Fruit Exploder
(“Lil McMaster Disaster)

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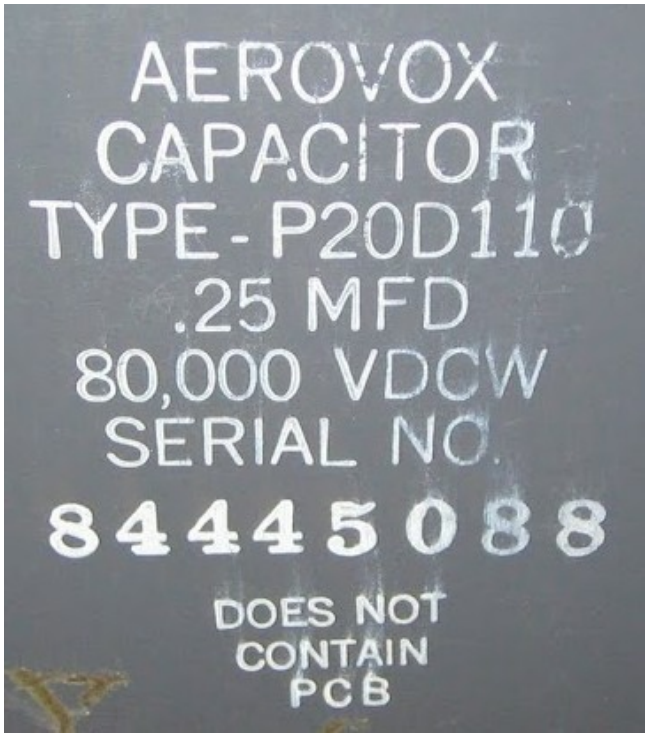
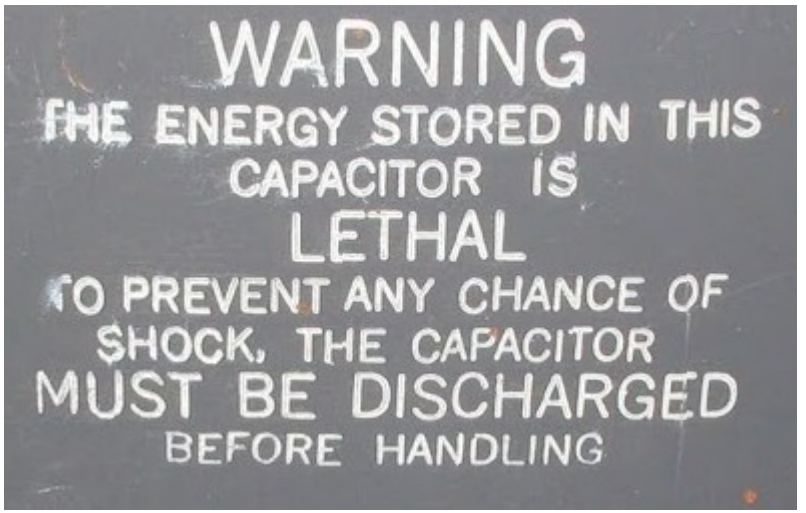
What

- High voltage capacitor stores energy
- High voltage switch closes, completing circuit
- Electrode focuses plasma => explosion
- There is no “Why” slide



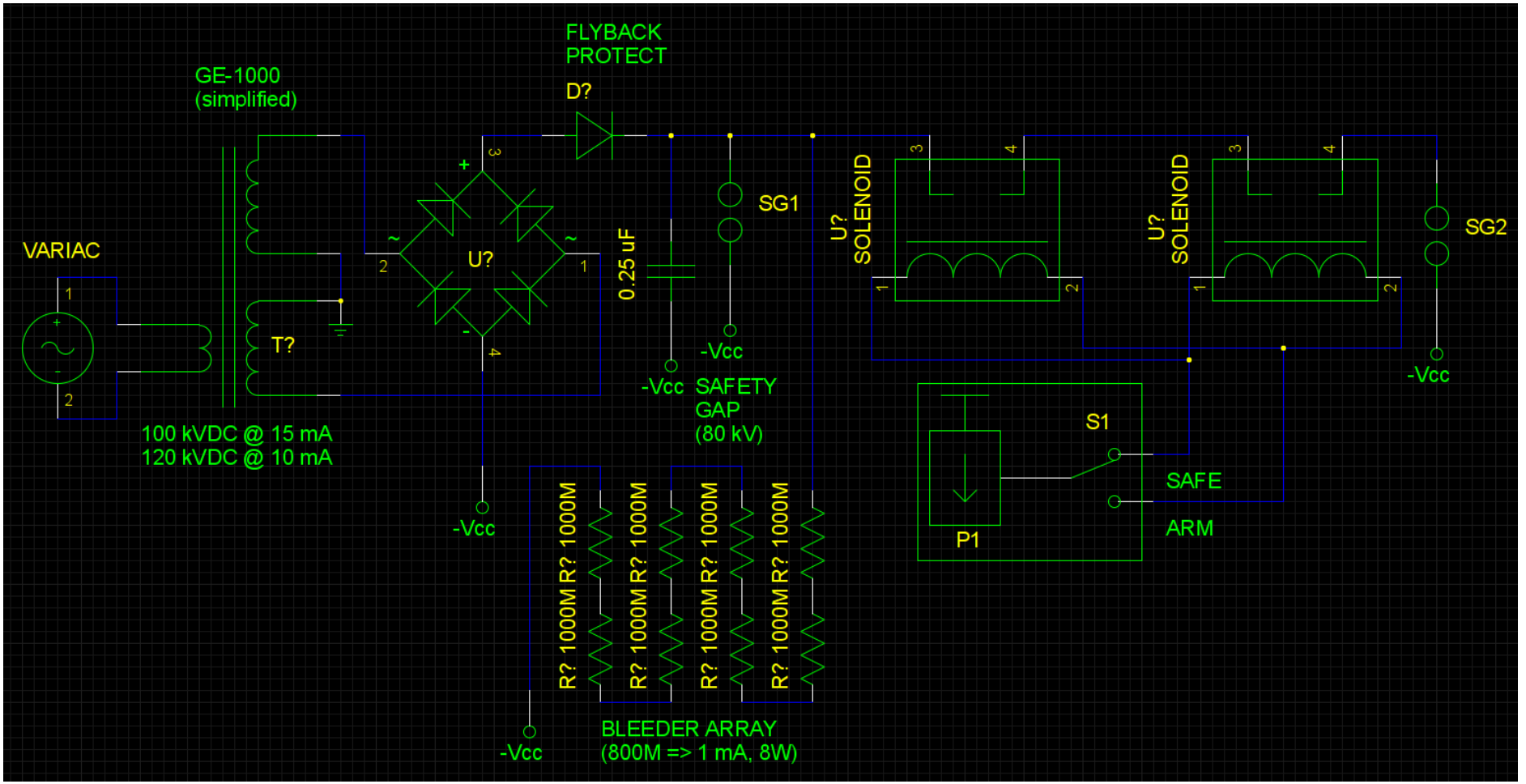


How much energy?

