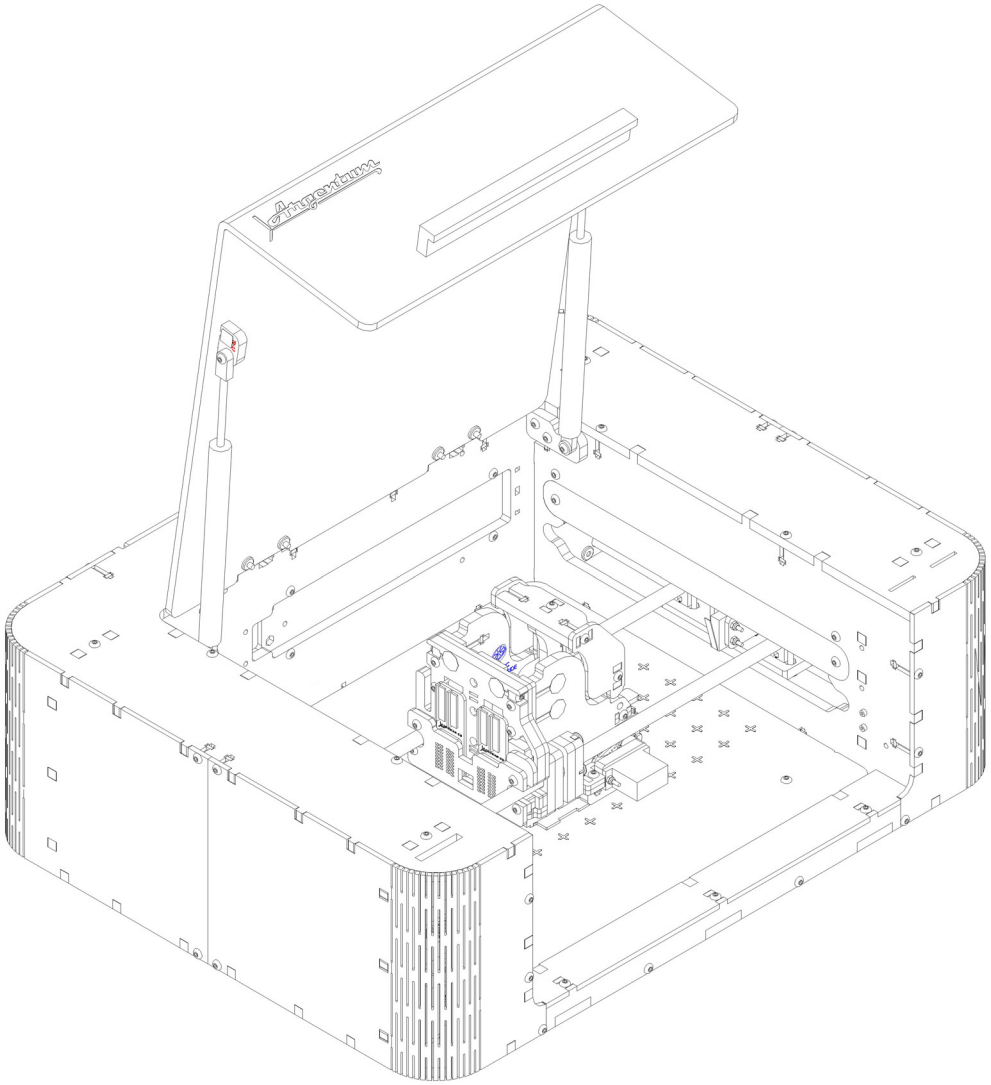
CARTESIAN CO

Argentum

Assembly Guide

v 1.01

English
September 2014


Ampertum

! GENERAL SAFETY

Before we begin, before we even make it to the contents page, let's talk safety. There are some very important things to take note of before you even imagine yourself making circuit boards.

There are many small pieces and plastic bags within the kit. These pose a choking hazard so please keep away from children and animals.

Many of the acrylic pieces will have sharp edges. Please use caution when handling. Use gloves as necessary.

Do not touch any exposed electrical contacts or the motherboard while power is connected. Disconnect power before attending to any electrical work.

When using the Silver cartridge, wear gloves and wash hands thoroughly after use.

Read all cartridge safety instructions.

! CARTRIDGE SAFETY

Let's not mess around with safety. The cartridges which you use to make the circuits are potentially hazardous if used incorrectly or damaged.

The Silver cartridge contains silver nitrate which is a corrosive liquid. On contact with the skin it will react and cause discolouration. If ingested or contact is made with your eyes, wash immediately and seek medical attention.

If a cartridge appears to be damaged or is leaking DO NOT TOUCH IT. Put on gloves and dispose of the cartridge immediately. Wash any skin immediately with water. Clean any affected areas with water.

A Safety Data Sheet (SDS) for the Silver cartridge is included in the shipping window of the shipping box. The SDS is also available on the Cartesian Co website.

All cartridges must be kept out of reach of children at all times.

CONTENTS


WELCOME

1A BEFORE WE BEGIN

Welcome to your Argentum assembly guide!

This document will lead you through the assembly process from opening the box to making your first circuit. During the assembly process, there are some techniques that you may not have encountered before – these will all be explained in this introduction.

Please keep in mind that it is very important that you follow all instructions closely to prevent incorrect assembly or damage to your printer.

1B WHAT YOU NEED

Before getting started, make sure you have the following items:

- Argentum kit
- A clear desk
- 1 x Large bin
- 2 x Hands - note that your hands will probably get dirty from the paper covering your acrylic parts
- A free day/weekend for assembly – depending on your aptitude, it's possible for the assembly to take around 2 days.
- It helps to have a friend (1 piece) help you in the assembly process – this is not necessary but will speed things up significantly.
- Strong sense of adventure (1 piece)

1C OPEN THE BOX

Cut open your Argentum box and pull out each packaged item from the cardboard box – you should have the following parts:

1. **Mechanical Parts Box:** A parts storage box that contains all of the mechanical parts needed for assembly of the printer.
2. **Motherboard Box:** The control electronics for the printer in a bubble wrap pouch
3. **Miscellaneous Parts Box:** A range of parts for performing the first print with your Argentum including printing substrates, SD card & SD card reader. Also contains a single laser cut part as a replacement for one in your kits.
4. **Power Supply:** 12V 5A power supply for powering to your Argentum.
5. **Cartridges:** A set of your first cartridges for use in your Argentum.
6. **Acrylic Lid:** The bent acrylic lid of the printer, it will be covered in bubble wrap.
7. **Laser Cut Parts:** A stack of acrylic parts bolted together and covered in bubble wrap.
8. **Screwdriver kit:** is a multi-head driving kit that is used to tighten the bolts in your kit.

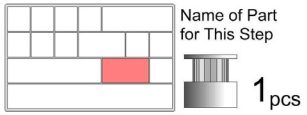
Some other extras that you may have ordered include:

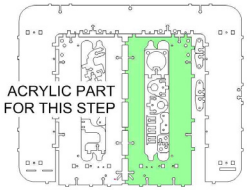
1. **USB Microscope:** a hand held microscope that connects to your computer via USB to allow a much better view of your prints.
2. **MacGyver Kit:** A starter kit of surface mount electronic components to help jump start circuit assembly.
3. **Additional Cartridges**

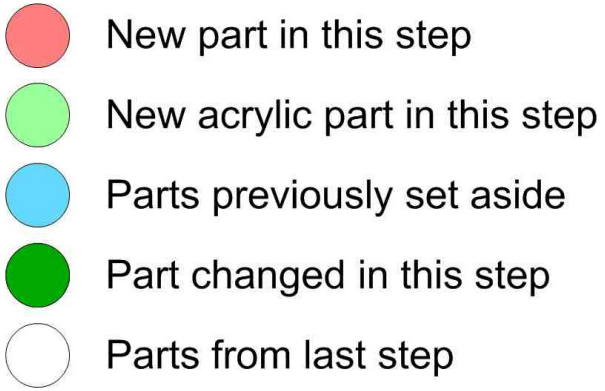
ASSEMBLY TECHNIQUES

1

HOW TO USE THE INSTRUCTIONS: Except for this introductory section, each page will have 4 assembly steps with up to 3 images. The main image will display the assembly step, top right will show where in your mechanical kit to find parts & top left will show where in your laser cut panel to find acrylic parts. The assembly images are colour coded as shown ->

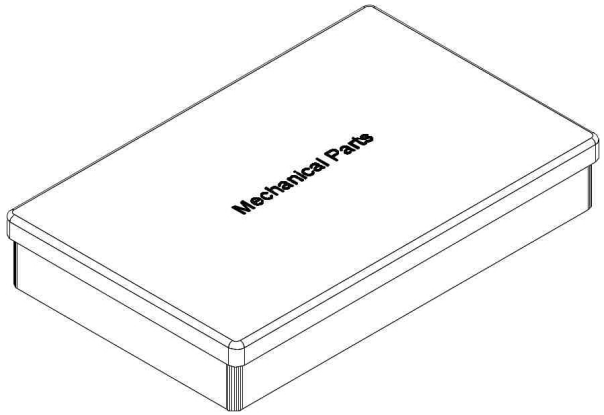






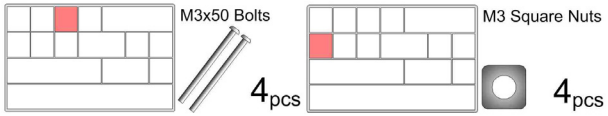
2

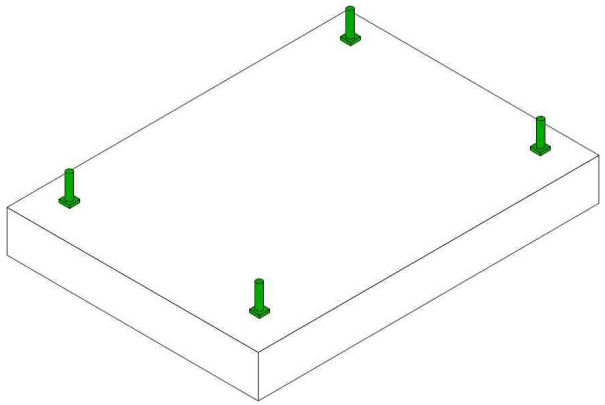
MECHANICAL KIT: Your mechanical kit (box 1) contains all the miscellaneous fasteners, pulleys, motors etc. needed for assembly of your printer. Please open your kit now and for each compartment that contains ONLY ONE BAG, open the bag and empty the contents into the compartment. After assembly you can use this box for your own parts storage.



3

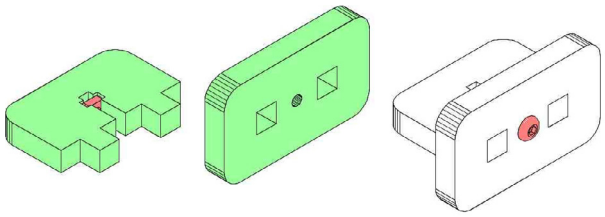
LASER CUT PARTS: Each section will make use of laser cut parts from 1.5mm, 3mm and 6mm thick acrylic sheets - the sheets needed are shown at the start of the section. These sheets are all stored within a stack held together with 4 bolts like as shown. PLEASE REMOVE THESE NUTS/BOLTS AND PLACE THEM IN YOUR MECH KIT WHERE INDICATED - YOU WILL NEED THEM.





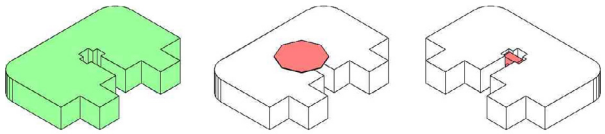
4

T-BOLT: The t-bolt is a method for locking 2 perpendicular plates together using a nut & a bolt. The left image shows an oddly shaped cut out that holds a nut in place and allows a bolt to lie. The central image shows a circular cut out through which the bolt passes, when combined the assembly is as on the right. It's important that you DON'T OVER-TIGHTEN t-bolts as they will eventually crack in some parts.



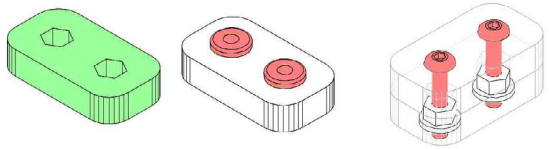
5

NUT STICKERS: Sometimes when assembling t-bolts, it is difficult to place the nut. We have made this process easier by using black stickers to hold the nut in place. In the left image, you can see a t-bolt cut out, in the central we have covered the cut out with a sticker, & in the right we have pressed a nut against the sticker with a finger. A square sticker can sub for any circular one.



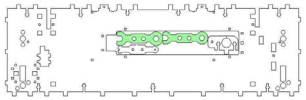
6

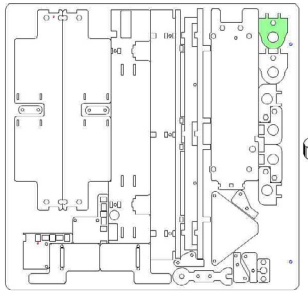
FLANGE NUTS: Some parts will have hexagonal cut outs as shown in the left image, if we would like to clamp this to another part we place an M3 flange nut into the hexagonal cut out and tighten a bolt through both parts (as on the right). The flange nut is upside down from its intended operation but this allows us to clamp the parts & tighten/loosen the nut without a spanner.

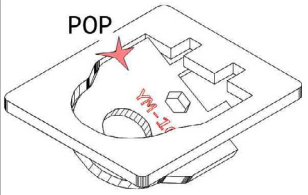


7

SNAP OUT PARTS: All of the laser cut parts for your printer are set up in panels. Each part will still be connected to the panel via one or more tiny connections. These are easily broken by pushing the part out with your fingers. This means the parts are easier to find as you assemble. For this reason, you may find it easier to not remove all your parts straight away but one by one.

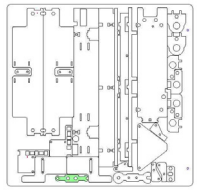


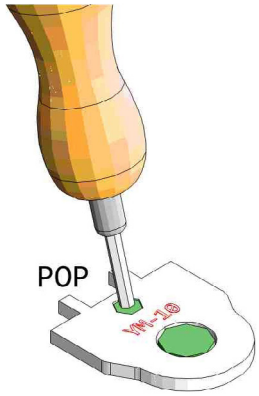


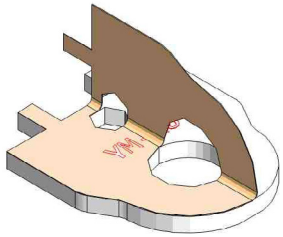


8

PREPARING PARTS: Each laser cut part will have a paper film & often some small cut outs still stuck inside, The covering film prevents the acrylic from being charred & scratched. Before assembling each part, it will have to be peeled & have all parts popped out. If you have a friend helping, it's useful for each section to have one peeling & one assembling.

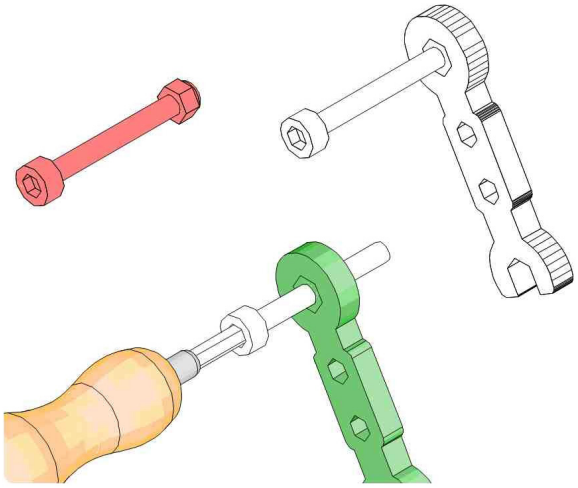






9

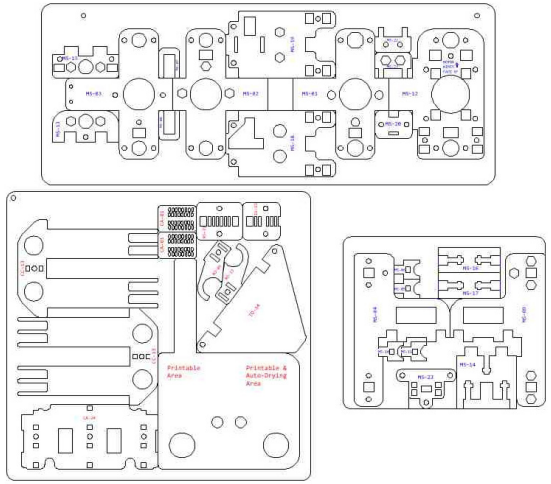
NYLOC NUTS: Some parts can't be clamped with a flange nut and in those cases we need to use a nut with a nylon insert that locks in place. There is a set of laser cut spanners inside your kit that are used to hold the nut while you tighten the bolt. The spanners positions are shown in the top left and top right images, PLEASE FIND AND POP THEM OUT NOW




MOTOR SHOULDER

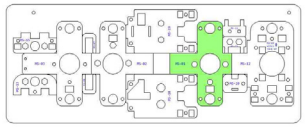
1

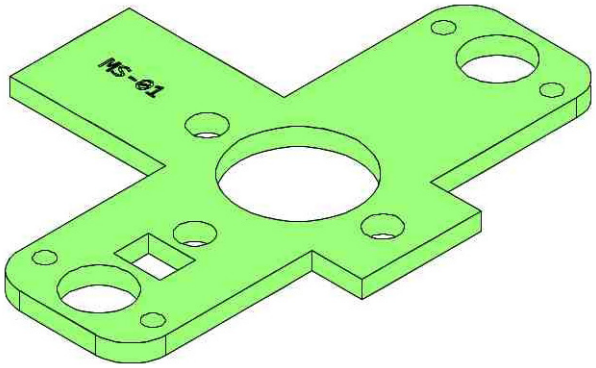
This section is for assembling the Motor Shoulder which mounts the x-axis motor and linear rods and moves along the y-axis linear rods. For this section you will need your mechanical kit, screwdriver kit, laser cut spanners & the 3 laser cut plates shown here. The top is in 3mm, bottom left in 1.5mm and bottom right in 6mm (found within a larger plate but pops out).



2

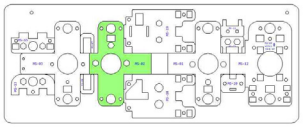
Find MS-01 & lay it flat in front of you as shown

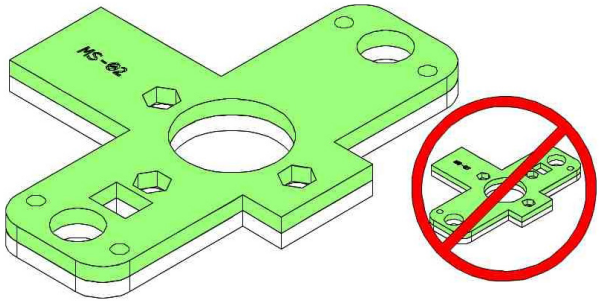




3

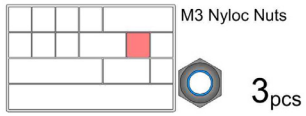
Find MS-02 & lay it on top of MS-01 as shown

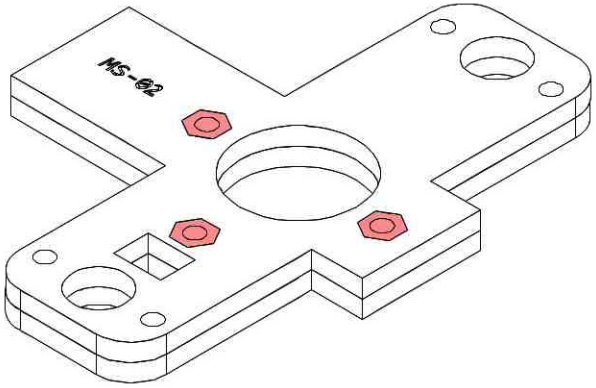




4

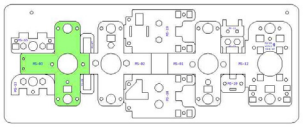
Grab 3 M3 Nyloc Nuts & place them into MS-02 as shown, note that the Nylon (blue part) is facing down.

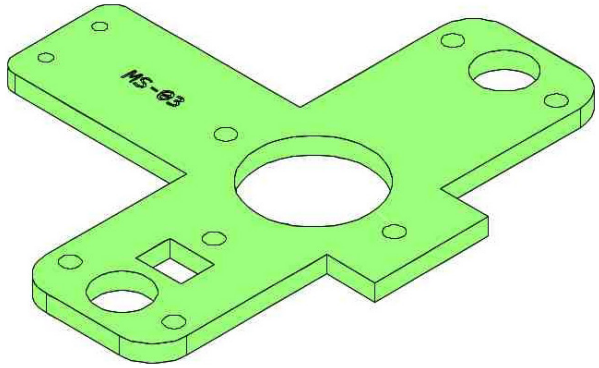




5

Find MS-03 & lay it flat as shown, don't stack it on the other pieces just yet.





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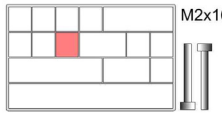
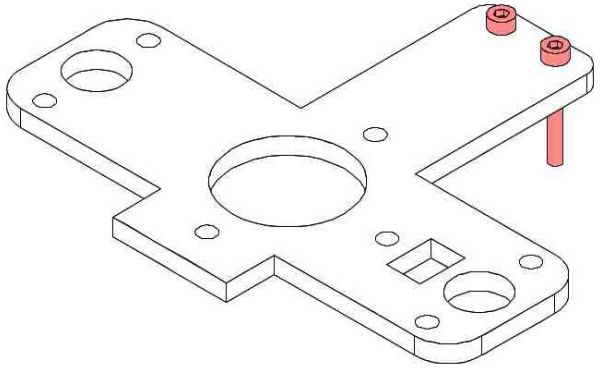


Turn MS-03 over and grab 2 M2x16 bolts from the mechanical kit and place them through the holes shown.



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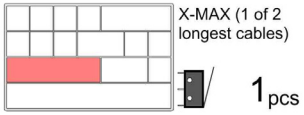
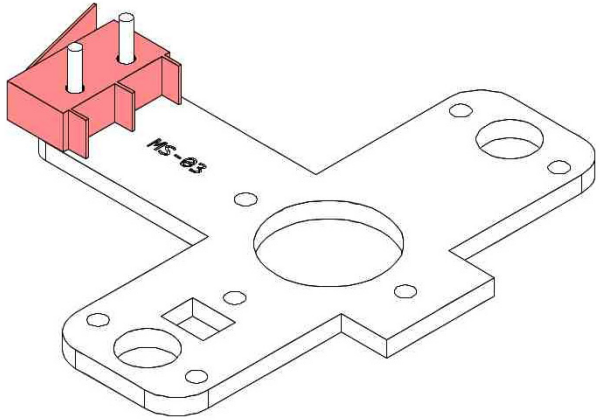


Flip the part back over with the bolts in place and get the X-MAX limit switch from the cable bundle and place it over the bolts - there are 4 limit switches, there are 2 identical ones with the longest cables - use one of these. MAKE SURE THE ORIENTATION OF THE SWITCH IS AS SHOWN.



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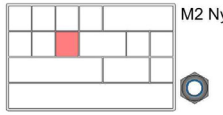
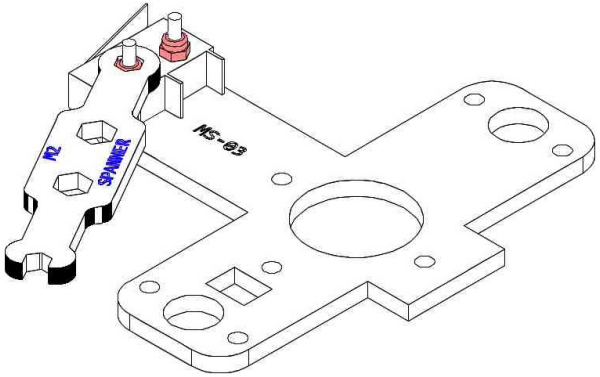
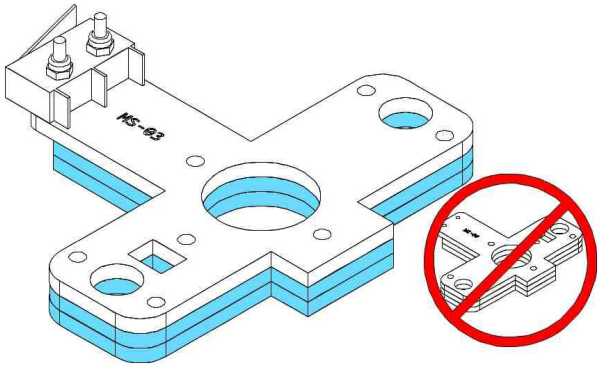


Double check your limit switch orientation is correct & get 2 M2 Nyloc nuts from the mechanical kit and begin threading them onto the M2 nuts. Tighten them using the laser cut M2 spanner from your kit.



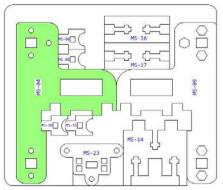
9

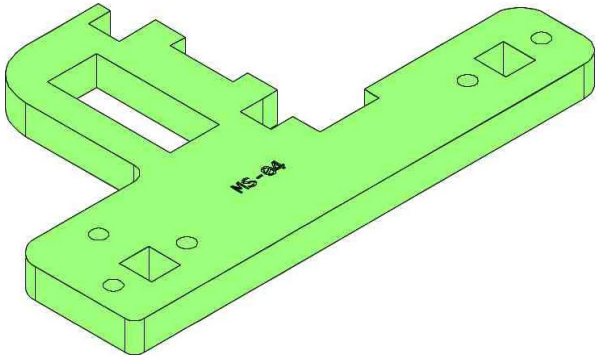
With the limit switch firmly attached, lay MS-03 onto MS-02 as shown, double check that the orientation of MS-03 (and the limit switch) are correct.



10

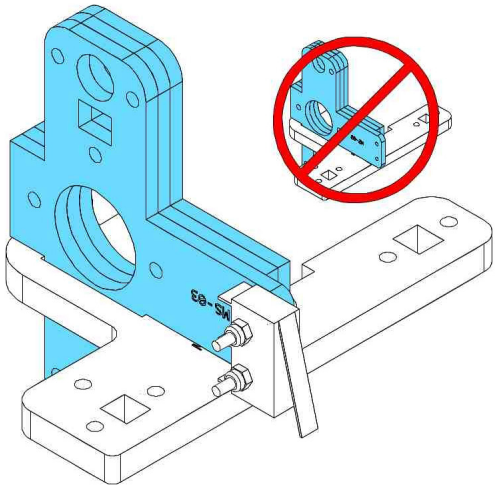
Find MS-04 & lay it down with the label facing upward as shown.





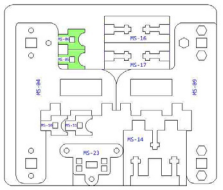
11

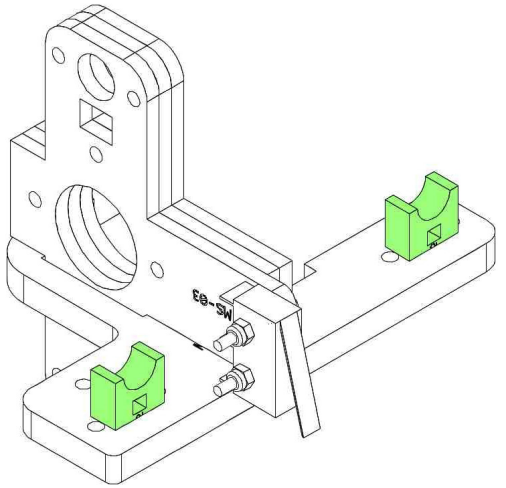
Slide the stack of acrylic into MS-04. Follow the orientation shown in the image.



12

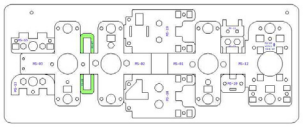
Find MS-05 & MS-06 & place them inside MS-04 as shown.

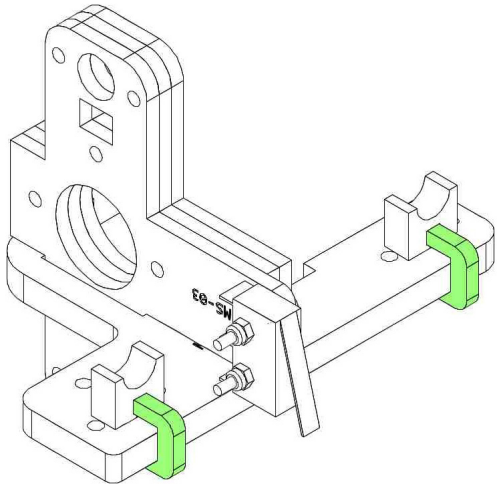




13

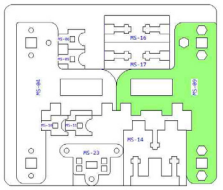
Find MS-07 & MS-08 & slide them into MS-05 & MS-06. NOTE: these parts are just temporary for helping to keep things in place during assembly. Now put this assembly to the side for a second.

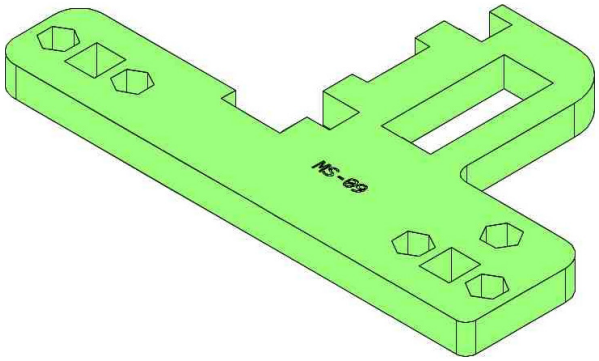




14

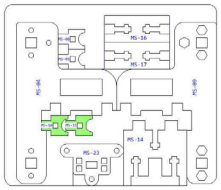
Find MS-09 & lay it flat as shown with the label facing up.

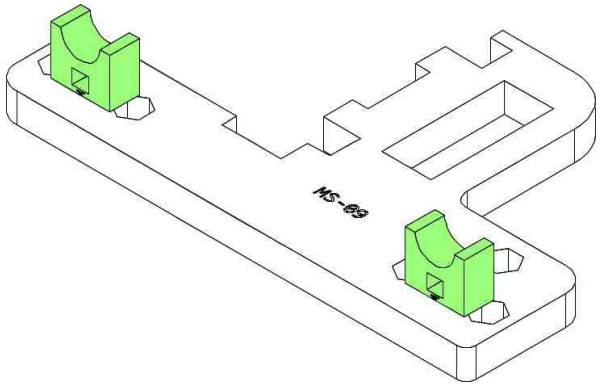




15

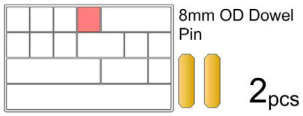
Find MS-10 & MS-11 & place them into MS-09 as shown

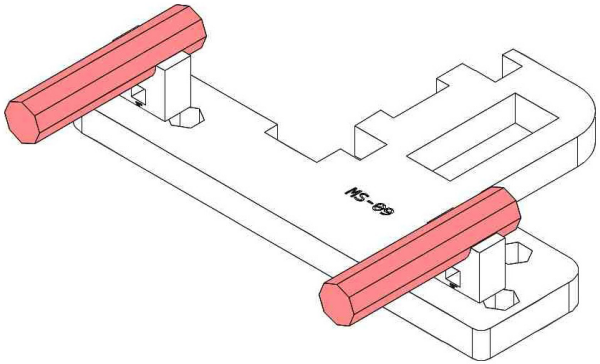




16

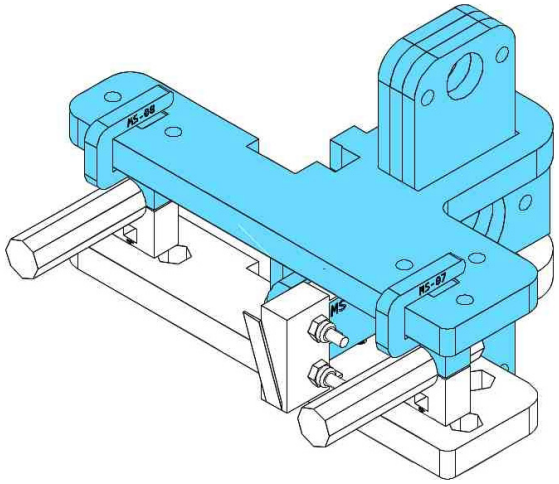
Find the 8mm wooden dowel pins from the mechanical kit & lay them into MS-10 & MS-11. Place them as shown - we're only using them as guides for assembly, they're acting as surrogate linear rods.



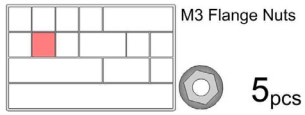


17

Grab the pieces you previously assembled together and now carefully flip them over and slide them into MS-09 as shown. Make sure the dowels are held nicely by MS-10, MS-11, MS-05 & MS-06. Hold the parts together with one hand for the next step and double check that everything is in the correct orientation.

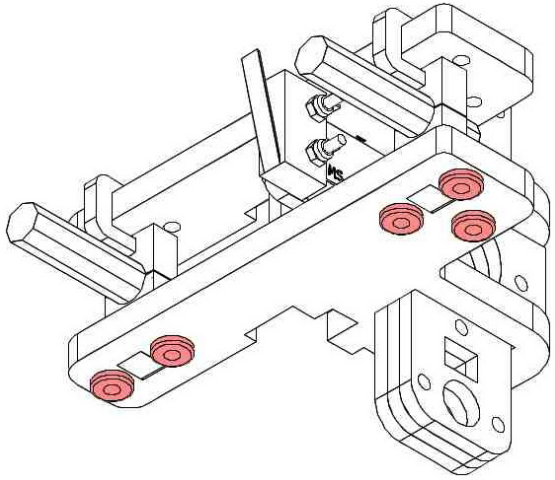


18

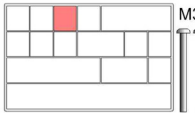


5pcs

Grab an M3 Flange Nut, place it in one of the hexagonal holes in the bottom plate (MS-09). Grab an M3x35 bolt, slide it in through the top (MS-04) and then tighten it loosely (shown in next step). Repeat for the other 4 nuts & bolts. Once finished, remove the dowels as well as MS-07 & MS-08 & place them back in your mechanical kit box. Now temporarily put this assembly aside.

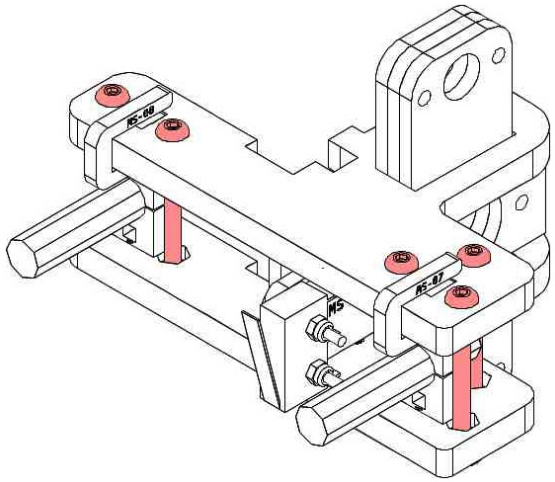


19

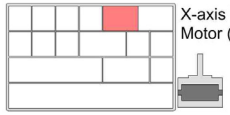


5pcs

These are the bolt positions

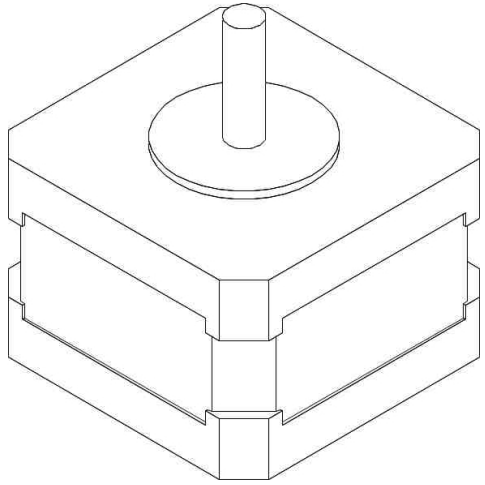


20



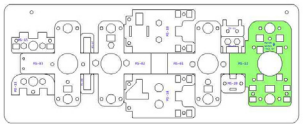
1pcs

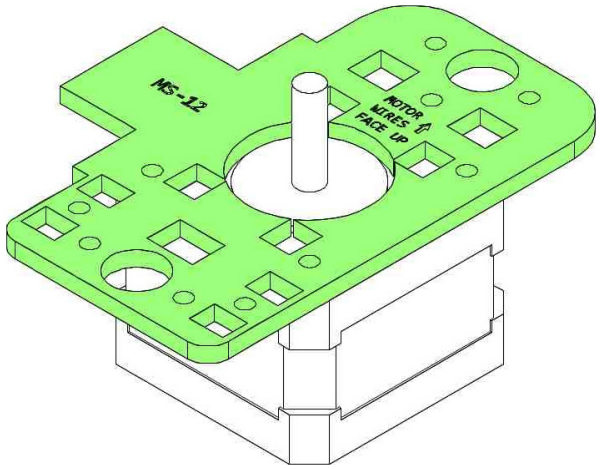
Find the X-axis Stepper Motor, this is the smaller of the two motors. Lay it on your table shaft up as shown.



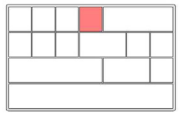
21

Find MS-12 & then place it over the motor. Note that the label faces up & make sure that your motors wires face the direction indicated on the piece.

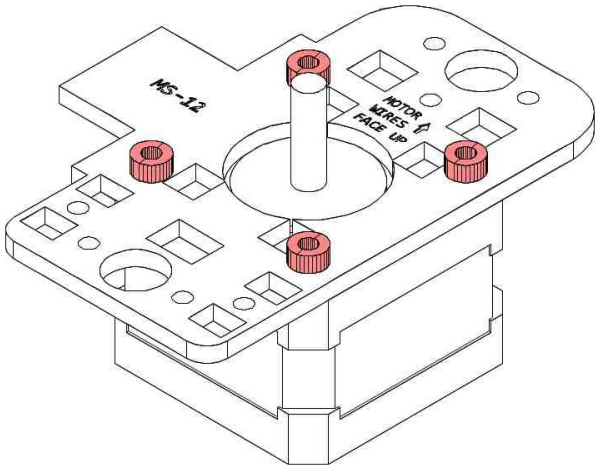




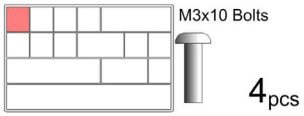
22



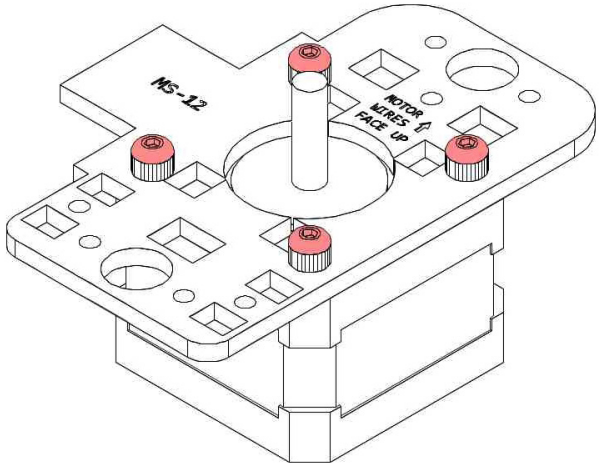
Grab 4 M3x3mm laser-cut spacers and place them over the motors 4 mounting holes as shown.



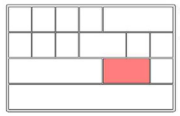
23



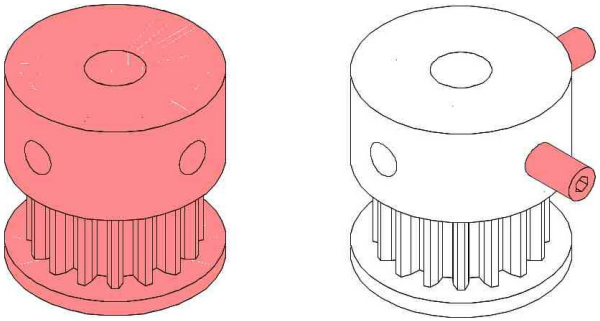
Grab 4 M3x10 bolts and bolt them through the spacers and MS-12 into the X-axis Stepper Motor. Tighten all 4 bolts.



24

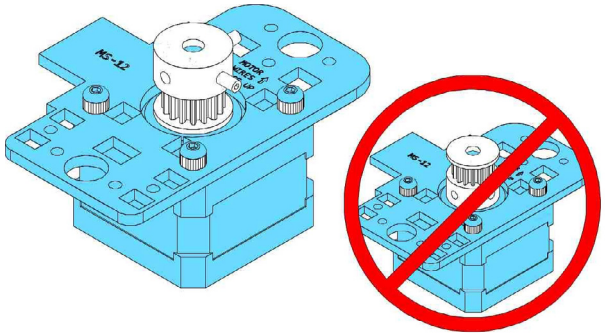


Grab 1 T2.5x16 Alum. pulley (note that all the pulleys are the same) & 2 M3 Grub Screws (they're both in the same bag). Loosely wind the grub screws into the pulley



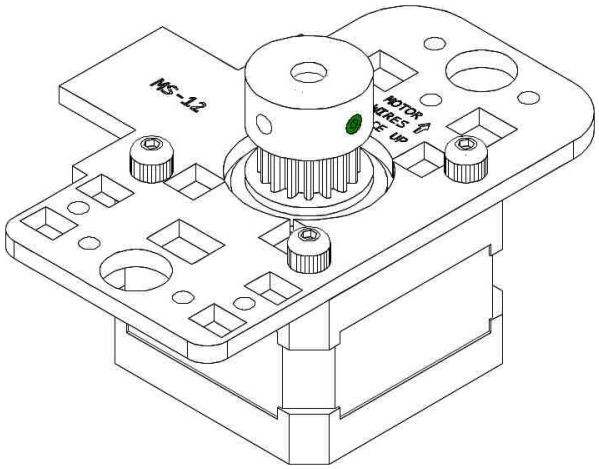
25

Slide the pulley onto the shaft with the teeth on the bottom side as shown. Double check that the pulley is not teeth up as shown in the crossed out diagram.



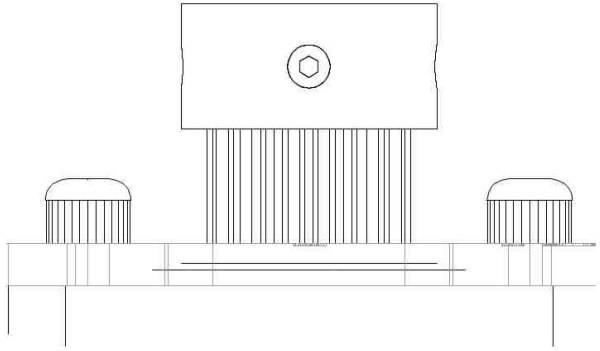
26

Slide the pulley along the shaft until the start of the teeth is about flush with the top of MS-12 as shown in the next step. Then tighten the grub screws to secure the pulley. MAKE SURE the pulley is in the correct place and the SCREWS ARE TIGHT as it will be annoying to come back and change later.



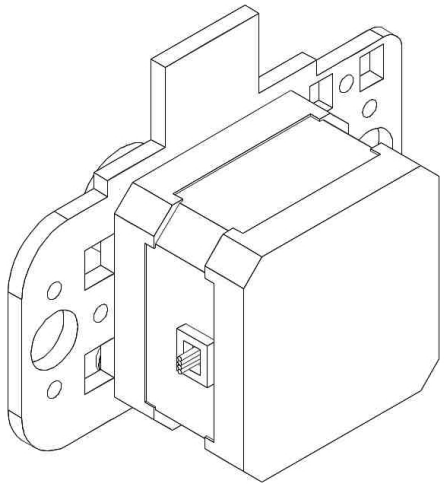
27

Position of pulley from side on.



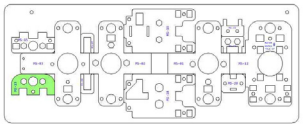
28

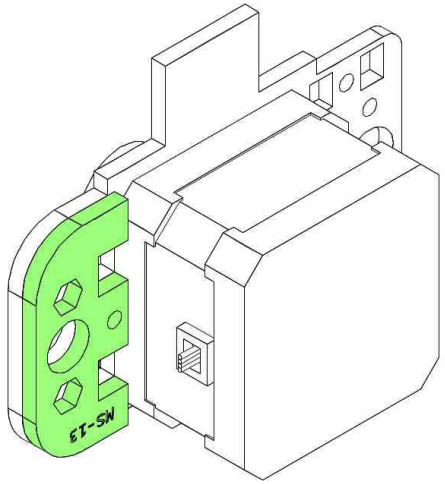
Lay the assembly on its side as shown so the motor wires are facing you.



29

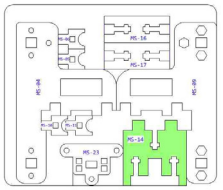
Find MS-13 & place it up against MS-12 as shown.

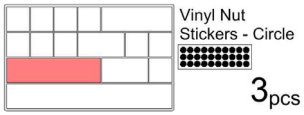


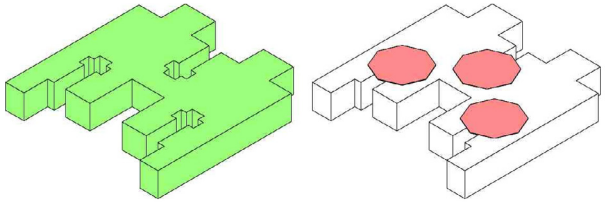


30

Find MS-14 & then lay it on the table with the label face down. Place a circular nut sticker over each t-bolt cut out as shown.

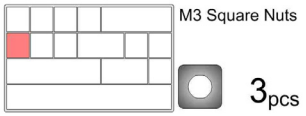


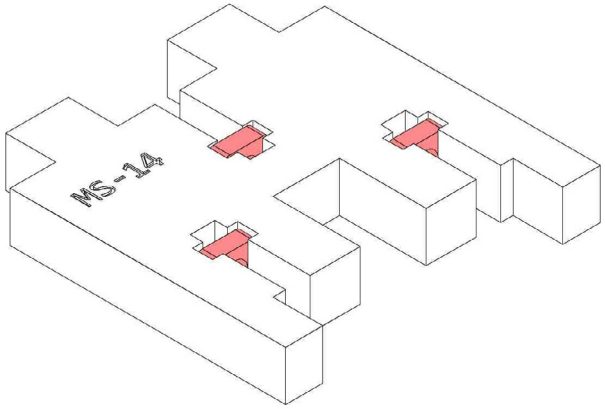




31

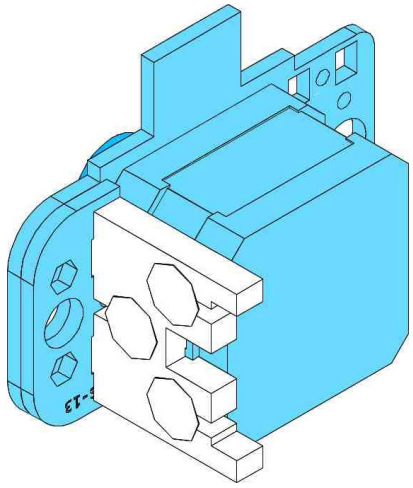
Flip the piece over and press 3 nuts into the 3 t-bolt slots - make sure to press the nut into the sticker so it holds!





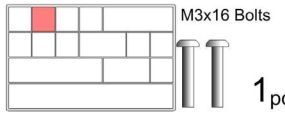
32

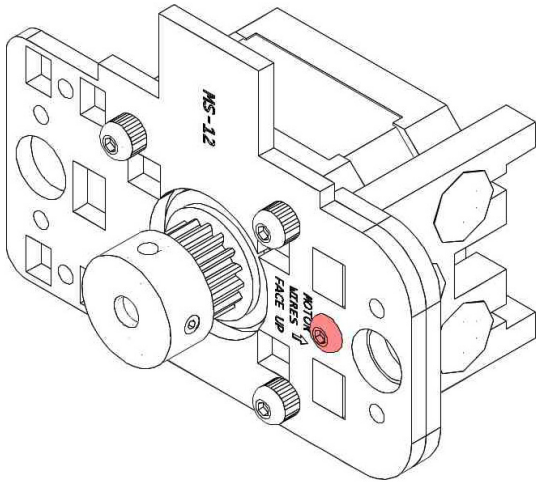
Grab the motor assembly again and slide MS-14 with its nuts into MS-13 & MS-12 as shown. Make sure the nut stickers are face up. Let the motor cables come out through the square cut-out in MS-14.



33

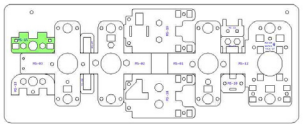
Place an M3x16 through MS-12 as shown and tighten.

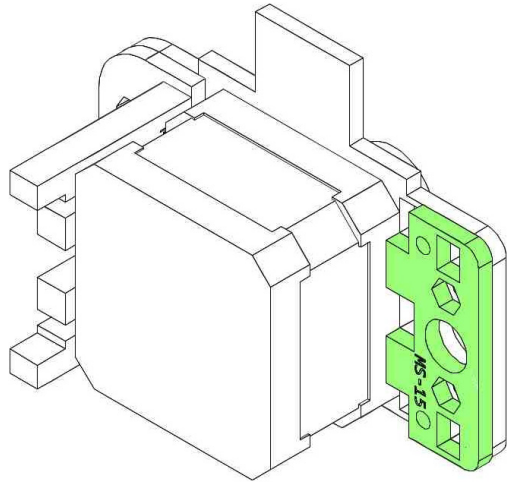




34

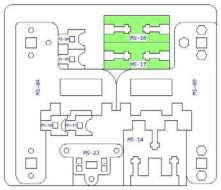
Turn the assembly around. Find MS-15 & place it up against MS-12 as shown.

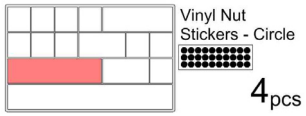


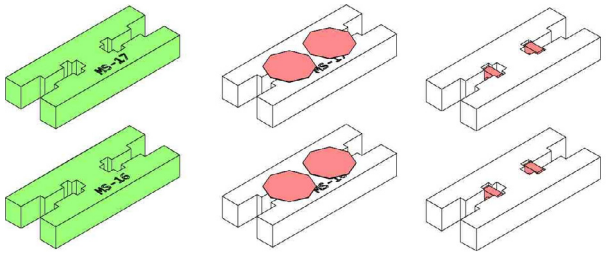


35

Find MS-16 & MS-17 & lay them on the table. Place a circular nut sticker over each t-bolt cut out as shown - 4 in total. Flip the pieces over and press 4 nuts into the 4 t-bolt slots - make sure to press the nut into the sticker so it holds!

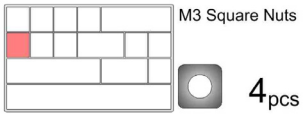


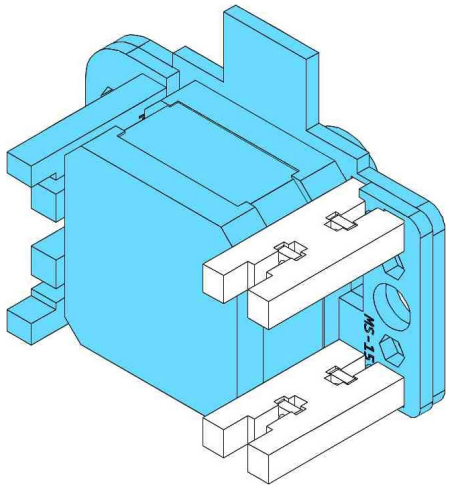




36

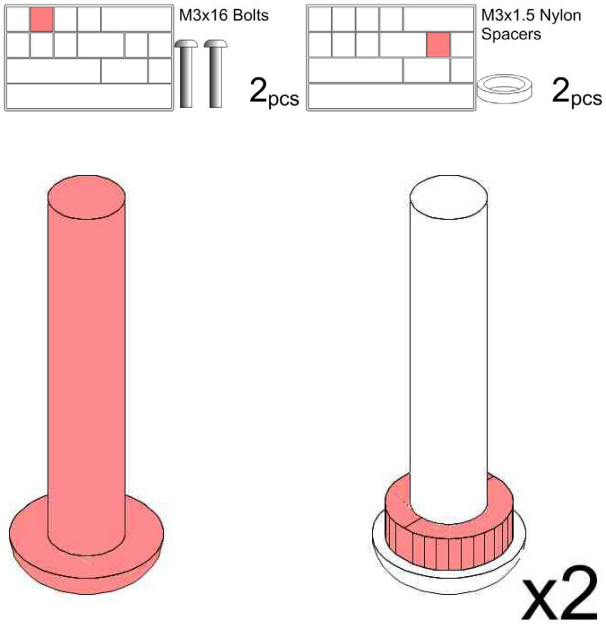
Grab your motor assembly again and slide MS-16 & MS-17 (with their nuts inserted) into MS-15 & MS-12 as shown. You may prefer to orient the parts so that the stickers are on the inside so that you can't see them - any orientation is fine.





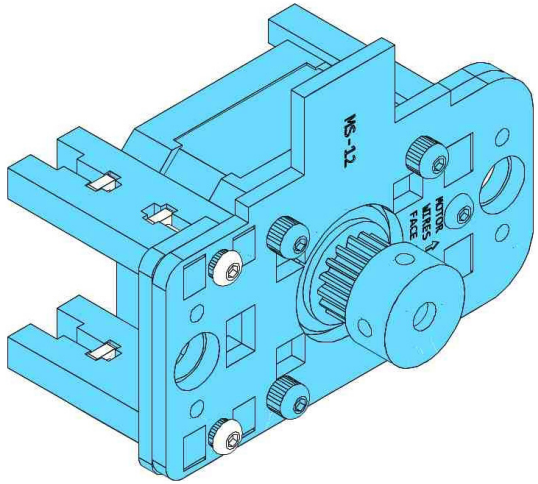
37

Get 2 M3x16 bolts and 2 M3x1.5mm Nylon spacers. Slide 1 spacer over each bolt.



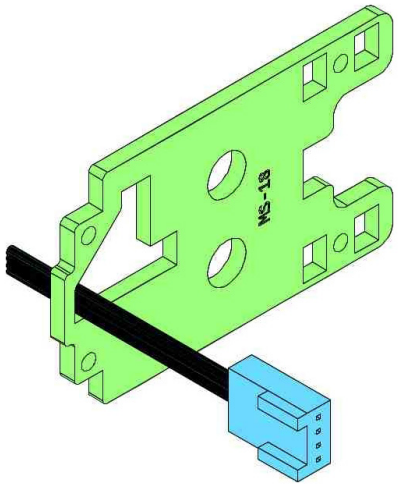
38

Use these 2 bolts with spacers to bolt MS-16 & 17 to MS-12. Tighten both bolts.



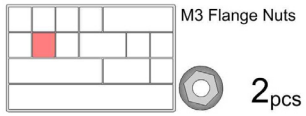
39

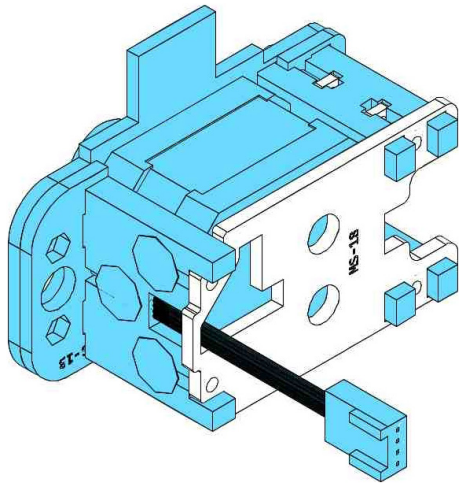
Find MS-18 & then thread the X-axis Stepper Motor cable through the large hole. Make sure to thread it through the direction shown (from un-labelled side to labelled side).



40

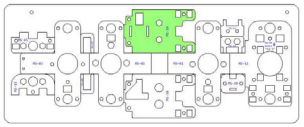
Push MS-18 all the way down until it's pressed against the motor as shown. Pull the motor cable all the way through too. Put the assembly to the side.

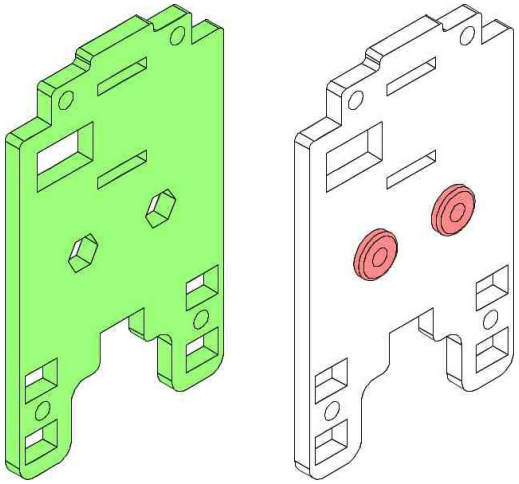




41

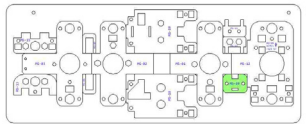
Find MS-19 & grab 2 M3 Flange Nuts and push them into MS-19 on the un-labelled side as shown. Set this piece down for one second.

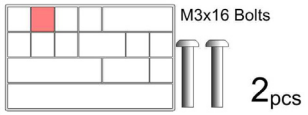


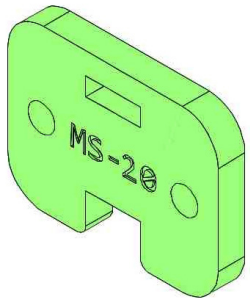


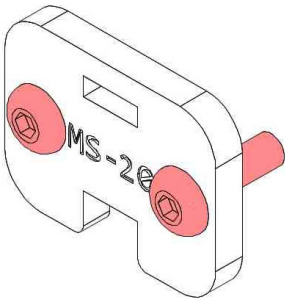
42

Find MS-20 & 2 M3x10 bolts and push them through the 2 holes in MS-20.



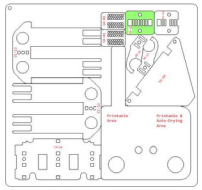


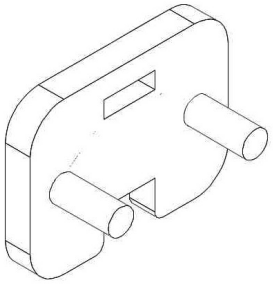


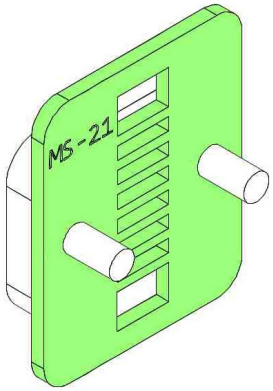


43

Find MS-21 & push it over the 2 bolts you just inserted through MS-20 as shown.

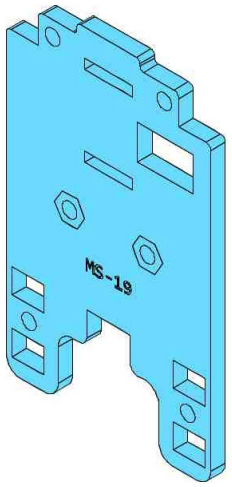


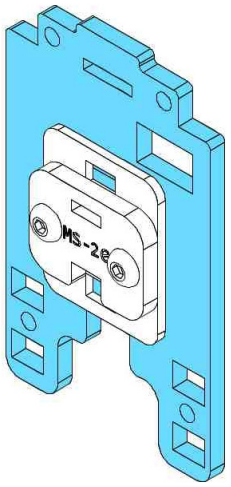




44

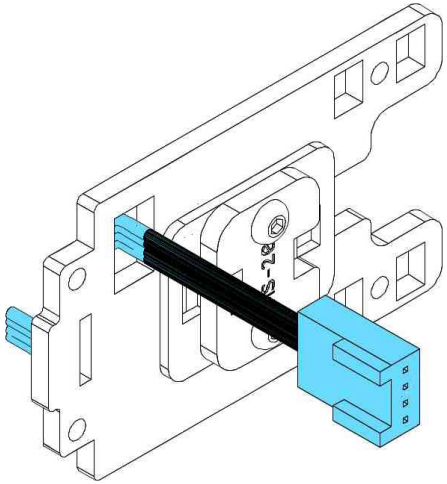
Now bolt this small assembly to the labelled side of MS-19 as shown. Tighten bolt bolts only lightly, we will loosen this part again later to clamp the y-axis belt.





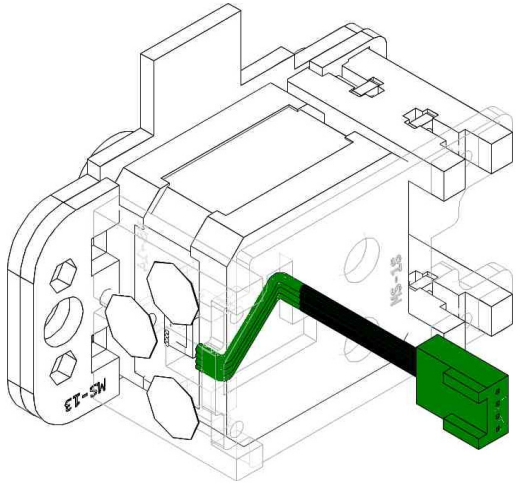
45

Thread the X-axis Stepper Motor cable through the large hole. Make sure to thread it through the direction shown (from the side *without* MS-20 & MS-21 to the side that has them bolted on).



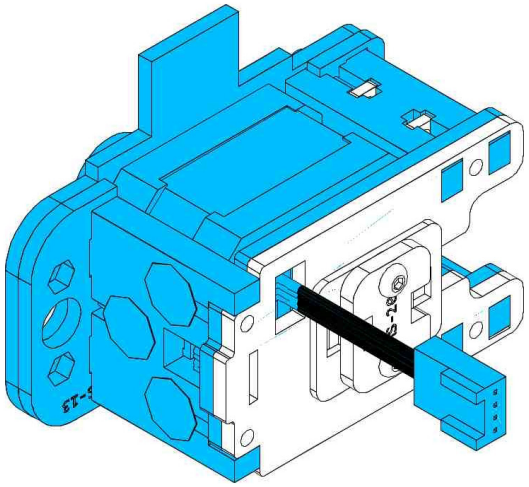
46

Now begin pushing MS-19 down the cable toward MS-18. As you press the plate onto the other, you want the motor cable to sit in the space left by MS-18. You can see how the cable should sit in this step and how it looks with MS-19 in place in the next step.



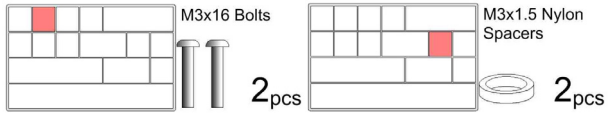
47

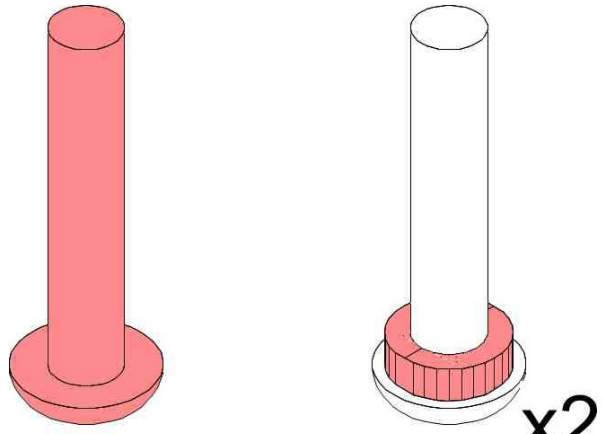
DO NOT move on until you are sure the motor cables are not being crushed between the plates as shown. Hold MS-19 in place with one hand while you continue so the cable does not come out of place.



48

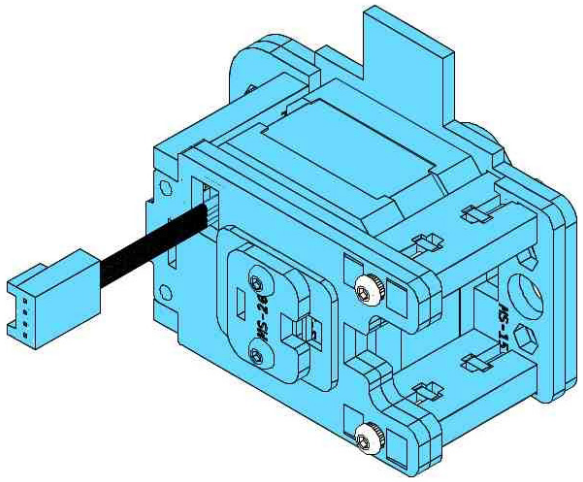
Get 2 M3x16 bolts and 2 M3x1.5mm Nylon spacers. Slide 1 spacer over each bolt.



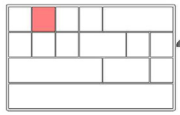


49

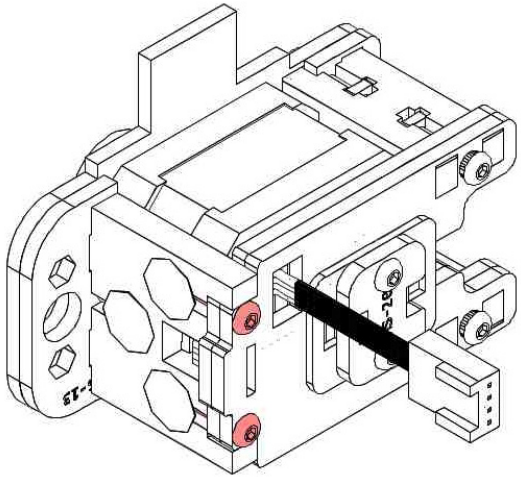
Push these bolts with their spacers through MS-19 to lock in with MS-16 & MS-17 as shown. Tighten both bolts.



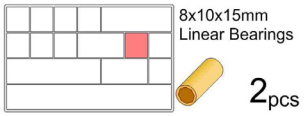
50



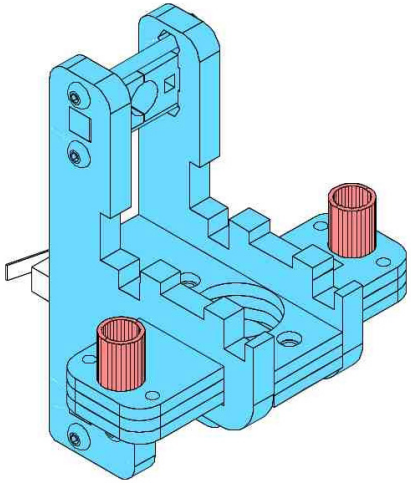
Get 2 more M3x16 bolts and push these through MS-19 to lock in with MS-14 as shown. Tighten both bolts.



51

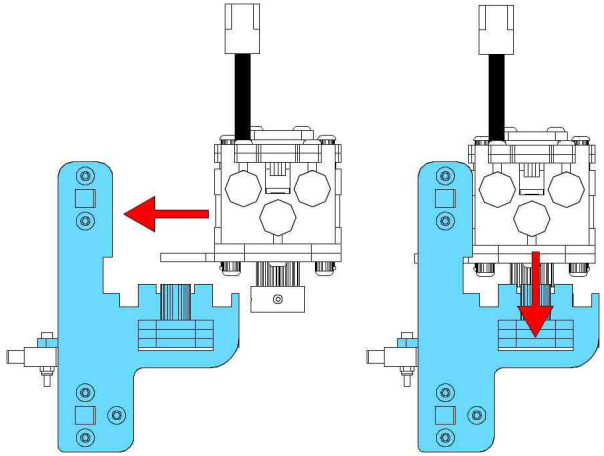


Pick up the previous assembly again. Grab 2 8x10x15 linear bearings from the mechanical kit and seat them in the large circular holes in MS-03 as shown. It helps to hold the assembly vertically as shown so the bearings stay seated in place.



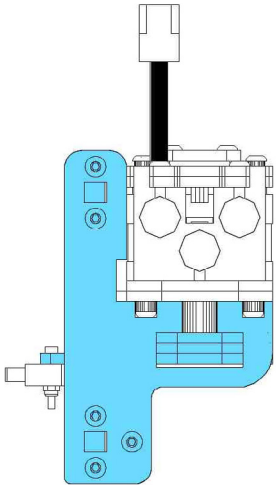
52

Slide the motor assembly horizontally into this assembly using the method shown in the 1st diagram. The tab on the motor assembly will fit snugly between the large plates of the clamp assembly. Then slide the motor assembly down using the method shown in the 2nd diagram. Teeth in the motor assembly will lock into the clamp assembly and the bearings will seat in both.



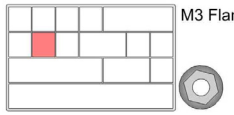
53

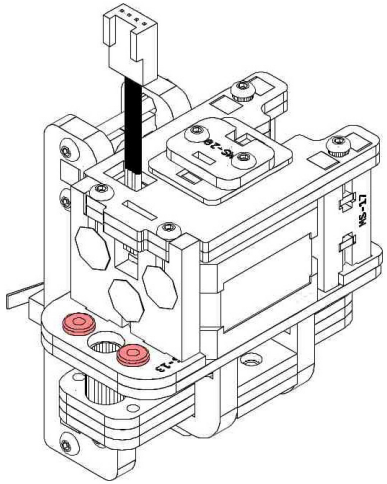
This is how the parts will appear after slotting them together.



54

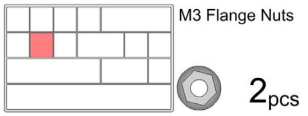
Get 2 M3 flange nuts and place them into MS-13 as shown.

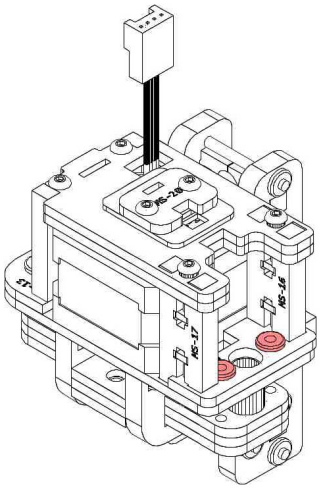




55

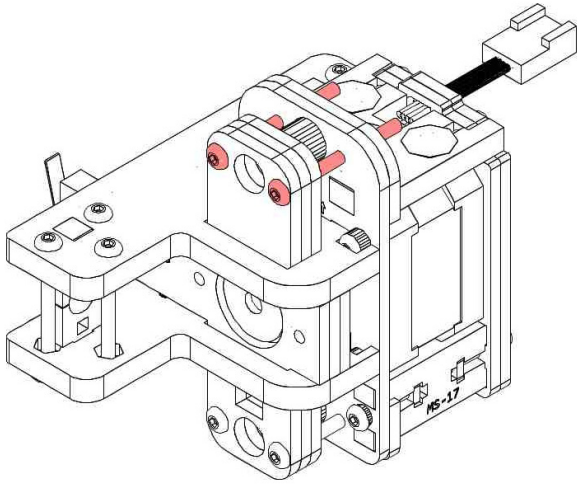
Get another 2 M3 flange nuts and place them into MS-15 as shown.





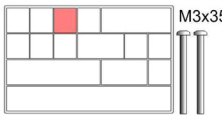
56

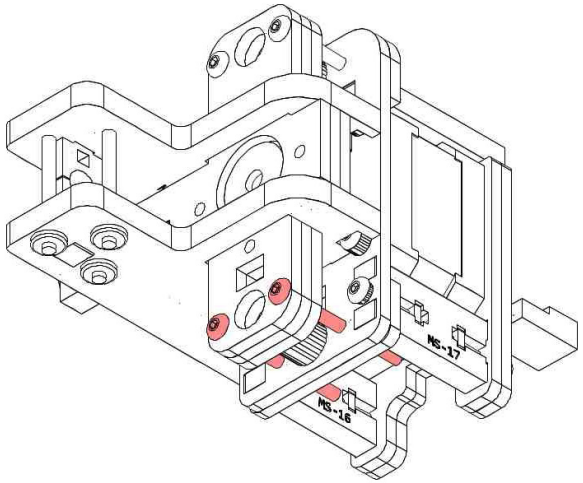
Get 4 M3x35 bolts and push them through MS-03 to engage with the M3 Flange Nuts placed in the previous steps. The positions are as shown in this step and the next. Only loosely tighten these for now. We will tighten them later when the shoulder is installed in the printer.



57

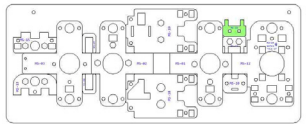
The bottom bolts.

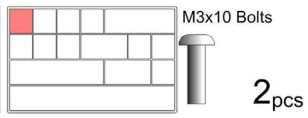


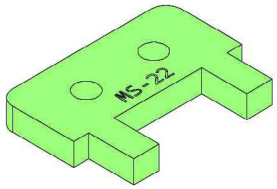


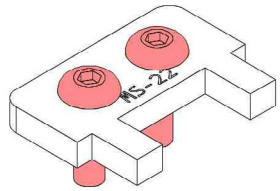
58

Find MS-22 & grab 2 M3x10 bolts and put them through the holes in the piece.



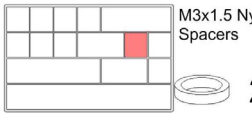


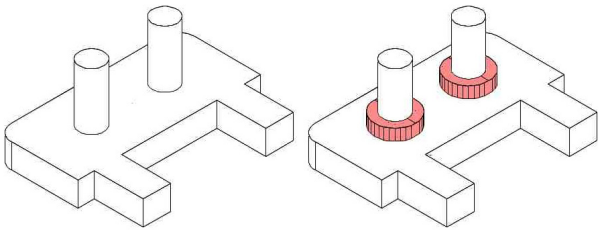




59

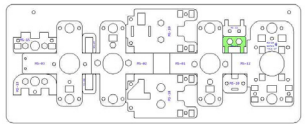
Flip MS-22 over so it lies with the bolt heads on your table. Get 2 M3x1.5 nylon spacers and place them over the bolts.

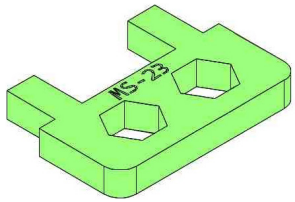


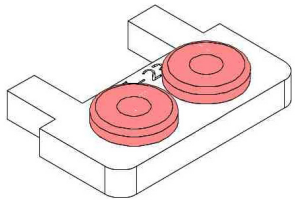


60

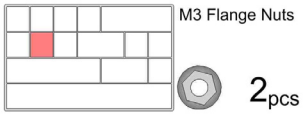
Find MS-23 & grab 2 M3 Flange Nuts and push them into MS-23 (it's easier to push them through the labelled side as shown).



