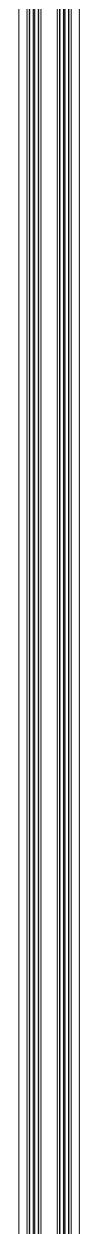
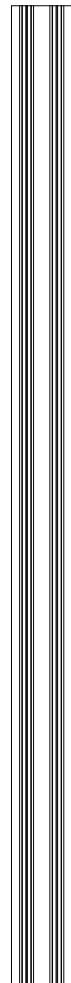


XY[Z]

# STRUCTURE ASSEMBLY



Profil  
X-Axis  
20x40



Profile  
Y-Axis  
20x40

Pulley  
GT2 6 mm  
16 dents  
**x2**

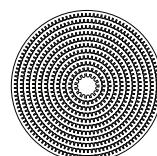
Screw  
M5x60  
**x4**

Screw  
M5x30  
**x4**

Screw  
M3x20  
**x9**

Nema 17  
**x9**

Belt GT2 6mm  
5m



Nut  
m5  
**x8**

Washer  
M5  
**x24**

V-slotwheel  
**x8**

T-nuts  
**x8**

Screw  
M3x10  
**x20**

Nut  
m3  
**x9**

Washer  
M3  
**x14**

Inner pulley  
GT2 6mm  
**x5**



Screw  
M5x30  
**x4**

Screw  
M5x60  
**x4**

Screw  
M3x20  
**x9**

Nema 17  
**x9**

Belt GT2 6mm  
5m

### PARTS TO 3D PRINT OR LASER CUT



Plate  
Nema 17  
**x2**

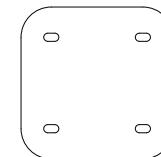


Plate  
Y-Axis

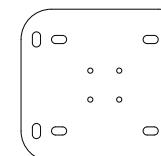


Plate  
X-Axis

### PARTS TO 3D PRINT



Spacer  
8mm  
**x8**



Spacer  
16mm  
**x4**

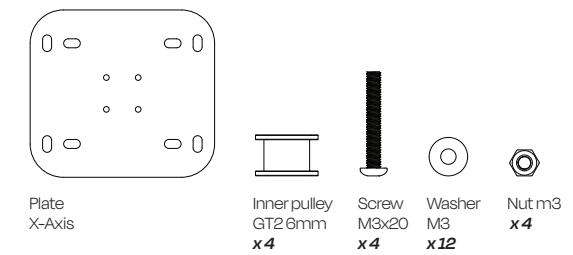
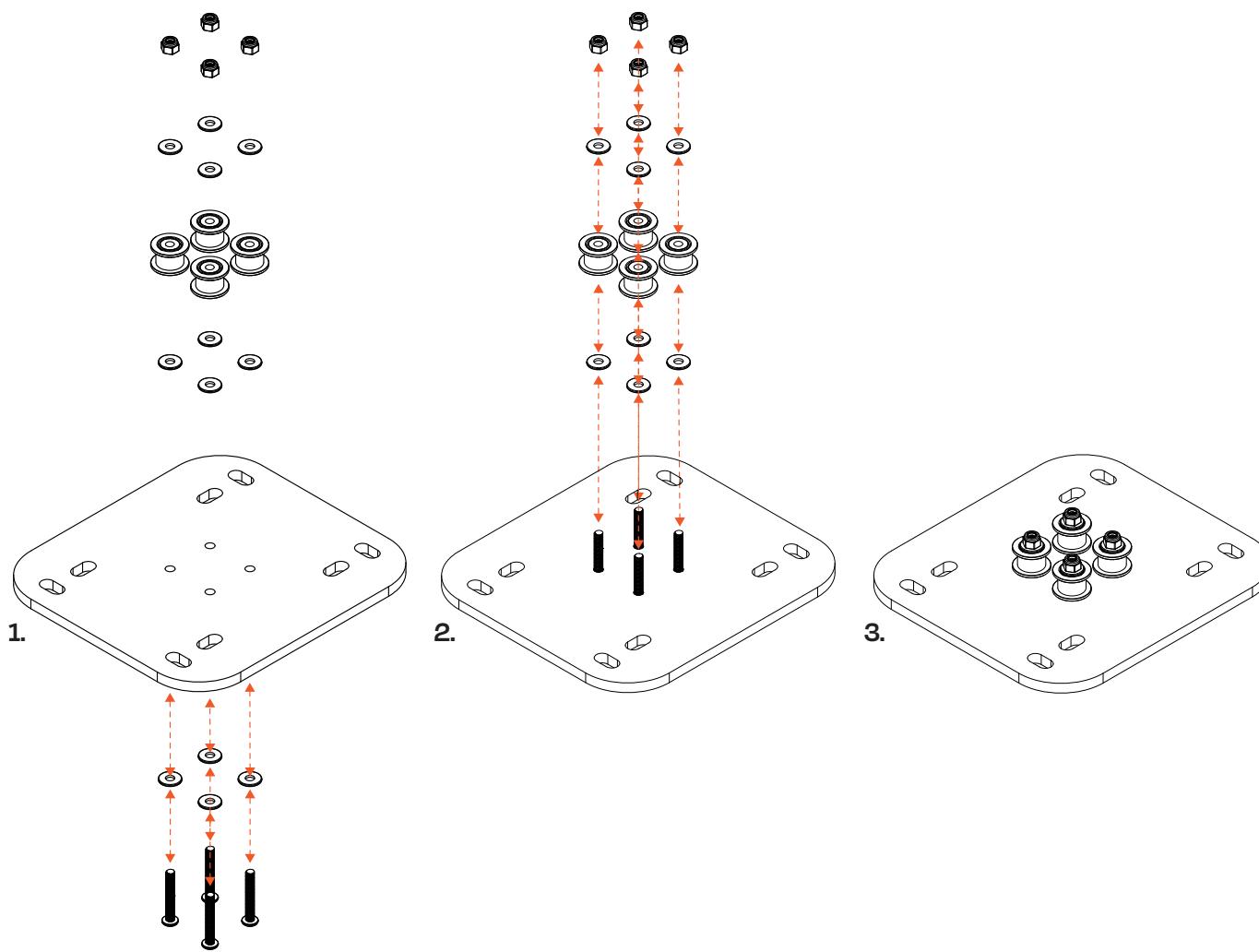


Belt  
tensioner



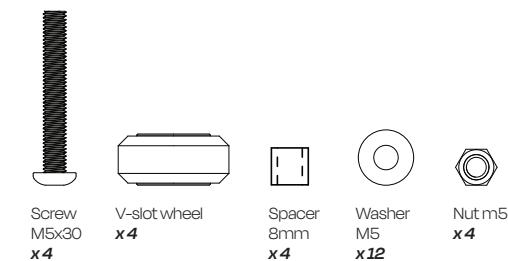
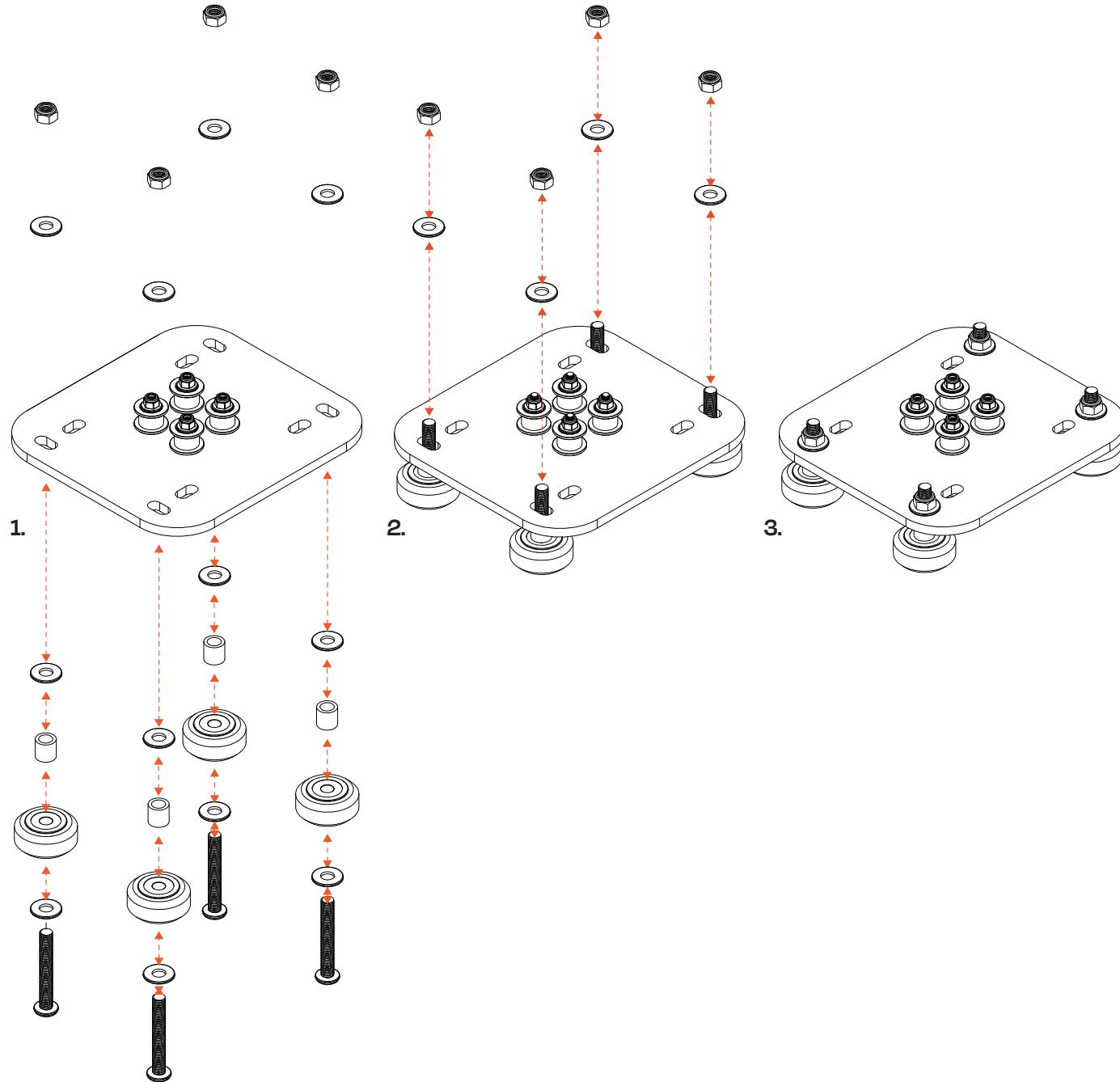
Plate  
Inner pulley

