes



Fasten the wire harness with the zip tie

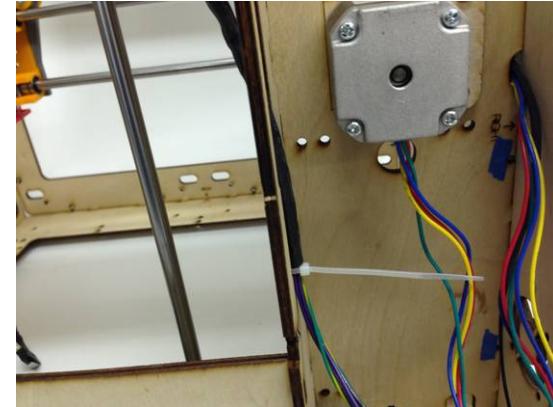
## Step 14: Installing Heated Bed wiring. (Cont)



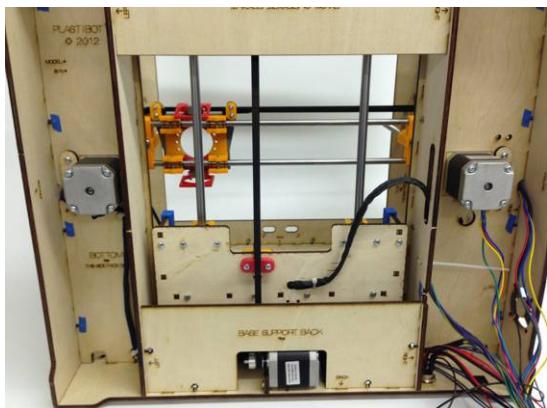
Flip the frame assembly so that the right side panel is on the top. Take the other end of the wire harness and insert thru the slot on the side support.



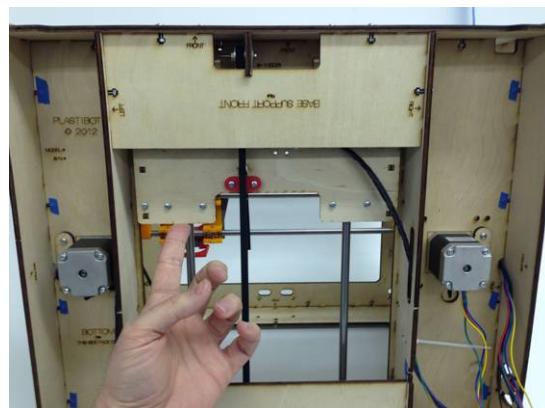
Add a zip tie on the 2 holes next to the slot of the side support.



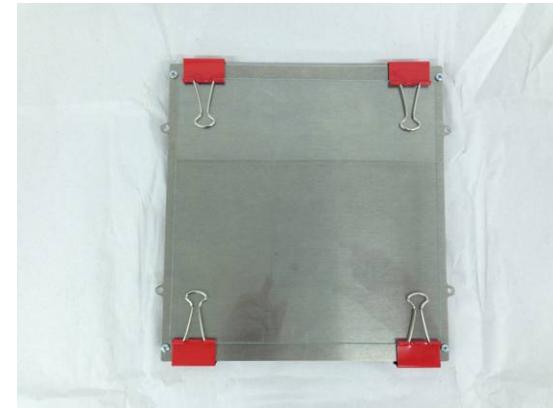
Fasten the wire harness with the zip tie. Do not tight completely yet so that we can make sure on the next step the wire is long enough to allow full bed travel.



Move the bed all the way to one side. Pull more wire as needed.



Move the bed to the other side. Adjust the wire harness as needed and complete tightening the zip tie.



Locate the Aluminum Bed..

### Parts Needed:

- Bed (Heated or standard)
- Frame Assembly

### Tools Needed:

- your hands

## Step 15: Installing Build Platform

**Note:** If you selected the heated bed option, your aluminum bed will include a PCB heating board as well as a Fiber Glass and Plywood insulator as shown below. Otherwise your bed will be a bare aluminum plate.

