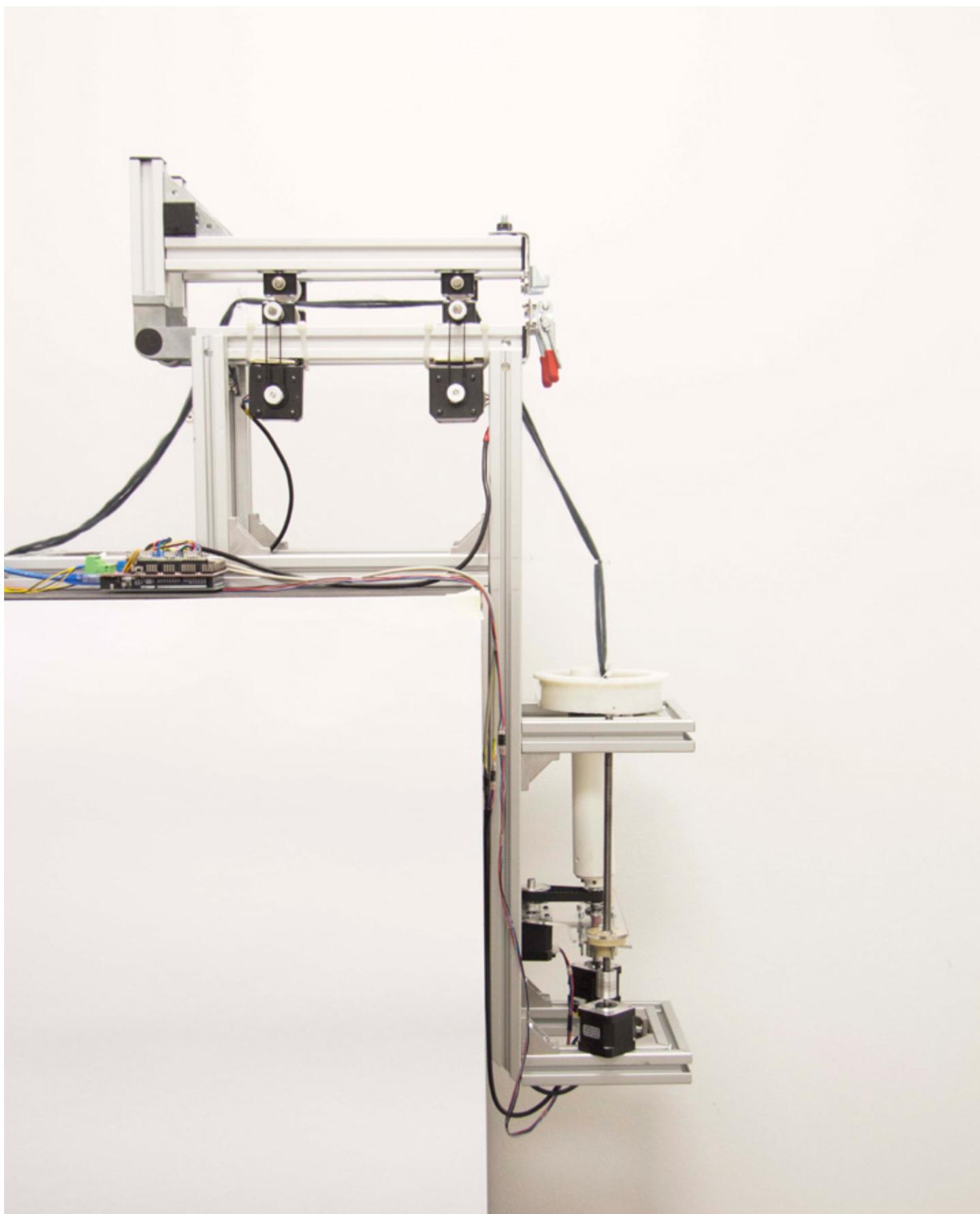


Assembly Instruction HILO Spinning Machine Metal Prototype 1, October 2019



The HILO Machine consists of three main parts (frame, drafting system, elevator). This is a step by step photo instruction with material overview, material preparation and assembly guideline.

Frame section Explanaiton

FRAME – Introduction

Tools you need

Preparing Frame

1. FRAME

- 1.1. Table Extrusion**
- 1.2. Elevator Extrusion**
- 1.3. Drafting Extrusion**
- 1.4. FRAME Final Assembly**

2. DRAFTING SYSTEM

- a. material overview**
- b. material preparation**
- c. assembly**

3. ELEVATOR

- a. material overview**
- b. material preparation**
- c. assembly**

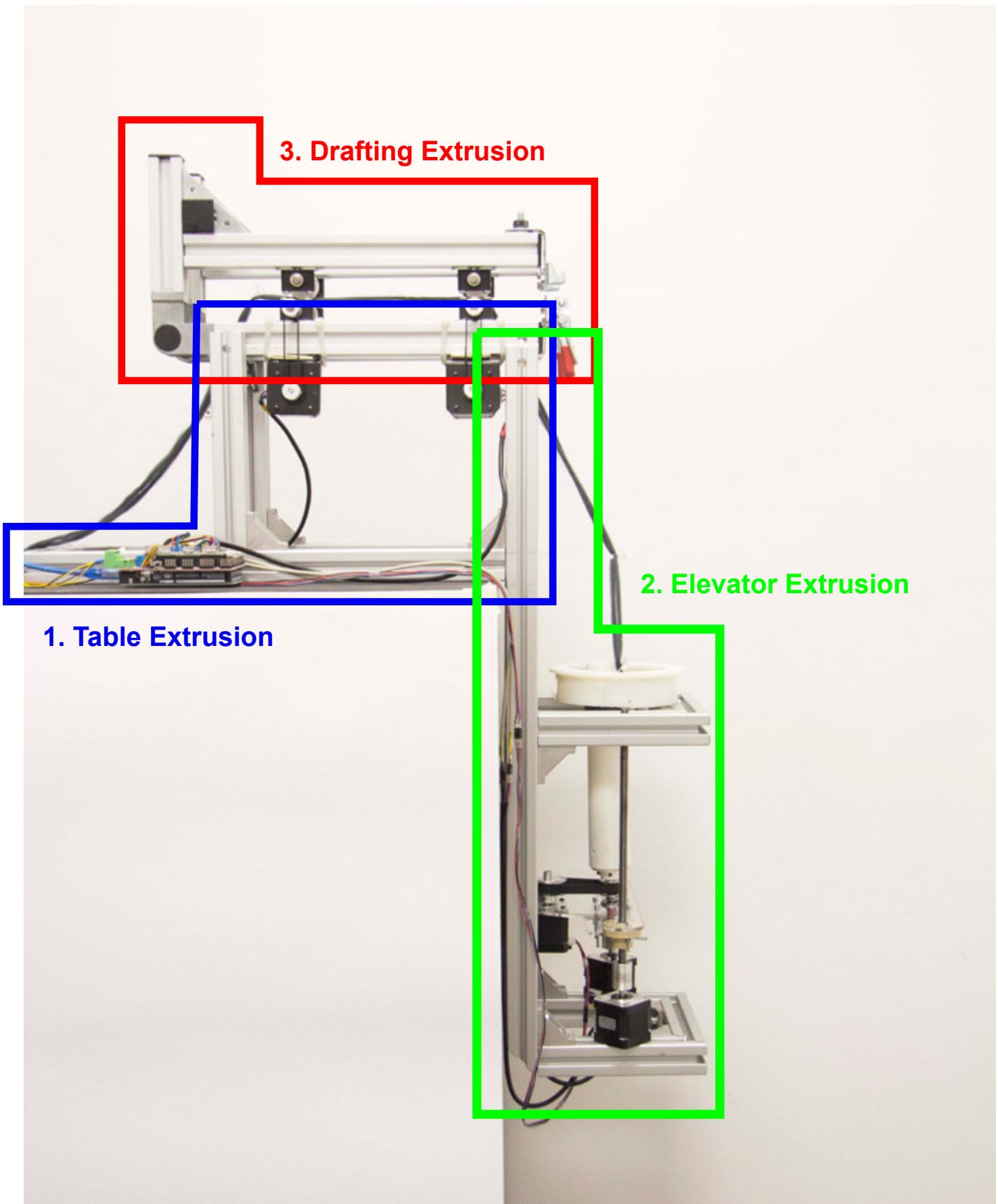
4. FINAL ASSEMBLY

FRAME +DRAFTING SYSTEM + ELEVATOR

5. ELECTRONICTS

- a. material overview**
- b. assembly**

Frame section Explanaition



1. FRAME – Introduction

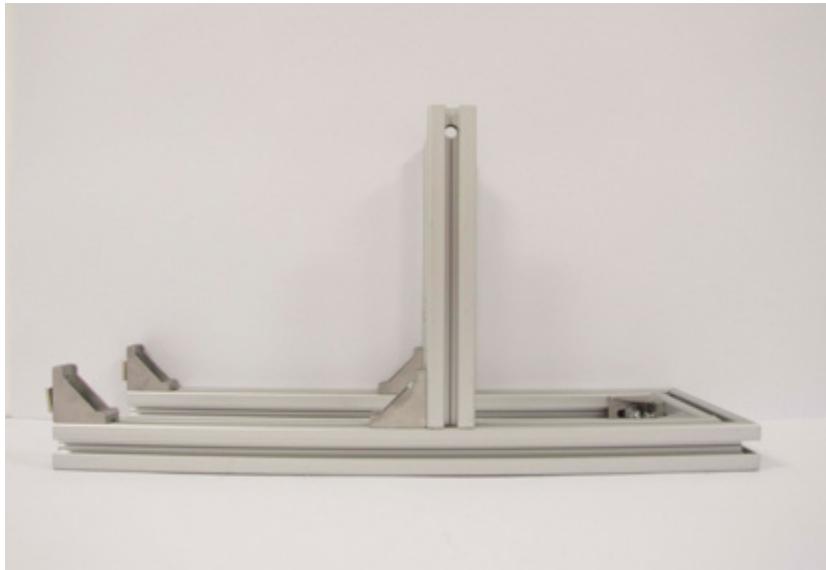
The basic frame is build out of three parts:

1. Table Extrusion
2. Elevator Extrusion
3. Drafting Extrusion

This FRAME chapter will show you how to build all three extrusion parts and assembly them into one.

Follow this instruction step by step and take a good look at the pictures. They will guide you!

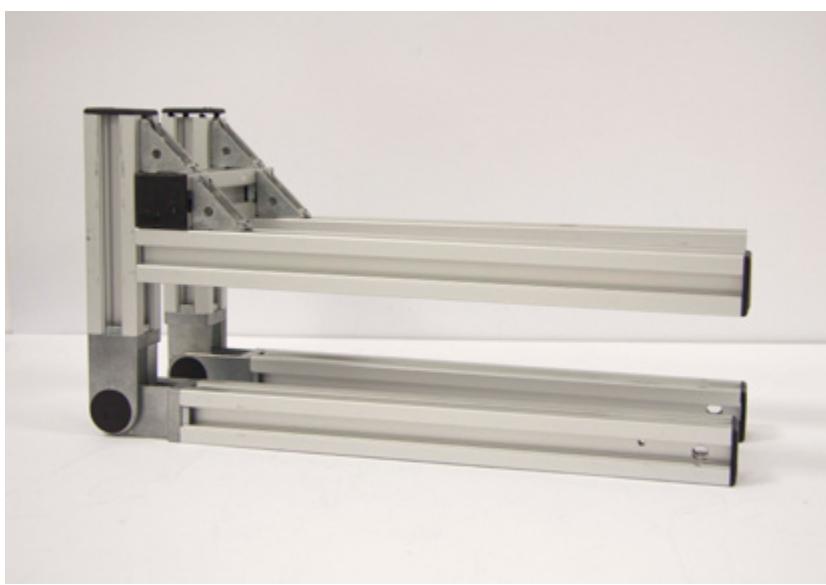
1. Table Extrusion



2. Elevator Extrusion



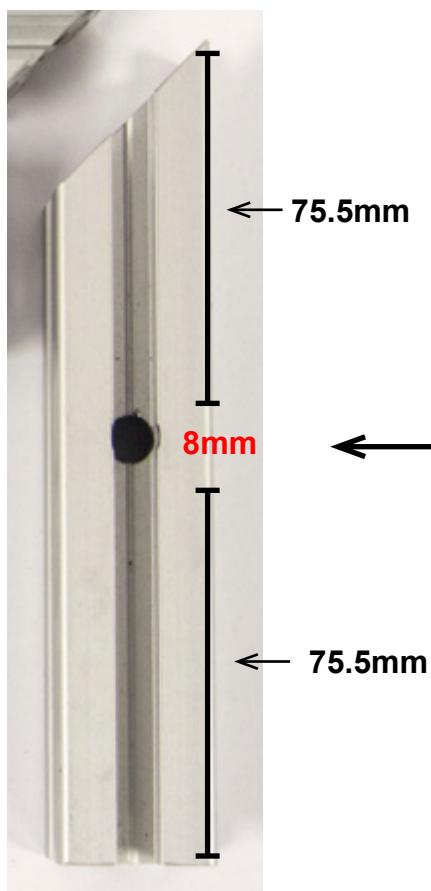
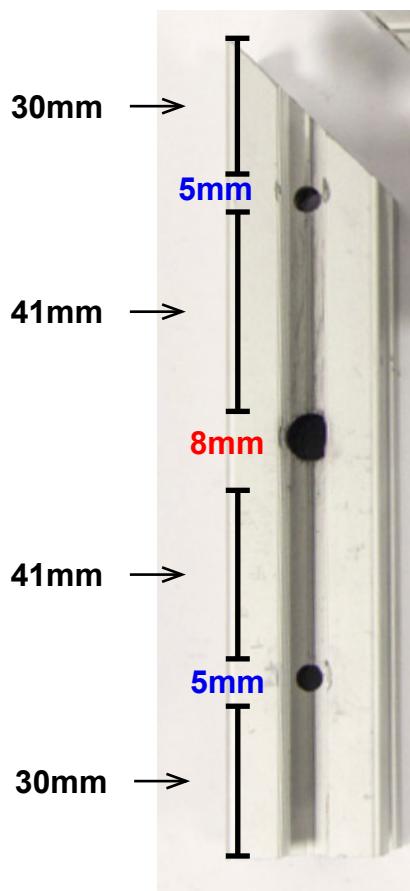
3. Drafting Extrusion



Tools you need



Preparing Frame



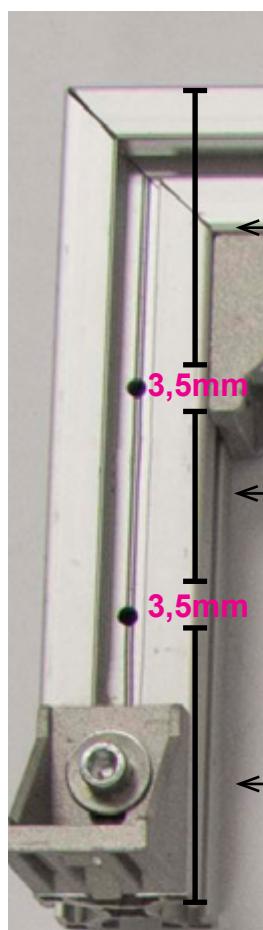
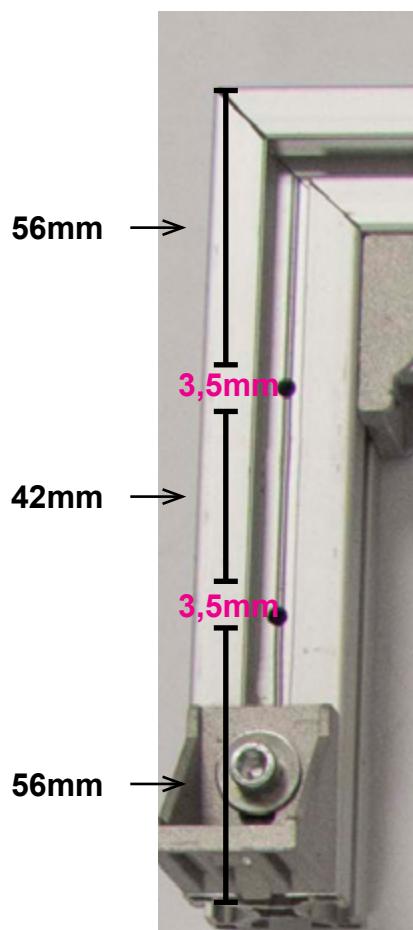
1. 2 x extrusion 160 mm
2. 2 x extrusion 160 mm

Drilling machine +
drill 8/5/3,5 mm

1. 2 x extrusions 160 mm

Please Drill 2 holes with a
diameter of 8mm.

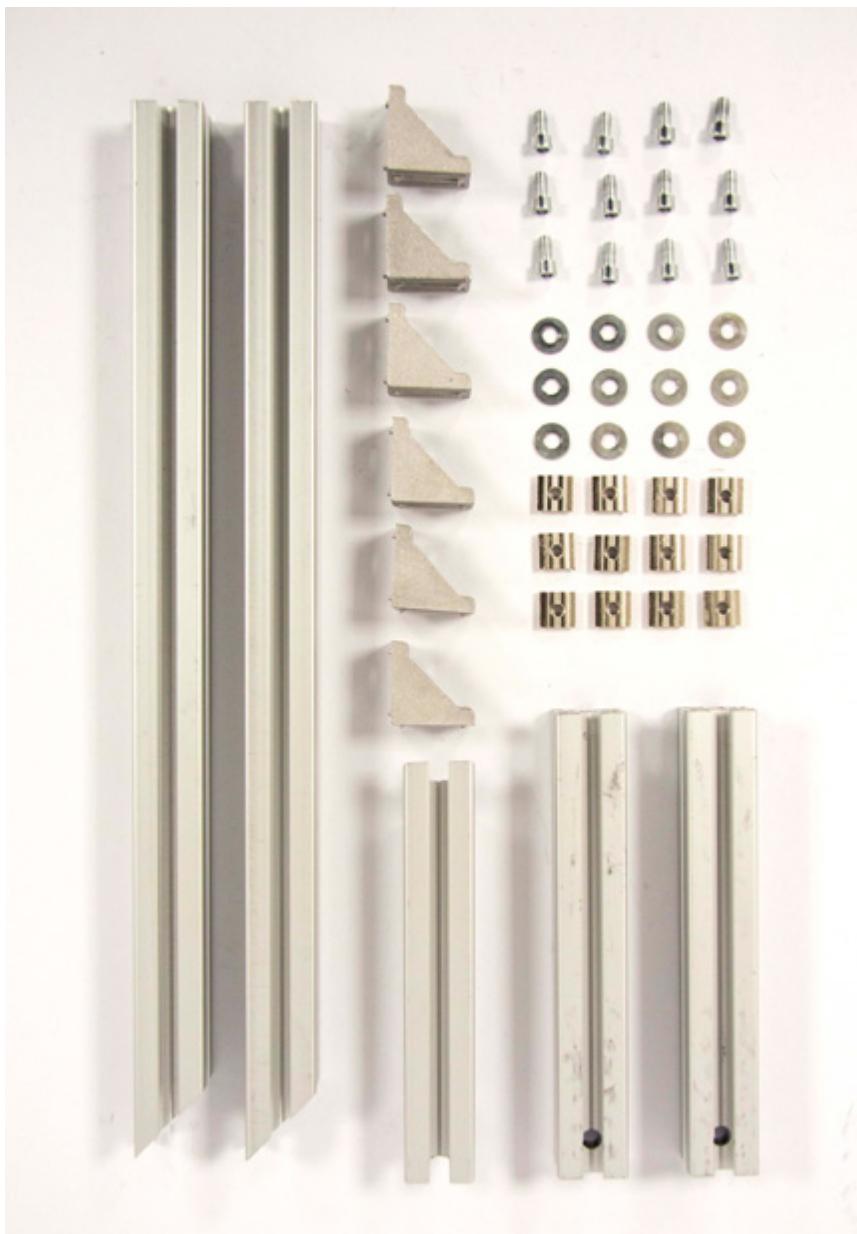
2 holes 5mm in one extru-
sion



2. 2 x extrusion 160 mm

Please Drill 2x2 holes with a
diameter of 3,5mm.

