

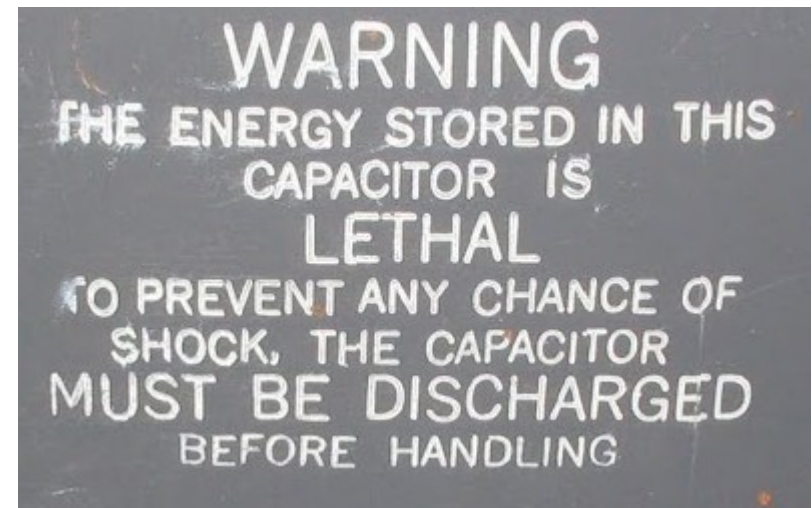
# Fruit Exploder ("Lil McMaster Disaster")