### Parts Needed:

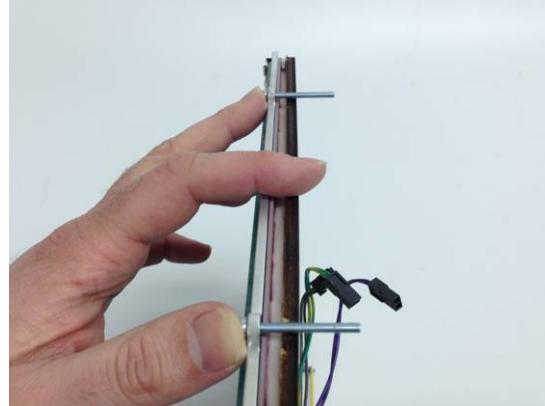
- Bed (Heated or standard)
- M3 x 30mm screw (4 pcs)
- Bed springs (4 pcs)
- M3 washer (4 pcs)
- rubber bands (2 pcs)

### Tools Needed:

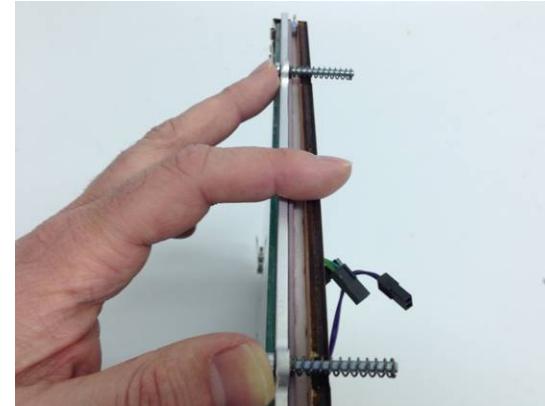
- your hands



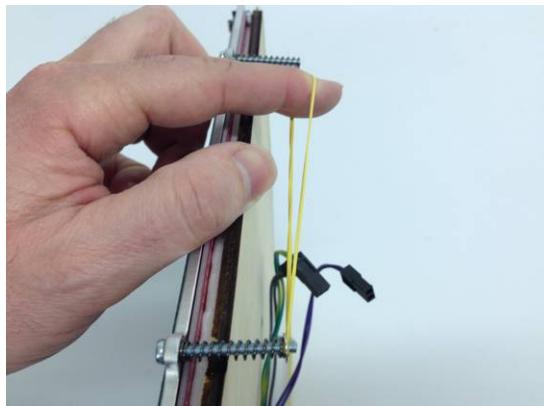
Locate the following parts (4 sets) – M3 x 30mm screw, bed spring, M3 washer.



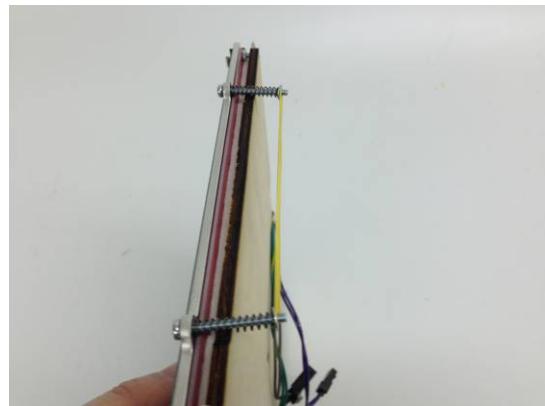
Place the bed sideways and insert the M3 x 30mm screws on the ear holes as shown



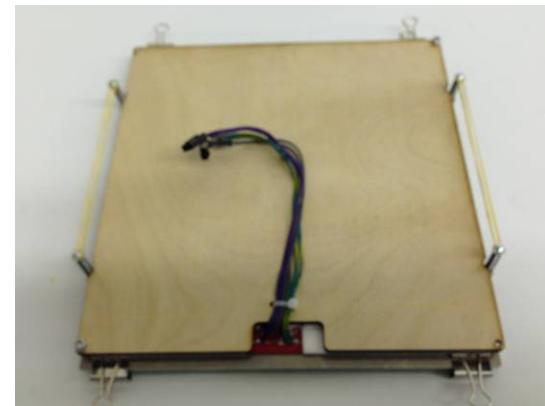
Insert the bed springs into the M3 x 30mm screws.



