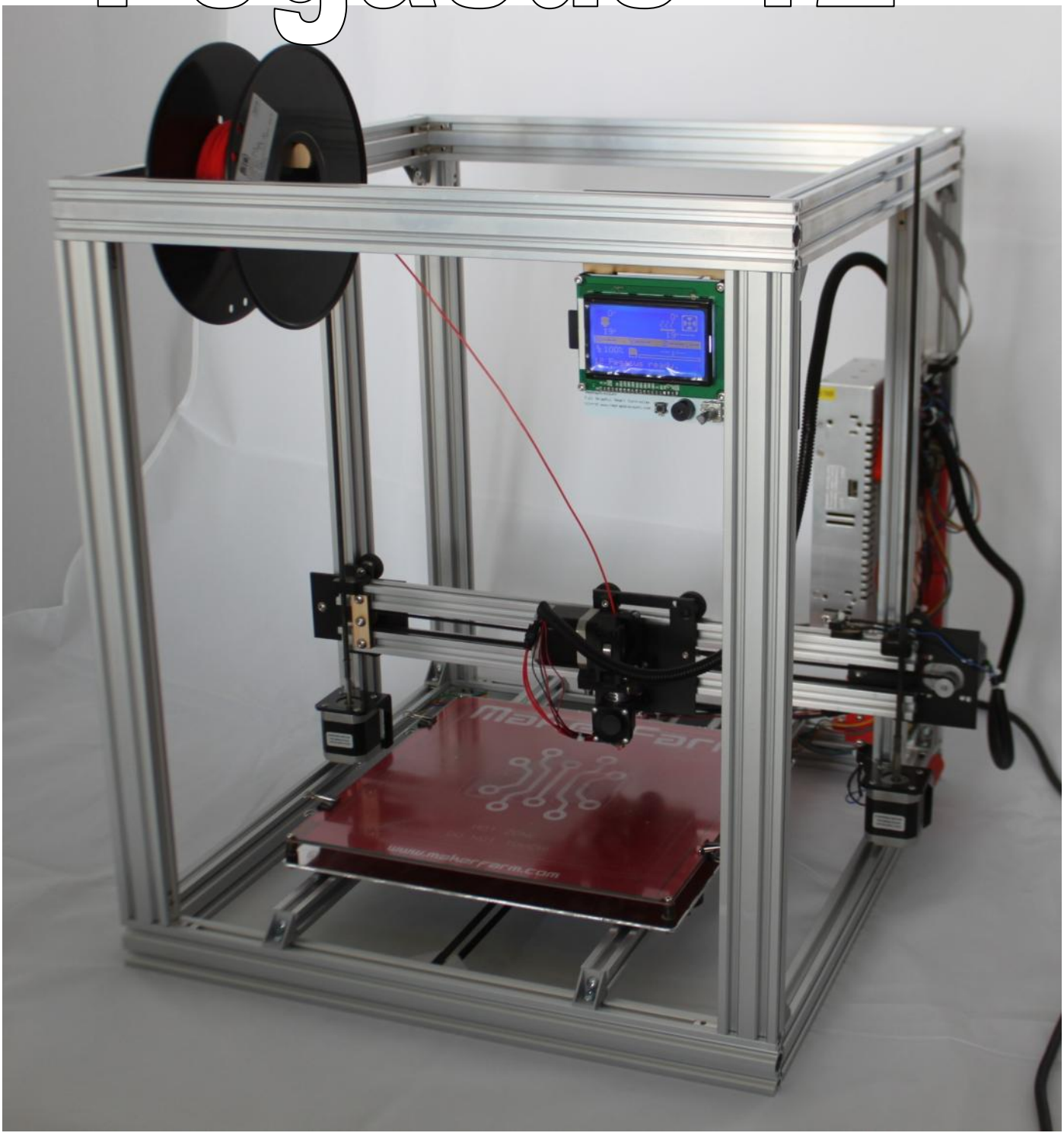
Pegasus 12"



Visual Instructions

MAKERFARM

Updated 6/19/17

Read before your build

Maker Farm Inc. Limited Warranty

1. Limited Warranty. Maker Farm Inc. ("MFI") warrants to the original purchaser (the "Customer") that the products purchased by Customer from MFI (the "Products") are free from defects in material and workmanship for a period of thirty (30) days from the date of shipment to Customer for Products, unless otherwise specified by MFI. MFI will accept returns of any non-clearance, unopened, unused and unassembled item ordered directly from www.Makerfarm.com, after the warranty your purchase is final and no returns will be accepted. MFI charges a restocking fee of 20% of the purchase price (price of product, excluding tax and shipping), and in addition the buyer must pay all shipping charges (shipping charges on the initial purchase is not refundable). Once a kit has left our shop there is no way for us to know how it was handled. Therefore, only unopened, unbuilt, kits that have no evidence of an attempted build or use will be refunded less the 20% restock fee. Things like opened/unsealed plastic bags, any marks on the components, etc. Will result in no refund given on the kit. Should you purchase a kit and begin to assemble it, you will not be able to return that kit for a refund.

2. MFI's Obligation. The sole obligation of MFI, at its option and without charge, is to repair, replace, or refund the original purchase price paid by Customer for, any Product or part, which MFI manufactures and which MFI agrees is defective. Repair parts or replacement Products may be new, remanufactured, or refurbished, at the sole discretion of MFI. All returned parts or Products that are replaced become the property of MFI.

3. Transfer of Other Warranties. In the case of equipment and accessories not manufactured by MFI, if a warranty is extended by the manufacturers thereof and transferable to Customer, MFI shall transfer such warranty to Customer.

4. Exclusions. MFI's limited warranty provided herein does not cover: (i) normal wear and tear; (ii) transport damage; (iii) failure to follow operation or maintenance instructions; (iv) Customer's negligent modification (including painting or staining wood pieces), disassembly or attempted repairs of the Product; (v) abuse, misuse or negligent acts; (vi) accidental or intentional damage; or (vii) cosmetic shortcomings which do not influence Product function.

5. Disclaimers. unless expressly set forth in this limited warranty, MFI makes no warranty of any kind whatsoever, express or implied, with respect to any products furnished hereunder. MFI expressly disclaims, where legally permitted to make such disclaimer, any warranties implied by law, including but not limited to any warranty of merchantability or fitness for a particular purpose.

6. Limitation of Damages. IN NO EVENT SHALL MFI BE LIABLE TO CUSTOMER FOR ANY INDIRECT, CONSEQUENTIAL, PUNITIVE, EXEMPLARY, INCIDENTAL OR SPECIAL DAMAGES, OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, PROFITS, OR DOWN-TIME (HOWEVER CAUSED AND UNDER ANY THEORY OF LIABILITY, WHETHER THE BASIS OF LIABILITY IS BREACH OF CONTRACT, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY), STATUTE OR ANY OTHER LEGAL THEORY), EVEN IF MFI HAS BEEN ADVISED OF THE POSSIBLITY OF SUCH DAMAGES. MFI'S TOTAL LIABLITY TO CUSTOMER, FROM ALL CAUSES OF ACTION AND UNDER ALL THEORIES OF LIABILITY, WILL BE LIMITED TO THE AMOUNTS PAID TO MFI BY CUSTOMER. THESE LIMITATIONS SHALL APPLY NOTWITHSTANDING ANY FAILURE OF ESSENTIAL PURPOSE OF ANY LIMITED REMEDY. THE REMEDIES UNDER THIS LIMITED WARRANTY ARE CUSTOMER'S SOLE AND EXCLUSIVE REMEDIES.

7. Return Merchandise Authorization (RMA) Process for Defective Products.

7.1 A Return Merchandize Authorization ("RMA") number must be obtained from MFI before Customer can return any Product to MFI for warranty service. An MFI representative will gather the appropriate account and Product information and verify warranty status. MFI must receive notification of the need for warranty service before the end of the applicable limited warranty period. The RMA number must be included on the outside packaging of the returned Product. To obtain an RMA number, please contact MFI by email as follows: elderfarrer@gmail.com

7.2 Any approved RMA should be considered provisional, based on verification of in-warranty status when the Product is received at MFI. If MFI determines that the Product is out-of-warranty, Customer will be notified. At the Customer's discretion, MFI will either scrap the out-of-warranty Product or return it to Customer.

7.3 Customer is responsible for all shipping charges for RMAs to MFI, and MFI is responsible for all shipping charges to return the Product or its replacement to the Customer. Standard Shipping is used to return products to Customers.

7.4 MFI will typically not decide whether to repair, replace, or refund the purchase price for, any returned Product until the returned Product is received at MFI and the warranty status is confirmed.

7.5 Under special circumstances, if the Customer would like to expedite the RMA process, MFI may agree from time to time to cross-ship a replacement Product after the issuance of an RMA number but before receipt of the returned Product, but MFI shall not be obligated to do so. Cross-ship orders require a valid credit card number or credit account to secure the MFI Product. The Customer's credit card or credit account will be credited if MFI receives the returned Product within fifteen (15) days of the date on which MFI ships the replacement Product, and provided further that the returned Product was in-warranty.

8. Discontinuance of Products. Notwithstanding any language in this limited warranty to the contrary, MFI shall have the right to discontinue the availability of any Product or components or replacement parts therefor, or to make design changes or improvements in the Products at any time and such discontinuance or change shall not constitute a breach of warranty, or result in liability for MFI under any legal theory whatsoever. MFI shall have no obligation to retrofit, change or improve Products purchased by Customer prior to the discontinuance or change.

9. Other Rights. This limited warranty gives you specific legal rights, and you may also have other rights which vary from State to State, and from Country to Country.

9.1 EXCEPT TO THE EXTENT LAWFULLY PERMITTED, THIS LIMITED WARRANTY DOES NOT EXCLUDE, RESTICT OR MODIFY STATUTORY RIGHTS APPLICABLE TO WHERE THE PRODUCT IS SOLD, BUT RATHER IS IN ADDITION TO THESE RIGHTS.

Table of Contents

Troubleshooting Guide: Download

Parts List

Pegasus 12”

This Guide has Hyper links so is not recommended to print the guide. To use the guide click File then Download and open the PDF in your PDF Viewer, if you view the Guide online the Hyper links will not function

Thank you for purchasing the Pegasus 12” Kit. To complete your build you will need a couple other items, Piece of Glass, Power Supply, Insulation and Hairspray:

Piece of Glass: 12”x12” then break the corners off to avoid hitting the bolt heads (3/16” or 5mm Thick Minimum if your heat bed relay is built into the Heat bed or 3.5mm thick if you have a separate heat bed relay). Most hardware stores will cut it to the size you need, Inside the USA Lowes or Home Depot

For the Power Supply, Insulation and Hairspray see the links at the bottom of the 12” Pegasus Page here: http://www.makerfarm.com/index.php/3d-printer-kits/12-pegasus-kit.html

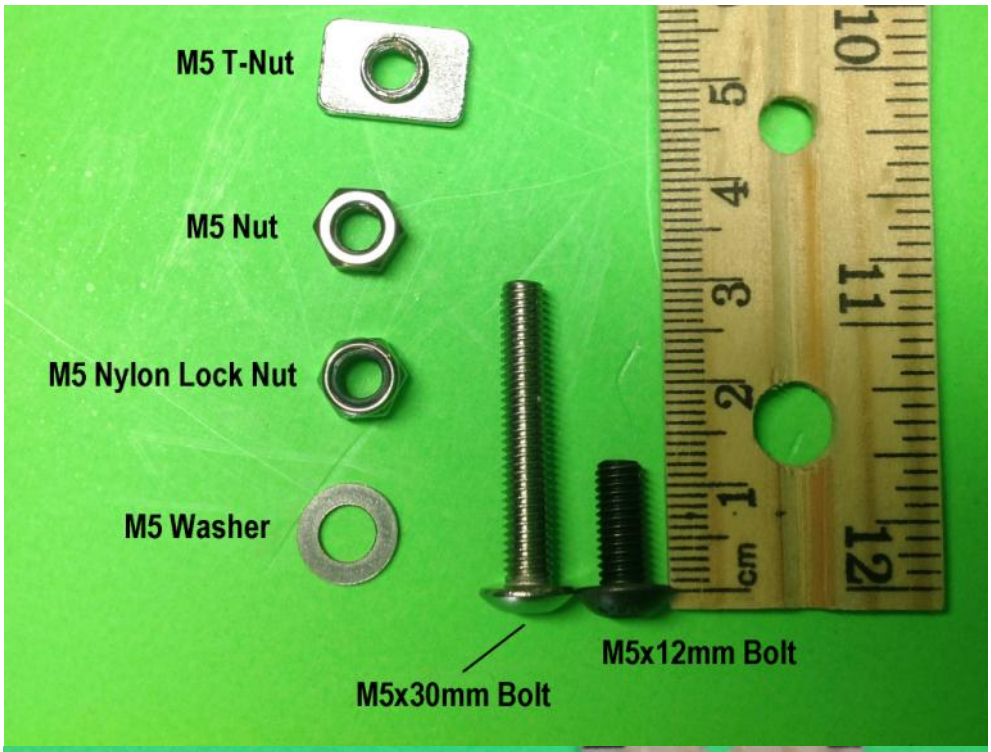
You may also want some filament to print with after you have built your printer. Makerfarm.com does sell filament and we would recommend using our filament or another high quality manufacturer. If you want to purchase your filament somewhere else make sure you get high quality filament, poor quality filament (Amazon and eBay) will jam and cause problems.

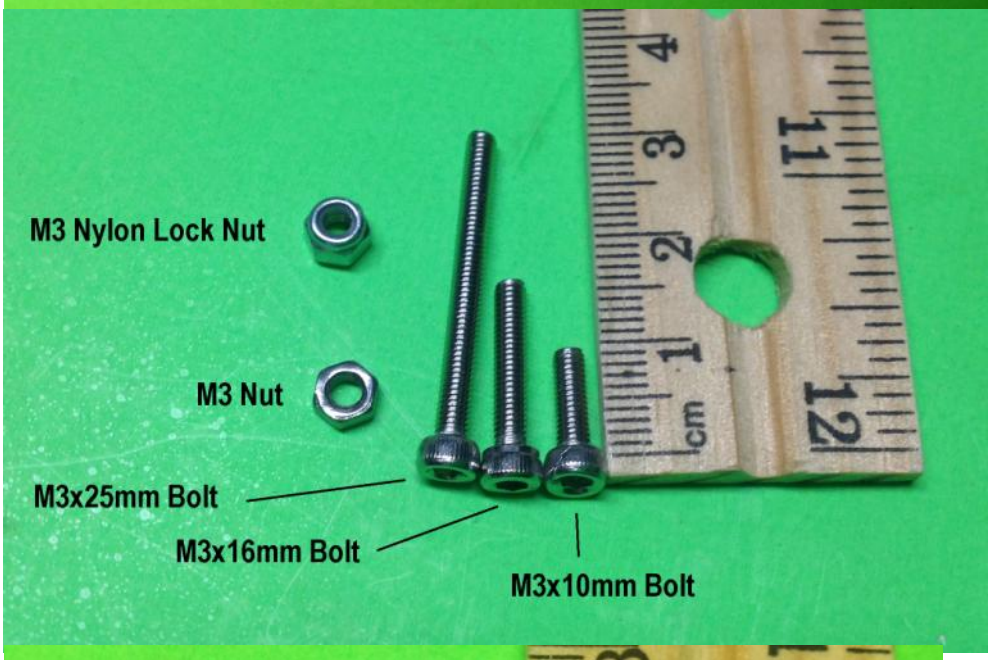
While your printer is on you should always be by your printer, do not leave it unattended

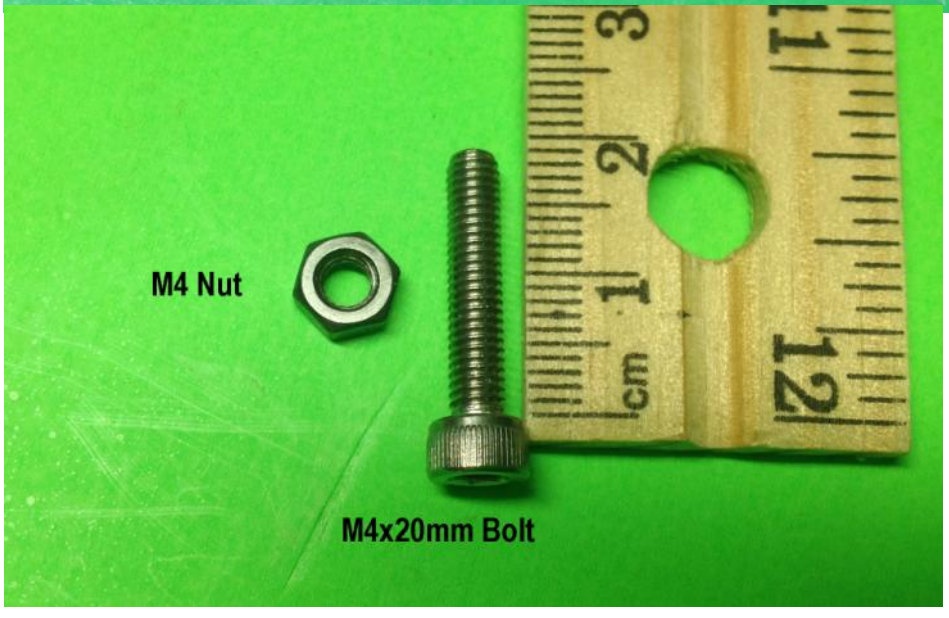
At any time if you have any questions feel free to e-mail or chat via google chat: elderfarrer@gmail.com

Thanks,
Colin Farrer— Sales@MakerFarm.com

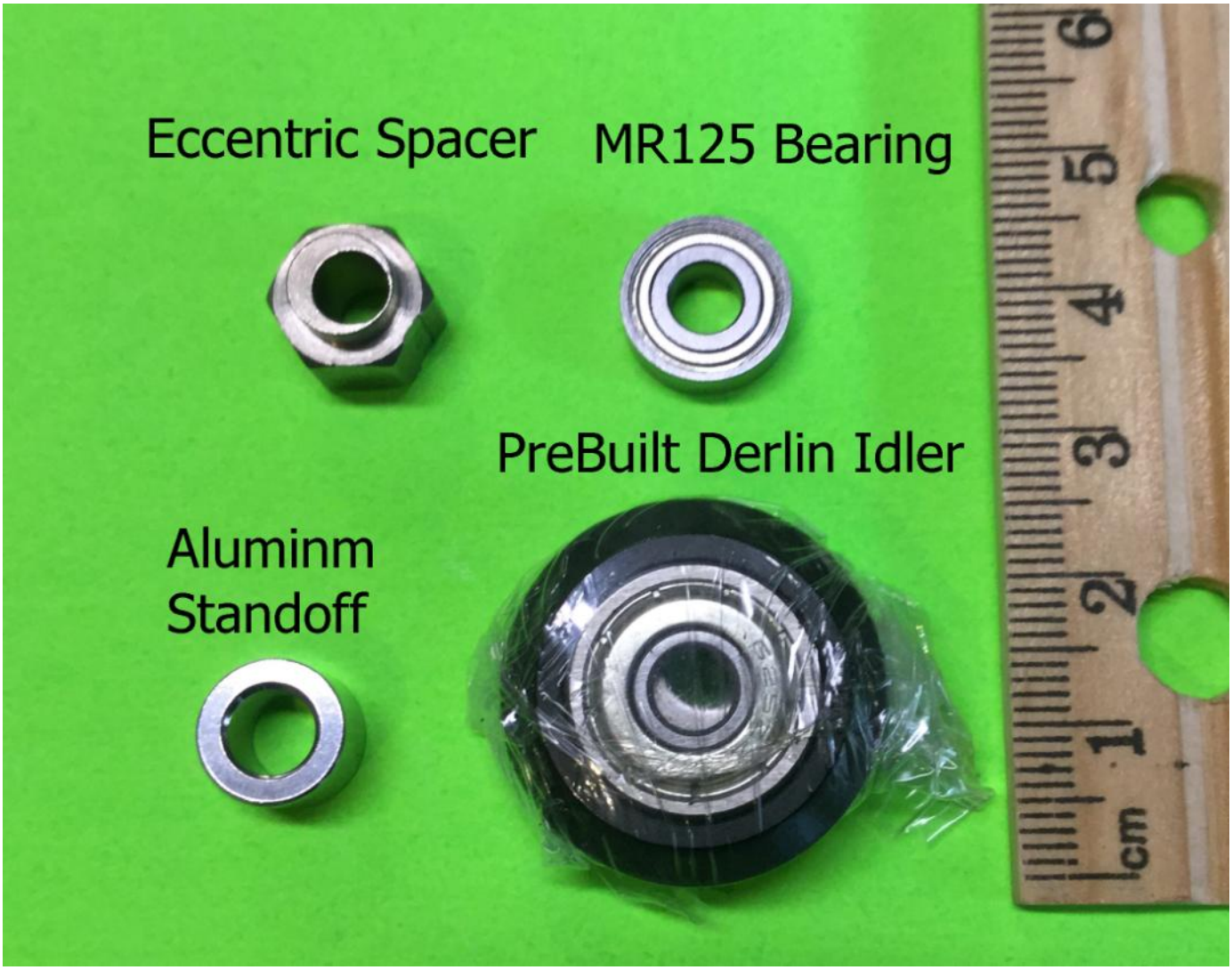
Hardware


M5 T-Nut
M5 Nut
M5 Nylon Lock Nut
M5 Washer
M5x30mm Bolt
M5x12mm Bolt


M3 Nylon Lock Nut
M3 Nut
M3x25mm Bolt
M3x16mm Bolt
M3x10mm Bolt


M4 Nut
M4x20mm Bolt

Hardware


Eccentric Spacer
MR125 Bearing
PreBuilt Derlin Idler
Aluminm
Standoff
cm

Frame

There are two different hardware kits for the Frame. Follow the guide for your version by clicking on the link below, after you finish that guide come back to this build guide to finish your build.

Frame Kit Version 1 has 10 Cast Corner Brackets with Nubs, 4 Cast Corner Brackets without Nubs and 32 Hidden Corner Brackets.

FRAME KIT VERSION 1 Build Guide

Frame Kit Version 2 has one kit with 35 Cast Corner Brackets with Nubs, 4 Cast Corner Brackets without Nubs and 7 Hidden Corner Brackets.

FRAME KIT VERSION 2 Build Guide

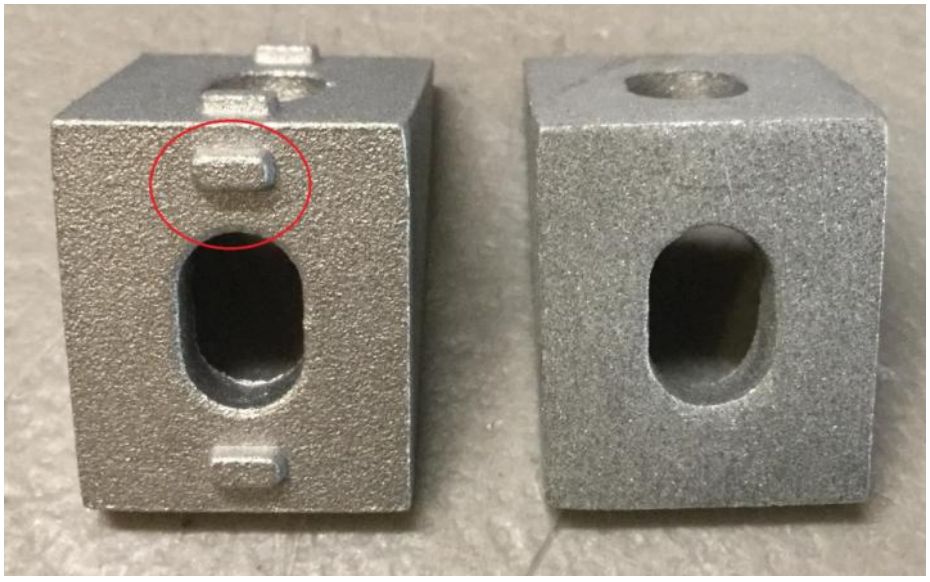
Y, Z Motor & Y Extrusion

Gather the following parts if your kit came with 14 of the 20x40 extrusions then follow pages 9, 10, 11

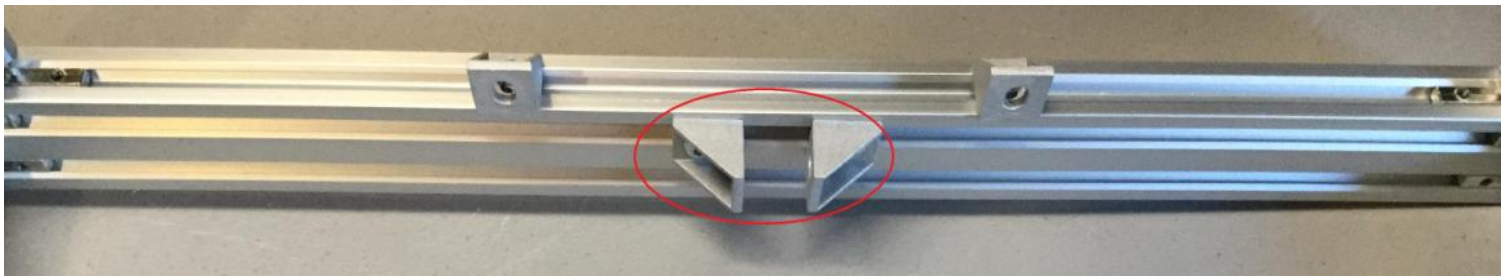
- **2 20x20mm Aluminum Extrusions**
- **2 x Cast Corner Brackets with Nubs if you have any left** (Shown by the red circle in the photo below, if none of your brackets have nubs then use 2 without nubs)
- **4 x Cast Corner Brackets without Nubs**
- **4 x M5x8mm Bolts**
- **3 x Motor Mounts**
- **1 x M5x12mm Bolt**
- **1 x T-Slot Nut**

If you have 16 20x40 extrusions instead of 14 the following then follow pages 12, 13 and 14

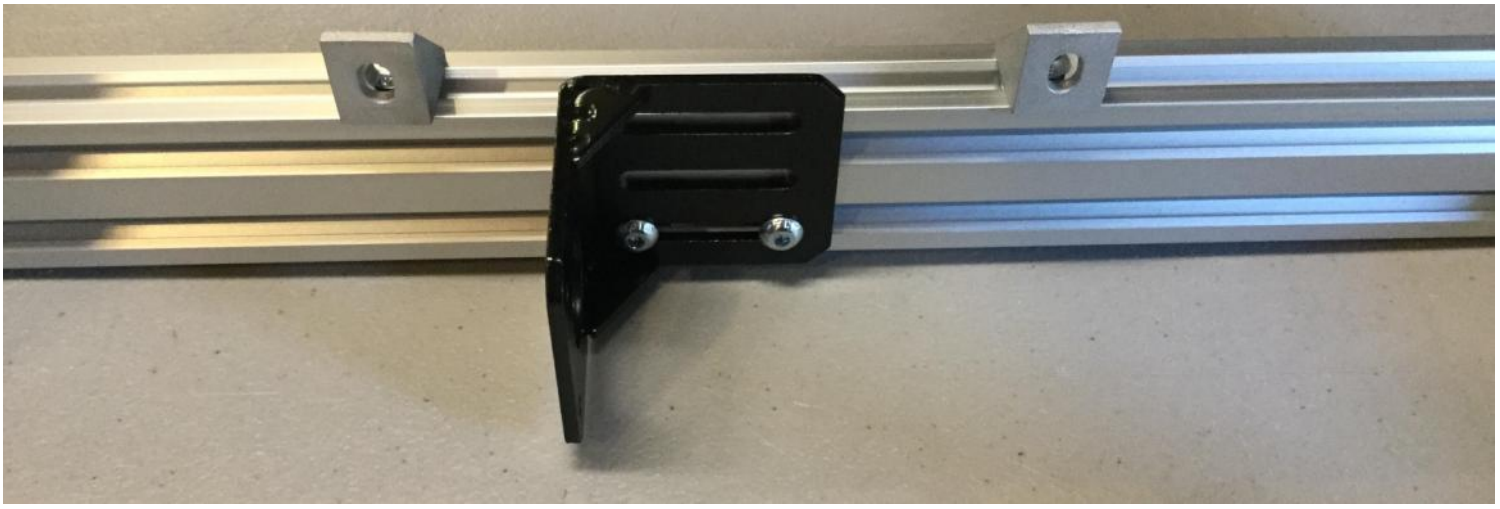
- **2 20x40mm Aluminum Extrusions**
- **8 x Cast Corner Brackets without Nubs**
- **2 x Cast Corner Brackets with Nubs**
- (Shown by the red circle in the photo below, if none of your brackets have nubs then use 2 without nubs)
- **8 x M5x8mm Bolts**
- **3 x Motor Mounts**
- **1 x M5x12mm Bolt**



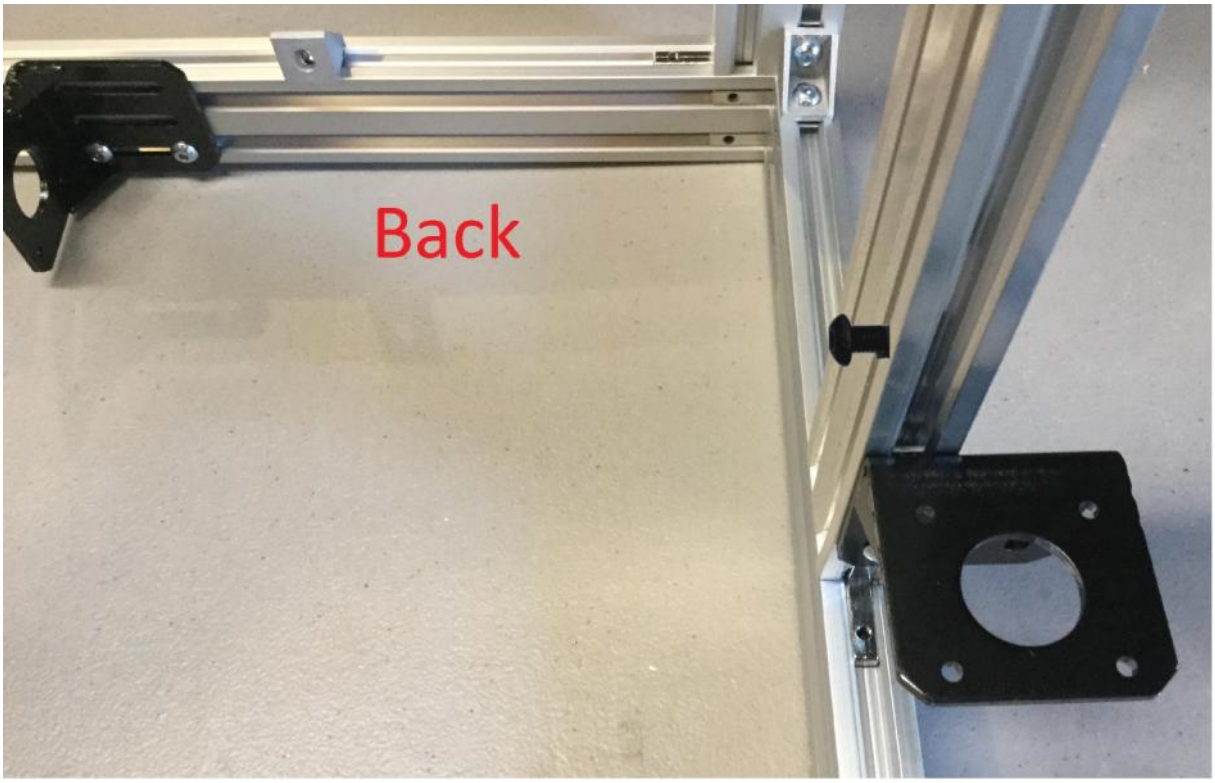
Install 4 Cast Corner Brackets on the bottom front of the machine using the M5x8mm bolts installed previously (Use the ones with Nubs if you havent already installed them them in the position with a Red Circle). You will adjust the actually placement later.



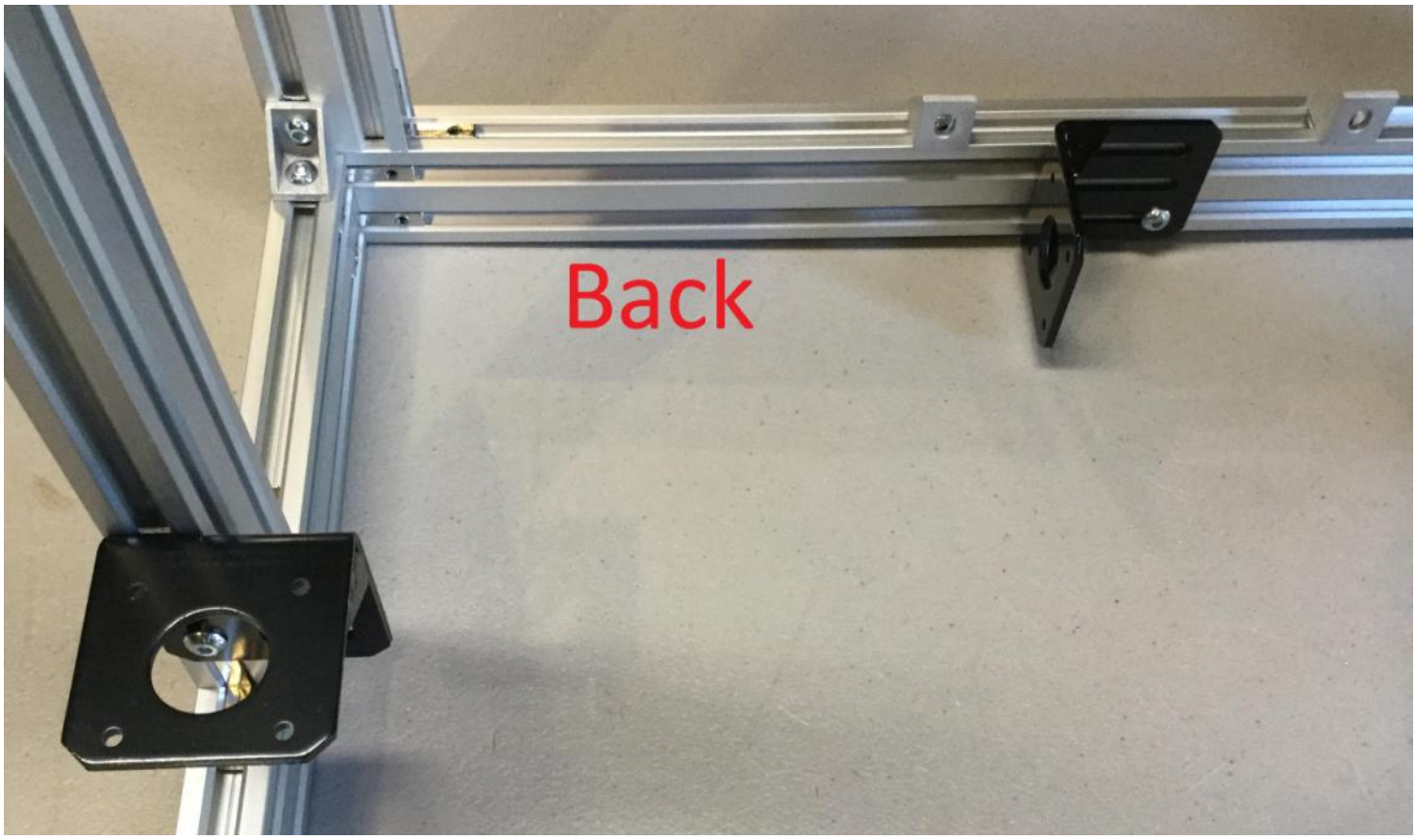
Now install 2 Cast Corner Brackets without Nubs and one Motor Mount on the bottom back of the frame using the previously installed M5x8mm Bolts. You will adjust the actually placement later.



Now Install a Motor Mount of the right side of the printer, make sure you use the slot on the far left of the motor bracket.

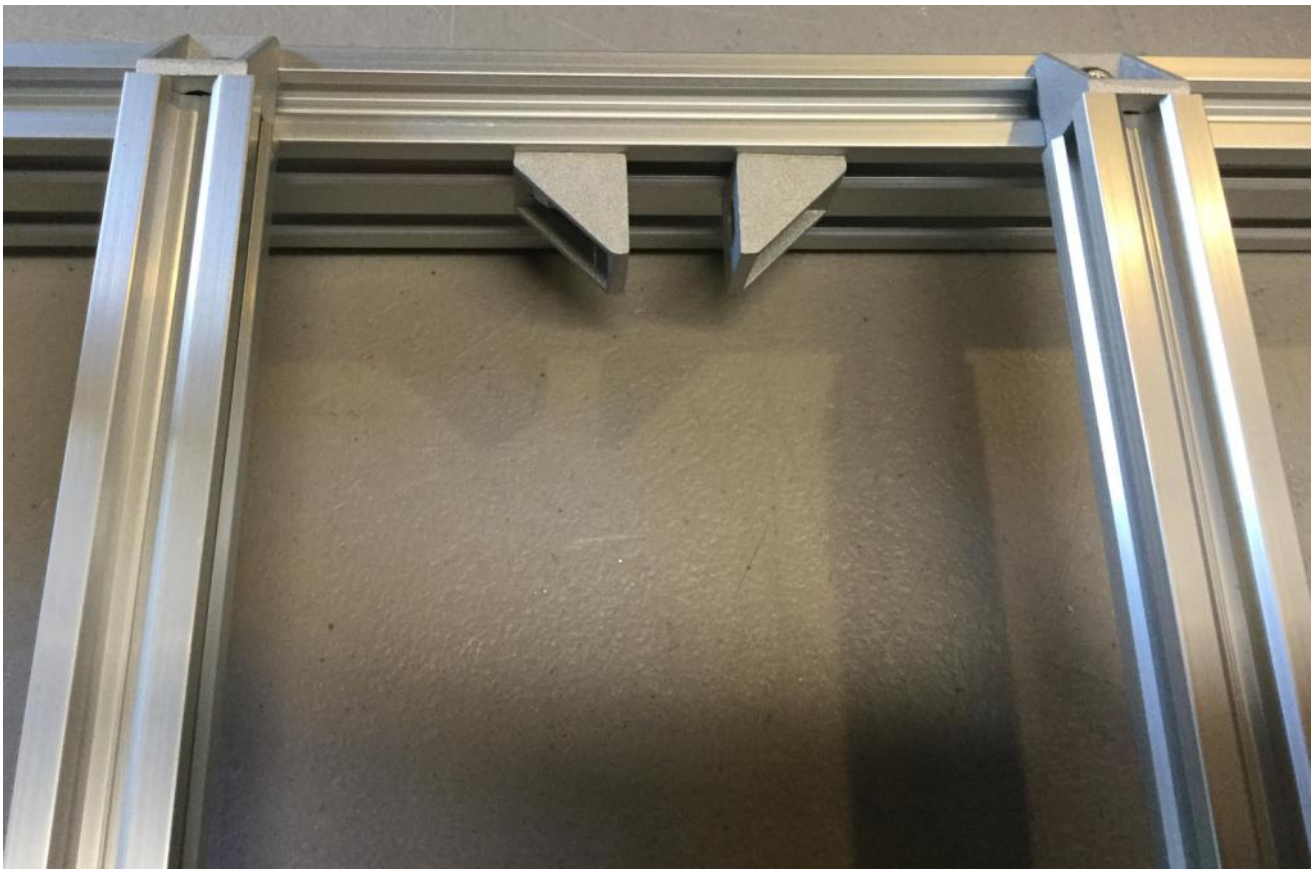


Now Install a Motor Mount of the left side of the printer, make sure you use the slot on the far left of the motor bracket.