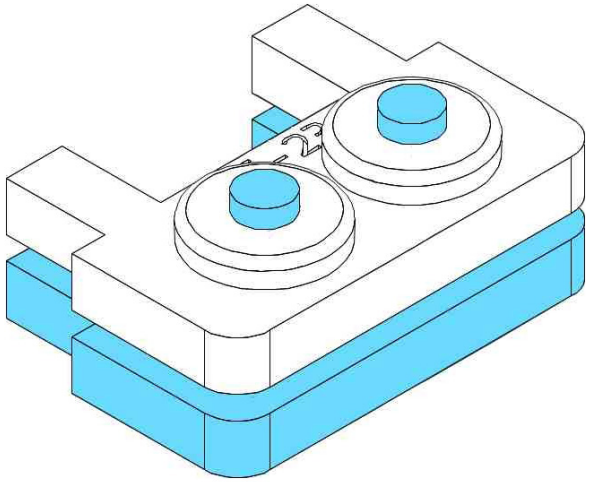




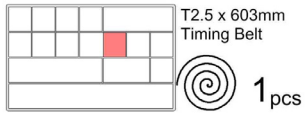
61



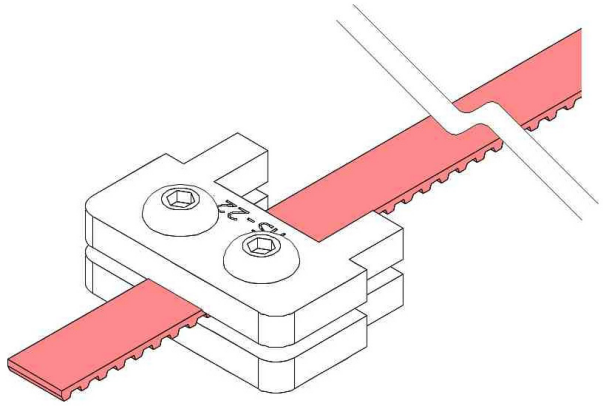
Now take MS-23 and place it over the bolts in MS-22. Hold the pieces together, pick it up and very loosely thread the bolts into the flange nuts. The parts should still be nice and loose as we'll be threading a belt between the plates.



62

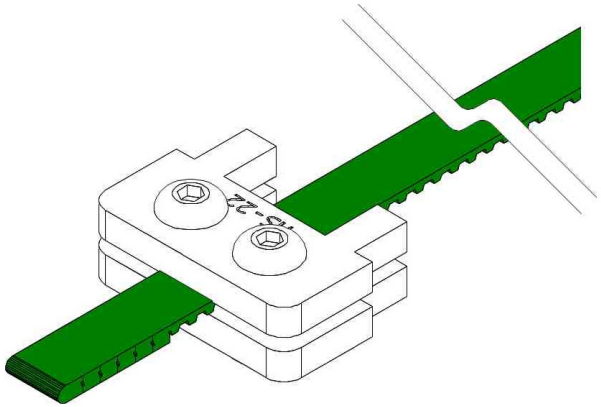


Grab one of the T2.5x603 timing belts. There will be 2 smaller belts and 1 bigger one; USE ONE OF THE SMALLER ONES. Thread the CURLED UP END of the belt between MS-22 & MS-23 (using the curled end makes things a lot easier later). Put the smooth side on the same side as the bolt heads as shown and just poke a small amount of belt out the end without tabs as shown.



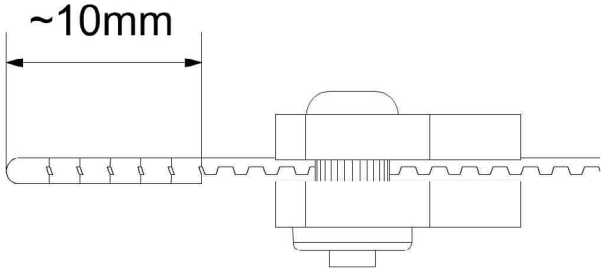
63

Fold the short end of belt back over on itself. You want the doubled over section to be about 10mm (~1/2 inch) long when folded as shown. This doesn't have to be accurate.



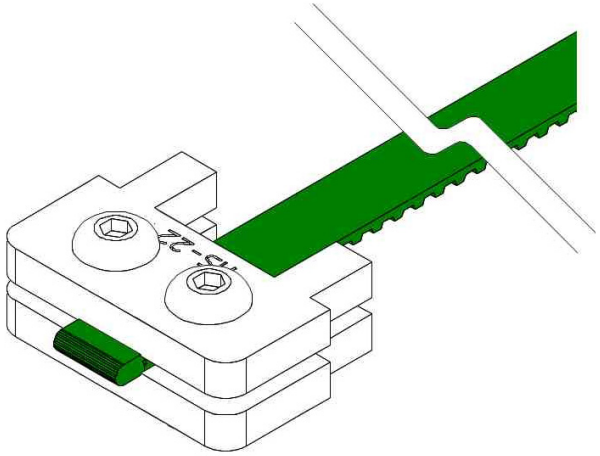
64

Near enough is good enough, just don't use too much.



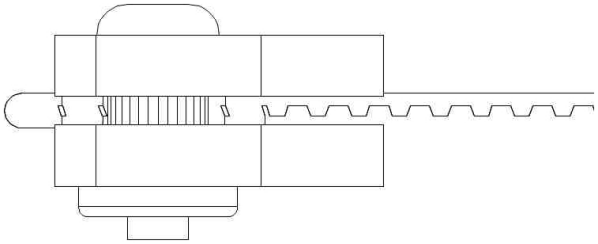
65

Now poke the folded end back between MS-22 & MS-23 just so there is a small amount of folded belt still poking out the end. This part sticking out bubbles out a little bit & helps to prevent the belt coming loose. Finally tighten the bolts to clamp the belt in place. DON'T TIGHTEN TOO MUCH as you might break the pieces - just make sure the belt won't come out when pulled tightly.



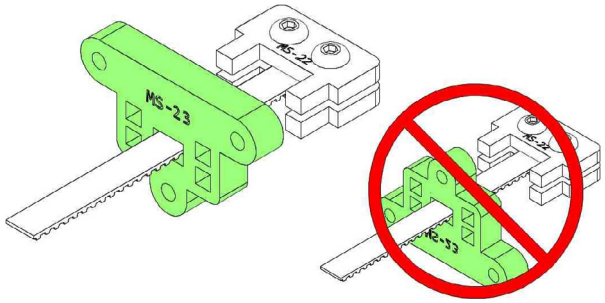
66

Looks roughly like this.



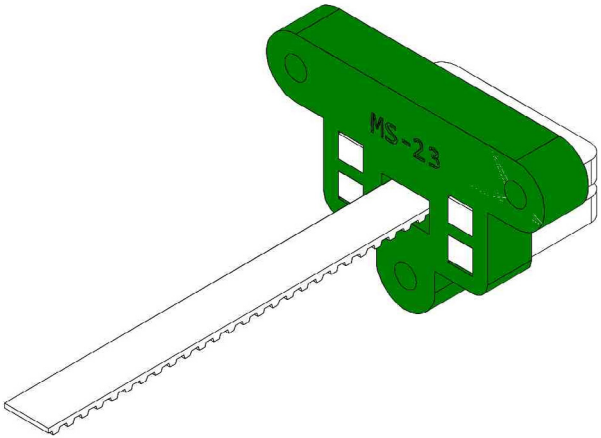
67

Find MS-24 (note that batch 1 printers have this part mislabelled as MS-23). Thread the belt through the centre hole on MS-24 - make sure the smooth side of the belt is facing the flat top edge of MS-24 as shown.

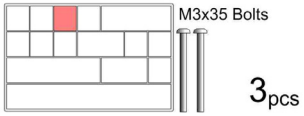


68

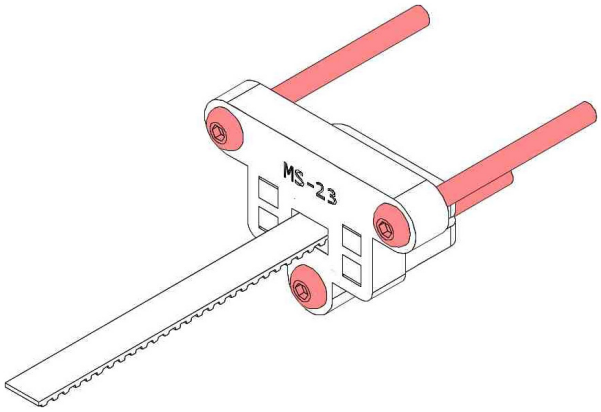
Slide it over MS-23 & MS-24 so they mate as shown.



69

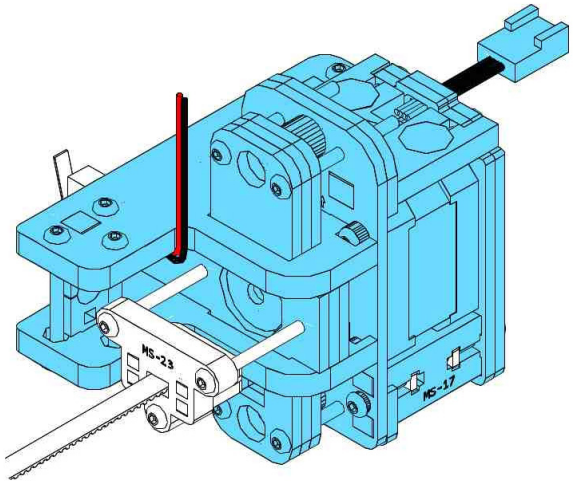


Grab 3 M3x35 bolts and push them through MS-24 as shown.



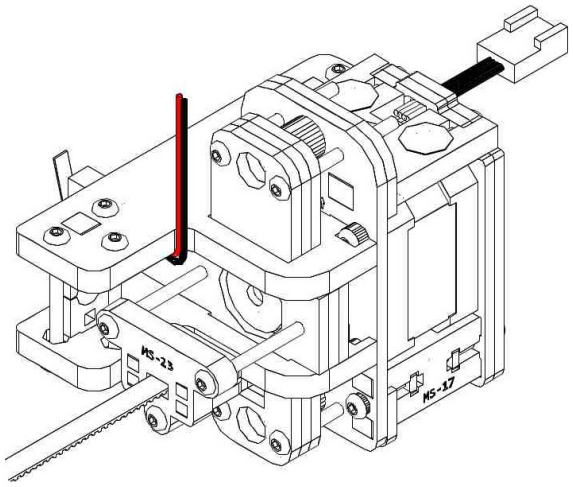
70

First thread the limit switch cables out of the assembly as shown. Now take this assembly and hand thread the bolts into the motor shoulder assembly made previously as shown. Note that you won't be able to hand thread them very far as the bolts hit the nylon in the Nyloc nuts - this is intentional.



71

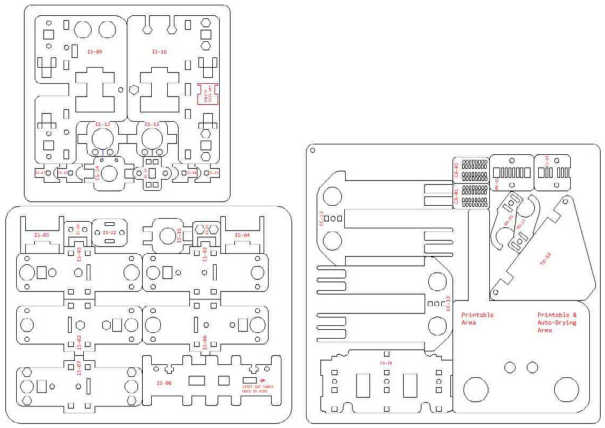
Your Motor Shoulder is all done!! Take a quick break, give yourself a high five and then move onto the next section




IDLER SHOULDER

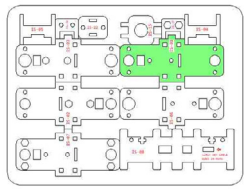
1

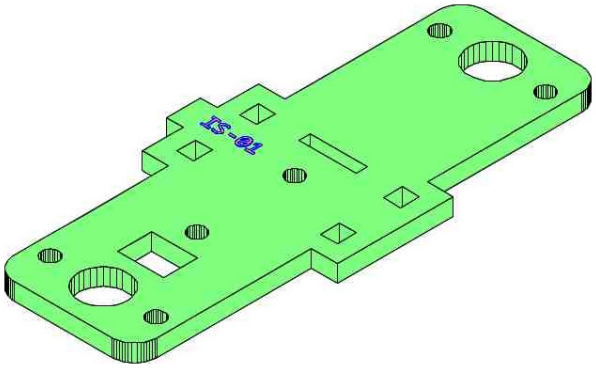
This section is for assembling the Idler Shoulder which mounts the x-axis idler pulley and linear rods and moves along the y-axis linear rods. For this section you will need your mechanical kit, screwdriver kit, laser cut spanners & the 3 laser cut plates shown here. The top left is in 6mm, bottom left in 3mm and bottom right in 1.5mm.



2

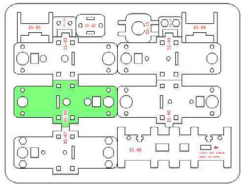
Find IS-01 & lay it flat with the labelled side up as shown.

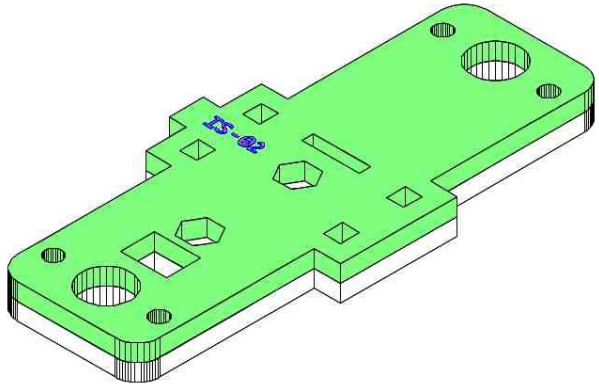




3

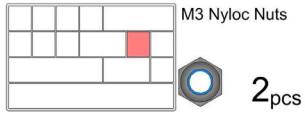
Find IS-02 & lay it on top of IS-01 as shown.

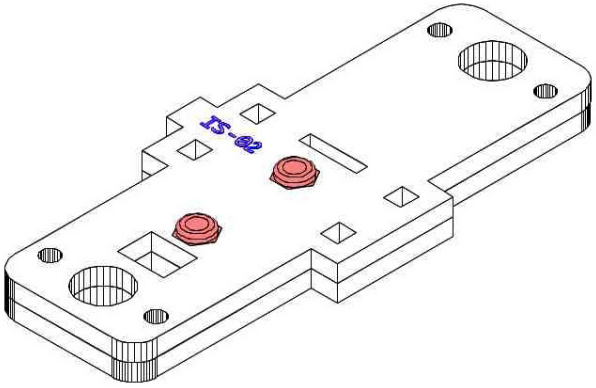




4

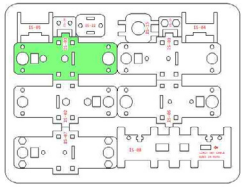
Grab 2 M3 Nyloc nuts from the mechanical kit and slide them into the hexagonal holes in IS-02. NOTE: make sure the Nyloc nuts are placed with the nylon facing up (i.e.. make sure you can see the blue part).

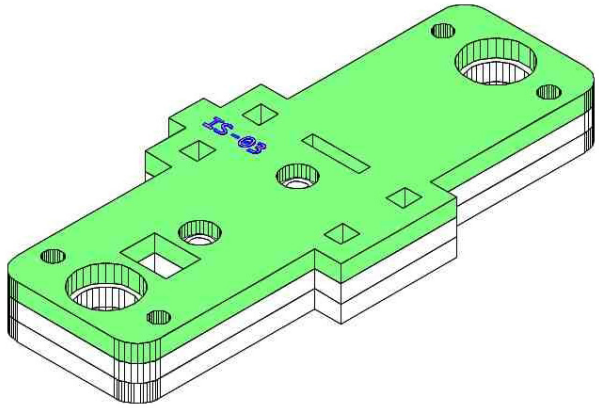




5

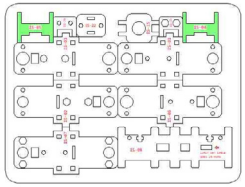
Find IS-03 & lay it on top of IS-02 as shown.

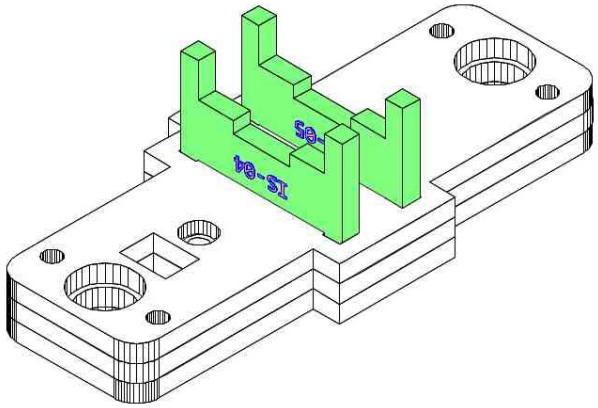




6

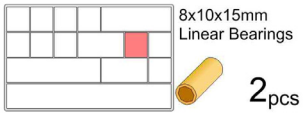
Find IS-04 & IS-05 & key them into them IS-03 as shown.

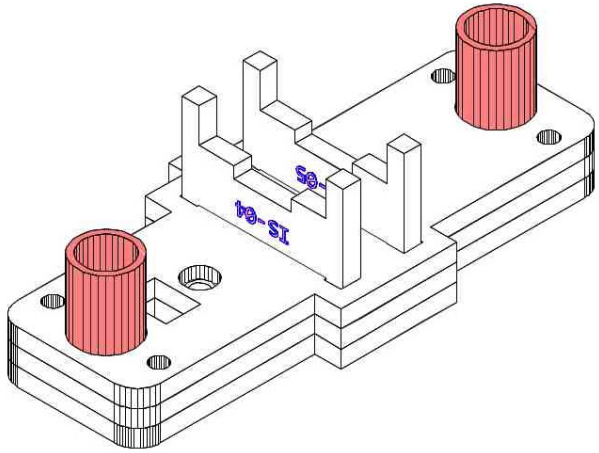




7

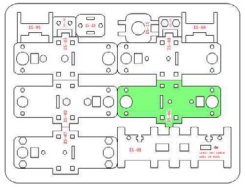
Grab 2 8x10x15 linear bearings from the mechanical kit and seat them in IS-03.

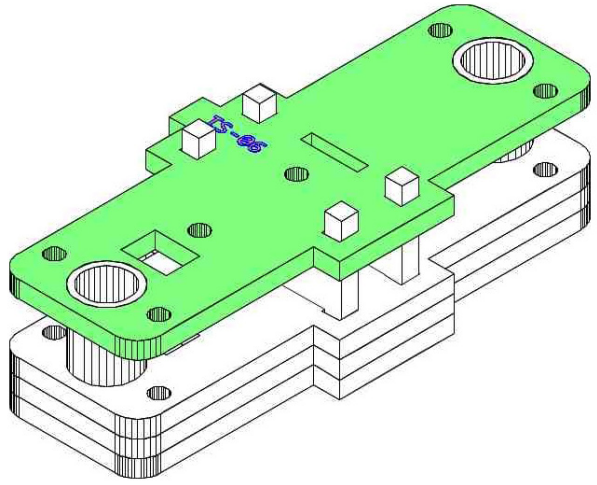




8

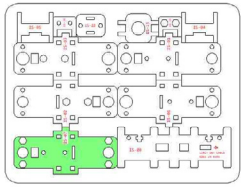
Find IS-06 & lay it on top of IS-04 and IS-05 as shown, the linear bearings should sit flush with the part.

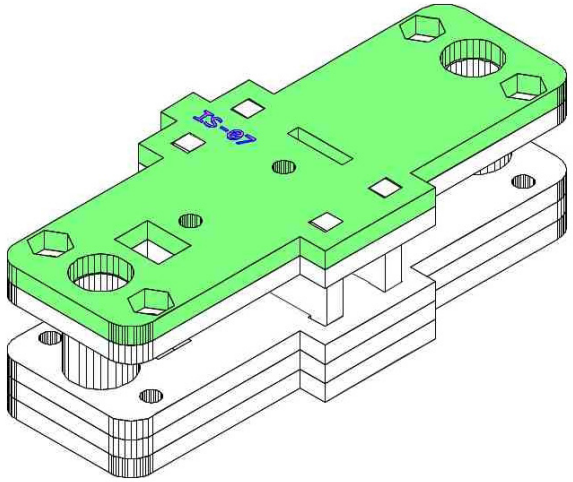




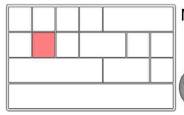
9

Find IS-07 & lay it over IS-06 as shown. IS-04 and IS-05 will key into the part but IS-07 will lay flat over the bearings.

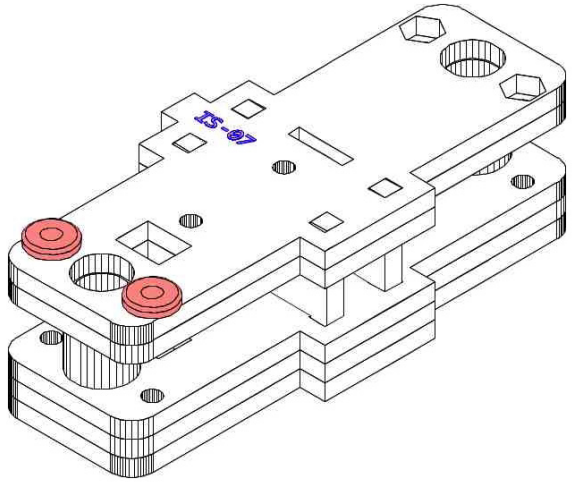




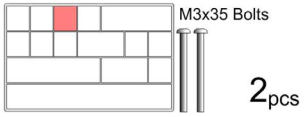
10



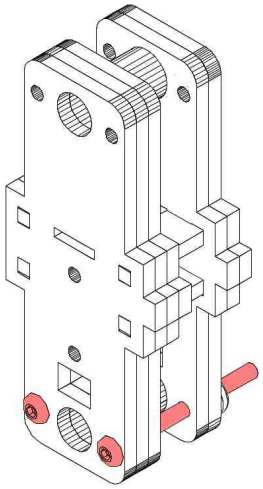
Grab 2 M3 flange nuts from the mechanical kit and push them into the 2 bottom hexagonal holes of IS-07.



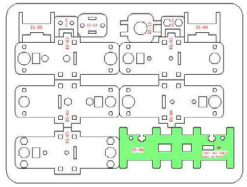
11



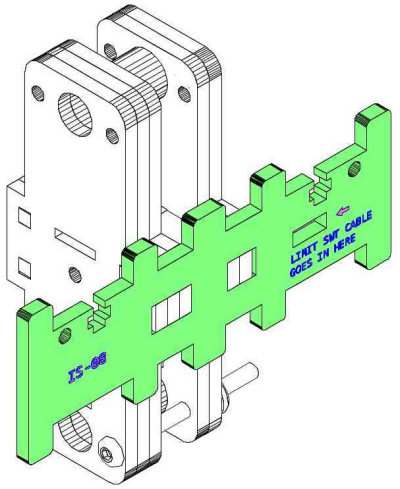
Grab 2 M3x35 bolts and thread them through the flange nuts you just placed. JUST HAND TIGHTEN them for now, they're just temporarily keeping things together.



12

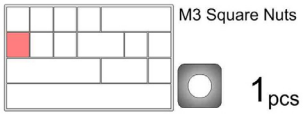


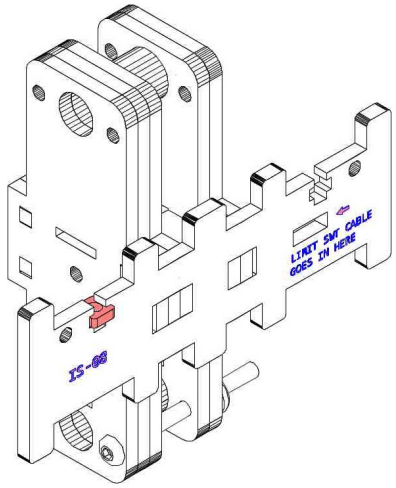
Find IS-08 & key it into the other parts as shown.



13

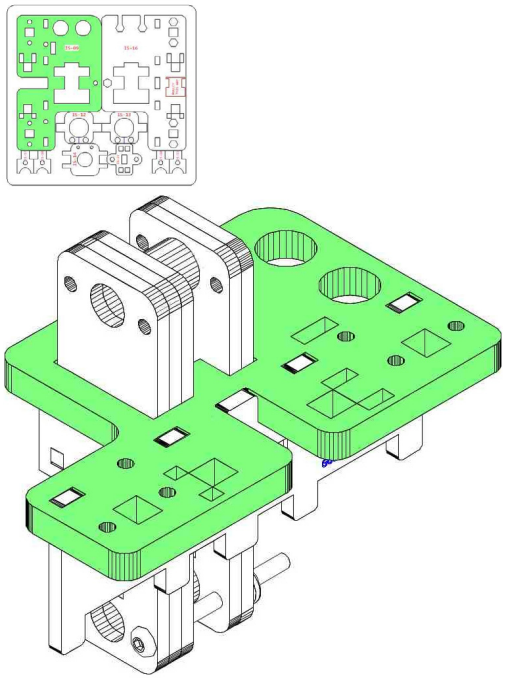
Slide an M3 Square nut into IS-08 as shown (you may prefer to do this after the next step because you'll have to keep the nut in place during the next step - whatever works for you).





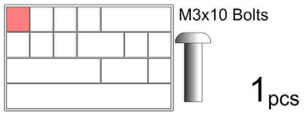
14

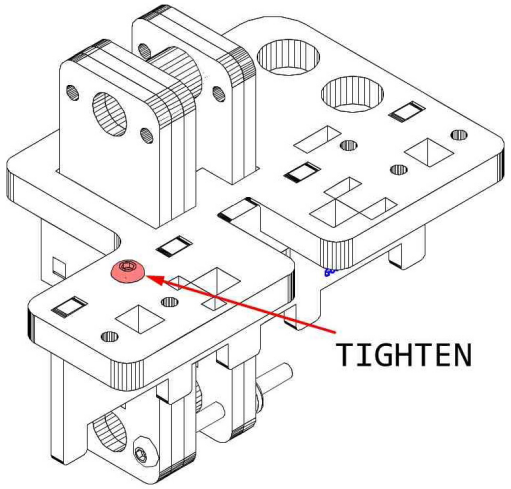
Find IS-09 & then slide it over the sub-assembly as shown. NOTE: the label is facing downward, it's important to use the orientation shown.



15

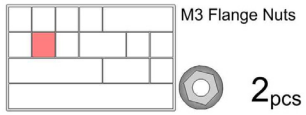
Now take an M3x10 bolt from the mechanical kit and slide it through IS-09 and tighten it into the nut you placed previously - it doesn't have to be too tight. This will keep all of the parts of the assembly in place so you don't have to hold them together anymore.

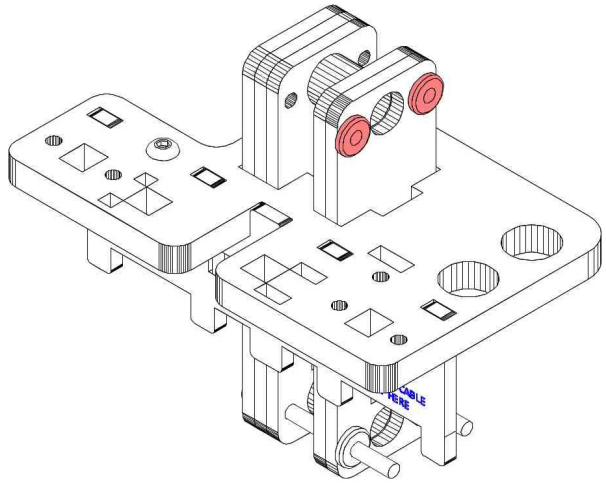




16

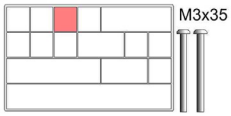
Place 2 M3 flange nuts into the top hexagonal holes in IS-07.

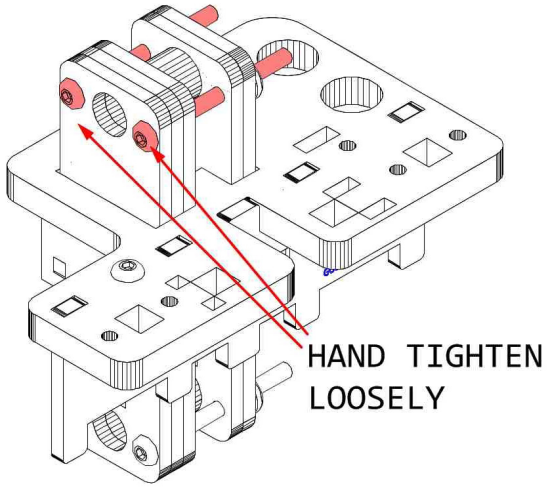




17

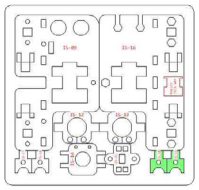
Hand thread 2 M3x35 bolts through the flange nuts you just placed as shown. JUST HAND TIGHTEN them loosely for now, we can tune how tight they are later.

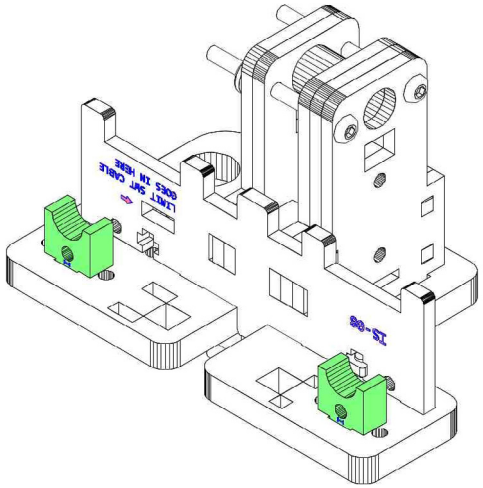




18

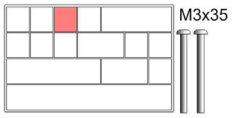
Find IS-10 and IS-11 & place them into IS-09 as shown.

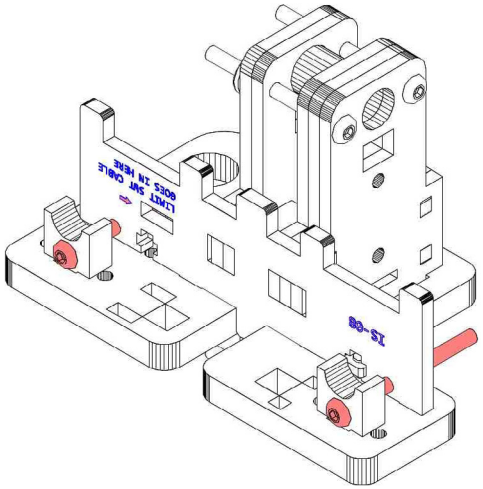




19

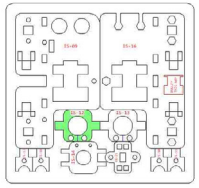
To keep these 2 parts in place, grab 2 M3x35 bolts and slide them through to IS-08 as shown. These will only stay temporarily to help with assembly. Place this whole assembly to the side for now.

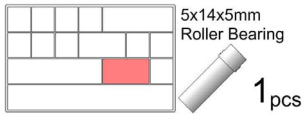


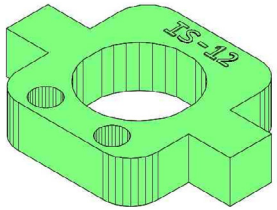


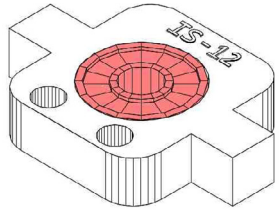
20

Find IS-12 & lay it flat. Take a 5mm ID Roller bearing from the mechanical kit (they're in the plastic tube) and press it into IS-12. Use your thumb to press it flat with the table your part is laying on.



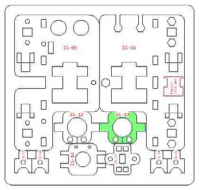


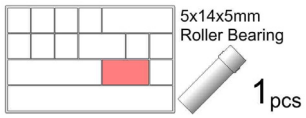


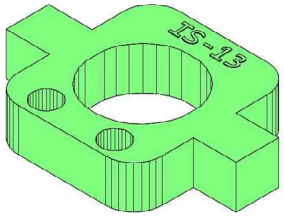


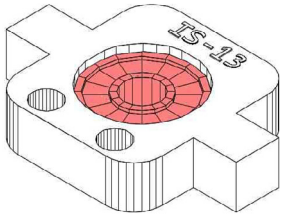
21

Find IS-13 & lay it flat. Take a 5mm ID Roller bearing from the mechanical kit (they're in the plastic tube) and press it into IS-12. Use your thumb to press it flat with the table your part is laying on.



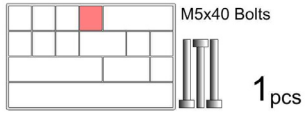


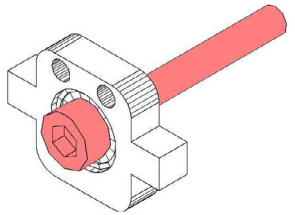


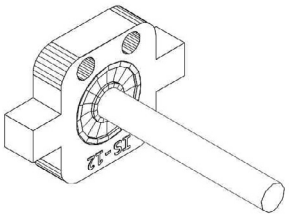


22

Grab one the M5x40 bolts from the mechanical kit and place it through the bearing in IS-12.

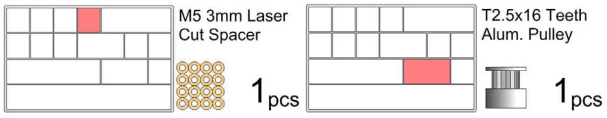


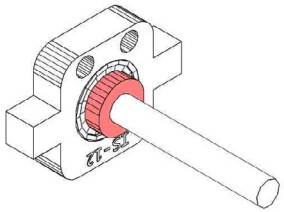


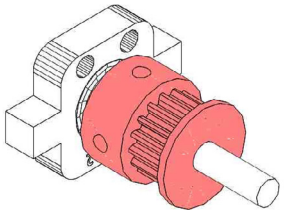


23

Pop one of the laser cut 5mm ID spacers out of the set in the mechanical kit, slide it onto the M5 bolt as shown. Next, grab a T2.5x16 Alum. Pulley and slide it onto the bolt teeth side out as shown. DOUBLE CHECK THE PULLEY ORIENTATION IS CORRECT.

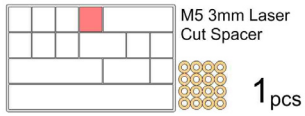


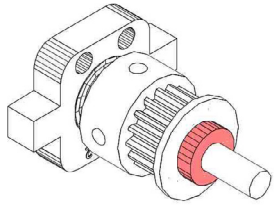


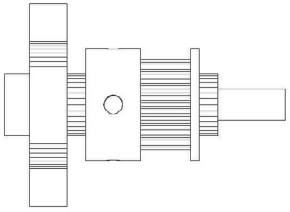


24

Pop another one of the laser cut 5mm ID spacers out and slide it against the pulley as shown.

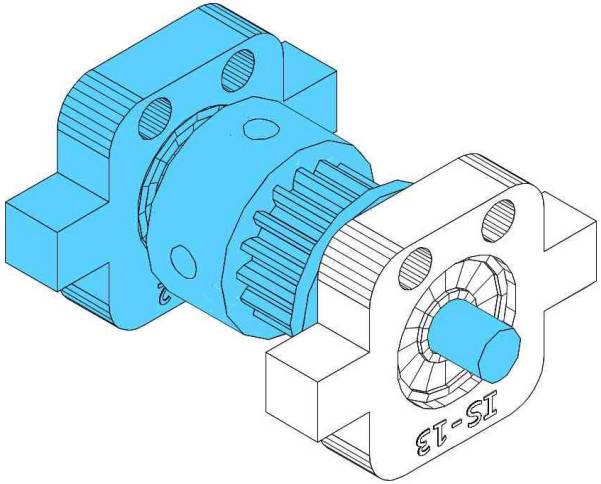






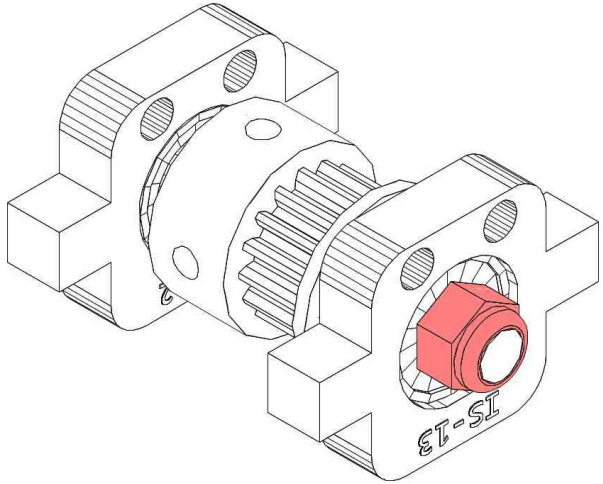
25

Slide IS-13 with the bearing over the M5 bolt as shown.



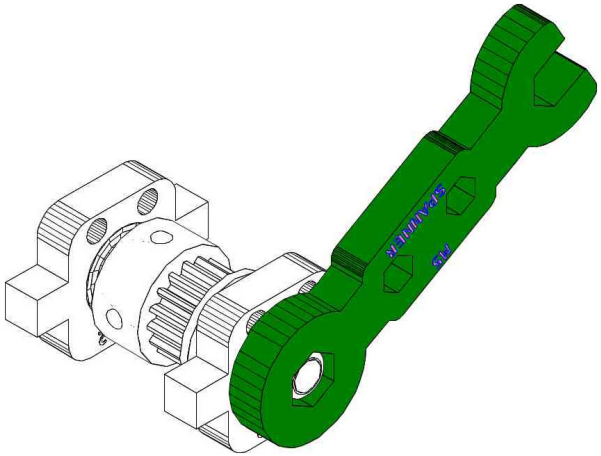
26

Take an M5 Nyloc nut and start threading onto the M5 bolt.



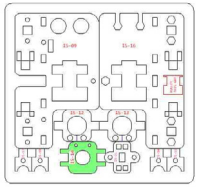
27

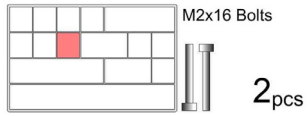
Use the M5 Spanner in your kit to tighten the nut - don't be too over zealous with tightening the nut.

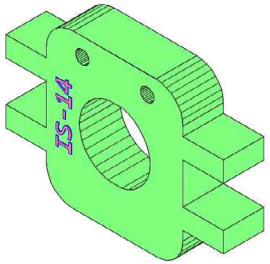


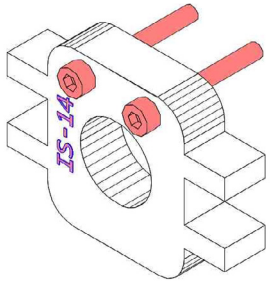
28

Find IS-14. Find 2 M2x16 bolts and slide them into IS-14.

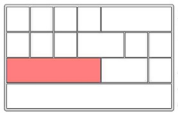






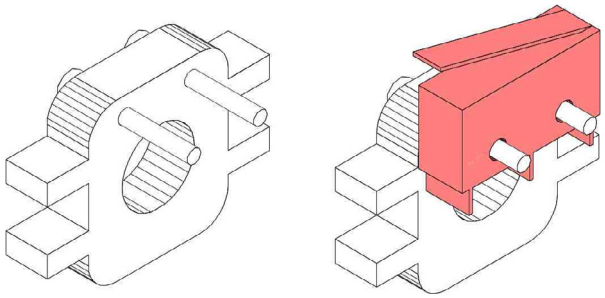


29

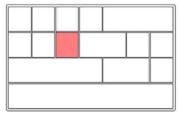


1pcs

Take the X-MIN limit switch from the cable bundle and place it over the 2 M2 bolts - there are 4 limit switches, there are 2 identical ones with the longest cables - use of these. MAKE SURE THE ORIENTATION IS AS SHOWN.

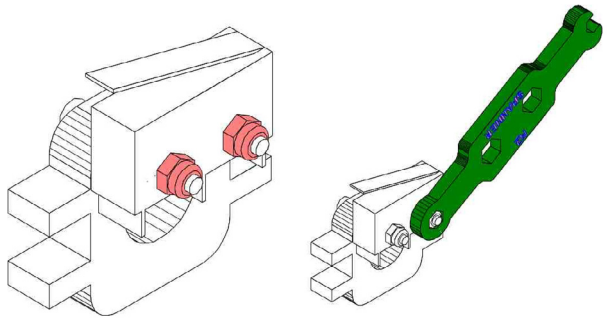


30



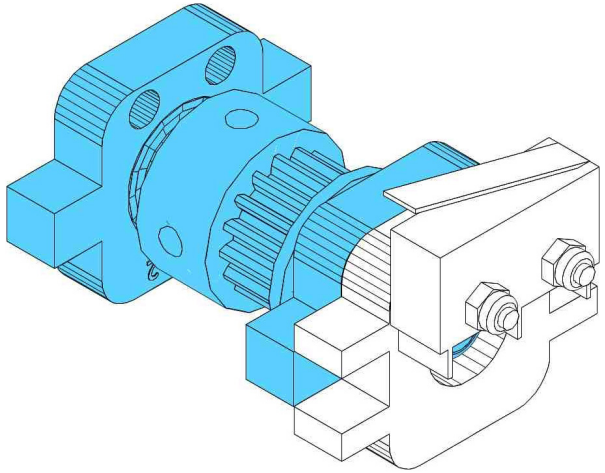
2pcs

Thread 2 M2 Nyloc nuts over the bolts, then take the M2 Spanner and use it to tighten both nuts.



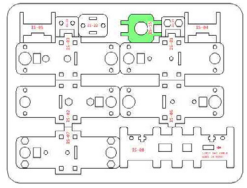
31

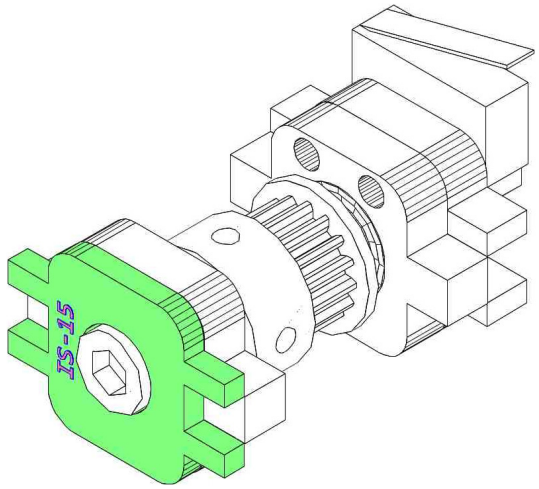
Place IS-14 and the limit switch against IS-13. The M2 bolts will key into the holes in IS-13. Make sure the switch is on the side of the pulley with the teeth as shown. NOTE: these parts won't stay together until they are keyed into another part, this just shows you how they will sit.



32

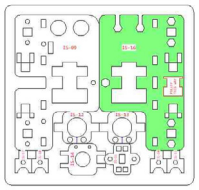
Find IS-15 & place it up against the other side of your assembly as shown. We'll be sliding these into another part to lock them in place next. Place your thumb on IS-15 and forefinger on IS-14 & gently squeeze the assembly to press the bearings into IS-14 & IS-15.

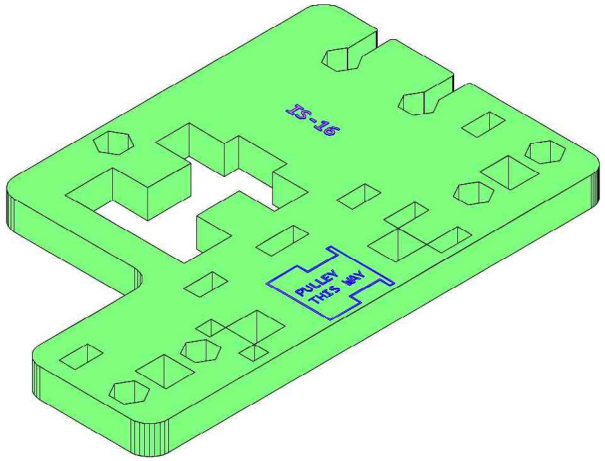




33

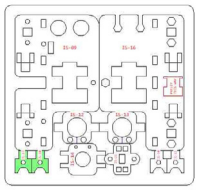
Find IS-16 & lay it flat with the labels face up.

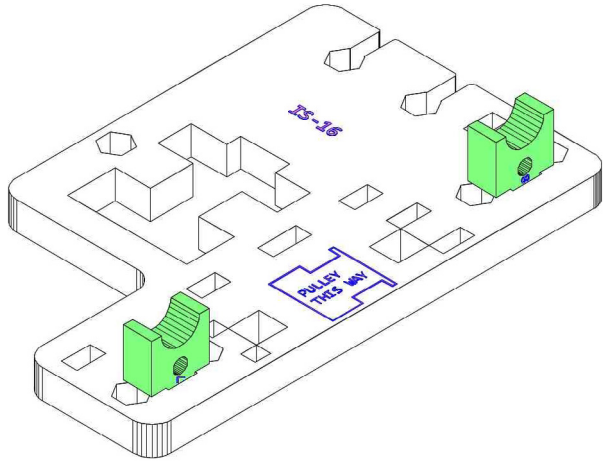




34

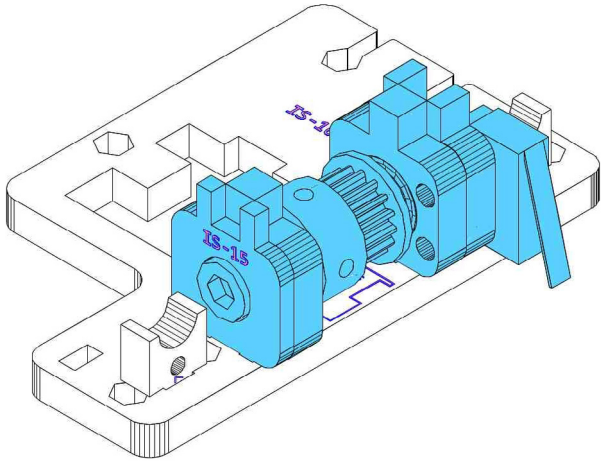
Find IS-17 and IS-18 & slide them into IS-16 as shown.





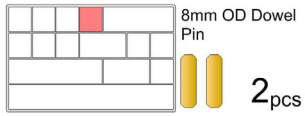
35

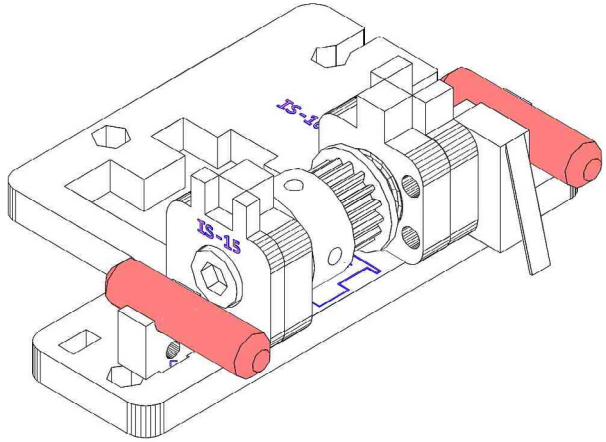
Now you are going to take the assembly with the pulley and slide it into IS-16 as shown. NOTE: The limit switch must be face out and the pulley must be in the orientation indicated on the label (and shown here). DOUBLE CHECK THIS BEFORE MOVING ON. NOTE: If you're having trouble inserting these parts, try sliding the bearings slightly in/out of their holders.



36

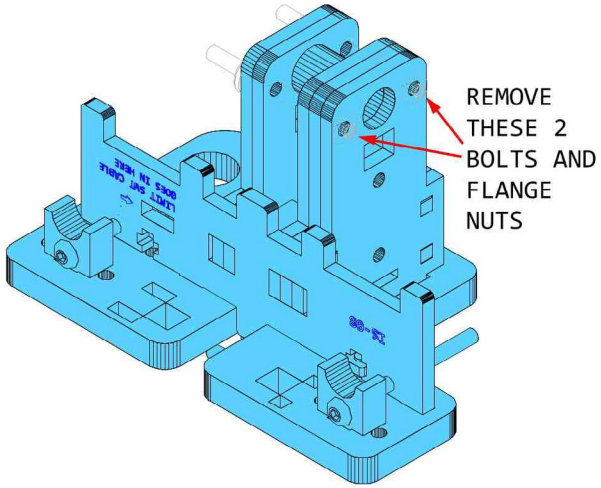
Take the 2 8mm wooden dowels from the mechanical kit and place them over IS-17 and IS-18 as shown. These are just to help with the assembly as you press the sub-assemblies together - they are surrogate linear rods.





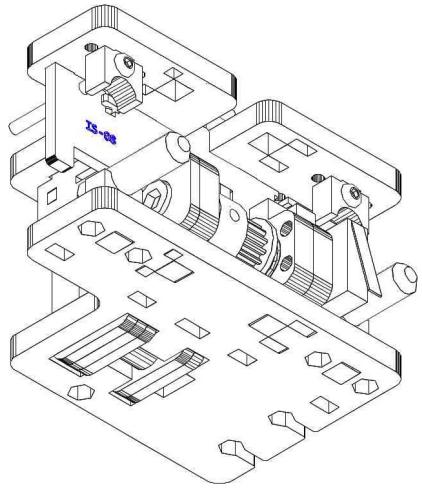
37

Grab the assembly we set aside before, we have to remove the 2 bolts and flange nuts indicated before continuing... sorry about that.



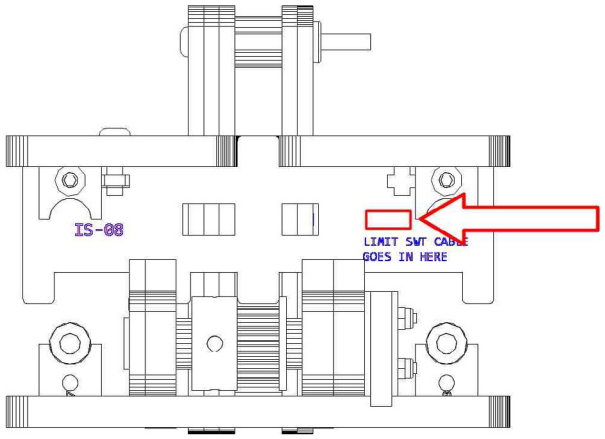
38

BEFORE PRESSING THE ASSEMBLIES TOGETHER make sure to thread the limit switch cable through the hole in IS-08 as shown in the next step. Now we need to combine the 2 assemblies together as shown, sliding IS-16 over the parts clamping the linear bearing.



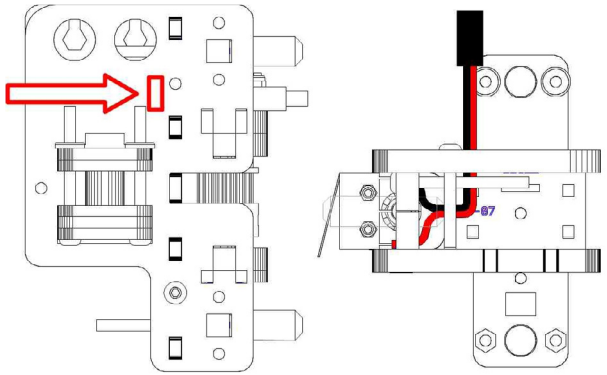
39

This is the hole through which the limit switch cable needs to be threaded as you put the sub assemblies together.



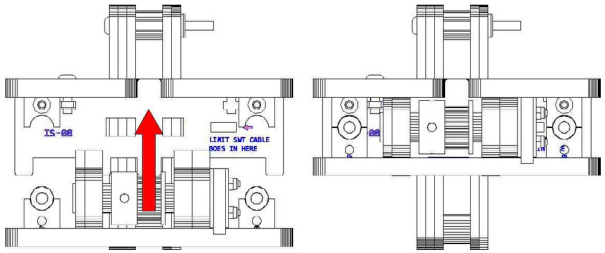
40

This cable will then also have to pass through IS-09 as shown. You may find it easier to push the cable through this hole while the 2 sections are still separated but you can also do it while they're together.

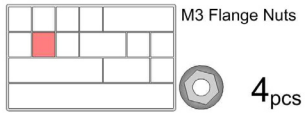


41

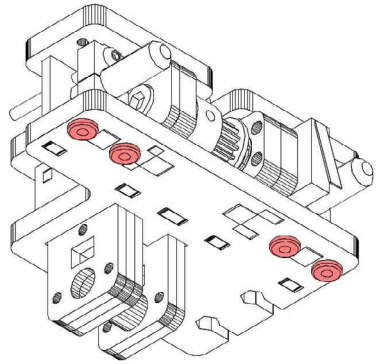
After the cable has been threaded through, press the sections together as indicated. You may have to play around with some of the parts so that they key together correctly. Hold the assembly in place for the next step.



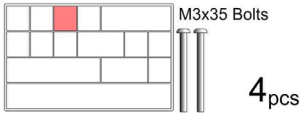
42



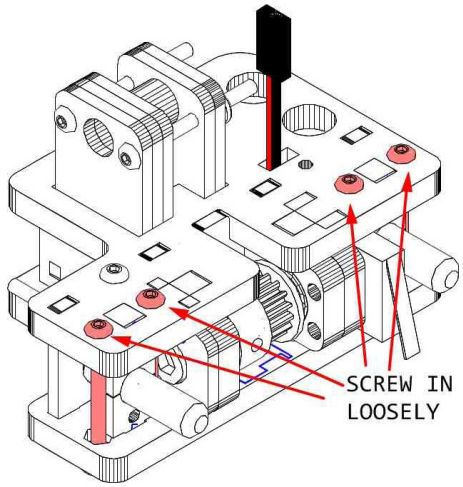
Take 4 M3 flange nuts and 4 M3x35 bolts from the mechanical kit. For the positions shown in this and the next step, place the flange nuts and then thread through the corresponding M3x35 bolt one by one. Don't tighten the bolts too much just yet but make sure the dowels are loosely held in place.



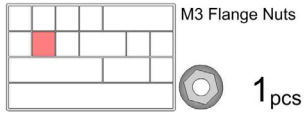
43



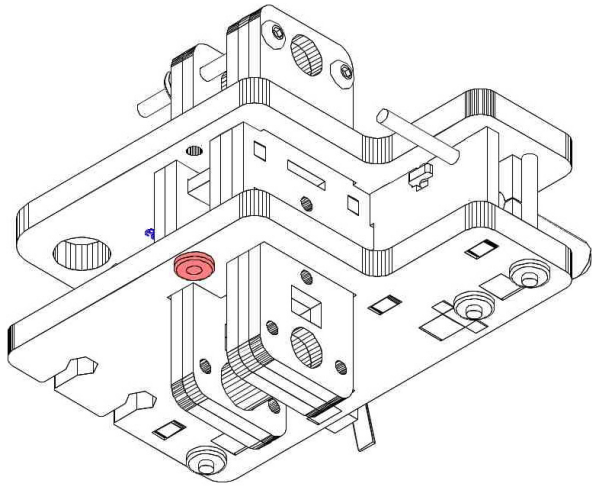
The assembly will now hold itself together so don't stress about holding it together carefully.



44

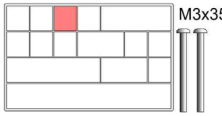


Take another M3 flange nut and M3x35 bolt and do the same for the rear position indicated in this and the next step.

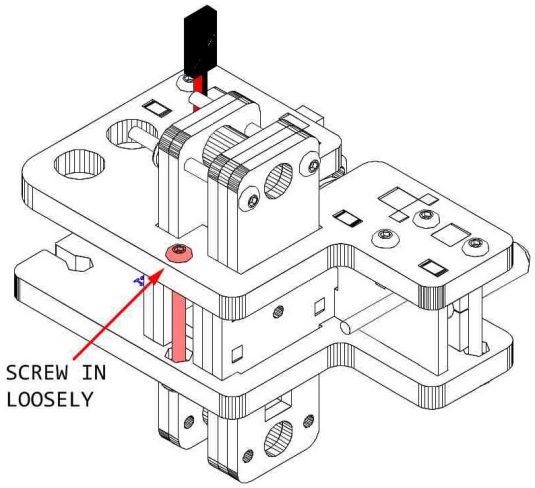


45

This is where the bolt goes.

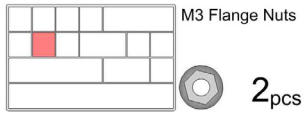


1pcs

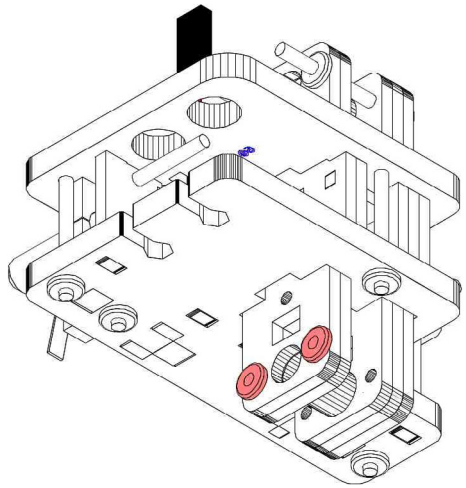


46

Take 2 M3 flange nuts and place them in the bottom positions shown (where we took them out before).

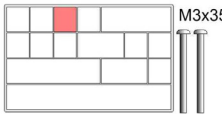


2pcs

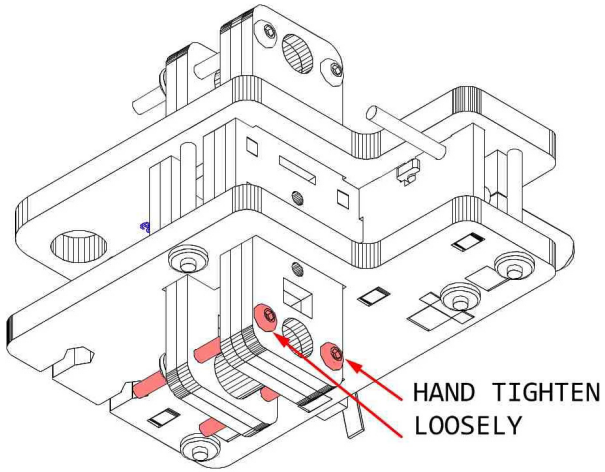


47

Thread 2 M3x35 bolts as indicated (again the same place we took them out before) tighten them loosely.

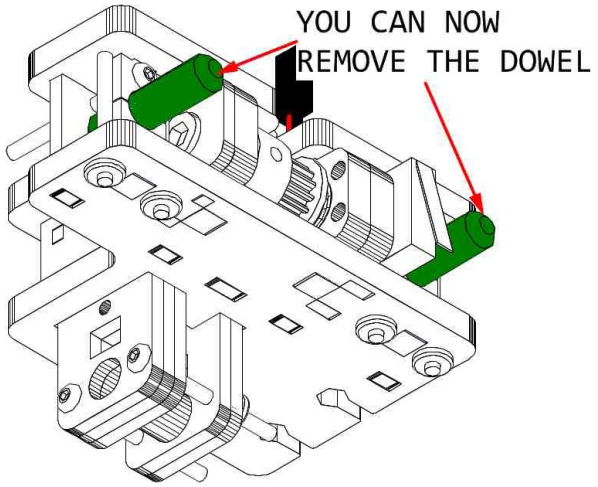


2pcs



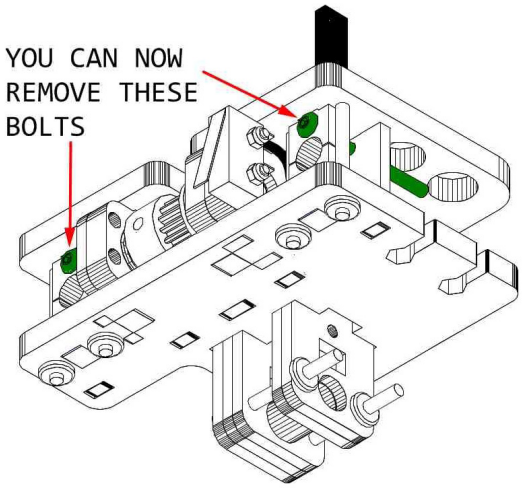
48

Now that the assembly will hold itself together, you can remove the wooden dowels.



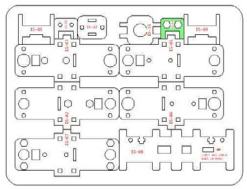
49

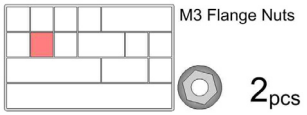
You can also remove these bolts, put them back in your mechanical kit.

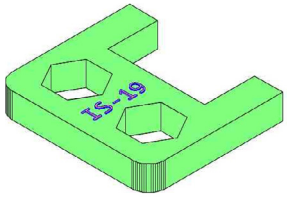


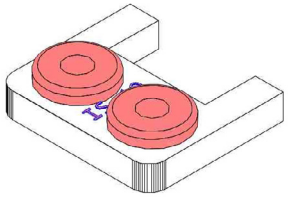
50

Find IS-19 & lay it flat. Grab 2 M3 flange nuts and press them into IS-19 as shown.



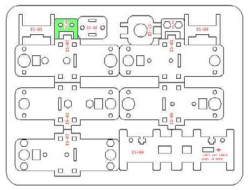


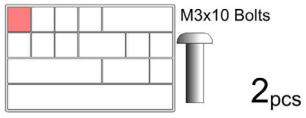


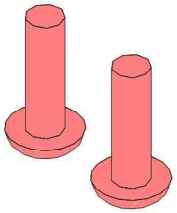


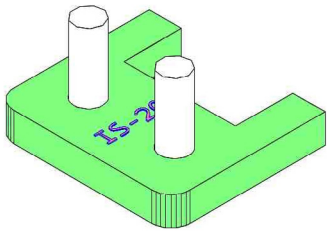
51

Find IS-20 & then take 2 M3x10 bolts from the mechanical kit and push them through the part.



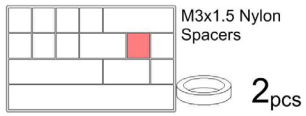


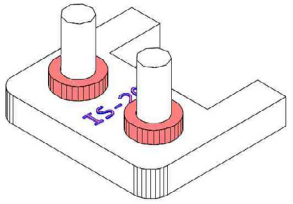


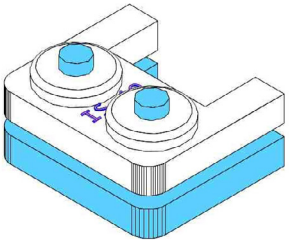


52

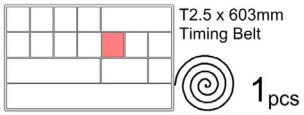
Grab 2 M3x1.5mm nylon spacers from the mechanical kit and place them over the bolts in IS-20 as shown. Then loosely thread these bolts into the flange nuts in IS-19. The bolts should remain quite loose as we are about to slide a belt between the plates.



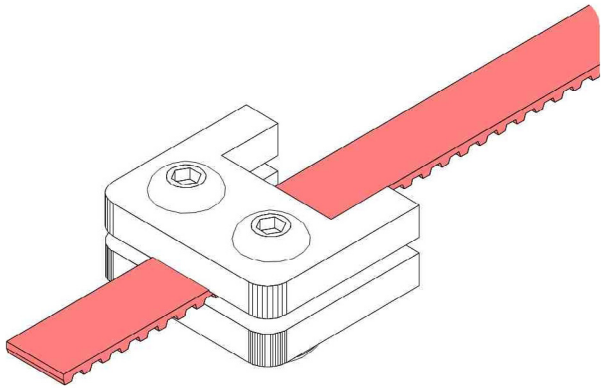




53

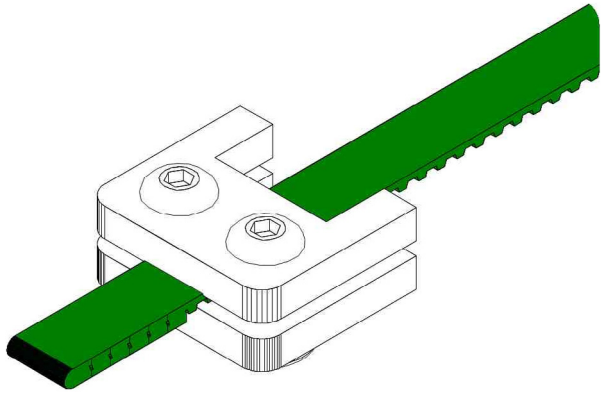


Grab one of the T2.5x603 timing belts. There will be 2 smaller belts and 1 bigger one; USE ONE OF THE SMALLER ONES. Thread the CURLED UP END of the belt between IS-19 & IS-20 (using the curled end makes things a lot easier later). Put the smooth side on the same side as the bolt heads as shown and just poke a small amount of belt out the end without tabs as shown.



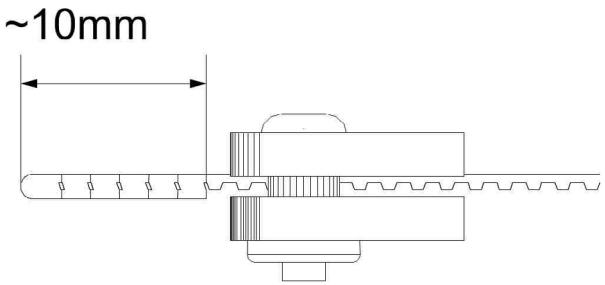
54

Fold the end of belt back over on itself. You want the doubled over section to be about 10mm (~1/2 inch) long when folded as shown. This doesn't have to be accurate.



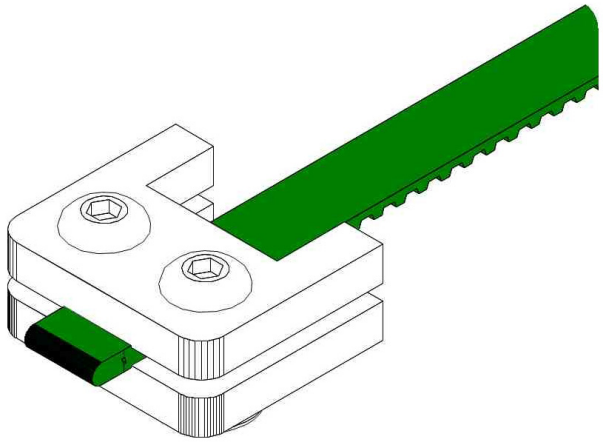
55

Near enough is good enough, just don't use too much.



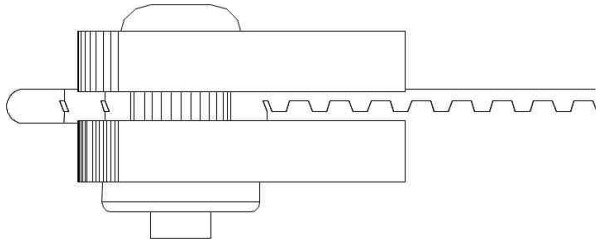
56

Now poke the folded end back between IS-19 & IS-20 just so there is a small amount of folded belt still poking out the end. This part sticking out bubbles out a little bit & helps to prevent the belt coming loose.



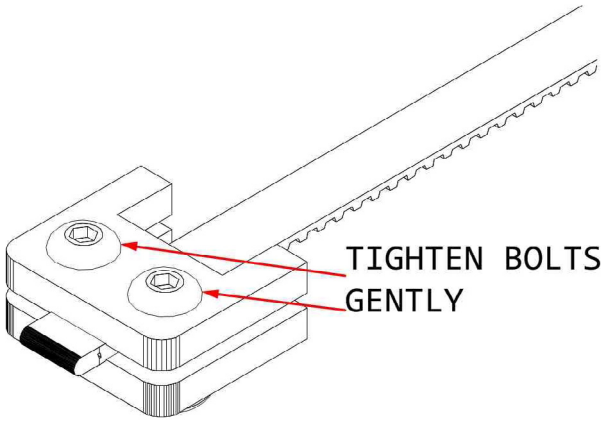
57

Looks roughly like this.



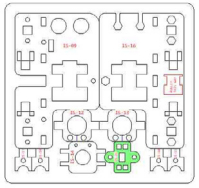
58

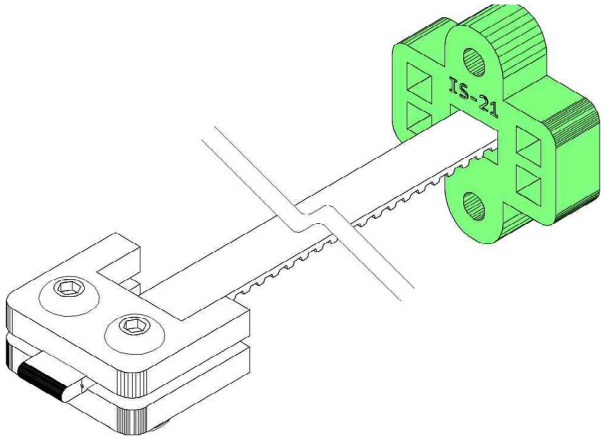
Finally tighten the bolts to clamp the belt in place. DON'T TIGHTEN TOO MUCH as you might break the pieces - just make sure the belt won't come out when pulled tightly.



59

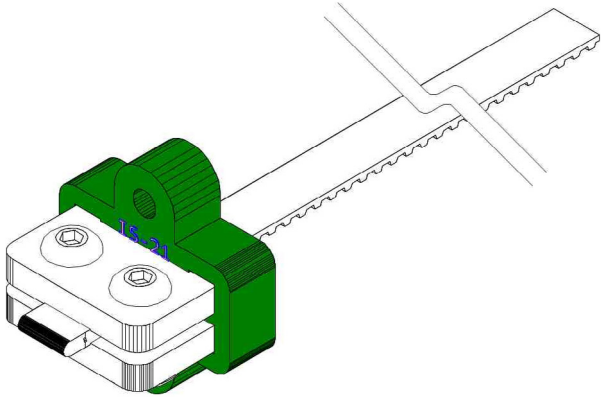
Find IS-21 & slide it over the other end of the belt as shown.





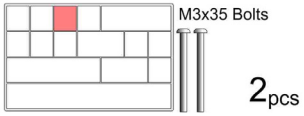
60

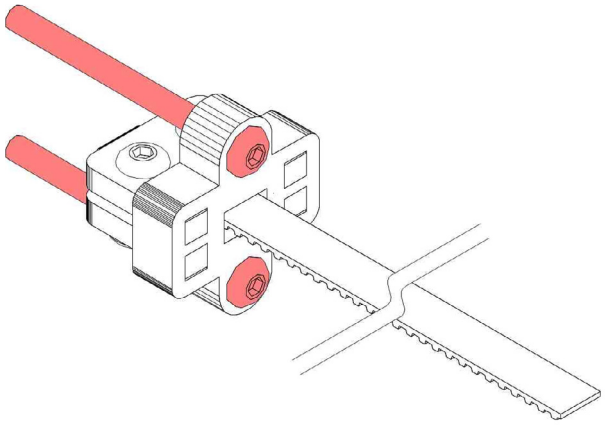
Push it all the way down to IS-19 & IS-20 so they key together as in the image.



61

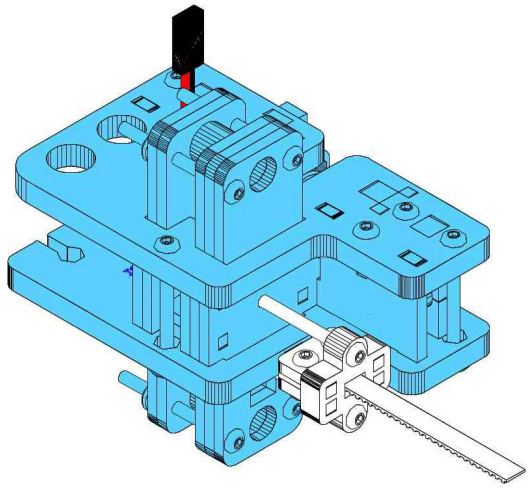
Take 2 M3x35 bolts from the mechanical kit and push them through IS-21 as shown.





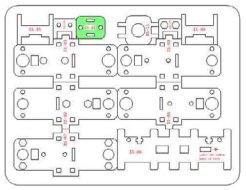
62

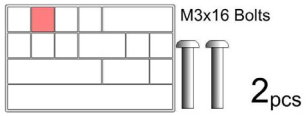
Now take this assembly and HAND THREAD the bolts into the idler shoulder assembly made previously as shown. Make sure that the smooth side of the belt is face up as indicated. Note that you won't be able to hand thread them very far as the bolts hit the nylon in the Nyloc nuts - this is intentional. YOU WANT THE BOLTS THREADED IN AS LITTLE AS POSSIBLE WHILE STILL HOLDING IN PLACE.

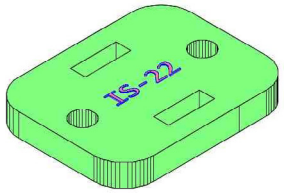


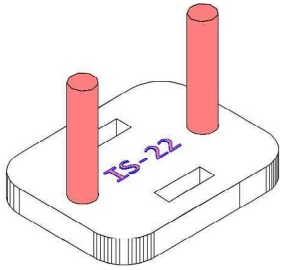
63

Find IS-22 & 2 M3x16 bolts from the mechanical kit - push them through IS-22 as shown.



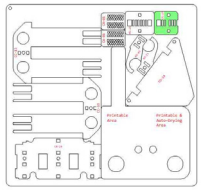


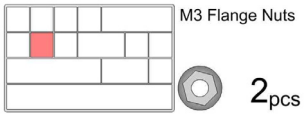


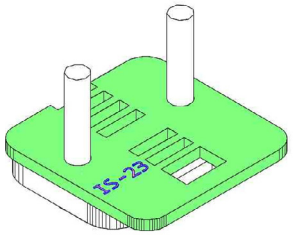


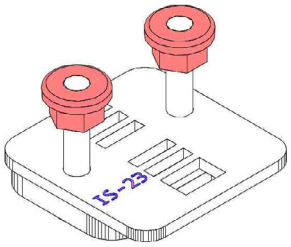
64

Find IS-23 & then lay it over IS-22 through the bolts as shown. Take 2 M3 flange nuts and loosely thread them over just the top of the bolts.



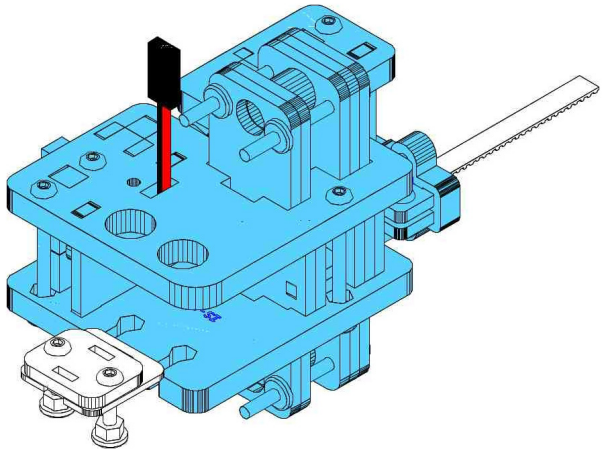






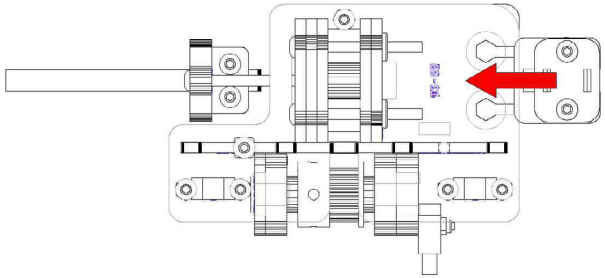
65

Now slide this assembly onto the rear of the idler shoulder as indicated.



