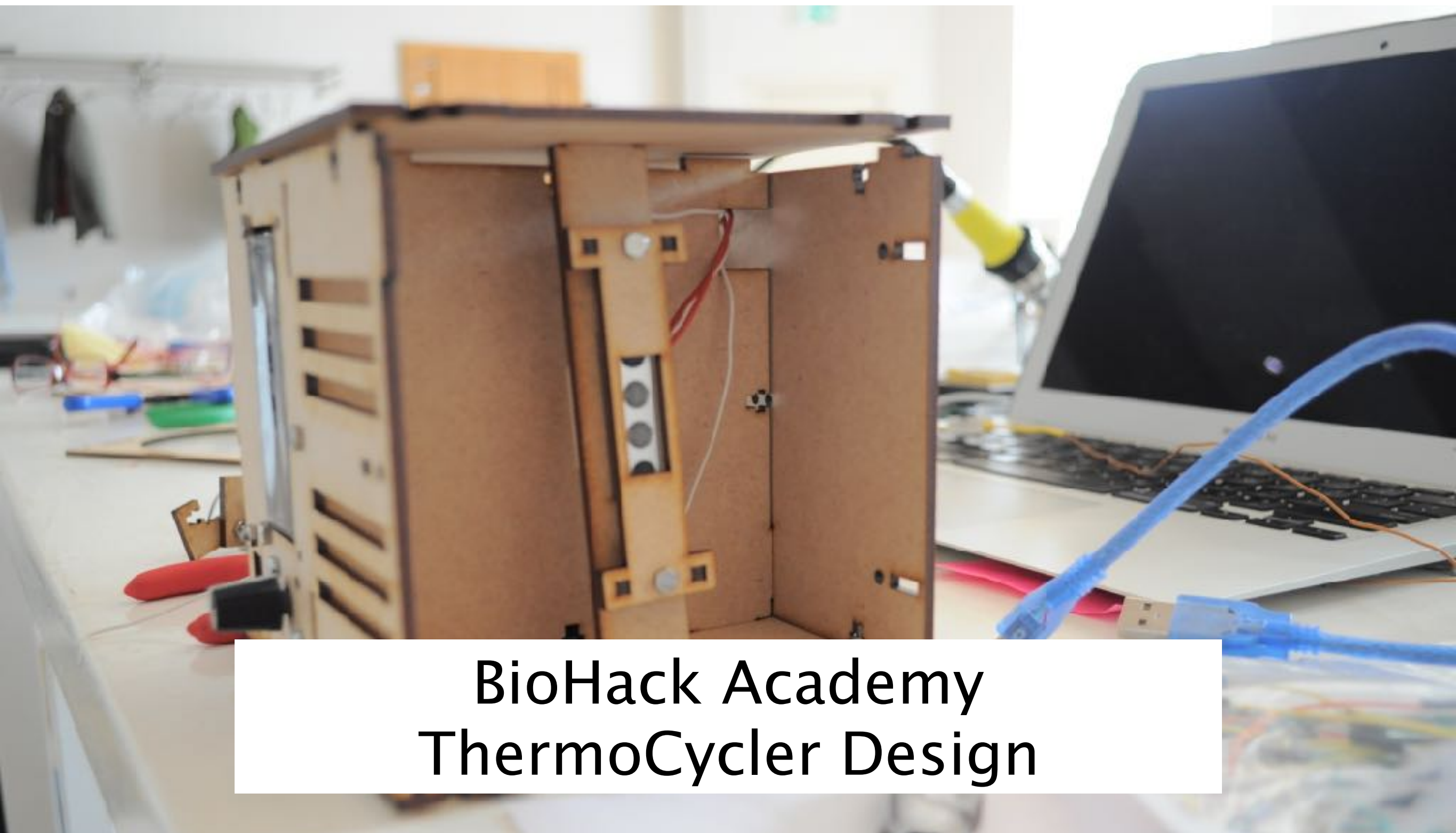




waag
wetlab amsterdam



BioHack Academy ThermoCycler Design



Why we need a thermocycler

- Multiply DNA
 - Analyse it
 - Clone it



Industry Standard





Hacks

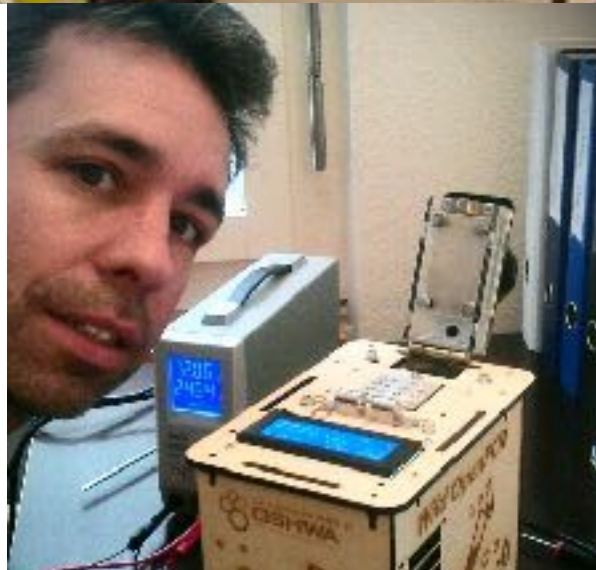
OpenPCR

Picture by MadLab



OpenerPCR

Picture by DIYBio Groningen



Wild Open PCR
Picture by GaudiLab



NinjaPCR



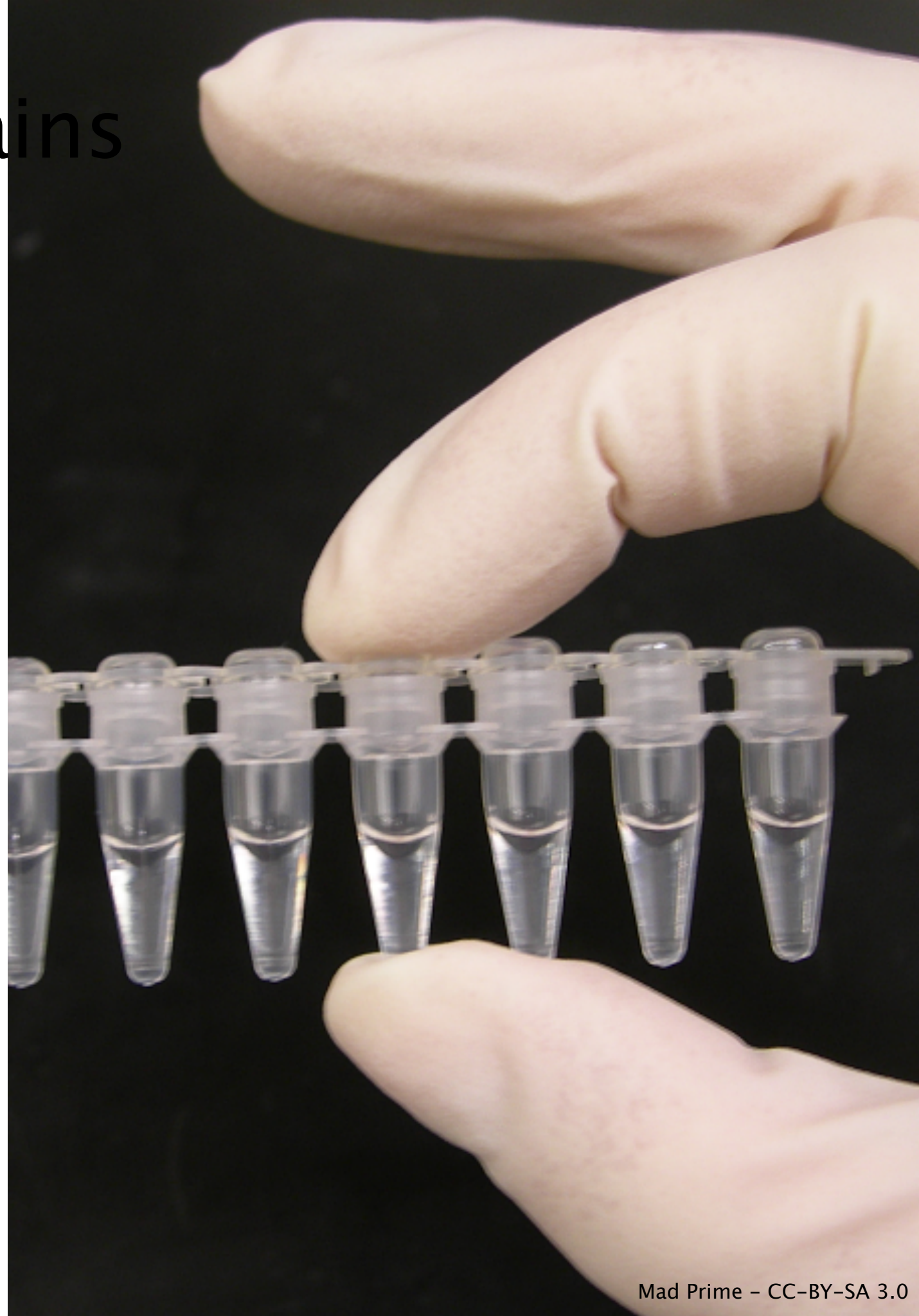
Open qPCR