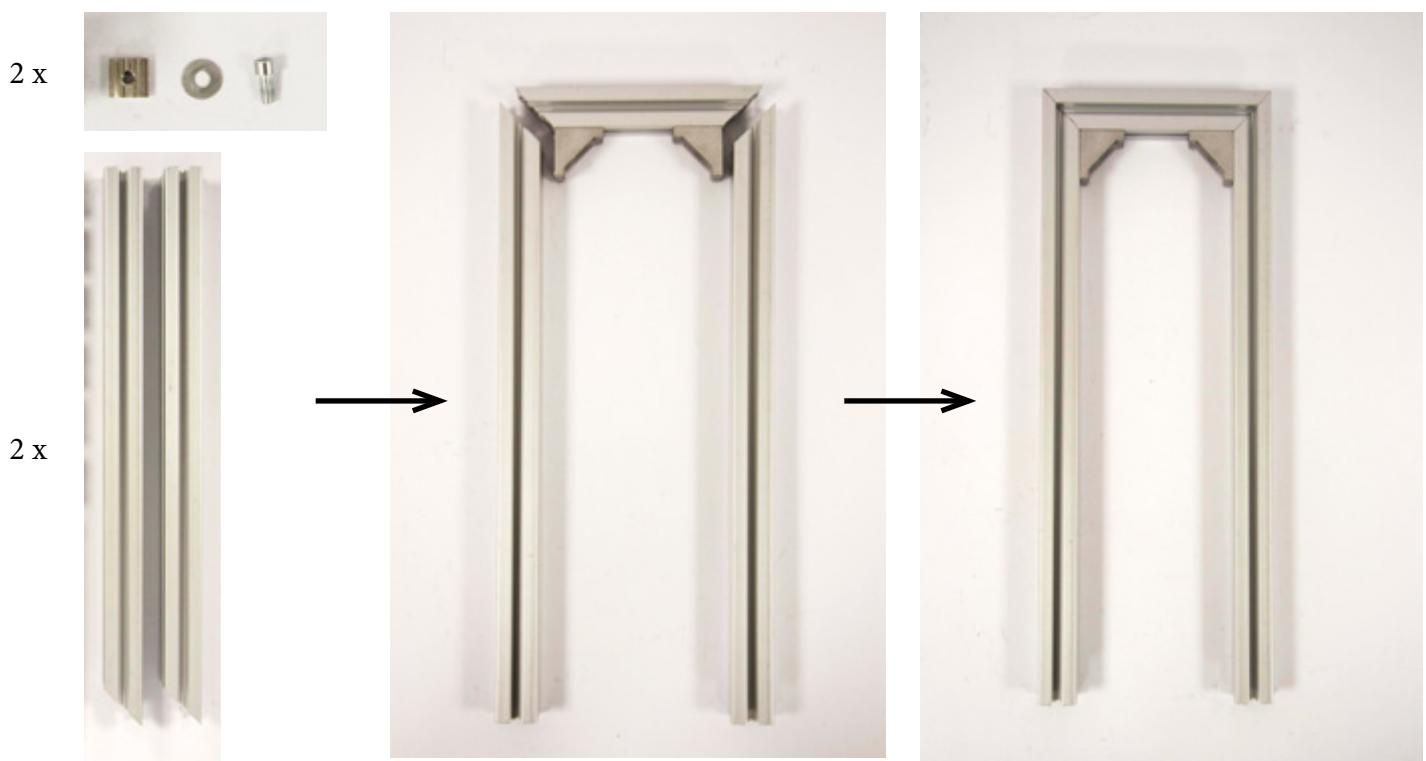
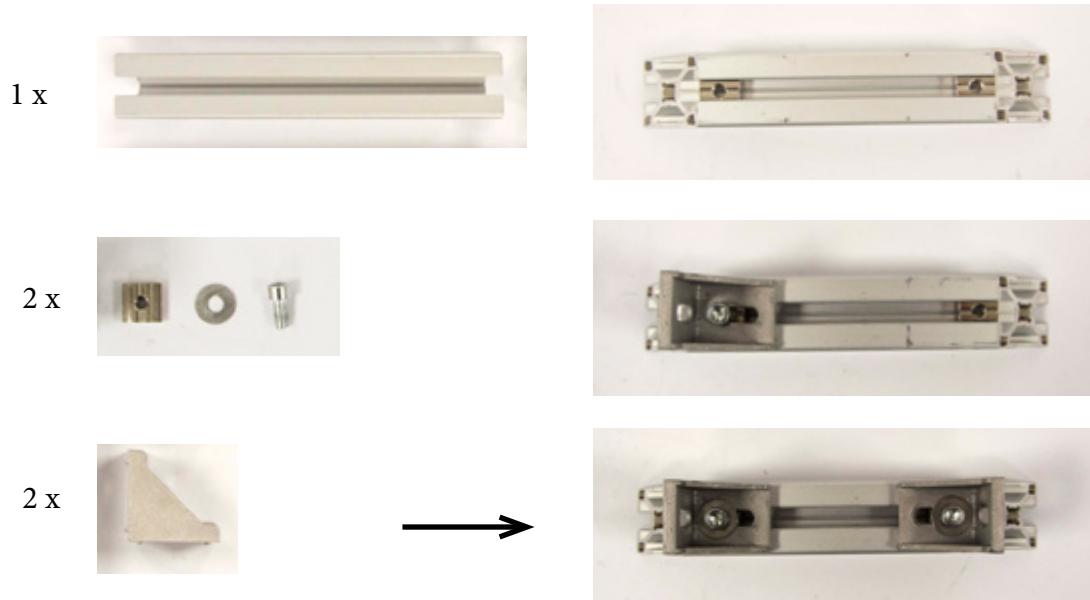
1.1. Table Extrusion – Material Overview



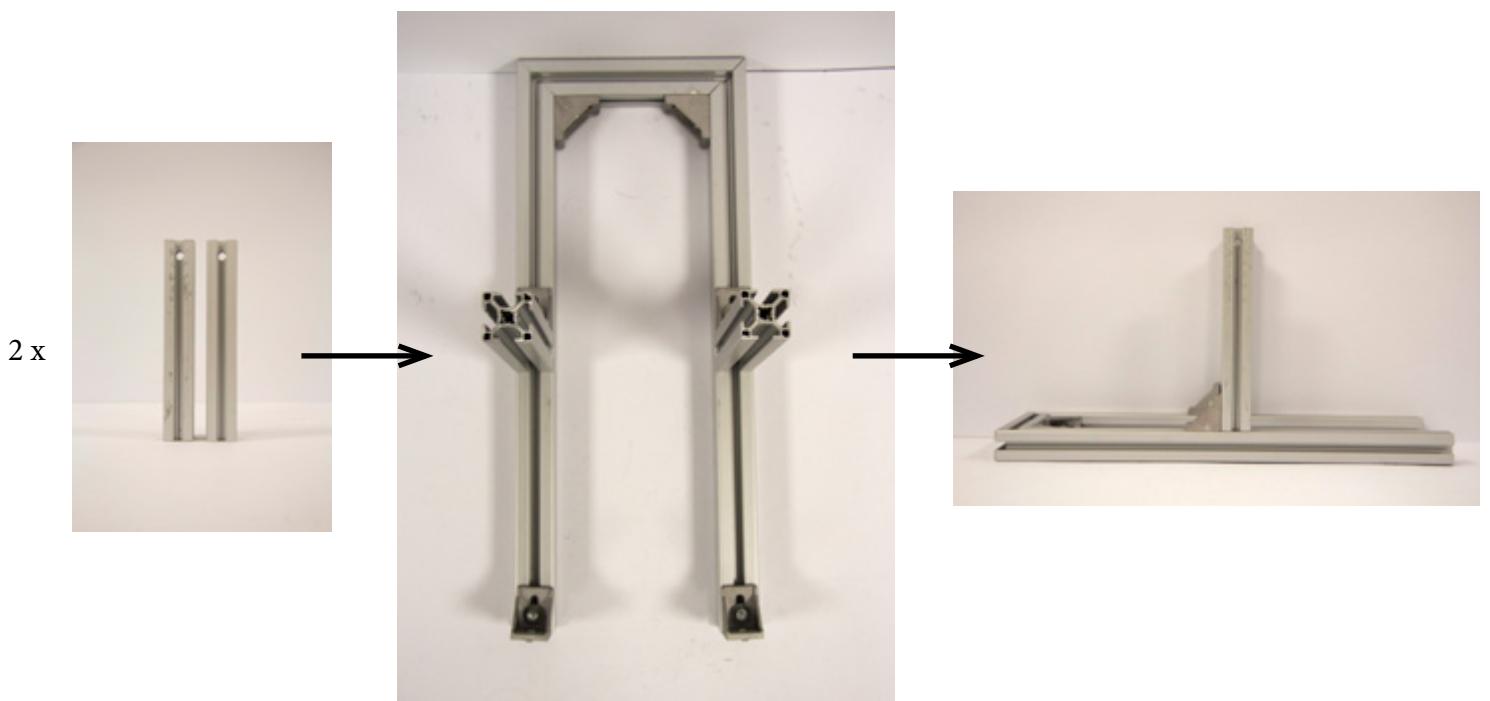
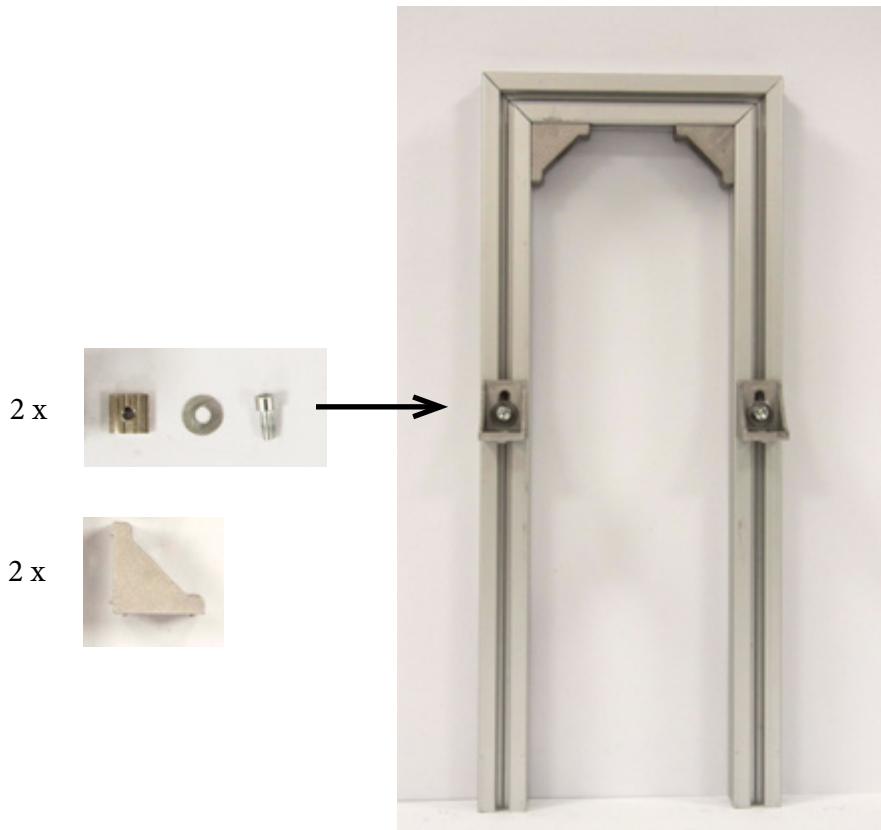
**2 x extrusions 450 mm
1 x extrusion 120 mm
2 x extrusions 200 mm
12 x Bolts Hexagon M4
12 x washer
12 x T-slotnuts M4**



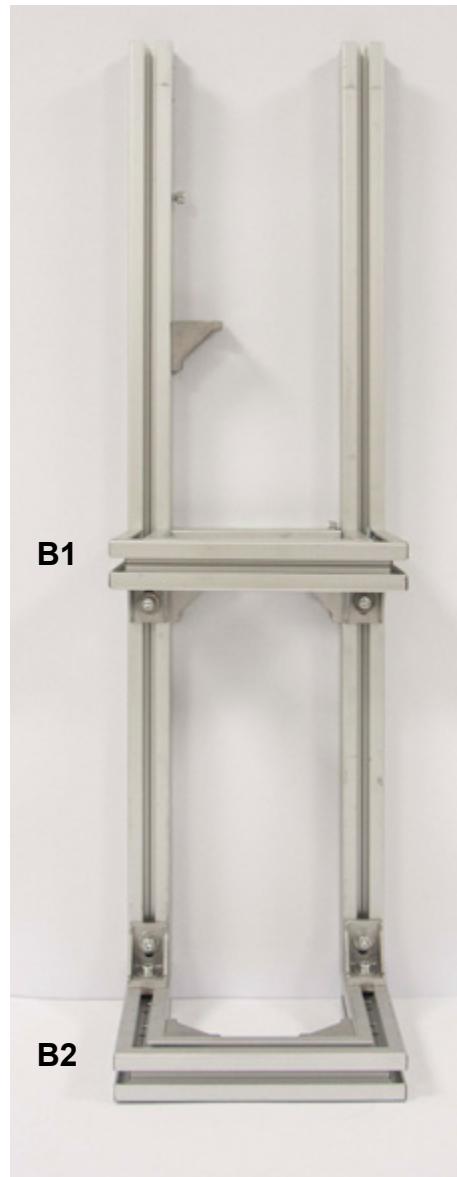
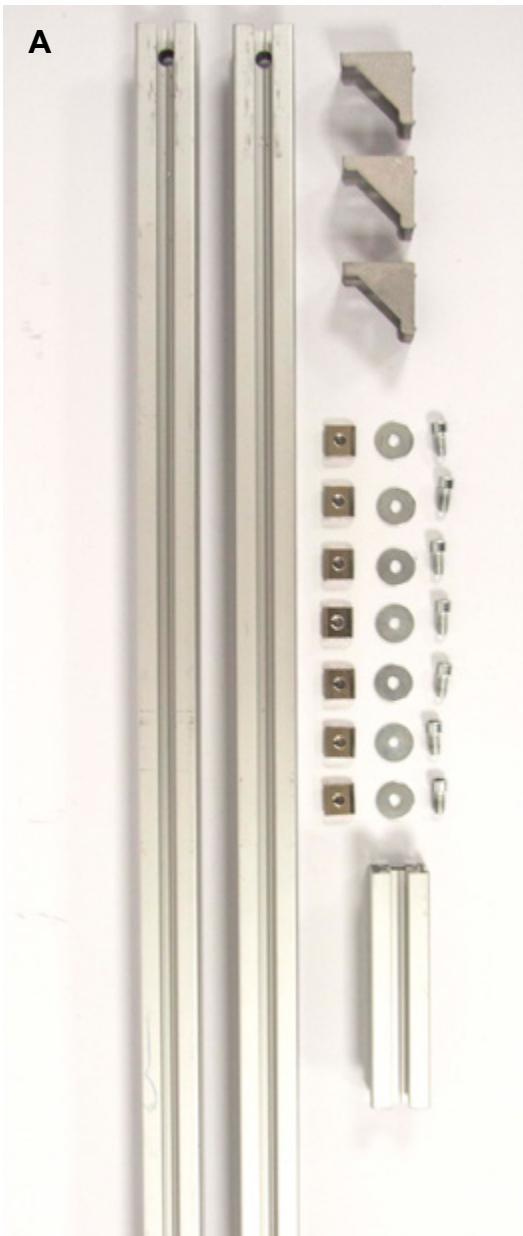
1.1. Table Extrusion – Material Assembly



1.1. Table Extrusion – Material Assembly



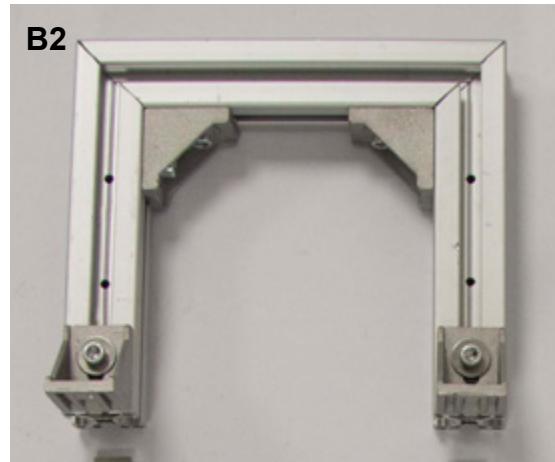
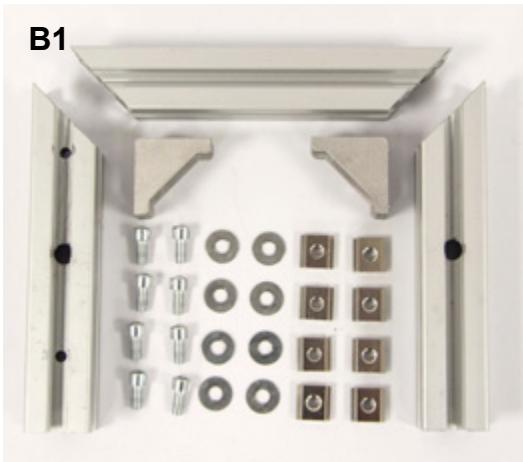
1.2. Elevator Extrusion – Introduction



A.
2 x extrusions 680 mm
7 x bolts Hexagon M4
7 x waser
7 x T-slotnuts M4
3 x angle

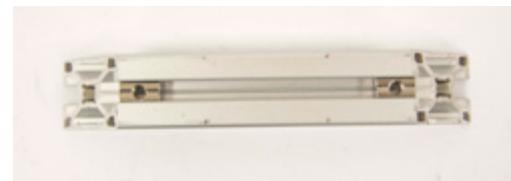
B1.
2 x extrusions 160 mm
1 x extrusion 120 mm
8 x bolts Hexagon M4
8 x waser
8 x T-slotnuts M4
4 x angle

B2
2 x extrusions 160 mm
1 x extrusion 120 mm
8 x bolts Hexagon M4
8 x waser
8 x T-slotnuts M4
4 x angle

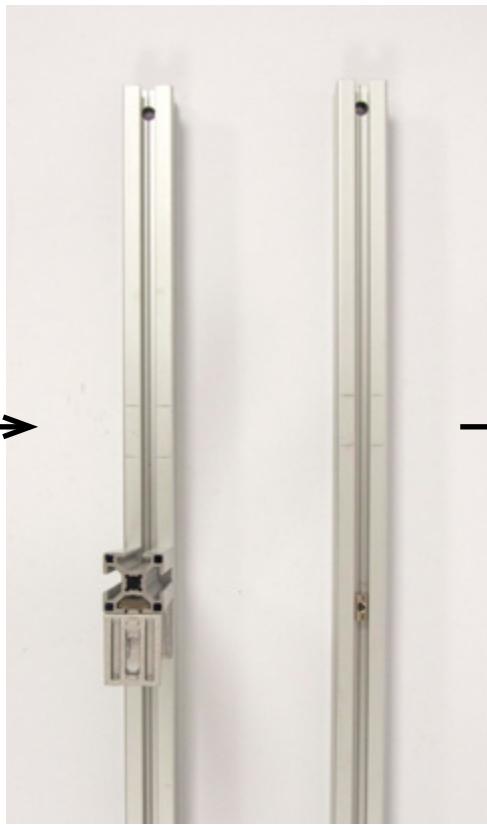
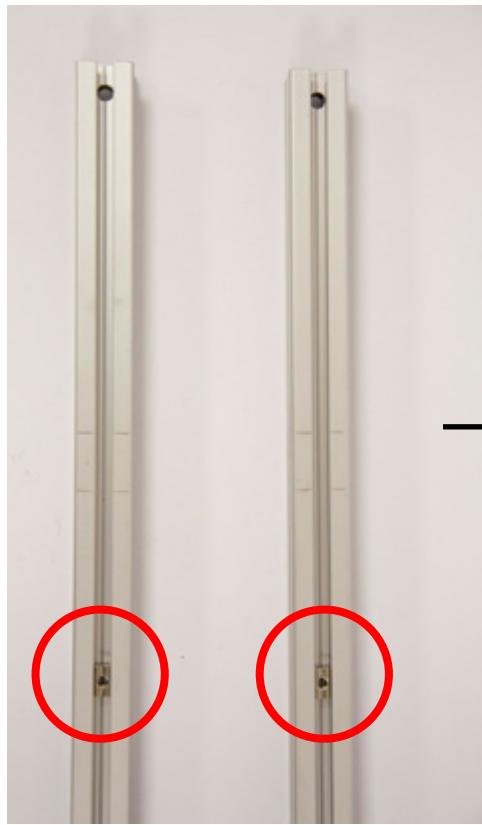