# 1.



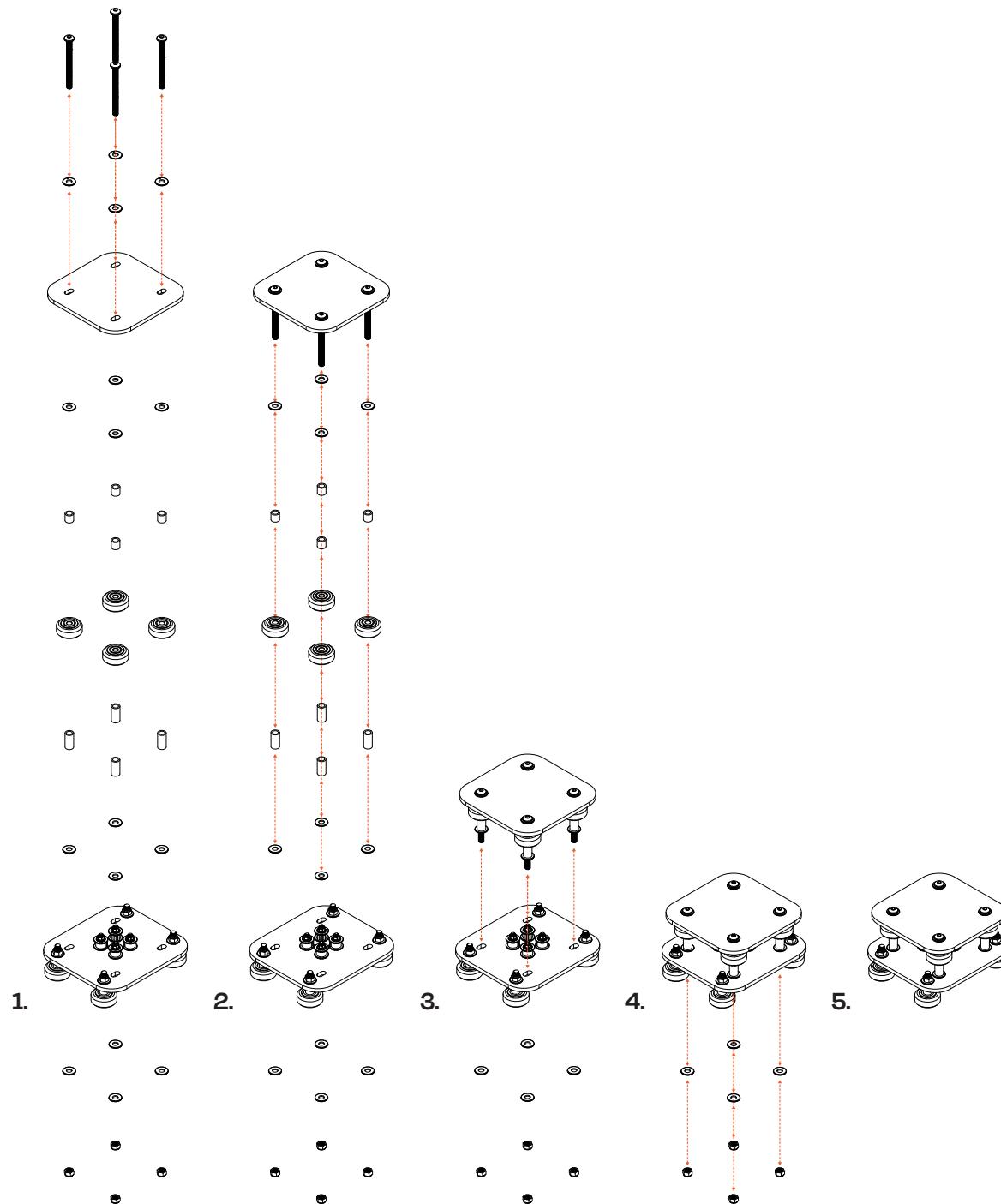
1. First, slide the washers onto the screws, then insert the assembly into the plate.
2. Next, thread washers onto the protruding screws, followed by the pulleys, and finally washers. Then tighten with the nuts.
3. The idler pulleys are now in place.

# 2.

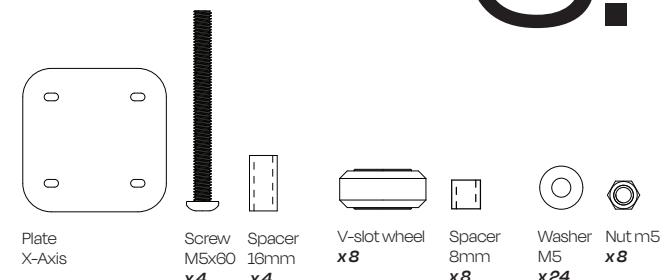


1. First, thread a washer, a V-SLOT wheel, a spacer, and finally another washer onto each screw. Then insert the complete assembly into the plate.
2. Next, thread a washer onto the protruding screws and then tighten with the corresponding nut.
3. The X-axis plate is now ready for use.

# 3.

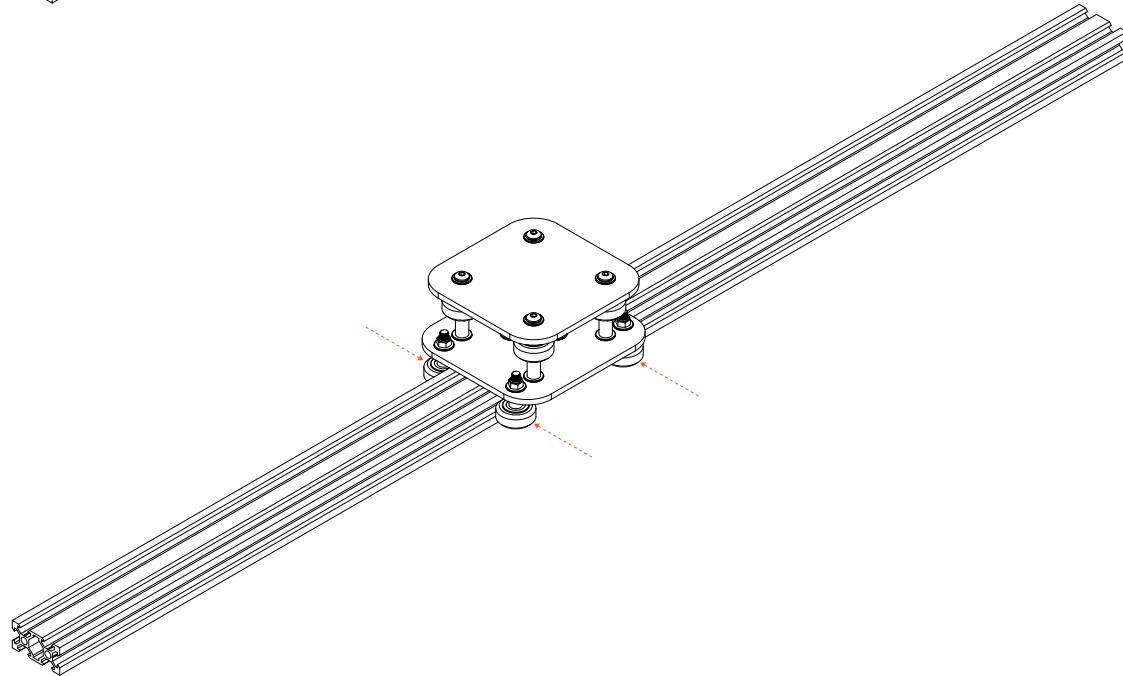


1. First, insert the screws into the pre-drilled holes of the plate.
2. Next, on each protruding screw, thread on in succession a washer, an 8mm spacer, a V-SLOT wheel, a 16mm spacer, and a final washer.
3. Then, insert the entire assembled assembly into the X-axis plate.
4. Finally, on the screws protruding from the plate, thread on a washer and then tighten firmly with the corresponding lock nut.
5. The carriage is now assembled and ready to use.

