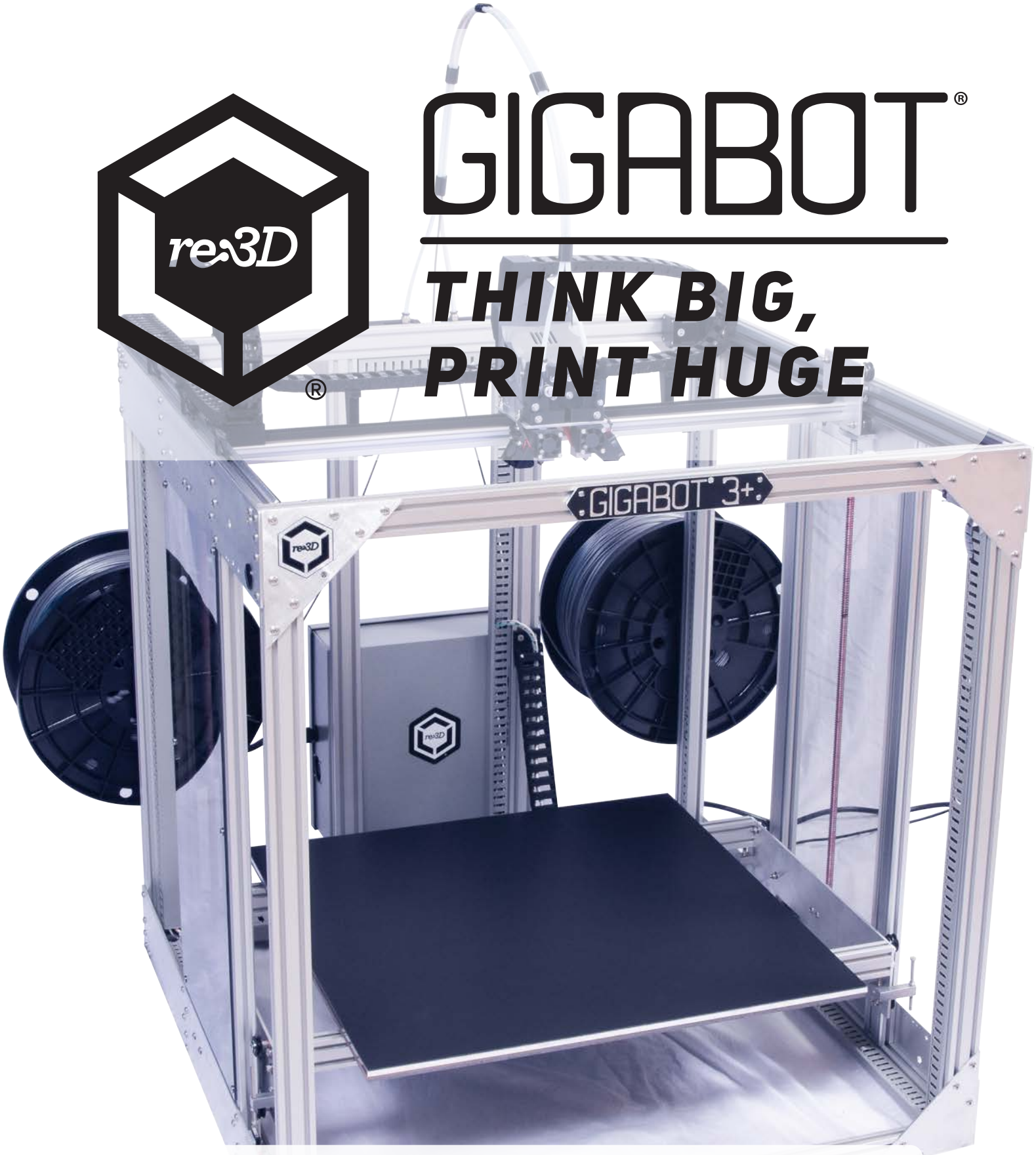
GIGABOT®

THINK BIG, PRINT HUGE



GIGABOT® : UNASSEMBLED (COMPLETE DIY KIT)

INTRODUCTION

THANK YOU FOR PURCHASING THE GIGABOT®: UNASSEMBLED (COMPLETE DIY KIT)!

This kit contains all the parts necessary to construct a fully functioning Gigabot®. You will find that this is a high quality and very capable 3D printer that not only helps you develop your biggest ideas, but lets you do so at the human scale.

REFERENCES & HELPFUL DOCUMENTS

Some external resources may be helpful during the assembly process. For example, knowing the correct names for different parts on the Gigabot®, or proper use of certain tools. Resources that we thought may be helpful have been linked to at the end of this guide.

VIDEO INSTRUCTIONS

If you prefer a video guide, go to our YouTube channel at https://www.youtube.com/user/GigaBot3D and find our related Gigabot® 3 assembly instructions. Retrofits, tips & tricks, and other video content are available as well.

COMMUNITY FORUM

See what other users are doing with their Gigabot® and share your experiences on our forum: https://re3d.zendesk.com/hc/en-us/community/topics

Rev. Dec 2016

LEGALESE

READ INSTRUCTIONS

All the safety and operating instructions must be read before the printer is operated.

RETAIN INSTRUCTIONS

The safety and operating instructions should be retained for future reference.

HEED WARNINGS

All warnings on the product and in the operating instructions should be adhered to.

FOLLOW INSTRUCTIONS

All operating and use instructions should be followed

CLEANING

Unplug this product from the wall outlet before cleaning. Do not use liquid or aerosol cleaners.

ATTACHMENTS

Do not use any attachments or enhancements not recommended by the product manufacturer as they may cause hazards.

WATER AND MOISTURE

Do not use Gigabot® near water - for example, near a bath tub, wash bowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool, and the like.

PLACEMENT

Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult, and serious damage to the product. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer, or sold with the product. Any mounting of the product should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer.

VENTILATION

Slots and openings in the cabinet are provided for ventilation and to ensure reliable operation of the product and to protect it from overheating, and these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.

POWER SOURCES

This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home consult your appliance dealer or local power company. For products intended to operate from battery power, or other sources, refer to the operating instructions.

GROUNDING OR POLARIZATION

This product may be equipped with either a polarized 2-wire AC line plug (a plug having one blade wider than the other) or a 3-wire grounding type plug, a plug having a third (grounding) pin. The 2-wire polarized plug will outlet, try reversing the plug. If the plug still fails to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug. The 3-wire grounding type plug will fit into a grounding type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding type plug.

POWER-CORD PROTECTION

Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the product.

LIGHTNING

For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the product due to lightning and power-line surges.

OVERLOADING

Do not overload wall outlets, extension cords, or integral convenience receptacles as this can result in a risk of fire or electric shock. A product and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.

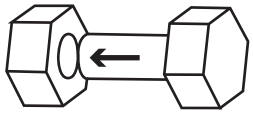
OBJECT AND LIQUID ENTRY

Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.

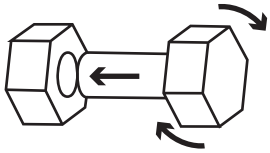
TABLE OF CONTENTS

LEGEND

INSERT



FASTEN



MEASURE

MARK

ROUTE

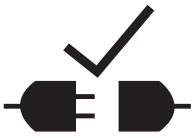
REMOVE

PLACE

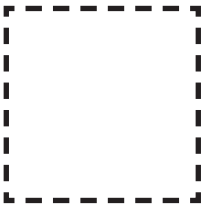
ALIGN

EVENLY SPACE

CONNECT



LOCATE

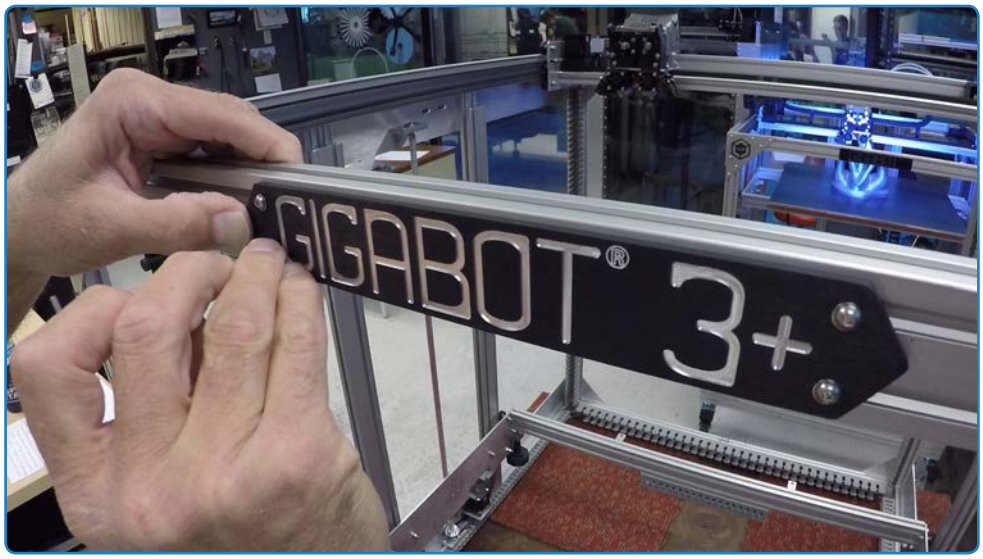


Objects of important are outlined with dotted lines, or highlighted.

BEFORE YOU BUILD

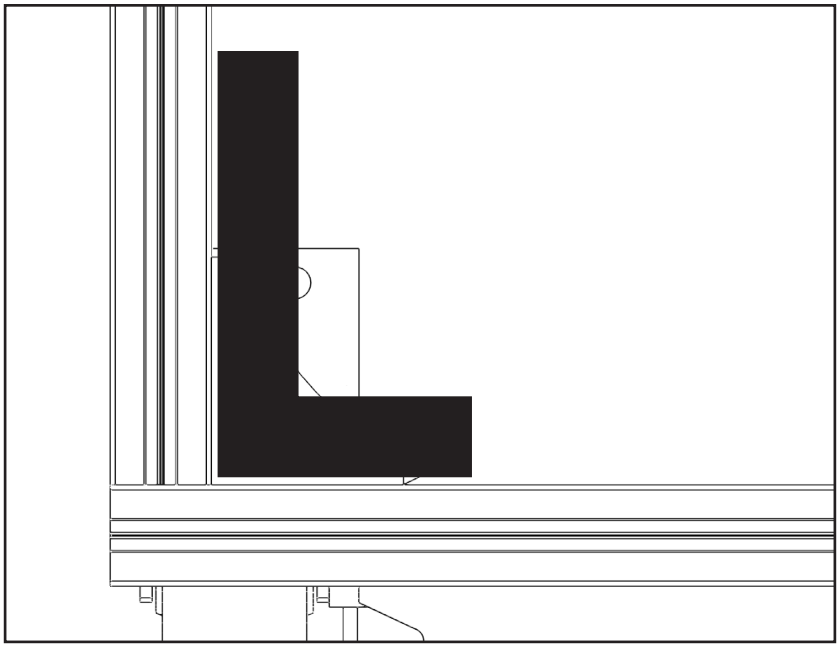
FOR THE VISUAL LEARNERS

We have recorded instructional videos of our technicians assembling the Gigabot and posted them to our YouTube channel. These work as a great standalone resource, but can also help clarify the printed instructions. This manual references them quite often, so do not hesitate to cross reference this manual and the video content if needed.



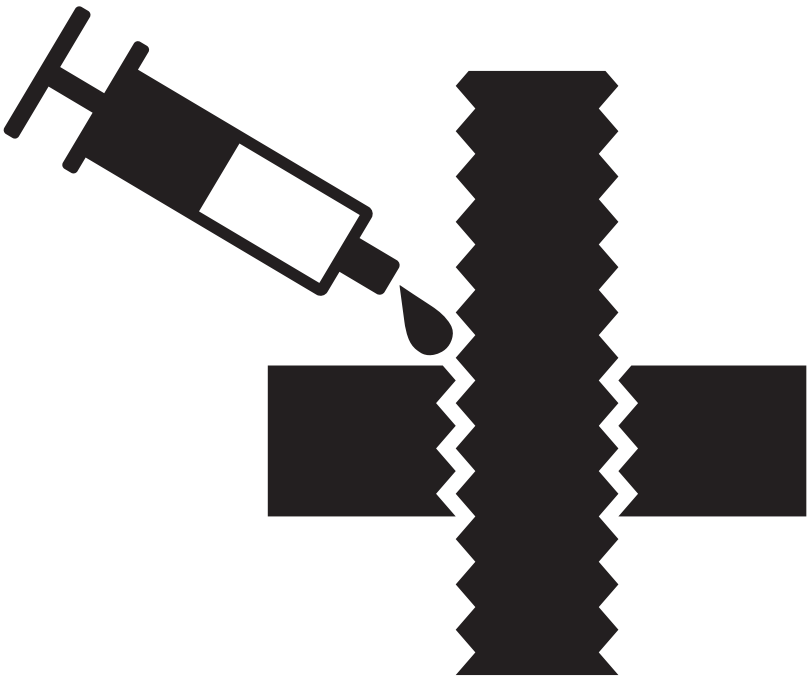
IT'S HIP TO BE SQUARE

When assembling the Gigabot it is essential to work on a flat surface and to carefully square perpendicular parts as much as possible. This is apparent in section F of this manual, but also in other areas such as the bed frame construction. It is just as important to ensure that part surfaces are flush with each other and not misaligned.



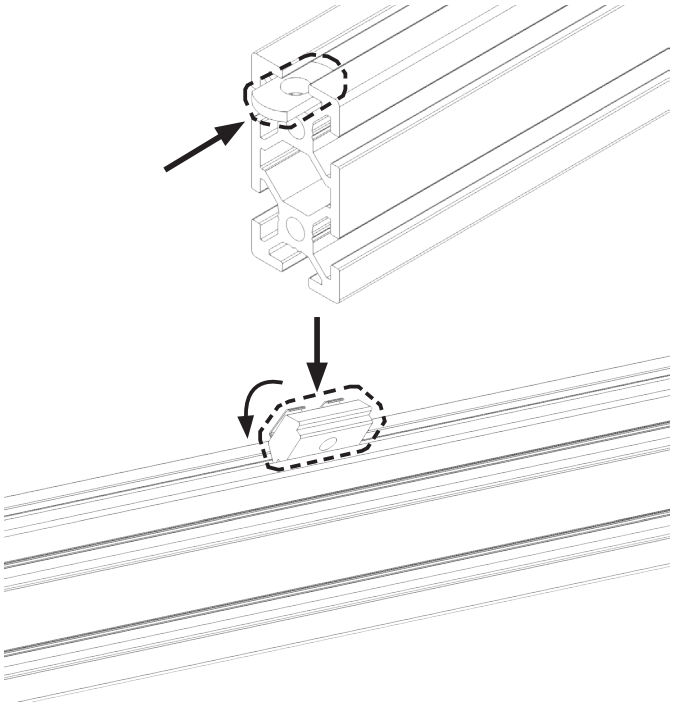
THE USES OF GREASE

During Gigabot assembly, grease is most important for the Z-axis ACME threaded rods as well as the assembly of wheels with eccentric spacers and to keep screw threads from galling. These situations are pointed out in this manual and will enable ease of assembly and smooth, quiet operation while printing.



T-NUTS, HOW DO THEY WORK?

T-nuts are an essential part of assembling the Gigabot. These are inserted into the extrusion in order to fasten parts to the frame. Post-assembly T-nuts, or “magic T-nuts,” as we like to call them, are also used. These hold their positions without sliding around, and are useful especially when modifying or retrofitting Gigabot without having to disassemble the frame.

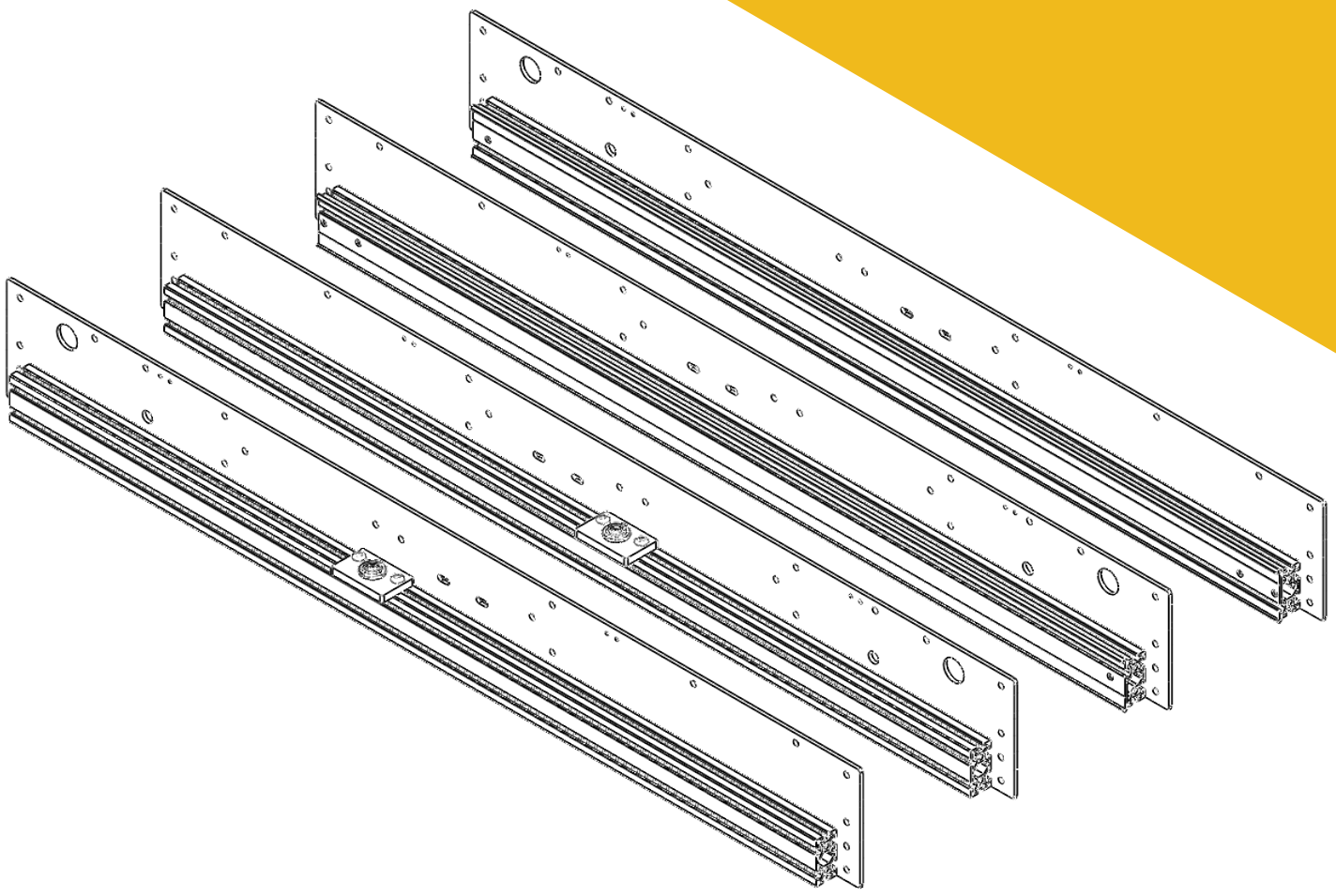


MEASURING AND MARKING

Some steps in the instructions will prompt you to mark locations on Gigabot in order to correctly locate and place parts. When marking, be sure to only use a pencil-using a permanent marker will leave unsightly marks on the metal!

A

SIDE PLATE ASSEMBLY



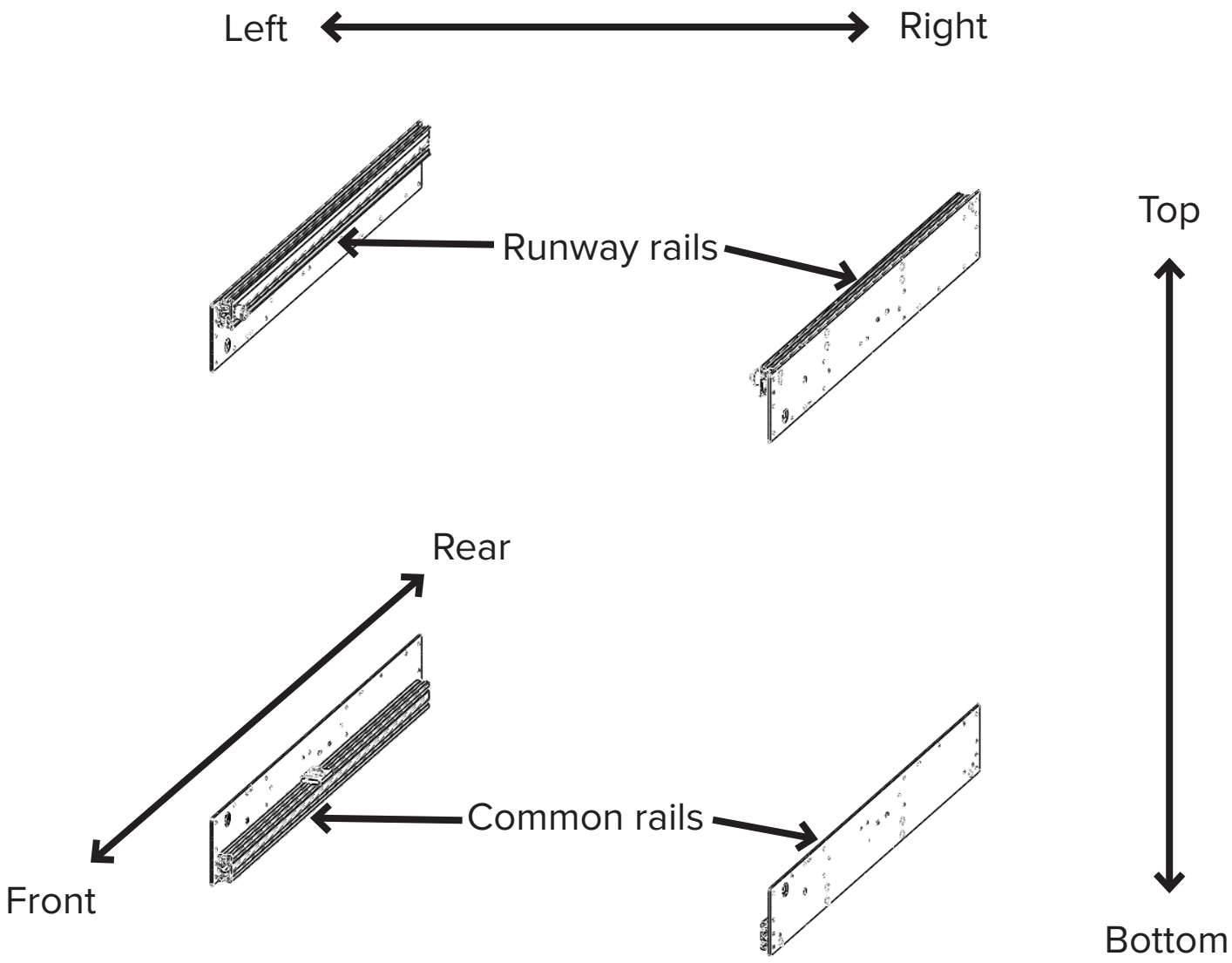
TOOLS & PARTS

Refer to packing list to identify parts

BOX #	PART	QUANTITY
4	Runway rails (Makerslide)	2
4	Common rails	2
1	Precision square	1
6	Allen keys	1
Snappybox	T-nuts	24
Snappybox	M5x8 BHCS	24
6	Corner plate (to be used as a guide)	1
4	Bed cross rail, dual extruder leveling block, or any extra rail (to be used as a guide)	1
Snappybox	M5x45 BHCS	2
Snappybox	Idler Pulleys	2
Snappybox	M5 flat washers	4
Snappybox	M5 lock nut	2
6	Grease	1
Snappybox	8mm Combo Wrench	1
WATCH THE ACCOMPANYING VIDEO:	https://youtu.be/BvHsYGNJj-0	

OVERVIEW

In the final assembly of Gigabot®, the side plate subassemblies will be oriented in the frame as shown.

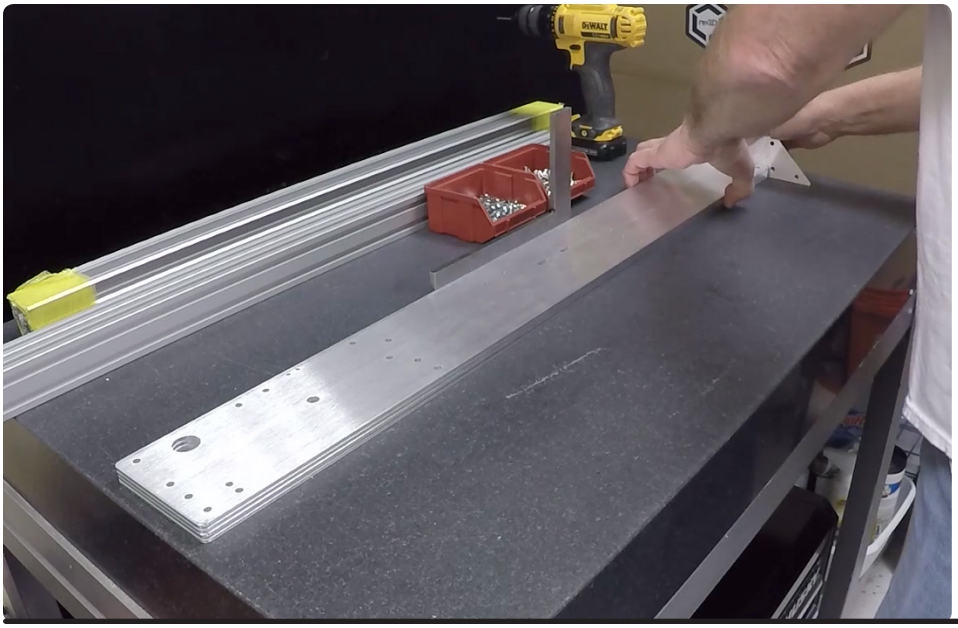


TIPS & TRICKS

#1 Work on a flat surface.

#2 Use a precision square and corner plate to check hole alignment and make the side plates flush with their rails.

#3 Be mindful of the orientation of each side plate.

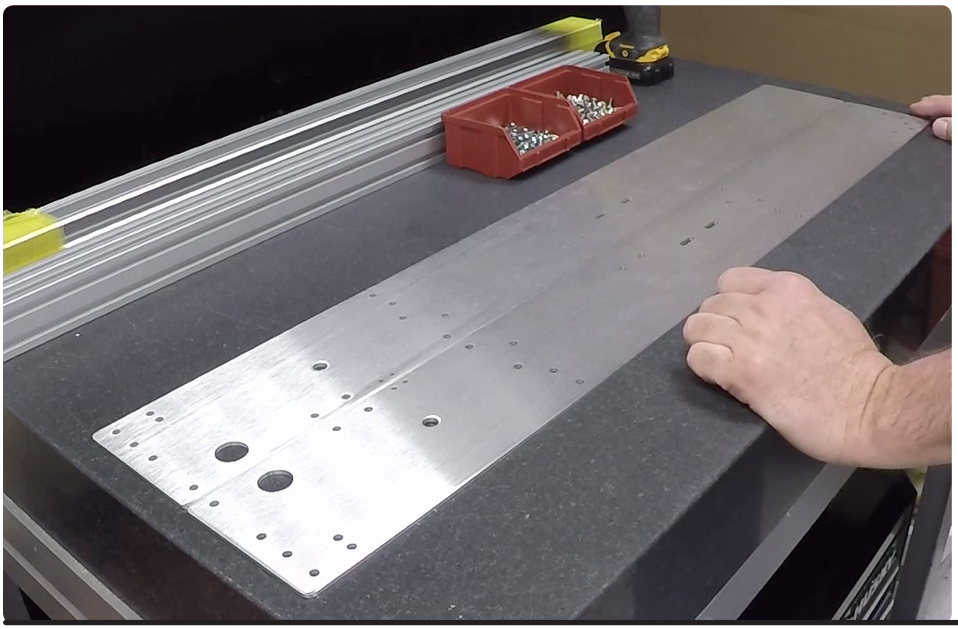


A1

First, you will assemble the lower side plates. Do a quick visual check to make sure the holes are relatively aligned. Use a corner plate and the precision square to align the plates.

A2

Work on a flat surface

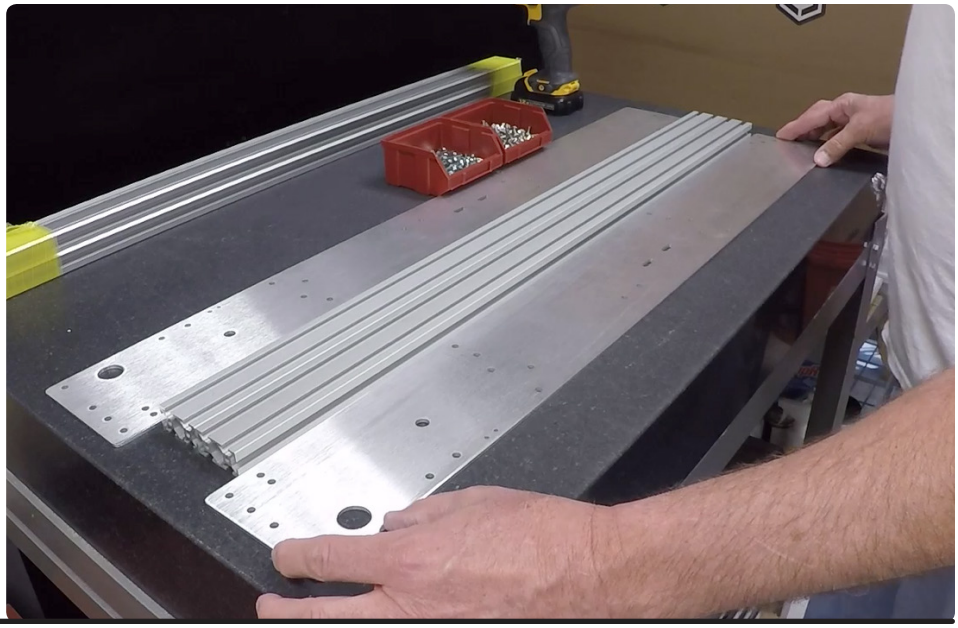


A3

Place side plates alongside each other, mirrored from each other as shown

A4

Place the common rail between the side plates, as shown

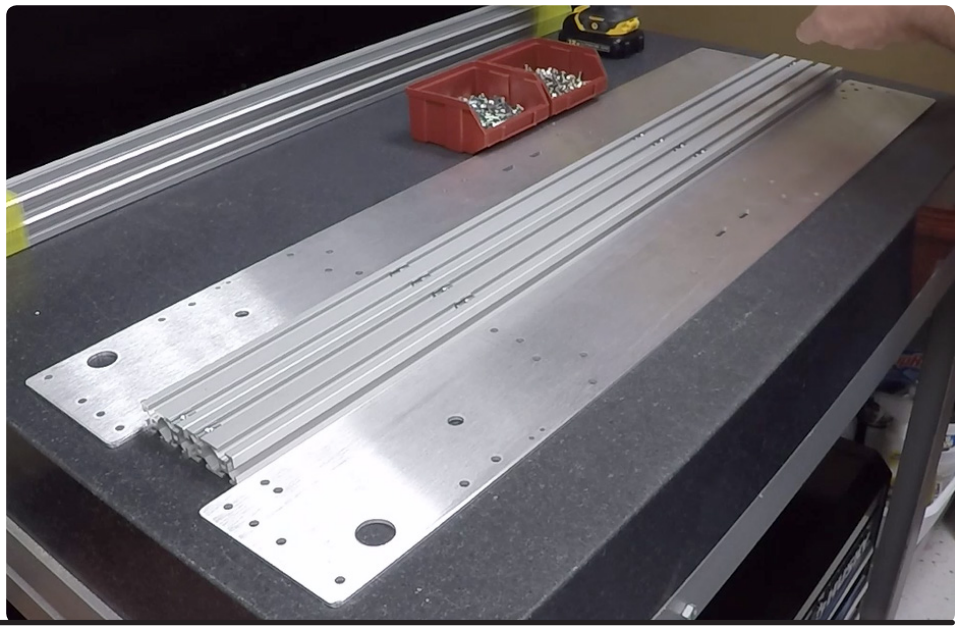


A5

6 T-nuts need to be placed in each rail as marked in yellow. See the diagram, or [see this section in the video at 2:53.]

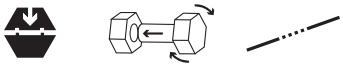
A6

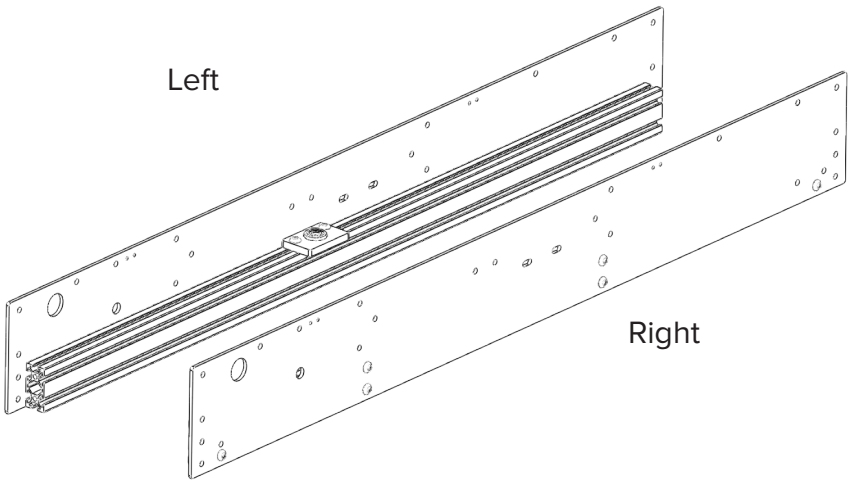
Insert the T-nuts and line them up to the side plate holes. This doesn't have to be perfect, but get them fairly close.



A7

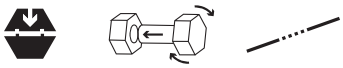
Place the side plate onto the rail and use 6 M5x8s and 3mm Allen Key to loosely fasten the plate to the rail. You can move the plate along the common rail to align the T-nuts to the holes if needed.





A8

Repeat this for the other side plate and rail. Make sure that they are still mirrored. See the diagram to distinguish which belongs on the left and right sides of the frame.

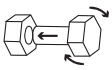


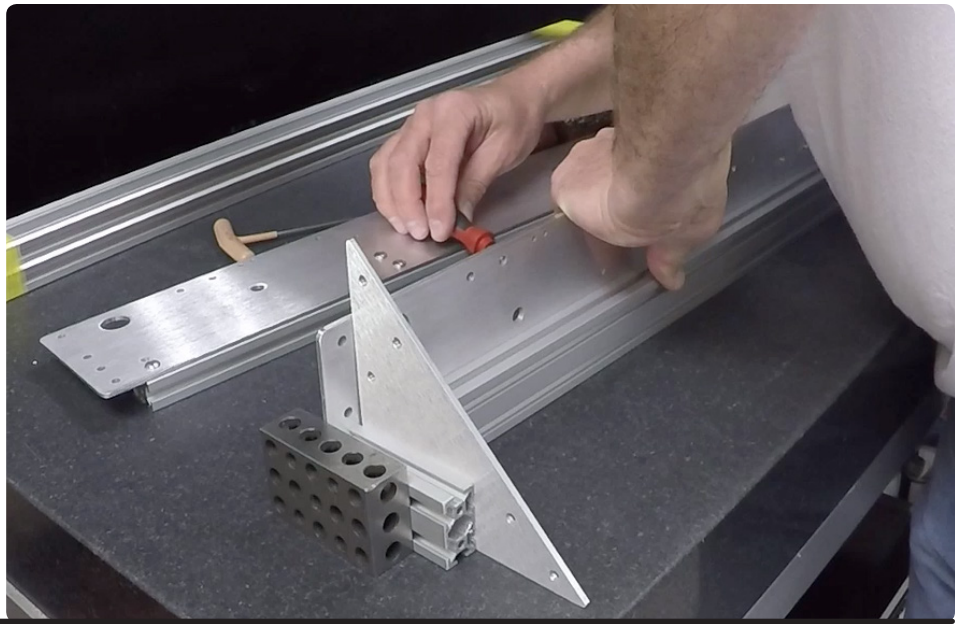
A9

Use a bed frame cross rail, or the dual extruder leveling block along with the corner plate and the precision square to correctly space the rail from the ends of the side plate. See the video at 5:42 for more.

A10

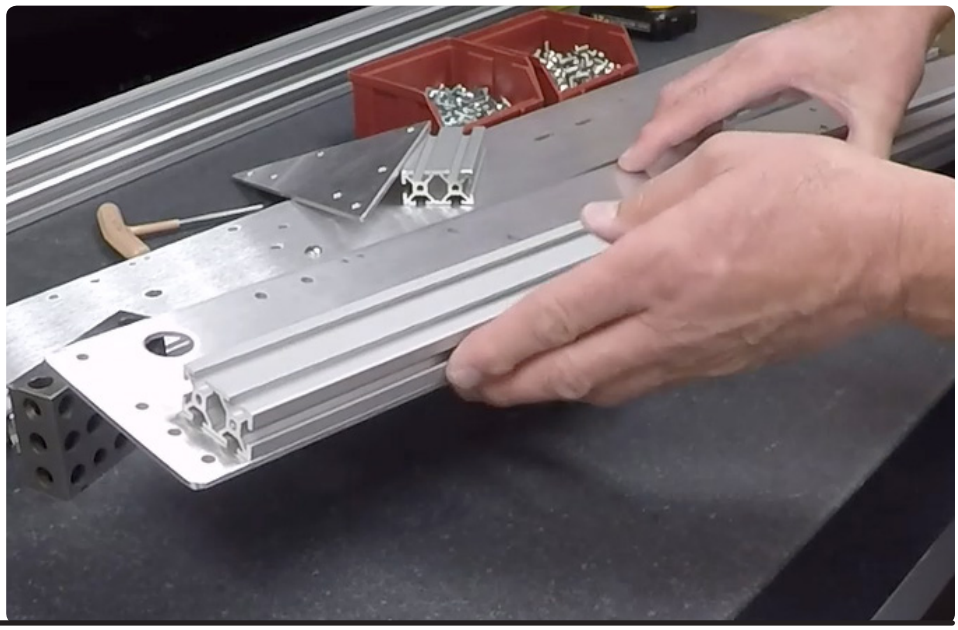
Press the rail and plate down and snug up the M5x8s.





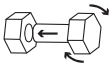
A11

Check that the rail and plate are flush on the bottom surfaces.



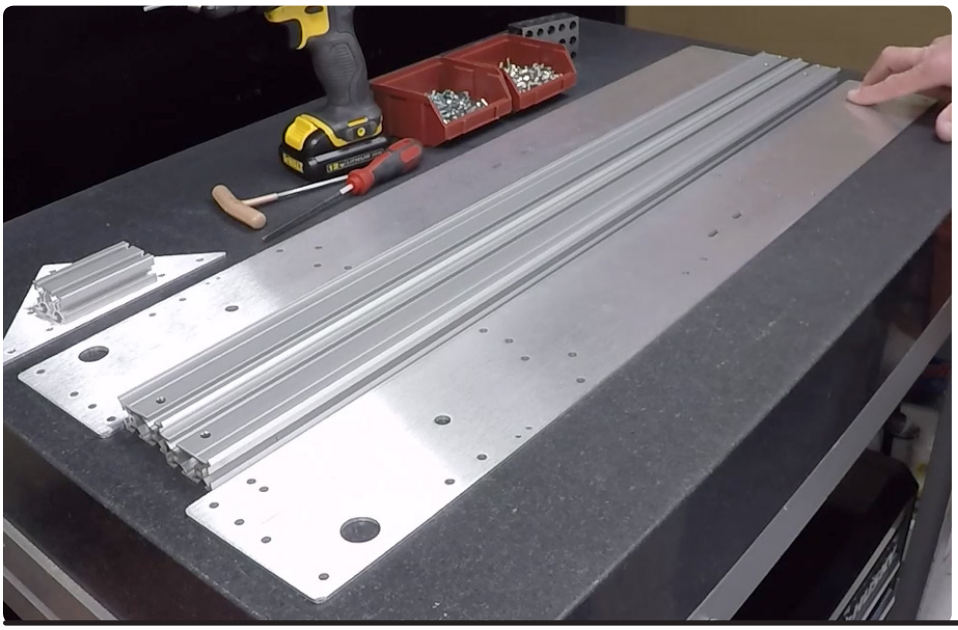
A12

Once flushed and spaced correctly, fully tighten the 6 M5x8s



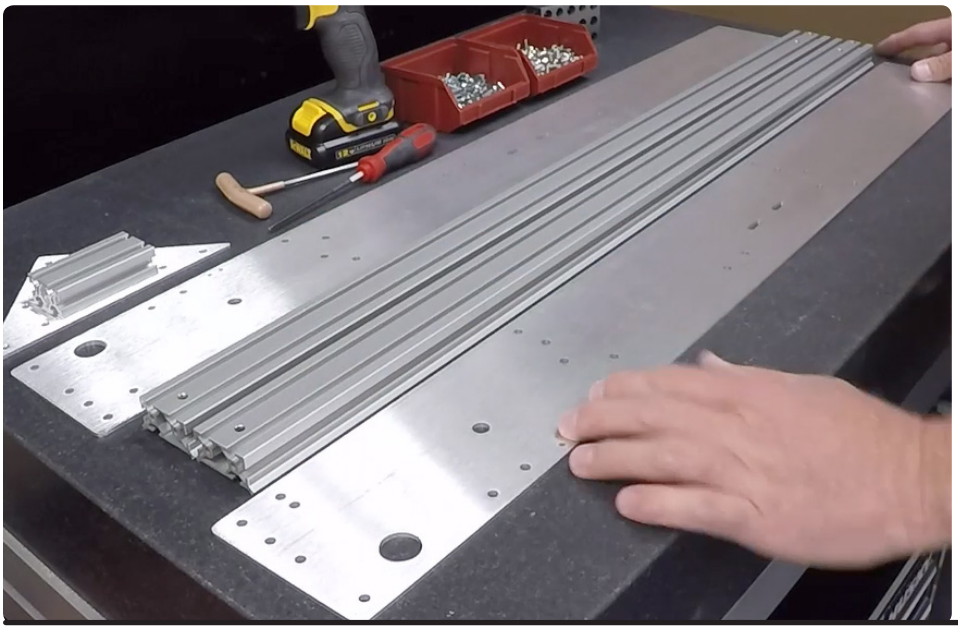
A13

Repeat the spacing and flushing process for the other lower side plate assembly. Refer to the video for other useful tips.



A14

Next, you will assemble the upper side plate assemblies. Similar to before, place the side plates mirrored alongside each other, with the power switch holes facing out.

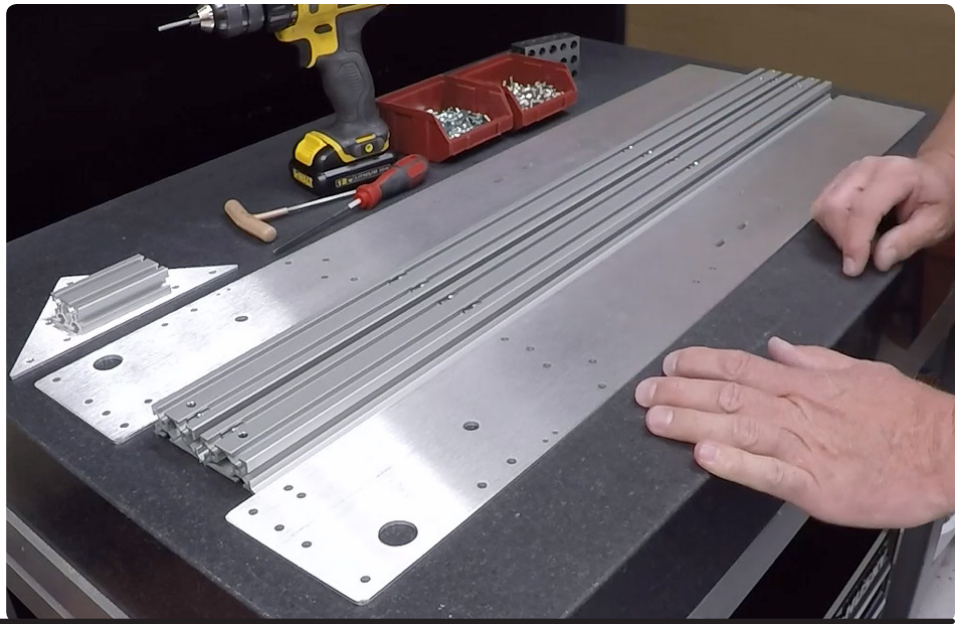


A15

Place the runway rails between the side plates with the single slot side down as shown. Note that the side with the single slot should also be facing outward.

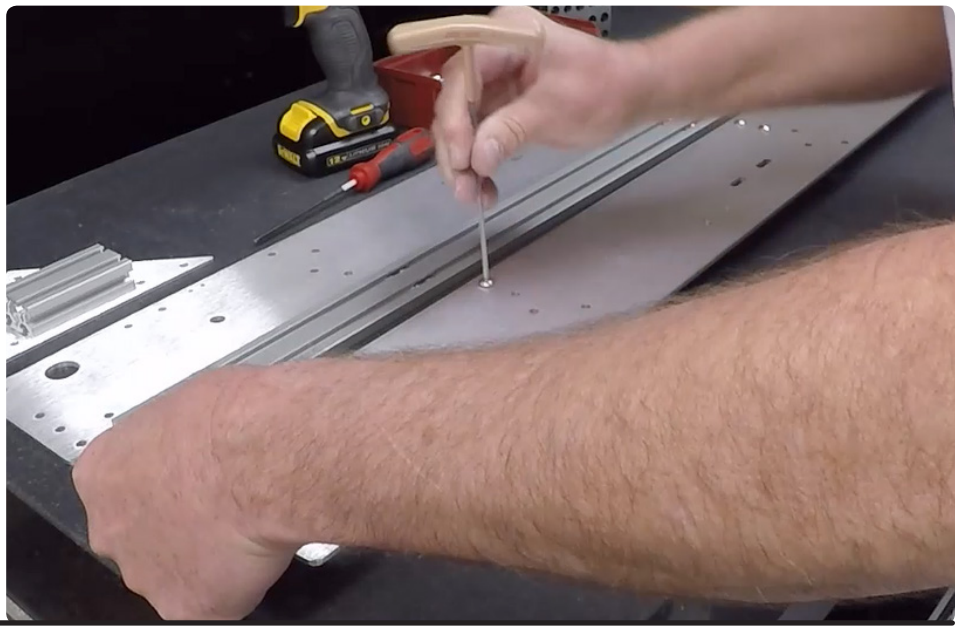
A16

Insert 6 T-nuts each and line them up to the holes as before. Again, alignment does not have to be perfect, but get them close.



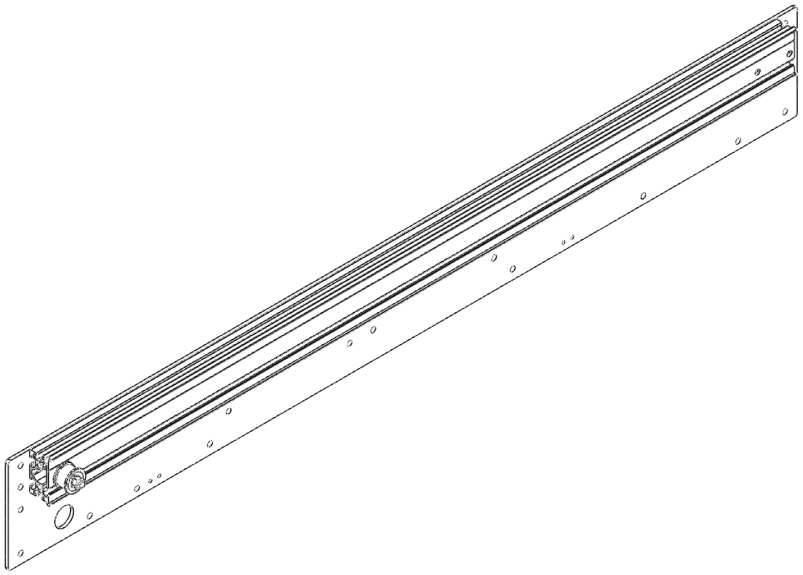
A17

Place the side plate onto the runway rail and loosely fasten it with 6 M5x8 BHCS.



A18

Repeat with the other upper side plate

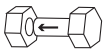


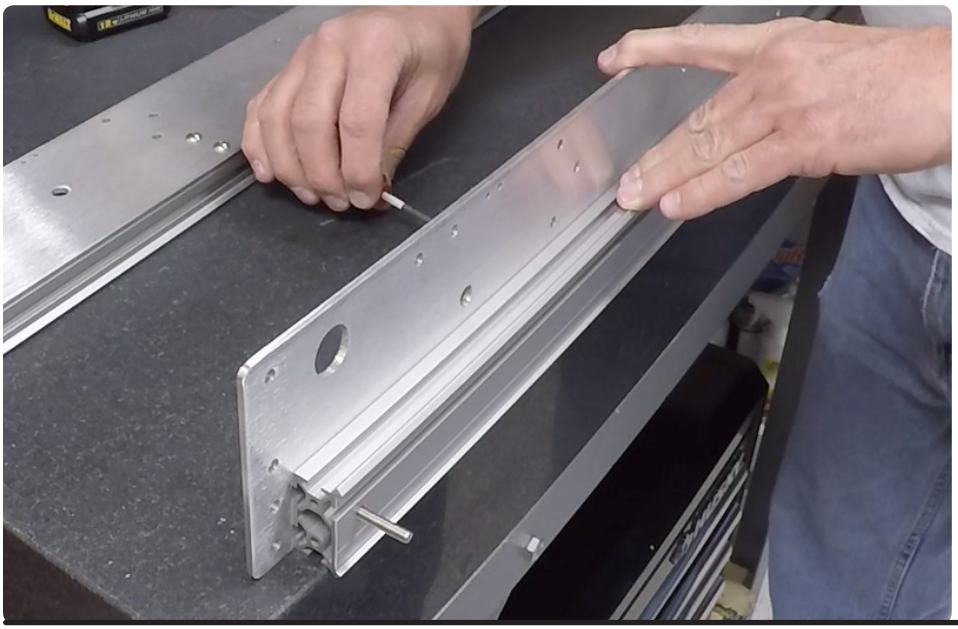
A19

Double check the orientation of the single slot side of the runway rails. When assembled into the frame, it should be facing down.

A20

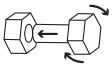
Insert M5x45 BHCS into the side plate holes (for idler pulley and Y motors) to line the plate up with the rail.





A21

Snug up the M5x8s and remove the M5x45s.

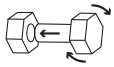


A22

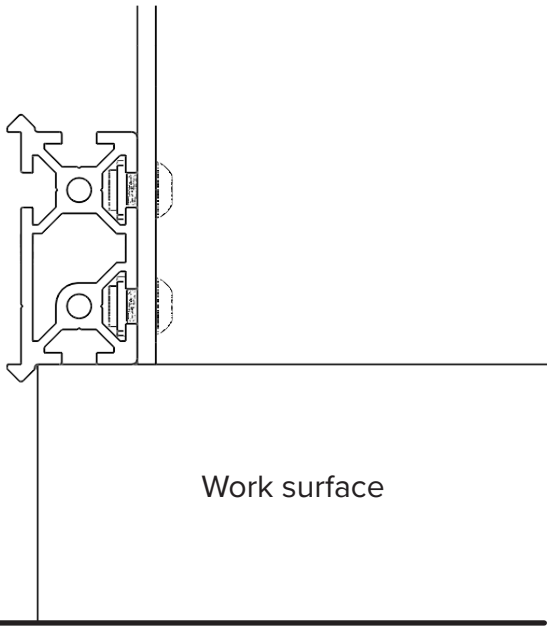
Use the corner plate spacing method from before to check the proper spacing at each end of the side plate assembly.

A23

Press down on the plate and rail and further snug the M5x8s. Note that to get the rail and plate surfaces flush, you will need to hang the protruding edge for the V-groove wheels off of your workspace.



Edge of Makerslide hangs off of the work surface.

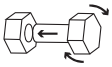


A24

You can double check the hole alignment with the M5x45s. Remove them afterwards.

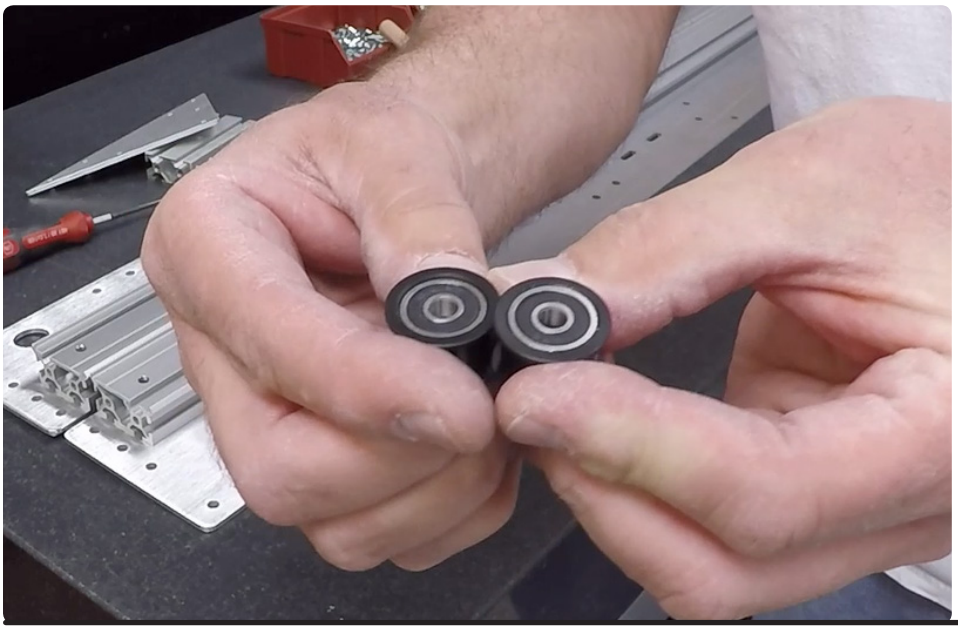
A25

Fully tighten the M5x8s.



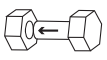
A26

Repeat this process for the other side plate assembly.



A27

Next, you will install the idler pulleys for the Y axis belts. Press the bearings into the idler pulleys to make sure they're fully seated.

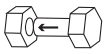


A28

Note that the recessed side should be against the rail when assembled.

A29

Insert 1 M5x45 into each rail for the pulleys, as shown.



A30

Each washer has a flat, dull side and a round, shiny side. Always place the round, shiny side towards the bearings.

A31

Place 3 M5 washers on the M5x45 (round, shiny side towards where the bearing will be).

A32

Place the idler pulley on the M5x45, with the recessed face towards the rail.

A33

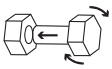
Add 1 M5 washer to the M5x45, shiny side toward the bearing.

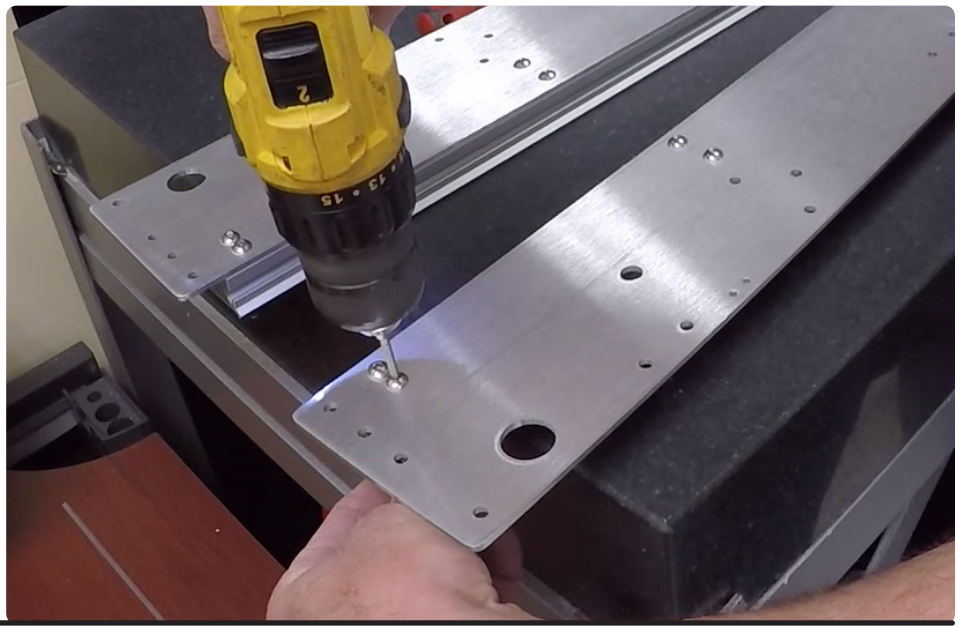
A34

Place a small amount of grease on the end of the screw. This keeps the hardware from galling. You can read an informative article on thread galling here.

A35

Fasten 1 M5 lock nut onto the M5x45, using the 8mm combo wrench and 3mm Allen Key to fully tighten. Do not tighten so much that the pulley cannot turn. It should always be able to turn smoothly.



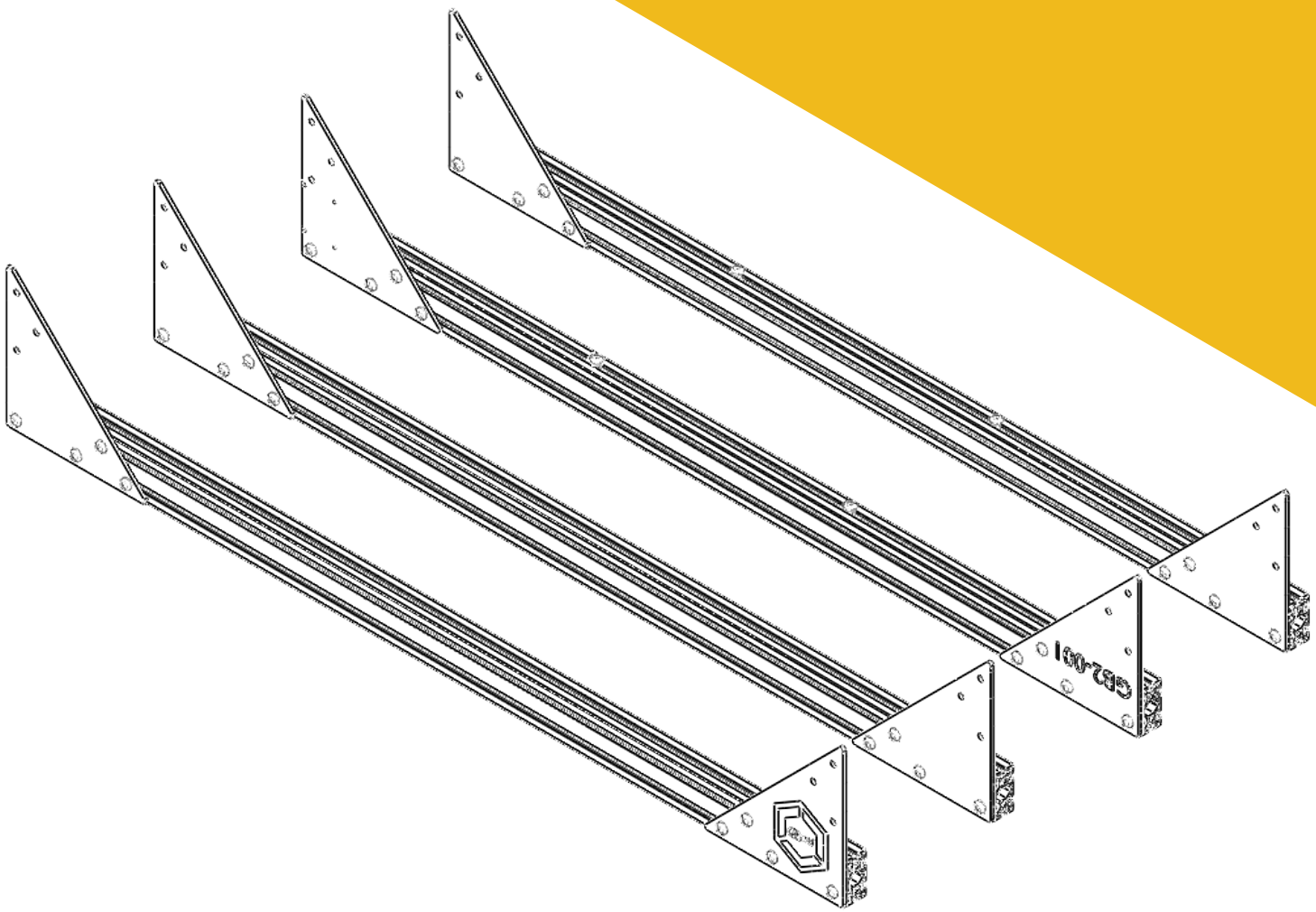


A36

Again, please watch our assembly video as an overview, or for further details.