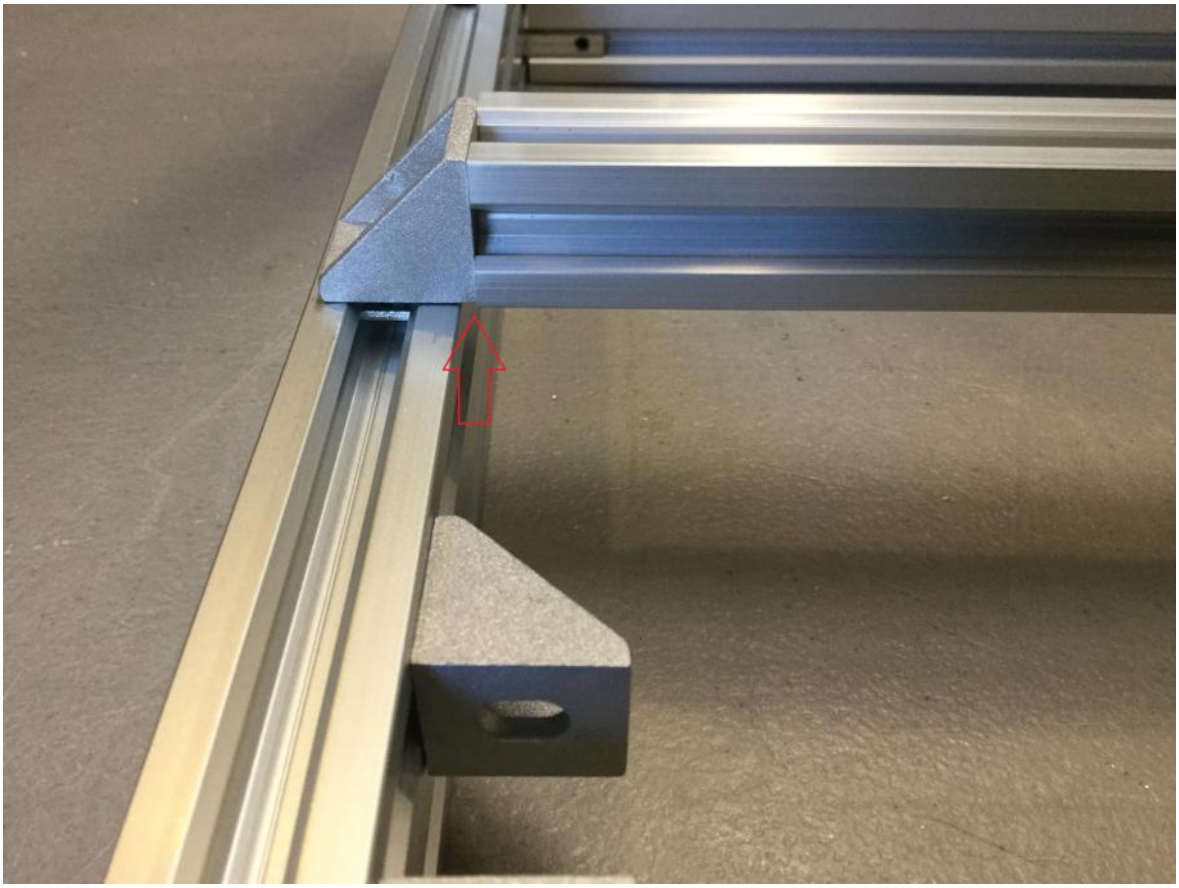


Next using the Extrusion and M5 bolts install the extrusion into the cast corner brackets. Also install the M5x12mm bolt and T-Slot nut onto the right extrusion.

Connect the extrusion to the Cast Corner Brackets in the front of the machine also.

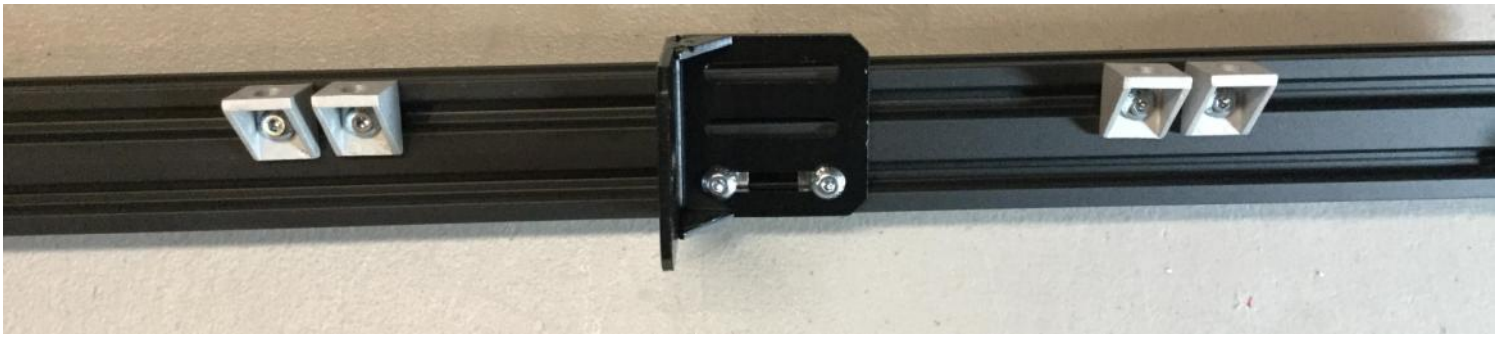


Make sure the bottom of the Extrusion is aligned with the bottom of the cast corner bracket on all 4 brackets otherwise your Y axis will not be flat.

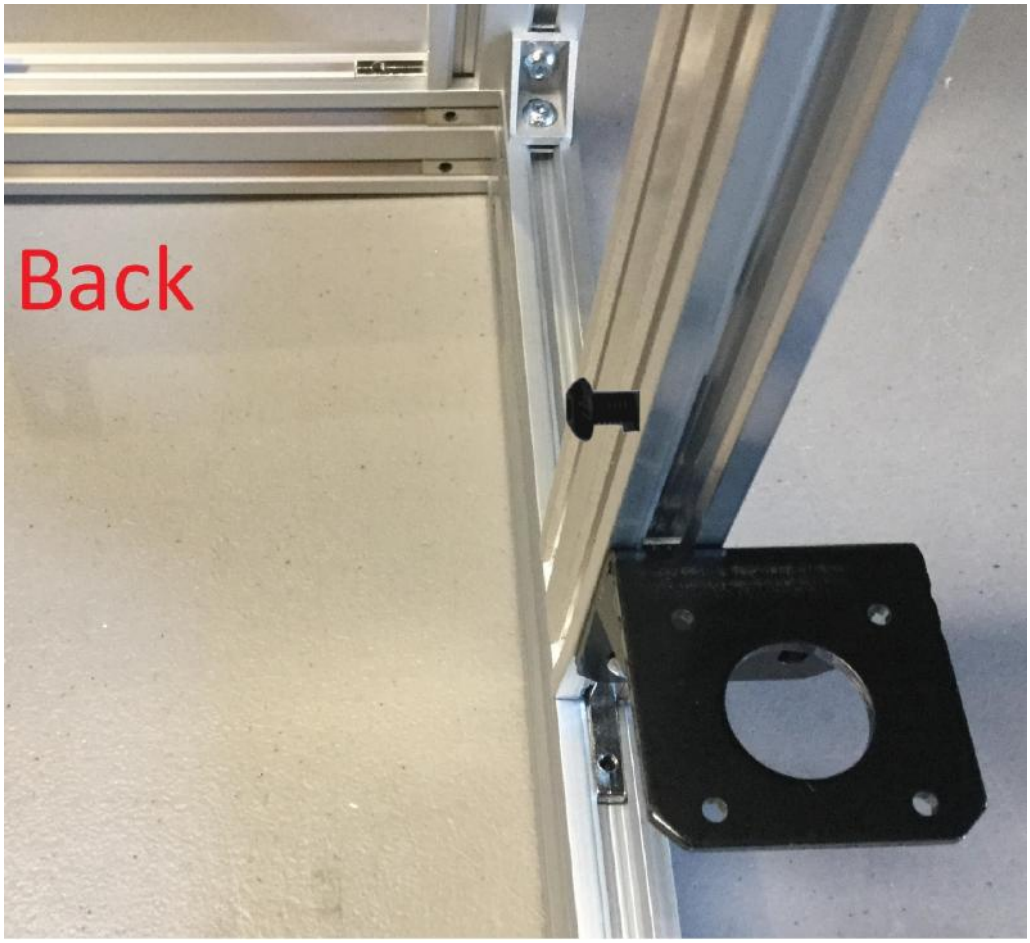


Install 6 Cast Corner Brackets on the bottom front of the machine using the M5x8mm bolts installed previously. You will adjust the actually placement later.

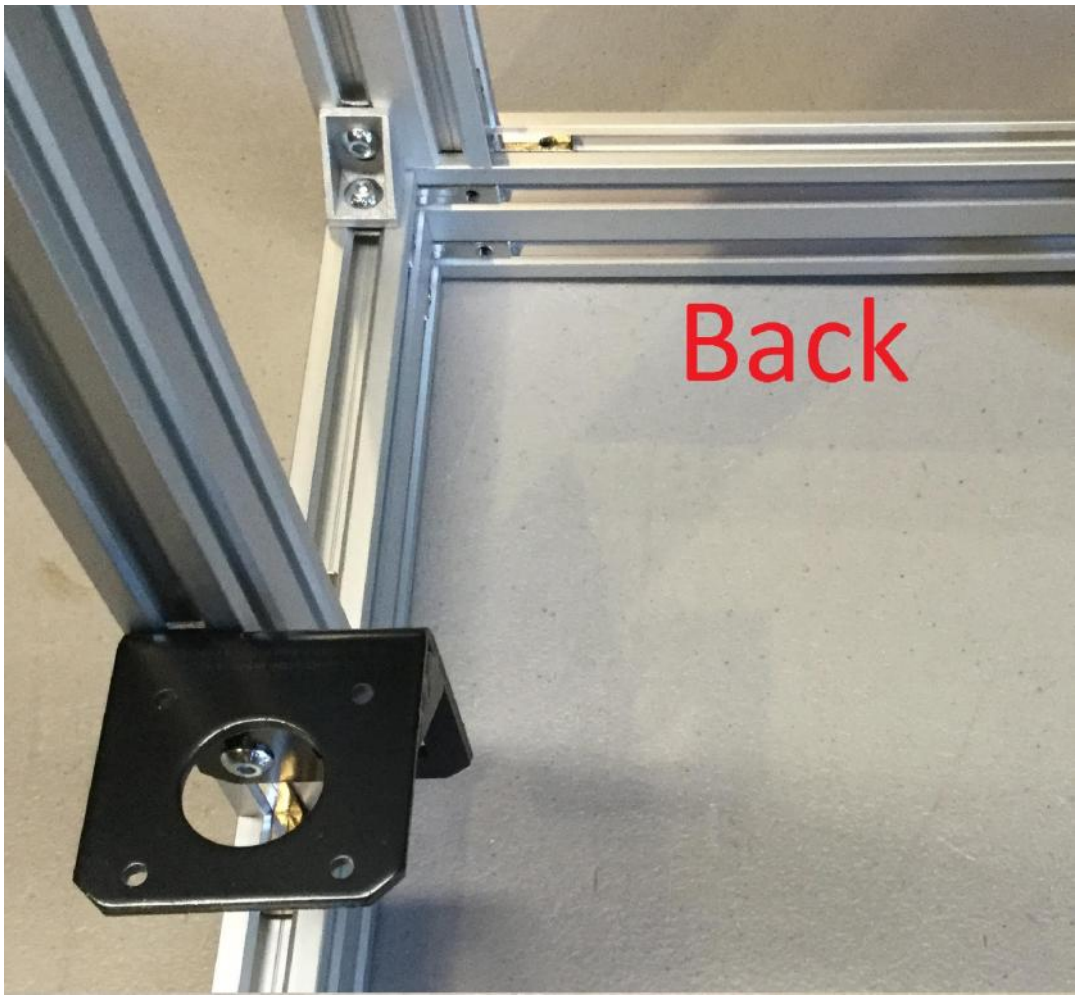
Now install 4 Cast Corner Brackets and one Motor Mount on the bottom back of the frame using the previously installed M5x8mm Bolts. You will adjust the actually placement later.



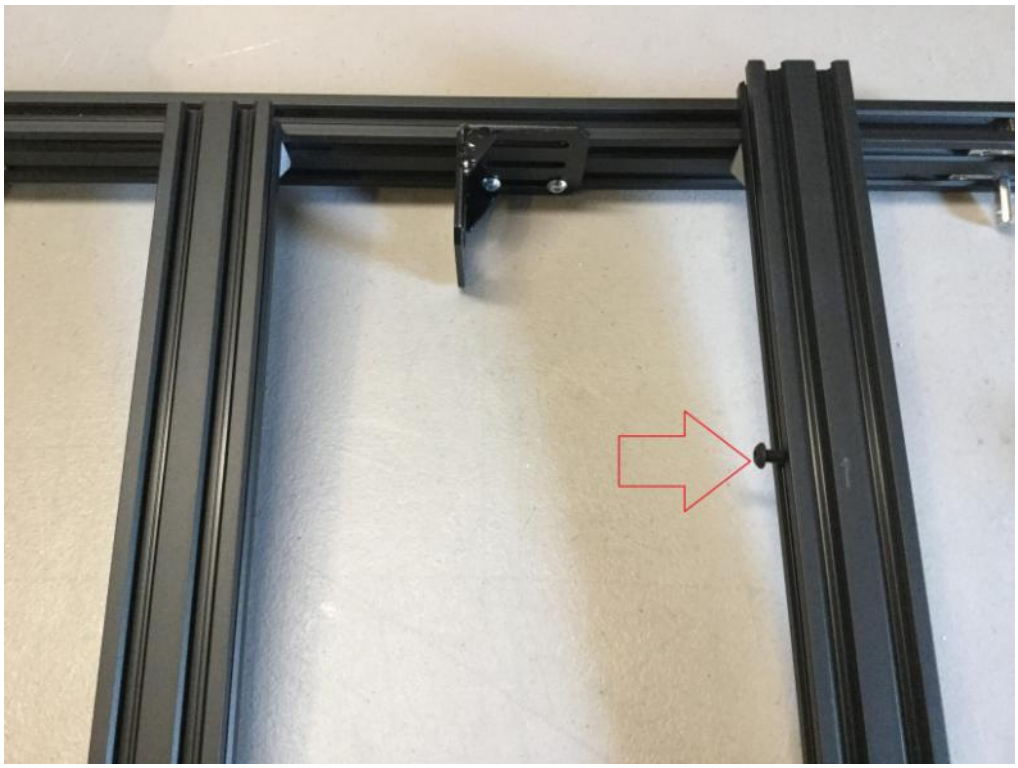
Now Install a Motor Mount of the right side of the printer, make sure you use the slot on the far left of the motor bracket.



Now Install a Motor Mount of the left side of the printer, make sure you use the slot on the far left of the motor bracket.

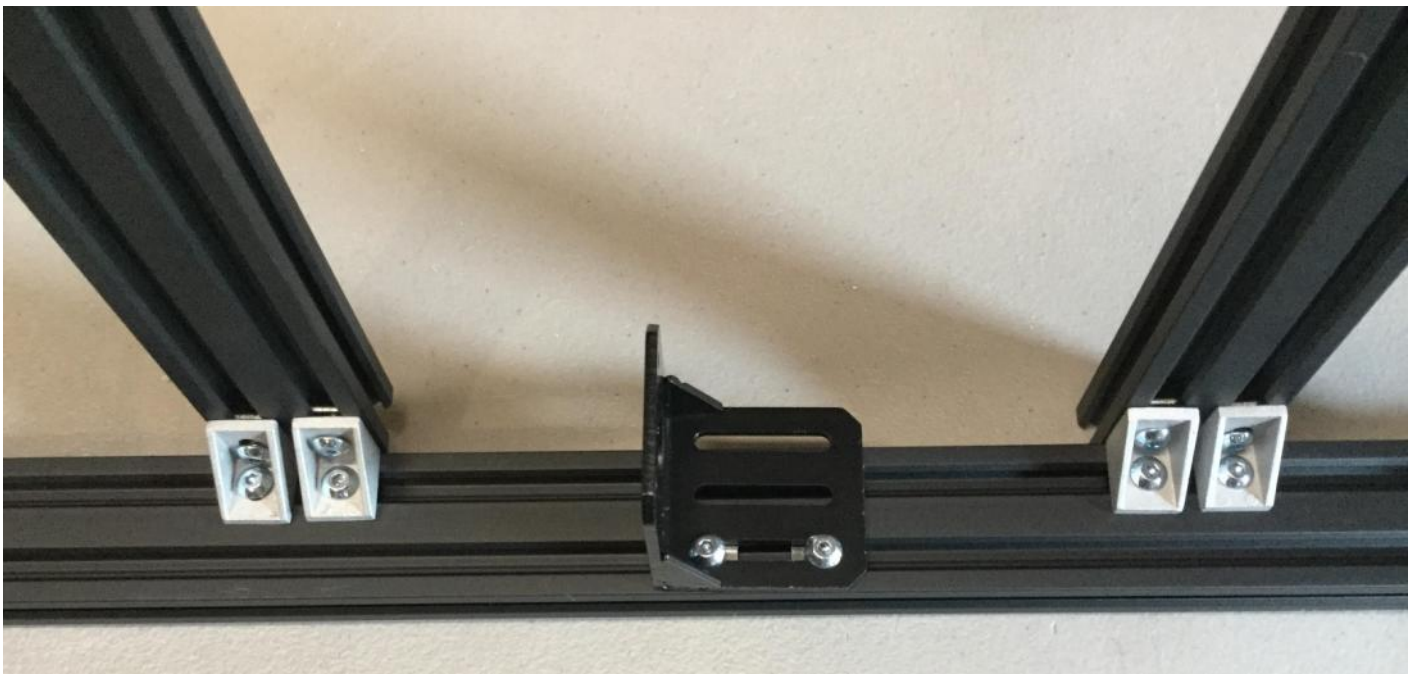


Next using the Extrusion, M5 bolts and T-Slot nuts install the extrusion into the cast corner brackets. Also install the M5x12mm bolt and T-Slot nut onto the right extrusion (Shown by red arrow).

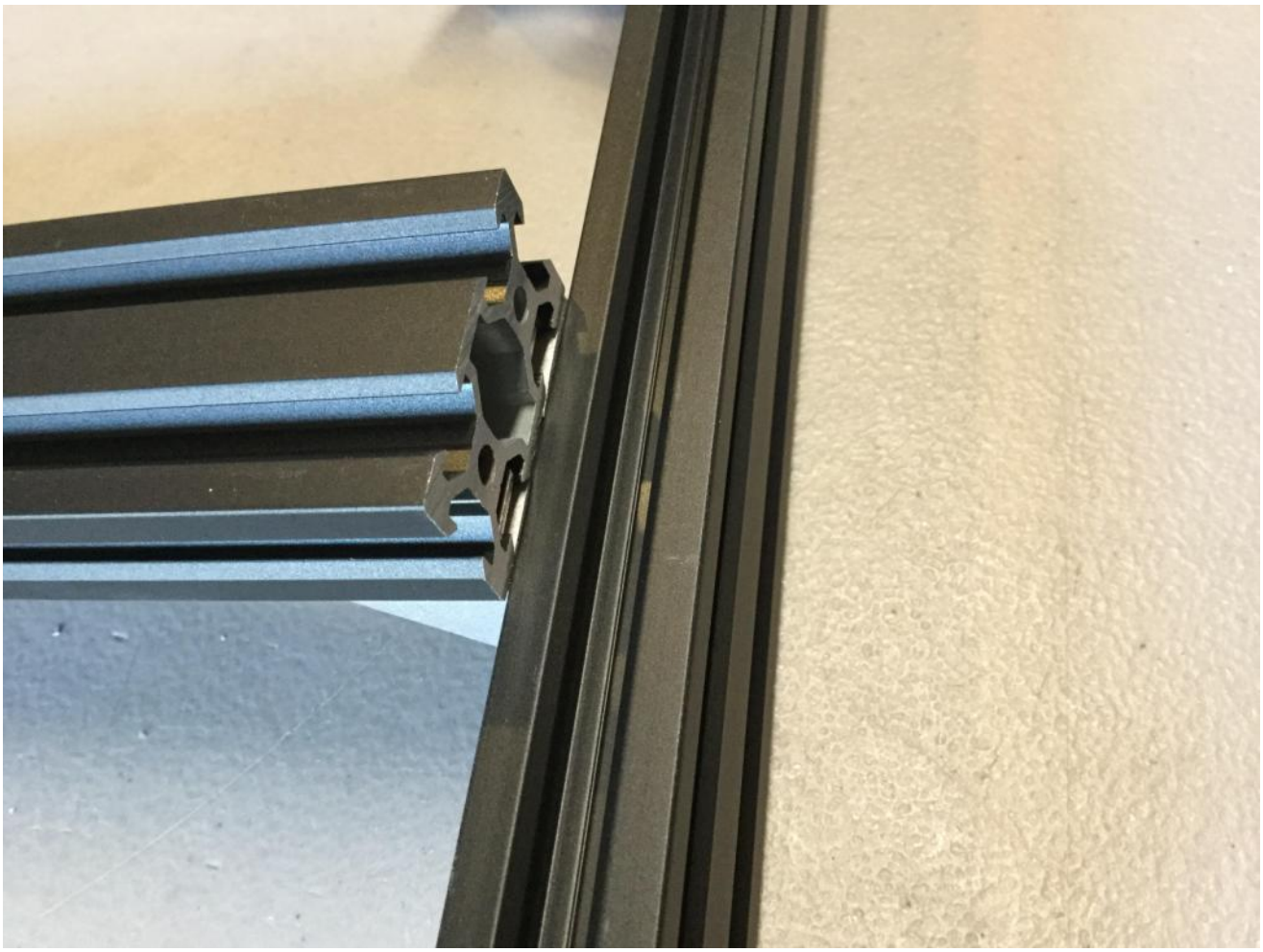


Connect the extrusion to the Cast Corner Brackets in the front of the machine also.

This picture will show how the underside of the extrusion will look.



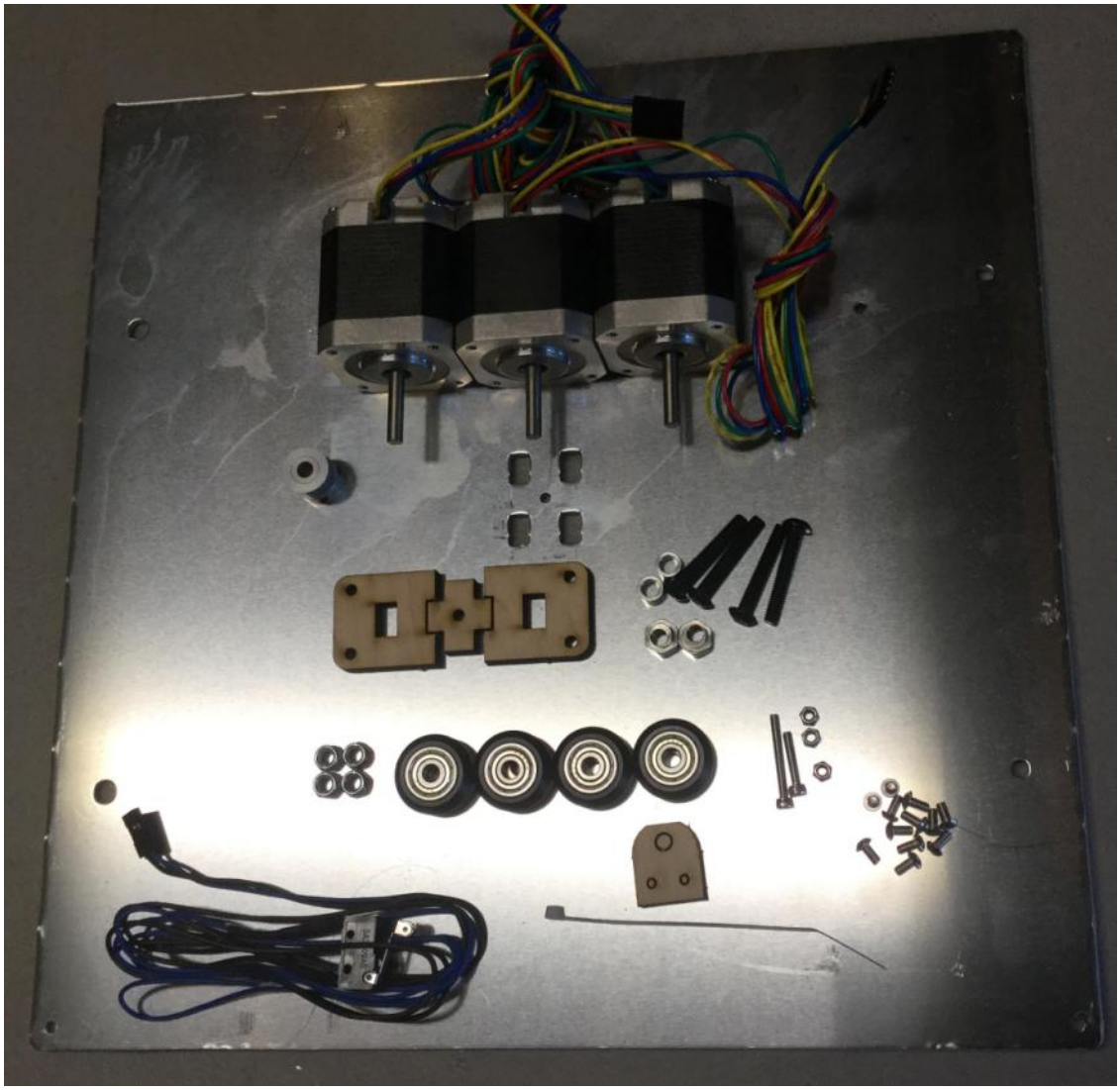
Make sure the bottom of the Extrusion is aligned with the top of the front and back extrusion pieces otherwise your Y axis will not be flat.



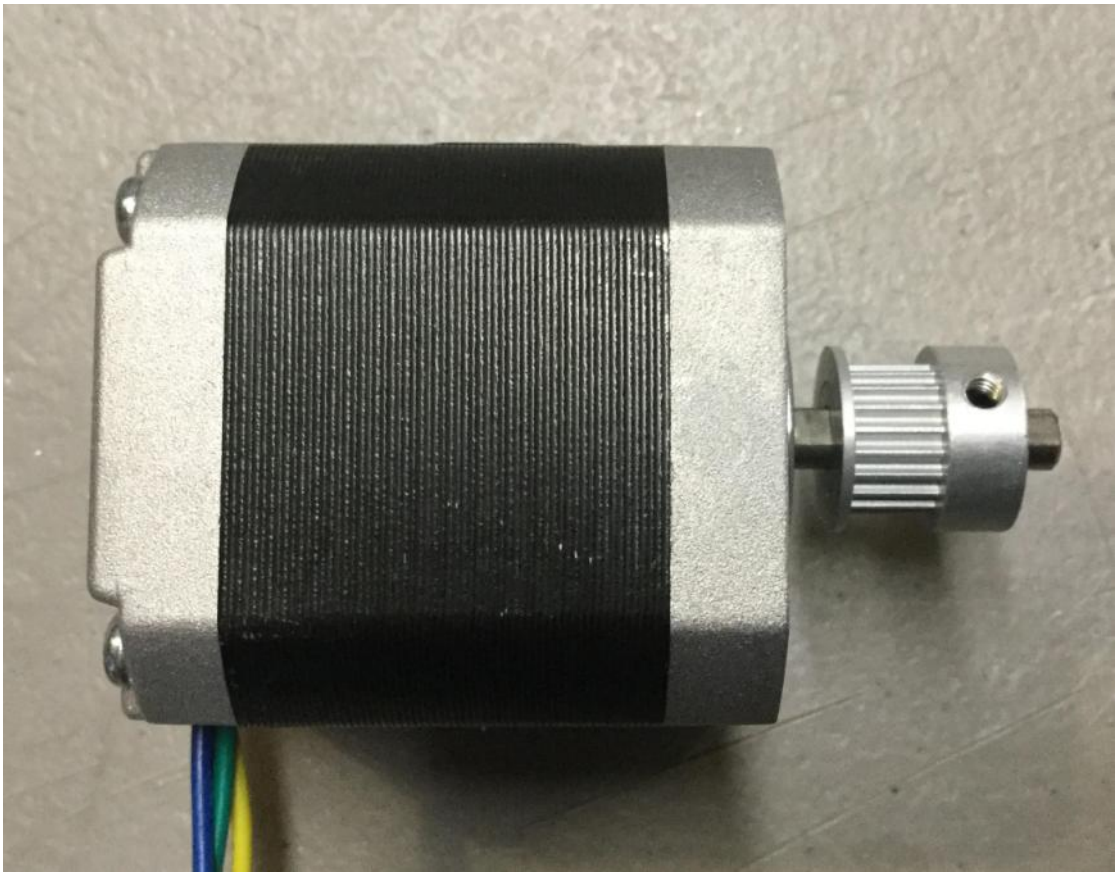
Y Bed

Gather the following parts

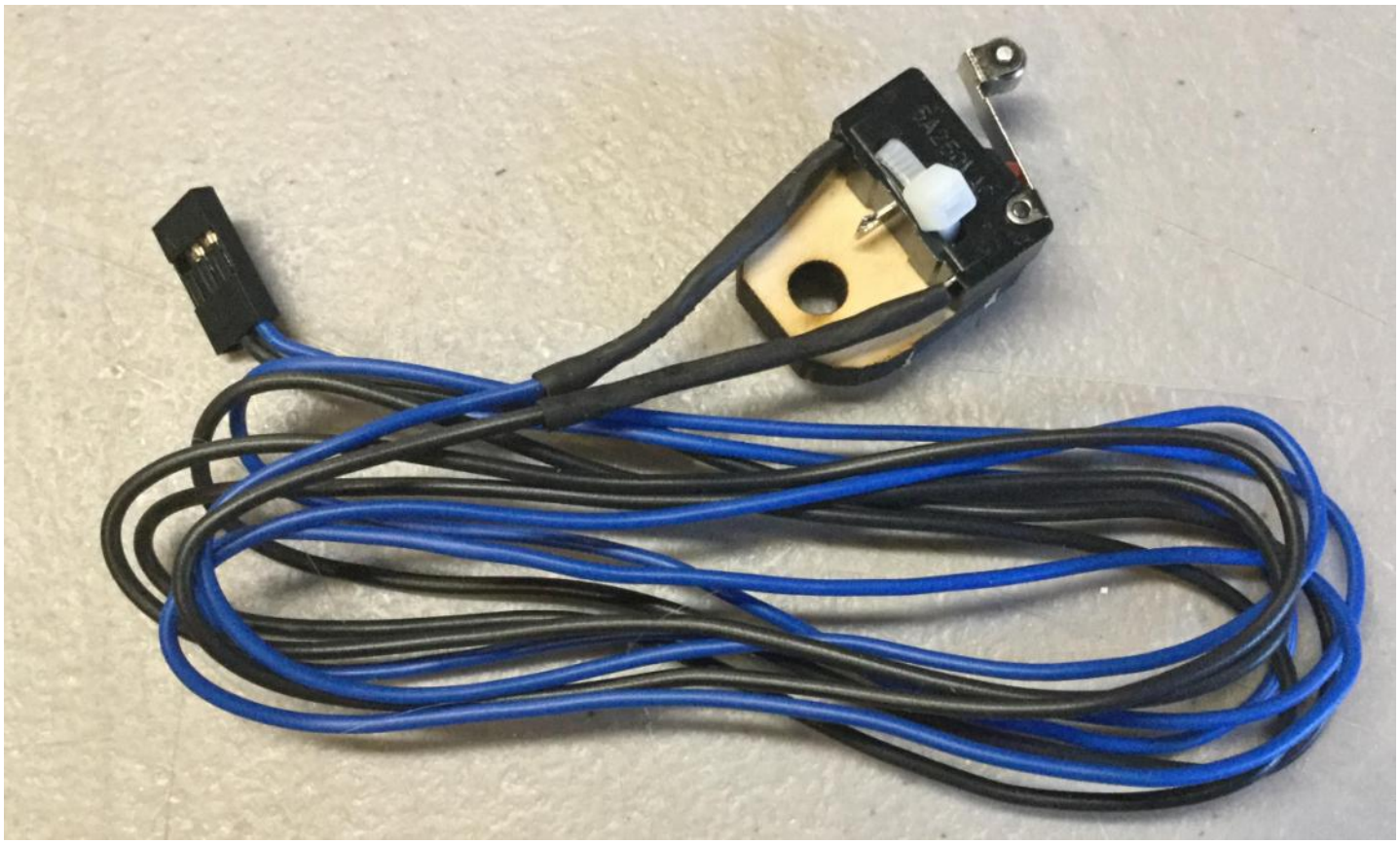
- **1 x Aluminum Heat Bed Mount**
- **3 x Motors**
- **1 x GT2 Gear and Set Screws**
- **1 set of wood Y belt Mount**
- **2 x Aluminum Spacers**
- **2 x Eccentric Spacers**
- **4 x M5x30mm Bolts**
- **4 x M5 Nylon Lock Nut**
- **4 x Delrin Idlers**
- **1 x M3x25mm bolt**
- **1 x M3x16mm bolt**
- **3 x M3 Nylon Lock Nut**
- **1 x Endstop**
- **1 x Zip Tie**
- **1 x Wood Endstop Mount**
- **12 x M3x6mm Bolts**



To start install a GT2 gear onto a motor as shown below, make sure to align one of the set screws with the flat spot on the Motor.

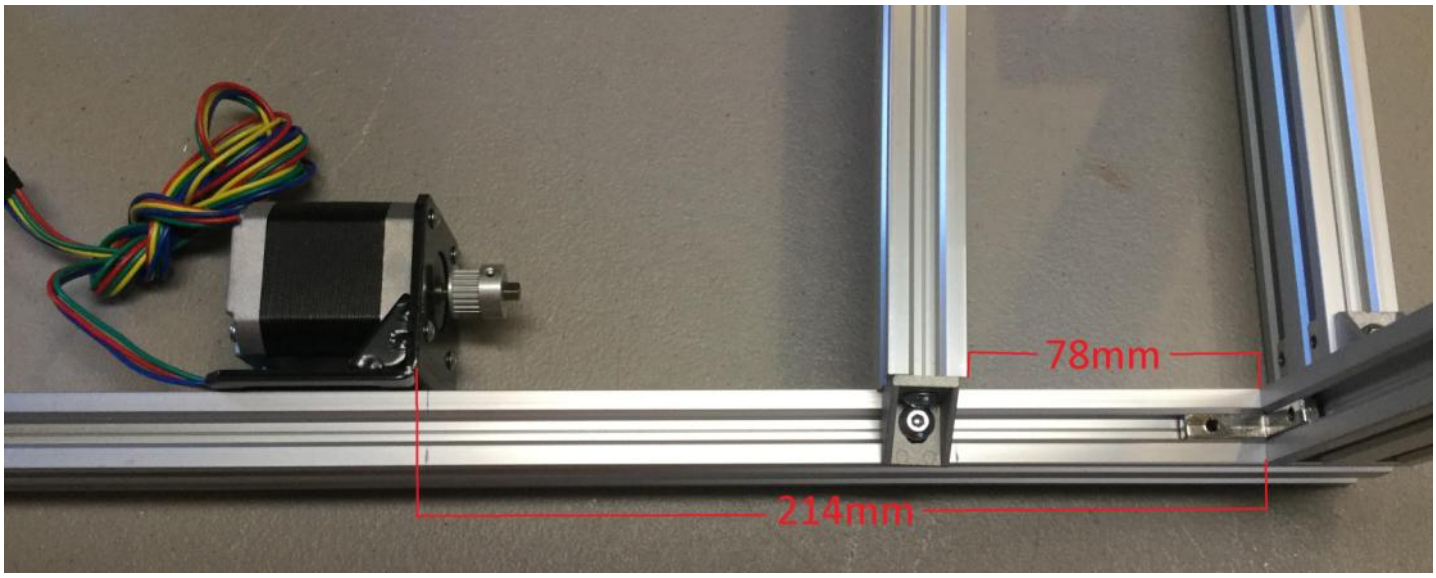


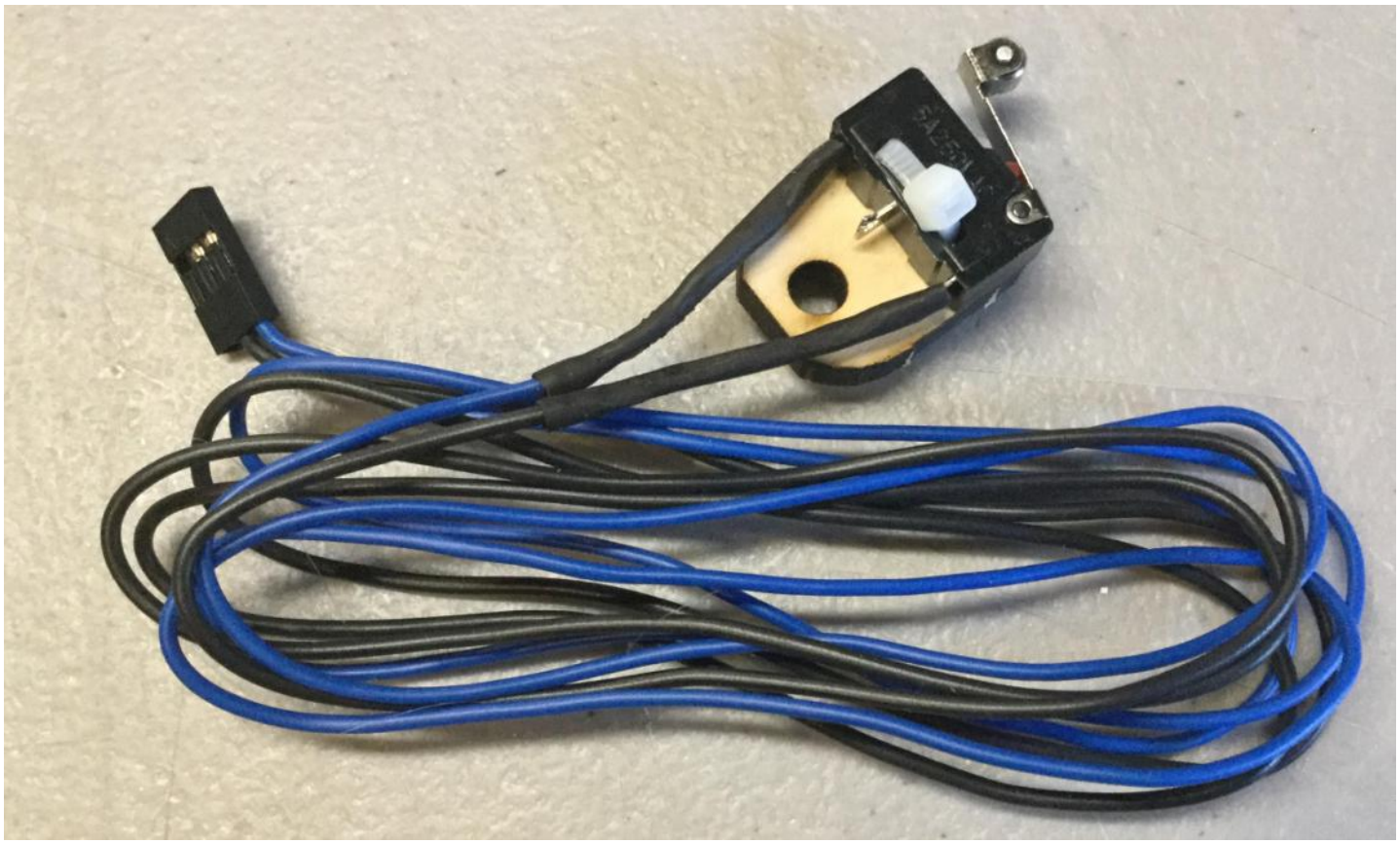
Using the Wood Endstop mount and a zip tie install the endstop as shown below.