John McMaster  
JohnDMcMaster@gmail.com

# What

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

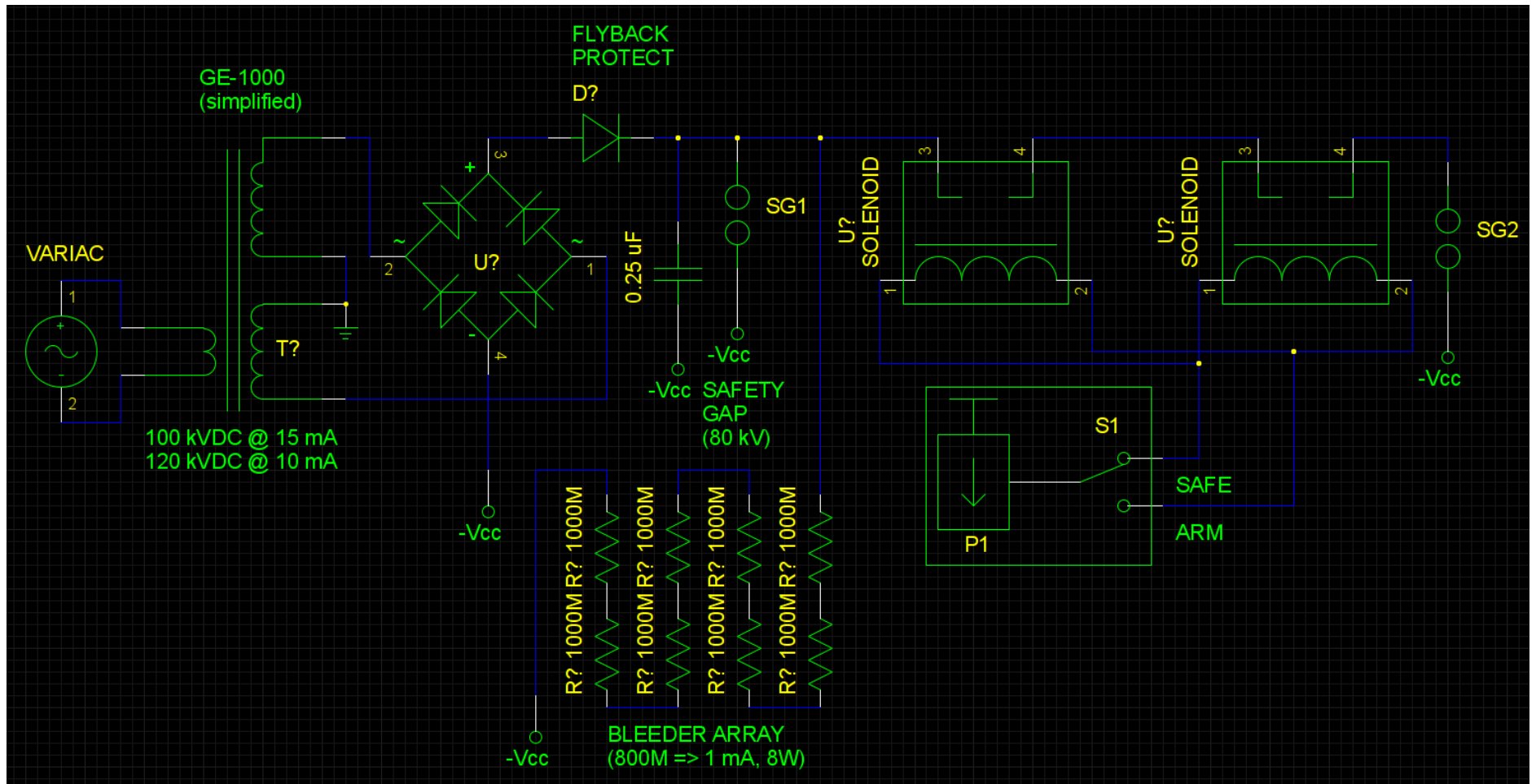


# How much energy?

- $E = \frac{1}{2} C V^2$
- $E = \frac{1}{2} * 0.25e-6 * 80e3^2 = 800 \text{ J}$ 
  - $C = 0.25e-6$
  - $V = 80e3$
- Loud! Run at half voltage
- $E = \frac{1}{2} * 0.25e-6 * 40e3^2 = 200 \text{ J}$