B

HEADER & FOOTER ASSEMBLY



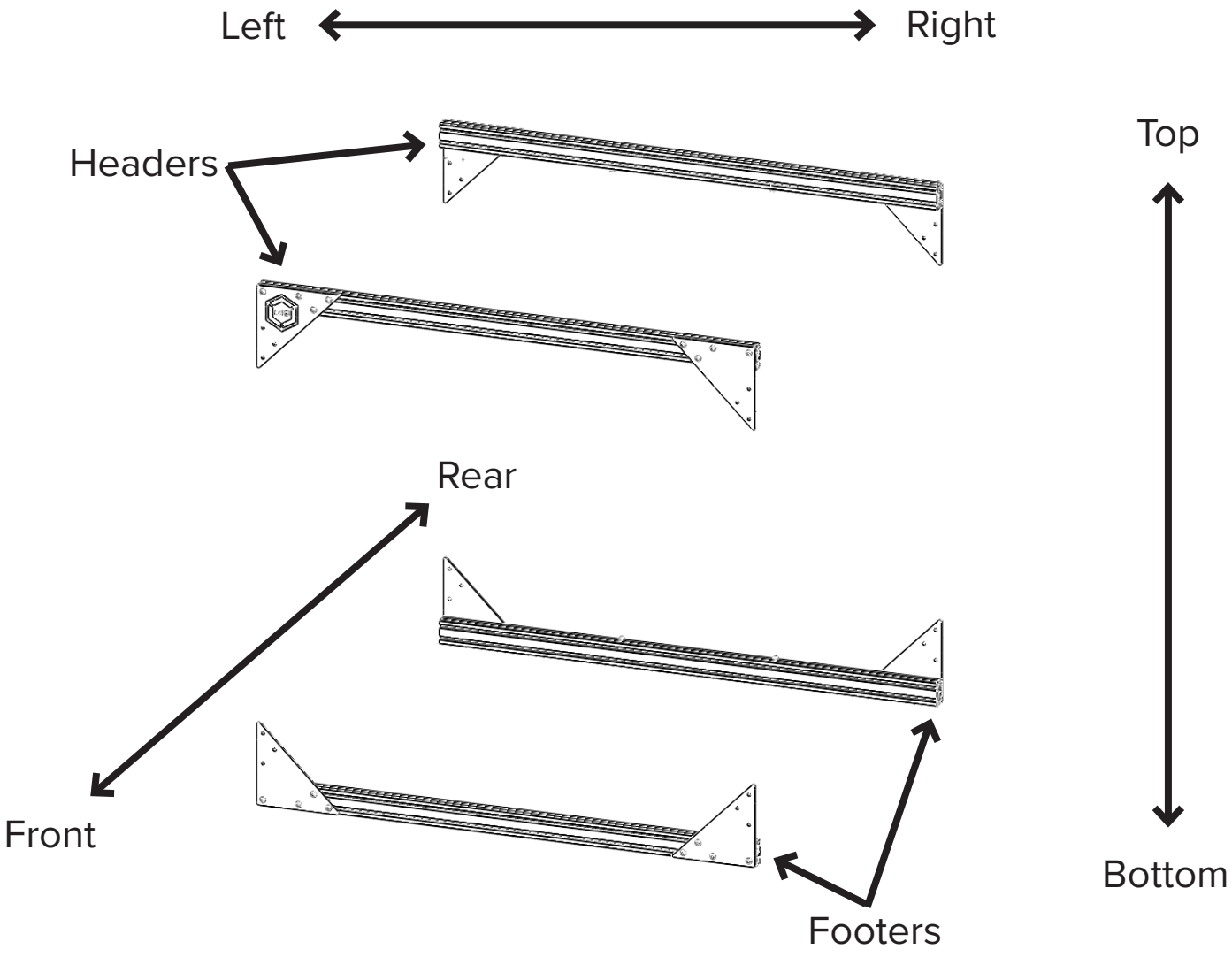
TOOLS & PARTS

Refer to packing list to identify parts

BOX #	PART	QUANTITY
4	Cross rails (blue tape)	4
6	Logo corner plate	1
6	Corner plate	5
Snappybox	M5 T-nuts	43
Snappybox	M3 T-nuts	6
Snappybox	M5x8 BHCS	33
Snappybox	M3x8 SHCS	1
4	Precision square	1
6	3mm Allen Key	1
6	Serialized corner plate	1
8	Tapped corner plate	1
Snappybox	M5x10 BHCS	4
WATCH THE ACCOMPANYING VIDEOS:	https://youtu.be/matY5suJLd4 https://youtu.be/MTFvHk73lvU	

OVERVIEW

In the final assembly of Gigabot®, the header and footer subassemblies will be oriented in the frame as shown.

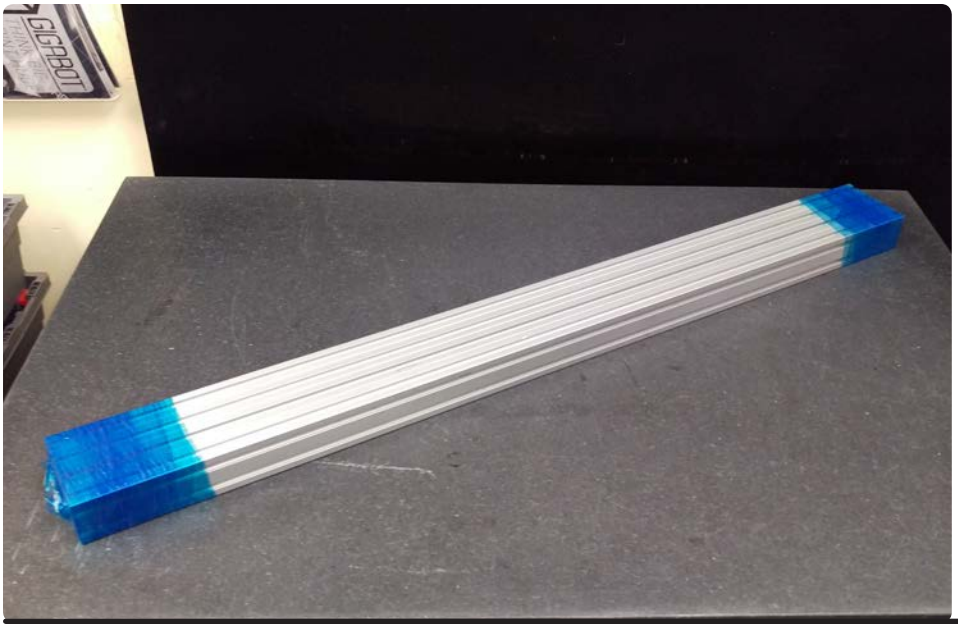


TIPS & TRICKS

#1 Work on a flat surface.

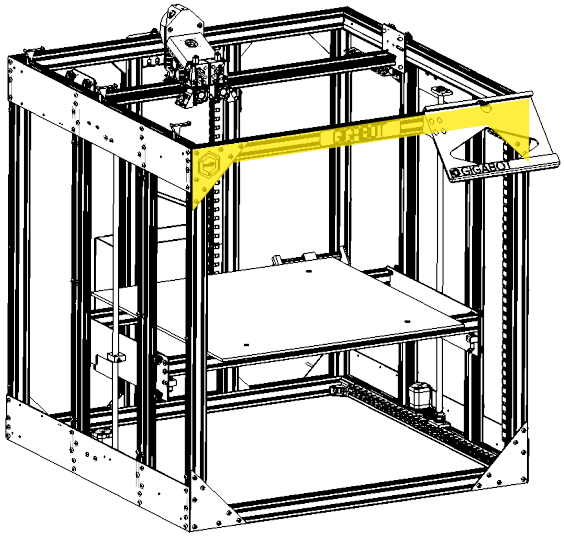
#2 Use a precision square and corner plate to make the corner plates flush with their rails.

#3 Rear header has many extra parts relative to the other headers and footers--be mindful of what parts the rear header needs.



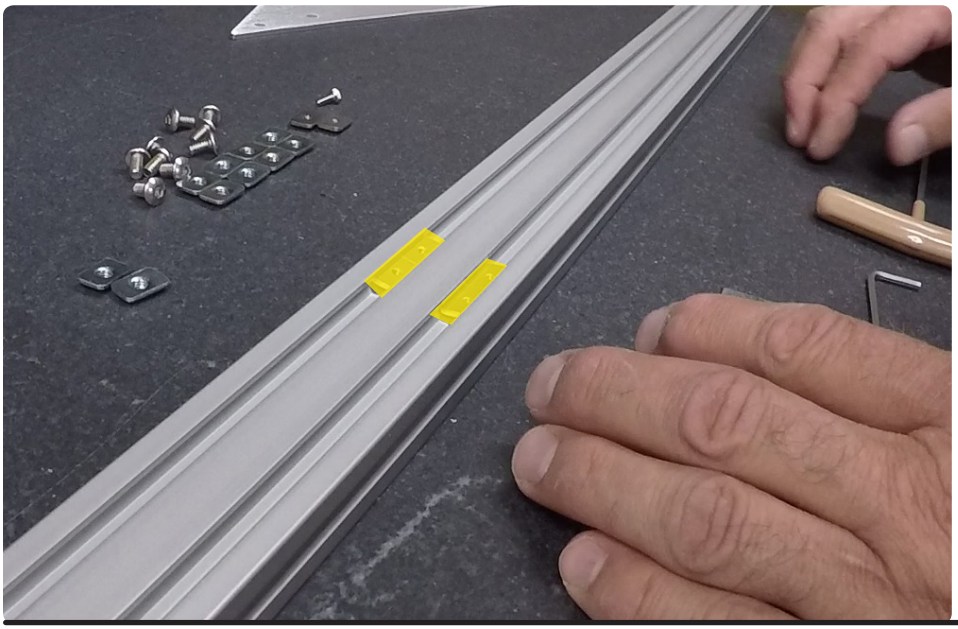
B1

Unpack the cross rails wrapped in blue tape.



B2

Begin assembling the front header, which will be placed as shown in yellow on the diagram.

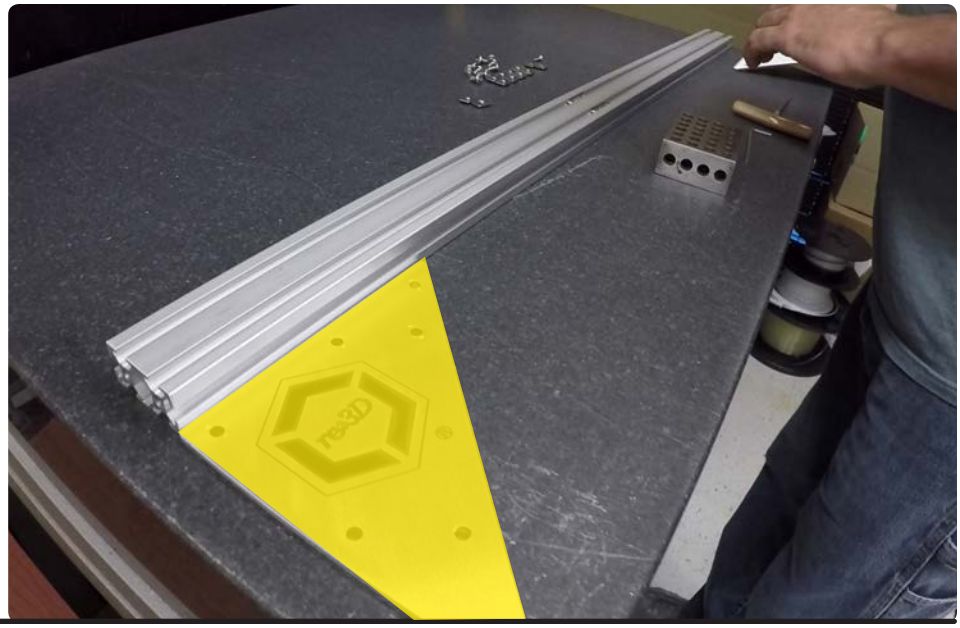


B3

Lay one cross rail on a flat surface. Insert 2 M3 T-nuts into each of the top surface slots (total of 4).

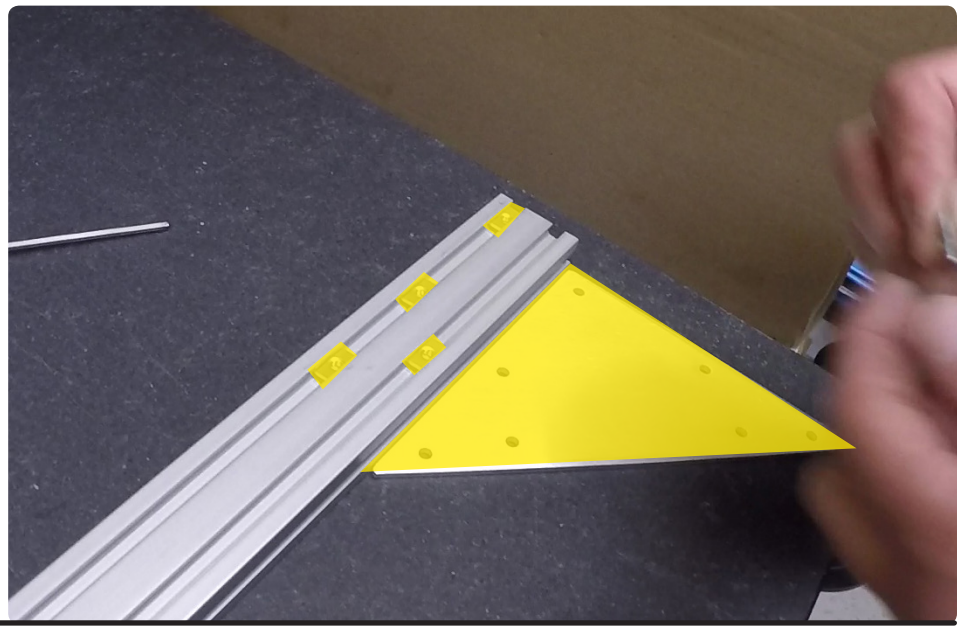
B4

Place the re:3D logo corner plate below the left side of the cross rail. On the right side, place a regular corner plate.



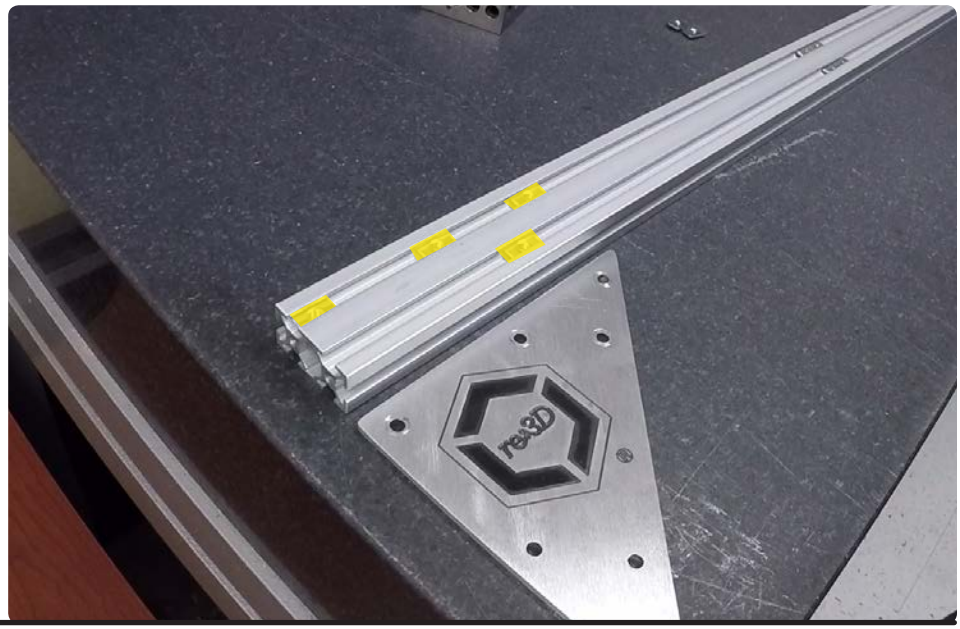
B5

Insert 4 M5 T-nuts into the right side of the cross rail as shown. The placement of these T-nuts should follow the hole positioning on the corner plate.



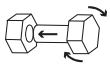
B6

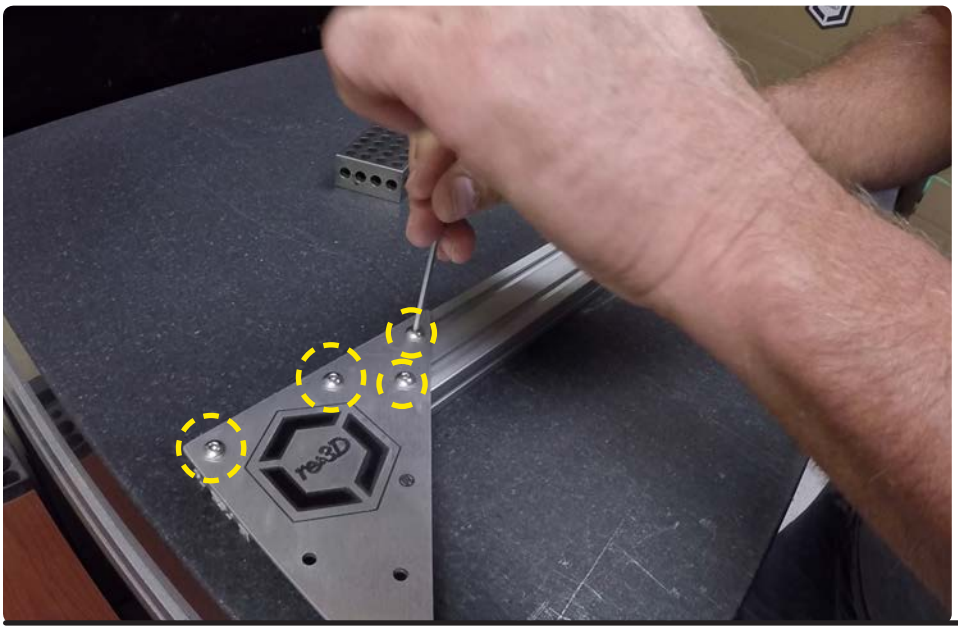
Repeat for the left side. Again, position T-nuts according to the hole placement on the corner plate.



B7

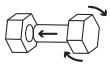
Use 4 M5x8mm BHCS and the 3mm Allen Key to loosely fasten the corner plate to the T-nuts in the cross rail.

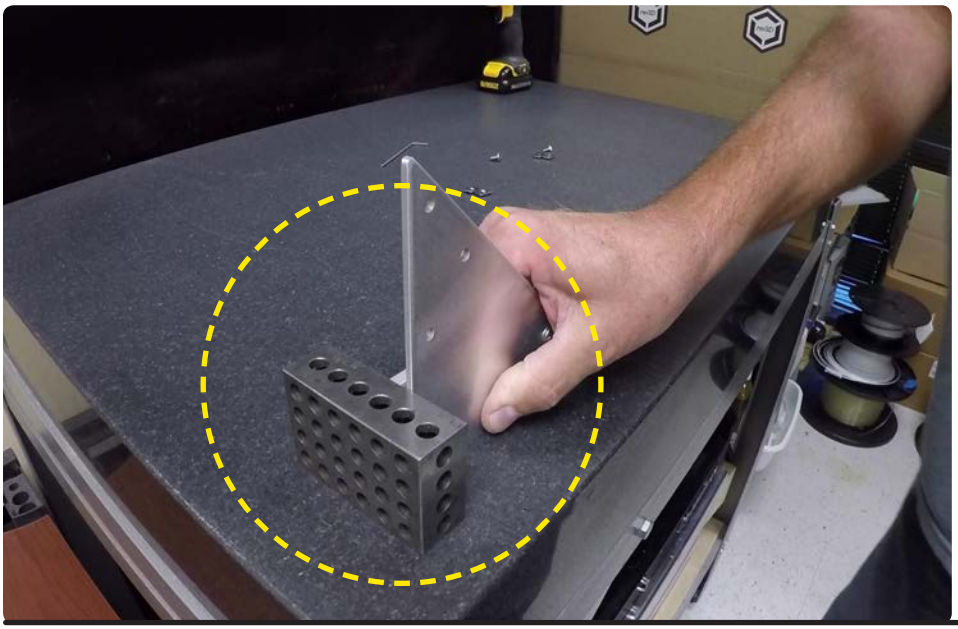




B8

Repeat this for the other corner plate.



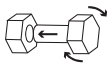


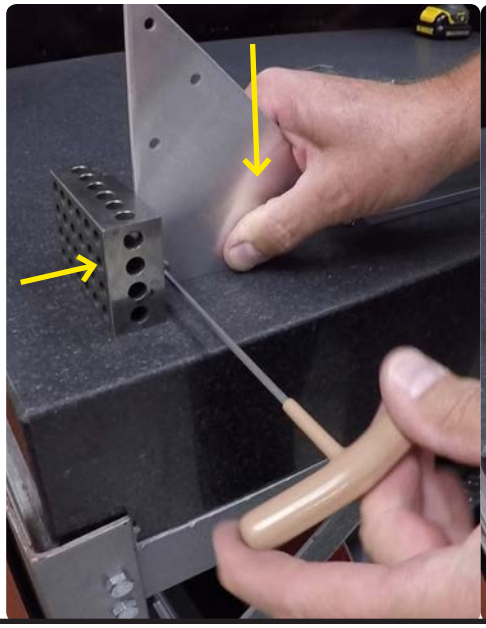
B9

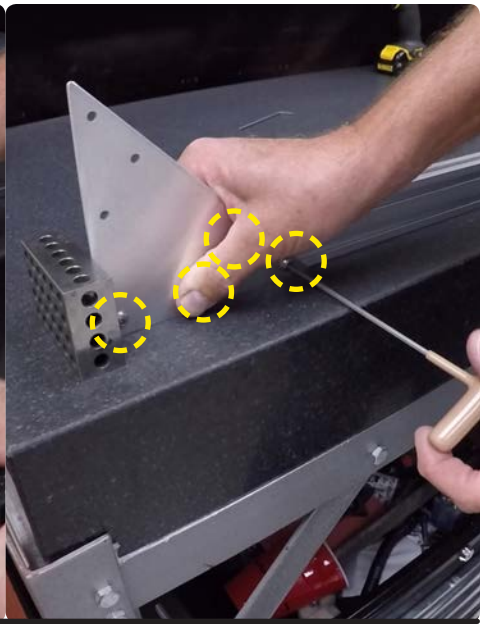
Use your precision square in combination with an unused corner plate/rail (here, only a 1-2-3 block is shown) to square and flush the edge of the corner plate with the end of the cross rail.

B10

Using one hand to press down from above, use the 3mm Allen Key to snug the M5x8mm BHCS attaching the corner plate to the rail. This will make the bottom surface of the rail flush with the bottom surface of the corner plate.

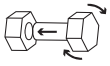


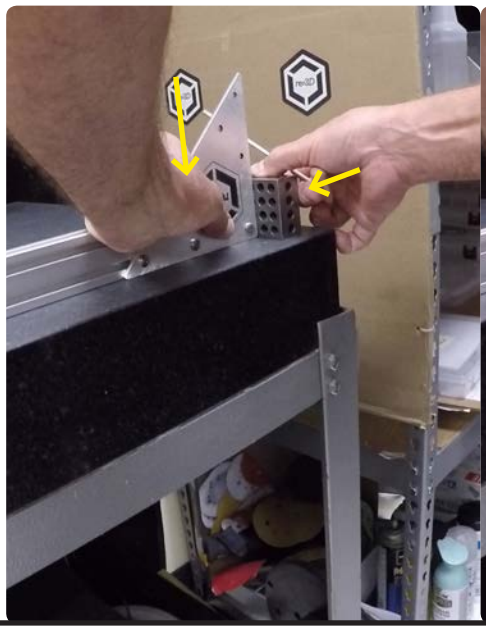


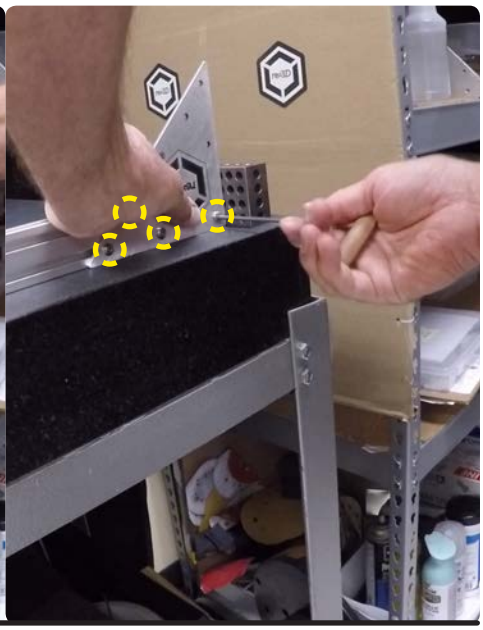


B11

Repeat the squaring/ flushing and snugging steps for the other corner plate.

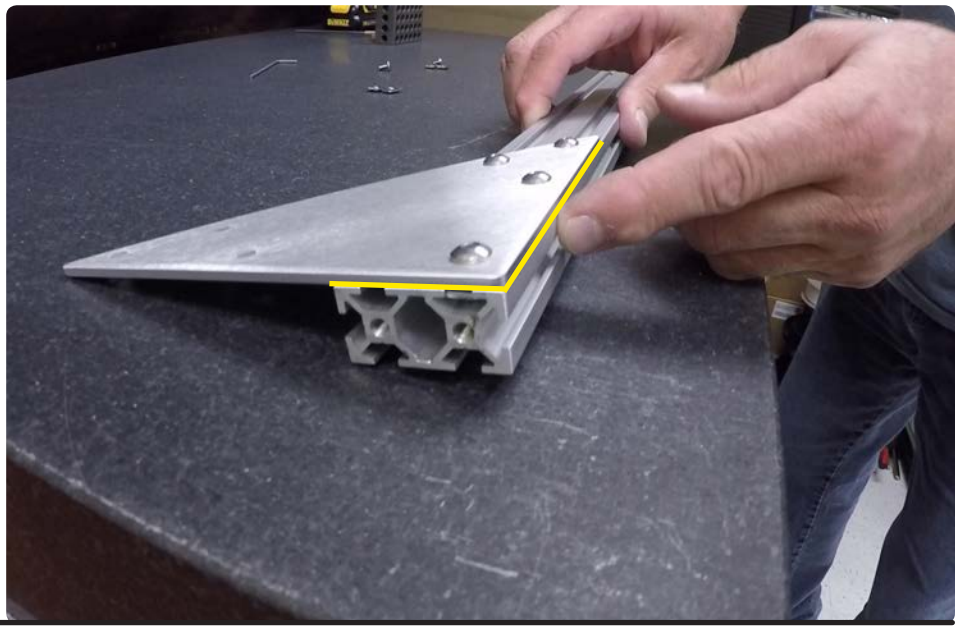






B12

Check the bottom and side of each corner plate for flushness and squareness against the surfaces of the cross rail.

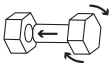


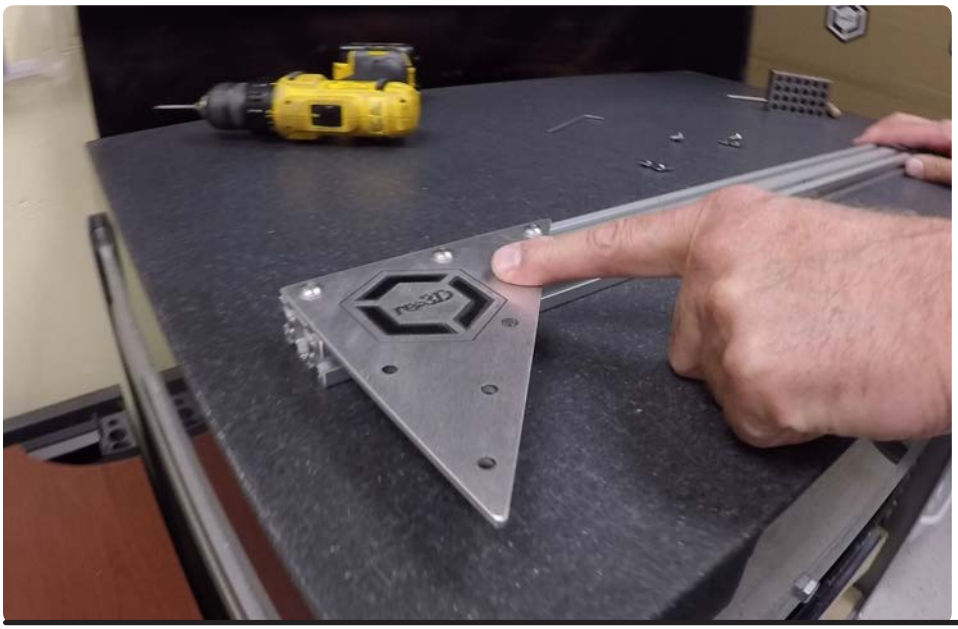
B13

If the surfaces are not flush or square, loosen the M5x8mm BHCS and repeat steps B9-B11 until they are.

B14

Once both corner plates are flush and square, fully tighten all M5x8mm BHCS to fasten them to the rail.





B15

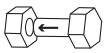
Using the logo plate as a reference, flip the assembly over so that the logo is on the right side and facing down.

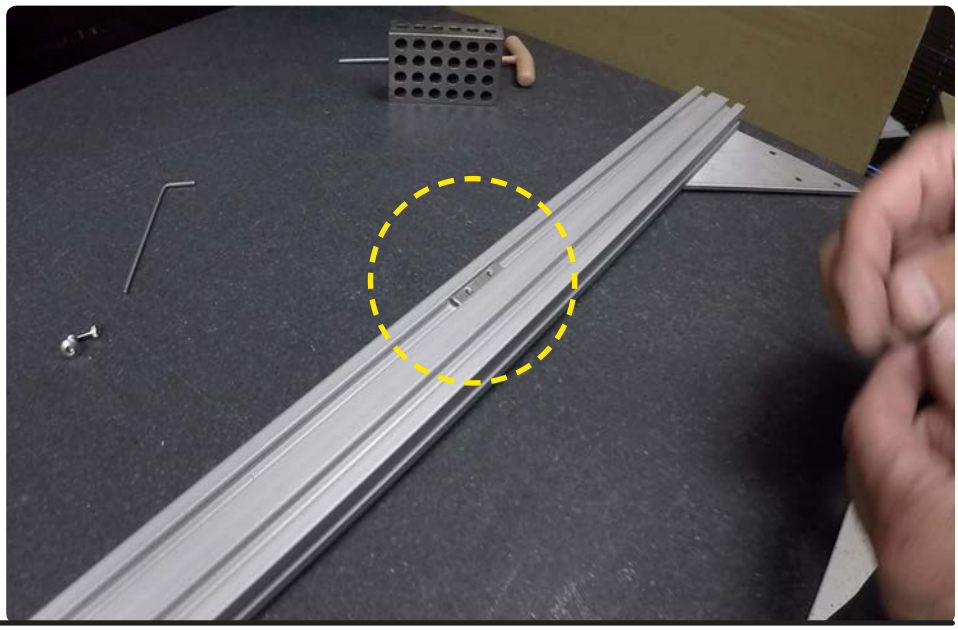
B16

Here, the assembly has been flipped. Again, note that the logo corner plate (highlighted in yellow) is now on the right side and facing down.

B17

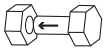
Insert 2 M3 T-nuts into the upper slot.

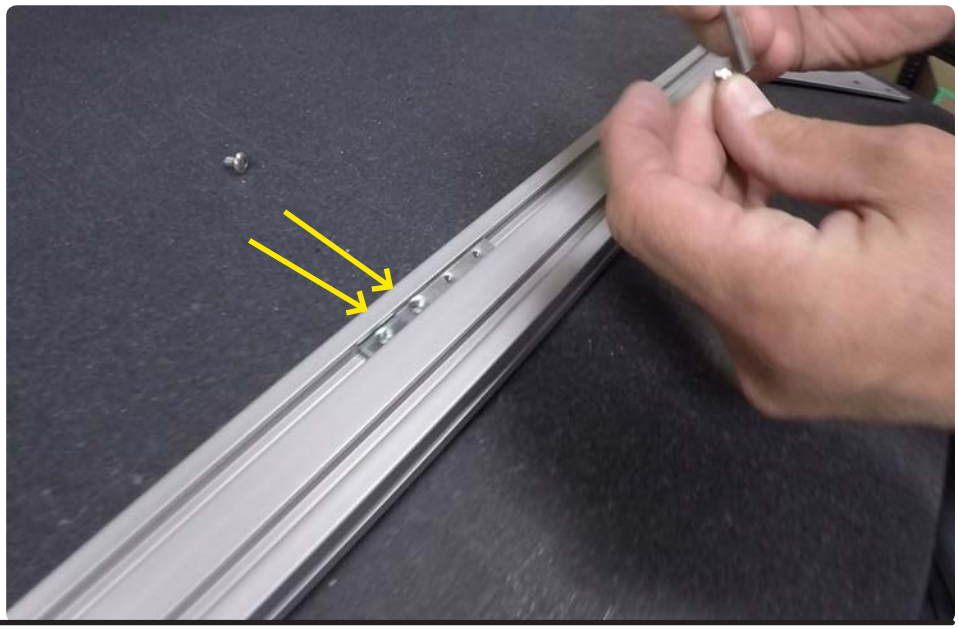


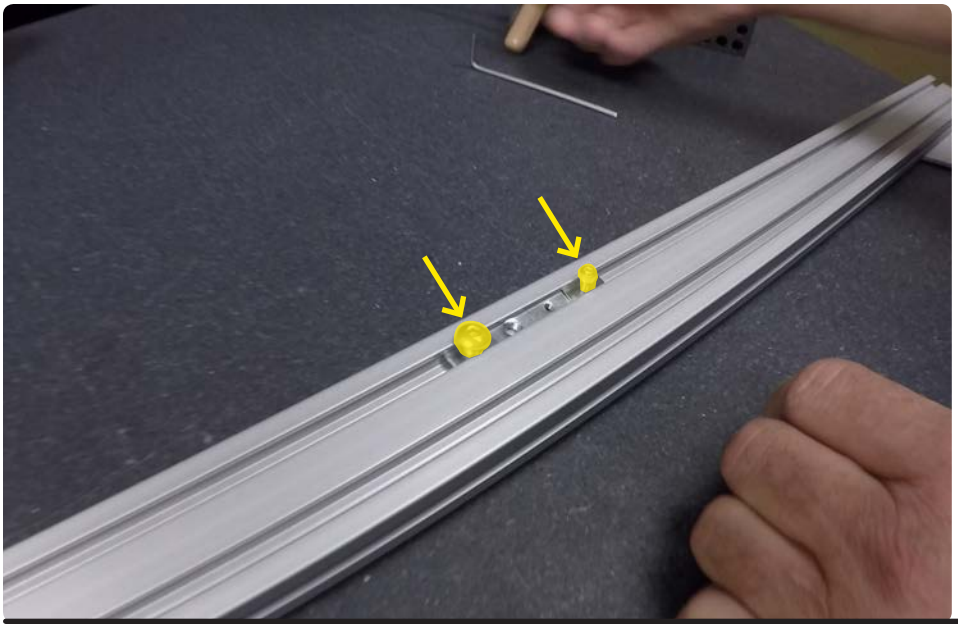


B18

To the left of the M3 T-nuts, insert 2 M5 T-nuts.

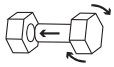


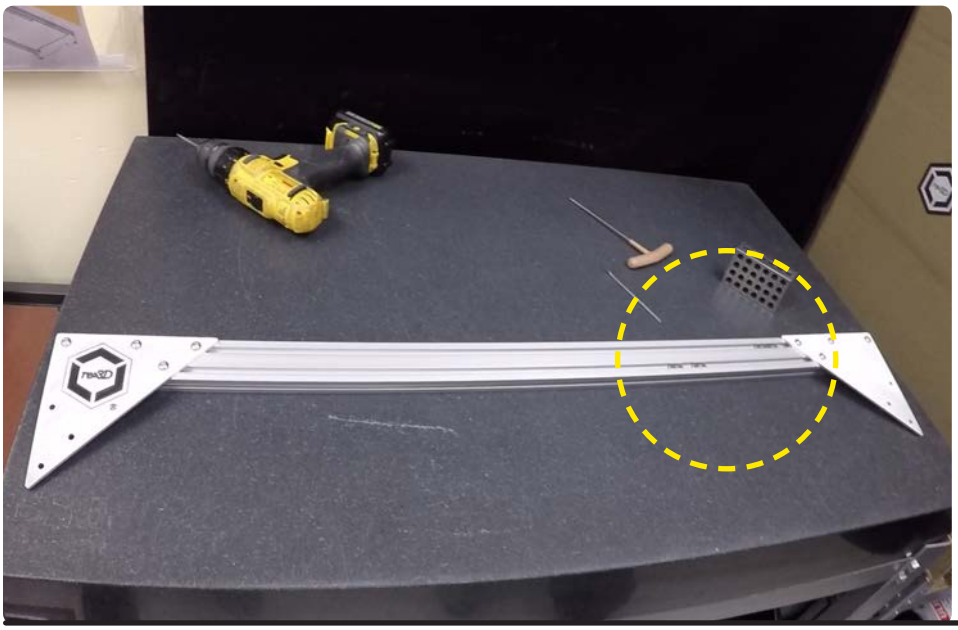




B19

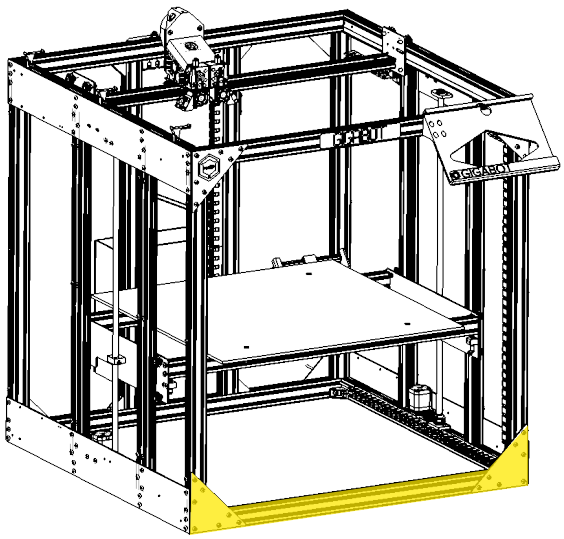
Fasten 1 M5x8mm BHCS onto the leftmost T-nut until it drives into the rail. Likewise, fasten 1 M3x8mm SHCS into the rightmost T-nut. This will keep the hardware in place while moving the front header assembly.





B20

Once finished, the front header should look as shown. Note that the 4 M3 T-nuts in the front facing slots are captured in place by the corner plate hardware.

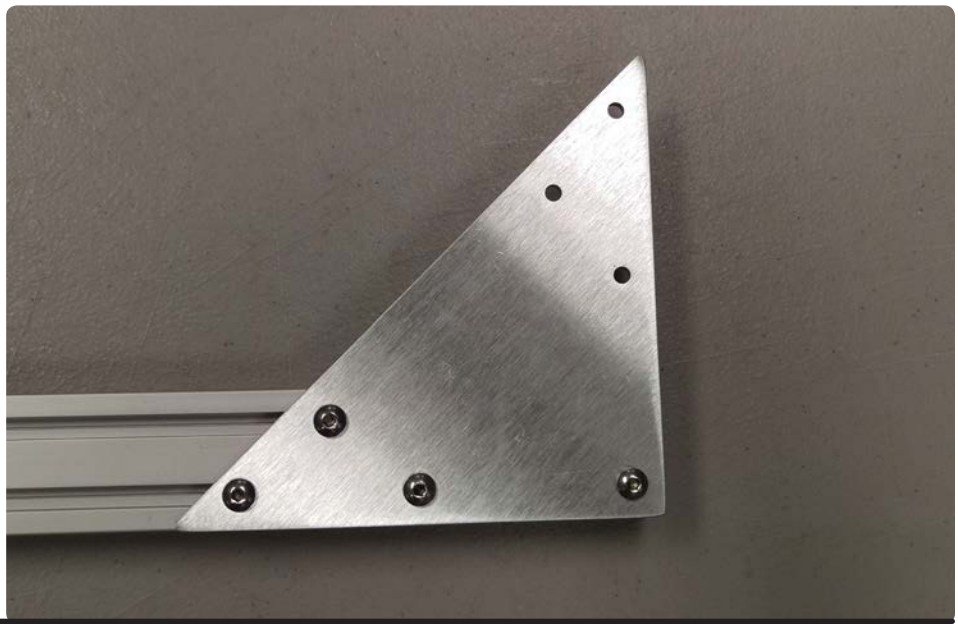


B21

Next will be the front footer, which will be placed as shown.

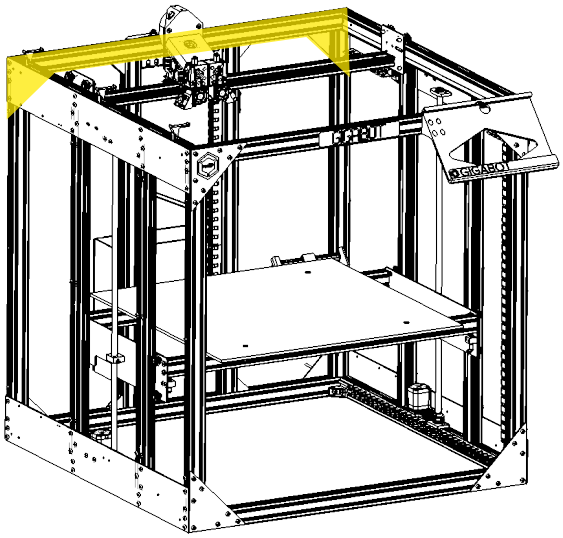
B22

Use the same process as before (steps B4-B14) to assemble the front footer, except use 2 regular corner plates and ONLY use enough T-nuts to install the corner plates.



B23

Next will be the rear header, which will be placed as shown.

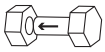


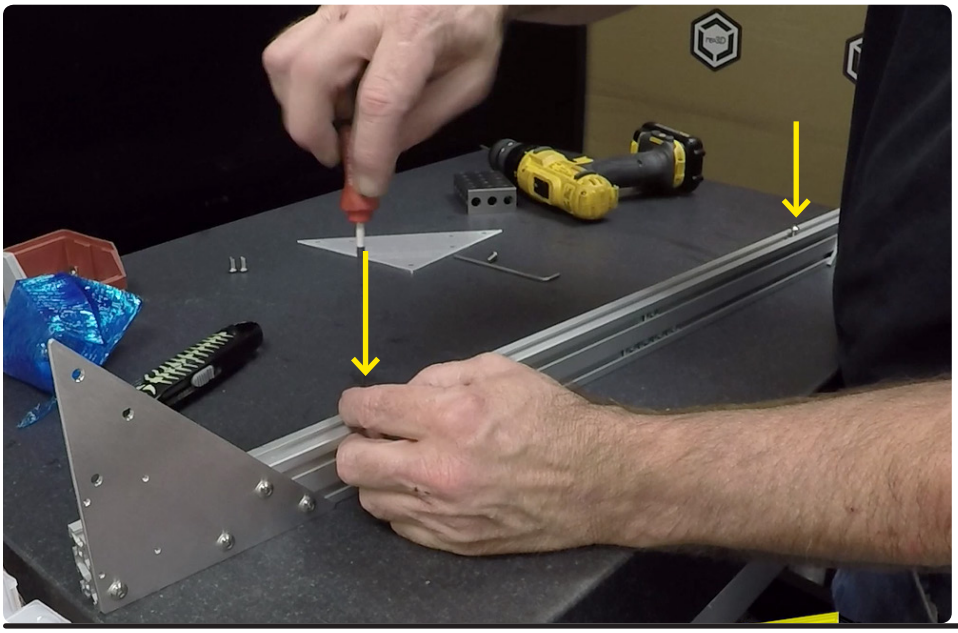
B24

This is almost the same as before in terms of corner plate assembly. The left corner plate uses a serialized corner plate (GB3-###), while the right uses the machined corner plate with 4 tapped holes for the Y axis cable carrier.

B25

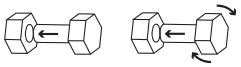
Include 5 extra T-nuts in the middle (2 for each FD unit, 1 for the 8.5” filament rod) as shown.

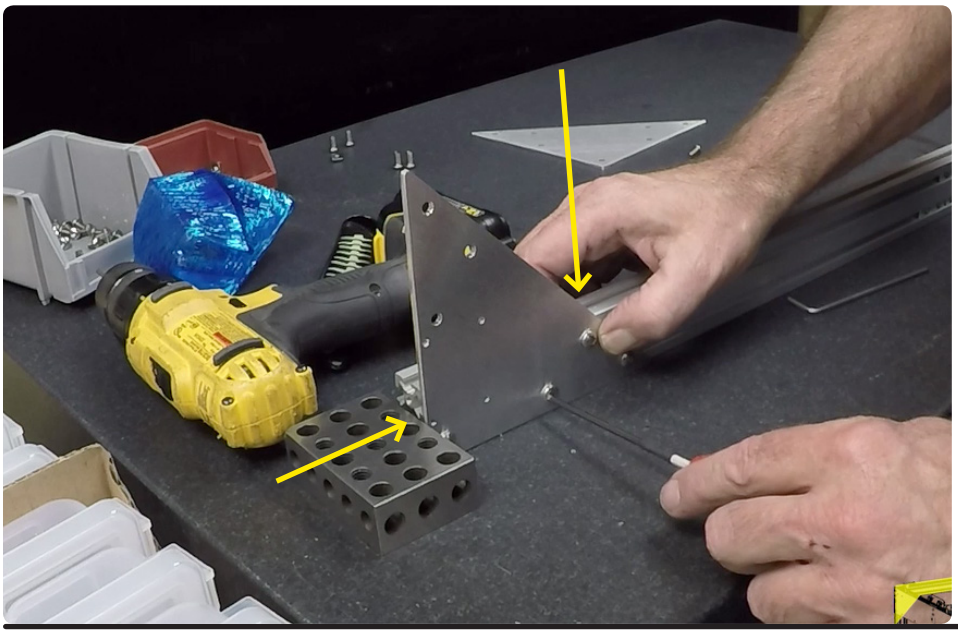




B26

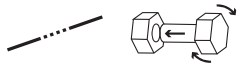
Also include 2 T-nuts in the very bottom slot (you may need to flip the assembly over) with M5x10 BHCS fastened down to hold them in place (make sure these cannot slide out).





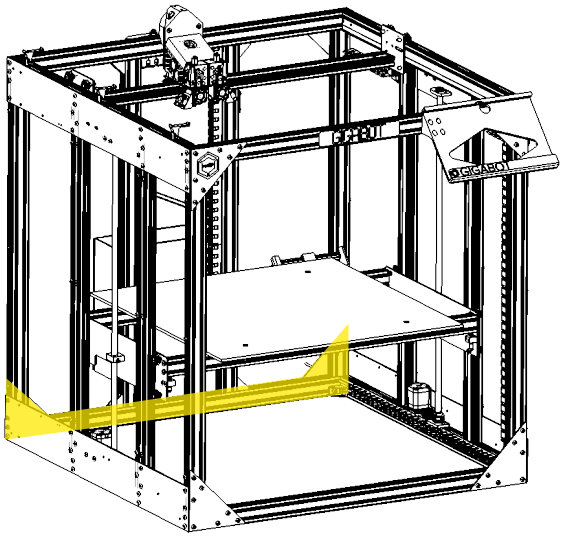
B27

Make the plates flush with the rail in the same way as before and fully tighten them down with the M5x8 BHCS and 3mm Allen Key.



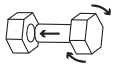
B28

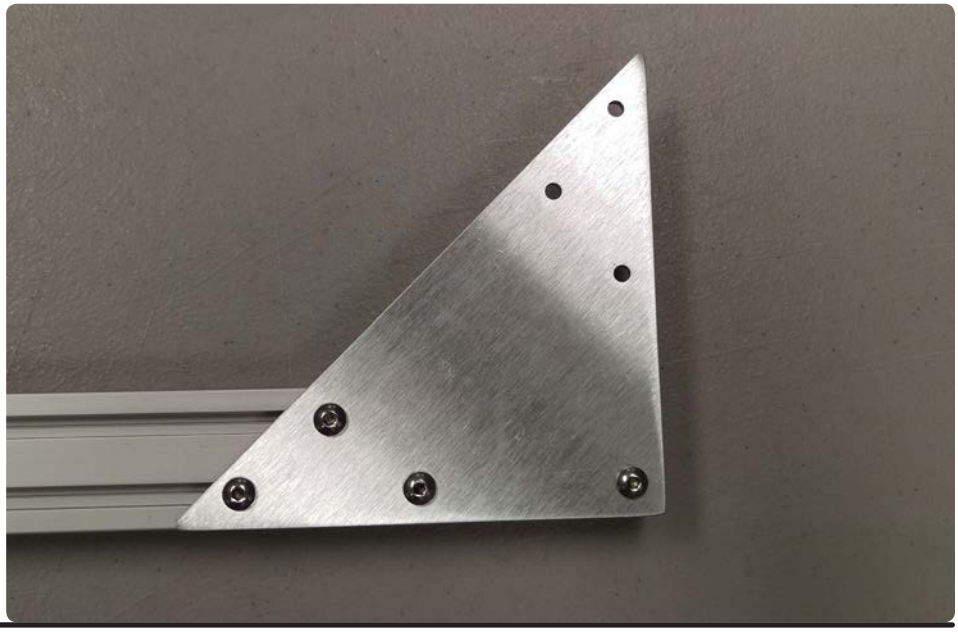
Next, you will assemble the rear footer, which will be placed as shown.



B29

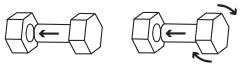
Assemble 2 normal corner plates on the rear footer in the same way as before.

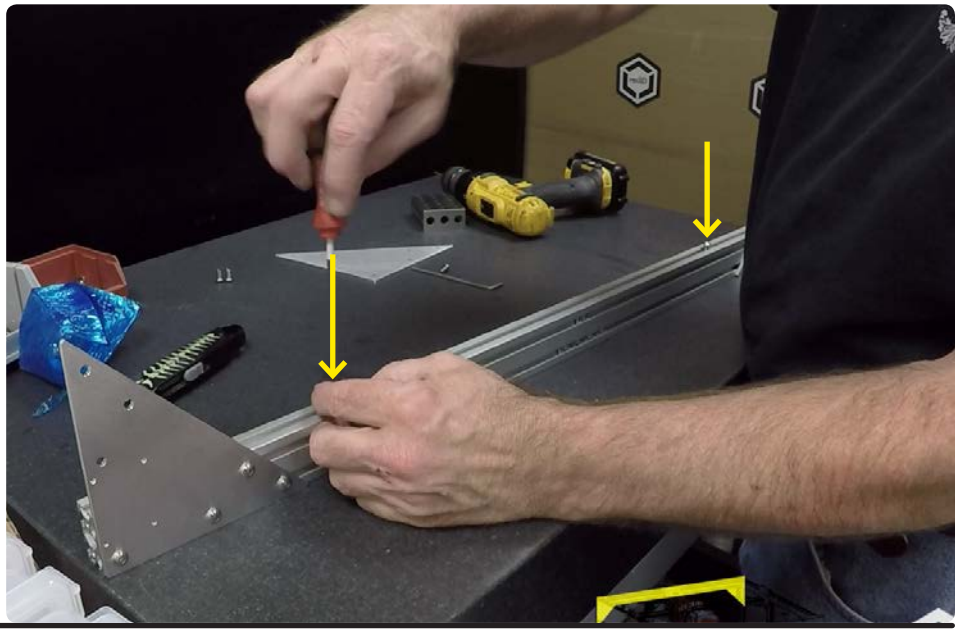


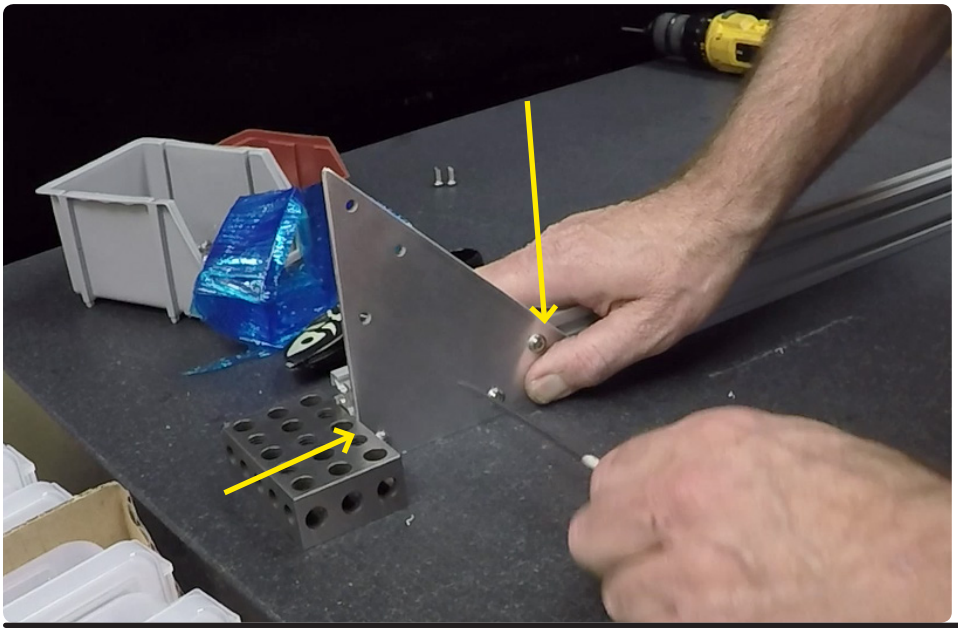


B30

In the top slot, include 2 T-nuts with M5x10 BHCS fastened down to hold them in place (make sure these cannot slide out).

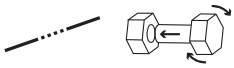






B31

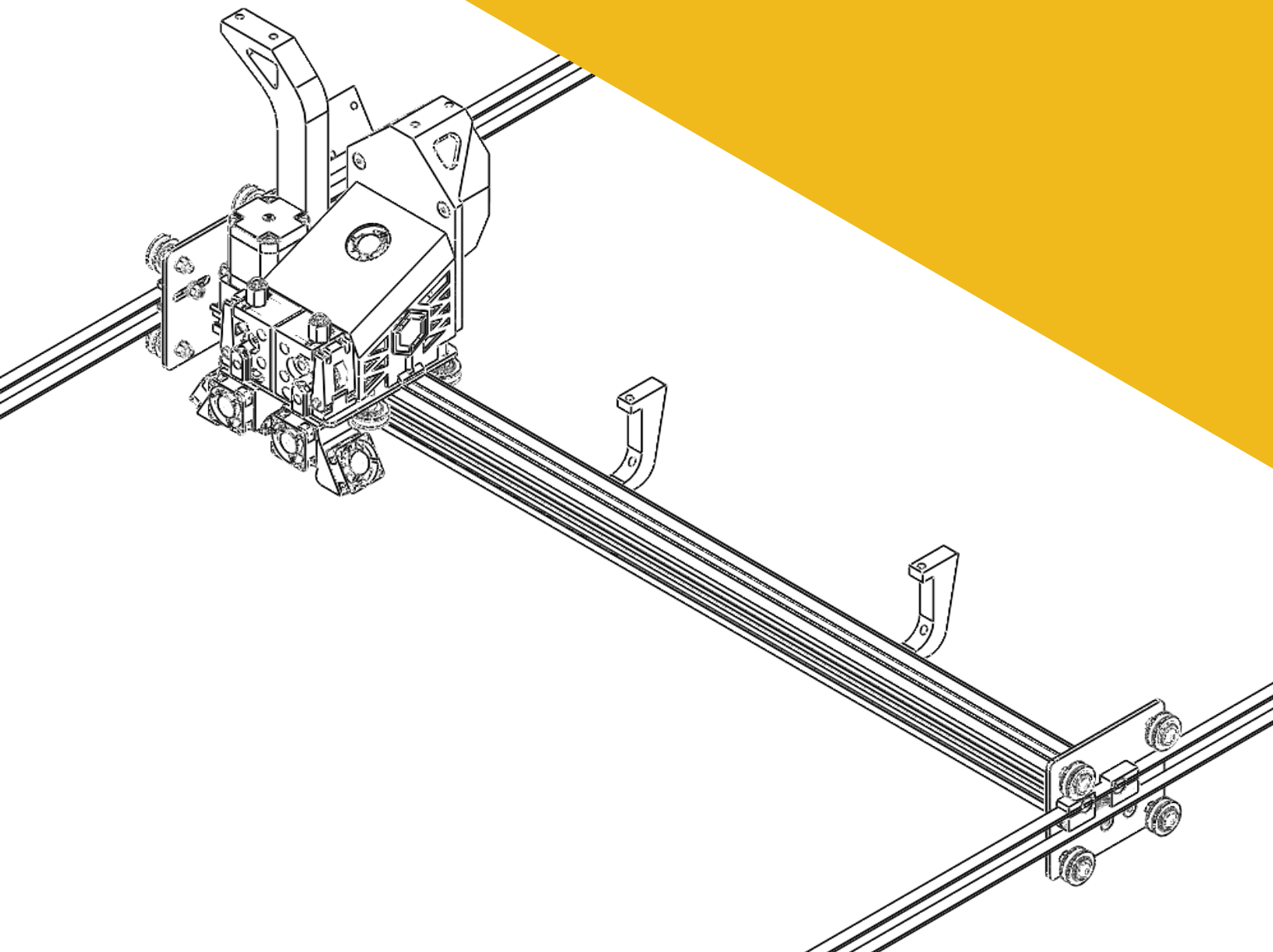
Make the plates flush with the rail in the same manner as before and fully tighten them down with M5x8s and 3mm Allen Key.



B32

For step-by-step guidance and overviews, please check out our video. Note that there are updated instructions for the GB3+ front header assembly, demonstrated in this video.

