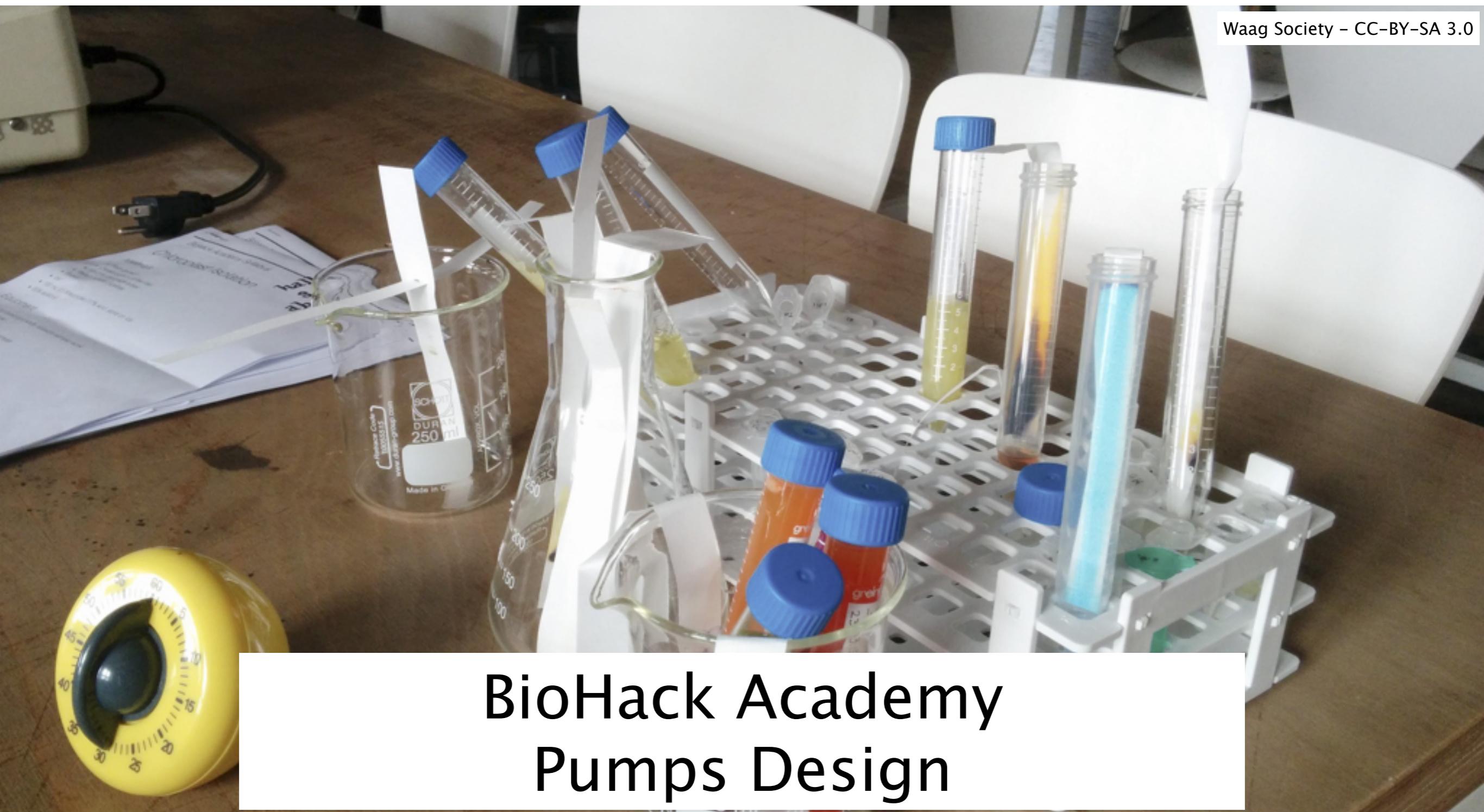




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BioHack Academy
Pumps Design



Content

- Syringe pump
- Peristaltic pump



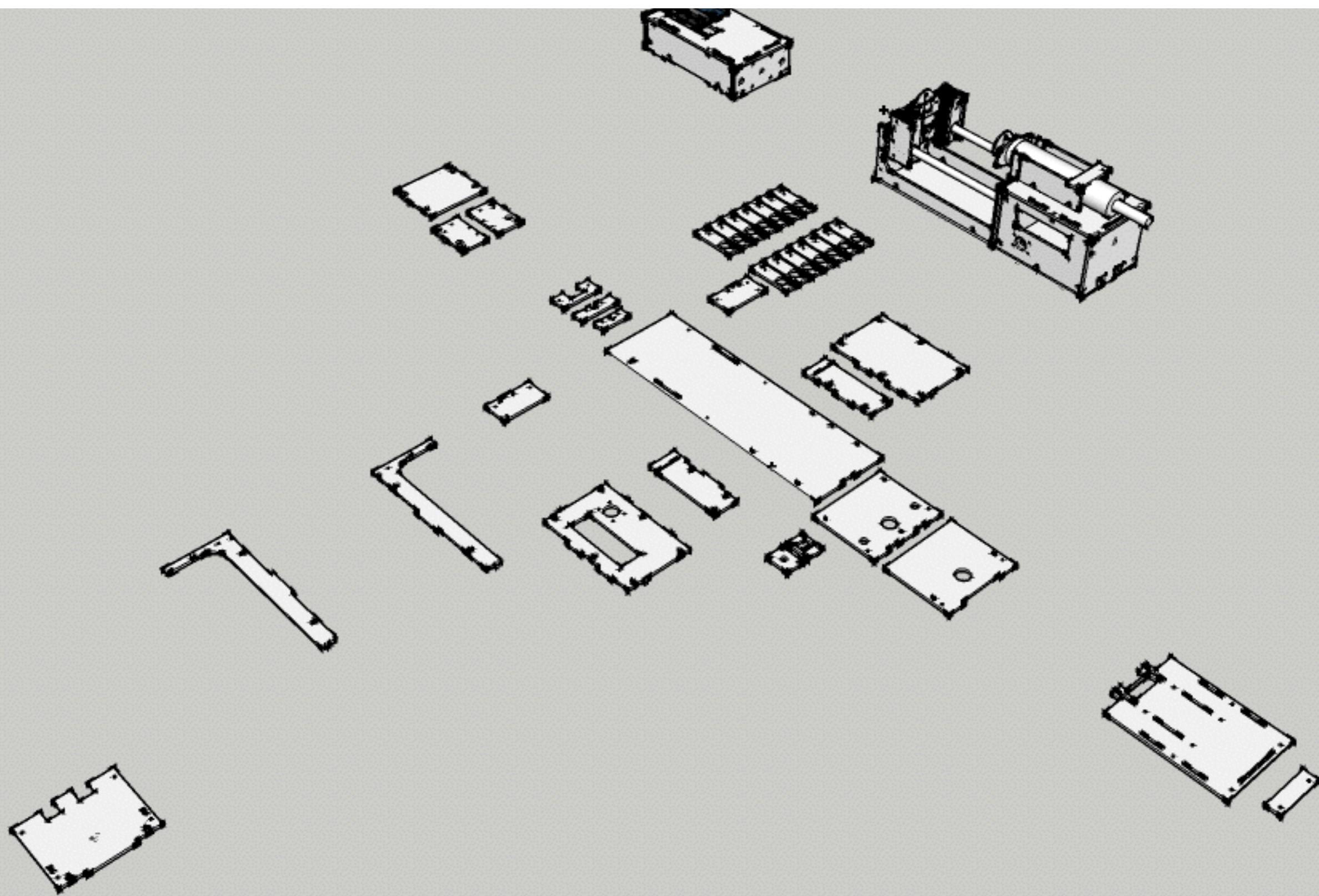
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Syringe Pump