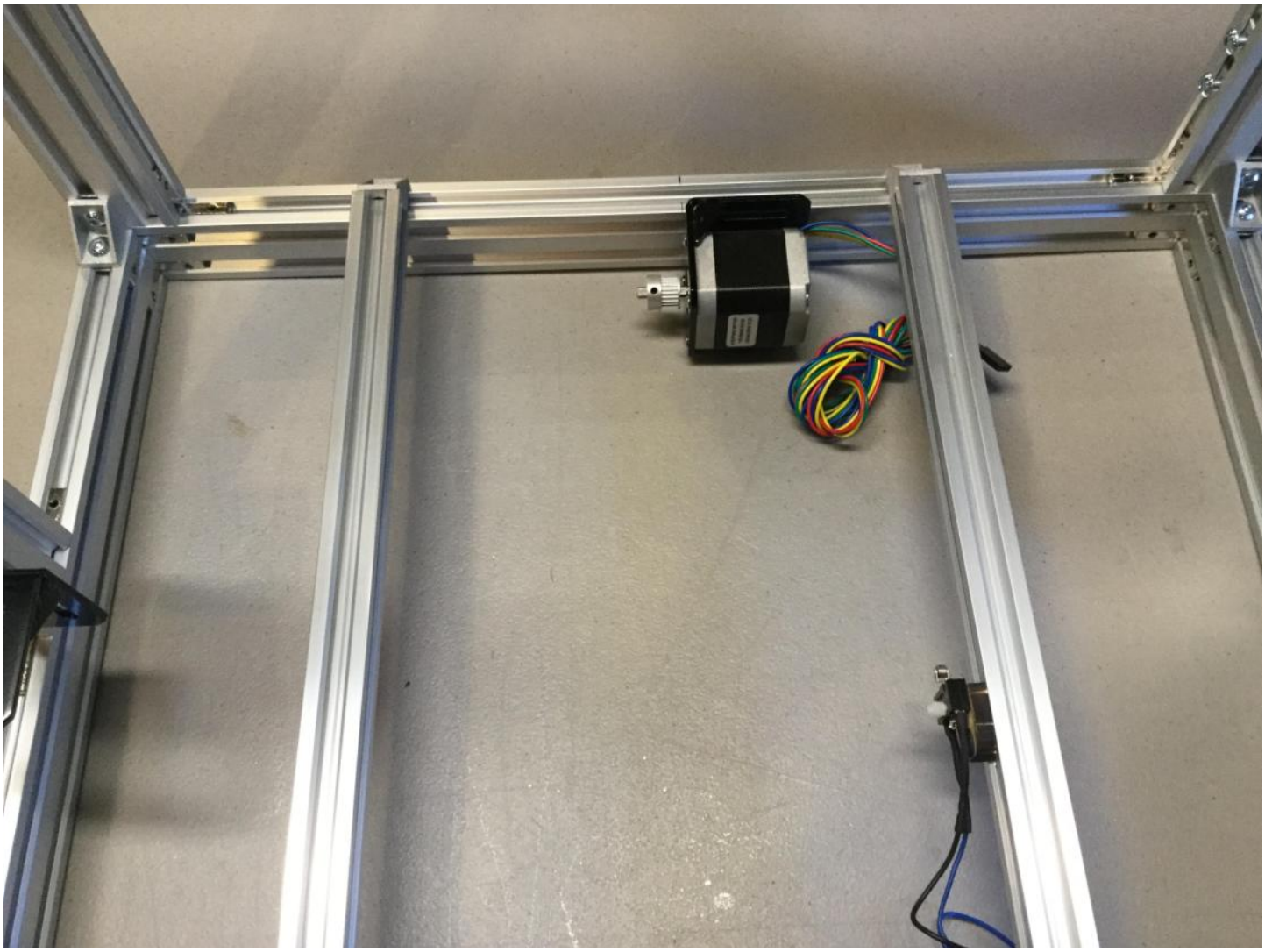
Next adjust the Y motor mount so the front of the mount is 214mm away from the inside of the extrusion as shown below, then move the extrusion in between the motor and side of the frame so its 78mm from the inside of the extrusion as shown below.

Next install the Motor with the GT2 gear using 4 of the M3x6mm bolts.



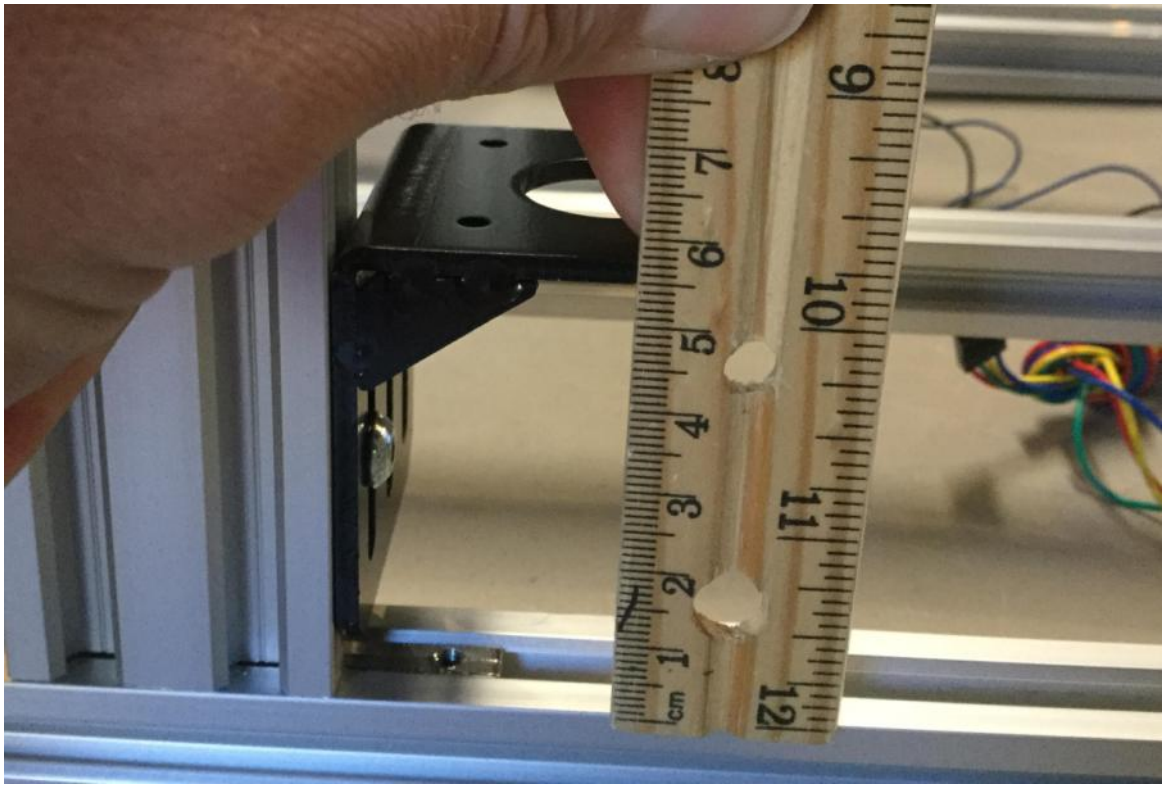


Install the endstop on the extrusion as shown below.

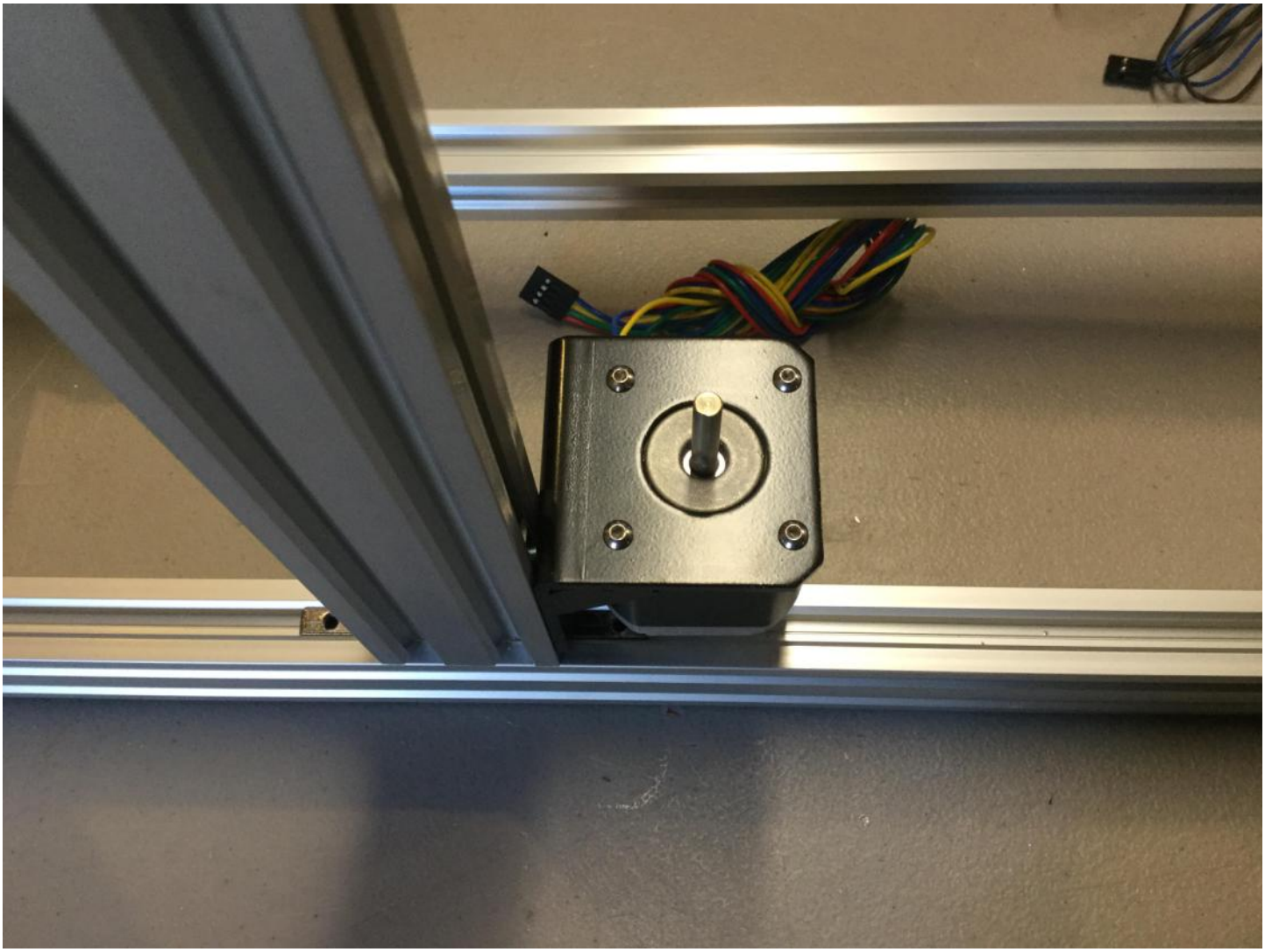


Adjust the two Z motor mounts so the surface the Z motor contacts is 55mm above the extrusion as shown.

Tighten the Z motor mount in place, make sure the mount is not tilted. This should let you just barely squeeze the motor into the mount.

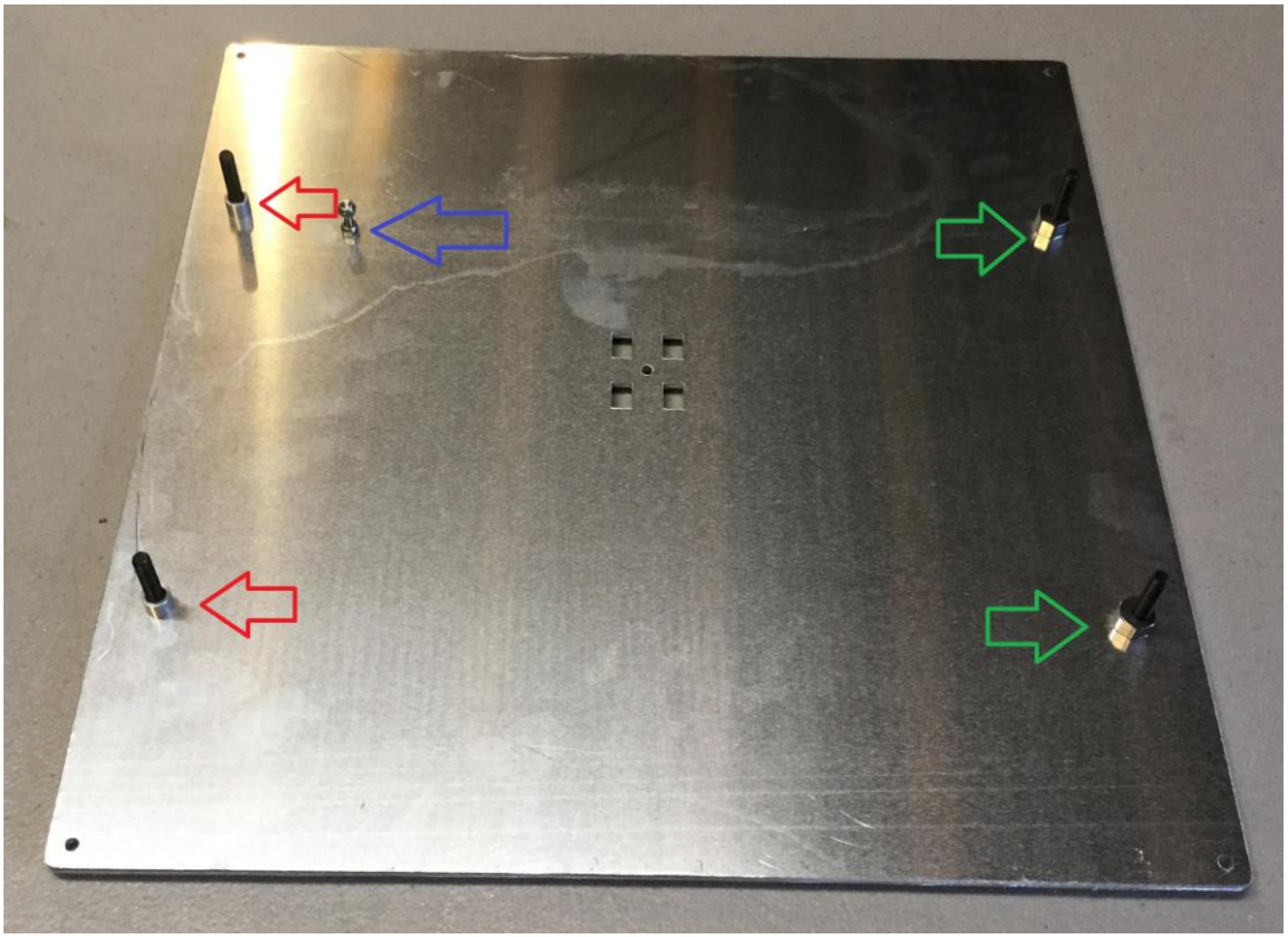


Installl the two Z motors into the Z mounts using 4 M3x6mm bolts on each motor.



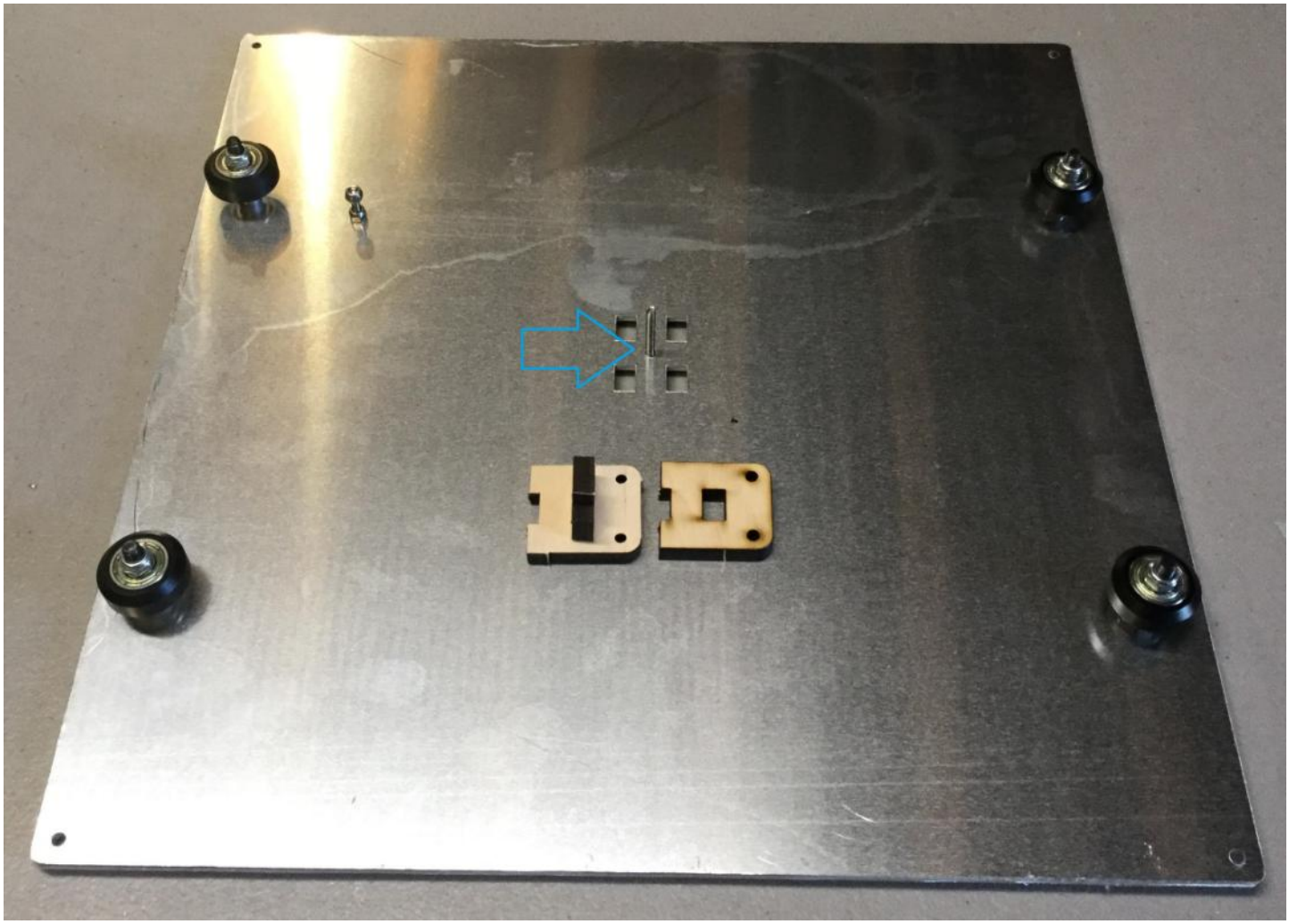
Get your Aluminum Heat bed mount, position the mount so the bolt hole shown by the Blue arrow is in the top left corner. Install the M3x16mm bolt with an M3 Nylon lock nut, then install a 2nd M3 Nylon lock nut onto the end of the bolt. (If you have upgraded your Y Extrusions to 20x40 you will want to install the M3x16mm Bolt and nut shown by the blue arrow in a hole 20mm to the right to allow for the thicker extrusion, you may need to drill a new hole if your kit didn't ship with the wider Y extrusion)

Install the 4 M5x30mm bolts in the 4 larger holes as shown by the Red and Green Arrows, then install an Aluminum Spacer on the bolts with the Red arrows and an eccentric spacer on the ones with the Green Arrows. Turn the Eccentric spacers so the Fat part of the spacer is closer to the center of the heat bed mount.



Now install a Delrin Idler onto each of the 4 M5x30mm bolts, then install a M5 Nylon Lock Nut onto each and tighten them down. Tighten them just enough so the Delrin Idler doesn't wobble, but the delrin can still turn.

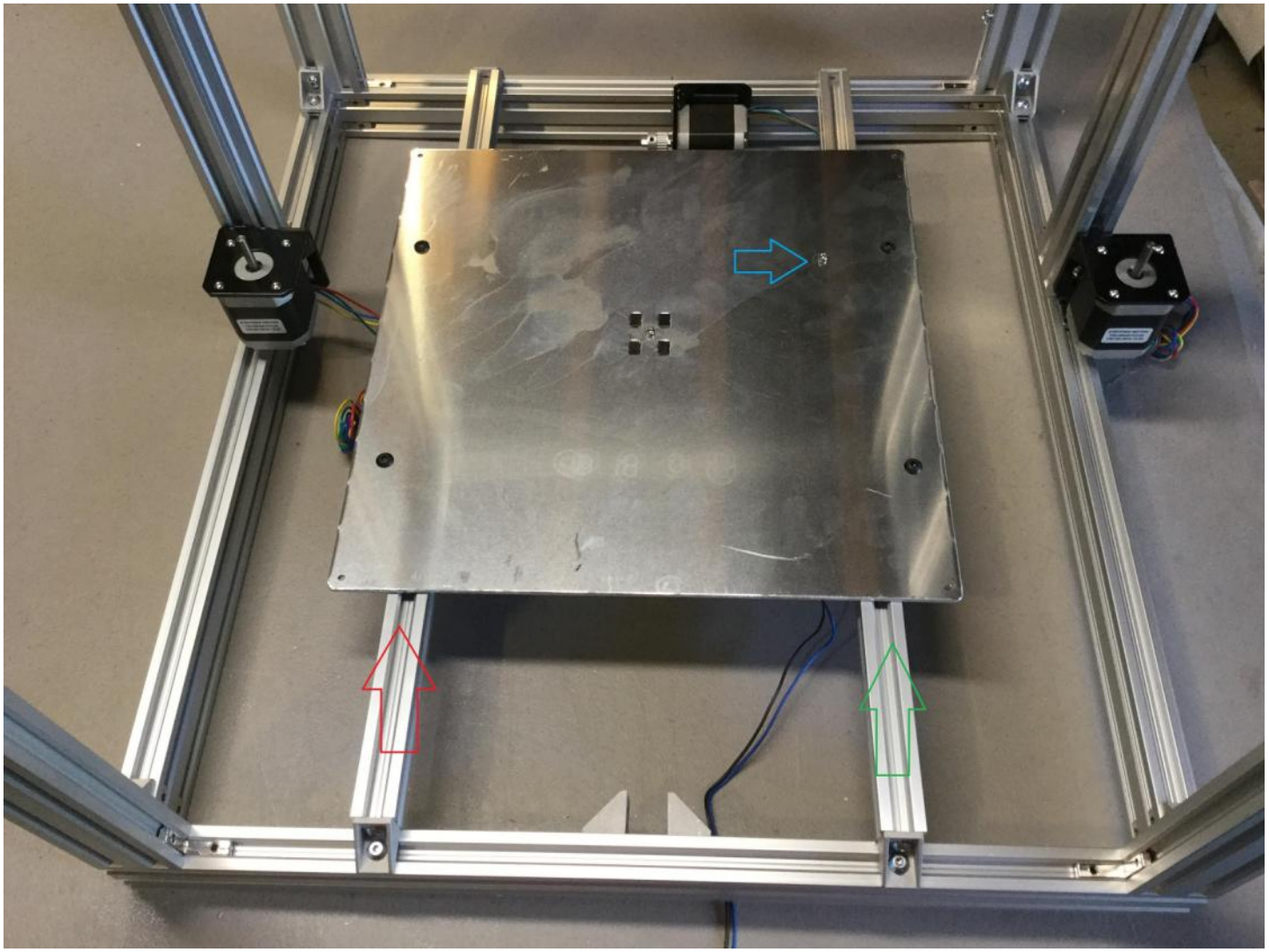
Install the M3x25mm bolt into the center of the Mount shown by the Blue Arrow. Get the Y belt Mount wood pieces and install the + Piece into one of the A shaped pieces as shown below.



Now install the other A wood piece onto the + wood piece then install it into the Aluminum Heat Bed Mount and tighten it down with the M3 bolt and a Nylon Lock nut.

Now install the heat bed mount onto the frame. You have already set the position of the Left Extrusion shown by the Red arrow, Make sure the bolts holding the right extrusion are loose so you can adjust that extrusion. Orient the Heat bed mount so the M3x16mm bolt (shown by the blue arrow) is on the right back corner of the printer frame. Now pull the Right Extrusion (Shown with the Green Arrow) to the Right of the machine so all the Delrin Wheels ride in the left and right extrusions. When the Right Extrusion contacts both Delrin Wheels you can tighten down the Right Extrusion.

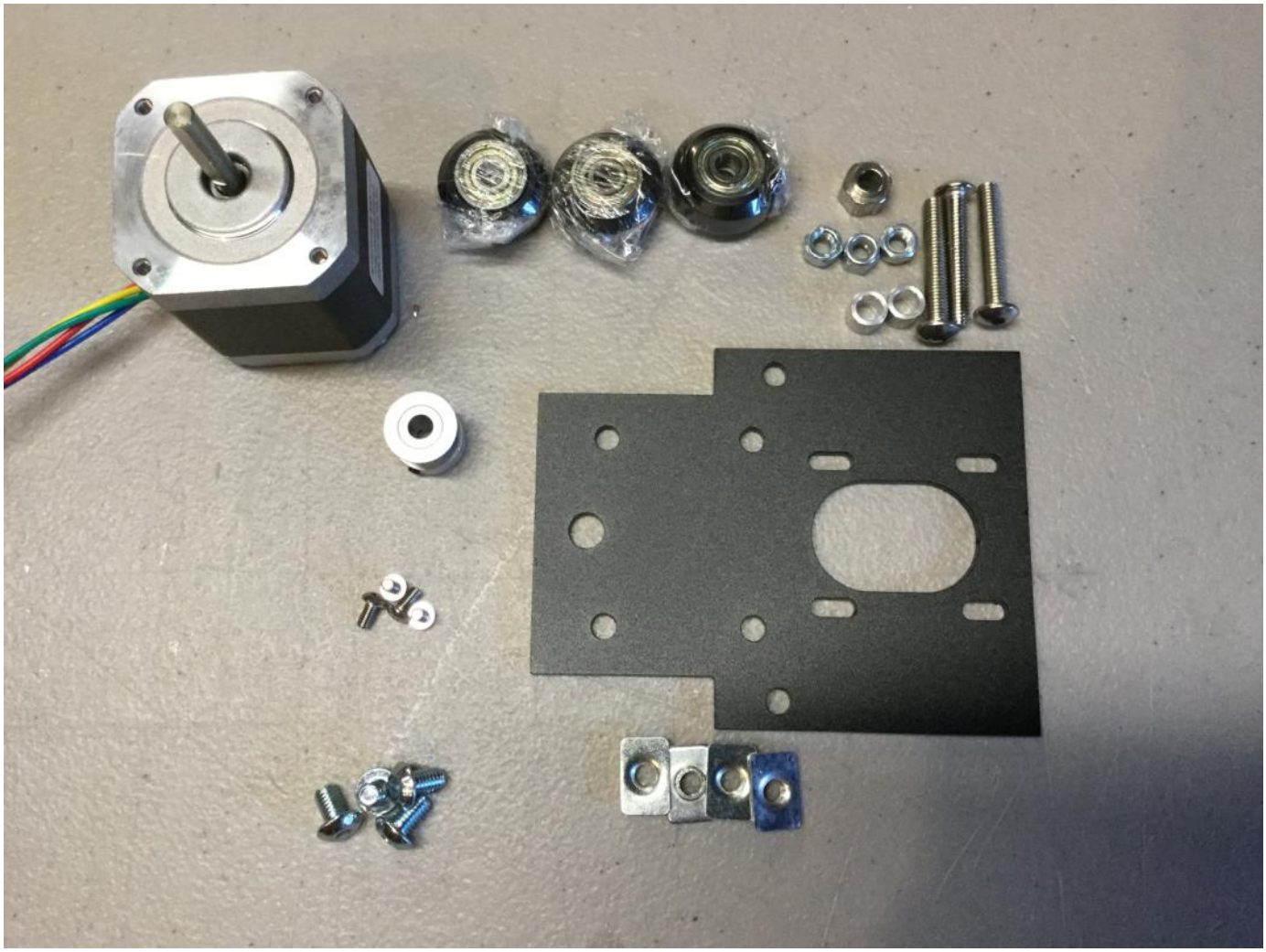
Now move the heat bed mount back and forth, make sure it turns freely, then pull up and push down on each corner to see if there is any play. If there is you can either pull the Right extrusion over a little and tighten it back down or you can adjust the eccentric spacers that are on the Right side of the heat bed mount.



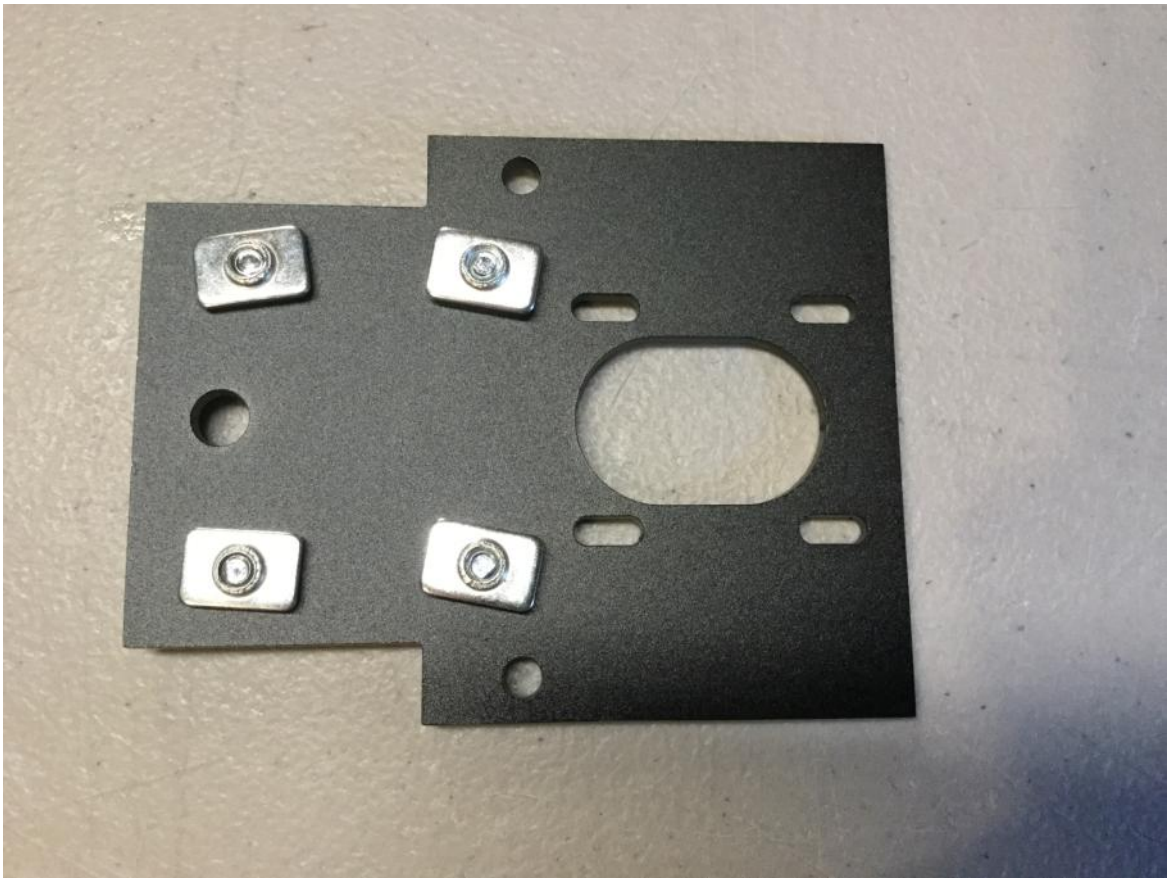
Metal X Motor Assembly

Gather the following parts

1 x Metal X motor Bracket
1 x Nema 17 Motor
1 x Gt2 Gear with Set Screw
4 x M3x6mm Bolts (M3x8mm bolt and M3 Washer can also be used)
3 x Delrin Idlers
1 x Eccentric Spacer
2 x Aluminum Spacers
3 x M5 Nylon Lock Nut
3 x M5x30mm Bolts
4 x M5x8mm Bolts
4 x T-Slot Nuts
1 x M5 Washer (not shown)

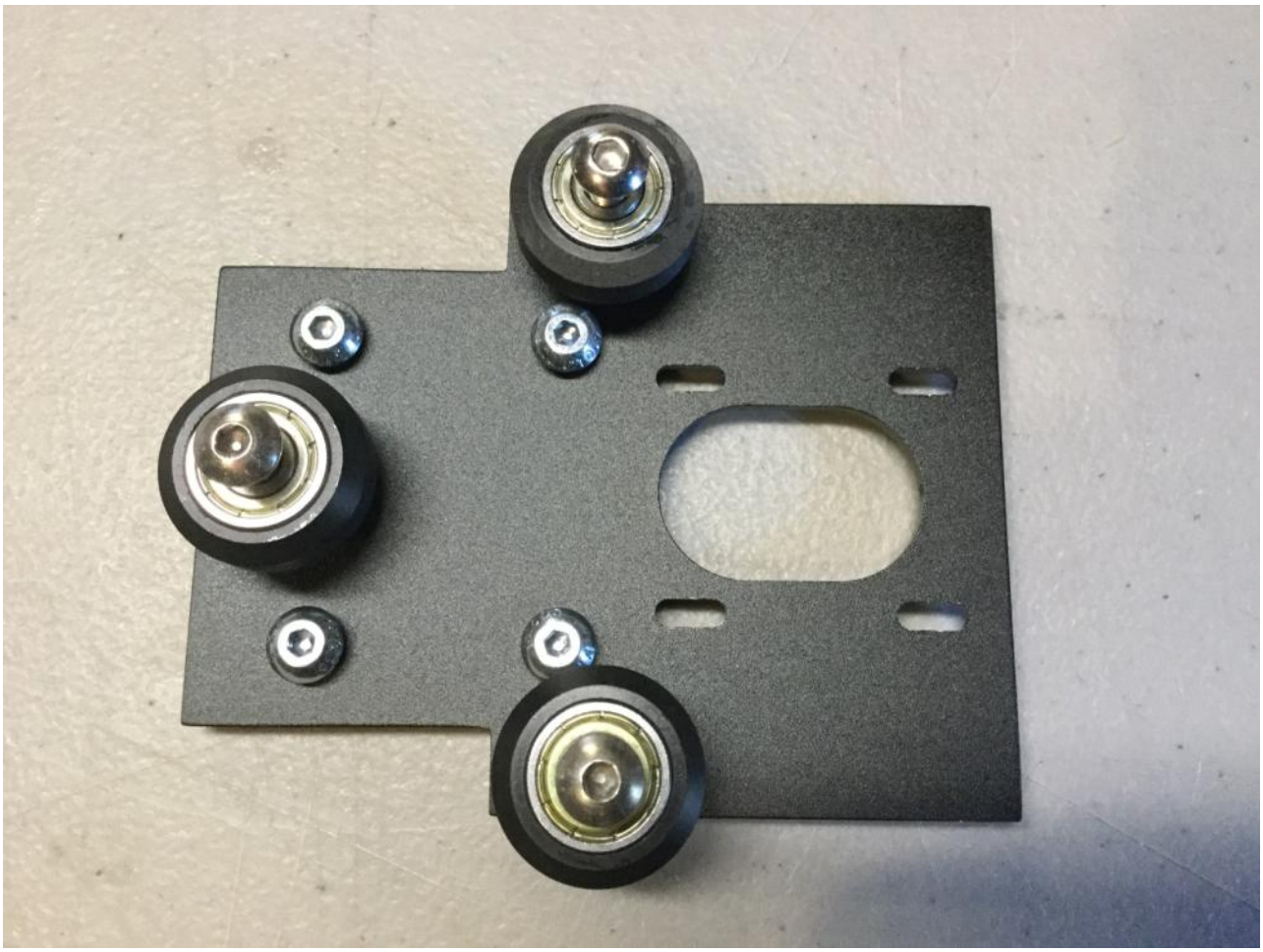


Install 4 M5x8mm bolts in to the Metal from the back then install a T-Slot Nut on each of the 4 bolts

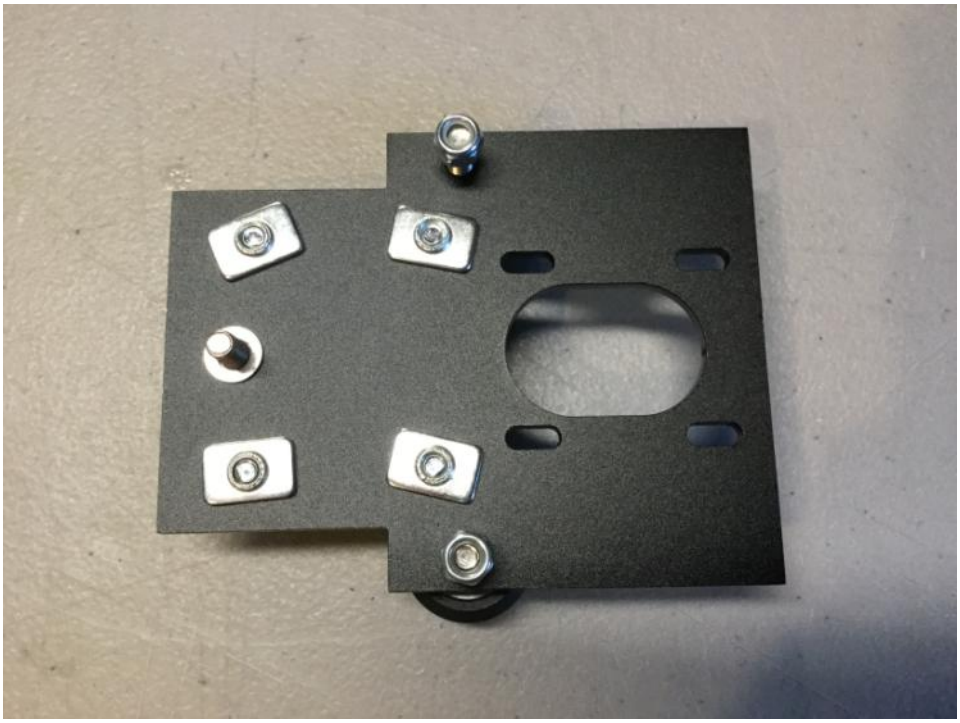


Get 3 M5x30mm bolts and install a a Delrin Idler on all 3, then an aluminum spacer on two and an eccentric spacer on the other.

Flip the Metal plate over and install the two bolts with delrin idlers and aluminum spacers on the side closest to where the Motor mounts, then the one with the eccentric spacer on the left.