1.2. Elevator Extrusion – Material Assembly – Part A

2 x



2 x



1.2. Elevator Extrusion – Material Assembly – Part B1 + B2

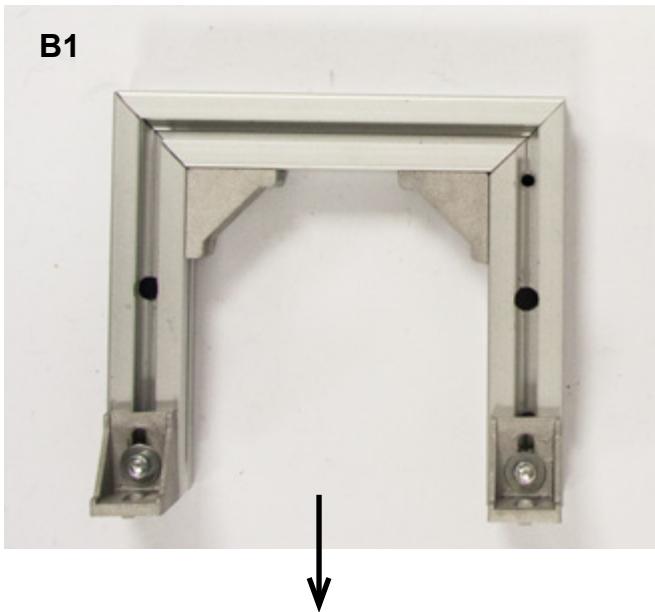
6 x



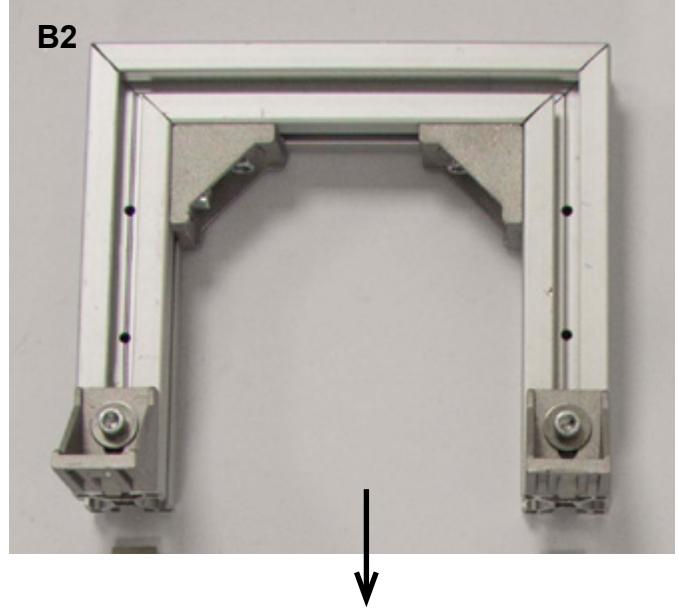
6 x



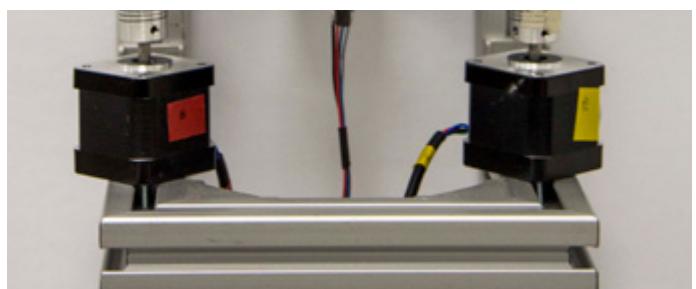
B1



B2

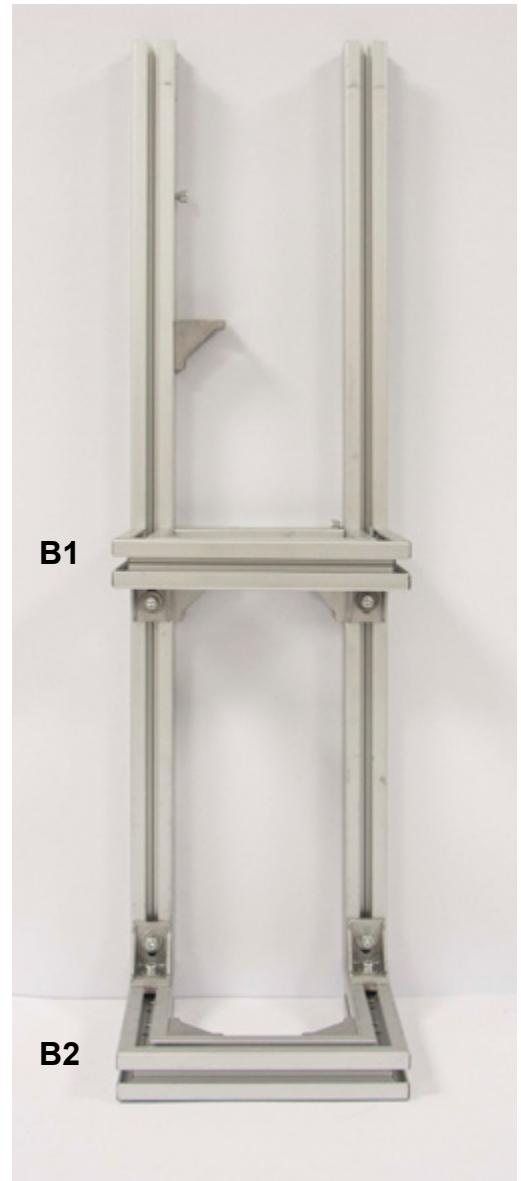
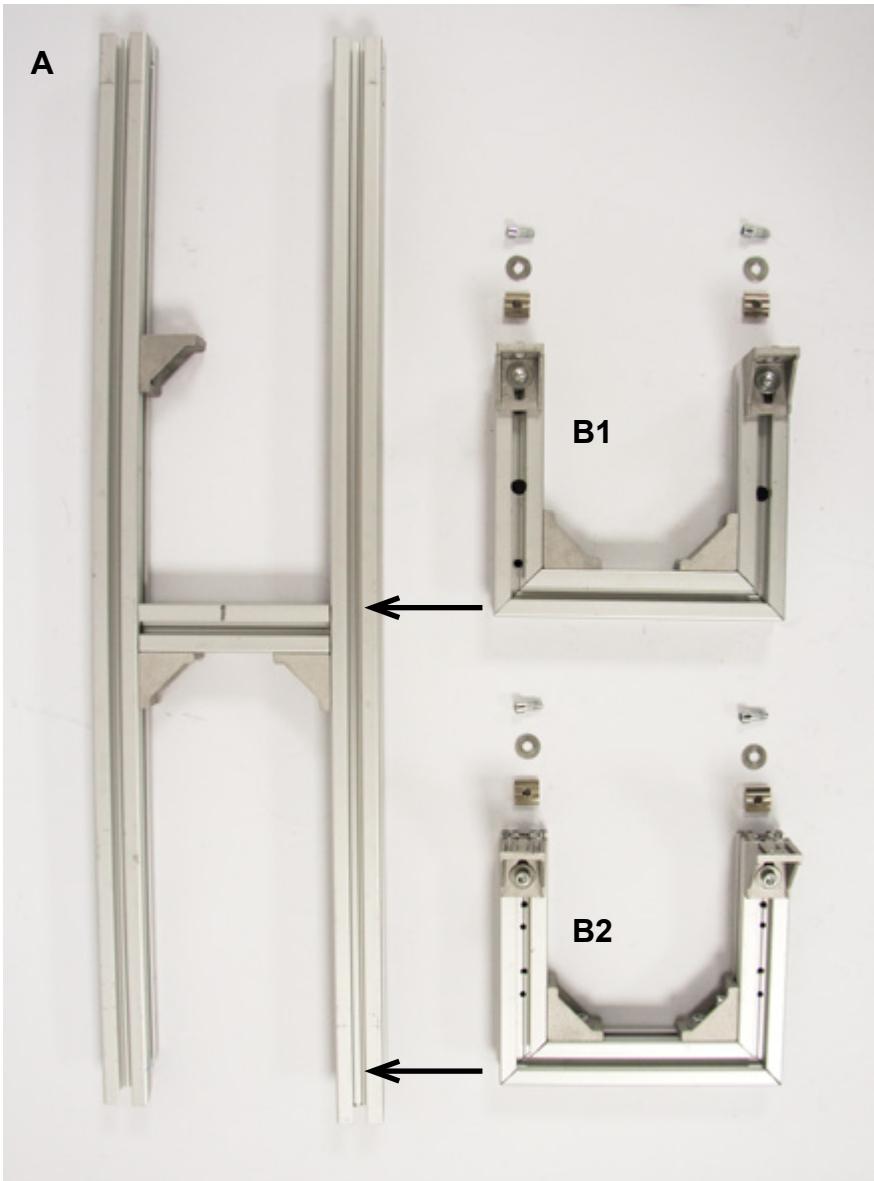


Apply this later - continu the steps

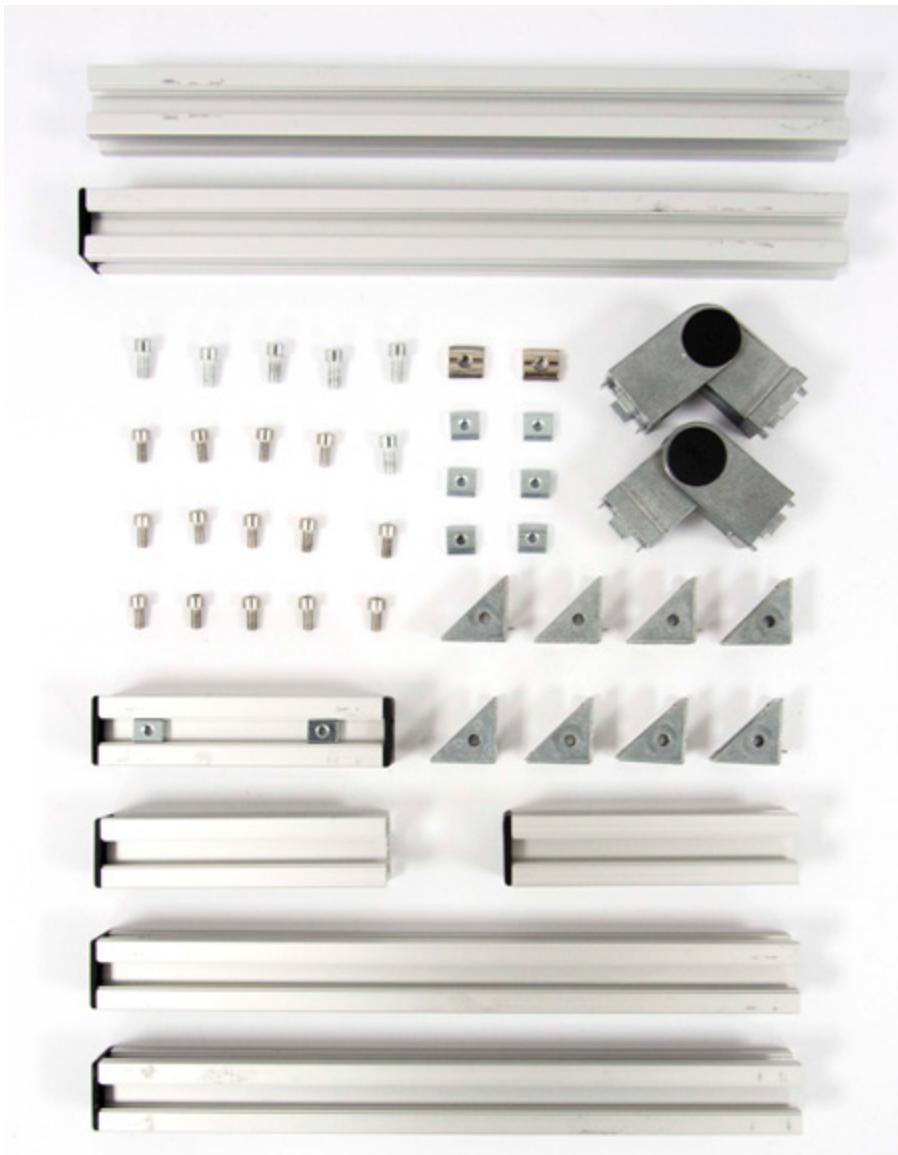


Apply this later - continu the steps

1.2. Elevator Extrusion – Material Assembly – Part A + B1 + B2



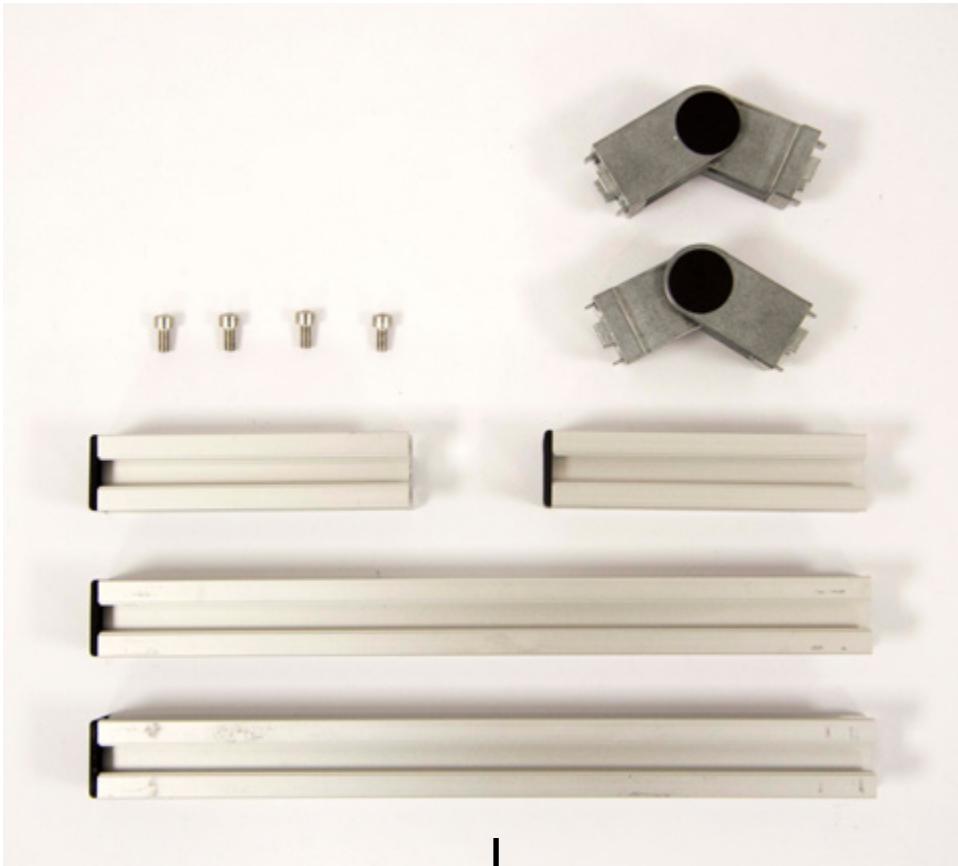
1.3. Drafting Extrusion – Material Overview



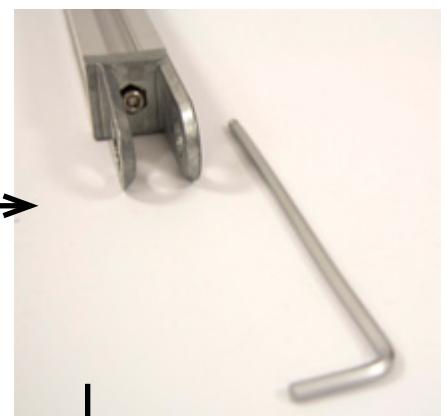
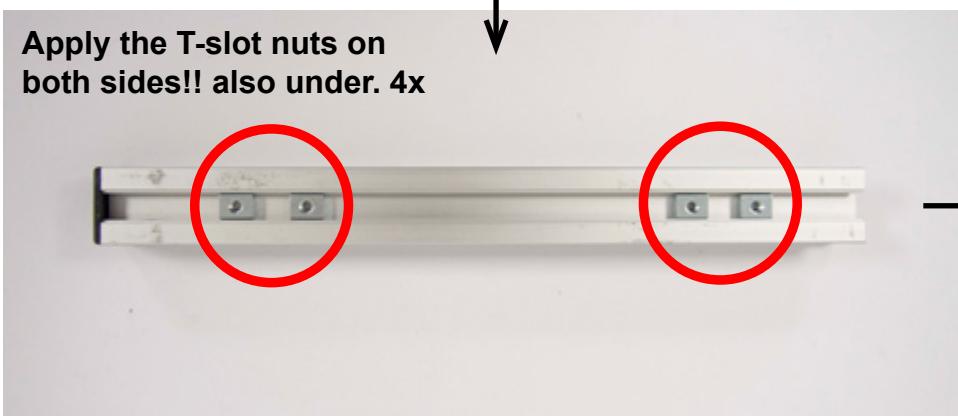
**2 x extrusions 327 mm
2 x extrusions 300 mm
2 x extrusions 122 mm
1 x extrusion 120 mm
20 x bolts Hexagon M4
10 x T-slotnuts M4
8 x
4 x angle
2 x Turing Hing**



1.3. Drafting Extrusion – Material Assembly



Apply the T-slot nuts on both sides!! also under. 4x



1.3. Drafting Extrusion – Material Assembly

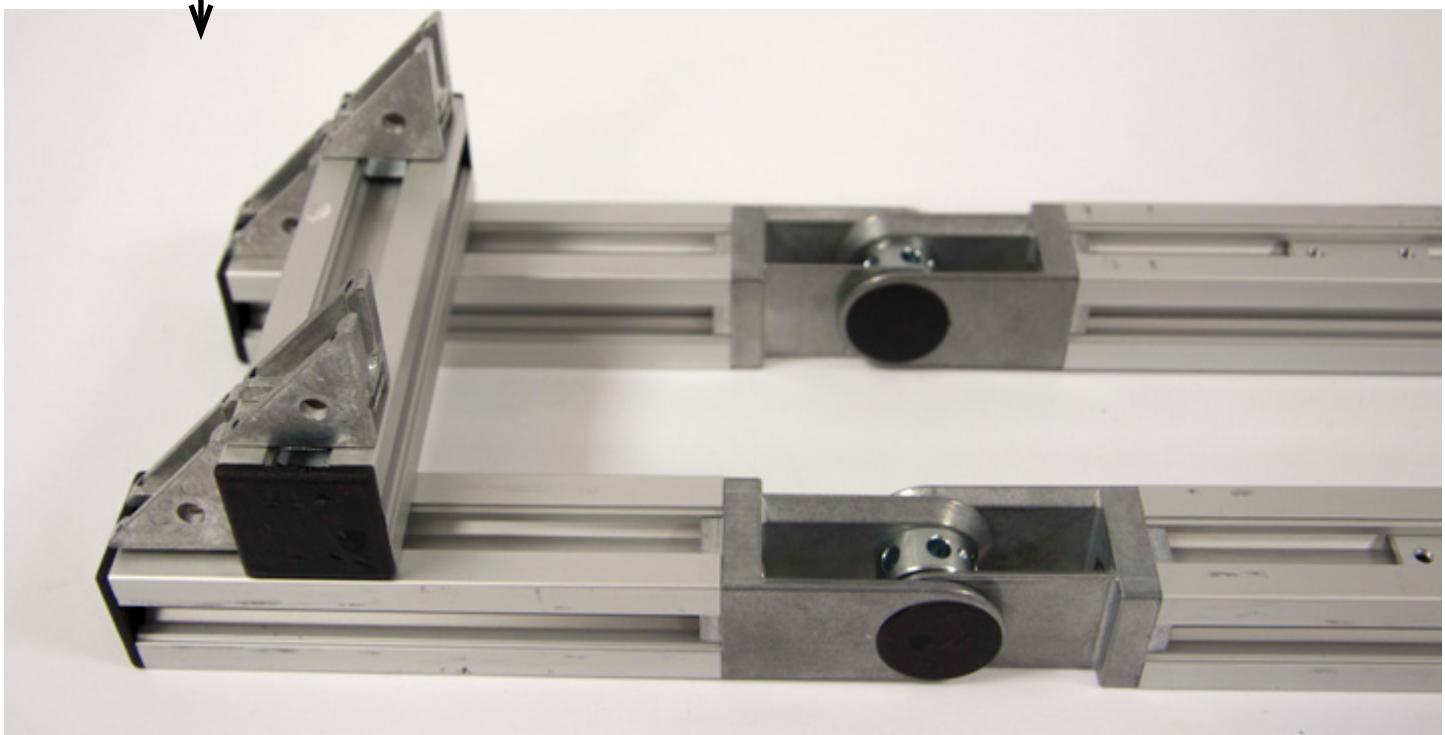
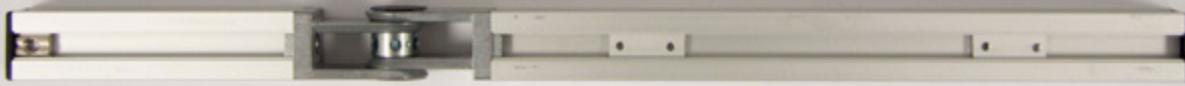
2 x