- E = 1/2 C V^2
- E = 1/2 * 0.25e-6 * 80e3^2 = 800 J
  - C = 0.25e-6
  - V = 80e3
- Loud! Run at half voltage
- E = 1/2 * 0.25e-6 * 40e3^2 = 200 J

First test

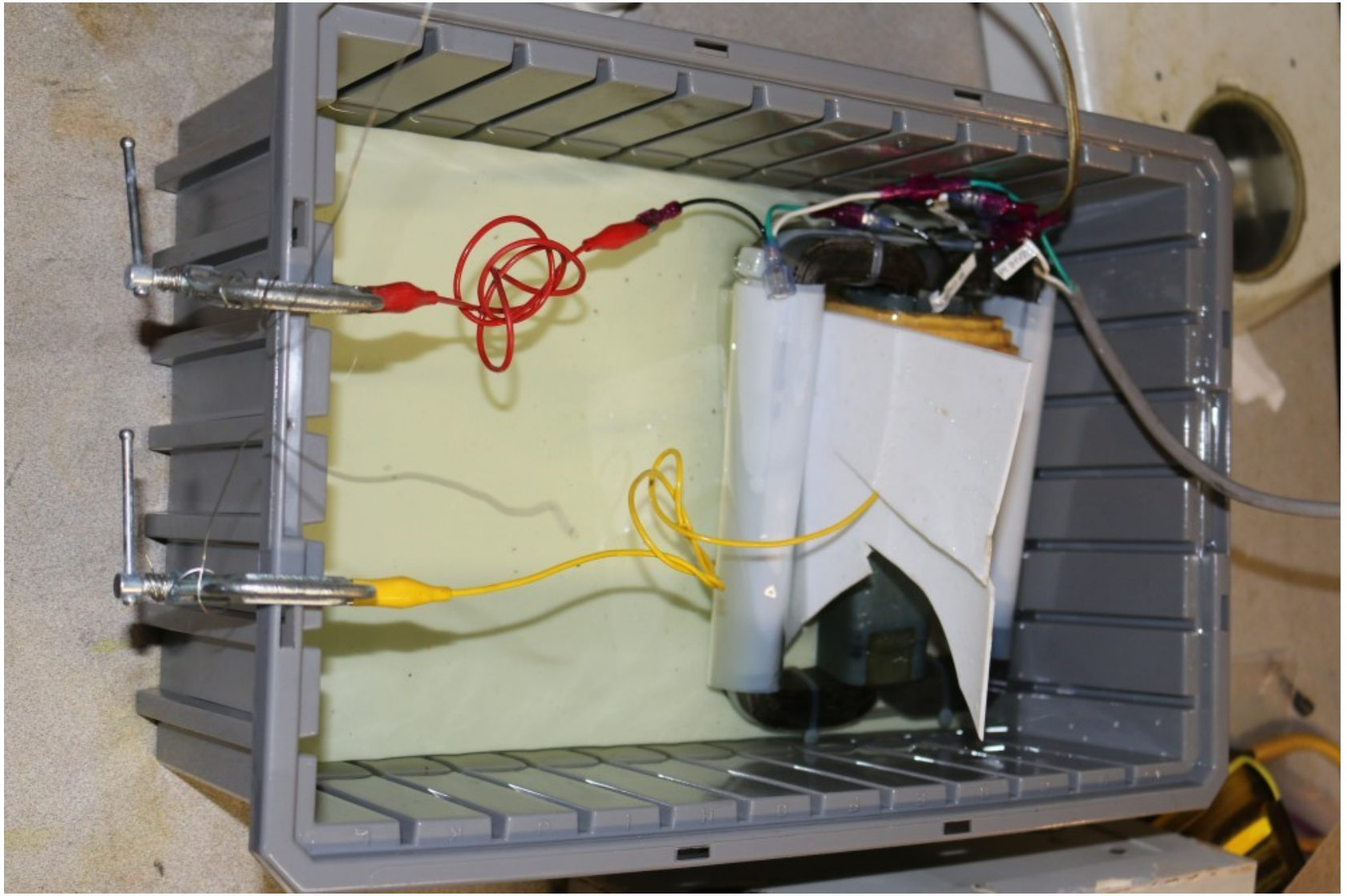
Final schematic