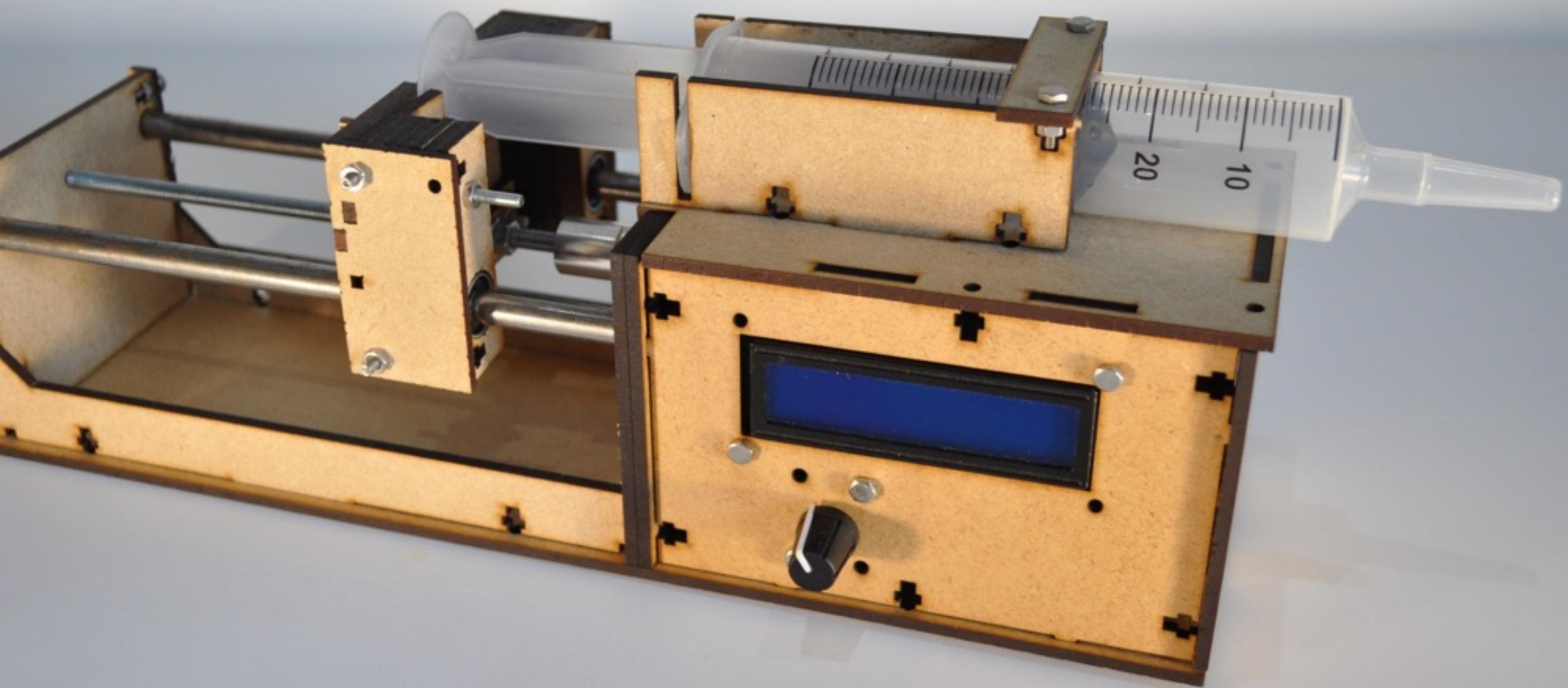


BioHack Academy design



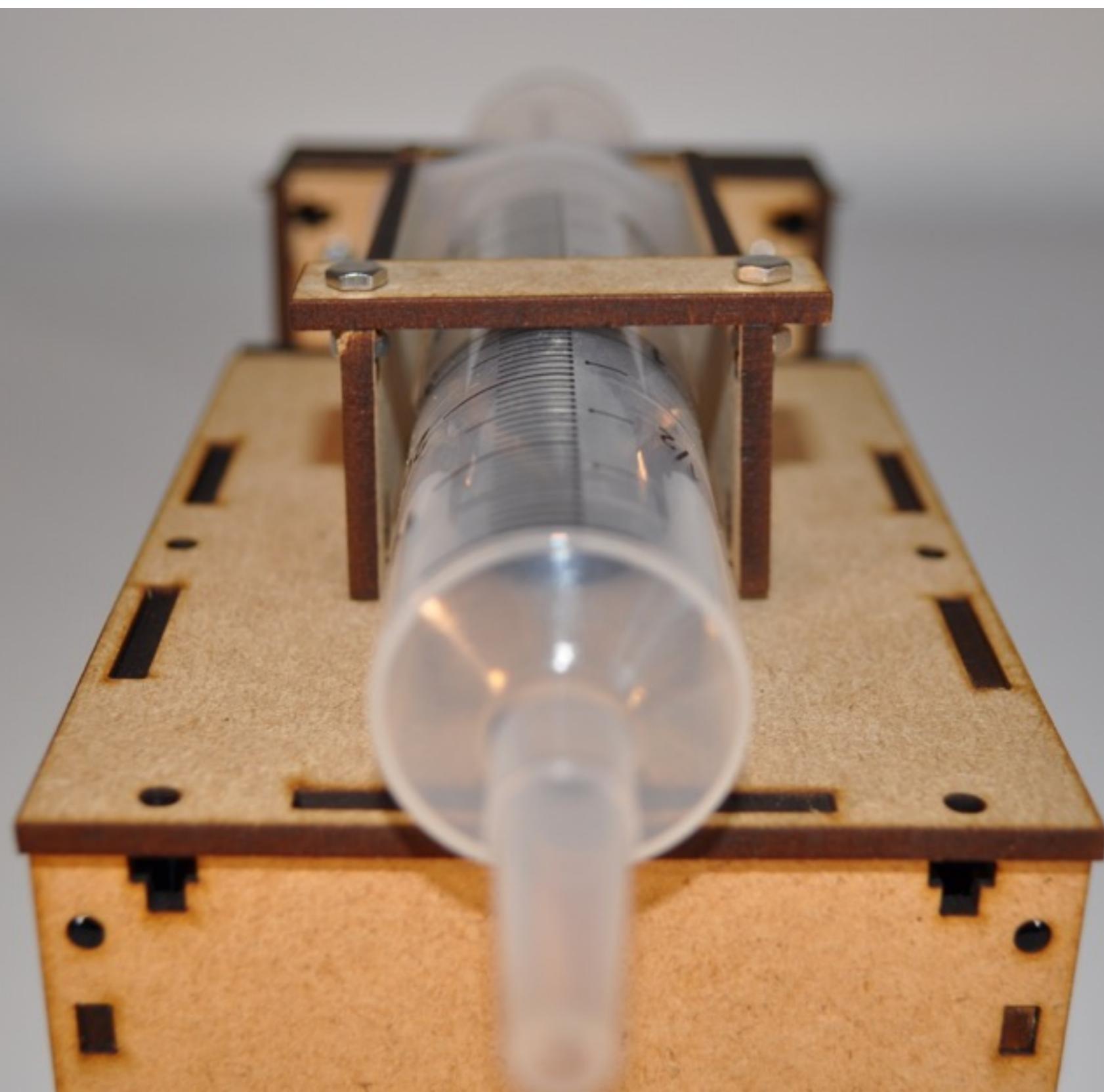


BioHack Academy design





BioHack Academy design



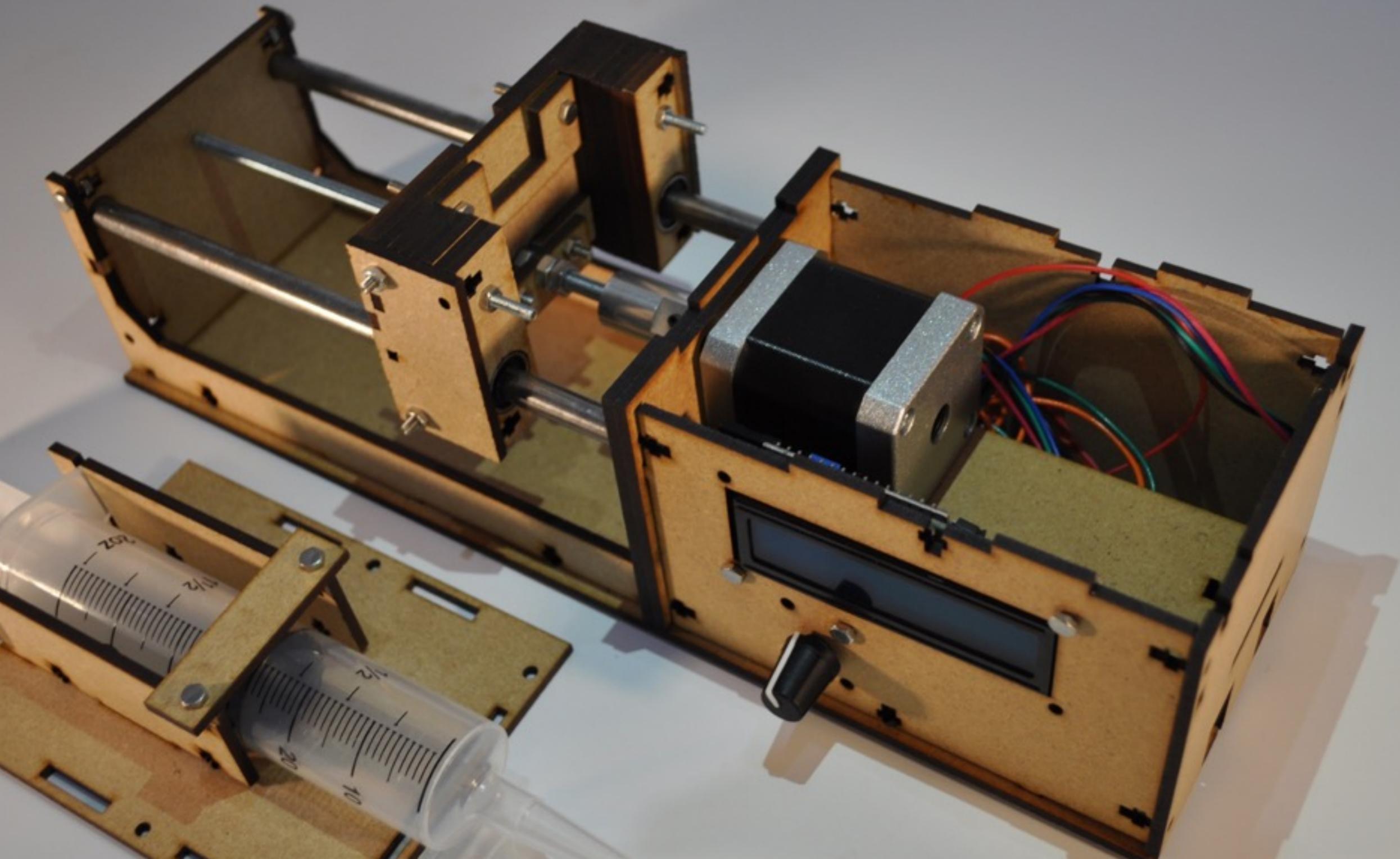


Bill of Materials

#	Amount	Description
1	1	1 NEMA17 Stepper motor
2	1	1 Pololu Stepper Driver
3	1	1 8mm smooth rod
4	1	1 Axis coupling
5	1	1 M5 threaded rod
6	3	3 Hexagonal M5 nut
7	1	1 100 uF capacitor
8	1	1 Rotary encoder
9	1	1 Knob
10	1	1 Button
11	2	2 10K resistor
12	2	2 10nF capacitor
13	2	2 100nF capacitor
14	1	1 12V 5A Power supply