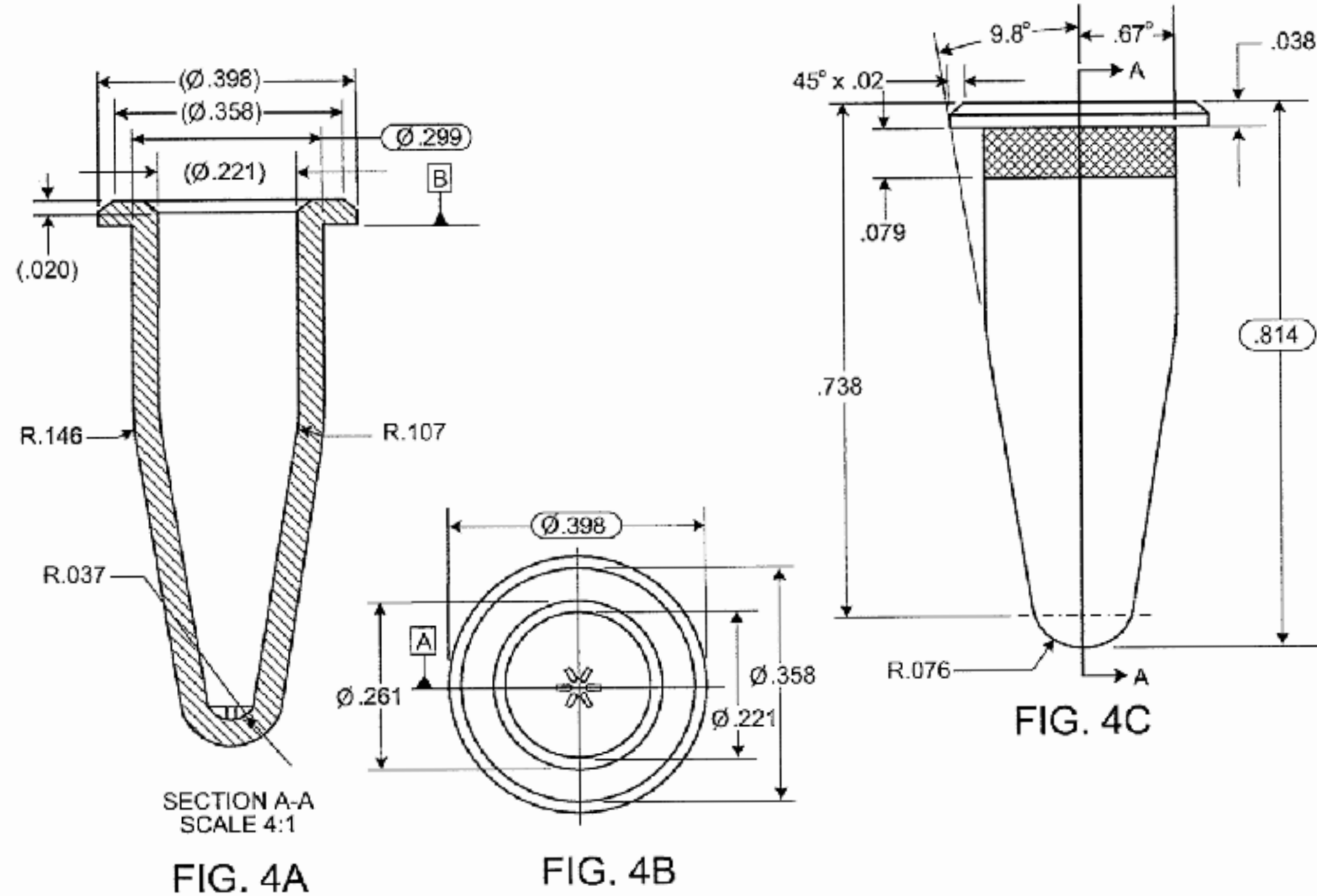
Design Constrains

- PCR tubes



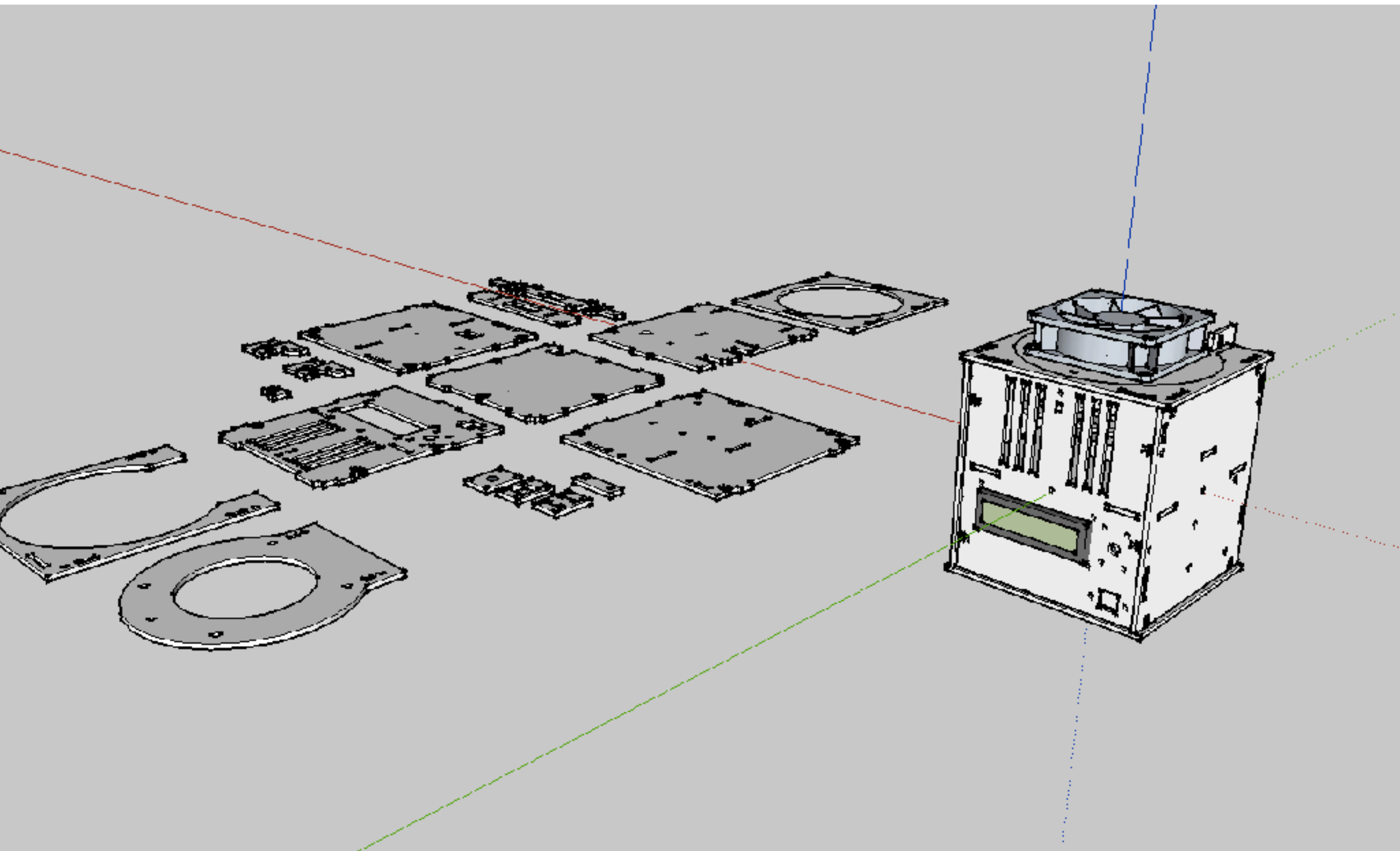


Patent US8216530





Biohack Academy Thermocycler





Bill of Materials

No	Amount	Description	Supplier NL	Cost
1	2	Power resistors	Farnell	0.64
2	2	10K NTC thermistor	Farnell , HackerStore , iPrototype	0.27
3	1	Rotary encoder	Farnell , iPrototype , EOO	0.42
4	1	Knob	Farnell	0.23
5	1	Power switch	Farnell , iPrototype	0.71
6	1	DC power jack	Farnell , EOO	0.85
7	1	12V 5A Power supply	Farnell , EOO	38.13
8	1	Push button	Farnell , iPrototype , Sparkfun	0.47
9	4	10K resistor	Farnell , EOO	0.03
10	4	Rubber feet	Conrad	0.08
11	1	I2C LCD display	iPrototype , Hackerstore	8.95
12	3	MOSFET	Farnell , EOO	0.90
13	1	12V 80 mm Axial Fan	Farnell , EOO	3.25
14	1	Diode	Farnell , iPrototype , EOO	0.19
15	1	Breadboard	Farnell . iPrototype	2.56
16	1	Custom milled PCR tube block		