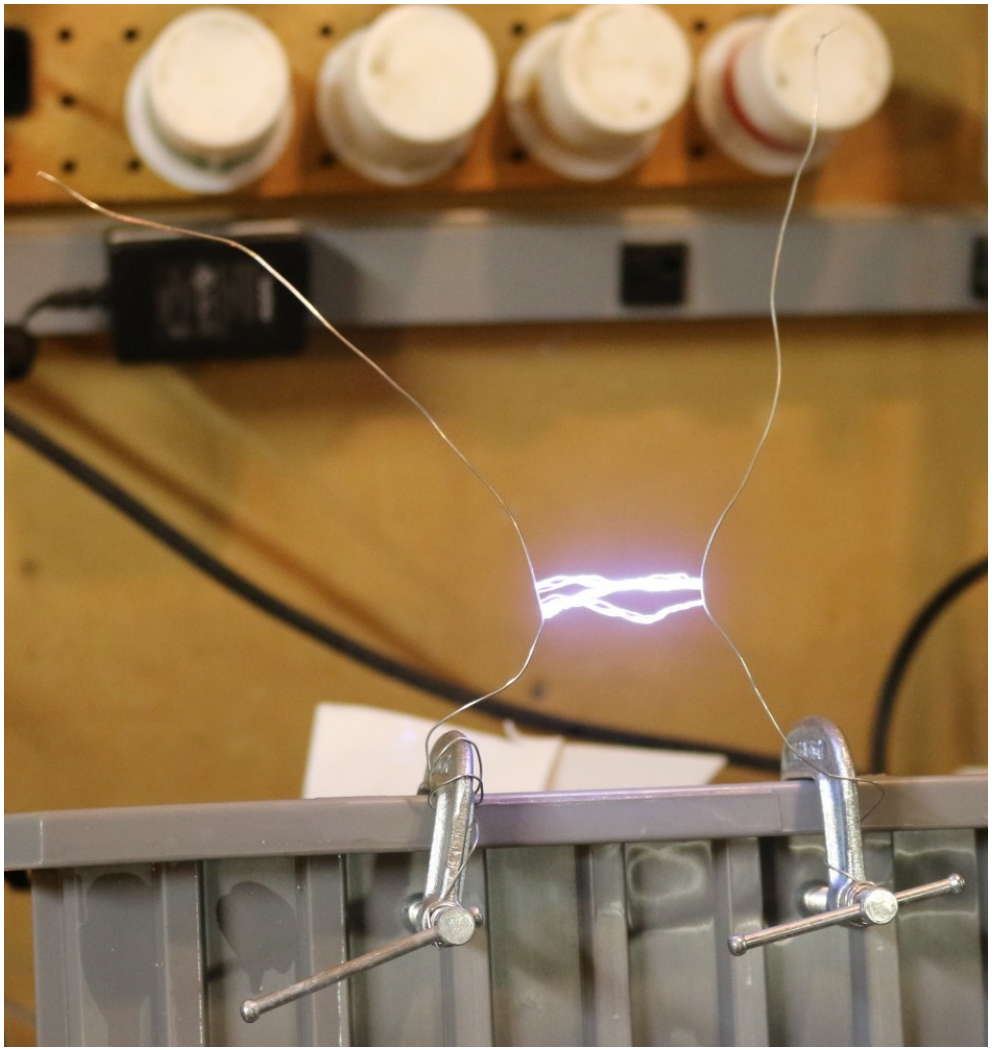
Obtaining HV transformer

Obtaining HV transformer

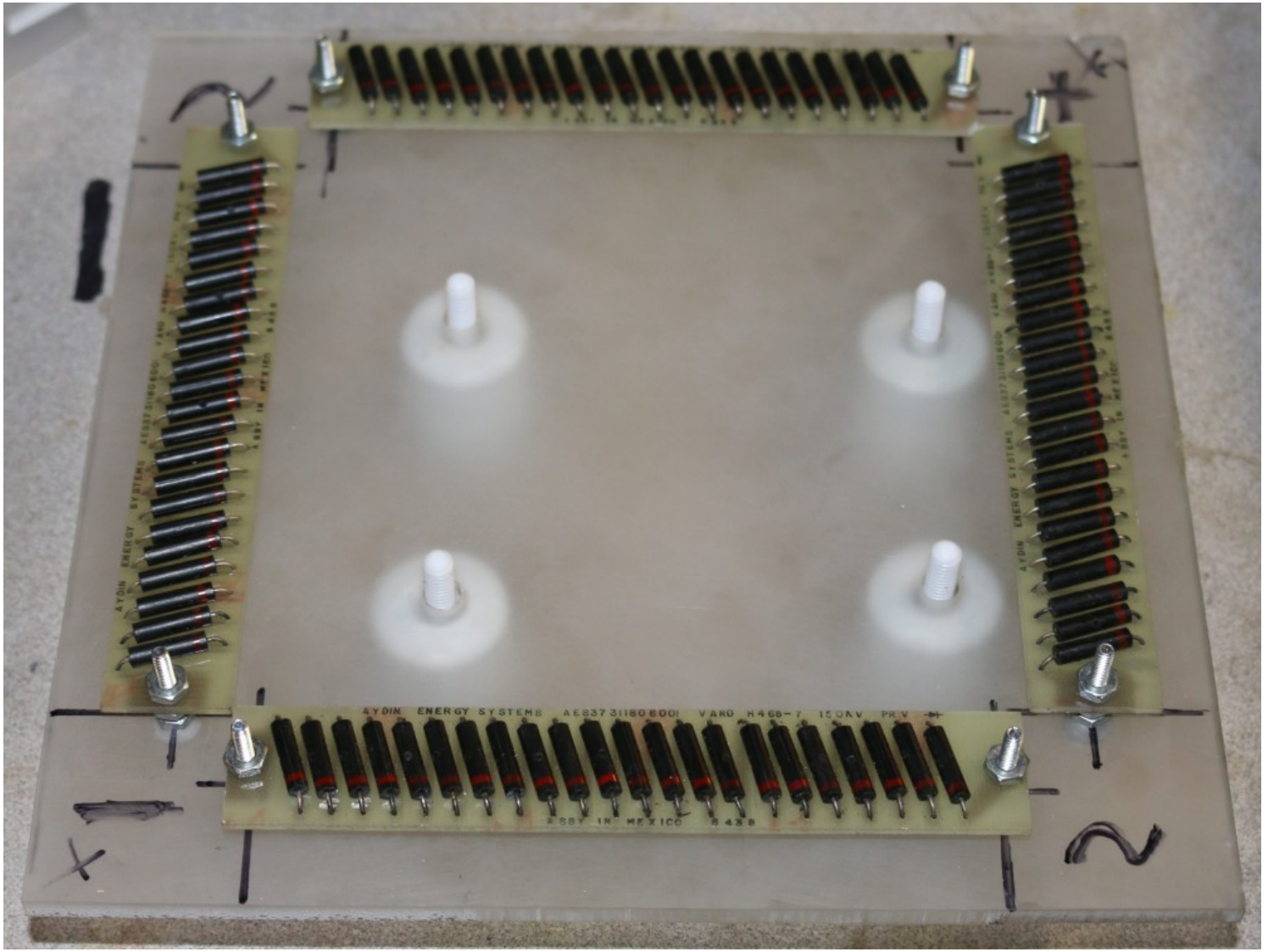
Transformer test: box



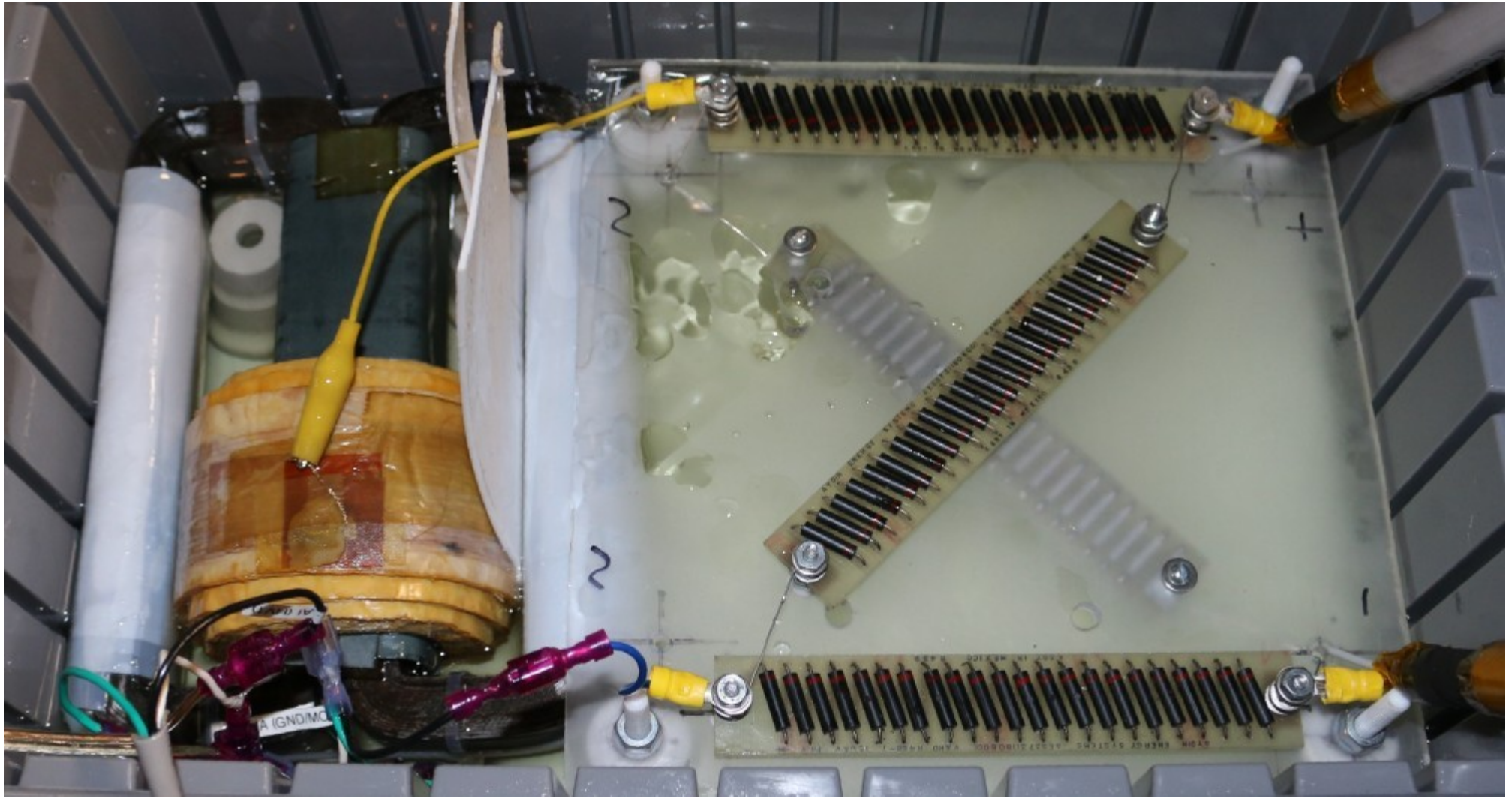
Transformer test: sparks!