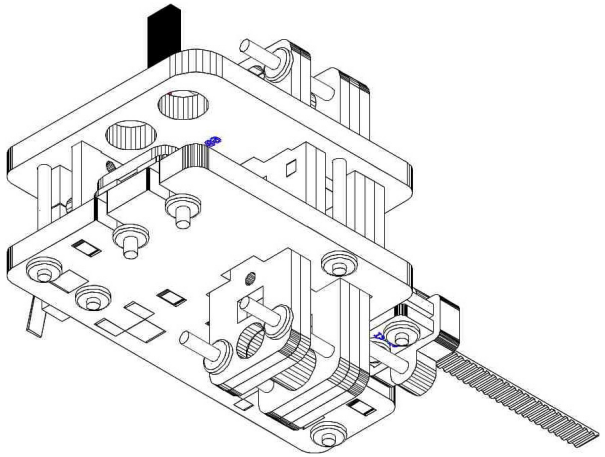
66

It will slide in place horizontally like this.



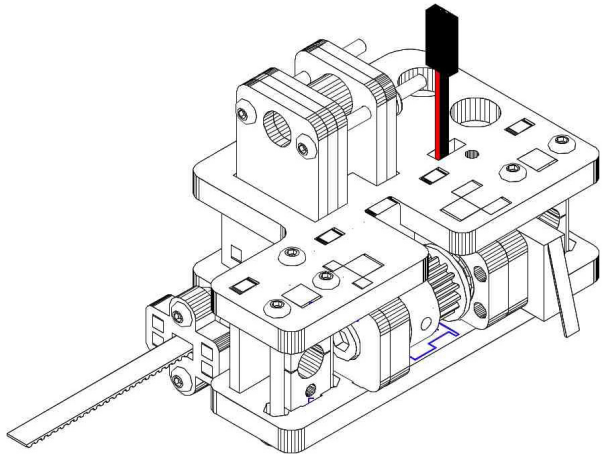
67

Push the flange nuts up into the hexagonal cut outs in the channel and then tighten the 2 bolts loosely so the flange nuts stay in place.



68

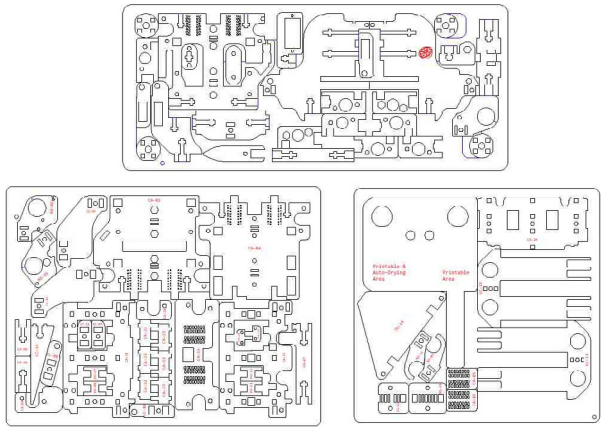
Your idler shoulder is all done!! Take a quick break, tell yourself some reassuring words of approval in the mirror and then move onto the next section.




CARRIAGE BODY

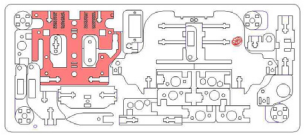
1

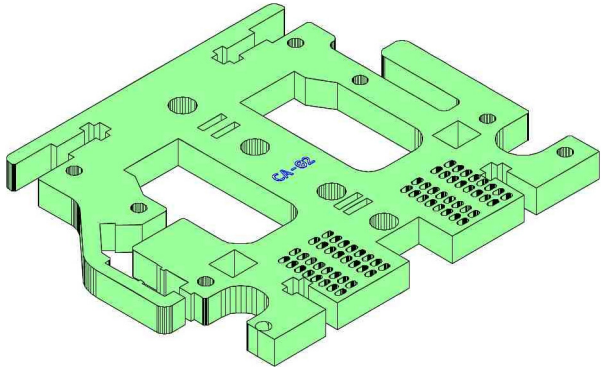
This section is for assembling the main Carriage body which mounts the cartridge & roller mechanism while moving along the x-axis linear rods. For this section you will need your mechanical kit, screwdriver kit, laser cut spanners & the 3 laser cut plates shown here. The top is in 6mm, bottom left in 3mm and bottom right in 1.5mm.



2

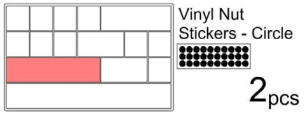
Find CA-02 & lay it flat as shown. Make sure that all the little cut outs are popped from the piece before moving on. NOTE: THIS PART HAS A REPLACEMENT IN THE MISCELLANEOUS BOX - DO NOT USE THE ONE SHOWN IN RED IN THE TOP LEFT IMAGE - USE THE ONE FROM THE MISCELLANEOUS BOX.

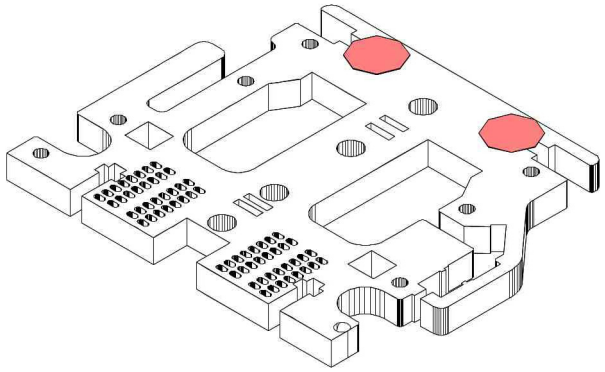




3

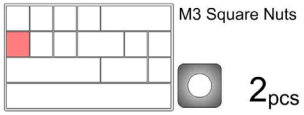
Flip the part over & stick 2 circular nut stickers over the t-bolt cut outs as shown.

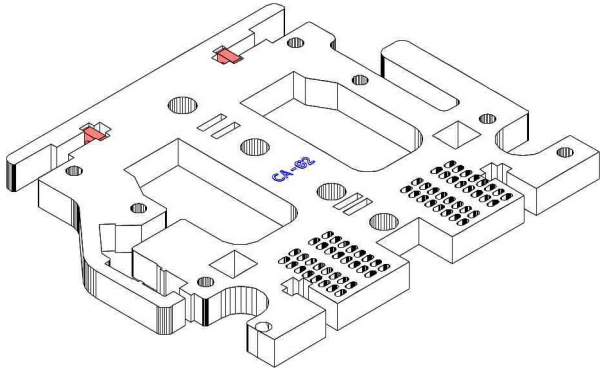




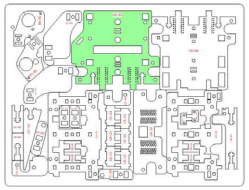
4

Flip the part over and place 2 M3 square nuts from the mechanical kit against the stickers you've just placed.

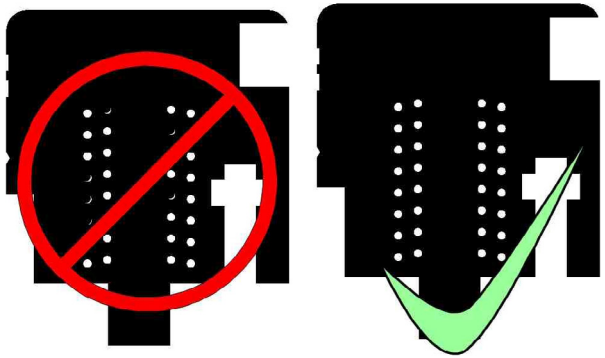




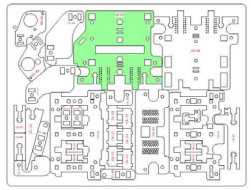
5



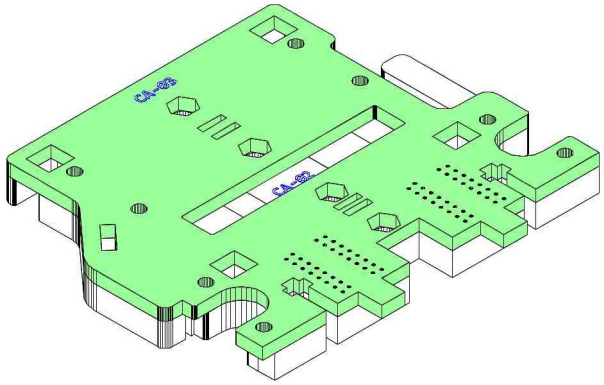
Next find CA-03, hold the part up to a light source and you'll probably notice some of the circular holes are partially occluded with leftover acrylic. We need to make sure these are all clear before moving on, you can remove the blockages with your finger, the tweezers in your screwdriver kit or a pin/needle if they're very difficult.



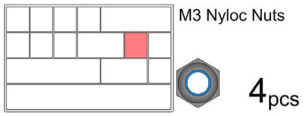
6



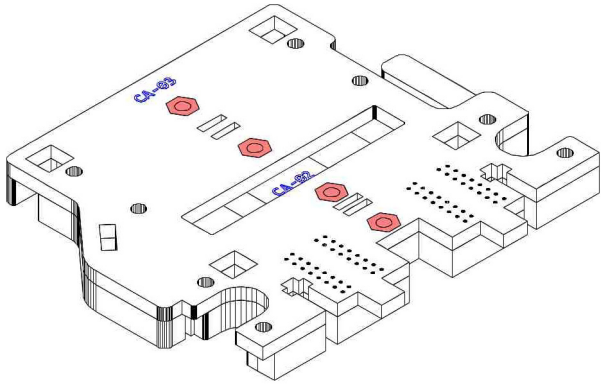
Once you are *sure* that all blockages are removed, place CA-03 over CA-02 as shown.



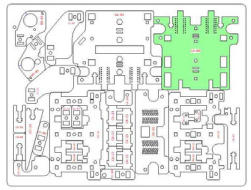
7



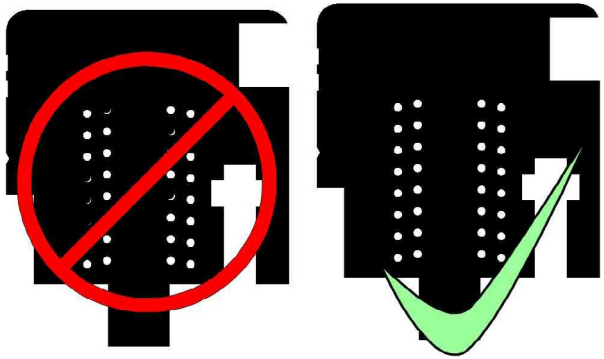
Take 4 M3 Nyloc nuts from the mechanical kit and slide them into CA-03 with the nylon (blue part) face down as shown.



8

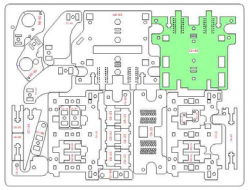


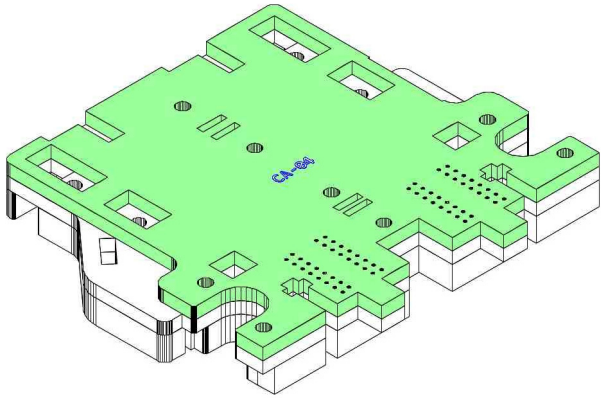
Next find CA-04, hold the part up to a light source and you'll probably notice some of the circular holes are partially occluded with leftover acrylic. We need to make sure these are all clear before moving on, you can remove the blockages with your finger, the tweezers in your screwdriver kit or a pin/needle if they're very difficult.



9

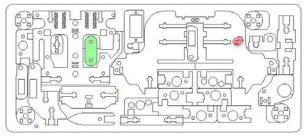
Once you are *sure* that all blockages are removed, place CA-04 over CA-03 as shown.

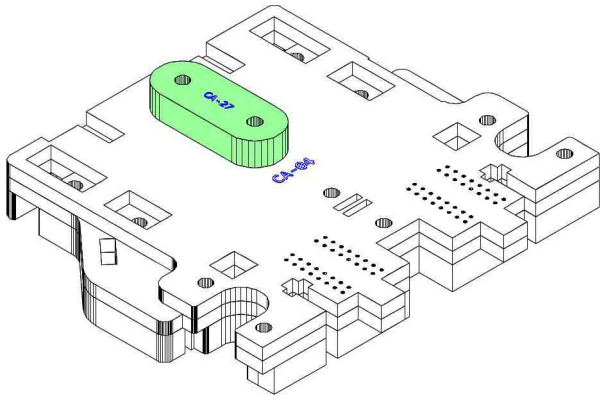




10

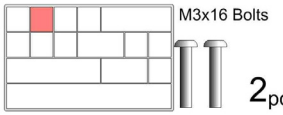
Find CA-27 and place it over CA-04 so the holes in the top centre line up as shown. Yes, we skipped a few numbers there, we are very ahead of our time.

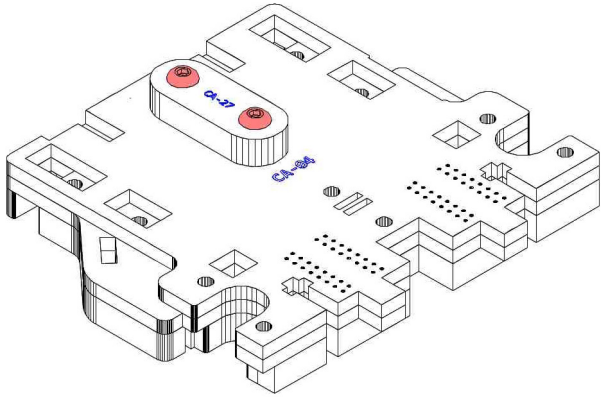




11

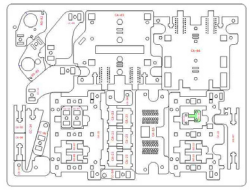
Take 2 M3x16 bolts and loosely tighten the plate in as shown. Don't bother tightening as later in the assembly we will remove at least one bolt.

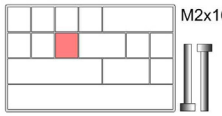


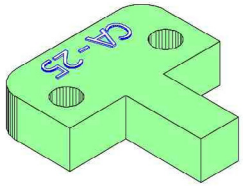


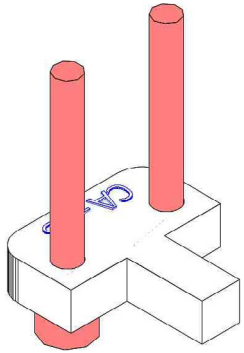
12

Find CA-25 & 2 M2x16 bolts. Slide the bolts through the plate as shown.



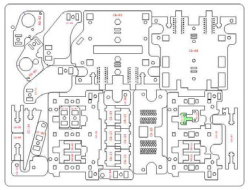


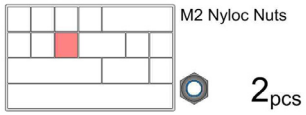


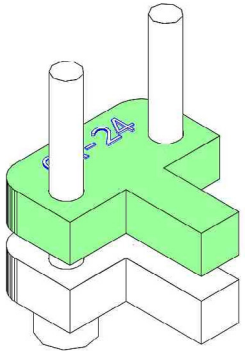


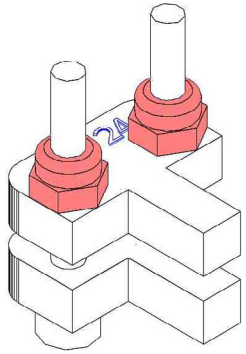
13

Find CA-24 and slide it over the top of these bolts as shown. Begin threading a pair of M2 nyloc nuts over the top of the bolts.



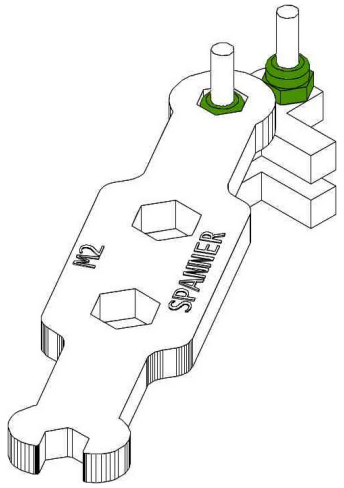






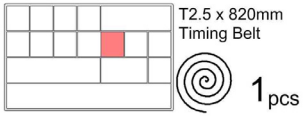
14

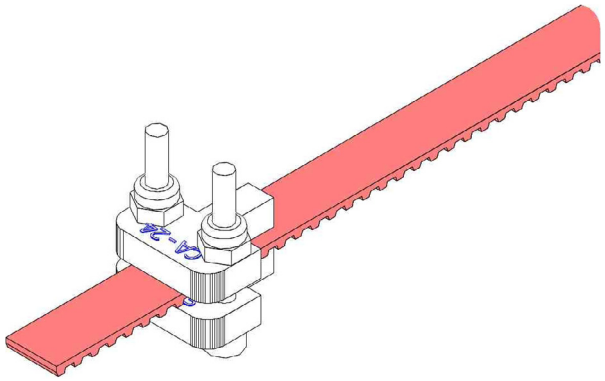
Tighten the nuts down most of the way BUT LEAVE ENOUGH ROOM to thread a belt between the plates.



15

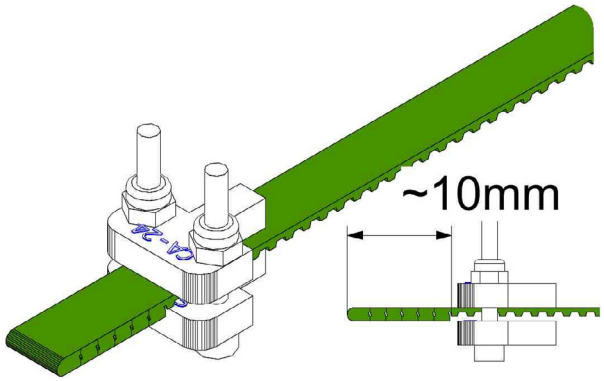
Find the longest timing belt in your mechanical kit - it's 820mm long. Thread THE CURLY END through the plates as shown, ensuring that the smooth side is facing the side with the nuts as shown. It will make things a lot easier later if you clamp the curled up end.





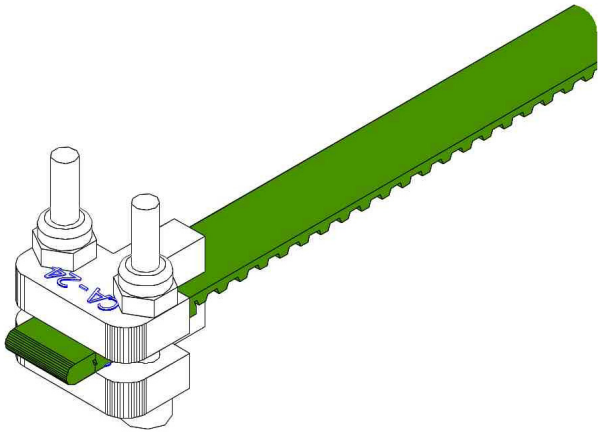
16

Fold the end of the belt over on itself roughly 10mm (~1/2 inch) this doesn't have to be perfect.



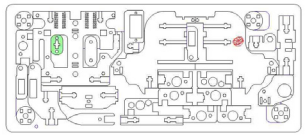
17

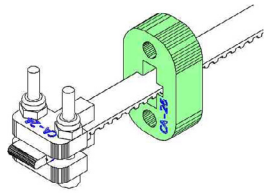
Pull the folded portion of the belt back between the plates as shown but leaving a small amount still poking out the other side. This small bit will bubble out and assist in keeping the belt in place. Tighten both M2 bolts and nuts again GENTLY, just make it tight enough that the belt will not come out when pulled tightly.

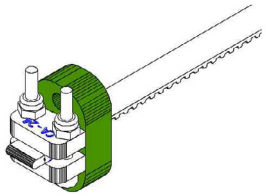


18

Find CA-26 and slide it over the other end of the belt as shown. Bring it all the way along and key it into CA-23/ CA-24 as shown.

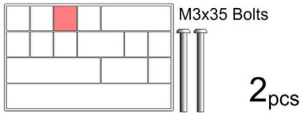




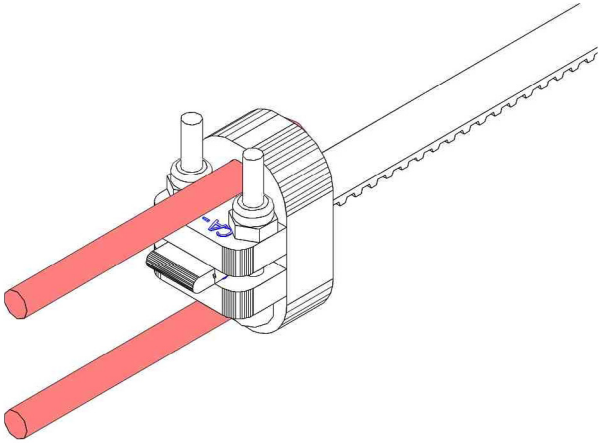


19

Take a pair of M3x35 bolts from the mechanical kit and place them through CA-26 as shown.

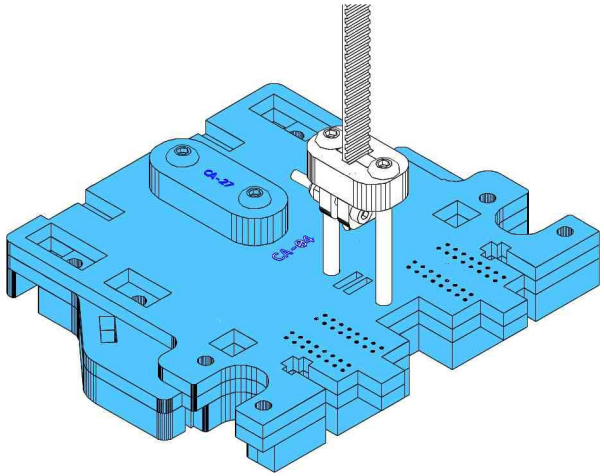


2pcs



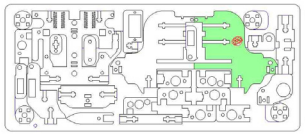
20

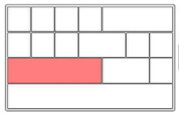
Now hand thread these bolts in through CA-04, make sure the belt teeth are face down as shown. You won't be able to thread very far before encountering the nyloc section - this is intentional, we want the bolts very loose as shown.

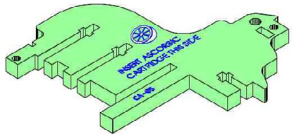


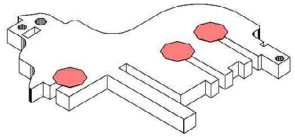
21

Find CA-05 (the one with "INSERT ASCORBIC CARTRIDGE THIS SIDE") and stick a circular sticker over each t-bolt cut out on the non-labelled side.



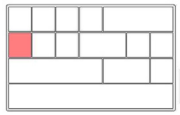


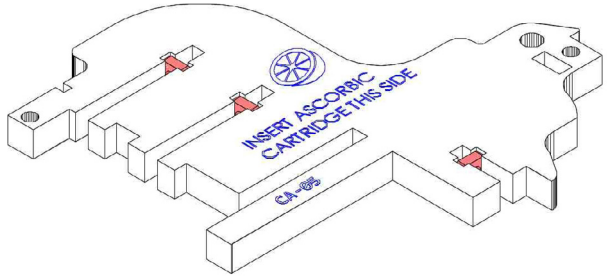




22

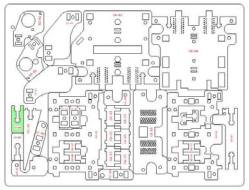
Now place an M3 square nut in each of the t-bolt cut outs from the other side.

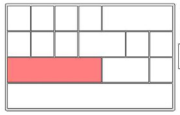


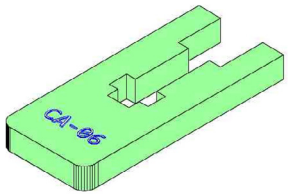


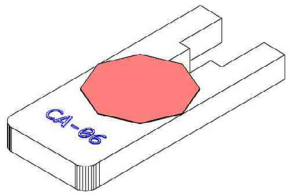
23

Find CA-06, lay it flat and stick a circular nut sticker over the t-bolt cut out on the labelled side as shown.



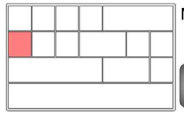


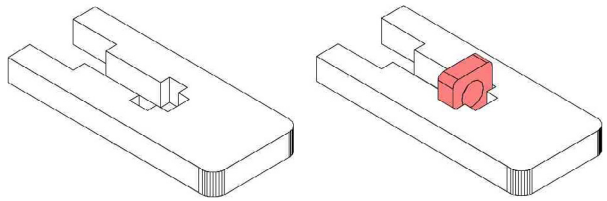




24

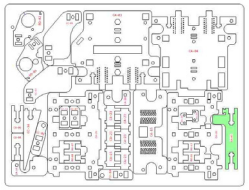
Flip the part over and insert an M3 square nut, it will poke out the top as shown - that's fine.

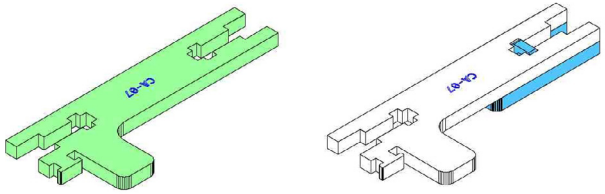




25

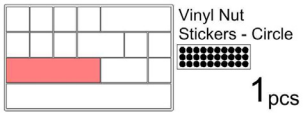
Find CA-07 and then lay it over the top of the nut in CA-06 as shown.

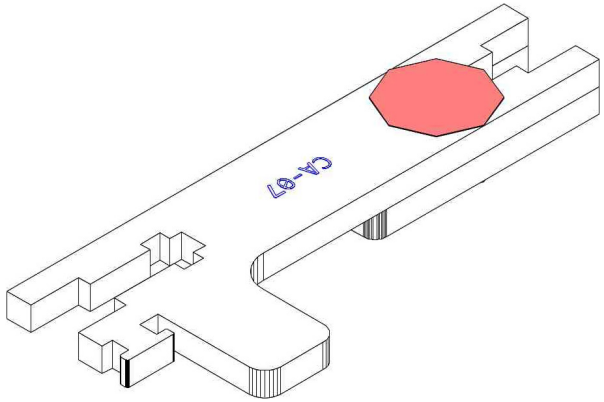




26

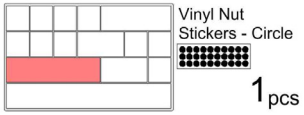
Now cover the other side of the nut with another circular nut sticker.

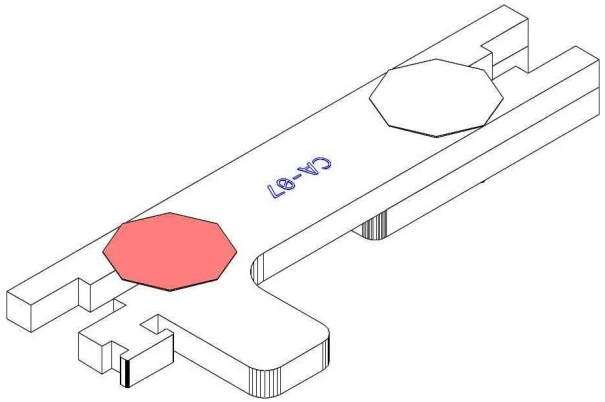




27

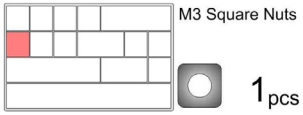
Place another circular sticker over the t-bolt cut out on the other end.

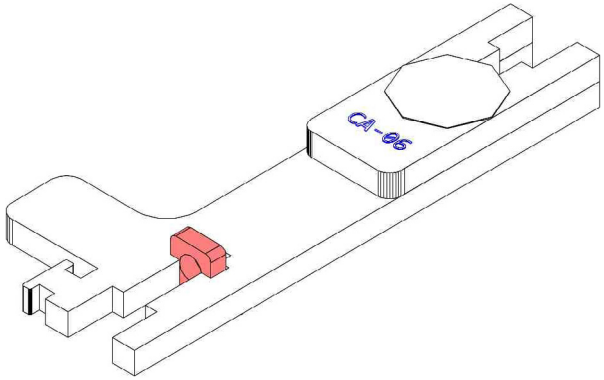




28

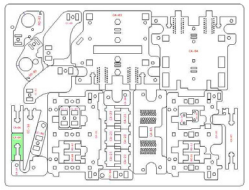
Carefully flip the parts over and place another M3 square nut into CA-07 as shown.

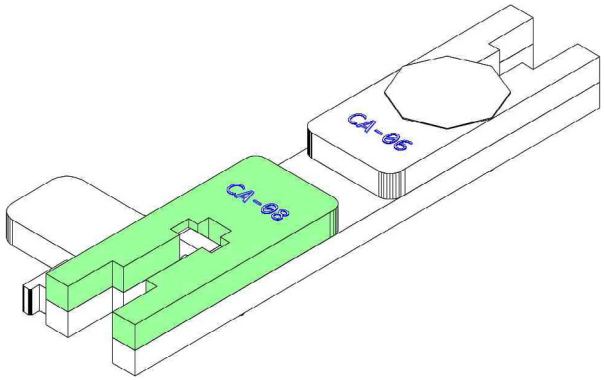




29

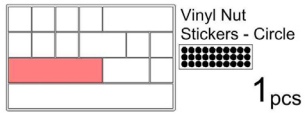
Find CA-08 and place it over the nut in CA-07 as shown here.

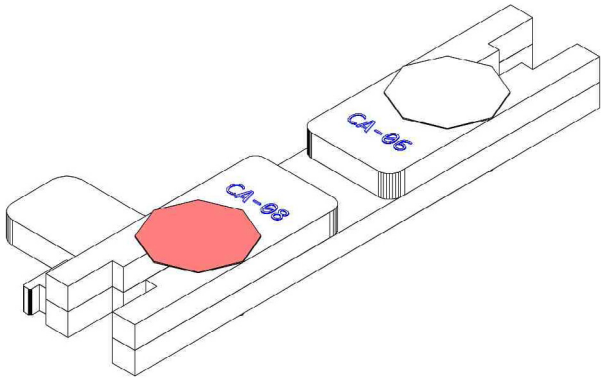




30

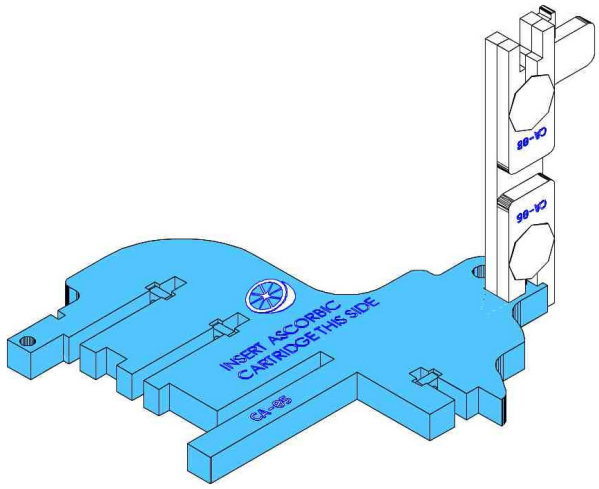
Again, cover the nut with a circular nut sticker.





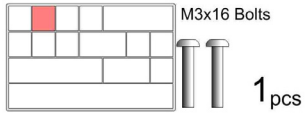
31

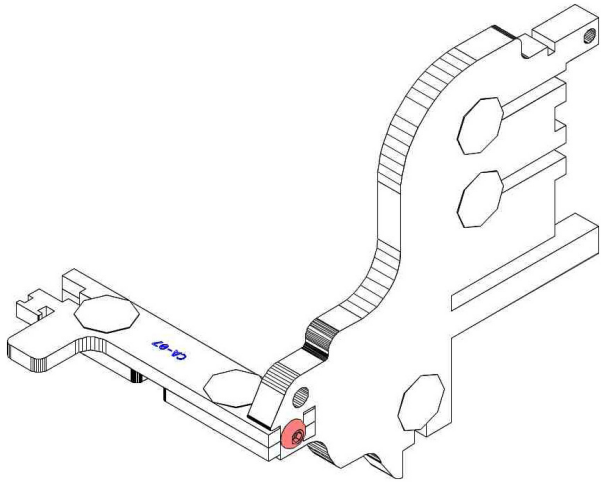
Now place this assembly into CA-05 - MAKE SURE that CA-06/CA-08 are facing down and that the tab in CA-07 faces away from CA-05 as shown.



32

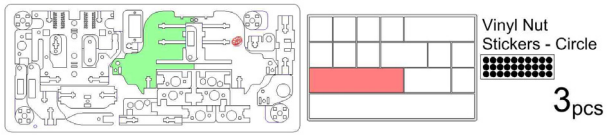
Take an M3x16 bolt and use it to secure the assembly to CA-05 as shown.

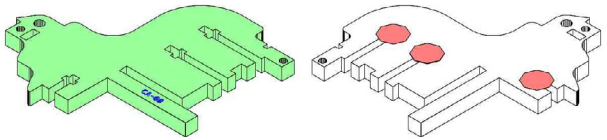




33

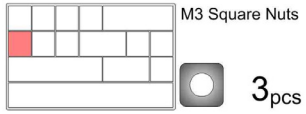
Find CA-09 and stick a circular sticker over each t-bolt cut out on the non-labelled side.

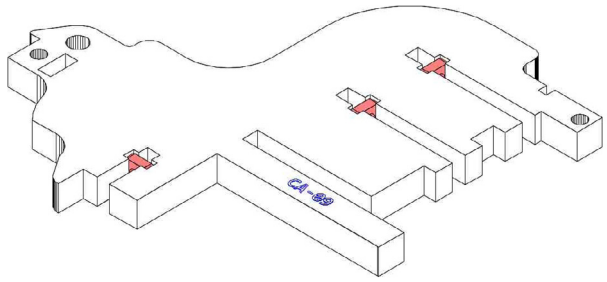




34

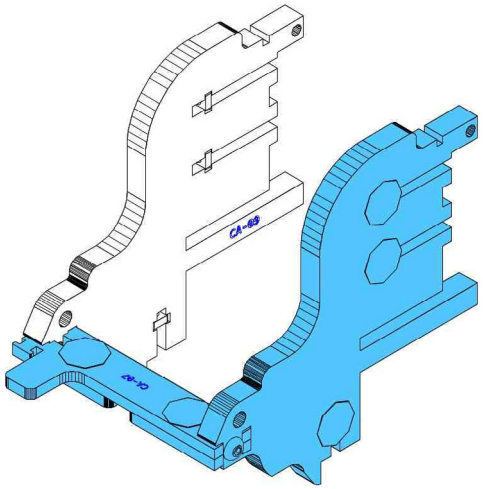
Now place an M3 square nut in each of the t-bolt cut outs from the other side.





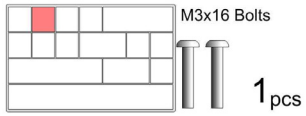
35

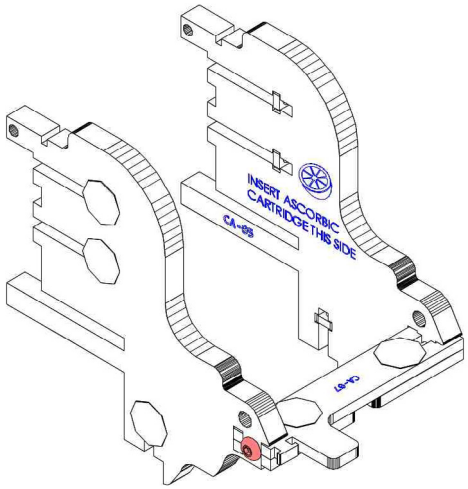
Tooth CA-09 into your assembly as shown.



36

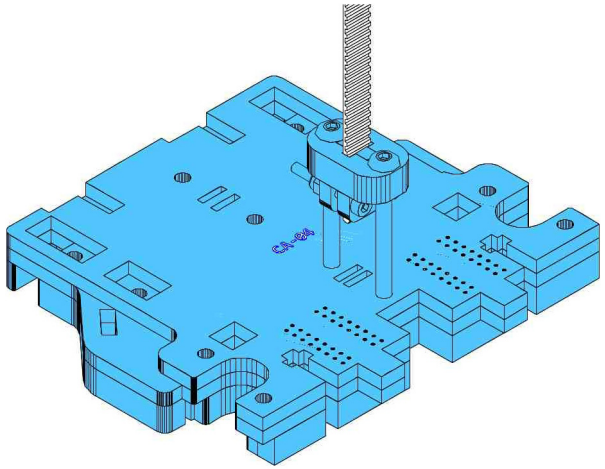
Bolt the parts together with another M3x16 bolt.





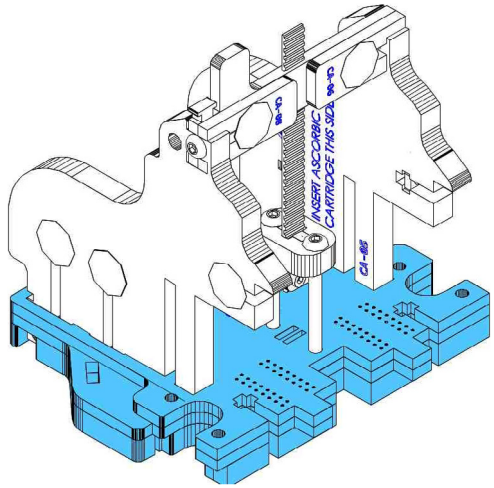
37

Bring back your stack of parts from the start of this section.



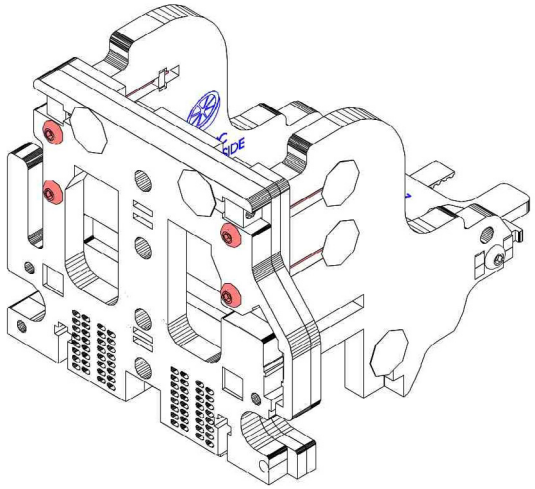
38

Now insert the side panels assembly into the stack as shown.



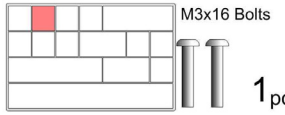
39

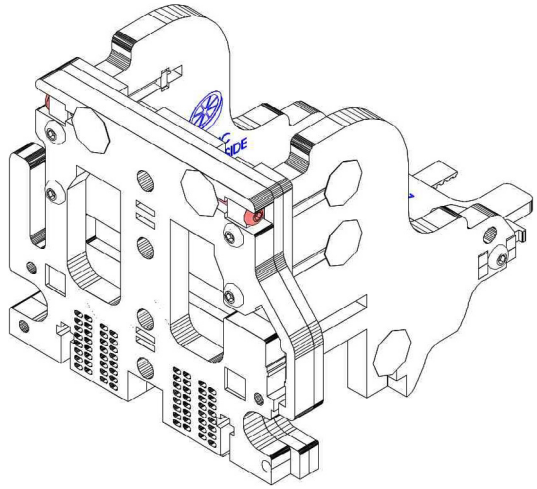
Now take 4 M3x35 bolts and use them to bolt the assemblies together from the back as shown.



40

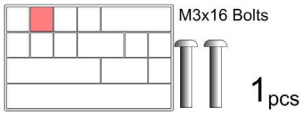
Take an M3x16 bolt and tighten it in the position shown.

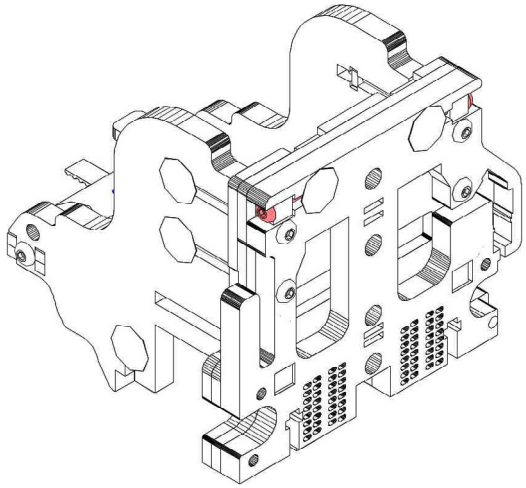




41

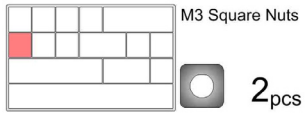
Do the same again on the other side.

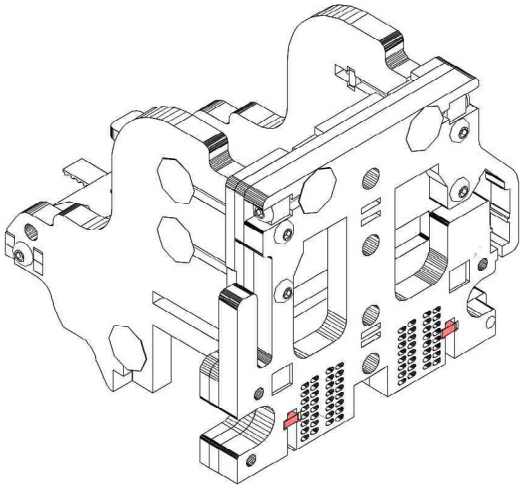




42

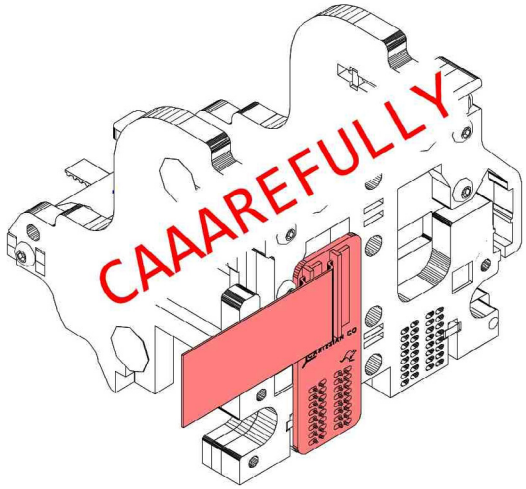
Now slide 1 M3 square nut into each of the cut outs in CA-02. NOTE: slide the nuts only into the 6mm part, not through to the 3mm parts. THESE NUTS ARE VERY IMPORTANT, MAKE SURE THEY ARE PROPERLY IN PLACE. Next we will be inserting the boards that connect to the cartridge - it might make this step easier if you loosen the bolts in steps 27, 28 & 29.





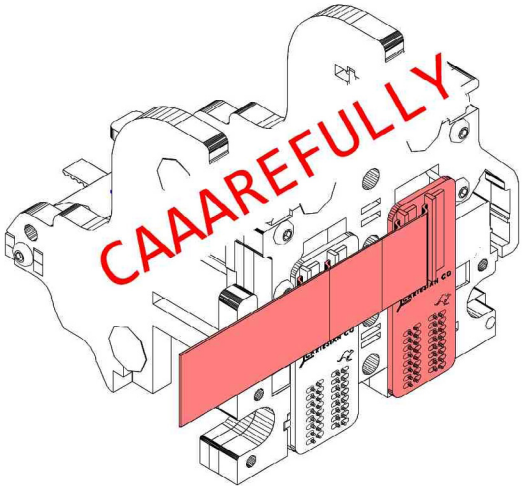
43

Next, we are going to place the pogo pin boards into the part BE EXTREMELY CAREFUL WITH THE POGO PIN BOARDS as they are quite fragile and are necessary for correct operation of your printer. Carefully unwind your pair of pogo pin boards, remove one of them from the storage pieces and gently slot it through the array of holes in CA-02 as shown. Be very aware of the pins and very careful not to bend them.



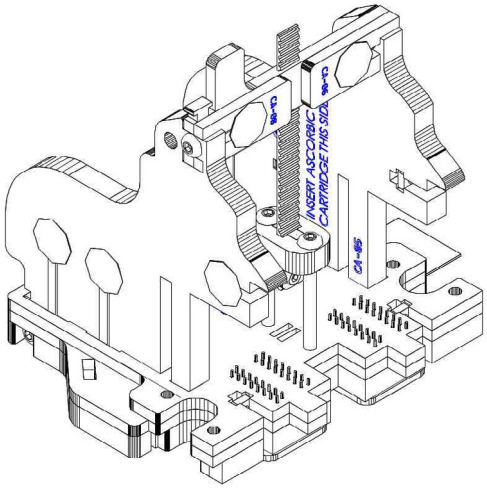
44

Now do the same with the other pogo pin board. Make sure the boards sit perfectly flush up against CA-02 with the pins poking out the other side before moving on.



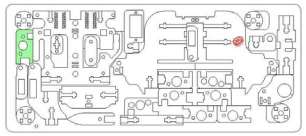
45

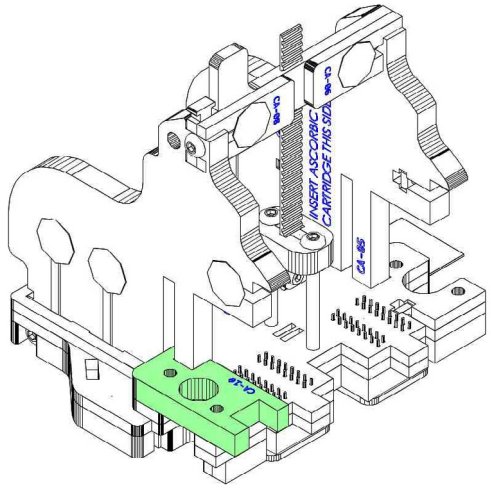
Now lay the assembly on its back as shown.



46

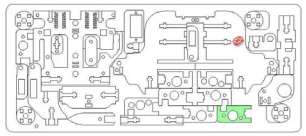
Find CA-10 and place it into the assembly as shown.

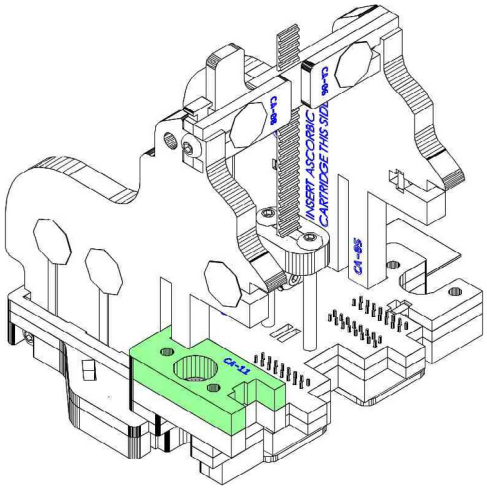




47

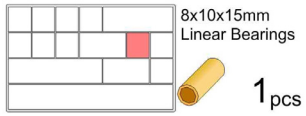
Do the same with CA-11.

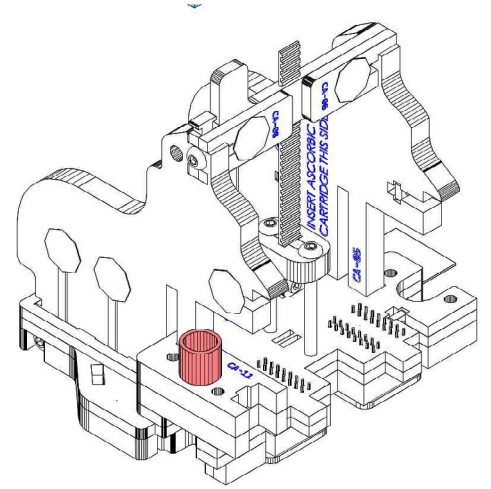




48

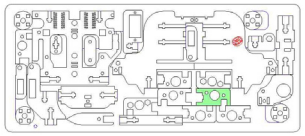
Now take an 8x10x15mm linear bearing and slot it into CA-11 as shown.

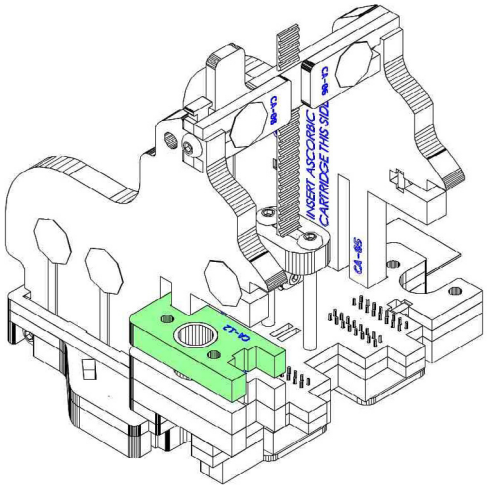




49

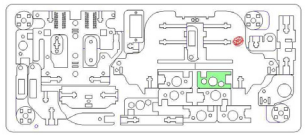
Find CA-12 and slide it over the bearing as shown.

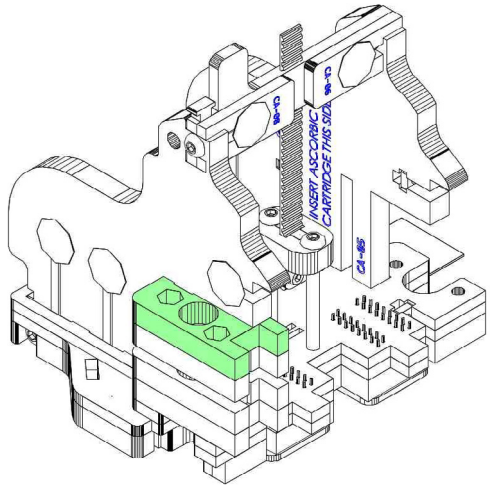




50

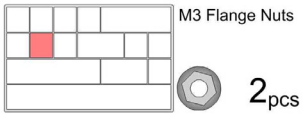
Then find CA-13 and put it in place as shown as well.

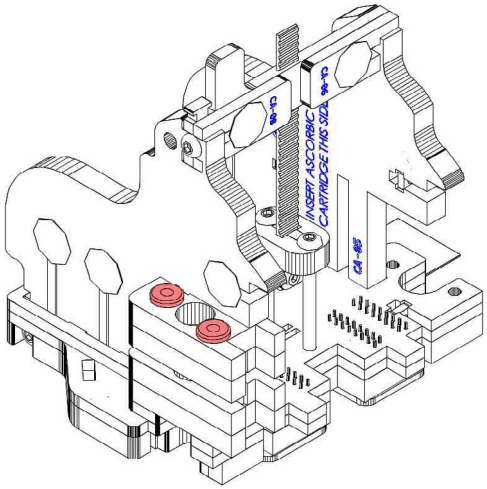




51

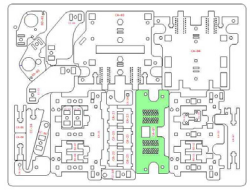
Take 2 M3 flange nuts from the mechanical kit and press them into CA-14 as shown. Put this assembly to the side temporarily.

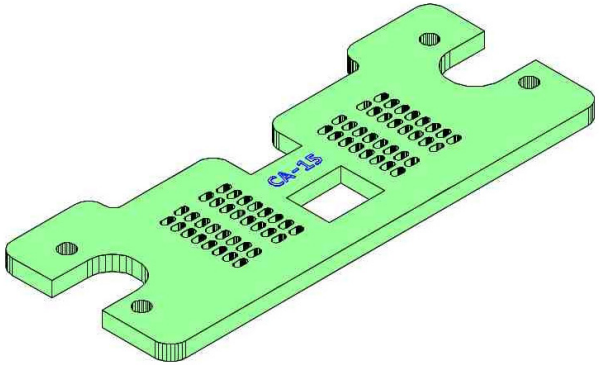




52

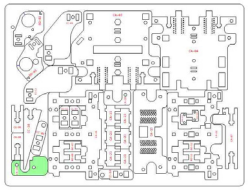
Find CA-15 and lay it flat with the labelled side up as shown.

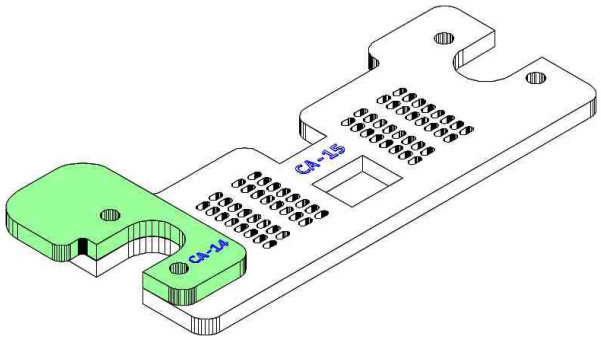




53

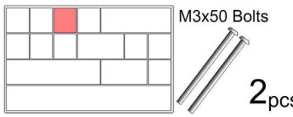
Find CA-14 and lay it over CA-15 as shown.

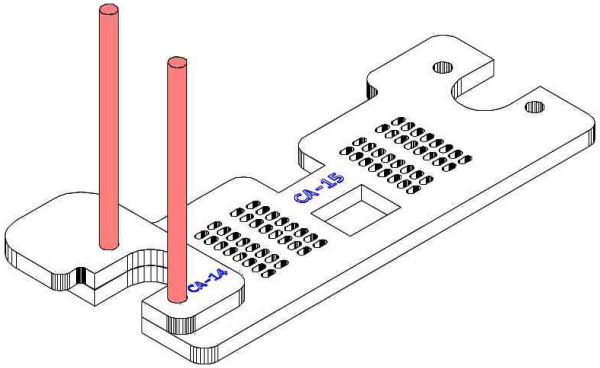




54

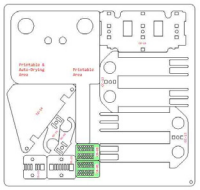
Take 2 M3x50 bolts (these are the ones that were holding your laser cut acrylic stack together) and push them through the two parts as shown.

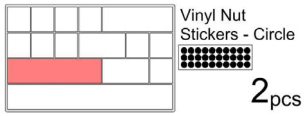


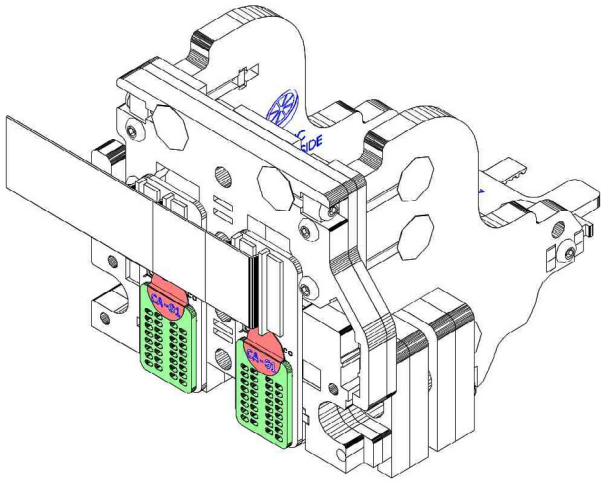


55

Carefully sit your previous assembly up, keeping all the parts in place. Find the CA-01 plates (there are two) from the 1.5mm acrylic stack & lay them up against the back of the PCBS as shown. Take a nut sticker for each one and place it as demonstrated to temporarily hold the parts in place.

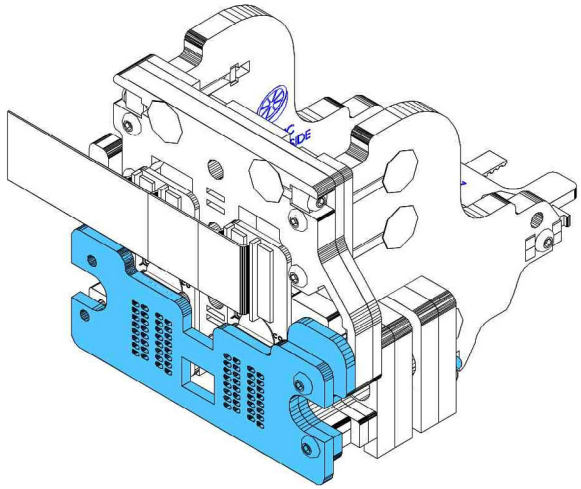






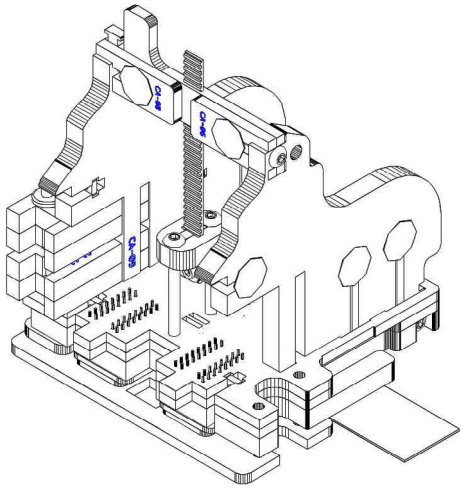
56

Take CA-14 & CA-15 with the bolts and slide them through the assembly as shown. Thread the bolts into the flange nuts placed previously but don't tighten them too much.



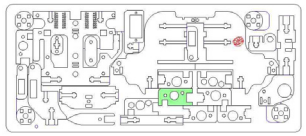
57

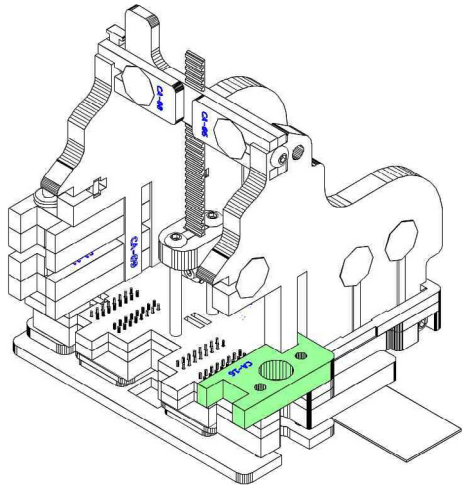
Lay the assembly on its back again as shown.



58

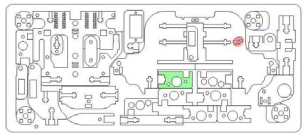
Find CA-14 and place it into the assembly as shown.

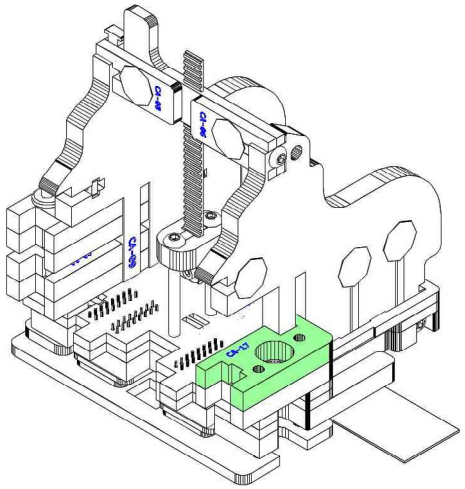




59

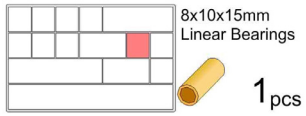
Do the same CA-17

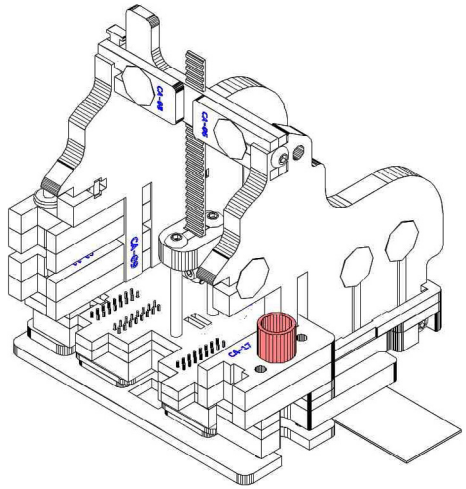




60

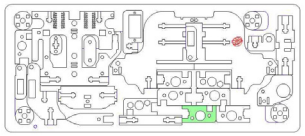
Take another 8x10x15mm linear bearing from your mech kit and slide it into CA-17 as shown.

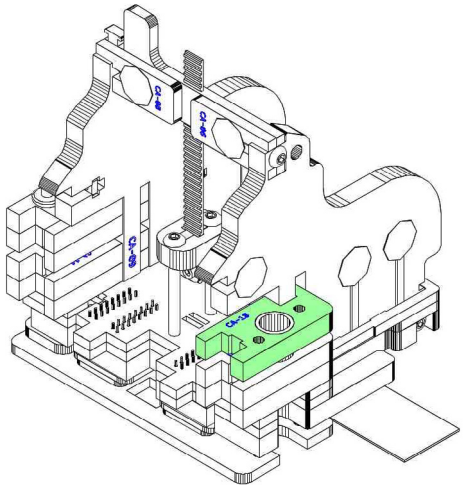




61

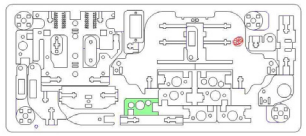
Find CA-18 and slide over the bearing as shown.

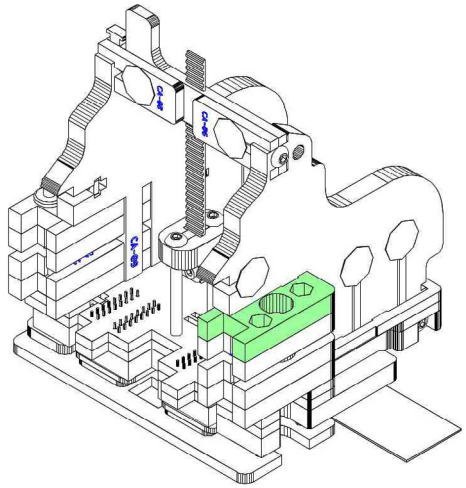




62

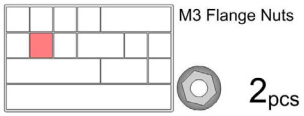
Find CA-19 and put it in place as shown.

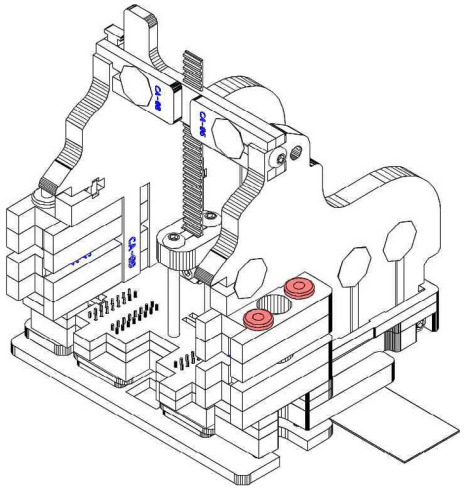




63

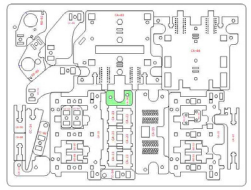
Take a pair of M3 flange nuts and push them into CA-19 as shown.

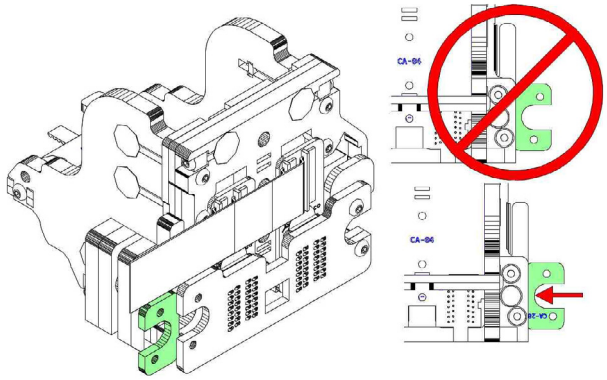




64

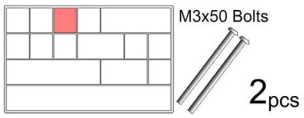
Sit the assembly up carefully again. Find CA-20 & slide it behind CA-15 as shown. BE CAREFUL to get the correct orientation as shown otherwise it will not allow the bolts through in the next step.

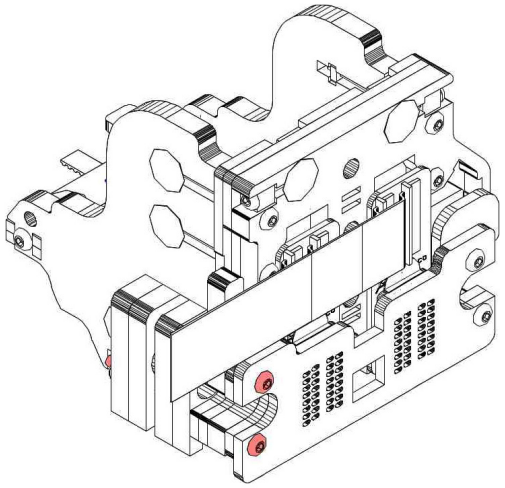




65

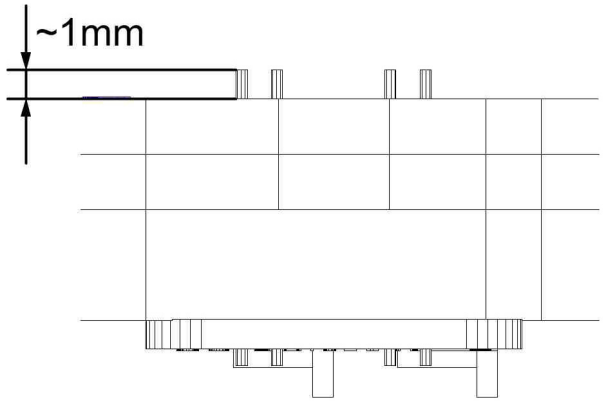
Take your last pair of M3x50 bolts and clamp the parts together as shown here.





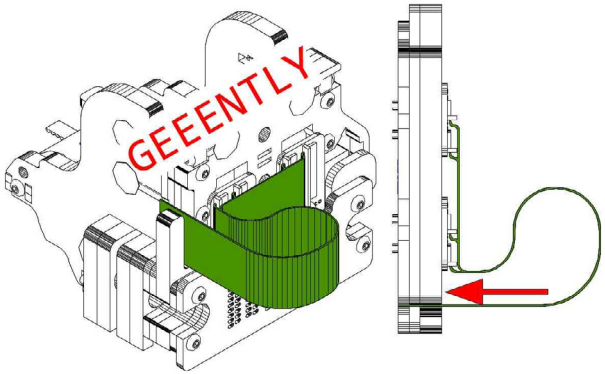
66

Now inspect that the connection pins are pushing through to the other side and do not extend further than ~1.5mm from the surface. If you are worried that they are extending too far, you may have to place some spacers between CA-03 & CA-04 (we suggest using nut stickers as they are thin enough to control the height very carefully).



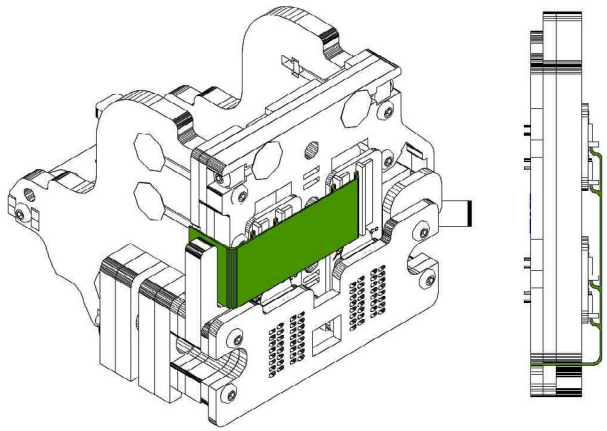
67

Now we are going to slot the FFC cables behind the tab in CA-02 to provide them with some stress relief. First give the cables lots of slack (i.e.. hold them as far along the cable from the board as possible and slot it behind the tab as shown.



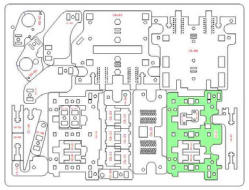
68

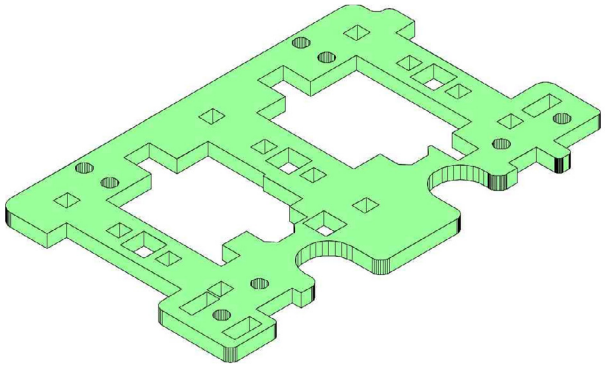
Then very GENTLY pull the cables past the tab so that they sit flush against the back as shown. Put this assembly to the side temporarily.



69

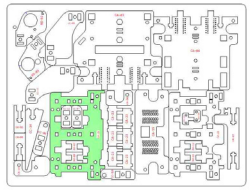
Find CA-22 and lay it with the labelled side down. as shown.

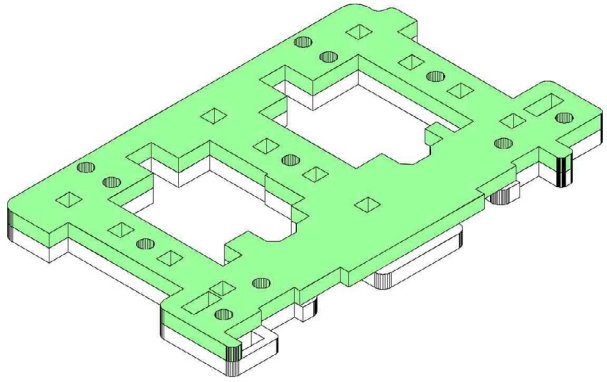




70

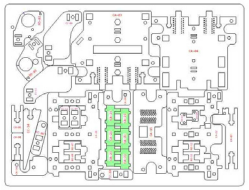
Find CA-21 and lay it over CA-22 with the labelled side down again as shown. Make sure that the parts line up as shown and DOUBLE CHECK THE LABELLED SIDE IS FACE DOWN.

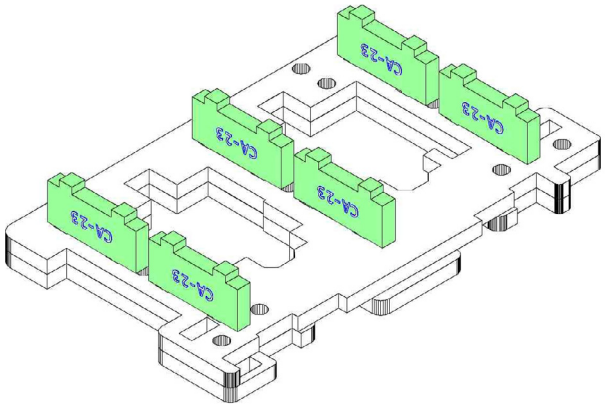




71

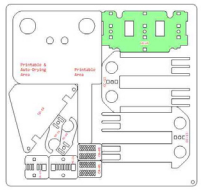
Find the CA-23 parts and slot the longer tabs into CA-21/CA-22 as shown. NOTE: due to warping in laser cutting, one of the CA-23 parts will have a slightly wider leg than the others and will be difficult to insert. Most batch 1 kits will have a replacement in your miscellaneous box. For those that don't, it is acceptable to leave this part out in one of the central positions.

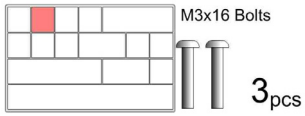


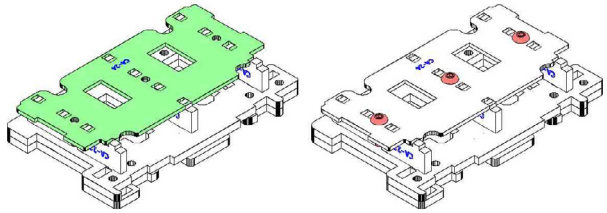


72

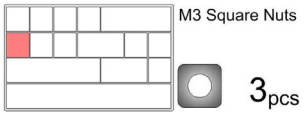
Find CA-24 & tooth it into the CA-23 parts as shown. Make sure the orientation is as shown. Then take 3 M3x16 bolts and slot them through CA-24 as shown.



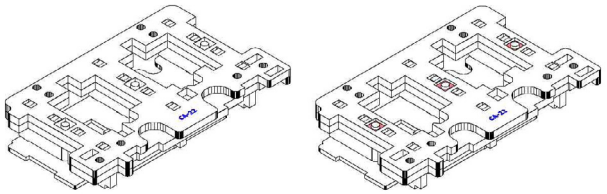




73



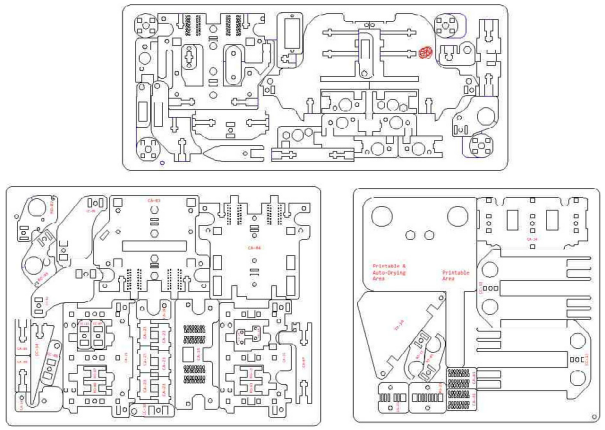
Carefully flip the assembly over and then slot an M3 square nut into each square cut out and tighten the respective bolt into it. We *won't* assemble this piece into the other major CA assembly until the RO section. So let's move onto there!




ROLLER MECHANISM

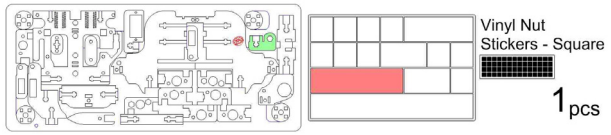
1

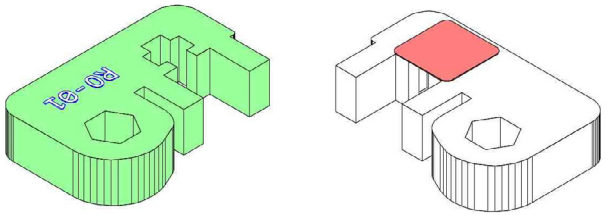
This section is for assembling the Roller Mechanism which mounts onto the main Carriage body and automatically dries your prints. For this section you will need your mechanical kit, screwdriver kit, laser cut spanners & the 3 laser cut plates shown here. The top is in 6mm, bottom left in 3mm and bottom right in 1.5mm (the same parts you were using for CA).



2

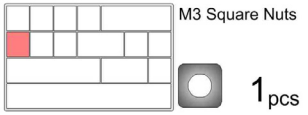
Find RO-01 and place a square nut sticker over the t-bolt cut out on the un-labelled side.

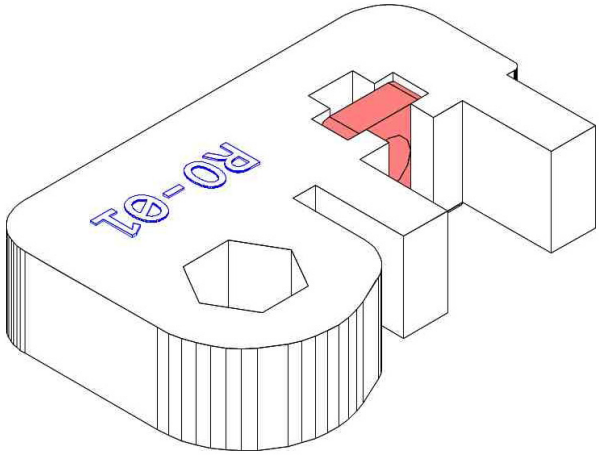




3

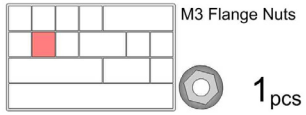
Slide an M3 square nut into the t-bolt cut out as shown.