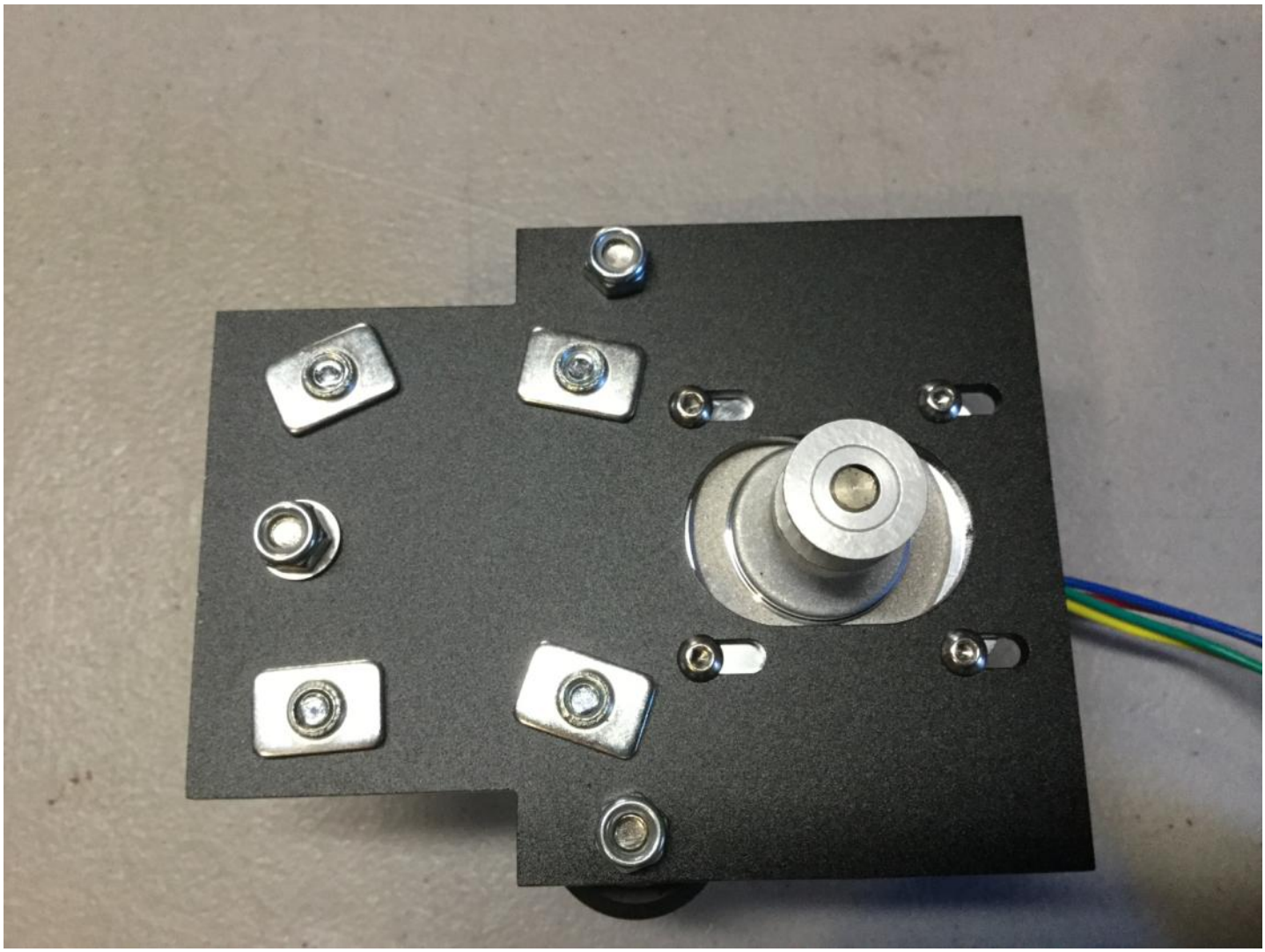


Flip the Metal plate back over, install a M5 washer on the bolt that has the eccentric spacer then install a Nylon M5 Lock Nut on the 3 Bolts and tighten



Install the GT2 Gear onto the Motor using the set screw, make sure the set screw hits the flat spot of the motor shaft.

Flip the metal piece back over, install the motor using the 4 M3x6mm bolts, but leave the bolts some what loose at this time. Have your motor wires come out of the side of the X Motor Bracket.

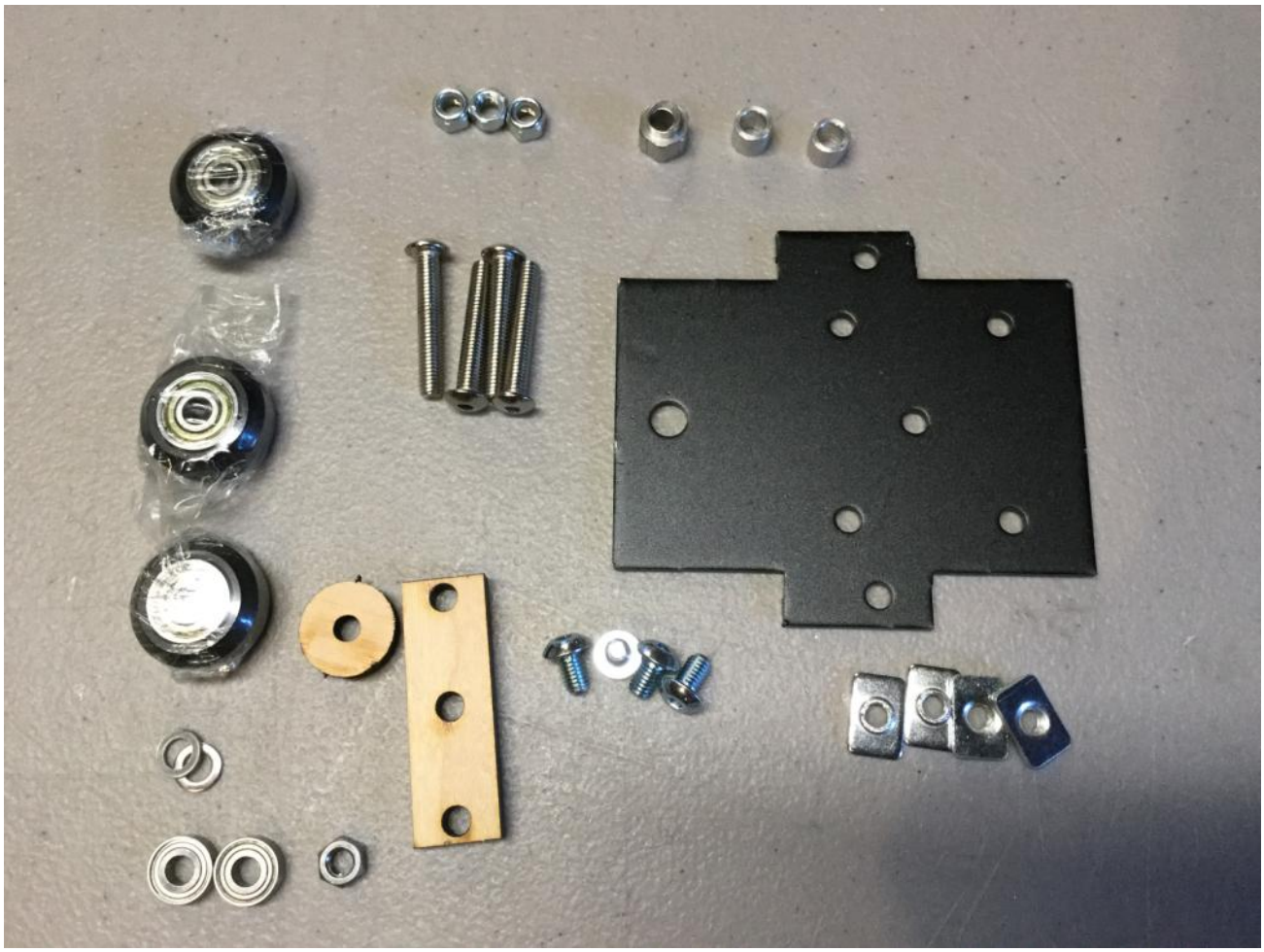


Metal X Idler Assembly

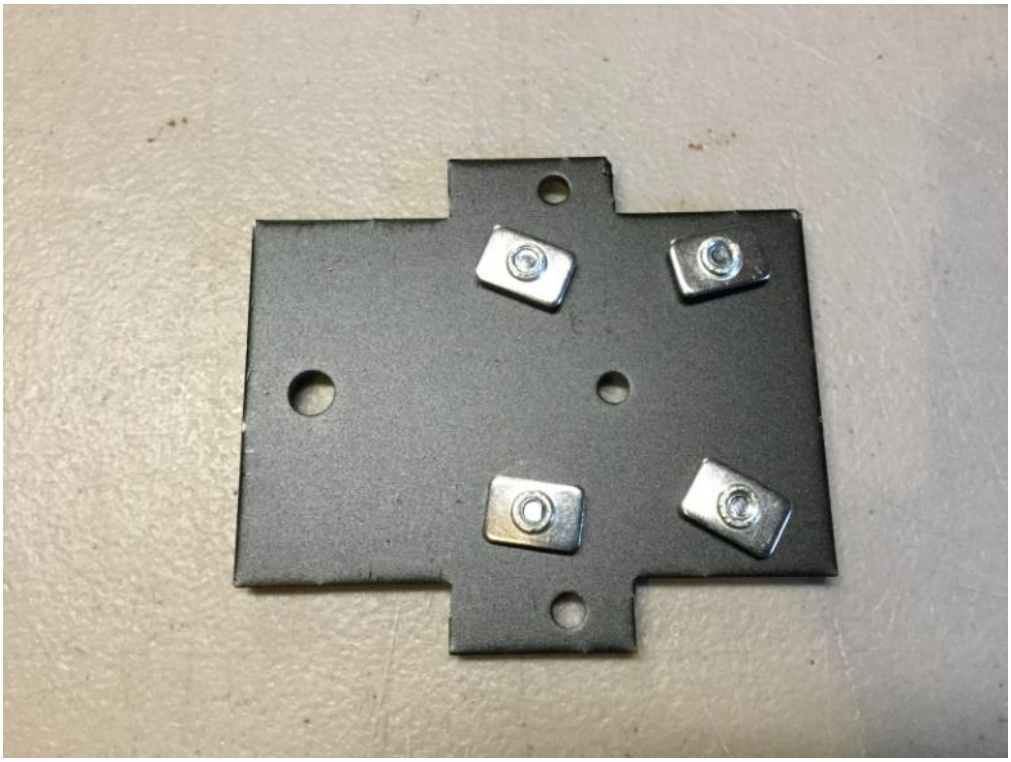
X Idler

Gather the following parts

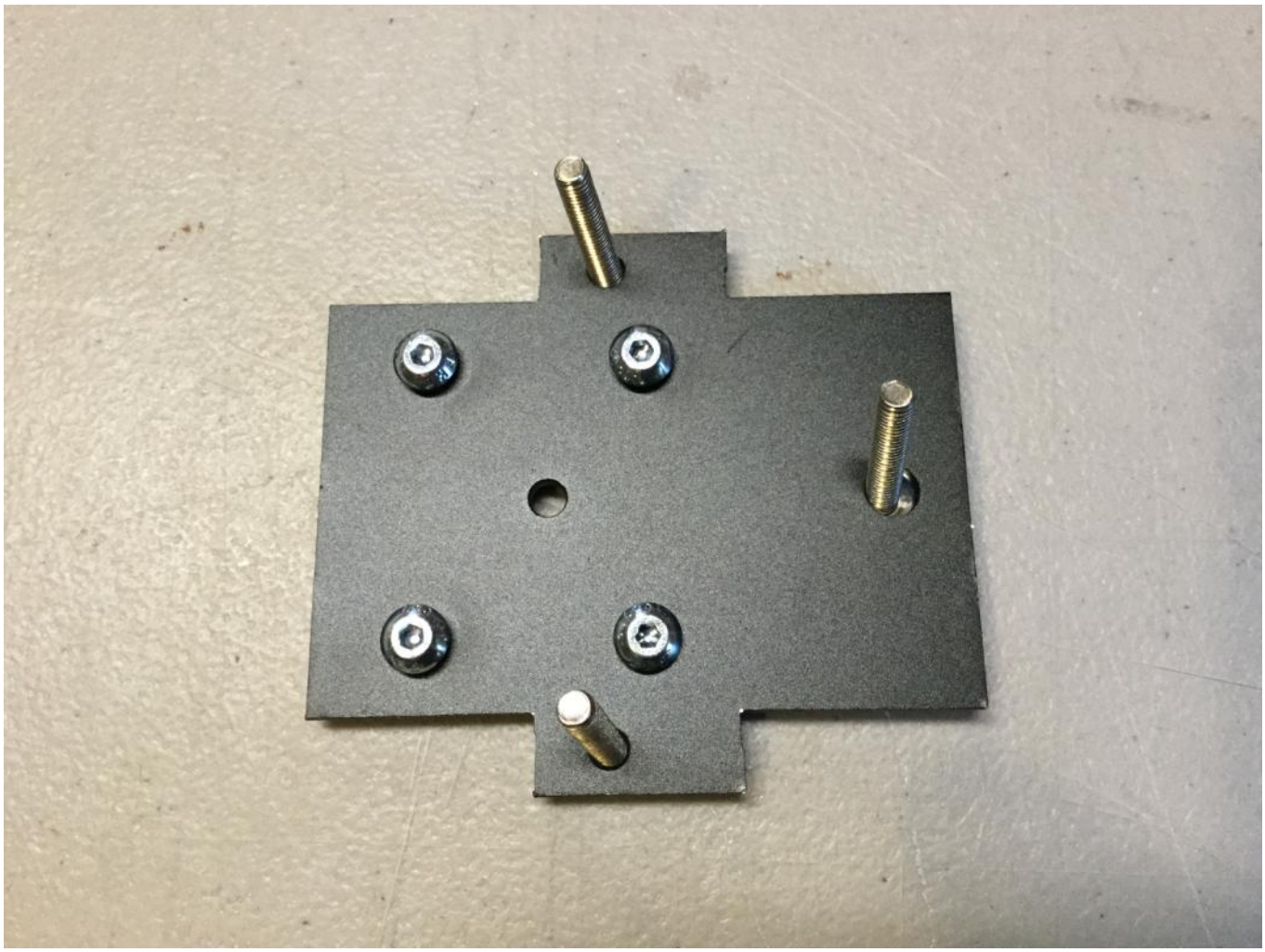
1 Set of X Idler Wood/Metal parts (Pictured Below)
3 x Pre Assembled Delrin Idler's (Black Wheel)
2 x MR125 Bearings
2 x M5 Washers
4 x M5x30mm Bolts
3 x M5 Nylon Locknuts
1 x M5 Nut (Regular)
4 x M5x8mm Bolts
2 x Aluminum Standoff
1 x Eccentric Spacer
4 x T-Slot Nuts



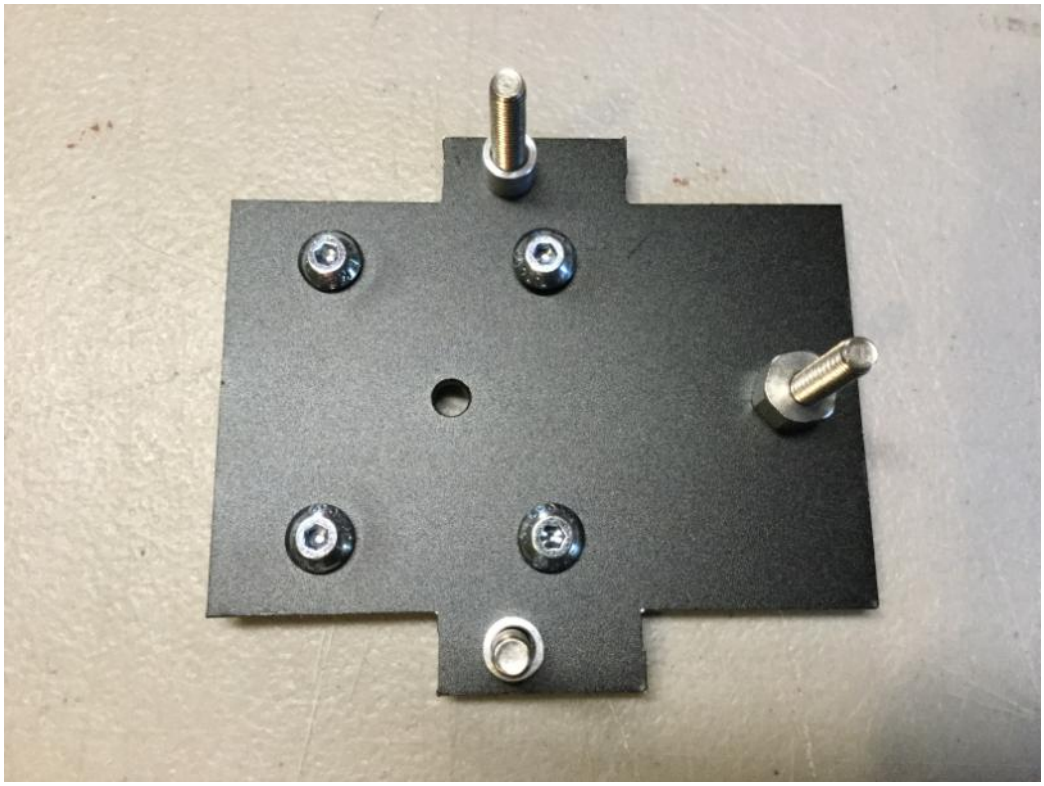
Next Install 4 of the M5x8mm bolts from the back side then flip the metal piece over and install the 4 T-Slot nuts leaving them loose.



Next flip the X idler over and install 3 M5x30mm bolts into the holes as shown below



Install an eccentric spacer on the bolt on the right then an aluminum spacer on the other two bolts, install a delrin idler on each bolt and last install and tighten an m5 Nylon Lock nut.



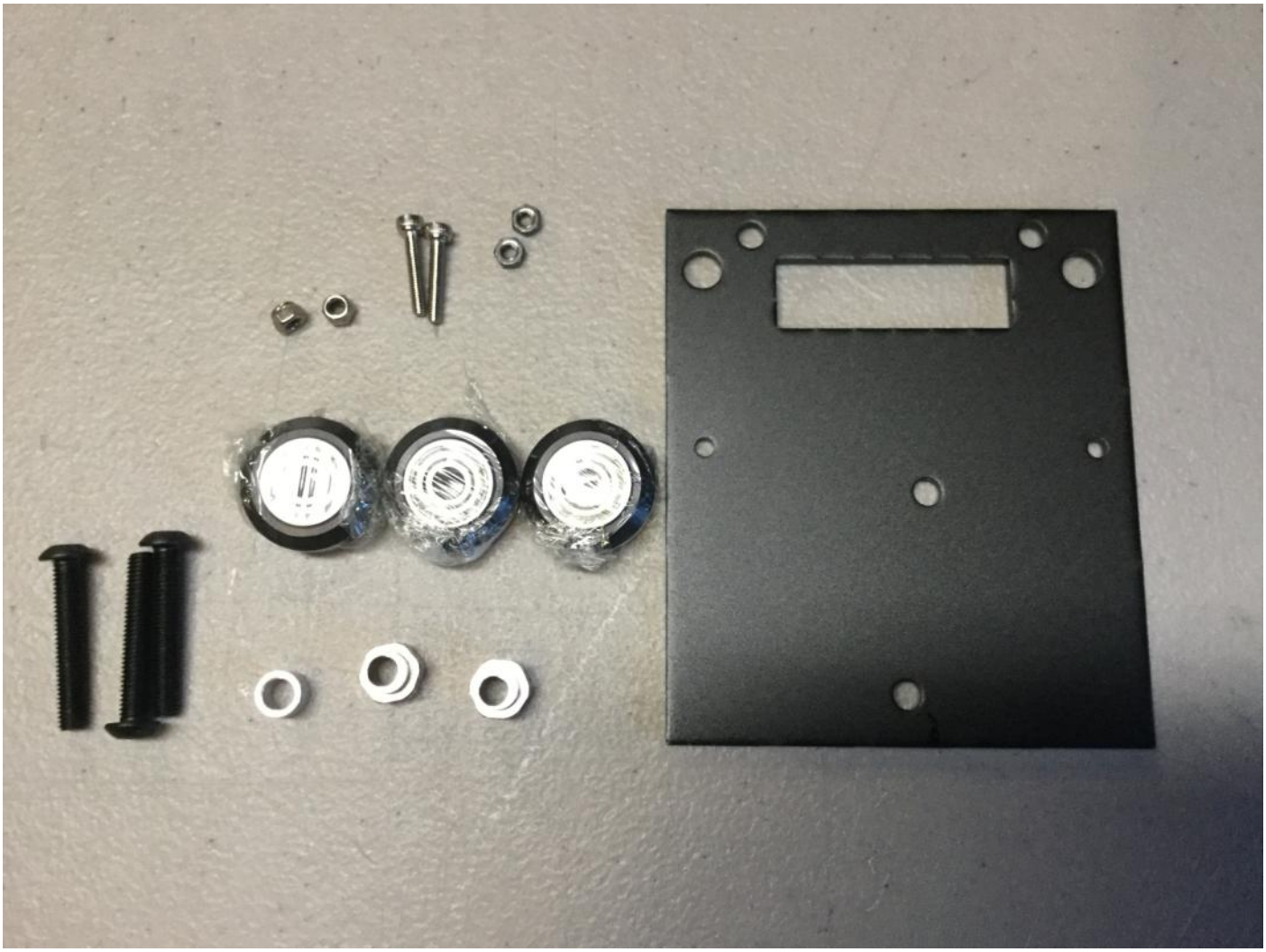
Last you will assemble the Belt idler, you will assemble it starting with an M5x30mm bolt, then the rectangular wood piece, an M5 Washer, Two MR125zz Bearings, another M5 washer, the wooden washer and last a regular M5 nut.

X Carriage

X Carriage

Gather the following parts

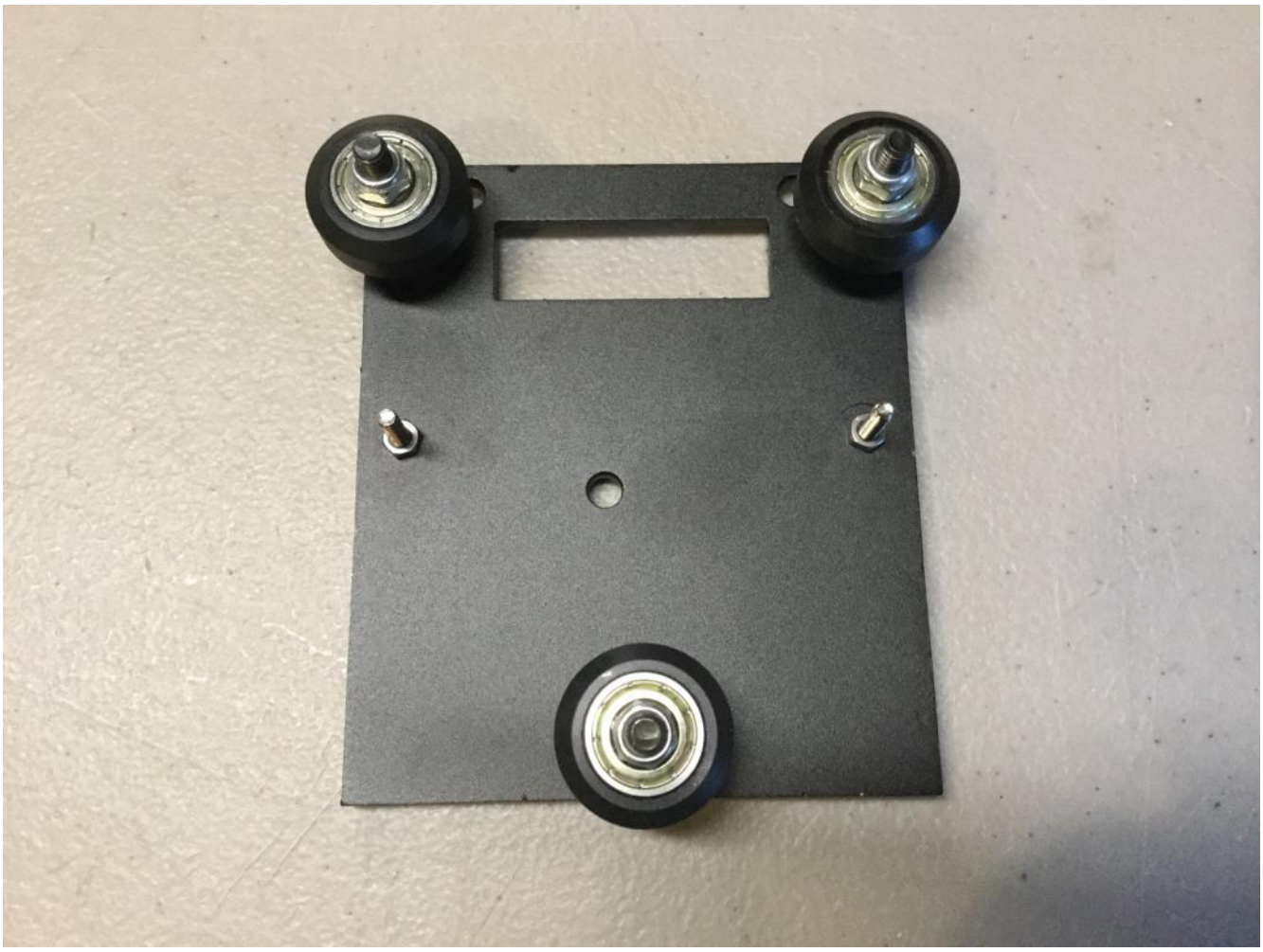
1 X Carriage Metal part (Pictured Below)
2 x M3x16mm Bolt
2 x M3 Nuts
3 x Pre Assembled Delrin Idler's (Black Wheels)
3 x M5x30mm Bolts
3 x M5 Nylon Locknuts (Not Shown)
1 x Aluminum Standoff
2 x Eccentric Spacer
2 x M3 Nylon Lock Nuts



Position the X Carriage piece as shown in the picture on the right, make sure the hole shown with the red arrow is on the left. Install the 3 M5x30mm bolts as shown then install the Aluminum Spacer on the bottom bolt and the two eccentric spacers on the top two bolts. Push the eccentric spacer into the metal and turn them so the notch is on the top.

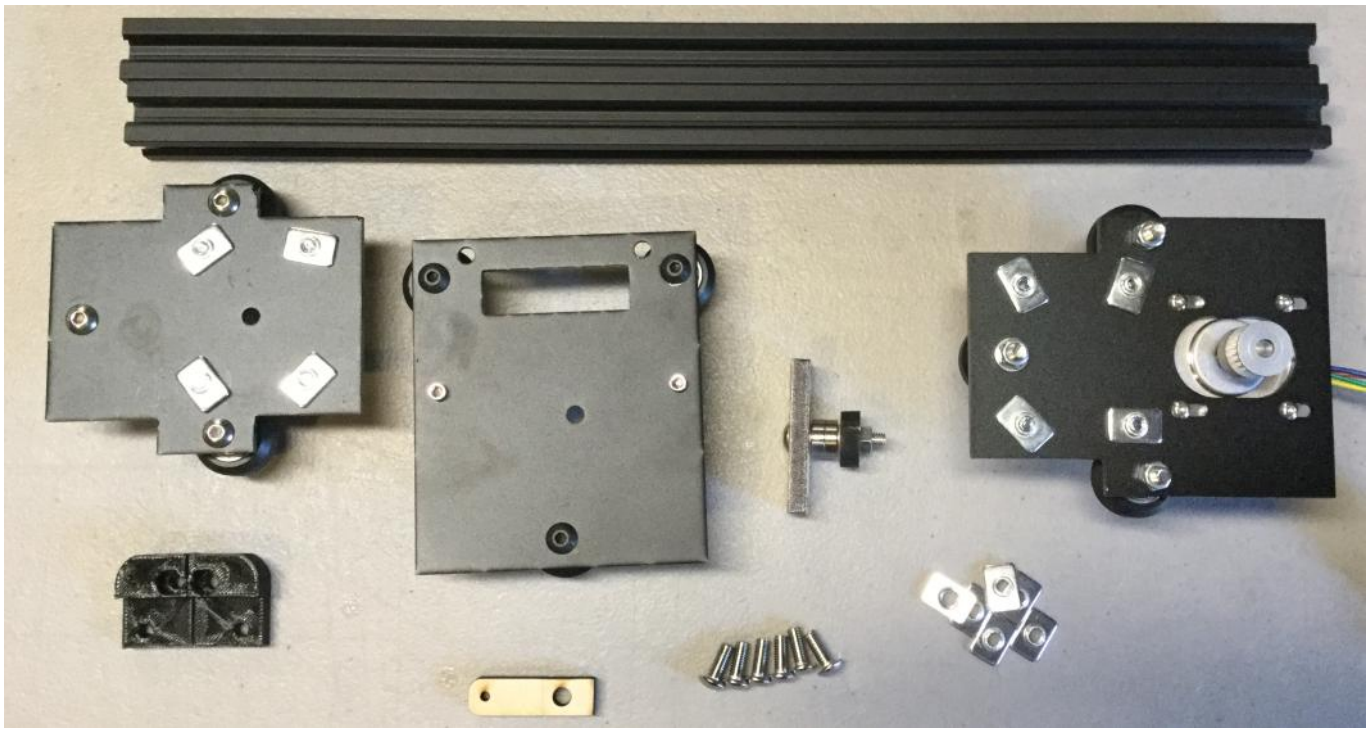
Install Delrin Idlers on to the 3 bolts then a M5 Nylon Lock nut onto each bolt, tighten the nuts, but make sure the Delrin Idlers still turn freely.

Last Install the two M3x16mm Bolts and regular M3 nuts as shown, tighten them down. Then loosly install the Nylon Lock nuts on the M3 bolts, you will remove them later to install the X Belt.

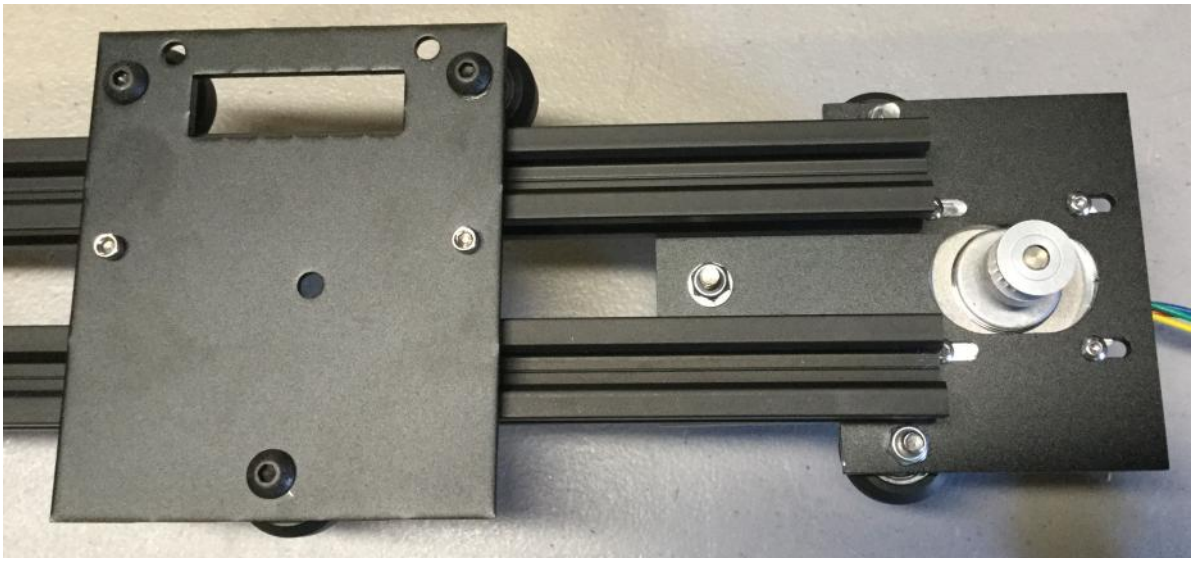


X Axis Assembly

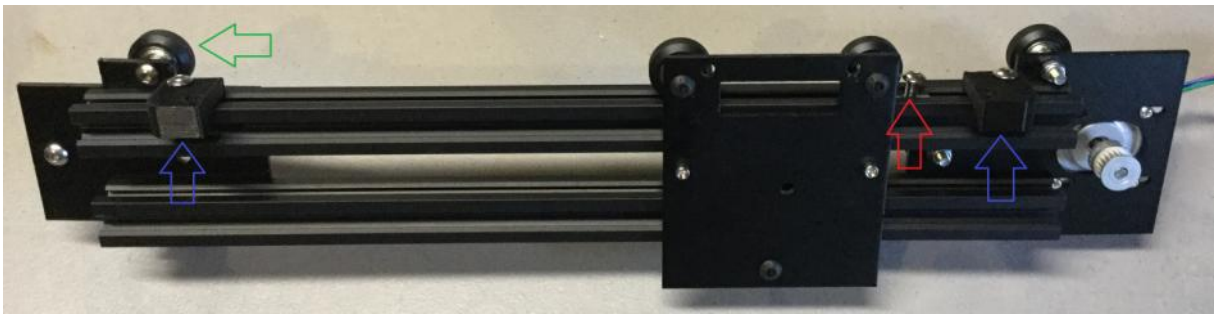
Assembled X Idler, X Motor, X Carriage and Z Nut Traps, your pieces may look a little different then the ones pictured and the Z nut traps will be printed.
2 x Aluminum Extrusions
6 x M5x12mm Bolt
6 x T-Slot Nuts
2 x MR125xx Bearings
2 x M5 Washers
1 x M5x30mm Bolt
1 x Regular M5 Nut



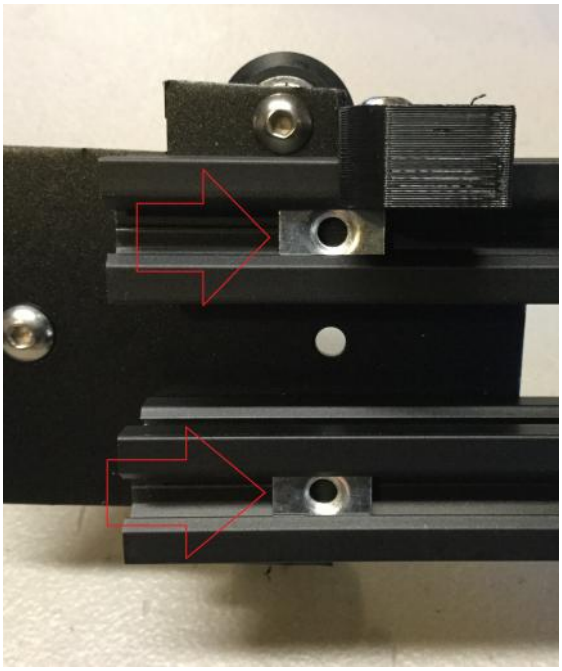
Slide the two Extrusions onto the T-Slot nuts on the X Motor Bracket, push the extrusions away from each other inbetween the two T-Slot nuts then tighten the bolts down, your Extrusions should now be parallel to each other. Slide the X Carriage onto the extrusion as shown below.



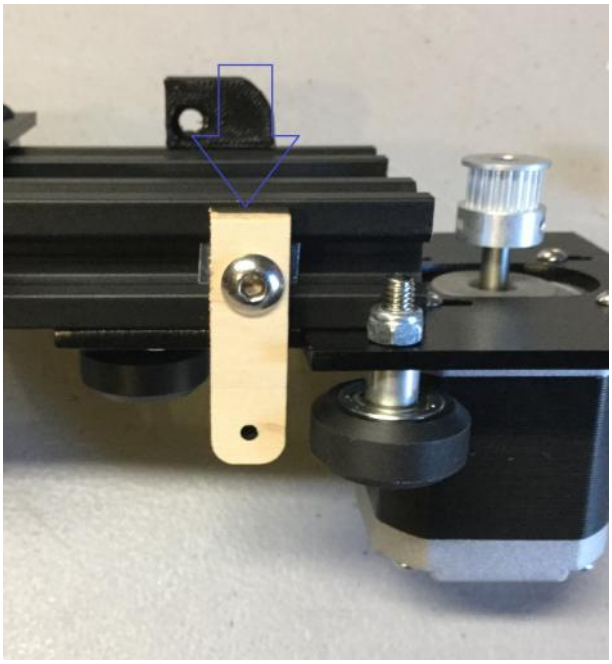
Install a M5x12mm bolt with a T-Slot nut into the top extrusion as shown by the Red Arrow, then Install one M5x12mm bolt and T-Slot nut into the two Z Nut traps and install them as shown by the Blue Arrows, Last slide the X Idler Bracket onto the back of the Extrusion as shown by the Green Arrow. (Leave the X idler loose)



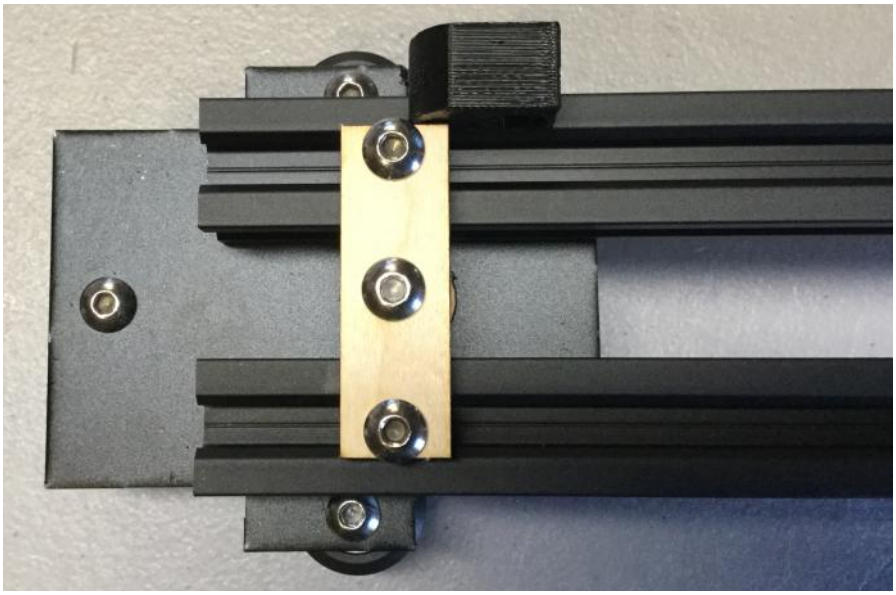
Install Two T-Slot Nuts into the Extrusion by the X Idler Bracket as shown by the Red Arrows Below, then install the Adjustable Z endstop piece with a M5x12mm bolt and T-Slot nut by the X motor bracket as shown by the Blue Arrow.