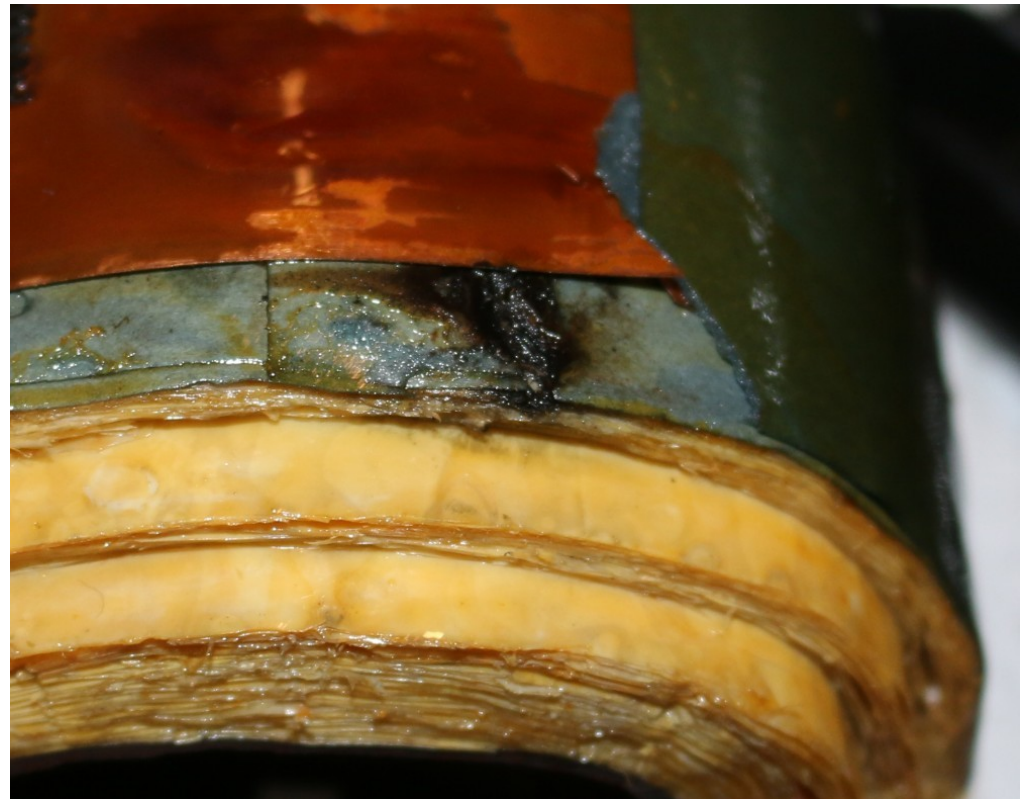
# Final schematic



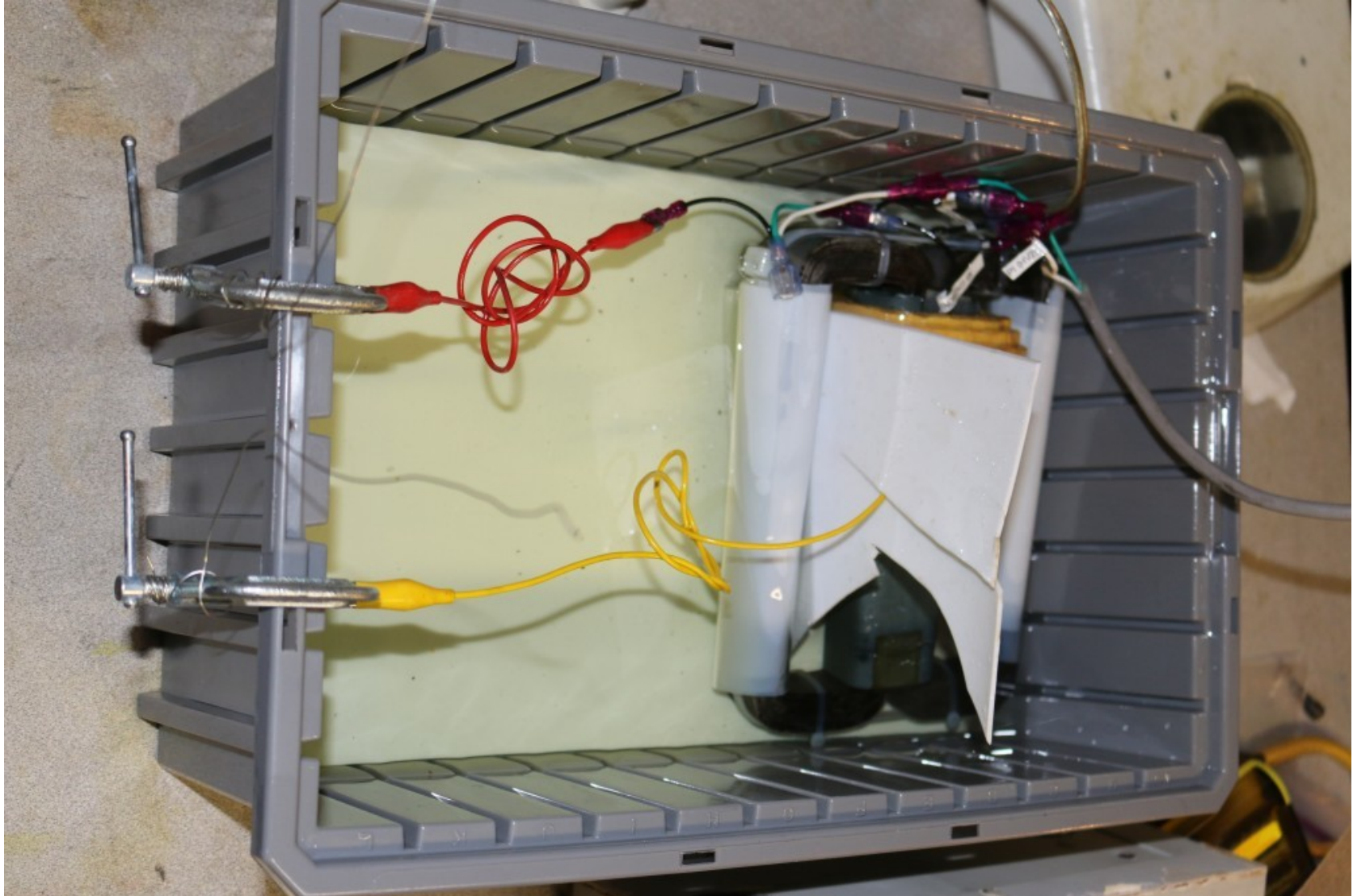