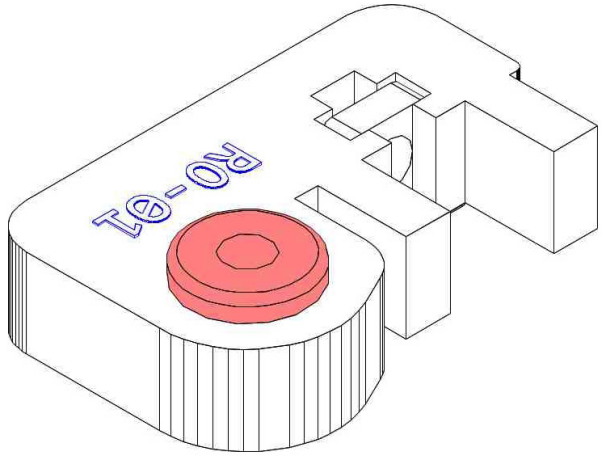




4

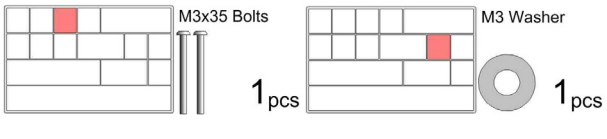
Take an M3 flange nut and press it into the labelled side of RO-01 as shown.

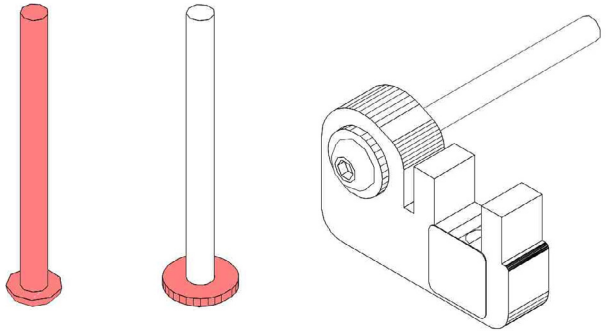




5

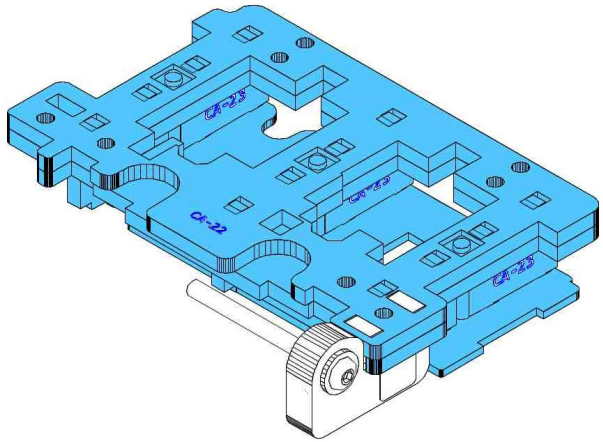
Take an M3x35 bolt and M3 washer from the mechanical kit and slide the washer over the bolt as shown. Then thread the bolt with the washer through the flange nut from the previous step as shown. Tighten the bolt.





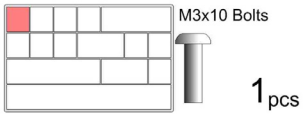
6

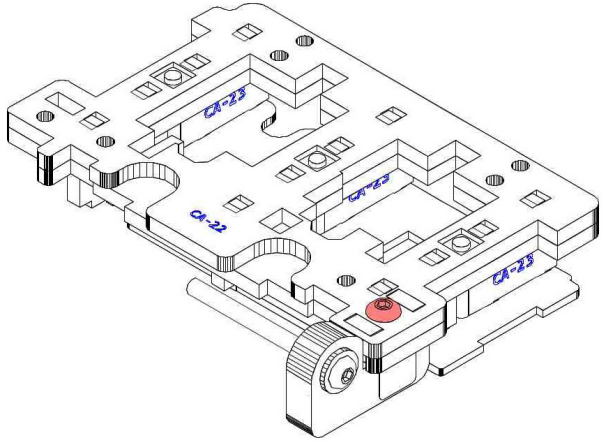
Place the assembly into the base sub-assembly made in the CA section as shown.



7

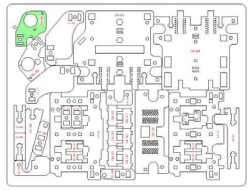
Use an M3x10 bolt to hold the part in place. Put this assembly to the side again.

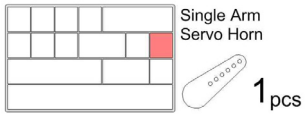


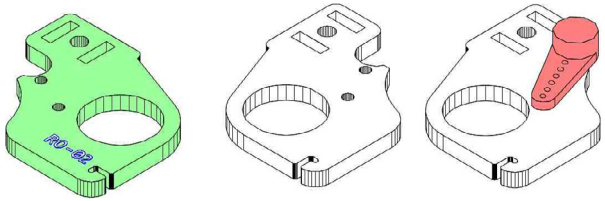


8

Find RO-02 and lay it labelled side down as shown in the central image. Open up the bag containing the servo from your mechanical kit and take out the servo horn with a single arm (as shown here). Place the horn over RO-02 as shown.

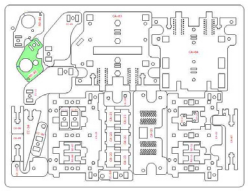


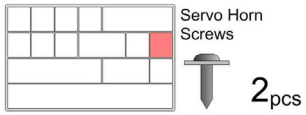


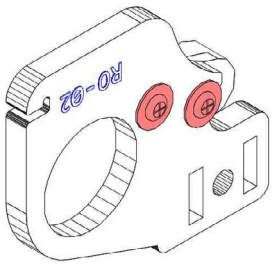


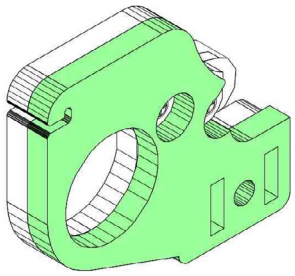
9

Next take the two flange head screws from the servo bag and screw the servo horn in place as shown. Find RO-03 and place it over RO-02 as shown.



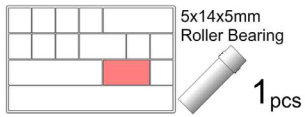


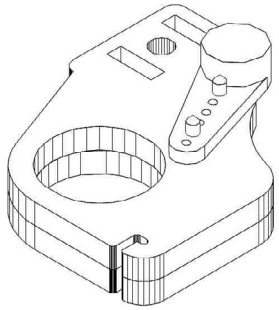


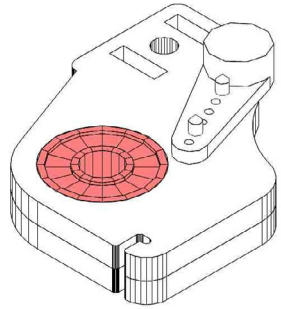


10

Lie the parts on the side again as shown on the left. Take a roller bearing and press it into the plates with your thumbs.

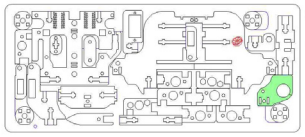


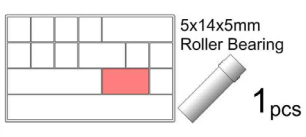


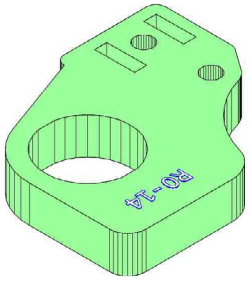


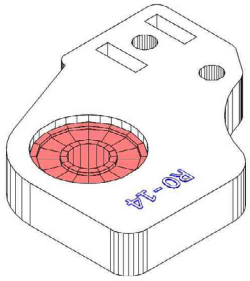
11

Find RO-14 and another roller bearing, press the bearing into RO-14 as shown.



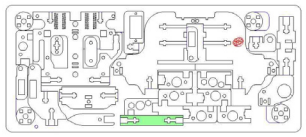


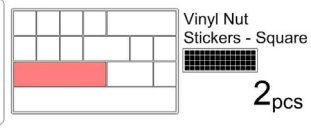


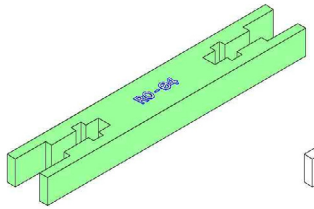


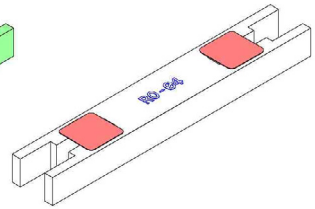
12

Find RO-04 and place a pair of square nut stickers over the t-bolt cut outs as shown.

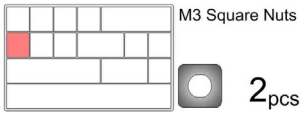




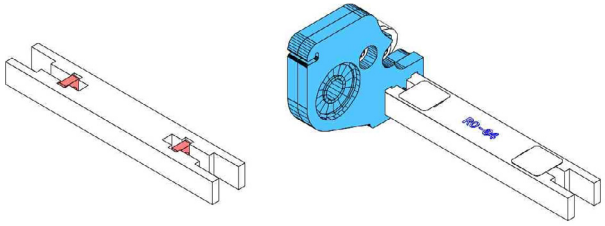




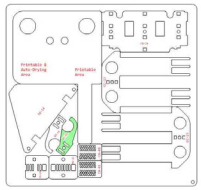
13

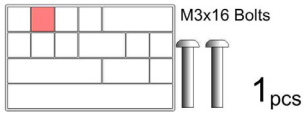


Place an M3 nut into each of the cut outs in RO-04. Slide RO-04 into RO-02/RO-03 as shown (on the side opposite to the servo horn).

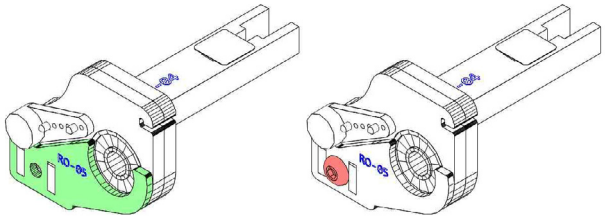


14

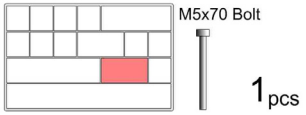




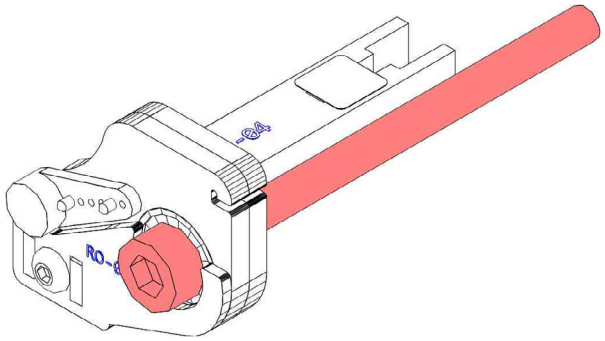
Find RO-05 and slot it over the end of the tabs from RO-04 as shown. Clamp the whole assembly together with an M3x16 bolt as shown.



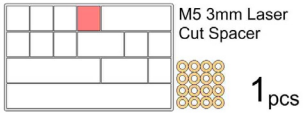
15



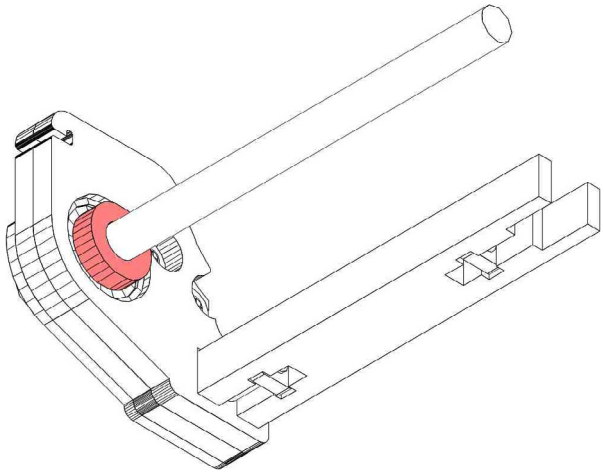
Take the M5x70 bolt from your mechanical kit and slide it through the bearing as shown.



16

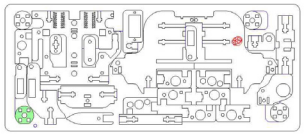


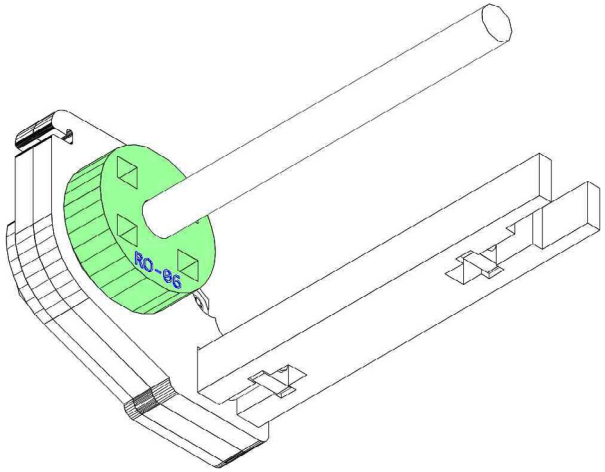
Place an M5x3mm laser cut spacer over the other side of the bolt as shown.



17

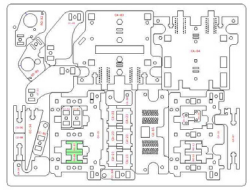
Find RO-06 and slide it on the bolt as shown.

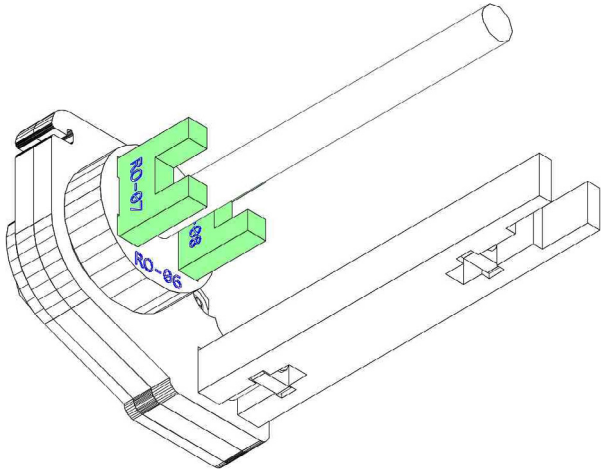




18

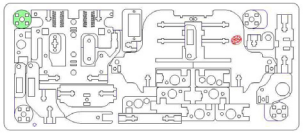
Find RO-07 & RO-08. Key them into RO-06 as shown, you may find it easier to sit the assembly vertically on your table.

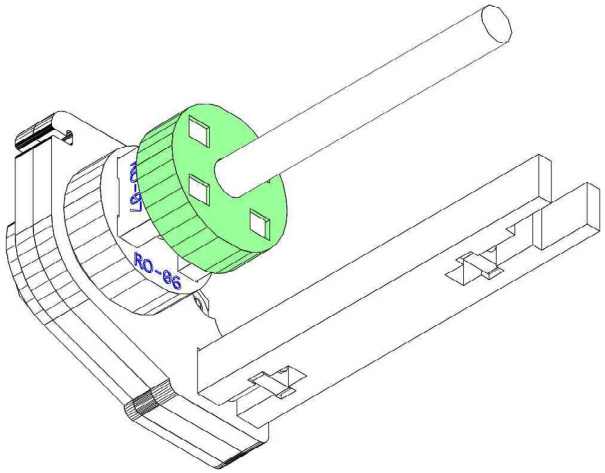




19

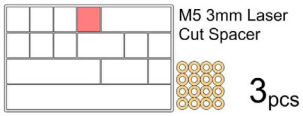
Slide RO-09 over the previous parts as shown.

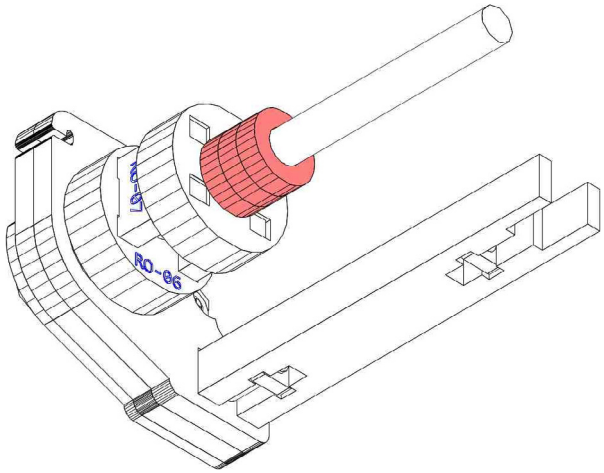




20

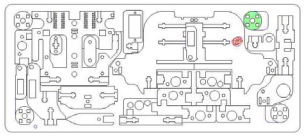
Take 3 M5x3mm laser cut spacers and slide them over as shown.

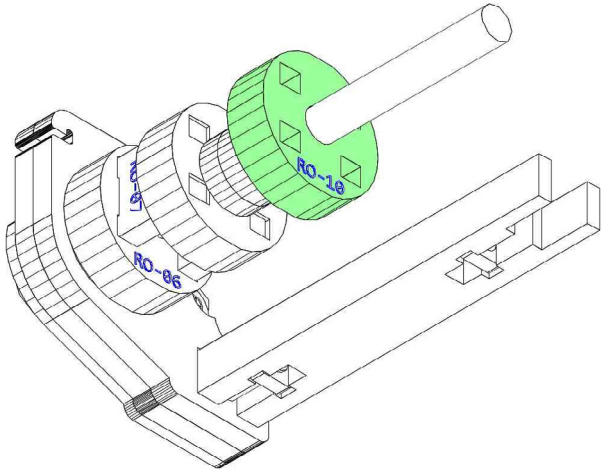




21

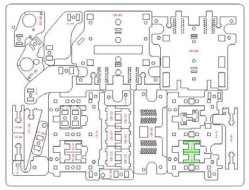
Find RO-10 and slide them over the bolt as shown.

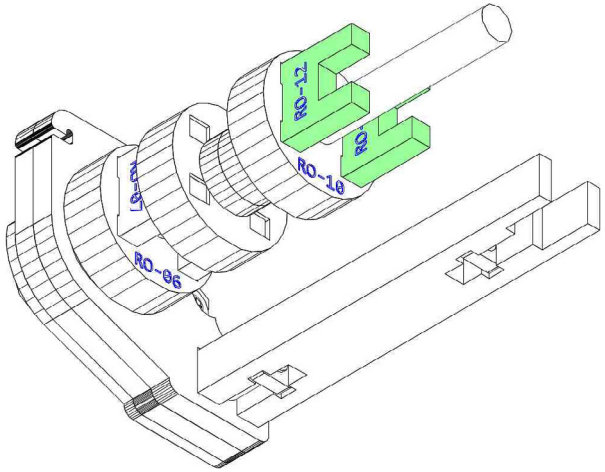




22

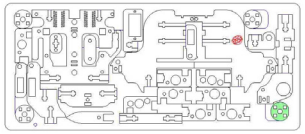
Find RO-11 & RO-12 and key them into RO-10 as shown.

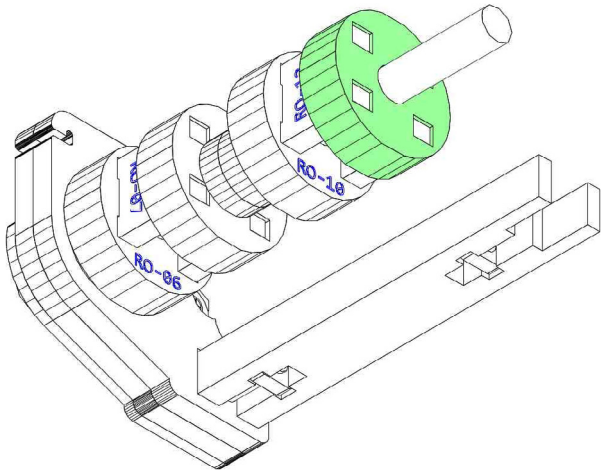




23

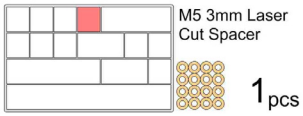
Slide RO-13 over the previous parts as shown.

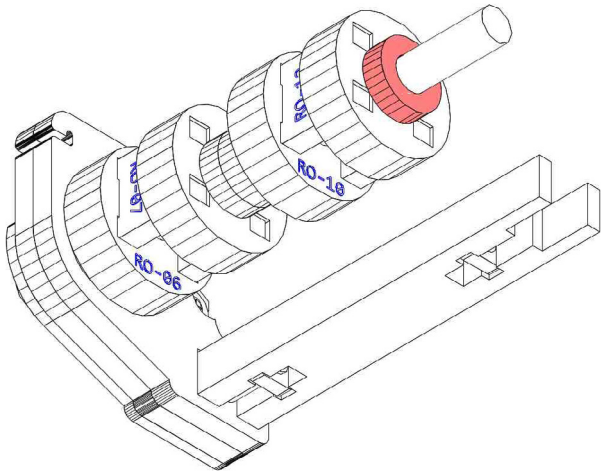




24

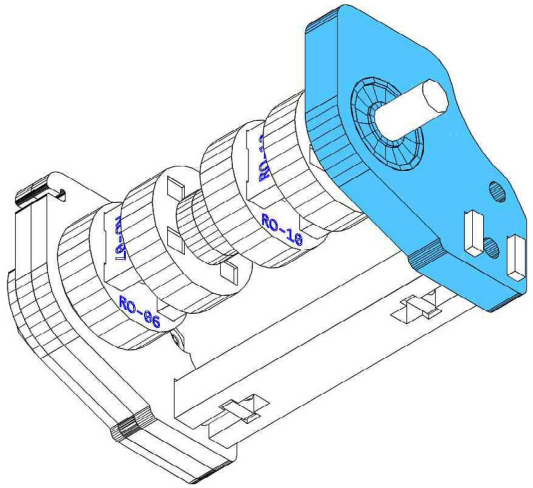
Place an M5x3mm laser cut spacer over the bolt as shown.





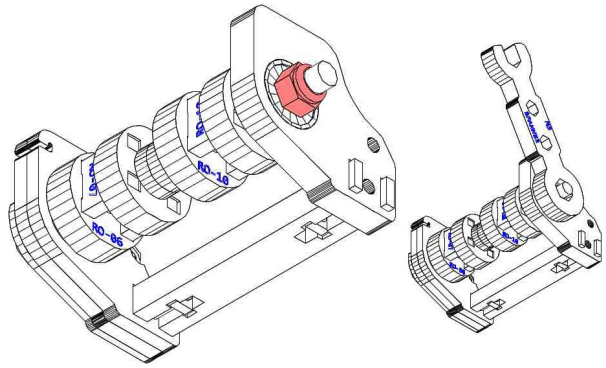
25

Take the previously assembled RO-14 with its bearing and slide it over the bolt, also keying the part into RO-04 as shown.



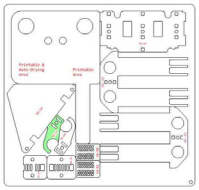
26

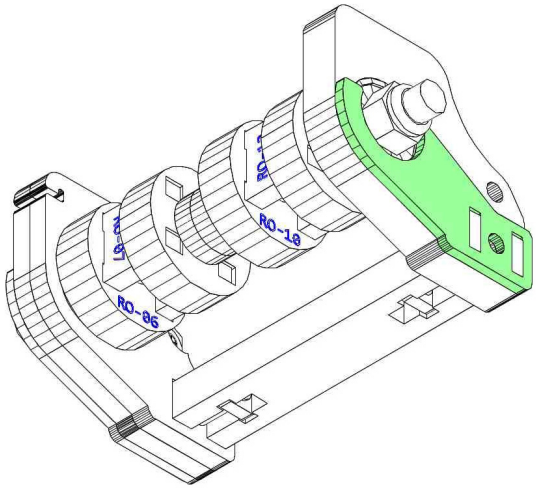
Take an M5 Nyloc nut from the mechanical kit and loosely thread it over the M5 axle bolt. Tighten the nut using your M5 spanner.



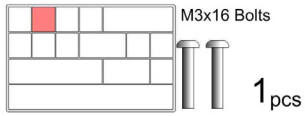
27

Find RO-15 from the 1.5mm plate and slide it over the end (keying into RO-04) as shown.

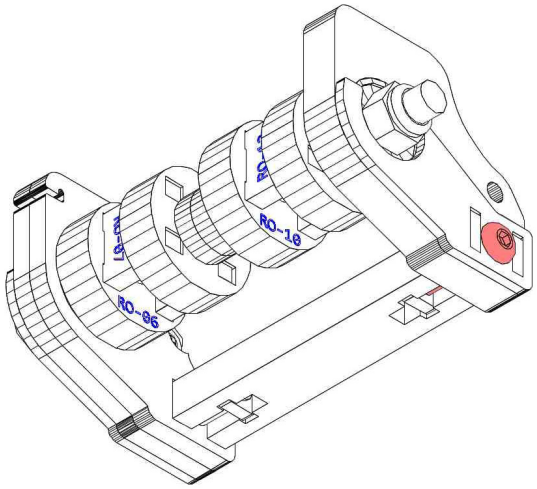




28

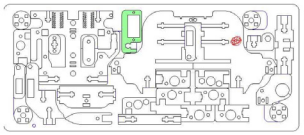


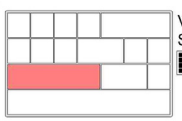
Clamp the whole assembly together with an M3x16 bolt.



29

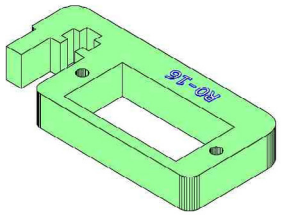
Find RO-16 and place a square nut sticker over the t-bolt cut out on the labelled side as shown.

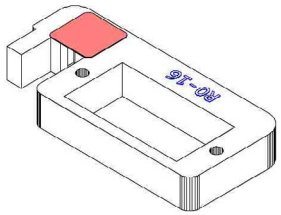




Vinyl Nut Stickers - Square

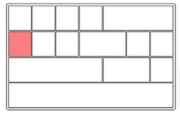
1 pcs





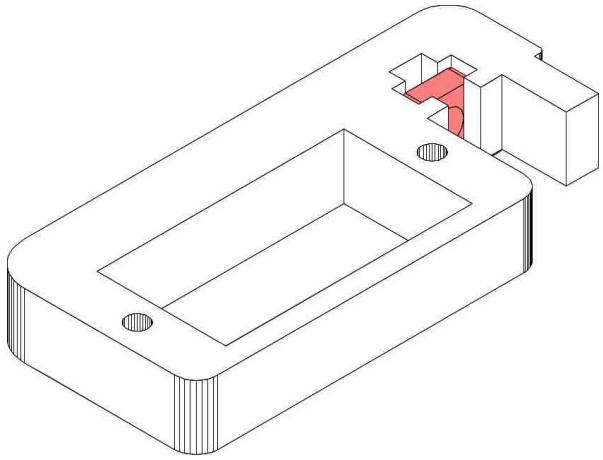
30

Press an M3 square nut into the opposite side.



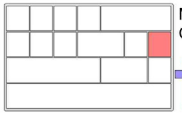
M3 Square Nuts

1 pcs



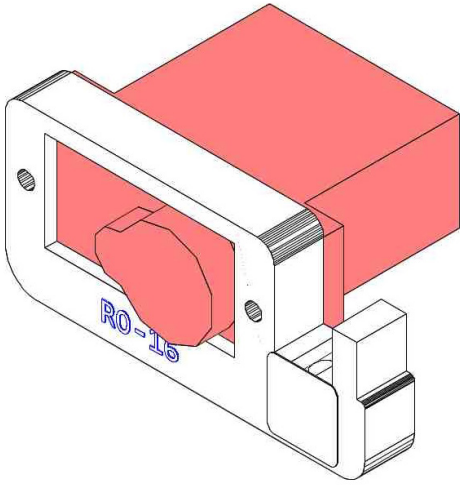
31

Take the metal gear servo from the mechanical kit and insert it into RO-16 as shown. Make sure you don't have the servo flipped around 180 degrees accidentally.



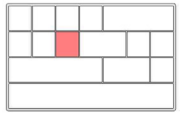
MG90S Metal Gear Servo

1 pcs



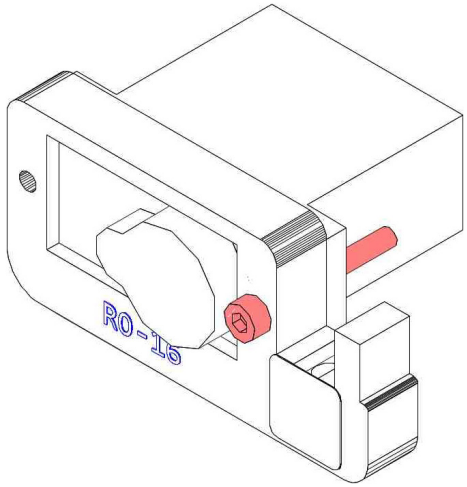
32

Slide an M2x16 bolt through RO-16 and the servo ONLY PLACE THE BOLT SHOWN.

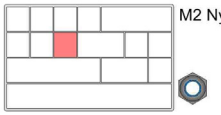


M2x16 Bolts

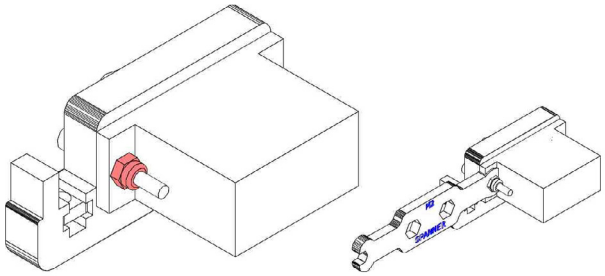
1 pcs



33

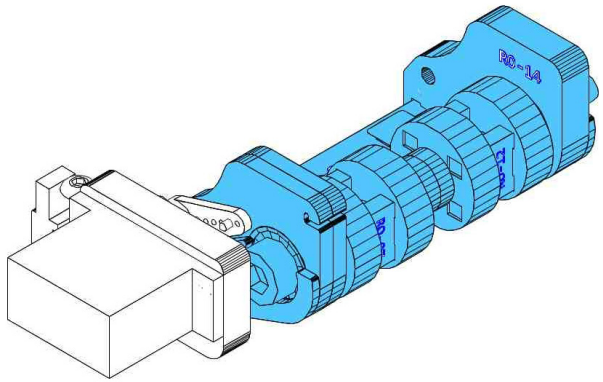


Begin to hand thread an M2 Nyloc nut onto the bolt, tighten the nut in place with your M2 laser cut spanner.



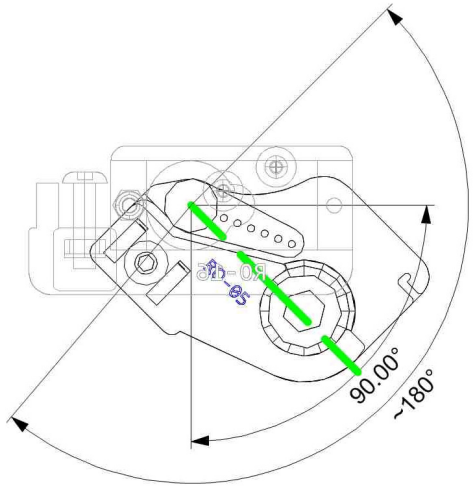
34

Press the servo horn from the previous assembly onto the servo (it takes a little bit of force to pop on the first time).

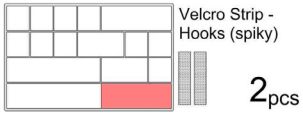


35

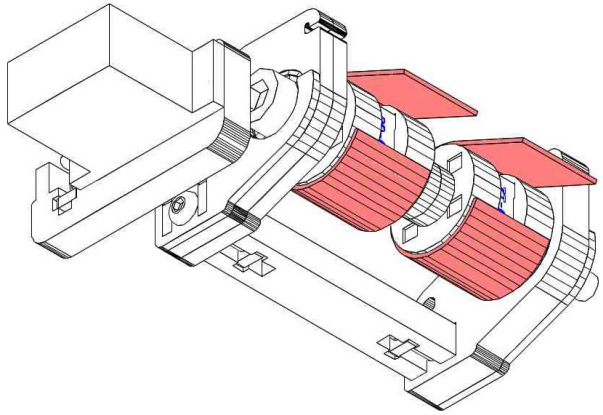
The servo has 180 degrees of rotation & we need to make sure that it's in a position so we can drive it without hitting the bounds. Rotate the servo to its approximate central position. Then pop off the servo horn and attach it in the orientation shown in the image. This ensures maximum range of movement in the servo, we will tune its exact position in software later.



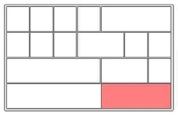
36



Take 2 of the hook (spiky) Velcro strips from the mech kit (as opposed to the loop strips which are soft). Peel the backing from the adhesive & *carefully* wrap the strips over the circular pieces as shown. If the strip overlaps, trim it down with scissors. To ensure the strips don't peel off when using the Velcro later, it's suggested but not required you glue or staple the ends of the strip together.

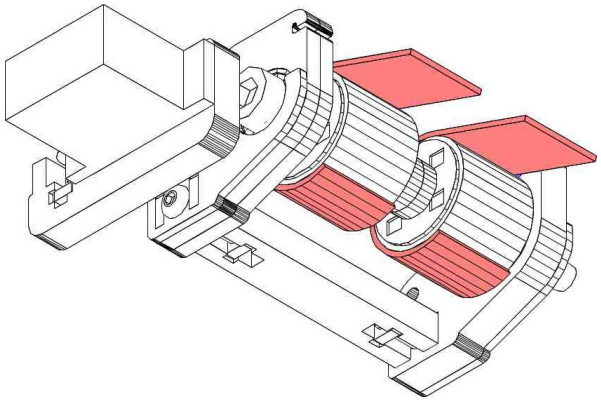


37



2pcs

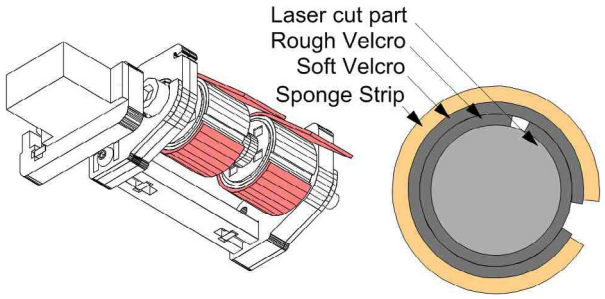
Take 2 of the loop (softer) Velcro strips from the mech kit. Wrap the Velcro around the rough strips on the assembly so that the Velcro meshes together with the adhesive side sticking out. Make sure the strip lies nice and smooth without any bubbles.



38

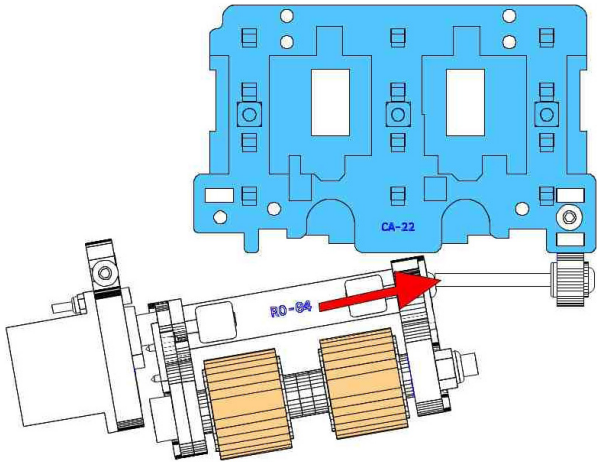
2pcs

Now peel the paper backing from the adhesive on the softer Velcro and find 2 absorbent sponge strips from your mechanical kit. Very carefully lay the sponge strip onto the adhesive - make sure the ENDS OF THE SPONGE STRIPS LINE UP with the ends of the soft Velcro strips. This should allow you to then peel the sponge strip off (with the soft Velcro attached) and then Velcro it back on very easily.



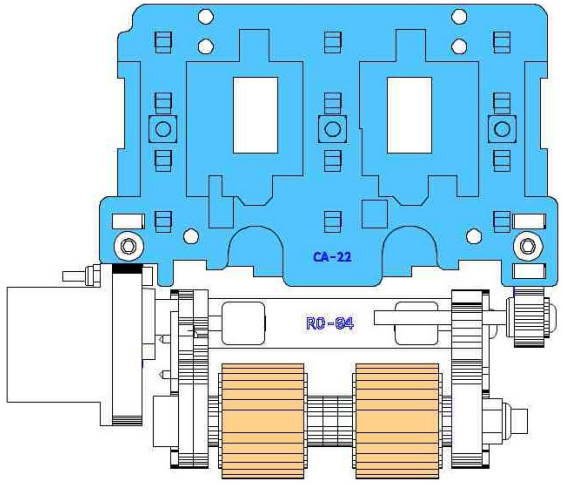
39

Now we are going to attach this assembly to the base section from CA. Begin by sliding the M3x35 bolt we assembled on previously through the hole in RO-14 (at the end of the servo assembly). You can see this more clearly 2 steps ahead if you're confused.



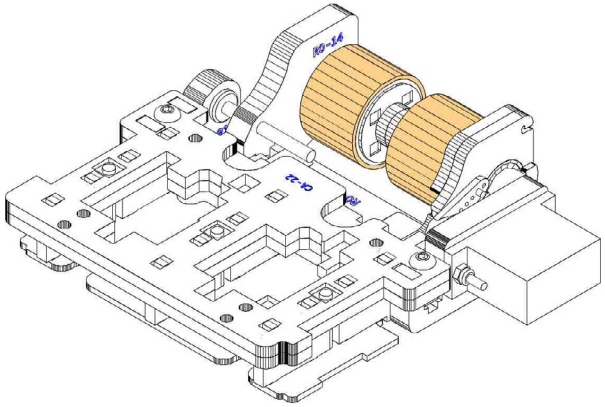
40

Then key the servo mount plate into the base assembly as shown here and in the next step.



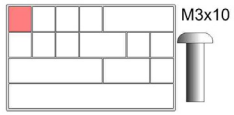
41

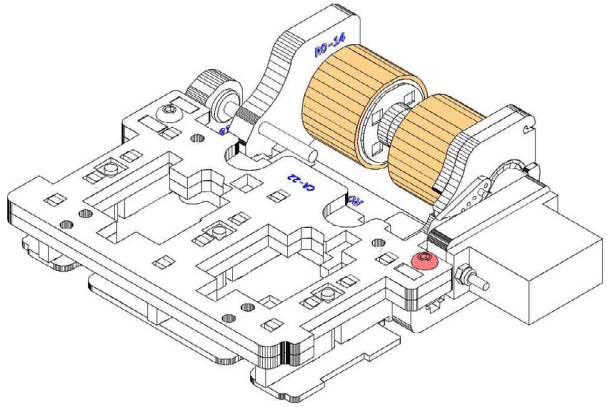
The two assemblies together.



42

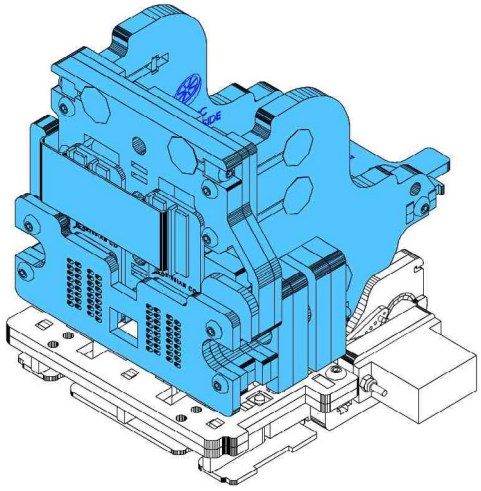
Now clamp the parts in place with an M3x10 bolt placed as shown.





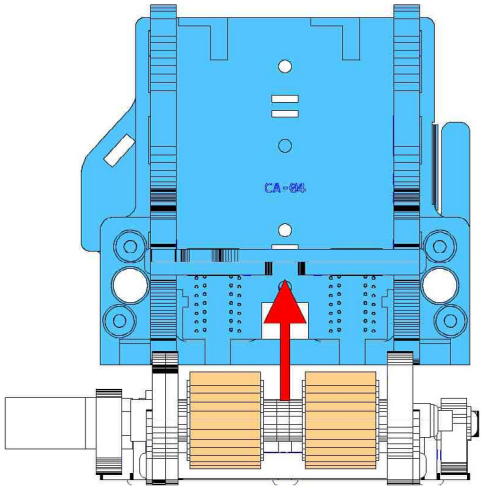
43

Now with the roller attached, we can assemble this whole part into the main carriage assembly as shown.



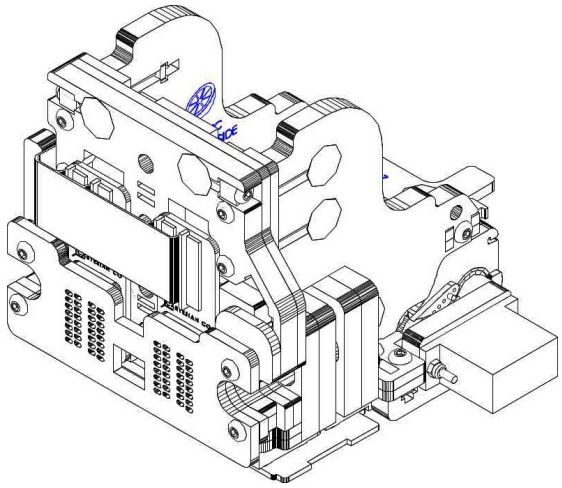
44

Line the two assemblies up and the base (with roller) will vertically key into the main body.

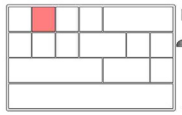


45

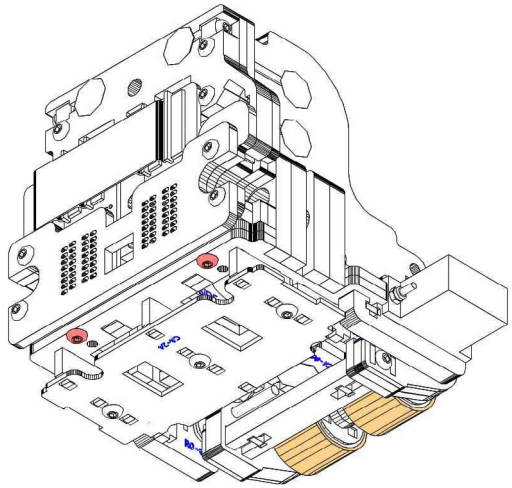
The two assemblies together.



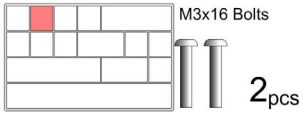
46



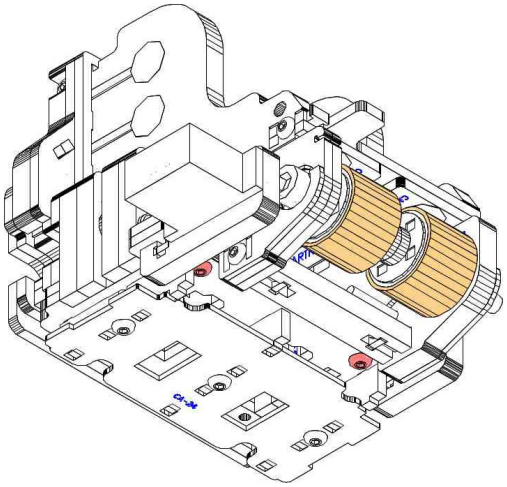
Take 2 M3x16 bolts and clamp the assemblies together as shown.



47



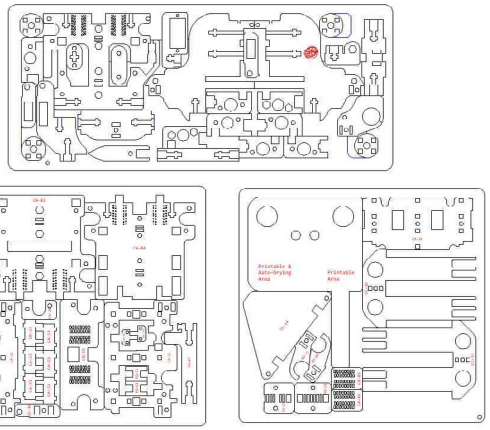
Take another pair of M3x16 bolts and clamp them in the rear section as well. Your carriage with roller is now done! Take a break, contemplate the true meaning of what it is to be human while staring thoughtfully into space & move onto the next section



CARTRIDGE CLAMP

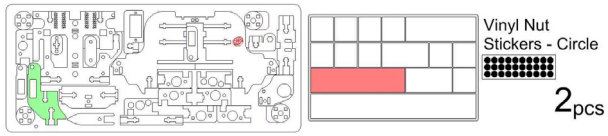
1

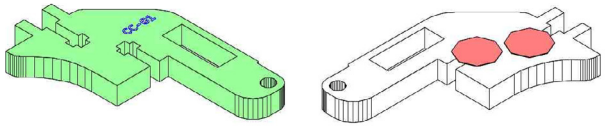
This section is for assembling the Cartridge Clamp which holds the cartridges in place during printing (as well as the pogo pin protector which assists in loading). For this section you will need your mechanical kit, screwdriver kit, laser cut spanners & the 3 laser cut plates shown here. The top is in 6mm, bottom left in 3mm and bottom right in 1.5mm (same as from RO & CA).



2

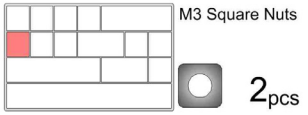
Find CC-01 & lay it flat on your table. Take 2 circular nut stickers and place them over the t-bolt cut outs as shown.

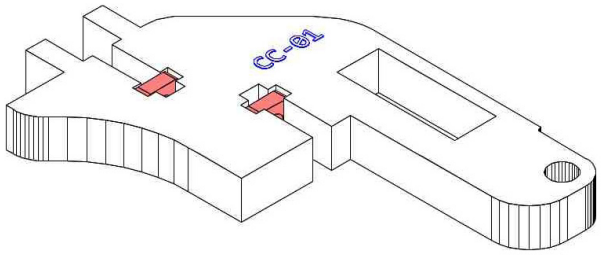




3

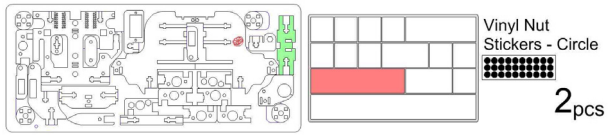
Flip the part over and take 2 M3 square nuts from the mechanical kit, press them into CC-01 as shown. Make sure to press the nuts up against the stickers so they don't fall out!

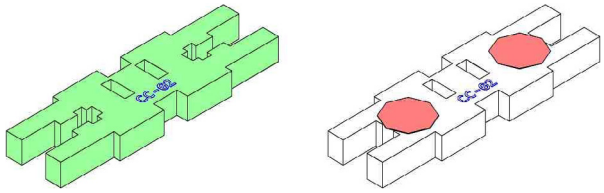




4

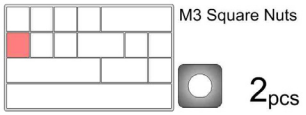
Find CC-02 & lay it flat on your table. Take 2 circular nut stickers and place them over the t-bolt cut outs in CC-02.

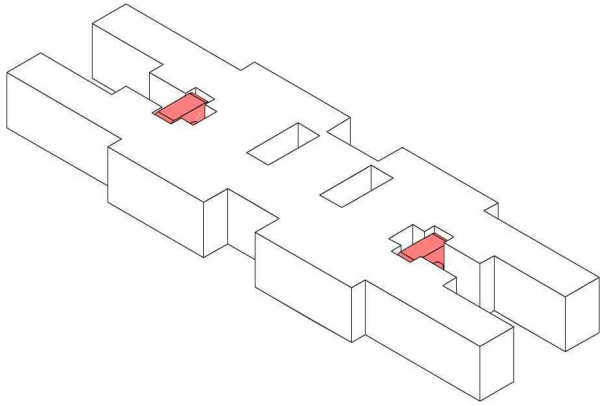




5

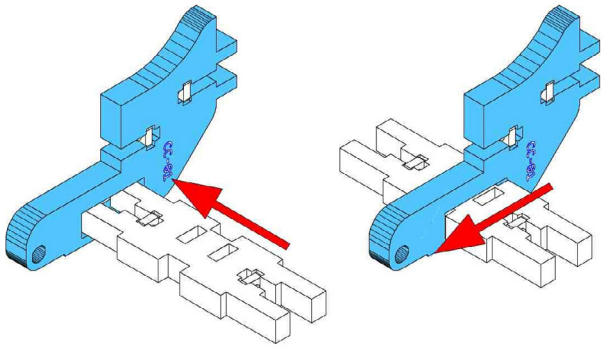
Flip the part over and take 2 M3 square nuts from the mechanical kit, press them into CC-02 as shown.





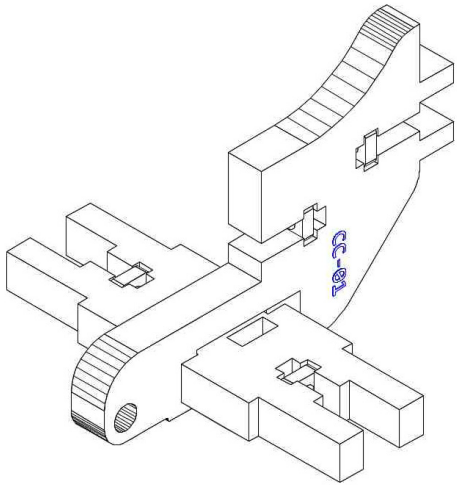
6

Slide CC-02 into CC-01 as shown, making sure the rectangular cut outs are at the top. Once you've slid it in sideways, press it down (as shown in the right image) for the next step.



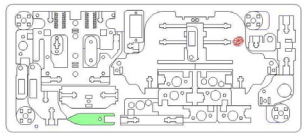
7

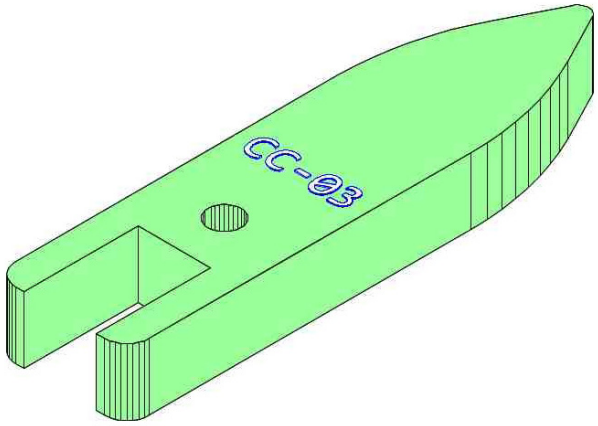
Your parts should now look like this.



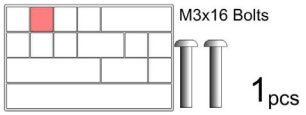
8

Find CC-03.

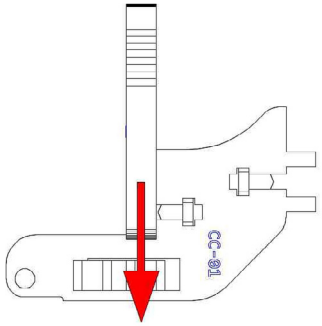


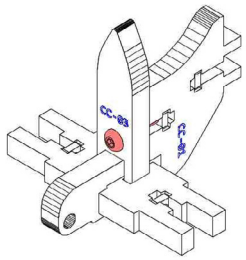


9

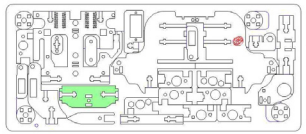


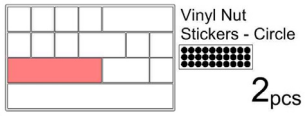
Slide CC-03 into CC-02 as shown so that it locks all 3 pieces together. Take an M3x16 bolt from the mechanical kit and put it through CC-03 as shown. Tighten the bolt. These parts won't sit right if you have CC-02 upside down.



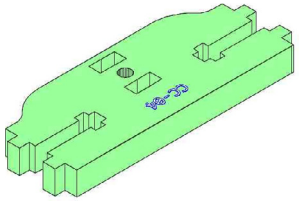


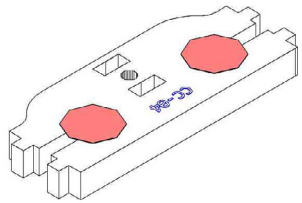
10



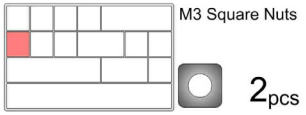


Find CC-04 & lay it flat on your table. Stick a pair of circular nut stickers over the cut outs.

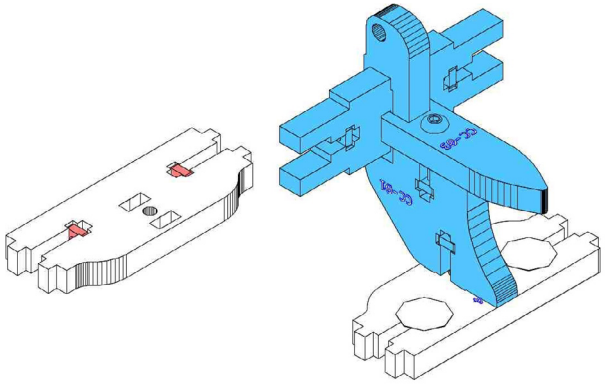




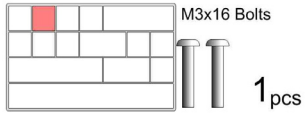
11



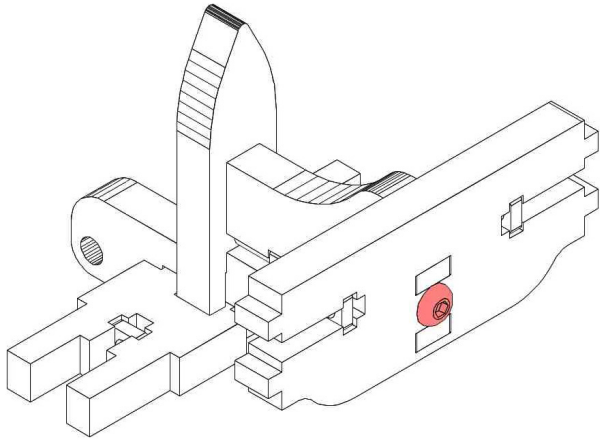
Flip CC-04 and press another pair of M3 square nuts into the t-bolt slots. Now put the tabs of CC-01 into CC-04 as shown (be careful not to have CC-04 rotated around 180 degrees).



12

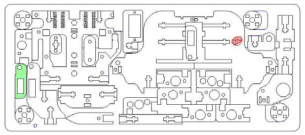


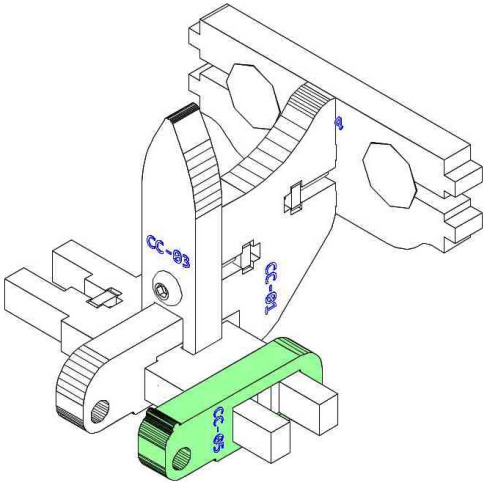
Take an M3x16 bolt from the mechanical kit and place it through CC-04. Tighten the bolt.



13

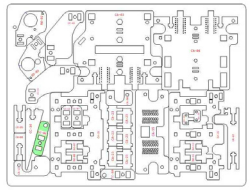
Find CC-05 & then slide it over CC-02 as shown. In this image, note that the nub is face up.

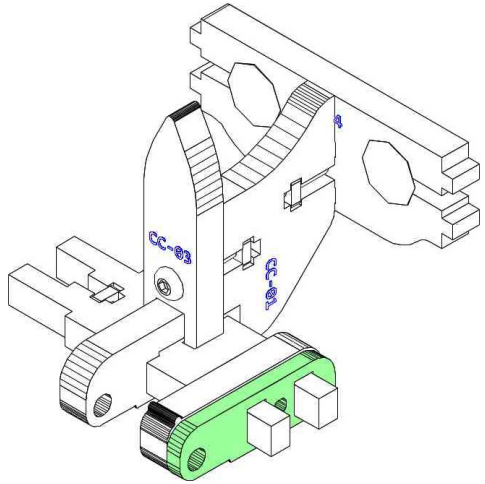




14

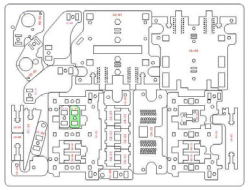
Find CC-06 & slide it up against CC-05 as shown (note the labelled side is up against CC-05).

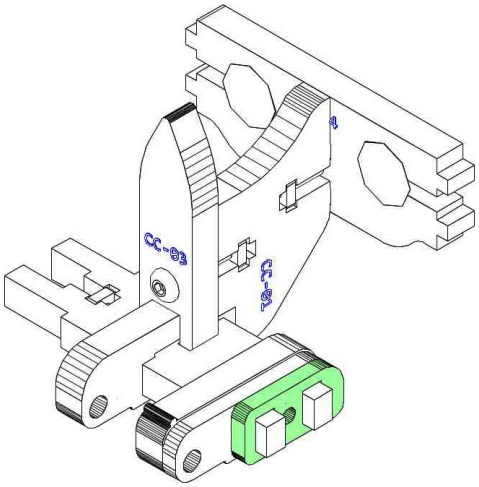




15

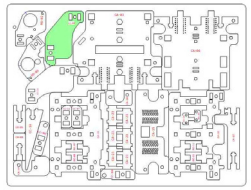
Now do the same for CC-07 (note the labelled side is up against CC-06).

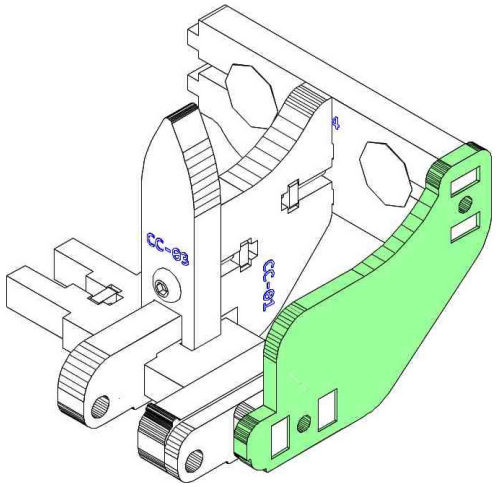




16

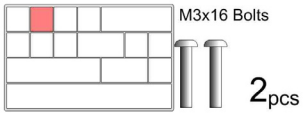
Find CC-08 & lock it into the other parts as shown, again note the labelled side is facing away from us.

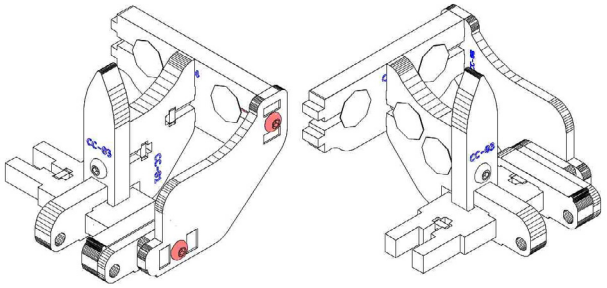




17

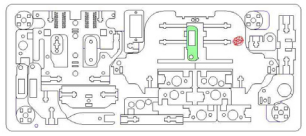
Grab a pair of M3x16 bolts from the mechanical kit and use them to fasten CC-08 at the two points indicated. We'll now do the same as a mirror image to the other side of the clamp.

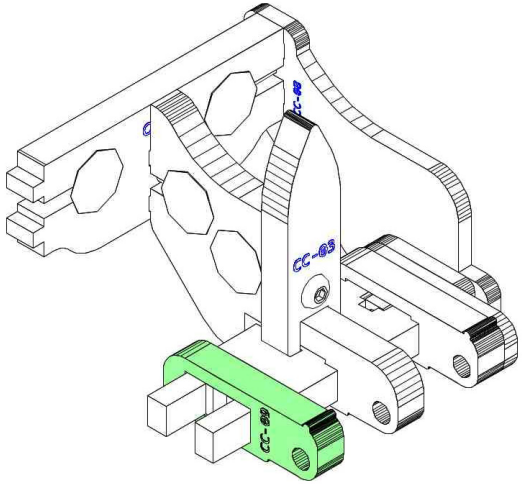




18

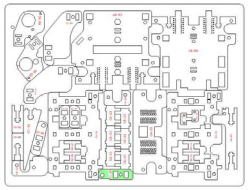
Find CC-09 and slide it onto CC-02. Again, note that the nub is facing up on CC-09 in this image.

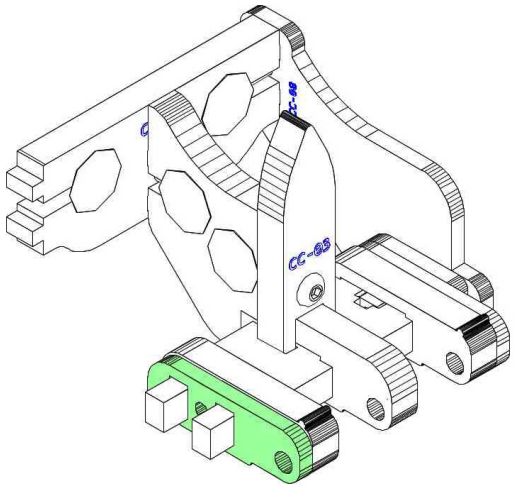




19

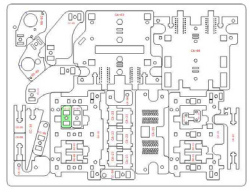
Find CC-10 and slide it up next to CC-09, once again the labelled side is facing away.

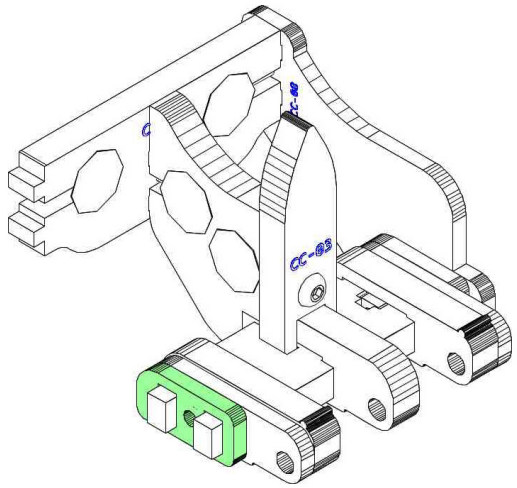




20

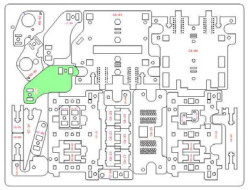
Same again with CC-11. Surprising, I know.

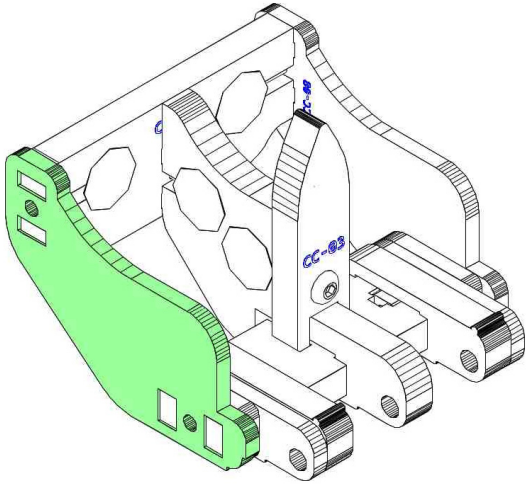




21

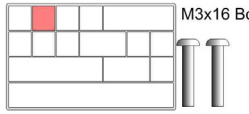
Key CC-12 into the other parts as shown, once more making sure that the labelled side facing into the assembly.

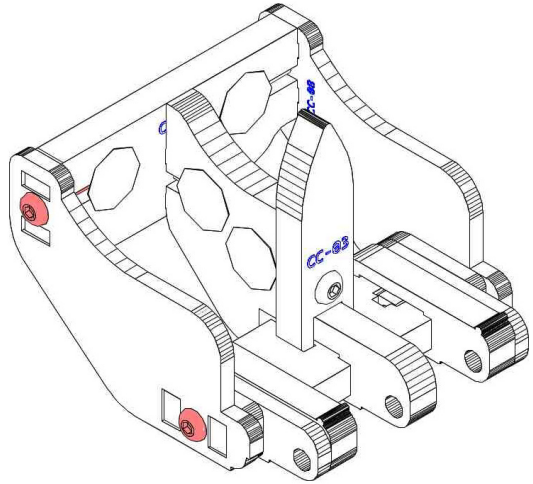




22

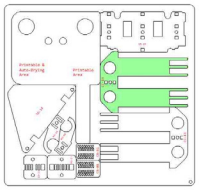
Take a pair of M3x16 bolts and clamp the parts together as shown.

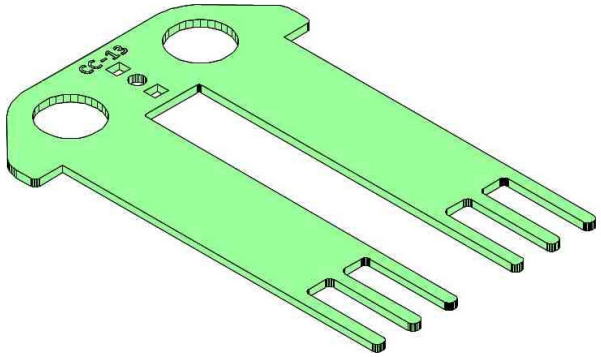




23

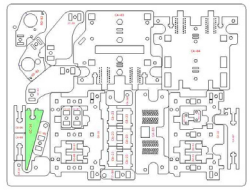
NOTE: THIS SECTION WAS OMITTED UNTIL v0.5, if you are being directed here from later in the instructions, please complete this and the next 2 steps before continuing where you were. Find CC-13 and lay it flat labelled side up.

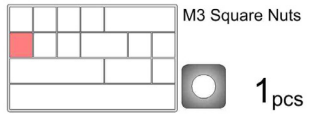


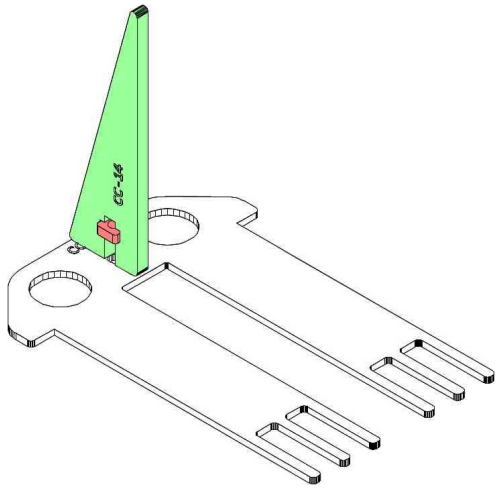


24

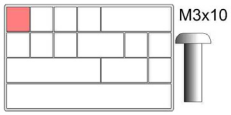
Find CC-14 and key it into CC-13 as shown here. Place an M3 square nut into CC-14 as shown.





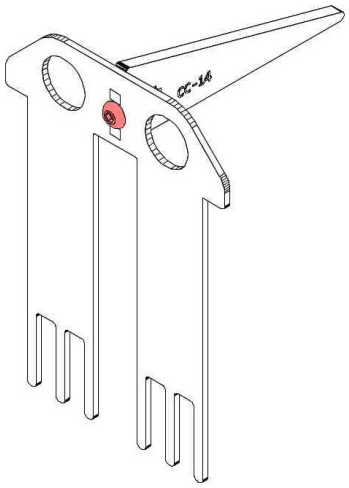


25



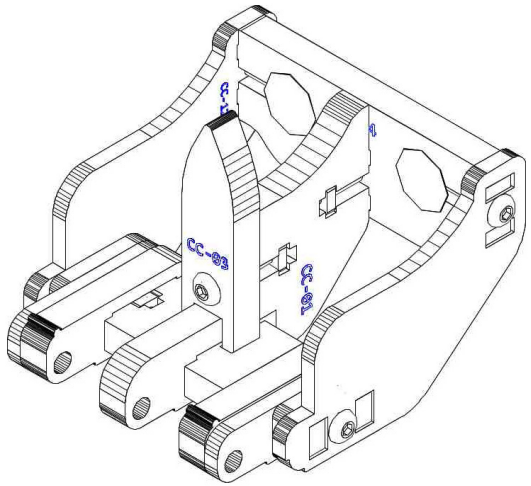
2pcs

Bolt the 2 parts together as shown, this part is placed inside the carriage while loading a cartridge to prevent you from bending the pins that connect to your cartridge. DO NOT EVER LOAD A CARTRIDGE WITHOUT USE OF THIS DEVICE. The extending protrusion prevents you from closing the clamp with the protector in place - proper use will be explained later.



26

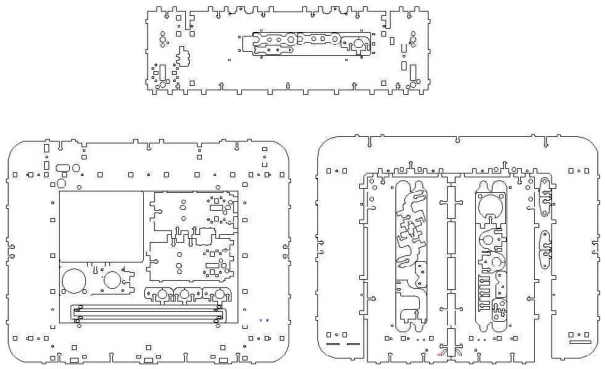
Your cartridge clamp (& pogo pin protector) is all done!! You truly are a superstar, go and tell your friends this *immediately*.



∞ MAIN INFRASTRUCTURE

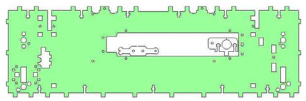
1

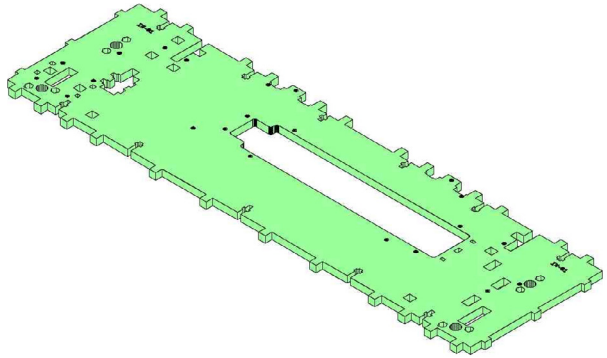
This section is for assembling the main Infrastructure of the printer, the skeleton if you will. For this section you will need your mechanical kit, screwdriver kit, laser cut spanners & the 3 laser cut plates shown here. All 3 plates are 6mm.



2

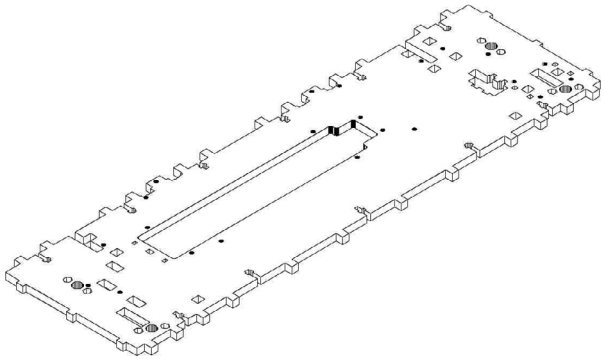
Find IN-01 and lay it flat with the labelled side up as shown.





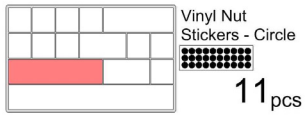
3

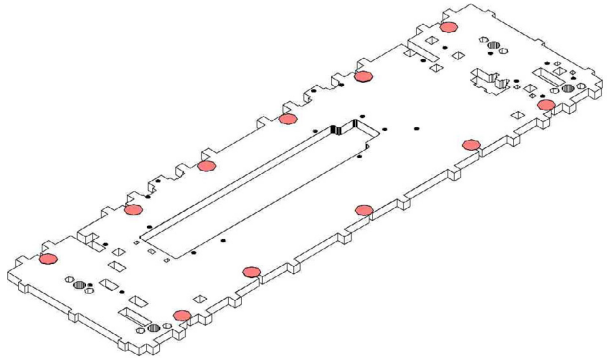
Flip the part over.



4

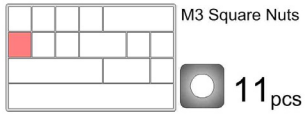
Place a nut sticker over each t-bolt cut out. Remember if you run out of circular stickers at any point, square stickers can be used instead.

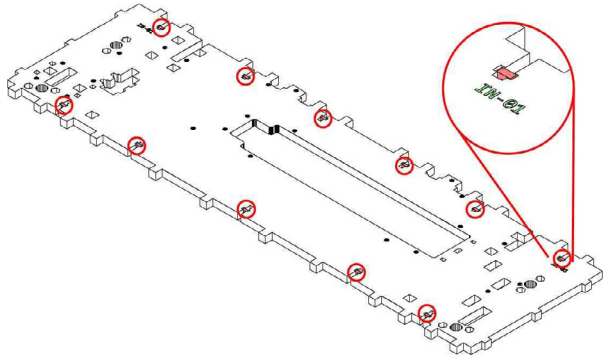




5

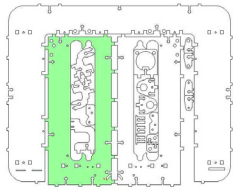
Flip the part back over and place an M3 square nut into each cut out as shown.

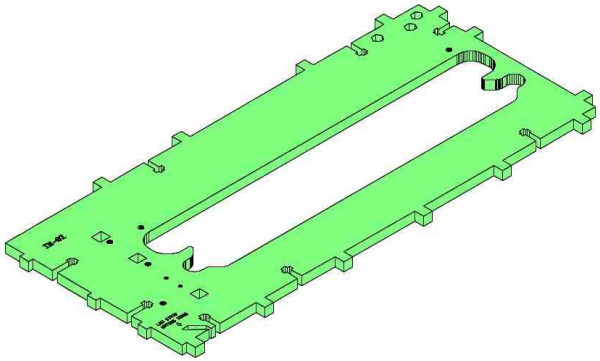




6

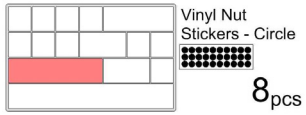
Find IN-02 & lay it flat with the labelled side up as shown.