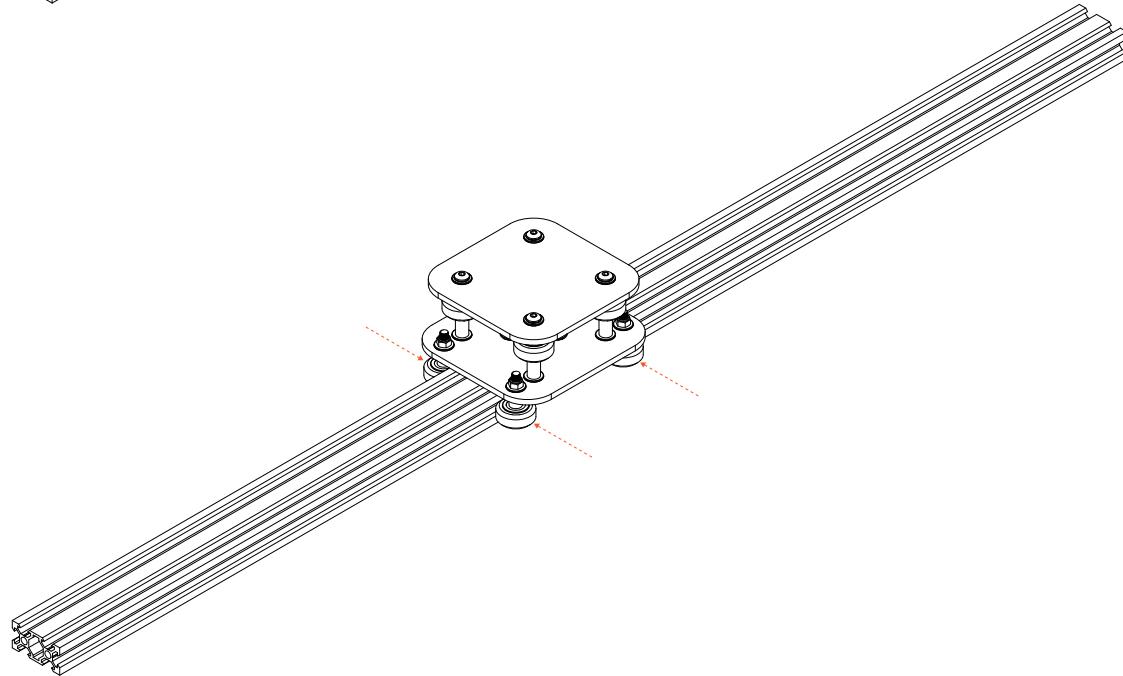


# 4.

1.



2.

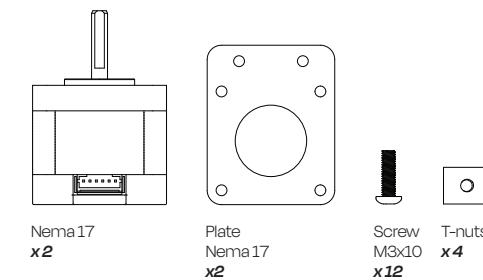
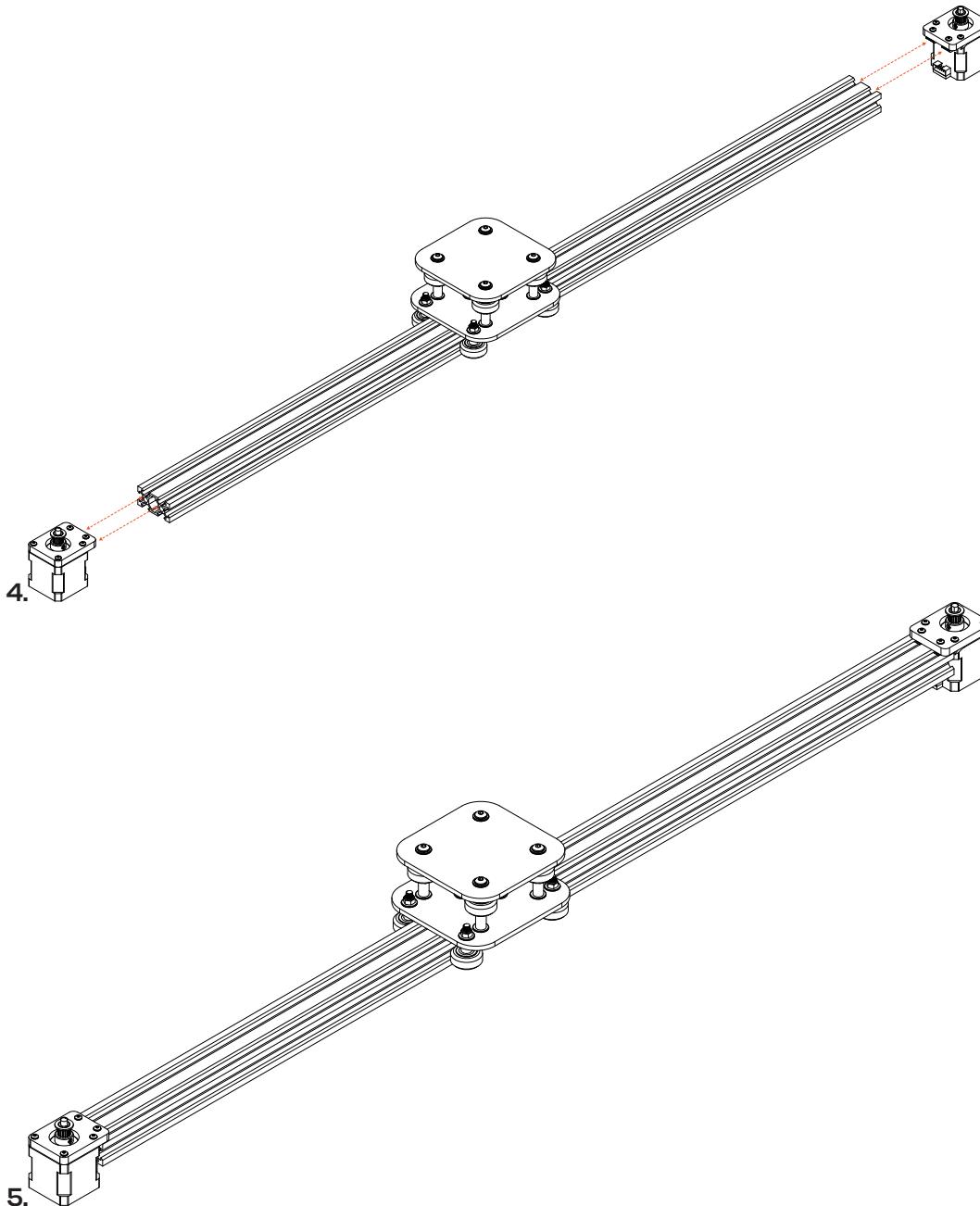
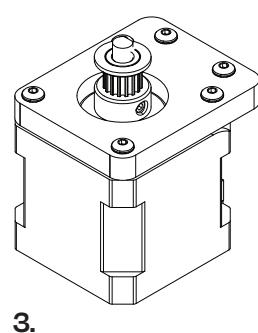
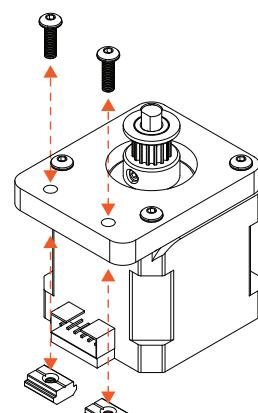
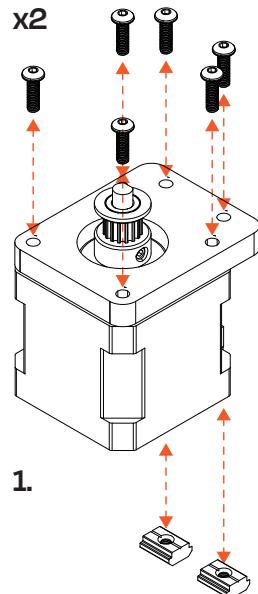


1. First, slide the profile onto the V-slot wheels of the carriage.
2. Next, adjust the position of the V-slot wheels to bring the profile closer to the carriage, then tighten the fasteners securely to ensure optimal hold.