# Obtaining HV transformer



# Obtaining HV transformer

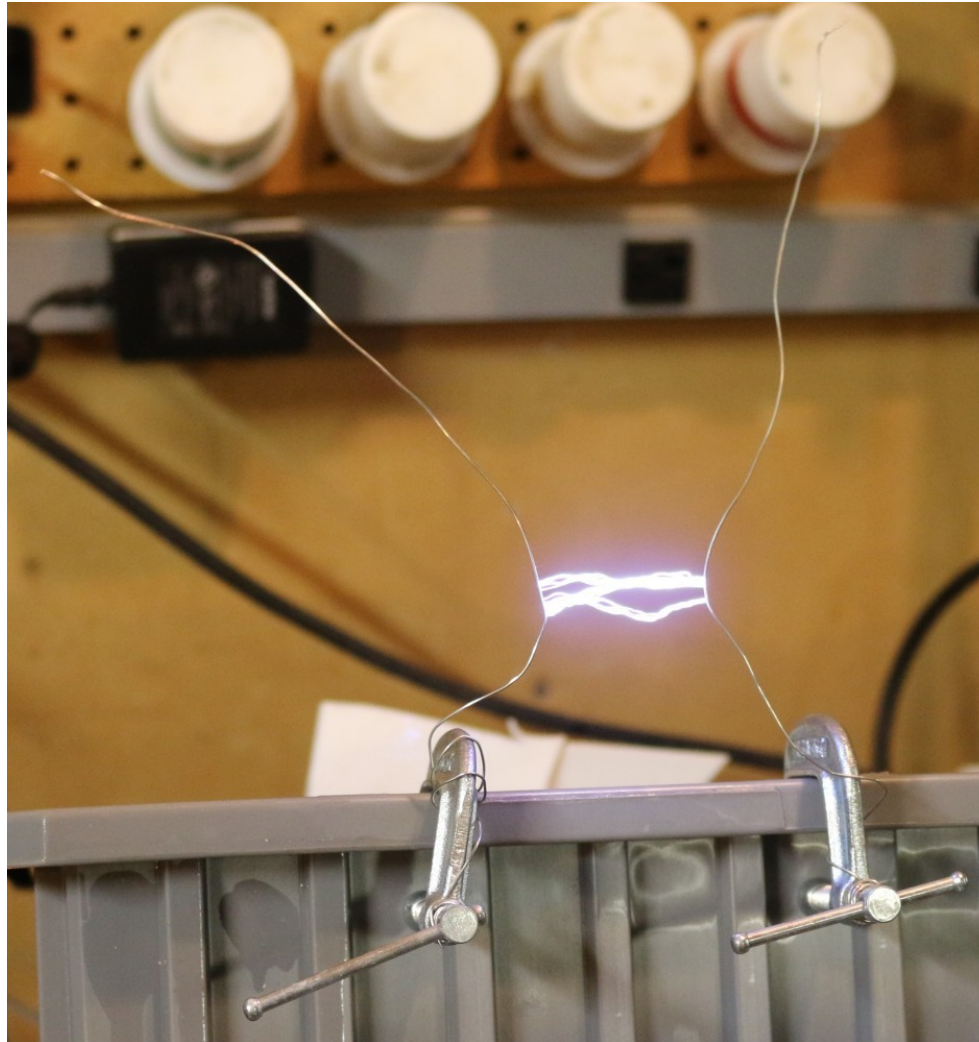


# Transformer test: box

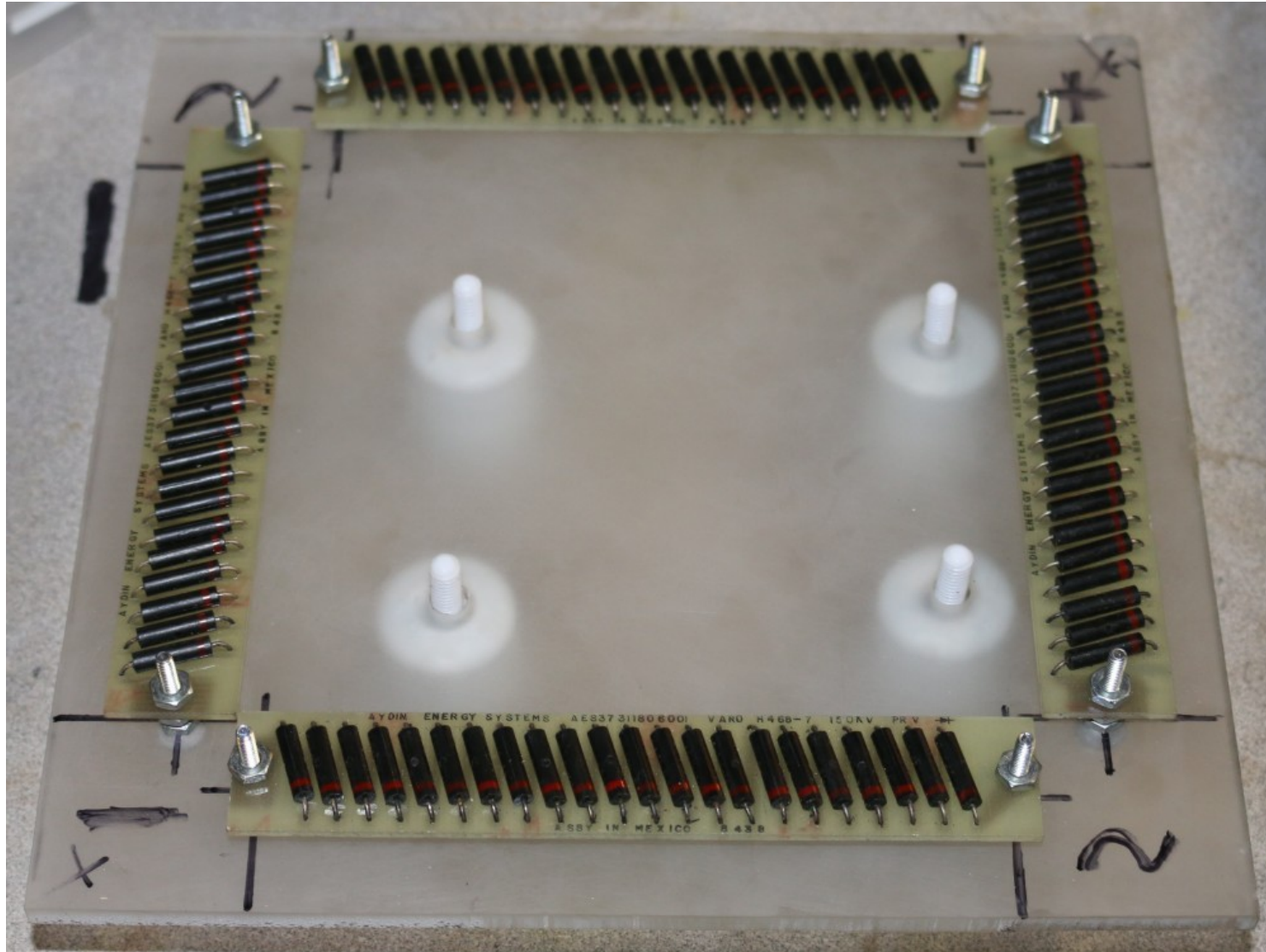