C BRIDGE ASSEMBLY



TOOLS & PARTS

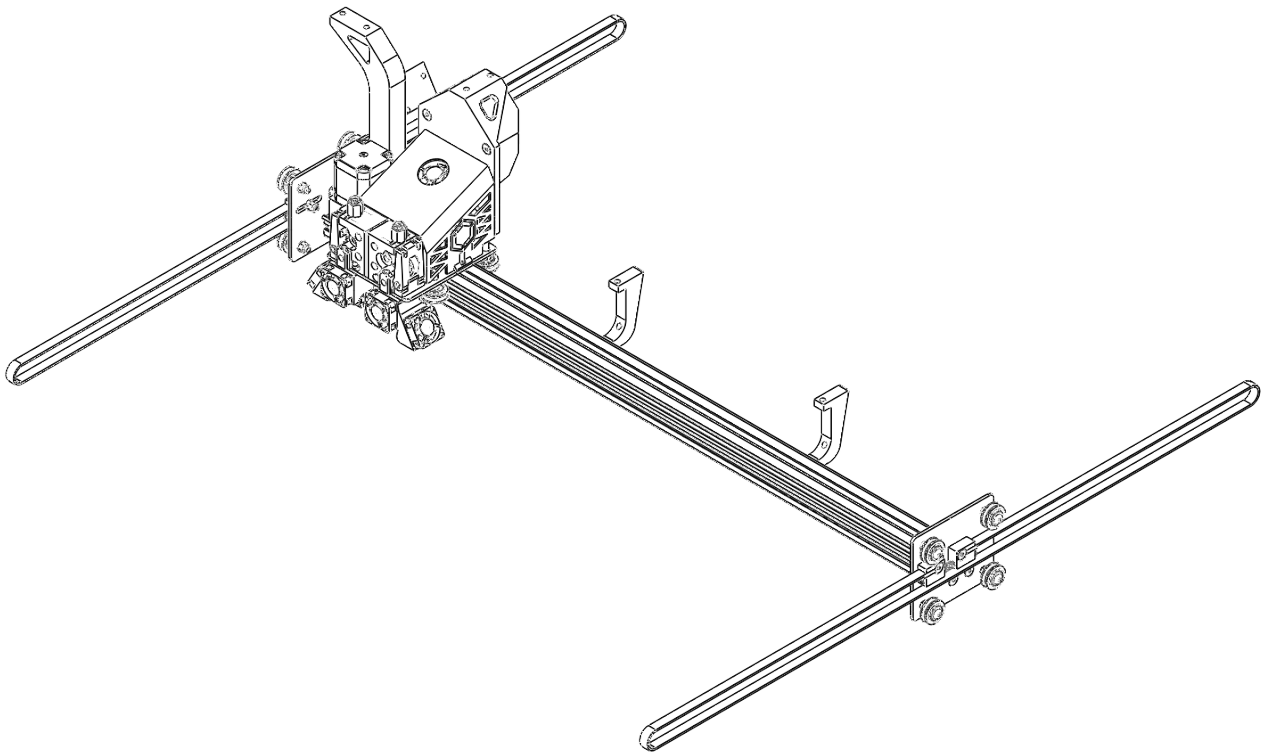
Refer to packing list to identify parts

BOX #	PART	QUANTITY
6	64” Y-Axis belts	2
Snappybox	Unthreaded tensioner	2
Snappybox	Threaded tensioner	2
Snappybox	M5x20 FHS	4
6	3mm Allen Key	1
Snappybox	M6x60 BHCS	2
6	Endtruck plates	2
Snappybox	M5x12 FHS	4
Snappybox	T-nuts	8
Snappybox	M5 flat washers	18
Snappybox	M5 lock washers	2
Snappybox	M5 hex nuts	2
Snappybox	M5 lock nuts	11
Snappybox	8mm combo wrench	1
Snappybox	Eccentric spacers	4
6	Grease	1
Snappybox	M5x30 BHCS	8
Snappybox	V-groove wheels	8
Snappybox	Round spacers	4
Snappybox	M5x45 BHCS	3
7	Assembled trolley	1
5	Motor with mount	1
6	4mm Allen Key	1
Snappybox	X cable carrier supports	3
Snappybox	M5x12 BHCS	3

WATCH THE ACCOMPANYING VIDEO: https://youtu.be/7lf3sqUJ-g8

OVERVIEW

In the final assembly of Gigabot®, the bridge subassembly will be oriented in the frame as shown.



TIPS & TRICKS

#1 Work on a flat surface.

#2 Carefully assemble the belts. Verify that there are no twists in the belts as they connect to the tensioner blocks.

#3 Verify that there are enough T-nuts in the bridge rail, and at the proper locations.

C1

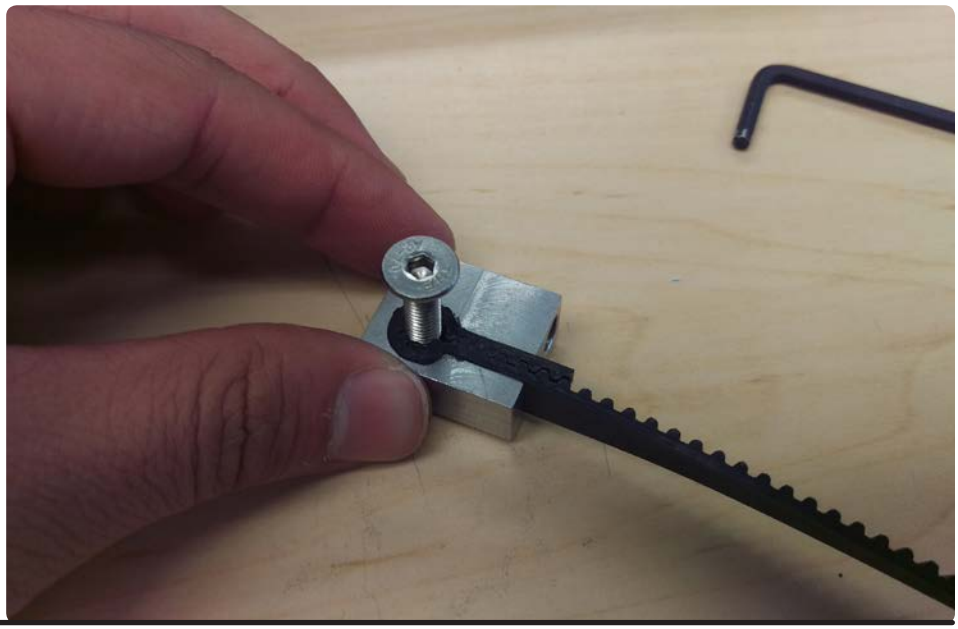
Locate the 2 64” belts from Box #6. These are for the Y axis. Also locate the 2 unthreaded tensioners and 2 threaded tensioners from the Snappy Box.

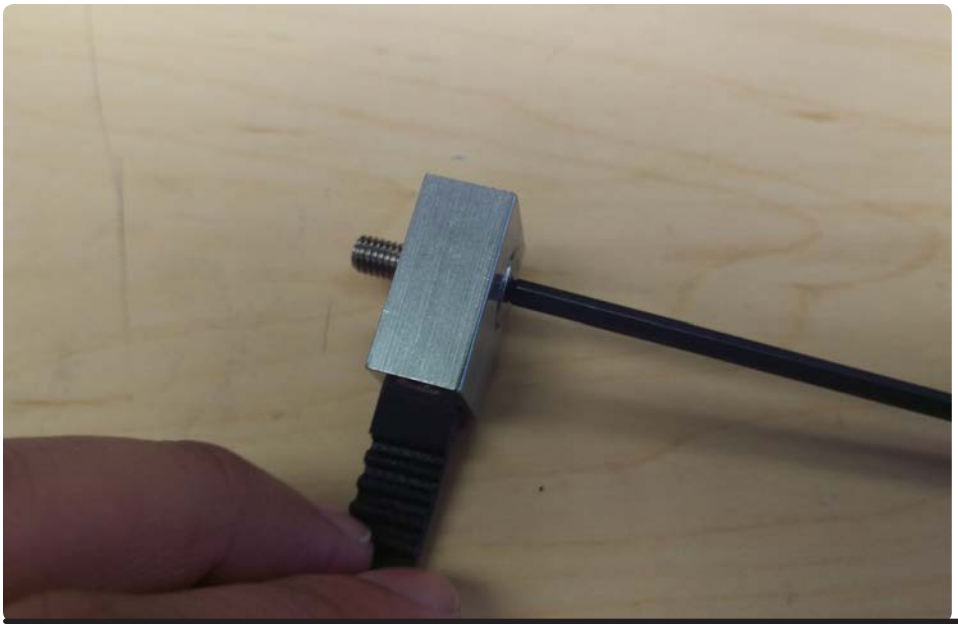
C2

Please watch our “Installing Belts onto Tensioners” video for a demonstration of this process. Pinch one end of the belt together as shown.

C3

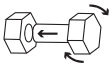
Loop the belt around a M5x20 FHS and press the belt with the screw into one of the tensioning blocks. Be sure to leave 2 teeth hanging out of the block on the end of the belt.

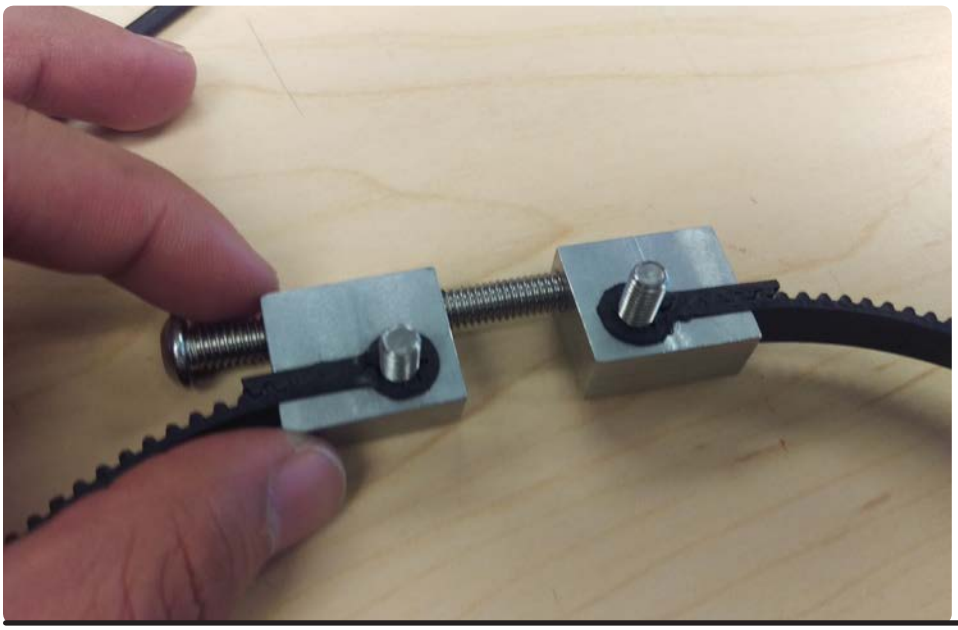




C4

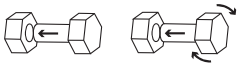
Use the 3mm Allen Key to screw the M5x20 FHS all the way through.





C5

Repeat this on the other end of the belt with the opposite tensioning block (they are paired, threaded with unthreaded). Orient the belts as shown. Insert an M6x60 BHCS through the unthreaded block and into the threaded block to connect them together.

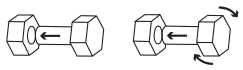


C6

Repeat this process for the other belt. You have now completely assembled the Y axis belts with their tensioning blocks. Set these aside for now.

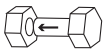
C7

Install the left end truck to the bridge rail with 2 M5x12 FHS. This attaches to the rail on the side with 2 holes for the X motor. Note the orientation of the plate and the use of the countersunk holes for the M5x12 FHS. Make this snug but not fully tight.



C8

Insert T-nuts for the X cable carrier supports and also the X/Y upright. There will be 5 T-nuts in the rear slot and 3 T-nuts in the bottom rear slot, as shown.

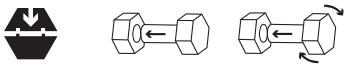


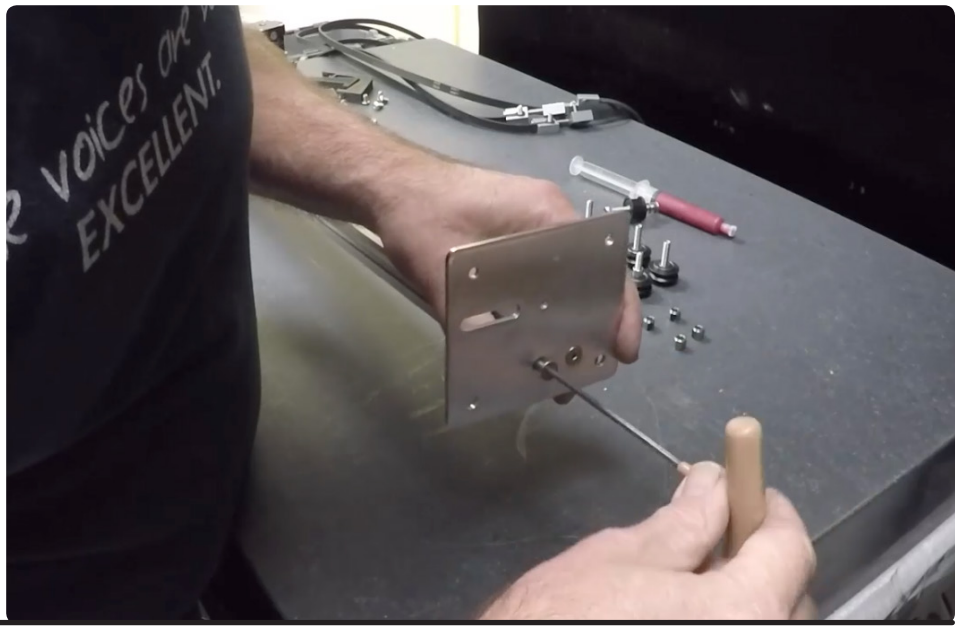
Rear

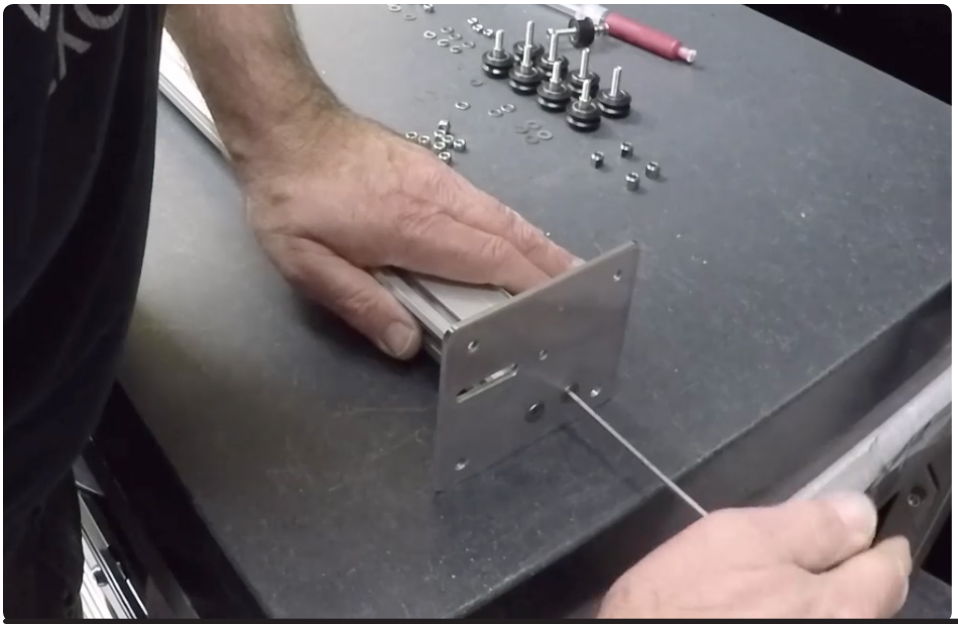
Bottom

C9

Install the right end truck to the bridge rail in the same fashion as the left end truck using 2 M5x12 FHS. Make the screws snug, but not fully tight.

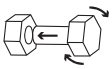


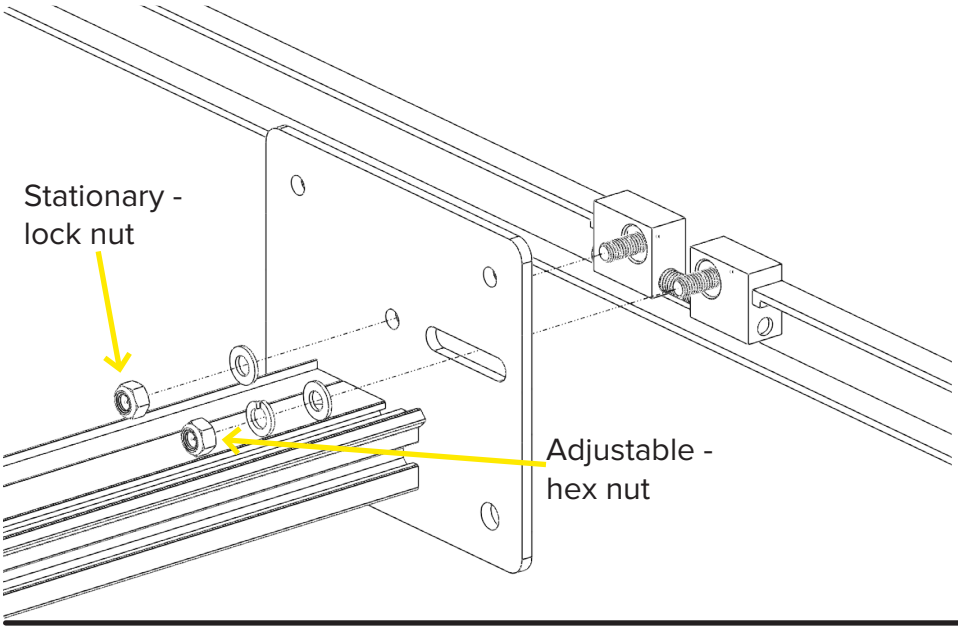




C10

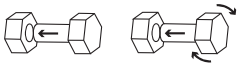
Assure that the end trucks are square to each other by placing the bridge assembly on a level surface. Press down on the bridge rail while fully tightening the end trucks to make sure it does not go out of square.

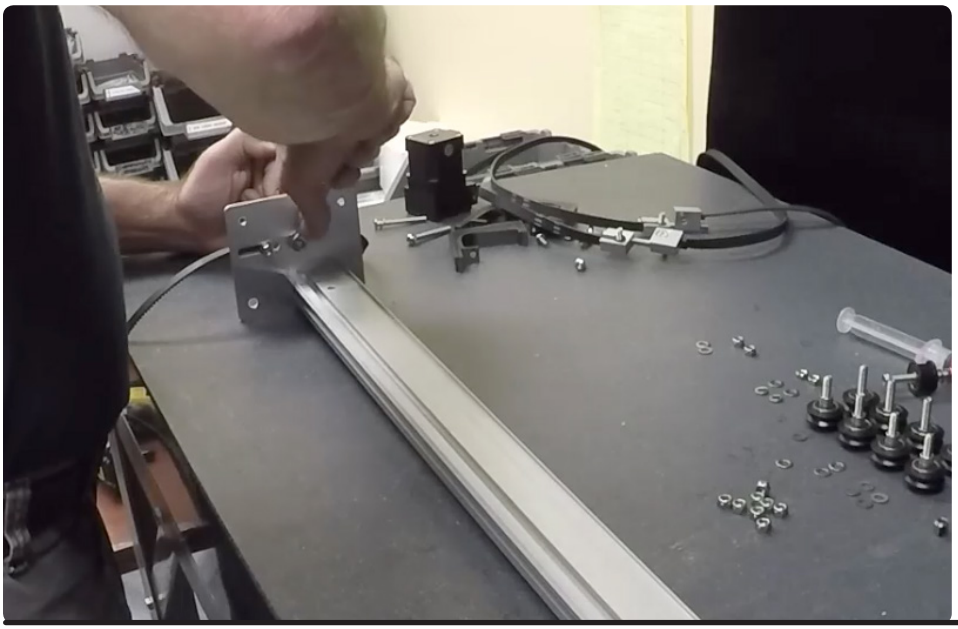




C11

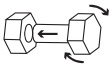
With no twists in the belt, install them to the end trucks as shown in the diagram. The stationary block is fastened with a flat washer and lock nut. The moving block gets fastened with a flat washer, lock washer, and hex nut.





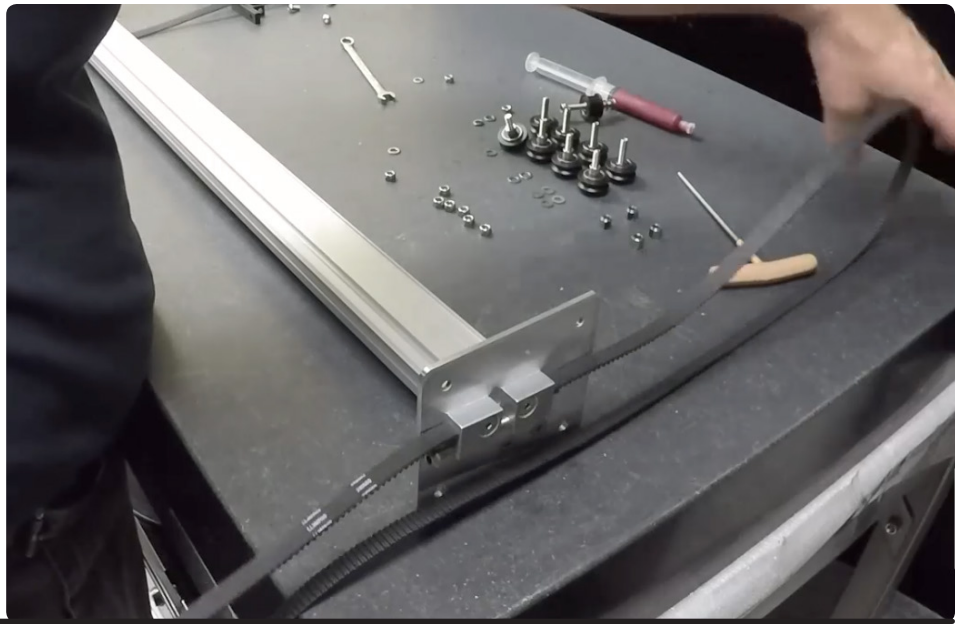
C12

Using the 8mm combo wrench and 3mm Allen Key, tighten them as much as possible. This helps seat both the belt and screw into the tensioning block so that the nuts may be loosened with just the 8mm wrench later.



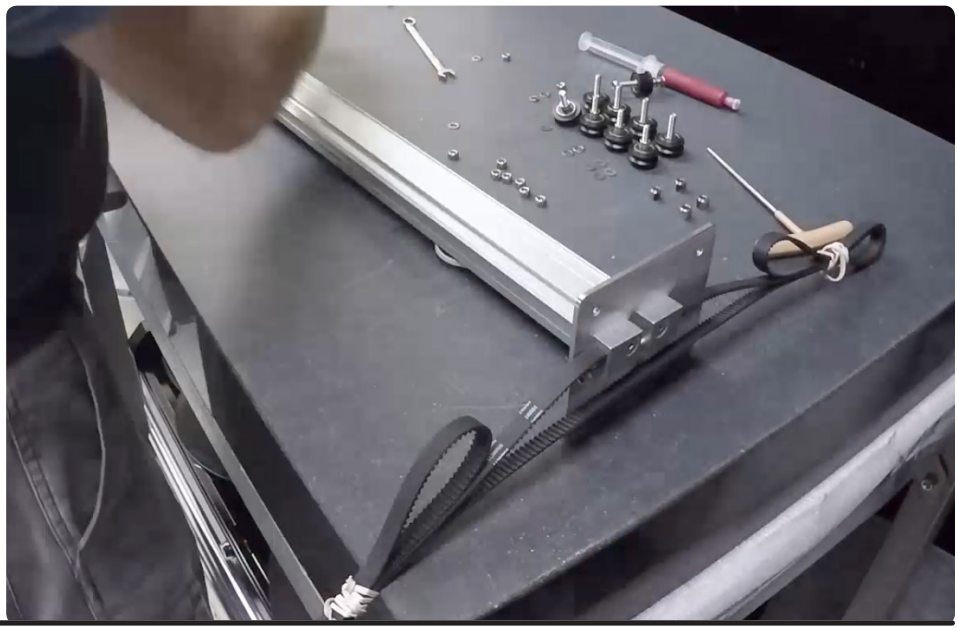
C13

Repeat this for the other end truck plate.



C14

Tie the belt ends together with rubber bands, twist ties, etc. to hold them in place prior to mounting the bridge assembly to the rest of the frame.

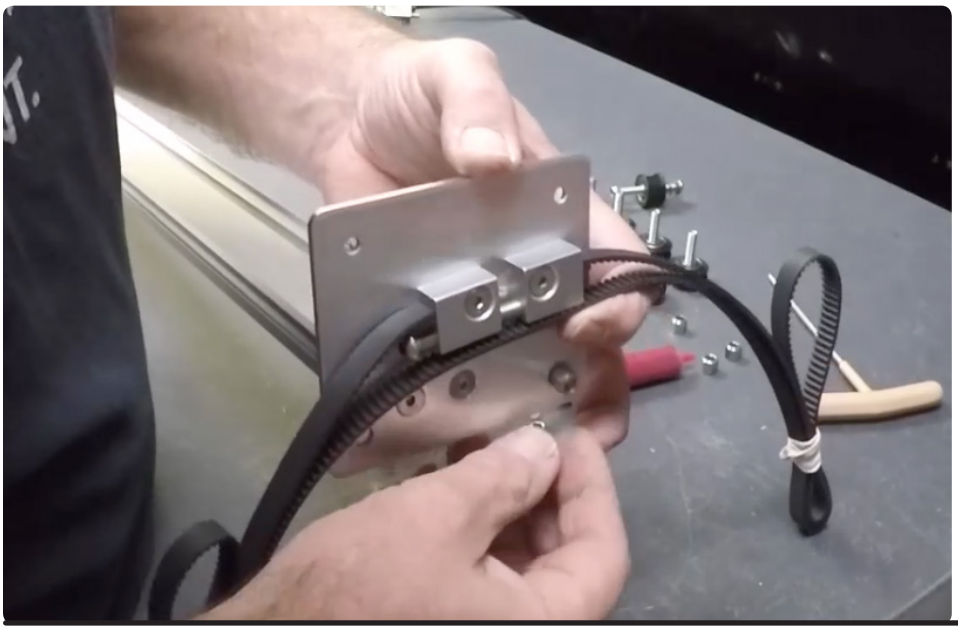


C15

You will now mount the wheels to the bridge assembly. Locate the eccentric spacers in the Snappy Box and mark each of them with a Sharpie on the “narrow” side.

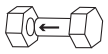
C16

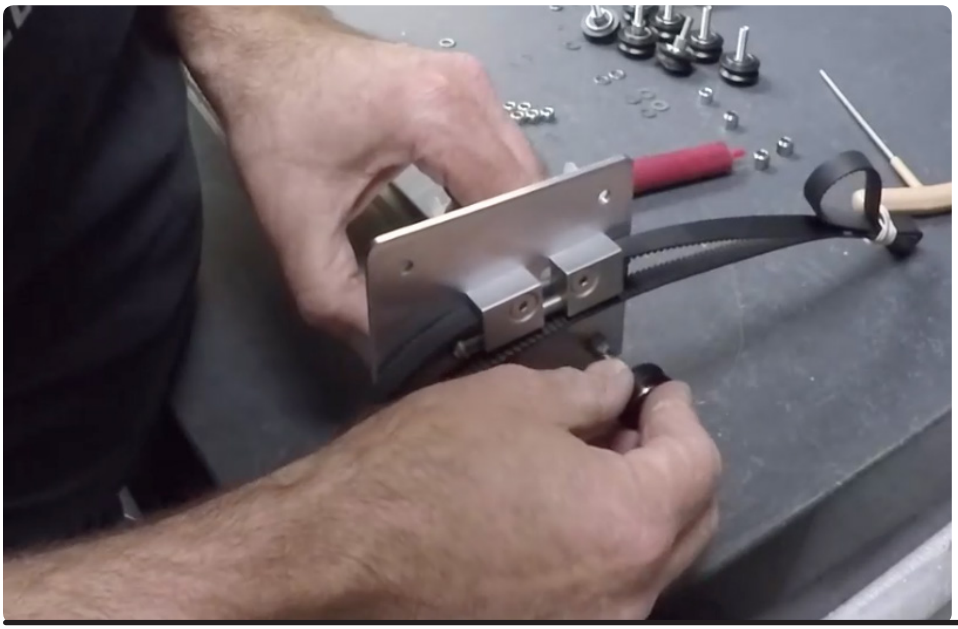
Place a small amount of grease around the edge of the eccentric spacer that fits into the end truck plate hole.



C17

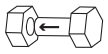
Insert the eccentric spacer into one of the bottom holes on the end truck plate and the grease should hold it in place.





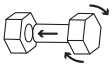
C18

Insert 1 M5x30 BHCS into a V-groove wheel and insert those into the eccentric spacer.



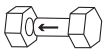
C19

On the other side, fasten a flat washer and M5 lock nut onto the M5x30.



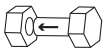
C20

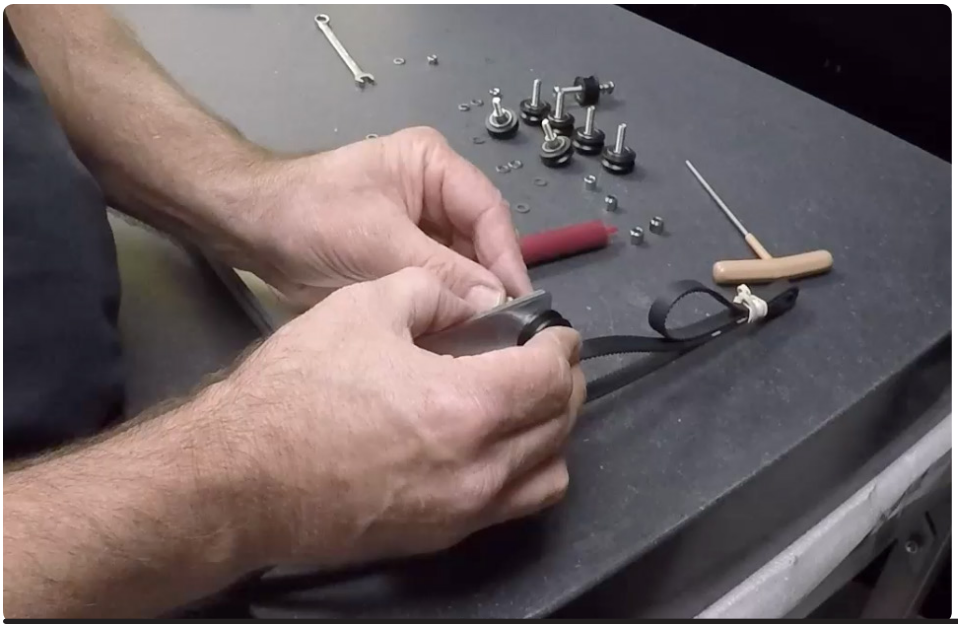
Insert another M5x30 into a V-groove wheel.



C21

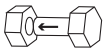
Insert a round spacer on the other side of the wheel.

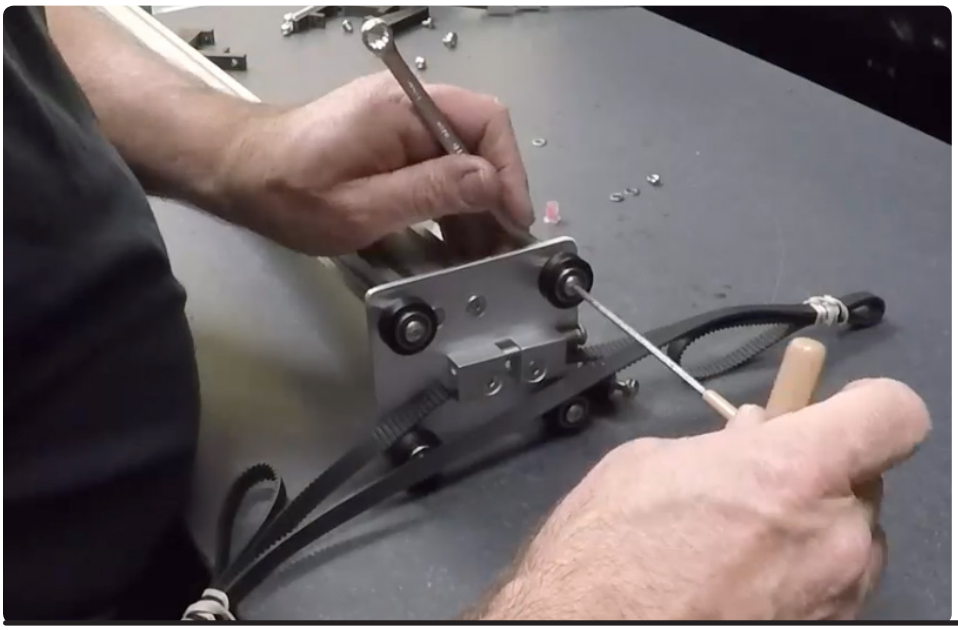




C22

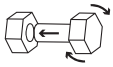
Insert this wheel subassembly into one of the top holes on the end truck plate (NOTE: this part does not use grease).

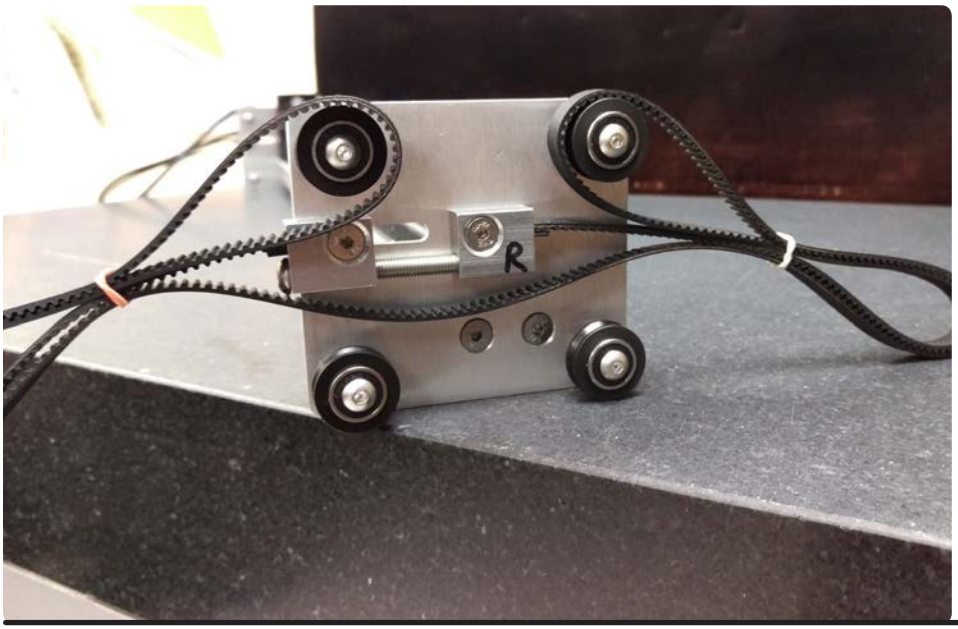




C23

Again, fasten this to the endtruck using a flat M5 washer and M5 lock nut. These can be loosely fastened for now and fully tightened later.





C24

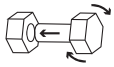
Repeat this process for all other wheels on the endtrucks. There are 2 wheels on the top of each endtruck with round spacers and 2 wheels on the bottom of each endtruck with eccentric spacers.

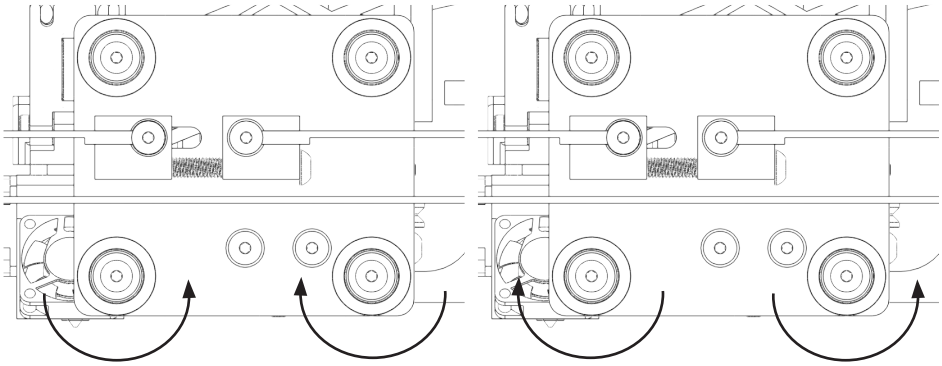
C25

Make sure that the marks on the eccentric spacers are pointing down towards the bottom of the endtruck plate. This spaces the wheels as far apart as possible. Use the 8mm combo wrench to rotate the spacer if needed.

C26

Fully tighten the wheels using the 8mm combo wrench and a 3mm Allen Key. Wheels should still spin freely (if using a drill driver, be careful not to strip out the head on the screw). Tighten till it's snug, and then give it another 1/8 turn.



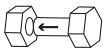


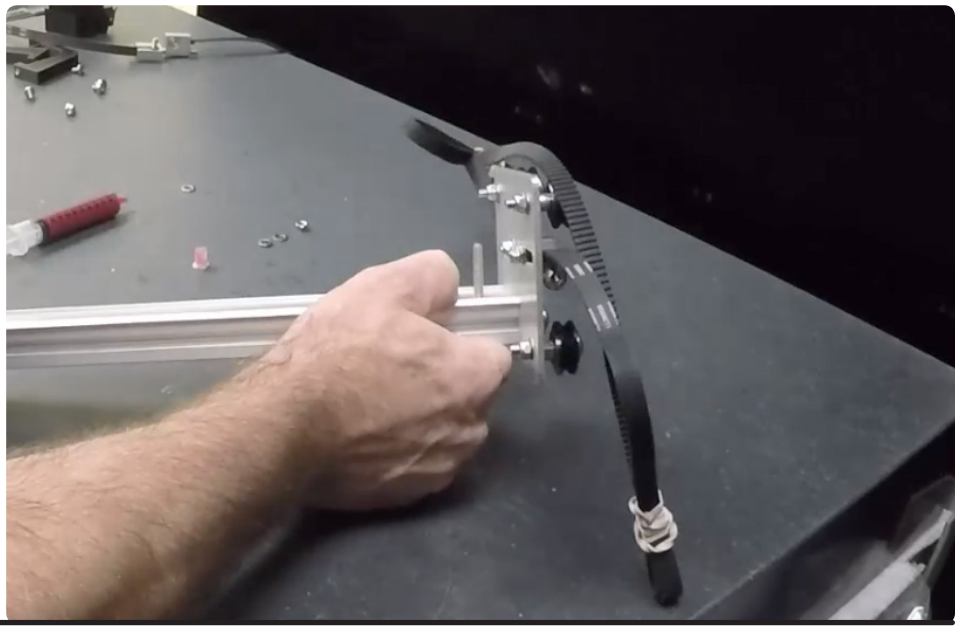
Inward:
tighten

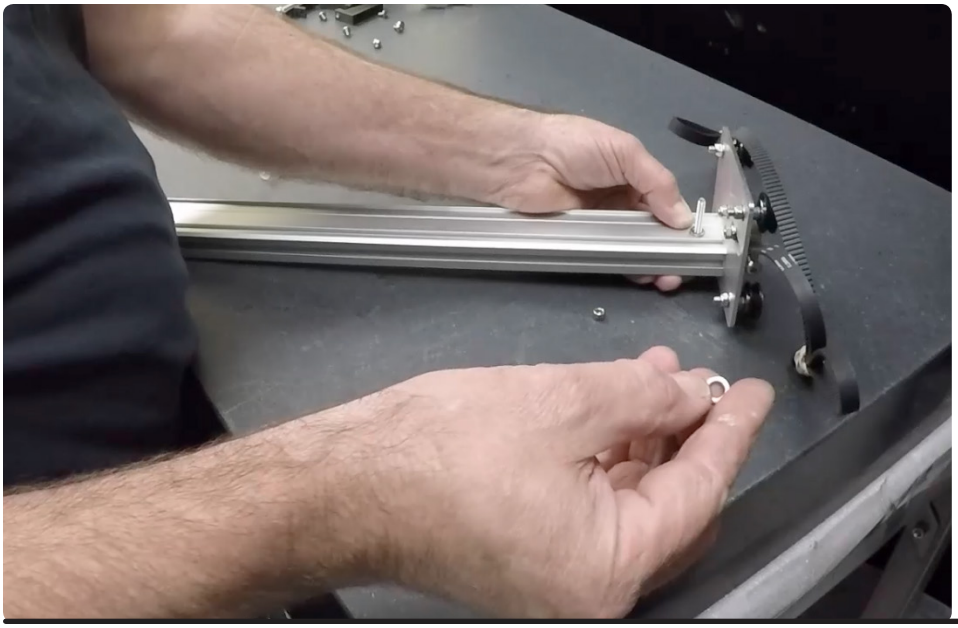
Outward:
loosen

C27

Insert an M5x45 BHCS into the single hole on the right side of the bridge rail from the bottom.

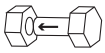


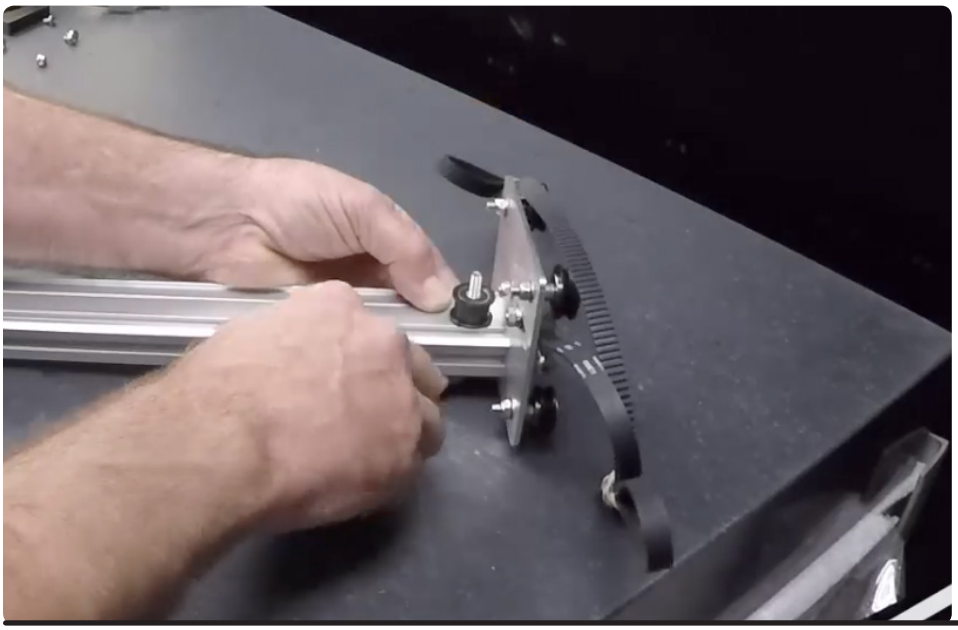




C28

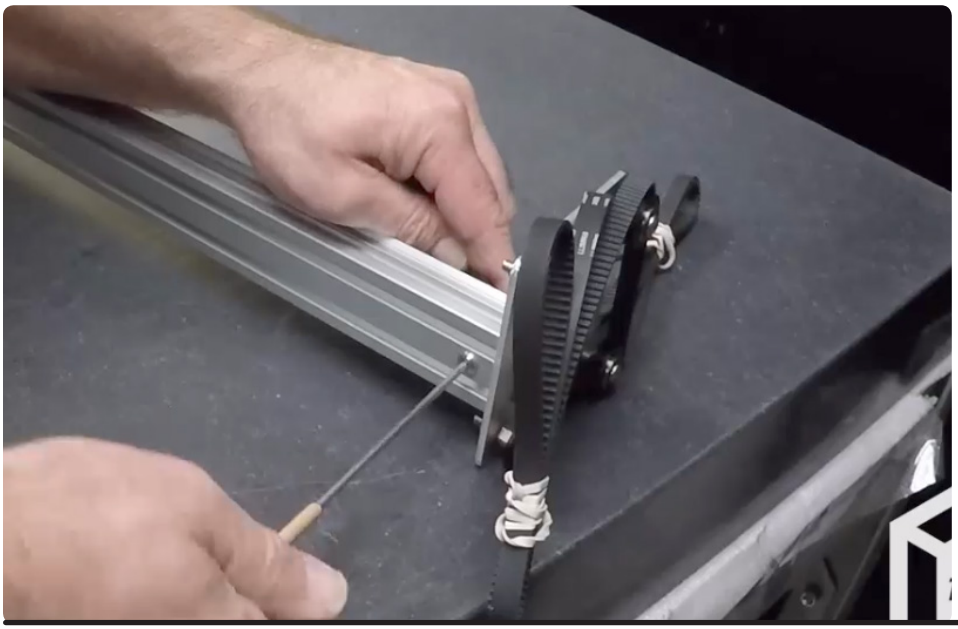
Above the rail, insert 3 M5 washers (round/shiny side up) onto the M5x45 BHCS.





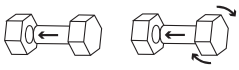
C29

Place the idler pulley onto the M5x45 BHCS, with the indented side facing down (you may need to realign the precision washer inside the pulley using a small Allen Key).



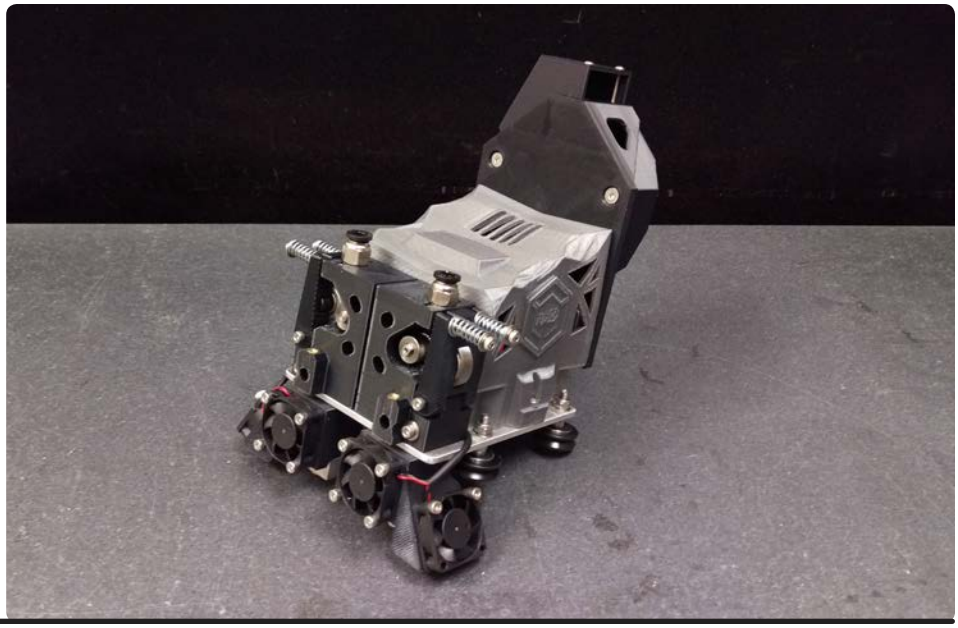
C30

Insert another M5 washer (shiny side towards the bearing) above the pulley and fasten it with 1 M5 lock nut. Fully tighten using the 8mm combo wrench and 3mm Allen Key. Again, tighten to snug and then an extra 1/8 turn. The pulley should still freely spin.



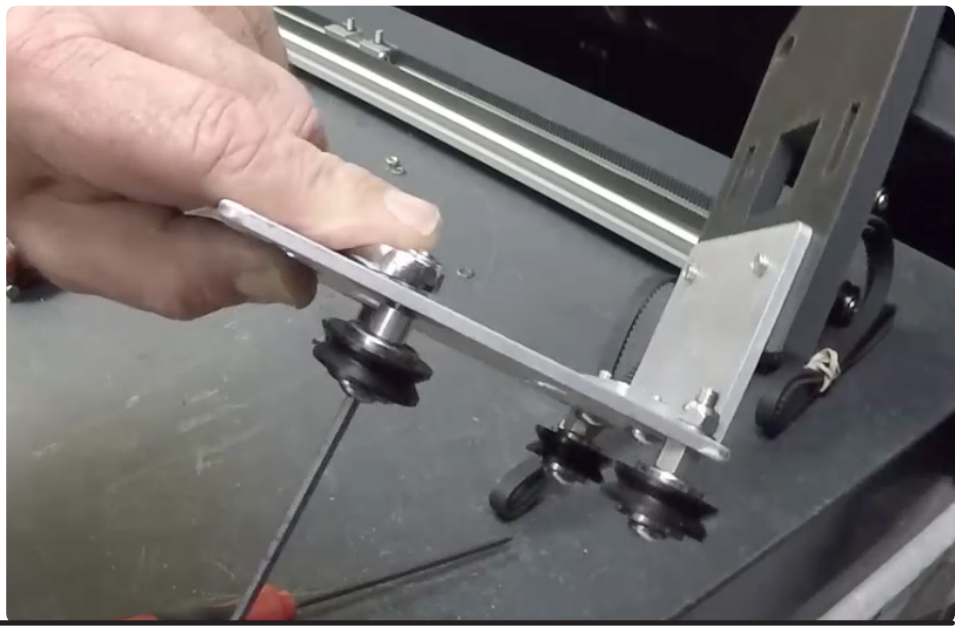
C31

Locate your assembled trolley in box #5. You will now install this to the bridge rail. Note: the trolley shown here is a dual extruder. Single extruder trolleys include only one hot end and extruder assembly.



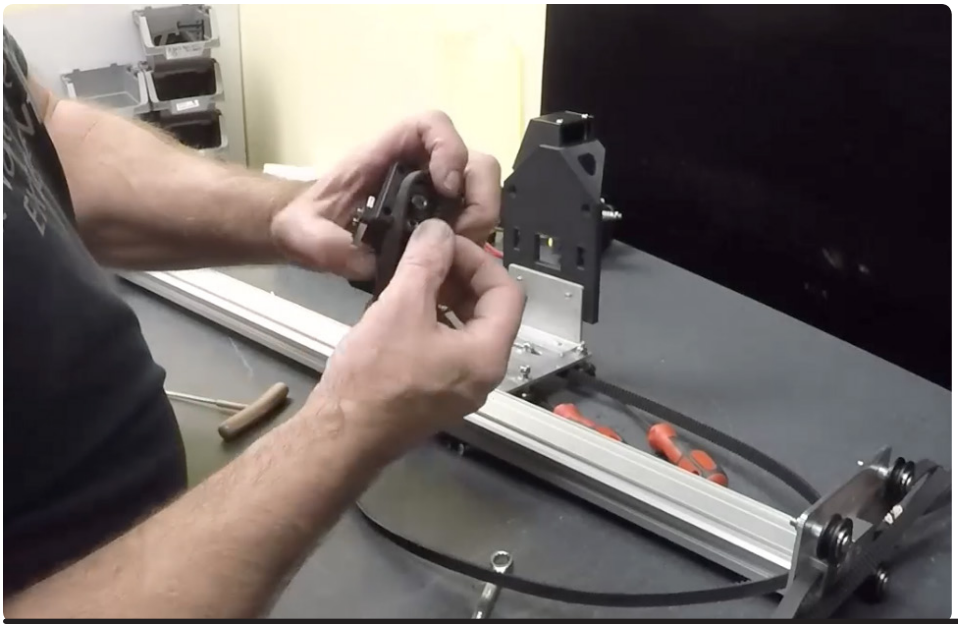
C32

Use the 8mm wrench and 3mm Allen Key to loosen the front wheels such that they hang very loosely. This will give you enough clearance to mount the trolley to the rail.



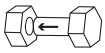
C33

Loop one end of the belt over the idler pulley.



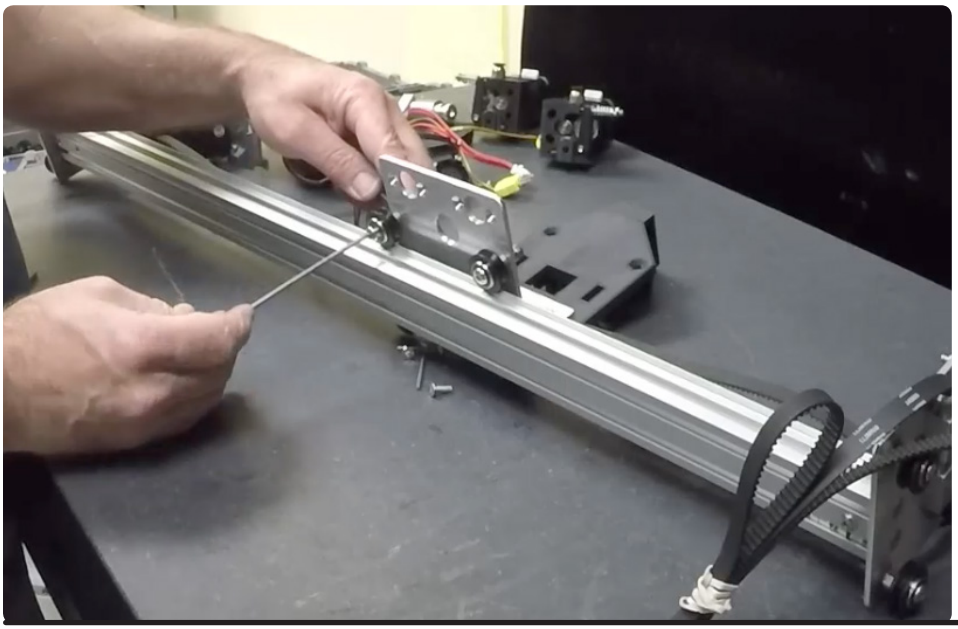
C34

Loop the other end of the belt into the X motor pulley: Insert the belt at an angle and pull it around and the belt will seat itself. Be gentle, or you may snap the flange off of the pulley. This is referenced in other videos, such as this.



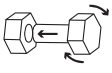
C35

Pressing the rear V-groove wheels against the Makerslide, maneuver the trolley onto the bridge rail. Since the front wheels are loose, it is possible to fit them onto the rail while still being attached to the trolley.



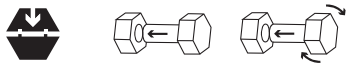
C36

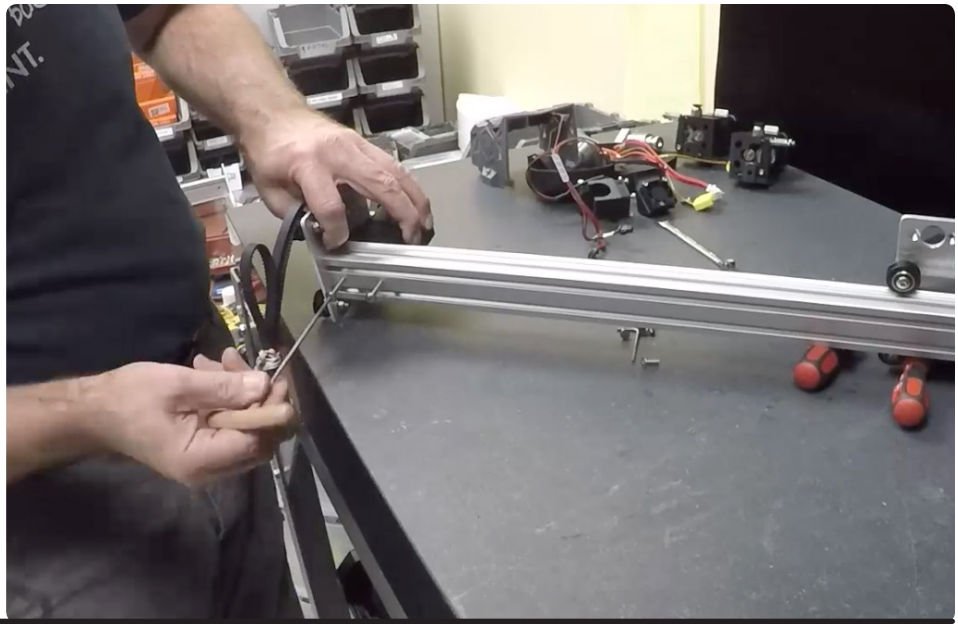
Once all of the trolley wheels are seated on the bridge rail, use the 8mm combo wrench and 3mm Allen Key to tighten them down, similar to before (snug, 1/8 turn extra).



C37

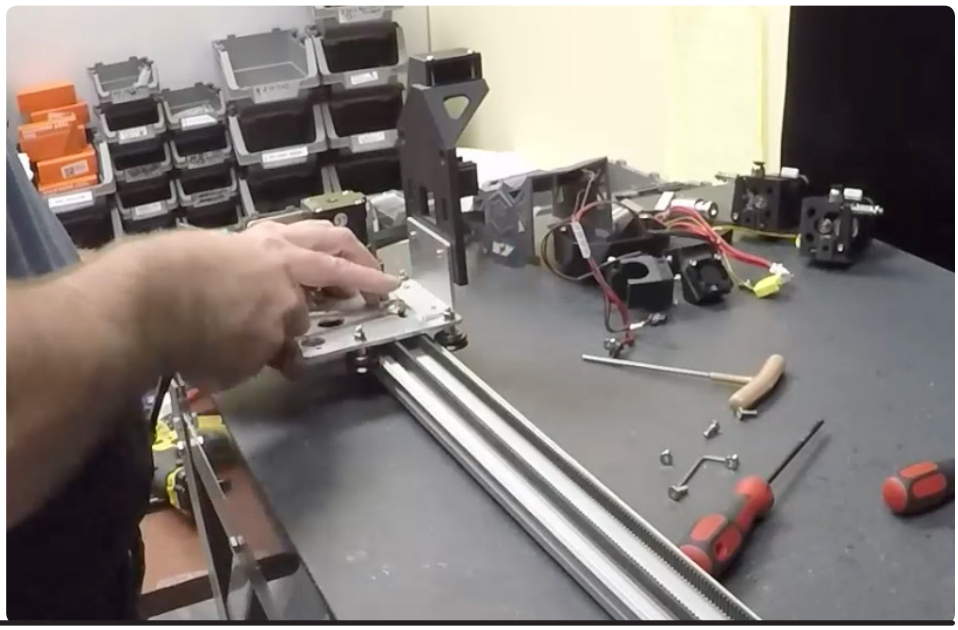
Install the X motor to the bridge rail using 2 x M5x45 BHCS and 2 x M5 washers. Place 1 washer between the head of the screw and the rail. This keeps the screw from bottoming out in the motor mount. Tighten with a 3mm Allen Key. The motor mount is a plastic part, so do not overtighten it, or you may strip out the threads.





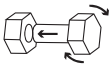
C38

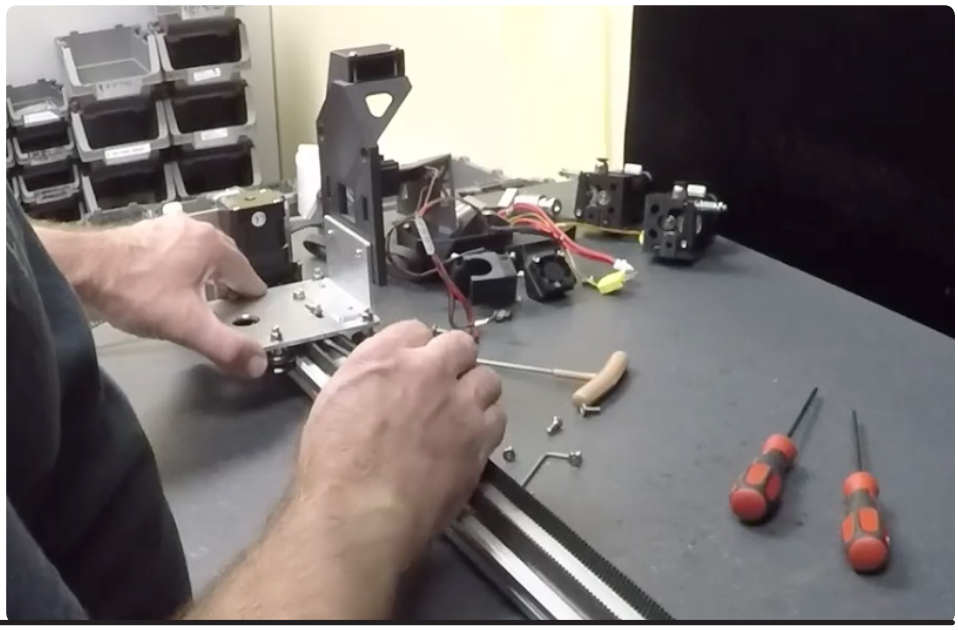
Use the 8mm combo wrench to loosen the hex nut for the tensioner in the slotted hole of the trolley plate. This will allow that tensioner to move back and forth in the slot.