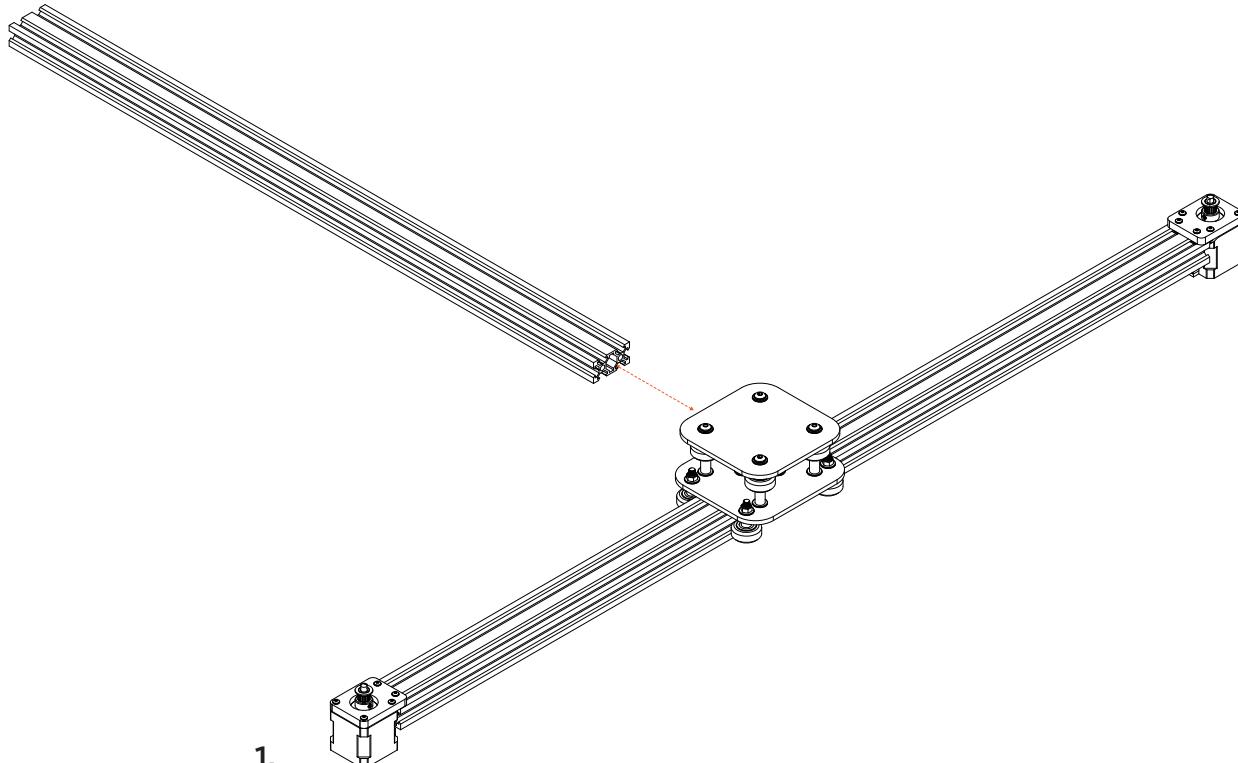
Profile  
X-Axis  
20x40



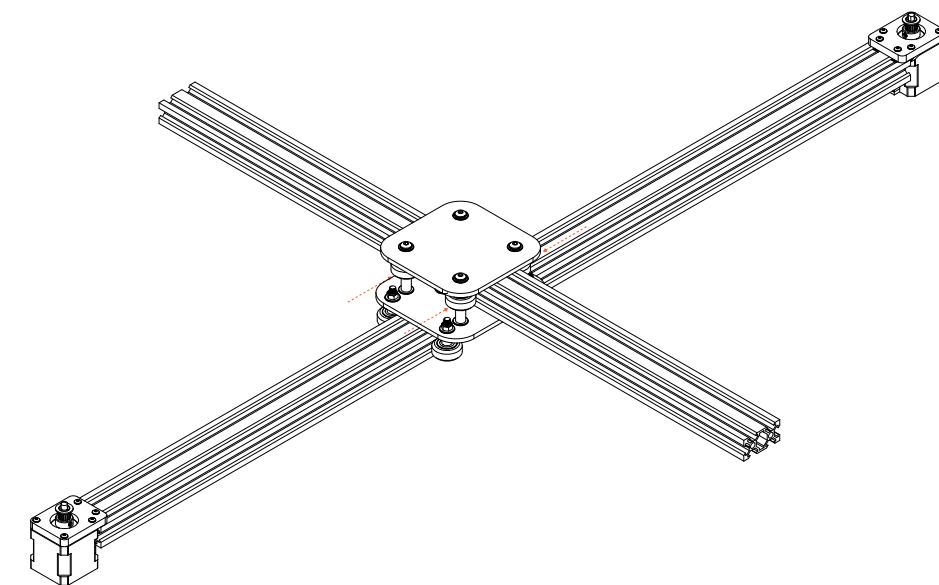
# 5.



1. First, position the plate on the Nema 17 motor, aligning the mounting holes. Then secure the plate using the provided screws, tightening them firmly.
2. Next, insert two screws into the remaining holes in the plate, and then thread on the corresponding T-nuts. Lightly tighten the T-nuts to hold the assembly in place.
3. The Nema 17 motors are now attached to the plates.
4. Then, position the two motor blocks at each end of the profile. Tighten the T-nuts firmly to secure the blocks to the profile.
5. The X-axis is now ready.



1.



2.

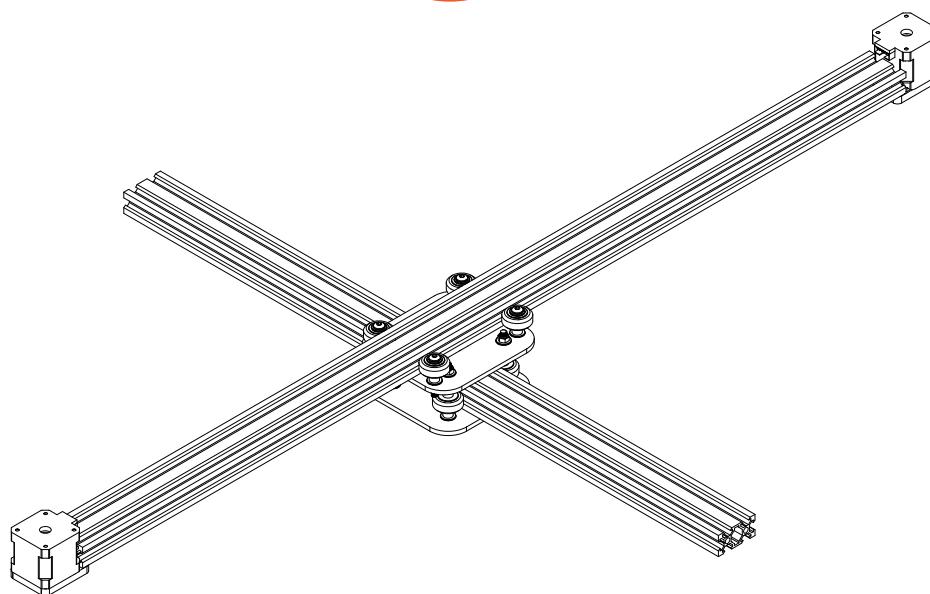
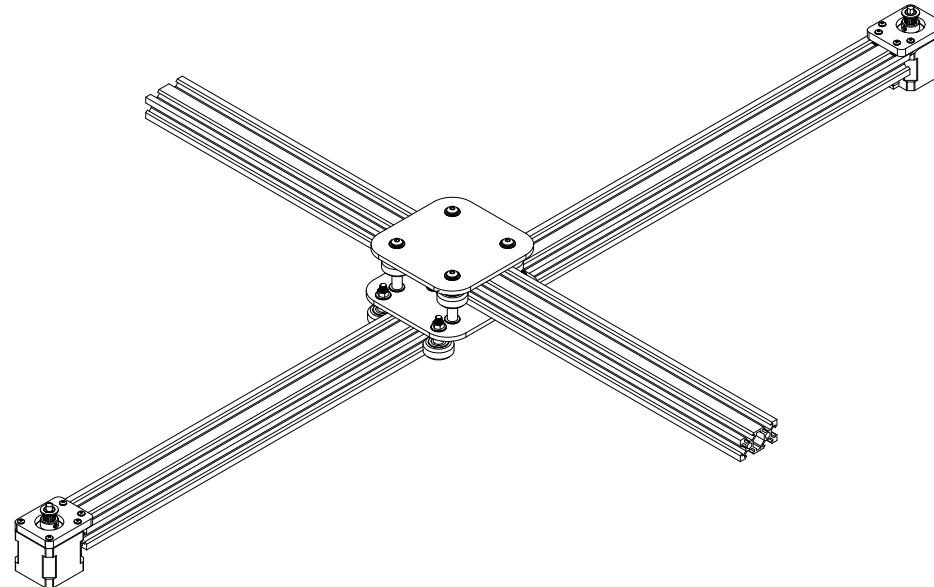
6.