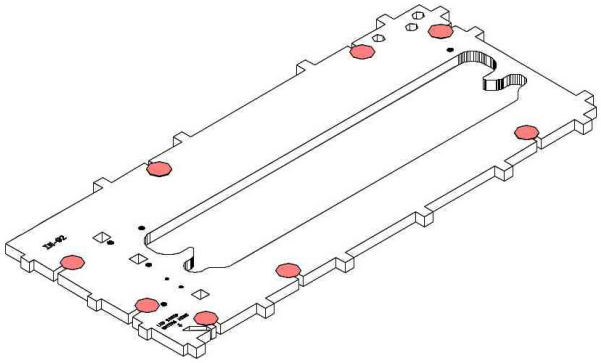




7

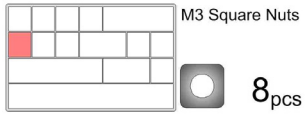
Place a nut sticker over each t-bolt cut out. Again circle or square is fine.

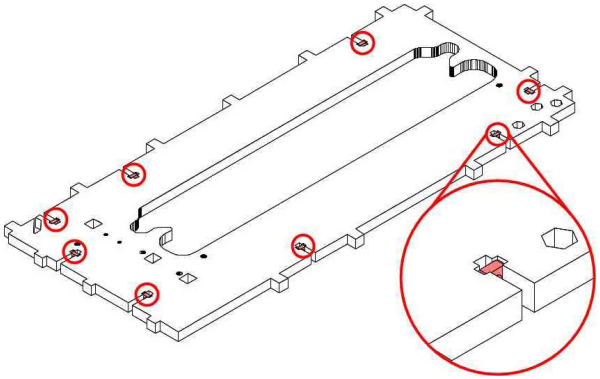




8

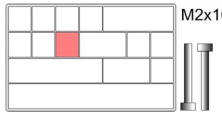
Flip the part over & place an M3 square nut into each cut out as shown.



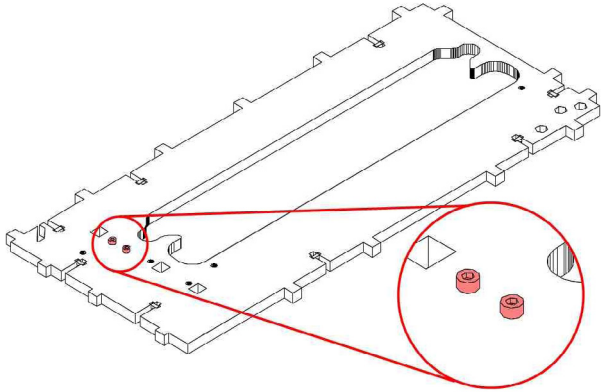


9

Push 2 M2x16 bolts through the 2 M2 holes as shown.

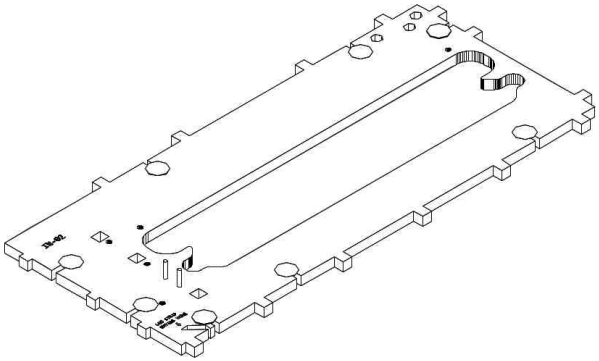


2pcs



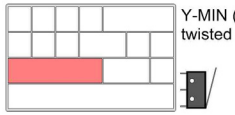
10

Flip the part back over while keeping the bolts in place.

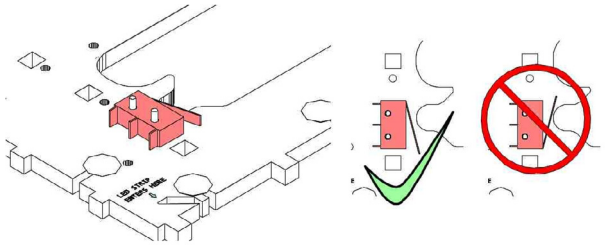


11

Find the Y-MIN limit switch from the mechanical kit and place it over the bolts as shown. NOTE: the Y-MIN limit switch is the only un-twisted cable - DO NOT us the others. Also double check the orientation of the limit switch. THIS STEP PREVIOUSLY INSTRUCTED TO USE A TWISTED CABLE, THIS WAS INCORRECT, THE Y-MIN SWITCH IS UN-TWISTED.

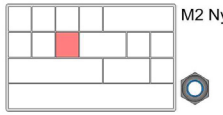


1pcs

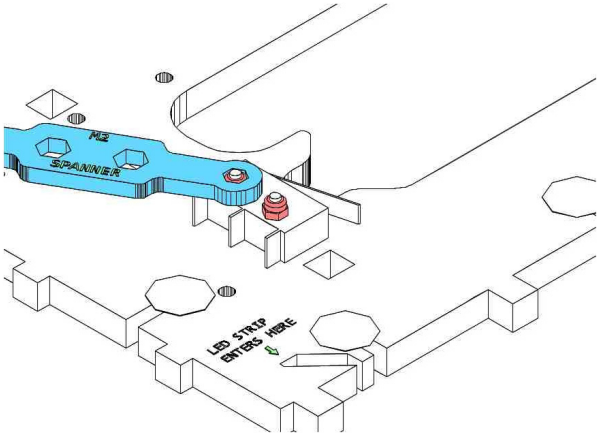


12

Tighten a pair of M2 nyloc nuts over the limit switch as shown.

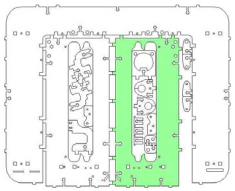


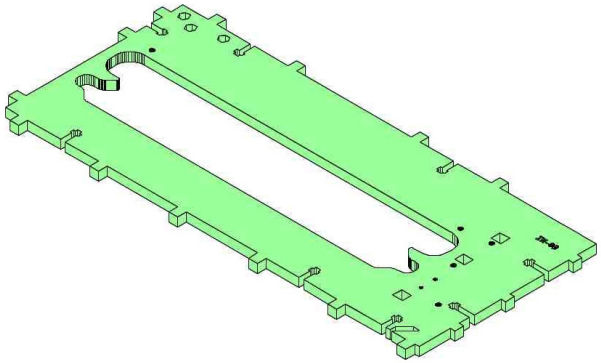
2pcs



13

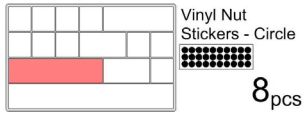
Find IN-03 & lay it flat with the labelled side up as shown.

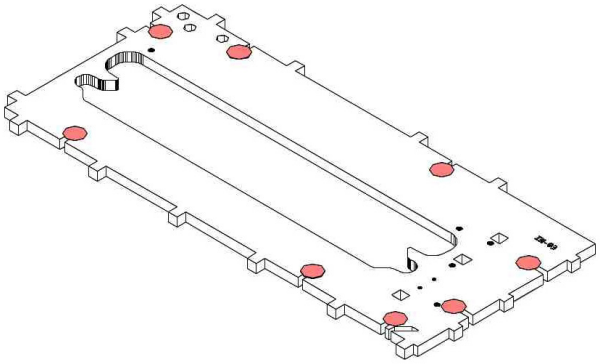




14

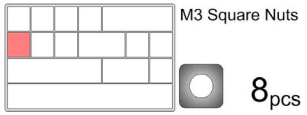
Again, place nut stickers over the t-bolt cut outs.

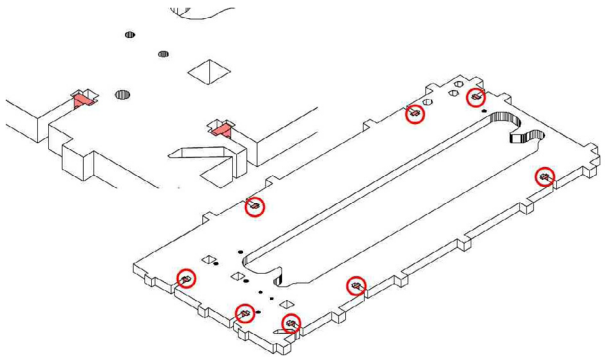




15

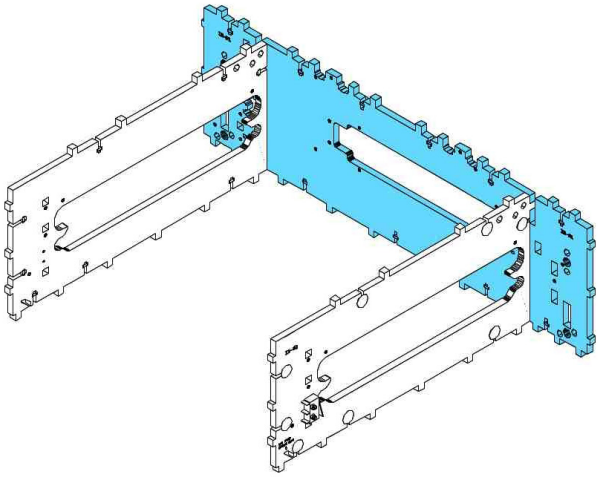
Flip the part over & place an M3 square nut into each cut out as shown.





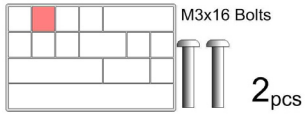
16

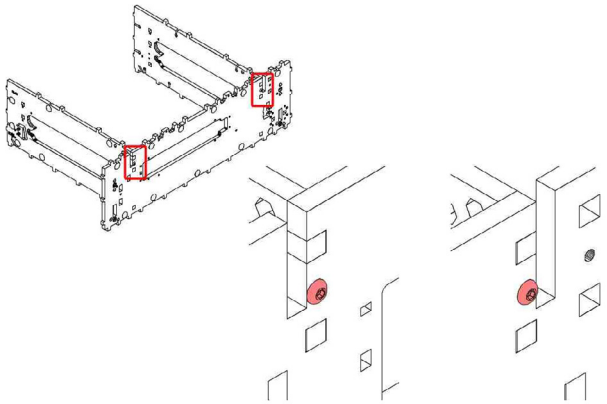
Take IN-01, IN-02 & IN-03 and key them in together as shown. BE GENTLE with the parts whilst doing so.



17

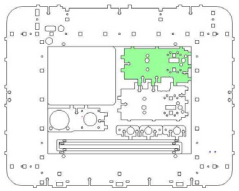
Bolt the three parts together using a pair of M3x16 bolts as shown.

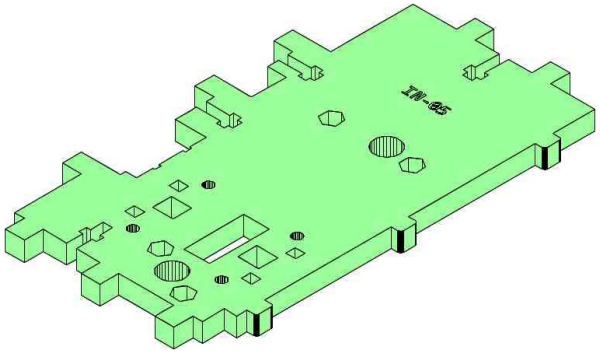




18

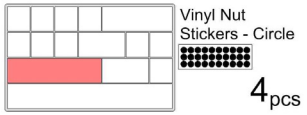
Find IN-05 and lay it with the labelled side up as shown.

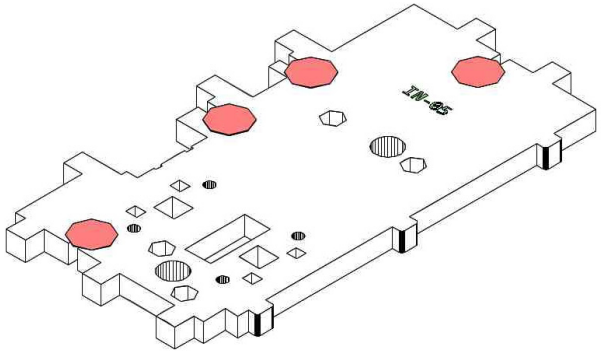




19

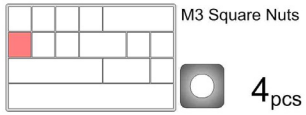
SURPRISE, put nut stickers over the t-bolt cut outs.

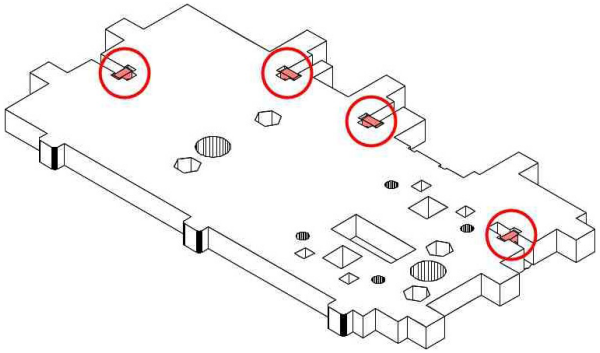




20

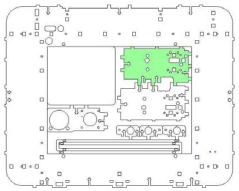
Flip it over and fill it with M3 square nuts.

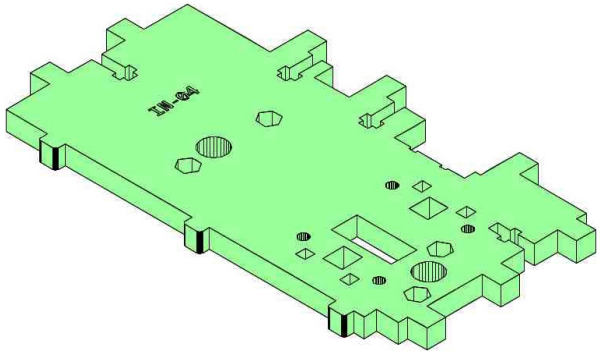




21

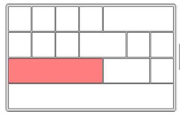
Now we are going to do the same with IN-04, only as a mirror image. Find the part and lay it labelled side up.

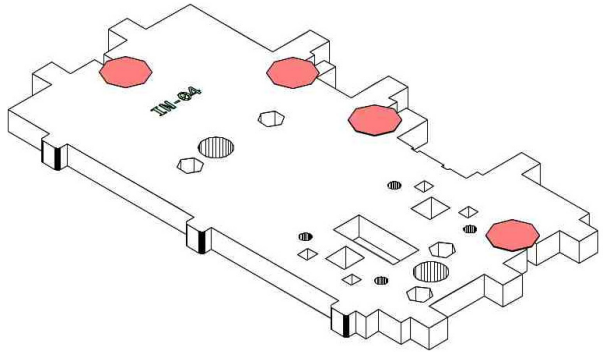




22

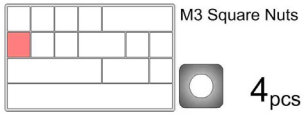
Apply nut stickers.

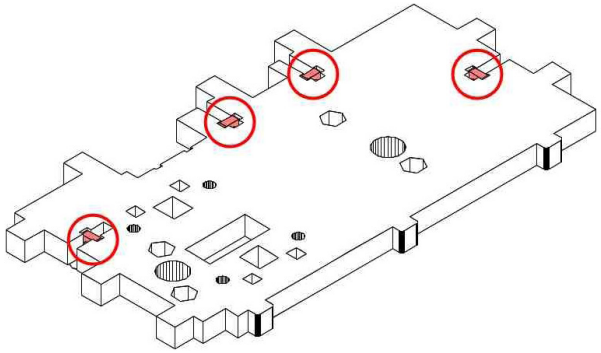




23

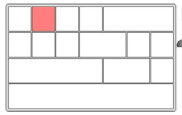
Flip over and insert M3 square nuts.

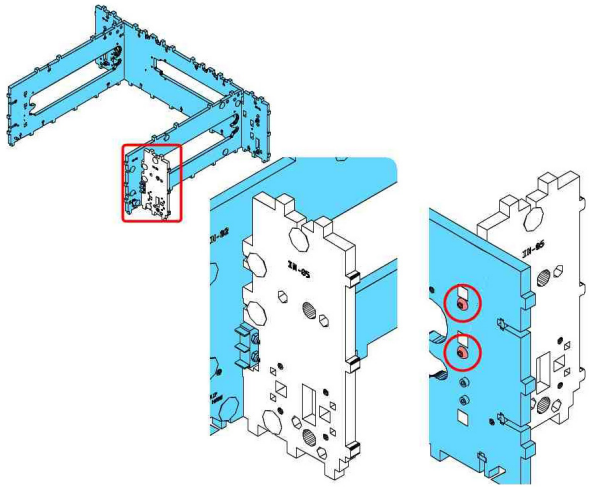




24

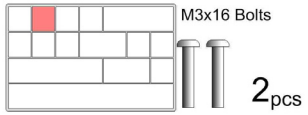
Now Key IN-05 into IN-02 as shown and then bolt the two together with a pair of M3x16 bolts as shown. REMEMBER BE GENTLE WITH THESE PARTS - they will be much more secure once inside the base plate.

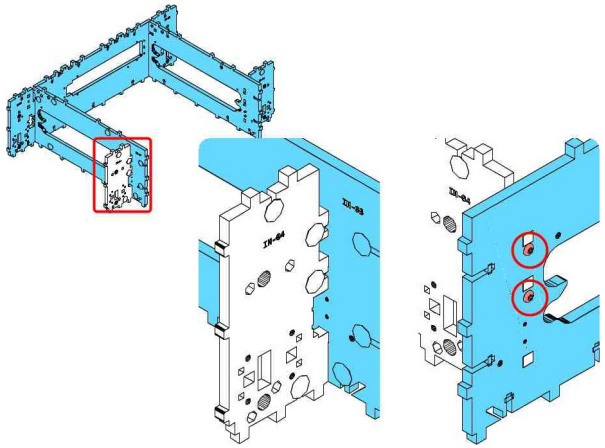




25

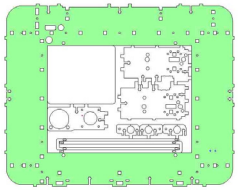
Bolt in IN-04 on the other side as shown.

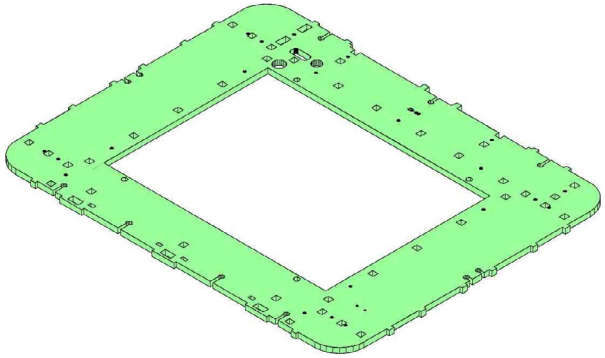




26

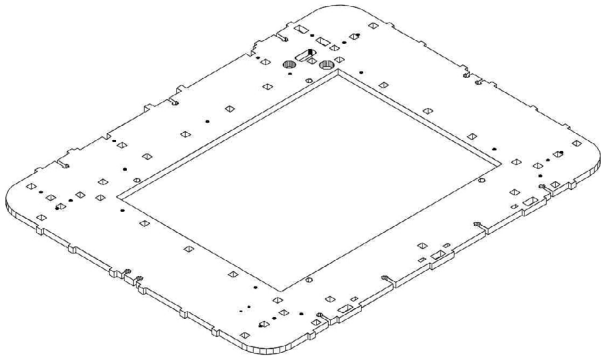
Find the base piece, IN-06 & lay it labelled side up.





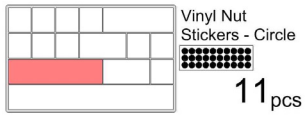
27

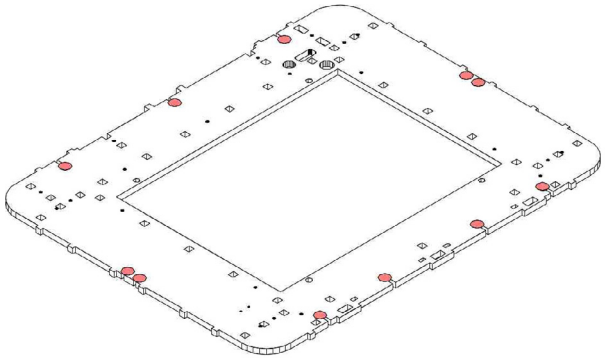
But then flip it over so that you can...



28

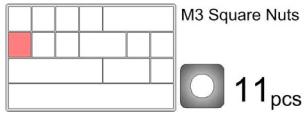
Apply the nut stickers to the underside, again circular or square is fine.

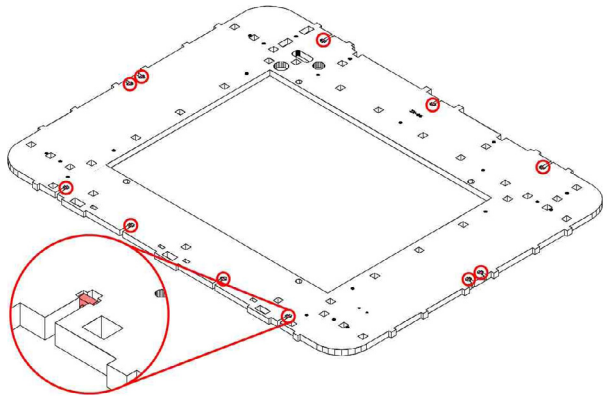




29

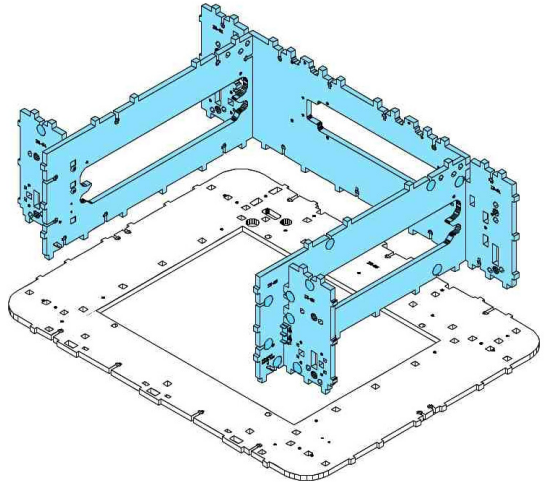
Flip it back to labelled side up and insert M3 square nuts.





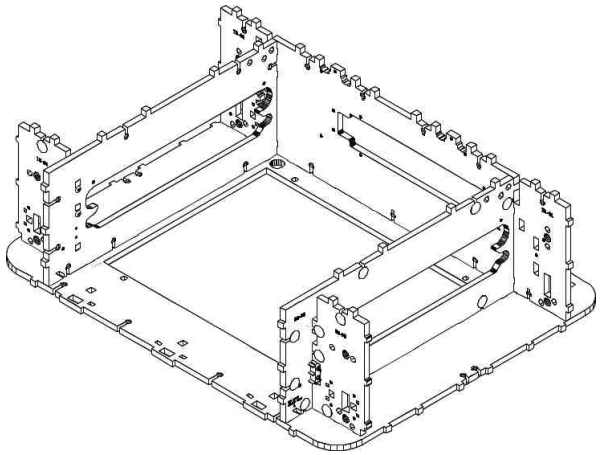
30

Now we are going to insert the other infrastructure parts into the base plate as shown. Remember, be gentle.



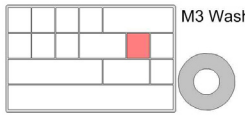
31

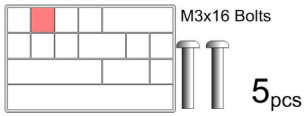
This is how the parts will look together. Oh my god, it's starting to look like an Argentum - how thrilling.

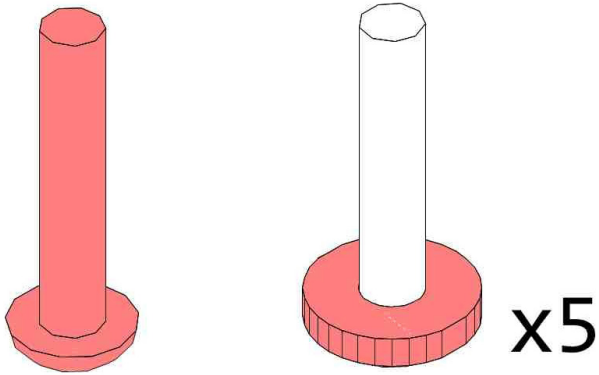


32

Take 5 M3x16 bolts and slide an M3 washer over each as shown.

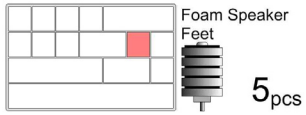


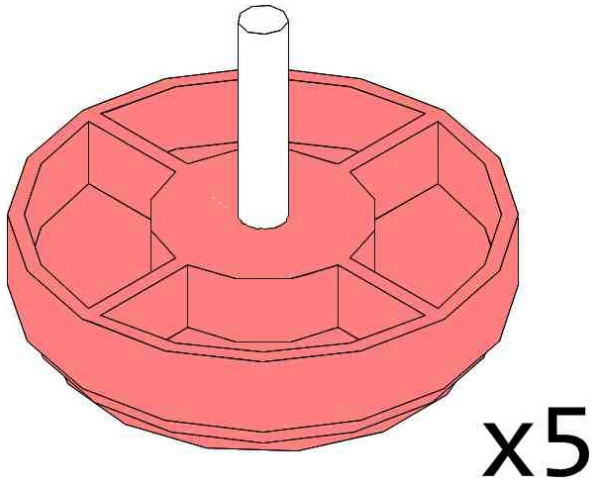




33

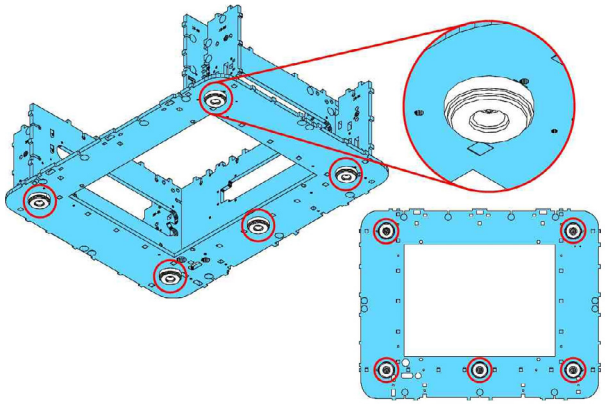
Now slide a foam backed foot on top of each washer as shown. You'll have to pull the bolt out of the stack of feet to do this, just put the nut & bolt back in with the others in your kit.





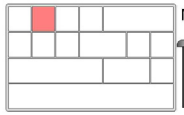
34

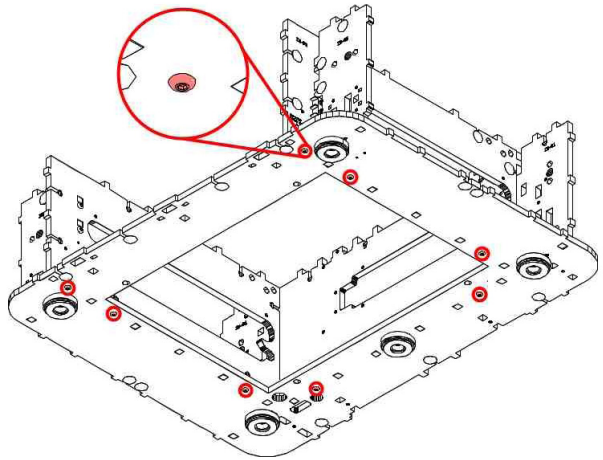
Now we are going to insert the bolts/washers/feet into these specific holes on the base and screw them into place. Tighten these bolts.



35

Now take another 8 M3x16 bolts and place them in the remaining holes indicated. The main infrastructure of your printer is now done!! Tweet a photo just like a 15 year old with their meal at a restaurant

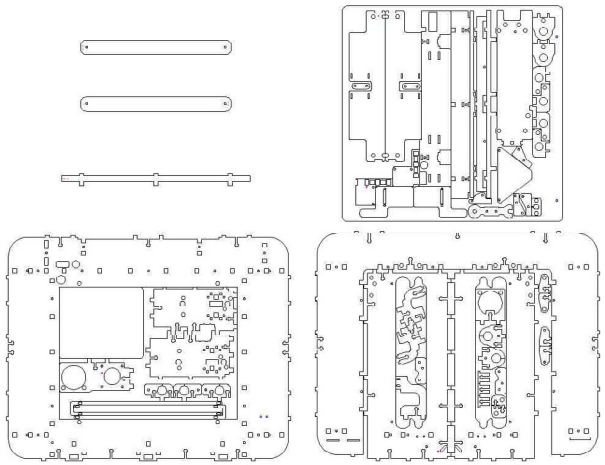




MISCELLANEOUS FRAME PARTS

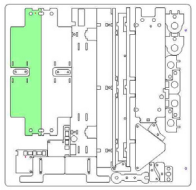
1

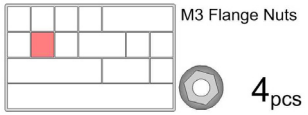
This section is for assembling the Miscellaneous Frame parts, these are just some parts around the infrastructure that fulfil many small roles. For this section you will need your mechanical kit, screwdriver kit, laser cut spanners & the 3 laser cut plates shown (plus the 3 frosted acrylic parts shown top left). The top right is in 3mm, bottom left bottom right in 6mm.

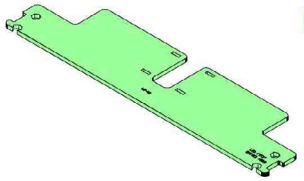


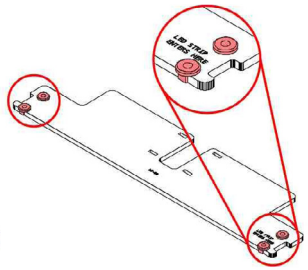
2

Find MF-01 & lay it flat with the labelled side up. Press an M3 flange nut into each of the hexagonal cut outs as shown. If they don't hold themselves in place, you may have to leave them out and place them again as needed.



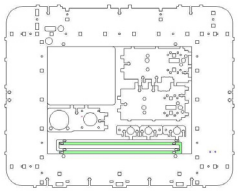


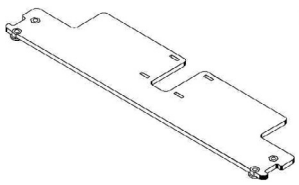


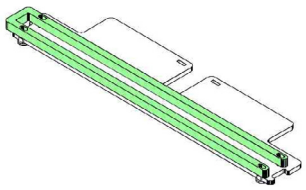


3

Flip the part over and find MF-02. BE CAREFUL removing MF-02 but if you do break it, you should still be able to place the broken parts in the same place and they will function as expected, it will just be harder to assemble. Even if you completely trash it, this part can be replaced with 8 M3x3mm laser cut spacers - 2 over each of the 4 holes. DOUBLE CHECK the orientation of MF-02.

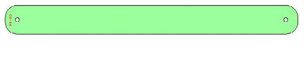


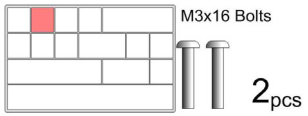


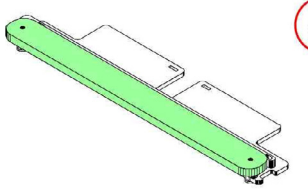


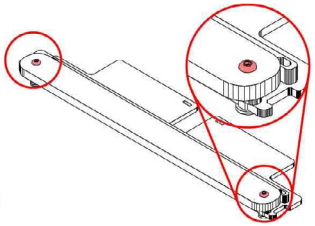
4

Find MF-03, this is one of the frosted acrylic pieces that is in the stack by itself - the etching may be difficult to read but don't worry, both similar parts are identical. Place the part over MF-02 as shown and bolt the three parts together using a pair of M3x16 bolts.



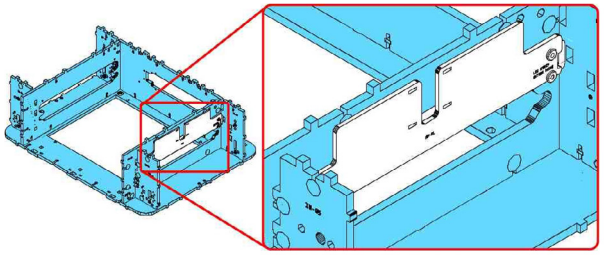




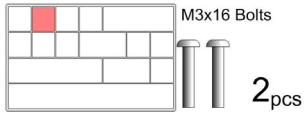


5

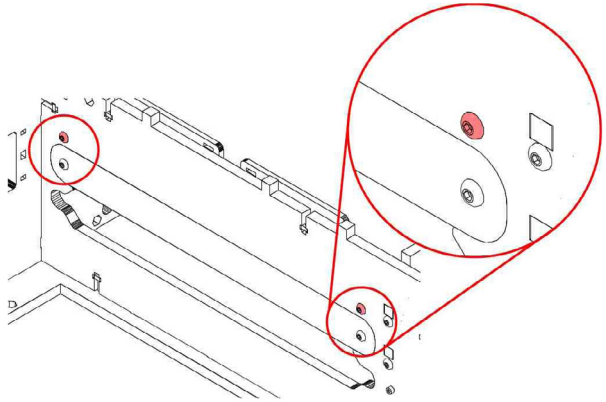
Place this assembly into the RIGHT HAND side of the infrastructure as shown. The frosted part should sit flush in the cavity of the side panel. It may need a small amount of encouraging to push in place as the frosted acrylic is prone to warping.



6

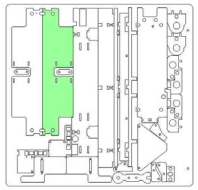


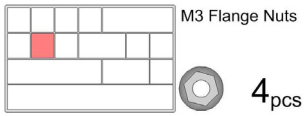
Now bolt the part in place against the flange nuts in MF-01. Make sure these bolts pass through the holes in MF-02.

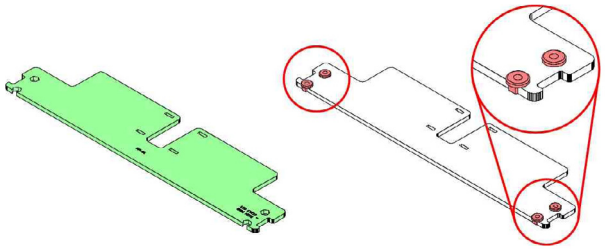


7

Now we'll do the mirror image on the other side. Find MF-04 & press 4 flange nuts into the UN-LABELLED side as shown.

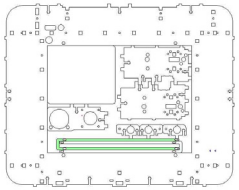


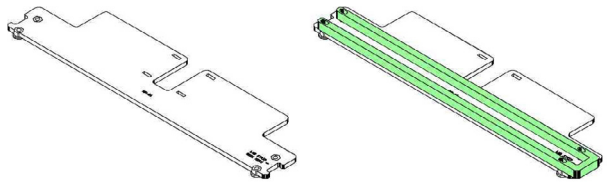




8

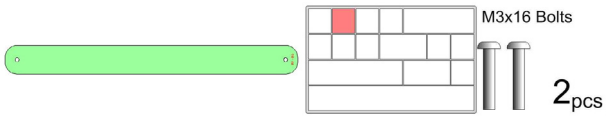
Flip the part over and lay MF-05 on top as shown. Remember to be careful removing it and double check its orientation.

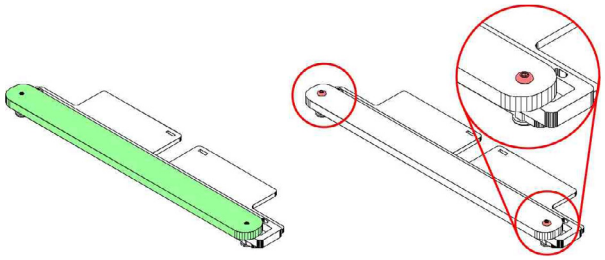




9

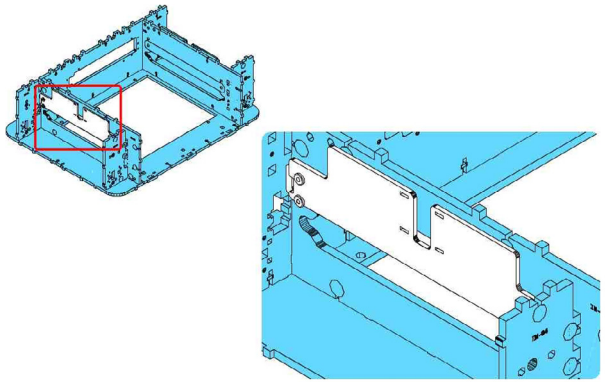
Find MF-06 (the 2nd frosted part), lay it on top and bolt the parts together using a pair of M3x16 bolts.





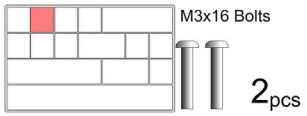
10

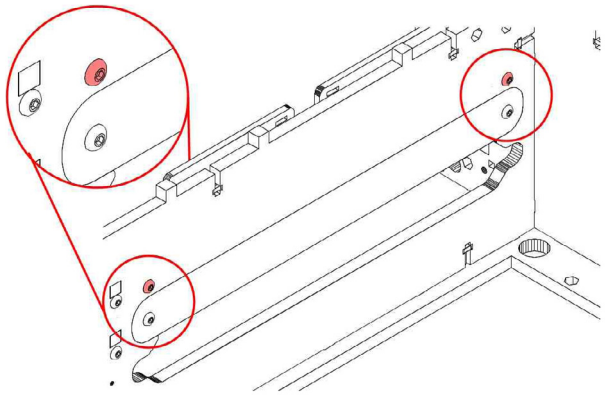
Place this section in the other side of your printer's infrastructure as shown.



11

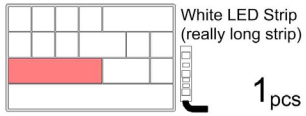
Bolt the assembly in using 2 M3x16 bolts, ensuring that they pass through the holes in MF-05

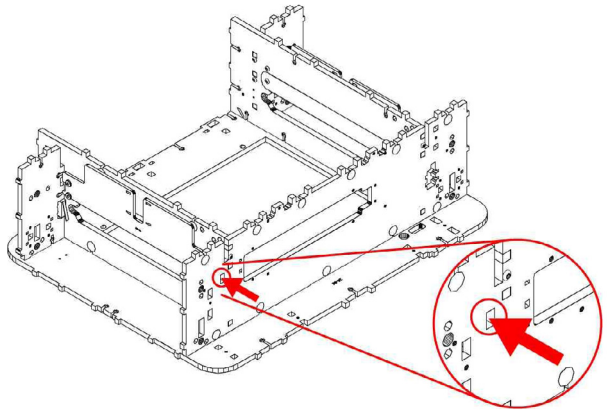




12

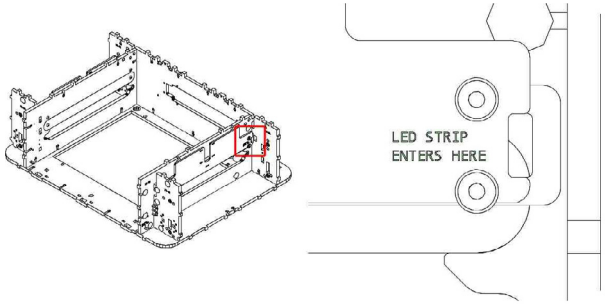
Now we are going to thread the White LED strip that will light up the print area. First, find the long LED strip from the mechanical kit (around a meter long [3 1/3 feet]) and thread it through the hole shown so that the LEDs are facing into the printer.





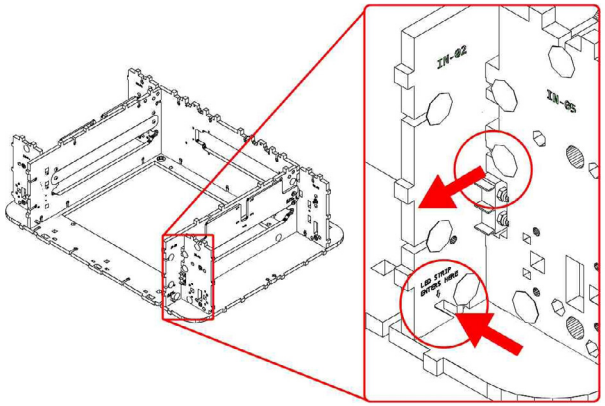
13

On the other side, you want to begin threading the strip through the hole that says LED STRIP ENTERS HERE as shown.



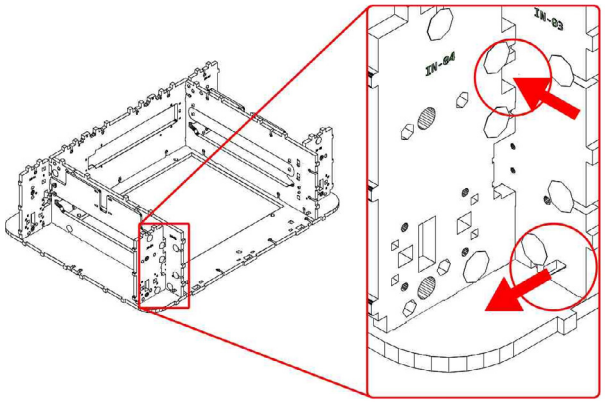
14

The strip will eventually come out of the hole at the top, pull it through so that there is only the cable left hanging out the back & then begin threading the strip through IN-02 where it says LED STRIP ENTERS HERE. MAKE SURE THE LEDS ARE FACING INTO THE PRINTER (and slightly upward) through this hole.



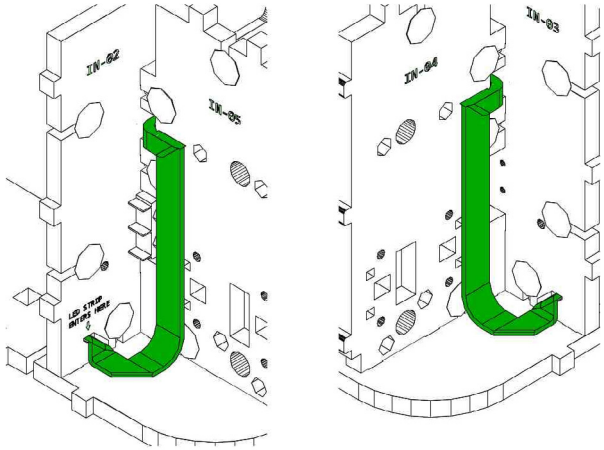
15

Thread the cable through the same hole on the other side in IN-03 as shown and then through the hole in IN-04 indicated. Push the strip through until you can see the end though the hole in MF-04 at the back left of the printer.



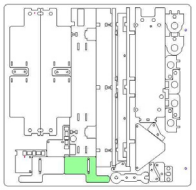
16

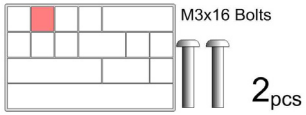
Next, you want to lay the LED strip against IN-04 & IN-05 similar to as shown. MAKE SURE THE LEDs ARE FACING THE WALL, NOT OUTWARDS. Don't be too rough the strip though, it doesn't have to lay perfectly flat just generally out of the way with the LEDS facing the wall.

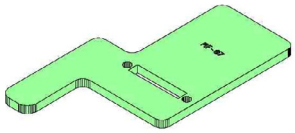


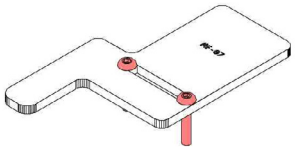
17

Find MF-07 & lay it flat with the labelled side up. Slide a pair of M3x16 bolts through the plate as shown.



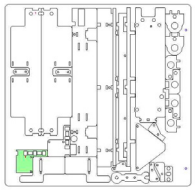


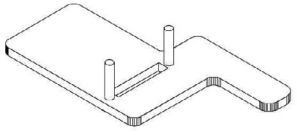


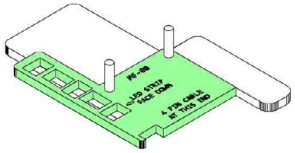


18

Flip the part over, keeping the bolts in place. Find MF-08 & lay over the bolts as shown, labelled side up.

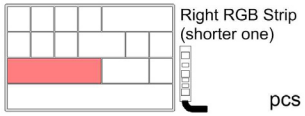


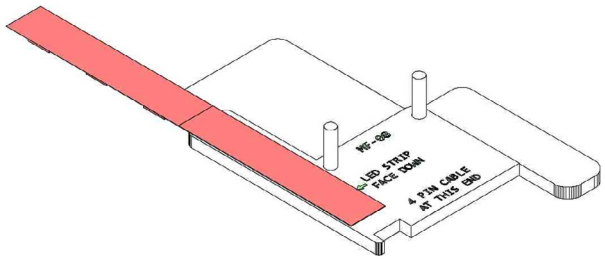




19

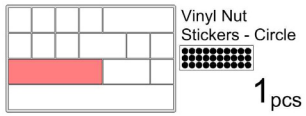
Find the right RGB LED strip from the mechanical kit (this is the SHORTER of the two RGB strips & lay it flat in MF-08. NOTE: the LEDs will key into cut outs in MF-08.

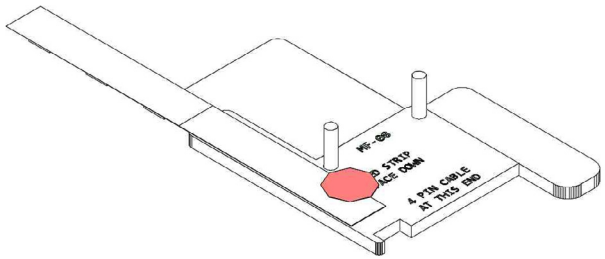




20

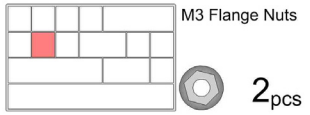
Placing a nut sticker or two here to keep the LED strip in place can make the next step easier. Alternately, use a piece of sticky tape to hold it in place much better. Or just be a man and don't use either... but seriously it's easier with sticky tape.

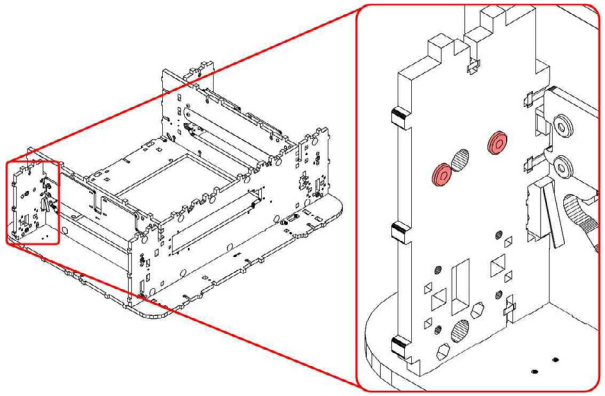




21

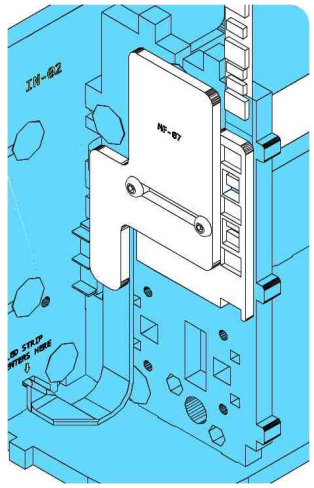
Press a pair of M3 flange nuts into the back of IN-05 as shown.





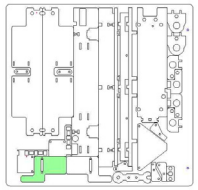
22

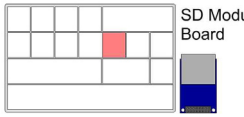
Now take your assembly with the LED strip and place it as shown, tighten both bolts into the flange nuts behind. MF-07 should sit over the white LED strip, helping to hold it down.

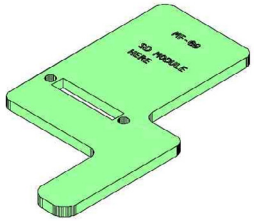


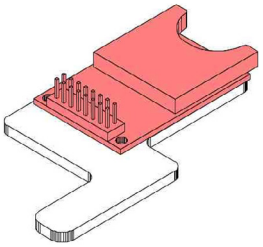
23

Find MF-09 & lay it flat, labelled side up. Find the SD module from the mechanical kit & remove the foam from the pins. Lay the SD module where it says SD MODULE HERE.



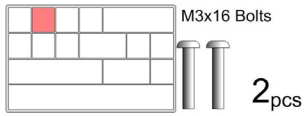


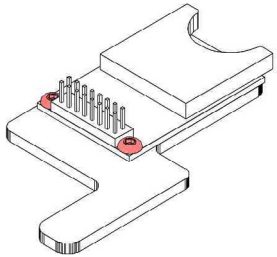


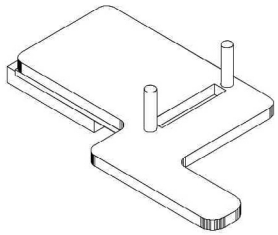


24

Slide a pair of M3x16 bolts through the pair as shown and then flip the parts over. Note that the bolt may not fit next to the SD plug in this step - it should be able to slip past as you tighten it into place in the following steps.

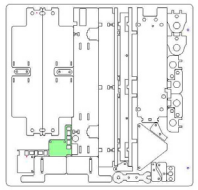


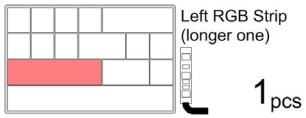


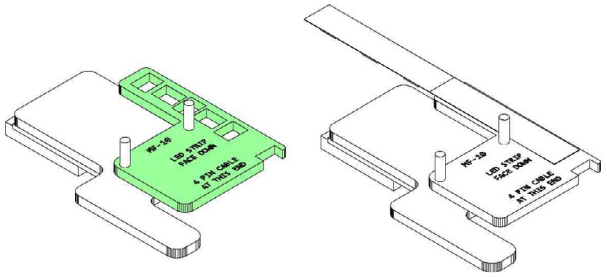


25

Find MF-10 and slide it over the bolts labelled side up as shown. Then take the remaining RGB LED strip from the mechanical kit (the LONGER of the pair). and lay it into MF-10 as shown.

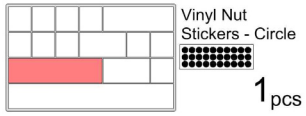


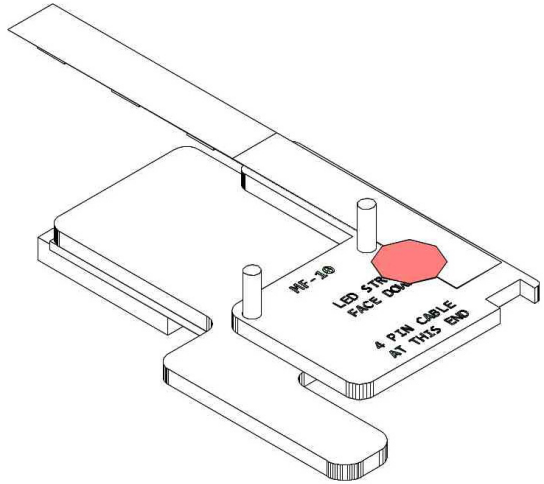




26

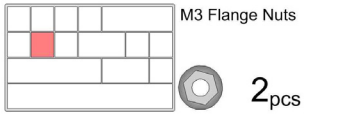
Again, taping of sticking the strip in place makes it a bit easier to assemble the parts onto your printer.

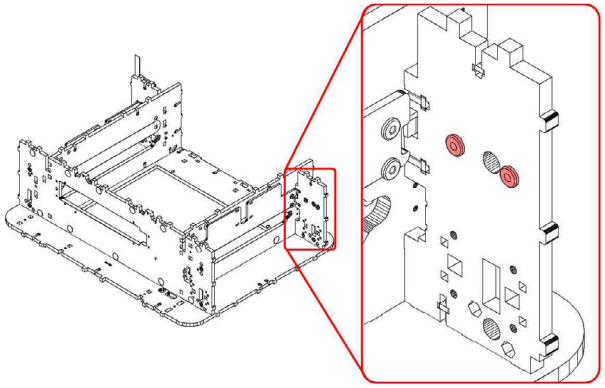




27

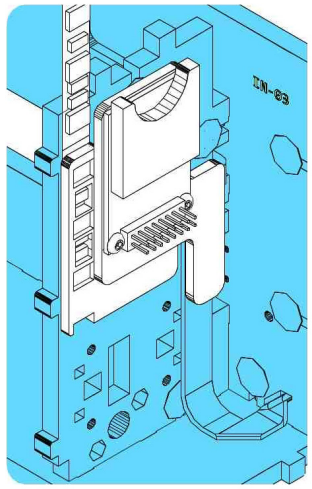
Place a pair of M3 flange nuts in the back of IN-04 as shown.





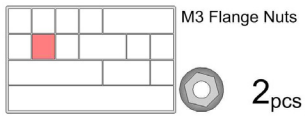
28

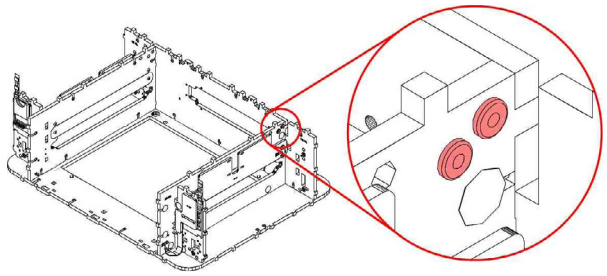
Now place the SD module assembly into place and tighten the bolts into the flange nuts.



29

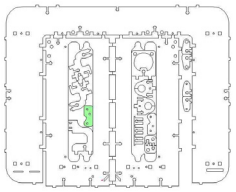
Place a pair of M3 flange nuts where shown (you may have to hold them in with your fingers).

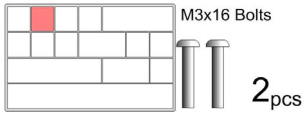


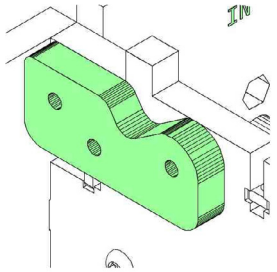


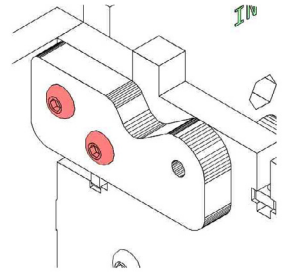
30

Find MF-11 and secure it into place by tightening 2 M3x16 bolts through it and into the flange nuts from the last step.



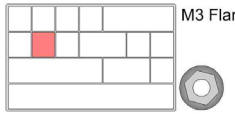


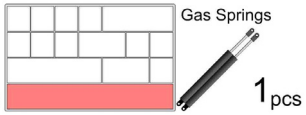


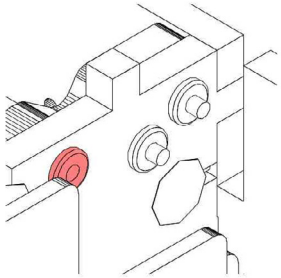


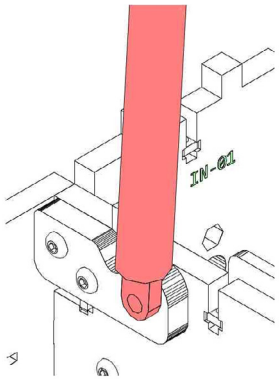
31

Now place a 3rd M3 flange nut into the other cut out and pull one of the gas springs from your mechanical kit, we will bolt it in place as shown in the next step.



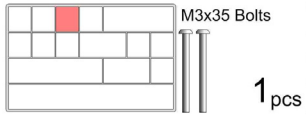


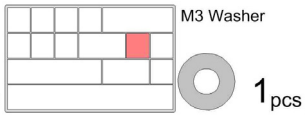


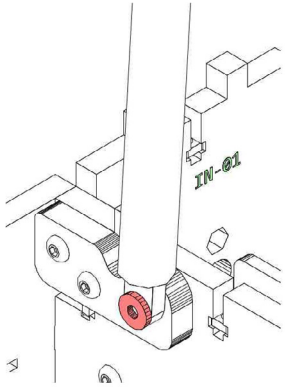


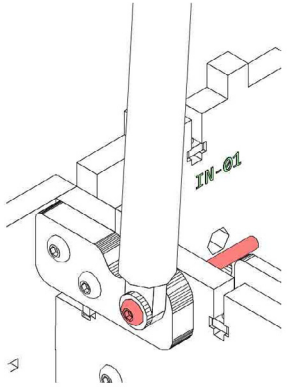
32

Using an M3 washer in between the bolt & the gas spring, tighten the part in place with an M3x35 bolt. Tighten the bolt so that the gas spring can only just pivot, then either let it lay forward or lean on the back of the printer.



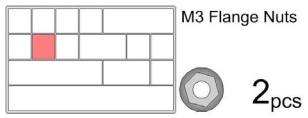


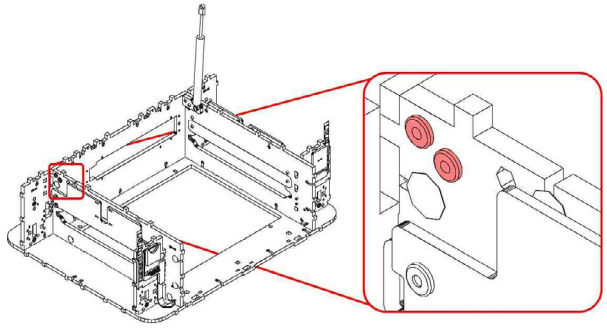




33

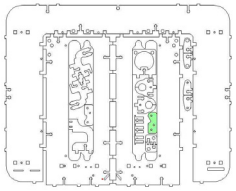
Now, we'll do the same to the other side. Place 2 M3 flange nuts into the cut outs shown.

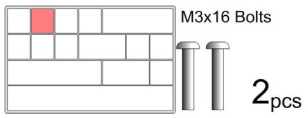


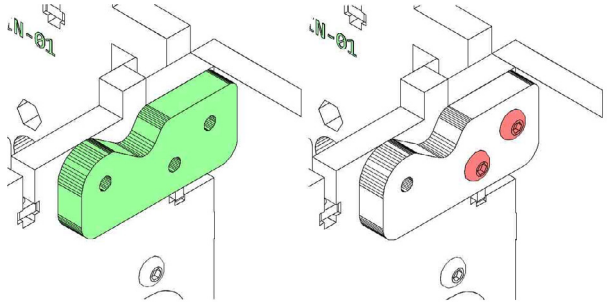


34

Find MF-12 and bolt it in place using 2 M3x16 bolts.

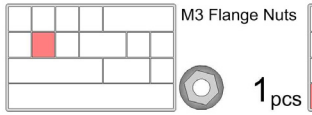


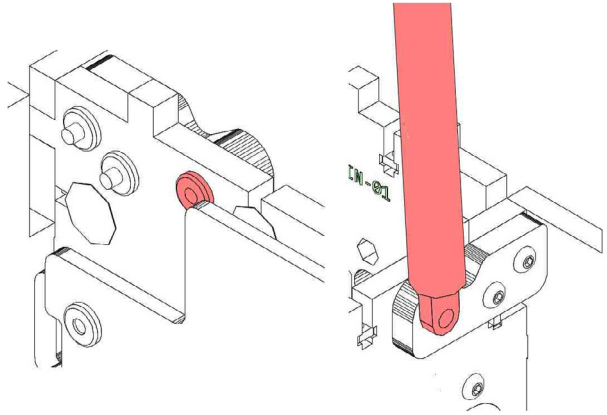




35

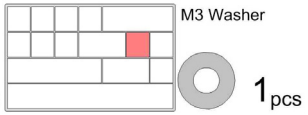
Place in a 3rd M3 flange nut and grab the 2nd gas spring.

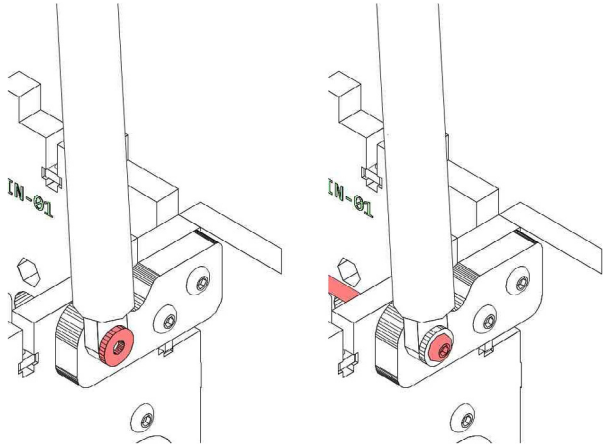




36

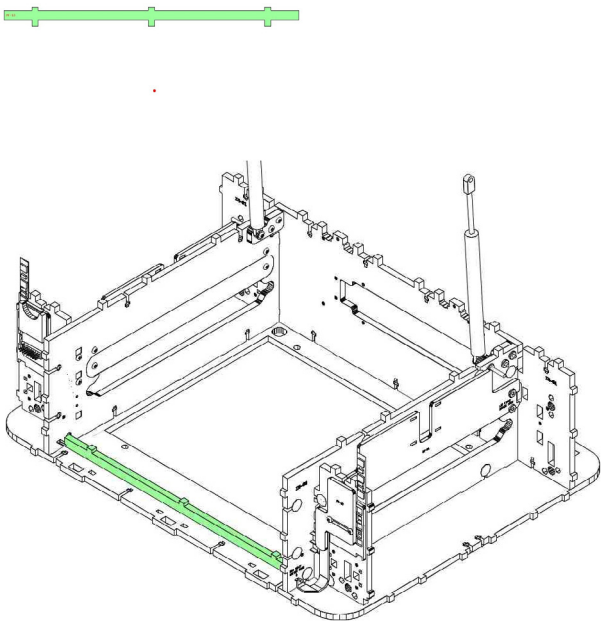
Using an M3 washer & an M3x35 bolt, lock the gas spring in place.





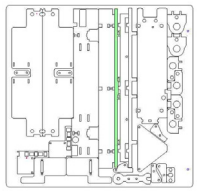
37

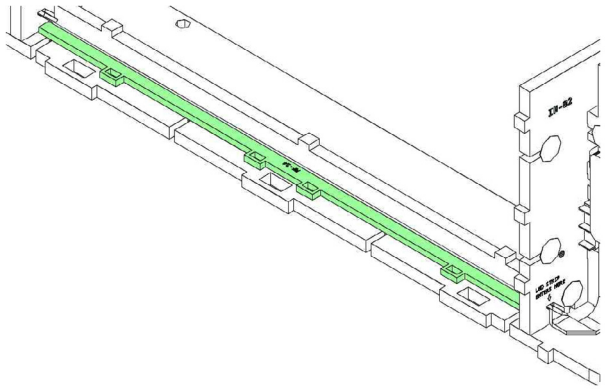
Take the last frosted acrylic part (MF-13) & slot the longer teeth into the base plate in the position shown.



38

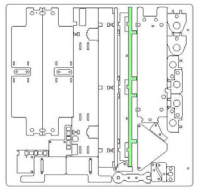
Take MF-14 & lay it on the base plate so the square holes in MF-14 line up with those in the base plate. Also make sure the orientation is as shown.

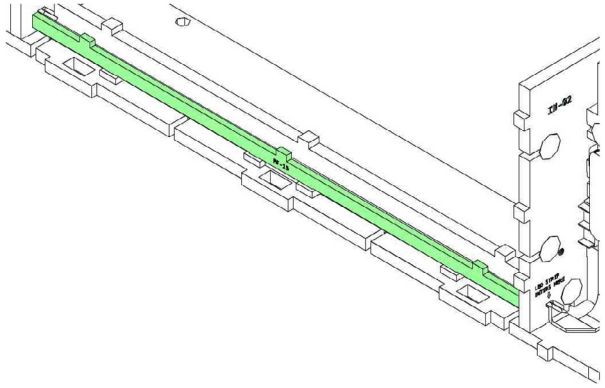




39

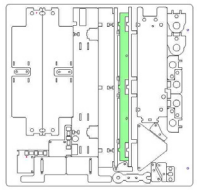
Take MF-15 and slide the longer teeth through MF-14 and into the bas plate as shown.

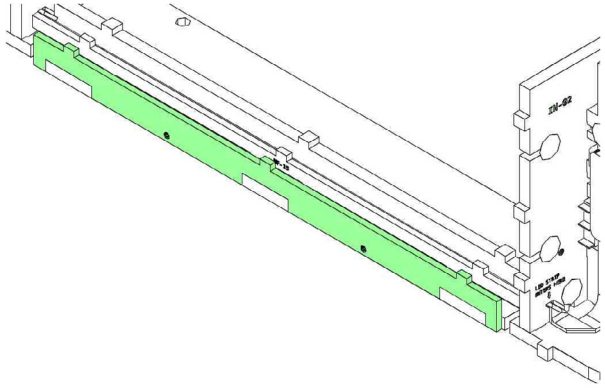




40

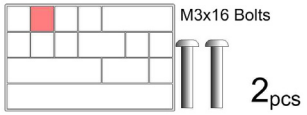
Find MF-16 and press it in place on the front of the printer as shown. Make sure that the label is facing into the printer.

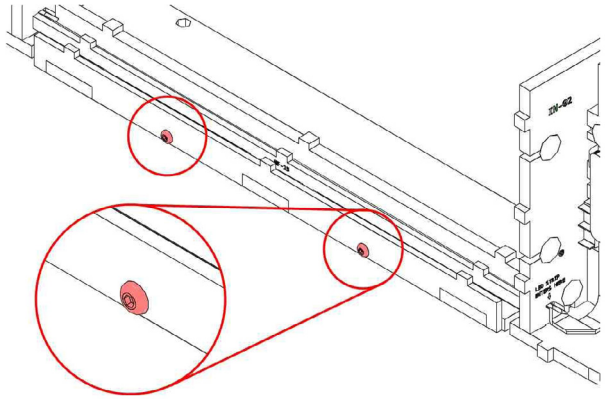




41

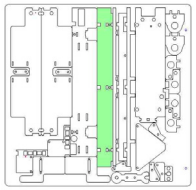
Bolt MF-16 in place from the front with a pair of M3x16 bolts as shown.

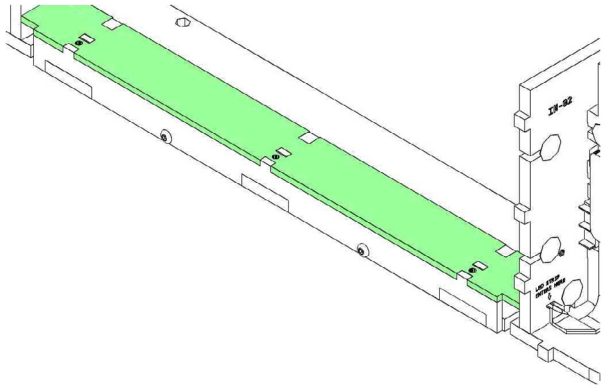




42

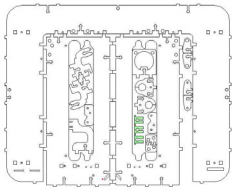
Find MF-17 & key it down onto the other parts as shown with the labelled side face down. As you close off the channel containing the LED strip, make sure it's laying such that it faces slightly upward - that way you won't crush it when closing this section off.

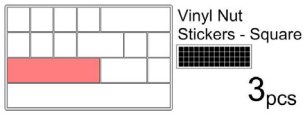


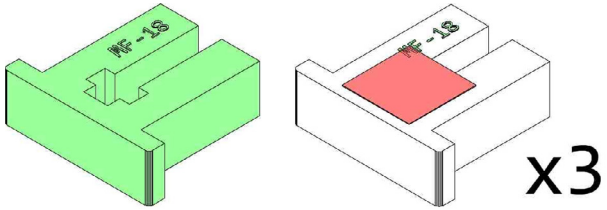


43

Find the 3 MF-18 parts and place a square nut sticker over each as shown.

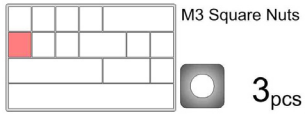


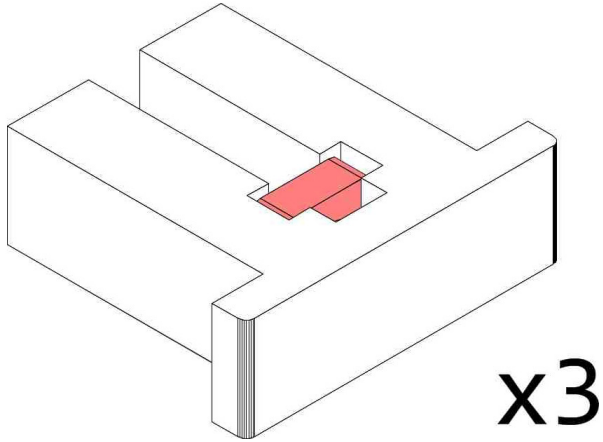




44

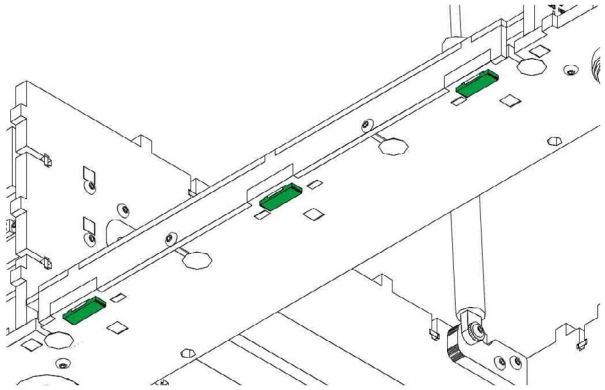
Flip each part over and place an M3 square nut inside them as shown.





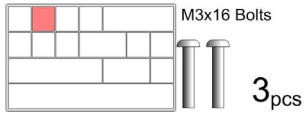
45

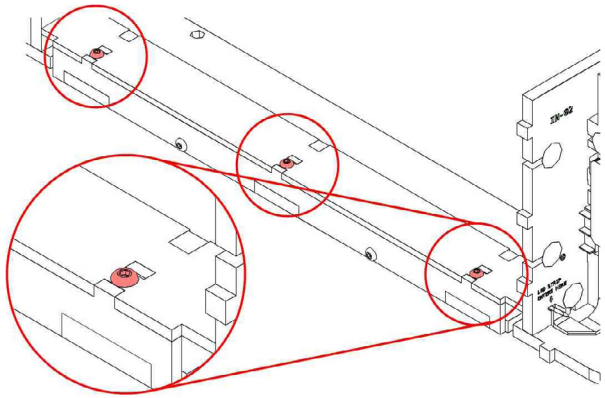
Perform this step and the next together, bolting in an MF-18 part one by one. Slide the MF-18 part into the rectangular hole in the base plate as shown. Then tighten an M3x16 bolt down into it from above as shown in the next step.



46

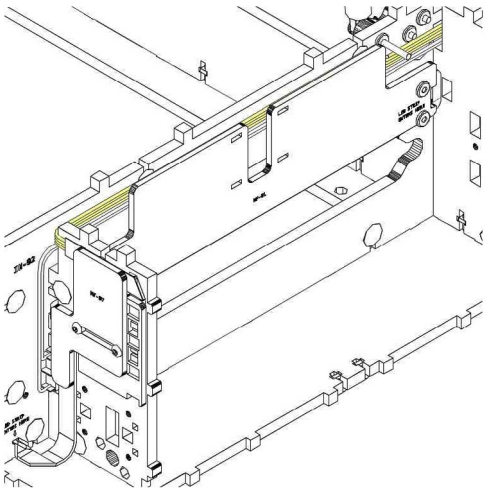
The bolts holding this LED channel assembly together.





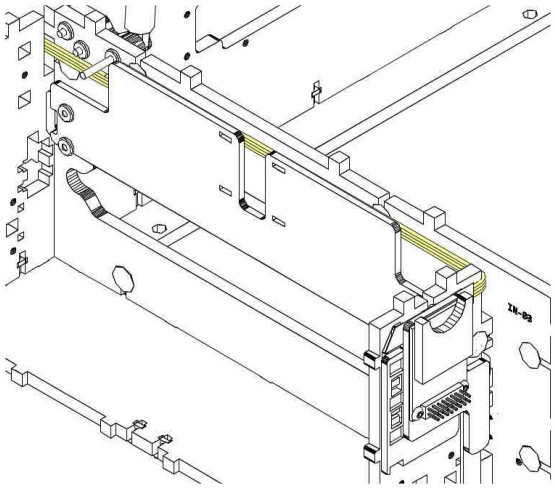
47

Now route the right RGB LED strip and Y-MIN limit switch cable through to the back inside the sectioned off channel made by MF-01.



48

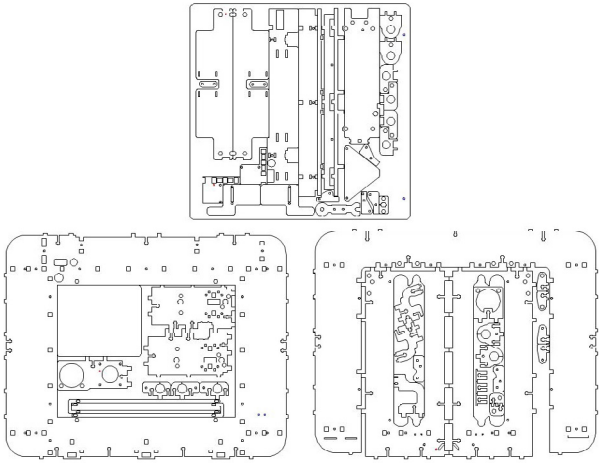
Do the same to the left RGB LED strip behind MF-04 as shown. This is the end of the MF section!! Now you have pretty lights everywhere, you're sure to win best Christmas garden lights this year



10 Y-AXIS MOTOR SECTION

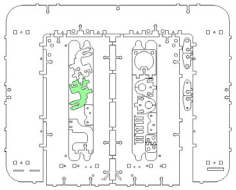
1

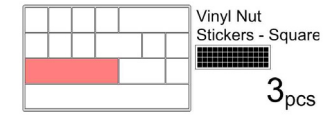
This section is for assembling the Y-axis Motor Section, this mounts the y-axis drive system and control electronics. For this section you will need your mechanical kit, screwdriver kit, laser cut spanners & the 3 laser cut plates shown. The top is in 3mm, bottom left bottom right in 6mm.

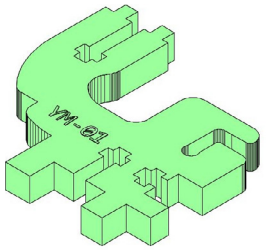


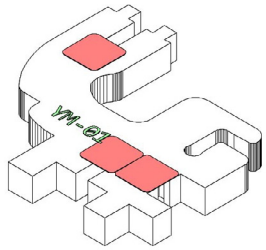
2

Take YM-01, lay it flat. Place 1 square nut sticker over each t-bolt cut out.



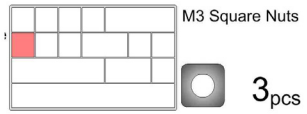


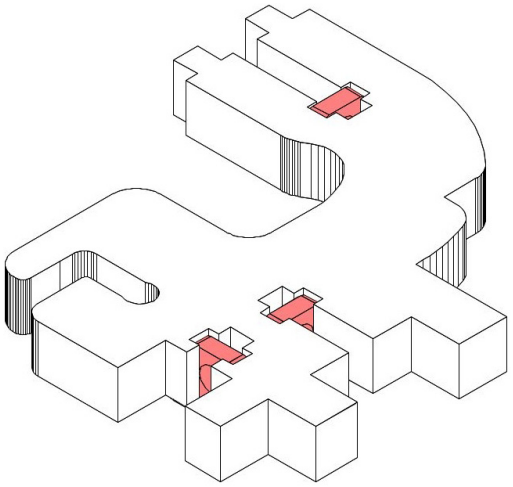




3

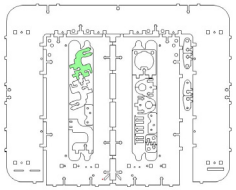
Flip part over, place 1 square nut in each cut out.