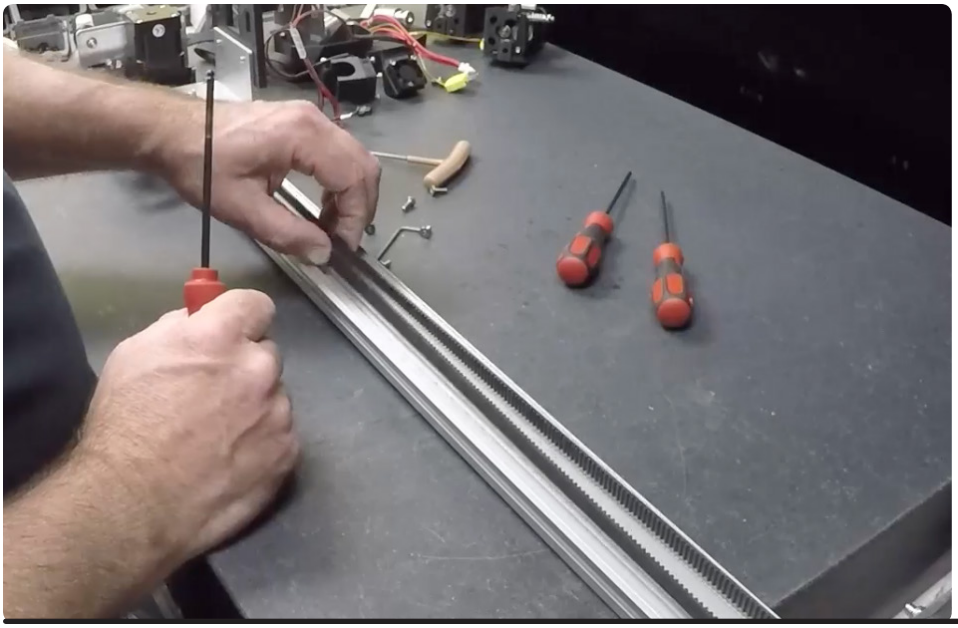


C39

Use a 4mm ball end Allen Key to tighten the M6x60 BHCS. This will bring the tensioner blocks together and put more tension on the belt. Likewise, loosen the M6x60 BHCS to loosen the belt. The moving block should end up close to the middle of the slot when properly tensioned.

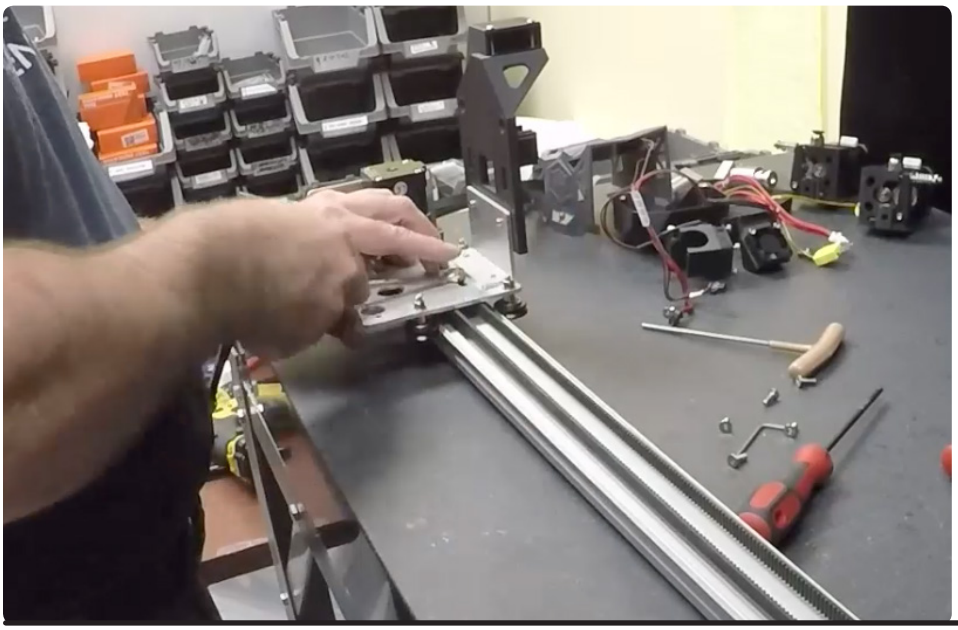






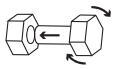
C40

Test belt tension by moving the trolley all the way over to one side and pinching the belt together near the middle of the bridge rail. There should be resistance to pinching the belt together, but you should also still be able to make the two sides touch without too much effort. Be careful not to overtighten the belt.



C41

When the belt is properly tensioned, tighten the hex nut on the tensioner to hold it in place. Make sure that this is tight, so it does not accidentally come loose over time.

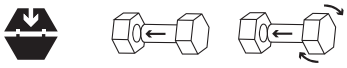


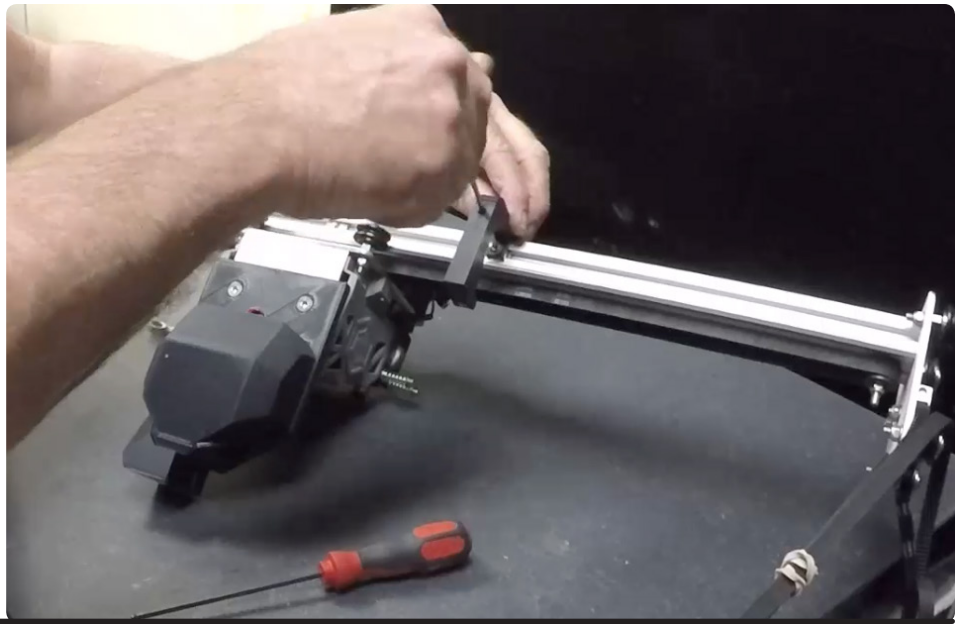
C42

In the rear slot of the bridge rail, set aside the 2 T-nuts closest to the X motor. These will be for the X/Y Upright bracket. The remaining T-nuts will be used for the X cable carrier supports.

C43

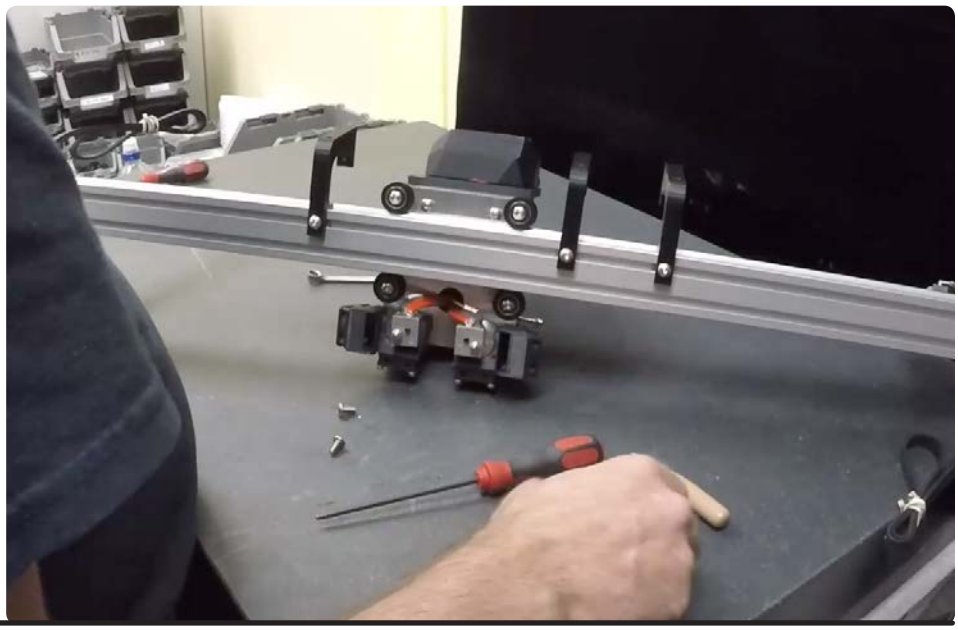
Install the X cable carrier supports to the bridge rail by fastening 1 M5x8 BHCS on the rear of the support and 1 M5x12 BHCS on the bottom of the support. Loosely fasten these for now—they can be put in their final locations and fully fastened when installing the cable carriers.





C44

Repeat this until all 3 supports have been installed.

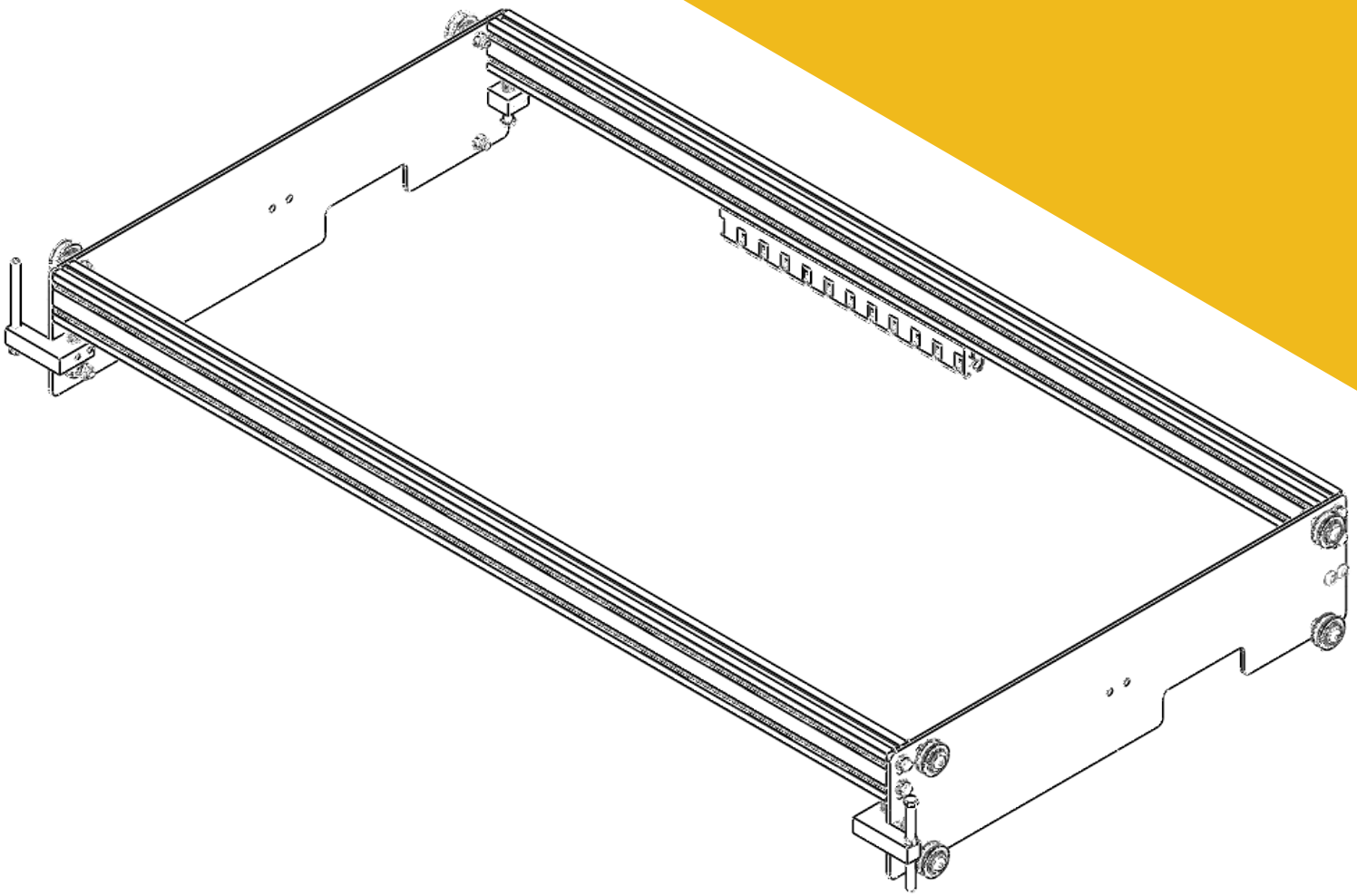


C45

For step by step instructions, please see our video.

D

BED FRAME ASSEMBLY



TOOLS & PARTS

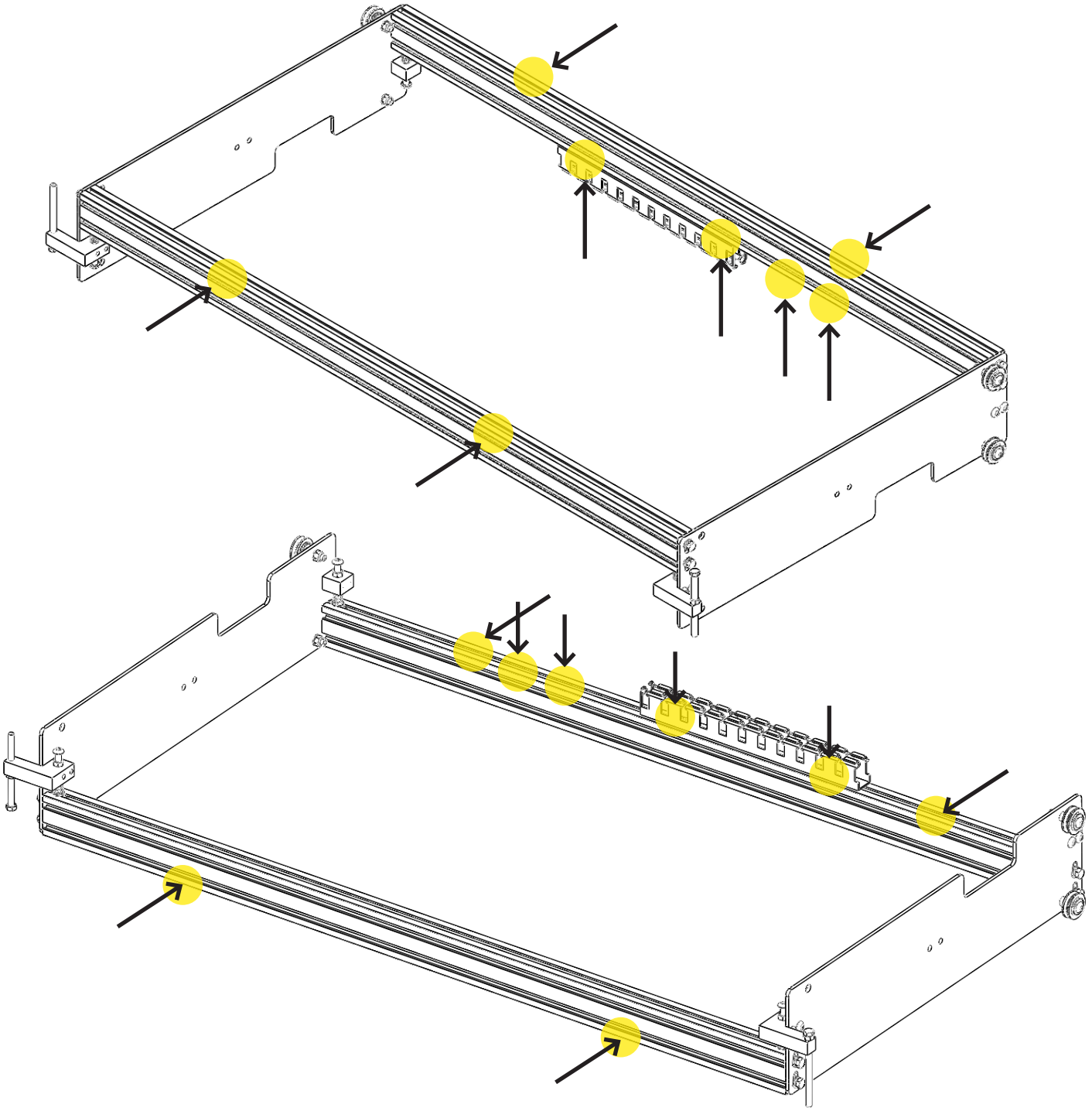
Refer to packing list to identify parts

BOX #	PART	QUANTITY
Snappybox	T-nuts	8
4	Bed cross rails	2
Snappybox	M5x12 hex head screws	8
Snappybox	M5 lock washers	8
Snappybox	M5 flat washers	14
4	Bed side plates	2
1	Precision square	1
Snappybox	8mm combo wrench	1
Snappybox	Bed angles	4
Snappybox	M5x8 BHCS	4
Snappybox	M5x45 BHCS	4
6	3mm Allen Key	1
Snappybox	M5x12 BHCS	8
1	#3 9.25” Panduit	1
Snappybox	V-groove wheels	6
Snappybox	Round spacers	6
Snappybox	M5x30 BHCS	6
Snappybox	M5 lock nuts	6
8	Bed leveling knobs (assembled)	4

WATCH THE ACCOMPANYING VIDEO: https://www.youtube.com/watch?v=5eKVEPtmlp8

OVERVIEW

Bed frame T-nut placement shown below. There are 8 in total.



TIPS & TRICKS

#1 Work on a flat surface.

#2 Regularly use the precision square to ensure that the side plates are mounted square to the bed cross rails.

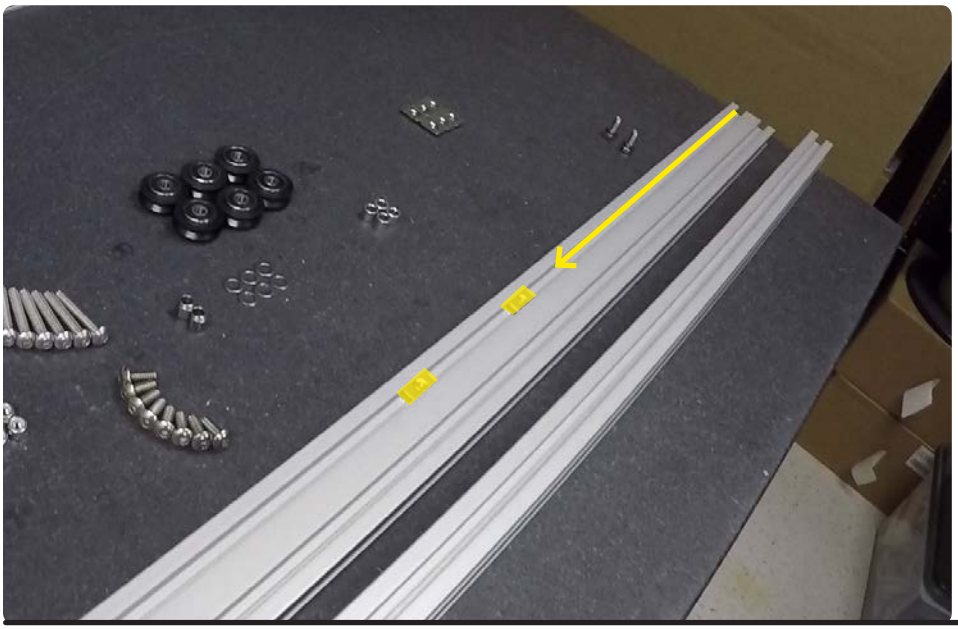
#3 Verify that there are enough T-nuts in the bed frame, and at the proper locations.

D1

There are 8 total M5x12mm hex head screws that fasten the bed cross rails to the bed side plates.

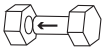
D2

Place 1 M5 lock washer and 1 M5 flat washer respectively on each M5x12mm hex head screw. Do this for all 8 screws and set them aside.



D3

Lay one of the bed cross rails with the wider side down and insert 2 M5 T-nuts into the upper slot on the top surface.

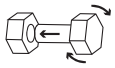


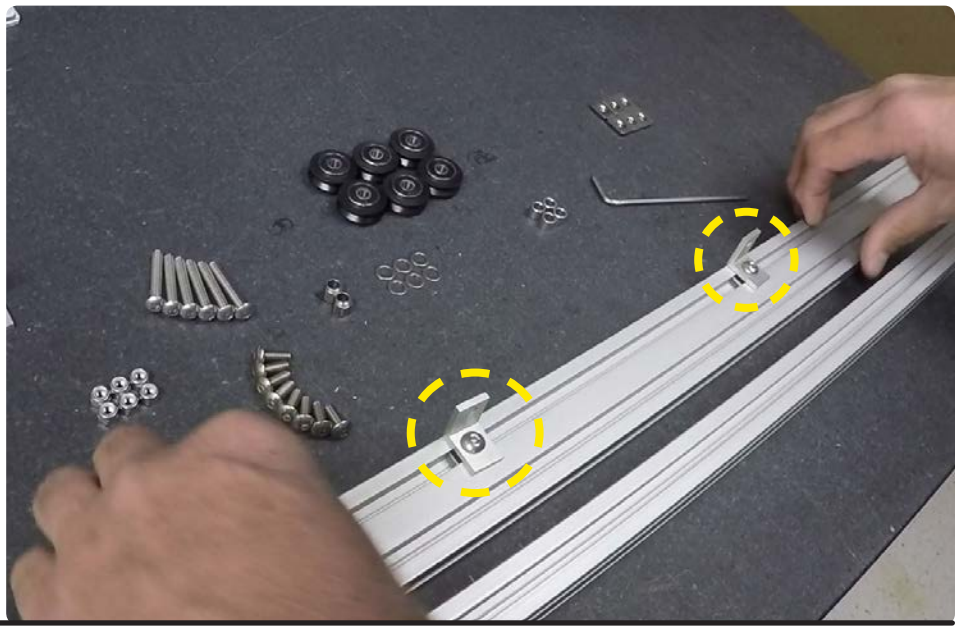
D4

Next you will fasten the bed angles to the rail. Note that each bed angle has 2 holes. One hole is off center while the other hole is closer to center.

D5

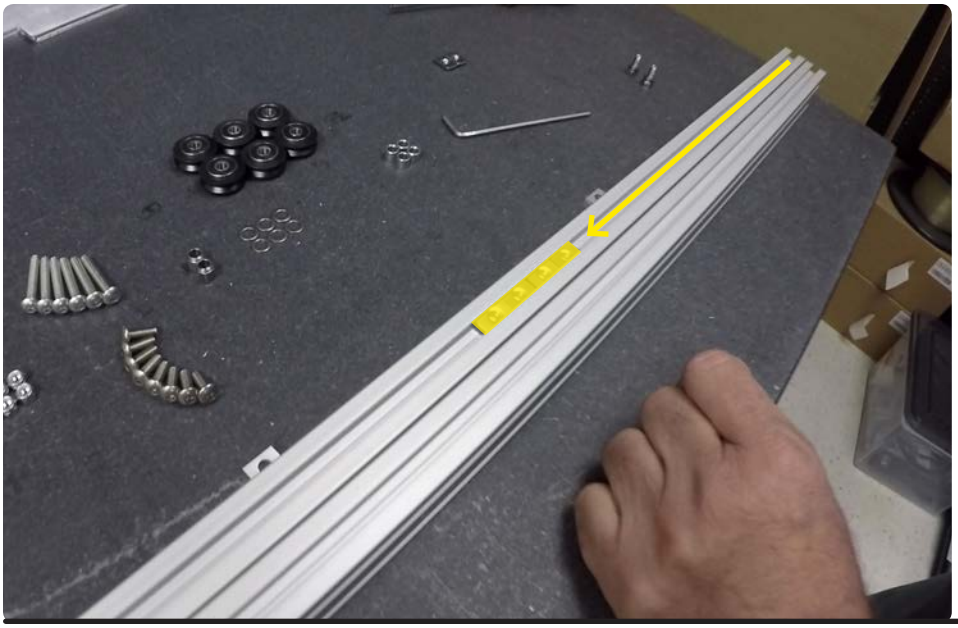
Using the hole closer to center, fasten 2 bed angles to the M5 T-nuts in the rail using M5x8mm BHCS and a 3mm Allen Key.





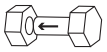
D6

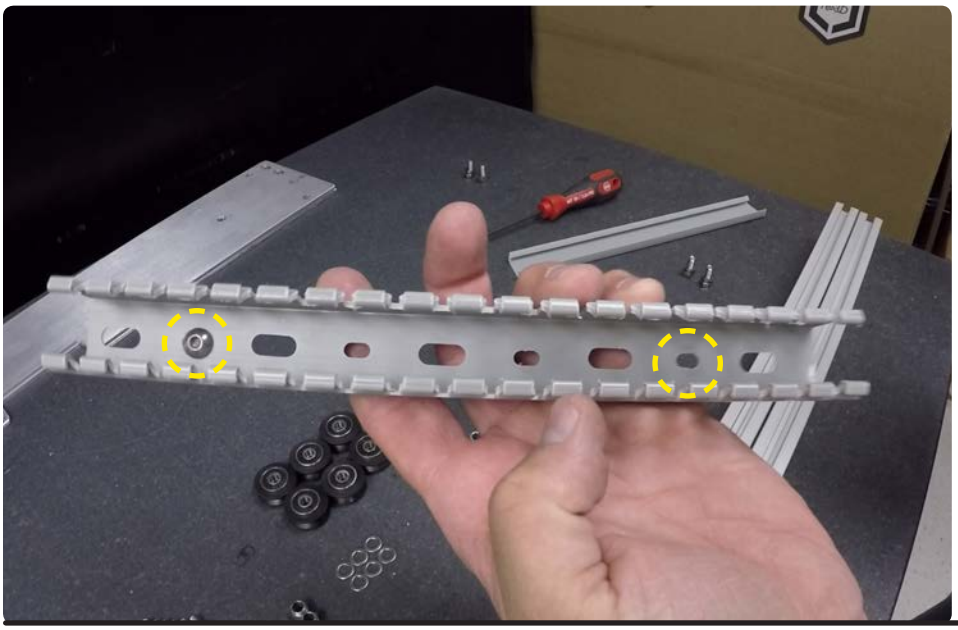
Turn the rail over such that the bed angles now sit on top of the work surface.



D7

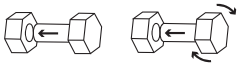
Keeping the rail in its current orientation, insert 4 more M5 T-nuts into the slot in the top most surface.

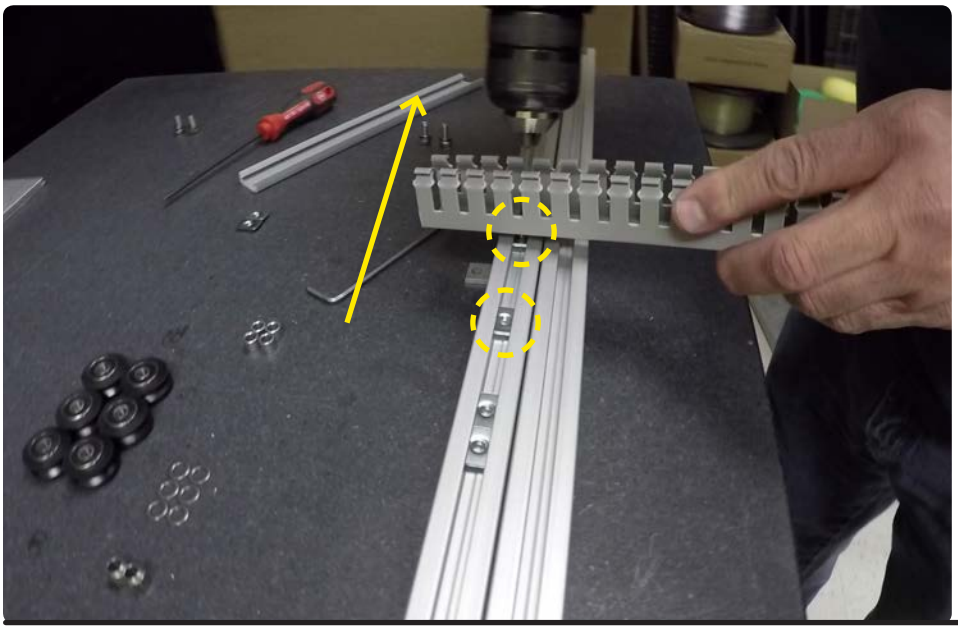




D8

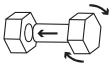
In the #3 size 9.25" Panduit, insert an M5x8mm BCHS at each end. Specifically, place them in the small hole nearest to the ends. These can be screwed in using the 3mm Allen Key.





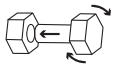
D9

Without changing the orientation of the rail, use a 3mm Allen Key to fasten the Panduit to the 2 M5 T-nuts furthest to the right. It is easier to fasten them one at a time, as shown.



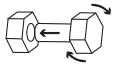
D10

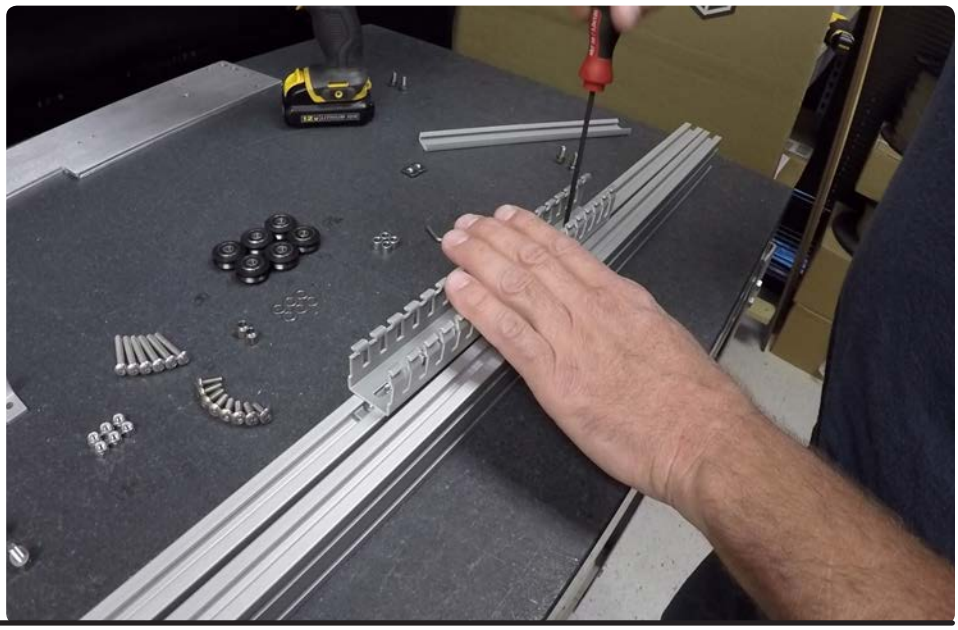
Loosely fasten the second M5x8. In its final position, this Panduit should be centered, but for now it is okay to have it off center for later assembly steps.



D11

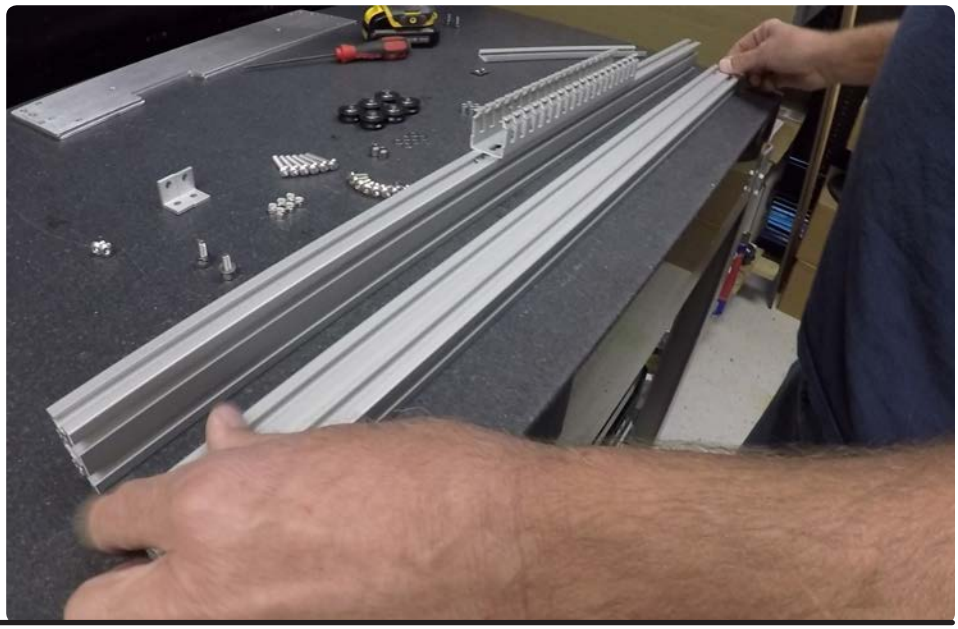
Once positioned, snug the M5x8 BHCS so that the Panduit does not move.

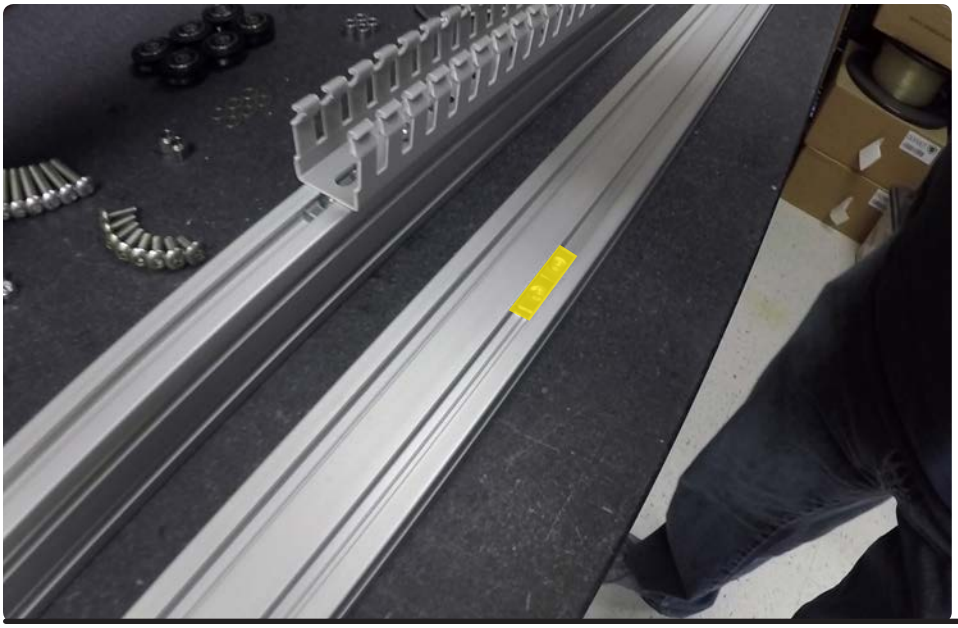




D12

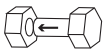
Set the other bed cross rail so that the wider side is down.





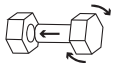
D13

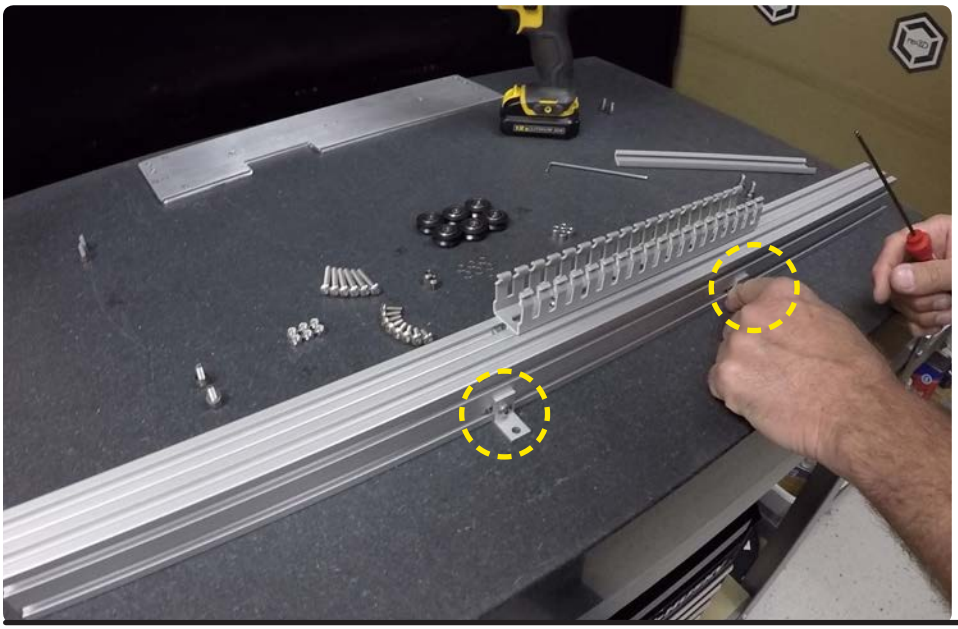
In the lower slot on the top surface, insert 2 M5 T-nuts.



D14

Similar to step D5, fasten 2 bed angles to this rail using M5x8mm BHCS and a 3mm Allen Key. Their positions along the rail do not matter so much yet, as they will be placed in their final position when the bed plate is installed.



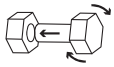


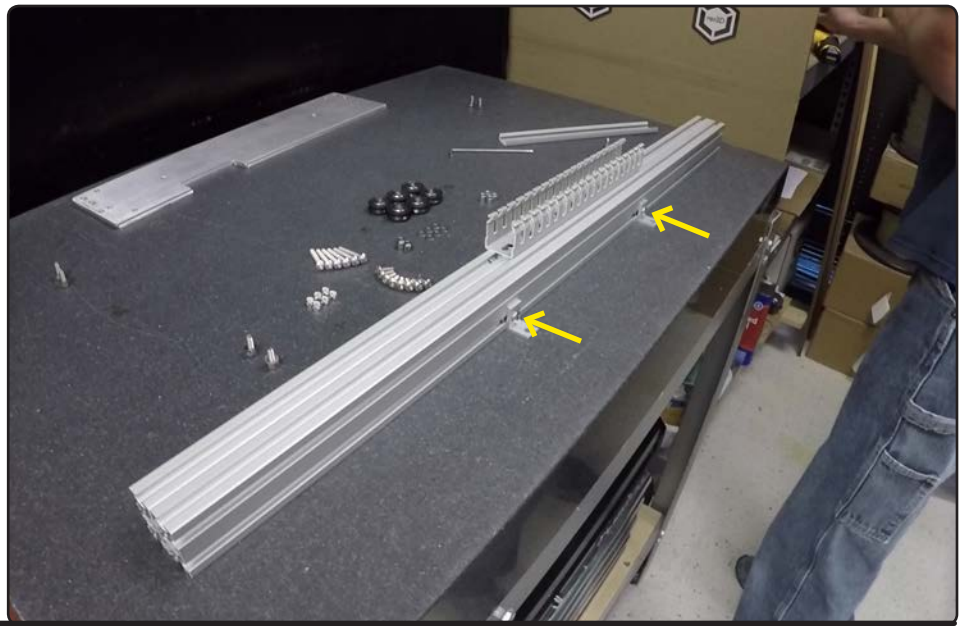
D15

Similar to step D6, turn the rail such that the bed angles are now flat on the work surface.

D16

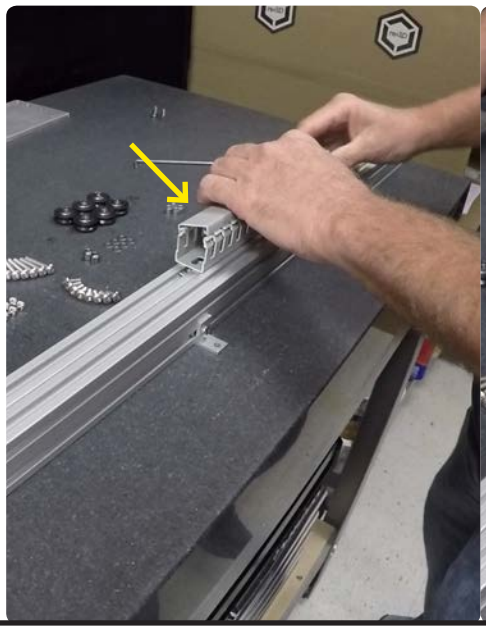
Snug the M5x8mm BHCS for the bed angles with a 3mm Allen Key.

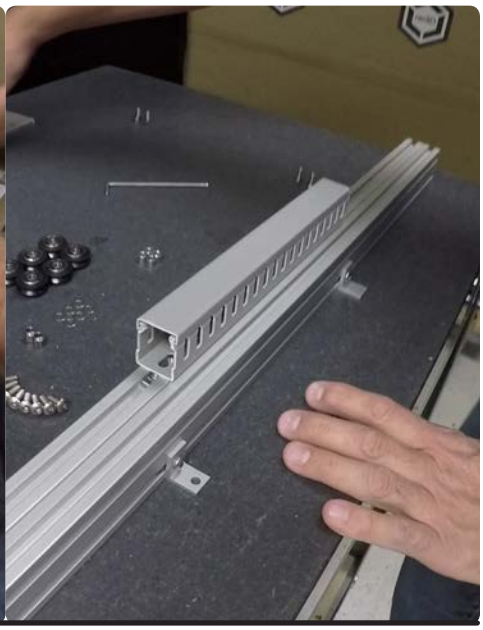




D17

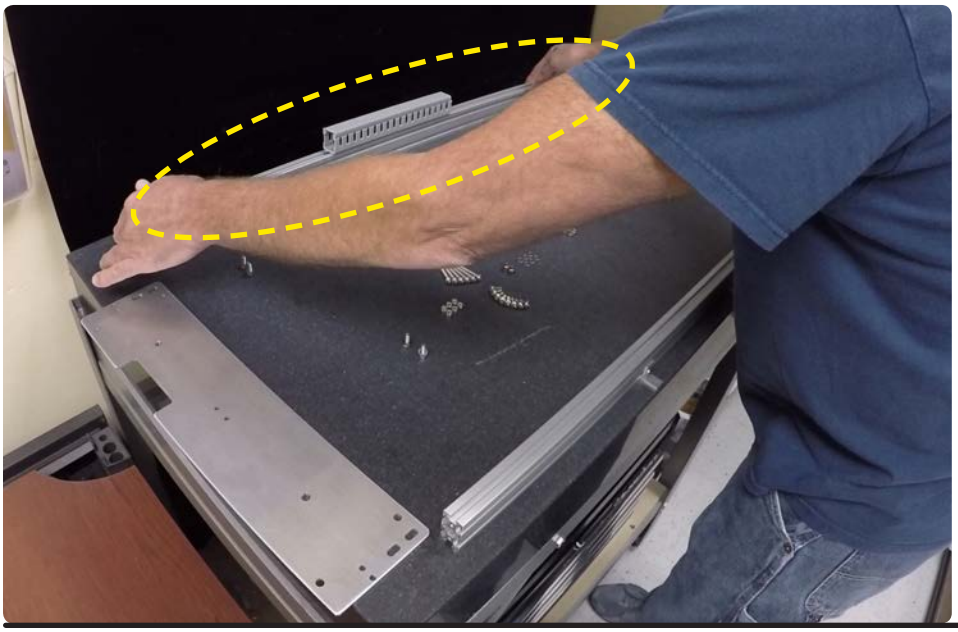
Place the cover on the #3 size 9.25” Panduit. Hook one edge of the cover onto the Panduit and gradually snap the other edge into place.





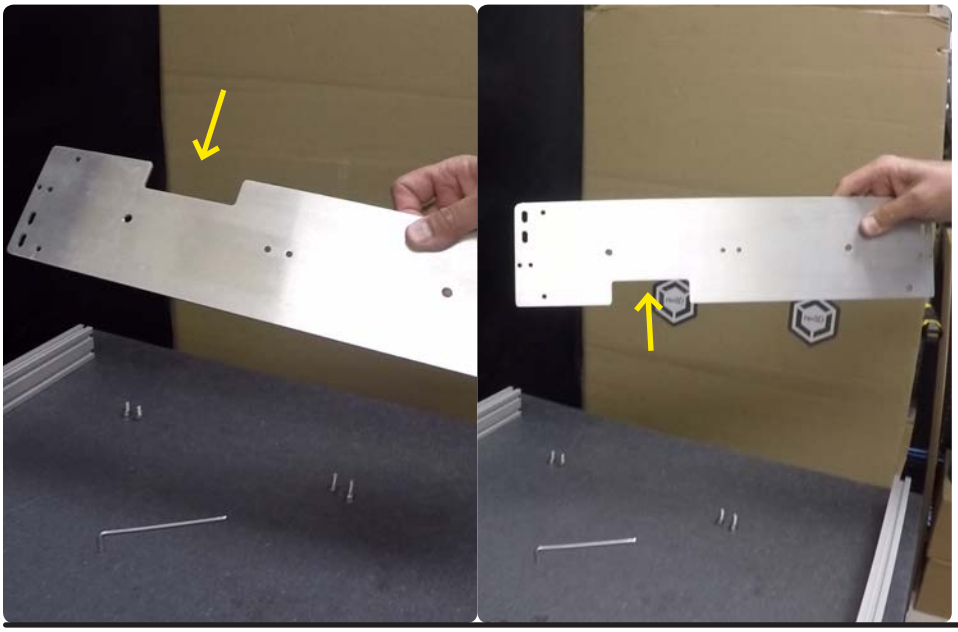
D18

Lay each of the bed side plates along the left and right ends of the bed cross rails, as shown.



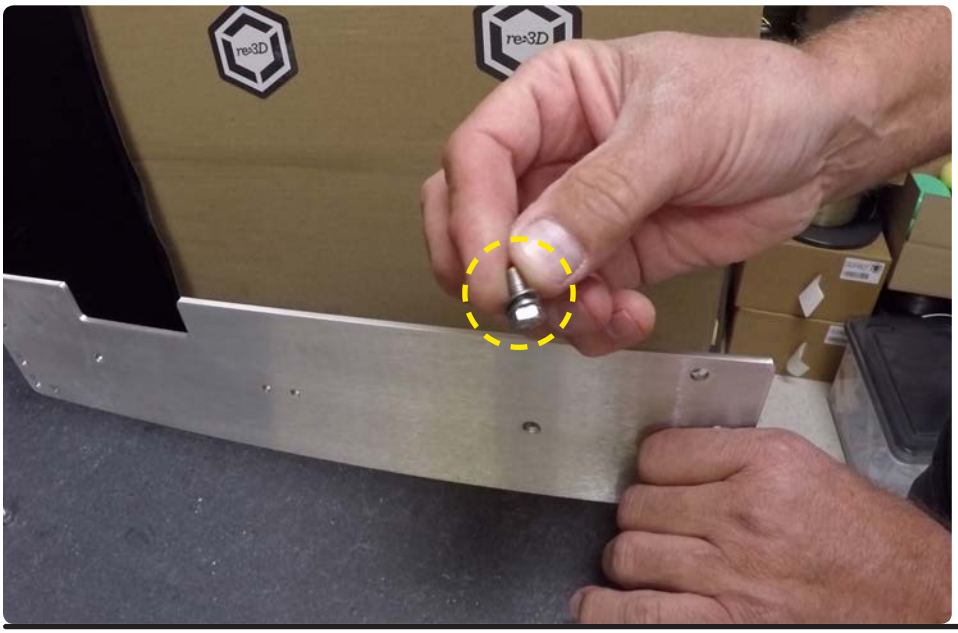
D19

Place the rail with the #3 9.25” Panduit at the other end of the bed side plates. Do not change the orientation of this rail from when it was assembled.



D20

Note that the bed frame will be assembled upside-down. The bed side plate will be fastened as shown in the left picture, but in the final Gigabot® assembly, it will be rightside-up as shown on the right.

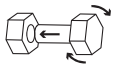


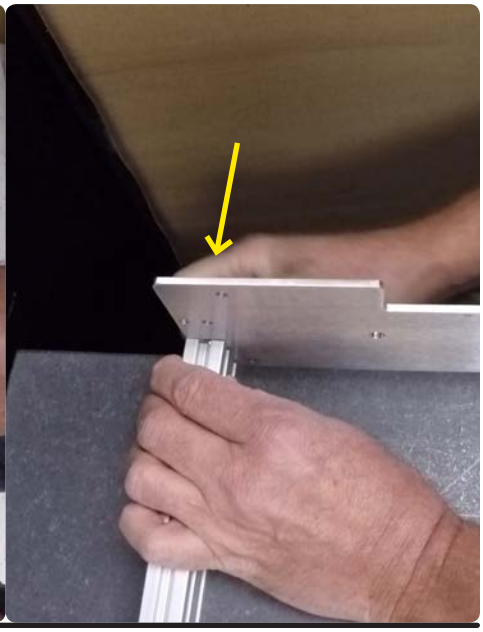
D21

Retrieve the 8 sets of M5x12mm hex head screw, M5 lock washer, and M5 flat washer made in steps D1 and D2.

D22

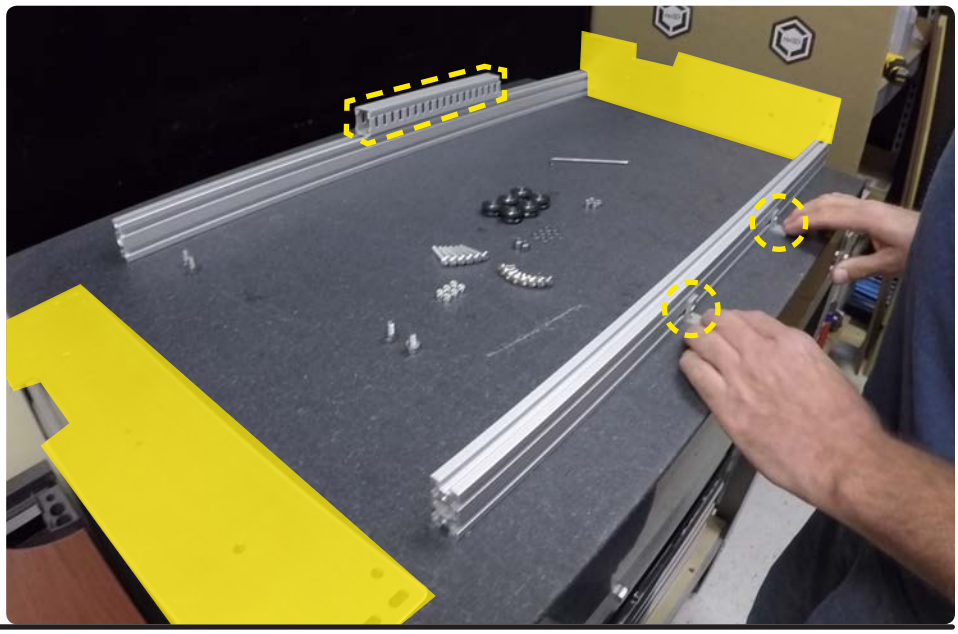
Fasten the right side bed side plate to the bed cross rails. For now, fasten the M5x12mm hex head screws by hand to get the bed frame loosely assembled. Use 4 sets of screws and washers per side plate.





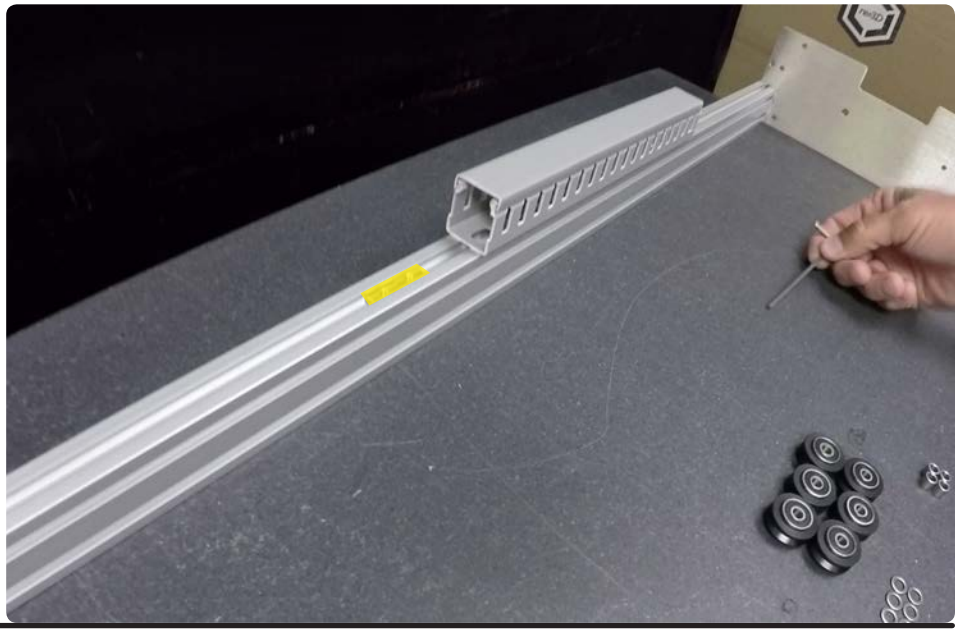
D23

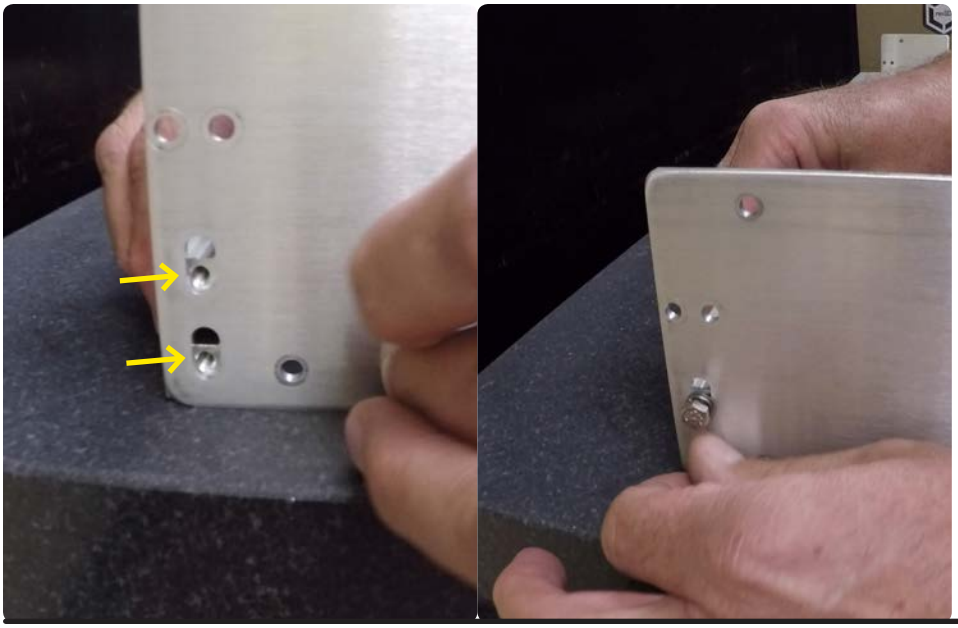
Double check the orientation of the rails and the side plates before you continue fastening the last side plate. All of the bed angles should be pointing outward and the indentations in the bed side plates should be towards the rail with the Panduit.



D24

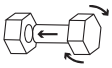
There are still 2 unused M5 T-nuts in the bed cross rail with the Panduit. Make sure these are still separate and accessible in the rail.





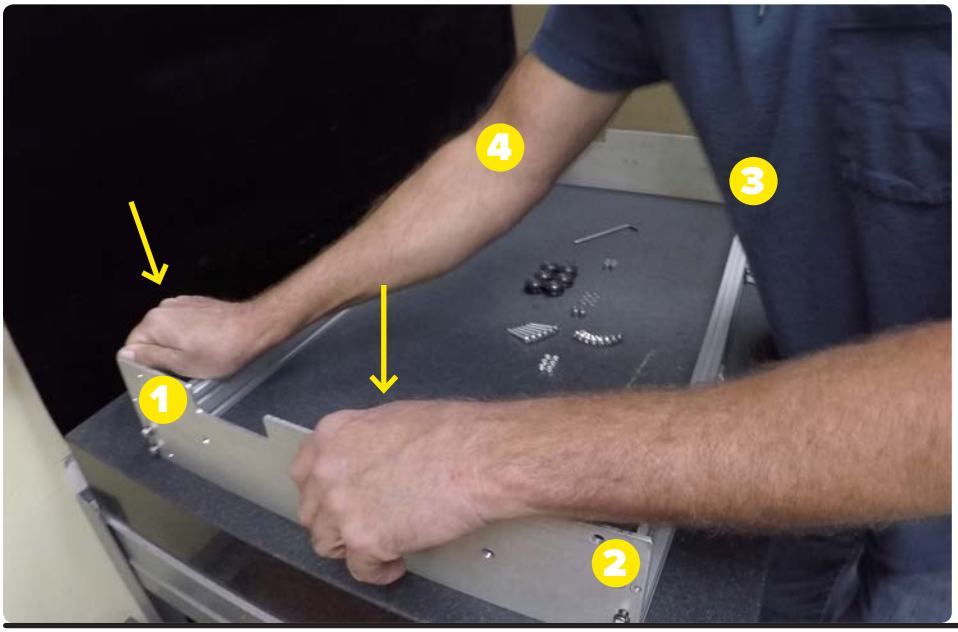
D25

Continue fastening the other bed side plate to the bed cross rails. In the left photo, notice how the starting position of the screws are on one end of the slots.



D26

Once all corners have been fastened, the main part of the bed frame assembly will be complete.

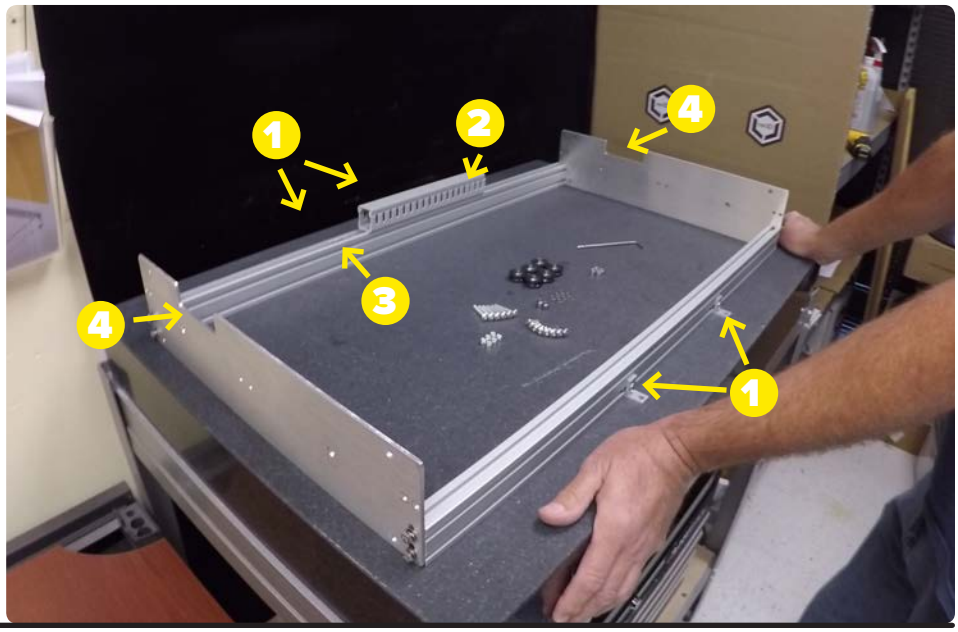


D27

Using one hand to hold the bed side plate, press the rail down at each corner. This makes the surface of the rails flush with the surface of the bed side plates.