Profile  
Y-Axis  
20x40

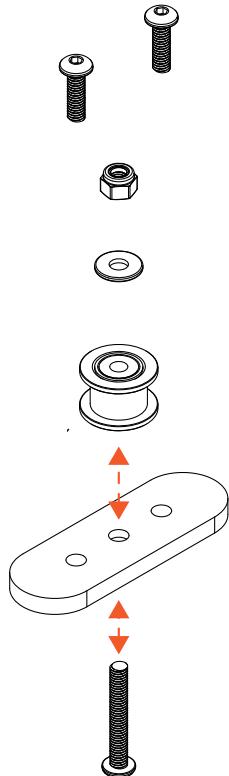
1. First, slide the profile onto the V-slot wheels of the carriage.
2. Next, adjust the position of the V-slot wheels to bring the profile closer to the carriage, then tighten the fasteners securely to ensure optimal hold.

7.

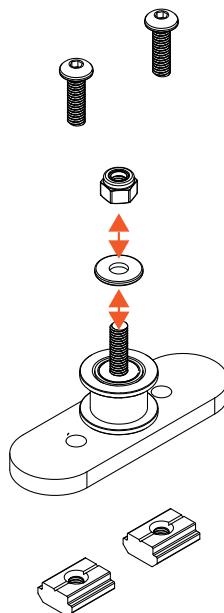


Reverse the structure.

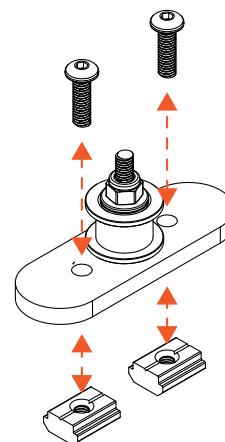
# 8.



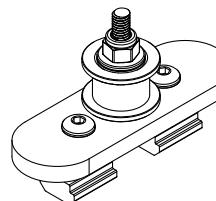
1.



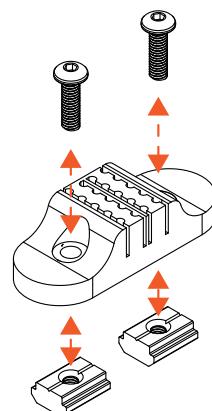
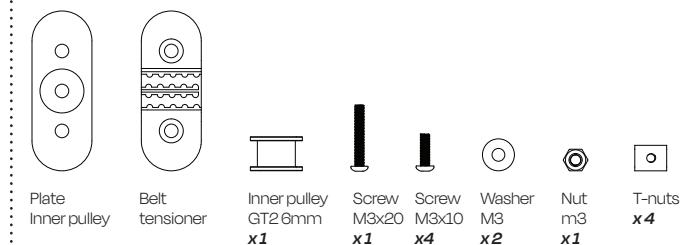
2.



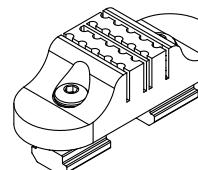
3.



4.



3.

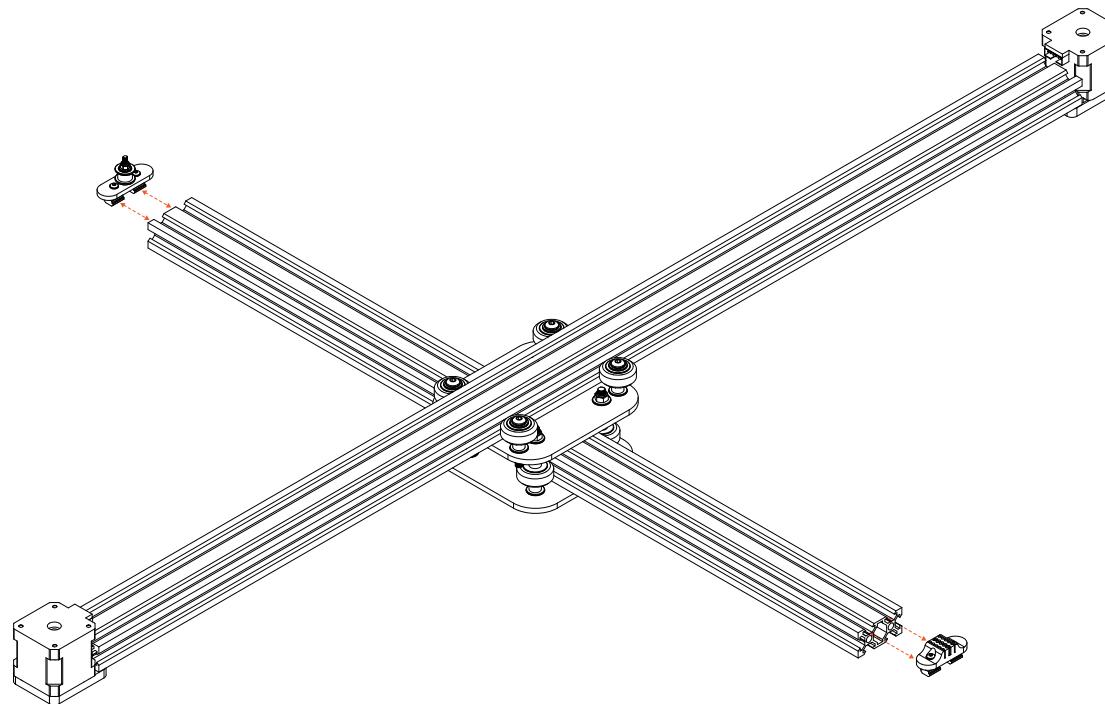


4.

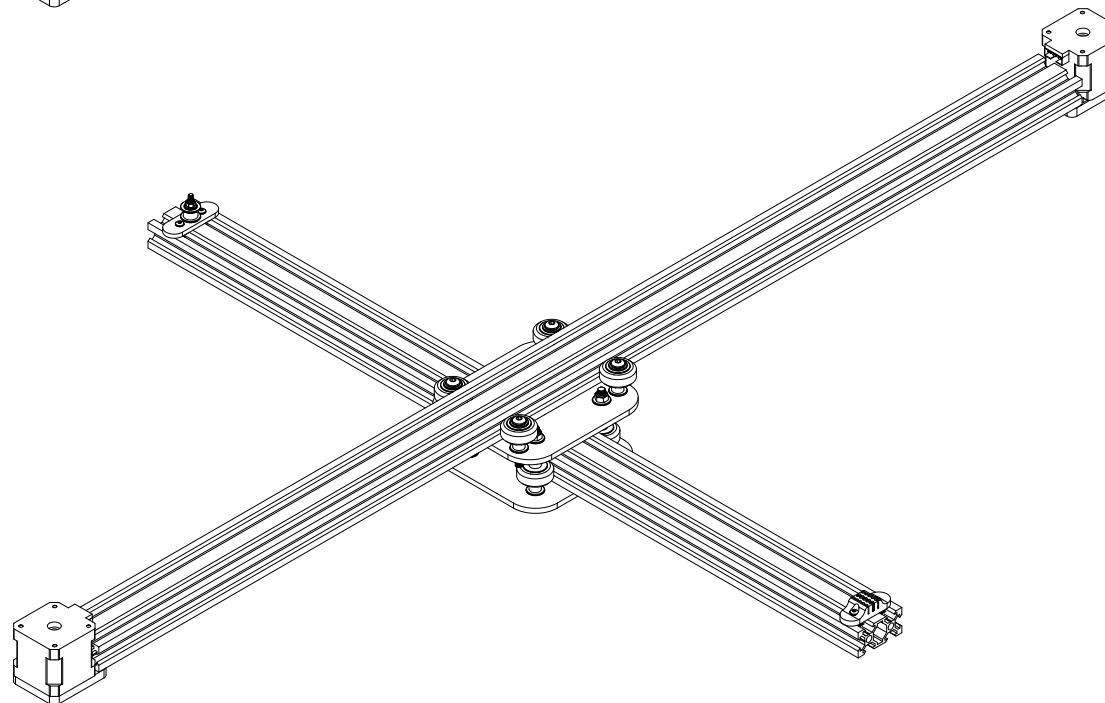
1. Insert the screw into the plate, and then slide the idler pulley onto the protruding threaded section.
2. Next, thread a washer onto the protruding threaded section, and then tighten firmly with a nut.
3. Then, insert two additional screws into the remaining holes in the plate, and then thread on the corresponding T-nuts. Lightly tighten the T-nuts to hold the assembly in place.
4. The Belt tensioner and idler system is now assembled. Finally, tighten the T-nuts securely to ensure optimal hold.

# 9.

1.