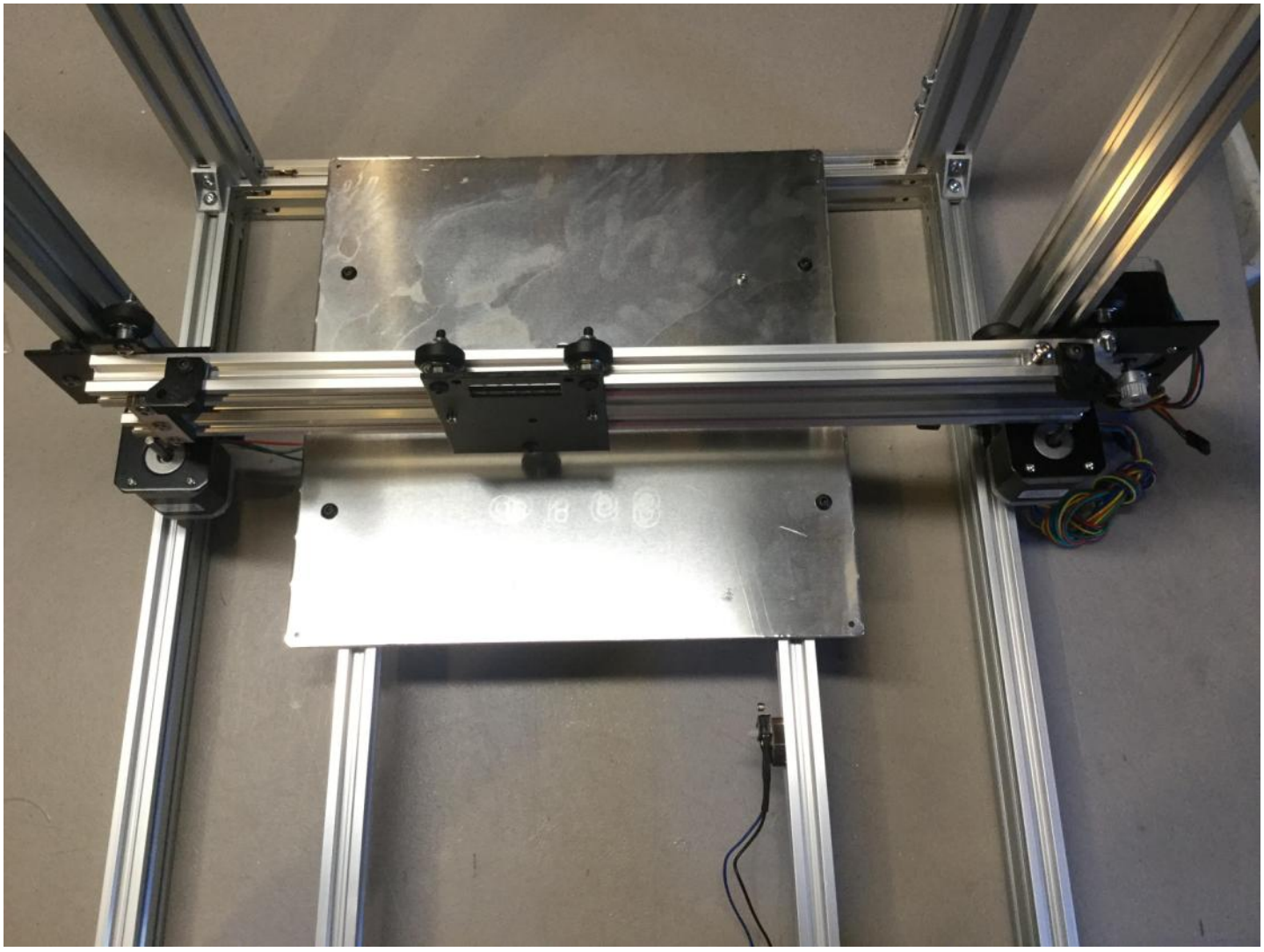
Last



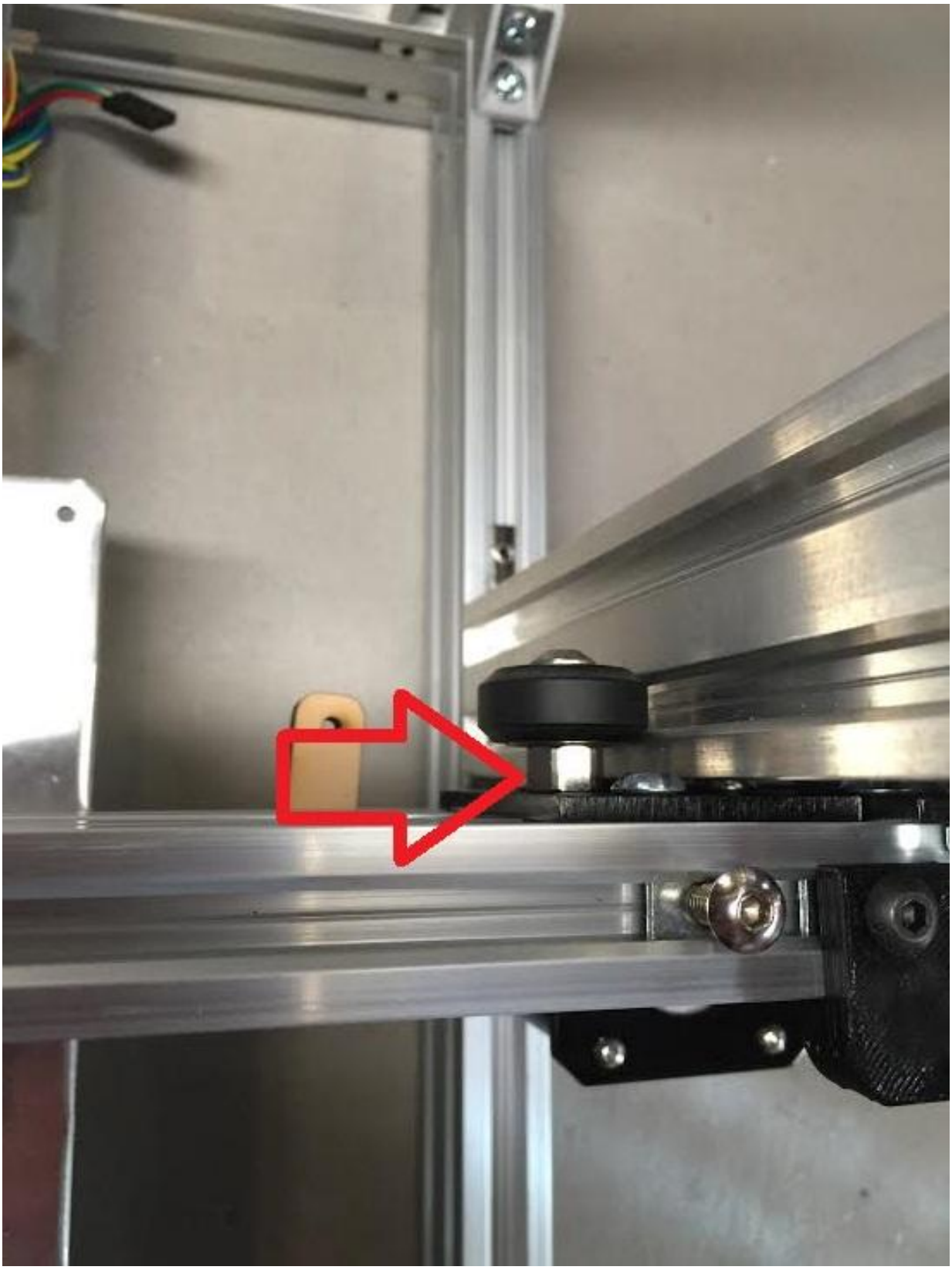
Install the Belt Idler onto the two T-Slots using two M5x12mm long bolts, The Belt Idler bolt will go into the hole in the X Idler bracket



Now slide the X axis down onto the Frame as shown below. Since your X idler bolts are loose you can adjust the placement of the X idler to allow the X axis to slide onto the extrusion.

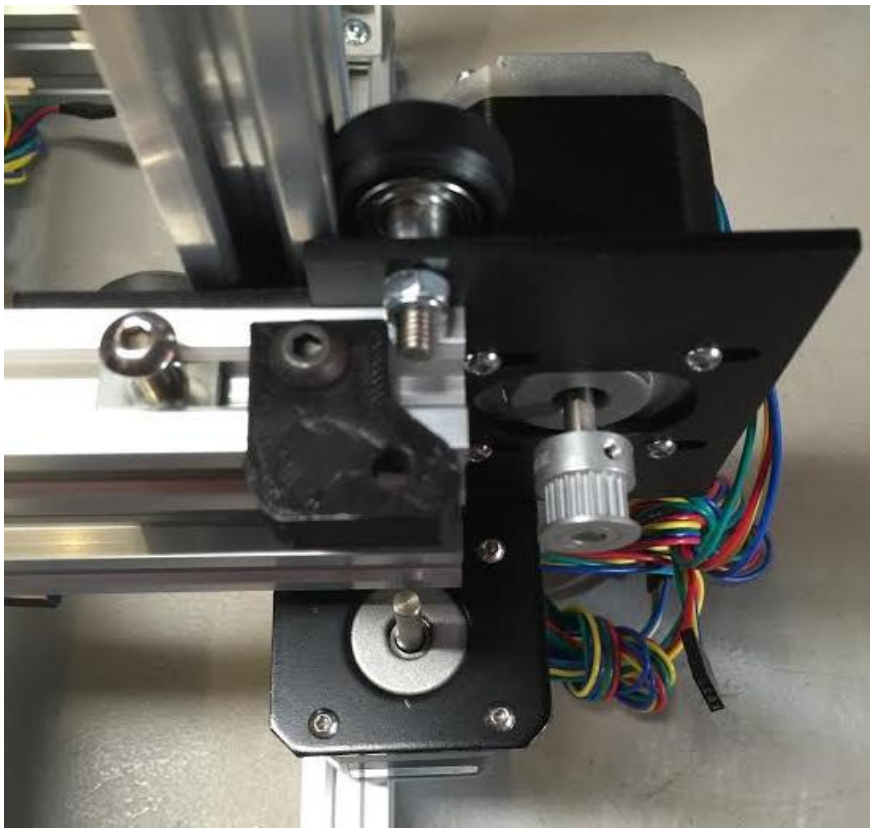


While the bolts that hold the X idler side to the extrusion are loose turn the eccentric spacer on the X motor until you can see that all 3 delrin wheels on the X motor contact the extrusion.

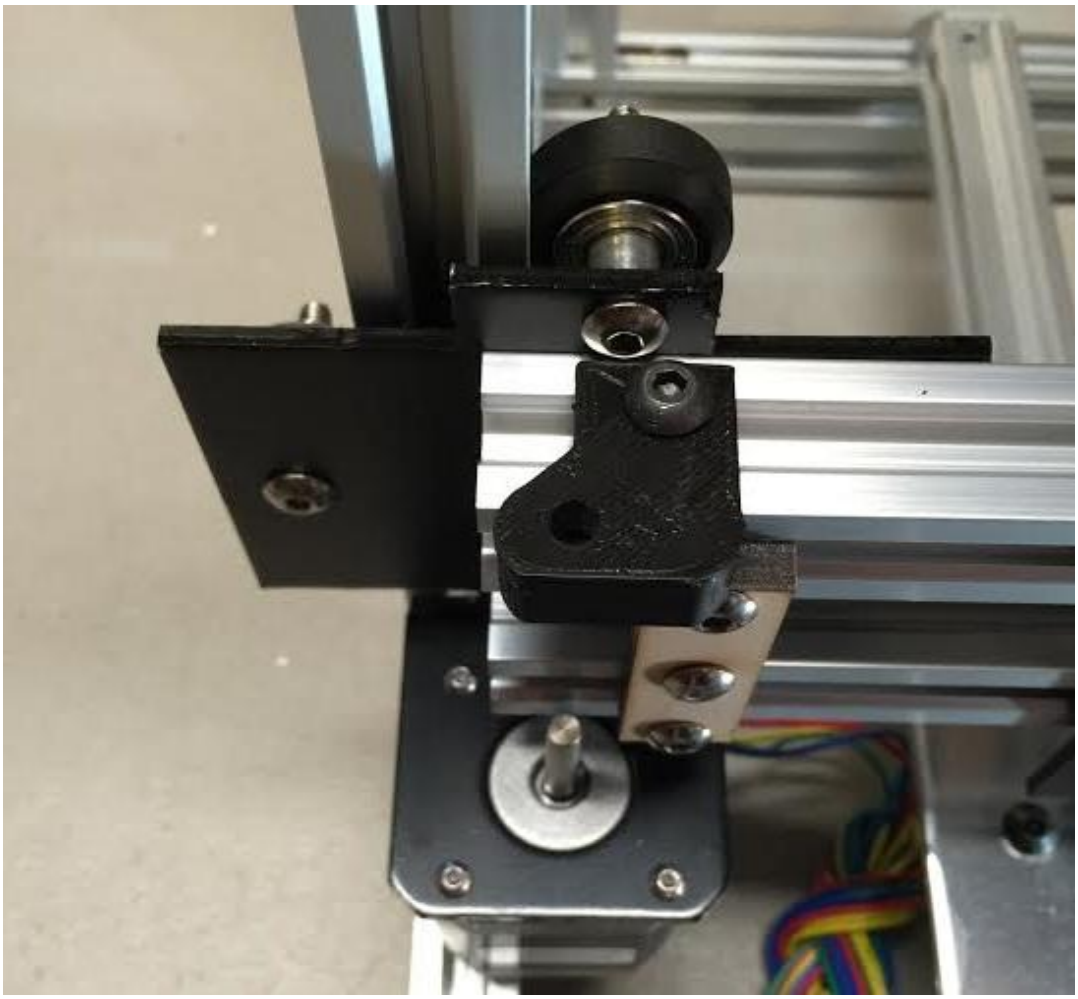


Now tighten the Eccentric spacer on the X Idler side so all 3 delrin wheels contact the extrusion, then tighten down all the bolts holding the X idler and Belt idler to the extrusion.

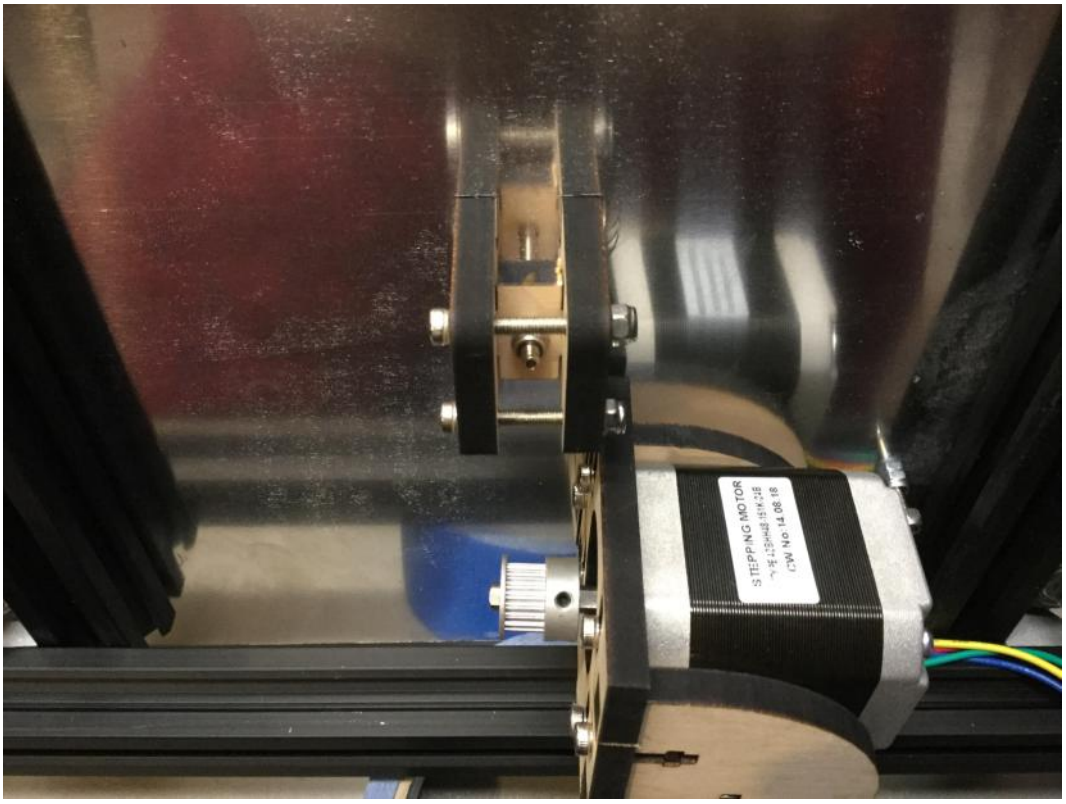
Align the Z nut trap hole with the motor shaft on the X Motor Side then tighten down the bolts holding the Z nut trap to the extrusion.



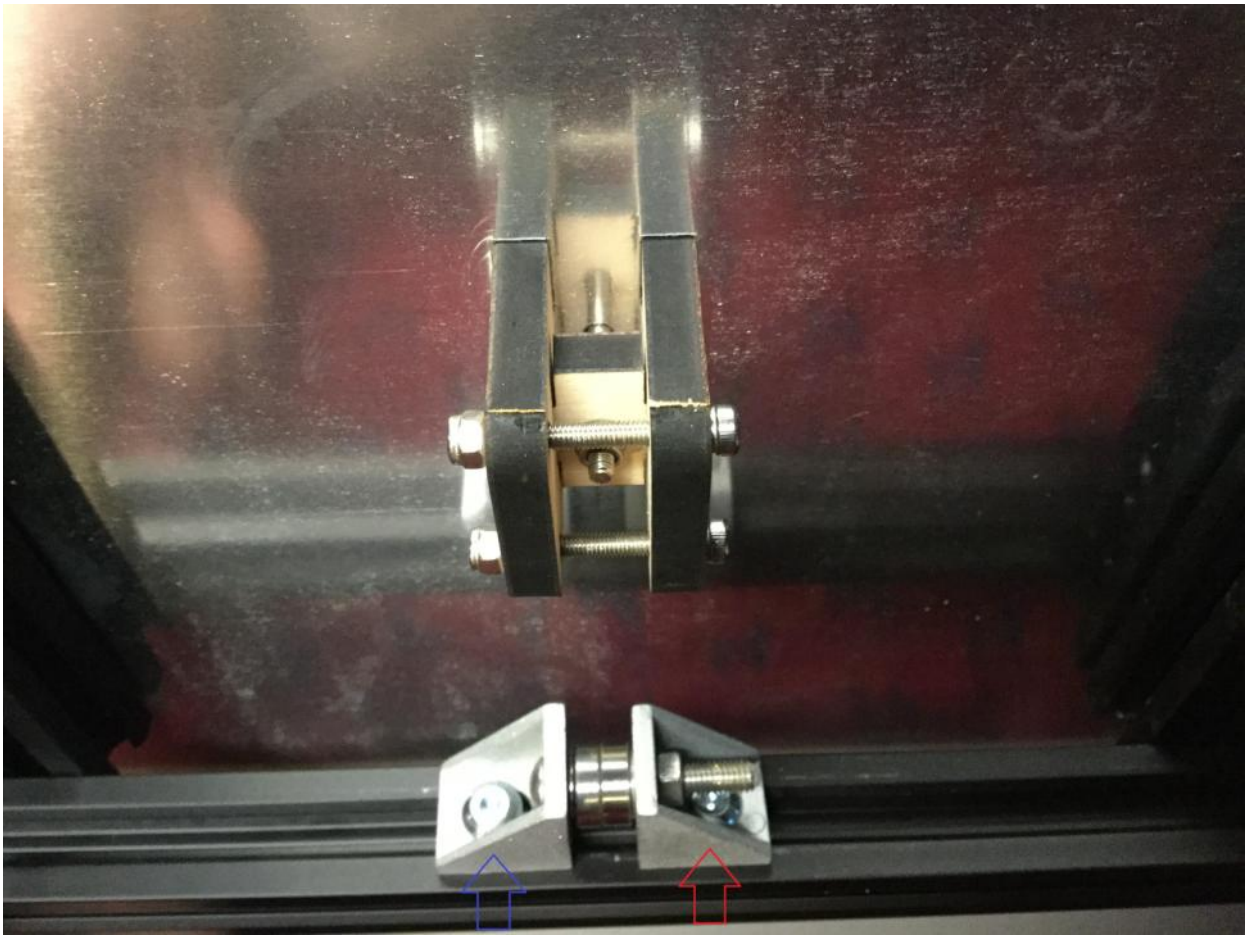
Repeat the process for the Z Nut trap on the X Idler side before tightening down the bolts.



Next turn the printer upside down carefully and align the gears teeth with the wooden mount as shown in the picture, then tighten the gear down with a set screw on the flat spot of the motor shaft.



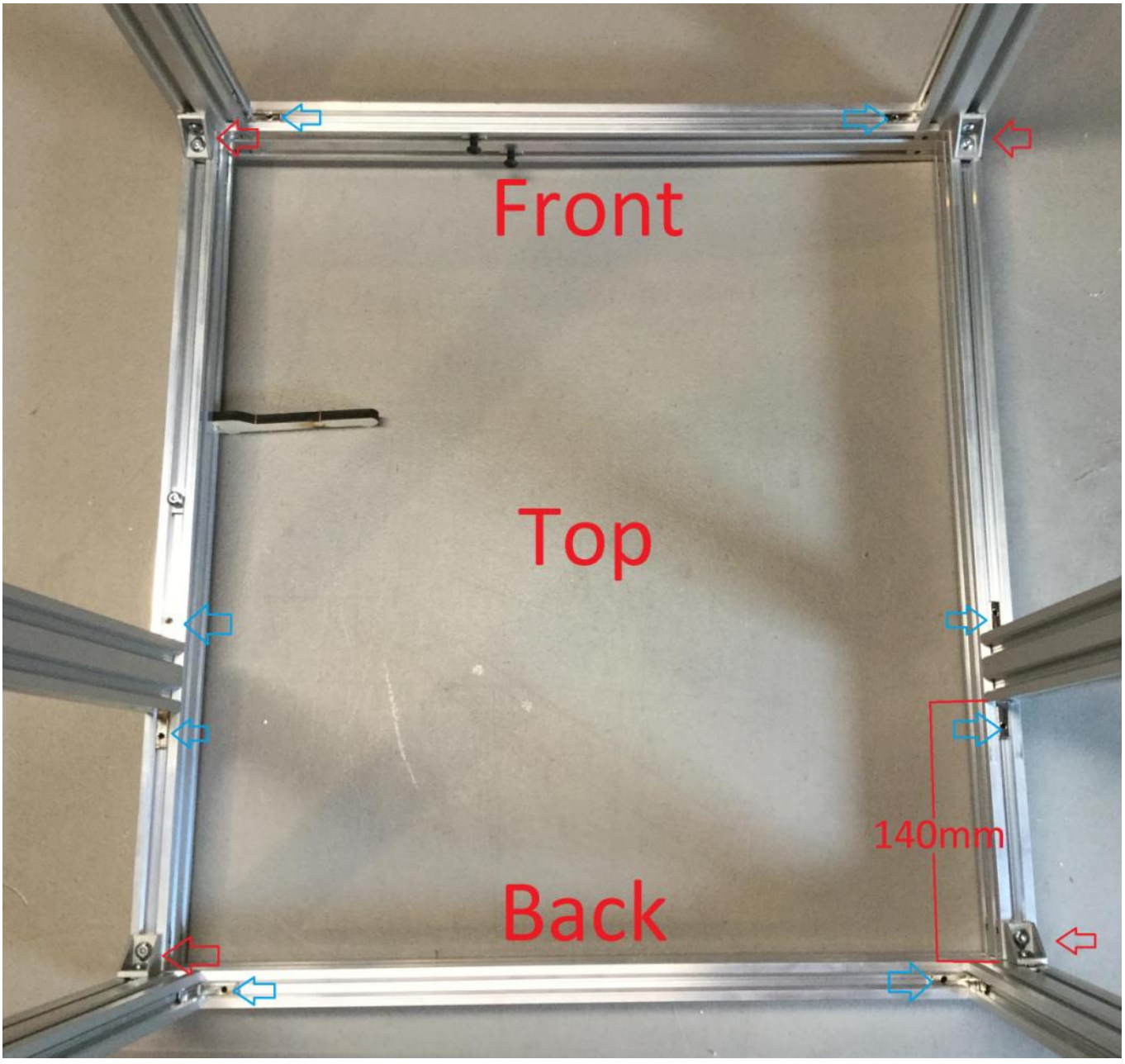
Now move the Heat Bed Mount to the front of the machine, align the Y Belt idler with the wooden mount as shown, then tighten down the bracket to the extrusion with the red arrow in the picture below, then with an M5x30mm bolt install in between the two brackets a washer, 2 MR125zz bearings, another washer, then tighten the M5x30mm bolt with an M5 regular nut, last tighten the bracket with the blue arrow as shown below.



Now install the top of the frame onto the extrusions you just installed. For now you will just align the 8 hidden corner brackets on the top part of the frame with the 6 extrusions so make sure the hidden brackets move freely and are not bolted in place. Once you have the top frame on you can align the extrusion in the 4 corners and tighten down the hidden corner brackets (you may want to use a clamp if you have one to keep everything tight).

After that you can flip the frame upside down so it looks like the picture below, move the two extrusions so they are 140mm from the inside of the back extrusion then tighten the hidden corner brackets down (Hidden corner brackets are all shown with blue arrows).

Next move the cast corner brackets down so you can connect them to the m5x8mm bolts you installed earlier (See Red Arrows). Tighten everything down and make sure everything is square. If the frame isn't square loosen the brackets and square up the frame before tightening them down. (To make taking pictures easier the X axis isn't shown in this picture)

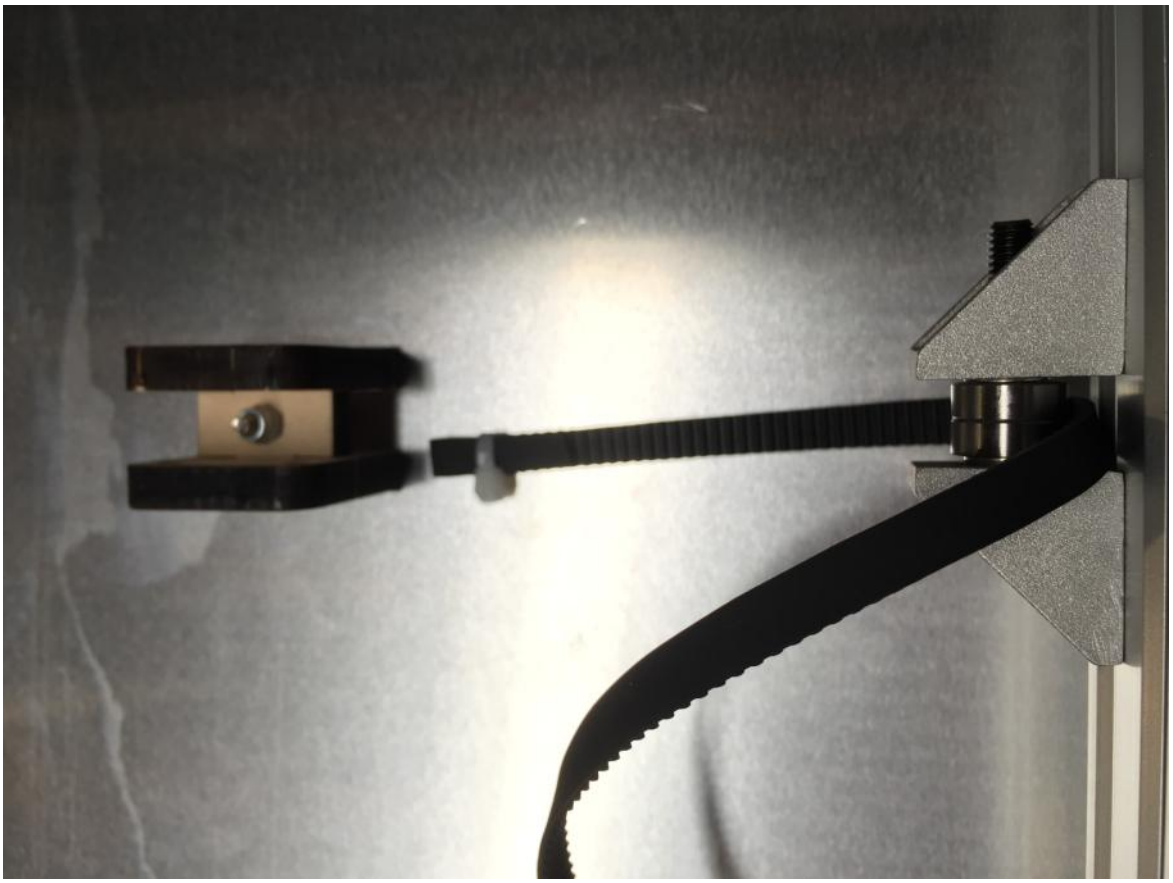


Belts

Belts

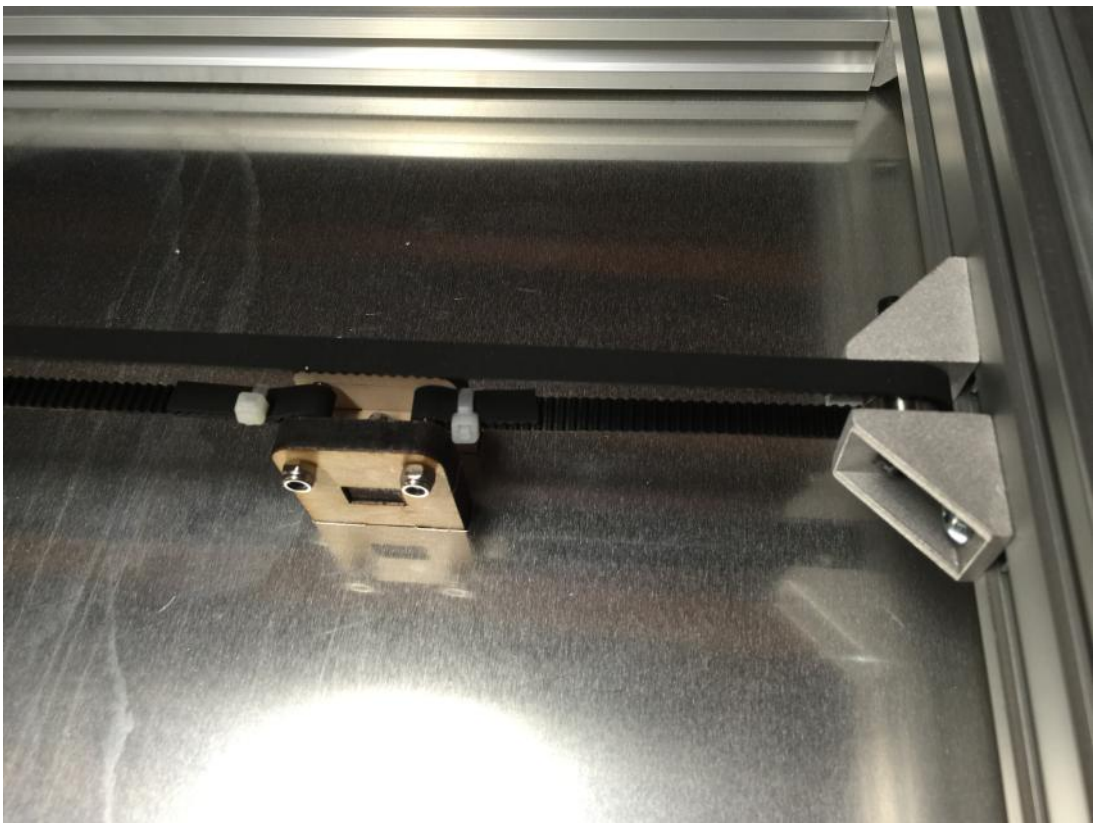
4 x Zip Ties
2 x M3x25mm Bolts
2 x M3 Nylon Lock Nut
1 x GT2 Belt

Next get your belt and cut a piece off that is 39 inches long loop one end over and use a zip tie to secure it, then install the belt through the Idler bearings.

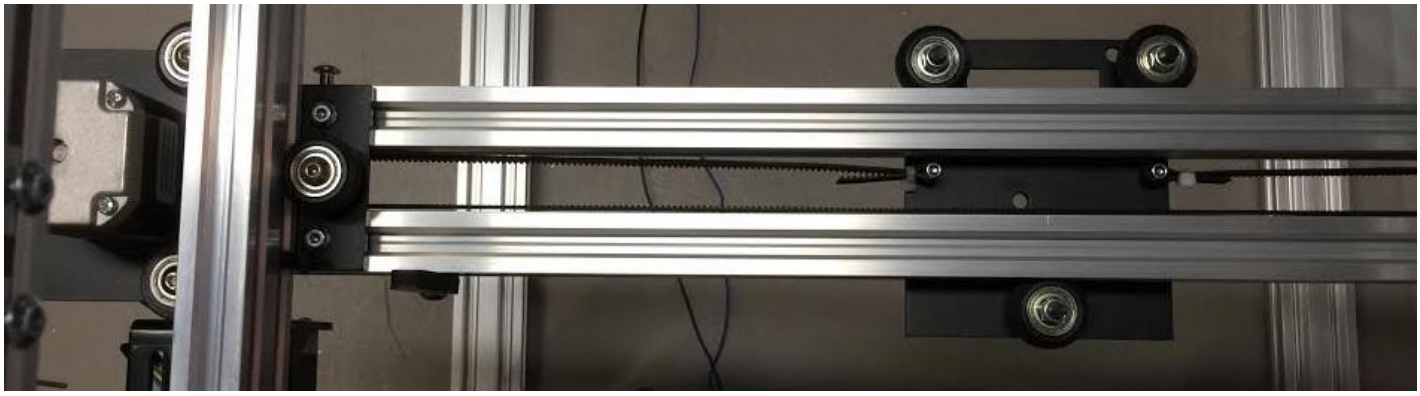


Install the loop onto the wooden mount using an M3x25mm bolt and Nylon lock nut, then run the belt back to the motor, around the GT2 Gear then back to the wooden mount, Loop the other end making sure that the belt will be tight when you install it into the wooden mount, then zip tie the loop and install the loop to the wooden mount using the other M3 bolt and Nylon Lock nut.

If you need to adjust the tension of the belt you can adjust the Y belt bearings in the front of the machine by moving them as far to the front of the machine as possible then tightening the M5x30mm bolt back down.

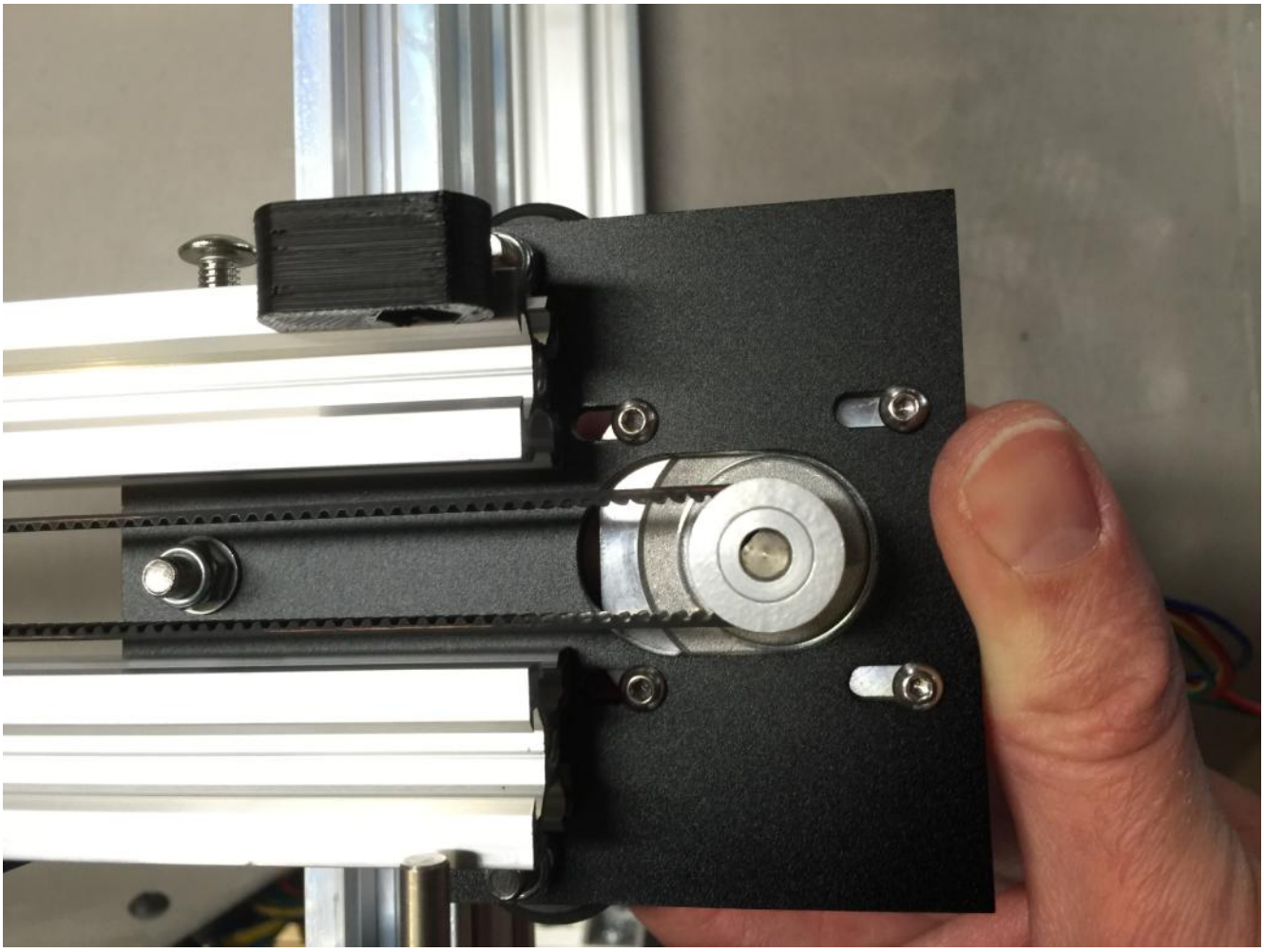


Next get the rest of the belt, loop one end over and use a zip tie to secure it, install that loop onto one of the M3x16mm bolts on the X Carriage, Run the other side of the belt through the idler then over to the other side of the printer and go around the gt2 gear on the motor and back to the other M3x16mm bolt. (Make sure you X motor is pulled as far to the center of the printer as possible) then loop the other end and install a zip tie before installing it on the other m3x16mm bolt. Install M3 Lock nuts on the M3x16mm bolts (use needle nose pliers to tighten the Nylon Lock Nuts.



At this time you can also adjust the Eccentric Spacer on the X carriage so all 3 wheels contact the Aluminum Extrusion.