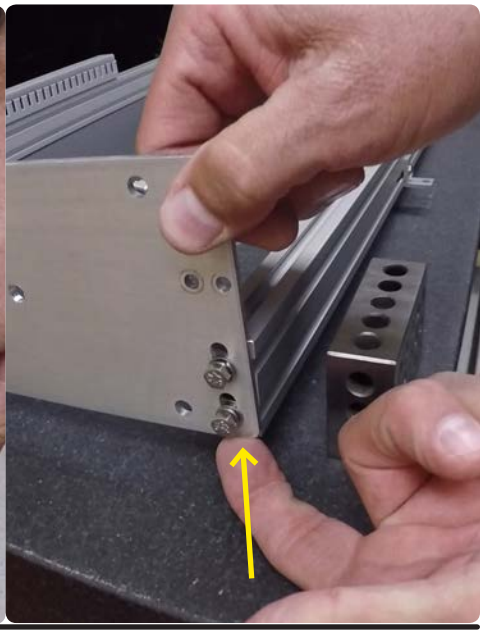
D28

The assembled bed frame thus far should appear as shown. Verify 1) bed angles in proper locations, 2) Panduit location 3) 2 extra M5 T-nuts 4) bed side plate orientation



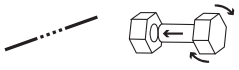
D29

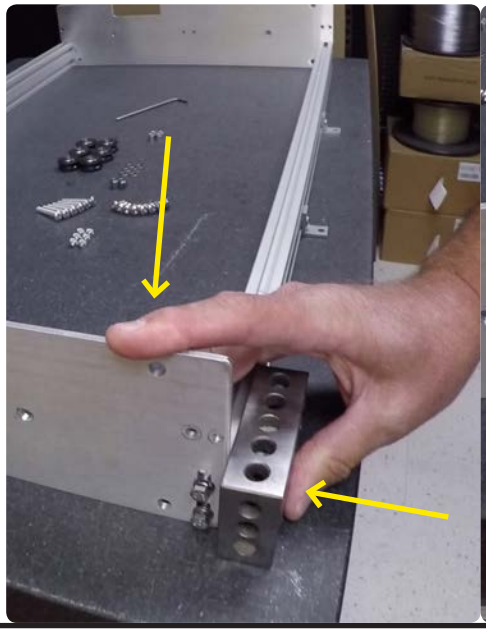
At each corner of the frame, it is important to make the surfaces flush where the bed side plate and bed cross rails meet.



D30

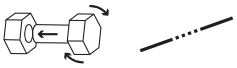
Hold a flat object such as the precision square (here, a 1-2-3 block is used) against the frame while putting pressure on top of the frame to maintain the flushness. Fully fasten the M5x12mm hex head screws with an 8mm wrench.





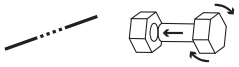
D31

Double check the flushness of the surfaces after tightening the M5x12 hex head screws.



D32

Repeat step D30 for the corner on the other side of the same bed side plate.

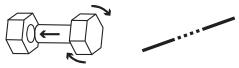


D33

Again, check for flushness after tightening, as in step D31.

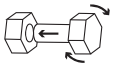
D34

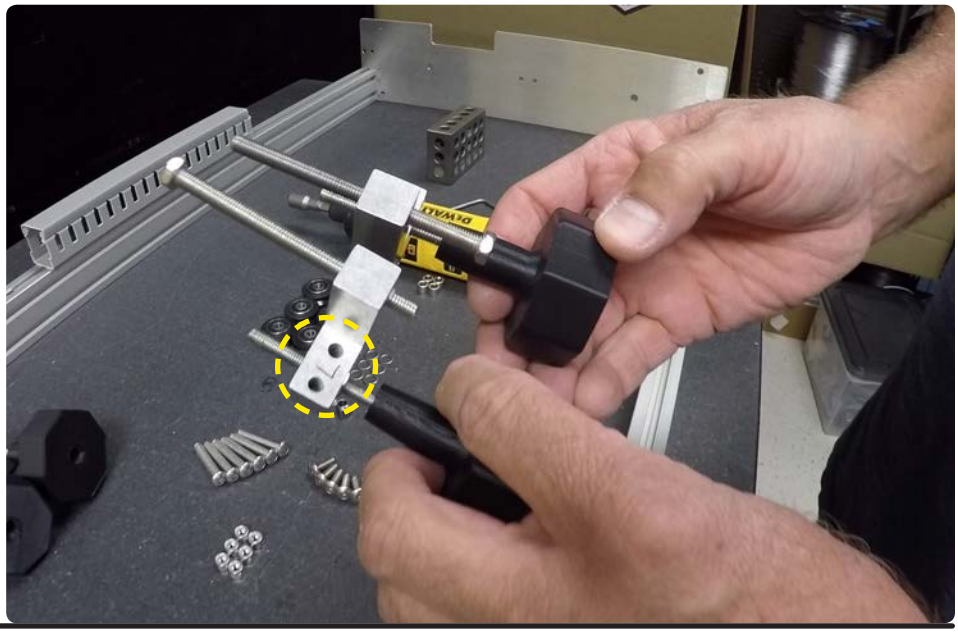
Repeat D30-D33 for the other bed side plate to fully fasten and flush all of the corners.



D35

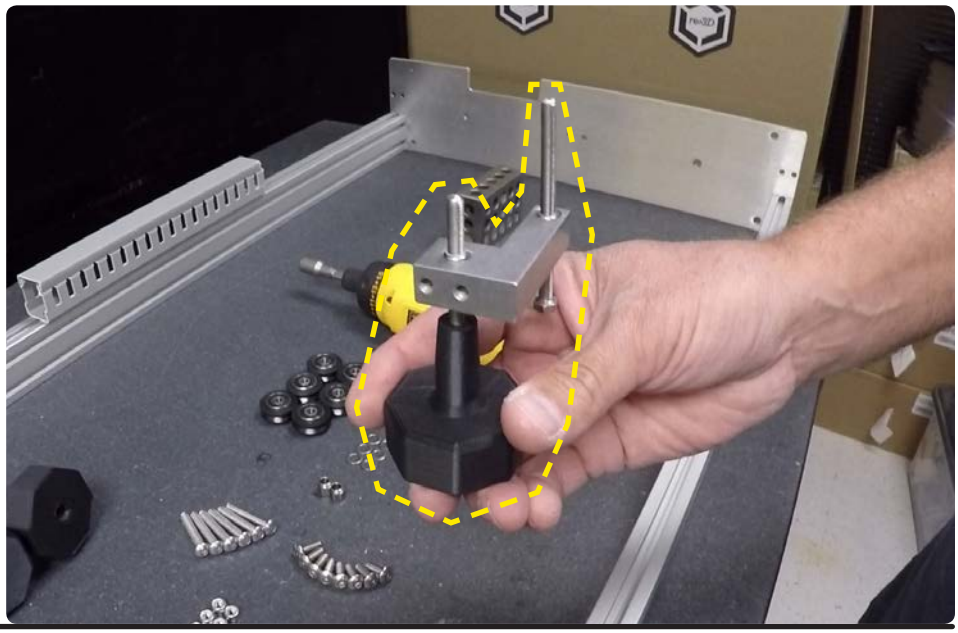
Next, you will fasten the preassembled leveling blocks to the bed frame. The blocks shown here are to be fastened in the front of the frame. Note that there is a distinct left and right block--for demonstration purposes, one has been marked.





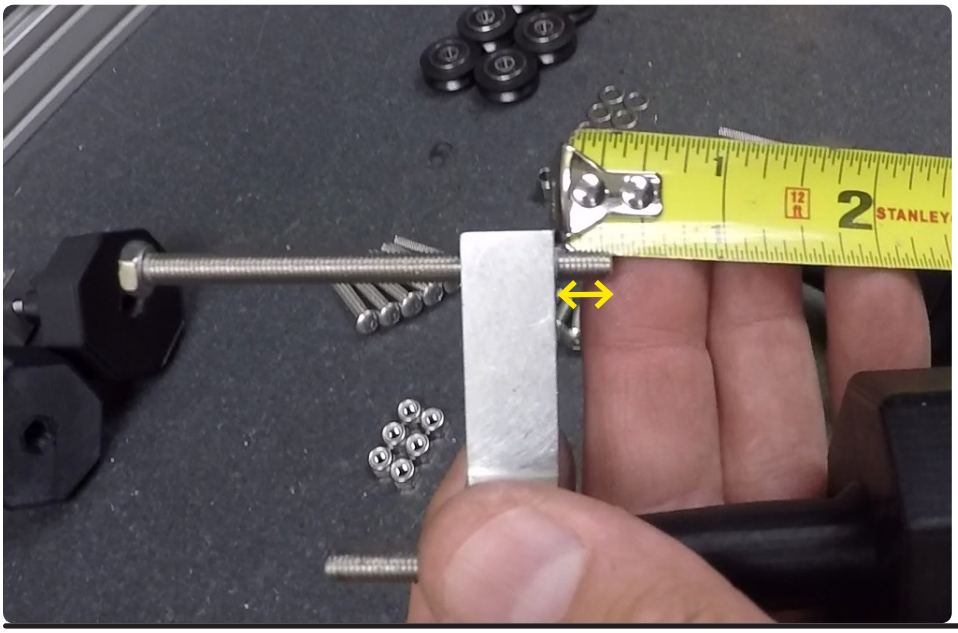
D36

In its final orientation, this leveling block will be positioned as shown, on the right hand side of the frame. Since the bed frame is being assembled upside-down, the leveling block will also initially be upside-down and on the left side.



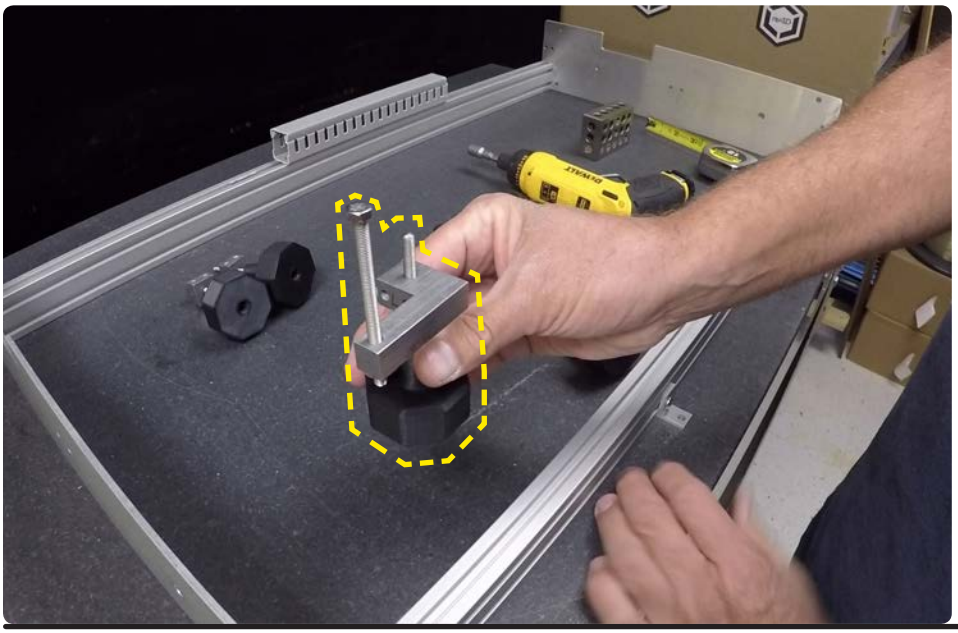
D37

For the assembled leveling block shown in D36, the head of the screw should extend 7/8” below the surface of the block.



D38

For the other assembly (marked “L” for “left” in step D35) the end of the screw should extend 5/16” past the bottom of the leveling block.



D39

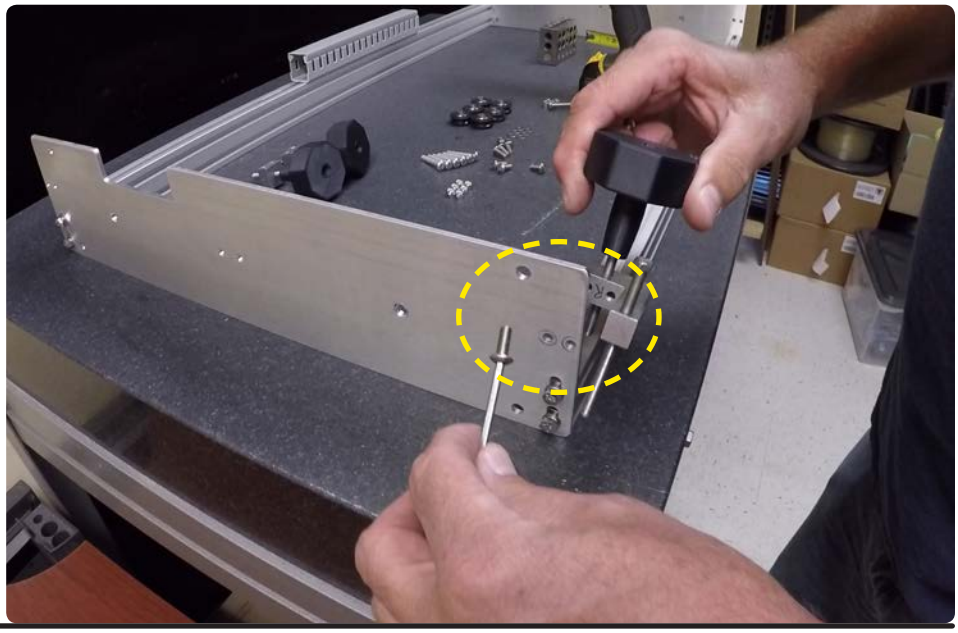
Similar to step D36, this shows the final orientation of the left-hand side leveling block. Initially, it will be fastened to the bed frame upside-down and on the right side.

D40

Before installing any of the leveling blocks, check that the end of the leveling screw with the plastic knob extends about 3/4” past the top of the block.

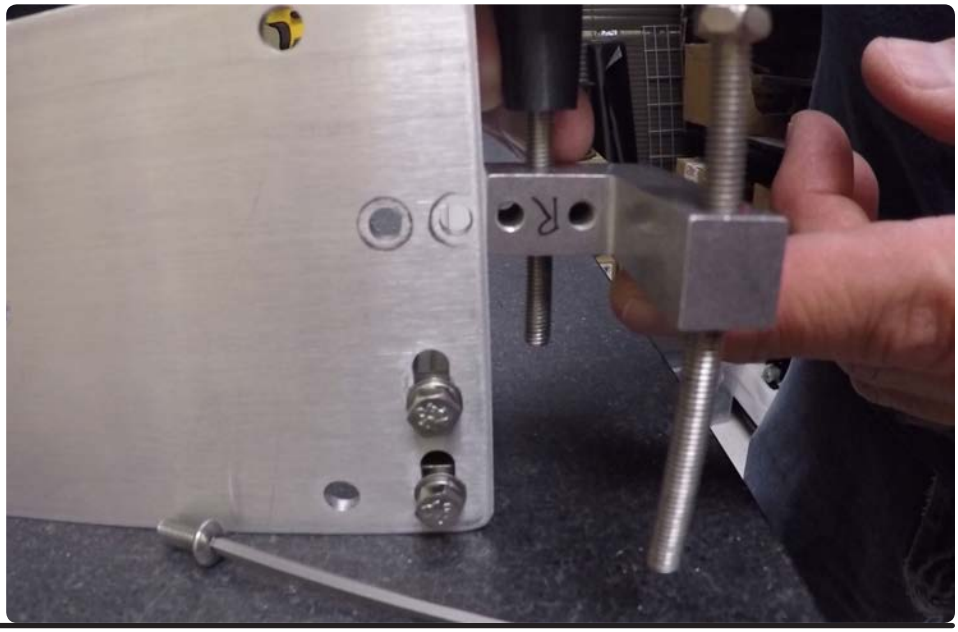
D41

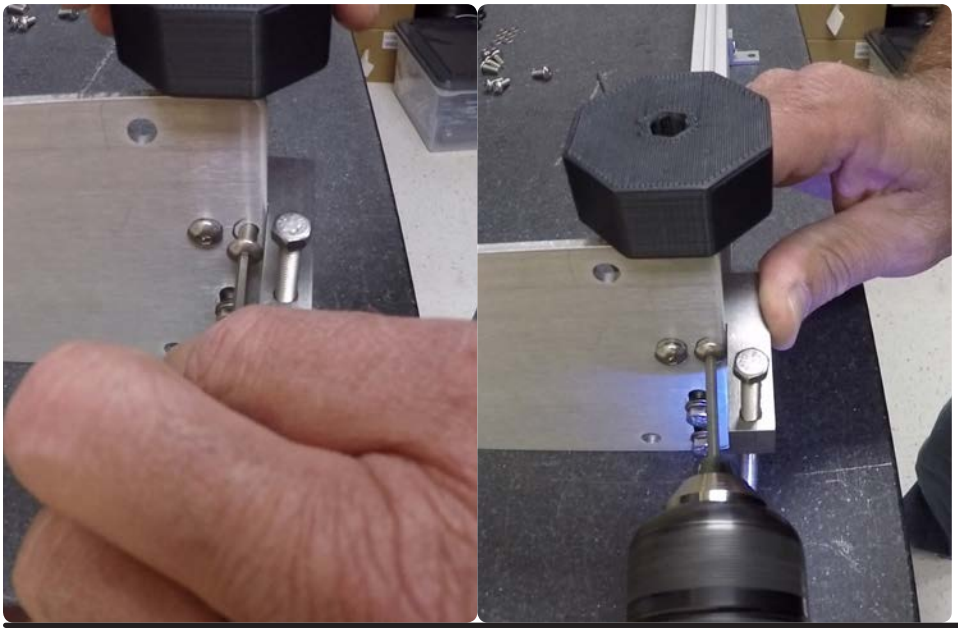
Each leveling block is fastened onto the bed frame with 2 M5x12mm BHCS and a 3mm Allen Key. Install the leveling block from D36 into the left side of the frame as shown.



D42

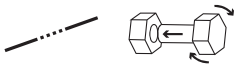
When fastening the leveling block to the bed side plate, align the centers of the holes on the bed side plate with the holes on the leveling block so that the M5x12mm BHCS are easily fastened.

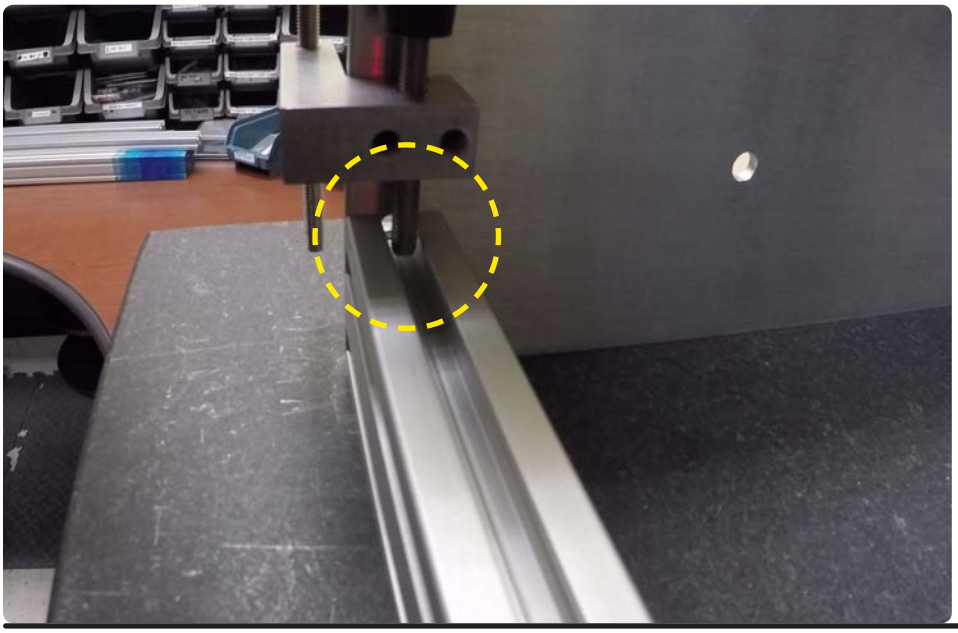




D43

As stated in D42, the leveling block should be aligned such that it is easy to snug the M5x12mm BHCS. Once snug, fully tighten them with a 3mm Allen Key.



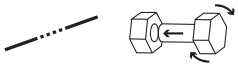


D44

Recall in D40 when the leveling screw was measured at extending 3/4” past the leveling block. This places the end of screw near the rail without making contact.

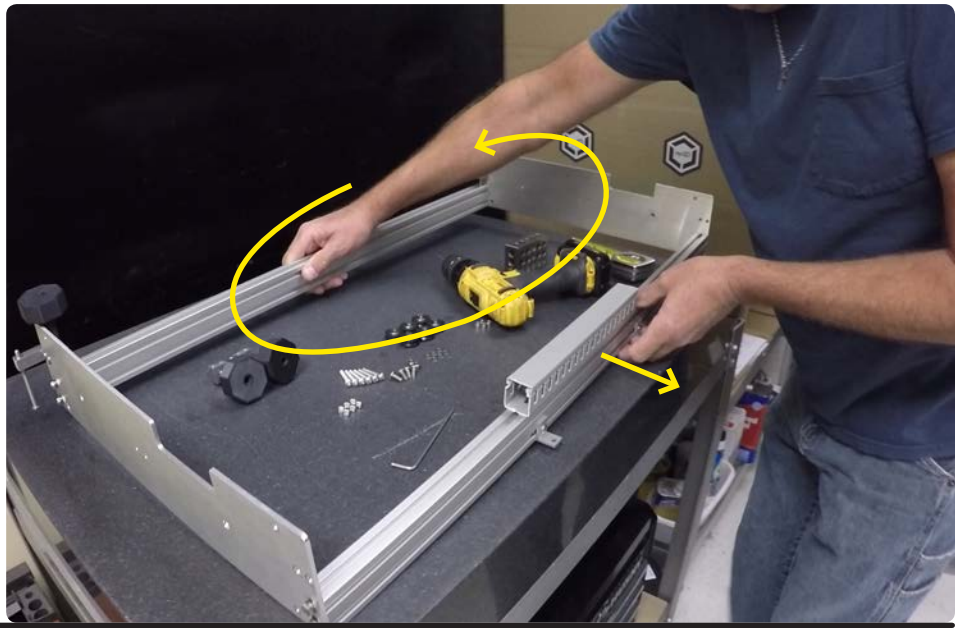
D45

Repeat steps D40-D43 for the leveling block from D39 and fasten it to the right side of the frame using 2 M5x12mm BHCS.



D46

Rotate the bed frame 180 degrees so that the rail with the Panduit is now nearest to you. You will now install the rear leveling blocks.



D47

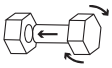
Note that these 2 leveling block assemblies are identical. In the bed frame's final orientation, they will be in the rear.

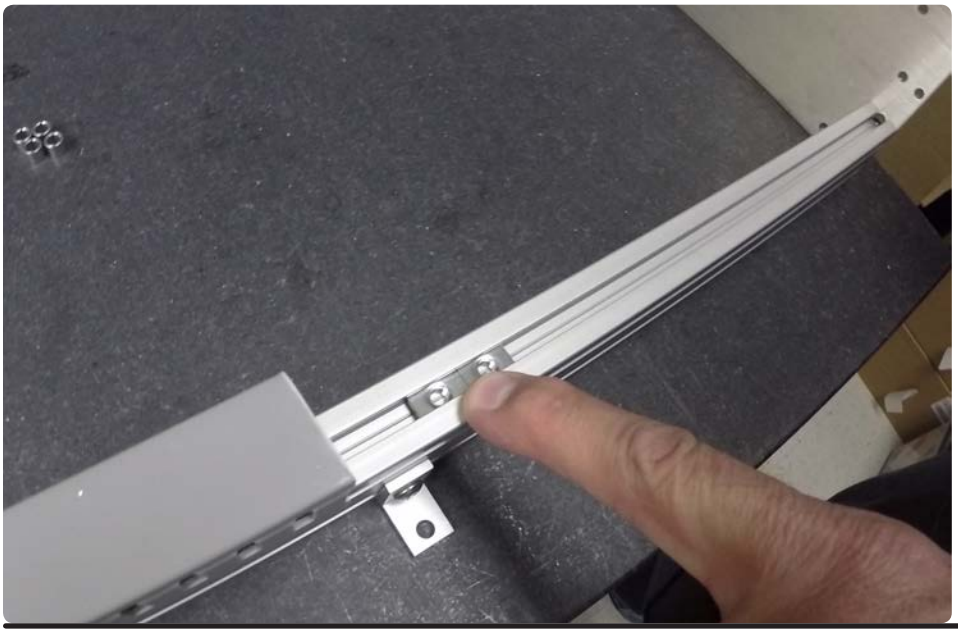
D48

Similar to D40, check that the ends of the screws extend 3/4" past the leveling block.

D49

Fasten one of the leveling block assemblies to the left bed side plate following the same steps as D41-D43. Use 2 M5x12mm BHCS and a 3mm Allen Key.



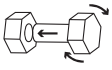


D50

Check that the 2 extra M5 T-nuts are not underneath where the last leveling block will be, or there will be interference with the leveling screw.

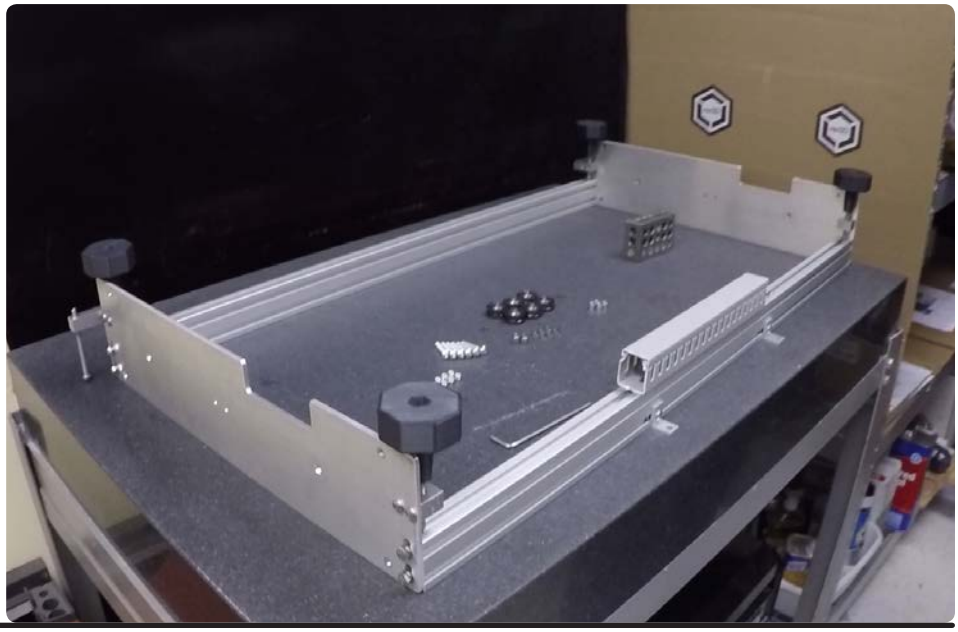
D51

Fasten the final leveling block assembly following the same steps as D41-D43. Use 2 M5x12mm BHCS and a 3mm Allen Key.



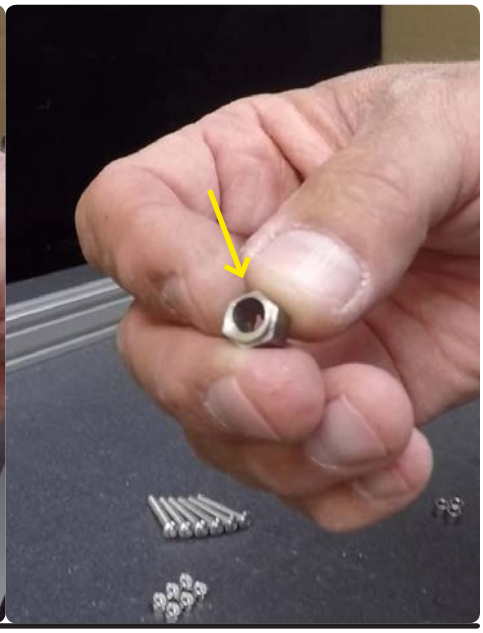
D52

The bed frame assembly should look as shown after installing all of the leveling block assemblies.



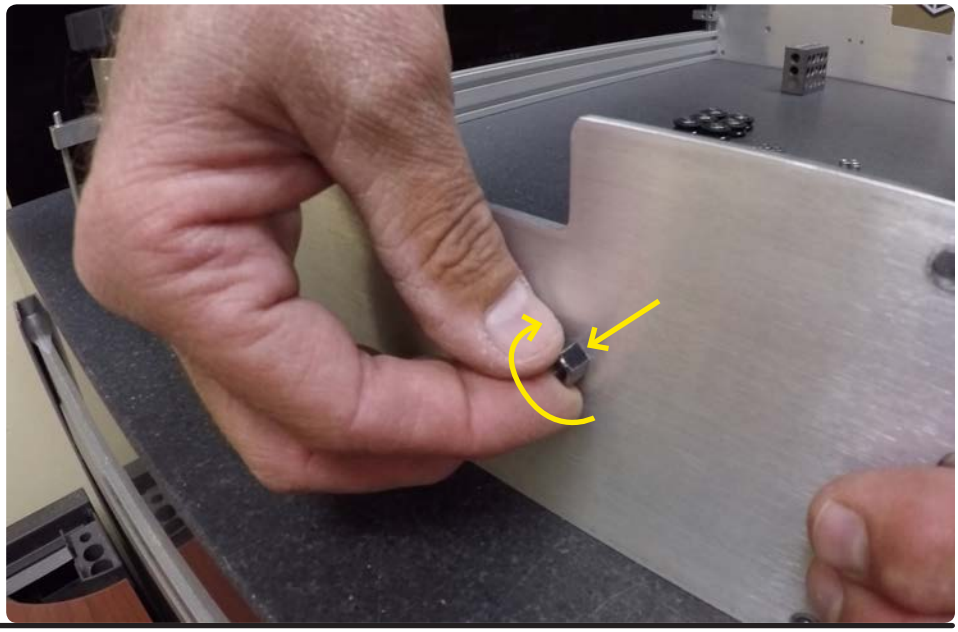
D53

Note that the V-groove wheels on Gigabot® use two types of spacers--a round spacer and an eccentric spacer. The eccentric has a hexagonal body that can be turned with an 8mm wrench, and also has a mark on the narrowest side.



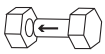
D54

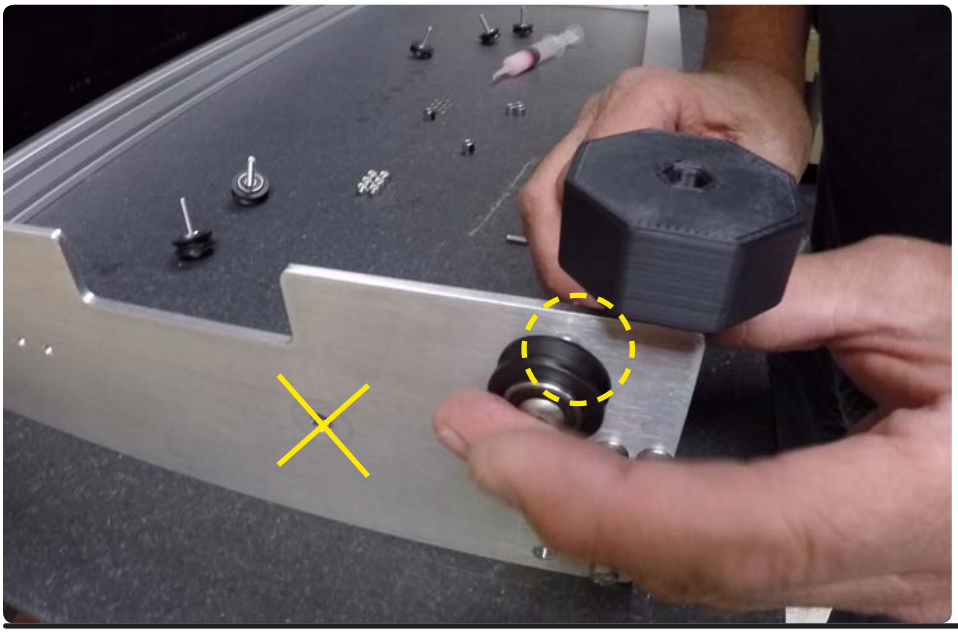
This step demonstrates the use of the eccentrics. It is possible to rotate the spacer with a 8mm wrench, allowing for adjustment of how tightly secured the wheels are to the rail. We refer to this as “adjusting the wheel tension.” Use the black mark as a reference.



D55

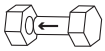
Insert an M5x30 BHCS into a V-groove wheel and then place a round spacer on the screw.





D56

Without having changed the orientation of the bed frame from earlier, insert this wheel assembly into one of the holes on the front of the left bed side plate.

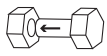


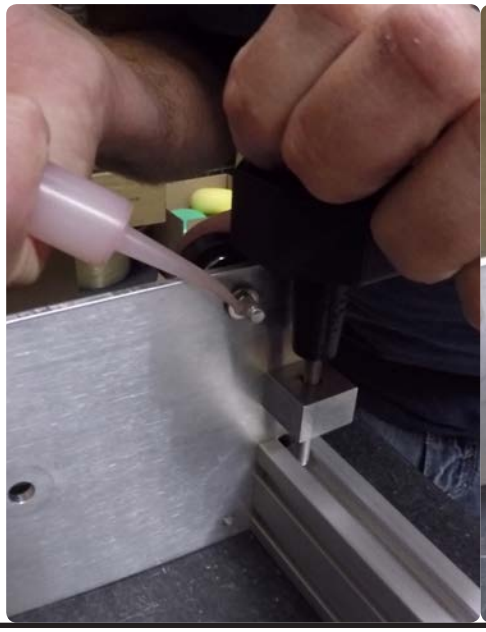
D57

Place 1 M5 flat washer on the screw. Apply a small bead of grease along the length of the screw and then fasten an M5 lock nut (may also be called Nylock nut).

D58

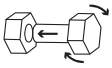
Repeat steps D55-D57 on the right bed side plate.

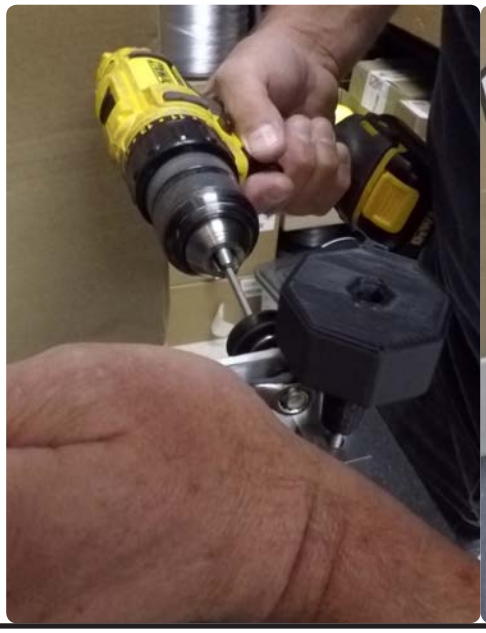




D59

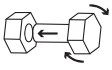
Tighten the wheel in place, using the 8mm wrench on the M5 lock nut and the 3mm Allen Key on the M5x30mm BHCS. A useful tip is to bias the hardware towards the edge of the side plate, giving the greatest amount of clearance when the bed frame is mounted to the Z uprights.

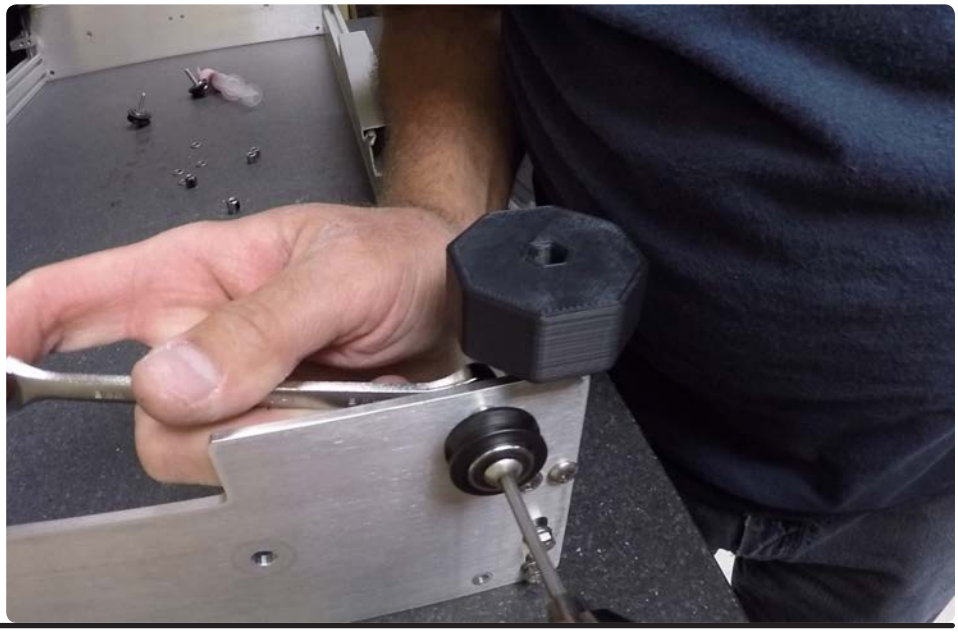


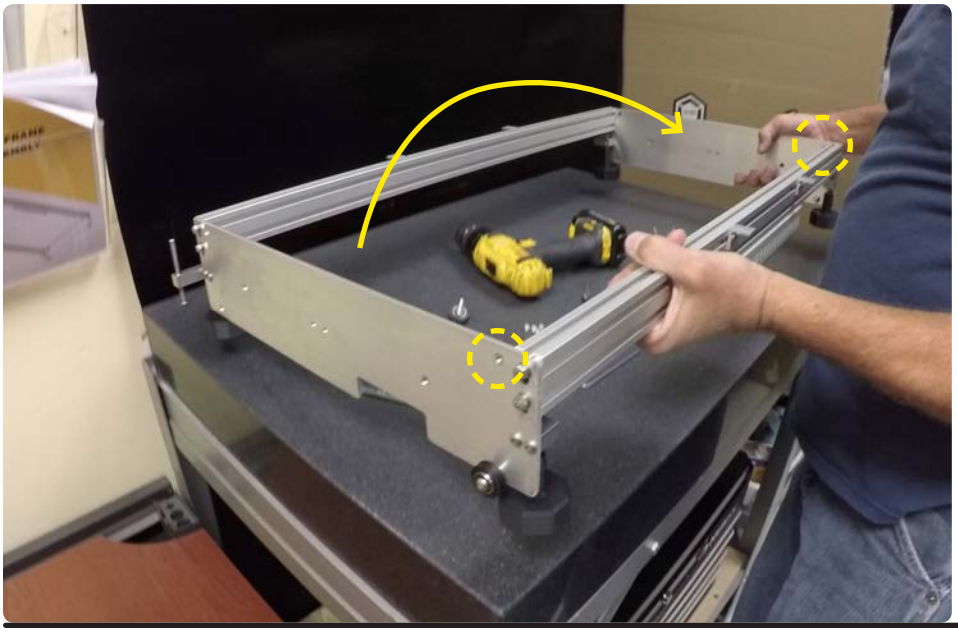


D60

Return to the other wheel and tighten this in place using the same steps as D59.





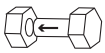


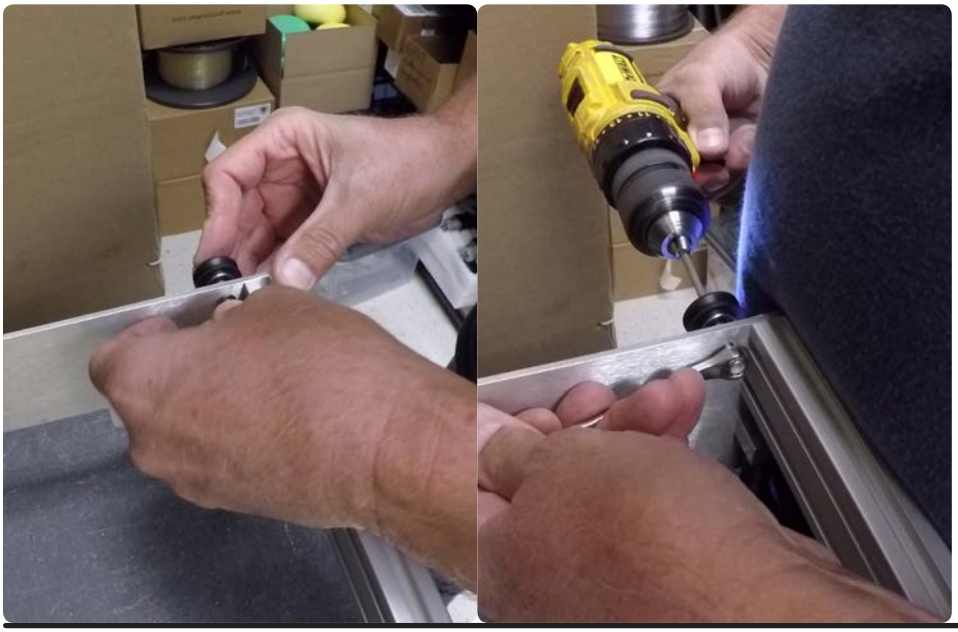
D61

Flip the frame over so that the leveling knobs are now on the work surface. The rail with the Panduit should remain closest to you. Next you will be fastening wheels to the holes indicated in the photo.

D62

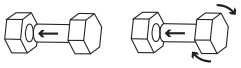
Starting with the left bed side plate, insert the wheel assembly in the same fashion as step D57.





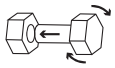
D63

On the right side, insert the wheel assembly in the same way as D57 and fasten it in the same way as D59.



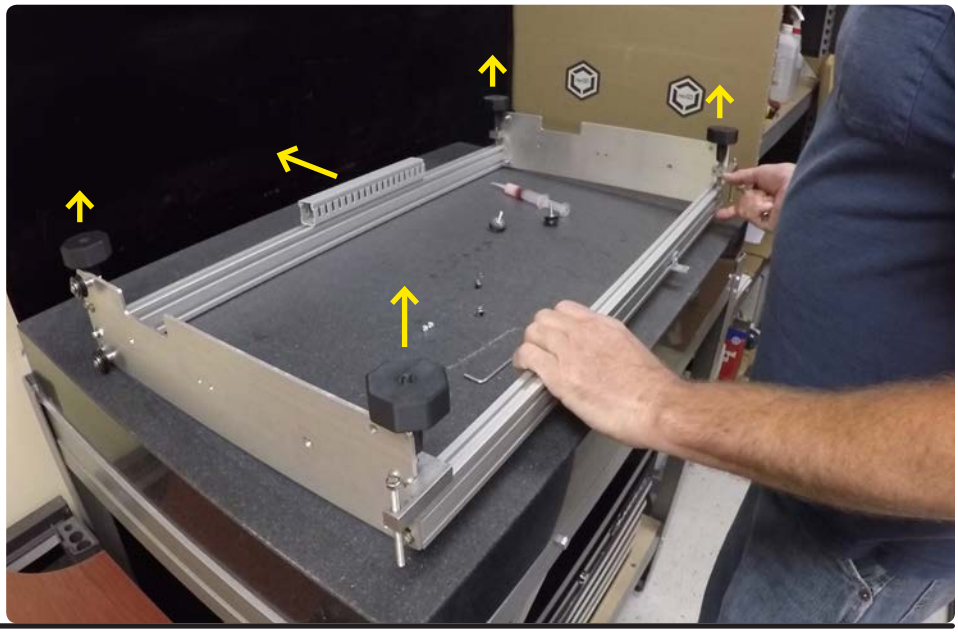
D64

Return to the other wheel and tighten this in place using the same steps as D59.



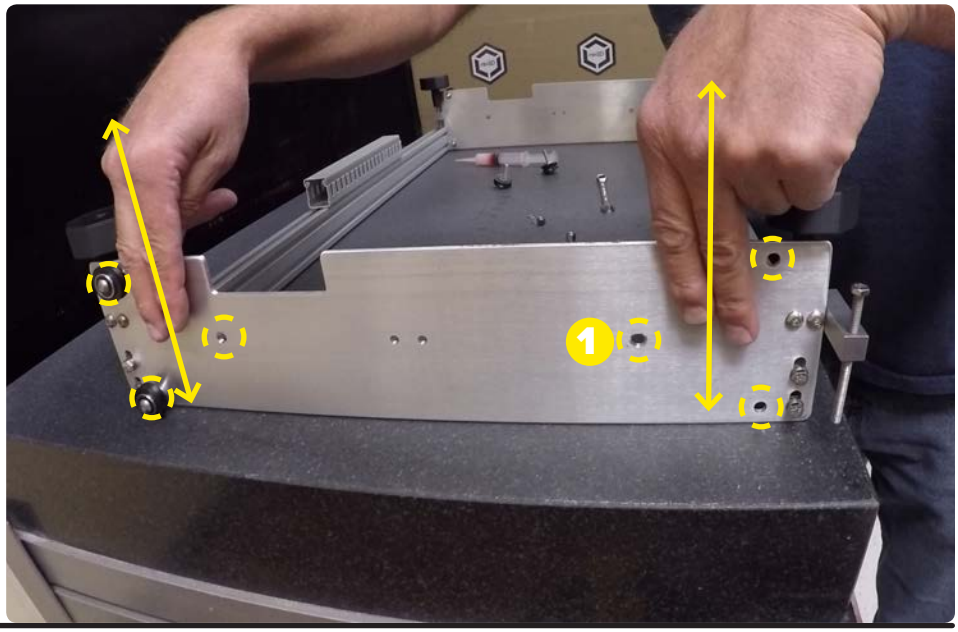
D65

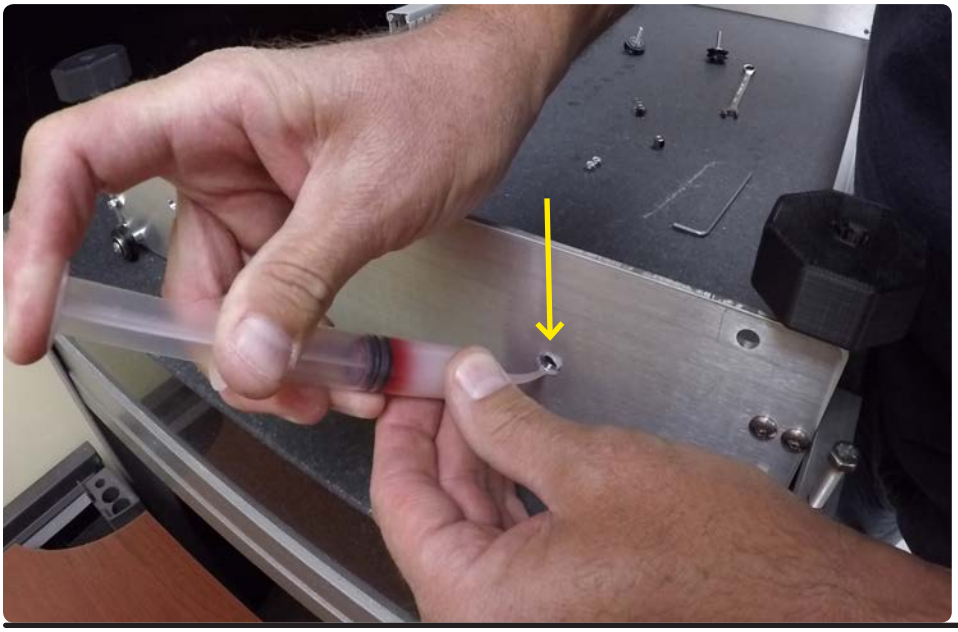
Then, flip the bed frame again so that the leveling knobs are pointed up and the Panduit is away from you.



D66

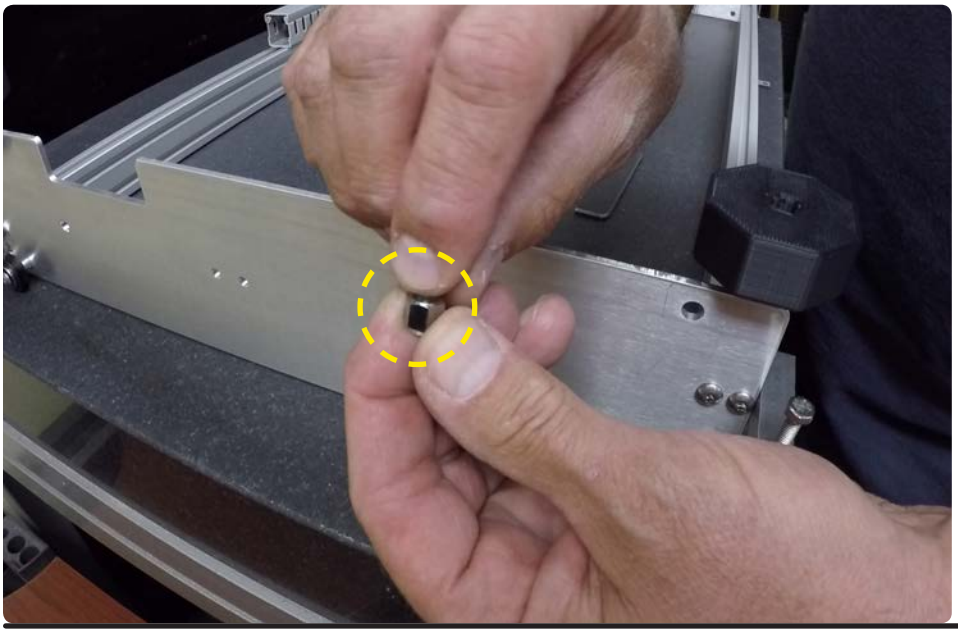
The Z-uprights will be located along each bed side plate as shown. Notice how the wheels are positioned to ride securely along both sides of each rail.





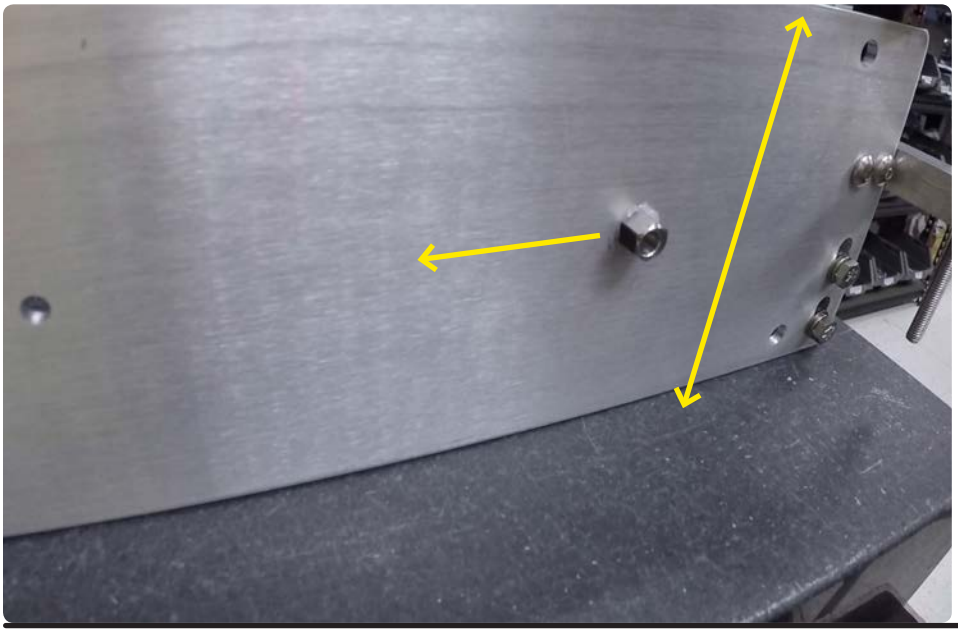
D67

Apply grease to the edge of the hole for the eccentric spacer. For clarification on this hole's location, refer to step D66--the hole is marked with the number 1.



D68

If your eccentric spacers are not already marked, make an easily noticeable mark on the face that is on the thinnest portion of the spacer.

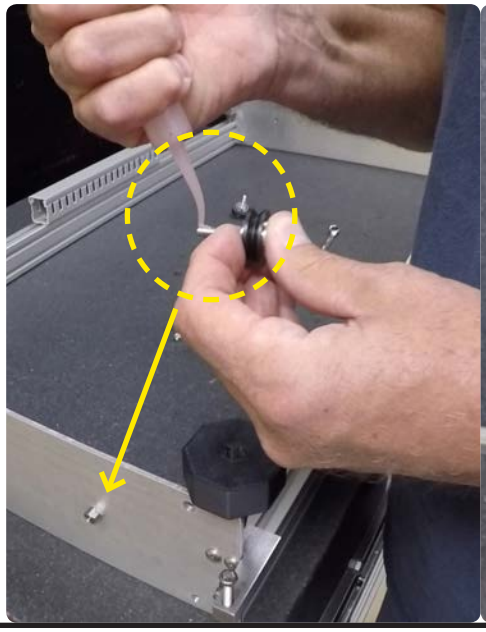


D69

Insert the eccentric spacer into the hole with the mark facing away from where the rail would be. This ensures that the wheels are placed in their widest position, making installation to the Z-uprights easier. The grease will hold this in place.

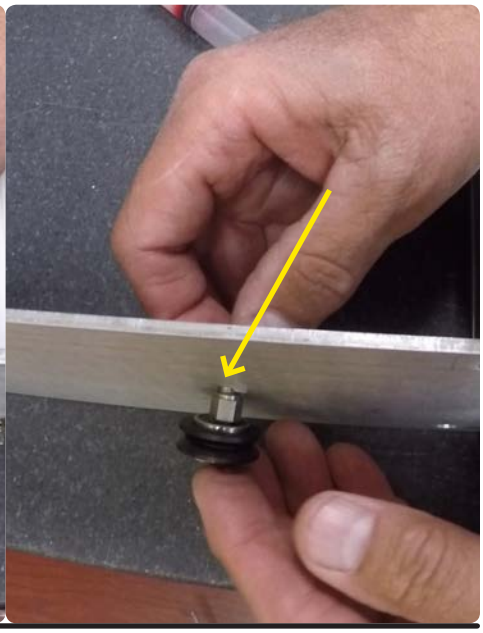
D70

Insert an M5x30mm BHCS into a V-groove wheel and apply grease to the screw threads. Insert this through the eccentric spacer. Then fasten an M5 flat washer and M5 lock nut onto the M5x30mm BHCS.



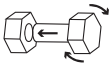
D71

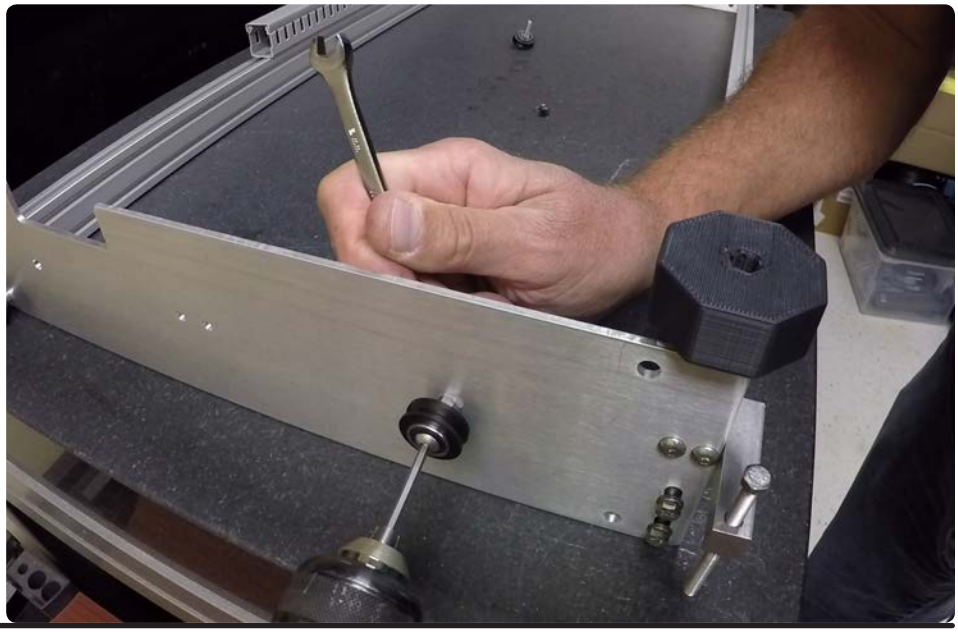
While fastening the wheels, it can be helpful to hold the wheel assembly by the lock nut, so that the eccentric doesn't fall out of place (shown on the right).

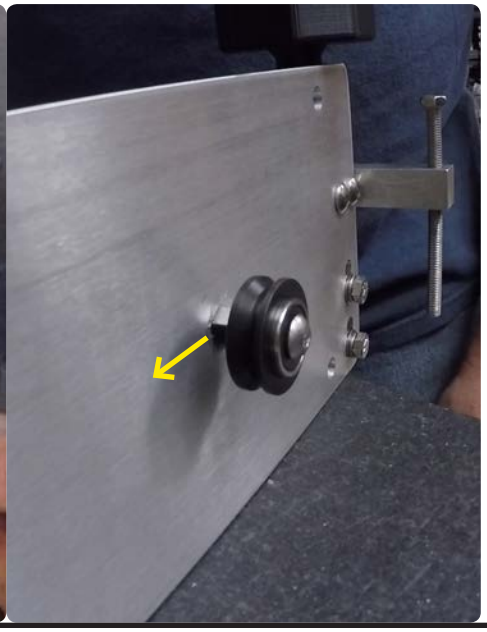


D72

Similar to the other wheels, fasten these using the 3mm Allen Key and 8mm wrench.

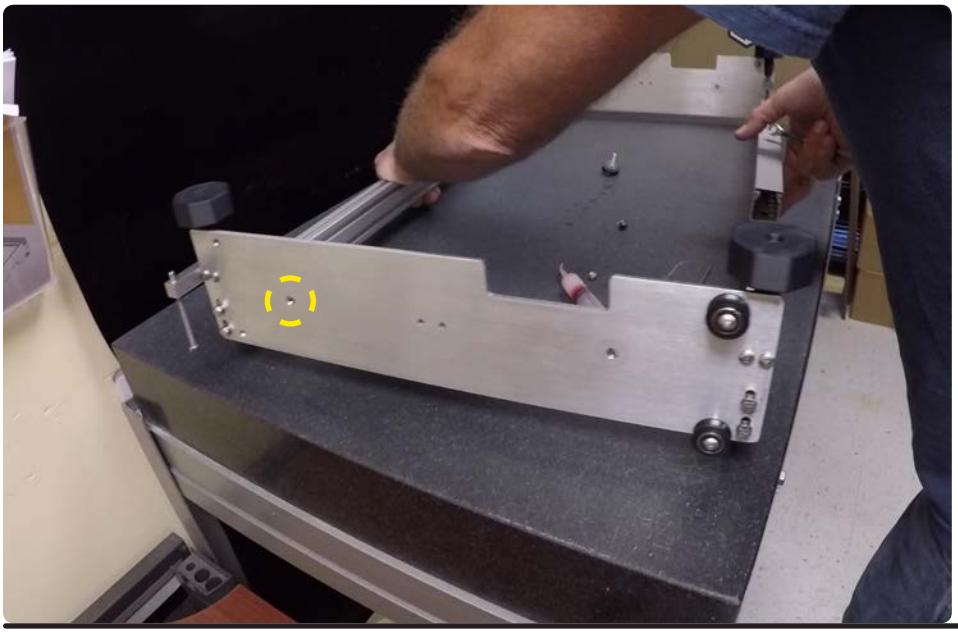






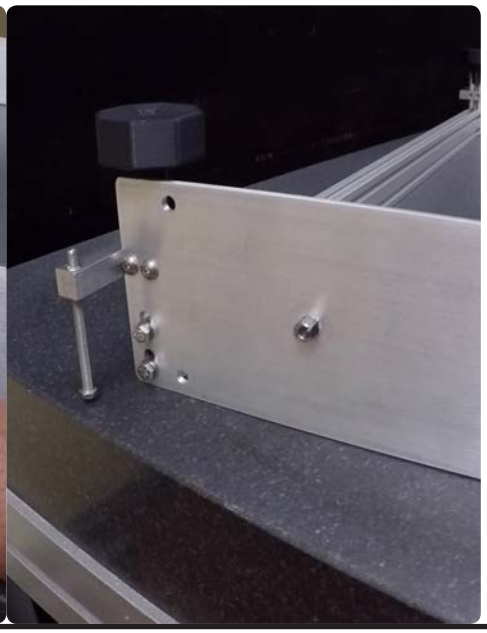
D73

After fastening, check the eccentric spacer to see if it has moved from its position from D69. If so, use the 8mm wrench to correct it.



D74

Here, the bed frame was rotated for easier viewing, but the steps are the same as in D67-D73. The hole being used is circled as shown.