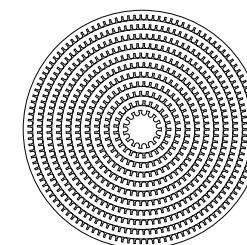
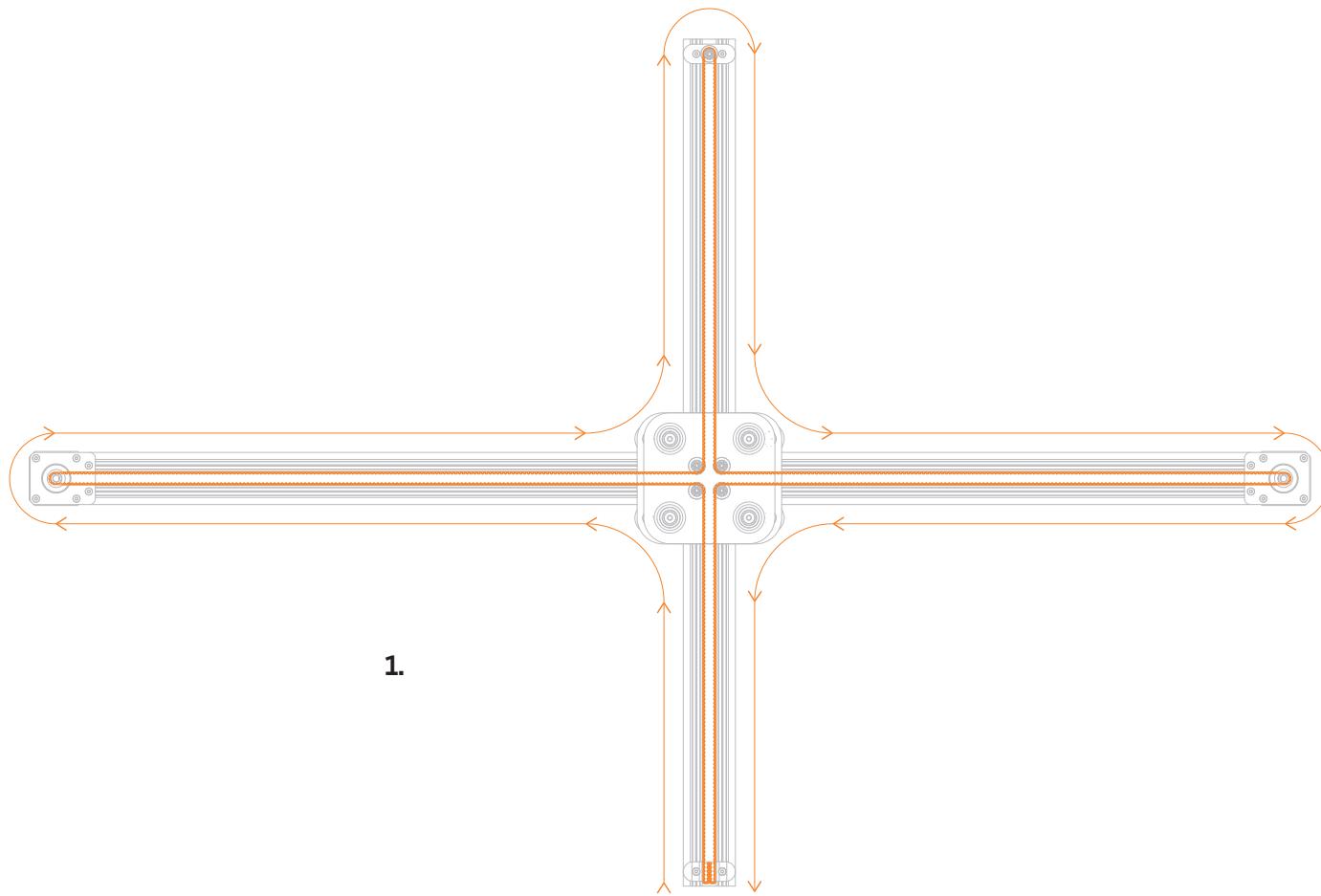


2.



1. Slide the two components to each end of the profile and fully tighten the T-nuts. First, position the two components at each end. Firmly tighten the T-nuts to secure the components to the profile.
2. The Y-axis is now assembled.

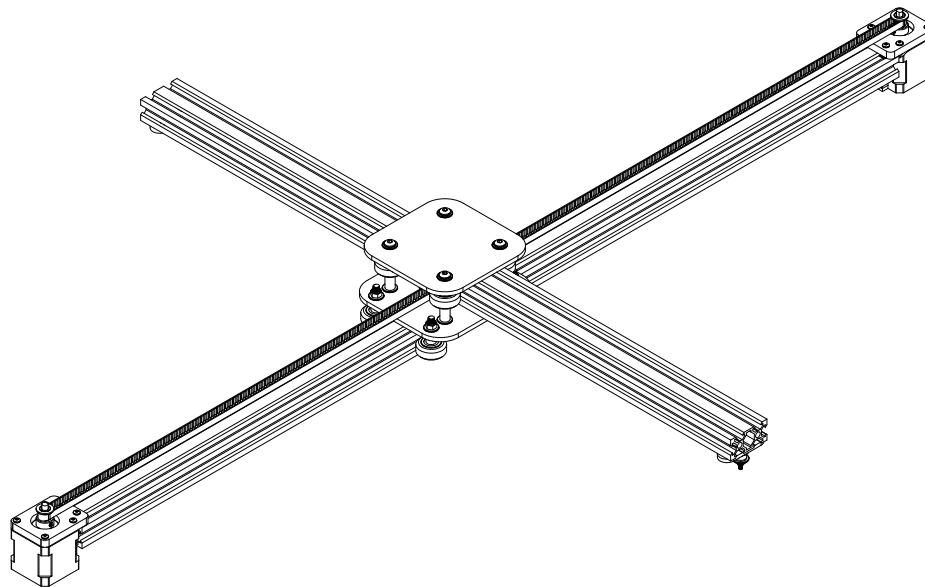
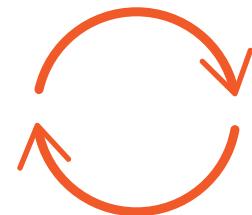
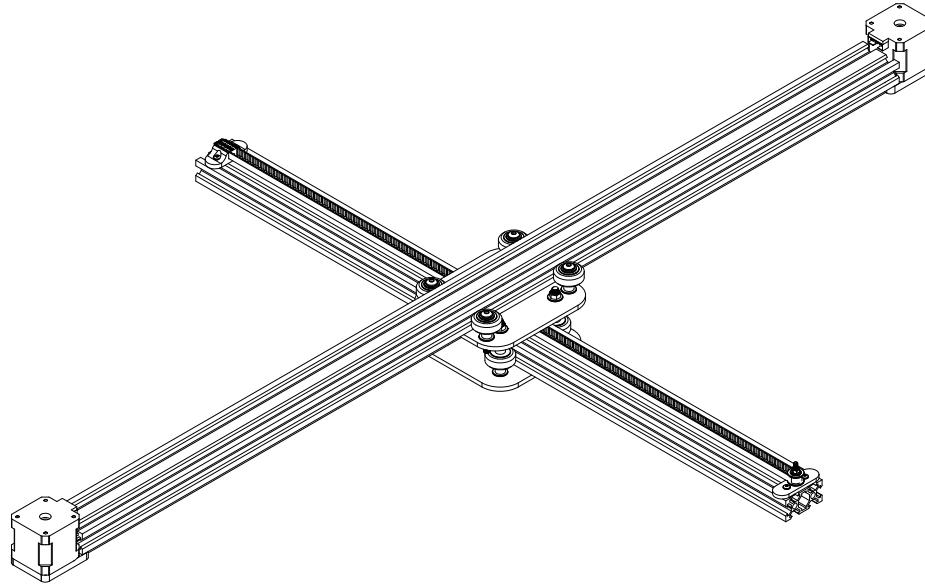
# 10.