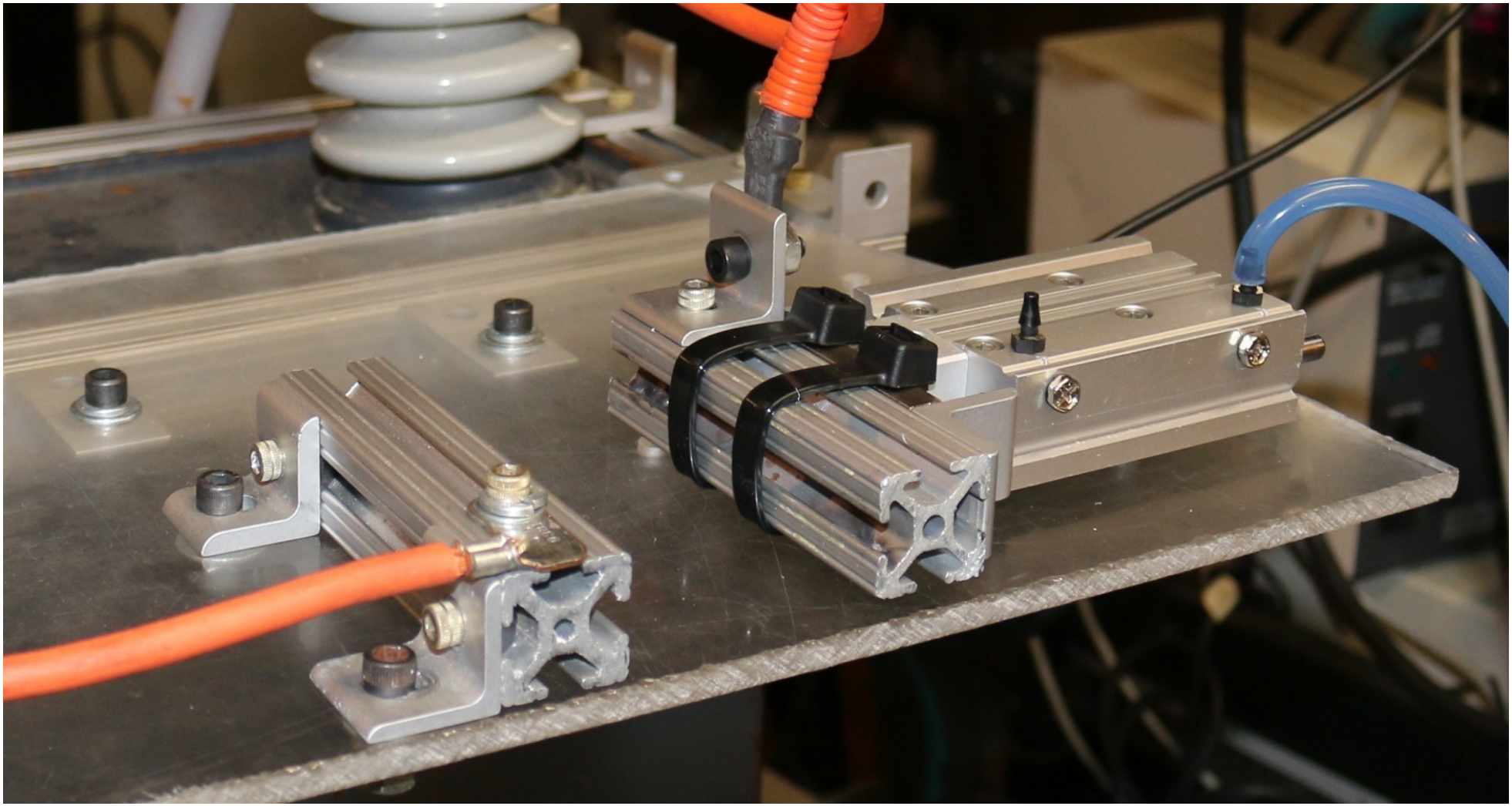
HV rectifier first cut



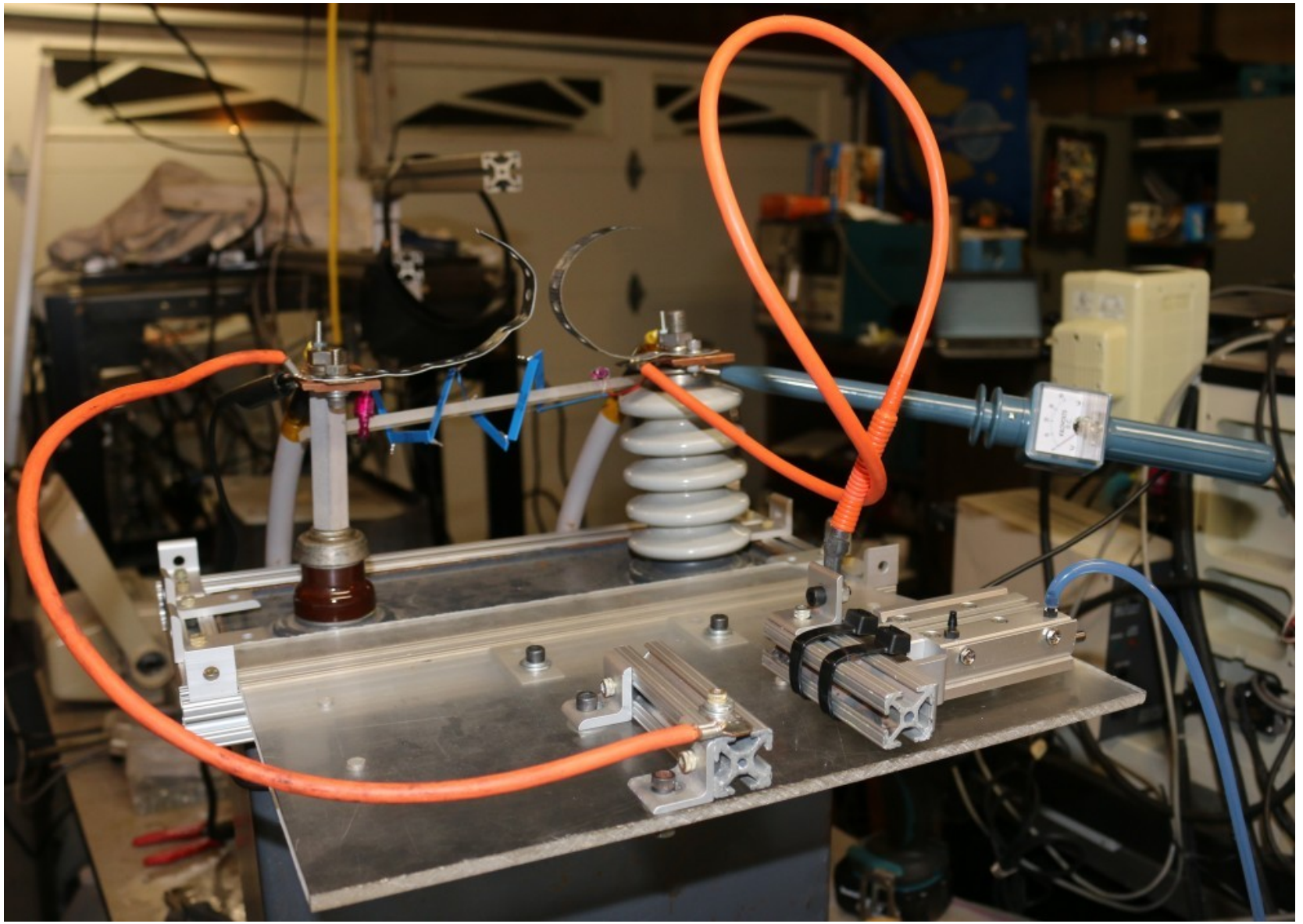
Prototype: PS