1 x extrusion 120 mm

8x

4x



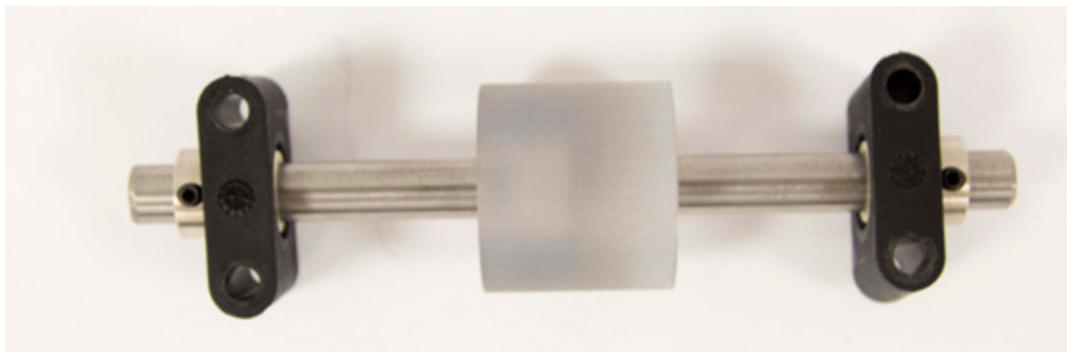
1.3. Drafting Extrusion – Material Assembly



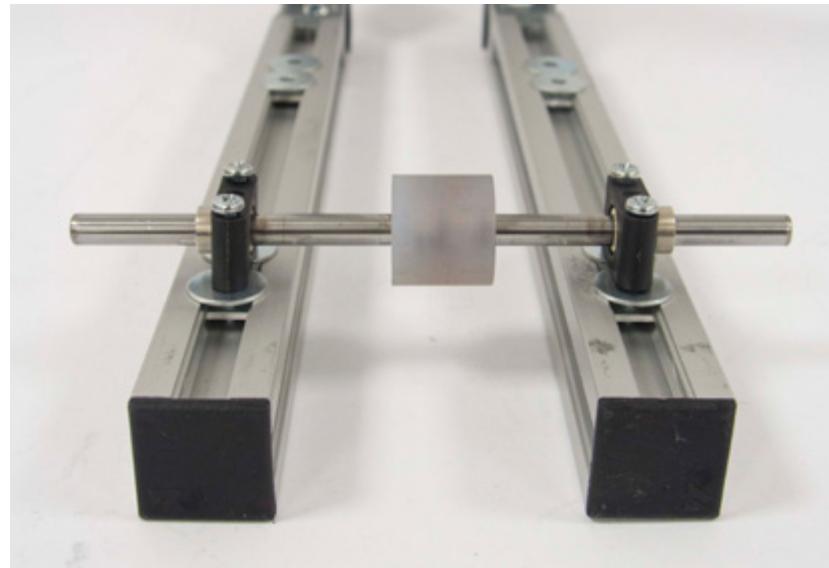
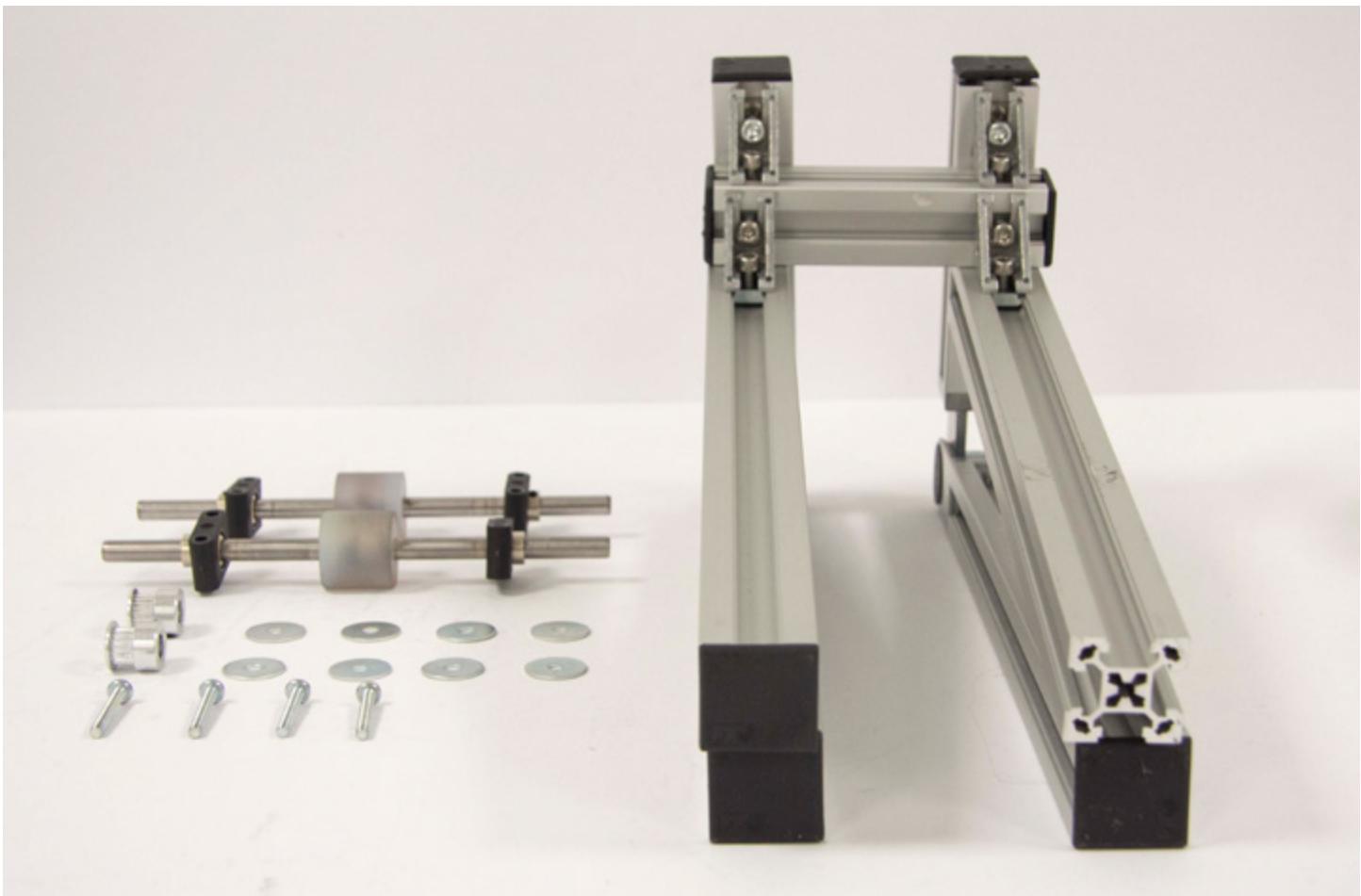
2. DRAFTING SYSTEM - Material Overview



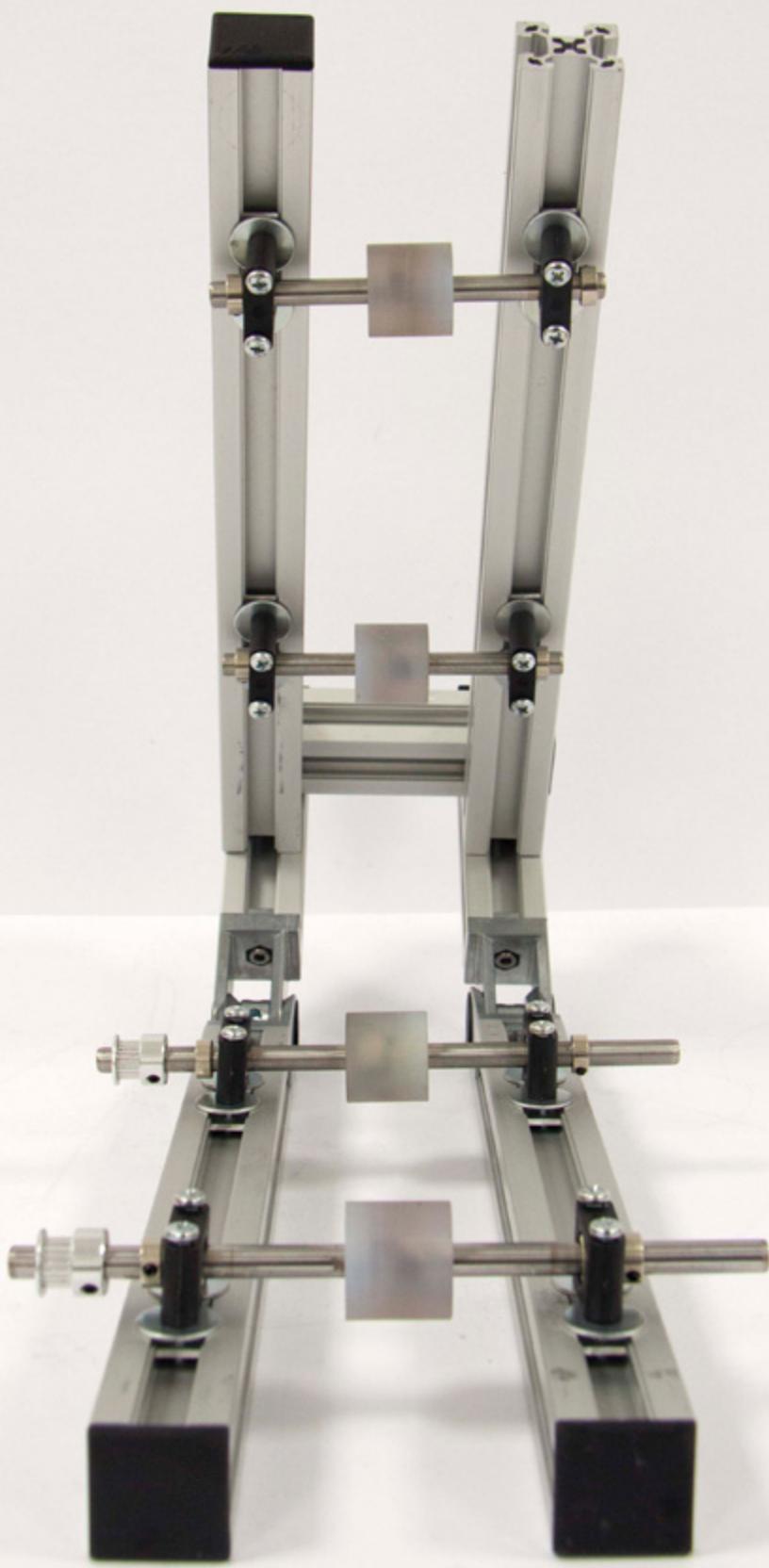
**16 croshead M4 screws
16 washers
2 x G2 teeth pulley
4 x 3D printed cilinder
8 x sleeve mounted
bearings 8mm
2 x shafts 100mm
2 x shafts 120mm**