Belt GT2 6mm 5m

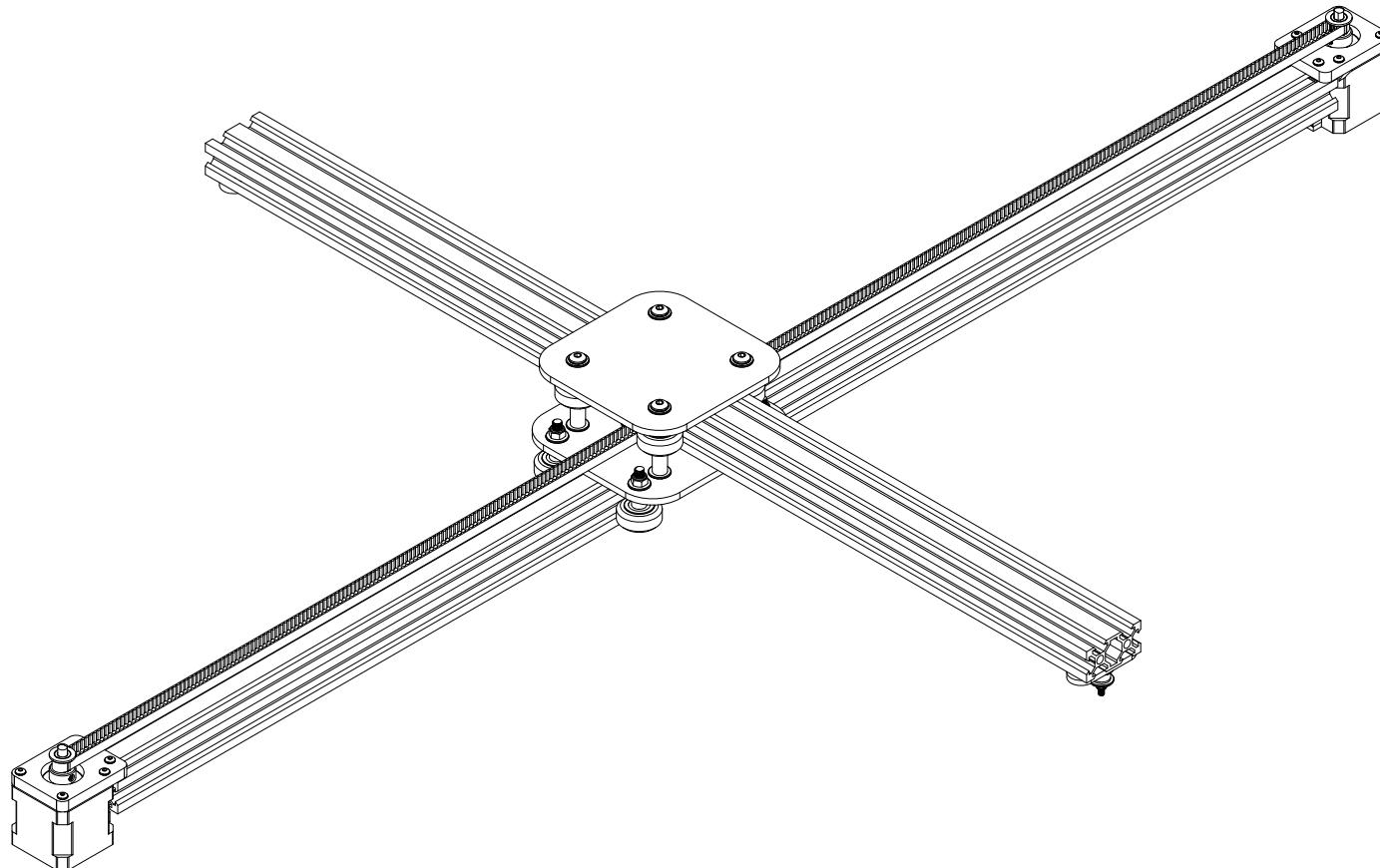
1. First, install the belt according to the provided diagram. Ensure that the belt is correctly wrapped around the pulleys.
2. Next, adjust the belt tension by moving the tensioner in the appropriate direction (as indicated on the diagram). Use a suitable wrench to tighten the tensioner once optimal tension is achieved. The tension should be sufficient to prevent belt slippage but not excessive enough to damage the bearings.

**11.**



Reverse the structure.

12.



The mechanical structure is ready.

# CONTROLLER ASSEMBLY



Screw  
M3x20  
**x4**



Nut  
M3  
**x4**



Heatsinks  
**x2**



Driver  
A4988  
**x2**



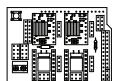
Fan  
30x30  
5v



Jumper  
**x6**



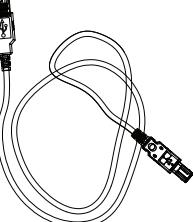
Servomotor  
9g



CNC Shield V3



DC 12V  
Adapter

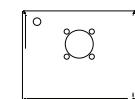


USB-B cable

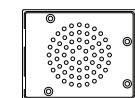
## PARTS TO 3D PRINT



Reset  
button

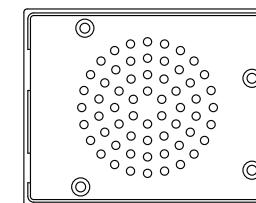
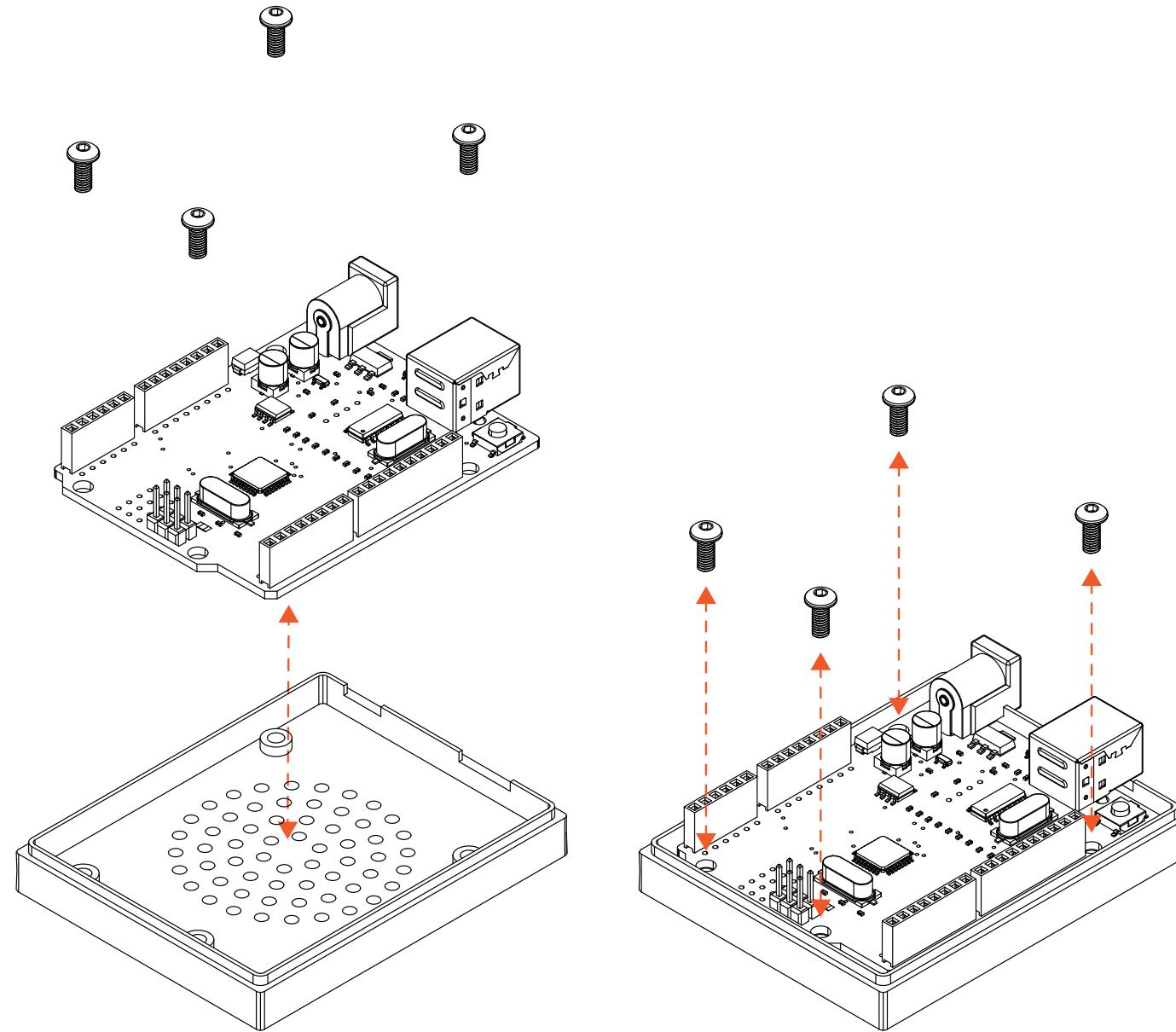


Top of the electronic  
component housing

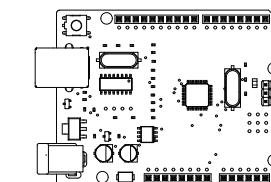


Bottom of the elec-  
tronic component  
housing

1.