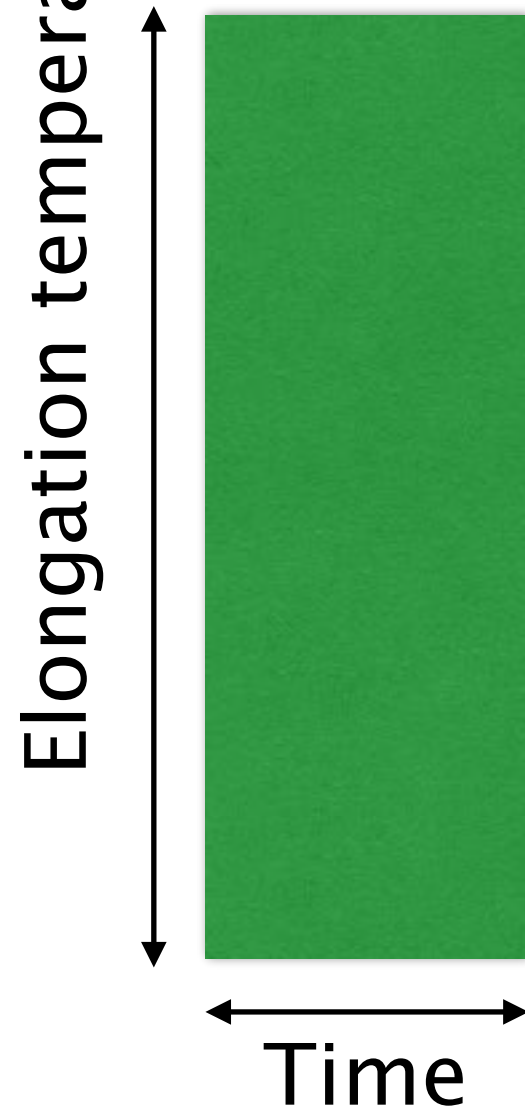
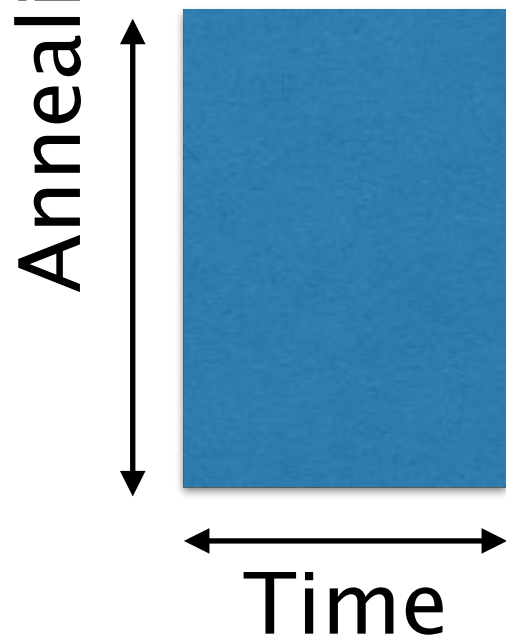
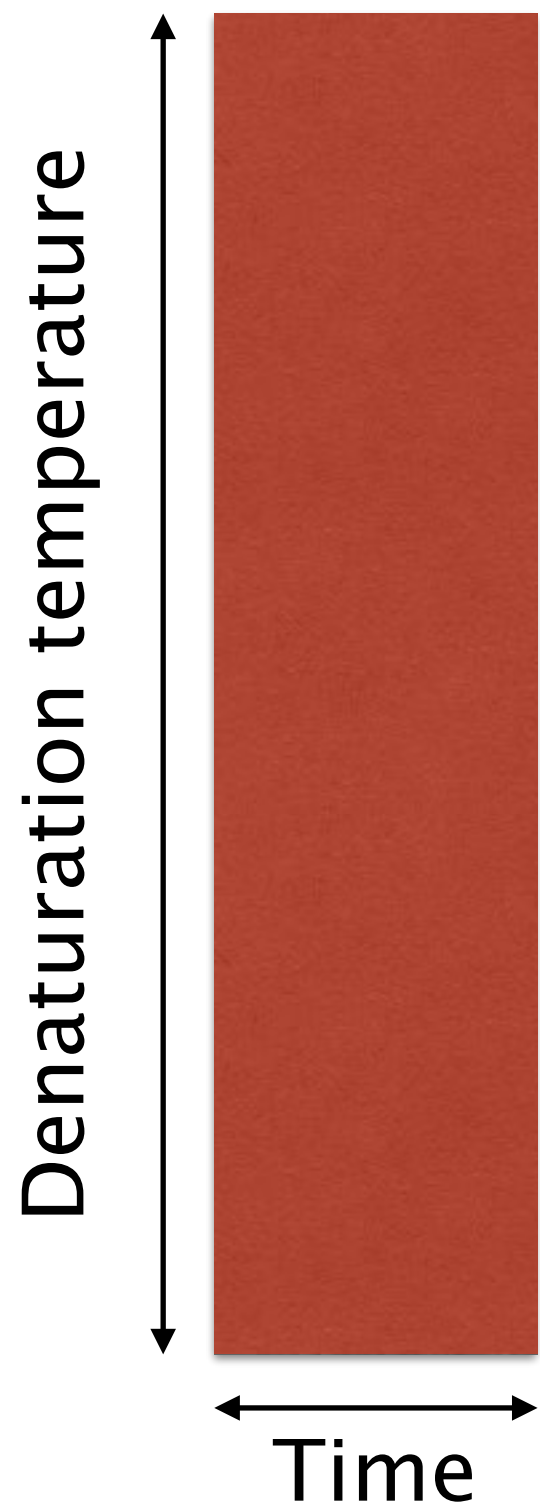
Custom block