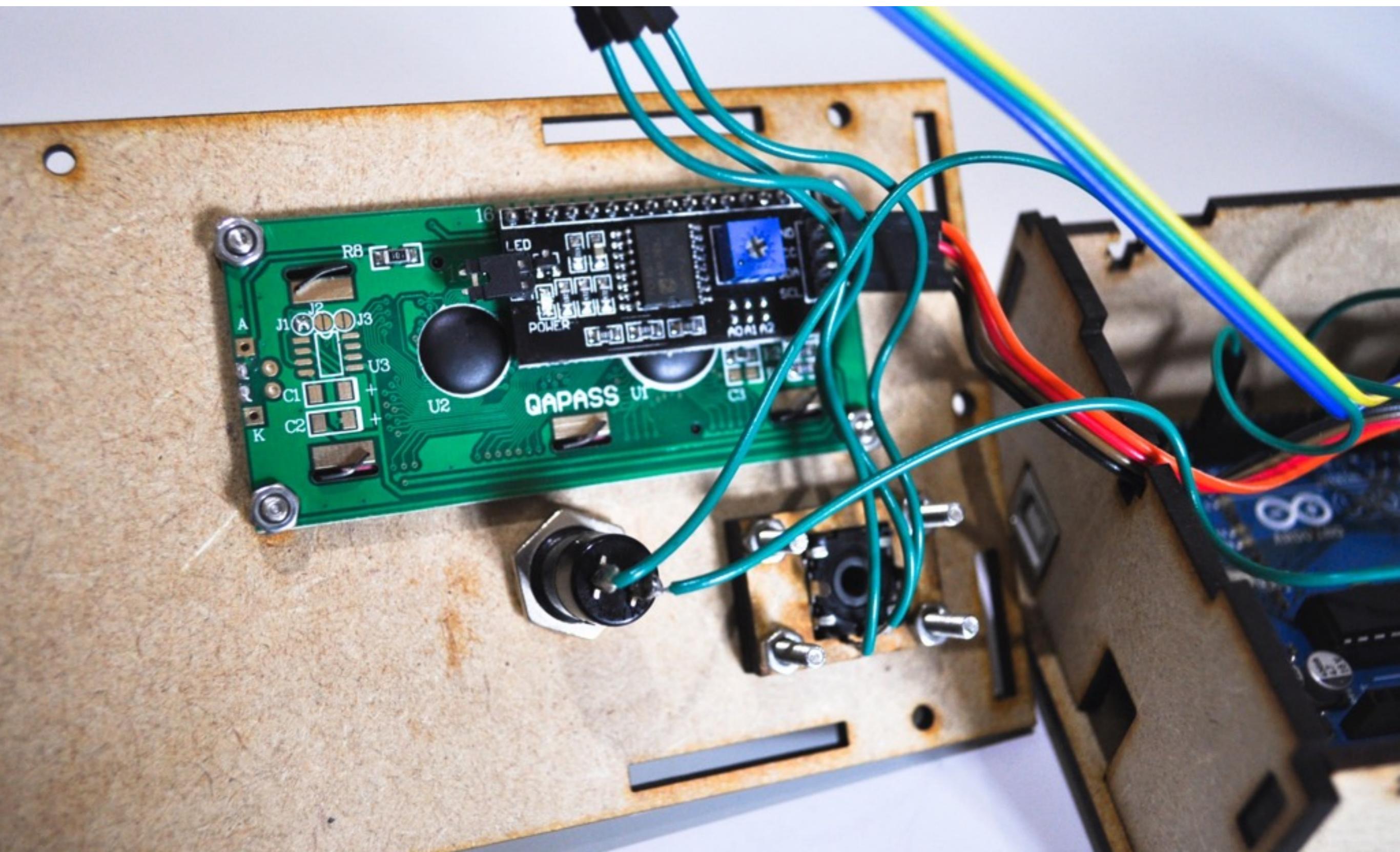


Electronics





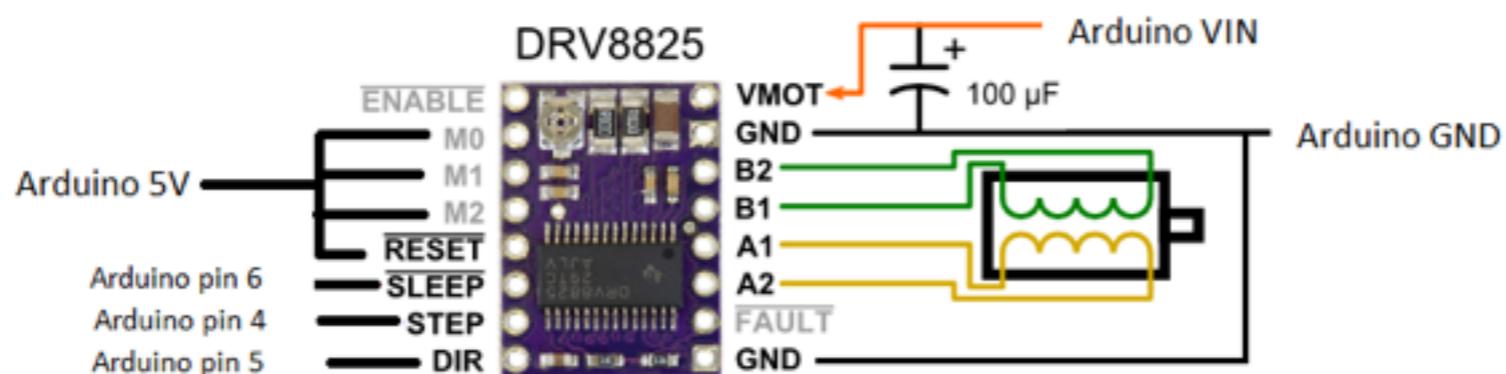
Electronics





Component Wiring

Peristaltic Pump
connection diagram





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Demonstration



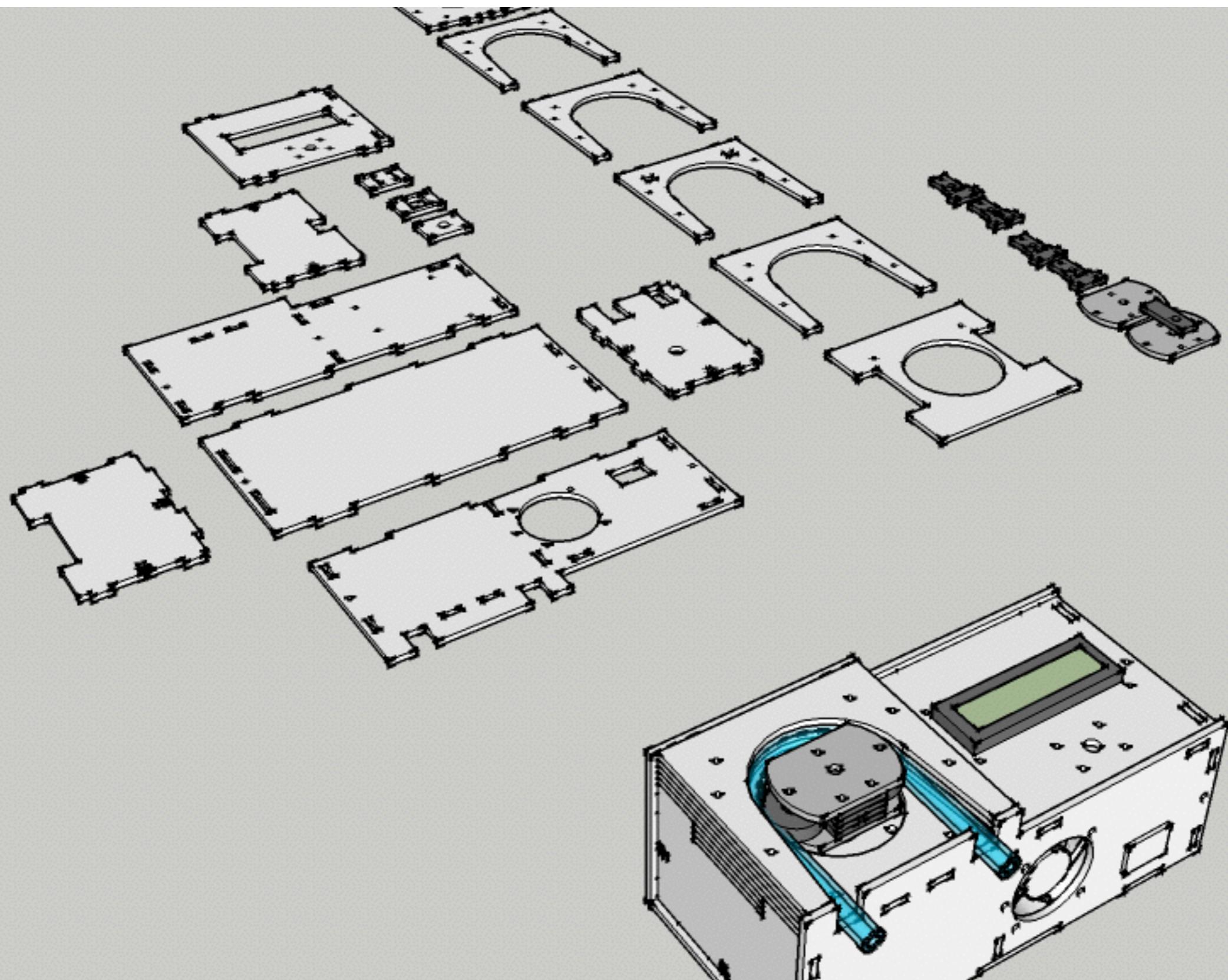
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Peristaltic pump