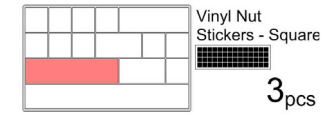


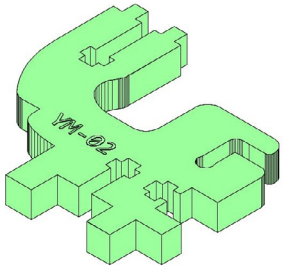


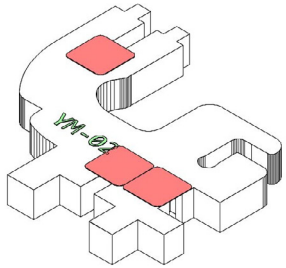
4

Take YM-02, lay it flat. Place 1 square nut sticker over each t-bolt cut out.



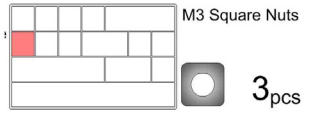


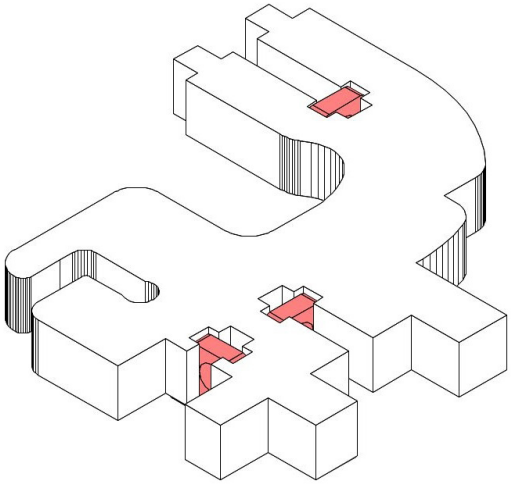




5

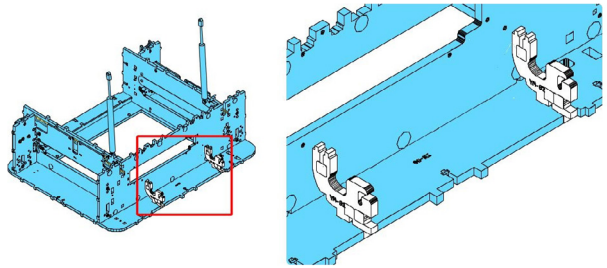
Flip part over, place 1 square nut in each cut out.





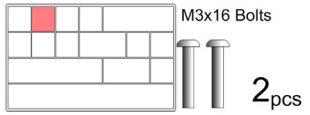
6

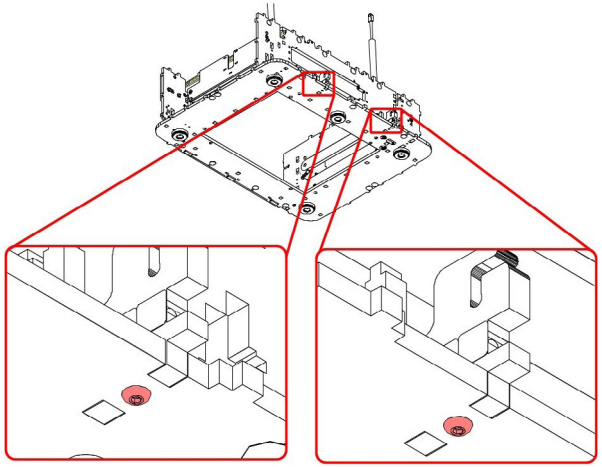
Take both YM-01 & YM-02 and place them into the infrastructure as shown with the t-bolt tabs.



7

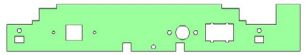
Bolt in both parts with an M3x16 bolt from below as shown. Only screw in loosely for now, it will help some other parts fit.

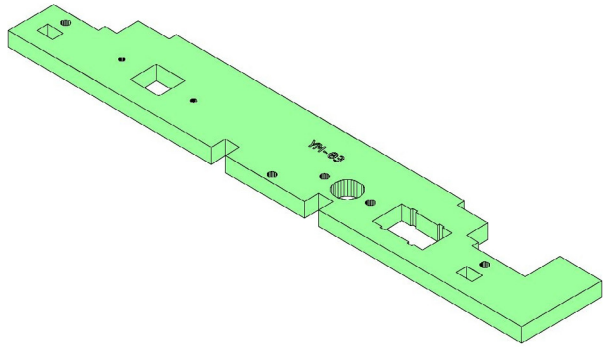




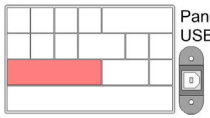
8

Take YM-03 (for those in batch 1, YM-04 is also mis-labelled as YM-03 - use the part that looks as shown).



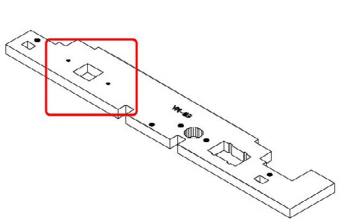


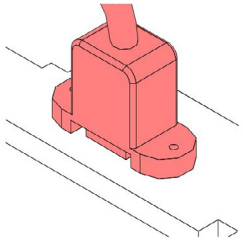
9



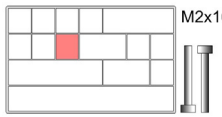
1pcs

Take the panel mount USB-B extension from the cable bundle in the mechanical box and place it up against YM-03 as shown. Make sure you place it on the labelled side of the plate as shown.

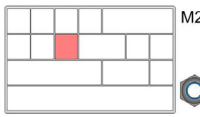




10

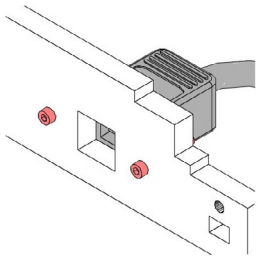


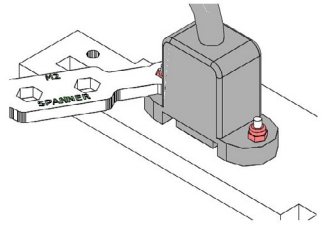
2pcs



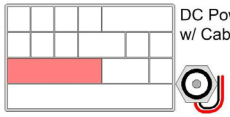
2pcs

Sit YM-03 up and slide 2 M2x16 bolts through past the USB plug. Thread an M2 nyloc nut onto the other side of both bolts, use the M2 Spanner to tighten the bolts.



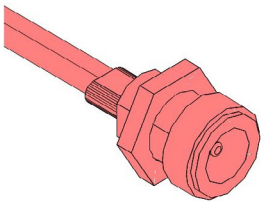


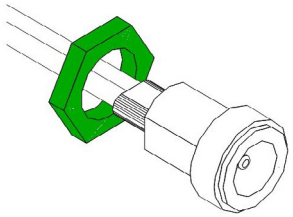
11



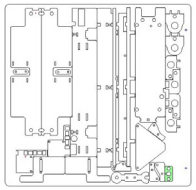
1pcs

Take the 12V DC power jack from the cable bundle in the mechanical box and unthread the nut from the plug.

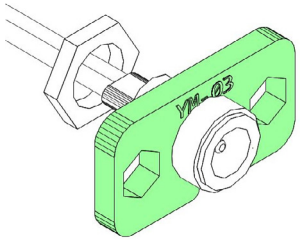


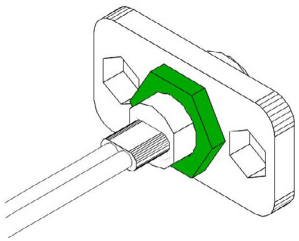


12



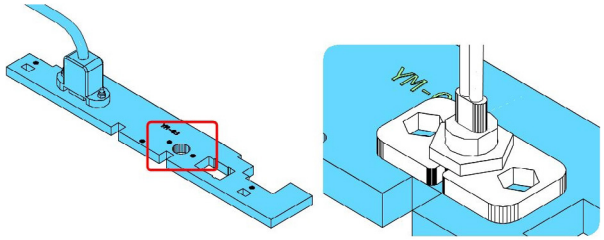
Take YM-04 (for those in batch 1, this is mis-labelled as YM-03). Push the cable through the cut out in YM-04 and pull the jack back through the plate so it sits as shown. Tighten the nut back onto the plate.



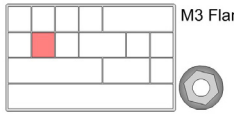


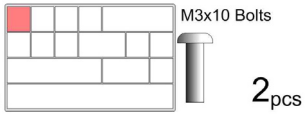
13

Place the DC jack with the plate into YM-03 as shown.

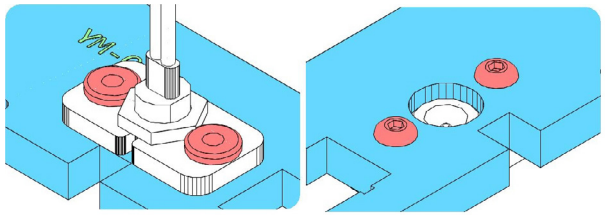


14

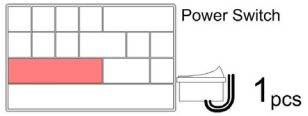




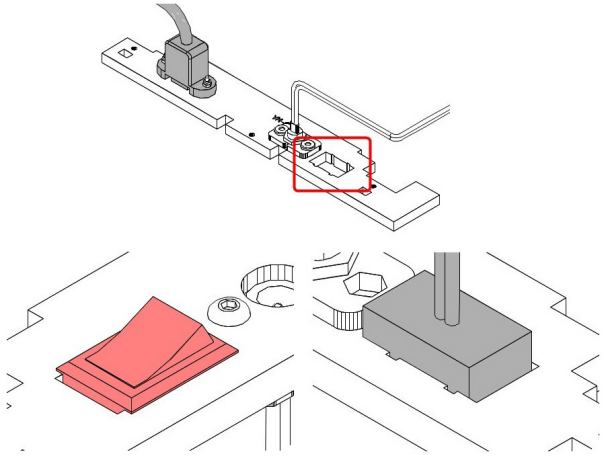
Press 2 M3 flanges into YM-04, turn the whole assembly on its side and bolt the plate on with 2 M3x10 bolts as shown.



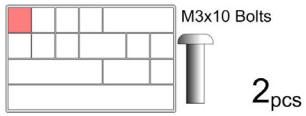
15



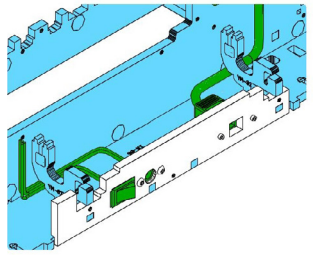
Find the Power switch in the cable bundle from the mechanical box. Thread the plug and cable through from the un-labelled side of the panel and press it into place as shown.

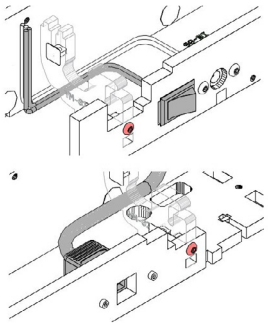


16



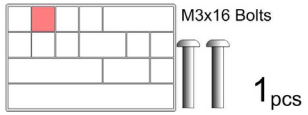
Press the piece you've been working on into the back of your printer as shown. As you're inserting the plate, make sure to route the three cables as shown. The power and switch cable go behind YM-01 and then up; the USB cable goes behind YM-02 and then up. Then screw an M3x10 bolt through YM-03 into YM-01 & YM-02 as shown in the images on the right.

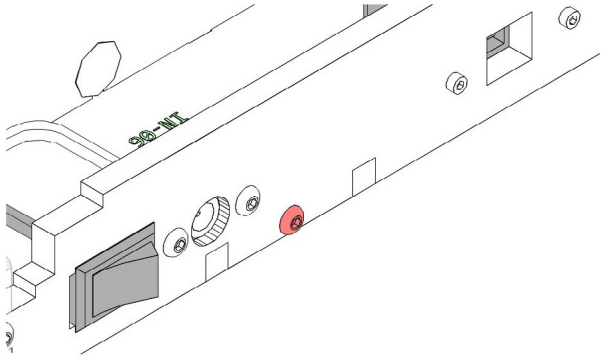




17

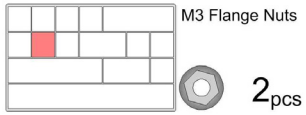
Screw in an M3x16 into the centre of YM-03 as shown. Tighten this bolt.

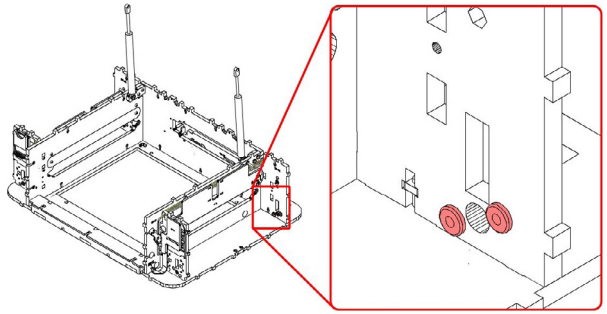




18

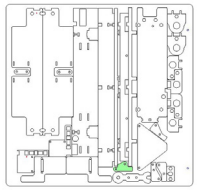
Place a pair of M3 Flange nuts in place as shown. If they do not stay in place, you may want to bolt in the flanges one at a time with the next step.

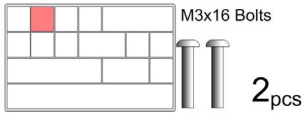


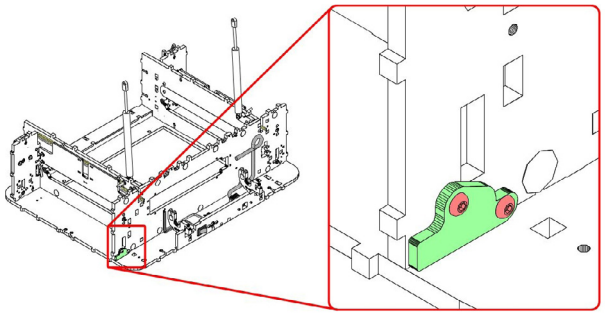


19

Take YM-05 and 2 M3x10 bolts. Bolt YM-05 in place as shown MAKE SURE THE ORIENTATION IS CORRECT. Tighten both bolts.

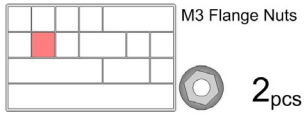


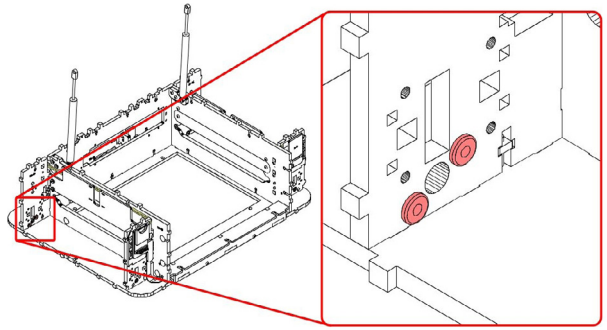




20

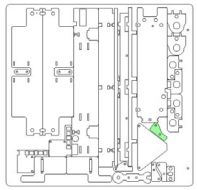
Place a pair of M3 Flange nuts in place as shown. If they do not stay in place, you may want to bolt in the flanges one at a time with the next step.

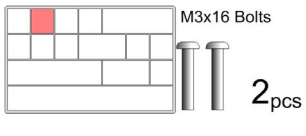


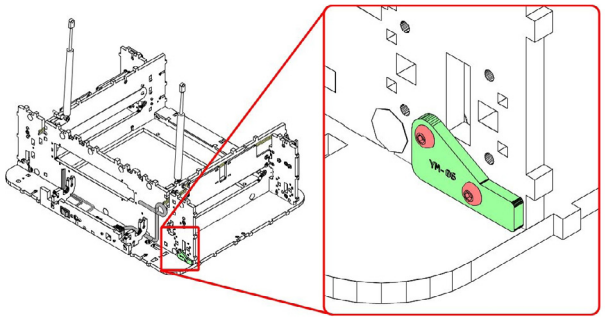


21

Take YM-06 and 2 M3x10 bolts. Bolt YM-06 in place as shown MAKE SURE THE ORIENTATION IS CORRECT. Tighten both bolts.

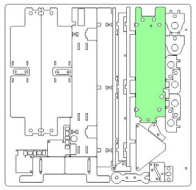


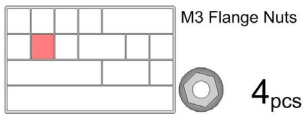


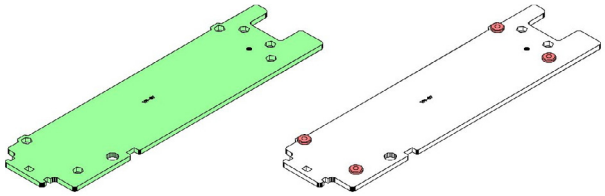


22

Take YM-07 and lay it labelled side up. Press 4 M3 Flange nuts into the hexagonal cut outs shown (NOTE: there are two empty cut outs left).

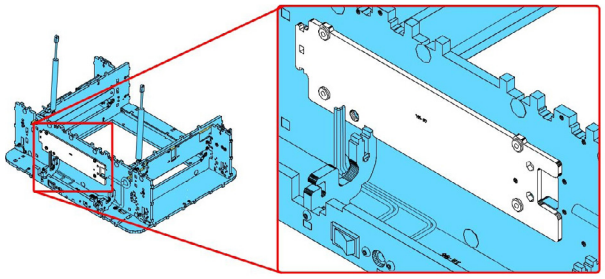






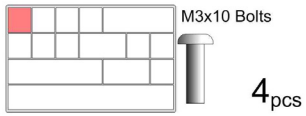
23

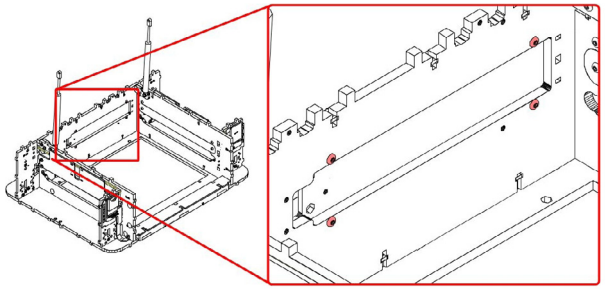
Place YM-07 onto the back of your printer as shown. We will bolt it in place in the next step.



24

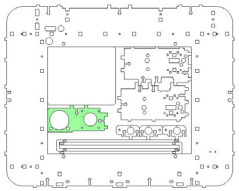
Take 4 M3x10 bolts and push them through the back plate of your printer as shown. Tighten these into the flanges mounted in YM-07.

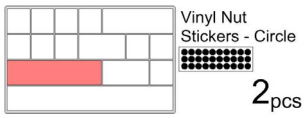


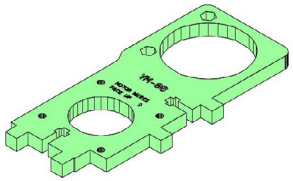


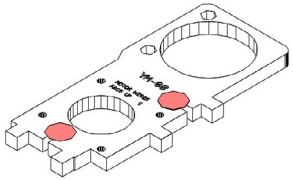
25

Take YM-08 and lay it flat labelled side up. Place a circular nut sticker over each of the 2 t bolt cut outs.



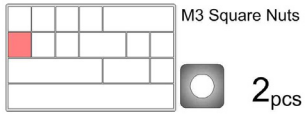


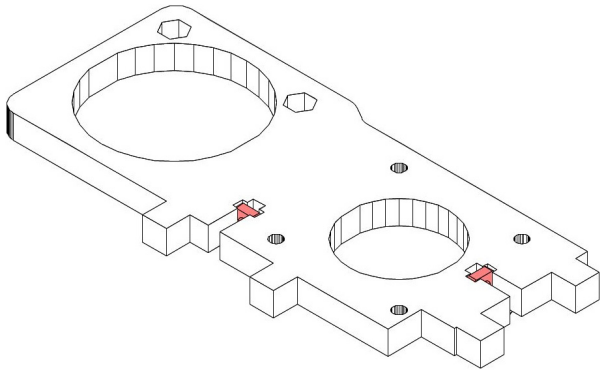




26

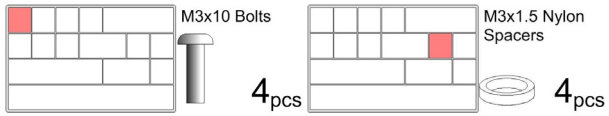
Flip the part over and place a nut in both cut outs, press them into the sticker to help them stay in place.

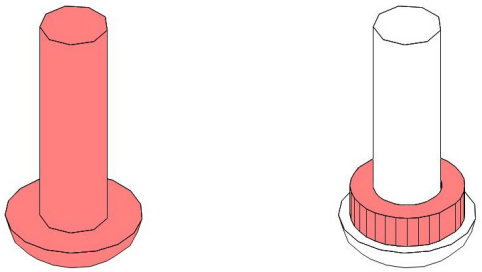




27

Take 4 M3x10 bolts and place an M3x1.5mm nylon spacer over each. If you've lost some of your spacers, note that you only *need* 2 of these bolts but 3 or 4 is better.

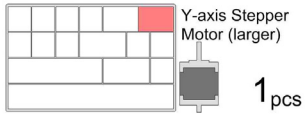


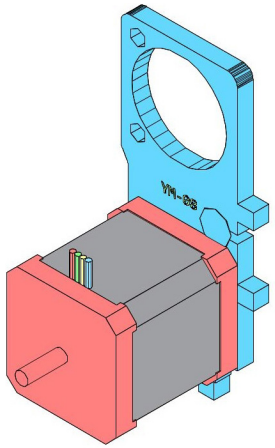


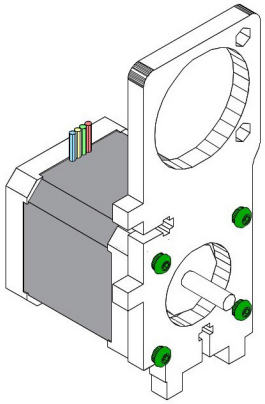
x4

28

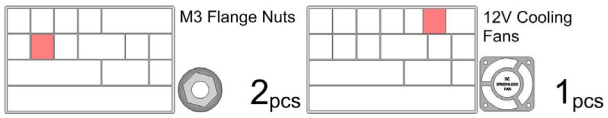
Take the y-axis stepper from the mechanical kit (bigger motor) and bolt it onto YM-08 with the bolts and spacers from the previous step as shown. MAKE SURE THE MOTOR IS ON THE LABELLED SIDE AND THE WIRES FACE UP.



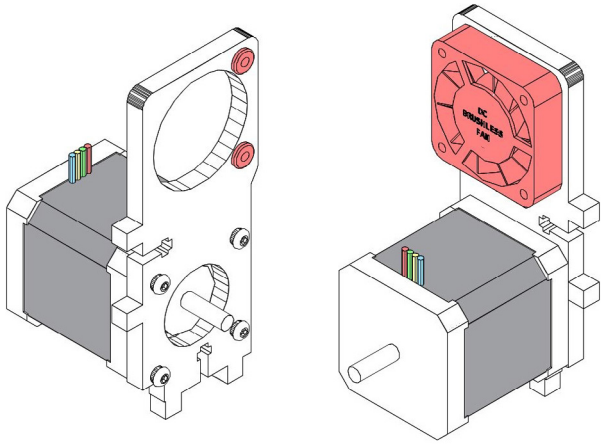




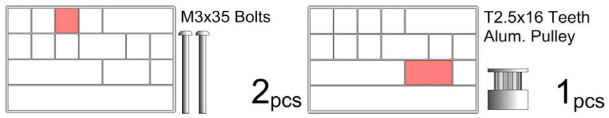
29



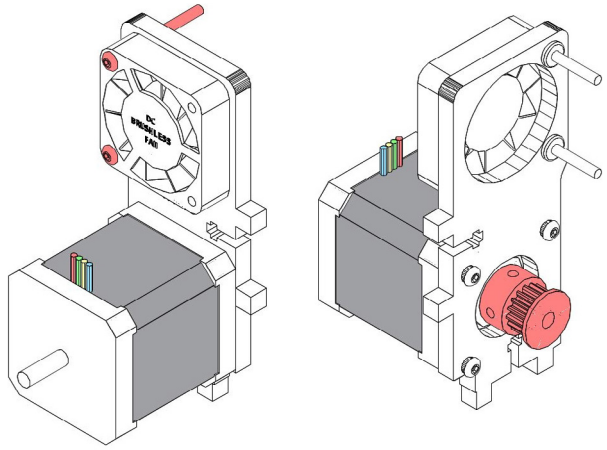
Press a pair of M3 flange nuts into the unlabelled side as shown. Take one of the 12V cooling fans from the mechanical kit, in the next step we will bolt it in place as shown. Orient the fan such that the cables face the same direction as the tabs shown on the side (i.e.. opposite side to the flange nuts).



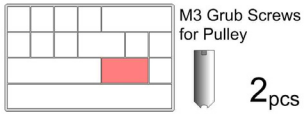
30



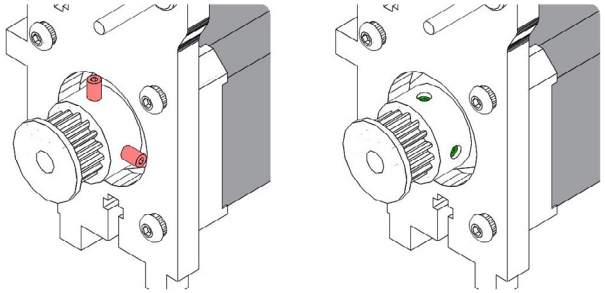
Double check that the fan sticker is facing out and then bolt it in with a pair of M3x35 bolts as shown. Take a pulley from the mechanical kit and slide it onto the motor shaft as shown. NOTE: THIS STEP PREVIOUSLY HAD A TYPO DESCRIBING M3x15 BOLTS - THIS SHOULD HAVE BEEN M3x35 AS SHOWN.



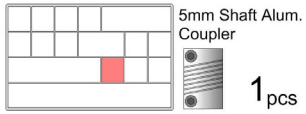
31



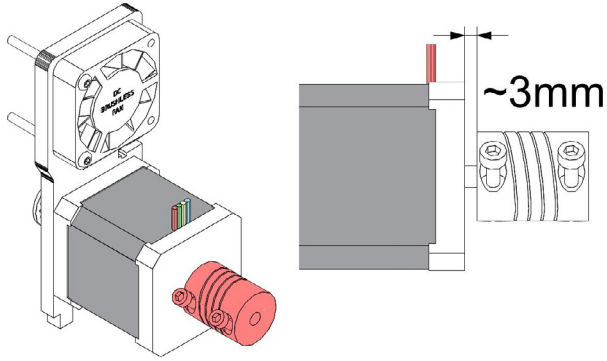
From the same bag as the pulleys, take 2 M3 grub screws and thread them into the pulley. Tighten only loosely so the pulley won't fall off for now.



32

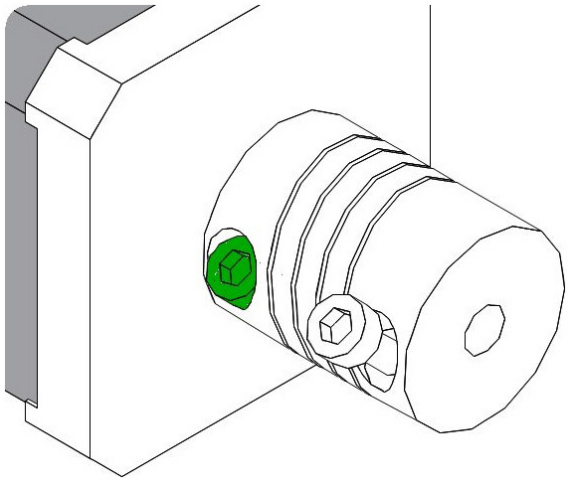


Take the aluminium coupler from the mechanical kit and slide it onto the rear motor shaft as shown. Leave around 3mm clearance from the back of the motor (doesn't need to be perfect). NOTE: you may need to loosen the bolts first.



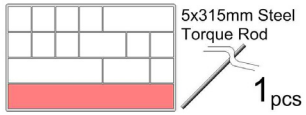
33

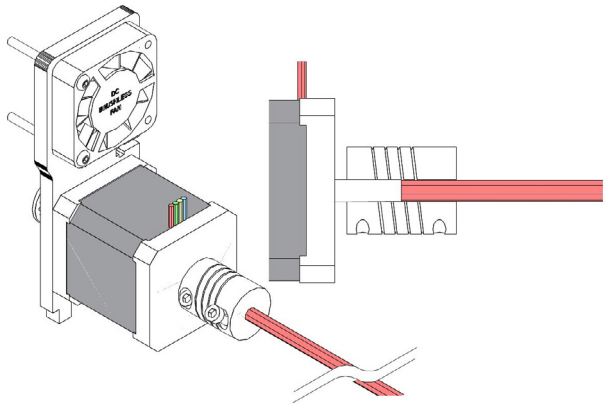
Tighten the bolt that will clamp the coupler to the motor.



34

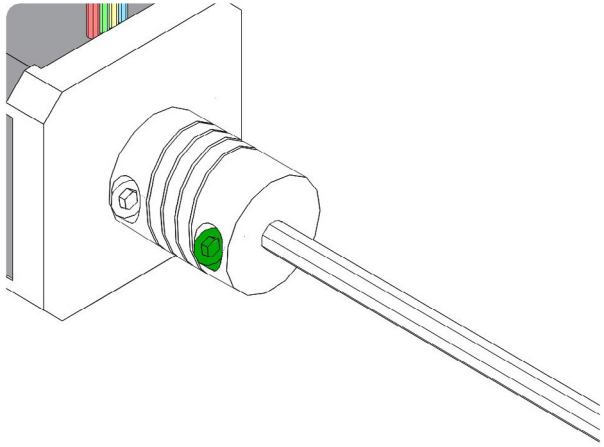
Take the 5mm steel rod from your mechanical kit and slide it into the aluminium coupler. Push it through until it hits the motor shaft.





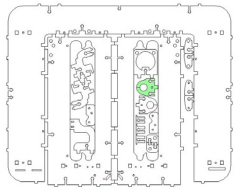
35

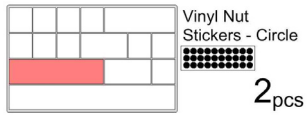
Tighten the other coupler clamping bolt.

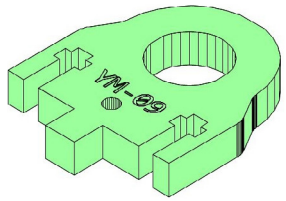


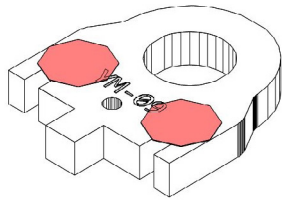
36

Take YM-09 and lay it flat, labelled side up. Place a circular nut sticker over each t-bolt cut out as shown.



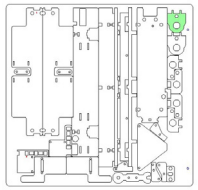


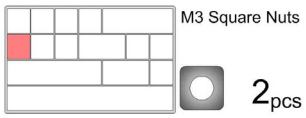


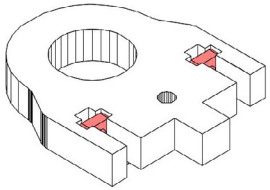


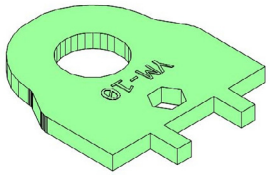
37

Flip the part over and place an M3 square nut in each cut out. Now take YM-10 and lay it flat, labelled side up.



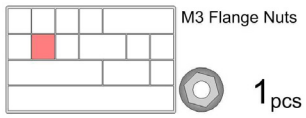


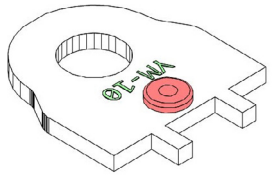


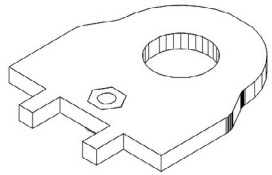


38

Press an M3 flange nut into the cut out and then flip the part over.

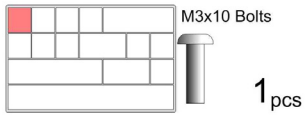


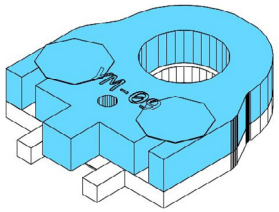


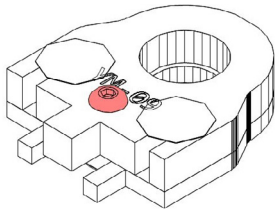


39

Place YM-09 with its nuts inserted over the top as shown (so the nuts are trapped inside). Bolt the parts together with an M3x10 bolt.

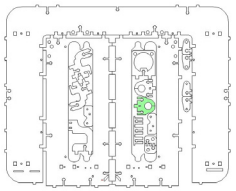


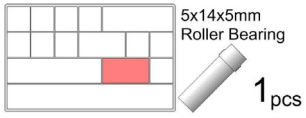


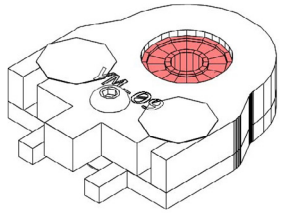


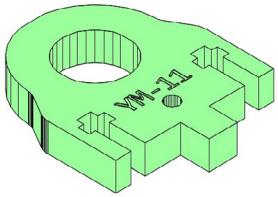
40

Take one of the roller bearings and press it into YM-09, with your thumbs. Press it down to touch the bottom plate.

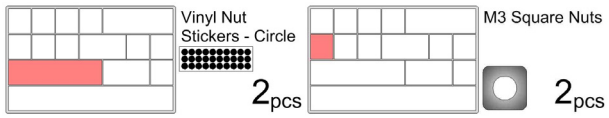




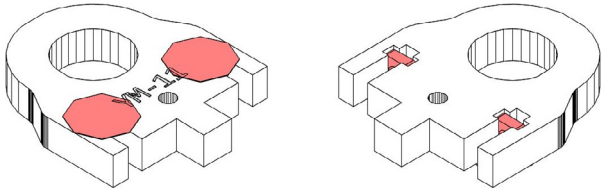




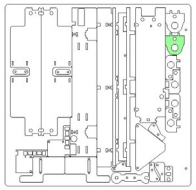
41

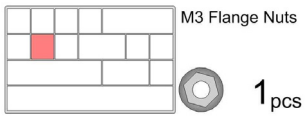


Place a circular nut sticker over each cut out. Flip the part over and place an M3 square nut in each cut out as shown.

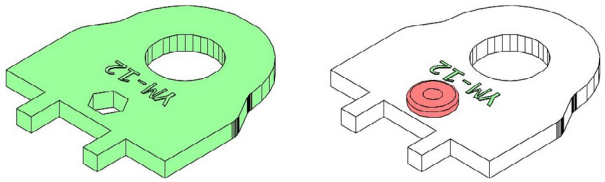


42



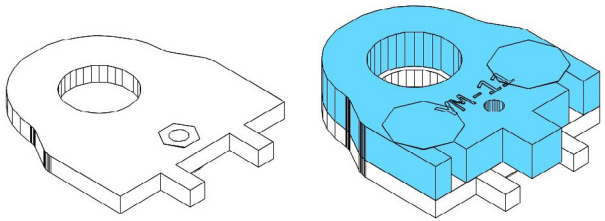


Take YM-12 and lay it flat, labelled side up. Press an M3 flange nut into the cut out as shown.

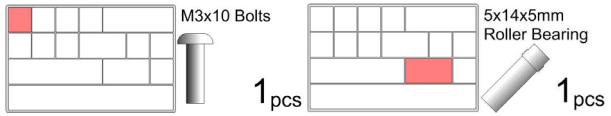


43

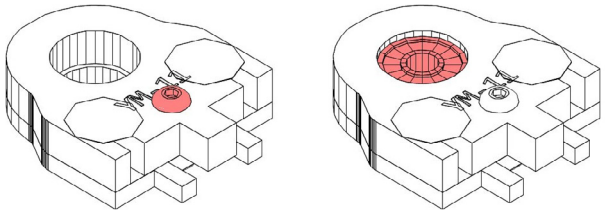
Flip the part over and place YM-11 over the top just like with the last section.



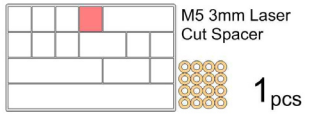
44



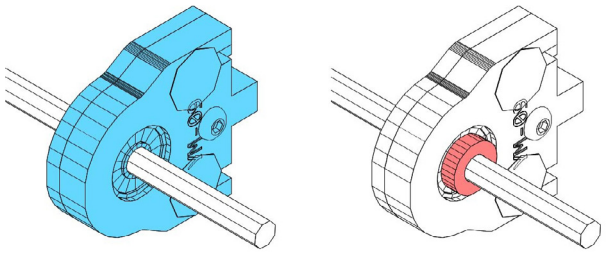
Bolt the parts together with another M3x10 bolt and then press a roller bearing into YM-11 as shown.



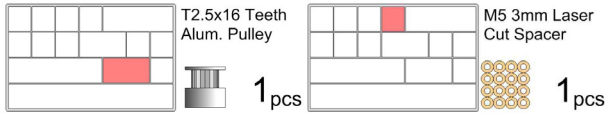
45



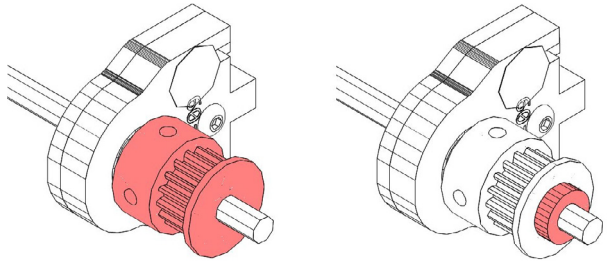
Slide the YM-09 bearing assembly onto the torque rod coming from the motor. MAKE SURE IT IS ORIENTED AS SHOWN. Slide an M5 laser cut spacer over the torque rod.



46

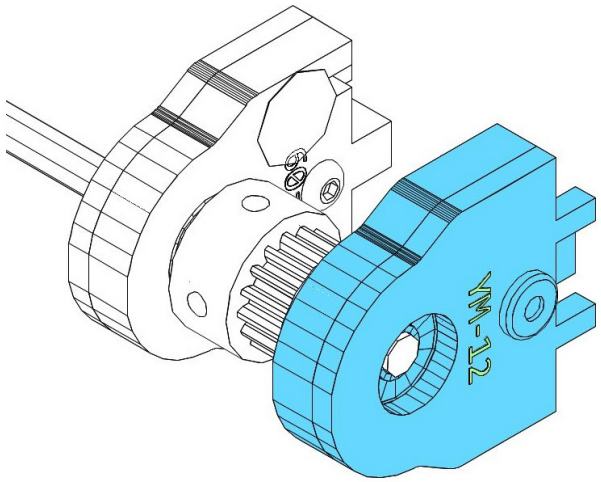


Slide a T2.5 pulley over the torque rod MAKE SURE IT'S ORIENTED AS SHOWN with the teeth side facing out. Then slide over another M5 laser cut spacer.



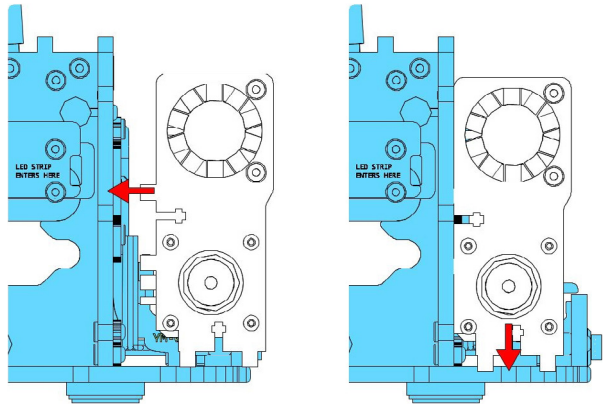
47

Slide the other bearing assembly over the torque rod IN THE ORIENTATION SHOWN.



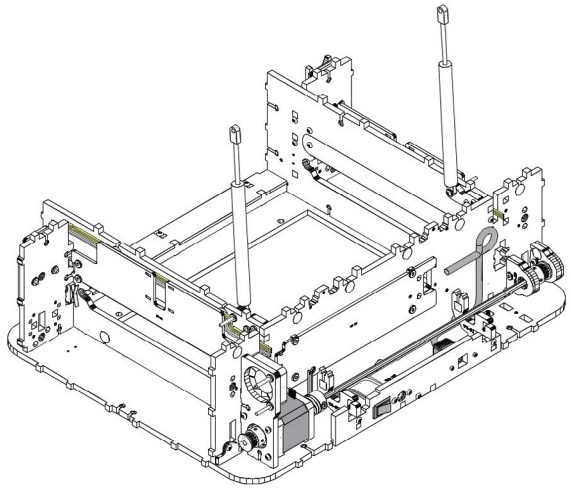
48

We will now insert the whole y-axis motor assembly into the printer. The motor mount plate slides in horizontally first and then downwards to lock in place.



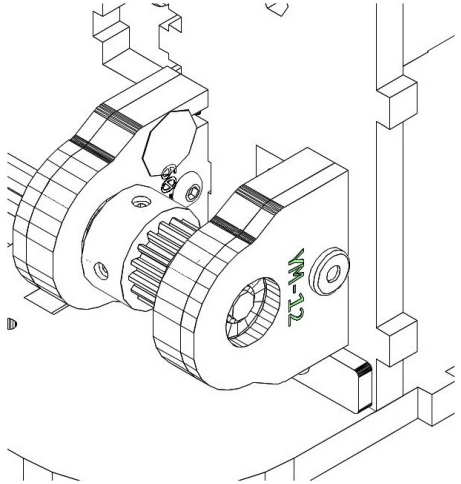
49

This is how the motor assembly should look after inserting the motor (NOTE: the next step shows how to place the bearing blocks on the opposite side).



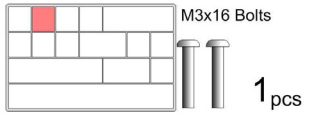
50

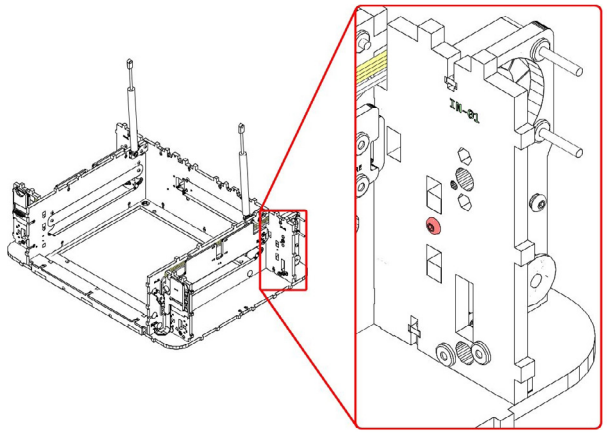
The bearing blocks tooth into the back plate as shown. Double check that the pulley is in the correct orientation as you do this.



51

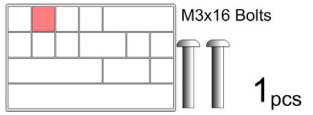
Take an M3x16 bolt and tighten it into the nut on the motor mounting plate as shown.

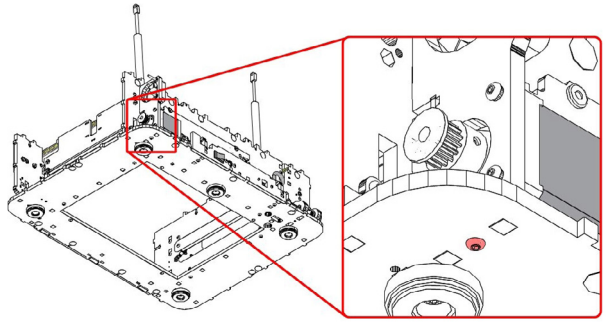




52

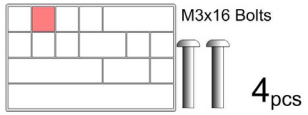
Now do the same with another M3x16 bolt from the bottom as shown.

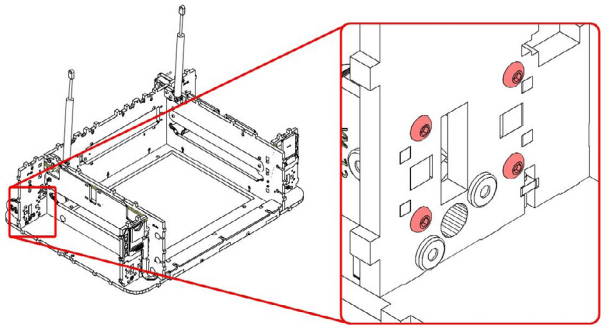




53

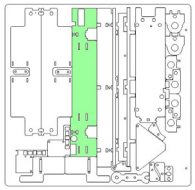
Bolt in the bearing blocks with a set of 4 M3x16 bolts as shown. GENTLY tighten all 4 bolts.

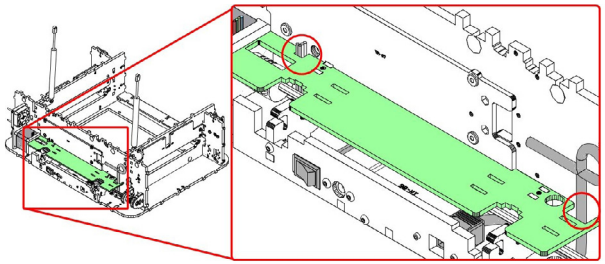




54

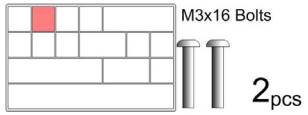
Take YM-13 and lay it in place as shown. The plate will tooth into YM-01 & YM-02. MAKE SURE THAT AS YOU PLACE THIS PART, YOU ROUTE THE DC JACK, SWITCH AND USB CABLES AS SHOWN. If your finding it difficult to fit the part in, you may need to loosen the bolts through the base to YM-01 & YM-02.

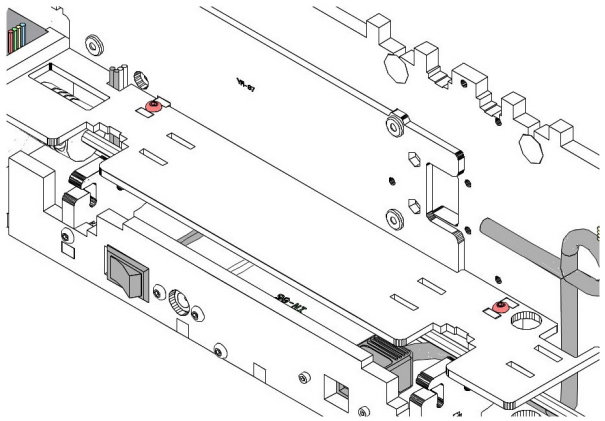




55

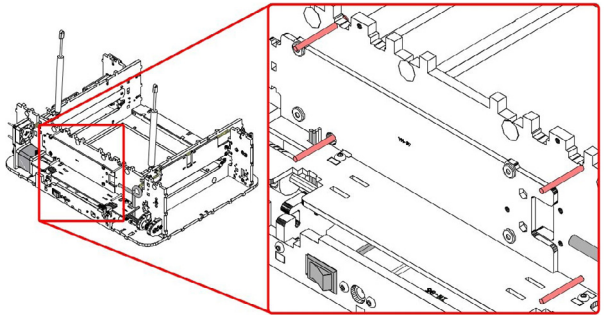
Bolt in the plate with a pair of M3x16 bolts as shown. Tighten both bolts, you can also now tighten the other 4 bolts into YM-01/YM-02.





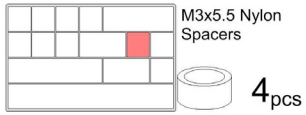
56

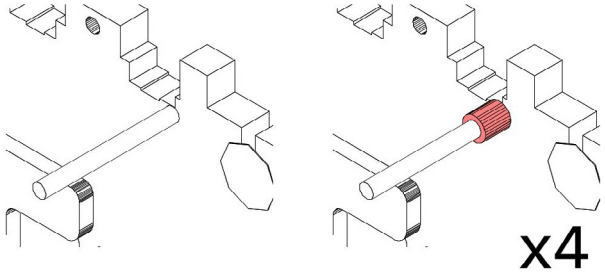
Take 4 M3x35 bolts and push them through from other side in the 4 holes shown. NOTE: double check that you're using the right holes.



57

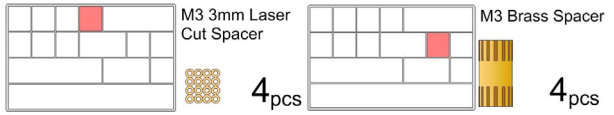
Slide an M3x5.5mm spacer over each bolt. They are just the slightly taller white ones.

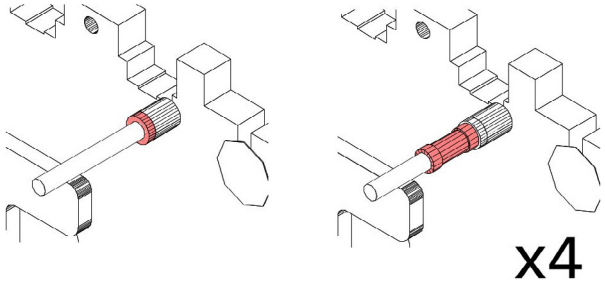




58

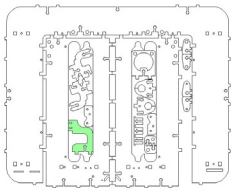
Take 4 M3x3mm laser cut spacers and slide one over each bolt. Take 4 M3 Brass spacers and thread one over each bolt, tighten these down.

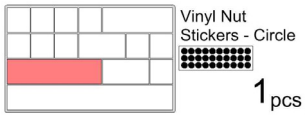


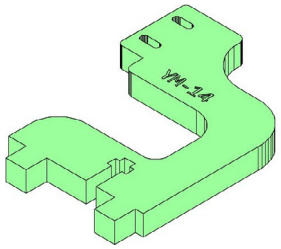


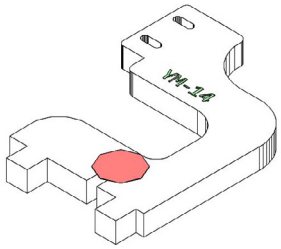
59

Take YM-14 & lay it flat with the labelled side face up. Place a circular nut sticker over the t-bolt cut out.



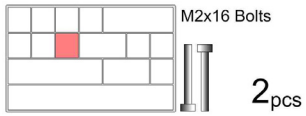


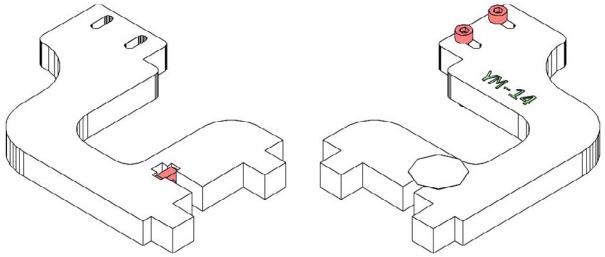




60

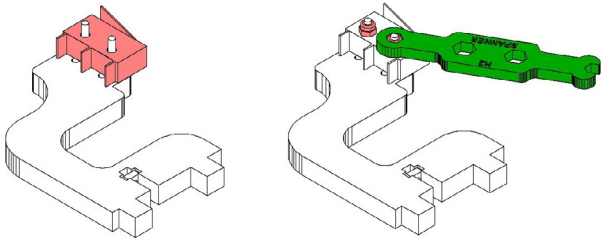
Flip the part over and press an M3 square nut into the t-bolt cut out. Slide a pair of M2x16 bolts into the elongated cut outs as shown MAKE SURE THE BOLT HEAD IS ON THE LABELLED SIDE.



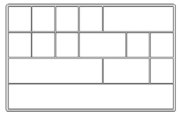


61

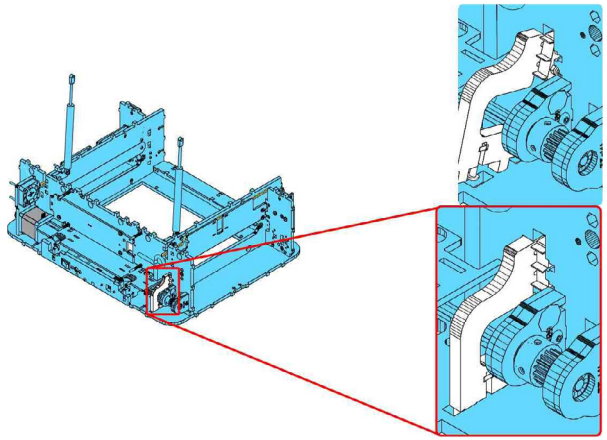
Place the Y-MAX limit switch over the bolts as shown. NOTE: the Y-MAX limit switch has the shortest cable and it is twisted. MAKE SURE THE ORIENTATION IS AS SHOWN. Thread a pair of M2 nyloc nuts over the bolts and tighten them down with your M2 spanner. NOTE: IF YOU HAVE NO MORE TWISTED SWITCH CABLES - SEE http://wiki.cartesianco.com/Flipping_Y_MIN_and_Y_MAX



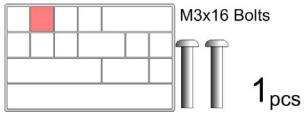
62



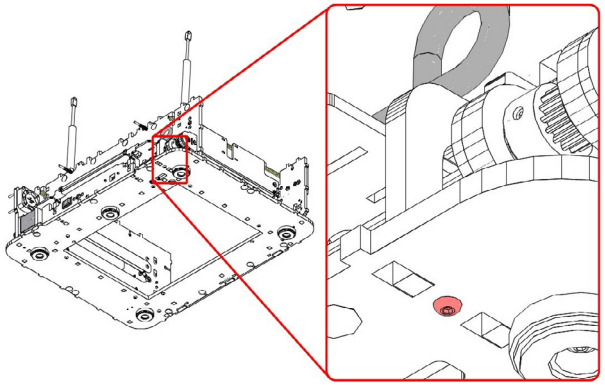
BE CAREFUL WHILE INSERTING THIS PART, IT CAN BE BROKEN BY FORCING IT INCORRECTLY. Inserting this part is a little tricky, you must first orient the part as shown in the top image with the nuts sliding into the cut outs shown, then press the bottom feet into their cut outs & slide the part all the way in as shown.



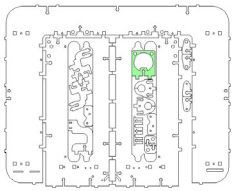
63

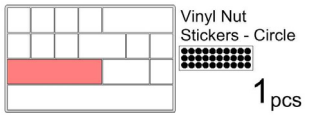


Bolt the limit switch assembly in place with an M3x16 bolt from the bottom as shown.

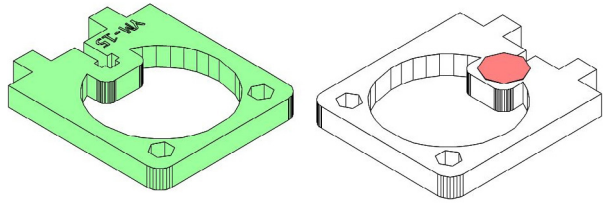


64

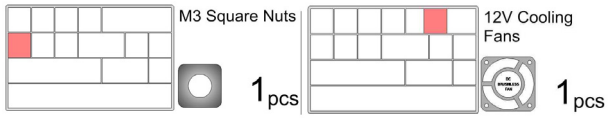




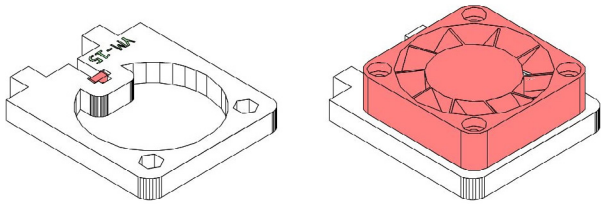
Take YM-15 and lay it flat, labelled side up. Flip it over and place a circular nut sticker over the t-bolt cut out.



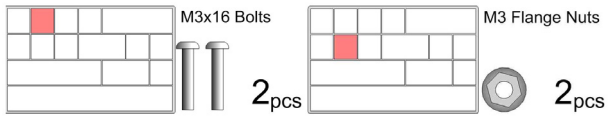
65



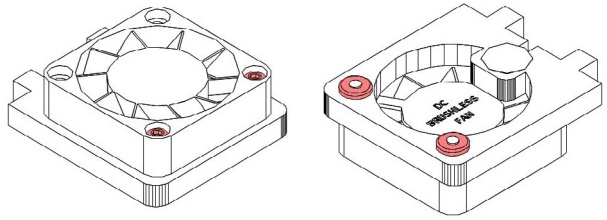
Flip the part back over and place an M3 square nut into the cut out. Place a cooling fan from the mechanical kit over the part with the sticker face down.



66

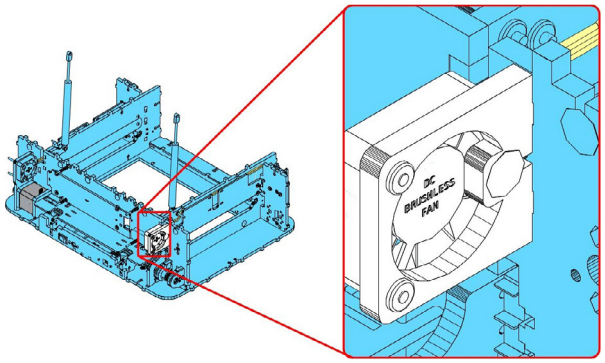


Slide a pair of M3x15 bolts into the fan as shown. Place a pair of M3 flange nuts into the cut outs on the other side and tighten both bolts.

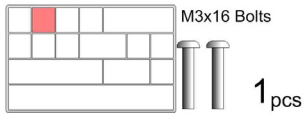


67

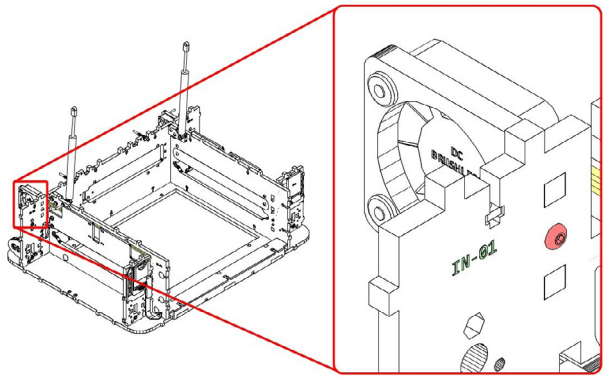
Place the fan assembly into the printer as shown, it will tooth in.



68

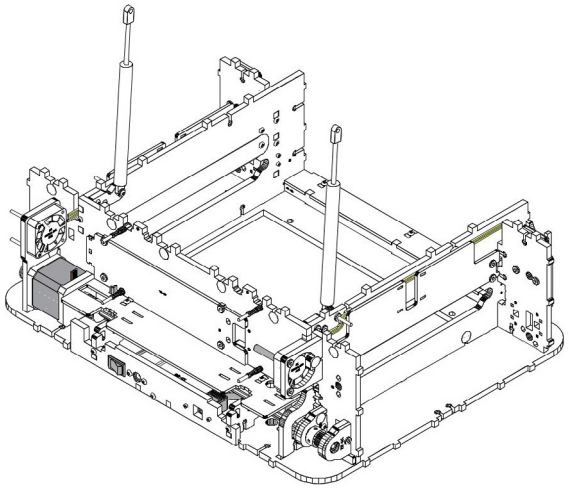


Bolt the assembly in place with an M3x16 bolt as shown. Tighten this bolt.



69

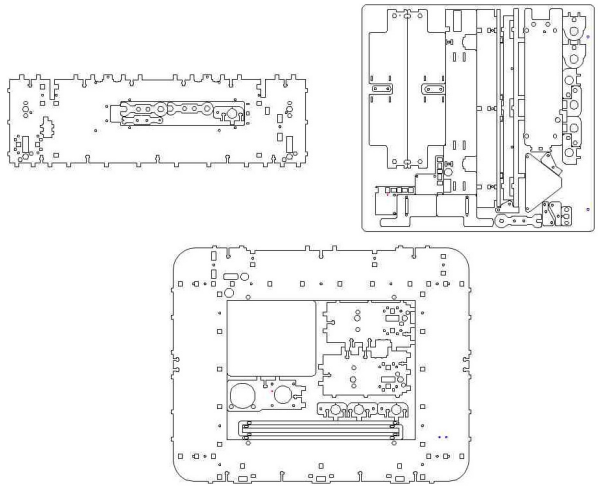
Your YM section is now done!! You have now achieved super-hero status, please contact your local government for a spandex suit.



GANTRY ASSEMBLY

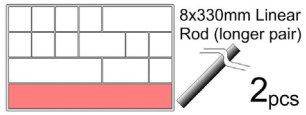
1

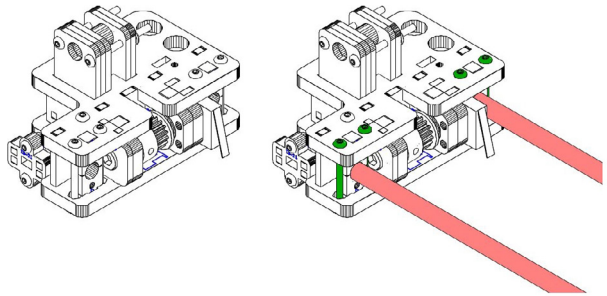
This section is for assembling the whole gantry system and setting up the drive belts. For this section you will need your mechanical kit, screwdriver kit, laser cut spanners & the 3 laser cut plates shown here. The top left is in 6mm, bottom in 6mm and top right in 3mm.



2

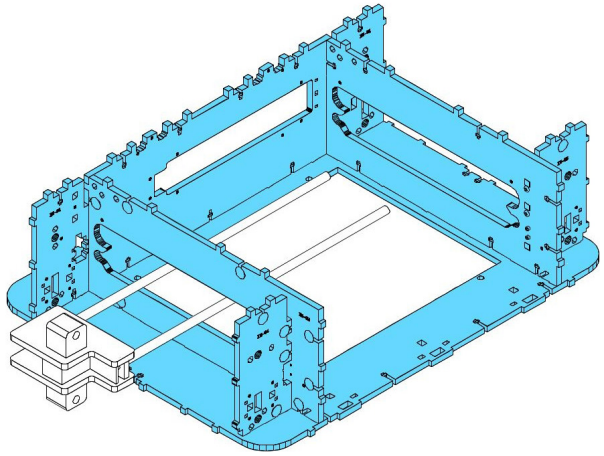
Find your Idler Shoulder assembly & take the 2 longer linear rods from your mech kit. BE CAREFUL to not scratch the rods. Insert the rods as shown, you may have to loosen the bolts shown in green first. Seat the rods ~3mm away from the back plate (just not butting against the plate) & then re-tighten the bolts so the shoulder clamps down onto the rods.





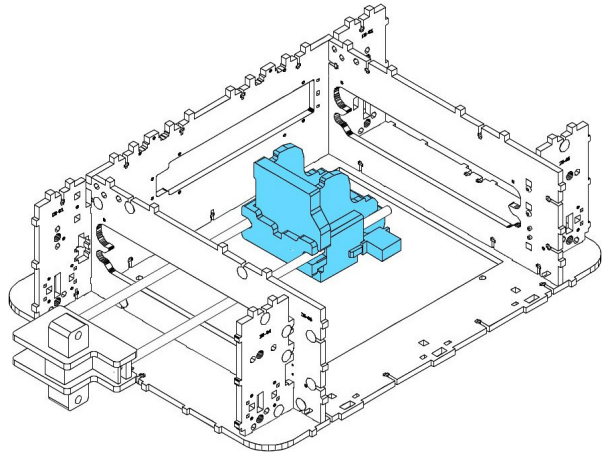
3

Place the Idler Shoulder with rods in through the left side of your printer as shown here. Leave the ends of the rods in the centre as shown. NOTE: some images in this section have omitted details and parts for clarity.



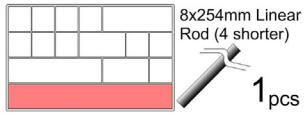
4

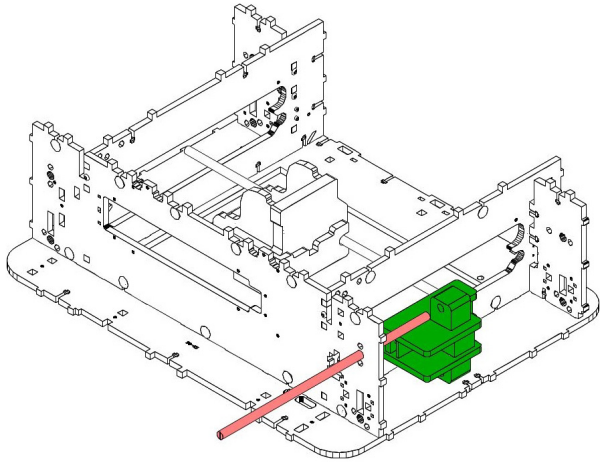
Now take your carriage assembly (with roller) and thread it onto the 2 rods as shown here. MAKE SURE you thread the Carriage in the orientation shown with your cables facing toward the back.



5

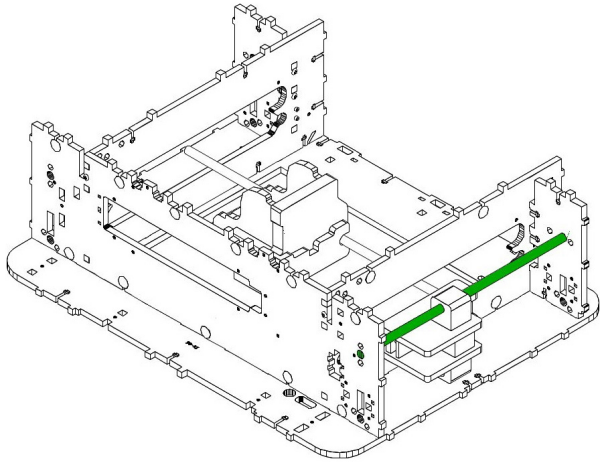
Take 1 of the 4 shorter linear rods and thread it through the top hole in the back left as shown.





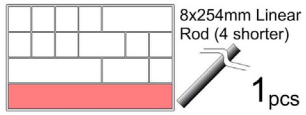
6

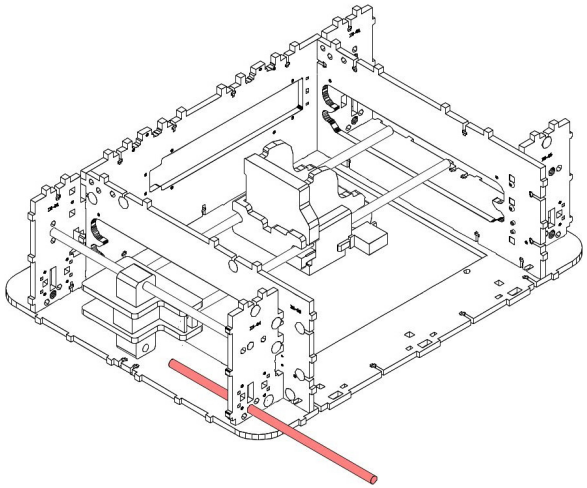
Push the rod through the top linear bearing on your Idler Shoulder and push the rod all the way through until it butts up against the cap on the opposite hole as shown.



7

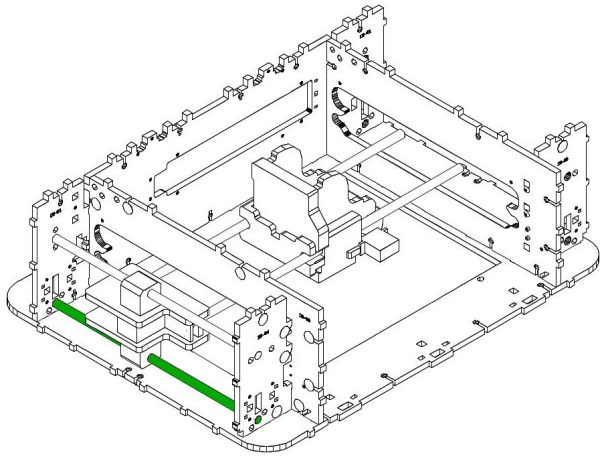
Now take another of the shorter rods and thread it through the bottom hole of the front left as shown.





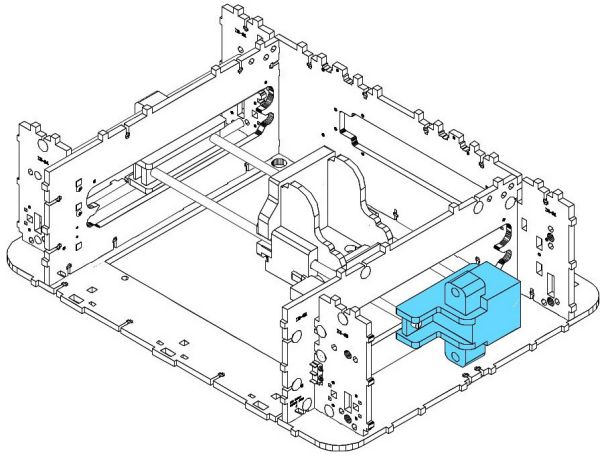
8

Make sure the limit switch on your Idler Shoulder isn't caught on the lip of the opening and push the rod through the lower bearing. Again, push the rod right through until it butts against the cap over the opposite hole.



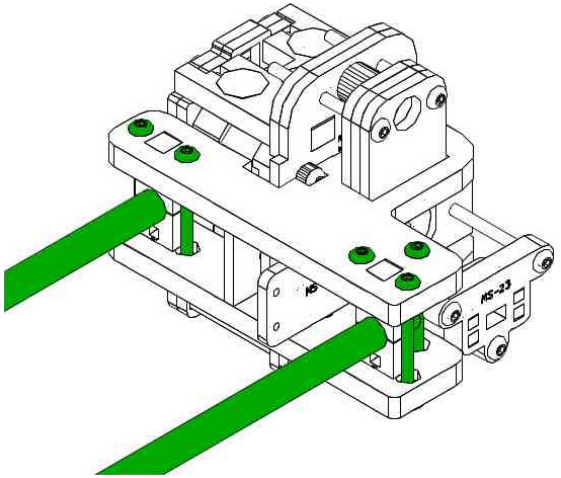
9

Take your Motor Shoulder assembly & place it up against the opposite ends of the x-axis rods as shown.



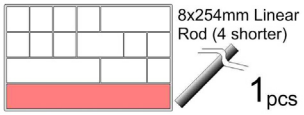
10

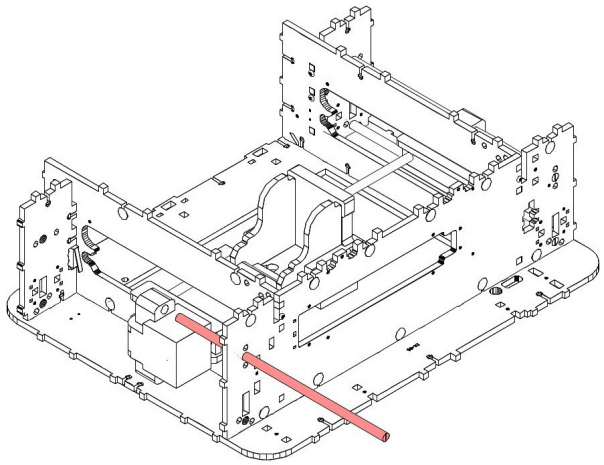
Insert the rods into the clamps of the Motor Shoulder (you may have to loosen the green bolts). Tighten the bolts again only loosely so the rods can slide a small amount for the next step.



11

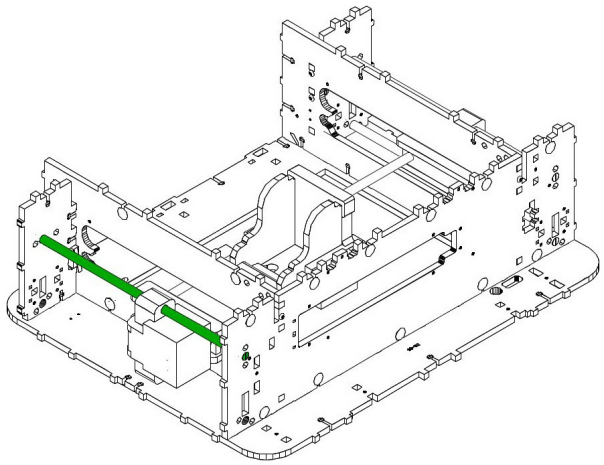
Take another shorter linear rod from your mechanical kit and thread it through the top hole of the back right hole as shown.





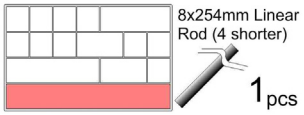
12

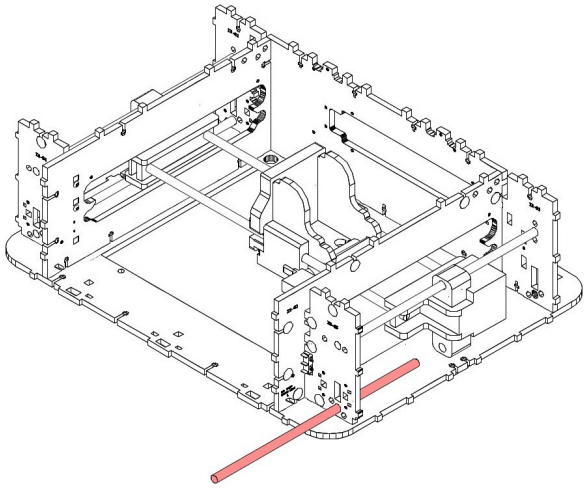
Push the rod through the top bearing of the Motor Shoulder - during this the x-axis linear rods will have to slide slightly to position the Motor Shoulder. Push the rod through to the opposite hole and press it to butt against the outer cap.



13

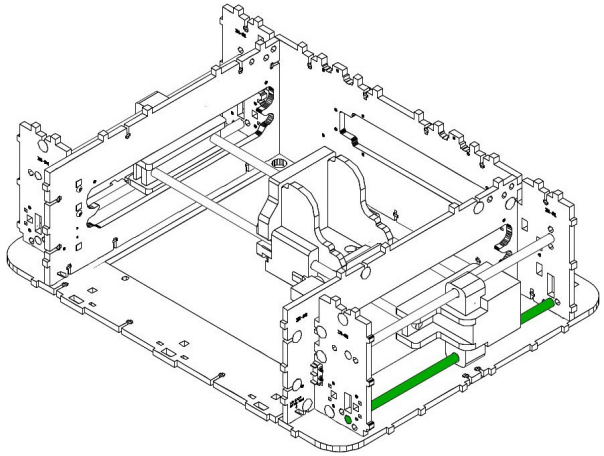
Now insert the last rod in the bottom hole of the front right.