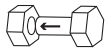


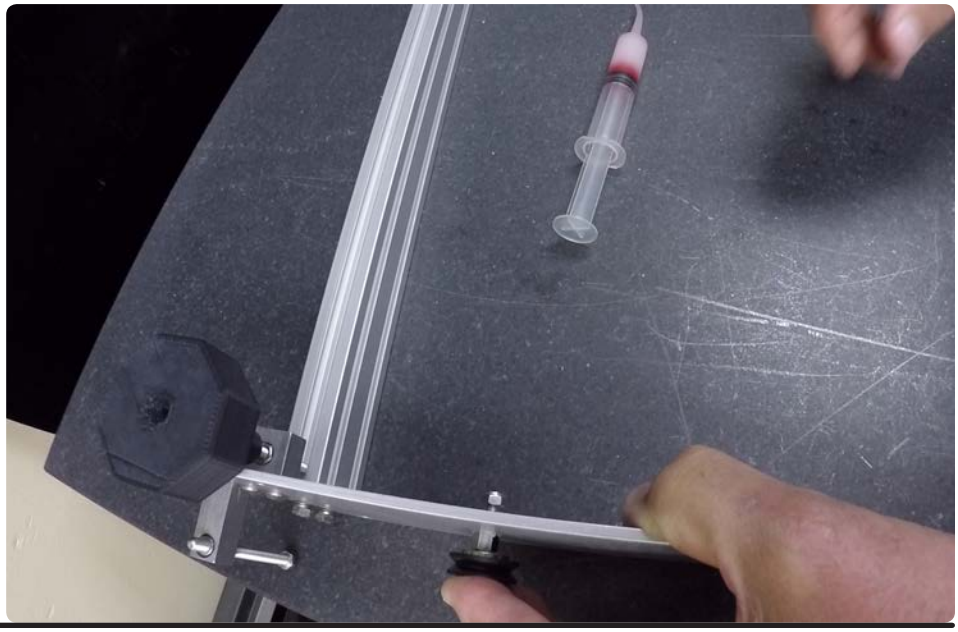
D75

Follow the same steps as D67-D68 to place the eccentric spacer.

D76

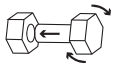
Insert another wheel like in D70-D71.

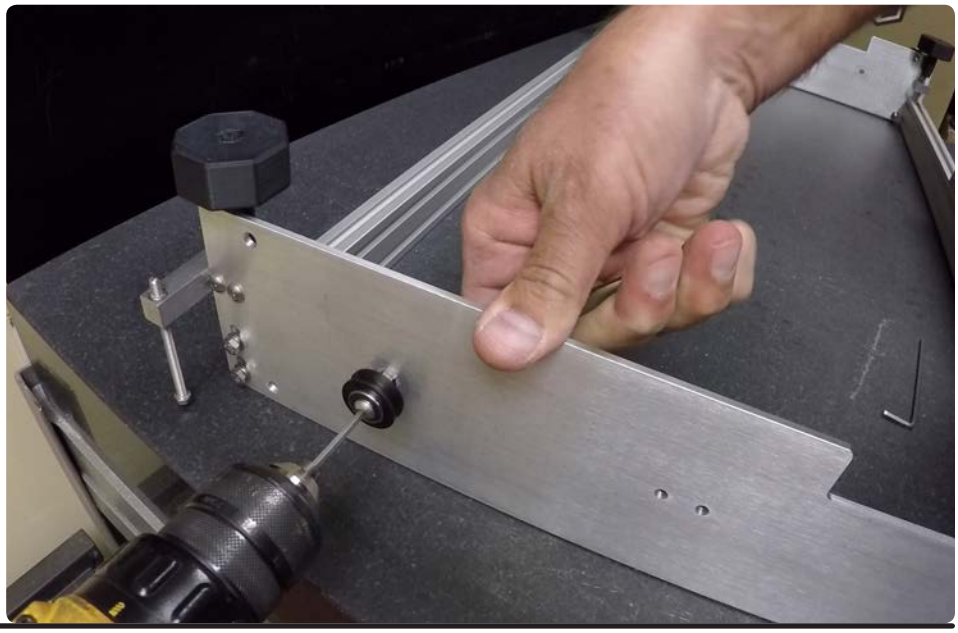




D77

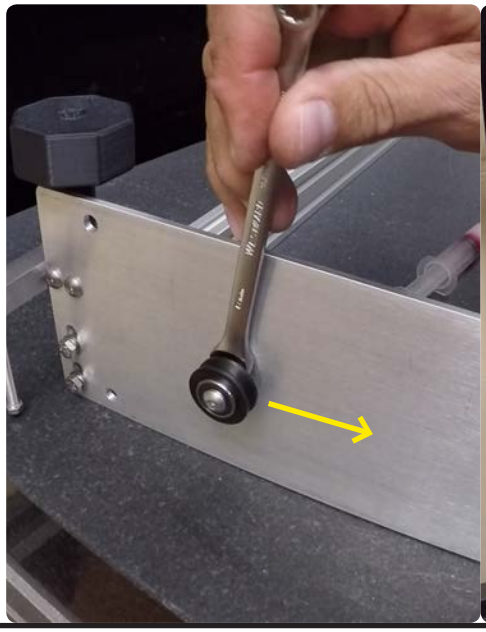
Use the 3mm Allen Key and 8mm wrench to tighten the wheel, as in D72.

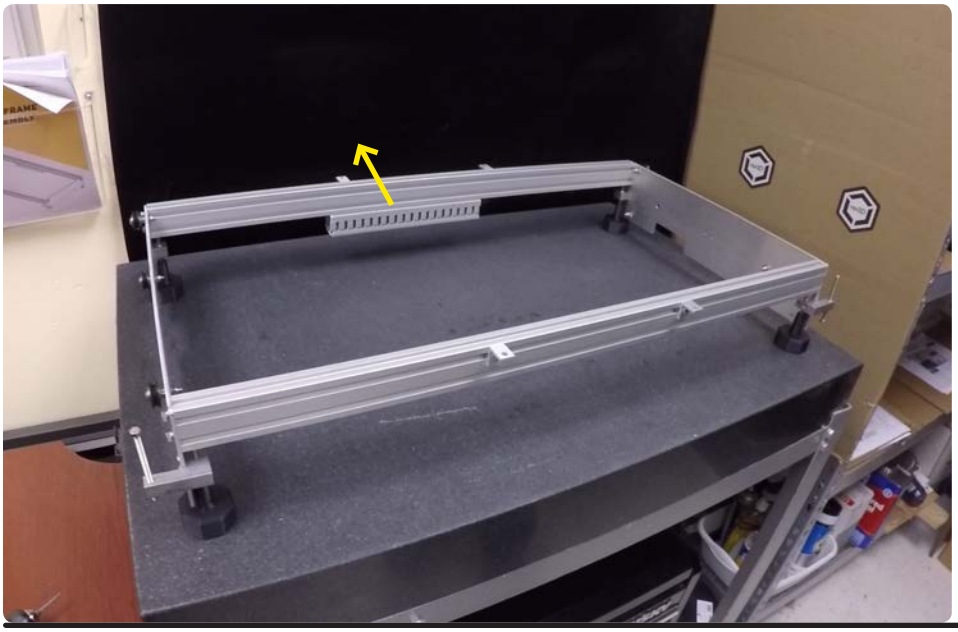




D78

Similar to D73, correct the rotation of the eccentric spacer if needed.





D79

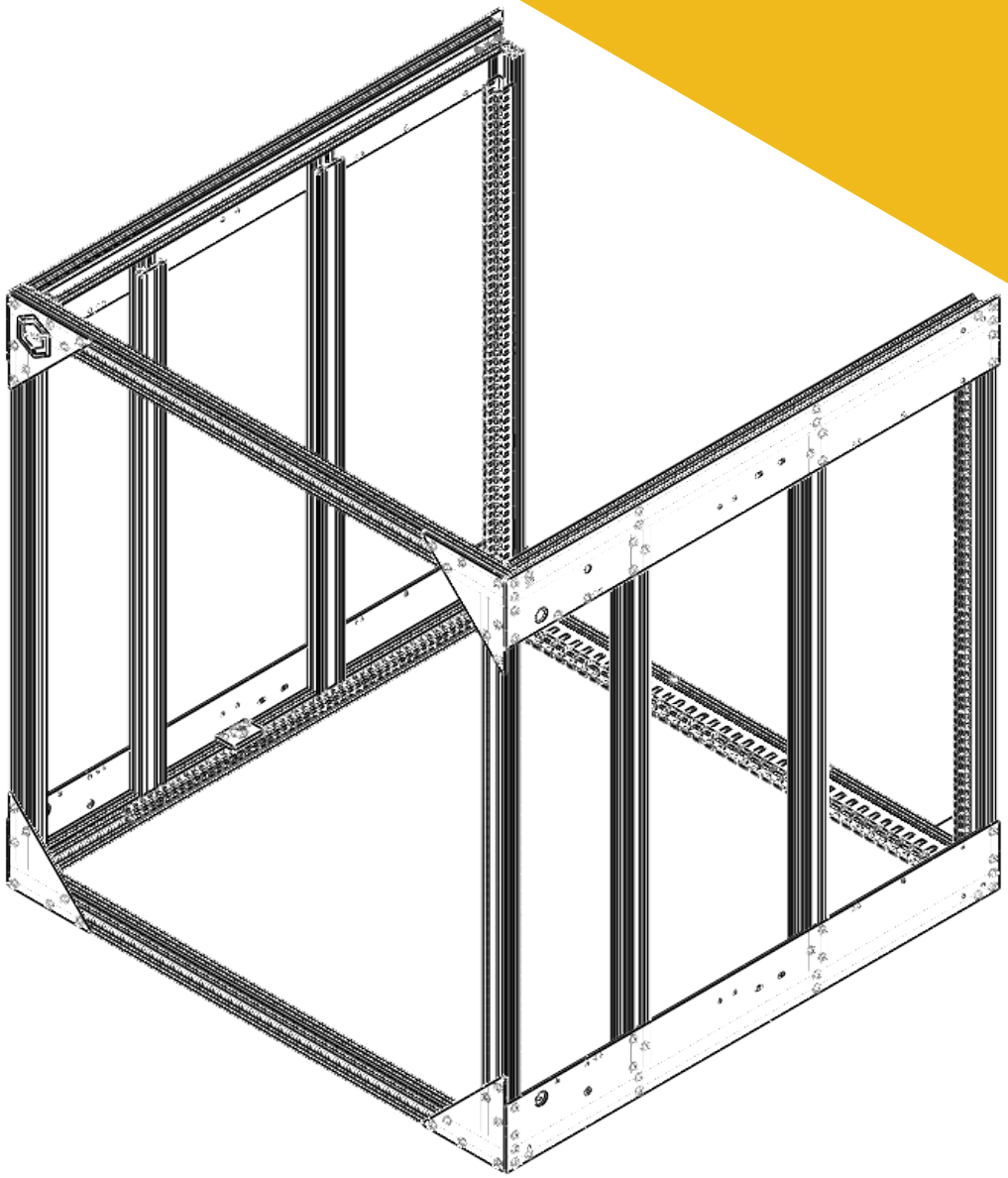
Flip the bed frame over again such that the leveling knobs are on the work surface and the Panduit is away from you. This is the final orientation of the bed frame.

D80

For further clarification on any steps, you may watch the video demonstration at this link: https://www.youtube.com/watch?v=5eKVEPtmlp8

E

FRAME ASSEMBLY



TOOLS & PARTS

Refer to packing list to identify parts

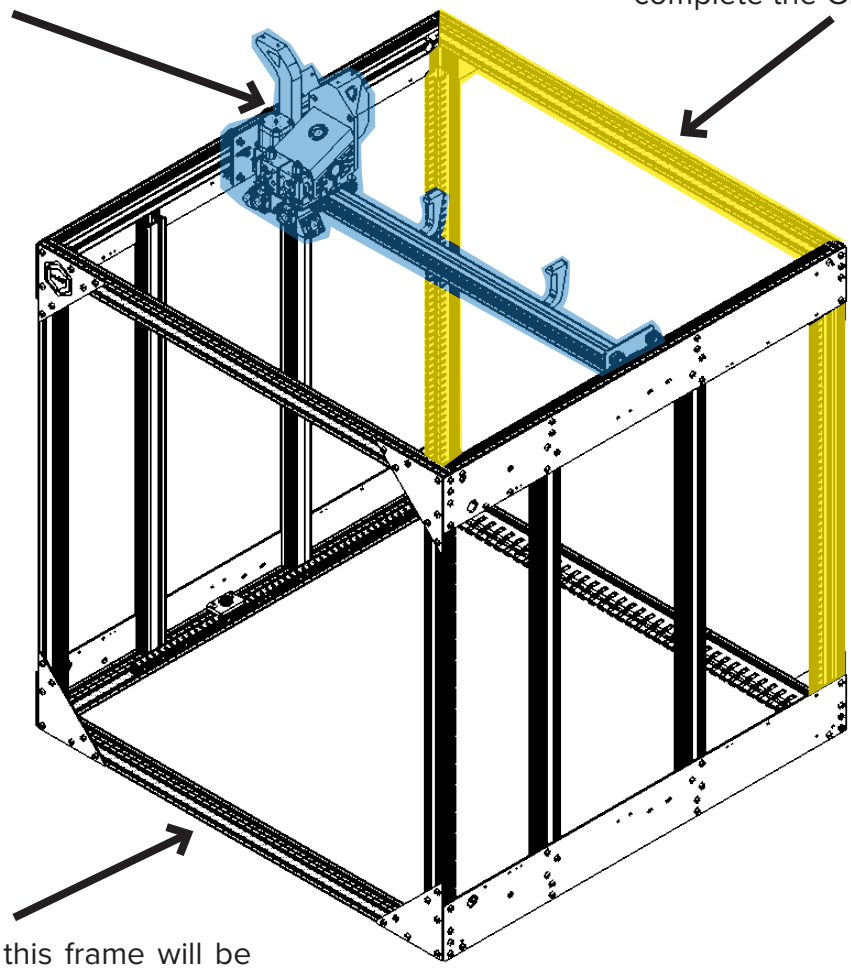
BOX #	PART	QUANTITY
1	#1 24” Panduit	1
Snappybox	M5x8 BHCS	68
Snappybox	T-nuts	68
6	3mm Allen Key	1
Snappybox	Lower bearing blocks	2
Snappybox	M5x12 BHCS	12
1	#4 30” Panduit	1
Snappybox	Triangle braces	4
Snappybox	M5x10 BHCS	8
1	#2 29” Panduit	1
1	#1 30” Panduit	1
1	#3 30” Panduit	1
1	#2 7.25” Panduit**	1
WATCH THE ACCOMPANYING VIDEO:	https://youtu.be/Ml5B4gsB5io	

OVERVIEW

The frame will be assembled as shown. Note that the bridge assembly is mounted before the rear uprights and rear header are installed.

2. The bridge assembly is mounted prior to the rear header and rear corner rails.

3. The rear header and these common rails are installed last to complete the Gigabot® frame.



1. The majority of this frame will be built first.

TIPS & TRICKS

#1 Work on a flat surface.

#2 Take your time when squaring the upright rails with the precision square to ensure the frame is properly built.

#3 The subassemblies you will need include: headers, footers, upper and lower side plates.

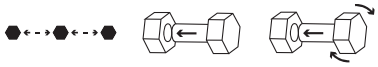
#4 Other components include: Z uprights, common rails (corners), and Panduits.

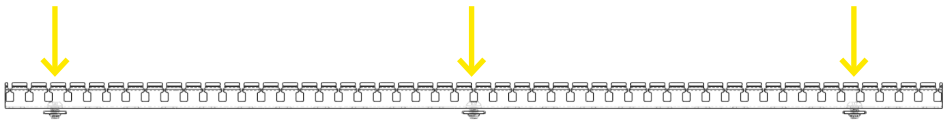
#5 Mount the bridge assembly prior to installing the rear corner upright rails and the rear header.

#6 Warning: The LED light strip may become hot during operation.

E1

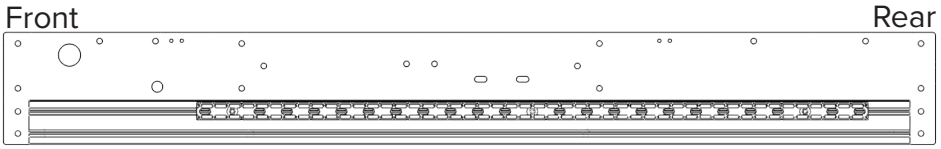
Prepare a #1 Panduit 24” by evenly spacing and inserting 3 M5x8 BHCS into the Panduit holes (use the small holes so that the screws stay in place). Loosely fasten a T-nut to each screw.





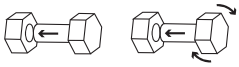
E2

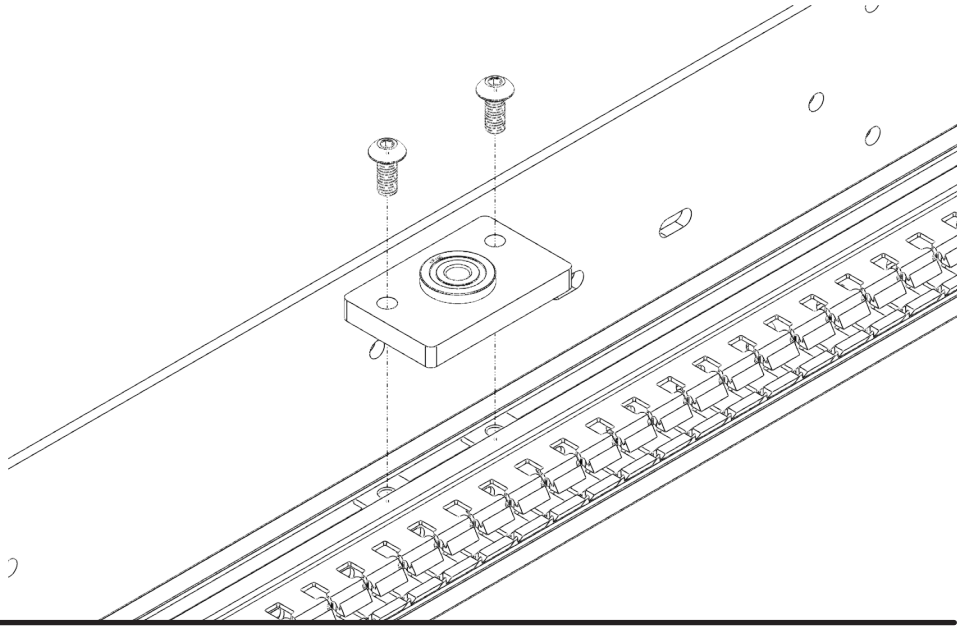
Insert this Panduit to the upper slot of the lower left side plate assembly (this will be used for the left Z motor and lower Z limit switch). Space the rear of this Panduit about 1.5” from the end of the rail and tighten the M5x8 BHCS with a 3mm Allen Key

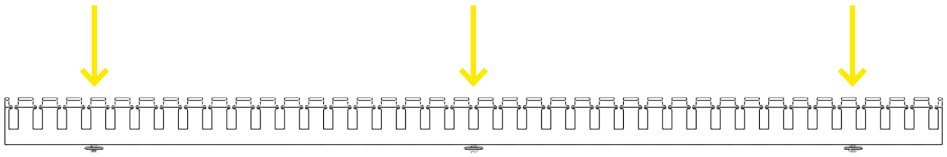


E3

On the same assembly, install one of the lower bearing blocks into the top slot of the rail using 2 T-nuts and 2 M5x12 BHCS. Make sure that the bearing is protruding from the top of the block when it is mounted to the rail. This can be loosely fastened for now and will be aligned later when the ACME threaded rods are installed.

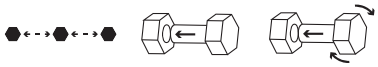


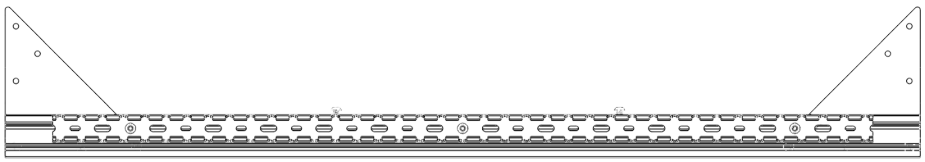




E4

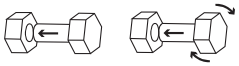
Similar to before, prepare a #4 Panduit 30” with 3 M5x8 BHCS and 3 T-nuts.

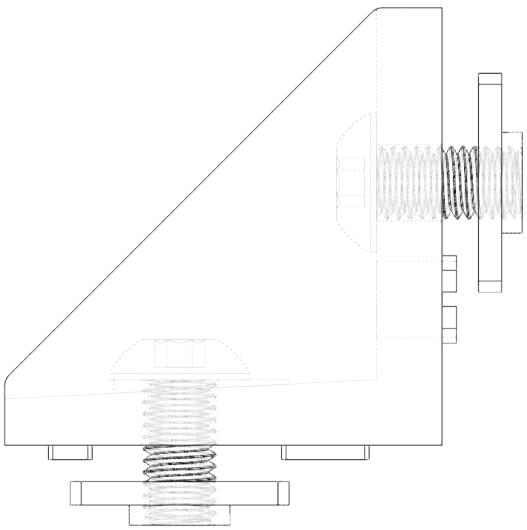




E5

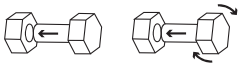
Insert this into the upper slot of the rear footer with the angled cuts of the Panduit facing down. Center this on the Panduit and tighten the M5x8 BHCS with a 3mm Allen Key.





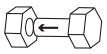
E6

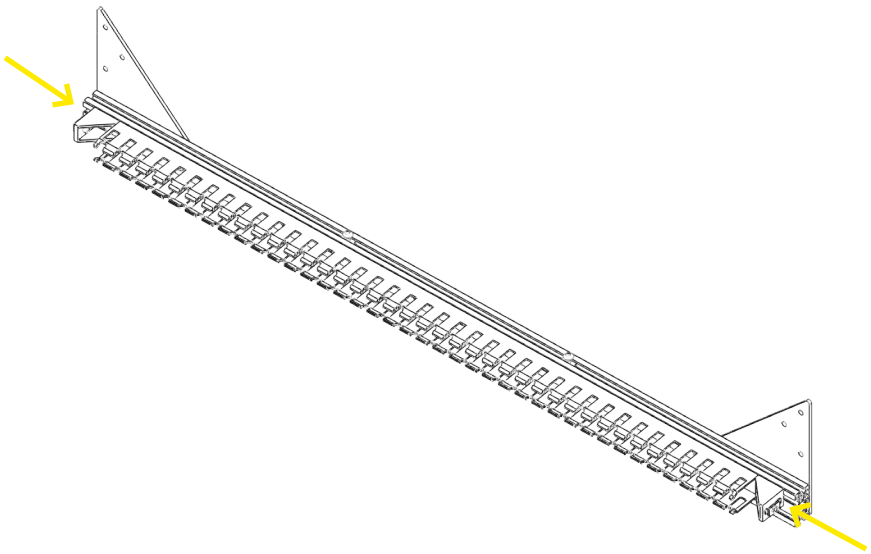
Prepare 4 triangle braces, each with an M5x10 and a T-nut on each side. If one side has more than one hole, use the most centered hole.



E7

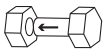
Insert one triangle brace assembly each into the corners of the rear footer, in the lower slot (total of 2 used).

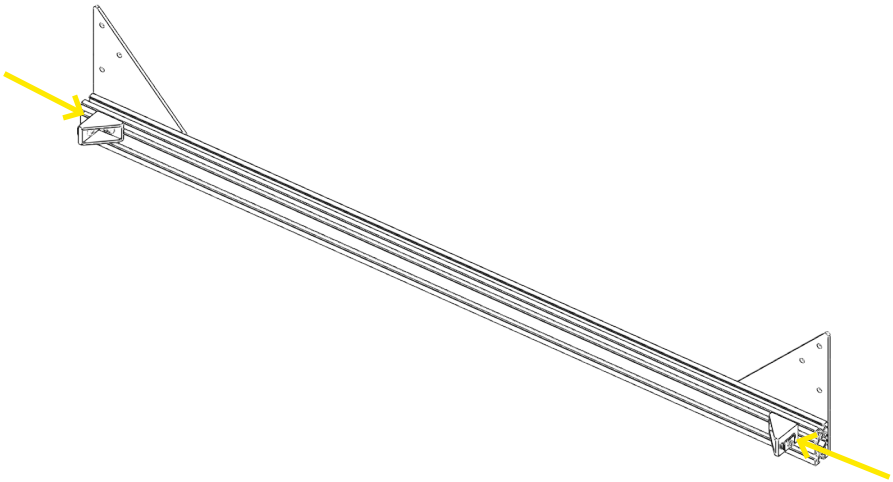




E8

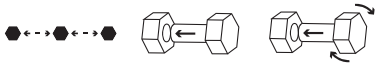
Insert one triangle brace assembly each into the corners of the front footer, in the lower slot (total of 2 used).

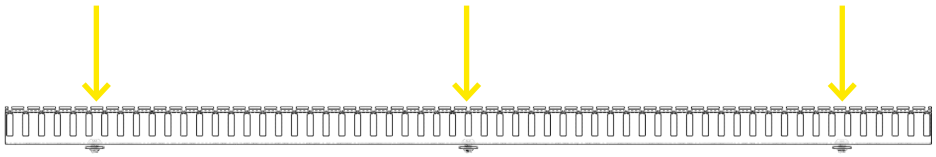


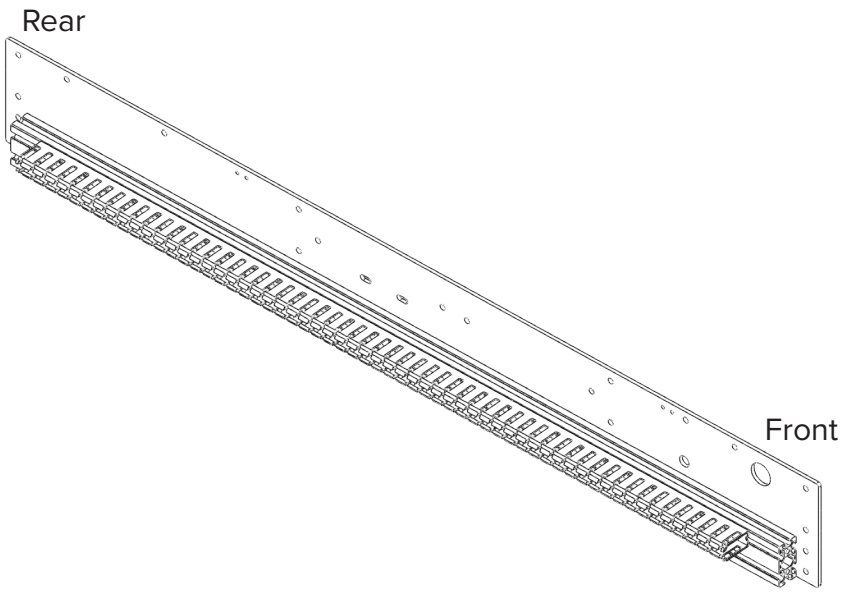


E9

Prepare a #2 Panduit 29” in the same fashion as above with 3 M5x8 BHCS and 3 T-nuts.

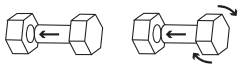


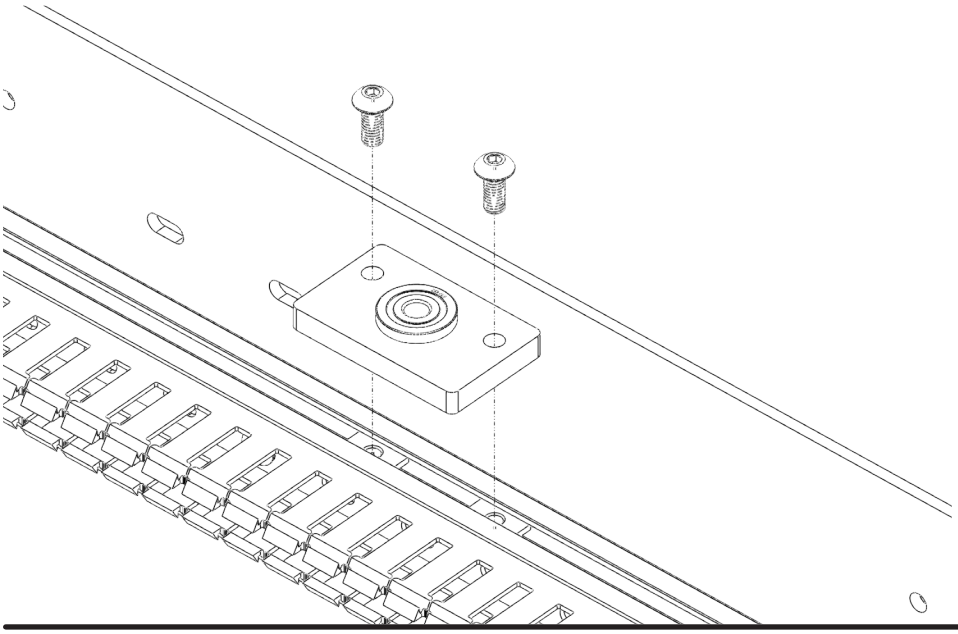




E10

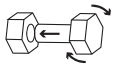
Insert this into the lower right side plate assembly (this will be used for the right Z motor and all wiring going to the bridge assembly). Space the rear of this Panduit about 1.5” from the end of the rail and tighten the M5x8 BHCS with a 3mm Allen Key.





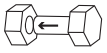
E11

On the same assembly, install one of the lower bearing blocks into the top slot of the rail using 2 T-nuts and 2 M5x12 BHCS. Make sure that the bearing is protruding from the top of the block when it is mounted to the rail. This can be loosely fastened for now and will be aligned later when the ACME threaded rods are installed.



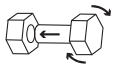
E12

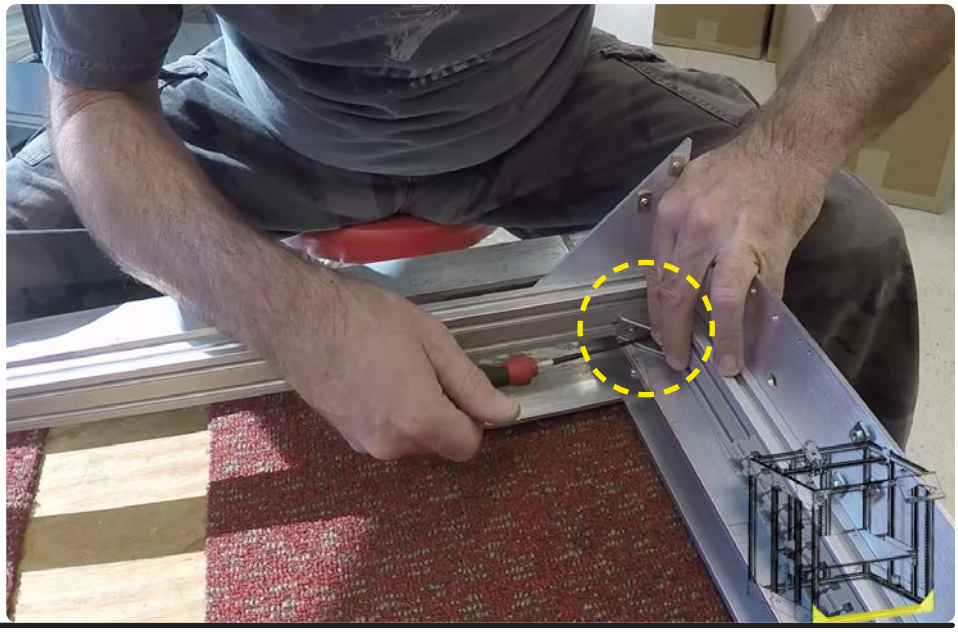
Connect the front footer to the lower side plate assemblies by sliding the T-nuts of the triangle braces into each rail.



E13

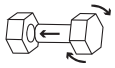
Holding the adjacent rails together, use the 3mm Allen Key to snug down down the 2 M5x10 BHCS in the triangle brace. Do this for both corners. (If you have framing clamps available, they are also very helpful when assembling these frames, as seen in our video).





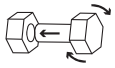
E14

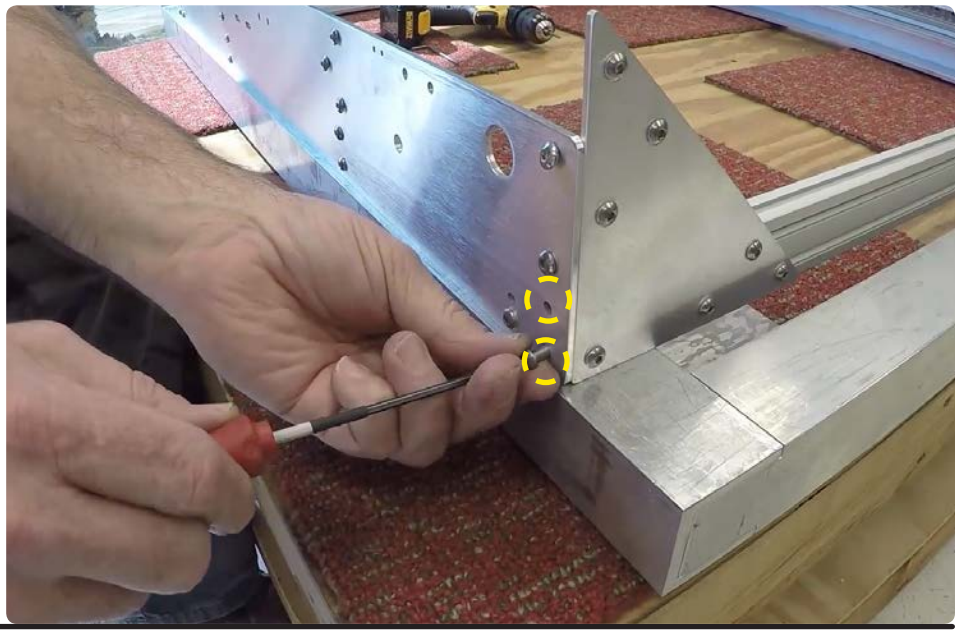
Repeat this process for the rear footer to attach it to the other end of the lower side plates.



E15

Use M5x12 BHCS to loosely fasten the side plates to both the front and rear footers. Each side is fastened with 2 M5x12s each, so you will use 8 total.



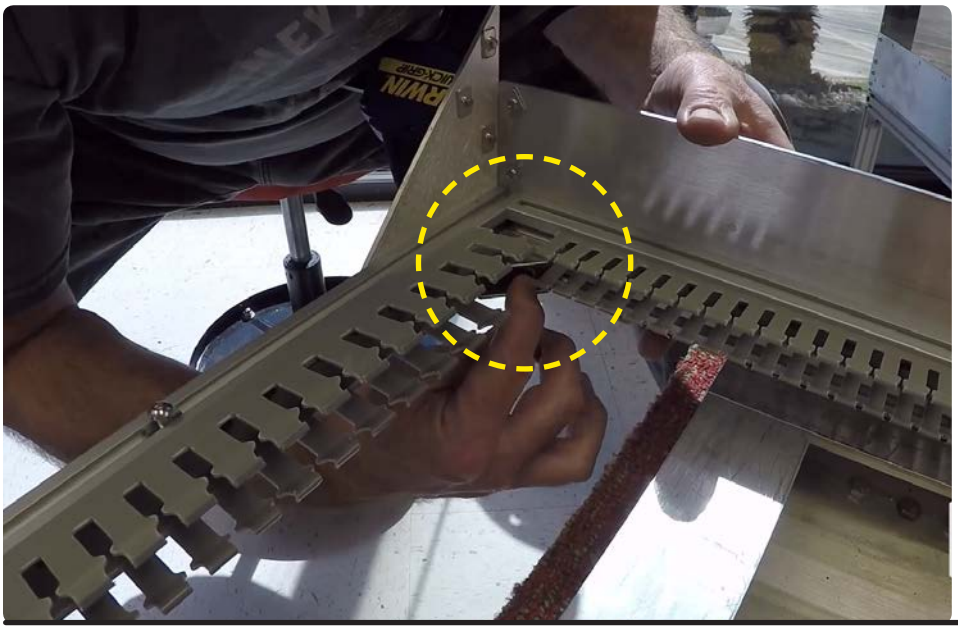


E16

As the corners are fastened together, use the precision square to verify that the rail top surfaces are flush with each other. Place the precision square such that it lays across the two adjacent rails and use a hammer to gently tap it down until the surfaces are flush. Framing clamps are very useful in this application (see our video).

E17

Once the cross rail is flush to the common rail, fully tighten the side plate against the cross rail by using the 3mm Allen Key to tighten the M5x12 BHCS.

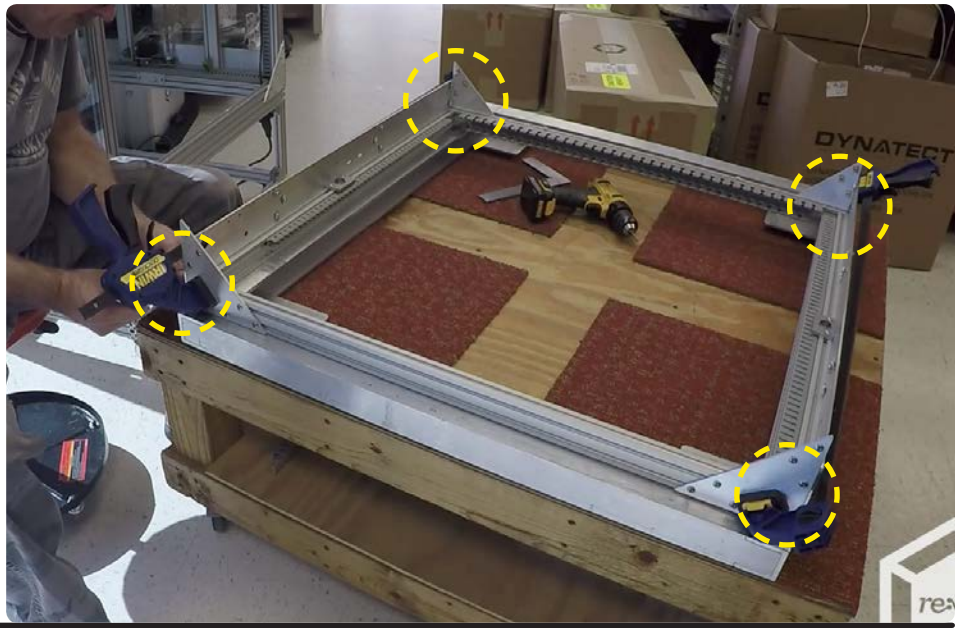


E18

Fully tighten the triangle brace on this corner with the 3mm Allen Key.

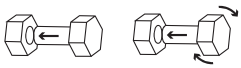
E19

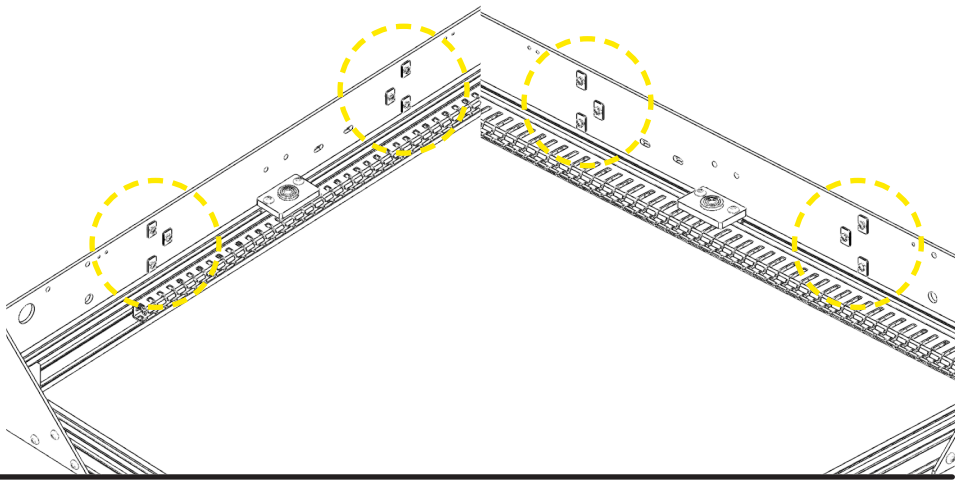
Repeat steps E15 through E18 for all 4 corners. If framing clamps were used, remove them after tightening all the hardware.



E20

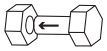
On the side plates, insert an M5x8 BHCS into each of the holes for the Z uprights. Loosely fasten an M5 T-nut to each screw. Each Z upright requires 3 sets of hardware to mount, so you will need to use 12 M5x8 BHCS and 12 T-nuts total.

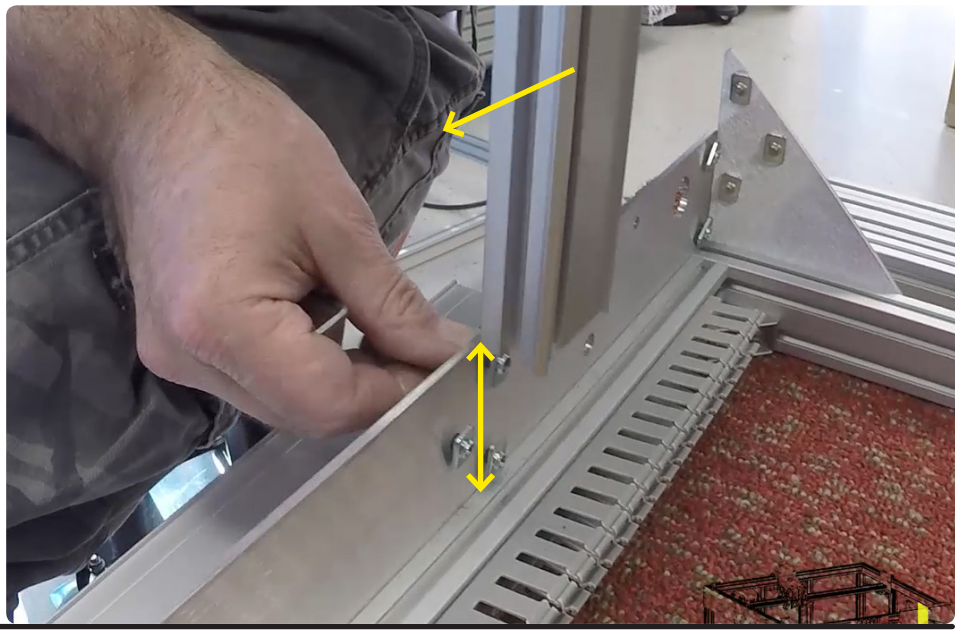


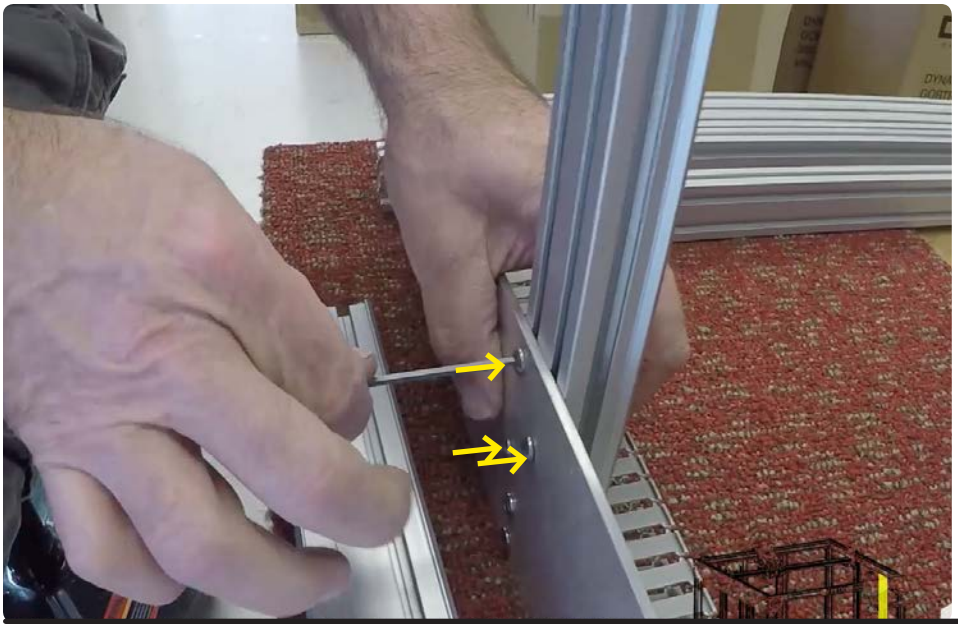


E21

Orient the T-nuts vertically as shown, and slide the Z upright down. The T-nuts should insert right into the slots on the Z upright. Orient the Z upright such that the machined end is facing towards the inside of the Gigabot. Also, have the single slot on the upright pointing towards the middle of the side plate, as shown.

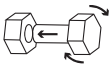


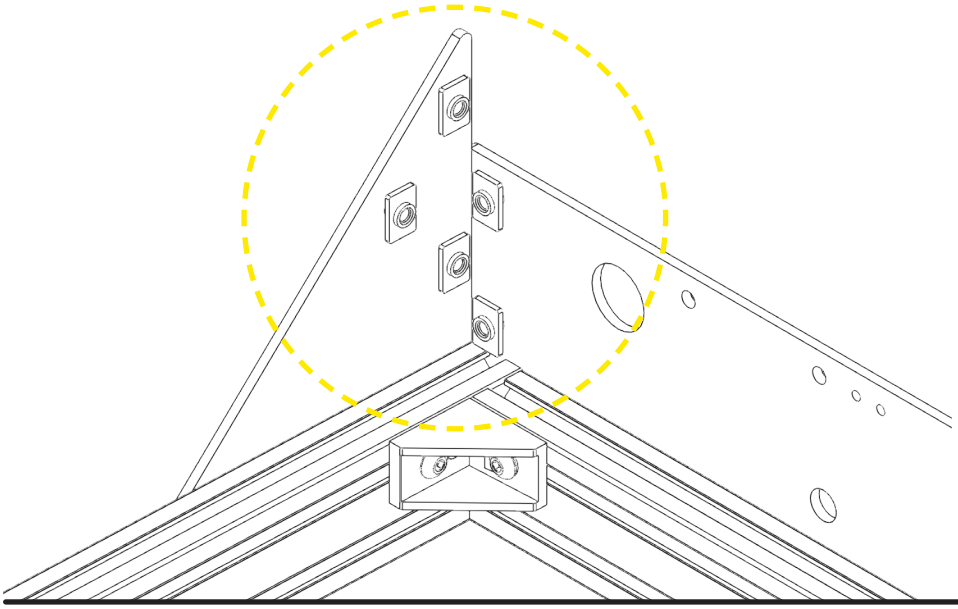




E22

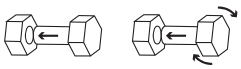
Loosely fasten the M5x8s for each Z upright—these uprights will be fully fastened after making the final alignments. Do this for all 4 Z uprights.

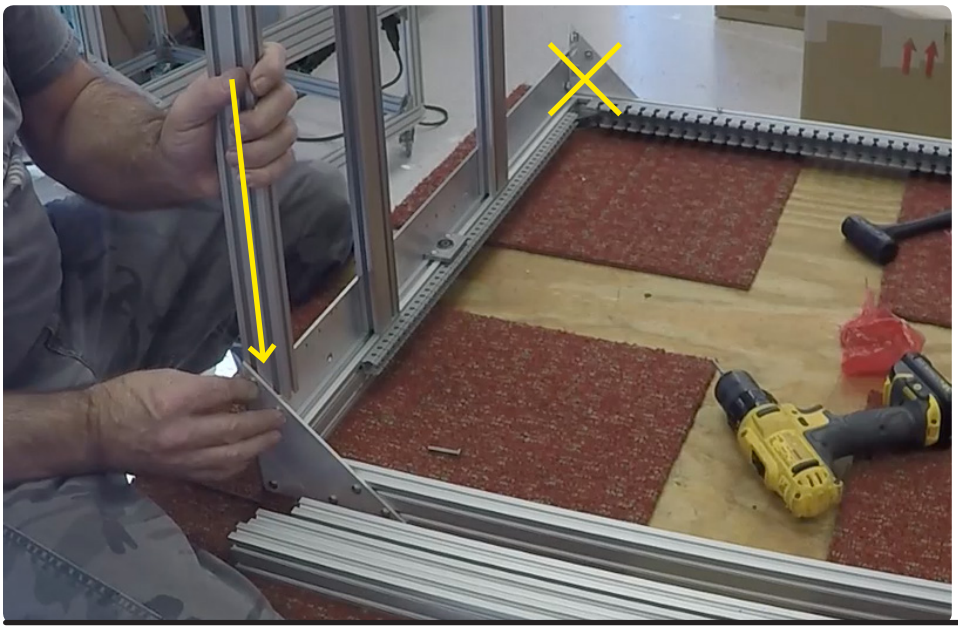




E23

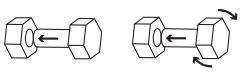
Similar to before, insert M5x8 BHCS into the holes in the side plates and corner plates of one of the corners and then loosely fasten a T-nut to each of those. There should be 5 M5x8 BHCS and 5 T-nuts per corner, so 20 of each piece of hardware to prepare all corners of the frame.





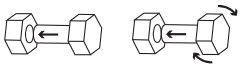
E24

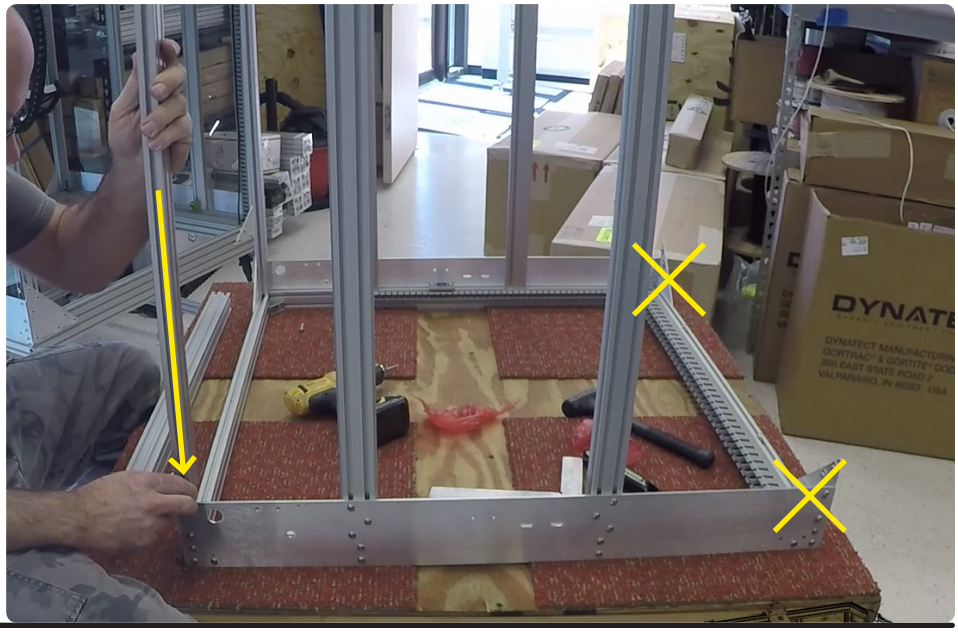
Orient the T-nuts vertically and then slide a vertical common rail down onto one of the front corners (not rear!) such that the T-nuts go into the slots of the rail. Loosely fasten the M5x8 BHCS so the rail stays in place. These will be squared and fully tightened later.



E25

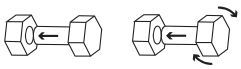
Repeat for the other vertical rail in the other front corner.





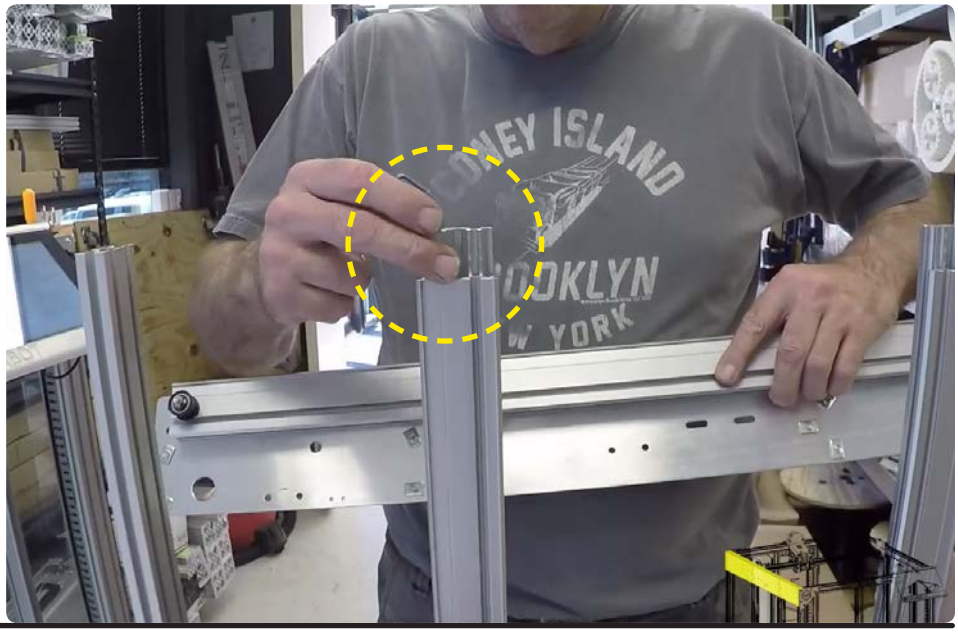
E26

On each upper side plate assembly (runway rail, side plate, idler pulley), insert the M5x8 BHCS and T-nuts in the holes as shown. Use 10 M5x8 BHCS and 10 T-nuts per side plate. Again, these should be loosely fastened to allow the rails to easily slide on.



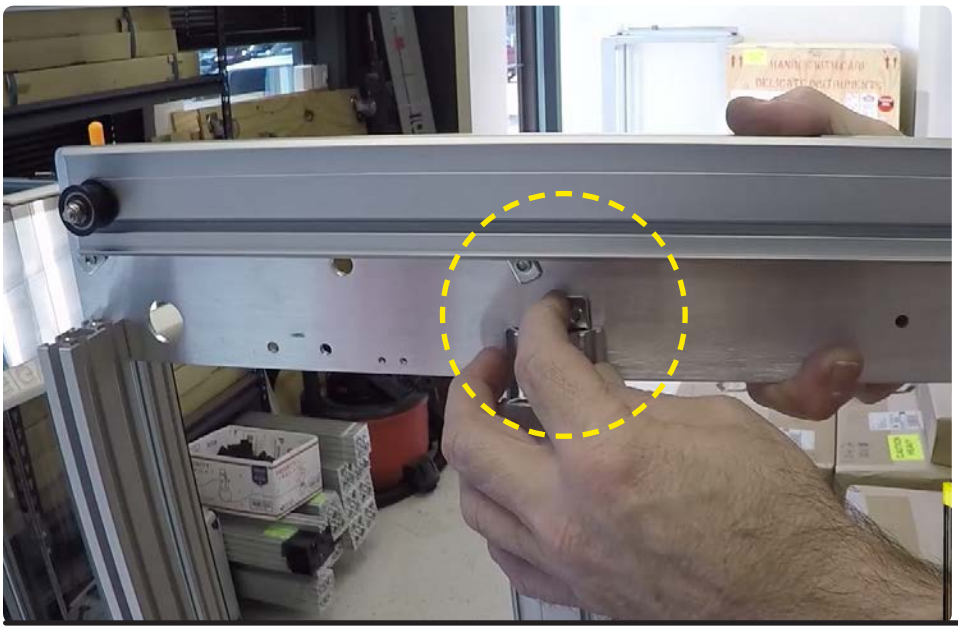
E27

During the next steps, be careful not to pinch your fingers between the side plate assembly and the rails. Also be careful of any sharp edges on the rails.



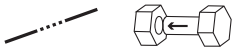
E28

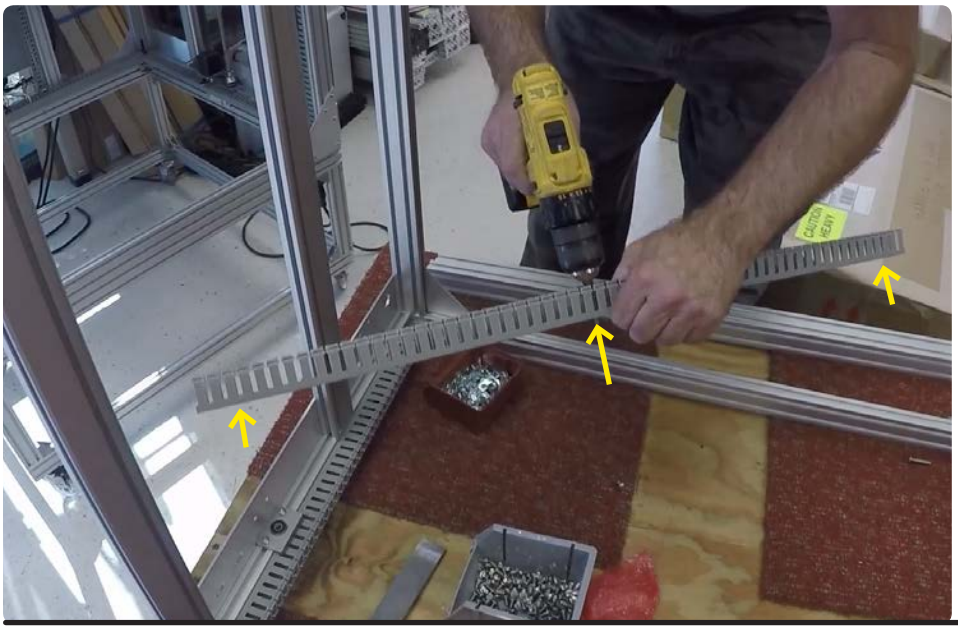
Starting with the left side plate assembly, orient it such that the large power switch hole and idler pulley pointing towards the front of the frame, and place it such that the T-nuts insert into the slots of the Z uprights and vertical common rail.



E29

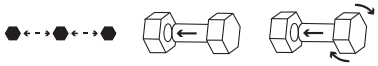
Since it is difficult to get all of the T-nuts aligned at once, you will need to slowly work each T-nut on the side plate assembly into the slots until it is totally seated on top of the rails.





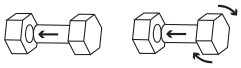
E30

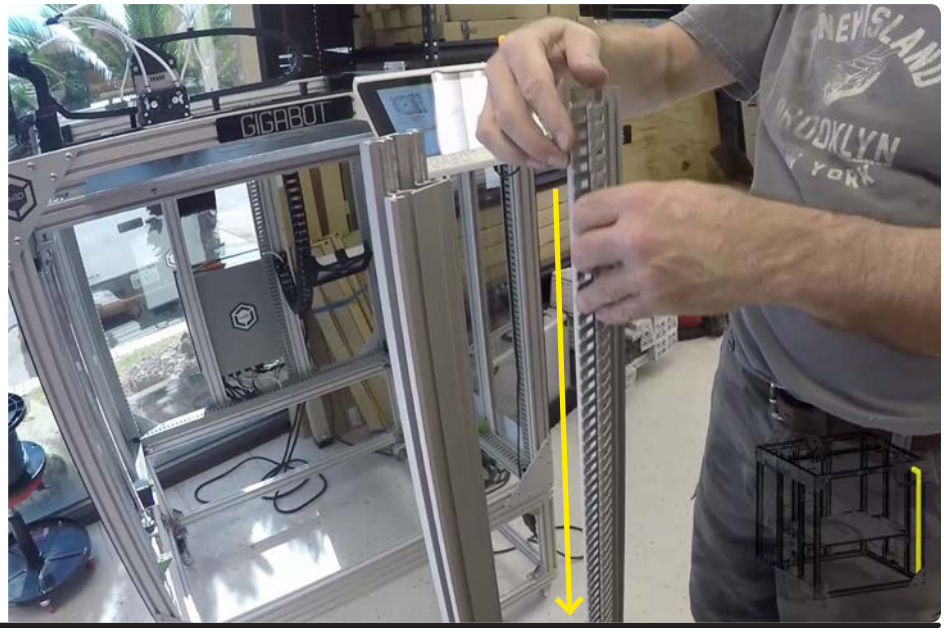
Evenly space and insert 3 M5x8 BHCS into the #2 29” Panduit and loosely fasten T-nuts on the screws.



E31

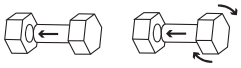
Insert this Panduit into the front right vertical rail. There are two slots, so make sure to insert it in the innermost slot of the two. Let it run all the way down and then fasten the M5x8 BHCS with the 3mm Allen Key.