Settings

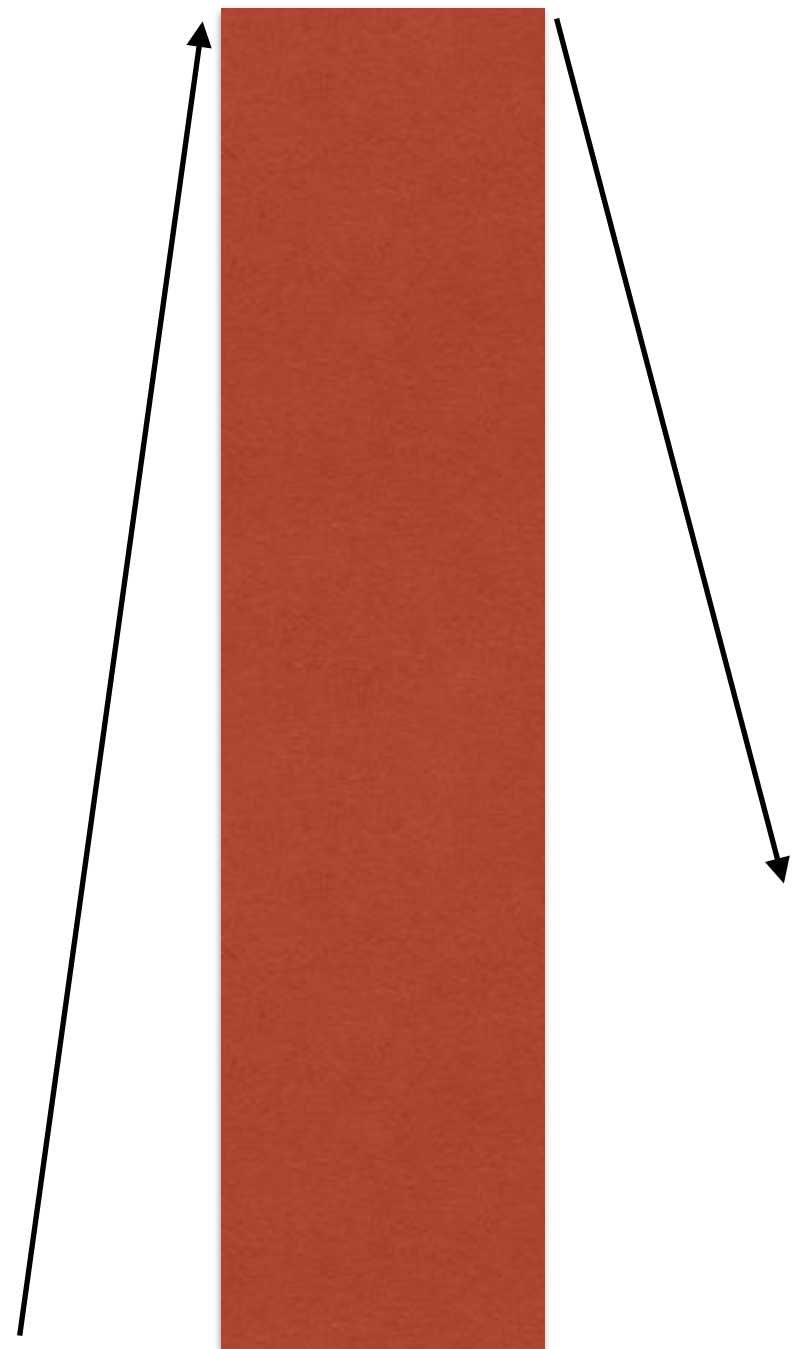
of cycles





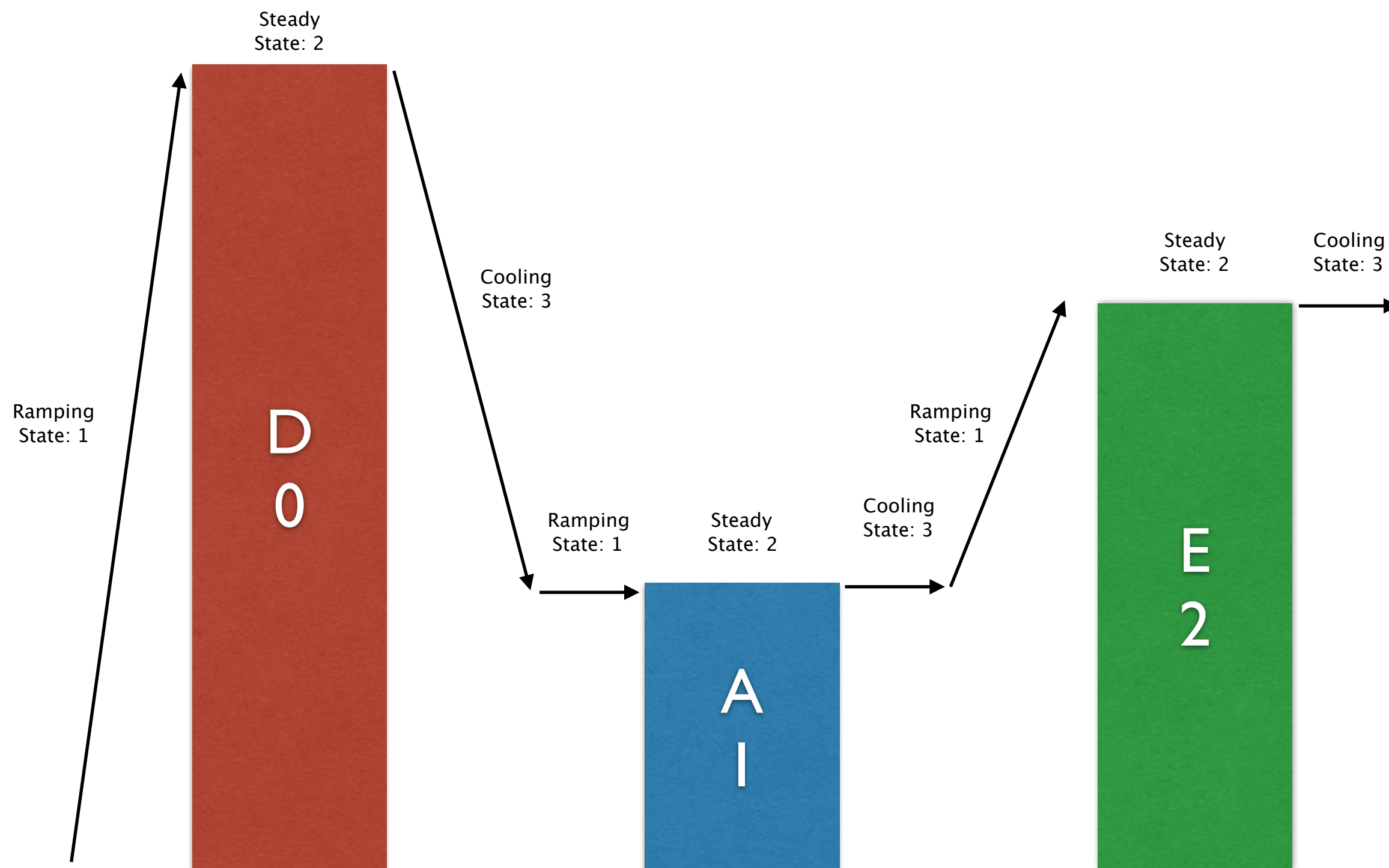
Program stages

- Each stage goes through 3 states:
 - Ramp up to a set temperature
 - Keep the temperature stable
 - Cool down