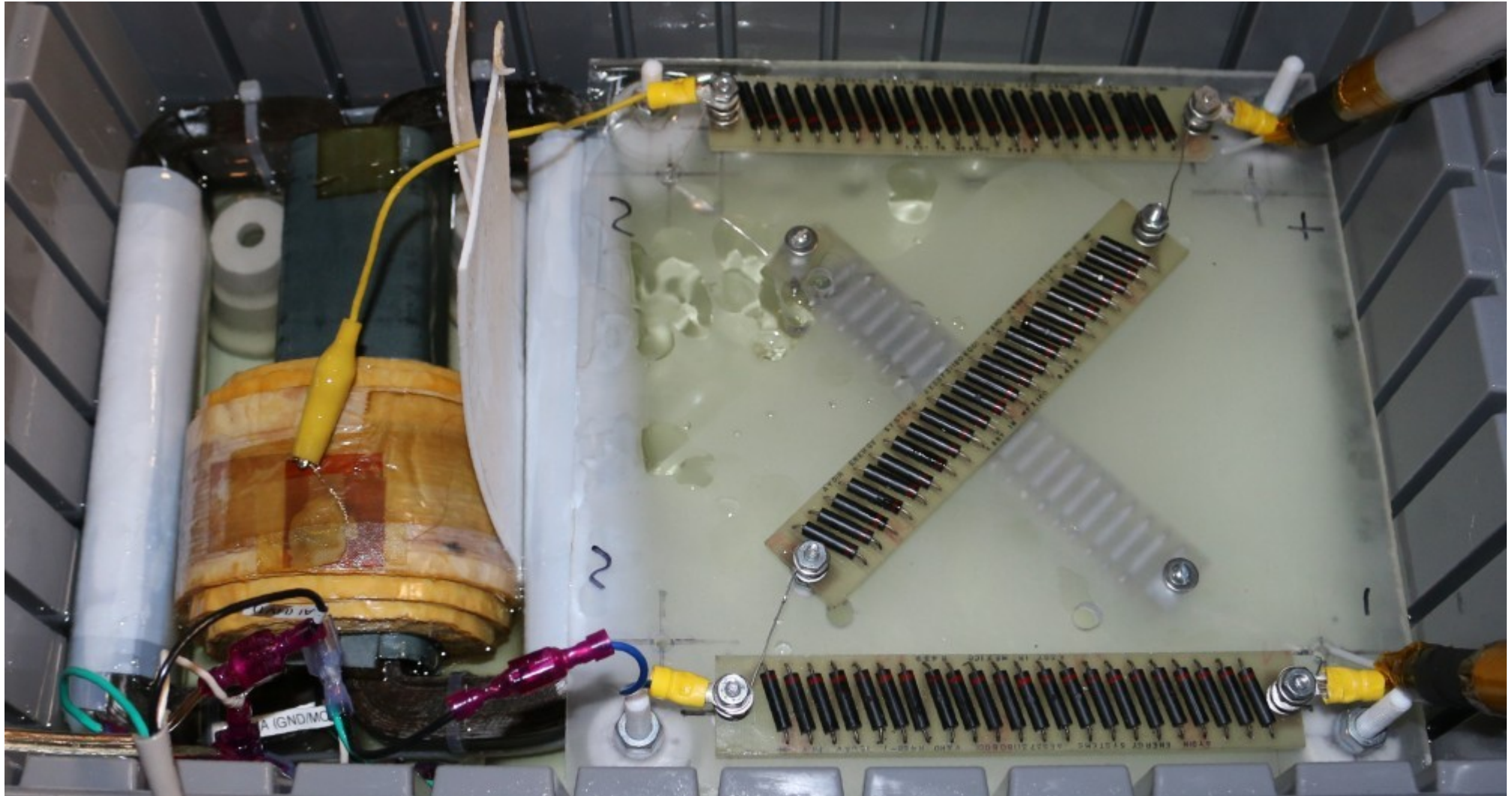
# Transformer test: sparks!