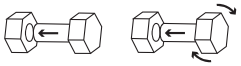
E32

Install the right side plate assembly in the same process as above. Be careful not to pinch yourself!



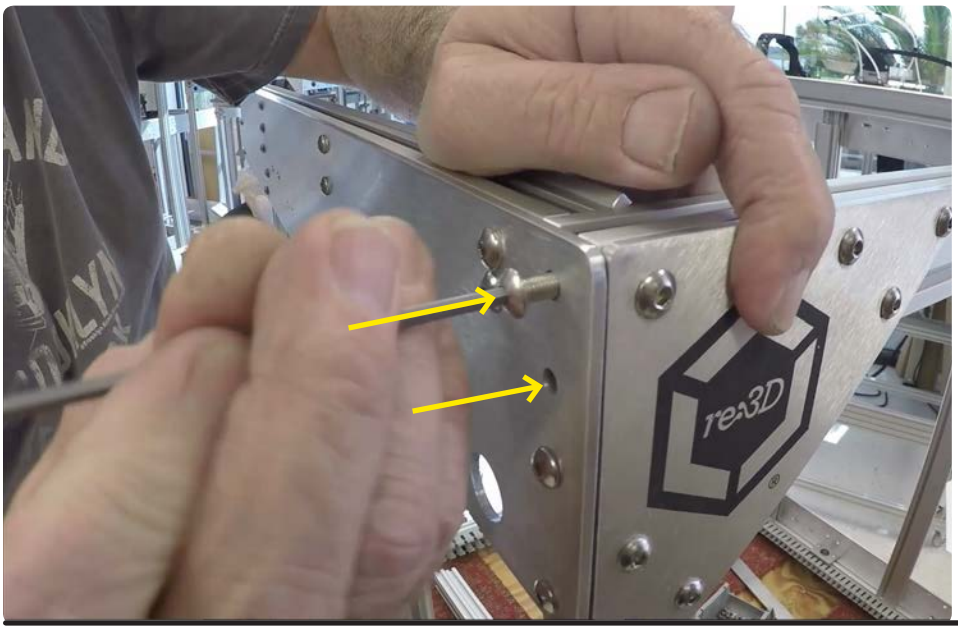
E33

Insert M5x8 BHCS into each of the corner plate holes in the front header (with logo corner plate) and loosely fasten them on with T-nuts. Use 6 M5x8 BHCS and 6 T-nuts in total.



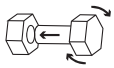
E34

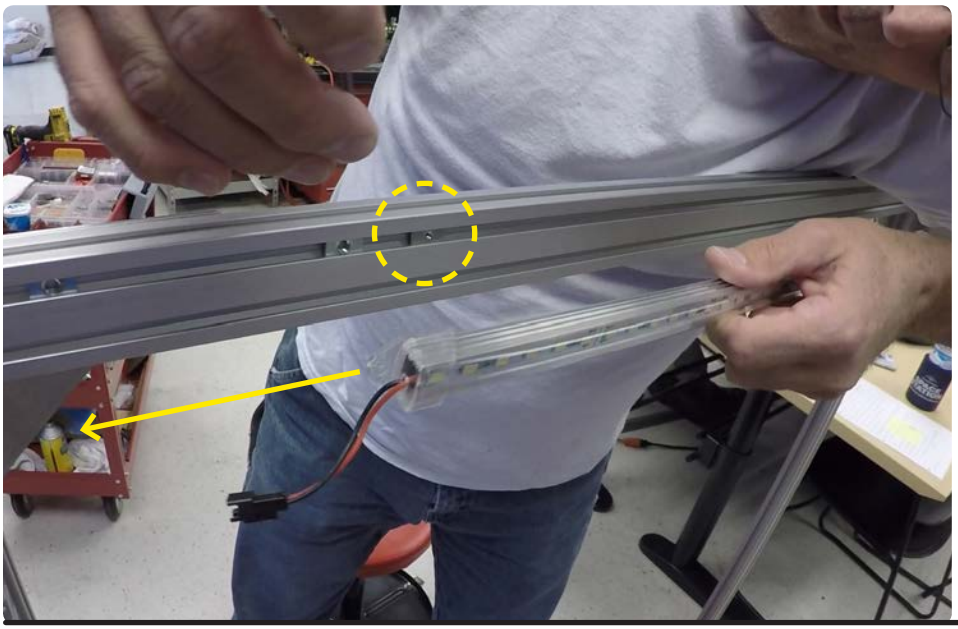
Similarly to the side plate assemblies, install the front header by dropping the T-nuts into the slots of the front vertical rails. Again, you may need to work the T-nuts into the slots one at a time. Be careful not to pinch your fingers.



E35

Attach the cross rail of the header to the side plates by using 2 M5x12 BHCS on each end for a total of 4 M5x12 BHCS. These can be loosely fastened for now and fully tightened later after flushing the top surfaces of the rails, similar to what was done with the lower frame.



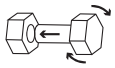


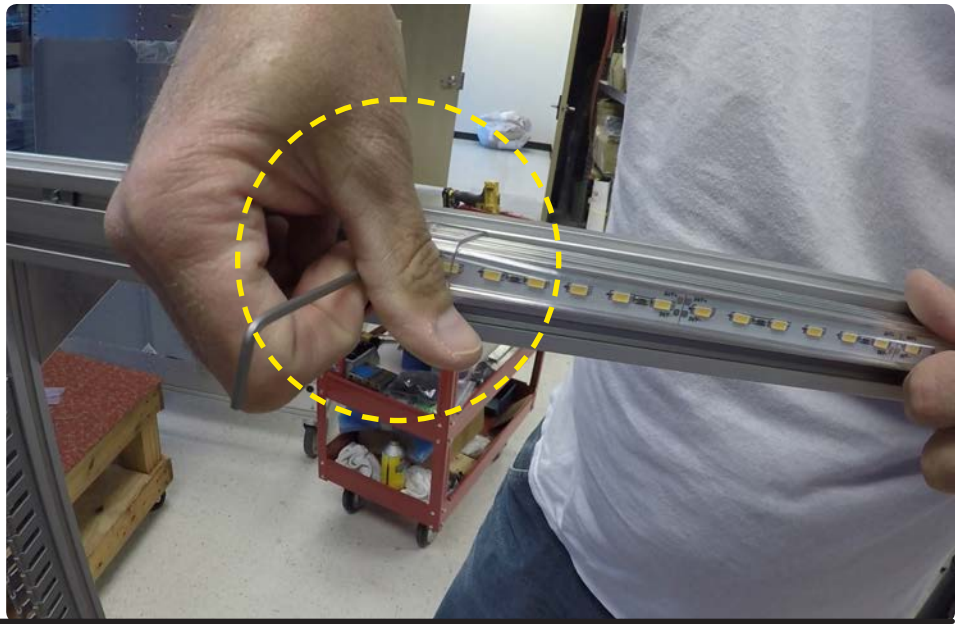
E36

Recalling front header assembly from steps B2-B20, remove the M5x8 BHCS and M3x8 SHCS from their respective T-nuts. Orient the LED strip such that the wire points towards the Gigabot® power switch. Loosely fasten this end of the strip to the M3 T-nut using a M3 flat washer, M3x8 SHCS.

E37

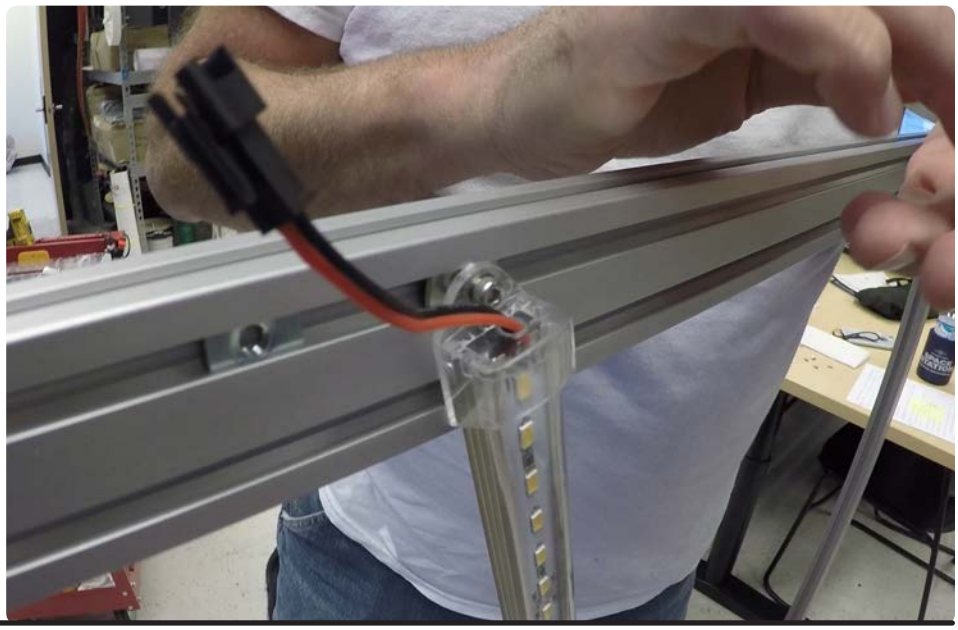
Tighten the screw using a 2.5mm Allen Key.





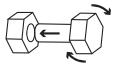
E38

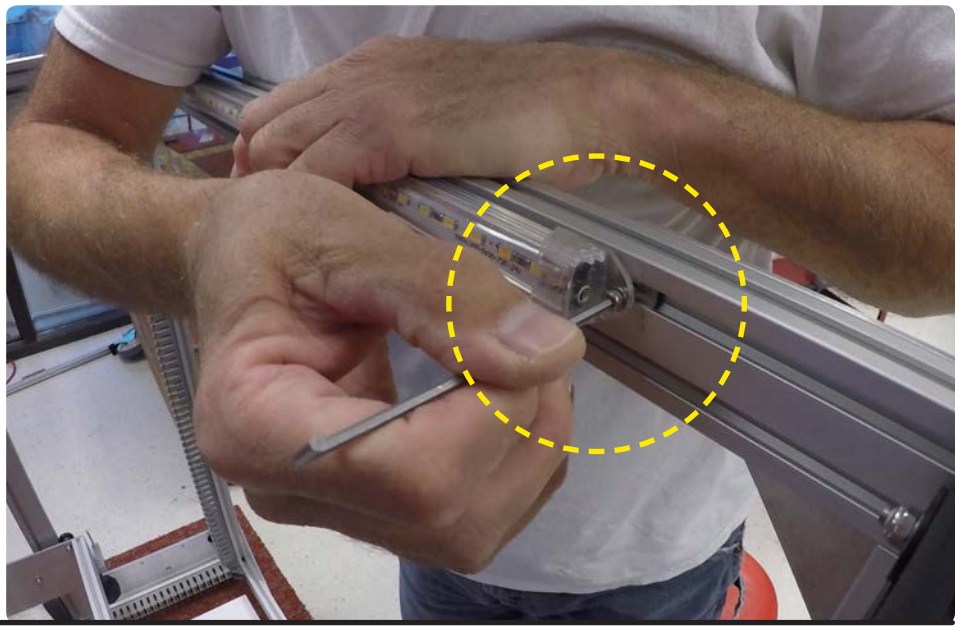
You can let this hang in this position while you prepare the hardware to fasten the other side.



E39

Similar to E36-E37, fasten the other side of the LED light strip to the M3 T-nut using a M3 flat washer, M3x8 SHCS, and 2.5mm Allen Key.



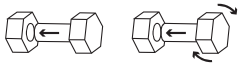


E40

The LED light strip is now attached to the front header, but the final position will be determined after installing the corresponding Panduit.

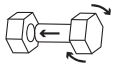
E41

Insert 2 M5x8 BHCS into holes on each end of a #1 size 5.25” Panduit using the 3mm Allen Key.



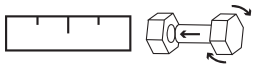
E42

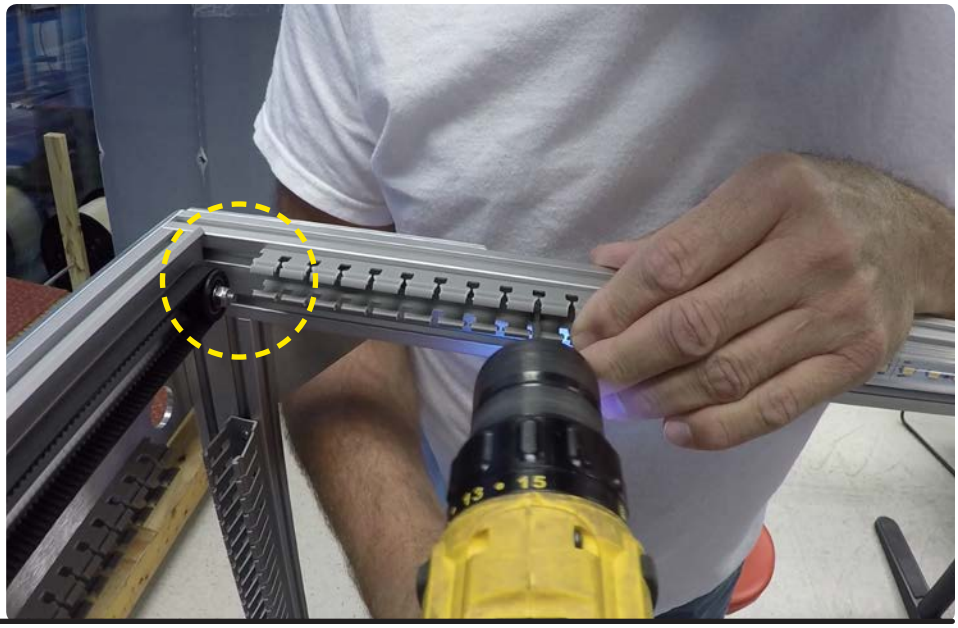
Fasten this Panduit to the M5 T-nuts in the front header using the 3mm Allen Key. Do one M5x8 BHCS at a time, as shown here.



E43

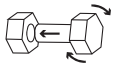
Space the Panduit roughly 3/8” from the M5x30 BHCS on the idler pulley and fully fasten the Panduit into place.





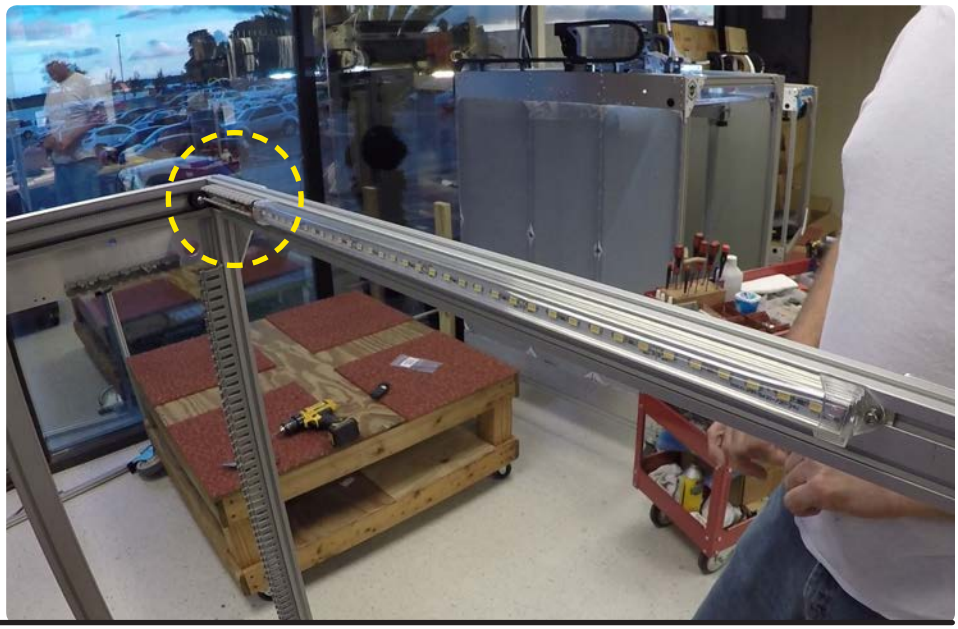
E44

After fastening the Panduit, slide the LED light strip against the Panduit and fully fasten this into place using the 2.5mm Allen Key. Do not overtighten the screws, or you will break the plastic tabs.



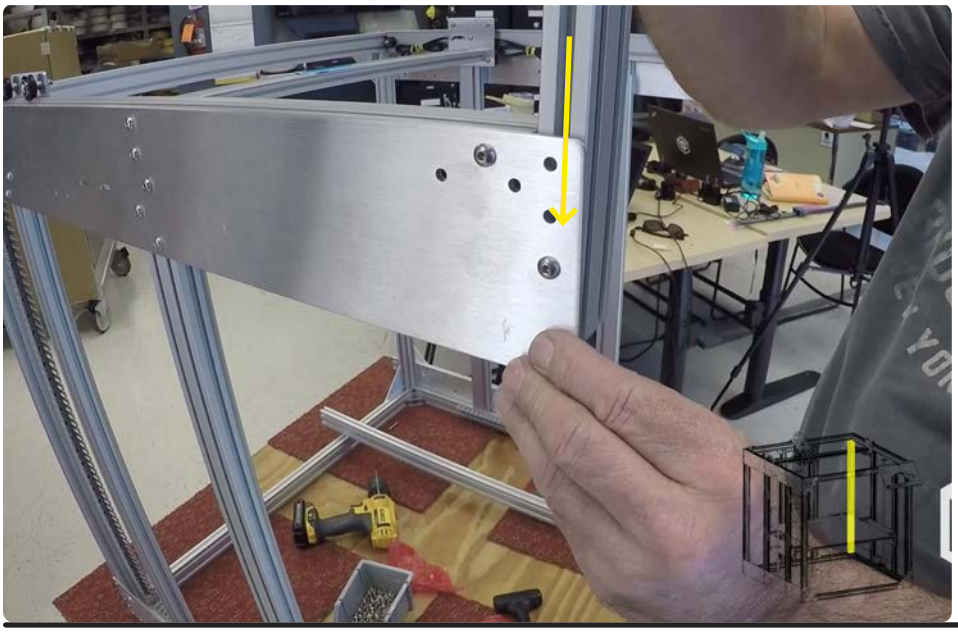
E45

The LED light strip and its Panduit are now fully fastened to the front header. You can route the LED wire through the Panduit to keep it out of the way.



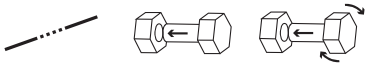
E46

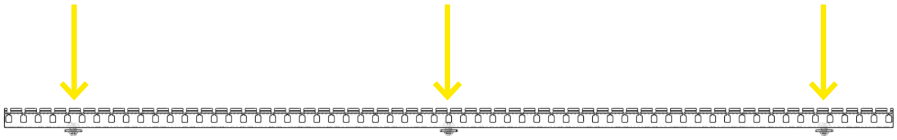
You are now ready to install the bridge assembly to the frame. With the extruders pointing towards the front of the Gigabot, roll the wheels onto the runway rails. Be sure that the Y-axis belts stay in between the upper and lower wheels as they mount to the runway rails.



E47

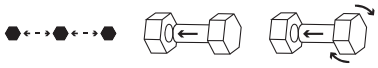
Mount the rear right vertical common rail by sliding it down into the rear right corner. There should already have been T-nuts installed to run through the slots of the rail that will hold it loosely in place. Finger tighten them once the rail is seated.





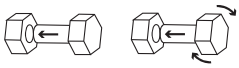
E48

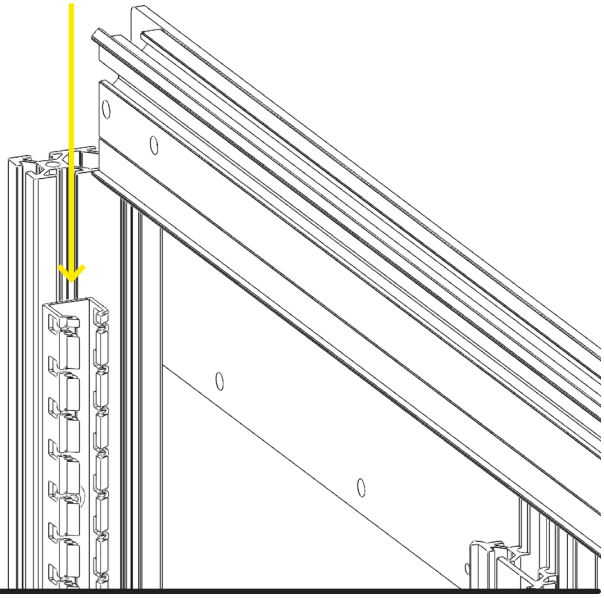
Evenly space and insert 3 M5x8 BHCS into the #1 30” Panduit and loosely fasten T-nuts on the screws.



E49

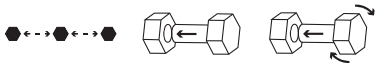
Insert this Panduit into the rear right vertical rail. There are two slots, so make sure to insert it in the innermost slot of the two. Let it run all the way down and then fasten the M5x8 BHCS with the 3mm Allen Key.





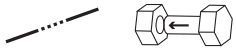
E50

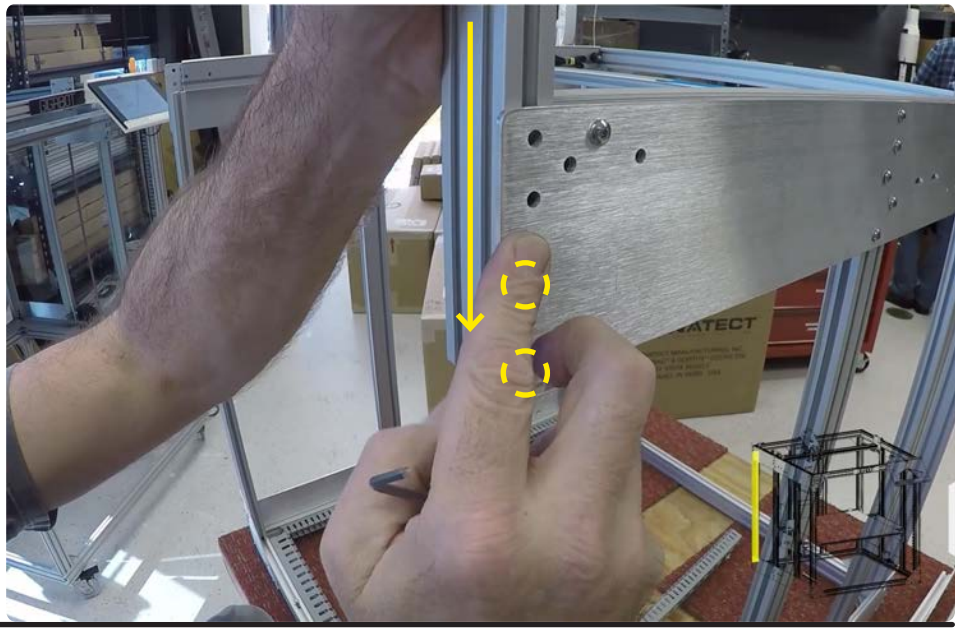
Evenly space and insert 3 M5x8 BHCS into the #3 30” Panduit and loosely fasten T-nuts on the screws.



E51

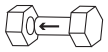
Get the rear left vertical rail started in the top 2 T-nuts of the side plate and hold this in place.

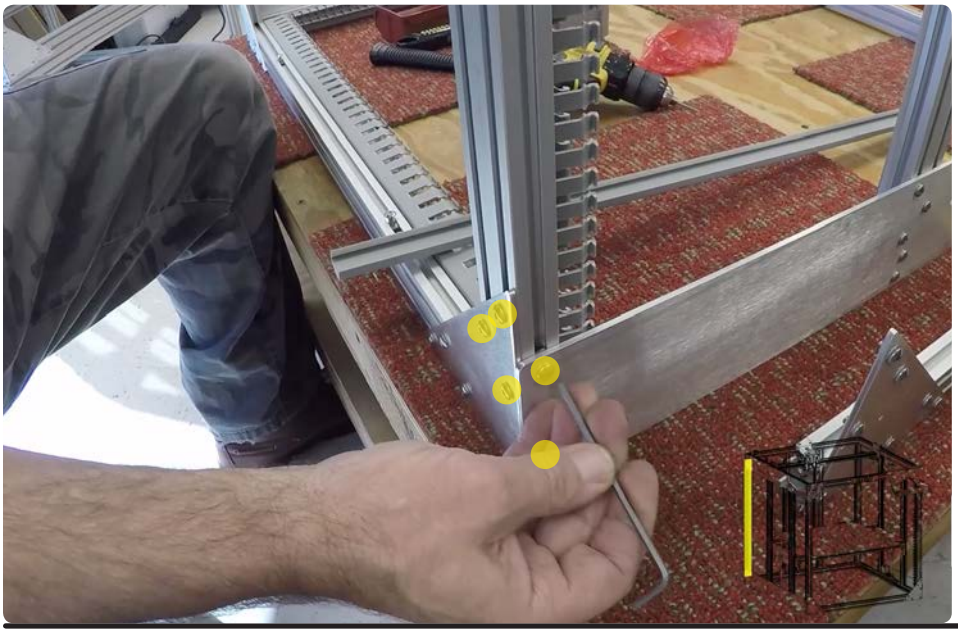




E52

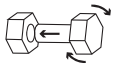
Start inserting the #3 30” Panduit into the innermost slot. Hold the Panduit in place and let the rail come down into the frame. As it descends, let the T-nuts on the Panduit run through the rail slots. Work the rail down until it is totally seated in the frame, with the side plate and corner plate T-nuts in the slots as well.





E53

Hand tighten the M5x8 BHCS for this rail once it is seated. Also tighten the #3 30” Panduit to the rail.

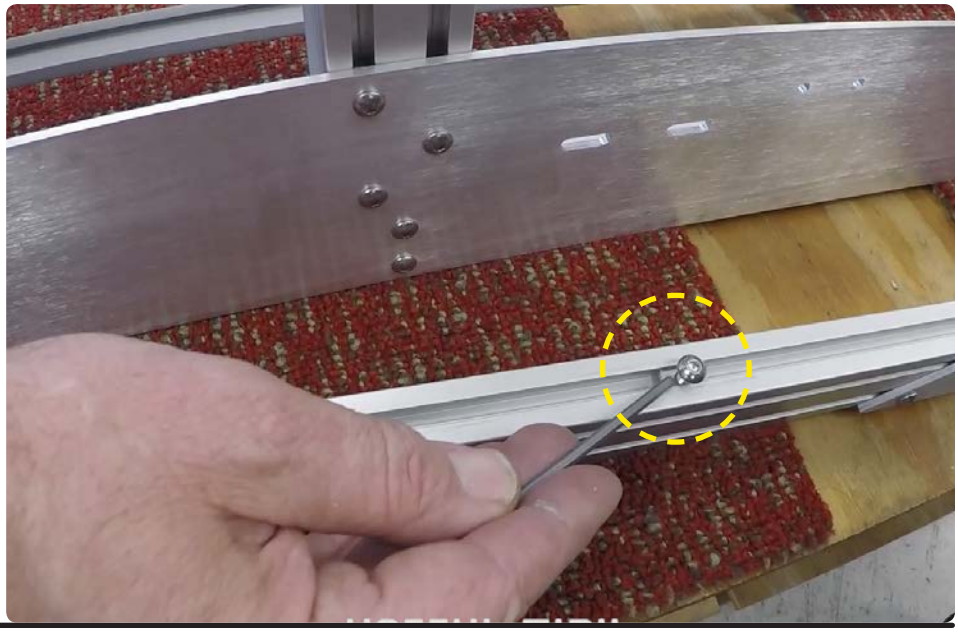


E54

On the rear header, double check that the M5x8 BHCS and T-nuts are inserted into the corner plate holes. Use 6 M5x8 BHCS and 6 T-nuts.

E55

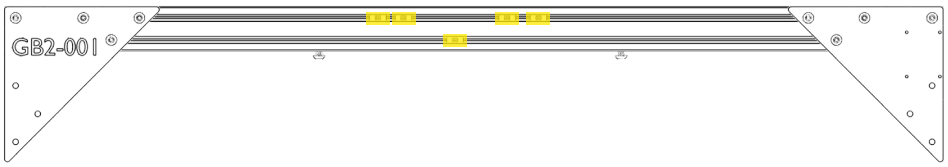
Also check that the M5x10 BHCS and M5 T-nuts are inserted to hold the electrical box uprights in place.



E56

There should also be 2 extra T-nuts in the same slot to hold the #2 7.25” Panduit. (also +5 T-nuts for both FD and filament rod) The rear header includes the serialized corner plate and the machined corner plate for fastening the Y-axis cable carrier.

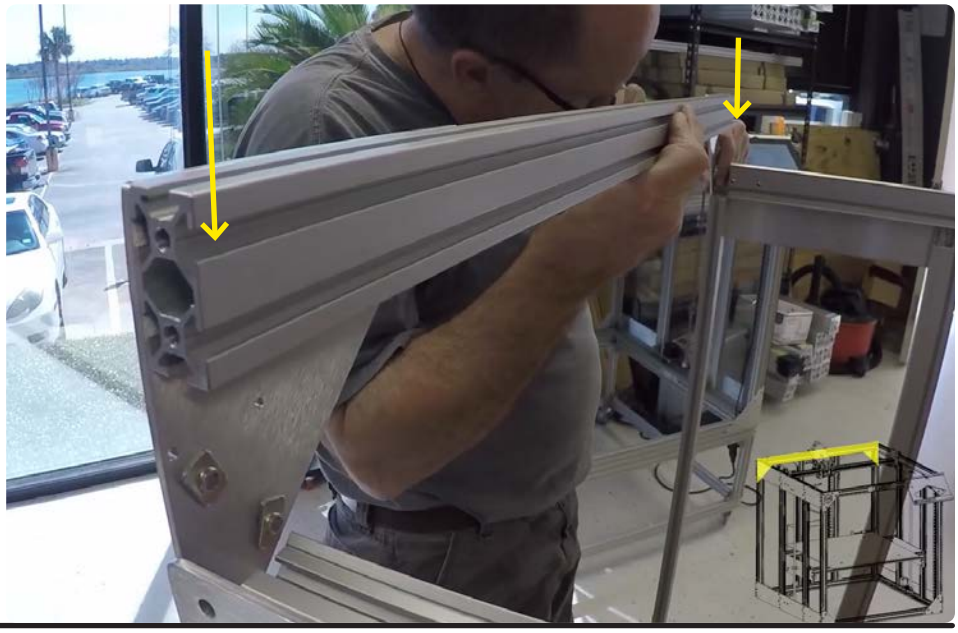
Bottom view

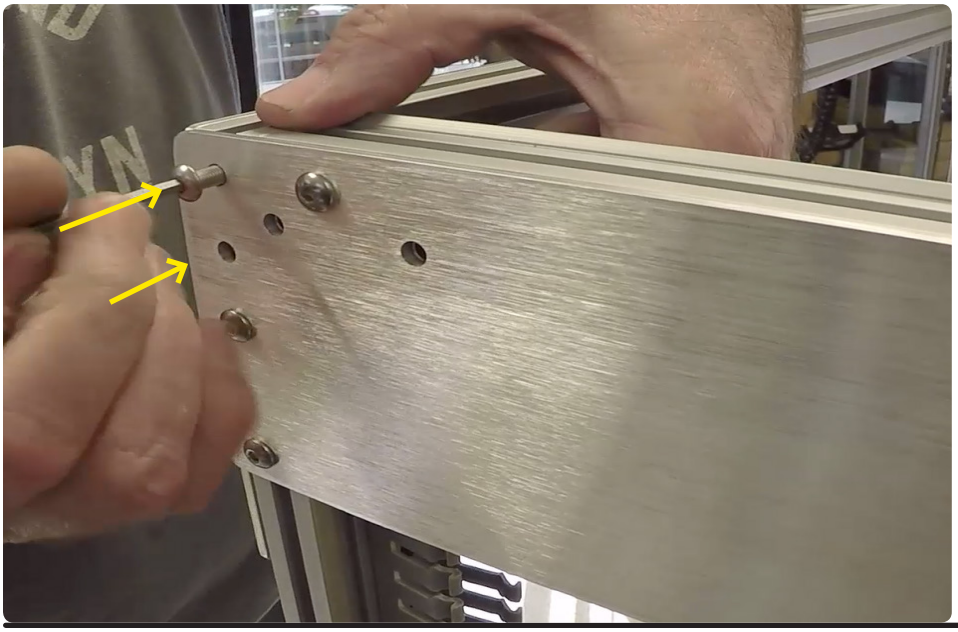


Back view

E57

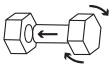
Similar to the front header, work the T-nuts down into the rear vertical rails until the rear header is seated on the Gigabot frame. Be careful not to pinch your fingers.

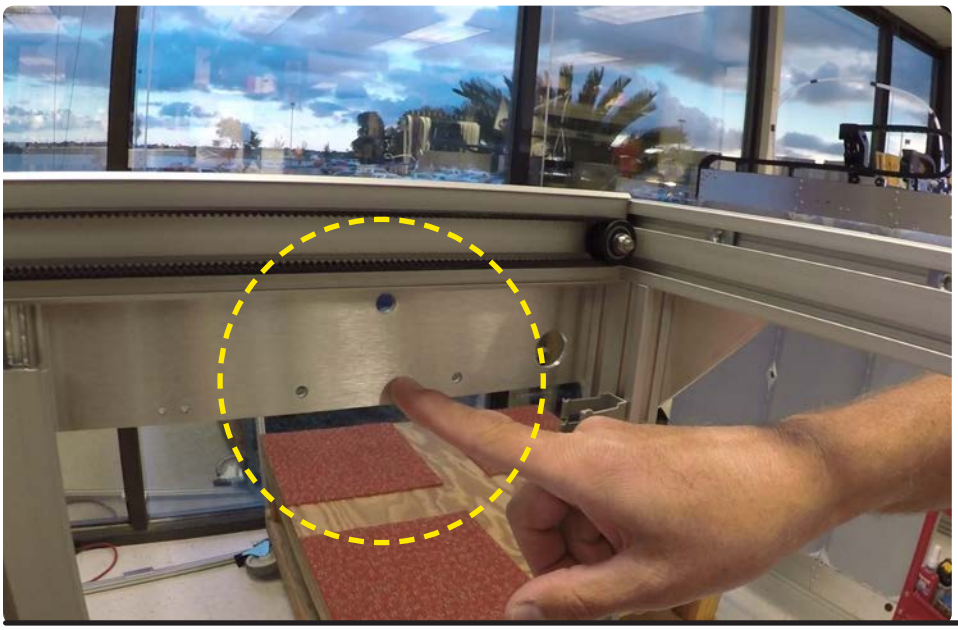




E58

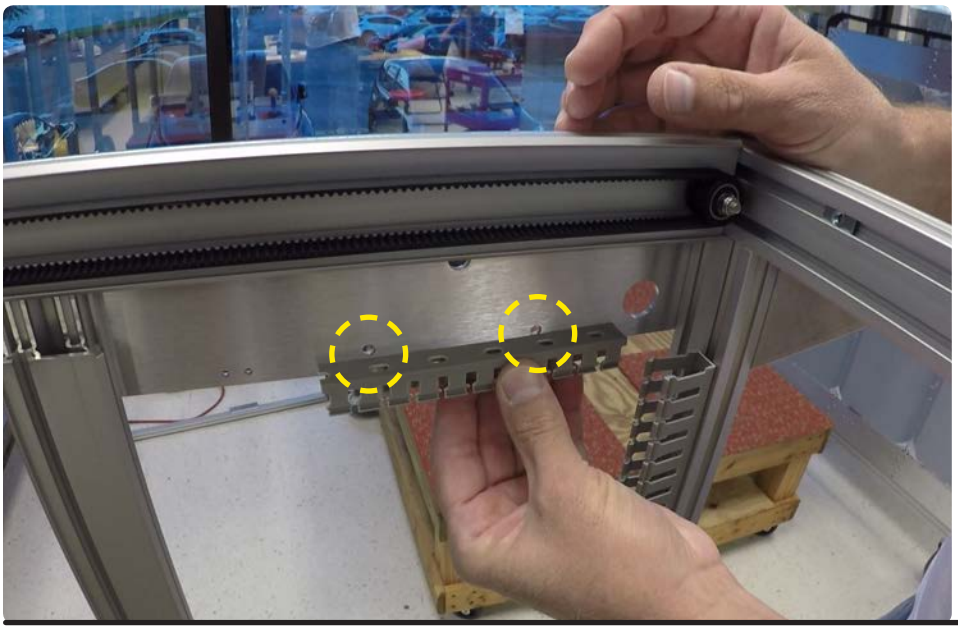
Fasten the rear header in place using 2 M5x12 BHCS at each end. Hand tighten them with the 3mm Allen Key.





E59

Next, you will need to install the #1 size Panduit for the Z upper limit switch wires. The holes for this are located on upper right side plate when looking from the front of Gigabot.

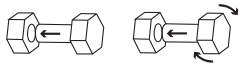


E60

Compare the holes on the Panduit with the side plate holes to determine where you need to insert the M5x8 BHCS on the Panduit. Regular Gigabots® use #1 size 2 3/8” Panduits, and XL use #1 size 5 1/4” Panduits.

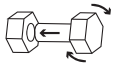
E61

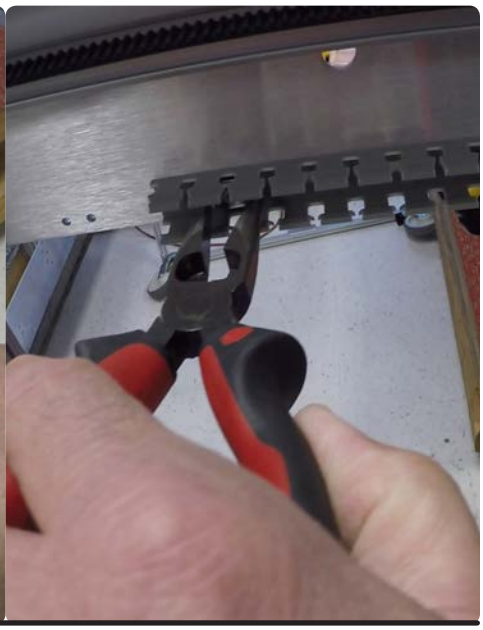
Insert a M5x8 BHCS into one of the holes from the other side of the side plate. Here, you can see the screw going through the hole and threading into the Panduit, which holds it in position.



E62

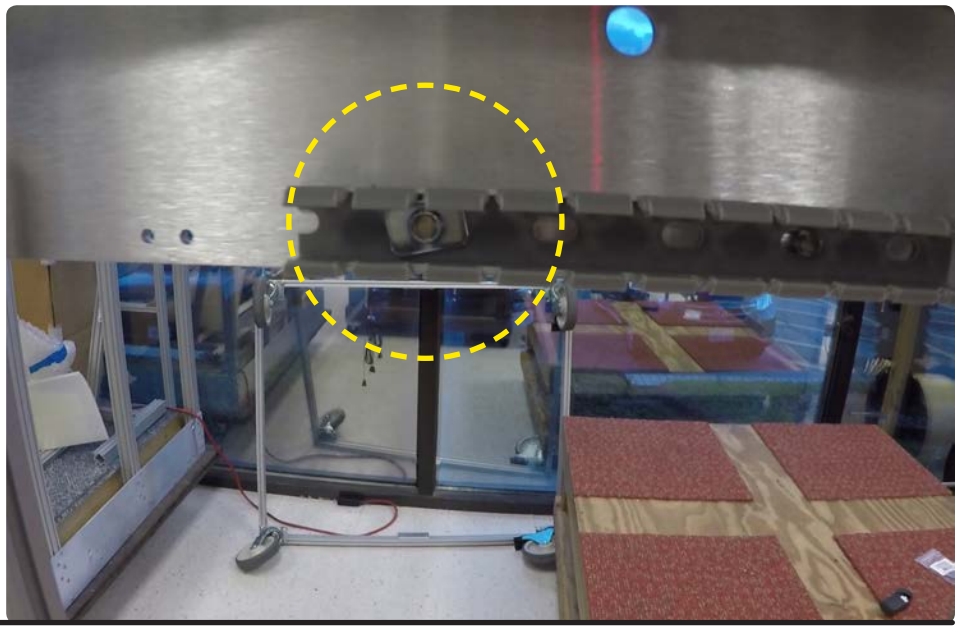
Using pliers or another tool, hold an M5 T-nut against the M5x8 BHCS and fasten them together using a 3mm Allen Key.

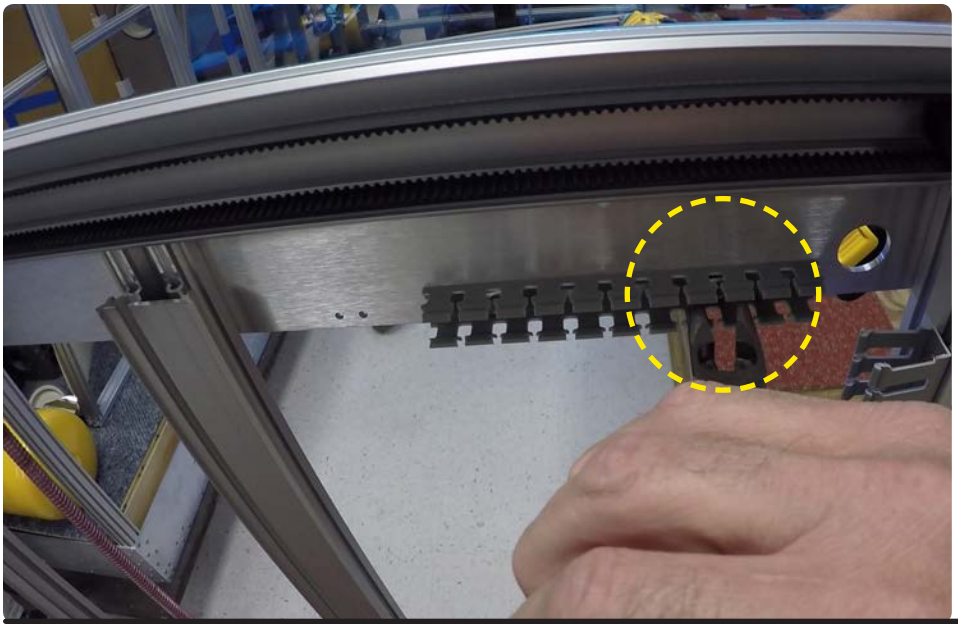




E63

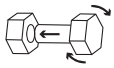
The T-nut and M5x8 BHCS now hold the Panduit in place, as shown.

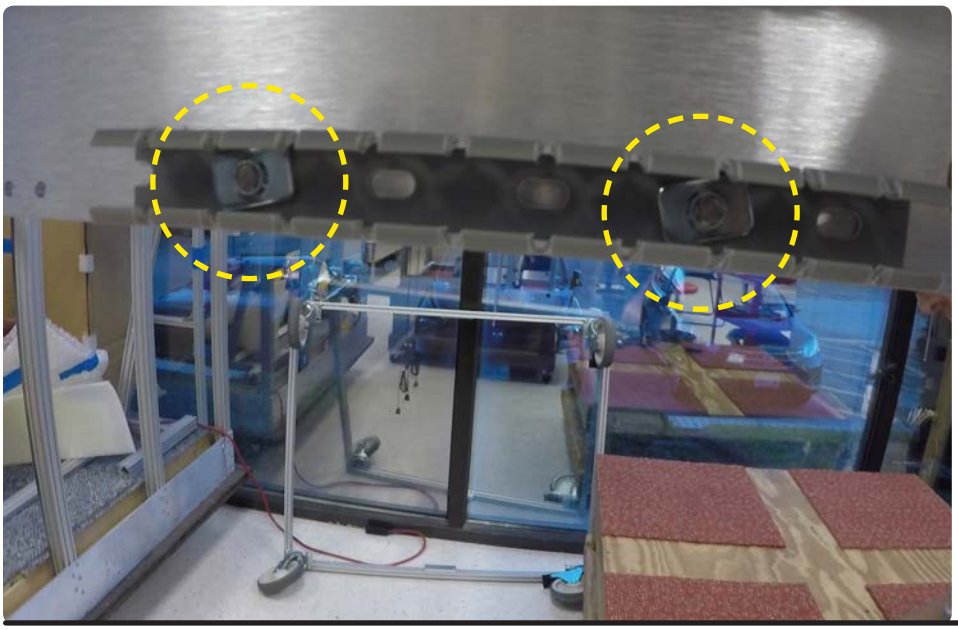




E64

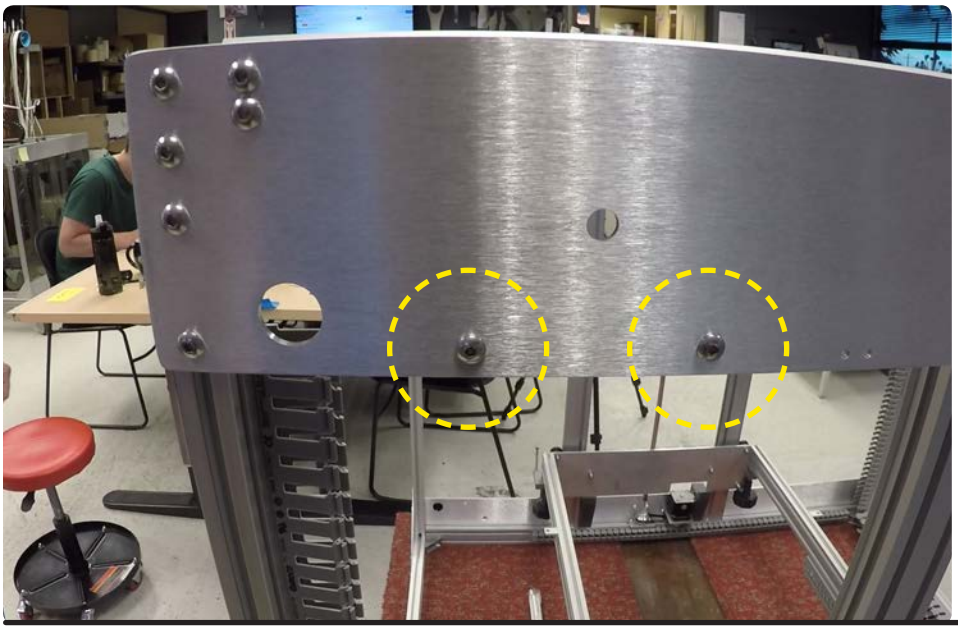
Repeat step E62 for the other Panduit hole.





E65

Now, the Panduit is completely fastened to the side plate.



E66

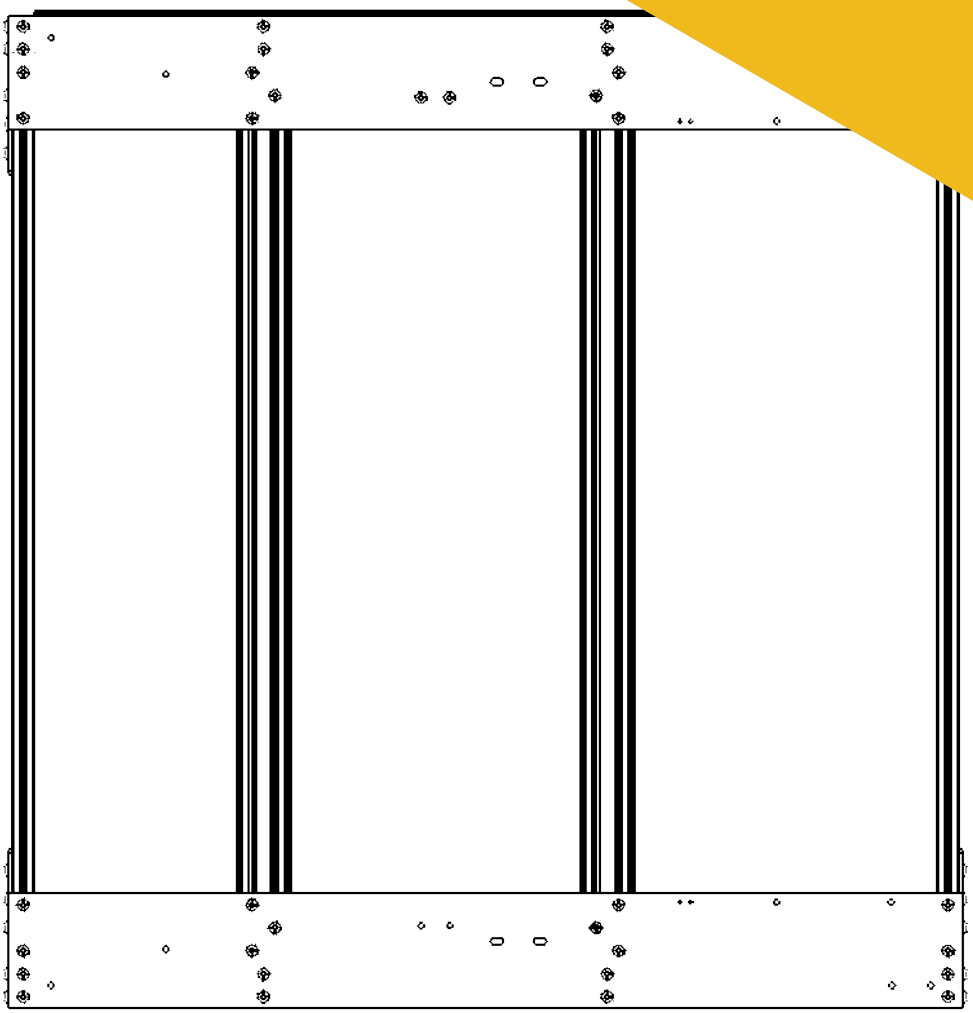
Here, M5x8 BHCS that fasten the Panduit are shown from the other side of the side plate.

E67

See the following video links for more detailed demonstrations:

- Frame assembly
- LED light strip installation
- Z upper limit switch Panduit installation

F SQUARING THE FRAME



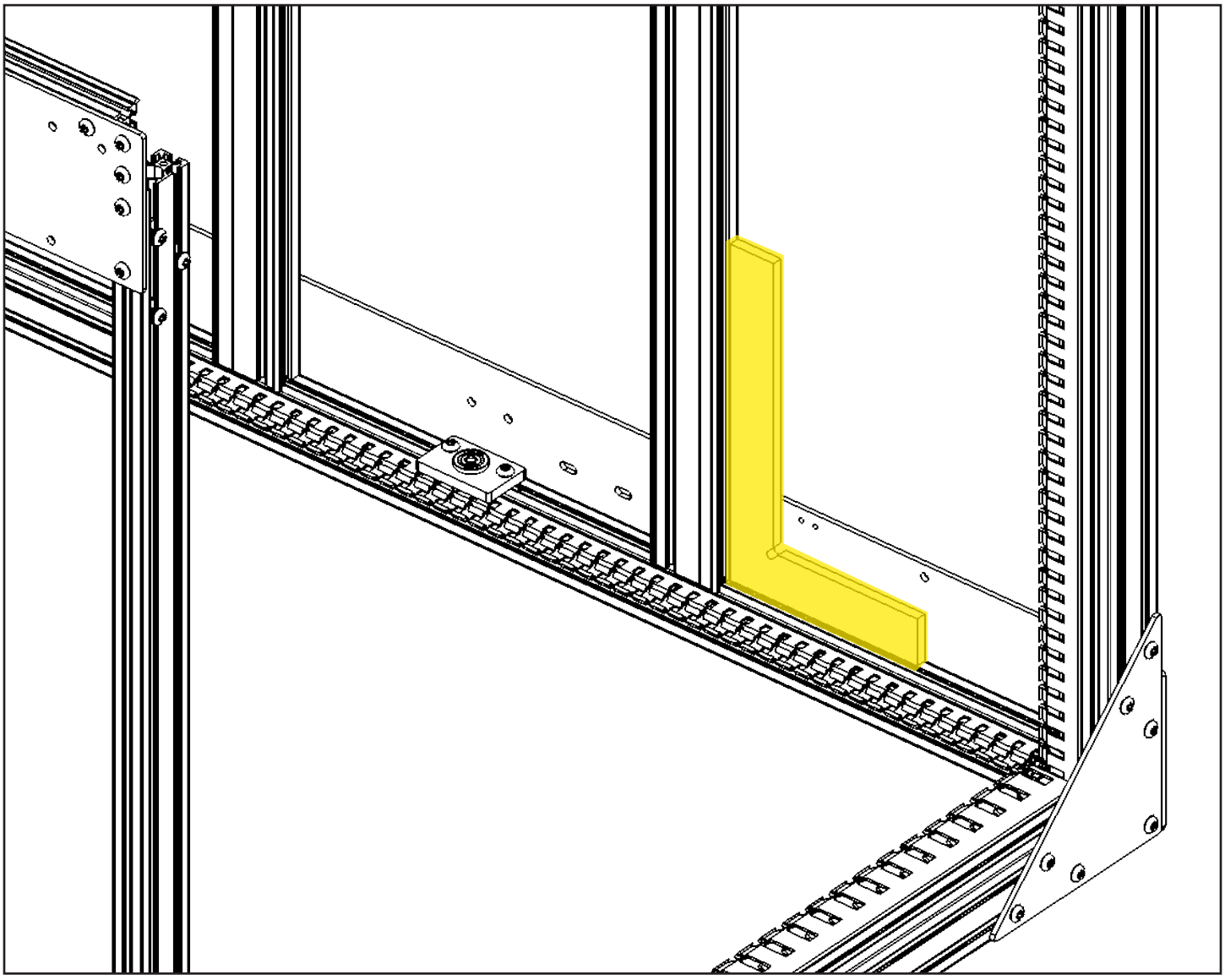
TOOLS & PARTS

Refer to packing list to identify parts

BOX #	PART	QUANTITY
1	Precision square	1
6	3mm Allen Key	1
1	Z upright alignment fixture	2
WATCH THE ACCOMPANYING VIDEO:	https://youtu.be/BClpl576FF4	

OVERVIEW

The precision square (as shown below) and the Z alignment fixtures will be used to square up each upright of the frame. Be patient and take your time to correctly go through this process to ensure that your Gigabot® is as square as possible. If Gigabot® is out of square, your prints will also be out of square.

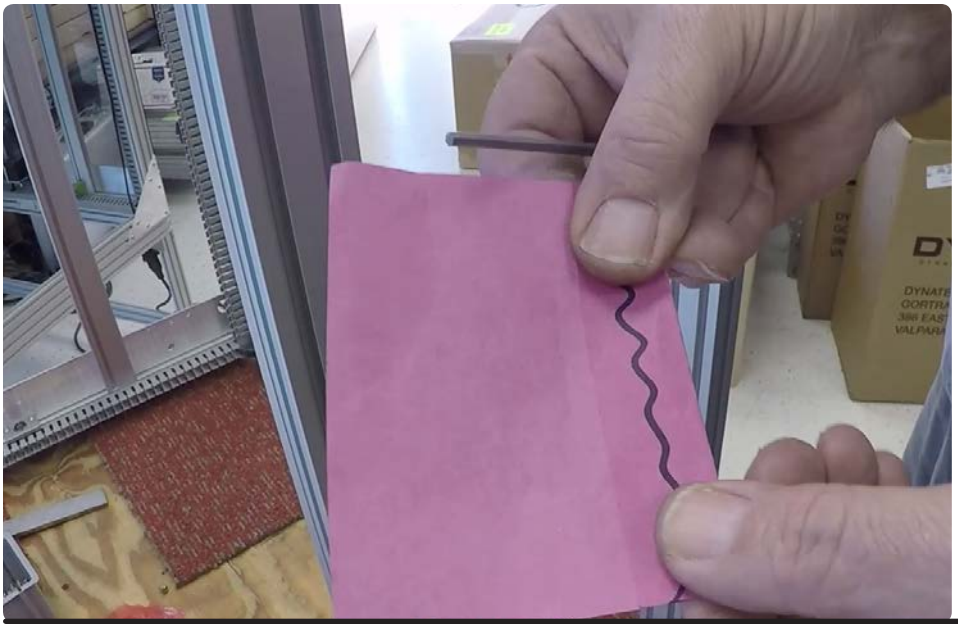


TIPS & TRICKS

#1 Work on a flat surface.

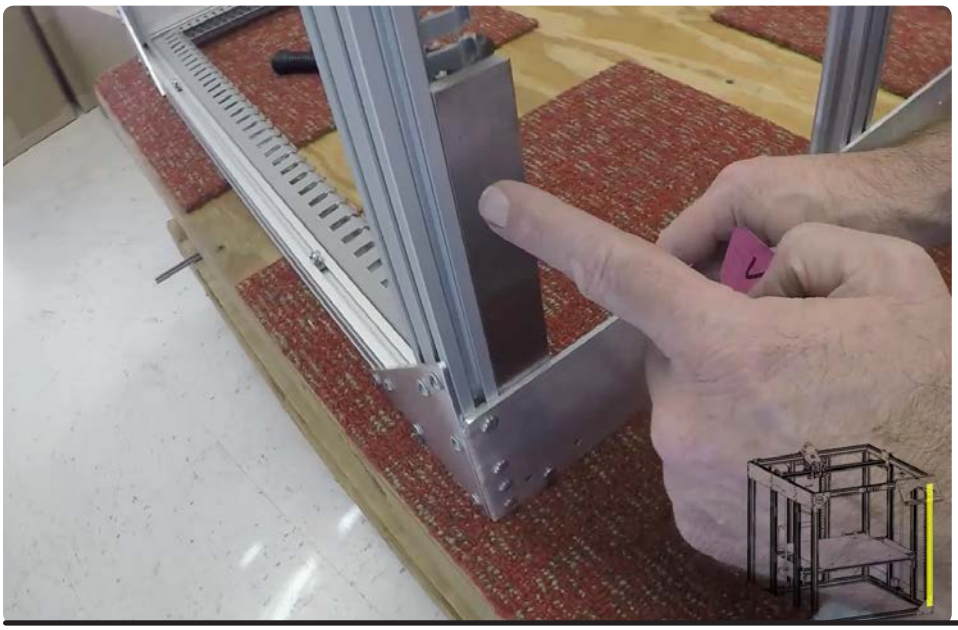
#2 Take your time when squaring the upright rails to ensure the frame is properly built.

#3 Closely follow the steps outlined for using the Z upright alignment fixtures (refer to the video if needed).



F1

When squaring the frame, it will be helpful to use a small piece of paper, such as a post-it note, along with the precision square.



F2

Starting with the rear left vertical rail, press the long leg of the precision square against the front of the rail.

F3

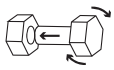
If there is a noticeable gap between the rail and the square, hand tighten the lowest M5x8 BHCS attached to the rail while leaving all the other screws loosely fastened. This will let it act as a pivot point for the rail while making it square.

F4

While using one hand to hold the square against the rail, use your other hand to adjust the position of the rail until it sits vertically.

F5

Keeping one hand on the rail, use your other hand to snug up the M5x8 directly above the pivot point. This will temporarily hold the rail in place.

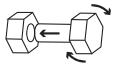


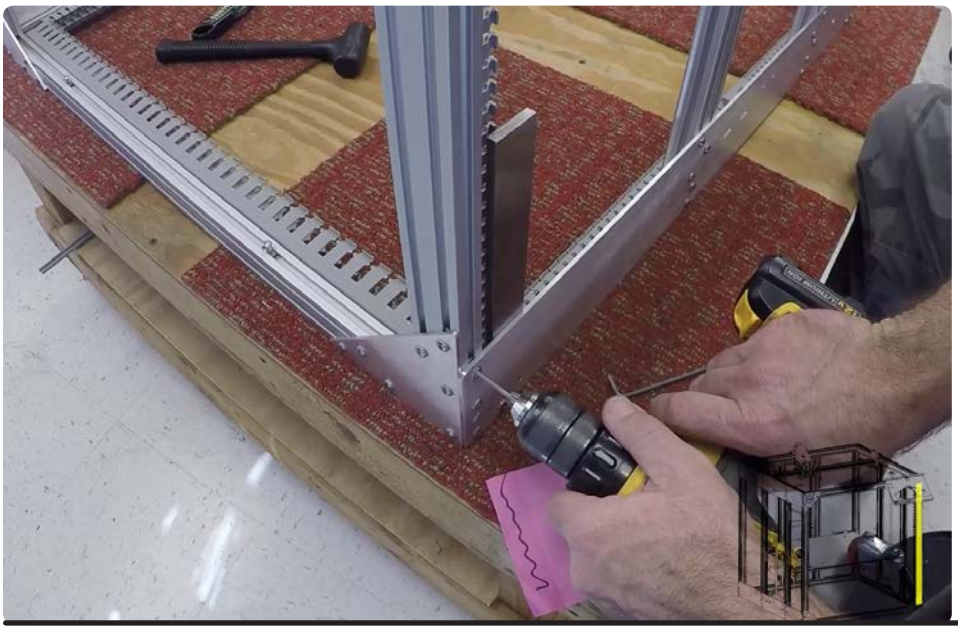
F6

Use the piece of paper as a feeler gauge/shim between the rail and the precision square. Hold the paper against the rail using the square and tug on it. You should feel the same amount of resistance to the pull all along the length of the square.