Bottom of the  
electronic component  
housing



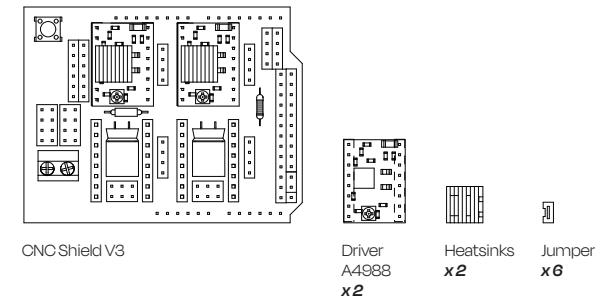
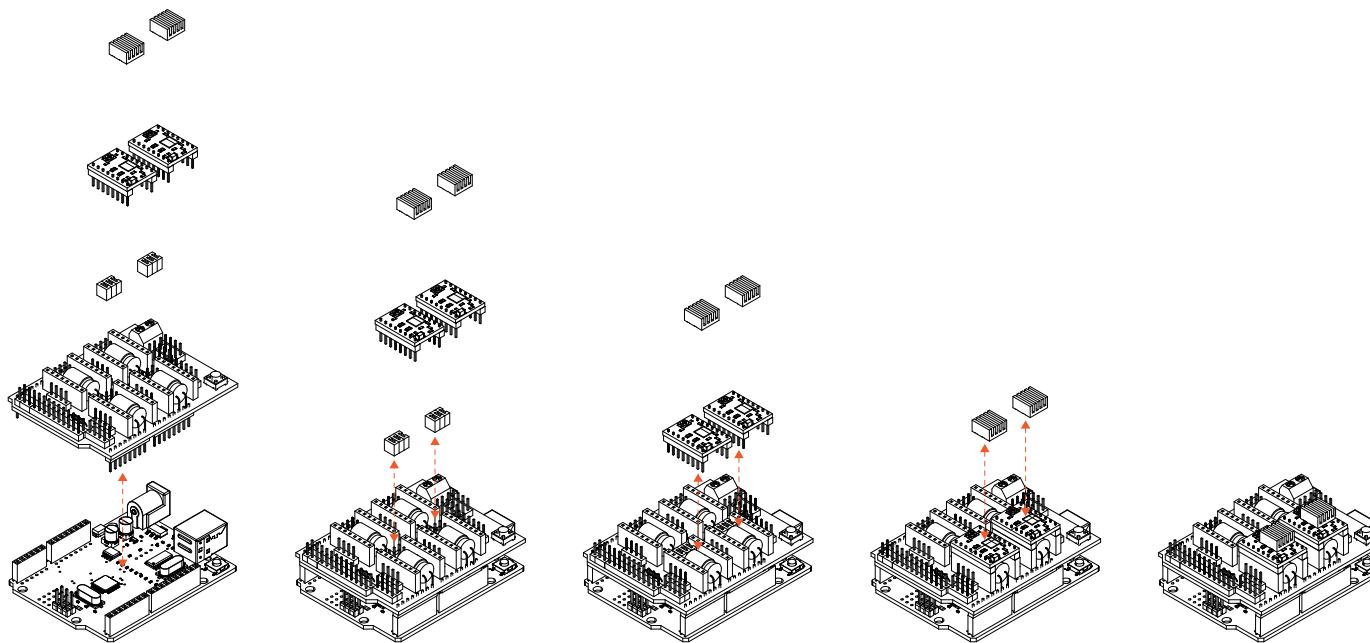
Arduino Uno



Screw  
M3x10  
x4

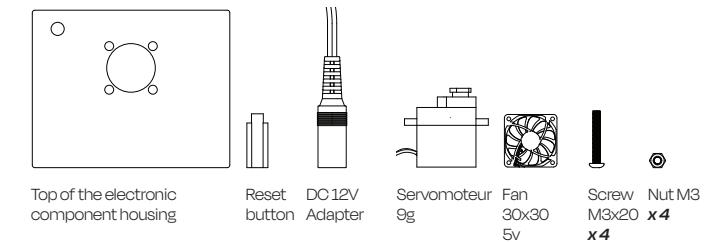
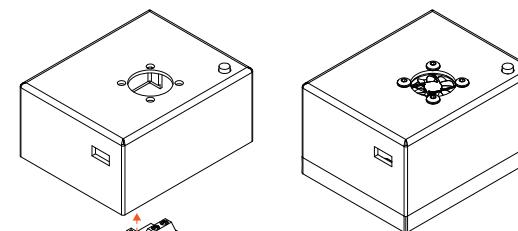
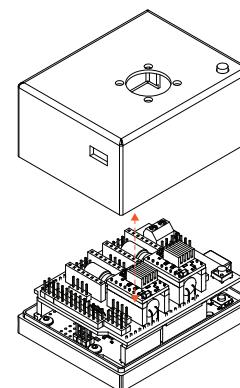
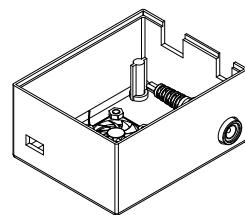
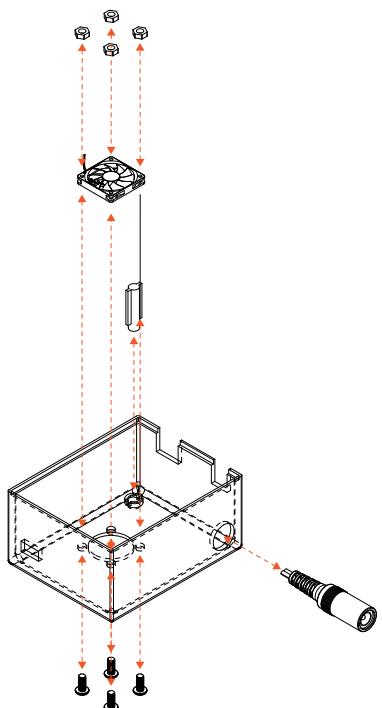
1. Position the Arduino Uno board on the plate, aligning the mounting holes.
2. Then, secure the board using the provided screws, tightening them firmly but not excessively.

# 2.



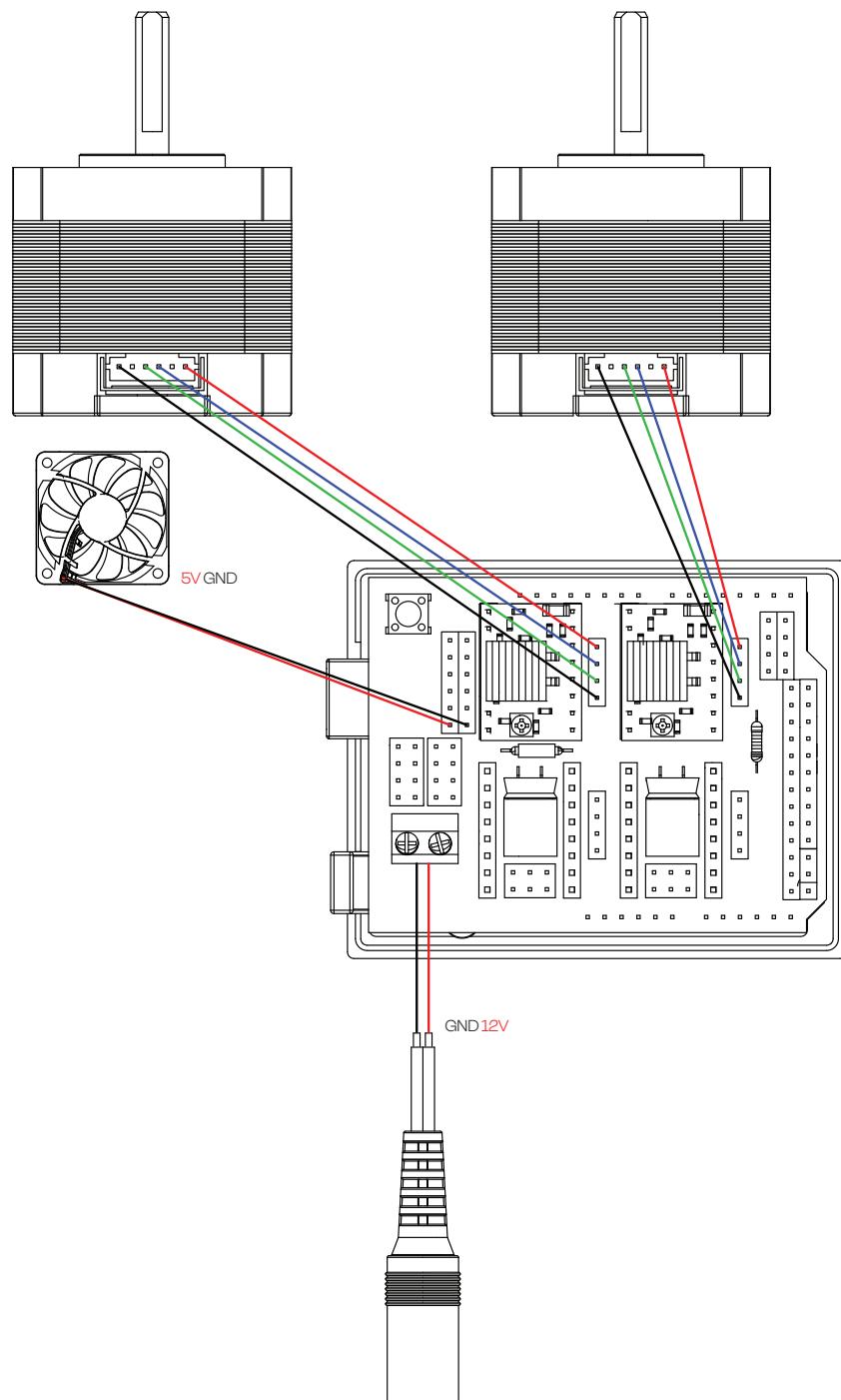
1. Align the CNC Shield with the Arduino Uno board, ensuring that the pins match up perfectly.
2. Insert the jumpers onto the Shield.
3. Insert the motor drivers into the designated slots on the Shield.
4. Attach the heatsinks to the chips.
5. The controller is assembled.

# 3.



1. Insert the power adapter, reset button, and fan into their respective slots on the enclosure.
2. Flip the enclosure over.
3. Secure the enclosure to the controller board.
4. The controller is ready.

4.



Schematic of the circuit