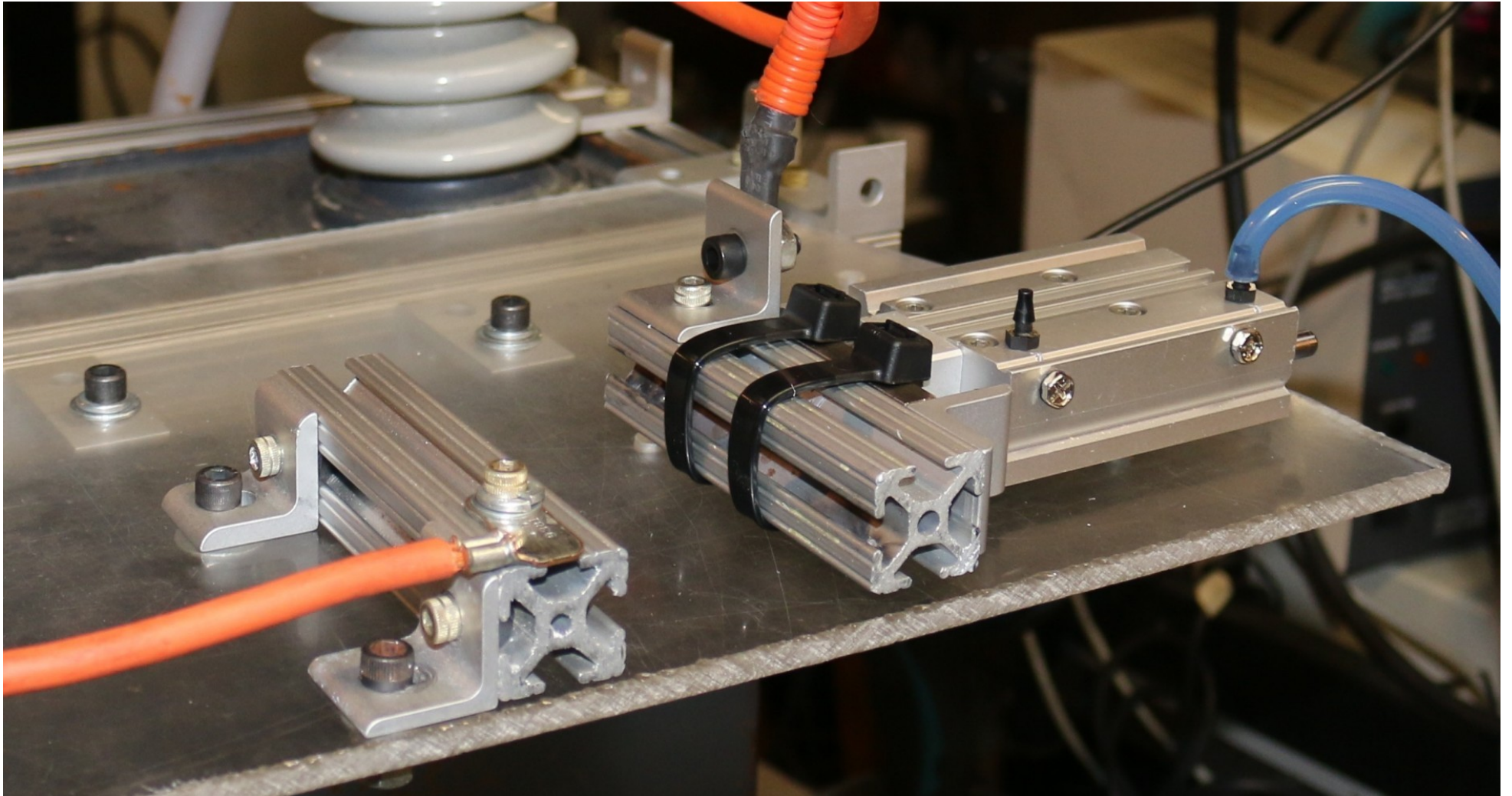
# HV rectifier first cut



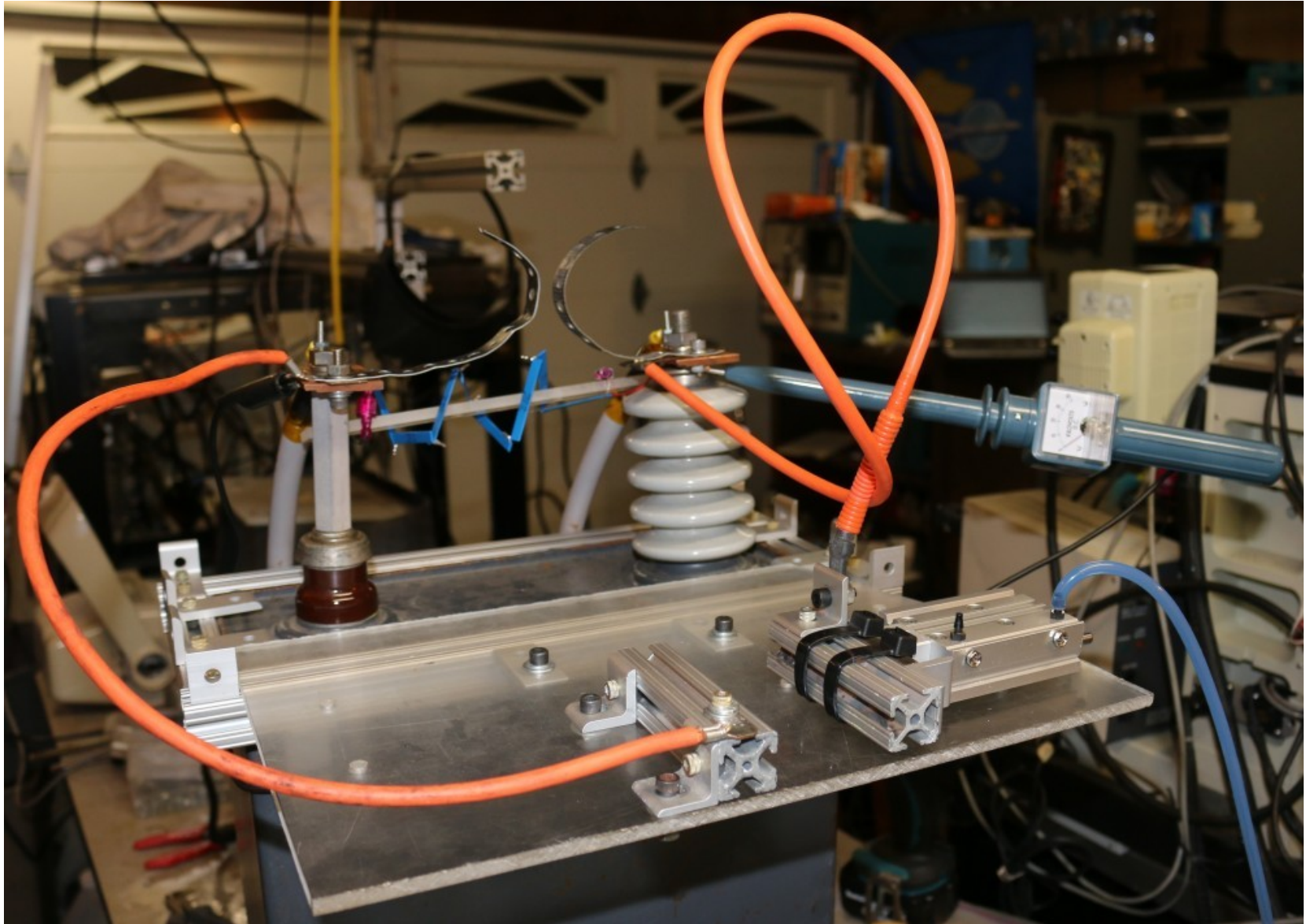