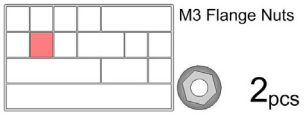
14

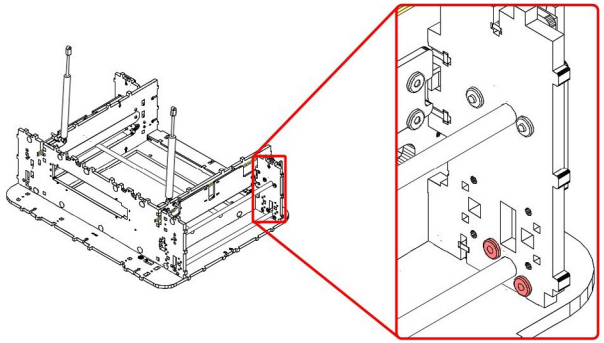
Again, double check the limit switch isn't caught and push the rod the whole way through to the opposite hole. Now re-tighten the rod clamping bolts on the Motor Shoulder (shown in green in step 10).



15

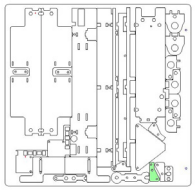
Now we are going to place end caps over each of the exposed rod ends. Start by placing 2 M3 flange nuts as shown.

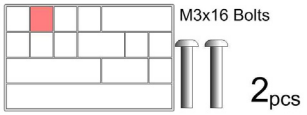


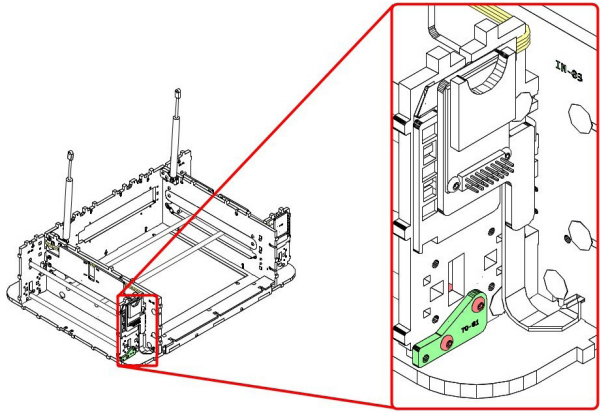


16

Take TO-01 and 2 M3x16 bolts and bolt the plate in place as shown. DON'T OVER TIGHTEN THIS PART, the design accommodates for inaccuracies in rod length & so the rod will always be slightly too long to sit flush. Make sure the part is firm in place but if you continue tightening, you will only place internal stress on your infra-structure.

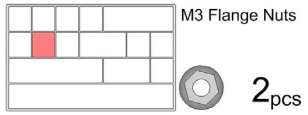


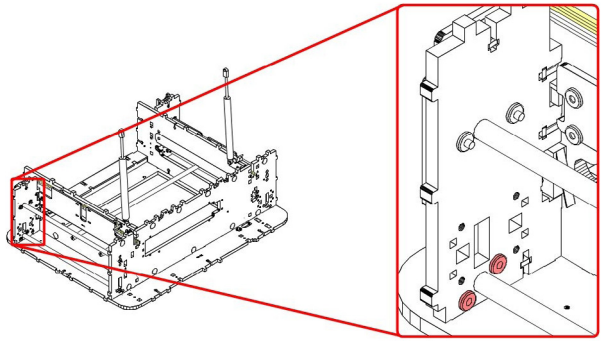




17

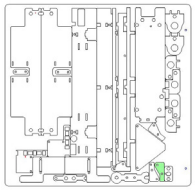
Place 2 M3 flange nuts as shown.

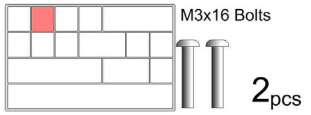


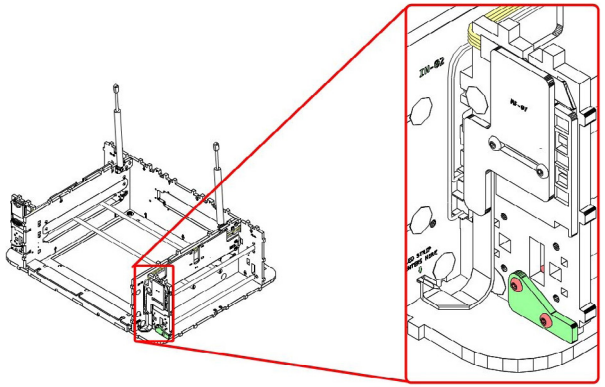


18

Take TO-02 and 2 M3x16 bolts and bolt the plate in place as shown. DON'T OVER TIGHTEN THIS PART.

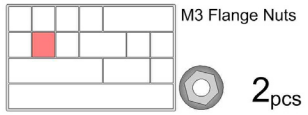


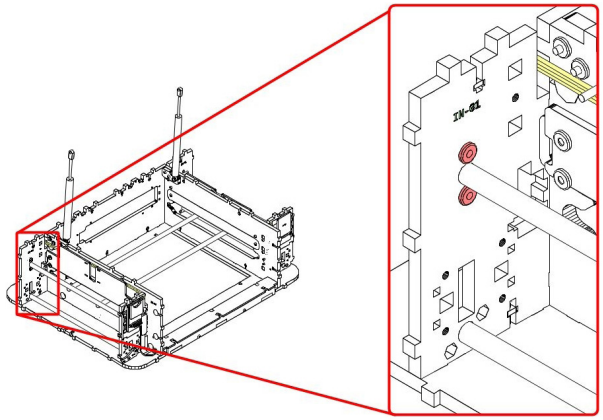




19

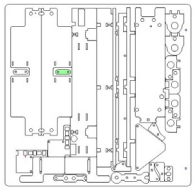
Place 2 M3 flange nuts as shown.

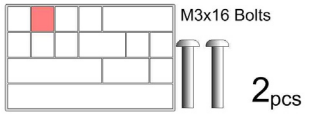


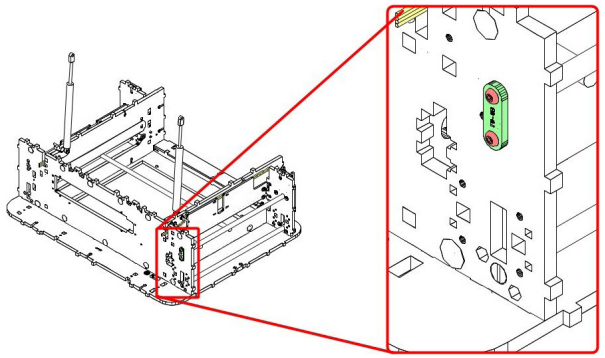


20

Take TO-03 and 2 M3x16 bolts and bolt the plate in place as shown. DON'T OVER TIGHTEN THIS PART.

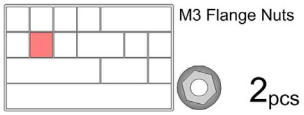


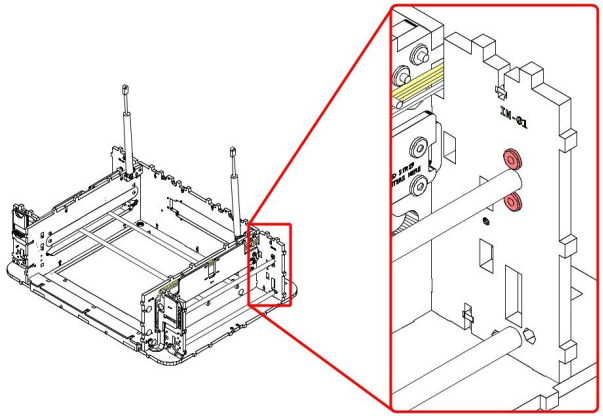




21

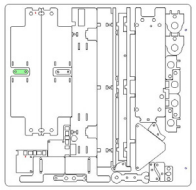
Place 2 M3 flange nuts as shown.

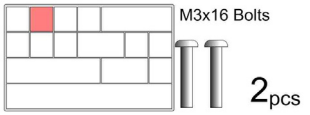


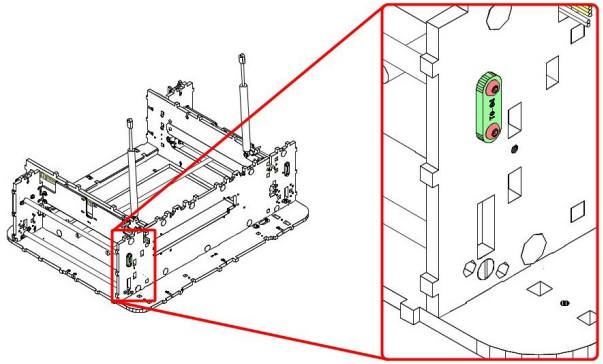


22

Take TO-04 and 2 M3x16 bolts and bolt the plate in place as shown. DON'T OVER TIGHTEN THIS PART.

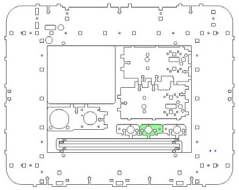


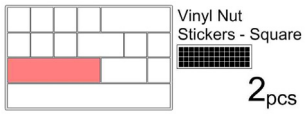


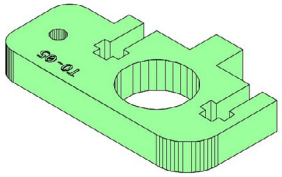


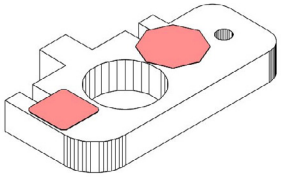
23

Find TO-05, lay it labelled side down and place a pair of nut stickers over the t-bolt cut outs. Note that the bottom cut out will only fit a square sticker, the top can be either.



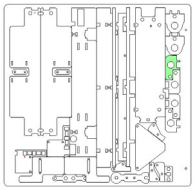


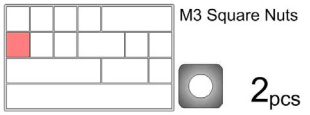


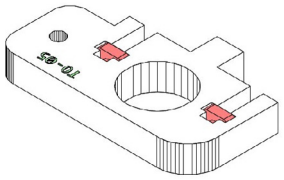


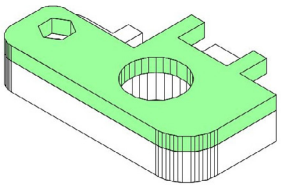
24

Flip the part over, insert 2 M3 square nuts. Find TO-06 and place it over the top labelled side down as shown.



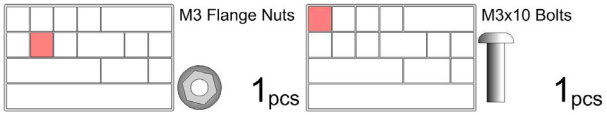


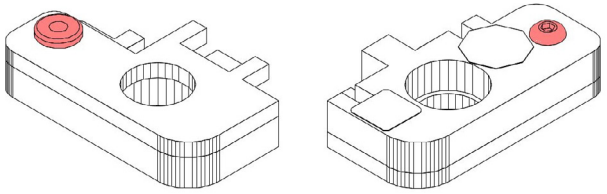




25

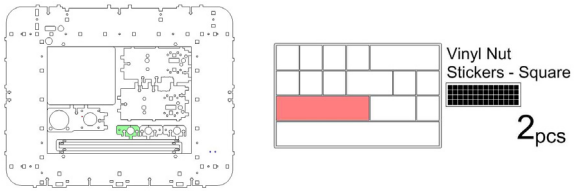
Push an M3 flange nut into the hexagonal cut out in TO-06 as shown. Flip the parts over and clamp them together with a single M3x10 bolt.

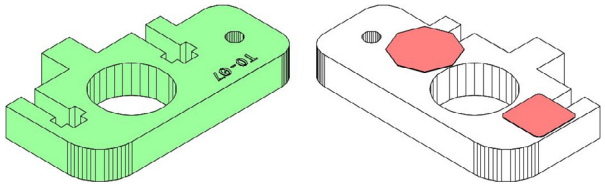




26

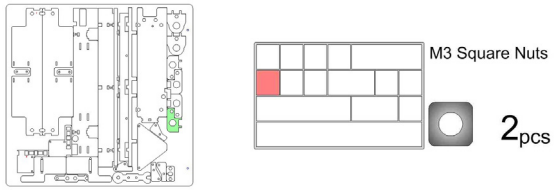
Find TO-07, lay it labelled side down, apply 2 nut stickers as shown.

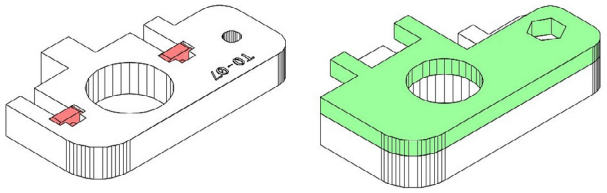




27

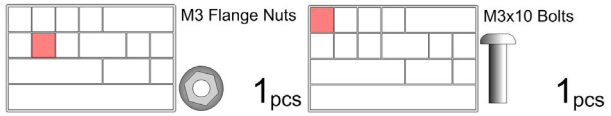
Flip the part over, insert 2 M3 square nuts. Find TO-08 and place it over the top labelled side down as shown.

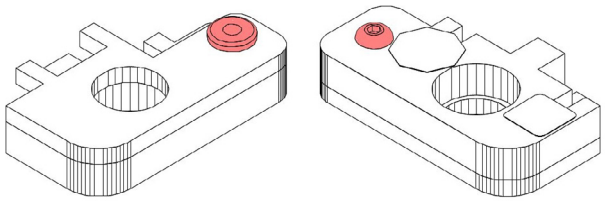




28

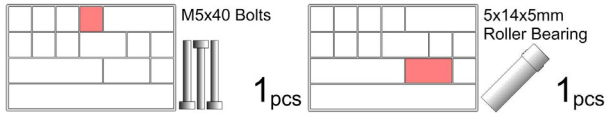
Push an M3 flange nut into the hexagonal cut out in TO-08 as shown. Flip the parts over and clamp them together with a single M3x10 bolt.

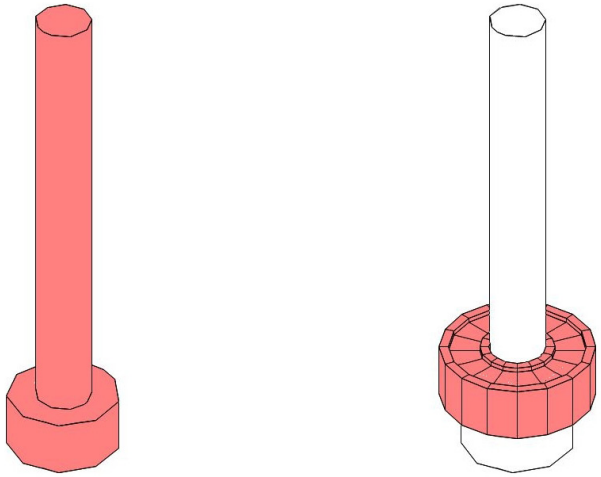




29

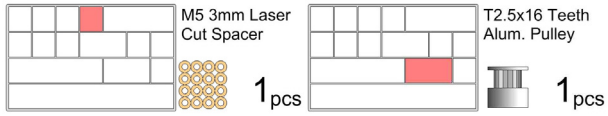
Find an M5x40 bolt and roller bearing from the mechanical kit and slide the bearing onto the bolt.

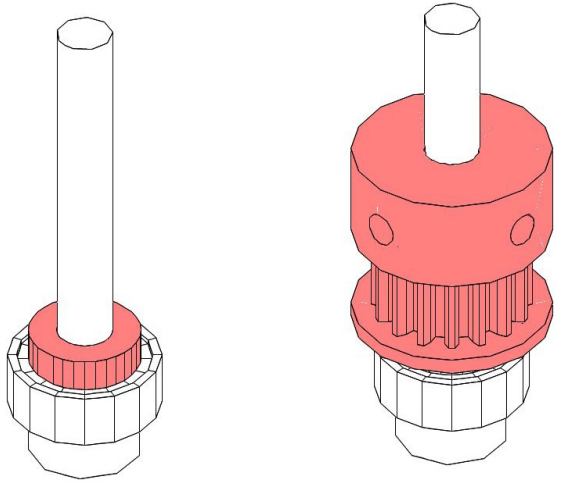




30

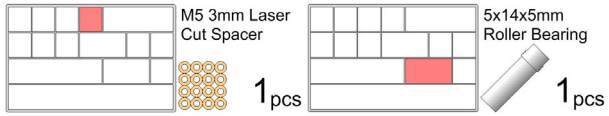
Slide on an M5 laser cut spacer & then an aluminium pulley TEETH SIDE DOWN as shown.

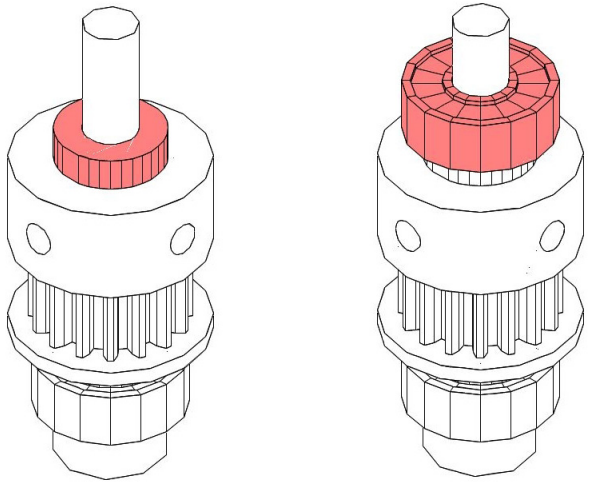




31

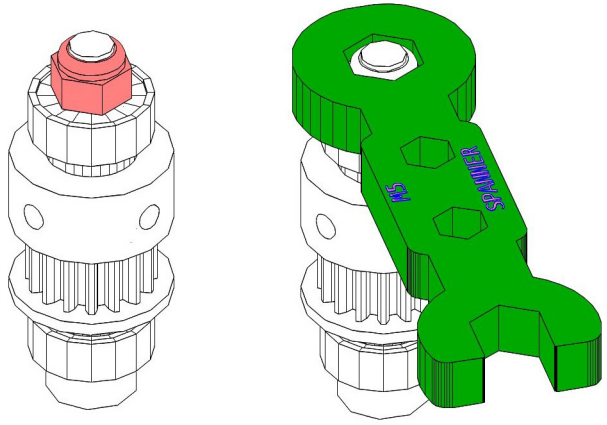
Insert another M5 laser cut spacer & then another bearing.





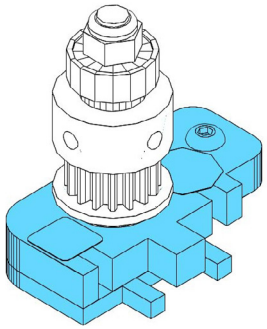
32

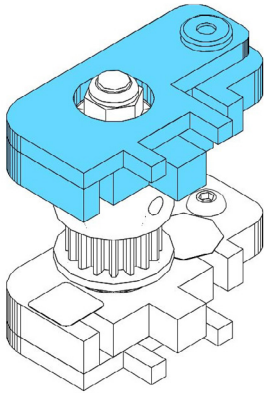
Begin threading an M5 nyloc nut onto the end of the bolt. Tighten this nut down with your spanner. DON'T be over-zealous with tightening this nut, it's best to have it loose by a tiny fraction.



33

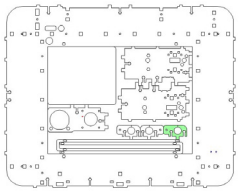
Take your two previous assemblies and insert the bearings into them as shown. MAKE SURE THE ORIENTATION OF THE PULLEY IS AS SHOWN. Put this assembly to the side temporarily.

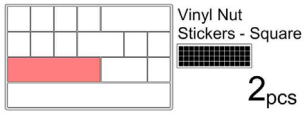


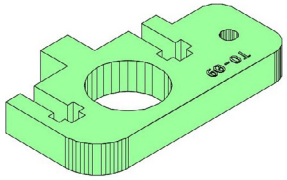


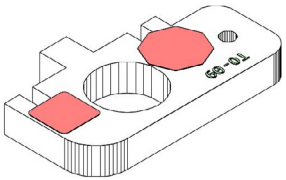
34

Find TO-09, lay it labelled side *UP* and place a pair of nut stickers over the t-bolt cut outs. Note that the bottom cut out will only fit a square sticker, the top can be either.



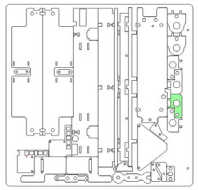


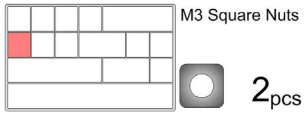


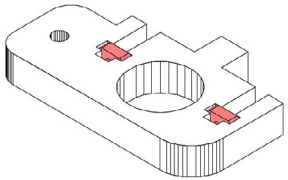


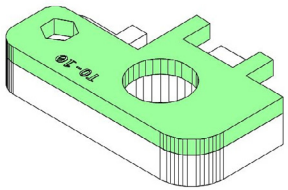
35

Flip the part over, insert 2 M3 square nuts. Find TO-10 and place it over the top labelled side down as shown.



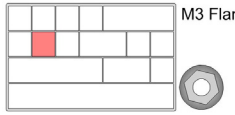


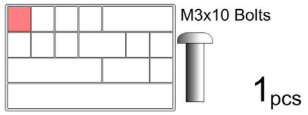


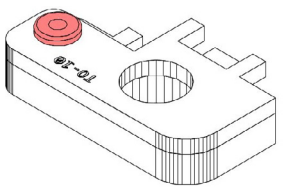


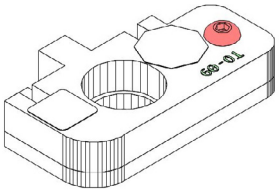
36

Push an M3 flange nut into the hexagonal cut out in TO-10 as shown. Flip the parts over and clamp them together with a single M3x10 bolt.



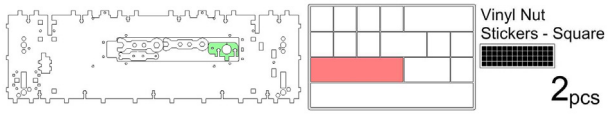


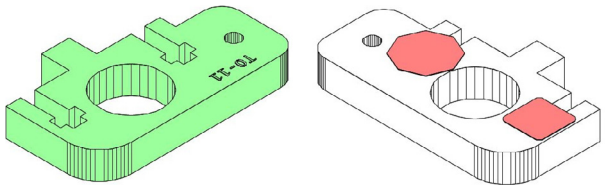




37

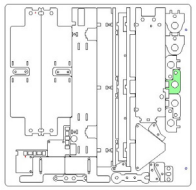
Find TO-07, lay it labelled side down, apply 2 nut stickers as shown.

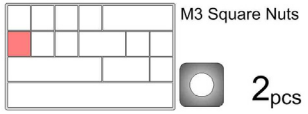


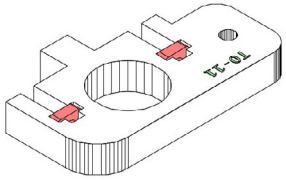


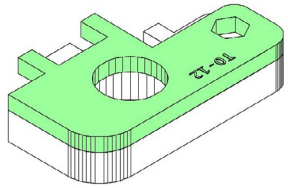
38

Flip the part over, insert 2 M3 square nuts. Find TO-12 and place it over the top labelled side down as shown.



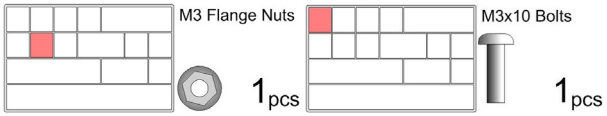


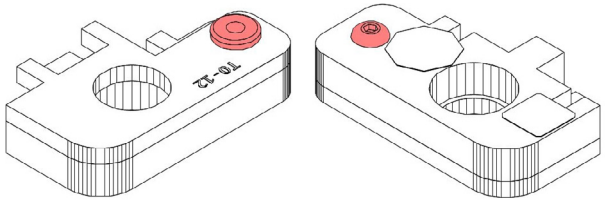




39

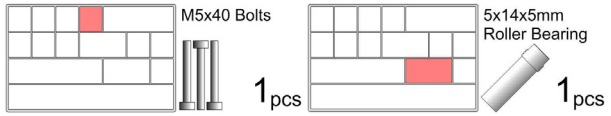
Push an M3 flange nut into the hexagonal cut out in TO-12 as shown. Flip the parts over and clamp them together with a single M3x10 bolt.

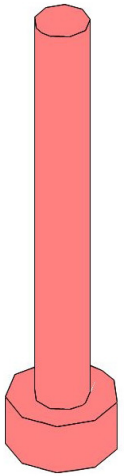


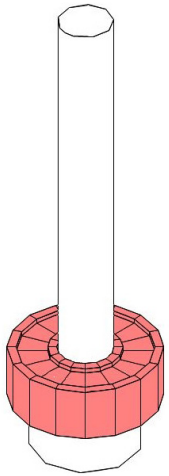


40

Find an M5x40 bolt and roller bearing from the mechanical kit and slide the bearing onto the bolt.

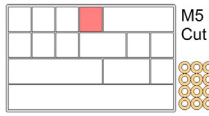


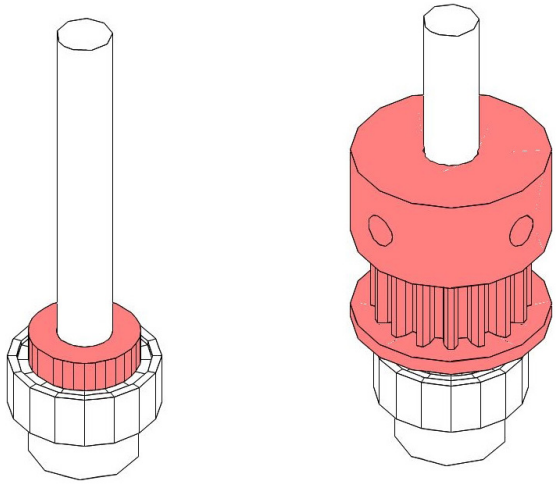




41

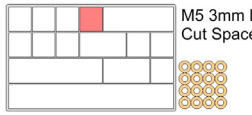
Slide on an M5 laser cut spacer & then an aluminium pulley TEETH SIDE DOWN as shown.

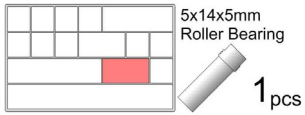


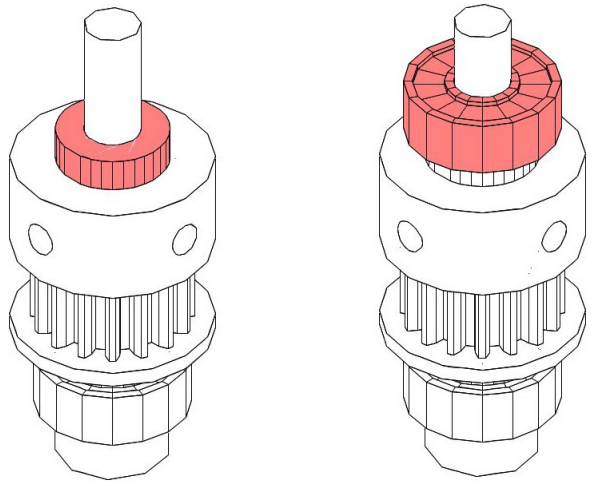


42

Insert another M5 laser cut spacer & then another bearing.

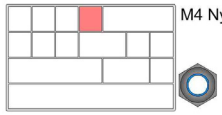


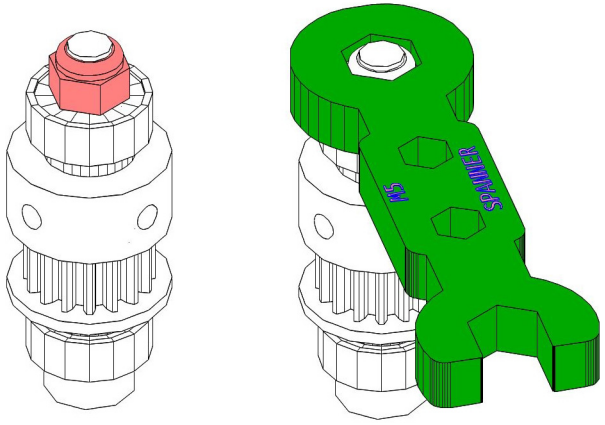




43

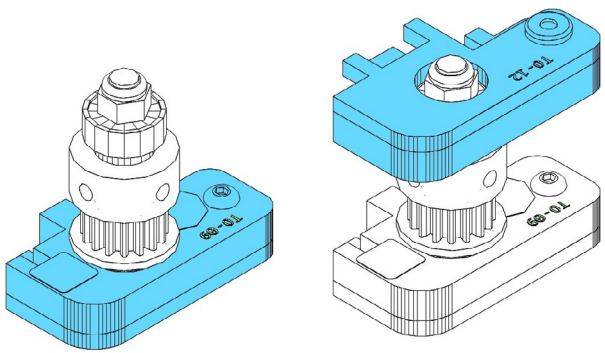
Begin threading an M5 nyloc nut onto the end of the bolt. Tighten this nut down with your spanner. DON'T be over-zealous with tightening this nut, it's best to have it loose by a tiny fraction.



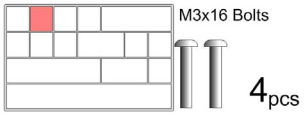


44

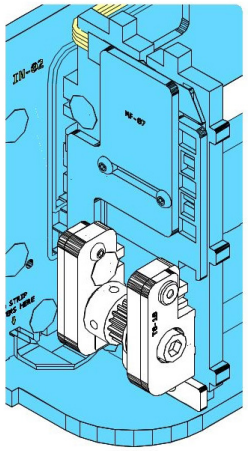
Take your two previous assemblies and insert the bearings into them as shown. MAKE SURE THE ORIENTATION OF THE PULLEY IS AS SHOWN.

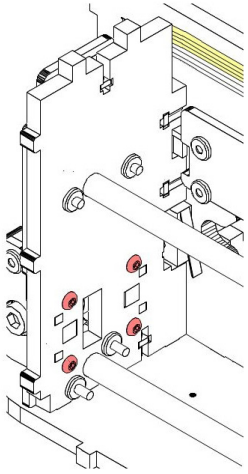


45

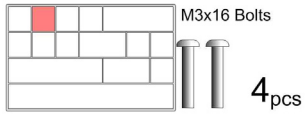


Insert the assembly into the front right of the printer as shown. DOUBLE CHECK THAT THE BOLT HEAD IS FACE OUT & THE PULLEY TEETH LINE UP WITH THE HOLE. Bolt the assembly in with a set of 4 M3x16 bolts.

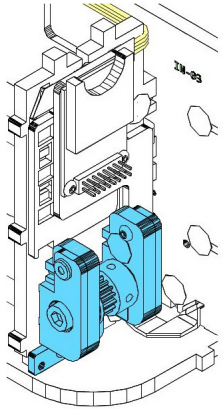


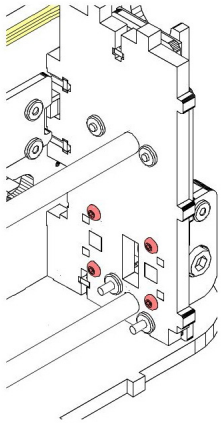


46



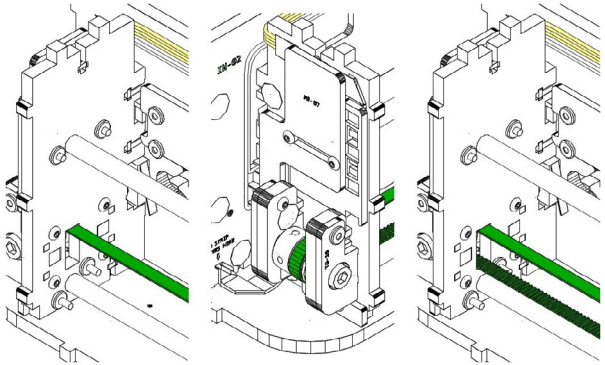
Place the other assembly into the front left of the printer. Again double check the orientations and then bolt in place with 4 M3x15 bolts.





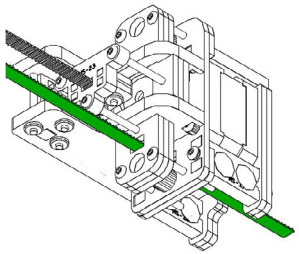
47

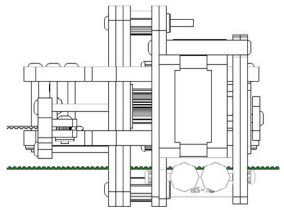
We are now going to thread the y-axis belts. Take the belt from your Motor Shoulder & thread it through the hole in the front right as in the left image. Loop the belt around the pulley as in the centre image. Then thread the belt back through the hole as in the right image.



48

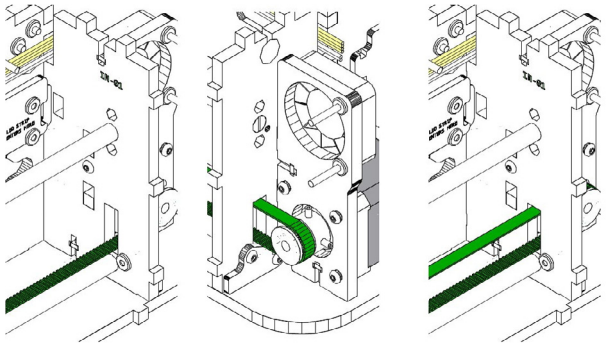
Next thread the belt through the Motor Shoulder in the holes as shown. If you are finding this difficult, you can tape the belt to something long & thin to assist in threading it through.





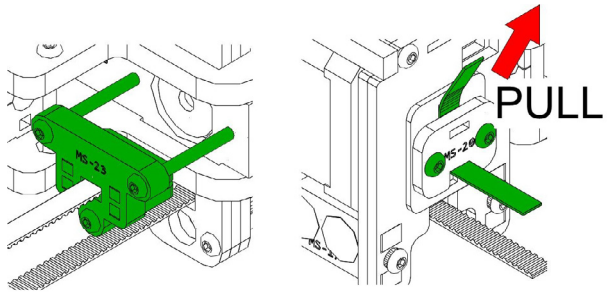
49

Now thread the belt through the back right in the same way as shown.



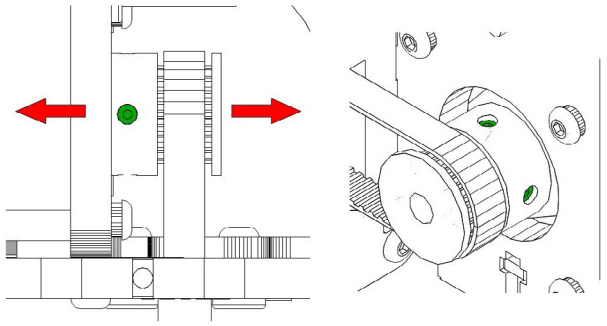
50

Ensure MS-23 is sitting up against the bolt heads as shown & pull the belt taut. Now we will clamp the belt in the Motor Shoulder. Loosen the bolts shown in green (or take it all the way off) & thread the belt in as shown. With the bolts loose, you can pull the belt as shown to tighten as much as possible. Tighten the bolts shown in green again to clamp the belt firmly.



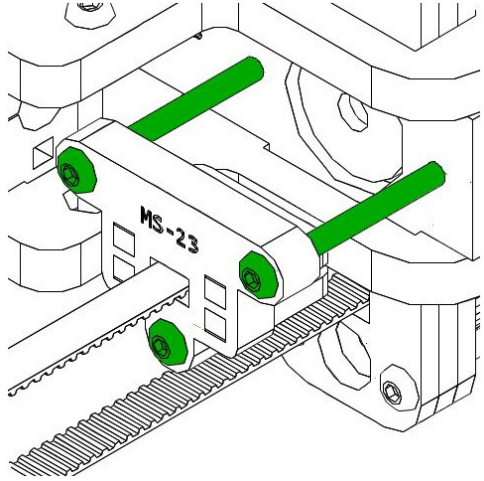
51

This image is of the pulley on the y-axis motor (back right of the printer). Make sure the pulley is horizontally aligned with the cut out for the belt and then tighten both grub screws tightly to lock onto the motor shaft.



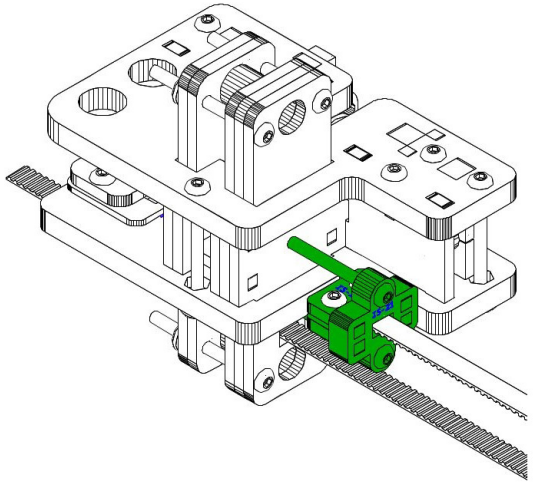
52

Finally, slowly tighten the 3 bolts shown on the Motor Shoulder to tune the tension on your belts. Your belts should be tight enough that you can pluck them like a guitar string and they vibrate in place.



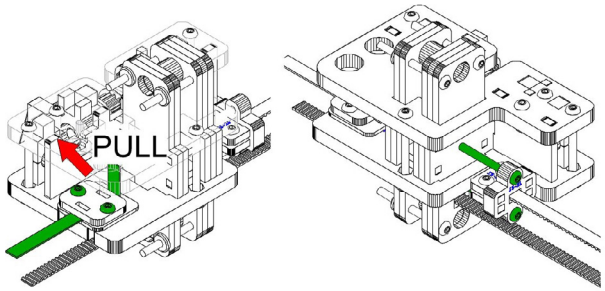
53

Now thread the belt through in the same fashion on the left hand side of the printer. Once you pulled it through, make sure that IS-21 is sitting right up against the bolt heads as shown & pull the belt taut.

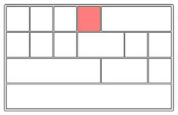


54

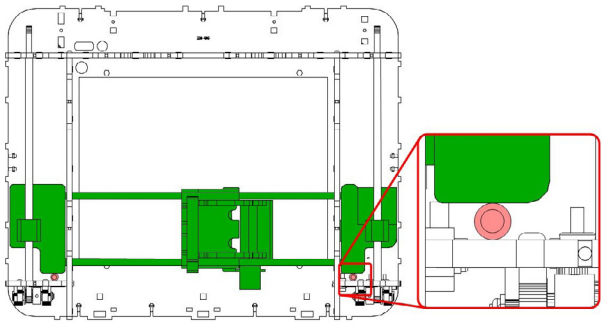
The clamp on the Idler Shoulder is slightly different, it works best in the configuration shown (i.e.. don't thread the belt through the rectangular cut outs. Pull the belt as tight as you can & tighten the rear clamp bolts as in the left image. Finally tune the tension in the belt by tightening the longer bolts as in the image on the right.



55

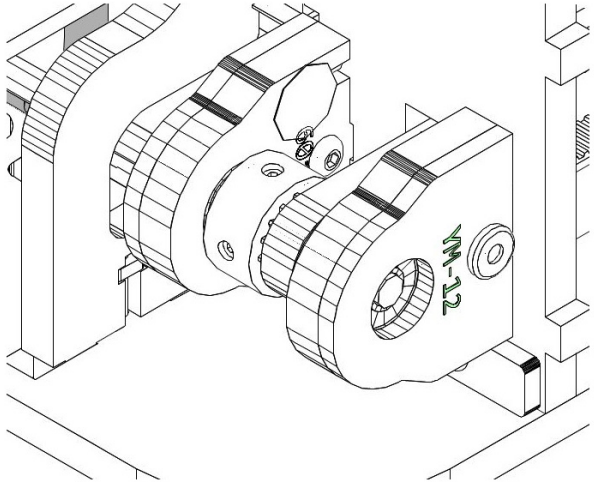


Next we will square up the gantry, make sure your belts are tight first. Move the gantry to the front of your printer, you need to place each shoulder at an equal distance from the front walls. An easy to do this is to place a wooden dowel between each shoulder and front wall and squeeze it in place - feel free to use any pair of objects with equal width though.



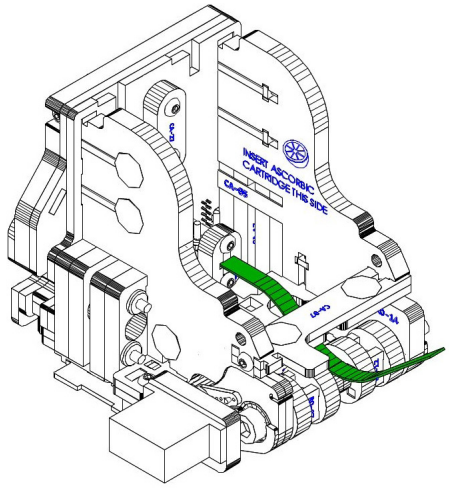
56

While keeping the gantry nice & square, strongly tighten the grub screws in the pulley at the back left of the printer (on the torque rod). After tightening these screws, the y-position of both shoulders will be locked together.



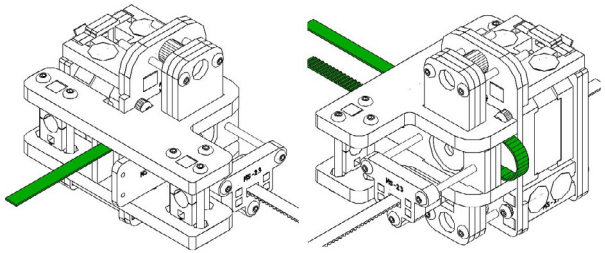
57

Now we will thread the x-axis belt, make sure the belt from the carriage is passing UNDER the rear bar of the carriage as shown.



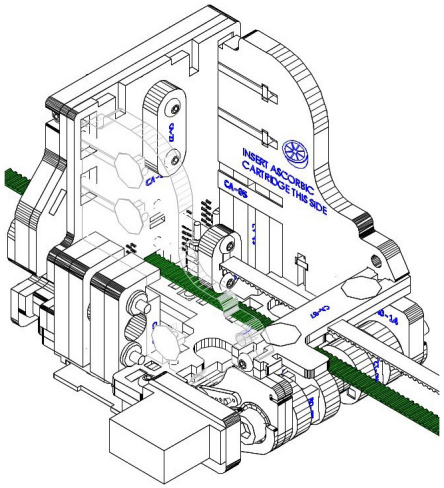
58

Thread the belt through the Motor Shoulder & over the pulley as in the left image. Then loop the belt over the pulley & back out as in the right image.



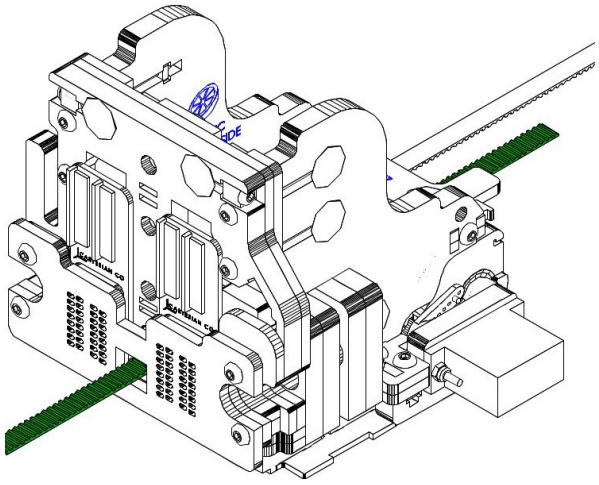
59

Thread the belt back through the carriage as shown, the belt should pass between the rollers & through a hole in the back plates.



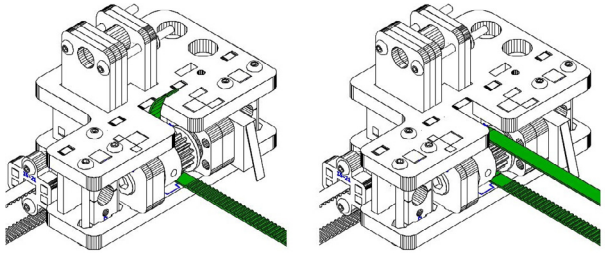
60

Your belt should come out the rear of the carriage as shown.



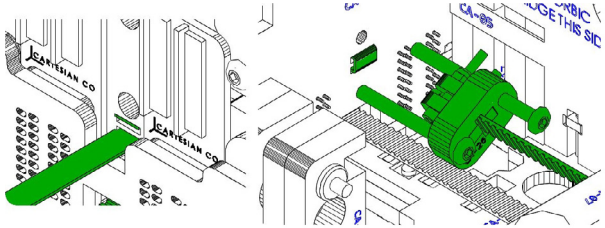
61

Push the belt underneath the pulley on the Idler Shoulder, it will pop out the top as shown. Pull the belt taut looping over the pulley as in the right image.



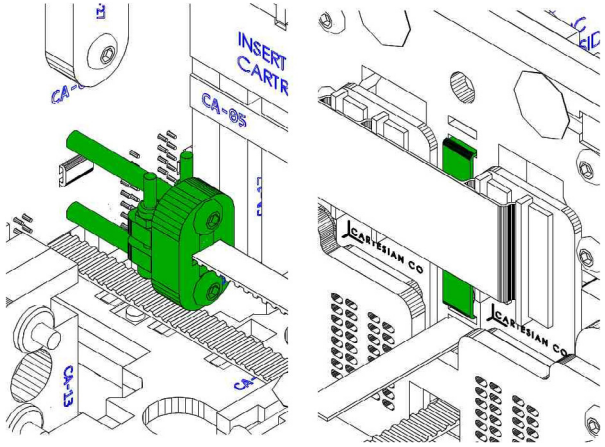
62

There will be 2 belt sized cut outs in the back of the carriage, thread the belt through the bottom of the 2 as shown. Remove the top bolt on the belt clamp as shown in the right image to get access to the belt. Pull the belt through tightly & then loop it through the top hole as shown in the right image.



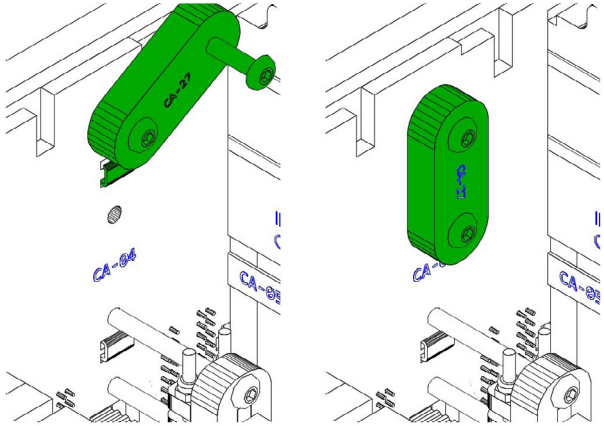
63

Replace the top bolt of the belt clamp as shown. Then pull the belt nice & tight again. Next, SLIDE THE BELT UNDER the FFC cables from the PCBs on the back & thread it through the bottom of the top 2 holes as shown.



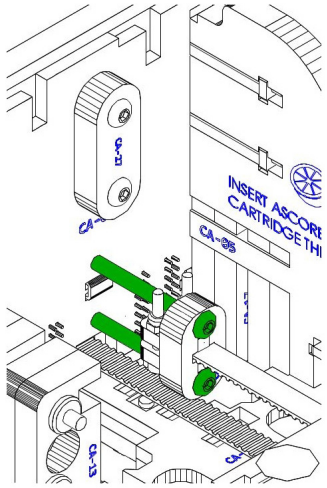
64

Twist CA-27 out of the way and then loop the belt back through one last time as in the left image. Keep the belt as tight as you can the whole time. Tighten the bolts in CA-27 to clamp down onto the belt.



65

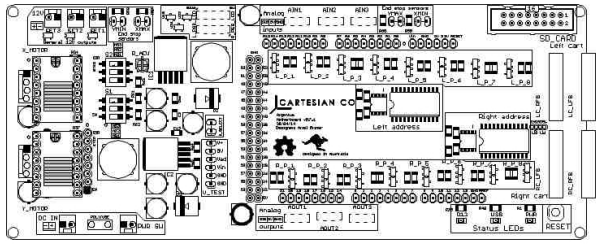
Tune the tension in your x-axis belt with these 2 bolts shown. You may have to use the extension bar in your screwdriver kit. Your belt should be just tight enough that you can pluck it like a guitar string. This section is now done!! Now we get to set up the ELECTRONICS - GET PUMPED.



12 ELECTRONICS ASSEMBLY

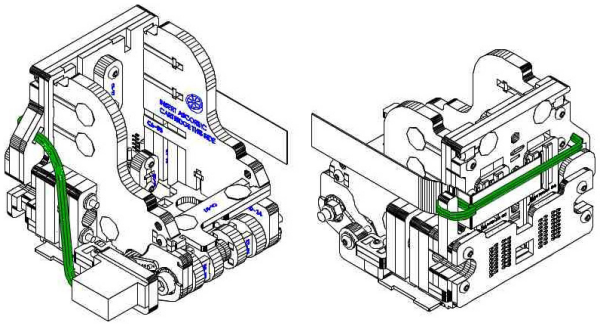
1

This section of the assembly is for wiring up all of the electronics in your printer ready for your first test. You won't need any acrylic parts or specific tools for this section but you will need the cardboard box labelled Motherboard. Begin by removing this board from its pouch and carefully pulling off the protective foam.



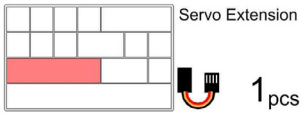
2

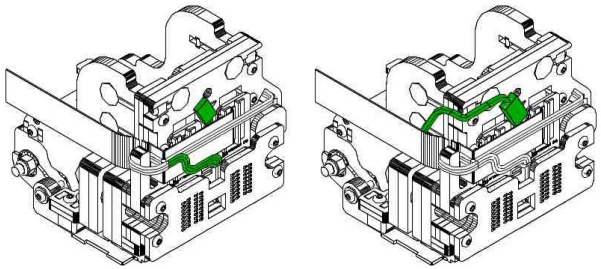
First we will route the wire for the roller servo. Take the servo cable and thread it through the hole in the carriage as shown in the left image. Next, lead the cable around the back of your carriage and loop it over the extending tab as shown in the right image.



3

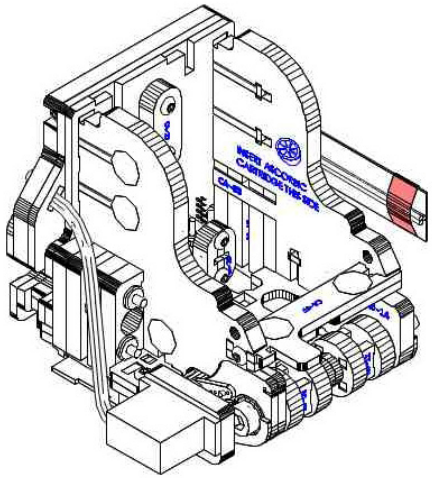
Now take the end of the servo cable and tuck it under the FFC cables, between the circuit boards as shown, leave the plug poking just out the top & laying flat against the carriage. Take the servo extension from your mech kit (long 3 wire cable: orange, red, brown), plug it into your servo & run it down to lie against the FFC cables on the side shown.





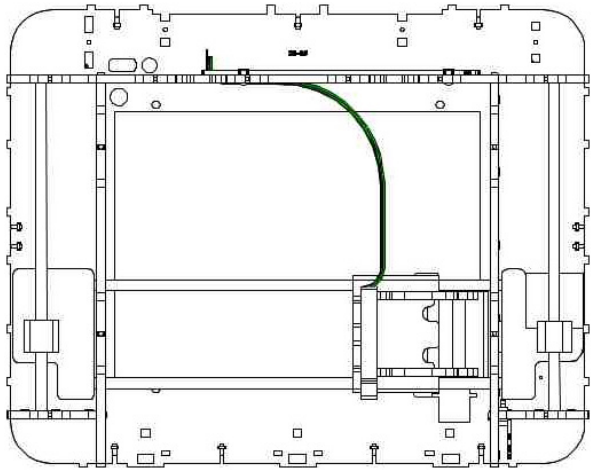
4

Here you can see the servo extension running along the outside of the FFC cable. It helps greatly to tape the cable in place here (alternatively you can use the Velcro strap used to hold your cables together in your kit).



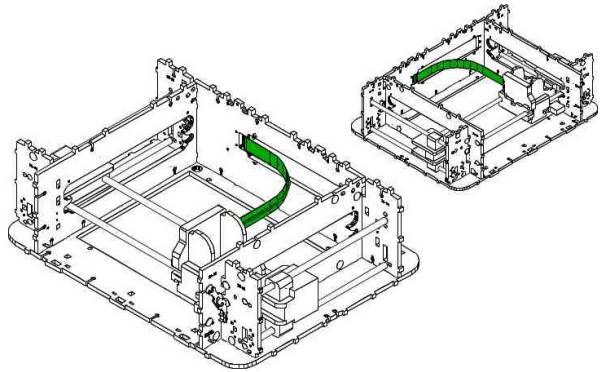
5

Push your gantry to the front right of the printer - this is where the FFC cable needs to be most extended. Now route the FFC cable with the servo extension running along the outside as shown here. Do not give the cable too much slack without stressing it - then poke it through the rear hole in the printer.



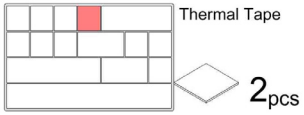
6

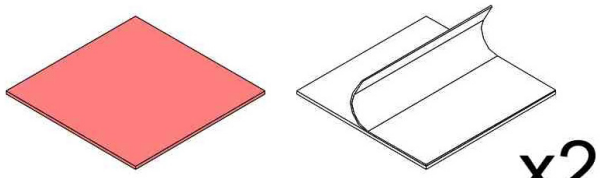
Here is another view of how the FFC cables sit & where they exit to the rear section of the printer.



7

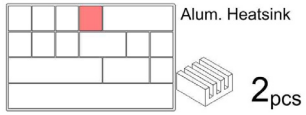
Take out the aluminium heat sinks with the thermal tape (blue squares). Peel one side off 2 of the stickers.

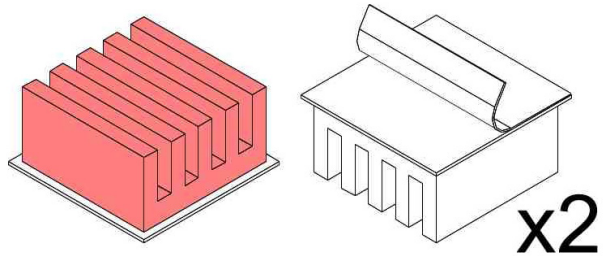




8

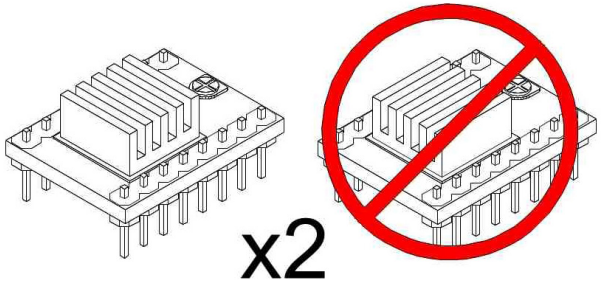
Stick an aluminium heat sink to each sticker as shown, then peel off the covering film.





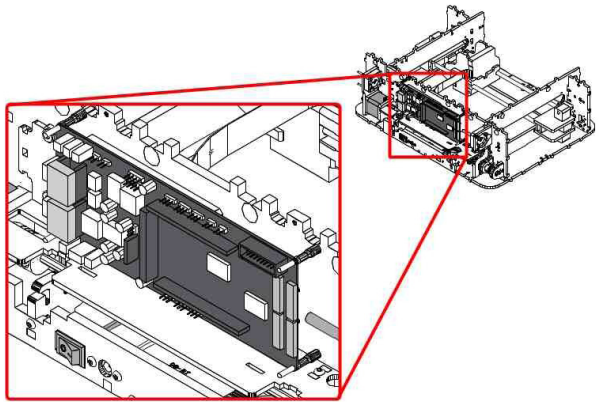
9

There are 2 stepper driver modules that look as shown plugged into your mother-board (they are red). Now carefully stick the heat sink with tape onto the main black chip on the board as shown. Orient the heat-sinks as shown in the left im-age NOT as on the right (this will help with cooling due to the airflow direction).



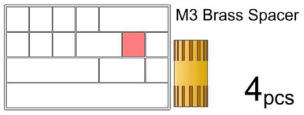
10

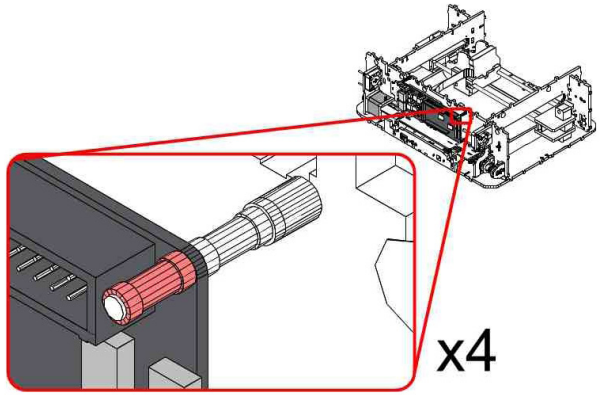
Now take your motherboard and slide it over the 4 bolts on the rear of your printer as shown. MAKE SURE THE TEXT FACES UP so you can read it (same orientation shown in image).



11

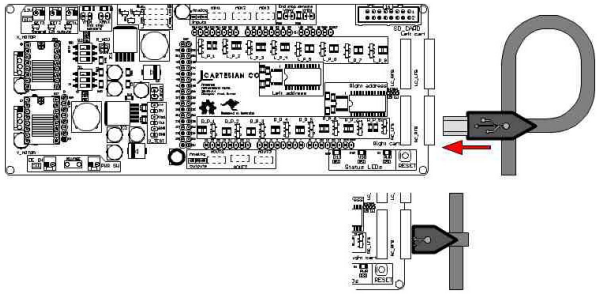
Take 4 brass spacers from your mechanical kit & use them to bolt down the PCB in place. MAKE SURE THAT WHILE YOU DO THIS YOU HOLD THE FFC CABLES TO THE CORRECT LENGTH THROUGH THE EXIT HOLE.





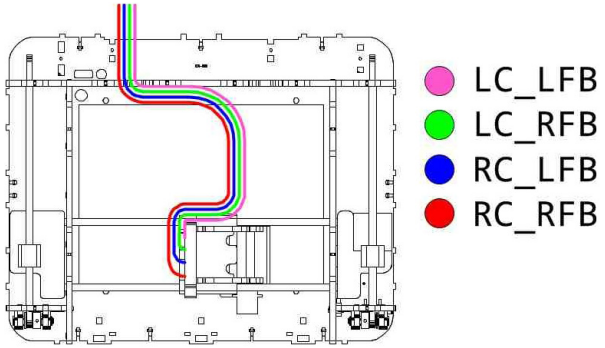
12

Next twist the USB cable to look as shown & then plug it into the USB port on the Arduino behind the mother-board.



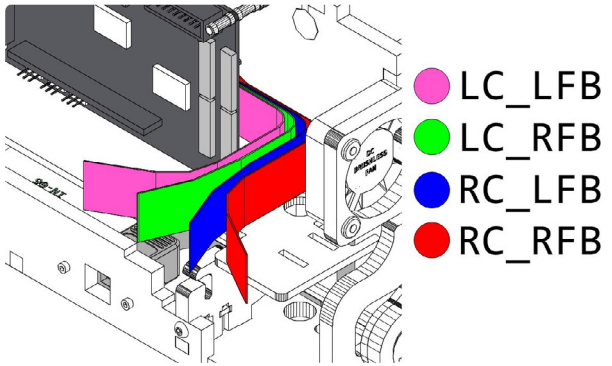
13

Now we need to identify which FFC cable is which. The cables will come out in the order as shown. The next step shows a 3D image to help demonstrate further.



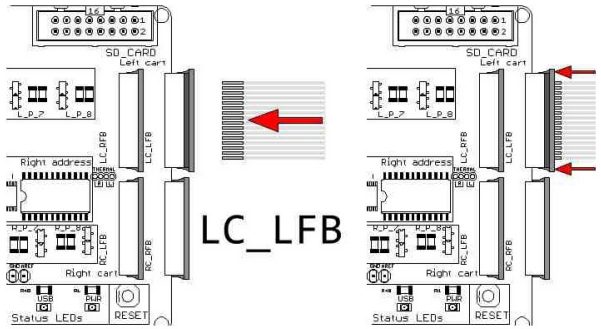
14

If you fan out the cables as shown, it is very easy to identify which is which. Now we will insert the 4 FFC cables, IT'S VERY IMPORTANT TO FOLLOW THE ORDER DEMONSTRATED. Also try to avoid unplugging the FFC cables after attached as it is possible to damage them.



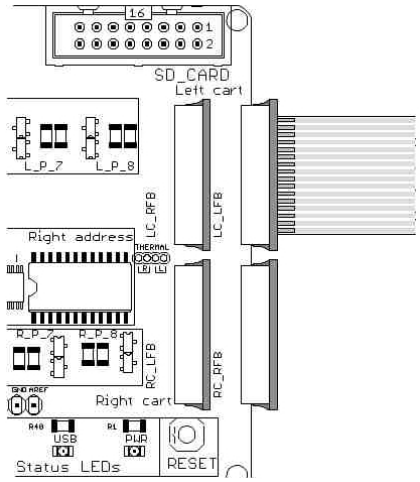
15

Begin by popping open the plastic clip on the Left Cartridge_Left From Back plug & pushing the cable in as deep as shown MAKE SURE THAT THE BLUE TAB IS FACING AWAY FROM YOU AS SHOWN. Then gently push the plastic clip closed as indicated.



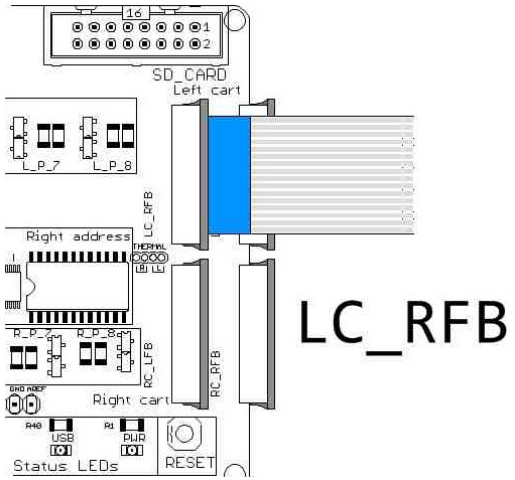
16

Make sure that your cable is inserted to the depth demonstrated here & that the clip is fully closed on both sides.



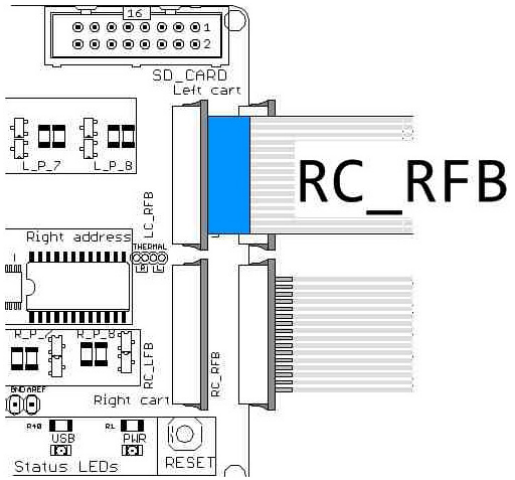
17

Now we will perform the same steps on the Left Cartridge_Right From Back. MAKE NOTE THAT IN THIS CASE THE BLUE TAB IS FACING YOU. Also due to the placement of the plugs, inserting this cable is quite difficult MAKE SURE the cable is pushed in to the depth shown. You will need to twist the cable to insert in this orientation - this is OK.



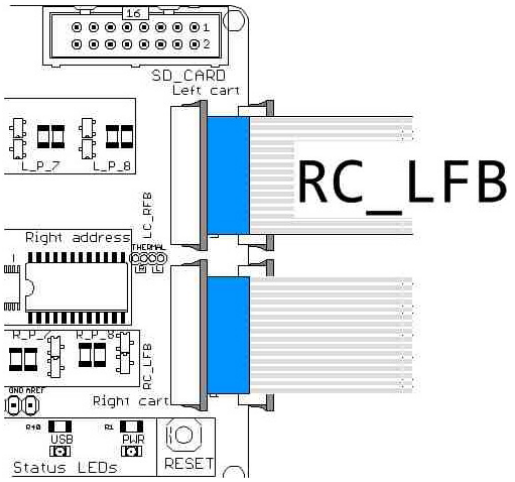
18

Now perform the same steps for Right Cartridge_Right From Back. MAKE SURE THE BLUE TAB IS FACING AWAY FROM YOU.



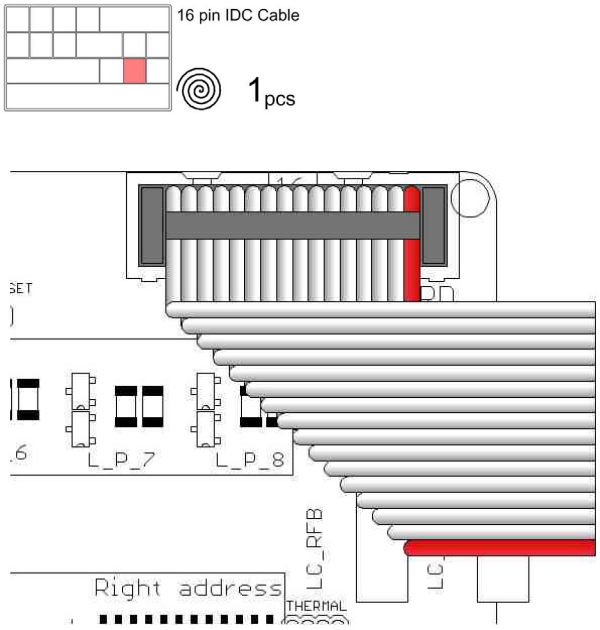
19

One last time for Right Cartridge_Left From Back. MAKE SURE THE BLUE TAB IS FACING TOWARD YOU. This cable will be tricky again, make sure it's pushed in far enough as shown in the image.



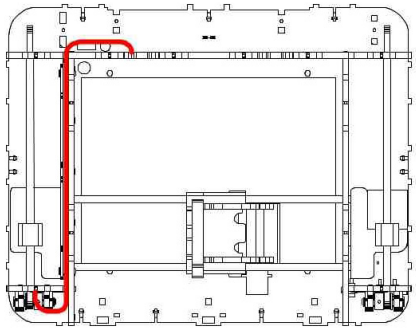
20

Next, take your IDC cable from the mechanical kit & remove any packaging. Plug one end into your motherboard (top right connector) as shown. MAKE SURE THAT THE CABLE POKES DOWN OVER THE BOARD WITH THE RED WIRE TO THE RIGHT AS SHOWN.



21

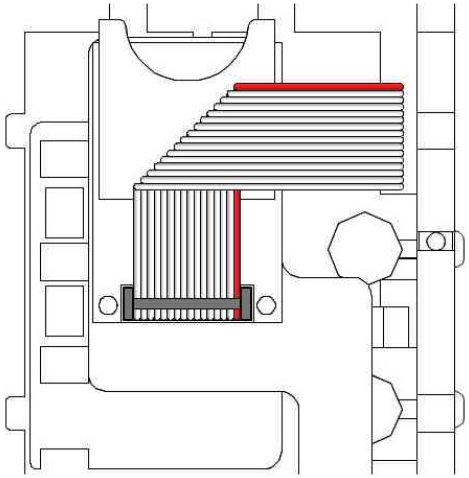
Now route this cable sideways through the channel in the side of your printer to the SD module in the front left.



IDC CABLE

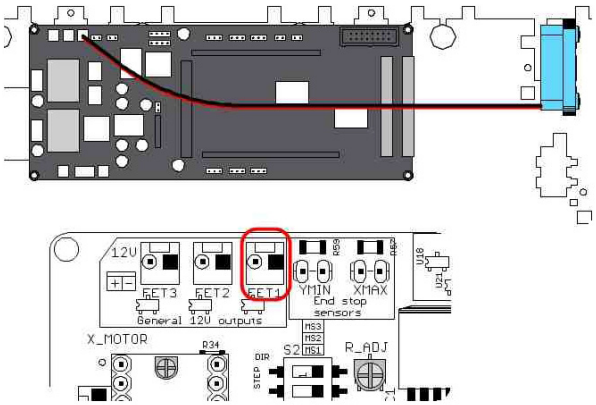
22

The cable should come through as shown, plug it into the SD module as shown. MAKE SURE THE CABLE EXITS FLAT OVER THE MODULE WITH THE RED WIRE ON THE RIGHT AS SHOWN.



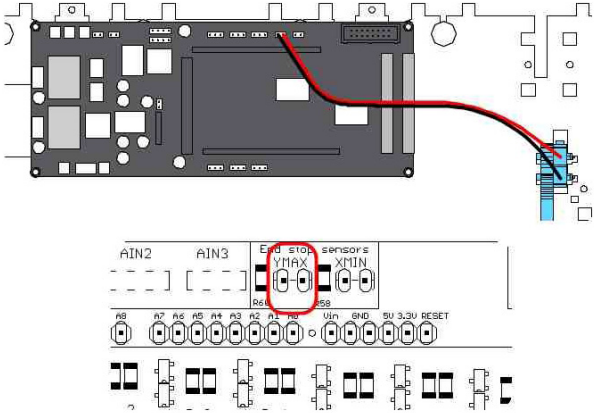
23

Take the cable from the right hand side fan (when looking from the back) and plug it into FET 1 of the General 12V Outputs as shown (near top left of your board). The plug is polarized, so it cannot be inserted incorrectly. NOTE THAT THE SILKSCREEN ON THE 12V OUTPUT POLARITY IS INCORRECT BUT THE PLUGS ARE MADE BE POLARIZED CORRECTLY.



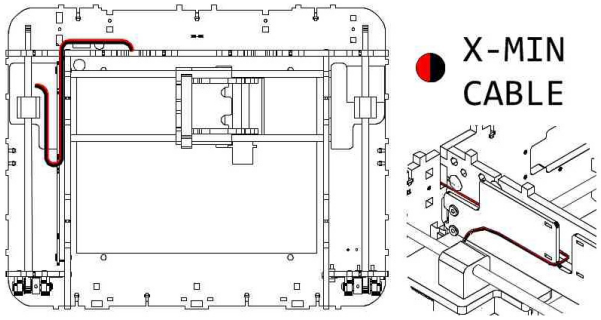
24

Next take the YMAX switch cable and plug it into the YMAX connector as shown here (polarity doesn't matter, either way is fine). NOTE: IF THIS CABLE IS FAR TOO LONG, YOU HAVE SWITCHED THE Y-MIN & Y-MAX SWITCHES (THERE WAS A MISSPELLED WORD IN THE "IN" SECTION). IF THIS IS THE CASE, THEY MUST BE SWITCHED BACK - SEE:
http://wiki.cartesianco.com/Flipping_Y_MIN_and_Y_MAX



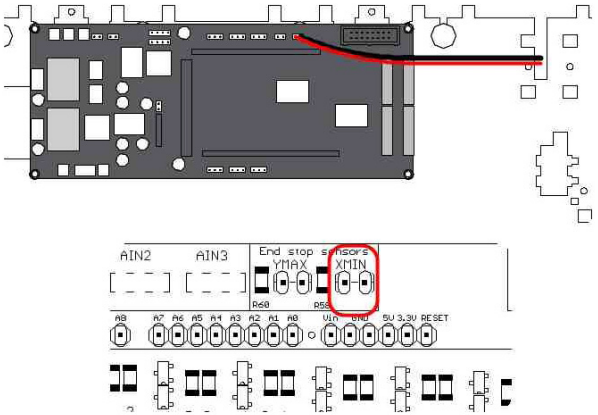
25

Now we will route the X-MIN limit switch cable, first move your y-axis to the back of the printer as shown, this ensures you give the cable the right amount of slack. Then take the cable coming from the Idler Shoulder and wrap it through the gap in the wire channel as shown here. Then route the cable out to the back as shown.



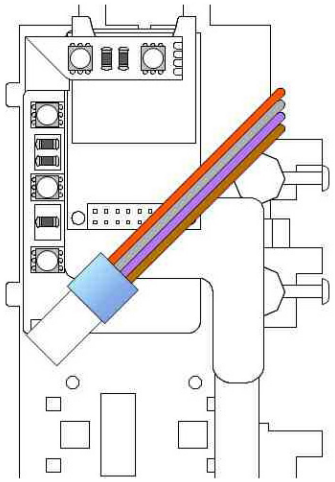
26

Now plug this cable in the XMIN connector as shown here. Polarization is not important, any orientation is fine.



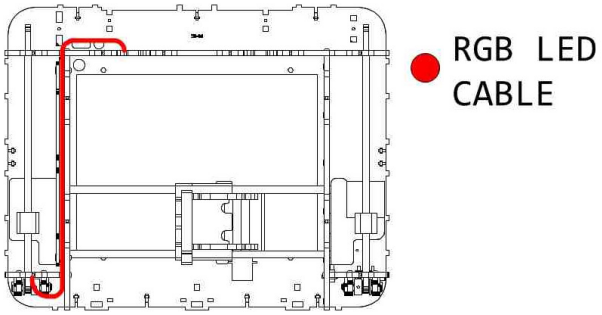
27

Take the top of the RGB LED strip at the front left and fold it down approximately as shown so it will not be crushed when the lid is inserted. Now fold the 4 pin cable end back to route through the wire channel as shown. BE CAREFUL TO NOT LAY THE LED CONNECTIONS AGAINST THE SD MODULE TO ENSURE NO SHORTS OCCUR.



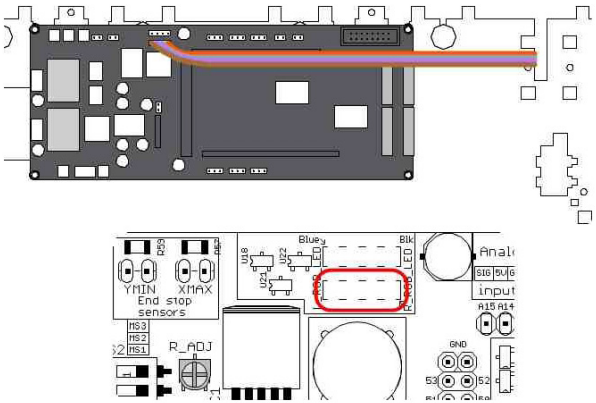
28

The RGB LED strip cable routes through to the back as shown.



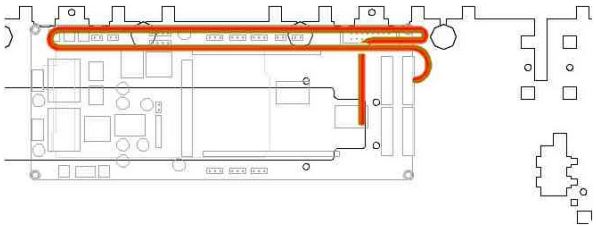
29

Plug the cable into the BOTTOM RGB LED strip connector as shown. Make sure the orange cable is on the right as demonstrated - if you plug it around the wrong way, it will not damage anything but the LEDs won't run.