Now pull the X motor to the Right of the printer to tension the belt then tighten down the 4 M3x10mm bolts that hold the motor to the X motor bracket



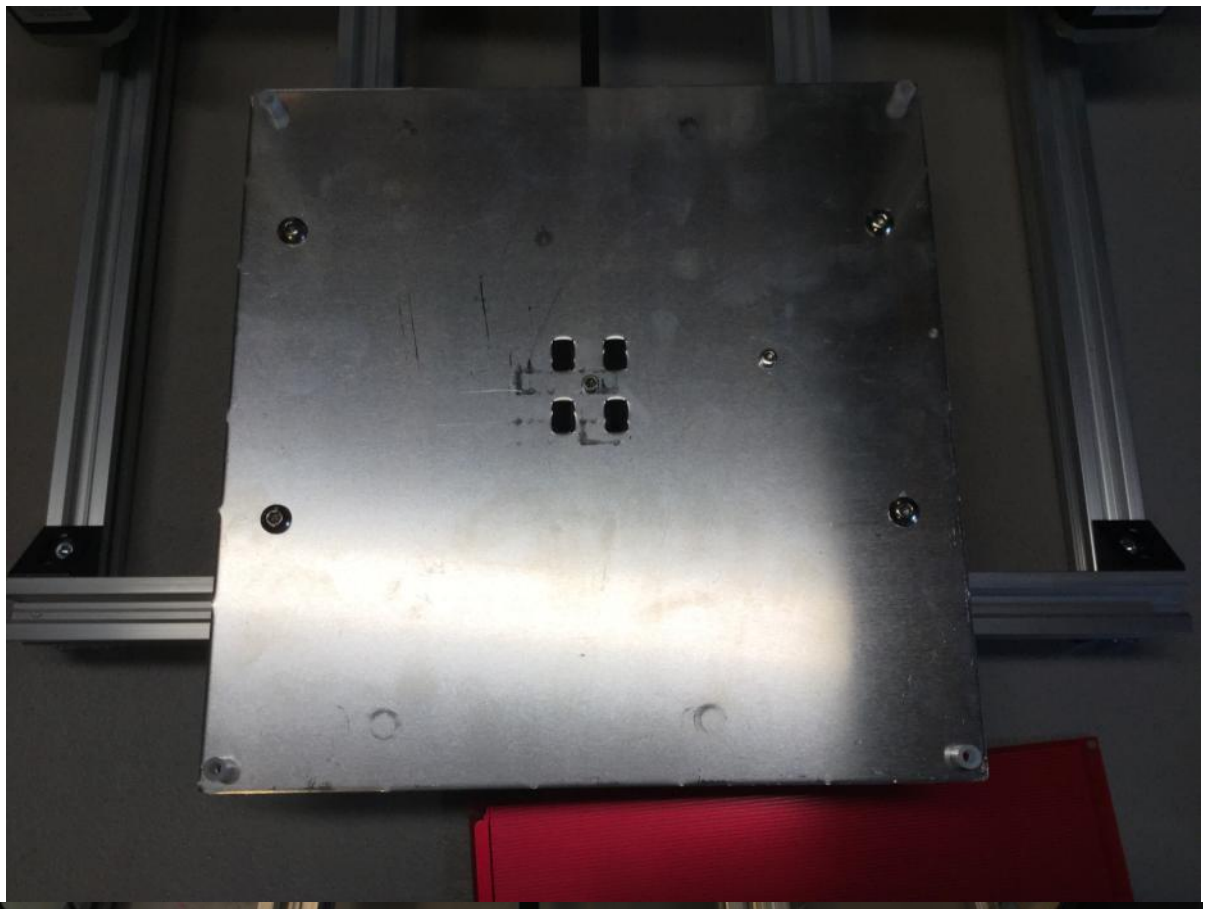
Heat Bed

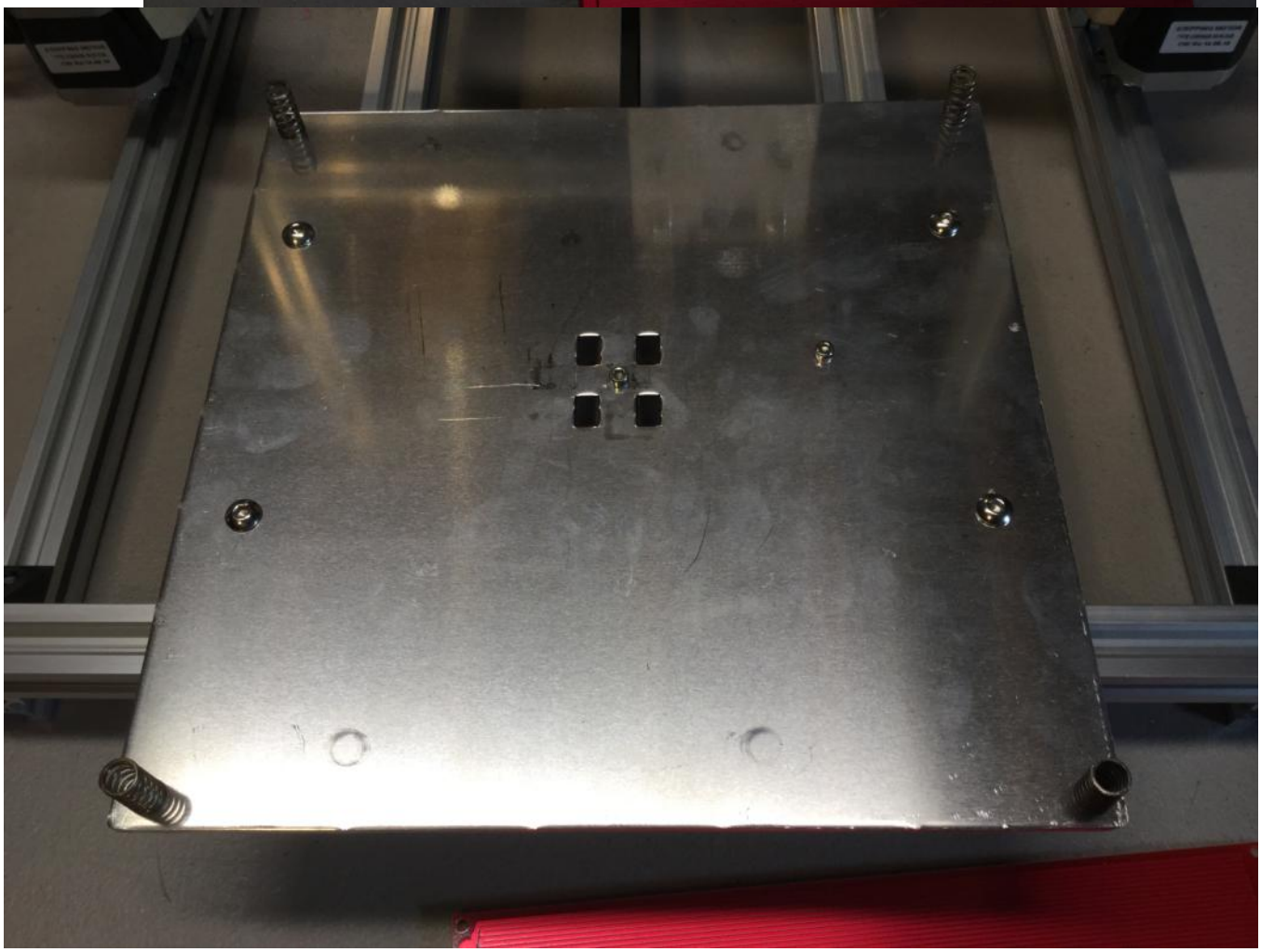
Heat Bed

1 x Heat Bed
1x Thermistor
4 x M3x25mm Bolts
4 x M3 Nylon Lock Nut
12 x Wood Spacers

Get the thermistor for your heat bed and if it hasn't already been taped to the bottom of the heat bed use kapton tape to tape it to the bottom so the glass bead is in the center of the bed (Your kapton tape will not be as wide as the kapton tape shown so you will use more strips of tape)

Position the 12 Laser Cut Wood spacers or 4 Springs over the 4 holes in the corner of the heat bed mount as shown in the two pictures below. (New kits will come with just the wood spacers instead of springs for better print quality)

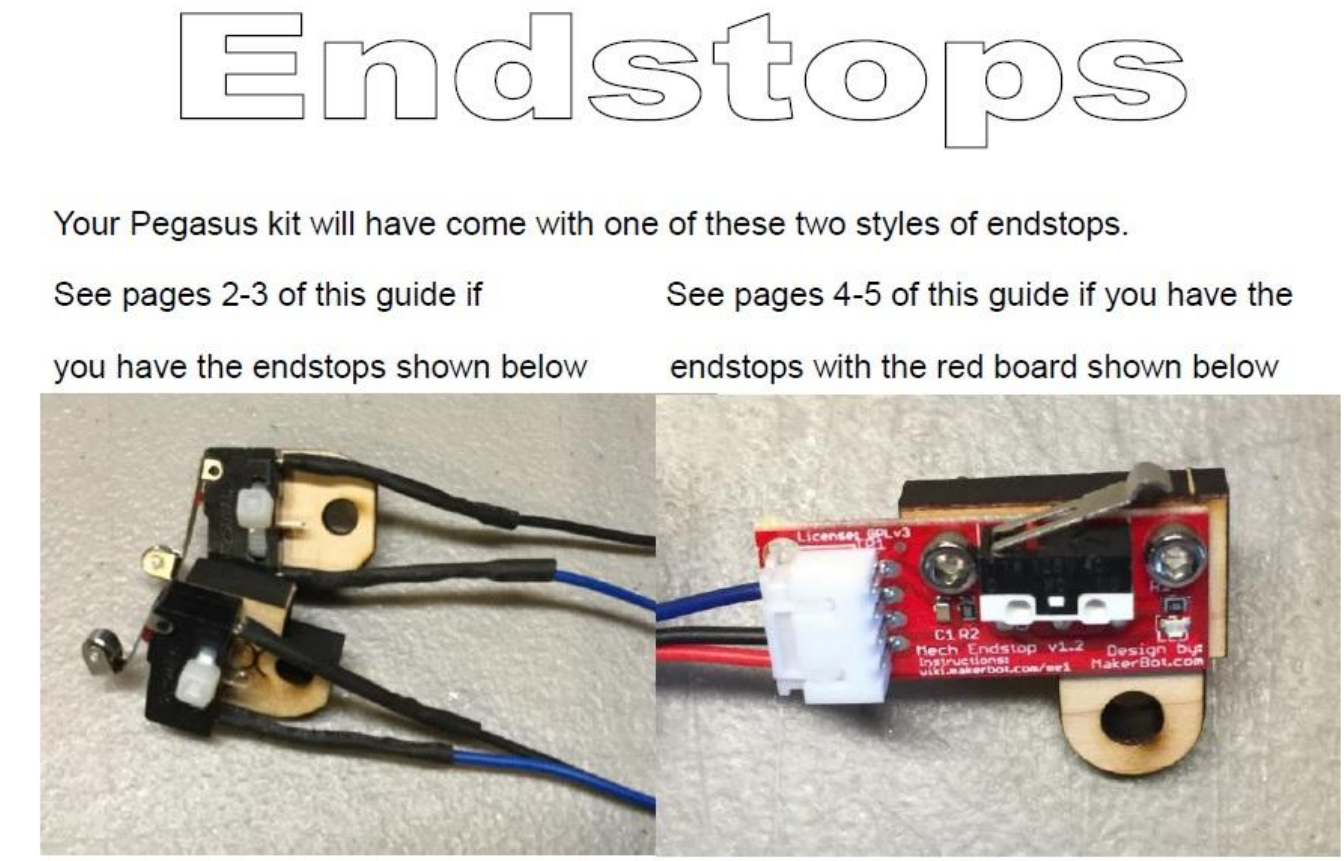




Install your Insulation/Fire Blanket on the heat bed mount, then put the heat bed on top then install 4 bolts through the corners, last install an M3 Nylon Lock nut onto each bolt and tighten them down.

Endstops

For the Endstops follow the endstop guide by clicking on the Picture below:

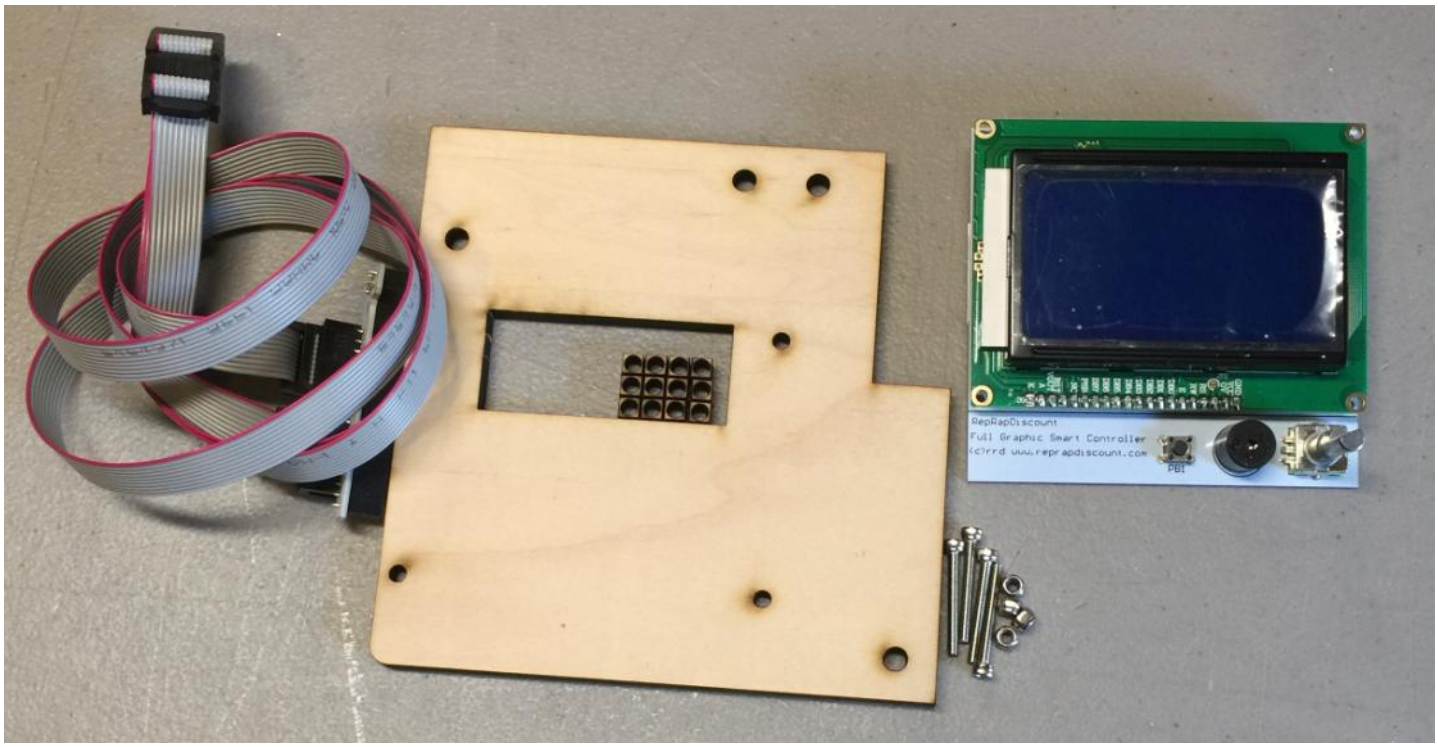


This page intentionally left blank

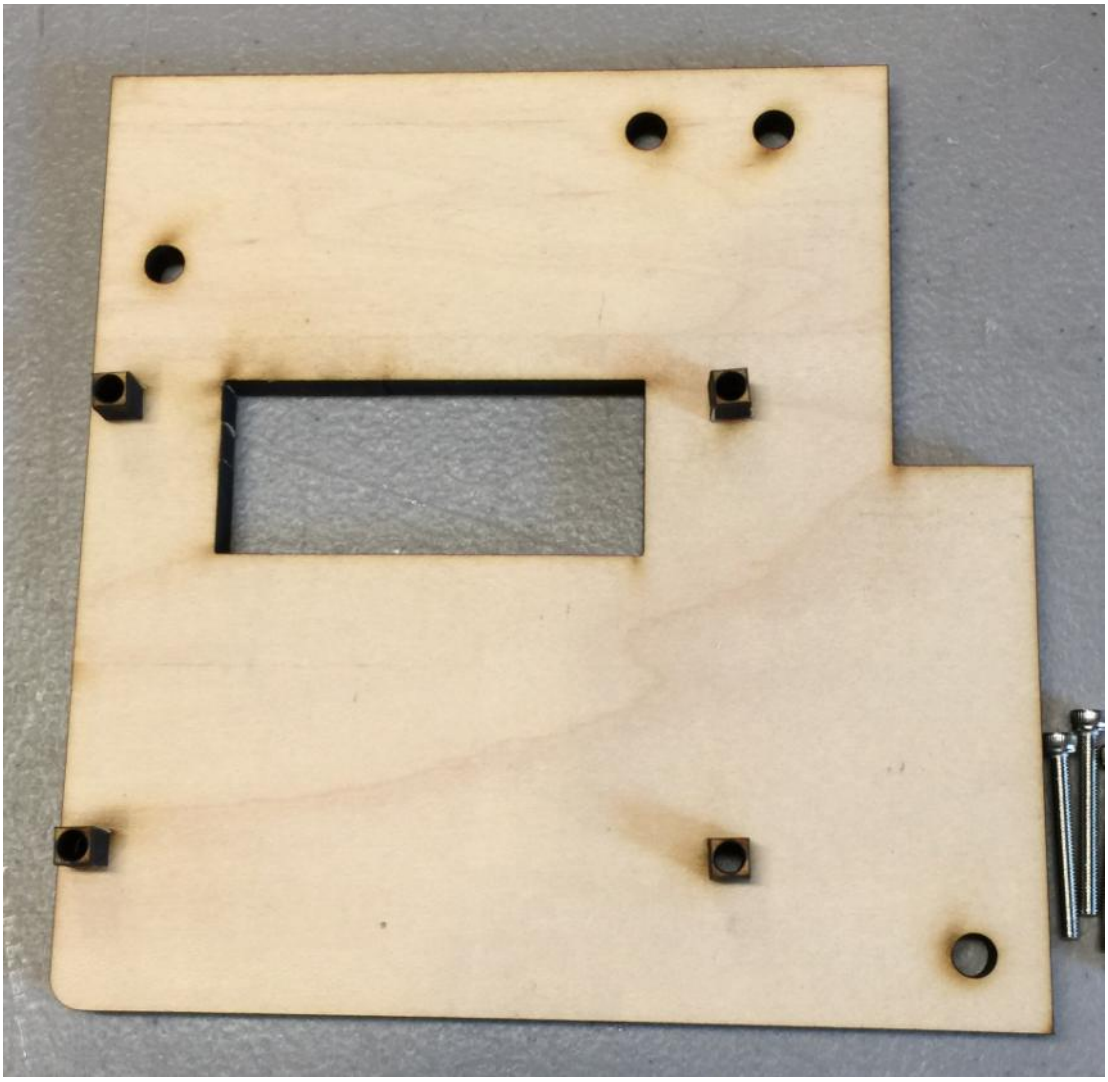
LCD installation

Optional LCD

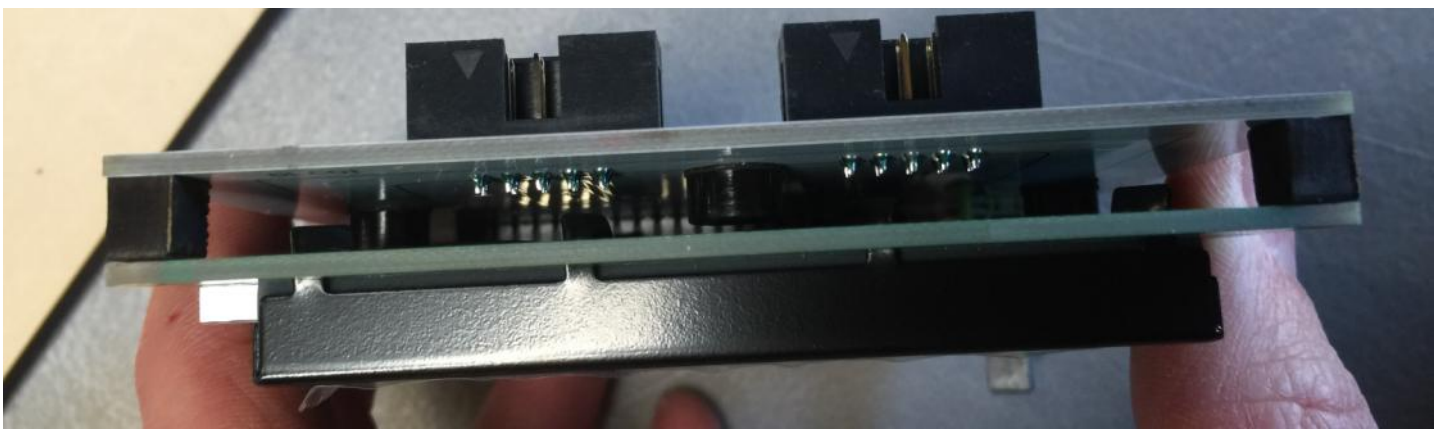
1 x Wood LCD Mount
4 x M3x25mm Bolt
4 x M3 Lock nuts
1 x LCD Interface



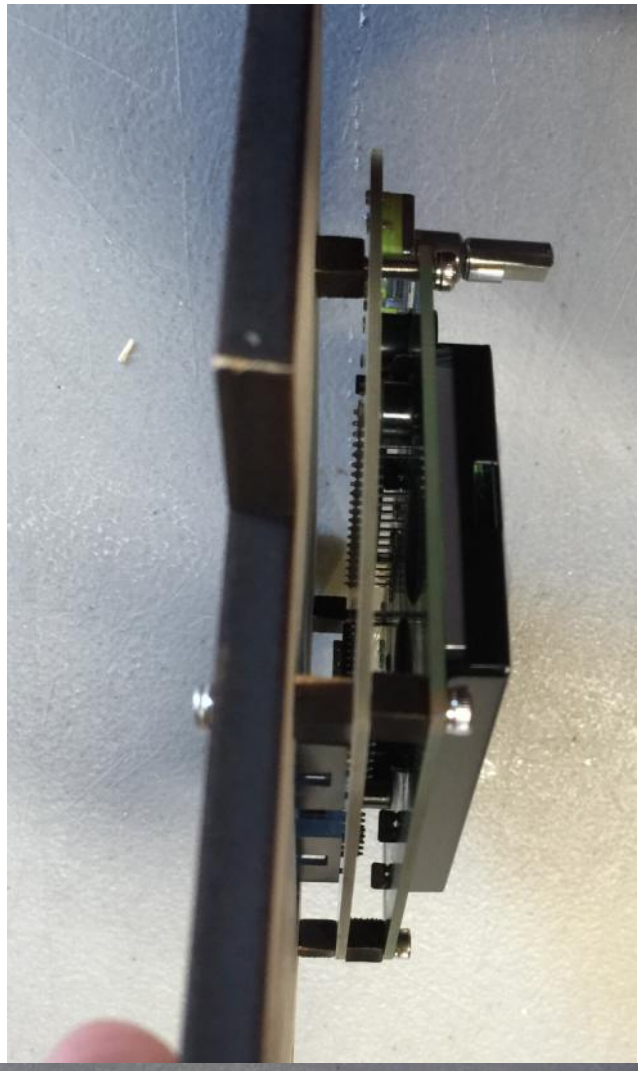
Get 4 of the wood spacers and put them on the 4 holes shown below.



Next get 2 more of the wood spacers and install them inbetween the two PCB boards on the LCD on the top two holes (Do not install a spacer on the bottom holes of the PCB’s)



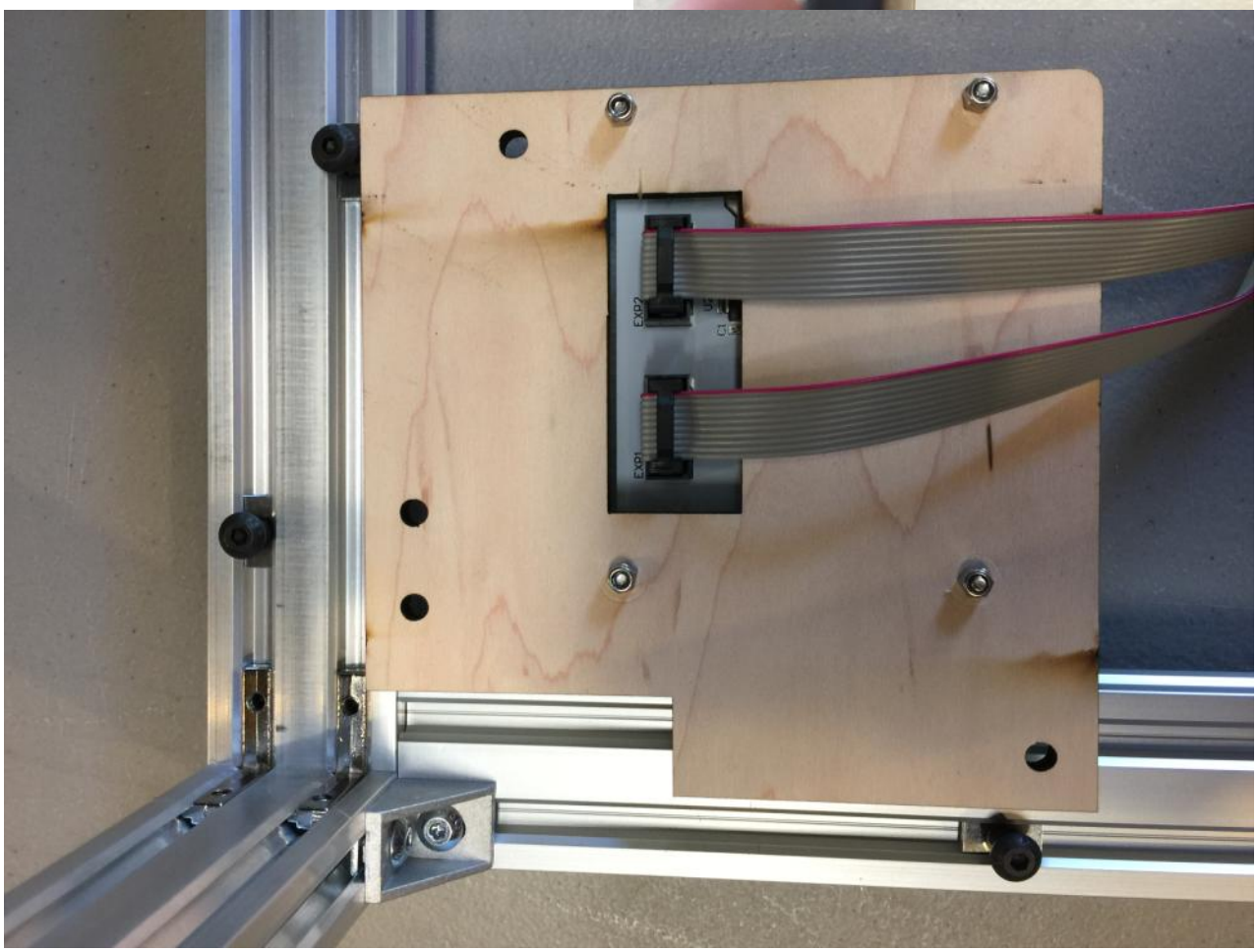
Get the 4 M3 bolts, install them through the front of the PCB's then through the previously installed wood spacers and into the wood plate as shown in the photo on the right.



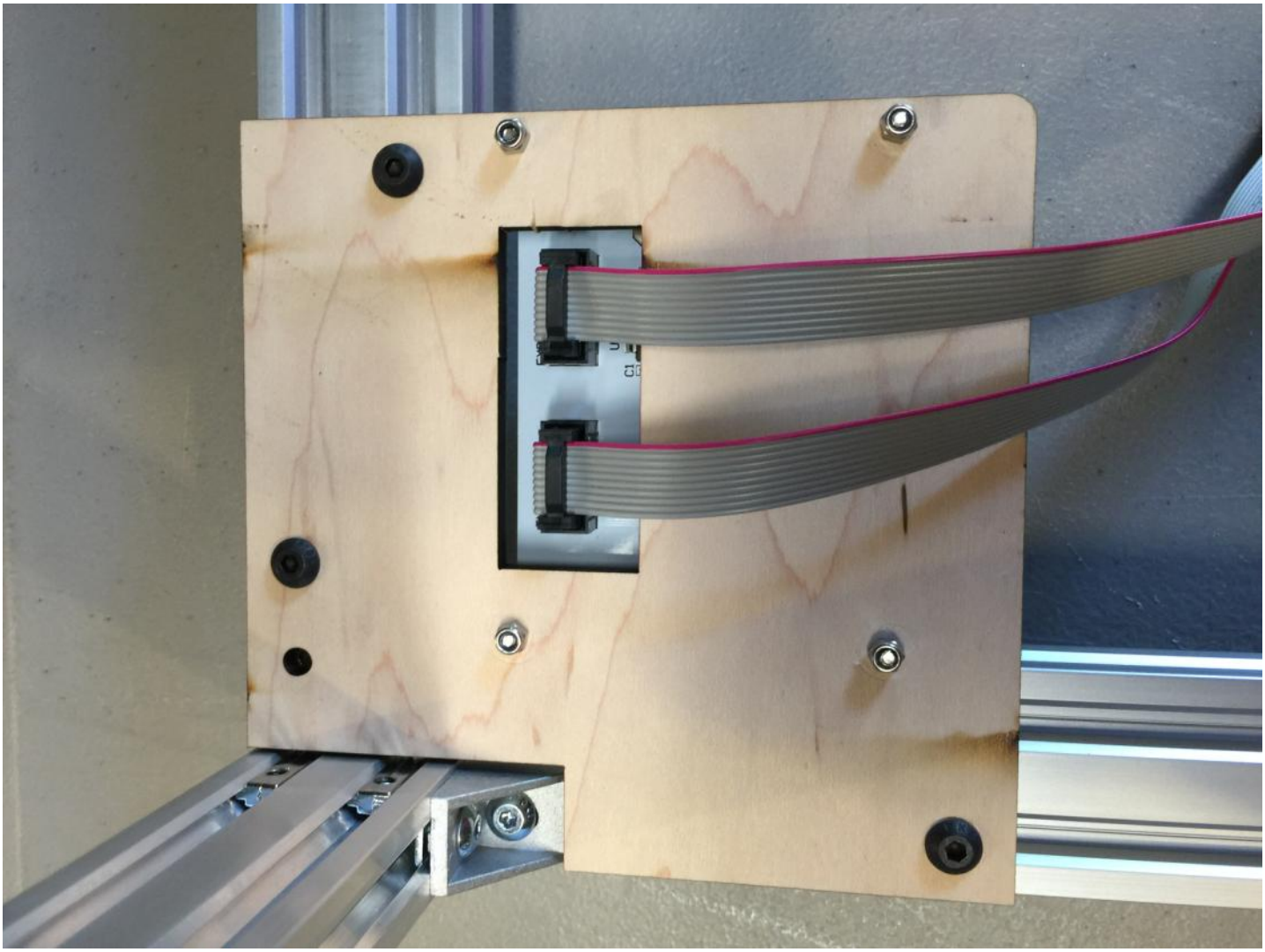
Install the 4 M3 Nylon Lock nuts on the bolts, make sure the two on top are tight, but don't tighten the bottom two to much or or the LCD will flex.

Install the Two ribbon cables, Connect one cable to EXP1 on the LCD and EXP1 on the Smart Adapter then the other cable to both EXP2 Ports.

Align the LCD with the 3 previously installed M5x12mm bolts in the top right front corner of the frame as shown below.



Then install the LCD using the 3 bolts



E3d Lite6 Hot End

Gather the following parts
1 x Hot End Kit

E3D Lite6 Assembly

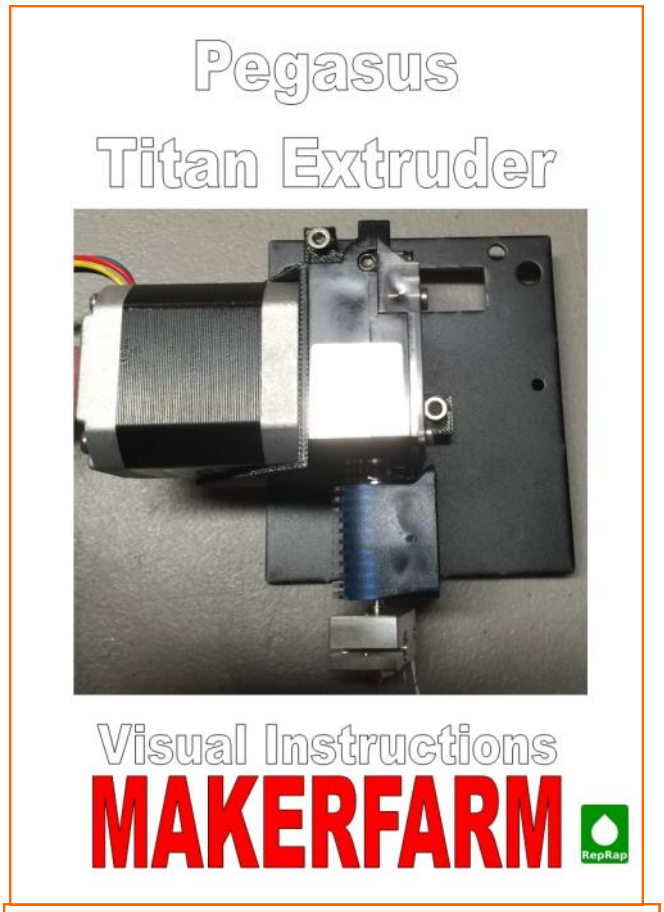
E3D-v6 Assembly

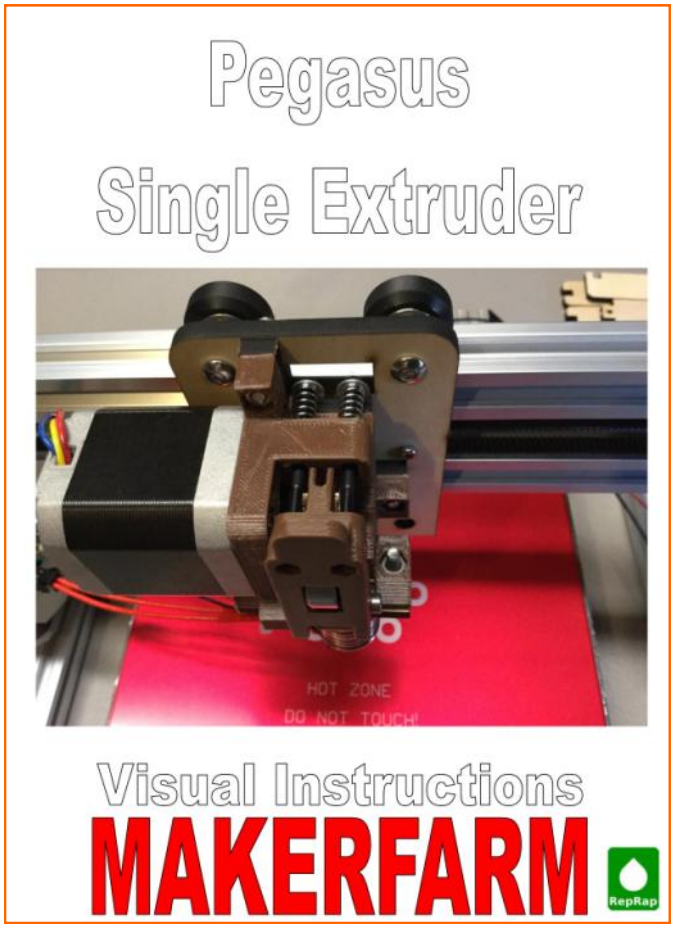
Your e3d Fan will connect directly to your power supply, Black fan wire to v– and red fan wire to v+

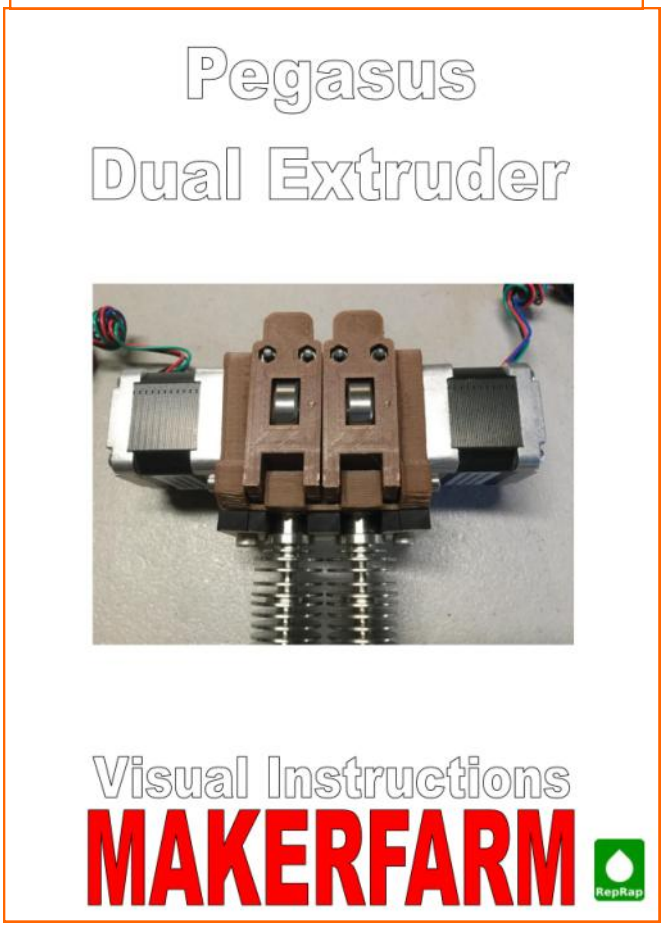
Extruder

Extruder

Click on the image of the Extruder you have to open the build guide for that Extruder.

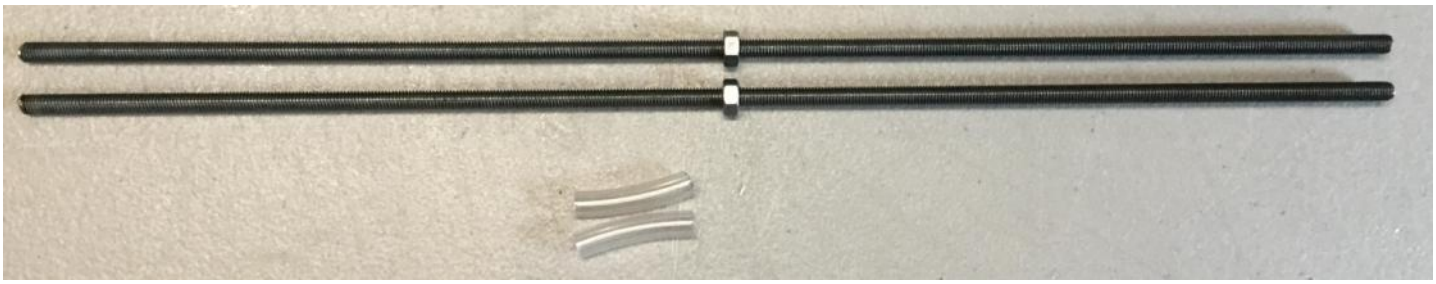






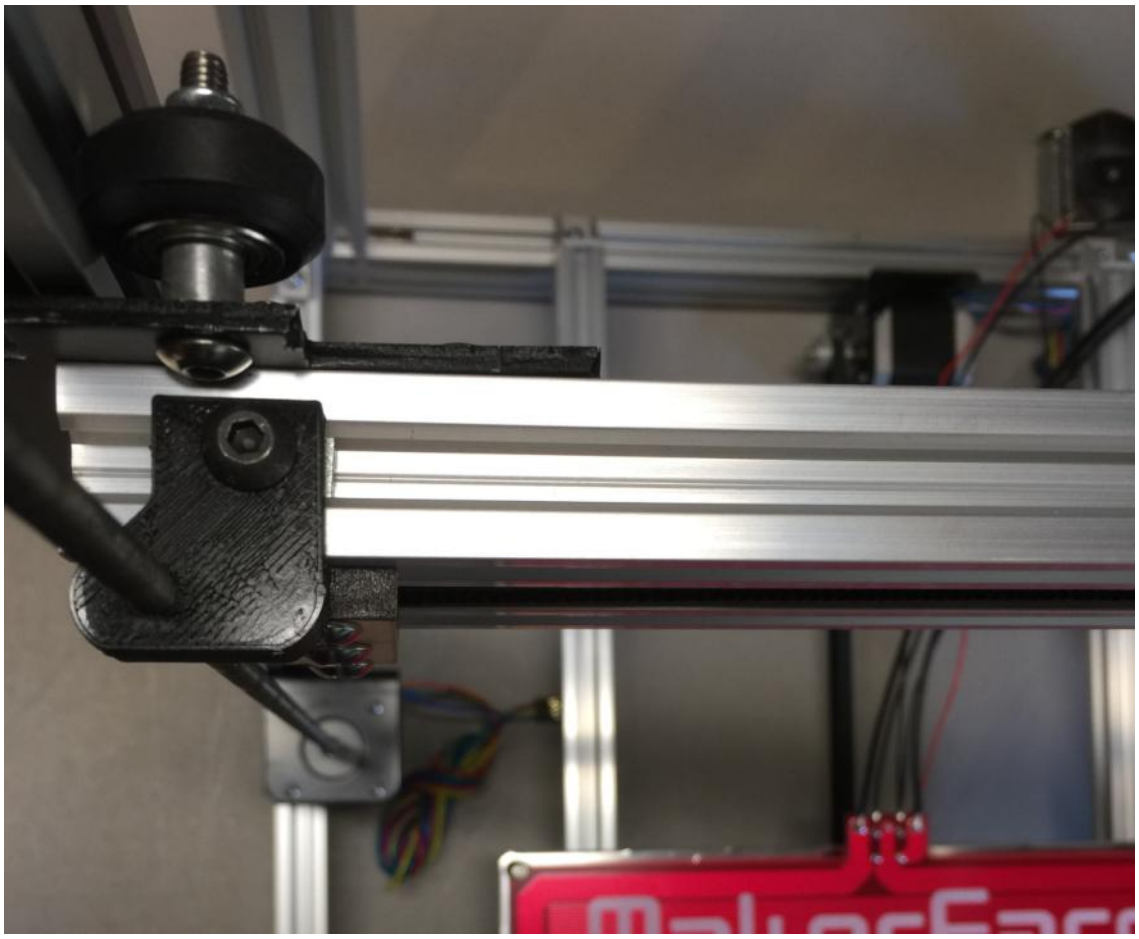
Z Rods

Gather the following items to mount the Z Threaded Rods
2 x M5 Threaded Z Rods
2 x M5 Regular Nuts
2 x Z Coupler Tubes

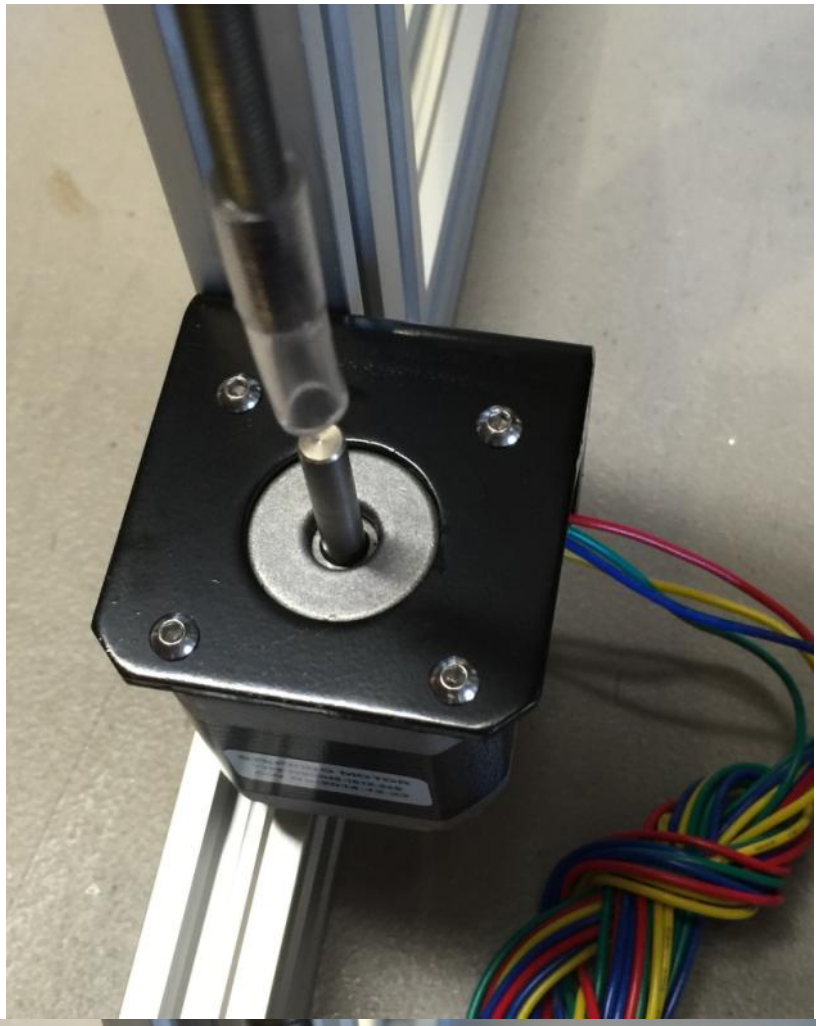


Thread the M5 nuts onto the threaded rods about half way, if the nut won't easily thread onto the threaded rod try the other end of the threaded rod.