Insert an M3 washer, compress the spring a little bit and use a rubber band to hold in position



Place an M3 washer on the other screw, compress the spring a little and stretch the rubber band to hold in place.



Repeat the previous 4 steps for the other side. It should look like the picture above with one rubber band on each side holding the screws.

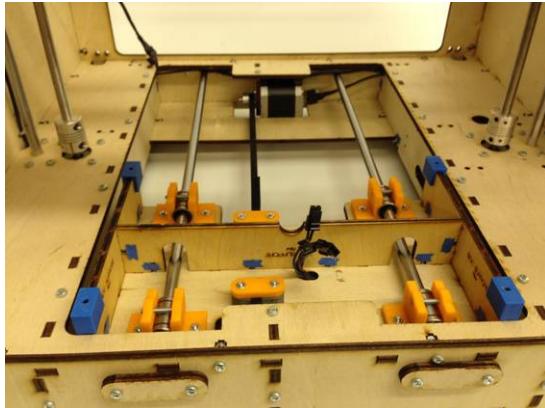
## Step 16: Installing Build Platform (cont.)

### Parts Needed:

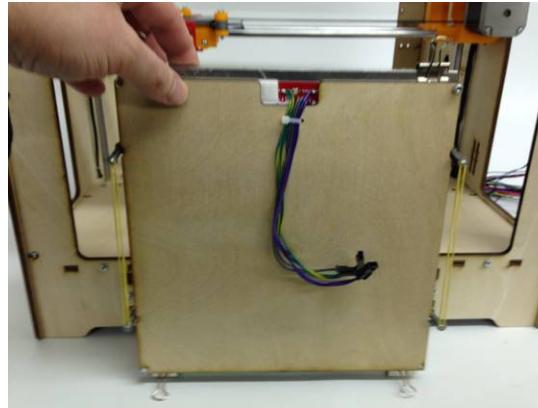
- Bed (Heated or standard)
- Frame Assembly

### Tools Needed:

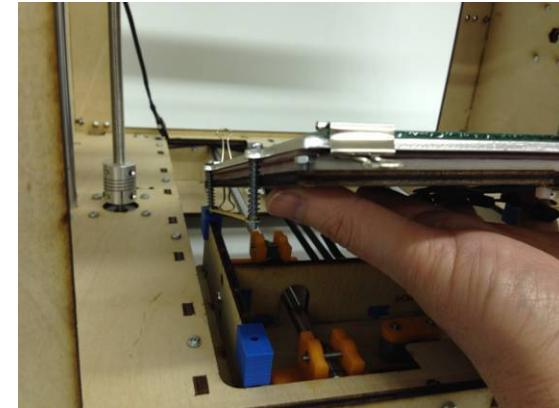
- wire clippers



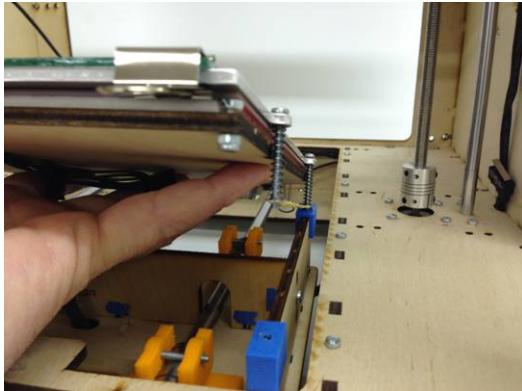
Move the Frog Assembly all the way to the front.



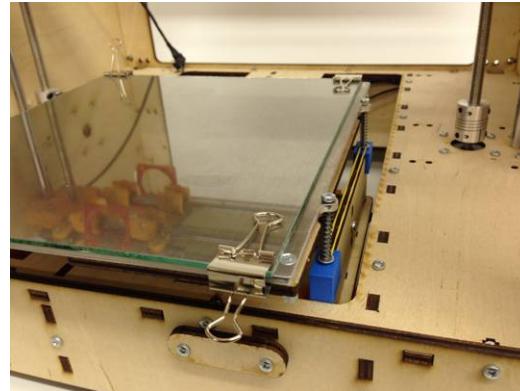
Ensure the side where the cables are coming out is facing you.