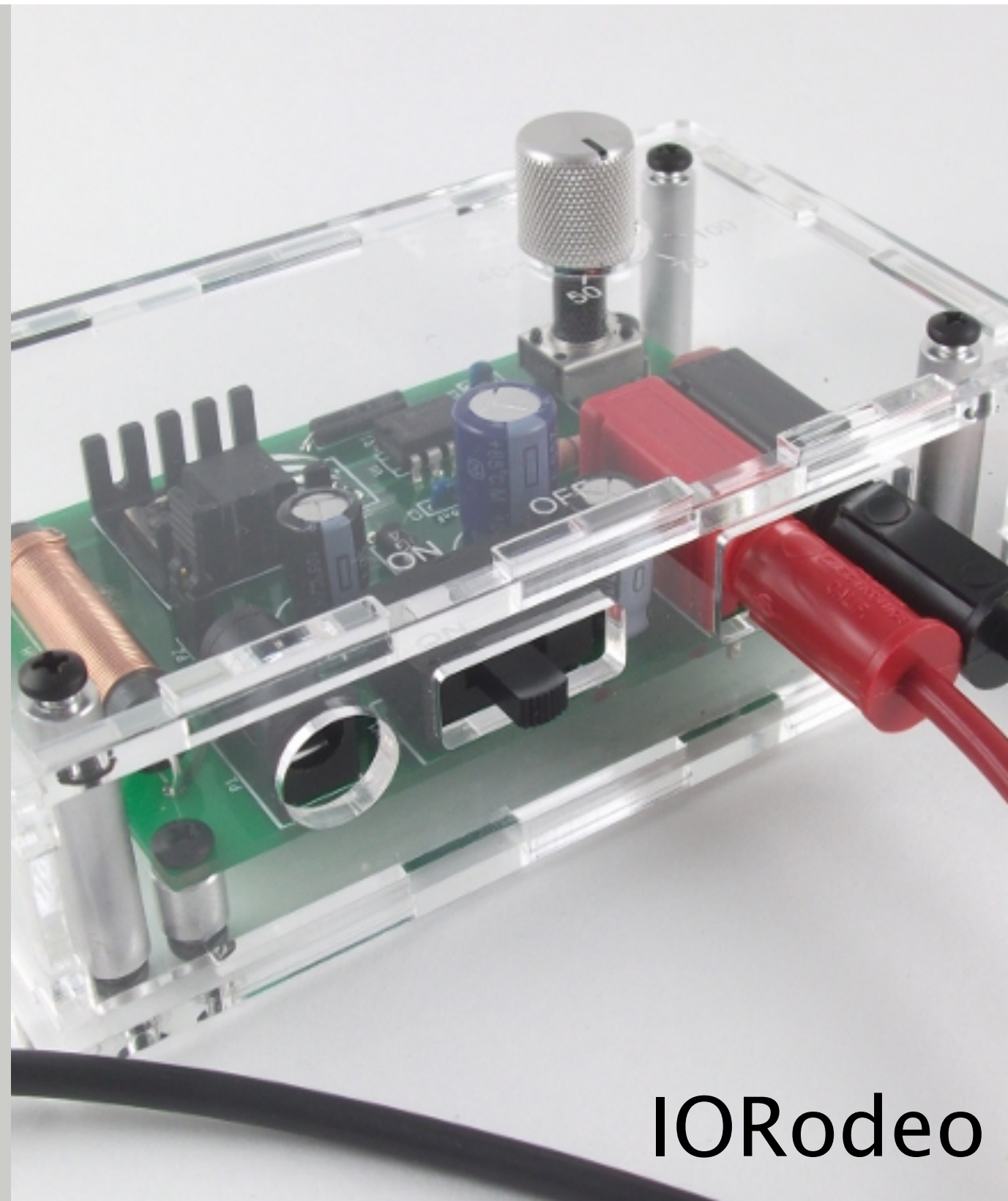
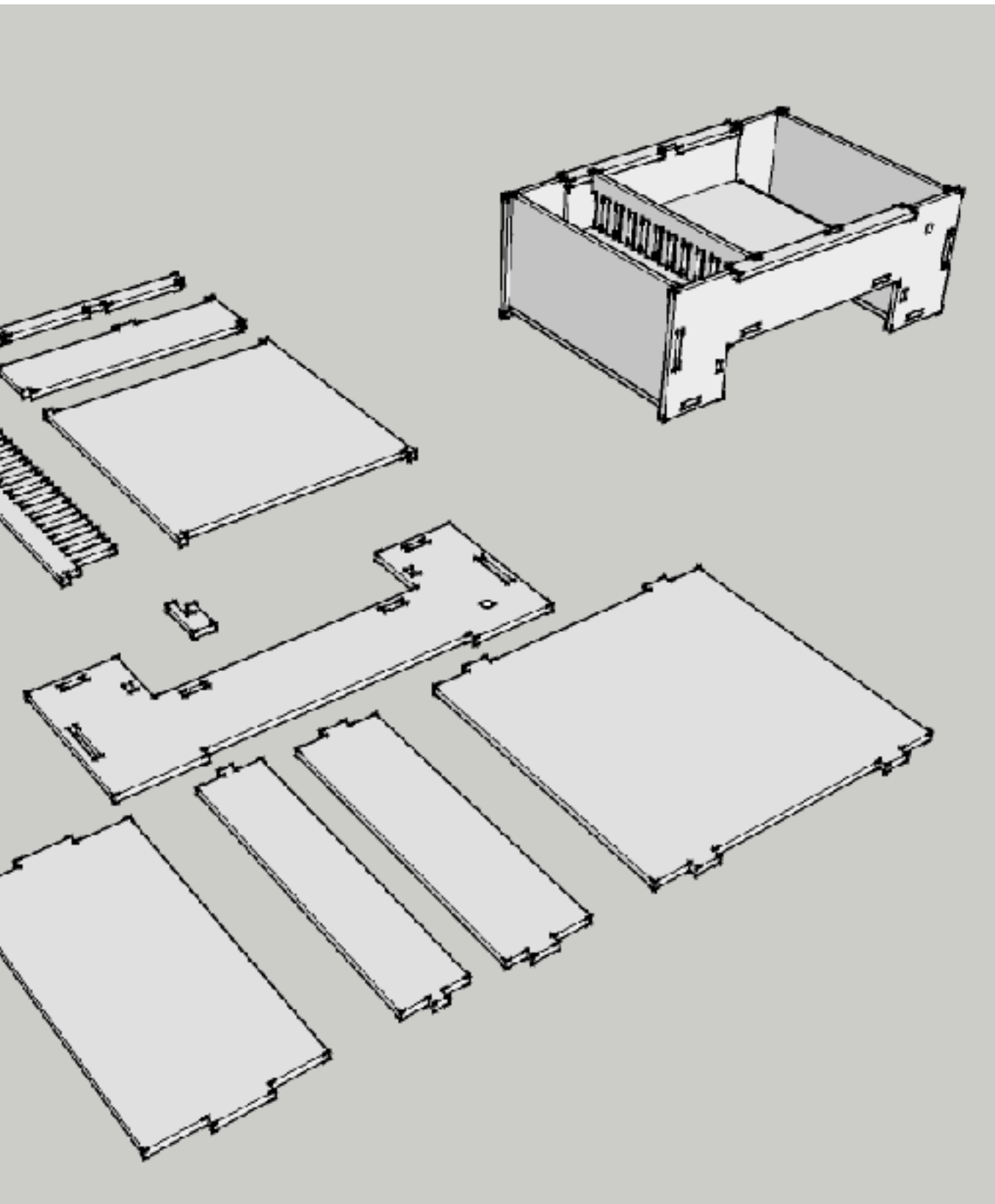