Next, Lift the X axis up, push the threaded rods through the printed Z nut trap and seat the M5 nut in the printed piece, repeat for the other side.



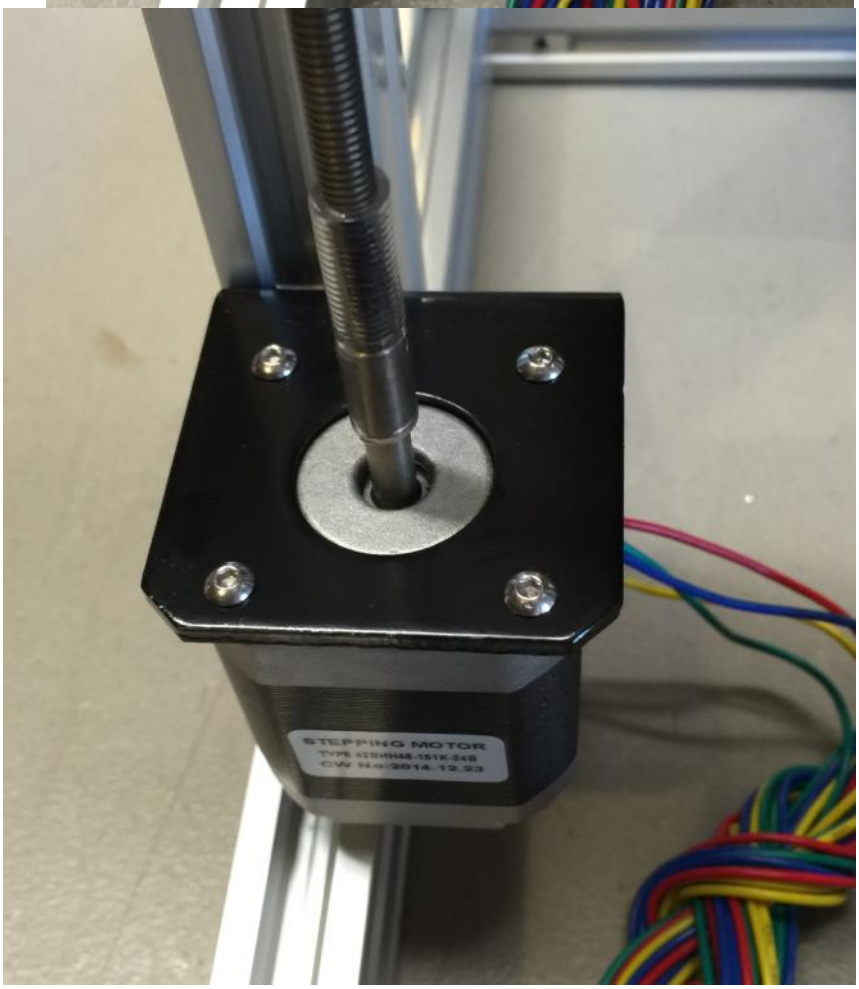
Push the clear tubing half the way onto the motor shaft, then align the threaded rod over the tube and while holding the tube push the threaded rod into the tube.



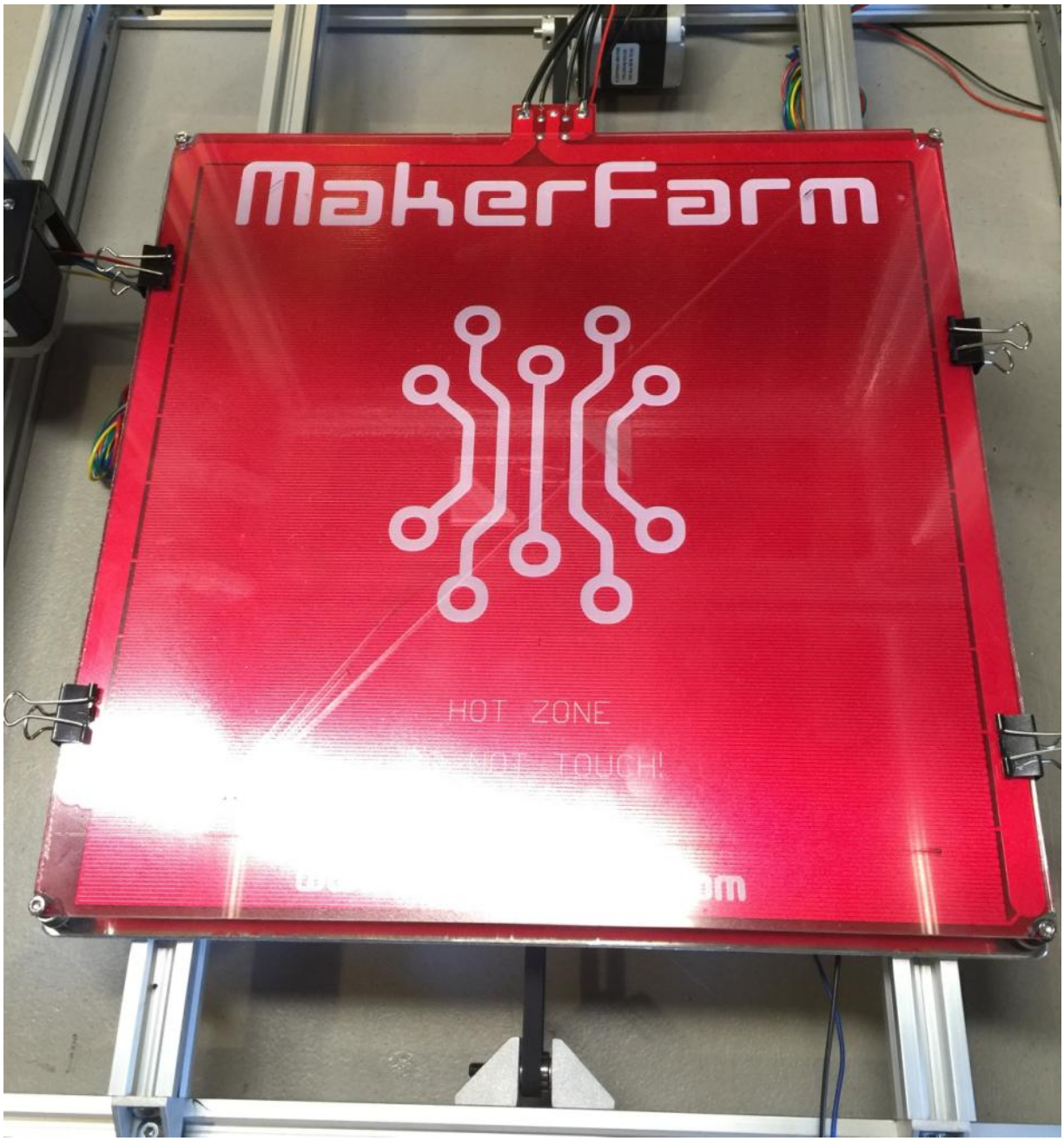
You should now have the threaded rod meeting the motor shaft half of the way into the clear tubing as shown in the bottom right picture.

Repeat the process for the other Z motor.

Your X axis should now be sitting on the M5 nuts on the threaded rods. If the X axis is not parallel to the heat bed you can hold onto one threaded rod to prevent it from turning and turn the other rod.



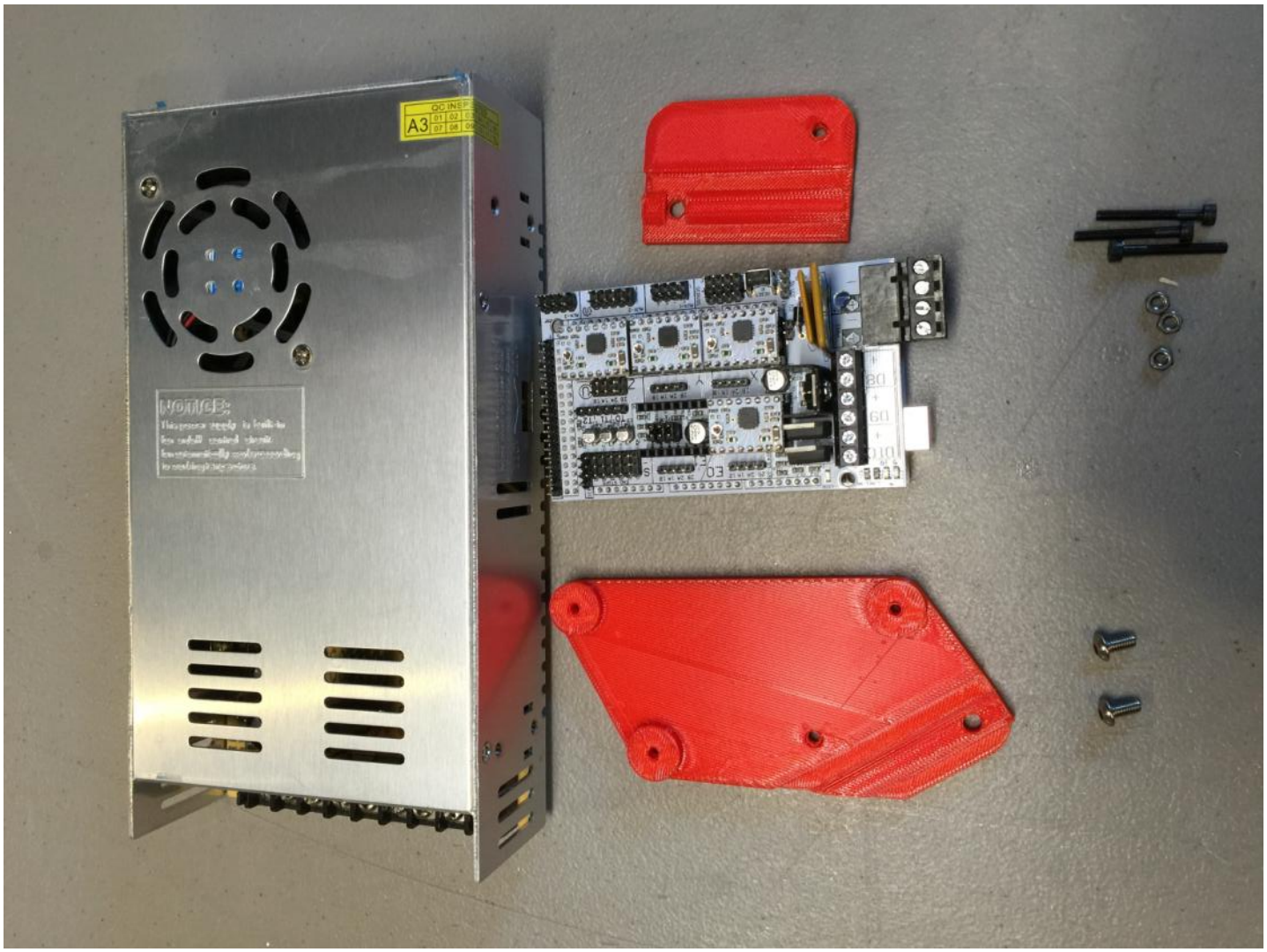
Next get the glass and hairspray mentioned on page 4 of the build guide, if you haven't already broken the corners off to clear the bolt heads you can do that now. I use plers to break a small amount of glass in each corner and repeat until the glass will sit flat on the heat bed and not on top of the bolts in each corner (The heat bed will not be flat which is why you have glass as a flat print surface). Once the glass fits in between the bolt heads spray one side of the glass with the hairspray, usually this should take about 5 seconds to cover the whole glass with the right amount of hairspray. (Usually I spray the glass once a month then every 4-6 months I remove the glass and wash all the hairspray off under hot water). Last use the binder clips to hold the glass to the heat bed (I remove the binder clip legs as they can vibrate or hit the electronics, keep the legs for when you need to put the glass back on the printer)



Ramps Install

Gather the following items to mount the RAMPS Electronics
1 x Printed Ramps mounting plates
1 x RAMPS Electronics
3 x M3x25mm Bolts
3 x M3 Nuts
2 x M4x8mm Bolts
1 x Power Supply

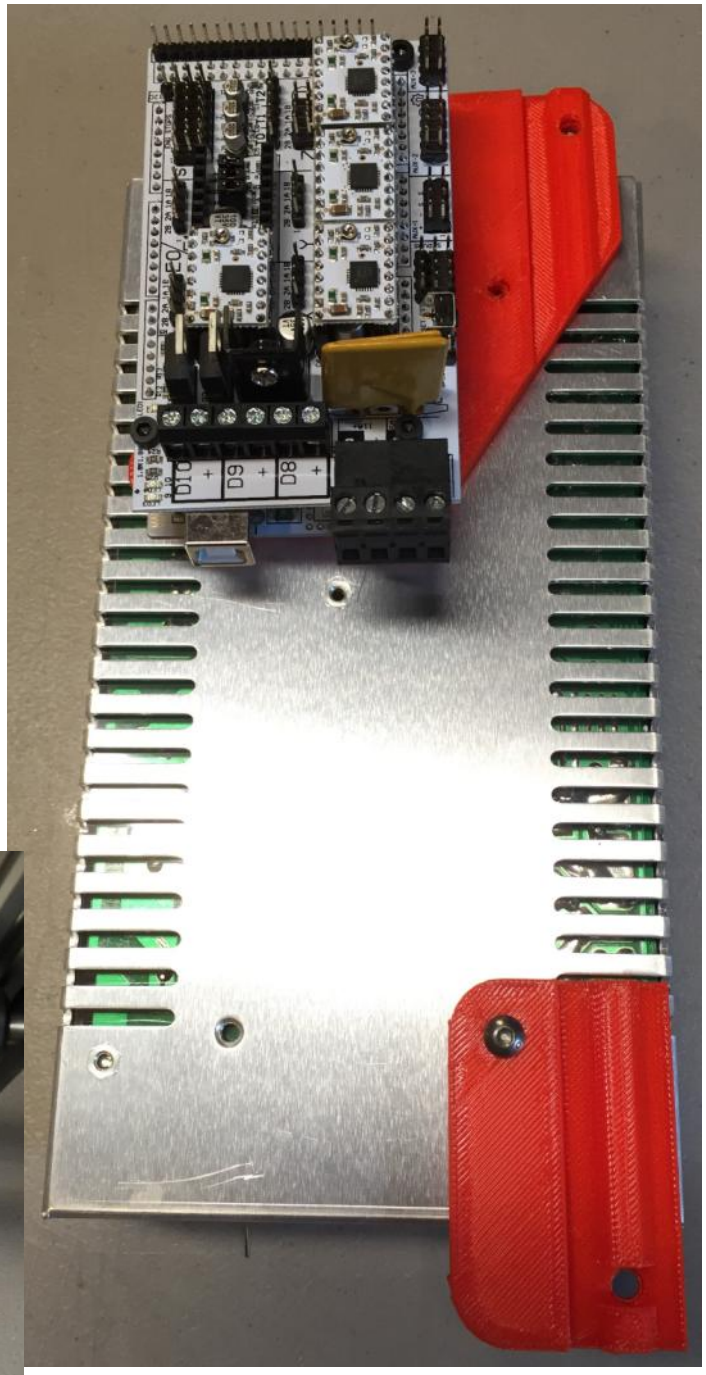
If you RAMPS isn't already assembled as shown below go ahead and follow the RAMPS Assembly guide here: Download



Install M3 nuts into the back of the printed mount as shown by the picture on the right, make sure the nuts are recessed into the mount.

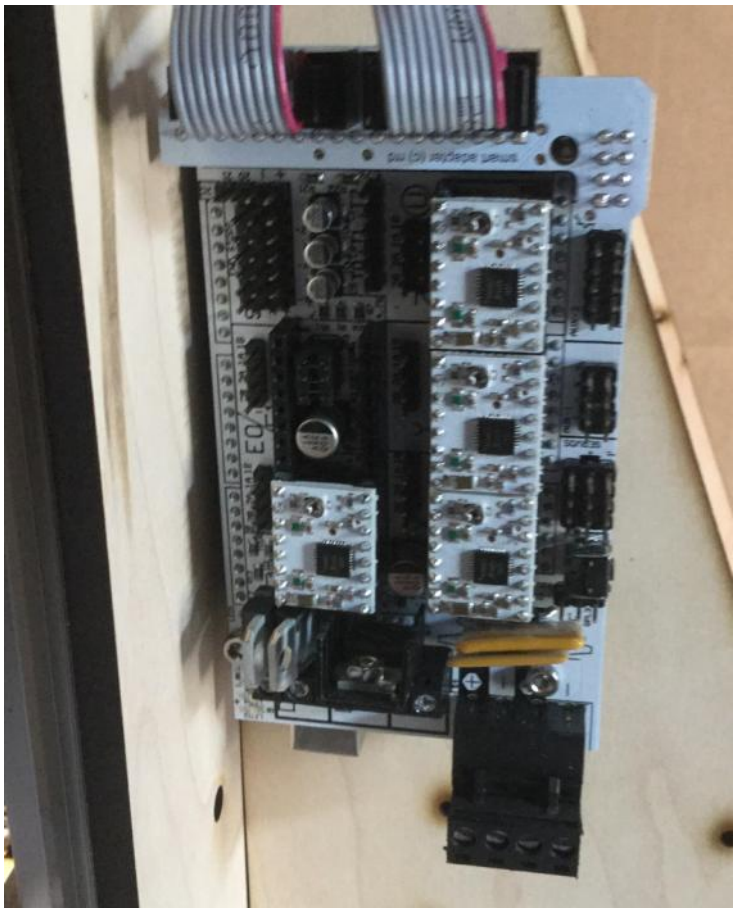
Using the two M4x8mm bolts mount the printed plates to the back of the power supply, the smaller plate will mount near the power connections for the power supply.

Install the RAMPS onto the top printed mount using the 3 M3x25mm bolts, do not over tighten the bolts as that could damage the electronics.



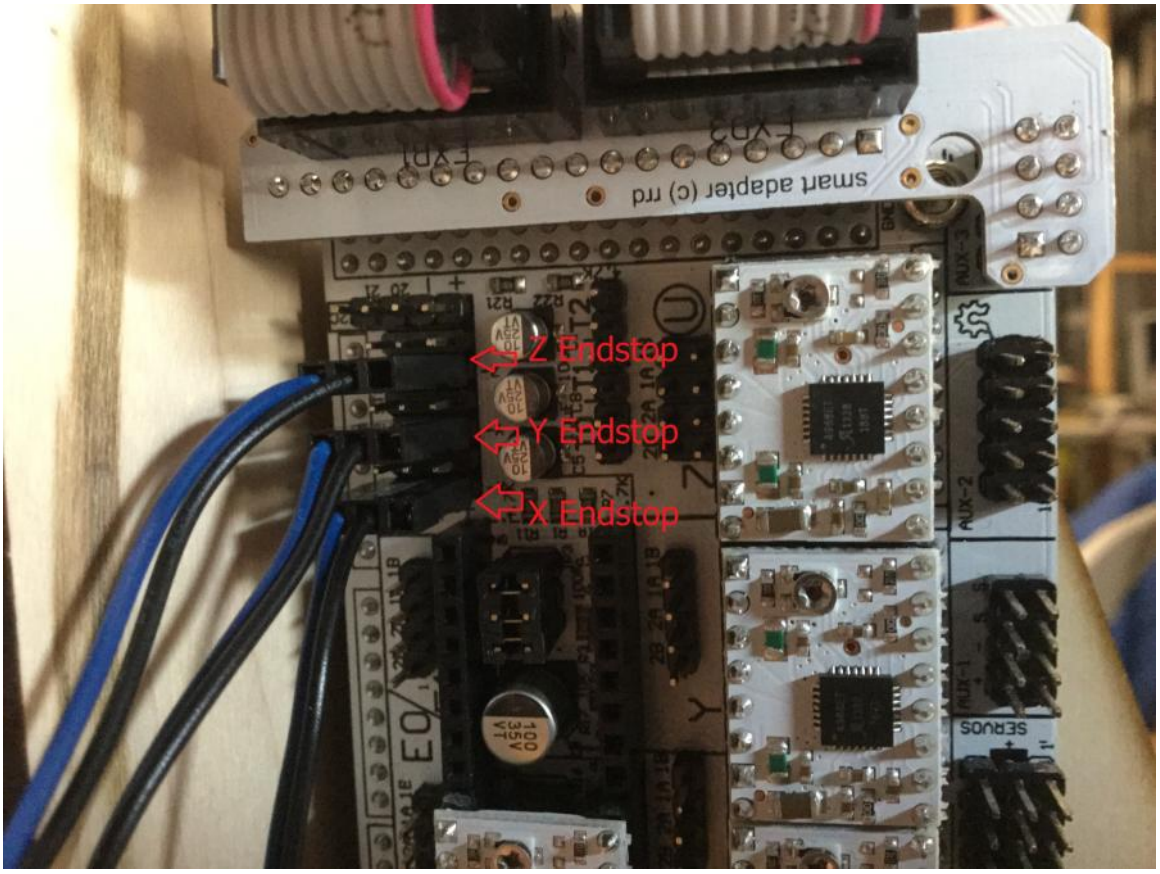
Using the two M5x12mm bolts already installed on the back right extrusion of the priner, mount the power supply as shown in the photo on the left.

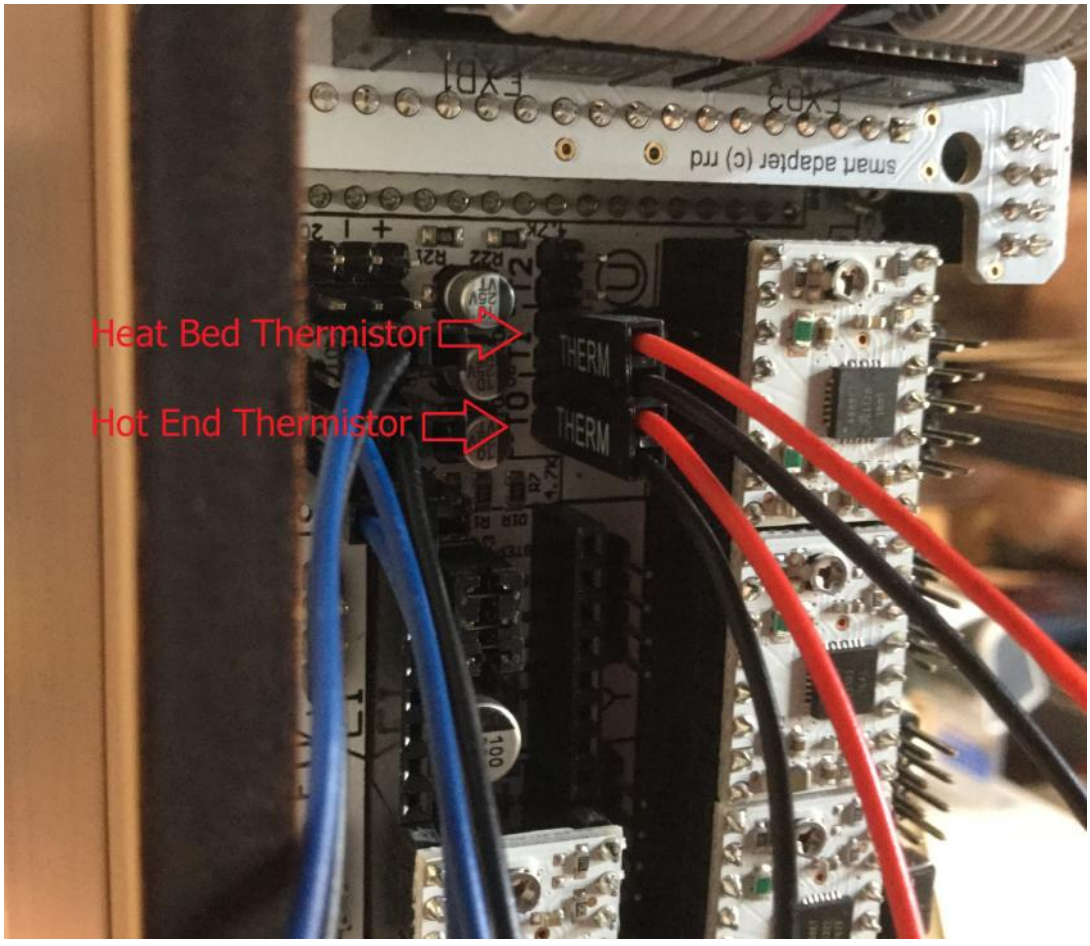
Connect the Optional LCD to the ramps board by plugging in the Smart Adapter to the top of the ramps as shown in the picture on the right



Next plug in the Endstops, make sure they are plugged in as shown or the printer will not power on.

If your endstops have red circuit boards you will plug the endstops into the same spot and same orientation where the blue wire is on the outside, red wire nearest the red arrows.





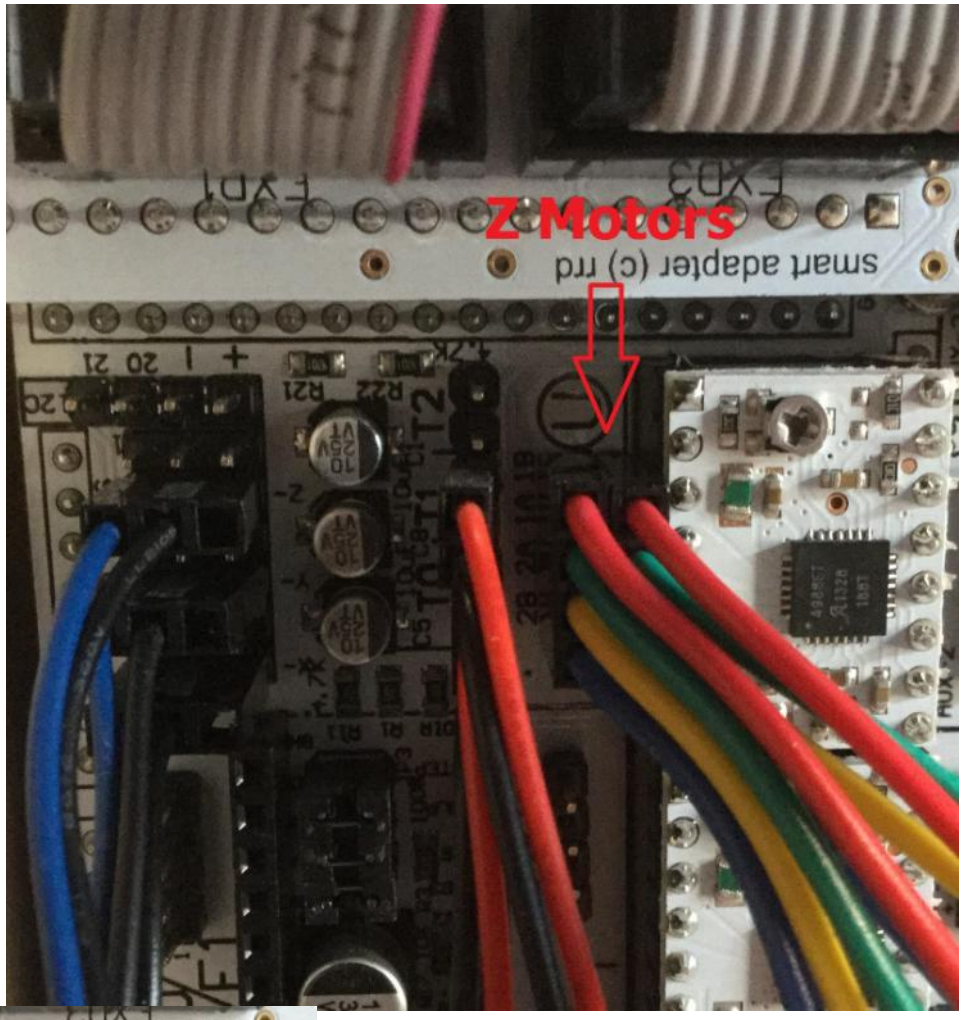
Now plug in the Hot end and heat bed thermistors.

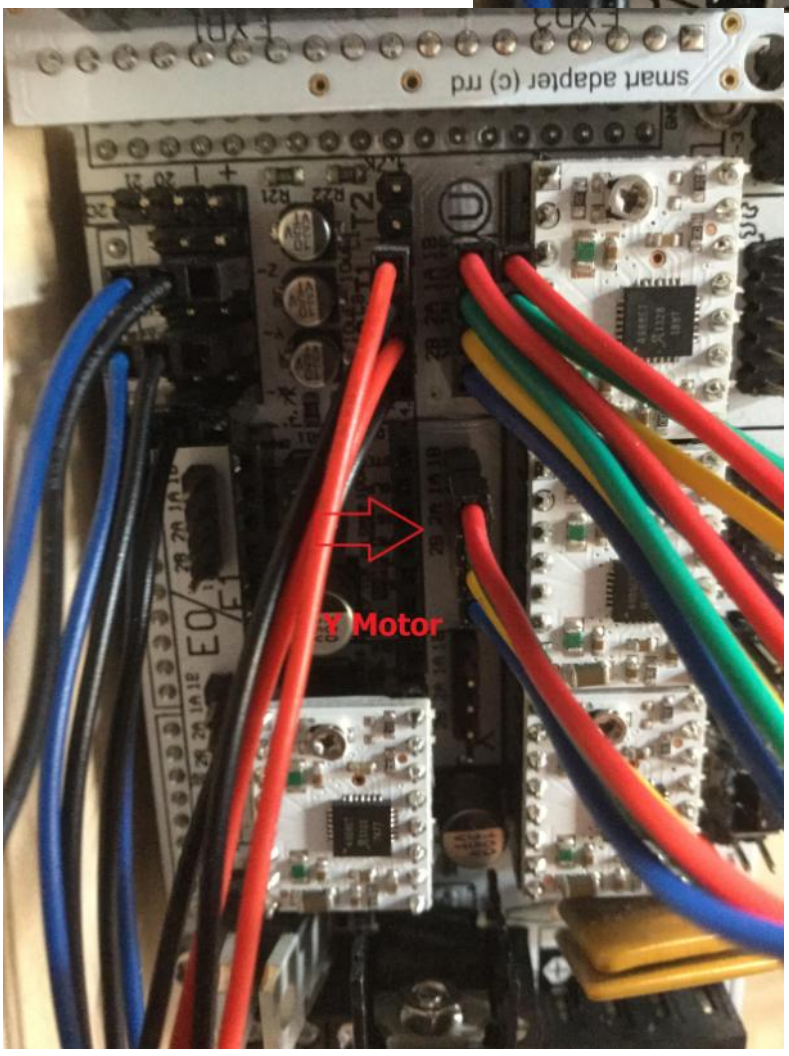
Hot End Thermistor plugs into T0 (For Dual Extruders this is the Right Hot End Thermistor)

Heat Bed Thermistor plugs into T1

For Dual Extruders the Left Hot End thermistor will plug into T2

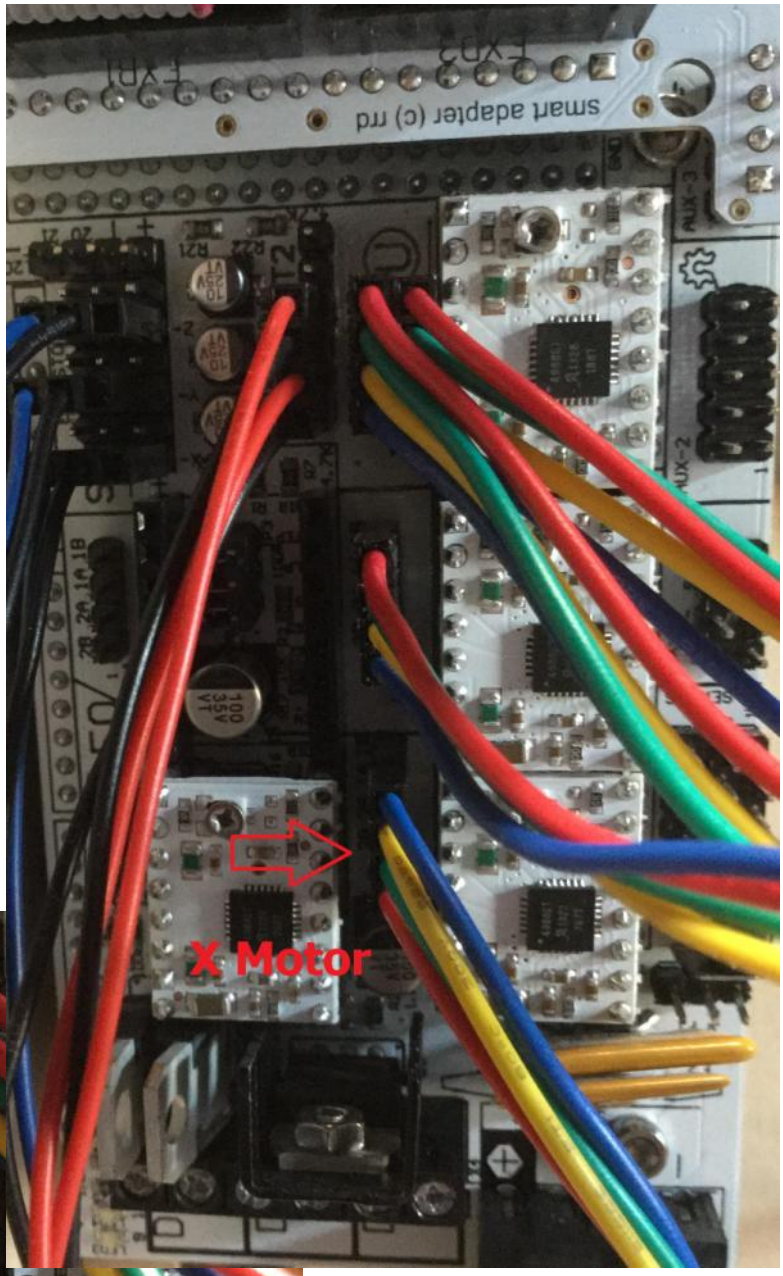
Next plug in the Z Motors

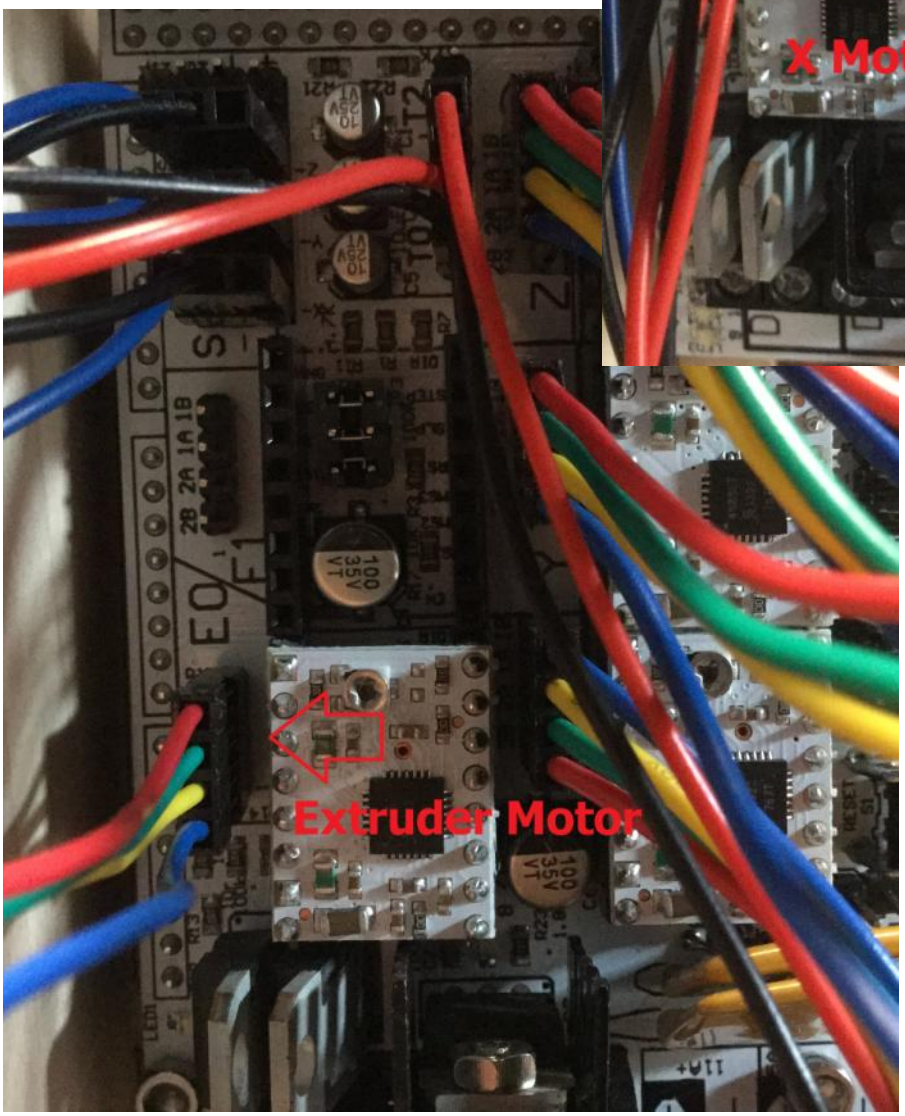




Now plug in the Y Motor

Next plug in the Xmotor, Note that the Blue wire is closest to the top of the machine opposite of all the other motor