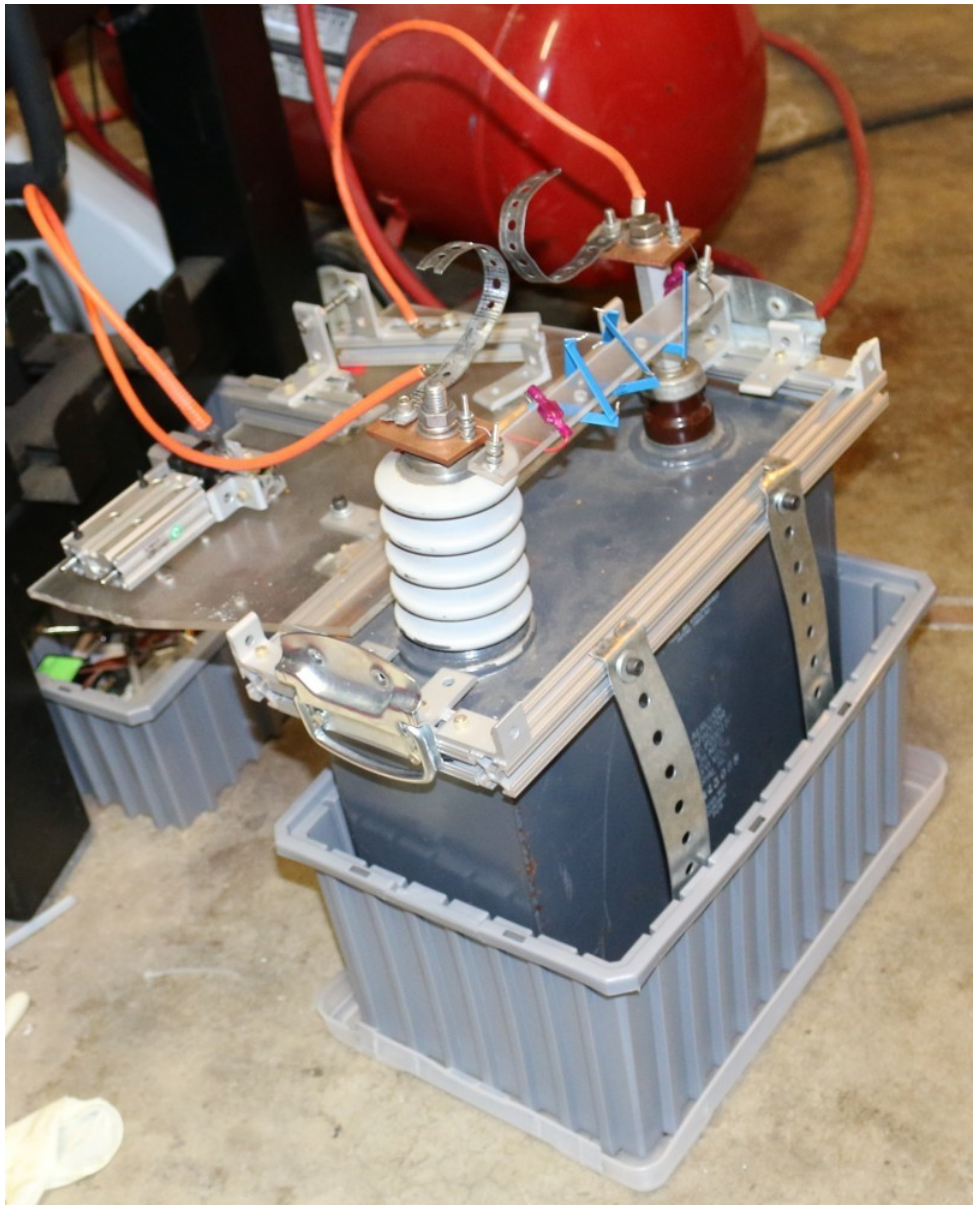
Prototype: HV switch



Prototype: capacitor (1/2)



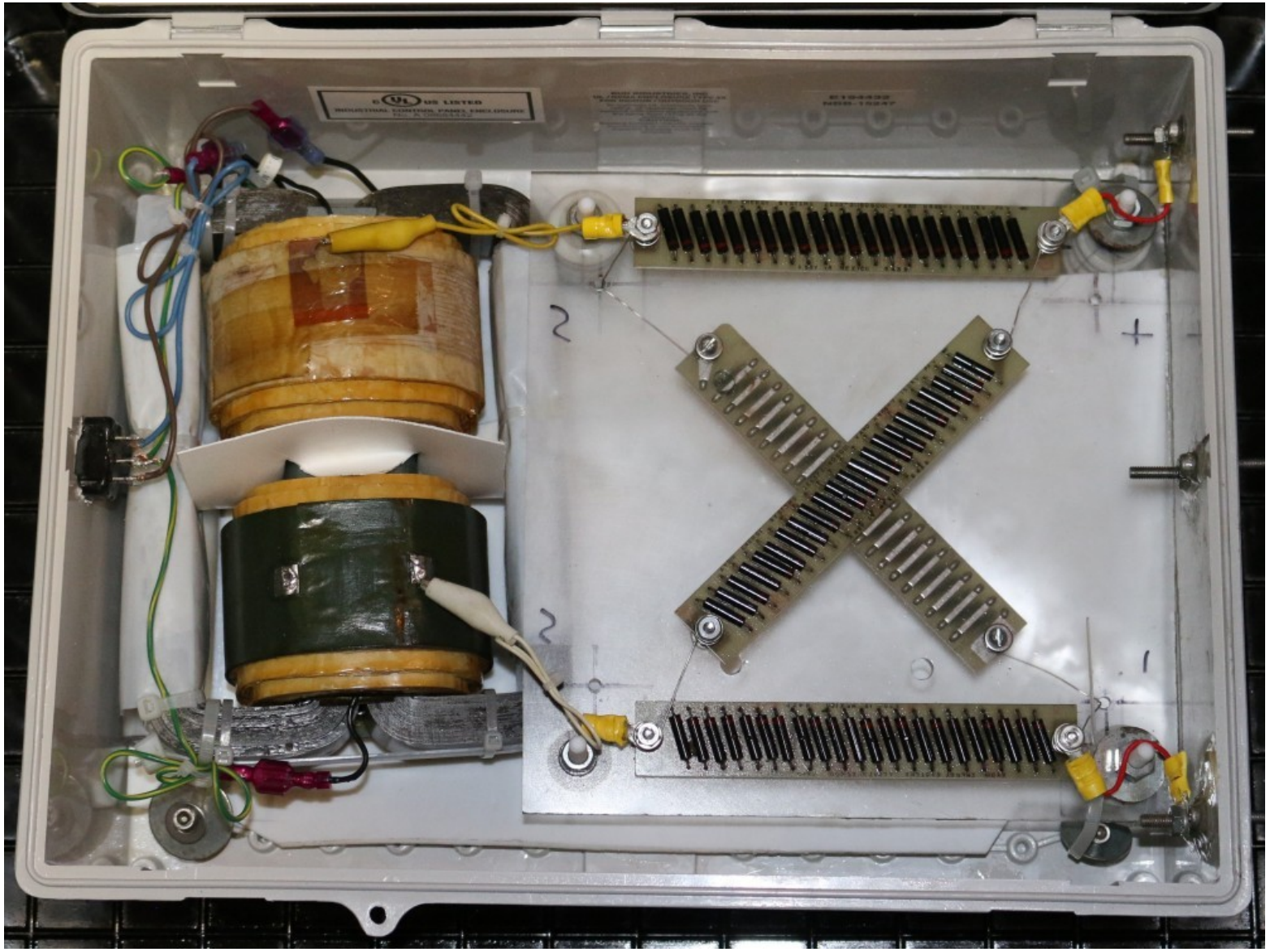
Prototype: capacitor (2/2)