2. DRAFTING SYSTEM - Material Assembly



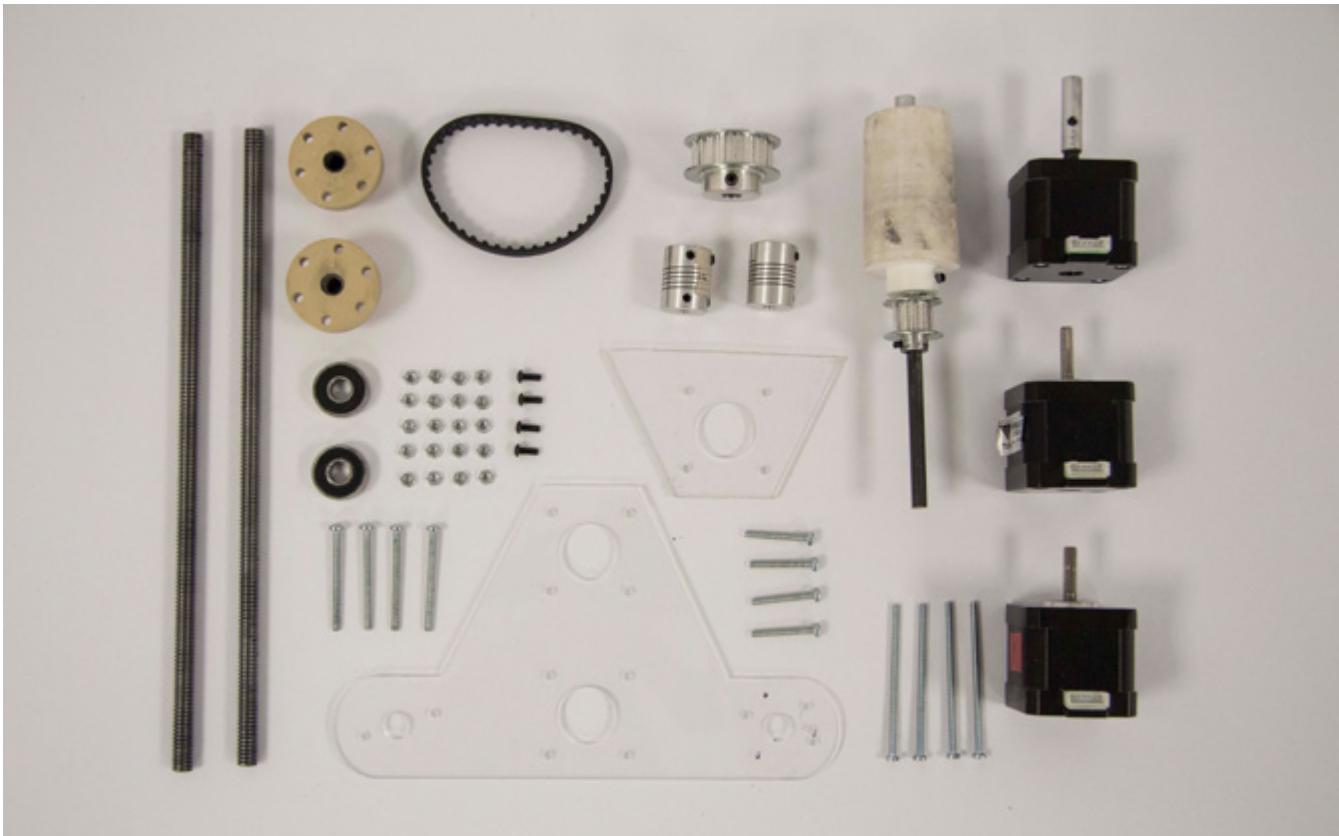
2. DRAFTING SYSTEM - Material Assembly



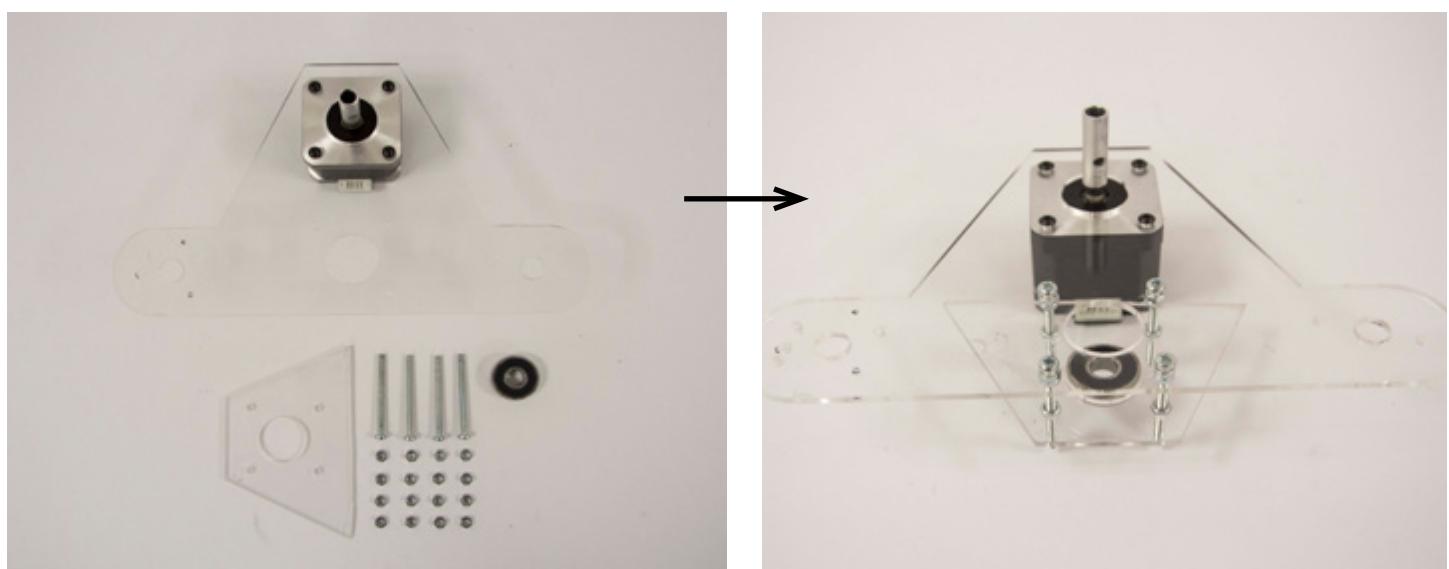
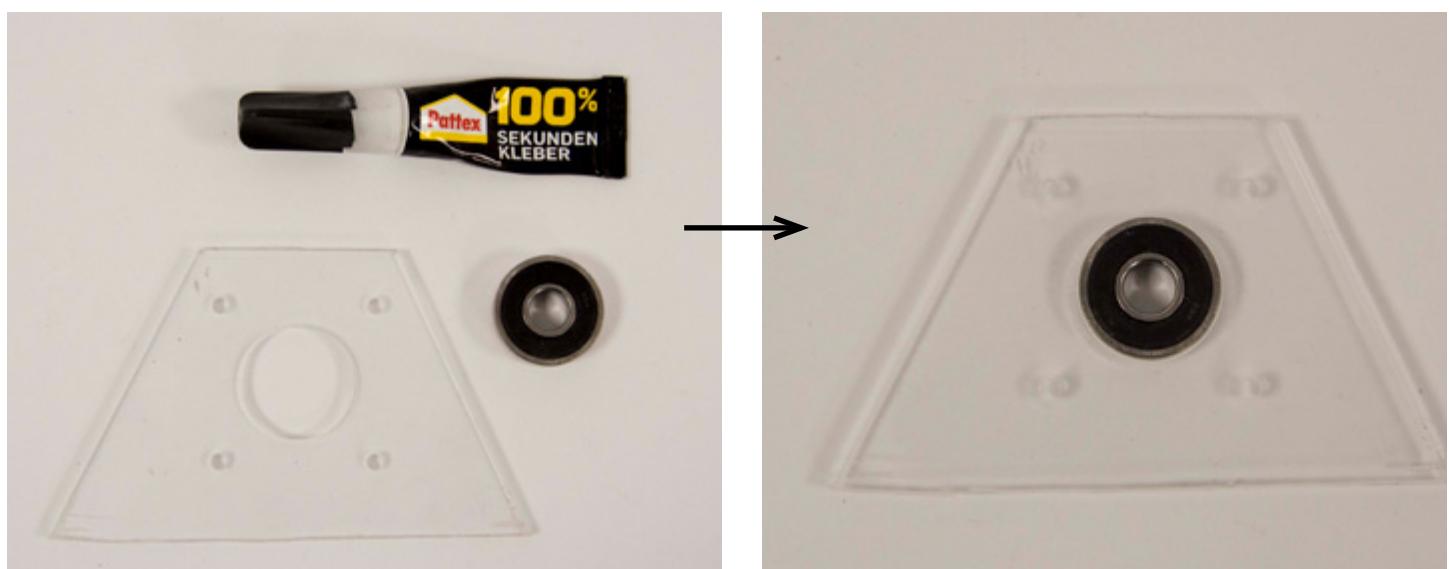
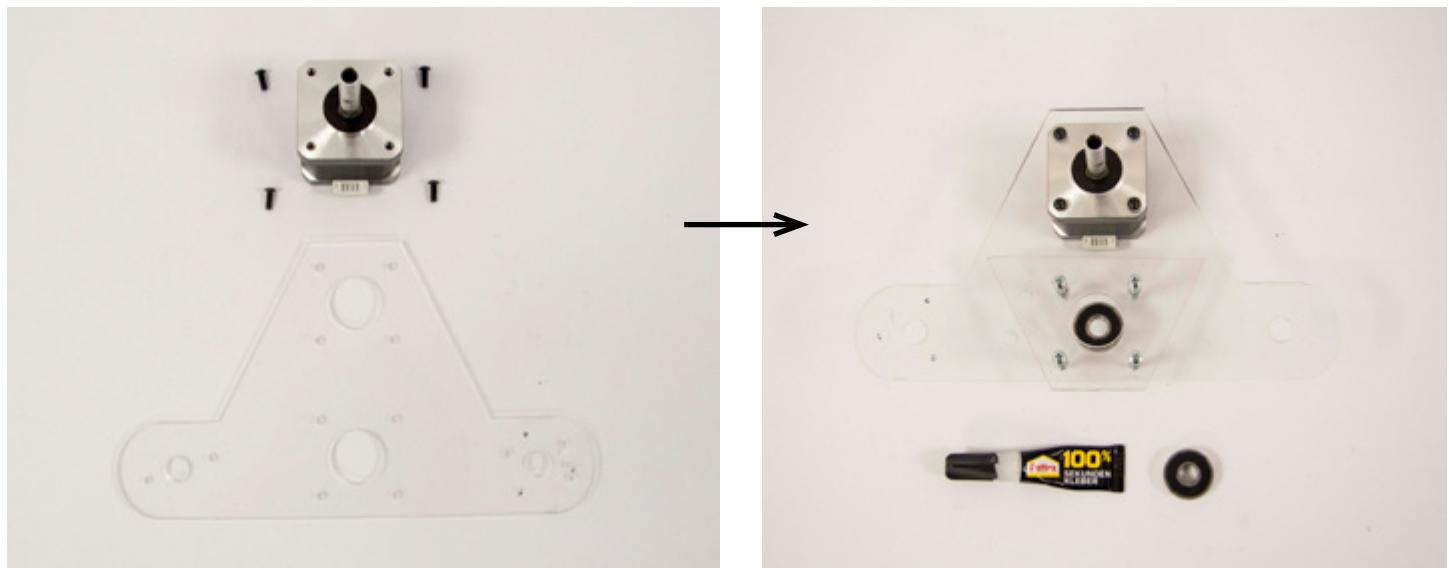
3. ELEVATOR - Material Overview



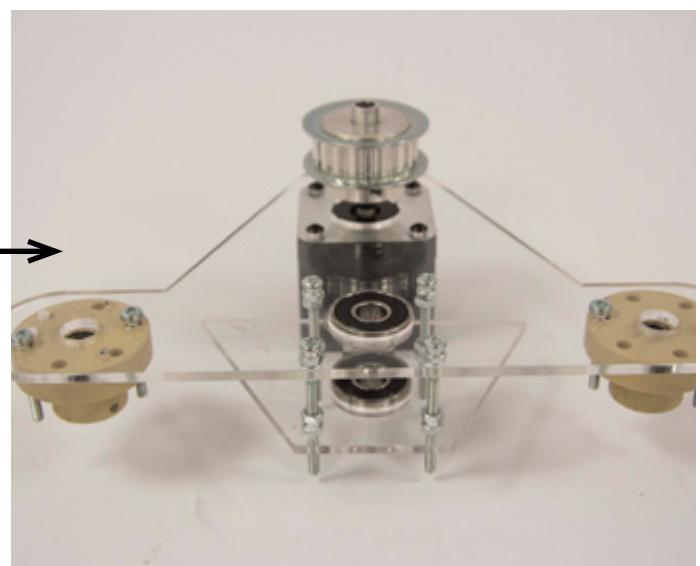
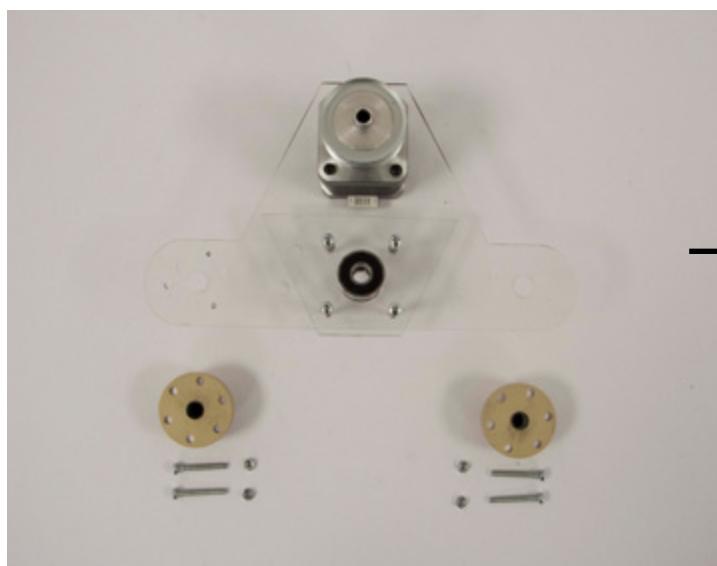
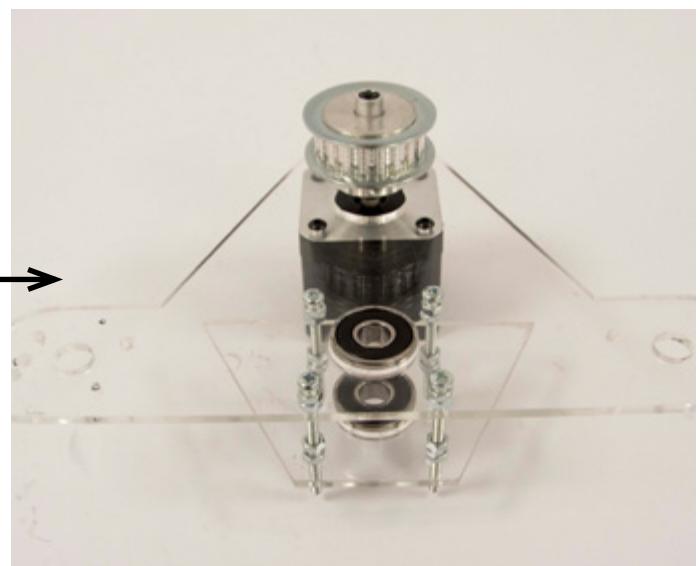
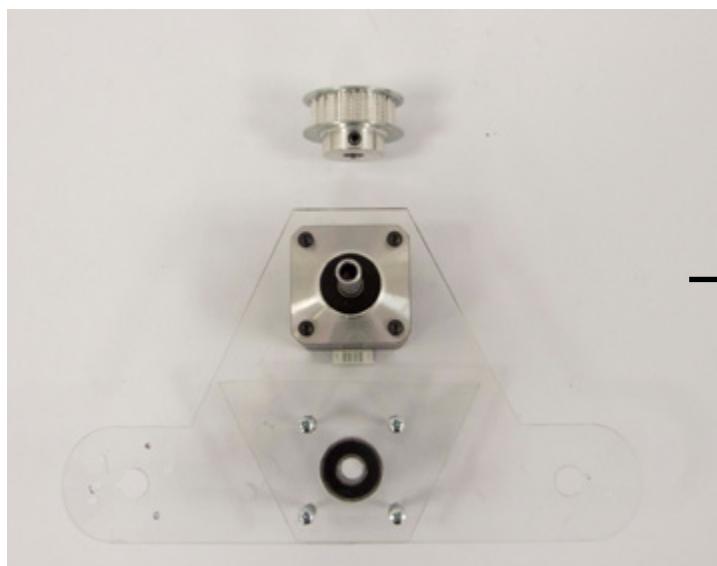
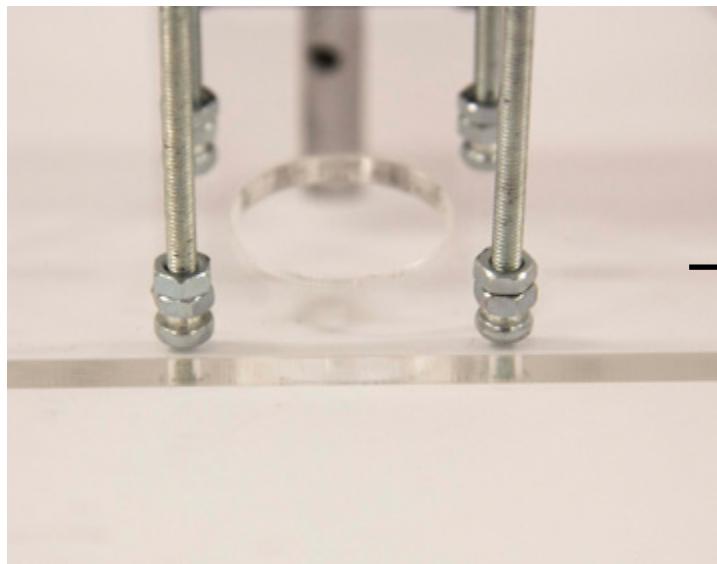
**3 x stepper motor
1 x elevator acryglas
1 x platform
1 x belt 80XL
2 x ball bearing 8mm
1 x secondglue
4 x M4 screws 40mm
12 x M4 lockingnuts nuts
8 x M4 screws 20mm
4 x M3 screws 50mm**



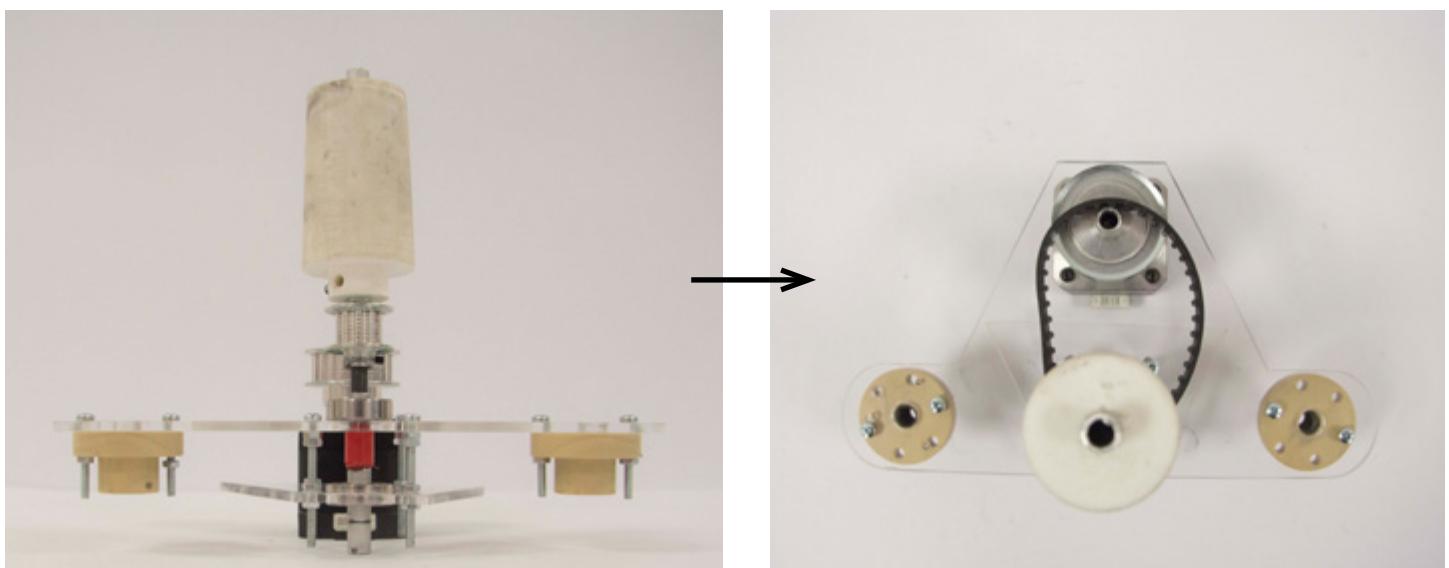
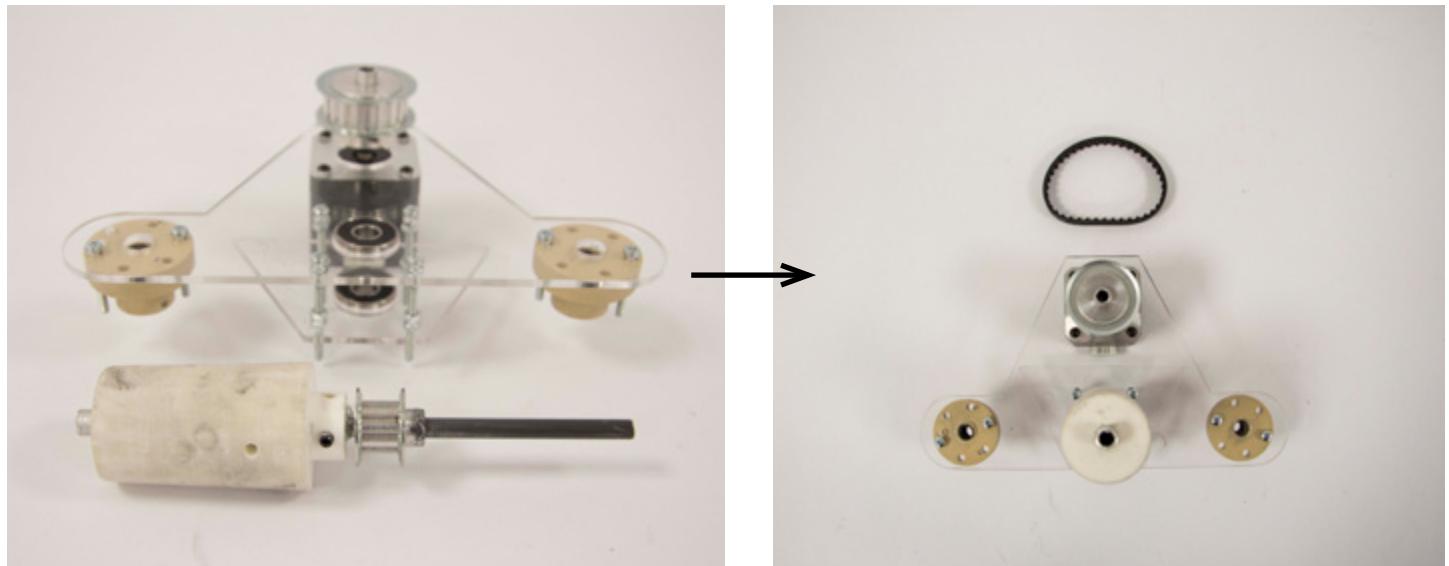
3. ELEVATOR - Material Assembly



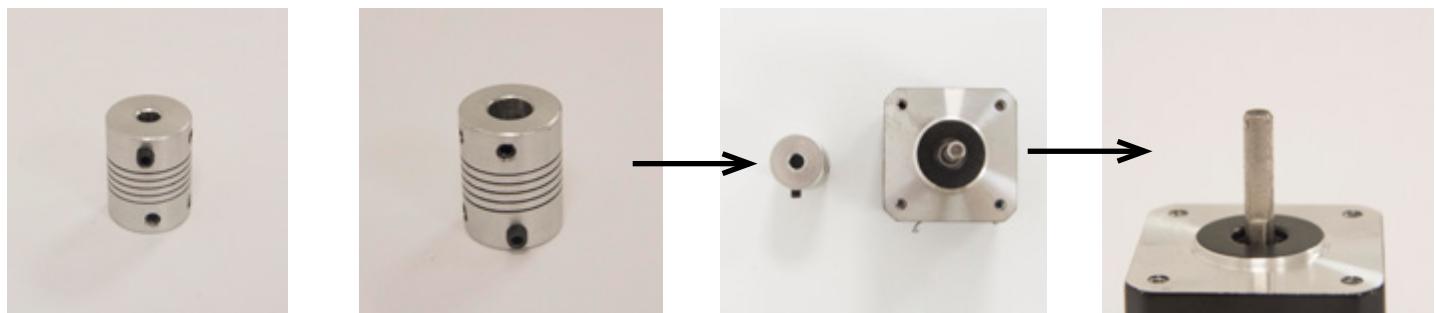
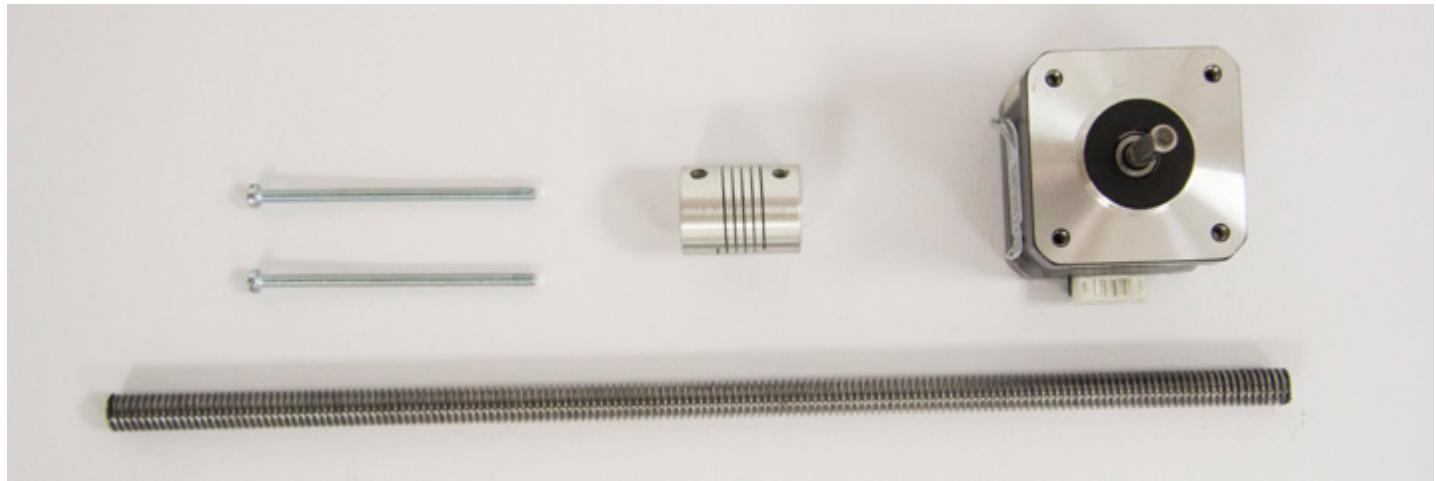
3. ELEVATOR - Material Assembly