Stages and States





Gel rig and power supply



IORodeo



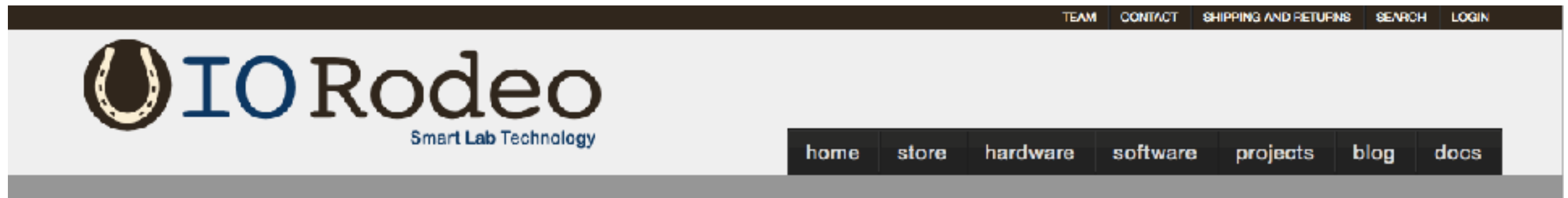
Bill of Materials Gel Box

No	Amount	Description	Supplier NL	Cost
1	1	Banana adapter (black)	AlleKabels	0.60
2	1	Banana adapter (red)	AlleKabels	0.60
3	1	Banana cable (black)	AlleKabels	3.85
4	1	Banana cable (red)	AlleKabels	3.85
5	1	3mm Acrylic sheet	Plexiglas.nl	
6	1	Acryl glue	DIY shop	
7	1	Platinum Wire	Sigma Aldrich	90.10



IORodeo kit

<http://www.iorodeo.com/content/electrophoresis-power-supply-kit>



Home » Store » Gel Imaging » Electrophoresis

Electrophoresis power supply kit

View Posts

SKU: IMG-08

Kit for making a 25-100 V variable power supply for electrophoresis as described in this [Documentation](#).

Each electrophoresis power supply kit comes with the following parts:

- **Power supply PCB**
- **Electronic components** - 20 through-hole components for soldering onto the PCB
- **Enclosure** - The kit comes with a acrylic enclosure with different color options available. The enclosure is very easy to assemble. We recommend using an enclosure when the power supply is in use. For makers that prefer to design a custom enclosure we have added the option to purchase the kit without the enclosure in the options below
- **Hardware** - All of the hardware for making the power supply including screws, standoffs and mini-screwdriver

Additional accessories you will need:

- 15V, 1.6A power supply with a 2.1mm plug, center +ve
- Banana jack/banana plug cables for connecting to the [mini-gel electrophoresis tank](#)