Improving HV box

- Add second transformer half => full voltage
- Seal so oil doesn't splash out
- Add electrical interface
- Fix components in place

PS: pre-oil



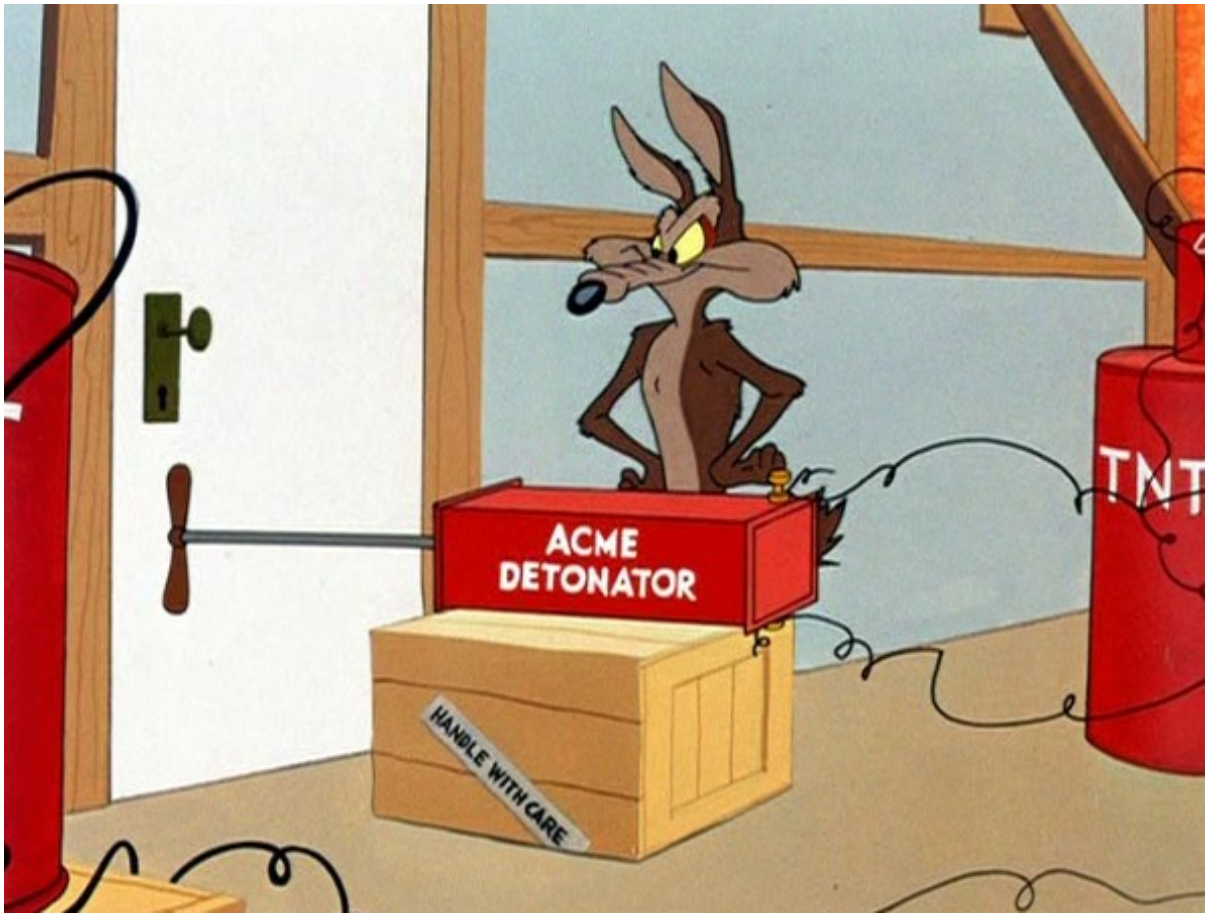
PS: post oil

PS: assembled

PS: polishing

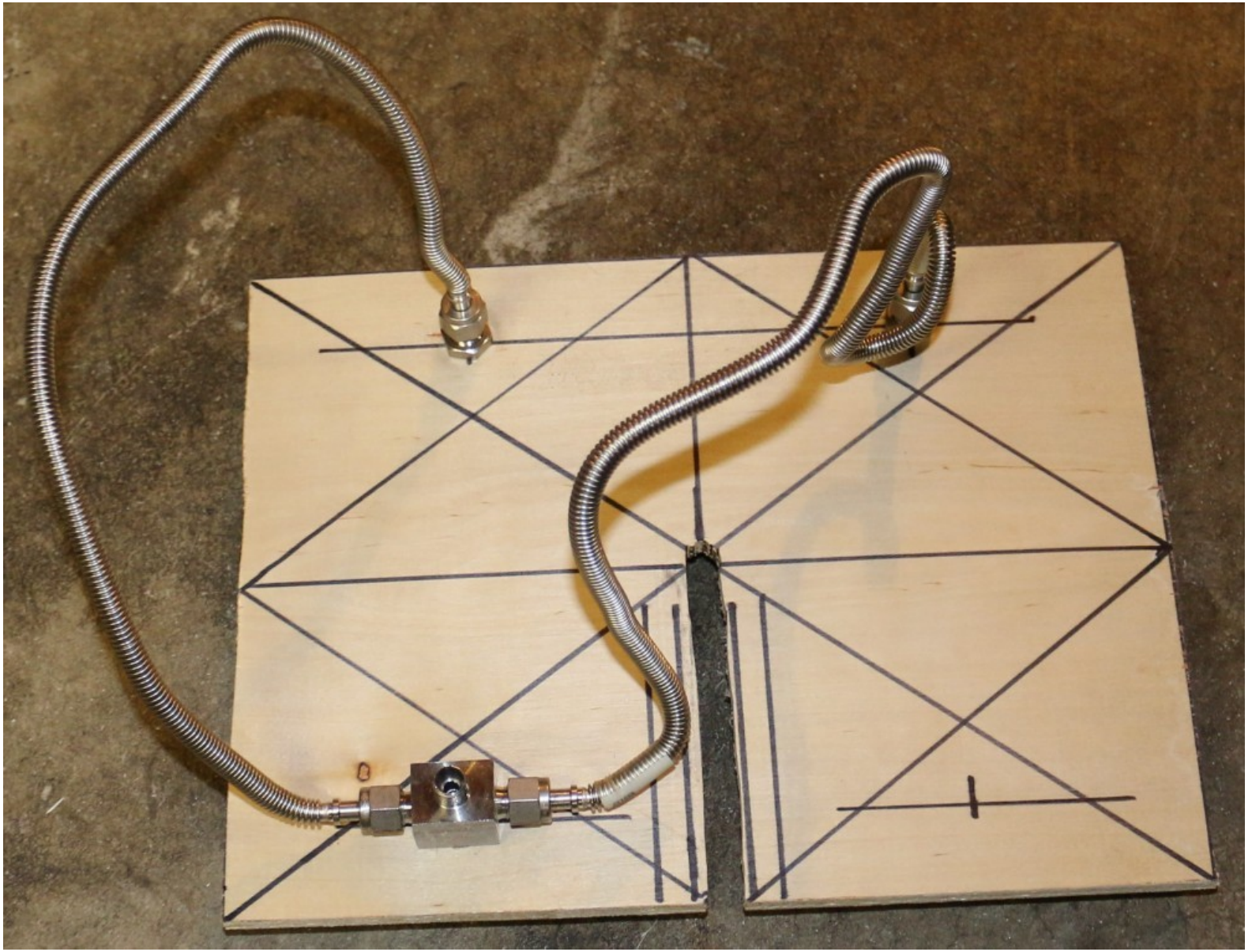
Detonator: improvements

- Problem: compressor heavy, no reset
- Idea: bicycle pump like ACME TNT detonator