3. ELEVATOR - Material Assembly



3. ELEVATOR - Material Assembly



1.4. FRAME – Final Assembly



A

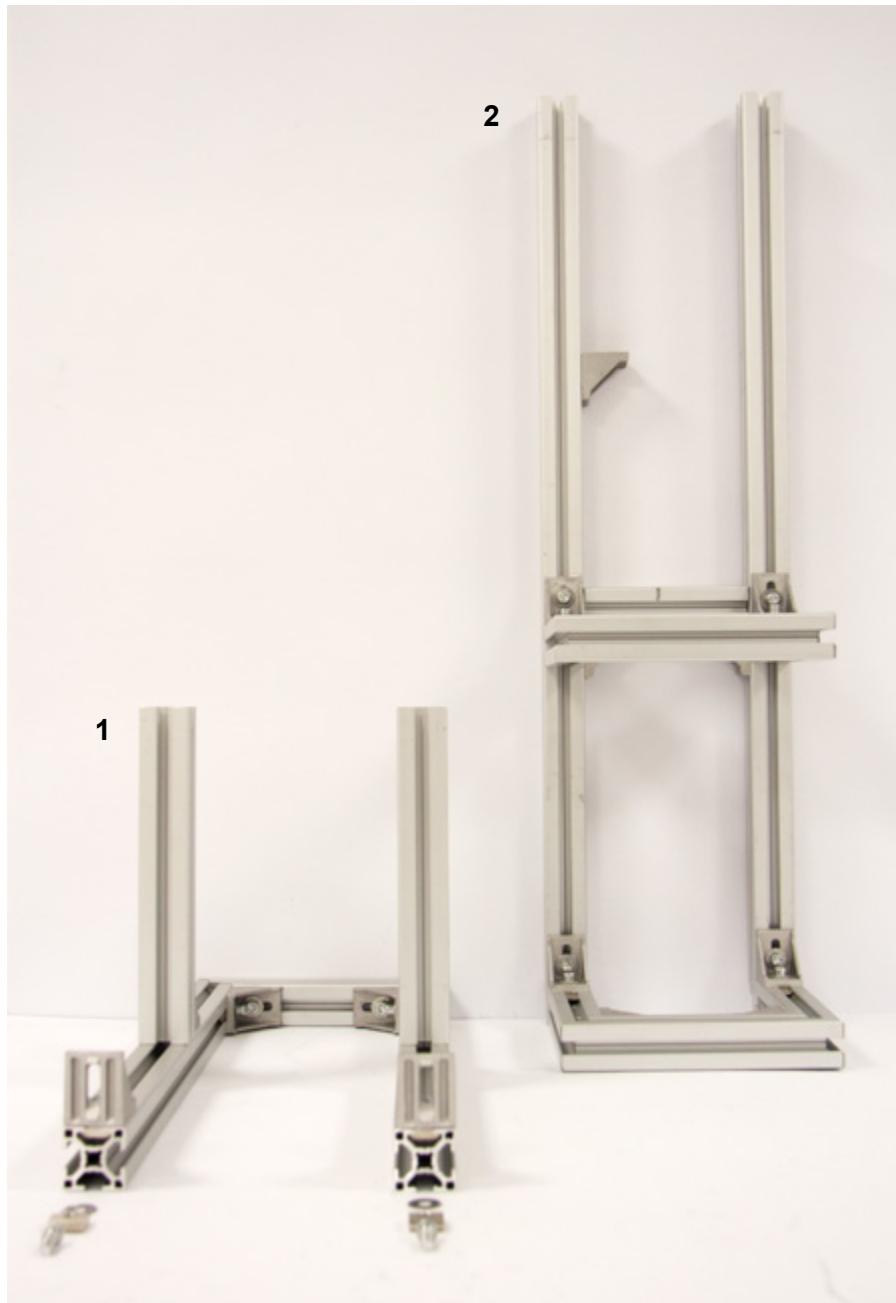


B

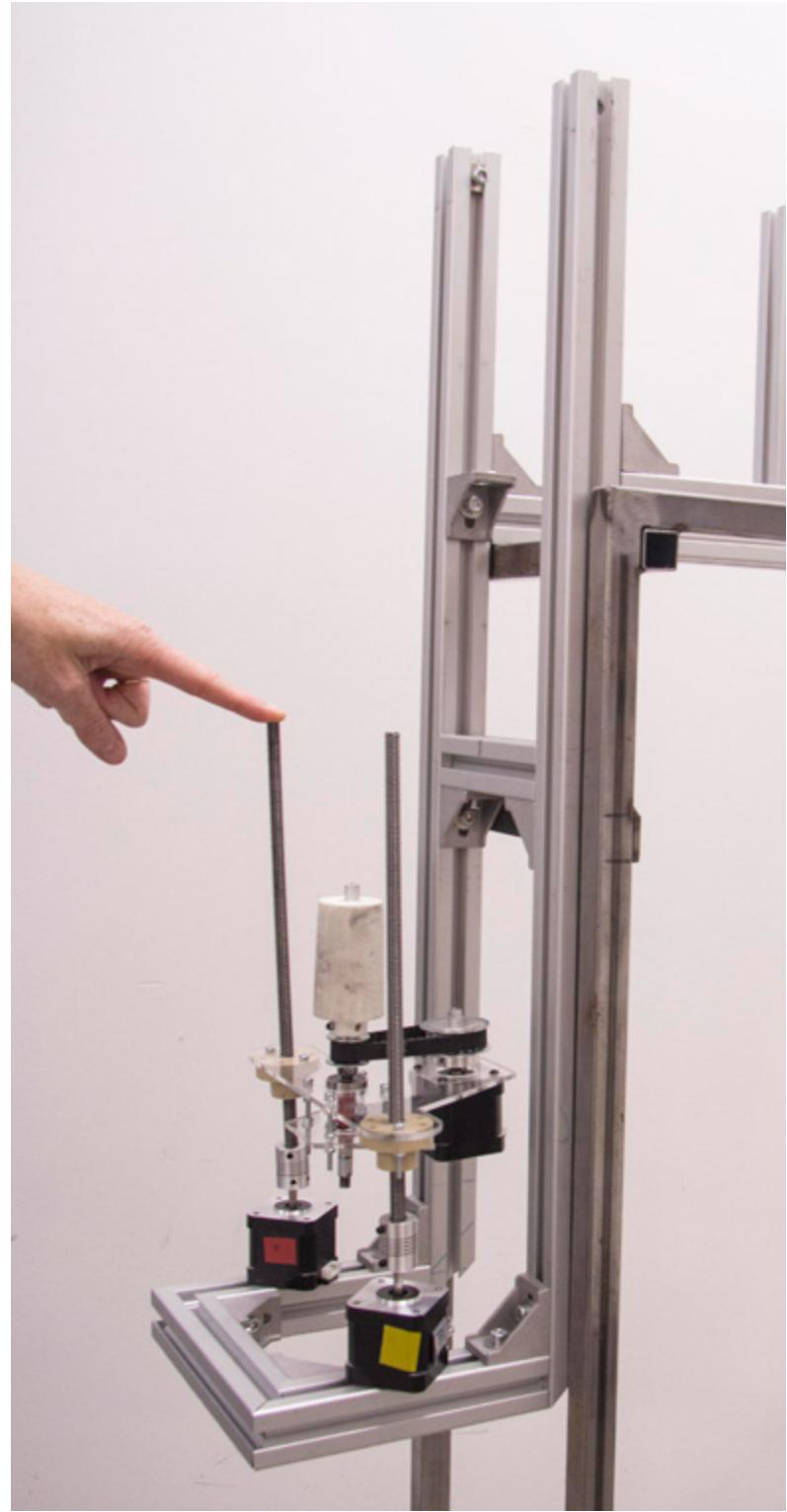
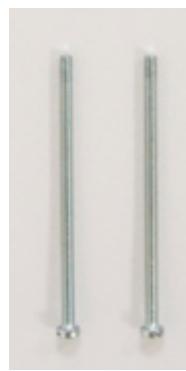
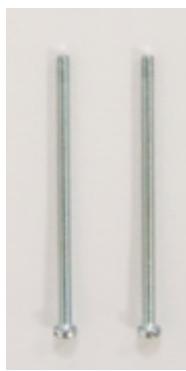
1.4. FRAME – Final Assembly

Assembly the Table (1) and Elevator Extrusion (2): Place extrusion 1 behind the extrusion 2 and make sure that both have the same height.

And hold the Drafting Extrusion ready for the next step!



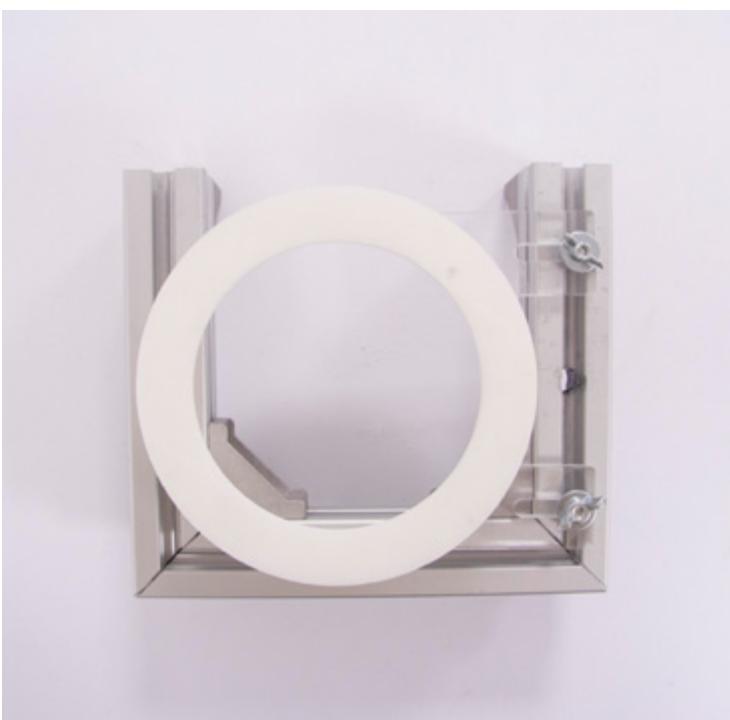
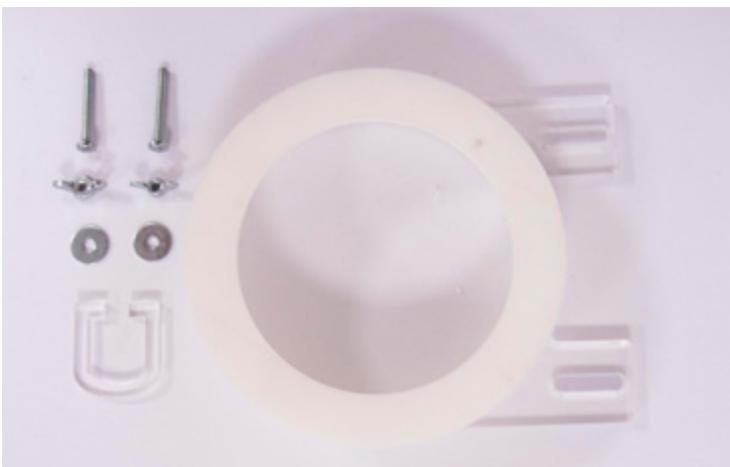
1.4. FRAME – Final Assembly



1.4. FRAME – Final Assembly



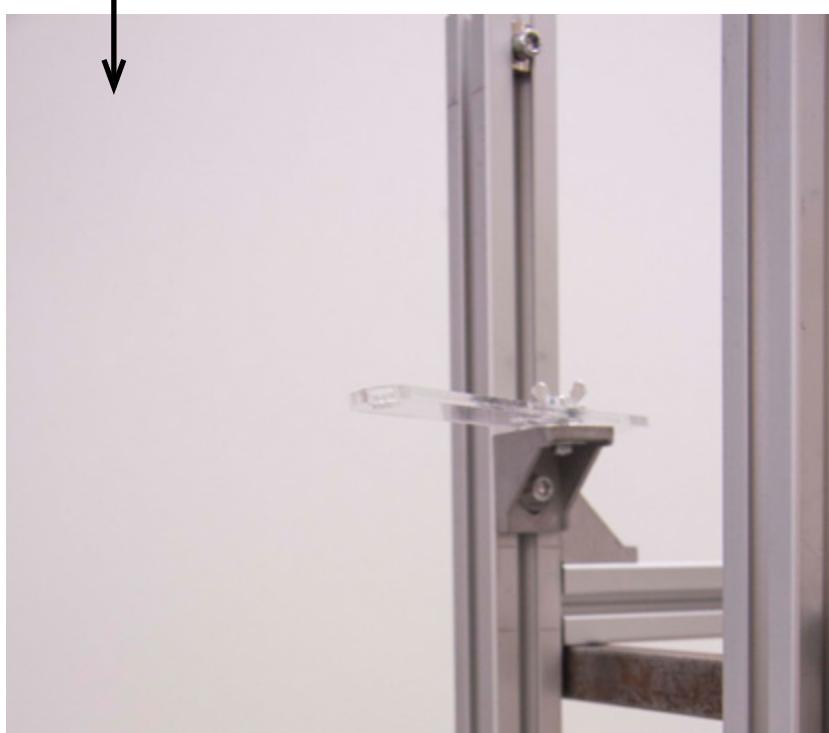
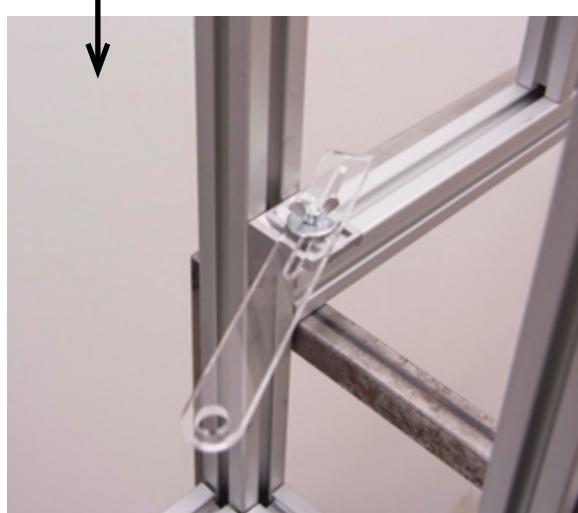
1.4. FRAME – Final Assembly