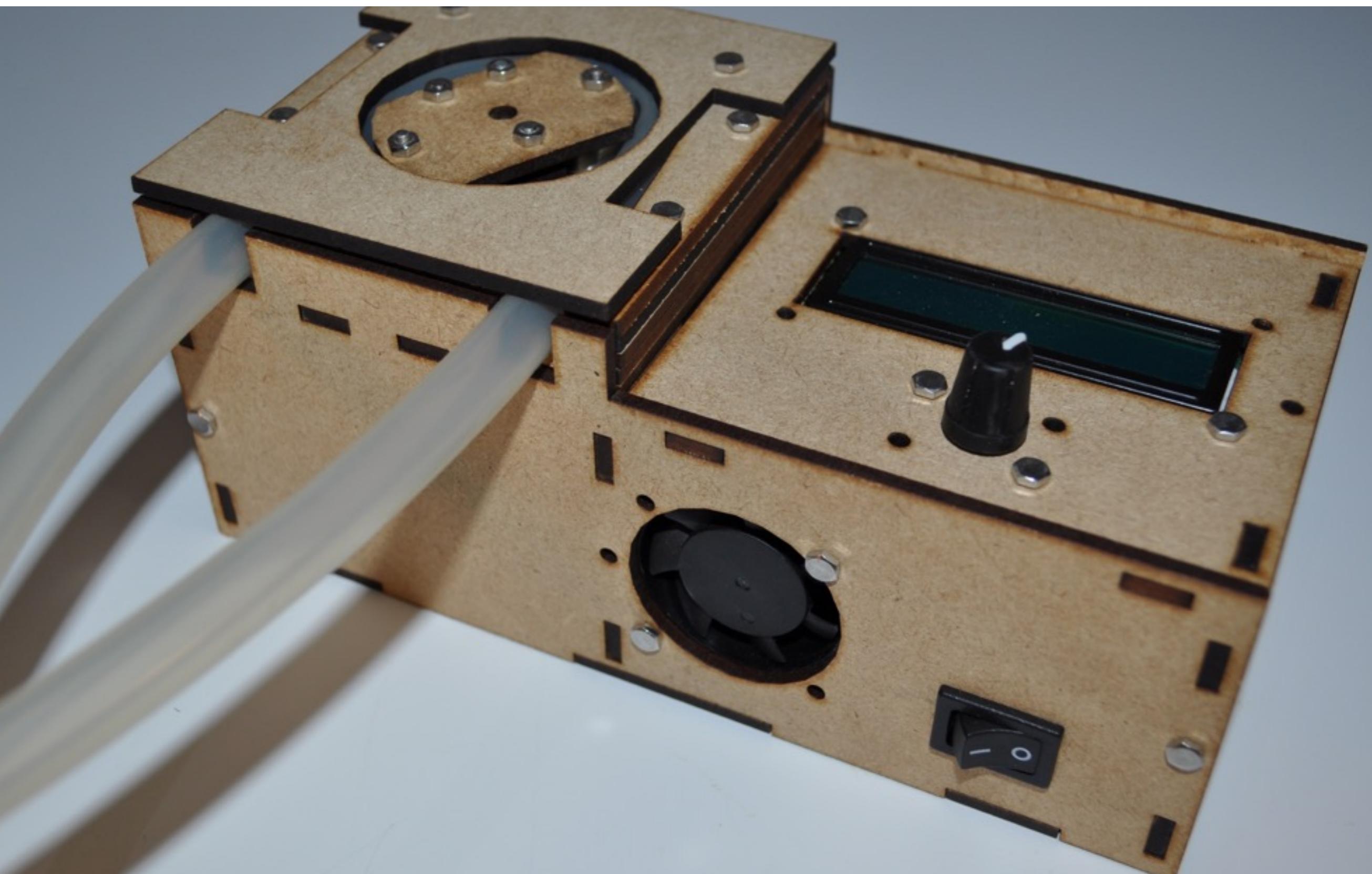


BioHack Academy design



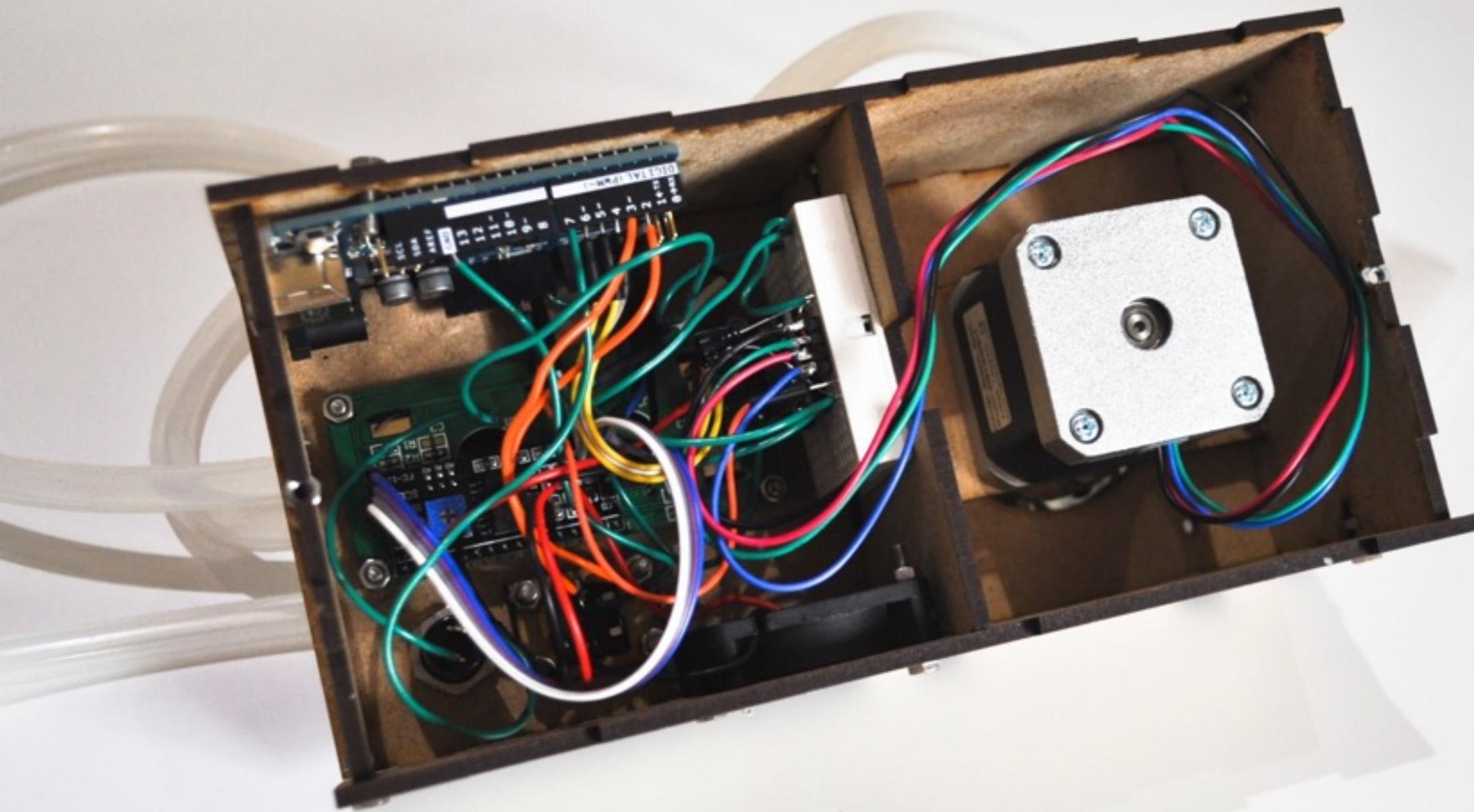


BioHack Academy design





BioHack Academy design





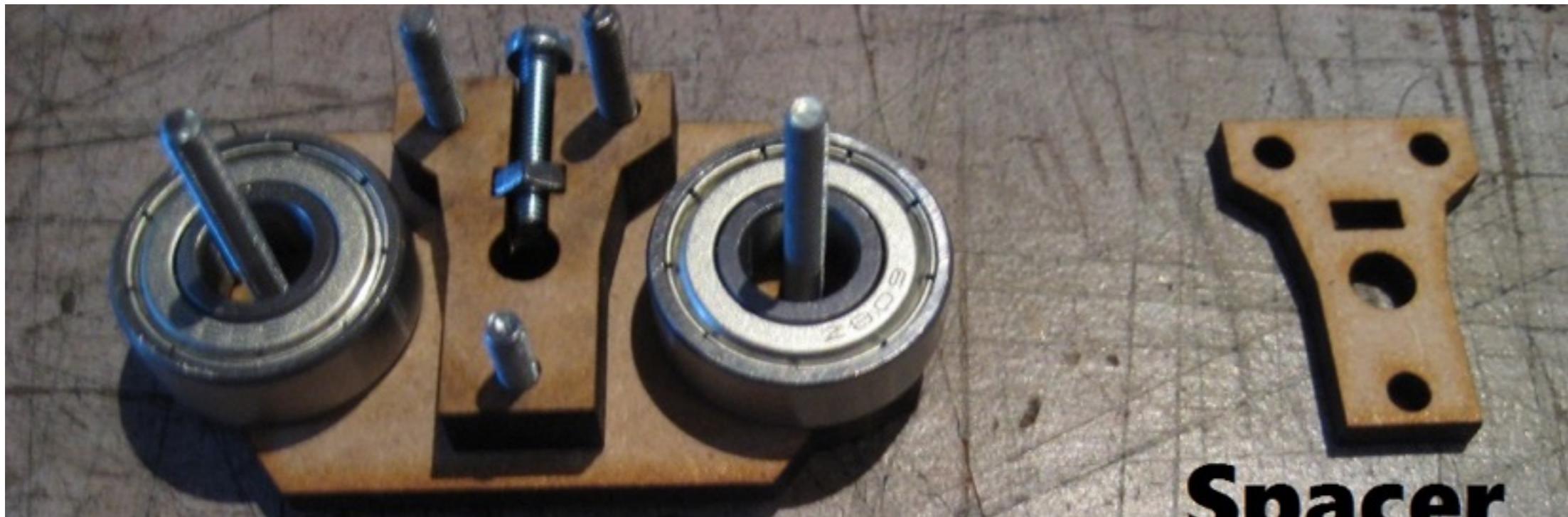
Bill of Materials

#	Amount	Description
1	1	1 NEMA17 Stepper motor
2	1	1 Pololu Stepper Driver
3	2	2 LM8UU Linear Bearings
4	1	1 100 uF capacitor
5	1	1 Heatsink
6	1	1 10 pack washers
6	1	1 Fan 40x40mm
7	1	1 Rotary encoder
8	1	1 Knob
9	1	1 Button
10	2	2 10K resistor
11	2	2 10nF capacitor
12	2	2 100nF capacitor
13	1	1 12V 5A Power supply
14	4	4 Rubber feet