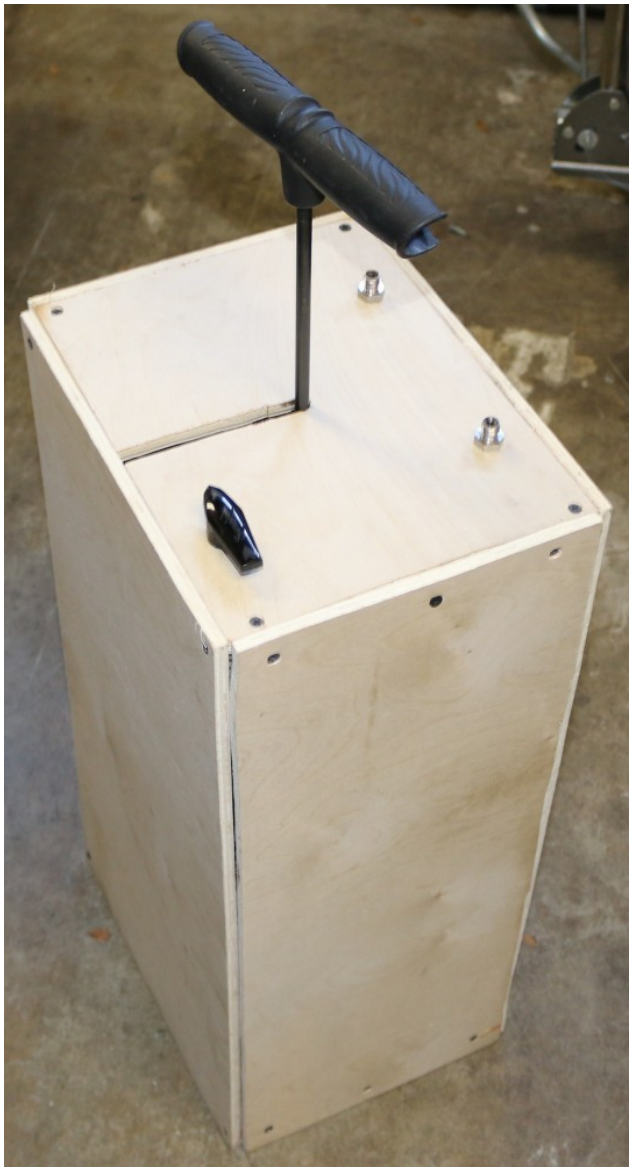
Detonator: planning

Detonator: reset

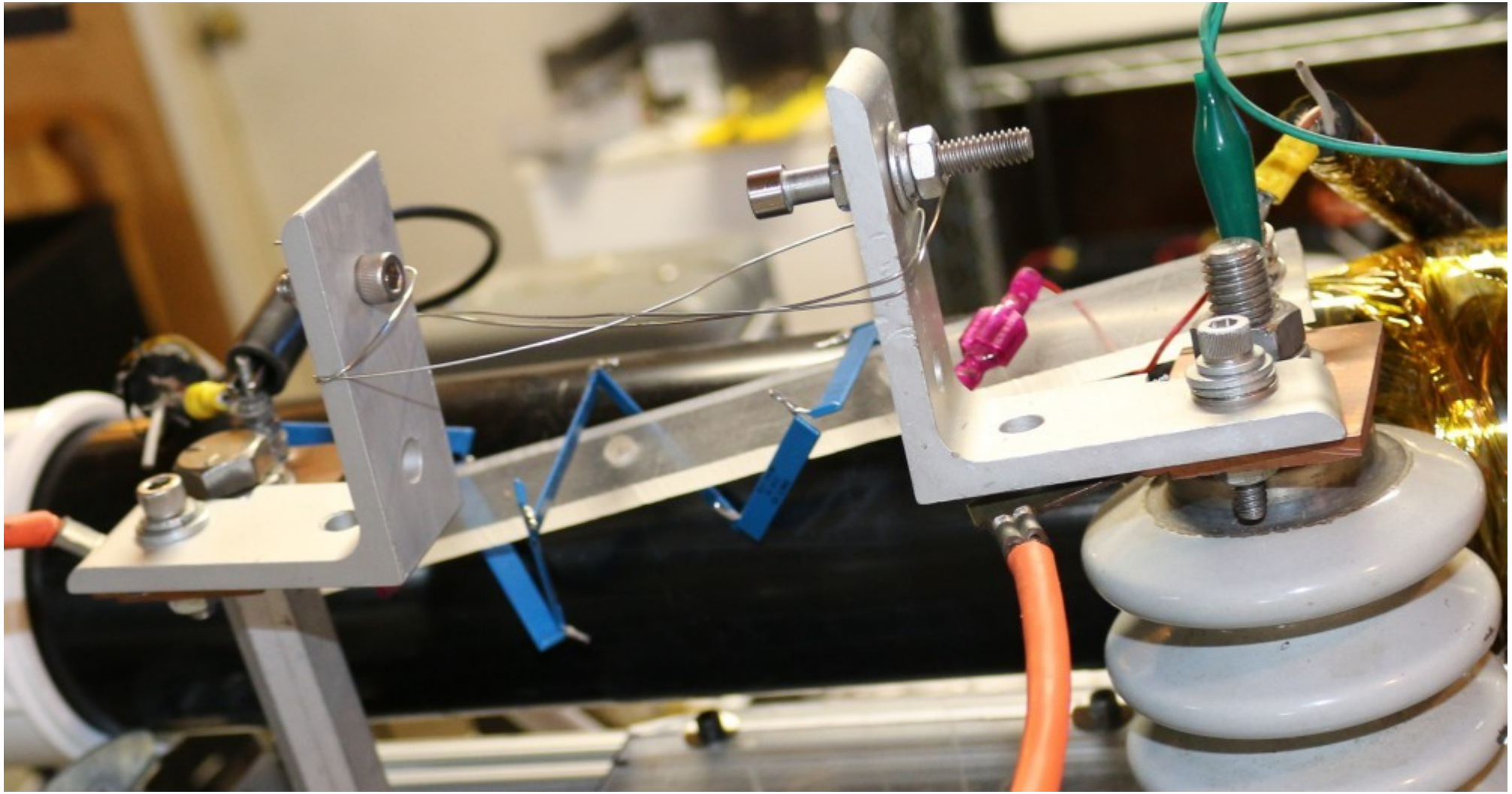


Detonator: assembling

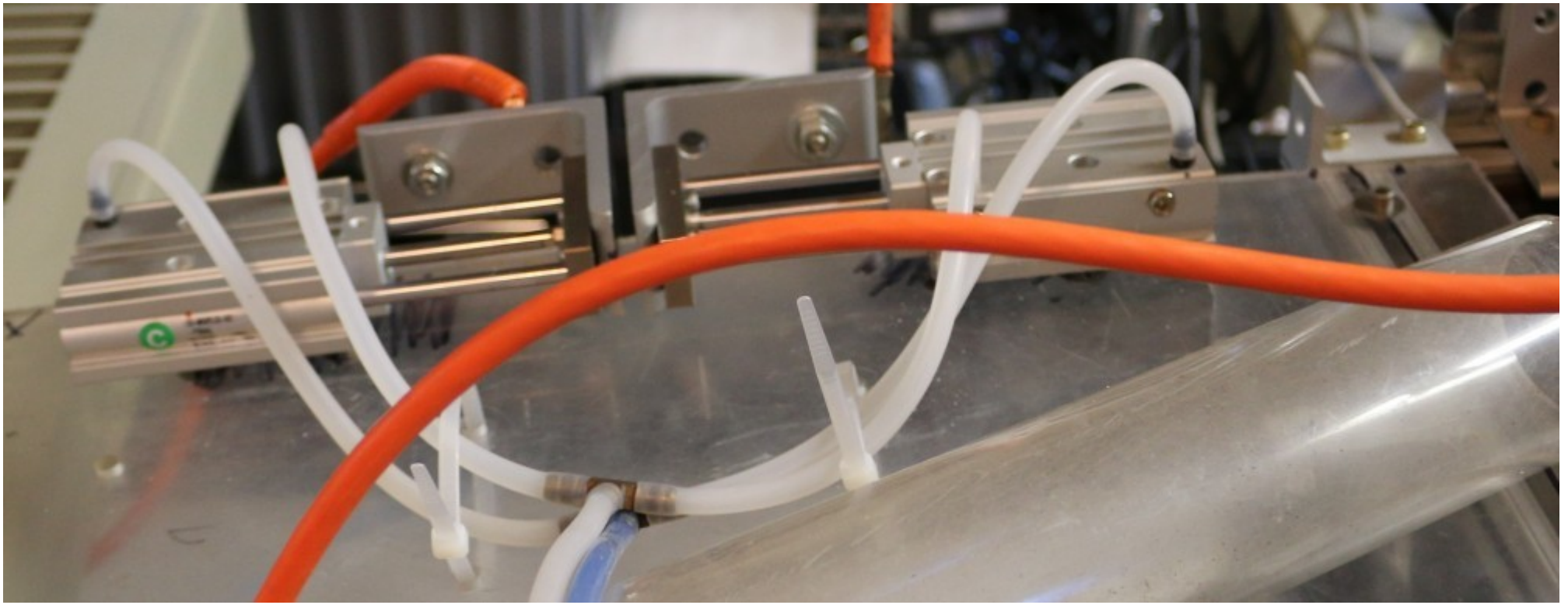
Detonator: complete



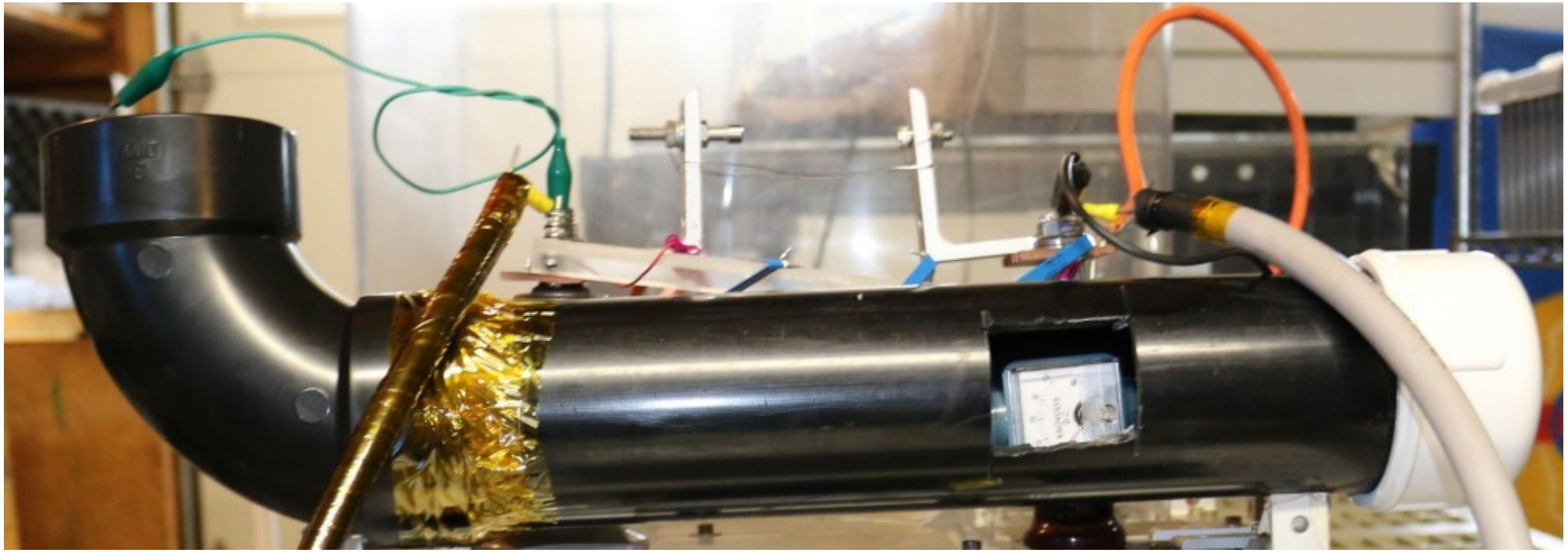
Improved safety gap



Improved HV switch



Improved meter



Improved shield

Final setup

Future work

Future work

- Plasma cannon on SC1 siege tank

Thanks for listening!

- Questions? Interested?
  - JohnDMcMaster@gmail.com