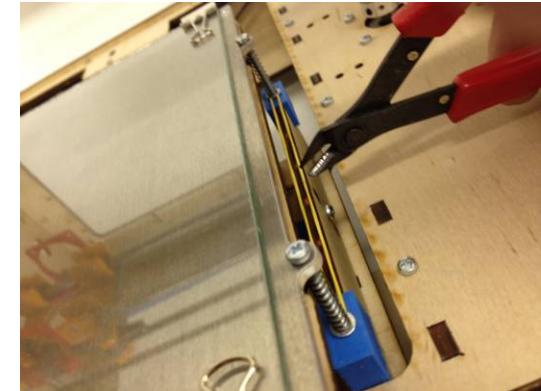
Hold the bed with your have as shown and position the back left screw on the Frog Bracket hole.



Position the back right screw on the Frog Bracket hole.



Sit the front screws on the Frog Bracket holes. Note that you may need to pull the front screws a bit towards you to reach the hole.



Once the 3 screws are properly sit on the Frog Bracket holes proceed to cut the rubber band on the right side first.

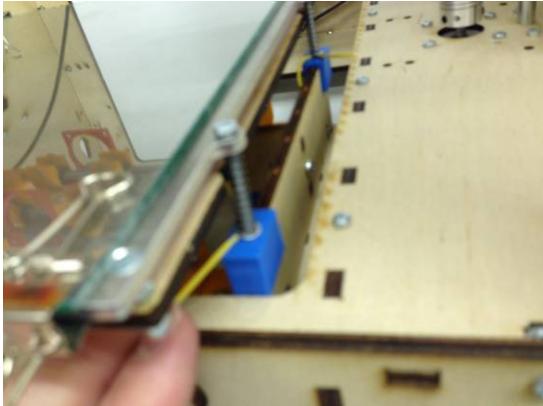
## Step 17: Installing Build Platform (cont)

### Parts Needed:

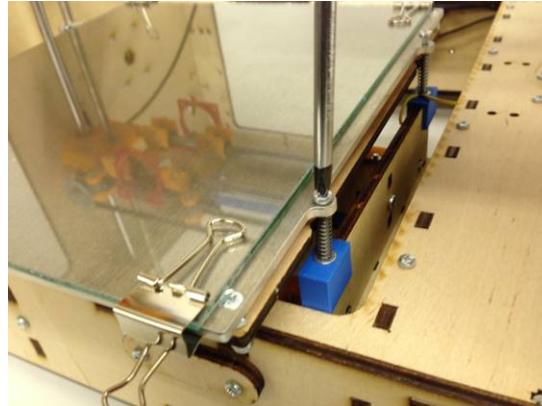
- Bed (Heated or standard)
- Frame Assembly
- Laser cut rod cap as spacer to set height