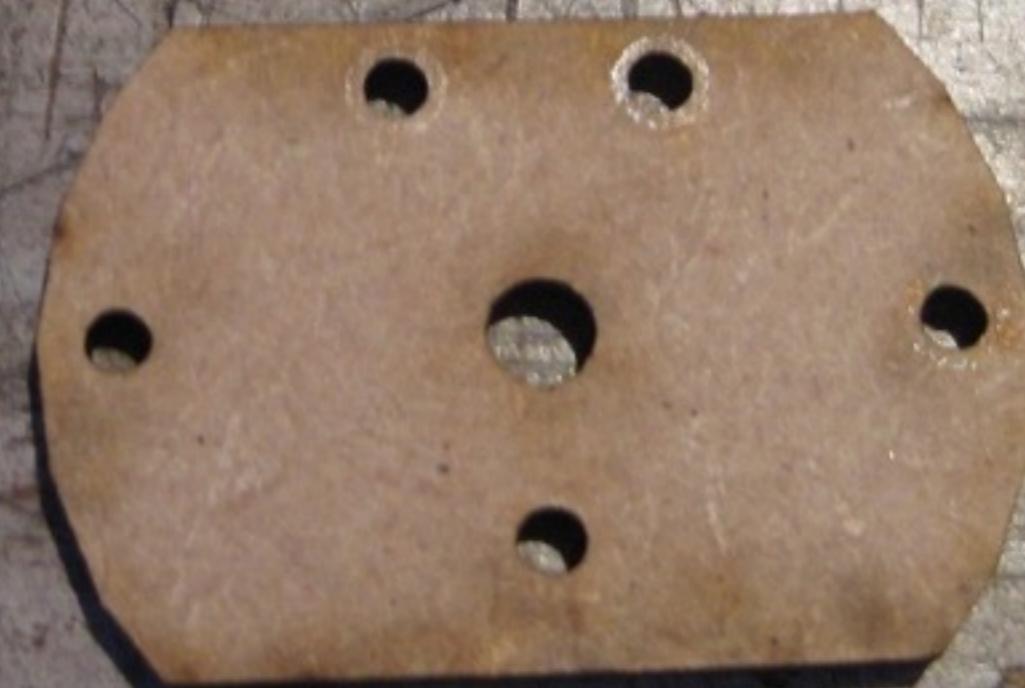
Axismounted bearings





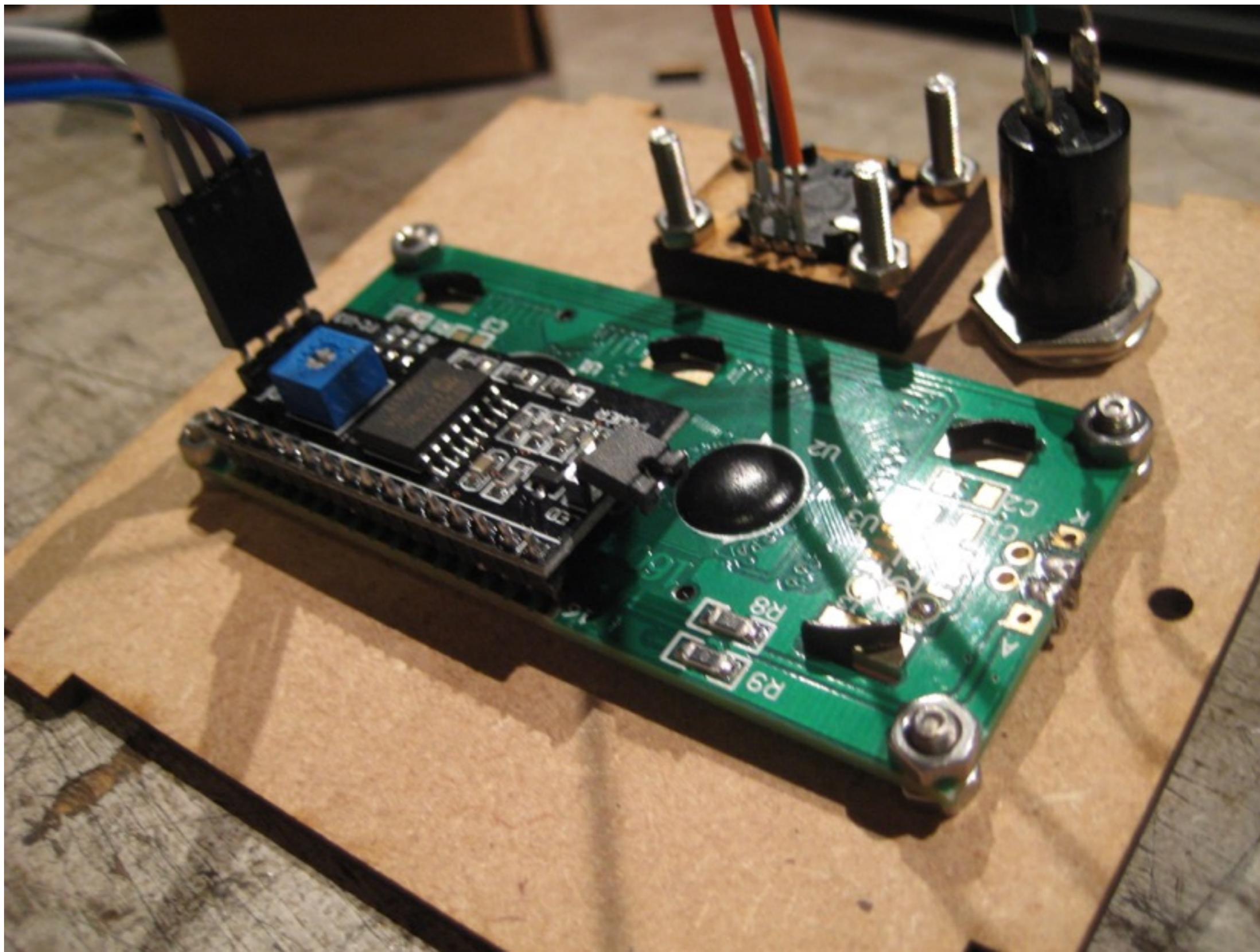
Spacer

**Add some washers between the
bearings and the wood**



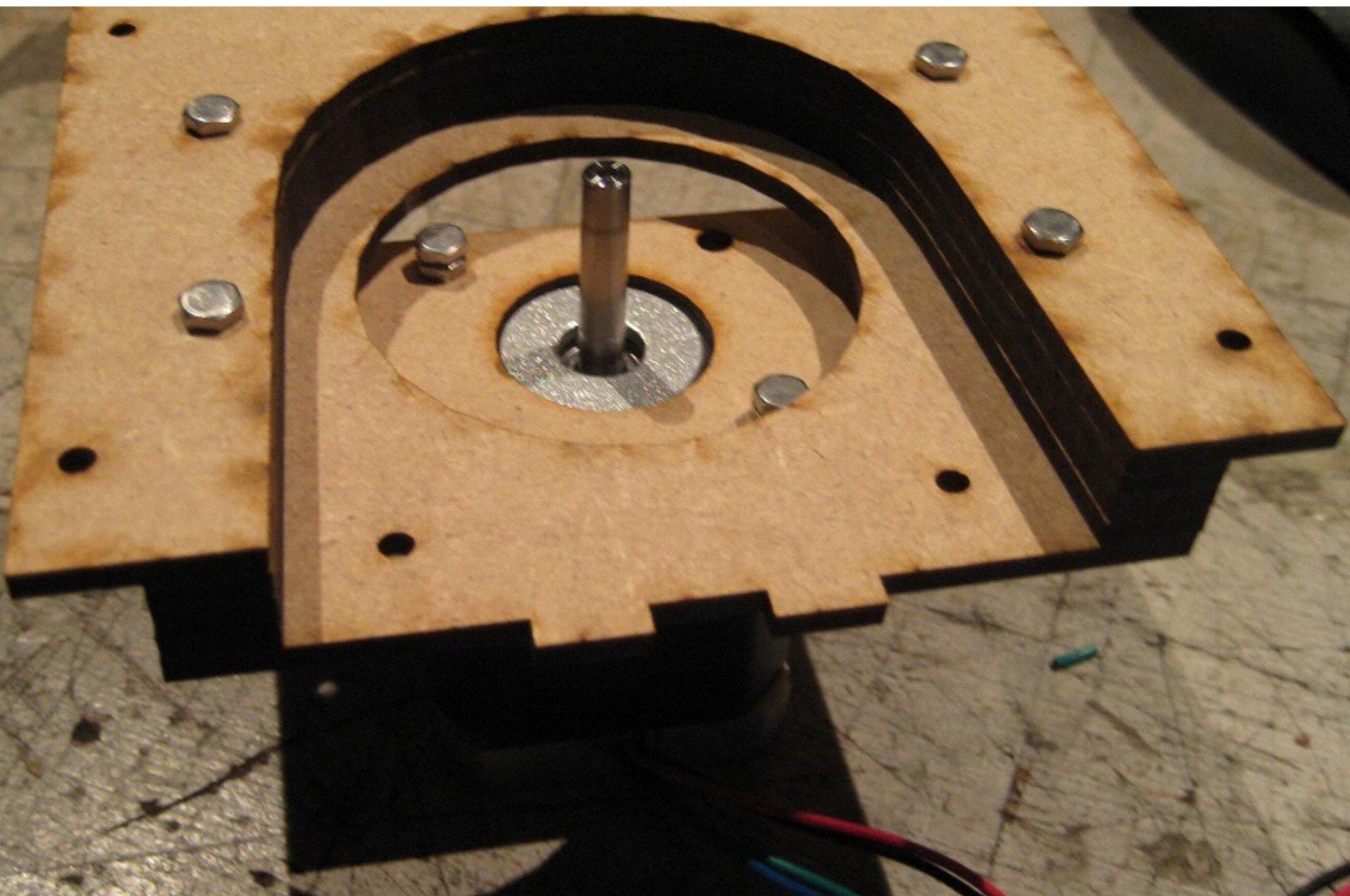


Control panel





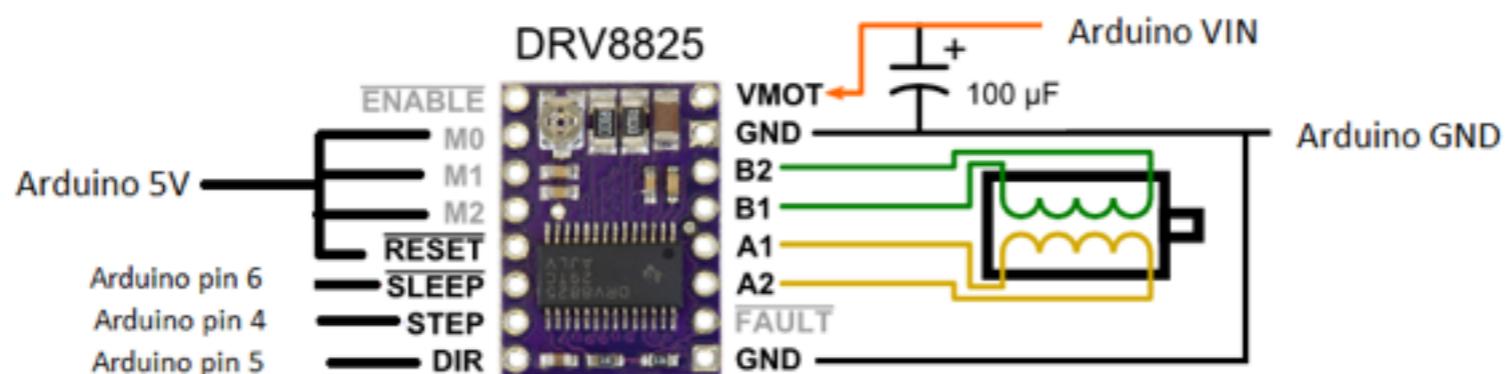
NEMA17 mount





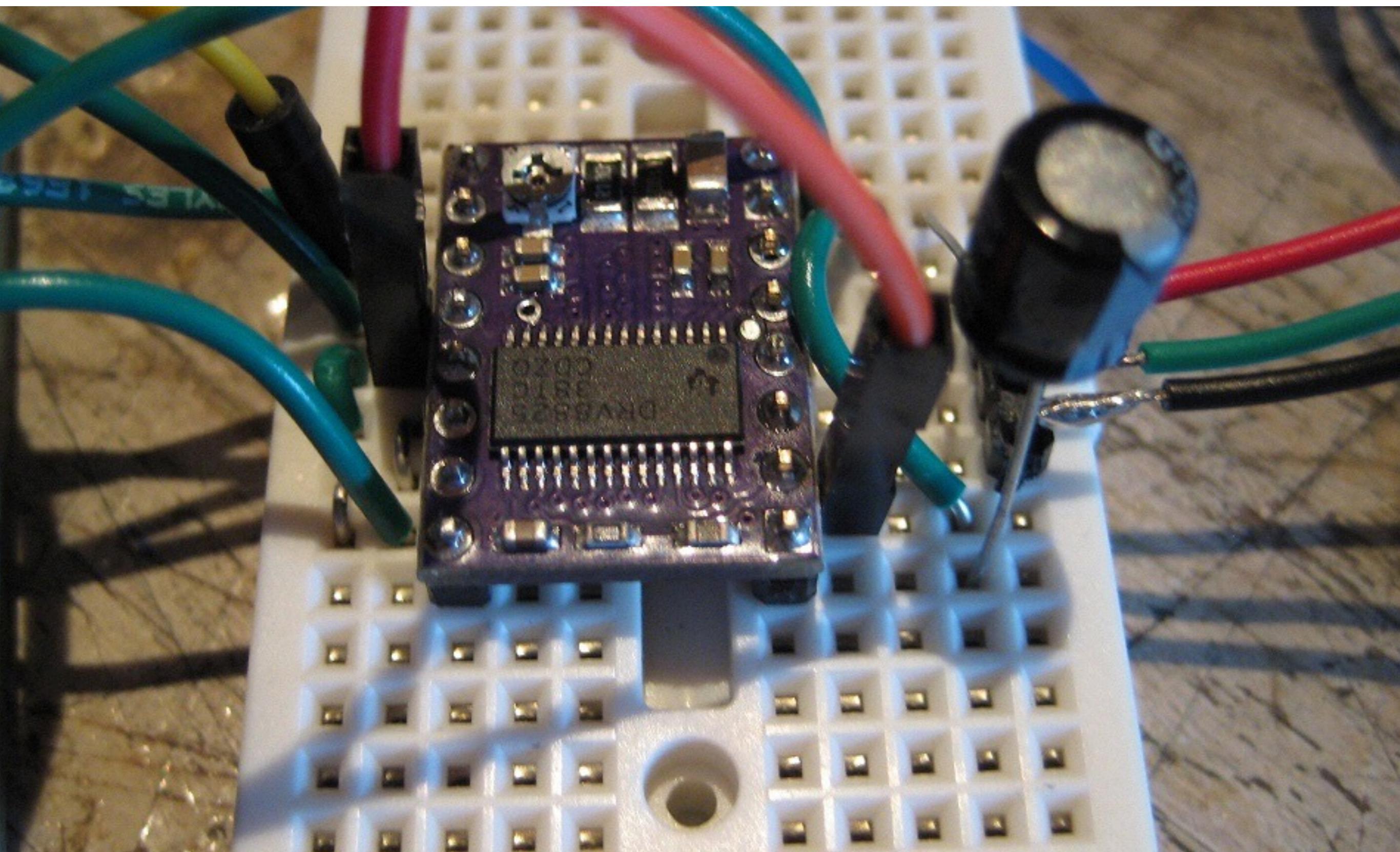
Component Wiring

Peristaltic Pump