Price: \$65.00

Select acrylic enclosure color from these options: *

- ☐ Amber
- ☐ Blue
- ☐ Clear
- ☐ Green



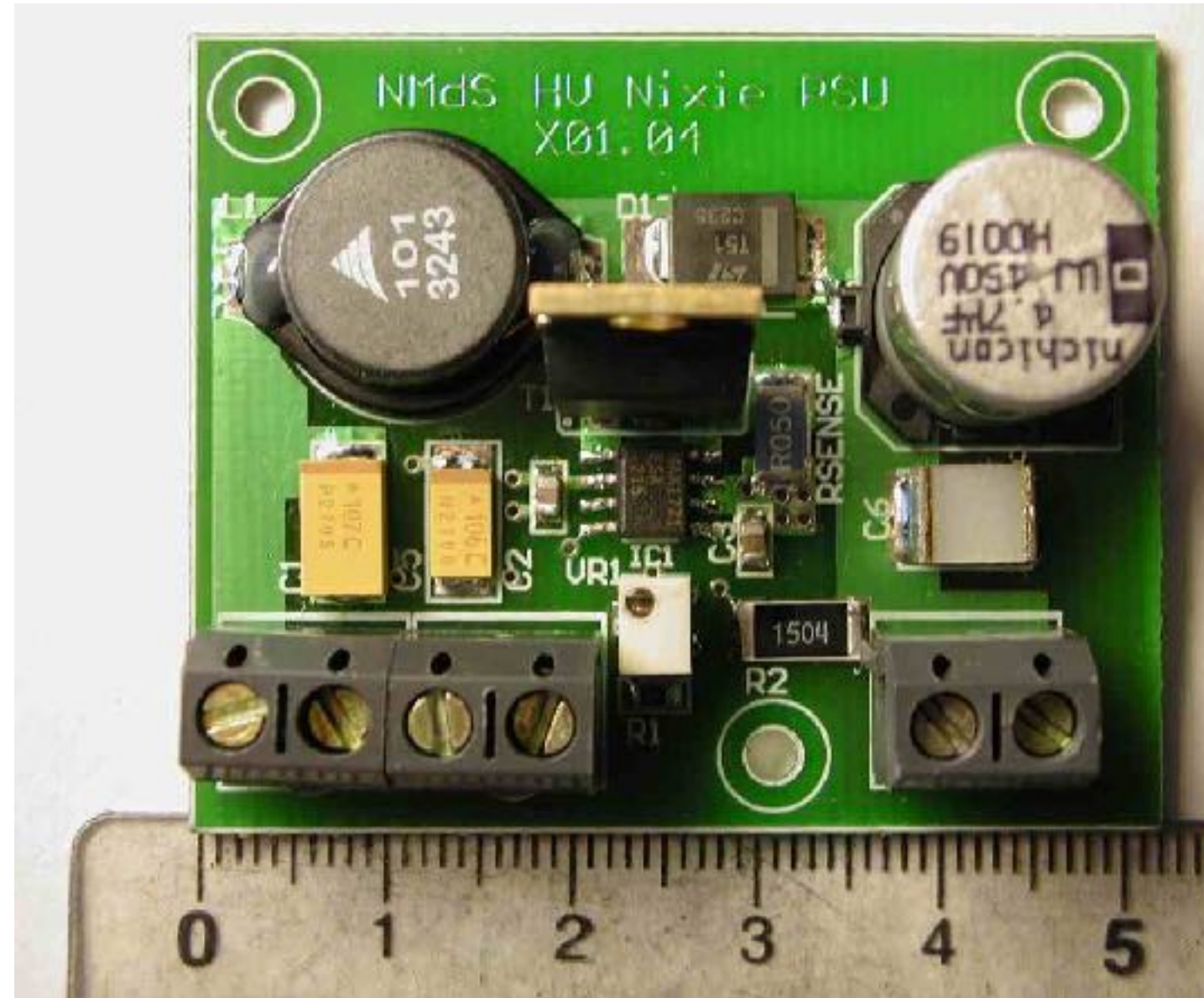
\$65.00



Nixie Power Supply

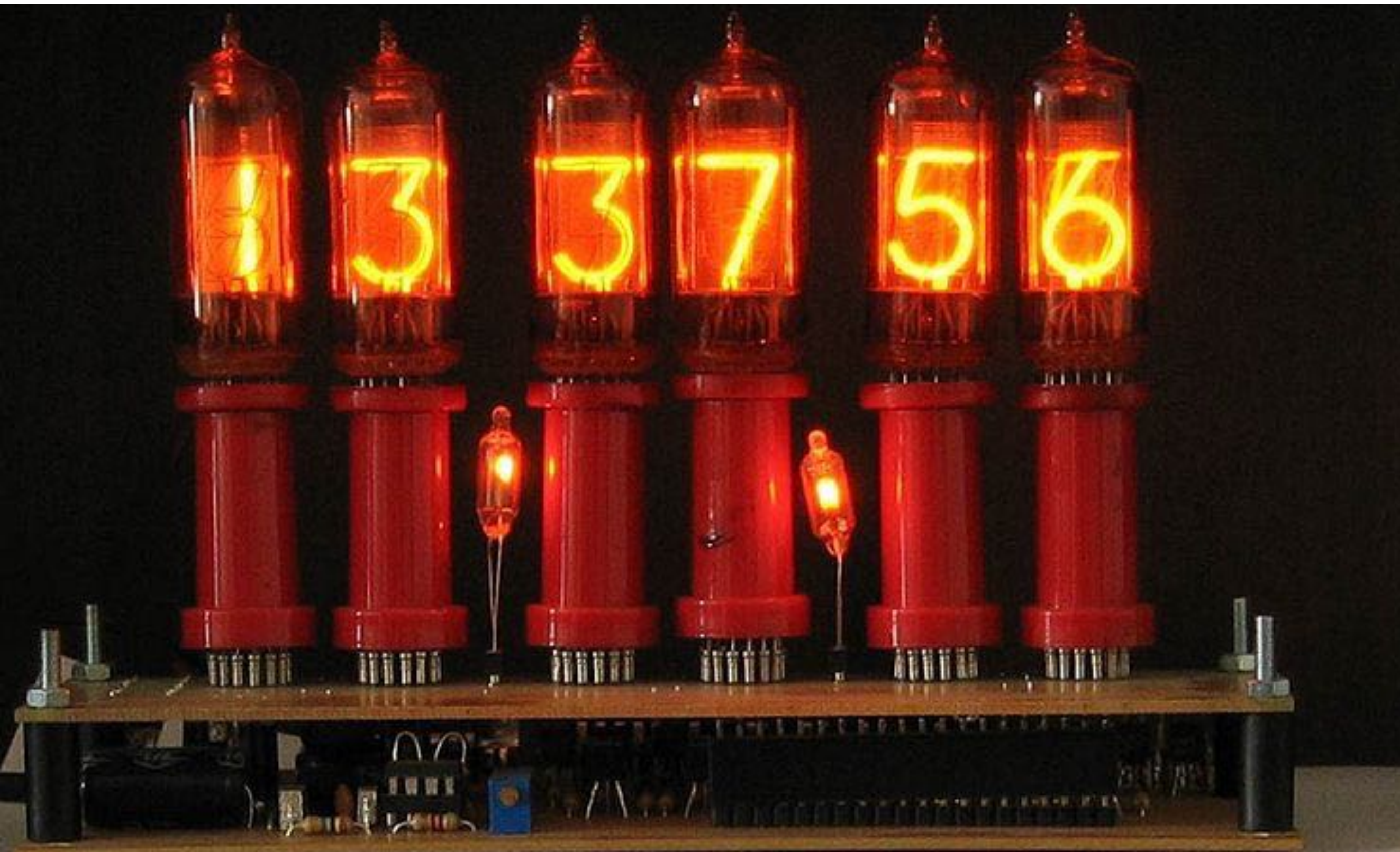
Nick De Smith

[http://www.desmith.net/
NMdS/Electronics/
NixiePSU.html](http://www.desmith.net/NMdS/Electronics/NixiePSU.html)





What's a Nixie?





Next week

- Mid term presentations
 - 5 minutes each
 - What is your idea?
 - How are you planning to do it?
 - How will it be documented?
- Send title + 1 sentence description to roland@waag.org
- And put it on your personal documentation page



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