F7

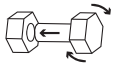
Once the squareness has been set, snug up all of the lower M5x8 BHCS. Check the squareness once more and adjust if needed.





F8

If it is still square, fully tighten all of the lower M5x8 BHCS connected to the rail to fully fasten it to the lower frame.

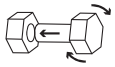


F9

Repeat the squaring process all the way around each corner. Prioritize squaring the rails so that they are not pitched forward or backward relative to the frame of the Gigabot (Y-axis). The rail should already be fairly square between the left and right directions (X-axis).

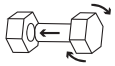
F10

Starting at the rear right corner of the frame, press down on top of the header and fully tighten the M5x8 BHCS in the corner plate to secure it. Move around the frame and tighten down all 4 of the upper corner plates.



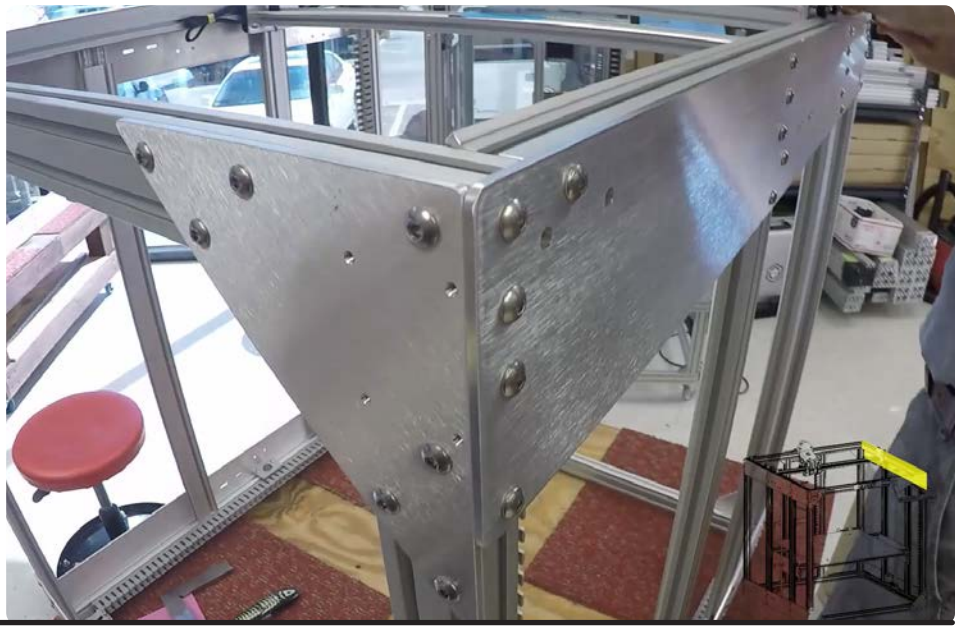
F11

Again, at the rear right corner, push the side plate assembly slightly up so that the top surface of the runway rail is barely above the top surface of the cross rail on the header. Then snug up the M5x12 BHCS that fasten to the cross rail.



F12

Repeat this for each corner.



F13

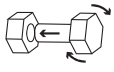
(If you have them,) attach framing clamps along the runway rails of the frame to hold the headers against the side plate assemblies. This will make sure that there are no gaps between the cross rails and the runway rails.

F14

Again, use the precision square and a hammer to make the top surfaces of the rails flush. Have the long leg of the square laying flat across the top of both the runway and cross rail. Use the hammer to gently bring the runway rail down until it is flush with the cross rail.

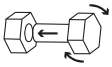
F15

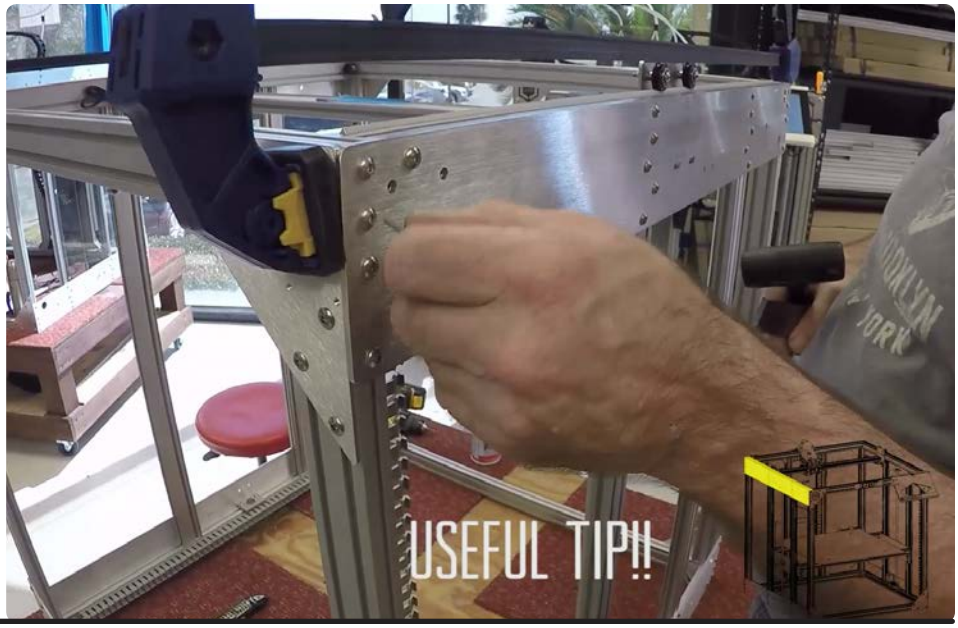
Repeat this for the opposite corner on the same side plate assembly. Gradually tighten the M5x8 BHCS as you go and continuously check for flushness on top of the rails.



F16

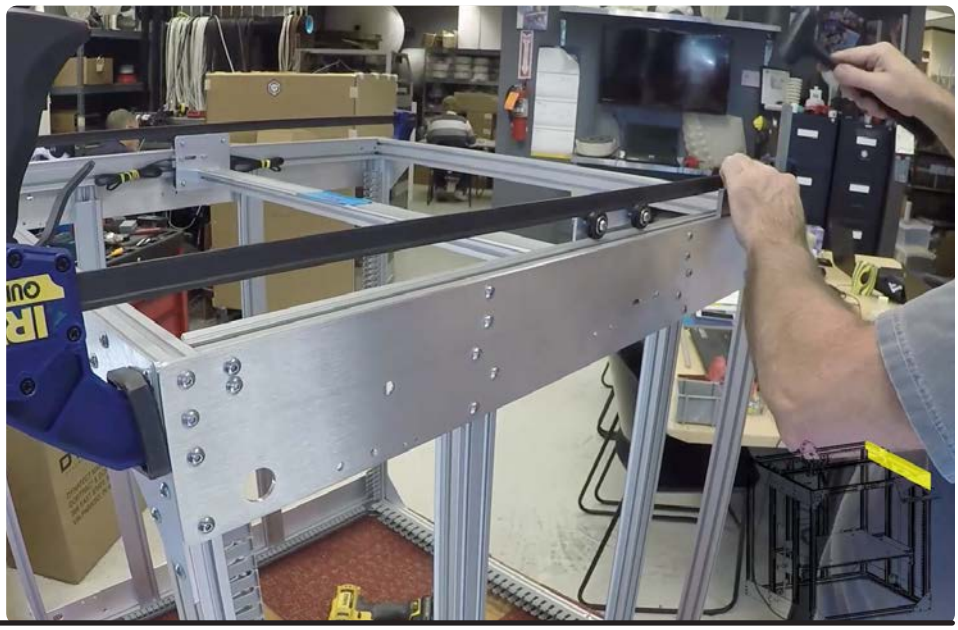
When both the front and rear of the side plate are flush with the front and rear headers, fully tighten the remaining screws on the side plate with the exception of the Z upright screws.





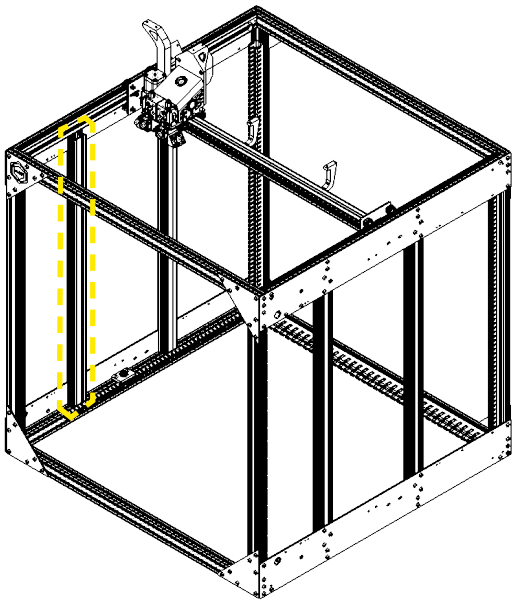
F17

Do this all again for the corners of the other side plate assembly and then remove the framing clamps once finished.



F18

Next will be aligning the Z uprights. All Z uprights should still be only loosely fastened to the frame at both the top and the bottom. Start with the front left Z upright.



F19

Notice how the bottom of the Z upright has room to move forward and backward. Push this all the way forward and make a pencil mark on the rail below it to where Z upright stops.

F20

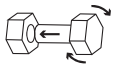
Then, pull the Z upright as far back as it will go. You can also make a mark here to help visual the total travel.

F21

Move the Z upright halfway between its forward and backward limits (we typically find this to be about 1/32” from either mark).

F22

Tighten the lowest M5x8 BHCS on the Z upright, similar to when the corner vertical rails were squared earlier.

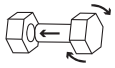


F23

Use the precision square to square this Z upright in the exact same way as before. Use the paper to gauge the rail's parallelism with the square.

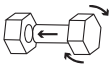
F24

Hand tighten the top screws to temporarily hold the Z upright in place and double check the squareness. Adjust as needed.



F25

Once square, fully tighten both the bottom and top screws for the Z upright. You are now ready to use the Z alignment tools to set the spacing for the rear Z upright.



F26

Install one of the alignment tools on the top of the Z uprights with the machined (shiny) side facing up. Fit the Z uprights in the grooves and push the tool all the way up until it contacts the side plate. Tighten the set screws on the sides of the tool with a 3mm Allen Key to hold it in place.

F27

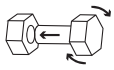
Similarly, install the other alignment tool on the bottom of the Z uprights with the machined side facing down and contacting the lower side plate. Fasten it in the same way as above.

F28

Perform a visual check to make sure that there is no gap between the inside of the alignment tool and the rail, as shown. This should be the case for both the top and the bottom.

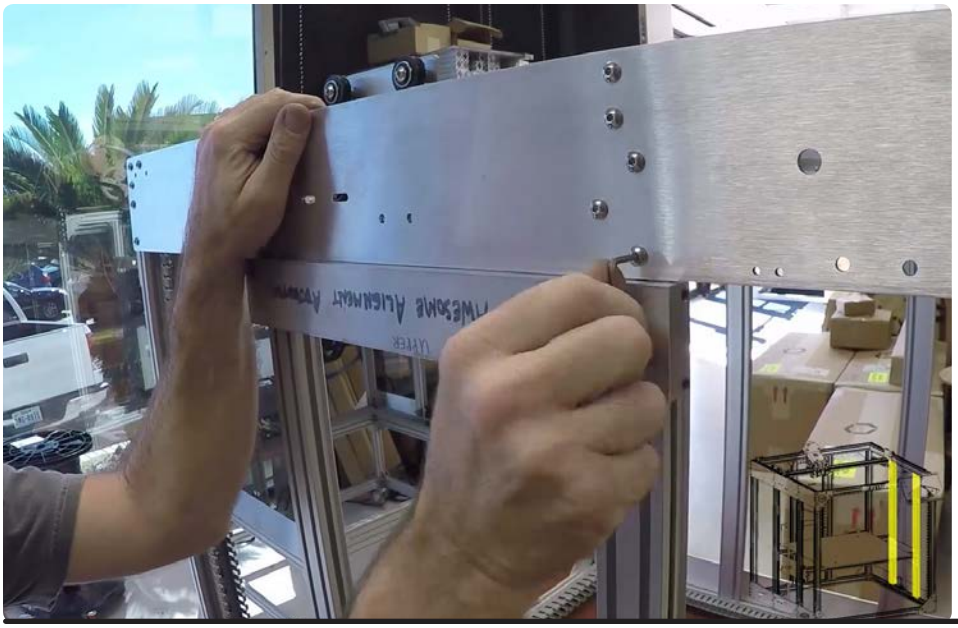
F29

Fully tighten the top and bottom screws for the Z uprights. Good practice is to gradually tighten them evenly rather than fully tightening them one at a time.



F30

Loosen the set screws to remove the alignment tools. They should be fairly tight on the rails and require some force to remove.



F31

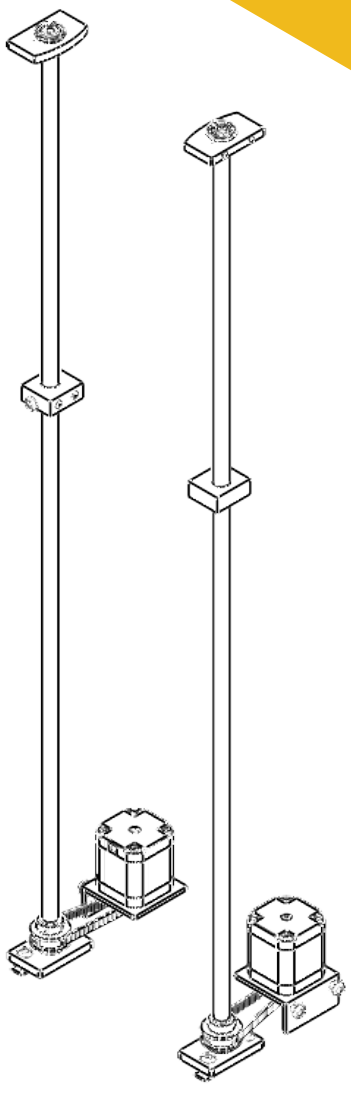
Repeat this same process on the right side Z uprights, beginning with centering and squaring the front right Z upright and going all the way through using the alignment tools to space them apart.

F32

For a demonstration of these step by step instructions, please see our video for this section.

G

THREADED RODS & Z MOTOR INSTALLATION



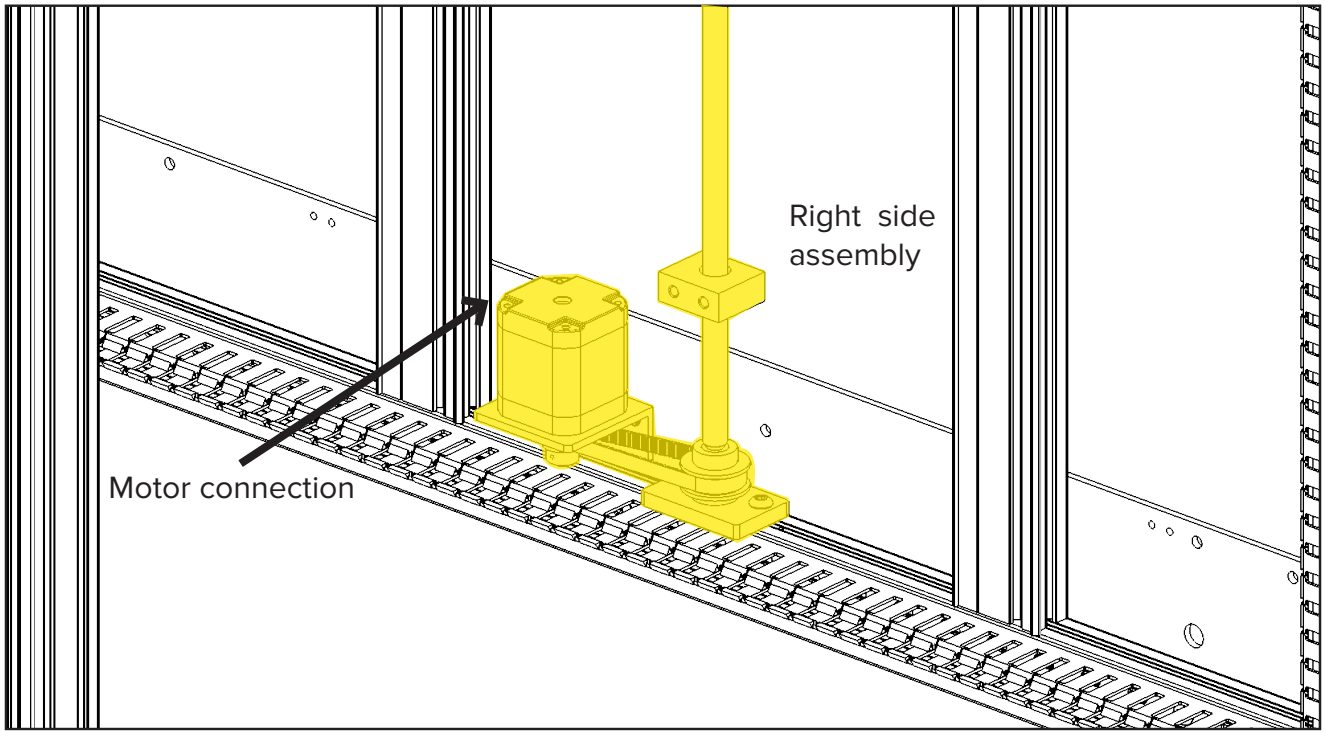
TOOLS & PARTS

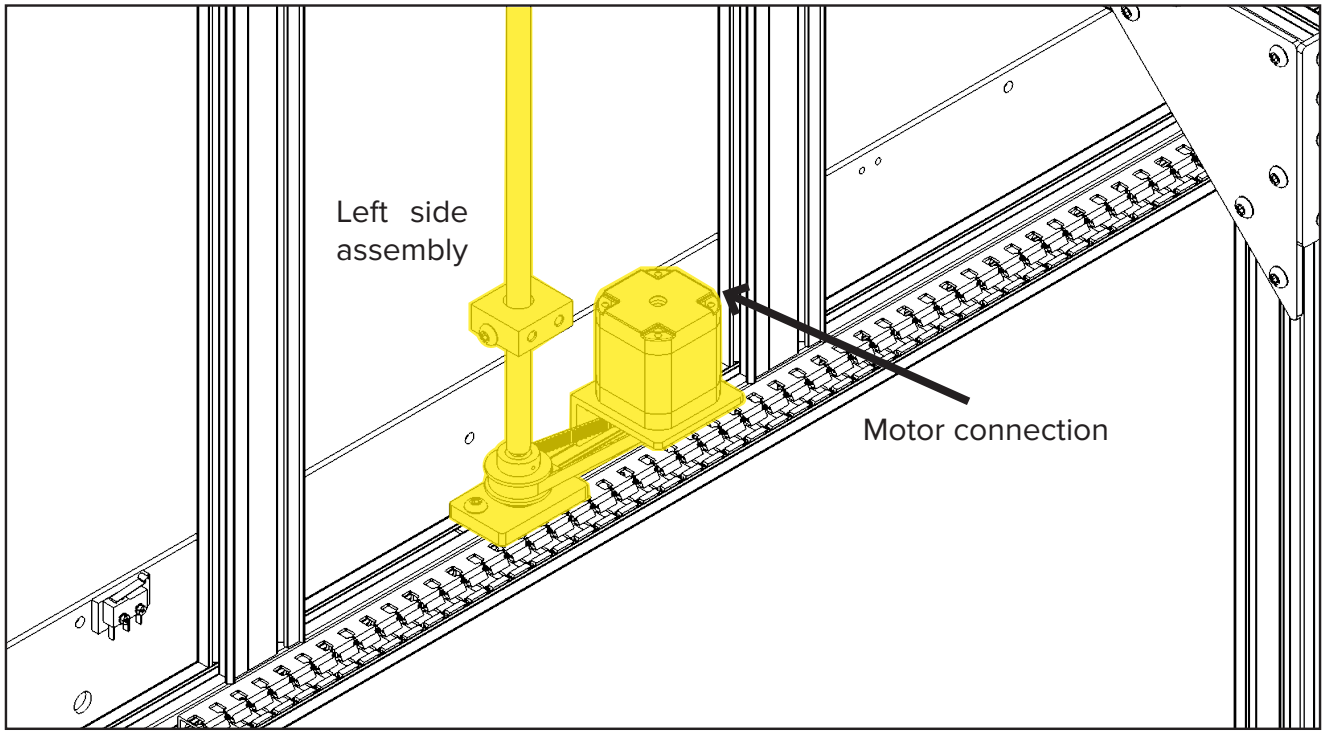
Refer to packing list to identify parts

BOX #	PART	QUANTITY
Snappybox	Nut cups	2
6	3mm Allen Key	1
1	ACME threaded rods	2
Snappybox	Threaded rod pulleys	2
6	2mm Allen Key	1
6	Grease	1
Snappybox	Upper bearing blocks	2
Snappybox	Z motor shelves	2
4	Z motors	2
Snappybox	MXL belt	2
Snappybox	Z-motor pulley	2
Snappybox	M5x8 BHCS	4
Snappybox	M5x12 BHCS	4
Snappybox	Z rod alignment tool	1
Snappybox	M3 washers	8
Snappybox	M3x8 SHCS	8
WATCH THE ACCOMPANYING VIDEO:	https://youtu.be/K4mky41-6fo	

OVERVIEW

You will install the Z motor and ACME threaded rod assemblies in the newly squared frame. These assemblies are what will drive the bed plate up and down in the Z axis.





TIPS & TRICKS

#1 Work on a flat surface.

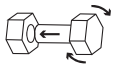
#2 Note that the Z motor assemblies are mirrored, with the motor cable connections always facing the rear of the frame.

#3 The grease is very messy and will easily stain clothing. Be prepared to wipe it off of your hands and wear clothes that you do not mind getting dirty, just in case.

#4 In step G12, double check that the upper bearing block has the bearing portruding above the block instead of below. This is a safety feature in case the ACME threaded rods start to bind--the bearings will pop out of place without causing damage to the nut cups, bed side plates, or any other parts.

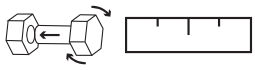
G1

Check that the nut is secured in the nut cups by tightening the set screw with a 3mm Allen Key



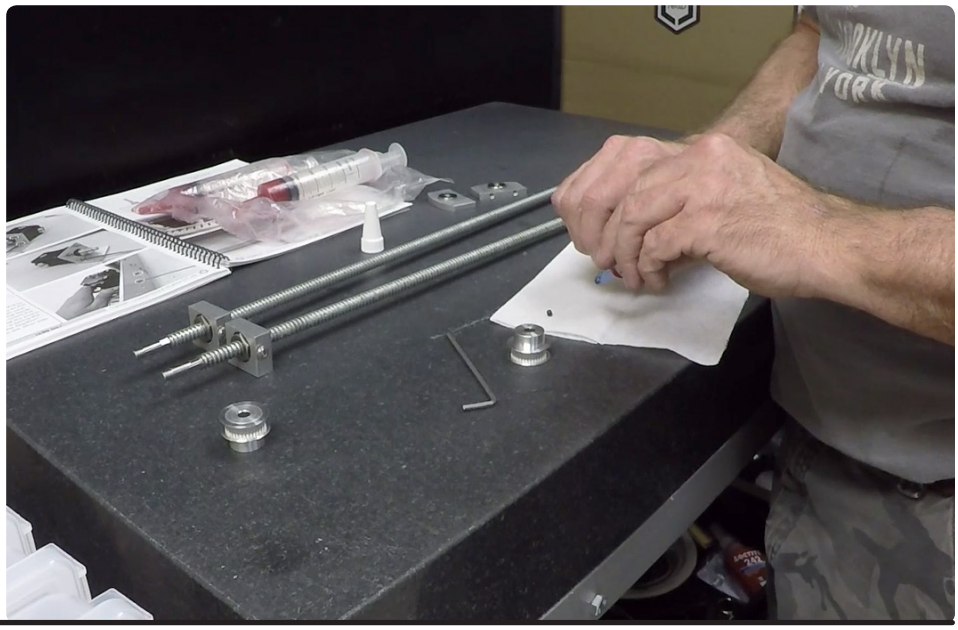
G2

With the nut facing away from you, fasten it onto the ACME threaded rod (Z rod). Let it run about 1.5” down the threads



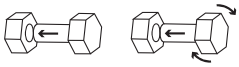
G3

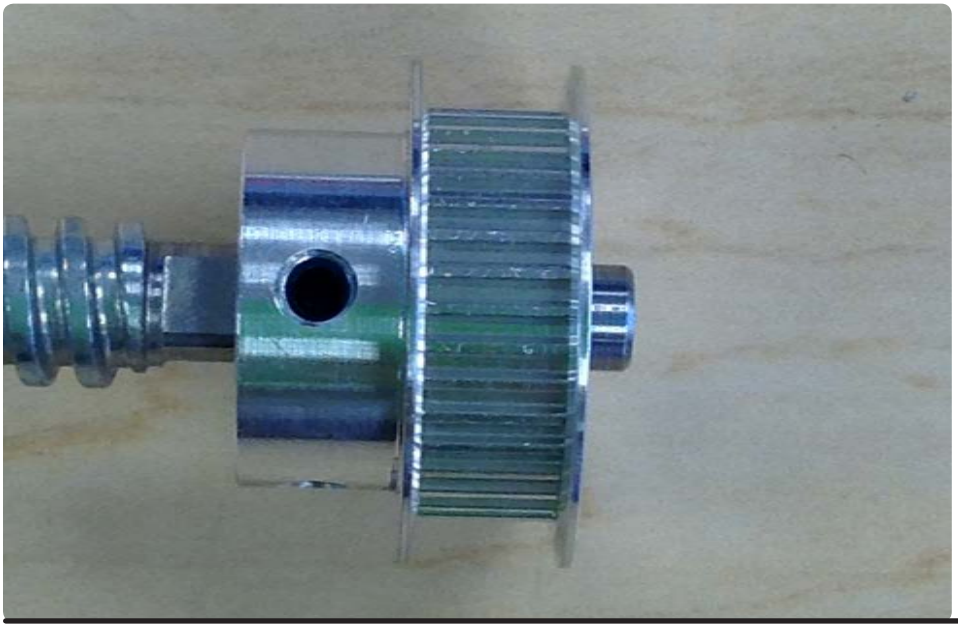
Loosen the set screws from the Z rod pulleys using a 2mm Allen Key and place a drop of threadlocker (no stronger than medium) on each one



G4

Reinsert them into the pulley just to start them, but do not fully tighten them yet



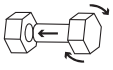


G5

Place the pulley onto the end of the Z rod, with the face of the pulley about 0.035”-0.040” (approx. 1/32”) past the edge of the “shoulder” on the rod.

G6

Once the pulley is in place, fully tighten the set screws to keep them in place.

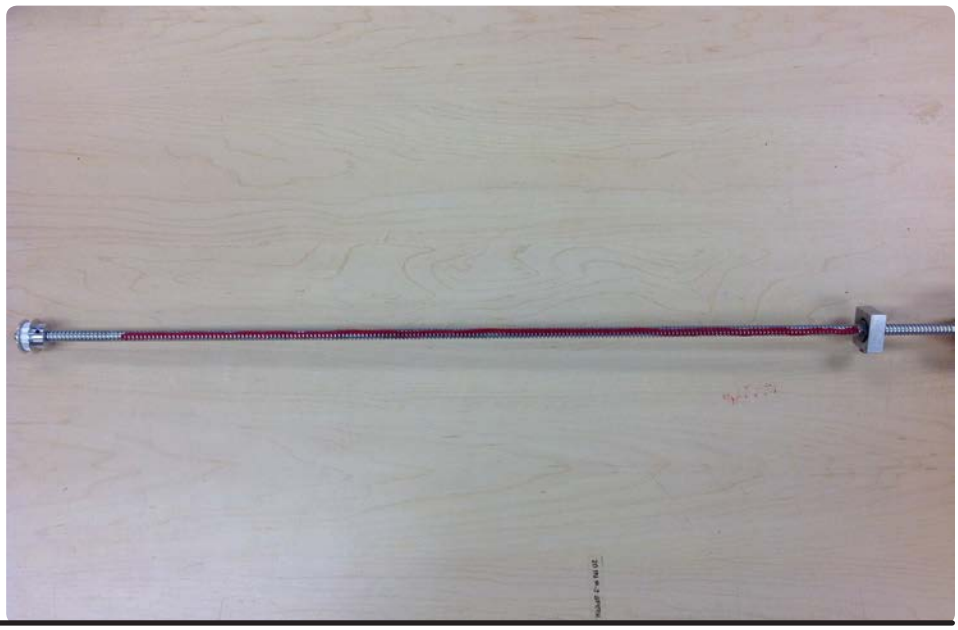


G7

Do this for both rods. Clean any excess threadlocker as needed.

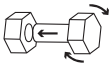
G8

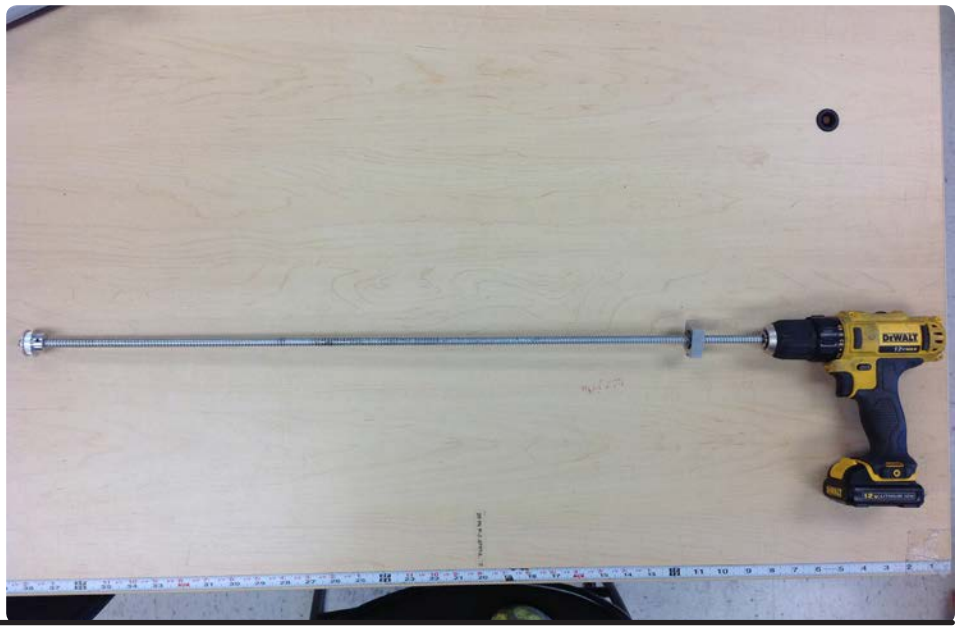
Deposit grease along the length of the Z rod, up to about 3” away from the other end. Be careful not to get this on your clothes!

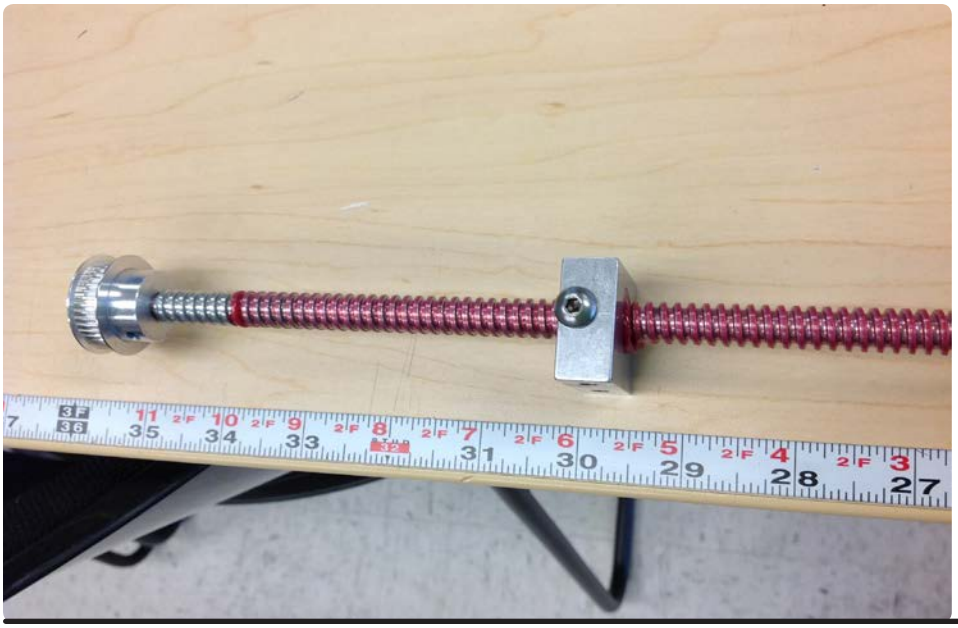


G9

You can quickly spread the grease around the threads by locking the bare end of the rod into the chuck of a drill and spinning it to work the nut cup along the length of the rod. Redistribute grease that collects on the nut cup back on the rod, but again be careful not to get grease on yourself.

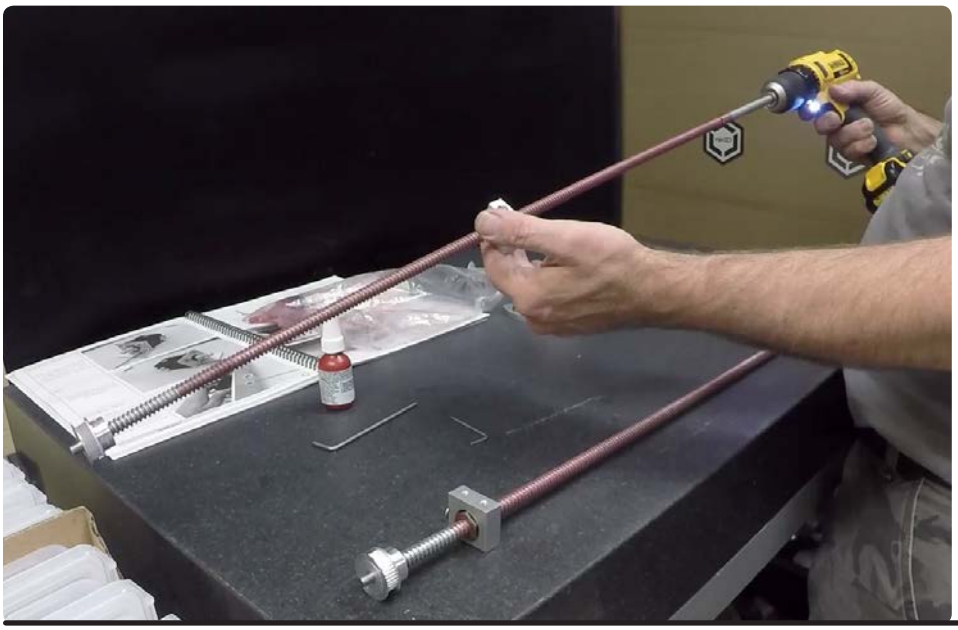






G10

Repeat this until there is an even coat of grease along the rod.

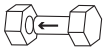


G11

Do this for both rods.

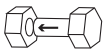
G12

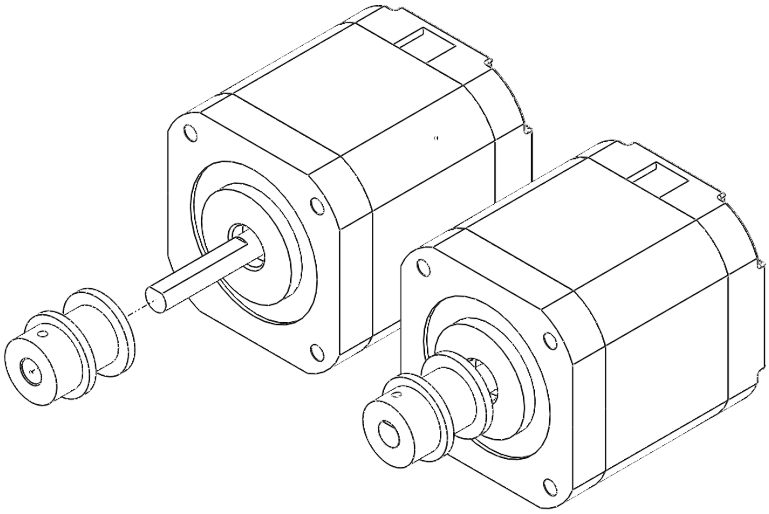
Place the upper bearing block onto one of the rods by inserting the rod end into the bearing. Insert it such that the bearing protrudes upward. If the bearing is indented, reverse the orientation of the upper bearing block. You are now ready to install the Z motors to the GB frame.



G13

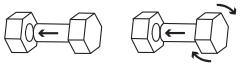
Install the Z motor pulleys onto both Z motors. The pulley should be flush with the end of the motor shaft. Use Loctite threadlocker on the set screws before tightening them with the 1.5mm Allen Key.

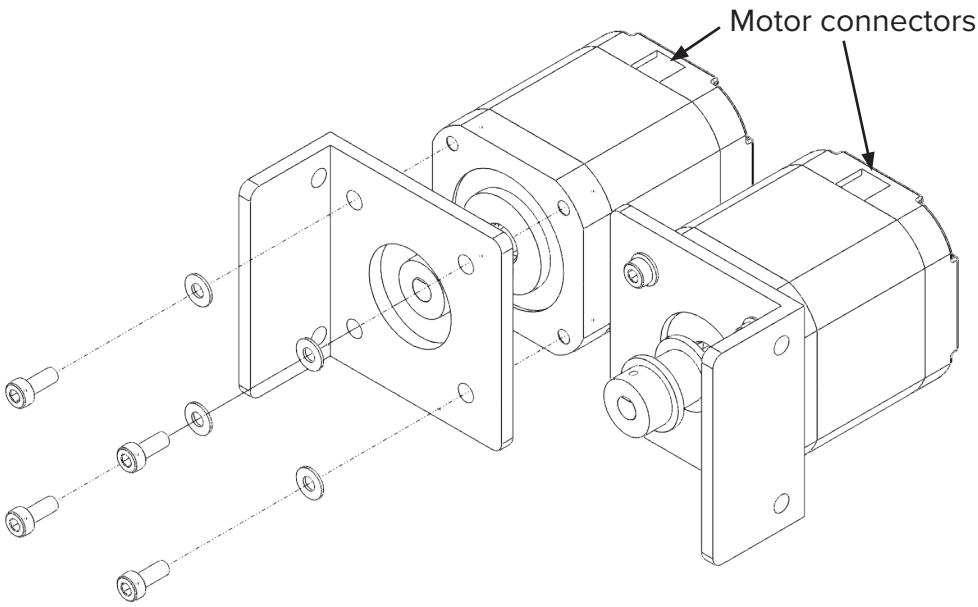




G14

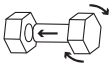
Assemble the Z motor shelves to the Z motors using M3 washers and M3x8 SHCS, as shown. Note that the left and right motors should be mirrored. When mounted, the motor connector is facing the rear of the bot.

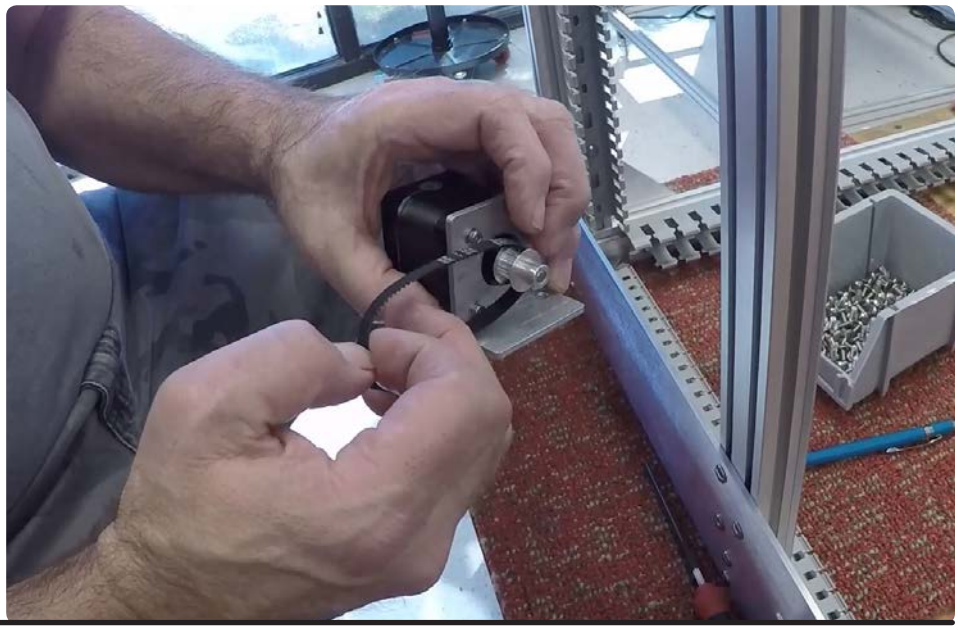


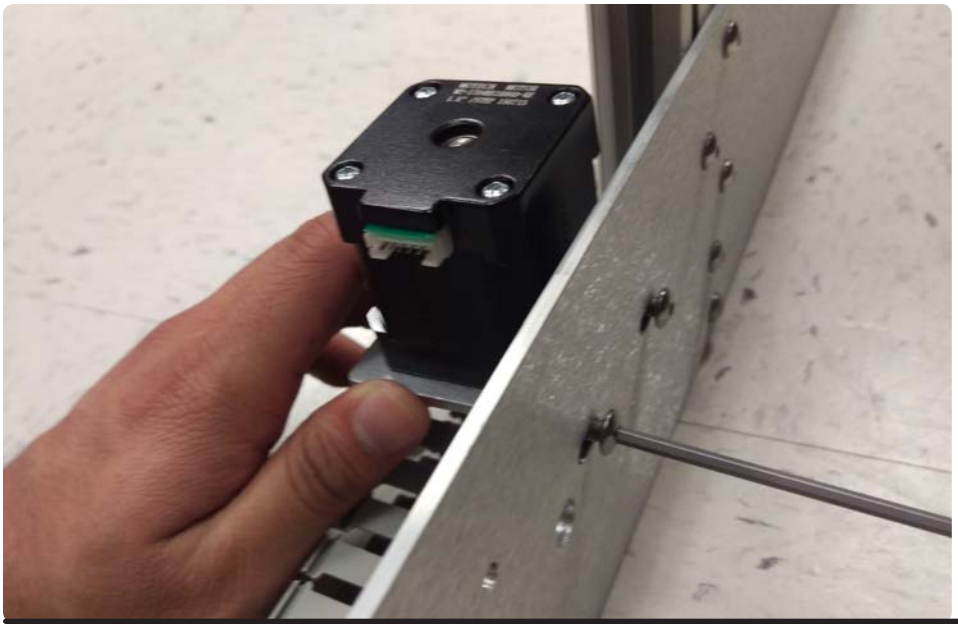


G15

Loop the MXL belt onto the Z motor pulley prior to mounting the motors.

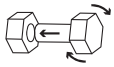


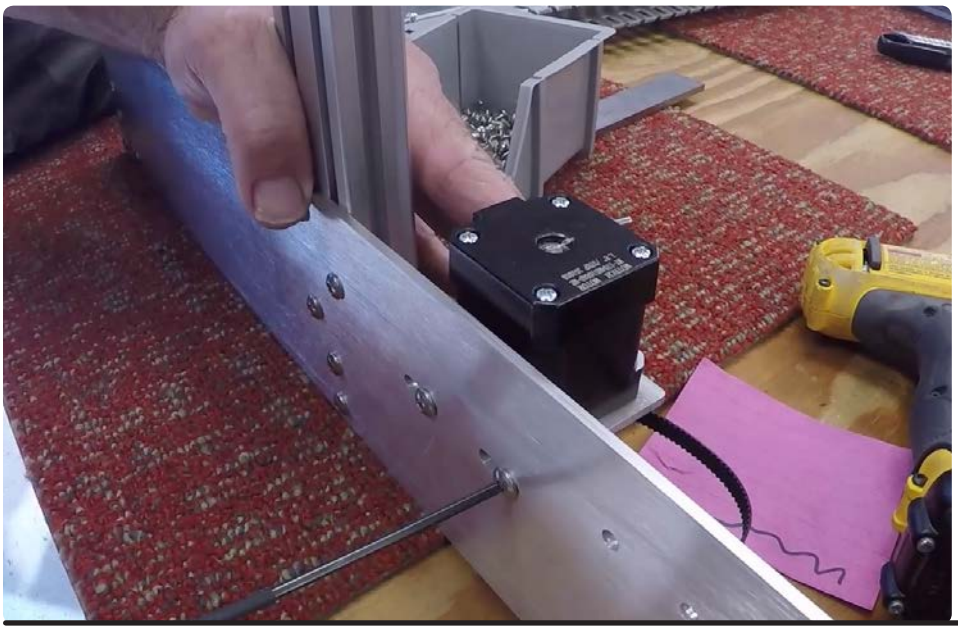




G16

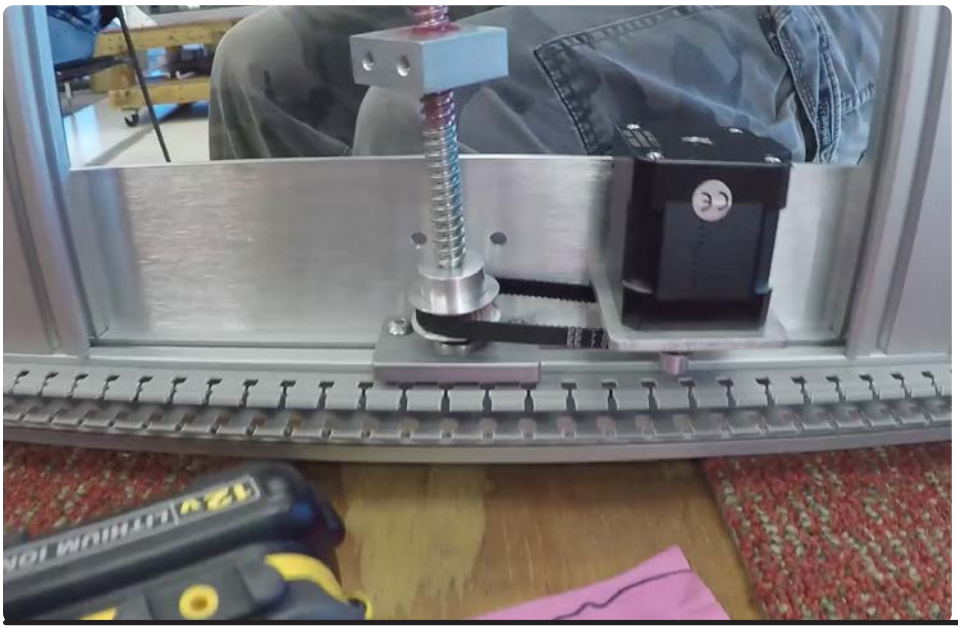
Fix the Z motors to the frame by loosely fastening the motor shelf to the side plate with 2 M5x8 BHCS each. The motor connectors must face the rear of the Gigabot®.





G17

Push the motor forward in the slots and hang the MXL belt on the bearing in the lower bearing block.

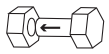


G18

Bring one of the Z rod assemblies and loop the MXL belt around the pulley on the Z rod.

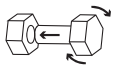
G19

Insert the bottom of the rod into the bearing in the lower bearing block.



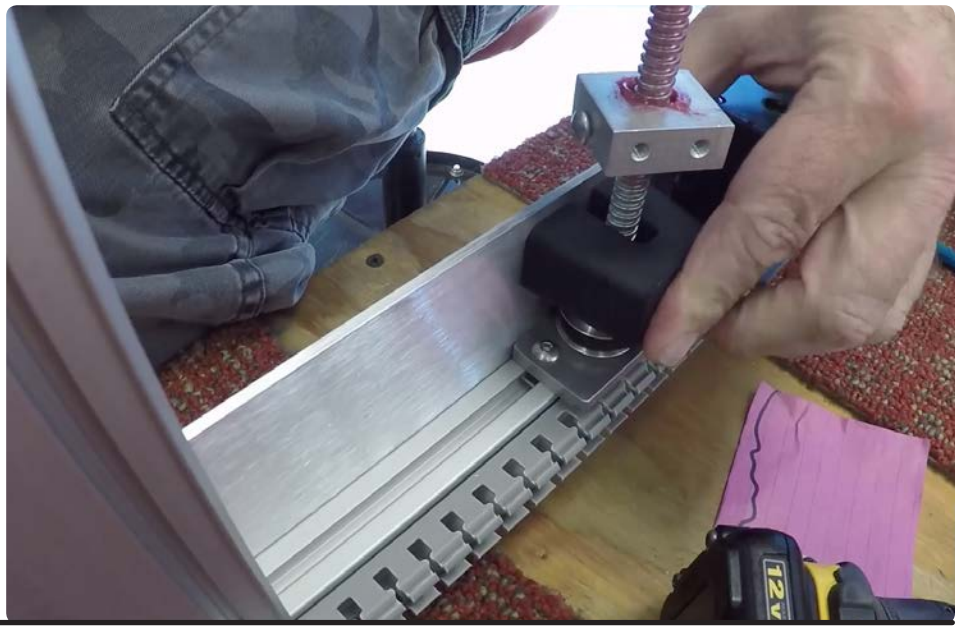
G20

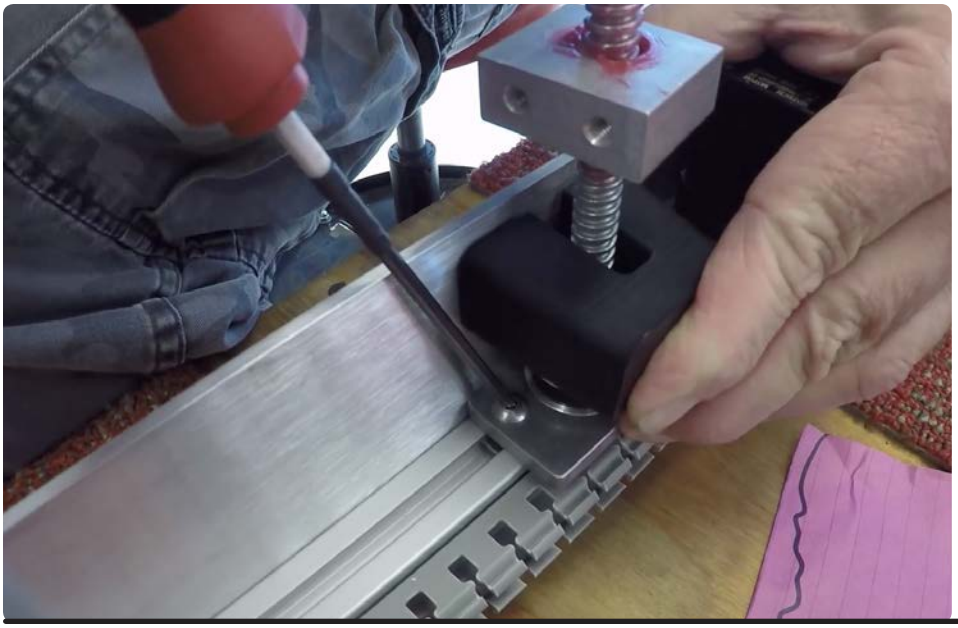
Loosely fasten the upper bearing block to the frame using 2 M5x12 BHCS.



G21

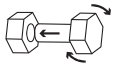
Use the printed Z rod alignment tool to center the rod between the guide holes.

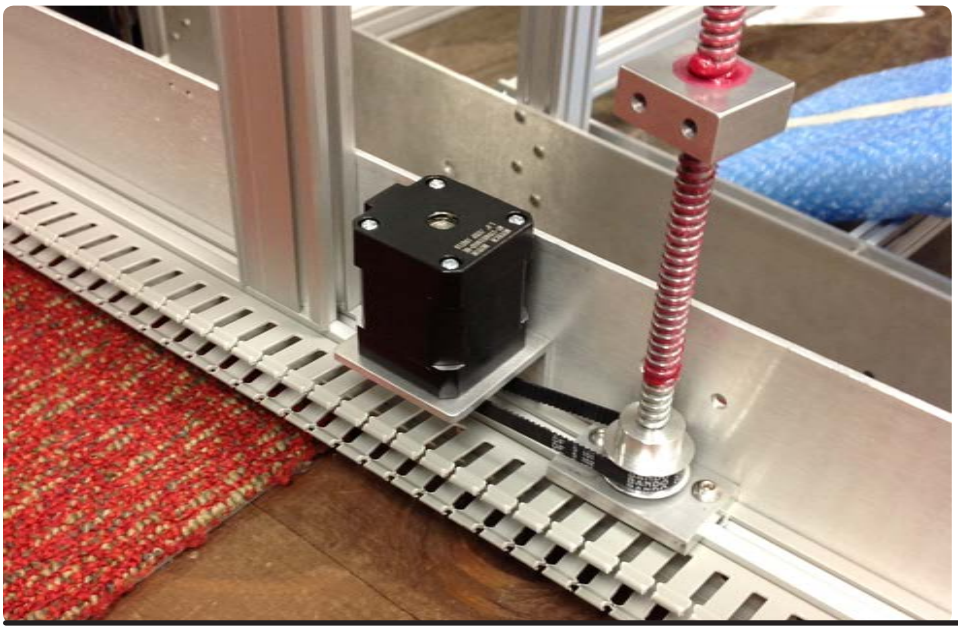




G22

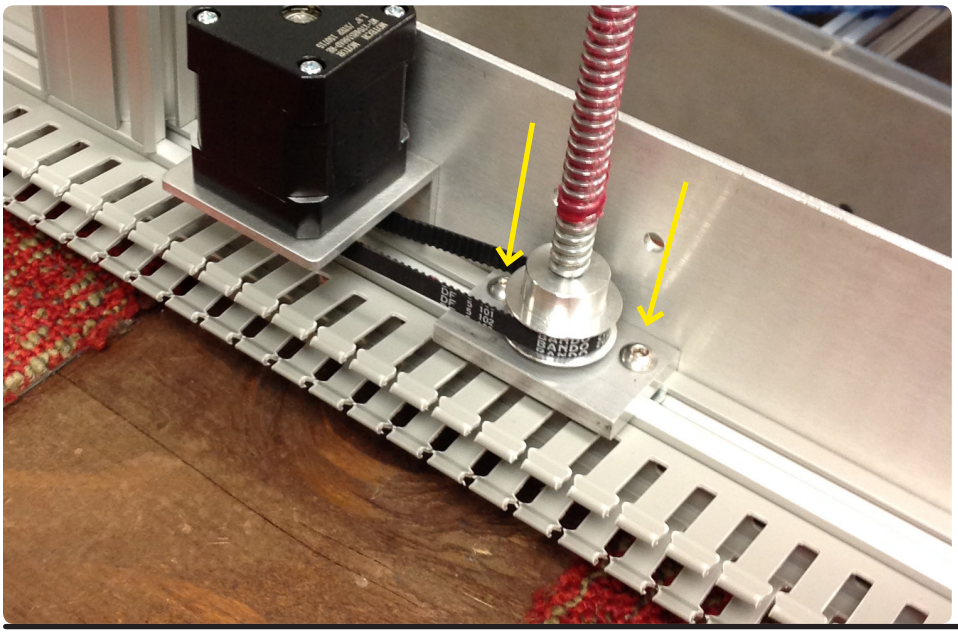
Holding the tool in place, use the ball-end of the 3mm Allen Key to tighten the M5 BHCS on the lower bearing block.





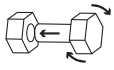
G23

Once tightened, remove the Z rod alignment tool.



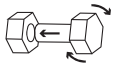
G24

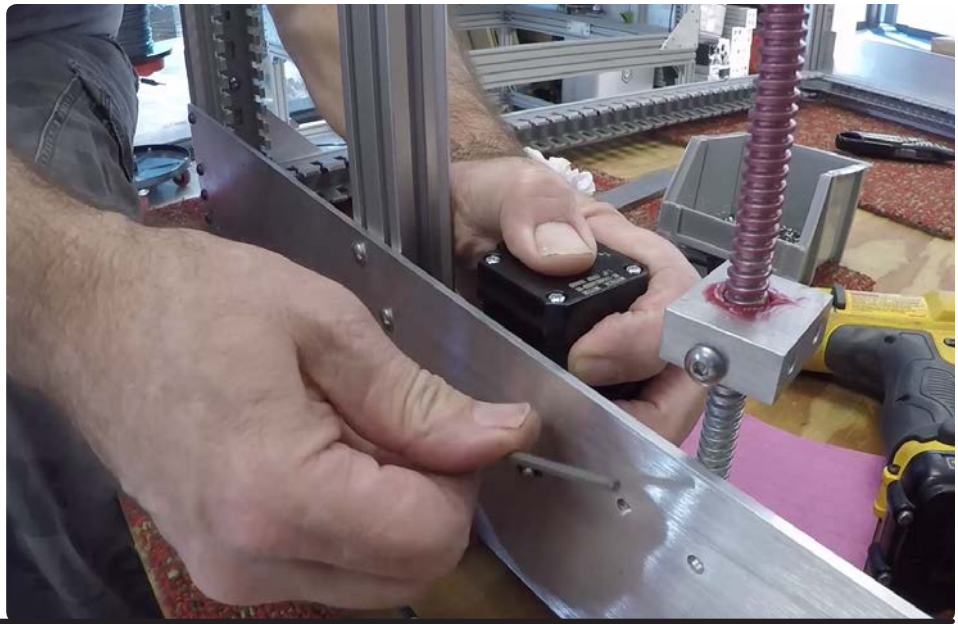
Fully tighten this lower bearing block into place.



G25

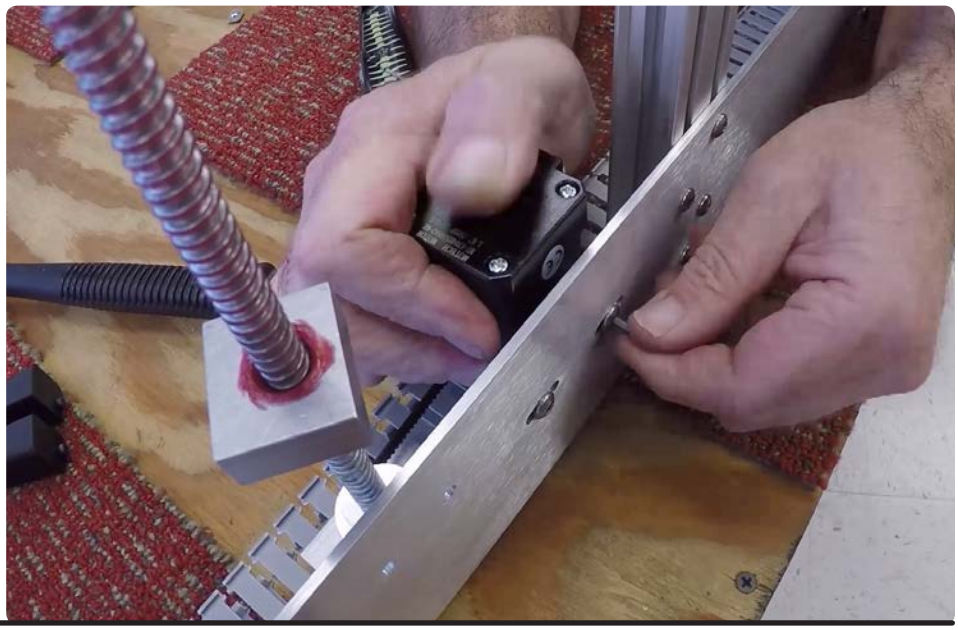
Tension the MXL belt by pulling the Z motor back in the slots and then tightening the M5 BHCS for the motor shelf.





G26

Repeat this process to install the other Z motor and Z rod assembly.



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For a demonstration of these step by step instructions, please see our video for this section.