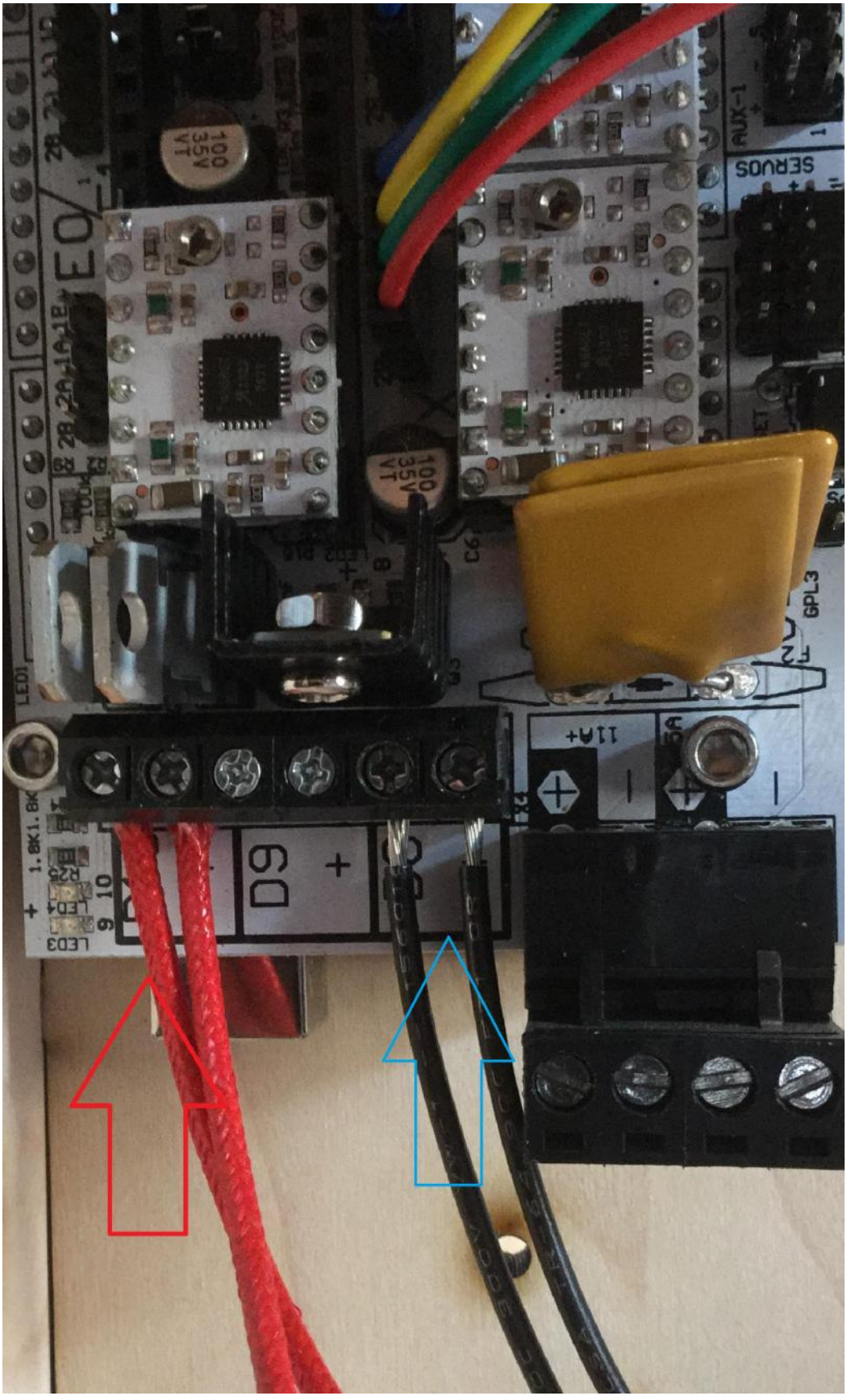




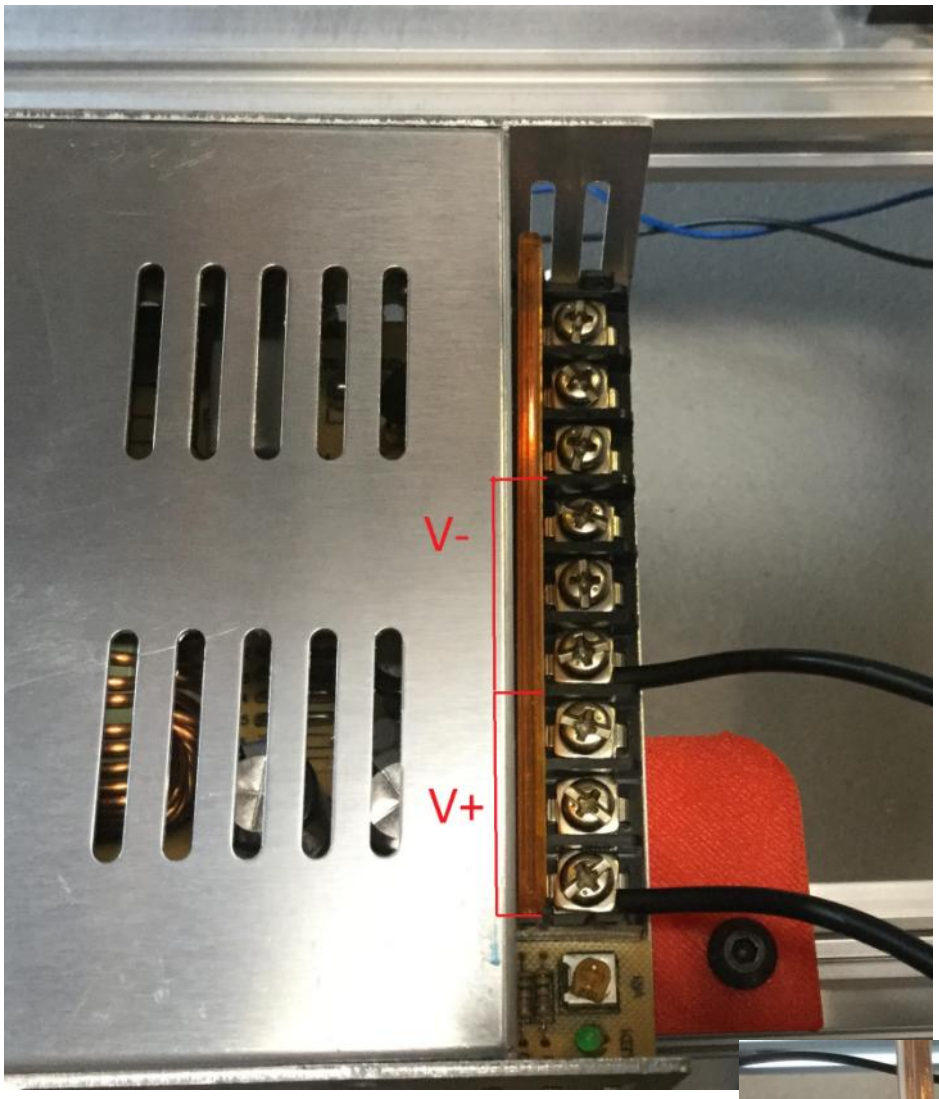
Now plug in the Extruder Motor (Single Extruder motor will plug into the E0 port, Dual Extruder Right Extruder motor will plug in to E0, Left Extruder will Plug into E1)

If your heat bed has 4 wires, connect the small heat bed wires to D8 on your electronics shown by the Blue Arrow below. If your heat bed has 2 wires then follow this guide to install the heat bed relay: Heat Bed Relay Guide

Next connect your hot end heater to D10 (Dual Extruders the Right Hot End heater will connect to D10, the Left hot end heater will connect to D9)

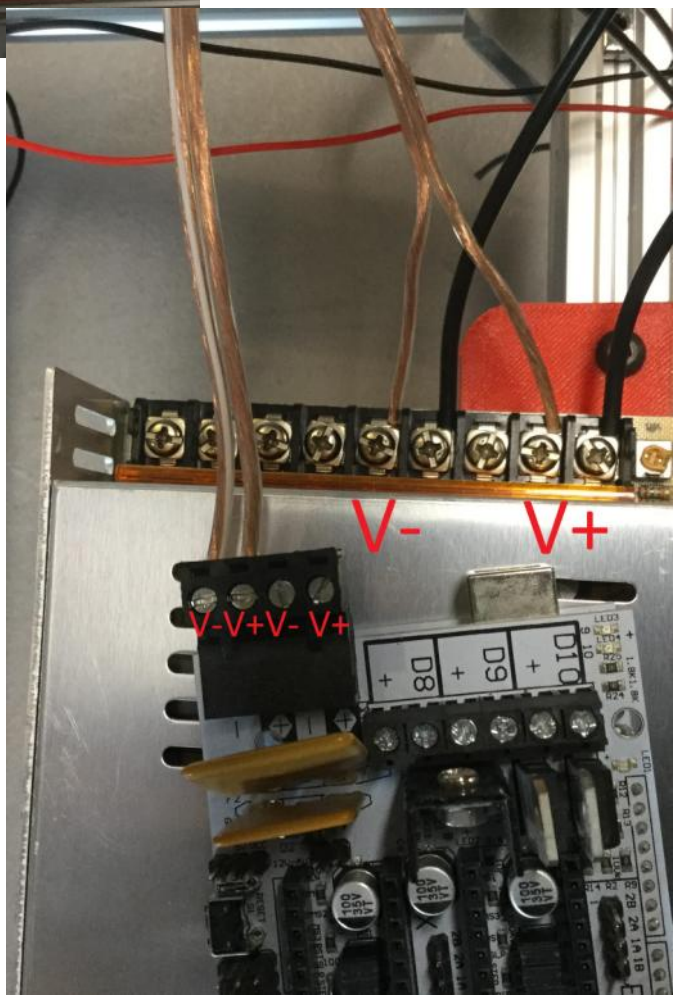


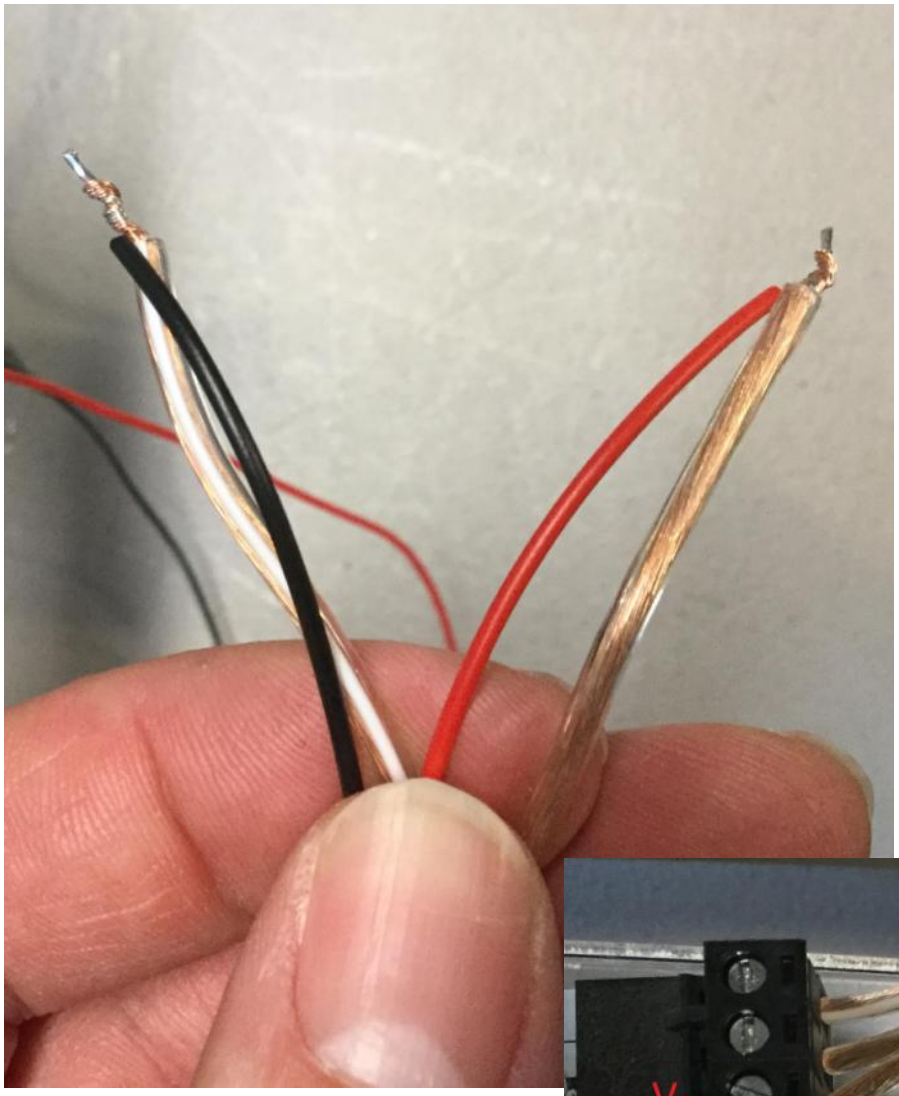
Wiring your 12v Power Supply to your RAMPS



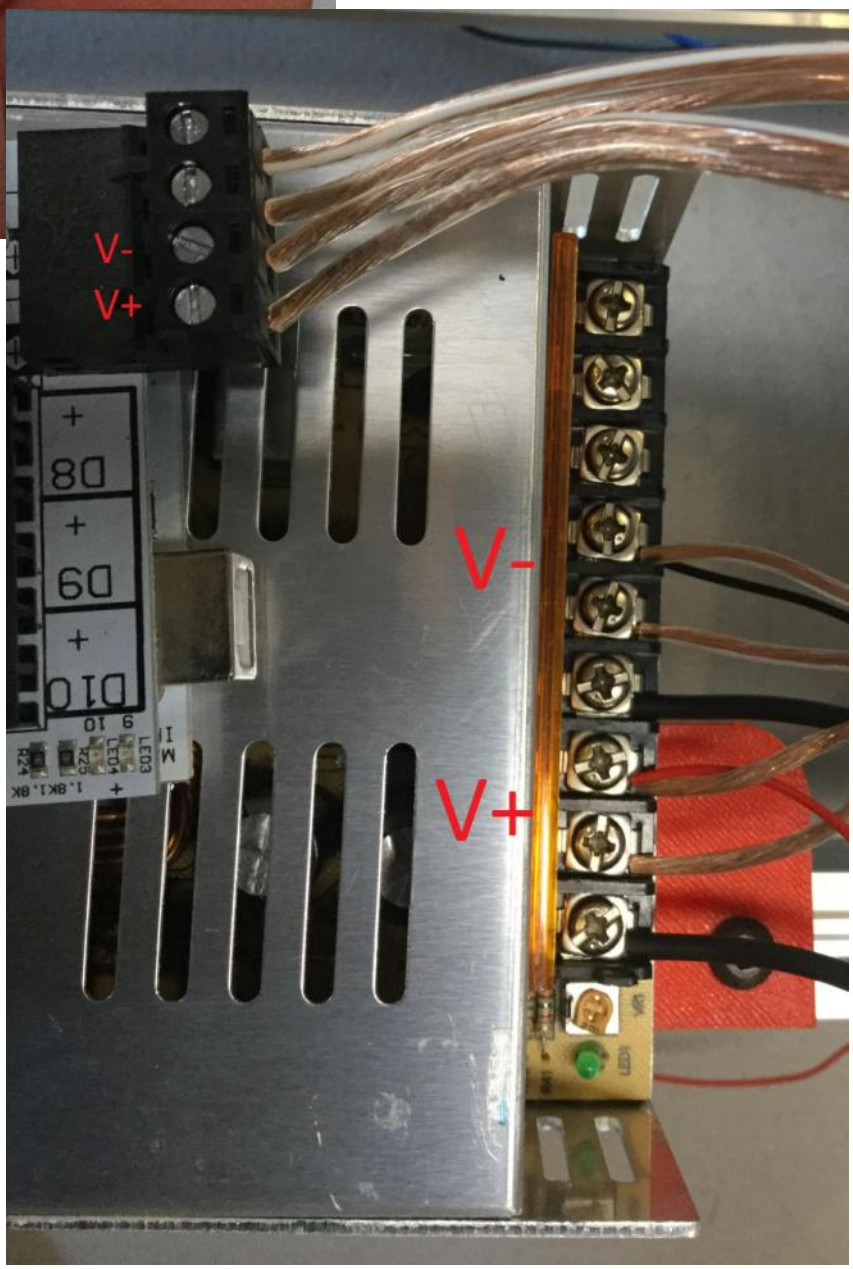
Connect your thick Heat Bed Wires to your Power Supply, Connect one wire to V+ and the other wire to V-, it doesn't matter which wire goes in either location.

Next get 10 inches of 16awg wire, connect One wire to V– on the Power supply then the connection labeled V- on the outer edge of the RAMPS power connector as shown in the picture on the right. Then connect the other wire to V+ on the power supply and connect the other end to the 2nd connection labeled v+ in the picture on the right.

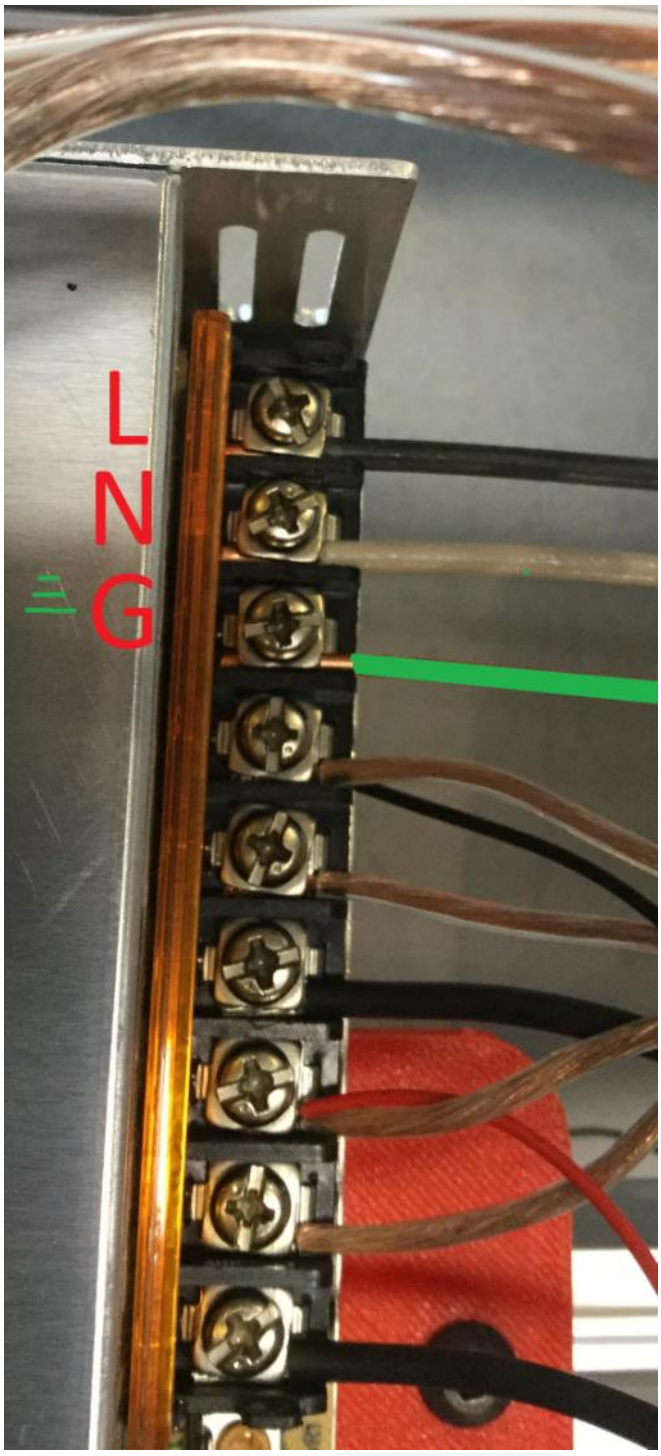




Next get 10 inches of the 16awg wire, strip off a portion of the insulation and connect it to the wire for the Fan on your hot end.



Connect the wire with the black fan wire to V– on your power supply and the wire with the red fan wire to V+ on your power supply. Then connect the other ends of the wires to the connections labeled in the picture on the right. (V– from power supply to v– on connector and v+ on power supply to V+ on connector)



To connect your Power Cord to the power supply you will connect the Ground Wire to the Terminal Labeled G on your Power supply, then the Neutral wire to the one labeled N and the Live wire to the one labeled L. To turn your printer on and off you will plug in the power cord and unplug the cord.

This page intentionally left blank

This page intentionally left blank

This page intentionally left blank

Downloads

Download the Pegasus Software for your printer here: Pegasus Software

Arduino Software: www.arduino.cc, download the arduino software version 1.0.6 (Don't get a newer version, get 1.0.6) and install on your PC or Mac.

-Pronterface Download

Installing firmware on Pegasus

To install firmware on your Pegasus download the Firmware guide: Download

If you have a Dual Extruder Kit follow the steps in the Dual Extruder Calibration Guide before proceeding: Dual Extruder Calibration Guide

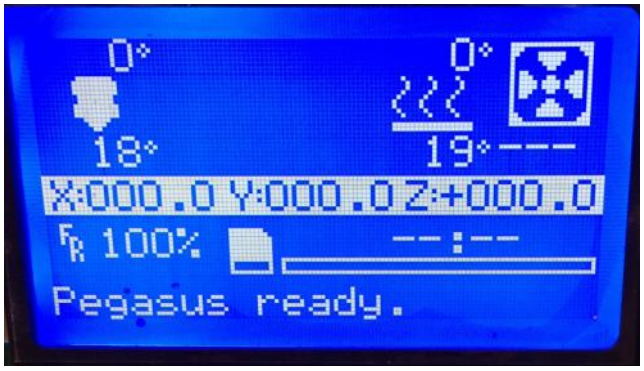
Follow the Extruder eSteps Calibration guide to set your eSteps: Extruder eSteps Calibration Guide

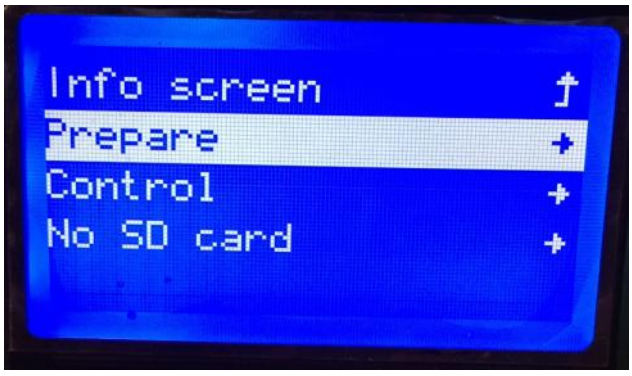
Initial Tests Video (This will show you how to configure the endstops, this video shows the i3v but the process of adjusting the endstops is the same. After 3:50 in the video it shows how to level the bed if you have bed springs.)

Manual Bed Leveling

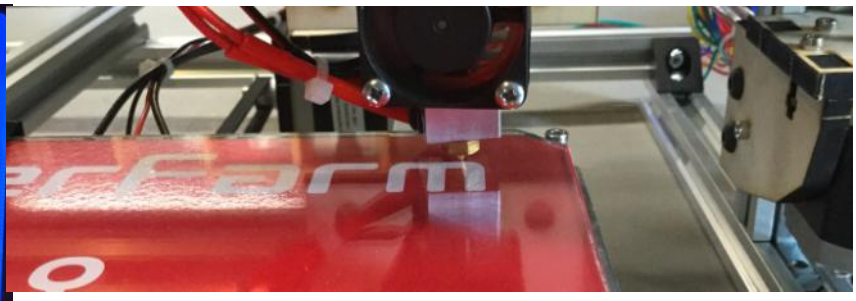
The Firmware used on the Pegasus printer has a “Manual Bed Leveling” Feature, basically you tell the printer when the nozzle touches the glass in 9 different spots then in future prints the firmware will raise and lower the nozzle while printing to accomidate for an uneven or unlevel surface. Now that you have your endstops set you setup the Manual bed leveling feature.

Start at the main LCD screen, push the knob and turn the rotary knob to select “Prepare” then push the knob again.





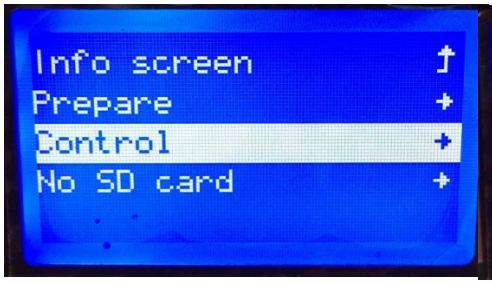
Then turn the knob until the arrow points at “Level Bed” then push the knob. The printer will home then the nozzle will move to the position shown below. Turn the knob until the nozzle just barely touches the glass then push the knob. The printer will then move to 8 other locations, turn the knob to move the nozzle up or down then when it just barely touches the glass push the knob again.

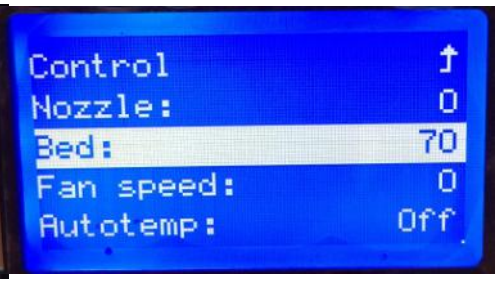


Once complete go back and select the “Control” menu, then “Store Memory”

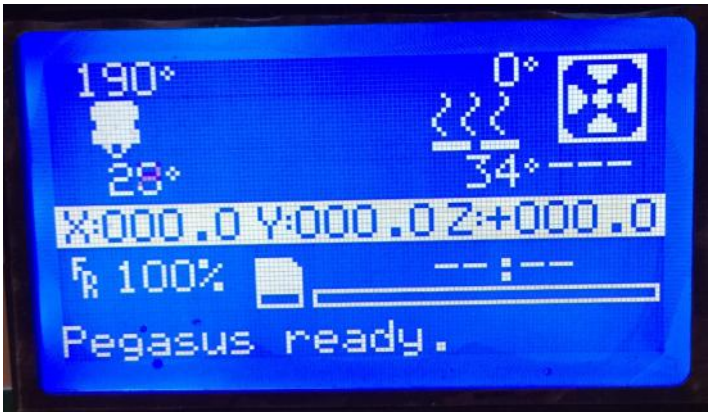
Temperature Tests

Next you will test that the heat bed and hot end heat up, select the “Control”, “Temperature”, “Bed” then turn the knob until the bed is set to 70. Then go back to “Control”, “Main” then

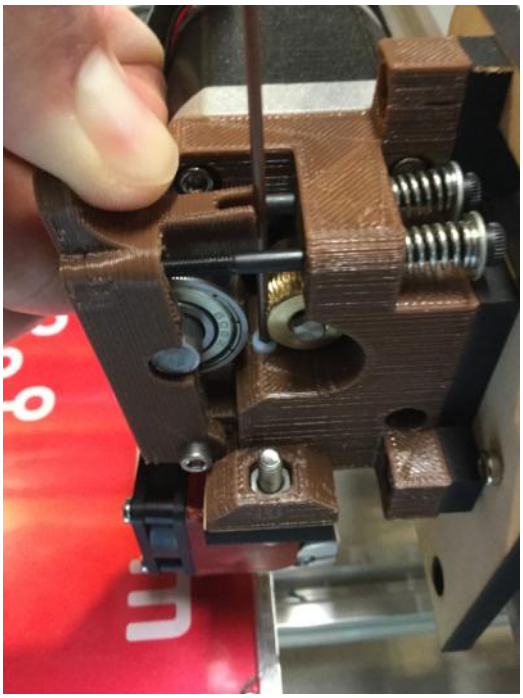




“Info Screen”, you should see the heat bed temp set to 70c and you should see the temp start to rise, while the temp is low check to see if you can feel the temp of the heat bed rising. While the heat bed is heating the hot end temp should stay low and shouldn’t rise in temp drastically. Once you know the heat bed is heating look at your hot end fan and verify that it is turning, if it is not make sure your hot end fan is connected directly to the power supply or the Power input of your ramps board.



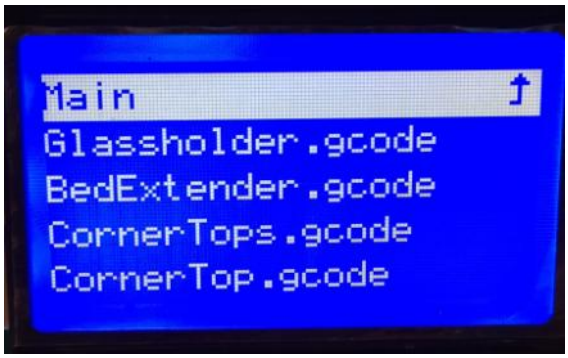
Go back to “Control”, “Temperature”, change the bed temp to 0 then change the hot end temperature to 190c. Now go back to the “Info Screen” and verify that the hot end temp is rising.



Now you can install filament into the extruder, pull back on the Guidler with your thumb, thread the filament past the MK7 Drive gear and into the PTFE tube, continue to push the filament until the filament stops at the nozzle then release the Guidler. Now is a good time to clean up the wiring of your printer, use the zip ties to keep them out of the way and neat. Make sure you leave enough slack so the extruder can move all the way right and left, the heat bed can move forware and back and the X axis can move up and down.

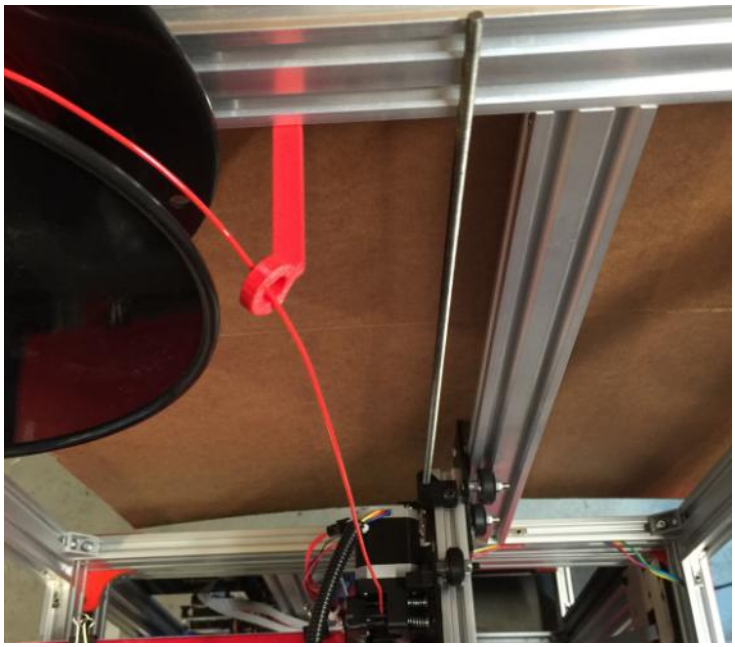
First Print

In the Pegasus Software/Gcode folder you will find „Hollow_Cube_ABS_Pegasus.gcode“ and „Hollow_Cube_PLA_Pegasus.gcode“ Copy both onto an SD Card and install the SD Card into the left side of your LCD Screen.



Now push the LCD knob and select „Print from SD“ then „Hollow_Cube_ABS_Pegasus.gcode“ if you have abs filament loaded into your printer or the „Hollow_Cube_PLA_Pegasus.gcode“ if you have PLA loaded. You should see your heat bed start to heat, then the hot end (once heat bed has reached the target temp) after that your printer should start printing. Once the print finishes let the heat bed cool to around 50c, then if the print hasn‘t popped off of the glass you can try to hold onto the glass around the print and with the other hand quickly pull the cube in one direction to pop it off of the glass.
(If you have a dual extruder you can now try to print the dual extruder gcode you created earlier)

Next lets print a Filament Guide, you can use either the ABS Gcode here: FilamentGuideABS.Gcode or the PLA Gcode here: FilamentGuidePLA.Gcode. Copy this gcode onto your SD Card and print it. Then Install the guide as shown on the picture on the right.



To generate gcode for a single extruder or to only print with one extruder from your dual extruder setup do the following:

Open slic3r then click File and Load Config either the ABS or PLA folder in the Pegasus Software\Slic3r\Slic3r 0.9.9 Configs\12 Inch Pegasus. Next click File, Quick Slice and select one of the stl files in the Pegasus Software\Printed Pegasus Parts\Direct Drive Extruder\ then save them to your sd card and print them out as spares.

Your Slic3r will now slice the stl into Gcode which you can copy onto an SD Card and print directly from the LCD interface or you can load the Gcode into Pronterface and print simply by Opening Pronterface, connecting to the printer clicking Load File then Print.

Slic3r Video

Note: if you upgrade your slic3r version to something other then 0.9.9 and if you don‘t use the slic3r configs from this guide you will have print problems.

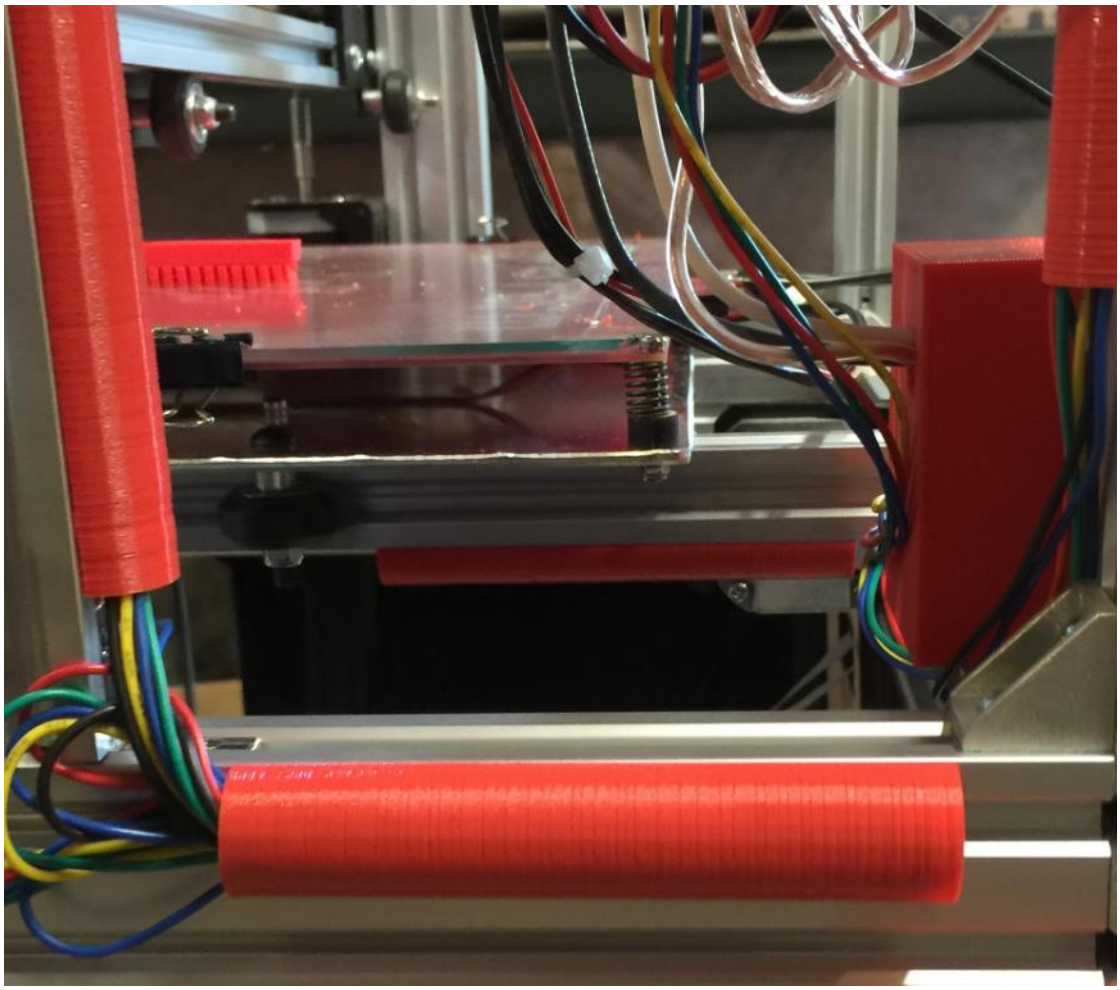
Wire Management

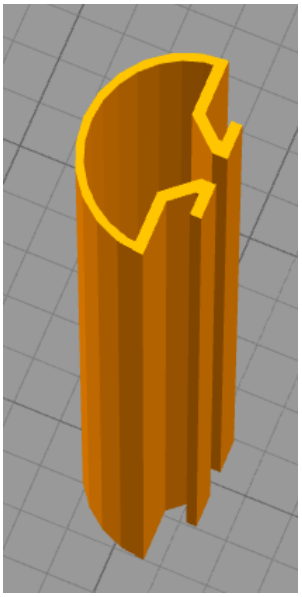
To Manage your wires you can print some wire covers, these will clip into your V-Slot Extrusion to hide your wires. There are two versions, a 10mm long and a 100mm long version.

Click on the link below, then unzip the file, you can either print the premade gcode or make your own.

Wirecover.zip

Use the Wire Cover to cover your LCD Cables, Motor, thermistor and endstop cables.

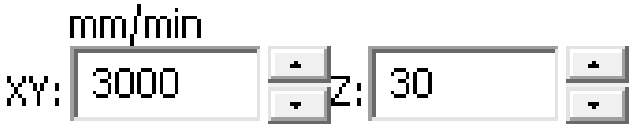




Using Pronterface

Now that you have everything installed you will open pronterface select the com port that your printer installed to and set the speed to 250000 then click connect.

Next set your Speeds:



Now you are going to test our endstops and make sure the motors are plugged in correctly. First click the button, your heat

bed should move forward and hit the switch causing the heat bed to stop.

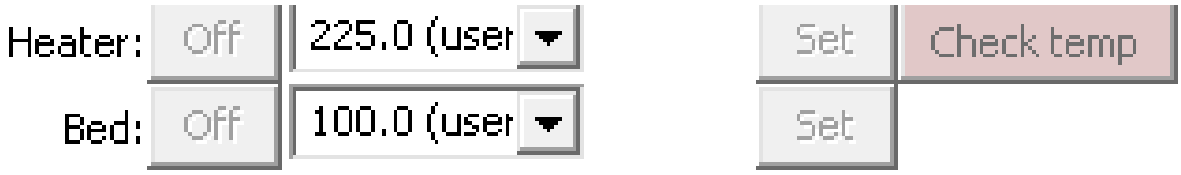
If your heat bed moves to the back of the printer instead you can turn the power supply off, unplug your usb cable and flip the connector around 180 degrees for the Y motor.

Once the Bed moves the correct direction you can adjust the Y endstop until the nozzle is just behind the back edge of the Glass. For the X adjust it so the nozzle doesn‘t hit the bolt holding the bed to the printer. For the Z endstop there will be an M3 bolt that will contact the switch, you can turn the bolt clockwise and counter clockwise until the correct home position has been reached which will be just barely touching the glass.

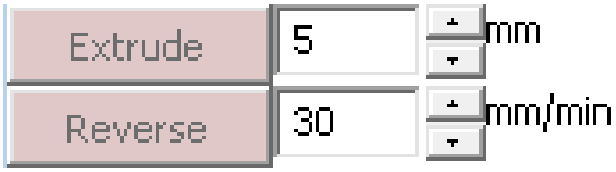
Then repeat for the other axis using the buttons.

Next heat up your heat bed to about 100c by typing in 100 and click the set button to the right of the bed temp. Confirm that the heat bed temperature is rising and then click „Off“ once you know its working.

Next you will test the hot end, first make sure the hot end fan is turning, if its not make sure it is connected directly to the power supply or the power input of the ramps board. Type 225 to the right of „Heater“ and click set in the Heater Row, then to check your temperature click the Check temp occasionally:



Once your hot end has reached 225c set your Extruder speed to 30 and click extrude.



If your filament gets pulled out of the hot end instead of pushing it in then power off the printer and rotate the motor connector for the Extruder Motor.

You should now be able to move your printer in all directions, but your endstops will only be used when you click one of the home buttons so don‘t keep telling your printer to go past that point. Now you can print some Gcode, instead of copying gcode to an sd card and printing via the LCD just load the gcode into pronterface and click „Print“

Any questions please e-mail elderfarrer@gmail.com or you can chat via google chat (elderfarrer@gmail.com)

Thanks,

Colin

Maker Farm Inc

Troubleshooting Guide: Download