connection diagram



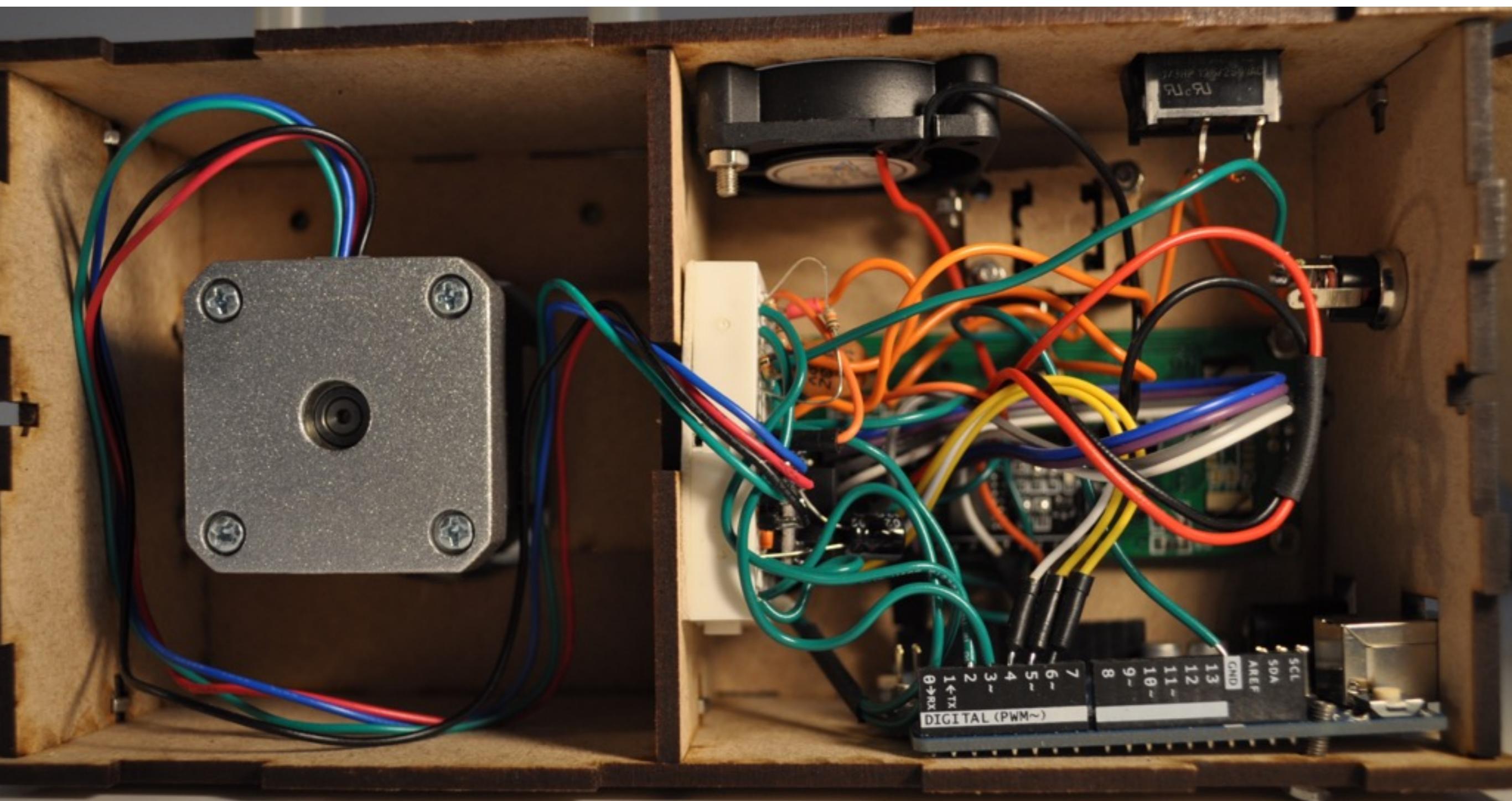


Stepper driver





Full assembly





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Demonstration

[http://www.youtube.com/watch?
v=rvNwhfQSCfg](http://www.youtube.com/watch?v=rvNwhfQSCfg)



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Coming up



Graduation Ceremony

- November 17



Assignment

- Answer the following questions in your documentation:
 - What does your project do?
 - What microbe / living thing do you use?
 - From what designs is it derived?
 - Which parts have been custom made, by what machine?
 - What are all the components and how much do they cost?
 - How is it assembled?
 - What can be improved?



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