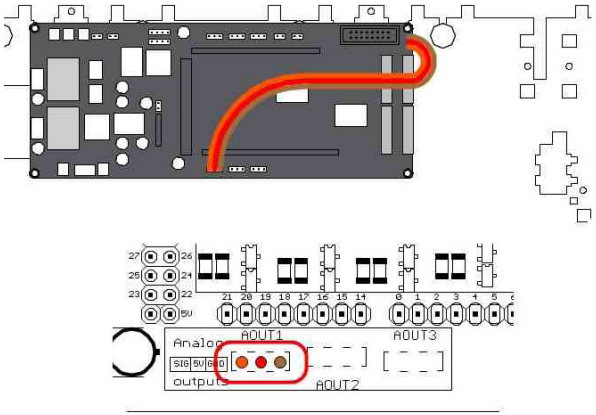
30

Now take the servo extension cable and begin by tucking one loop behind the motherboard as shown here (the cable is very long & it is a convenient/neat place to store some excess).



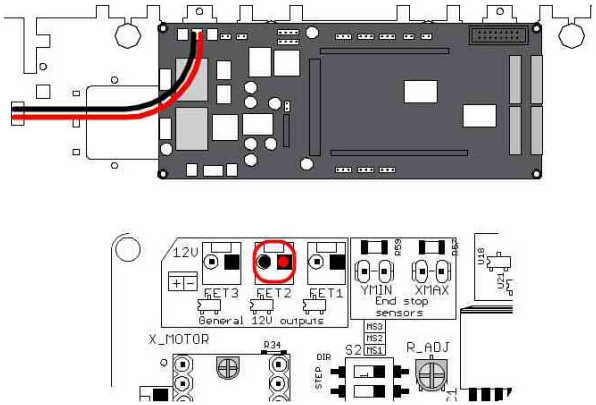
31

Now plug the servo cable into AOUT1 in the Analogue outputs as shown. Make sure the cable is plugged in as the diagram on the board suggests with orange on the left and brown (or black) on the right.



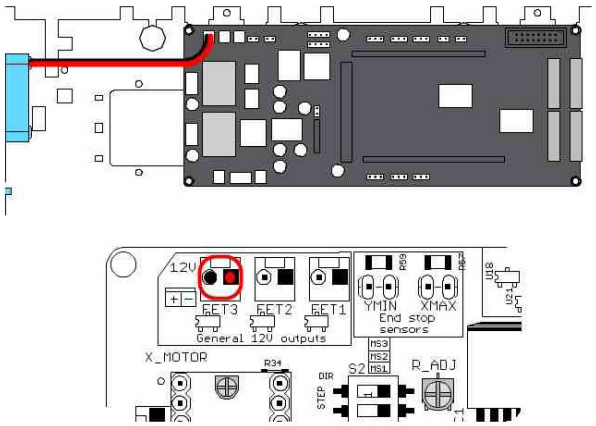
32

Now take the White LED strip cable extending from the hole in the back of the printer on the left and insert it into FET 2 on the General 12V Outputs. Again the plug is polarized correctly, it cannot be plugged in incorrectly.



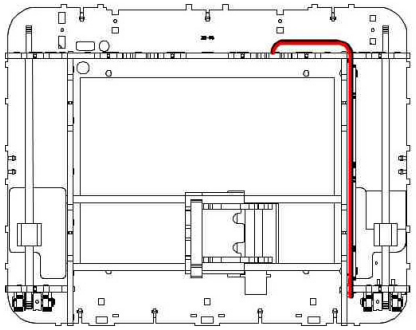
33

Take the left hand side fan (when looking from the back) and plug it into FET 3 from the General 12V Outputs.



34

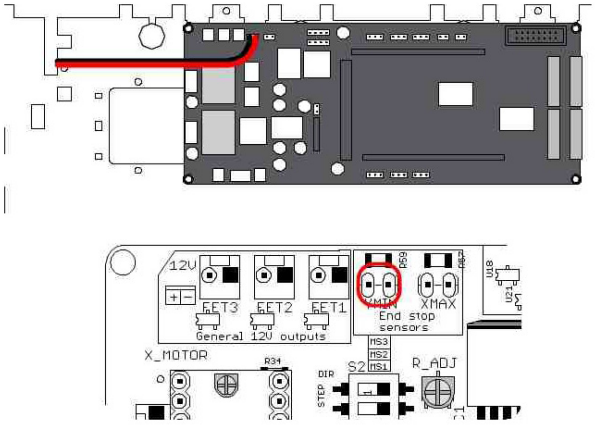
Now route the Y-MIN limit switch cable through the right wire channel as shown. NOTE: IF THIS CABLE IS FAR TOO SHORT, YOU HAVE SWITCHED THE Y-MIN & Y-MAX SWITCHES (THERE WAS A MISSPELLED WORD IN THE "IN" SECTION). IF THIS IS THE CASE, THEY MUST BE SWITCHED BACK - SEE http://wiki.cartesianco.com/Flipping_Y_MIN_and_Y_MAX



Y-MIN CABLE

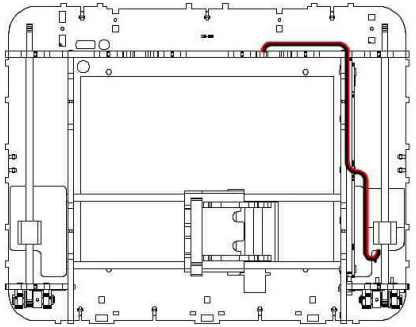
35

Plug this cable into the YMIN connector as shown, polarization is not important, any orientation is fine.



36

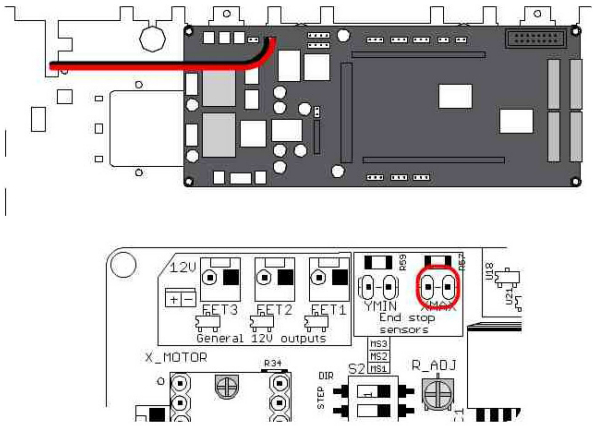
Bring your gantry to the front of the printer in order to route the X-MAX cable as shown, bring the cable over the top of the Motor Shoulder and through the right wire channel opening as with step 25.



X-MAX CABLE

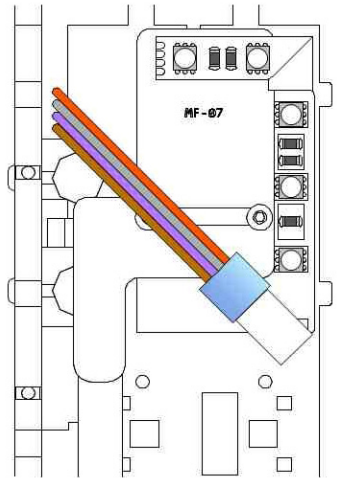
37

Then plug this cable into the XMAX connector as shown. Polarization is not important, any orientation is fine.



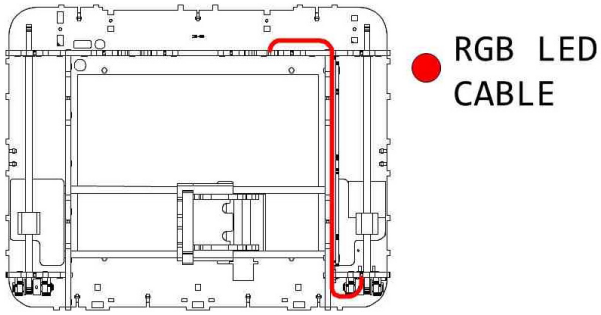
38

Take the top of the RGB LED strip at the front right and fold it down approximately as shown so it will not be crushed when the lid is inserted. Now fold the 4 pin cable end back to route through the wire channel as shown.



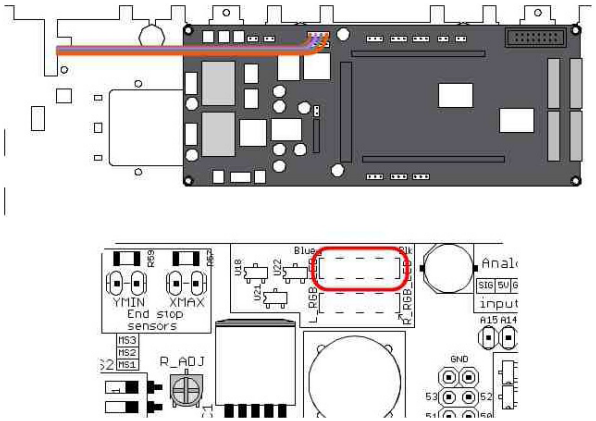
39

The RGB LED strip cable routes through to the back as shown.



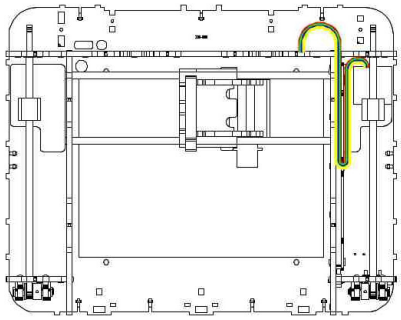
40

Plug the RGB LED strip into the top connector in the same orientation as the previous RGB LED strip (orange cable on the right).



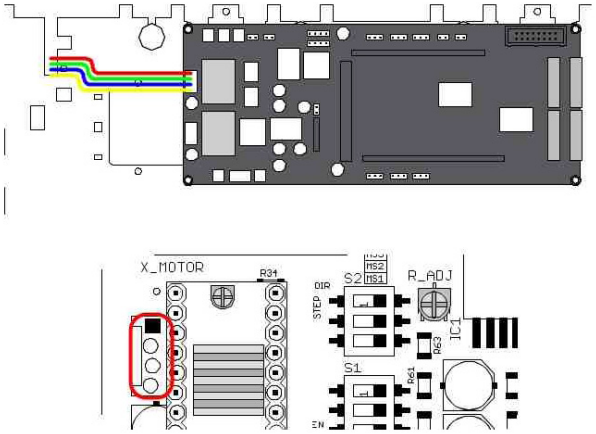
41

Push the gantry to the back of the printer & route the x-axis motor through to the back as shown through the wire channel.



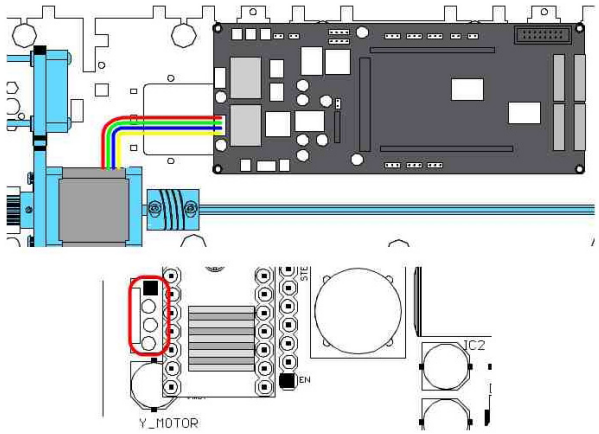
42

Plug the polarized motor plug into the X_MOTOR connector (the top one) as shown here.



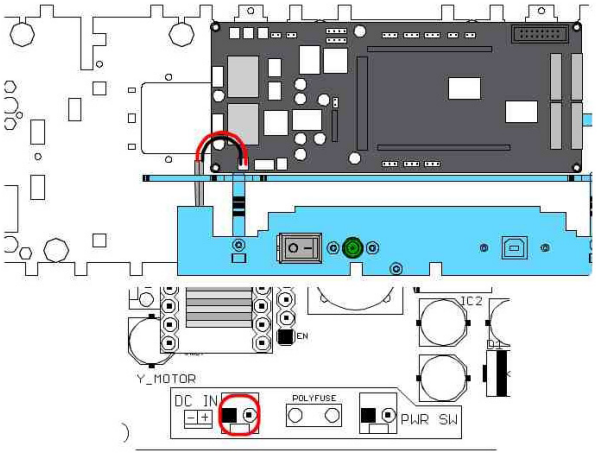
43

Now take the Y-AXIS motor cable & plug the polarized plug into the Y_MOTOR connector (the bottom one) as shown here.



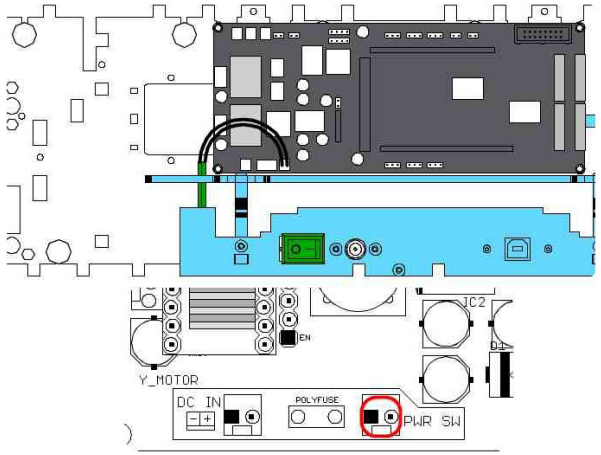
44

Now take the DC in cable coming up through the covering plate as shown (this cable is the Red & Black one) and attach the polarized plug into the DC IN connector as shown.



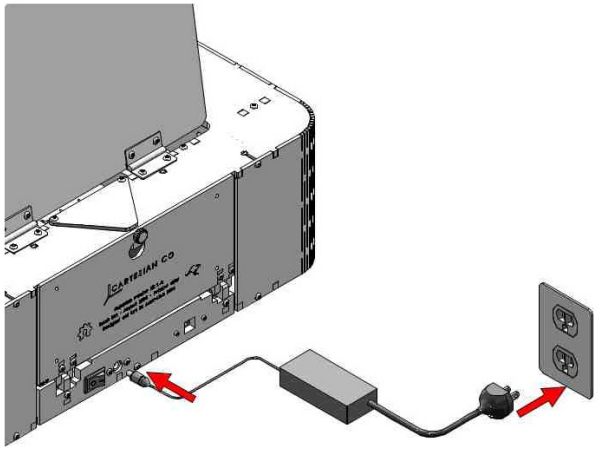
45

Now take the Power Switch cable coming up through the covering plate as shown (this cable is the grey/grey one) and attach the polarized plug into the PWR SW connector as shown.



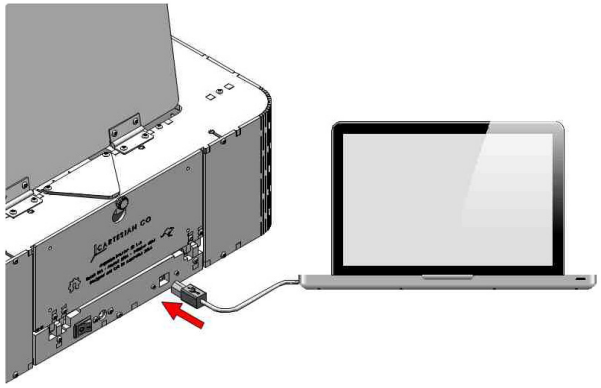
46

Find your 12V power supply (in a marked cardboard box) and plug in your mains IEC power cable (this will vary depending on your country). Plug the power supply into the wall as shown on the right and then connect the output of your power supply into your printer's power jack as seen on the left.



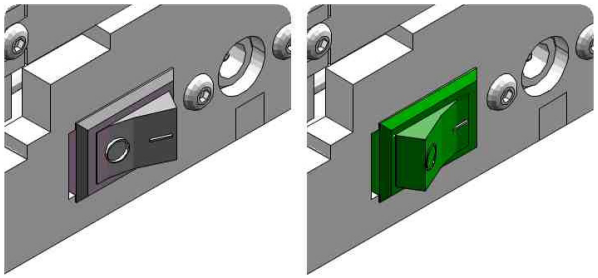
47

Now take the USB-A to USB-B cable provided in your Miscellaneous box and connect your Argentum to your computer using the plug shown on the left.



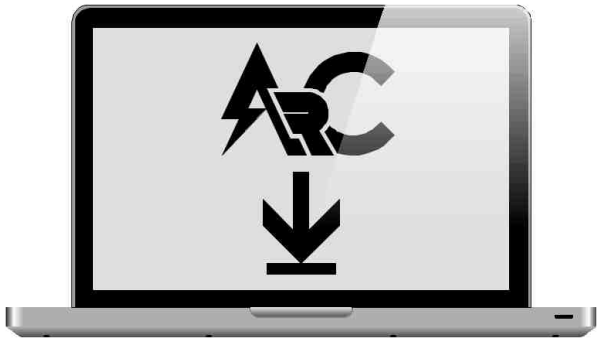
48

Turn your Argentum's power switch on as shown (NOTE that O denotes Off & - denotes On).



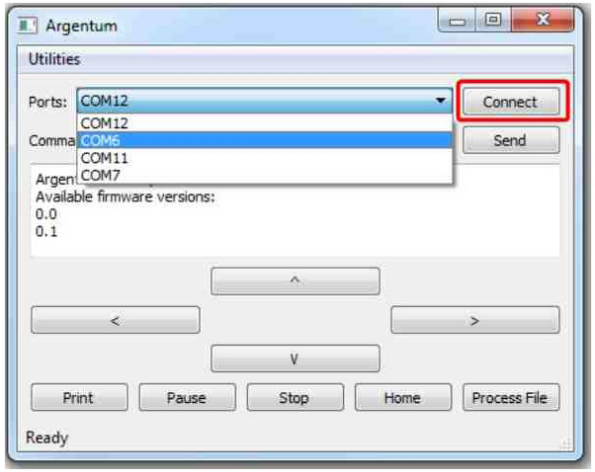
49

Now go to the Cartesian Co website & download the Argentum Control software (ArC) (http://www.cartesian-co.com/software/). The software is currently in a beta form but will be automatically updated as upgrades are continually made. Remember the project is also open source so if you would like to try your hand at modifying the software, you can check the Git repository.



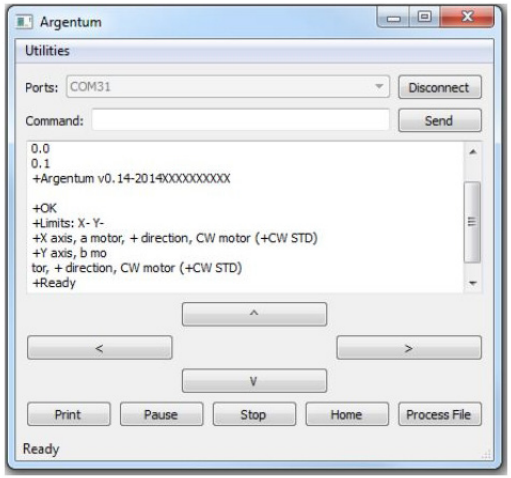
50

Open the Argentum Control Software & the window should look roughly as shown. Select your printers communication port from the Ports drop-down menu (NOTE: the format shown [COMX] is the Windows format, your format will appear different on a *nix system). Now click 'Connect' (highlighted in red).



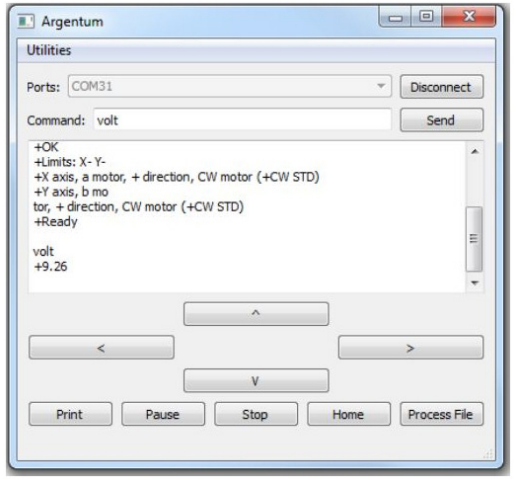
51

Your Argentum control board should come pre-loaded with the latest firmware as of the shipping date. Your Argentum terminal should now look roughly as shown here. This indicates that your printer is connected and ready to be calibrated.



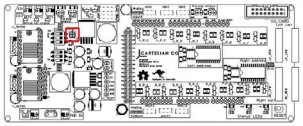
52

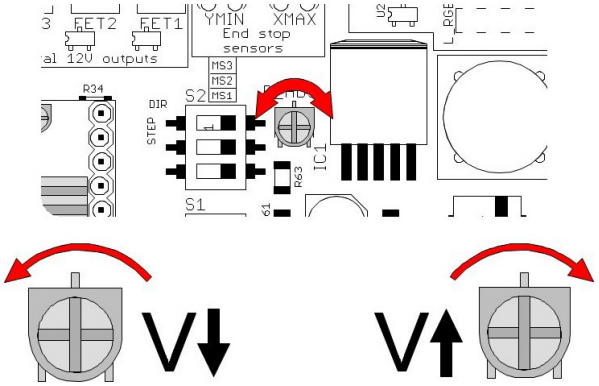
The first thing we want to do is set the variable voltage power supply that drives the cartridges. For now we will set it to 9.00V. Type 'volt' into the command line and click Send. Your printer should respond as shown. This printer had the voltage set to 9.26V - slightly too high. NOTE: if the reading is ~4V double check your power switch is On.



53

At the back of your printer at the control board, we are going to turn the V_ADJ trim-pot shown to tune the voltage. Use your screwdriver kit with a fine posidrive head (phillips). If your voltage is too high, turn the pot clockwise a VERY SMALL amount & vice versa.



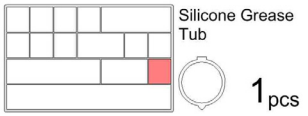


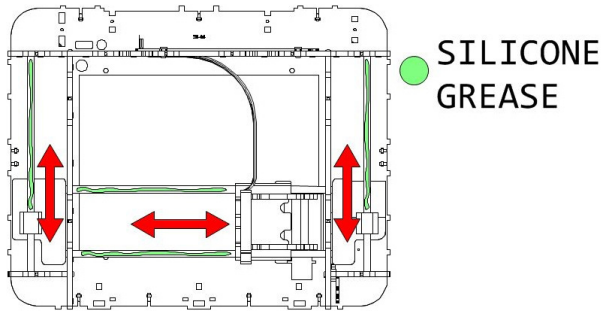
54

Now type 'volt' into the Command entry again & click Send. If your voltage is between 8.90 V & 9.10 V then this step is complete. If not, jump back to the previous step.

55

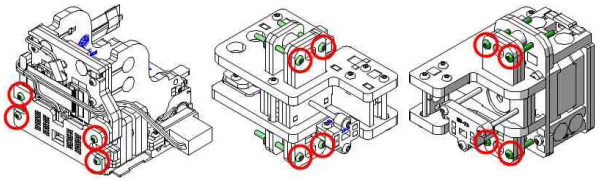
Now we are going to grease the linear rails of our printer. Take the clear Silicone grease tub from the mechanical kit & use your finger to wipe a fine coating over all 6 linear rods as shown (DON'T use too much). Now TURN YOUR PRINTER OFF AT THE SWITCH and use your hands to move the printer along in each axis a few times. This will help to spread the grease onto the bearings and along the rods.





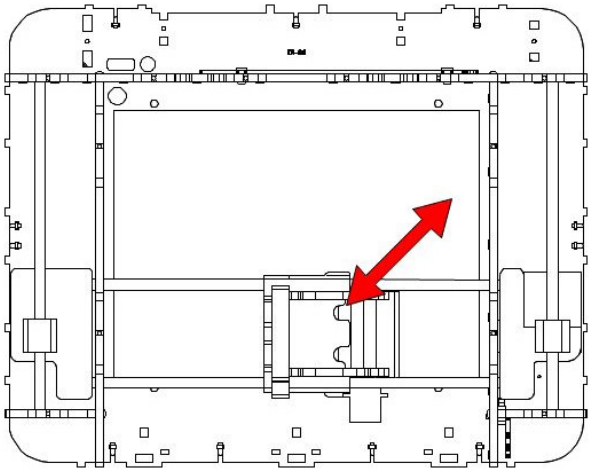
56

Now we are going to tune the 12 bolts that clamp the bearings to increase rigidity but keep the gantry smooth. This is most easily done by feel, begin with the Carriage. Tighten all 4 bolts evenly until movement is jerky, then loosen them until movement is smooth again. Repeat for both shoulders (you may not be able to reach one of the bottom bolts, this is OK).



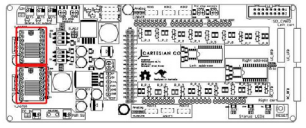
57

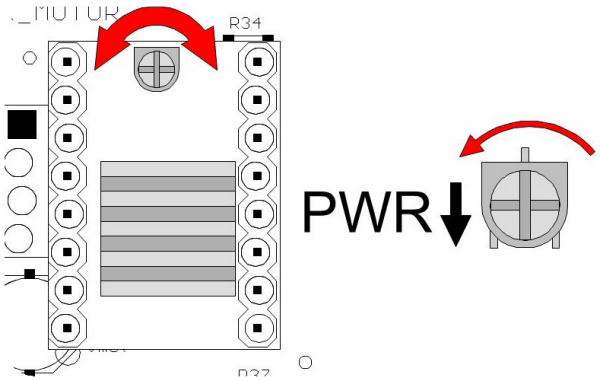
Move your printer's carriage to roughly the centre & then TURN YOUR PRINTER BACK ON VIA THE POWER SWITCH. Now enter into the Command line of ArC 'stest' and click Send. Your printer should begin oscillating diagonally as indicated. These next steps will tune the stepper motor driver current levels so that this movement is constant & consistent (doesn't skip) without over-heating the motors.



58

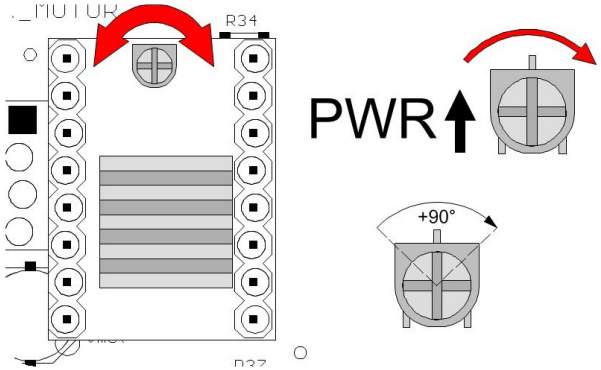
Starting with the X axis motor driver (top one, silkscreen also indicates X_MOTOR), adjust the trim pot on the module all the way counter clockwise. This will stop that motor from moving. NOTE: you may have to repeatedly send the 'stest' command throughout this & the next steps.





59

Now turn the stepper current back up (turning the trim pot clockwise) until that motor starts to move again. Now turn the trim pot clockwise an additional 45 - 90 degrees to ensure the motors don't skip if they encounter some small resistance.

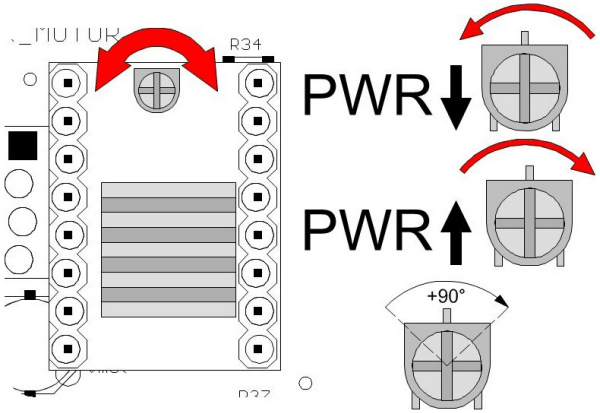


60

Repeat the previous 2 steps but for the Y-axis stepper driver (bottom one, again indicated as Y_MOTOR). Your printer should now be ready for it's first print!! HOW EVER SO EXCITING! Go straight to:

http://wiki.cartesianco.com/Starter_Circuit

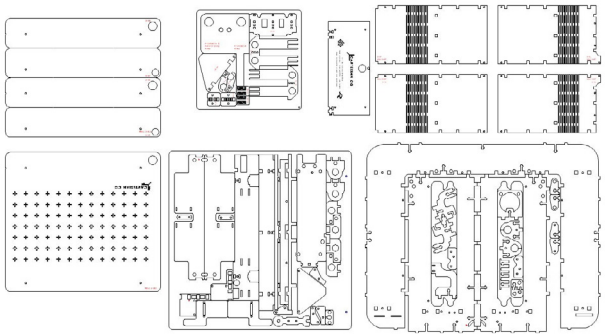
RIGHT NOW!



13 OUTER SHELL

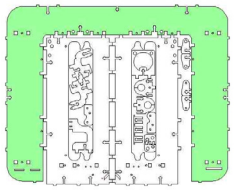
1

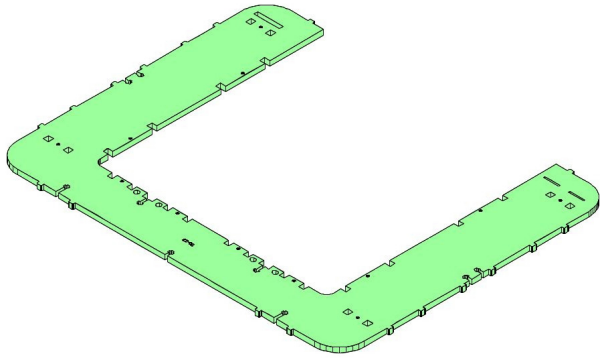
This section is for assembling the final section of your printer to enclose everything all nicely. For this section you will need your mechanical kit, screwdriver kit & all of the panels shown here. To make it easier to troubleshoot BEFORE UNDERTAKING THIS SECTION, PLEASE RUN A TEST PRINT ON YOUR ARGENTUM BY RUNNING THROUGH THIS TUTORIAL:
http://wiki.cartesianco.com/Starter_Circuit



2

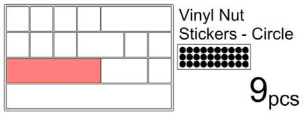
Find TO-13 and lay it labelled side up as shown. BE CAREFUL TO NOT DROP THIS PIECE as the weight of the plate can cause it to break if dropped on a corner.

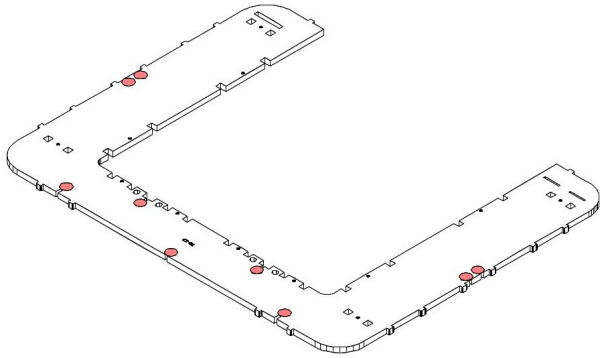




3

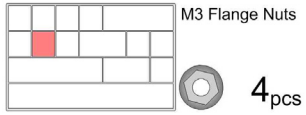
Place a circular (or square) nut sticker over each of the 9 t-bolt cut outs on TO-13 as shown.

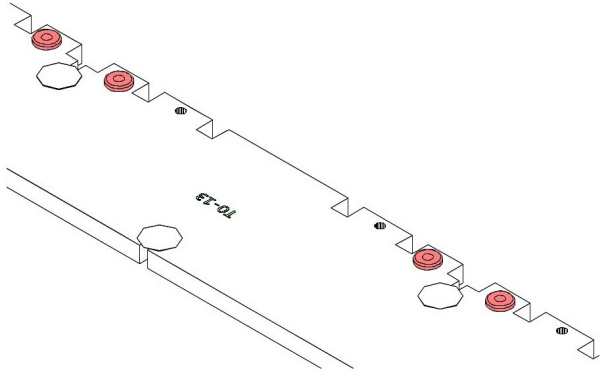




4

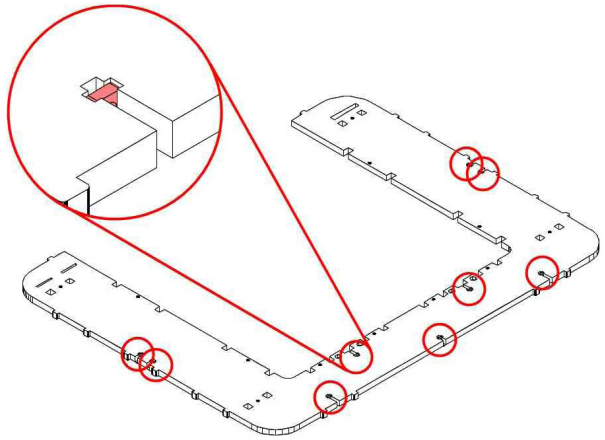
Take 4 M3 flange nuts and press them into the 4 cut outs as shown.



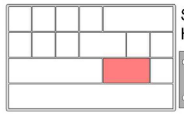


5

Flip the part over & place an M3 square nut into each of the 9 t-bolt cut outs as shown.

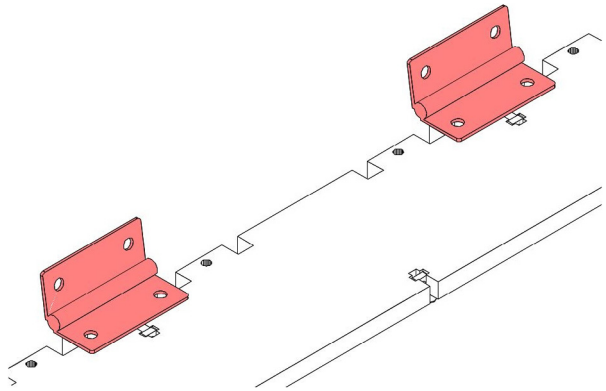


6

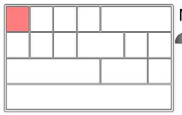


2pcs

Take the 2 stainless steel hinges from the mechanical kit & place them on TO-13 as shown.

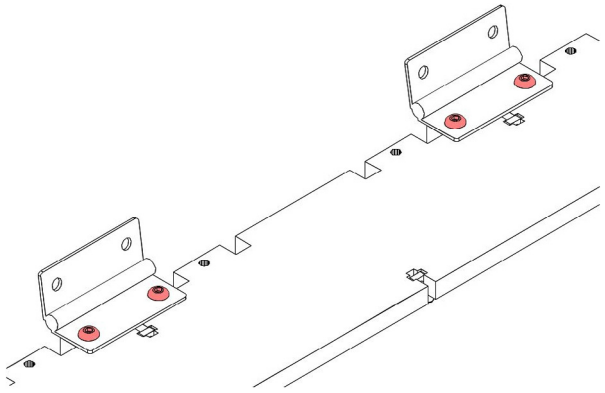


7

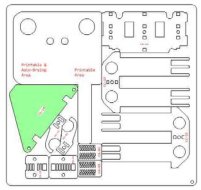


4pcs

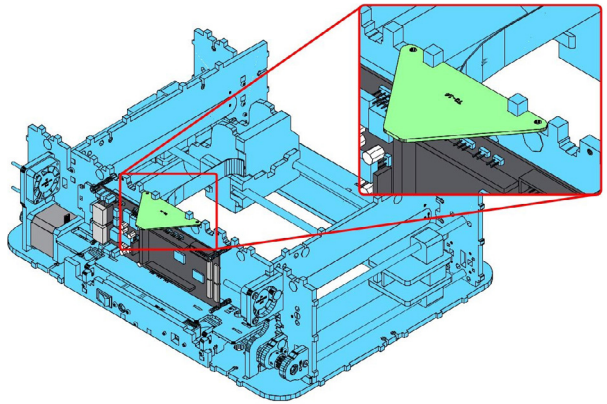
Take a set of 4 M3x10 bolts & bolt the hinges onto the part through the M3 flange nuts as shown.



8

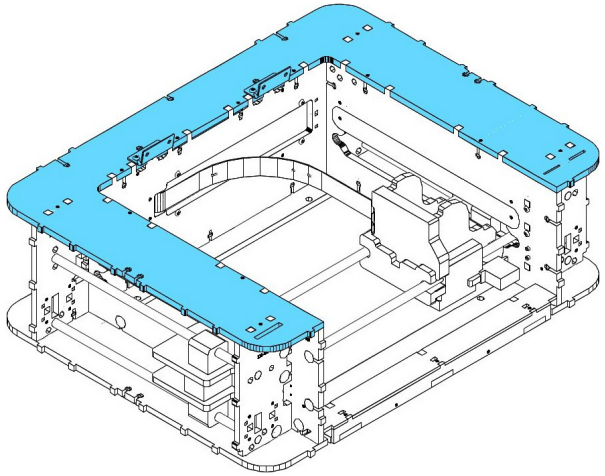


Find TO-14 from the 1.5mm plate & lay it in place in your printer as shown - it should sit against your control electronics for now.



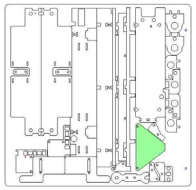
9

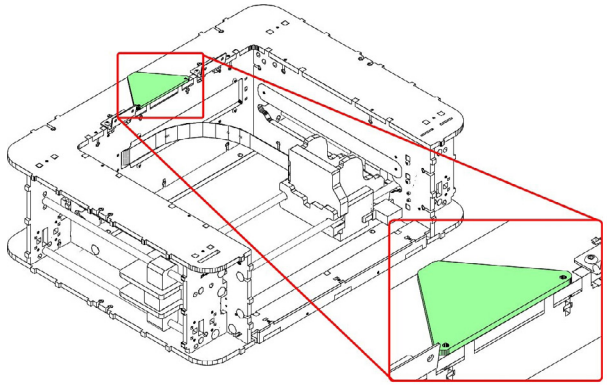
Now place the TO-13 assembly in place on the top of your printer as shown. There should be a large number of tabs that key into the part. MAKE SURE THAT YOU DO NOT PINCH ANY CABLES WHILE PLACING THIS PART.



10

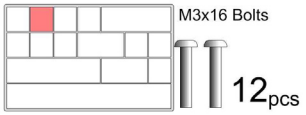
Take TO-15 and place it over the top as shown (place it labelled side down).

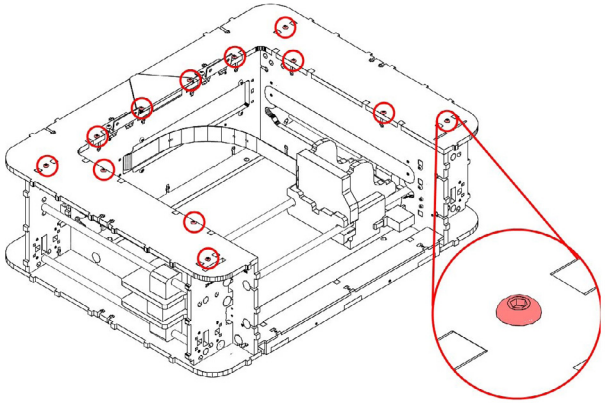




11

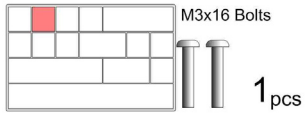
Now bolt TO-15 down through TO-13 & TO-14 using 2 M3x16 bolts DON'T TIGHTEN these 2 bolts too much, these 2 t-bolts are a bit fragile. Bolt the rest of TO-13 down with another 10 M3x16 bolts as shown.

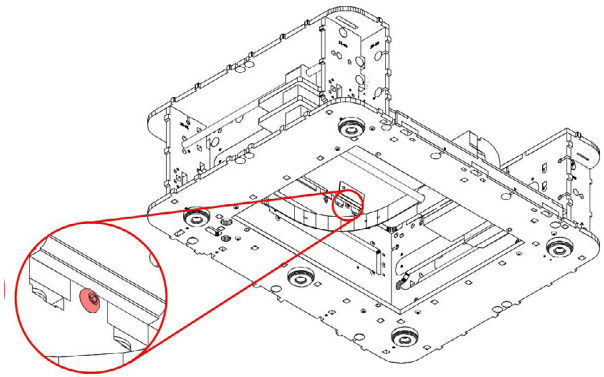




12

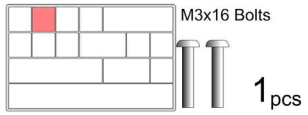
Now bolt the back plate into the top plate with a horizontal M3x16 bolt as shown here.

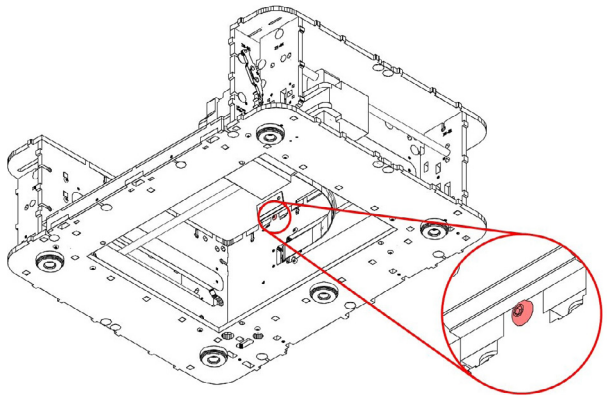




13

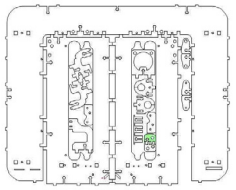
And the same again in this position.

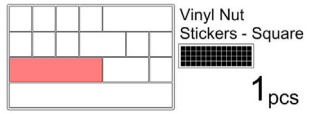


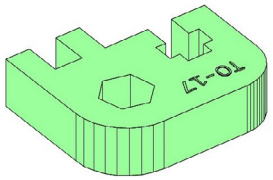


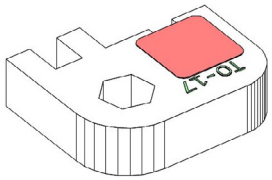
14

Find TO-17 & lay it labelled side up and then place a square nut sticker over the t-bolt cut out.



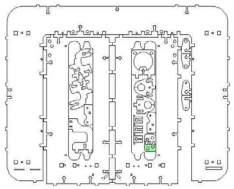


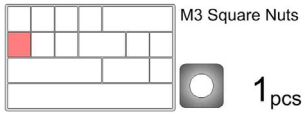


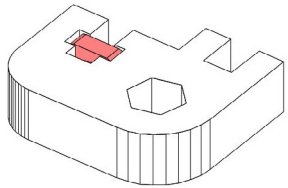


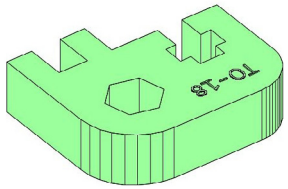
15

Flip the part over & place an M3 square nut into the t-bolt cut out. Find TO-18 & lay it labelled side up.



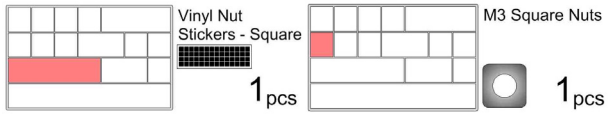


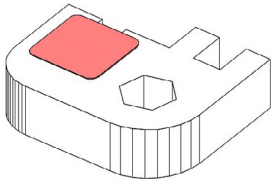


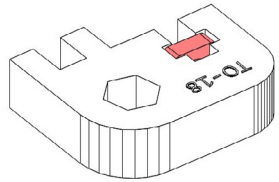


16

Place a square nut sticker over the t-bolt cut out. Flip the part over & place an M3 square nut into the t-bolt cut out.

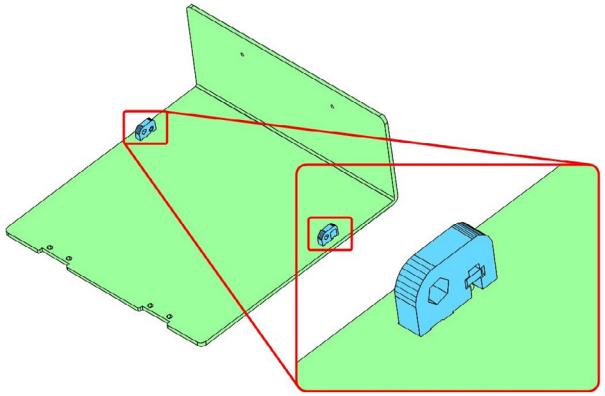






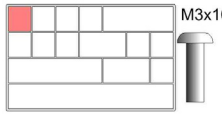
17

Find your Argentum lid (the big bent piece - technically TO-19 but not labelled) & peel the backing off. Take the TO-17 & TO-18 parts and key them into the lid as shown.

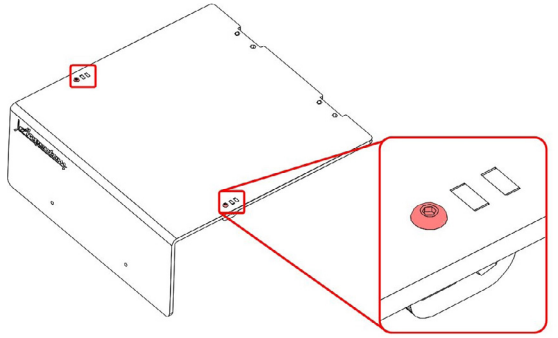


18

Use a pair of M3x10 bolts to bolt the 2 parts in place.

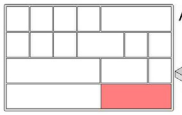


2pcs

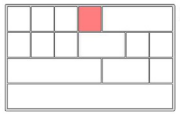


19

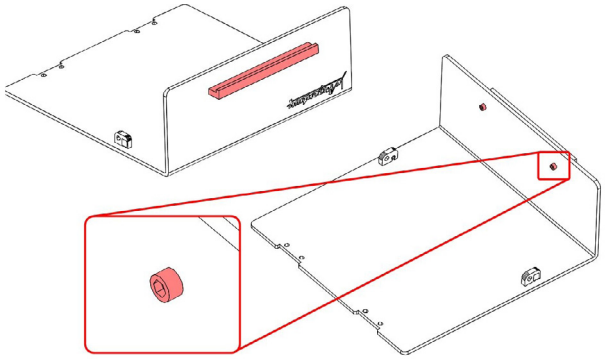
Now take the Aluminium handle & the 2 M4x8 bolts from the mechanical box & bolt the handle onto the lid as shown here.



1pcs

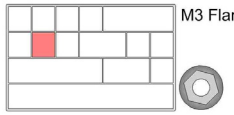


2pcs

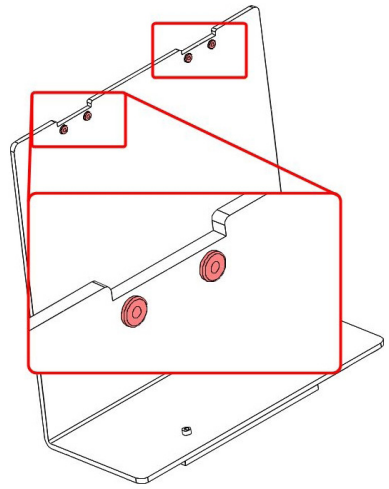


20

Press 4 M3 flange nuts into the bottom side of the lid as shown.

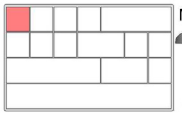


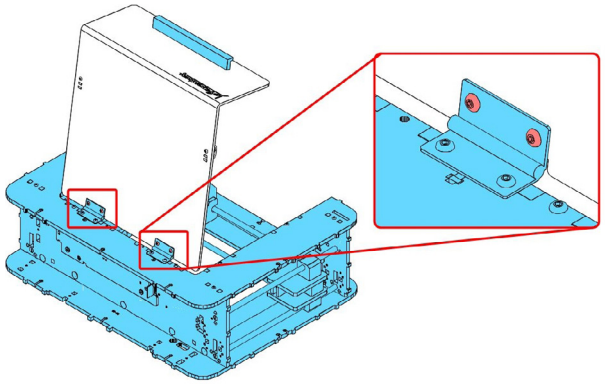
4pcs



21

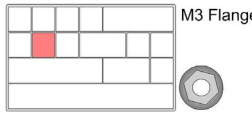
Sit the lid in place on your printer with the hinges seated on top. You can rest the lid on the gas strut hinges on either side. Use a set of 4 M3x10 bolts to bolt the hinges onto the lid using the flange nuts just placed.

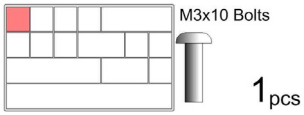


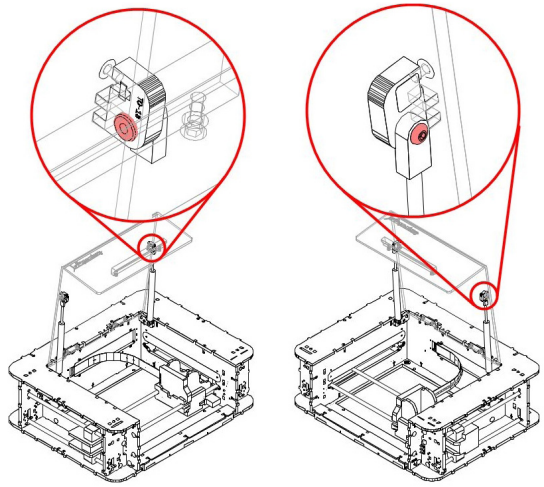


22

Now we will connect the right gas strut to the mount on the lid as shown. Use an M3 flange nut on the 'inside' face of TO-17/TO-18 and bolt the strut on using an M3x10 bolt. It may help to use a washer next to the bolt head too.

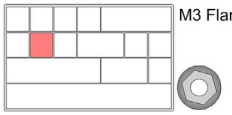


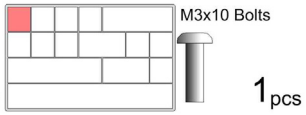


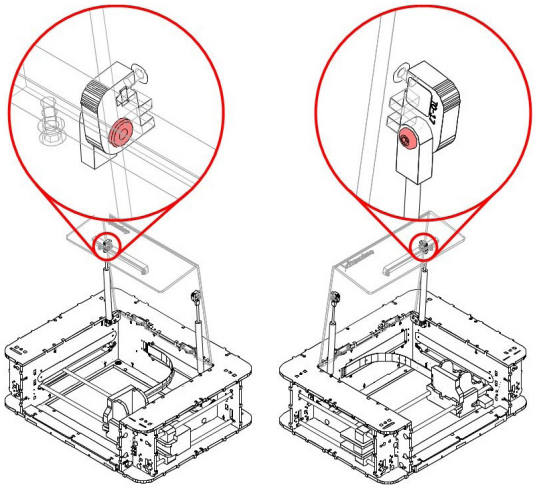


23

Repeat the previous step for the left side.

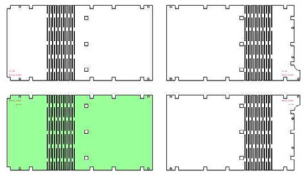


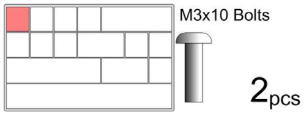


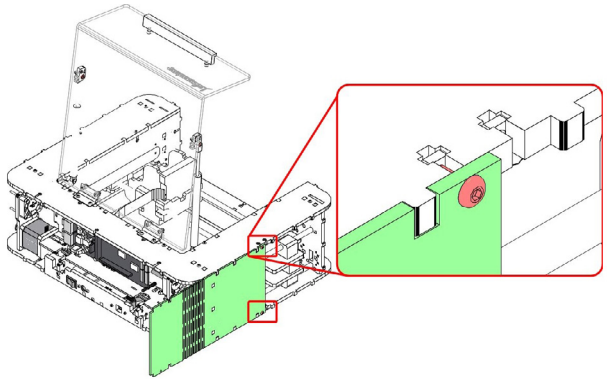


24

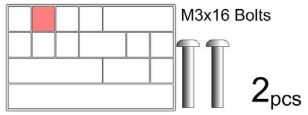
BE AS GENTLE AS POSSIBLE WITH THESE NEXT PARTS. The kerf bending is wider than standard to allow for air flow so the parts are quite strong but can still break. Place SH-03 into the back left section of your printer as shown. It may take a small amount of force to key the plate in place as shown. Now use a pair of M3x10 bolts to secure the points indicated.



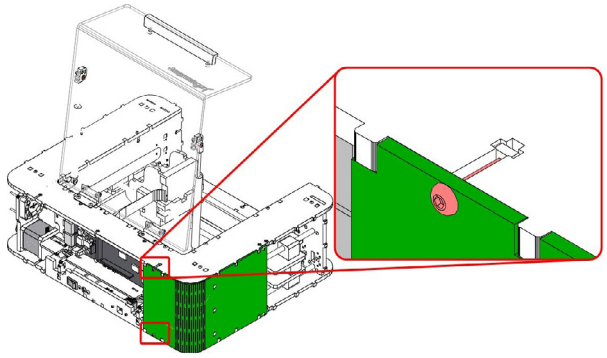




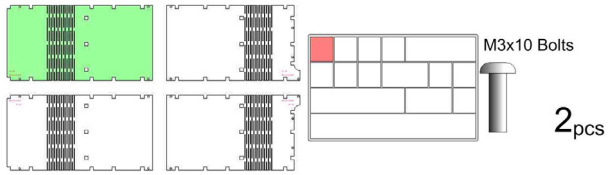
25



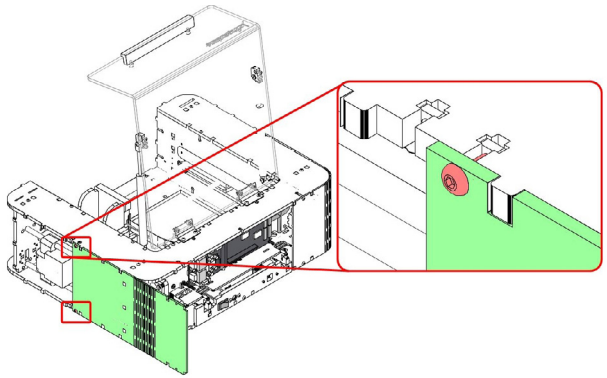
Now GENTLY fold the part back around to tooth into the back of the printer. Secure this section in place with a pair of M3x16 bolts where indicated.



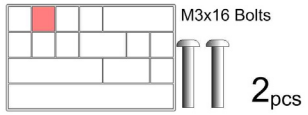
26



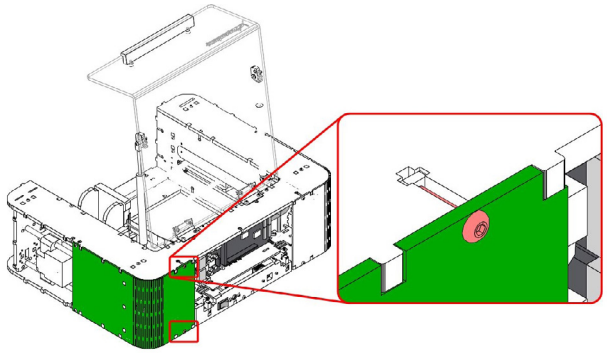
Place SH-04 into the back right section of your printer as shown. It may take a small amount of force to key the plate in place as shown. Now use a pair of M3x10 bolts to secure the points indicated.



27

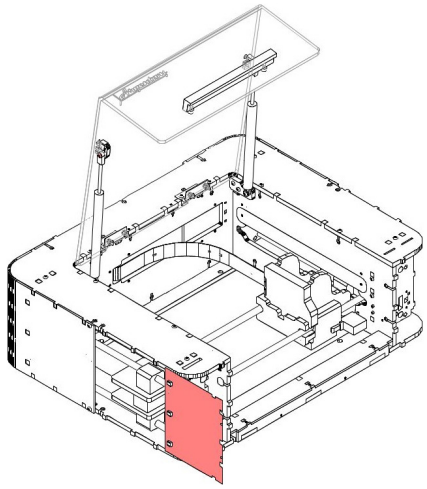


Now GENTLY fold the part back around to tooth into the back of the printer. Secure this section in place with a pair of M3x16 bolts where indicated.



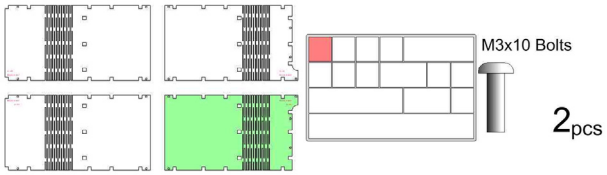
28

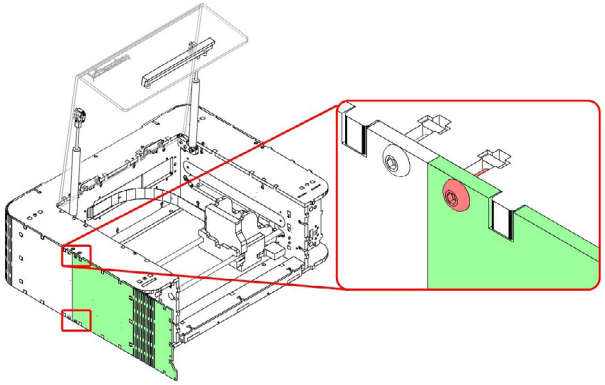
Inside your Miscellaneous box you will find a folded sheet of perforated paper. Tear one of the sections out - this will be used to diffuse the light from the RGB LED strips. Place the piece as shown.



29

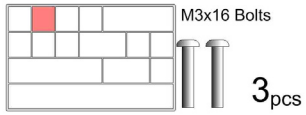
Place SH-02 into the front left section of your printer over the top of the paper. It may take a small amount of force to key the plate in place as shown. Now use a pair of M3x10 bolts to secure the points indicated.

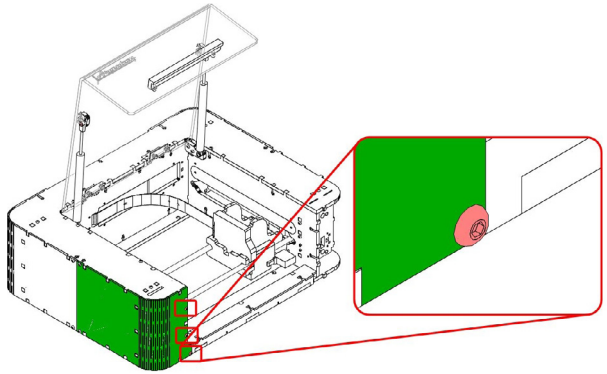




30

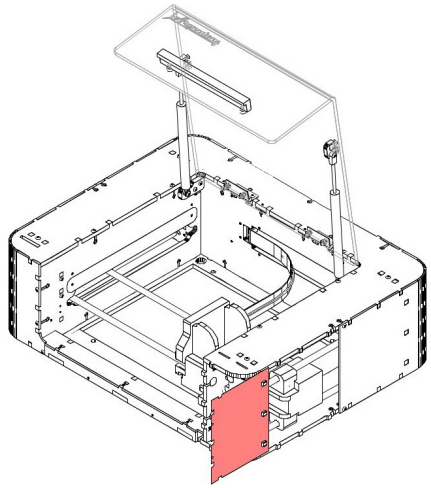
Now GENTLY fold the part back around to tooth into the front of the printer. Secure this section in place with a set of 3 M3x16 bolts where indicated.





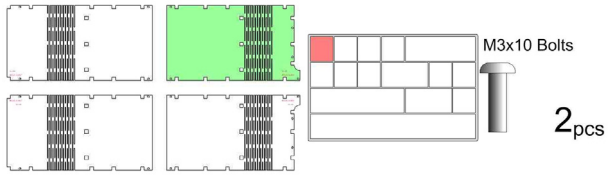
31

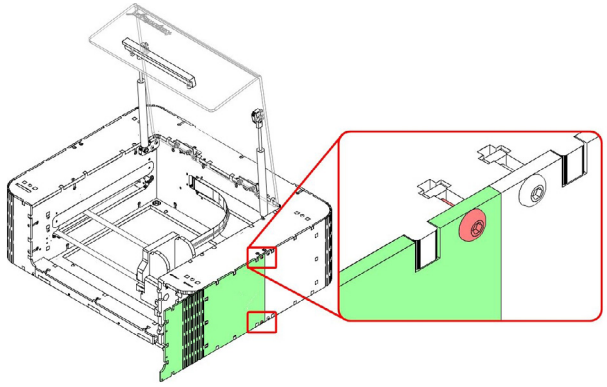
Tear out another diffuser from the sheet & place it as shown.



32

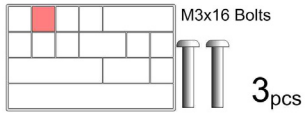
Place SH-01 into the front right section of your printer over the top of the paper. It may take a small amount of force to key the plate in place as shown. Now use a pair of M3x10 bolts to secure the points indicated.

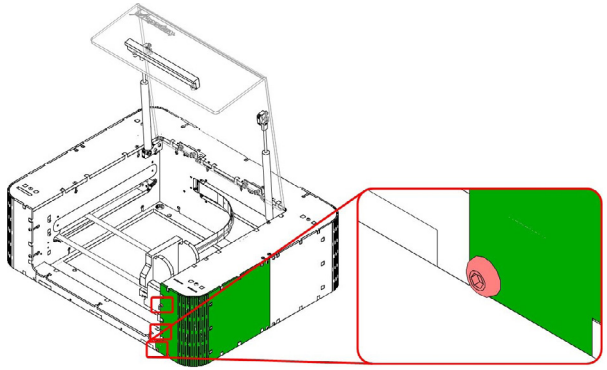




33

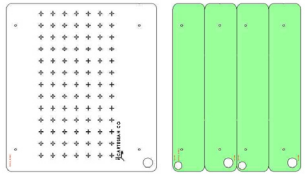
Now GENTLY fold the part back around to tooth into the front of the printer. Secure this section in place with a set of 3 M3x16 bolts where indicated.

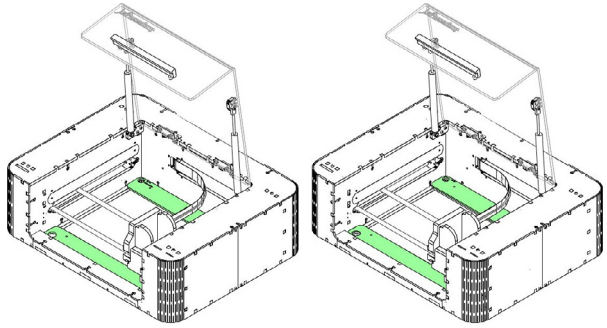




34

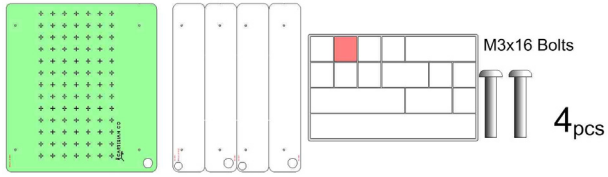
Find the 4 long thin pieces shown (SH-05, SH-06, SH-07 & SH-08). These will be used to raise the height of the bottom plate. Place SH-05 & SH-07 at the back of the printer so that the label is face up & readable from the front of the printer as shown. Do the same with SH-06 & SH-08 in the bottom of the printer as shown.

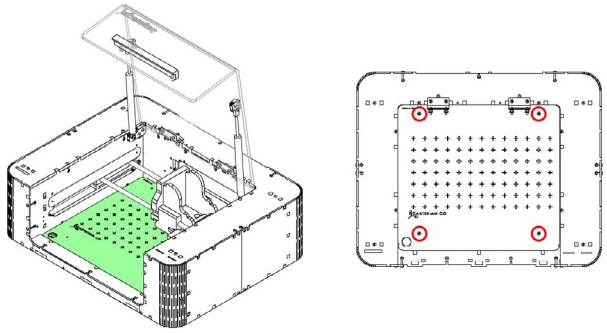




35

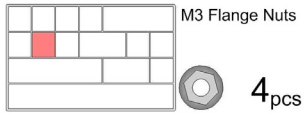
Now we will place the base plate (it will be sprayed Silver). Be careful peeling this piece as some of the paint will flake off the covering. First move your gantry to the back of the printer, then slide the part in underneath so that you can read the Cartesian Co logo from the front. Now push an M3x16 bolt through each of the 4 holes in the base plate (indicated on the right).

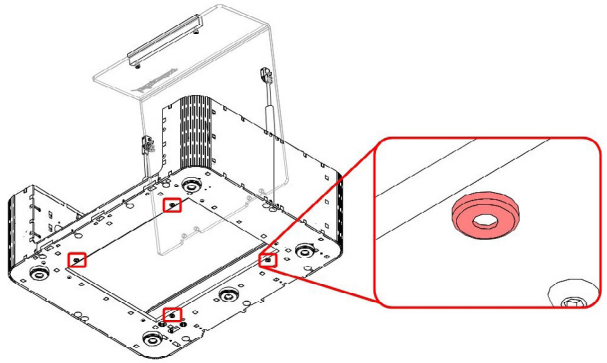




36

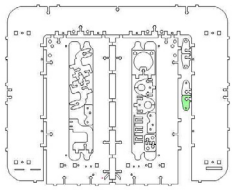
Thread each of the 4 bolts onto a flange nut pushed into the bottom of the printer in the positions indicated.

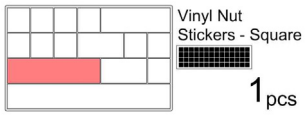


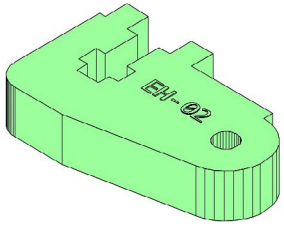


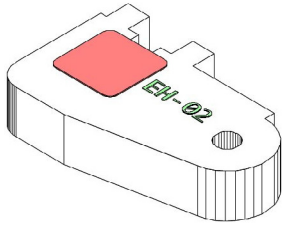
37

Take EH-02 & place a square nut sticker over the t-bolt cut out on the labelled side.



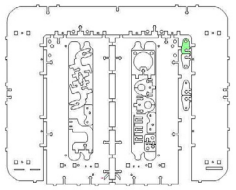


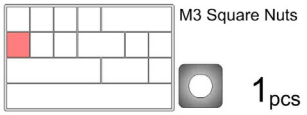


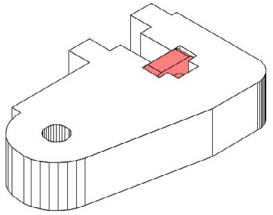


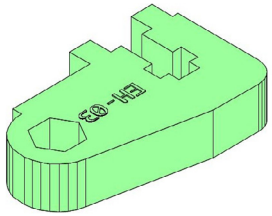
38

Flip the part over & insert an M3 square nut. Find EH-03 & lay it labelled side up.



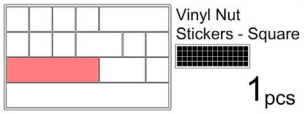


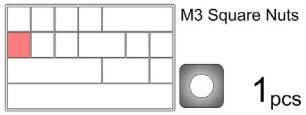


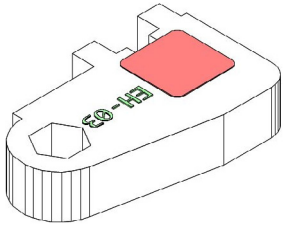


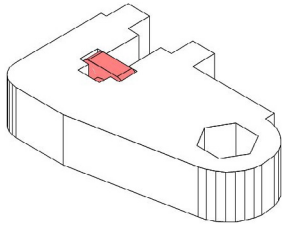
39

Cover the cut out with a square nut sticker & then push an M3 square nut in from the other side.



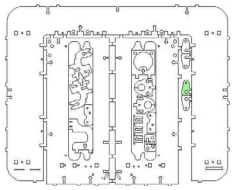


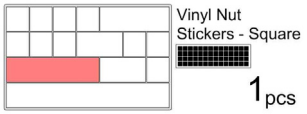


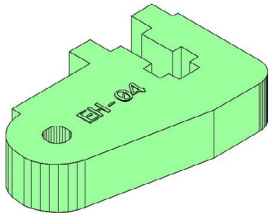


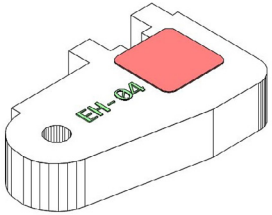
40

Take EH-04 & place a square nut sticker over the t-bolt cut out on the labelled side.



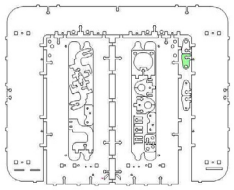


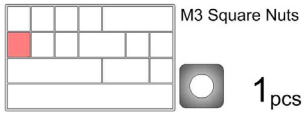


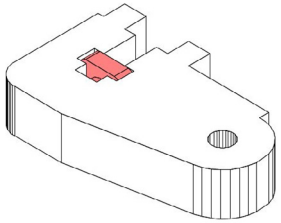


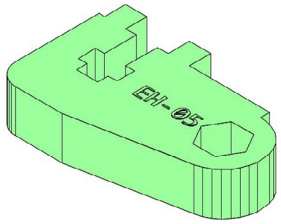
41

Flip the part over & insert an M3 square nut. Find EH-05 & lay it labelled side up.



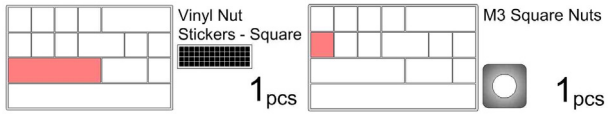


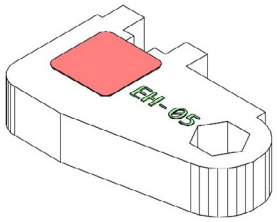


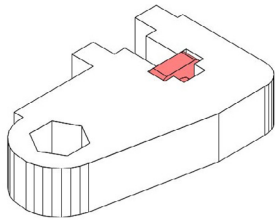


42

Cover the cut out with a square nut sticker & then push an M3 square nut in from the other side.

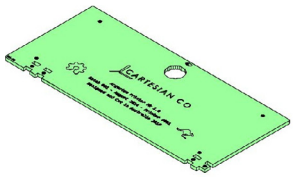


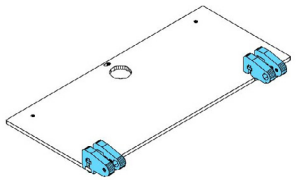




43

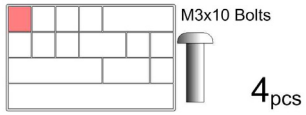
Find EH-01 (the silver back plate - again be careful peeling it). Key the 4 parts from the previous steps into the unlabelled side of EH-01. Make sure EH-02 & EH-04 are on the OUTSIDE while EH-03 & EH-05 are on the INSIDE.

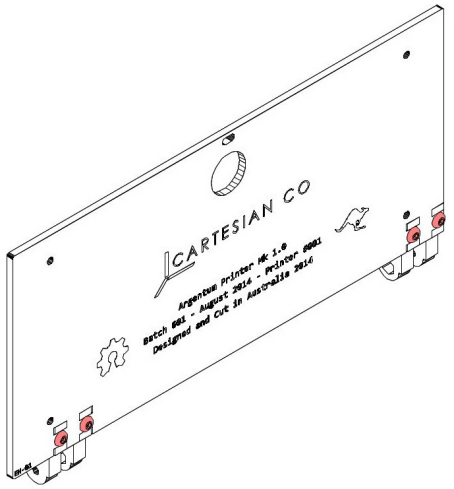




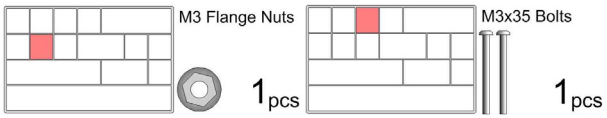
44

Bolt the parts in with a set of 4 M3x10 bolts as shown.

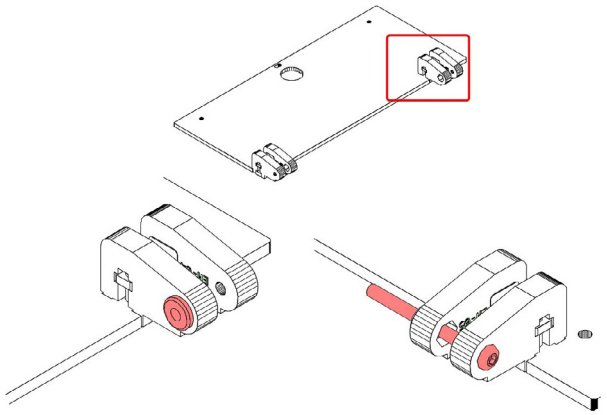




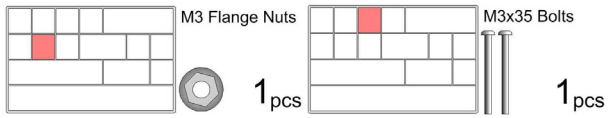
45



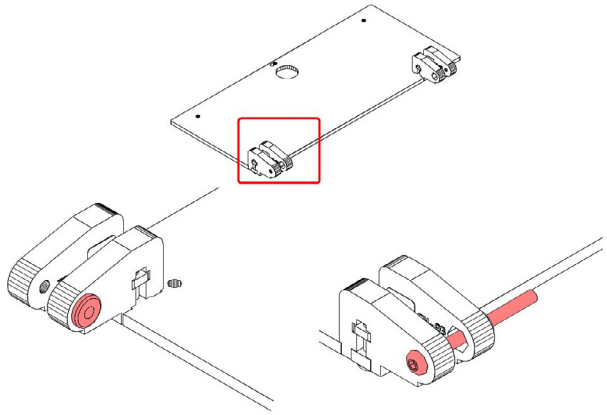
Take an M3 flange nut and press it into one of the tab parts as shown. Then HAND THREAD an M3x35 bolt in place as shown. DO NOT TIGHTEN this bolt very much - it is purely acting as a pivot for the back plate.



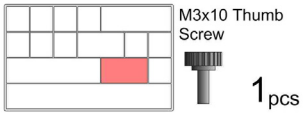
46



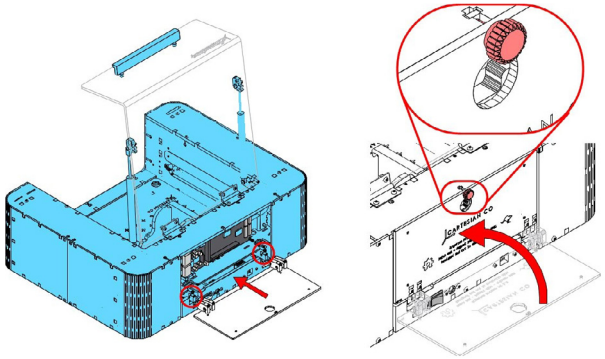
Repeat the last step on this side. Be careful with the outside part on this side as the mounting point can be a bit fragile.



47

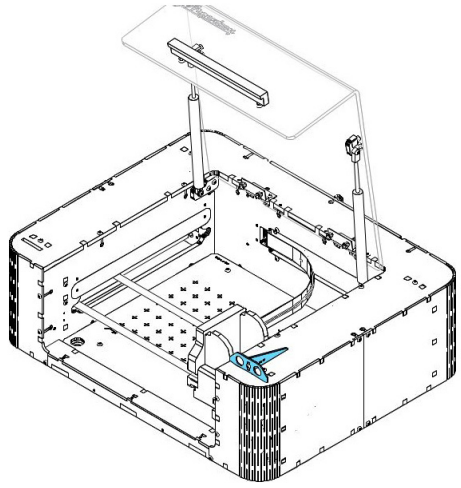


Slide this back plate into the rear of your printer as shown, the M3x35 bolts will slide into a cut out in the plates & can then slide downward. Then close the back plate up & secure the top in place with the M3x10 thumb screw from your mechanical kit as shown.



48

Finally take your pogo pin protector and slide it into the cut out in the front right of your printer as shown here. OH MY WORD IT'S ALL FINISHED, go take a shower to clean off the excess awesome seeping from your skin & then post a photo to the Cartesian Co Forum!!!



END

Well done, you.