1.4. FRAME – Final Assembly



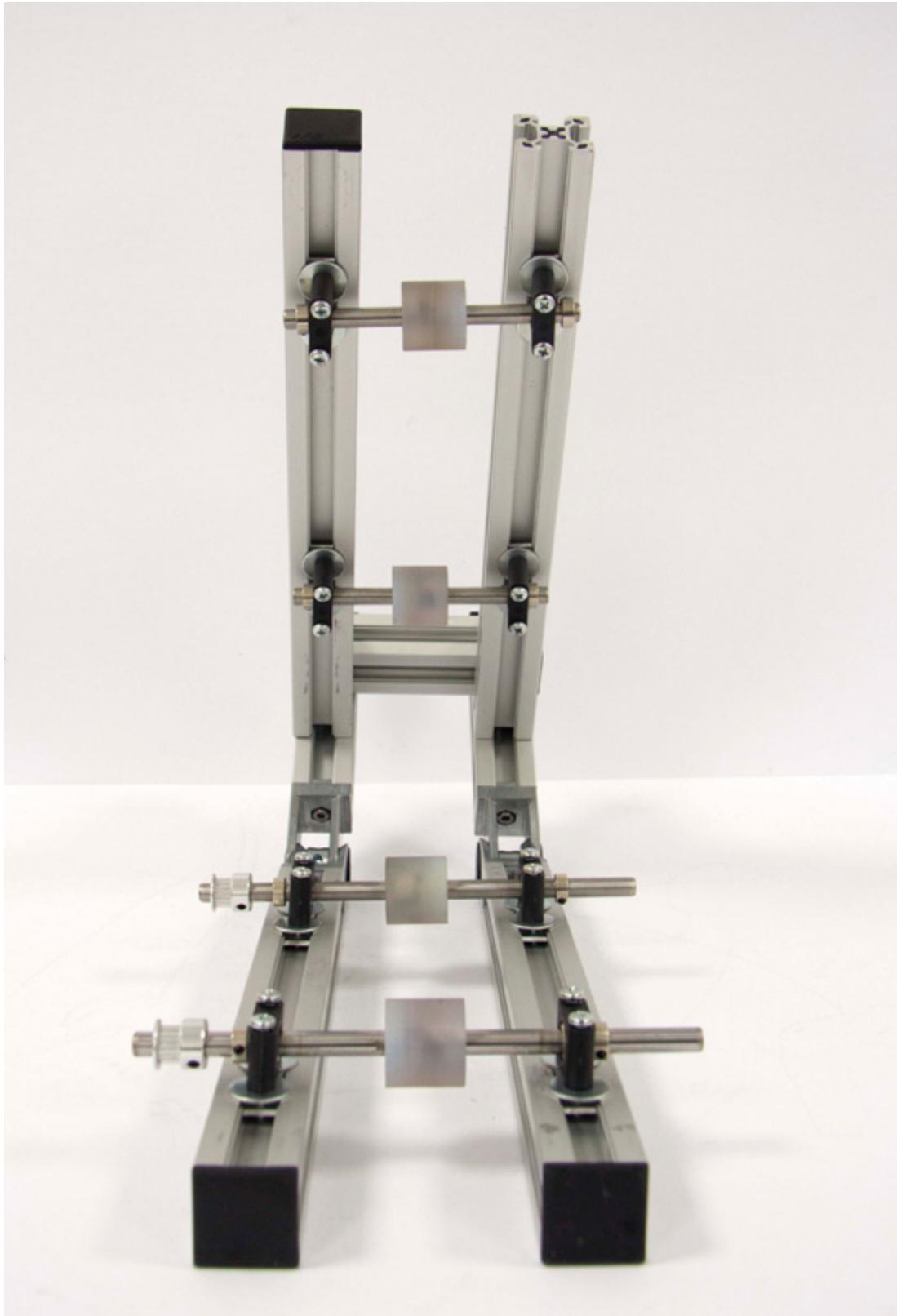
1.4. FRAME – Final Assembly



1.4. FRAME – Final Assembly



1.4. FRAME – Final Assembly

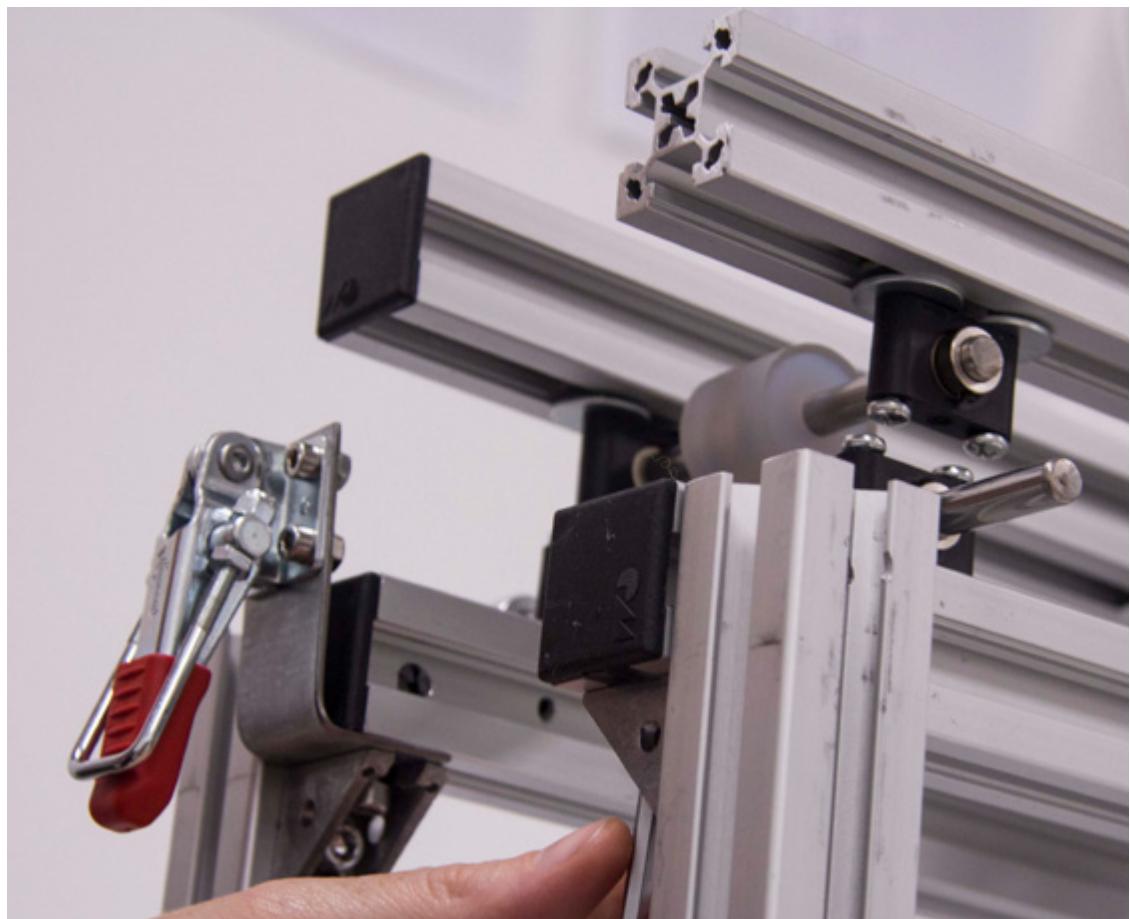
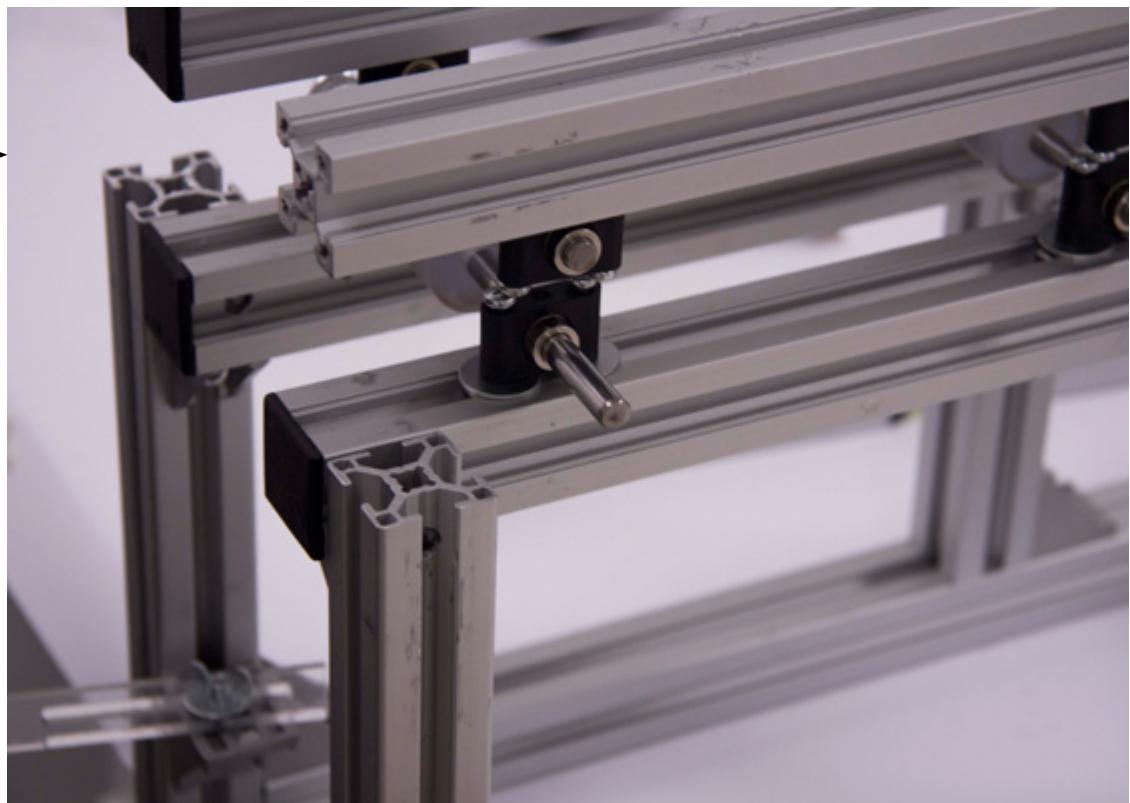


1.4. FRAME – Final Assembly

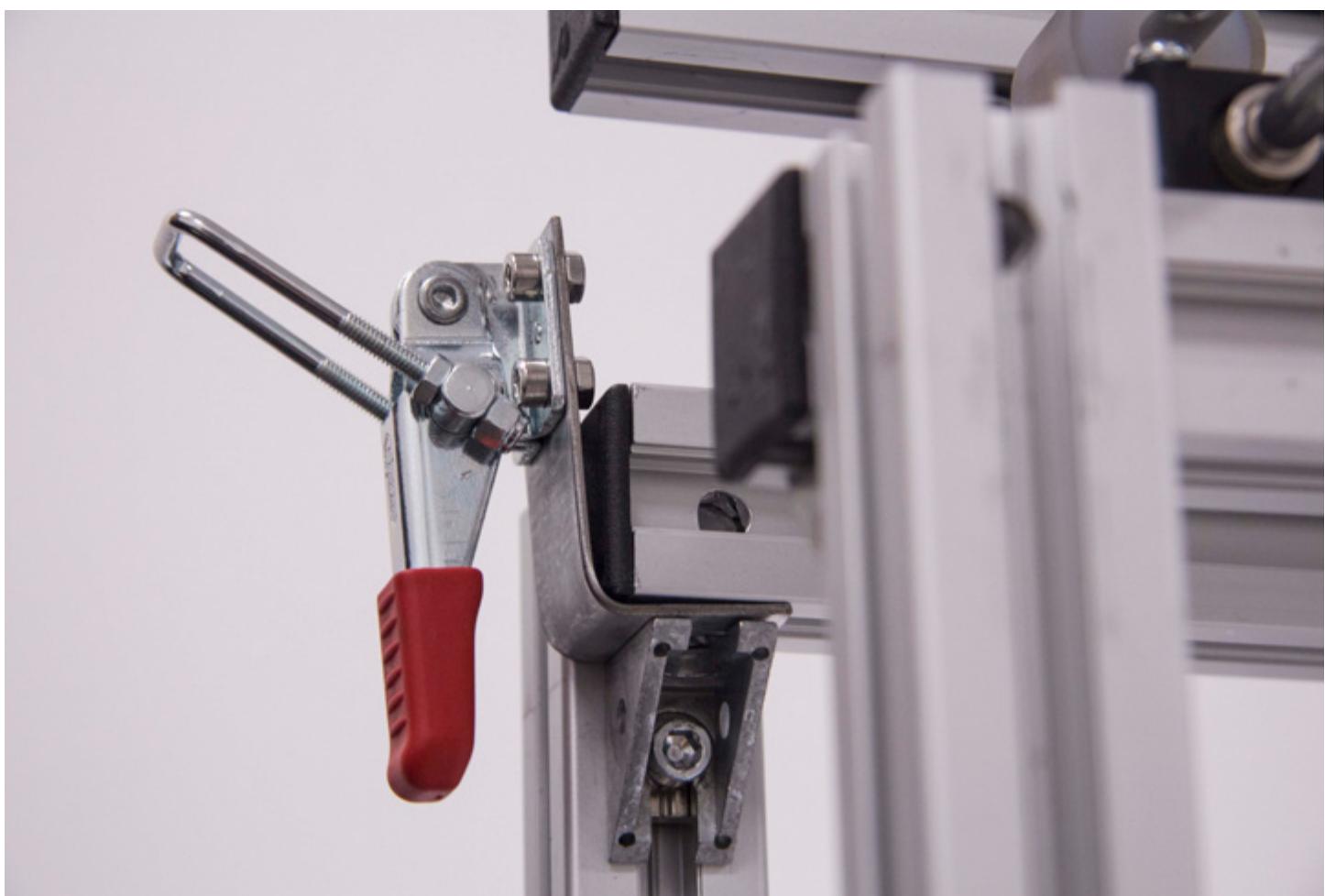
8 x



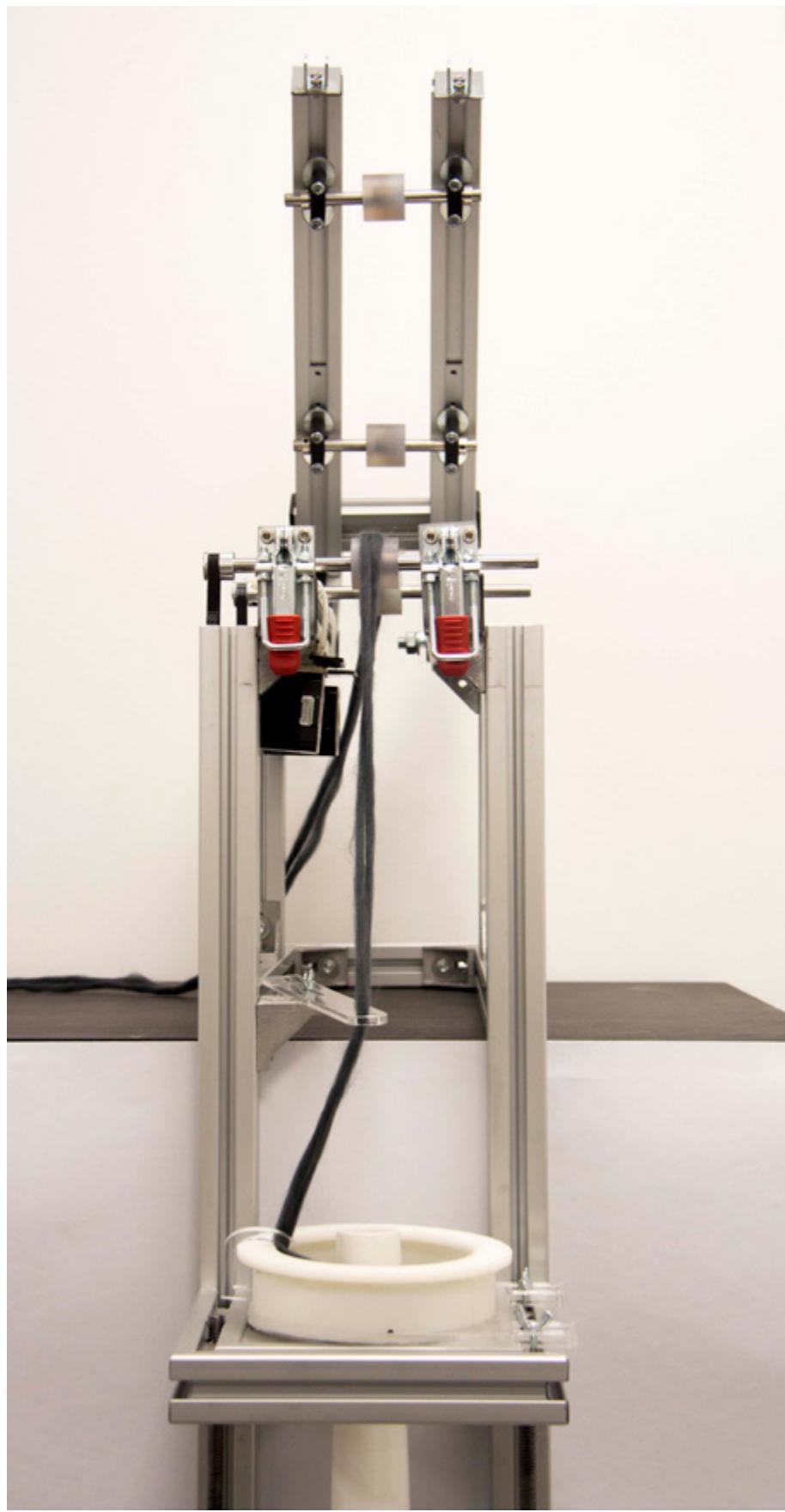
4 x



1.4. FRAME – Final Assembly



1.4. FRAME – Final Assembly



1.4. FRAME – Final Assembly

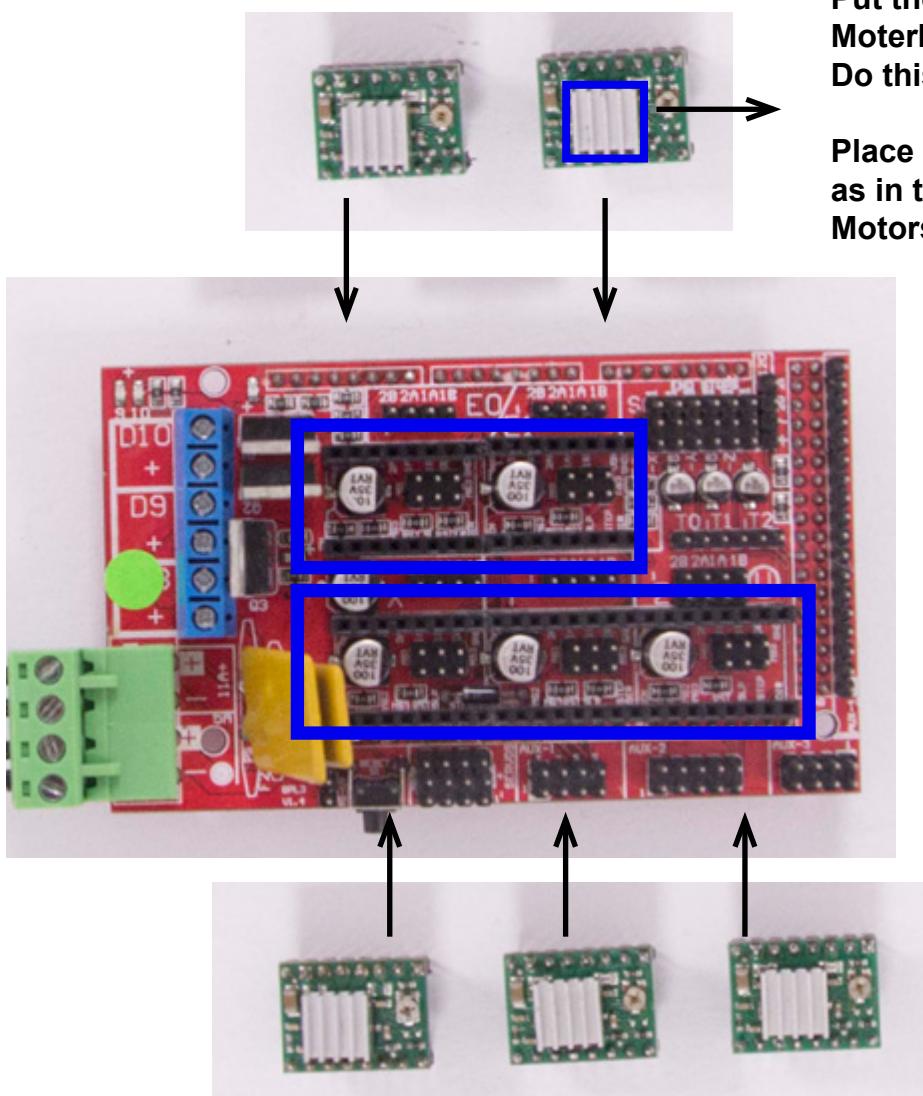


5. ELECTRONICS - Material Assembly

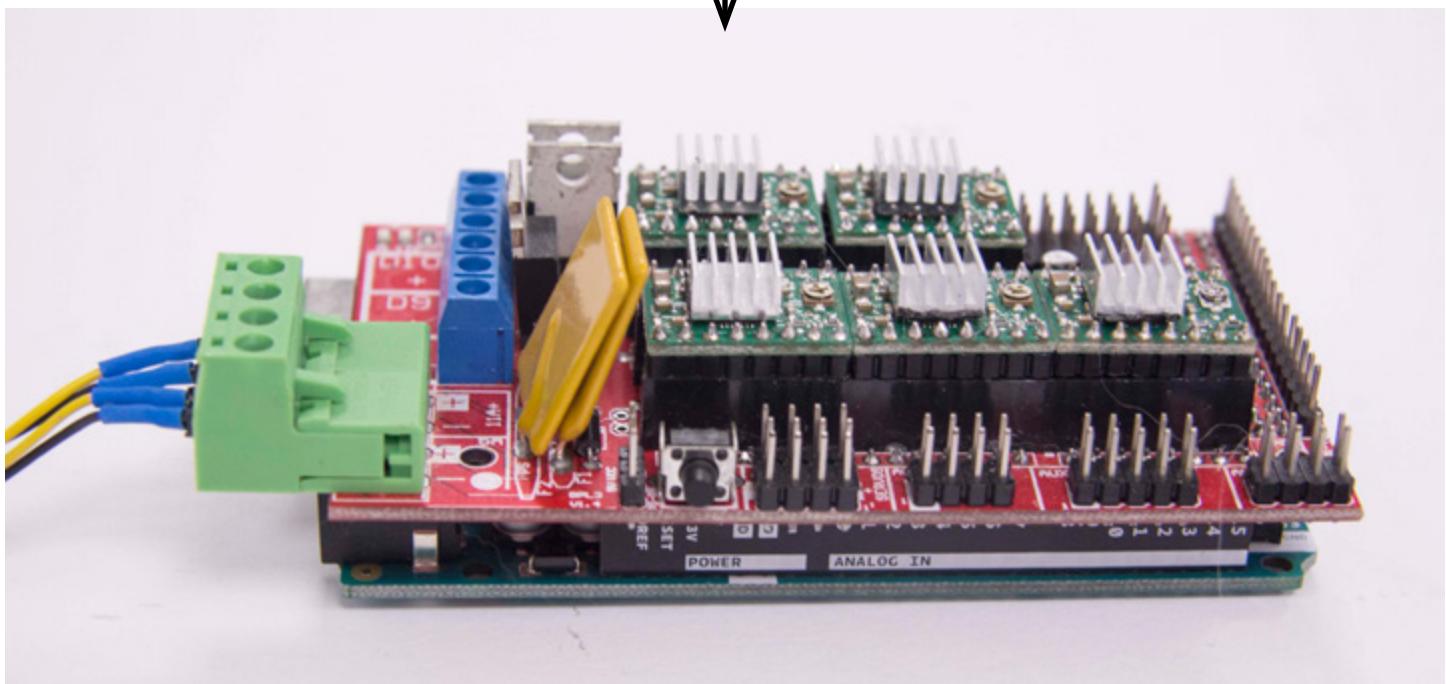
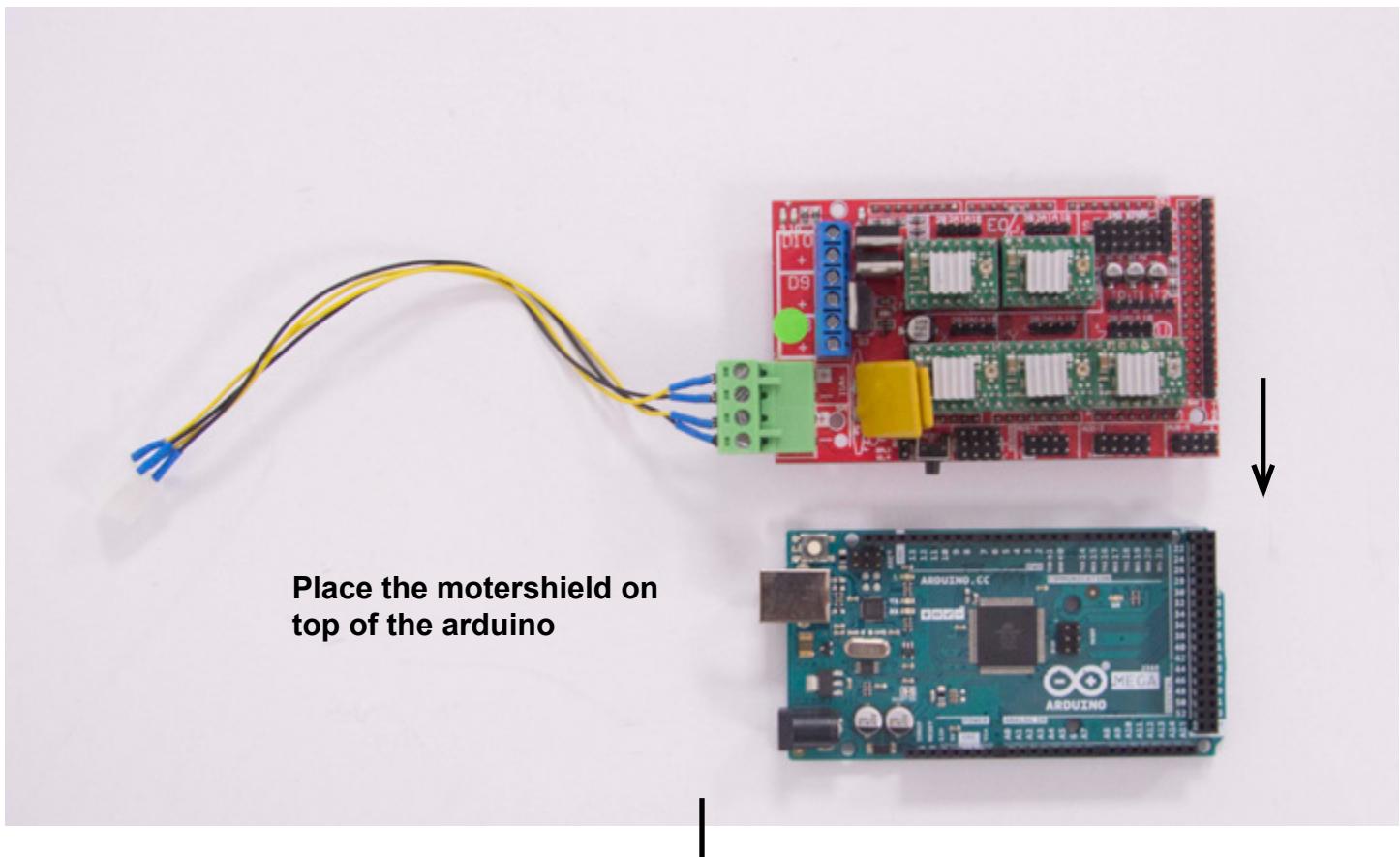
1 x Motorboard
5 x Heatsink
5 x Motorboards pololu
1 x MotorsShield
1 x Arduino mega
5 x Connection wires
1 x Powersupply
1 x Usb A to B cable
1 x Power cable