### Tools Needed:

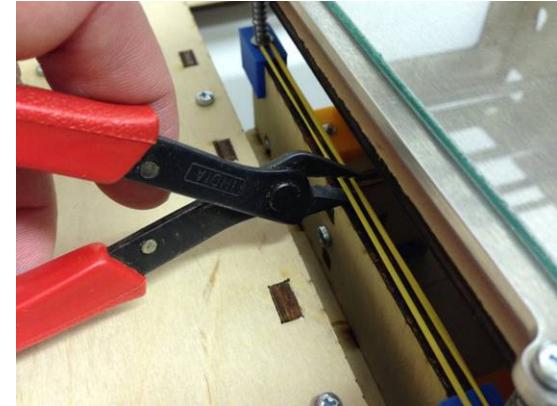
- Philips screwdriver
- wire clippers



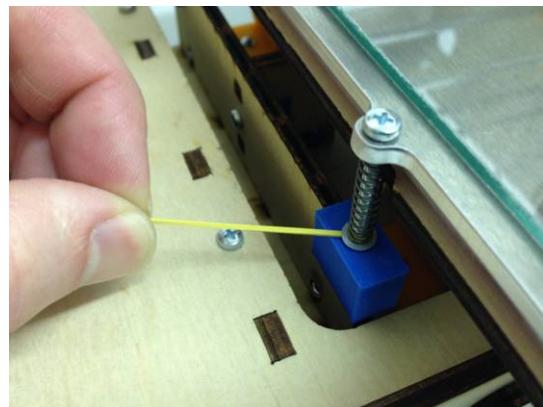
Remove the rubber band from the front and back screws taking care of not pushing the screw out of the hole.



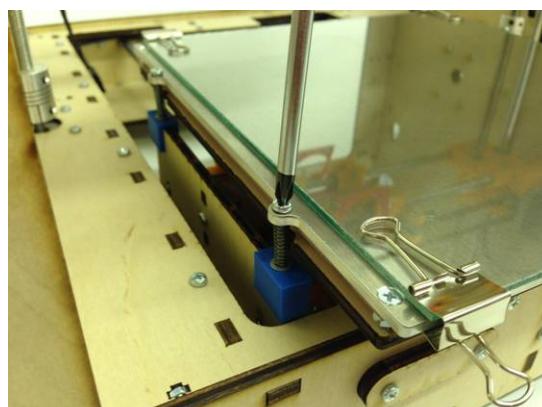
Screw in the two screws until they grab the nut. You will have to push in the screw while screwing in so that the screw can go low enough to thread on the nut.



Proceed to cut the rubber band on the left side.



Remove the rubber band from the front and back screws taking care of not pushing the screw out of the hole.



Screw in the two screws until they grab the nut. You will have to push in the screw while screwing in so that the screw can go low enough to thread on the nut.



Finish by using one of the left over caps to screw in all four screws of the bed to the same height. Put the end cap on top of the frog brackets otherwise the screw will hit bottom before reaching the end cap

## Step 18: Installing Build Platform (cont)

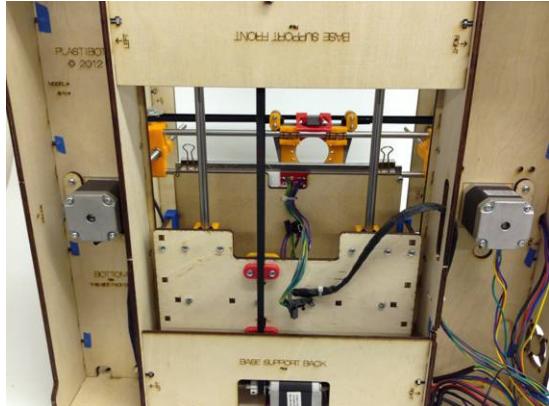
**Note:** If you didn't select the heated bed option you don't need to complete these last steps.

### Parts Needed:

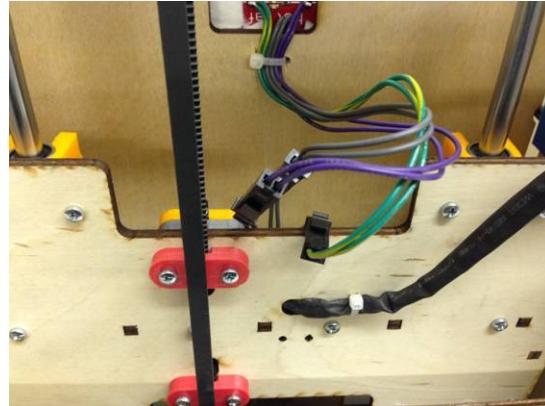
- Bed (Heated or standard)
- Frame Assembly

### Tools Needed:

- your hands



Flip the printer frame so that the bottom is facing you and the front is facing up.



Connect the heated bed wires. Purple to Purple, Green to Green and Gray to Gray. Gray is sometimes replaced by a black/red wire on some of the kits.



Once connected, tuck in the wires in between the frog and Bed as shown so that they don't get in the way.