Put the Heatsink on top at the Motorboards from pololu.
Do this 5x.

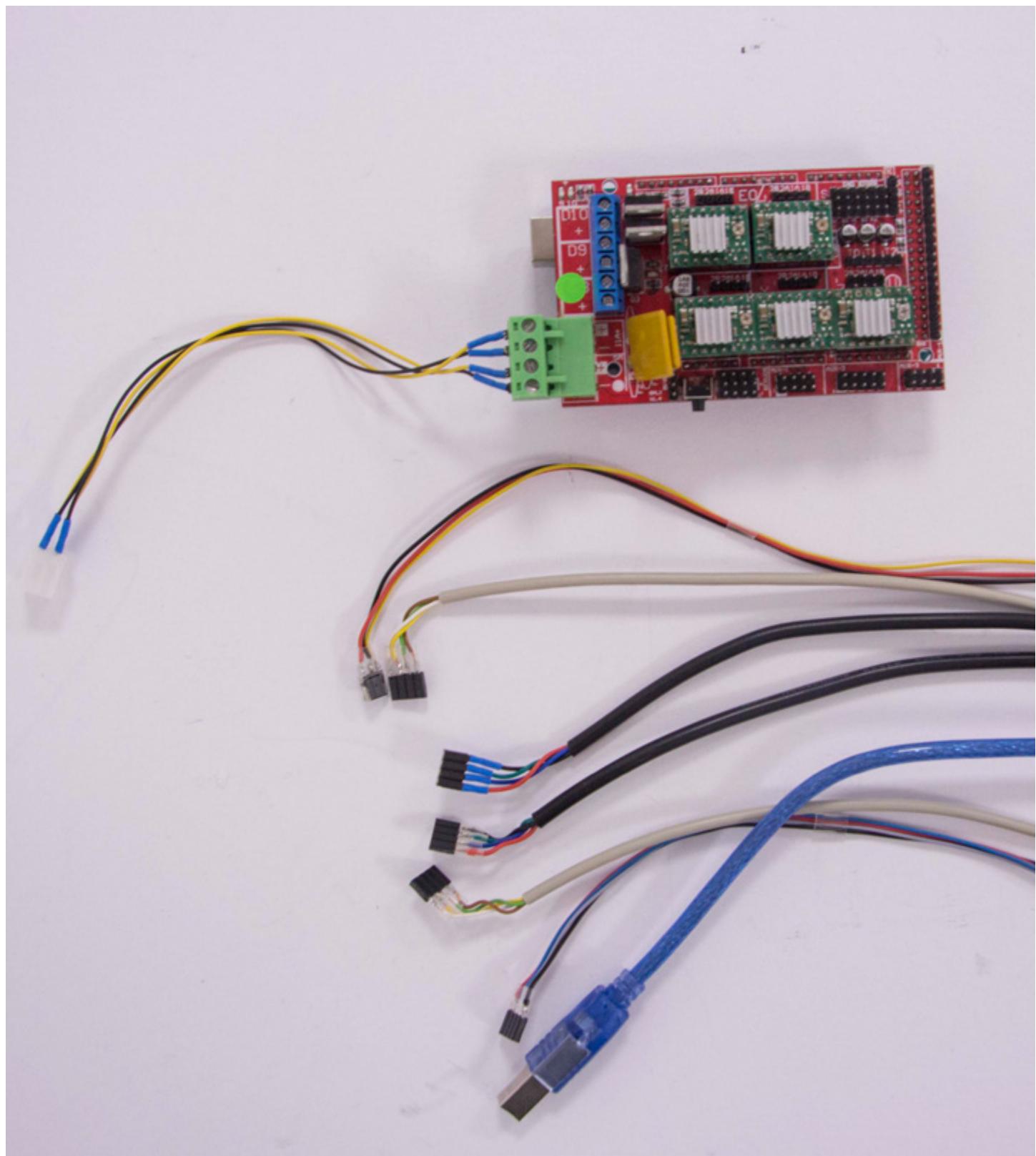
Place it ectecly in the positon as in the photo on top of the MotorsShield



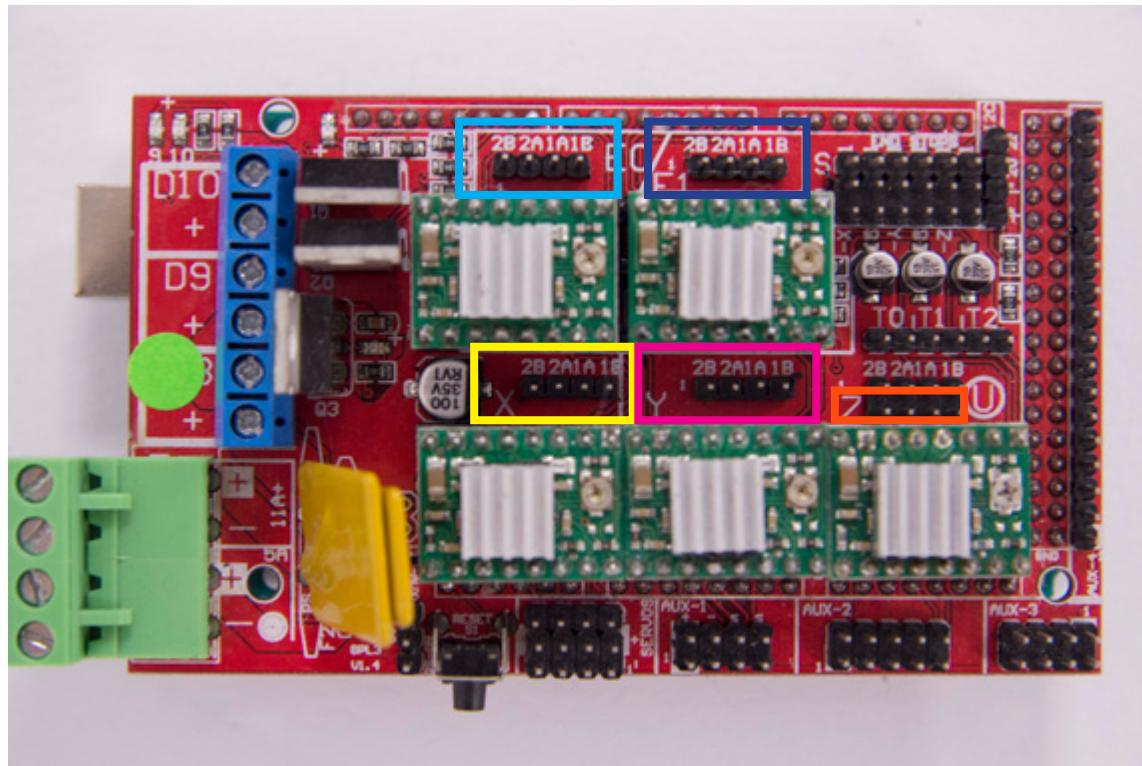
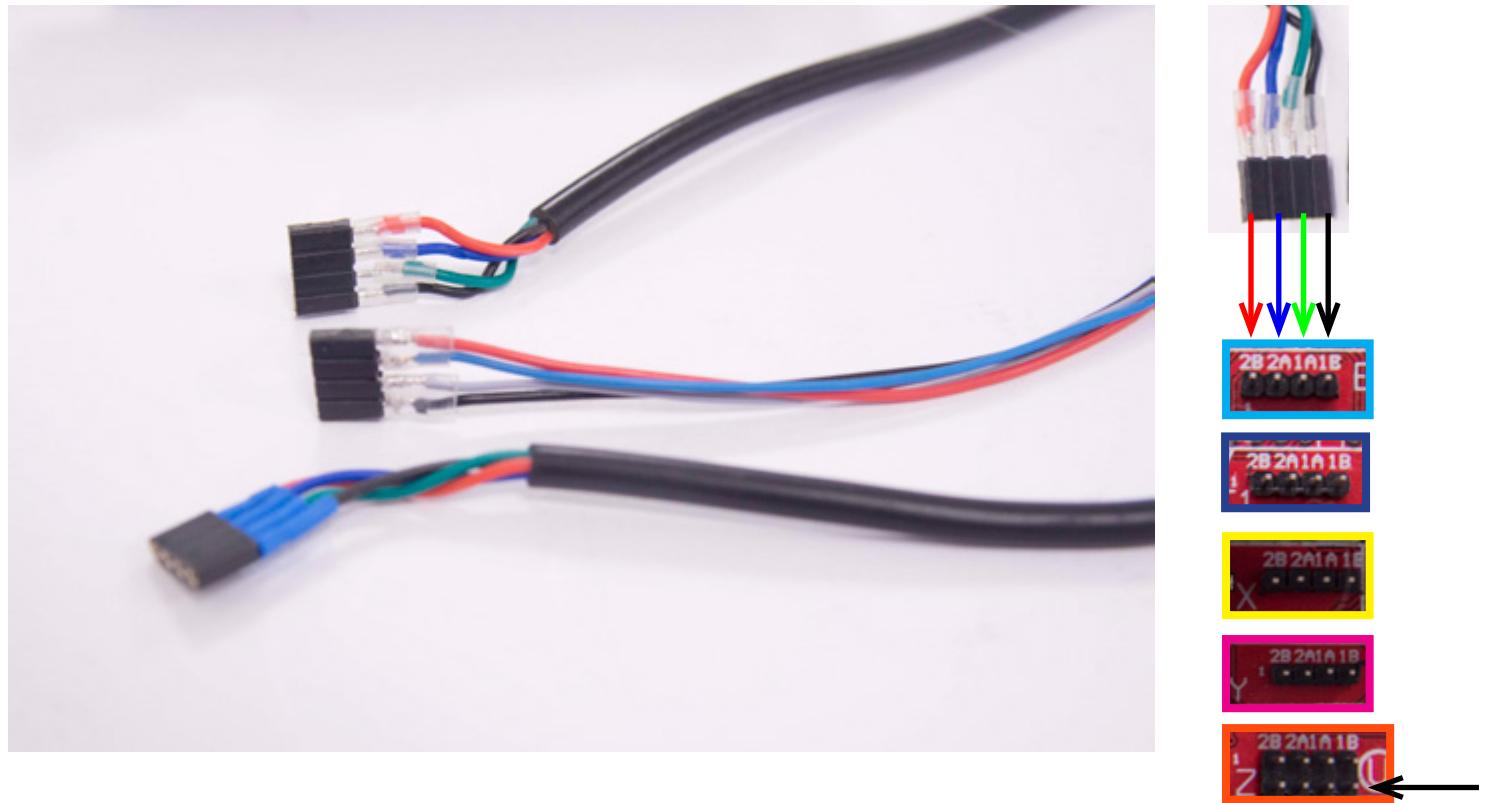
5. ELECTRONICS - Material Assembly



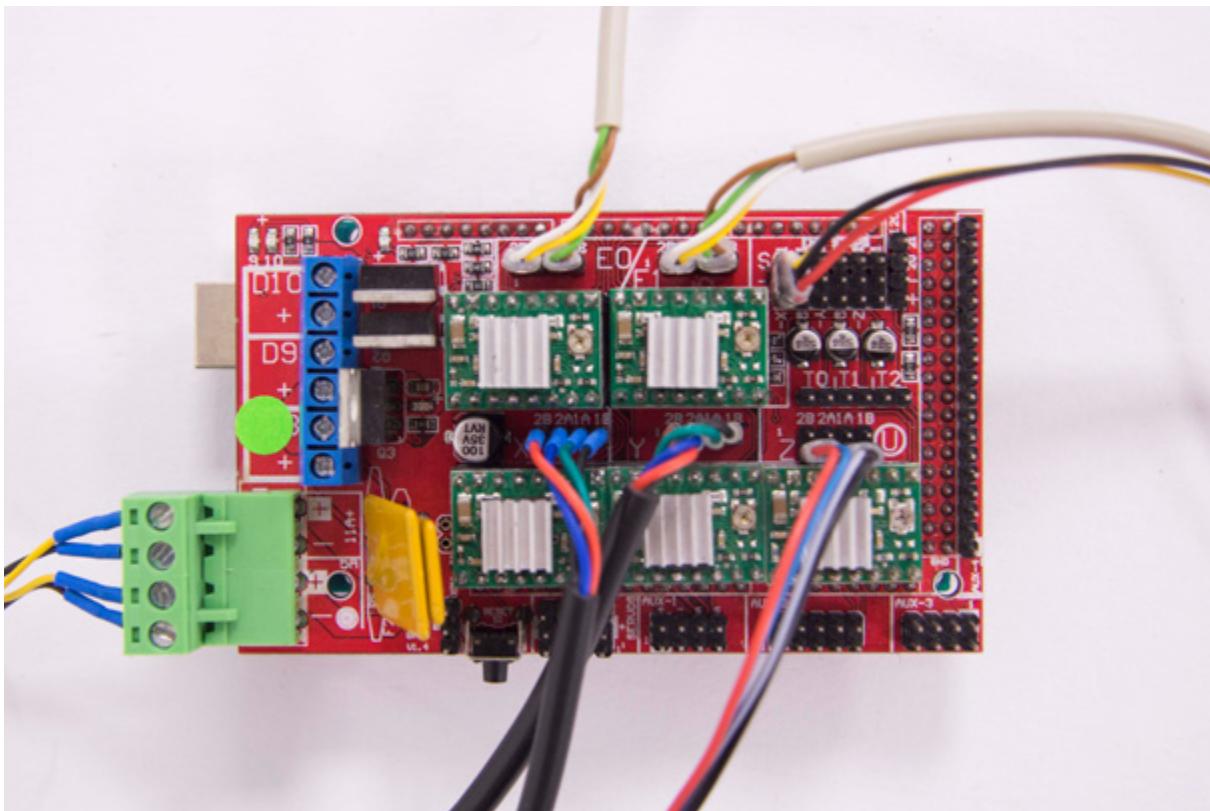
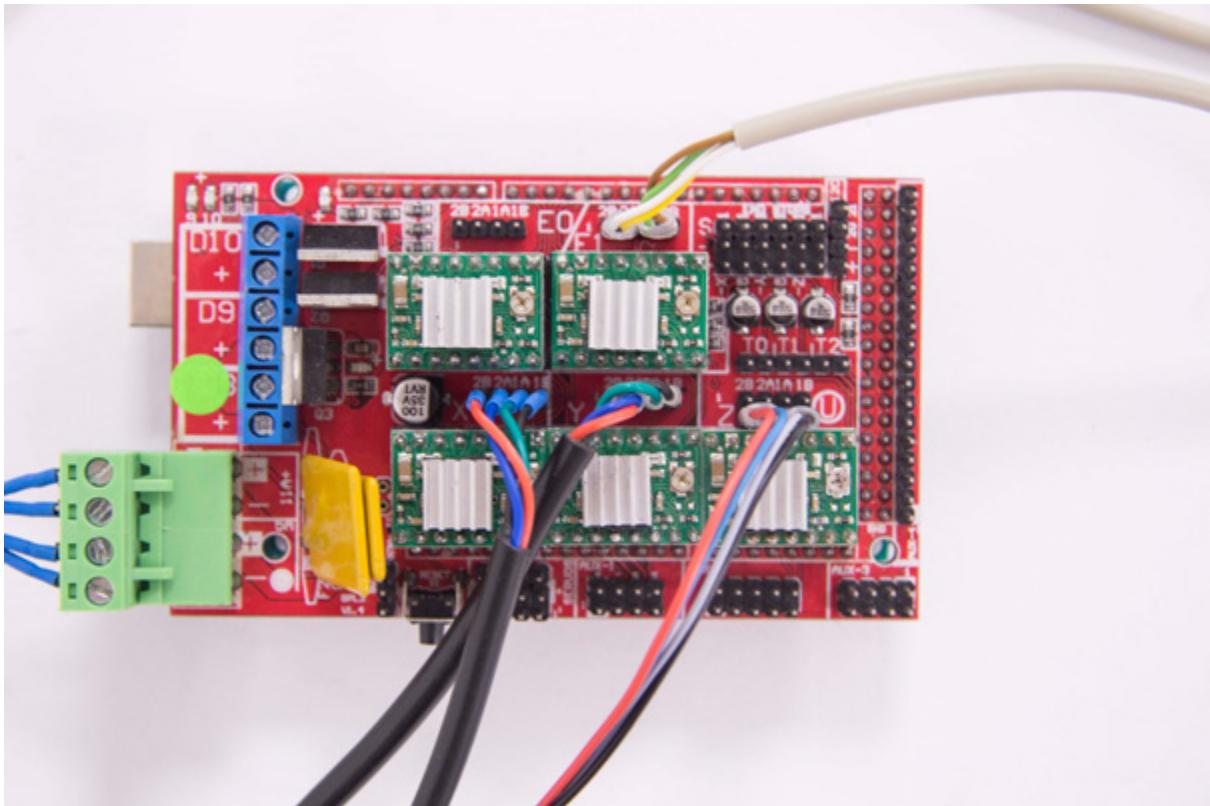
5. ELECTRONICS - Material Assembly



5. ELECTRONICS - Material Assembly



5. ELECTRONICS - Material Assembly



5. ELECTRONICS - Material Assembly