# Prototype: PS



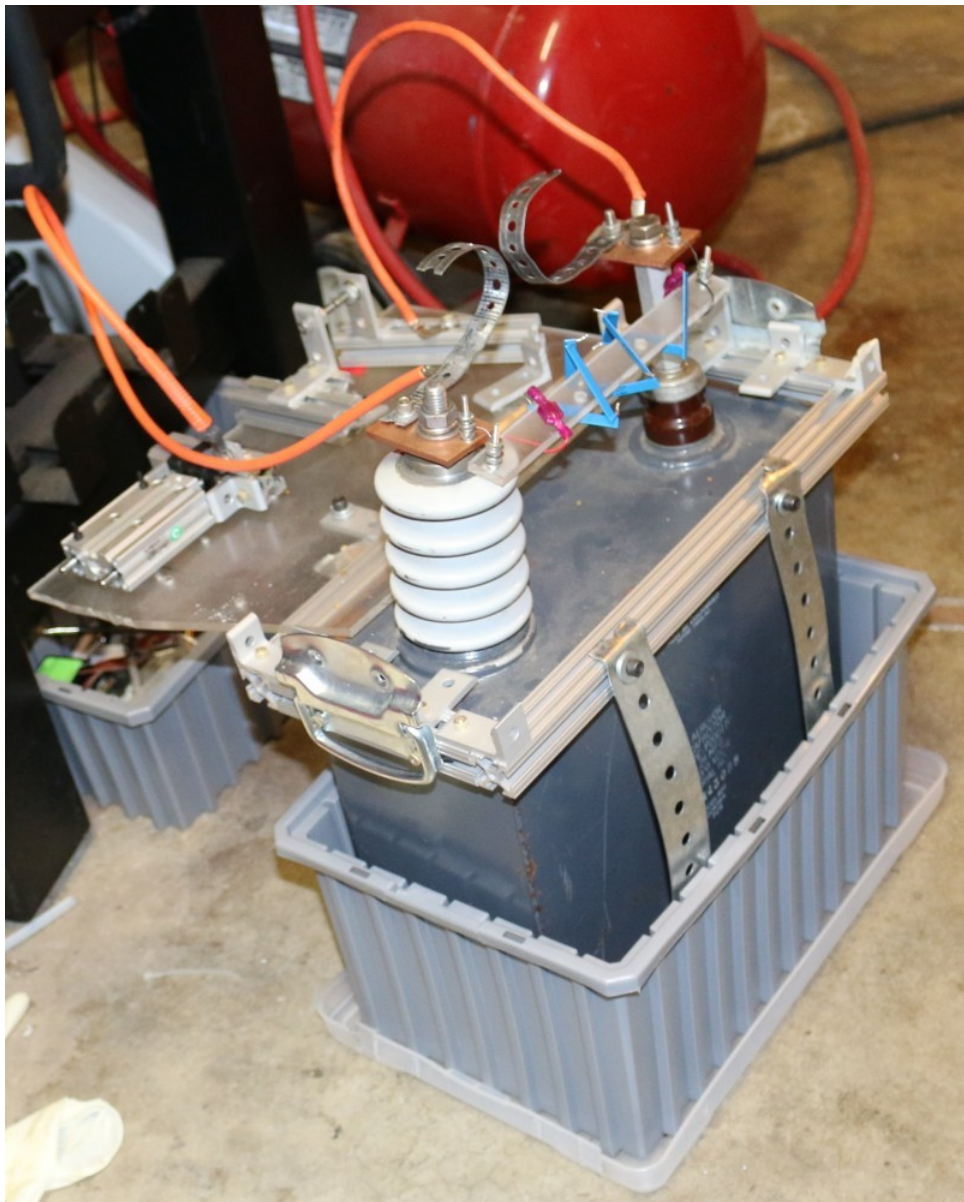
# Prototype: HV switch



# Prototype: capacitor (1/2)



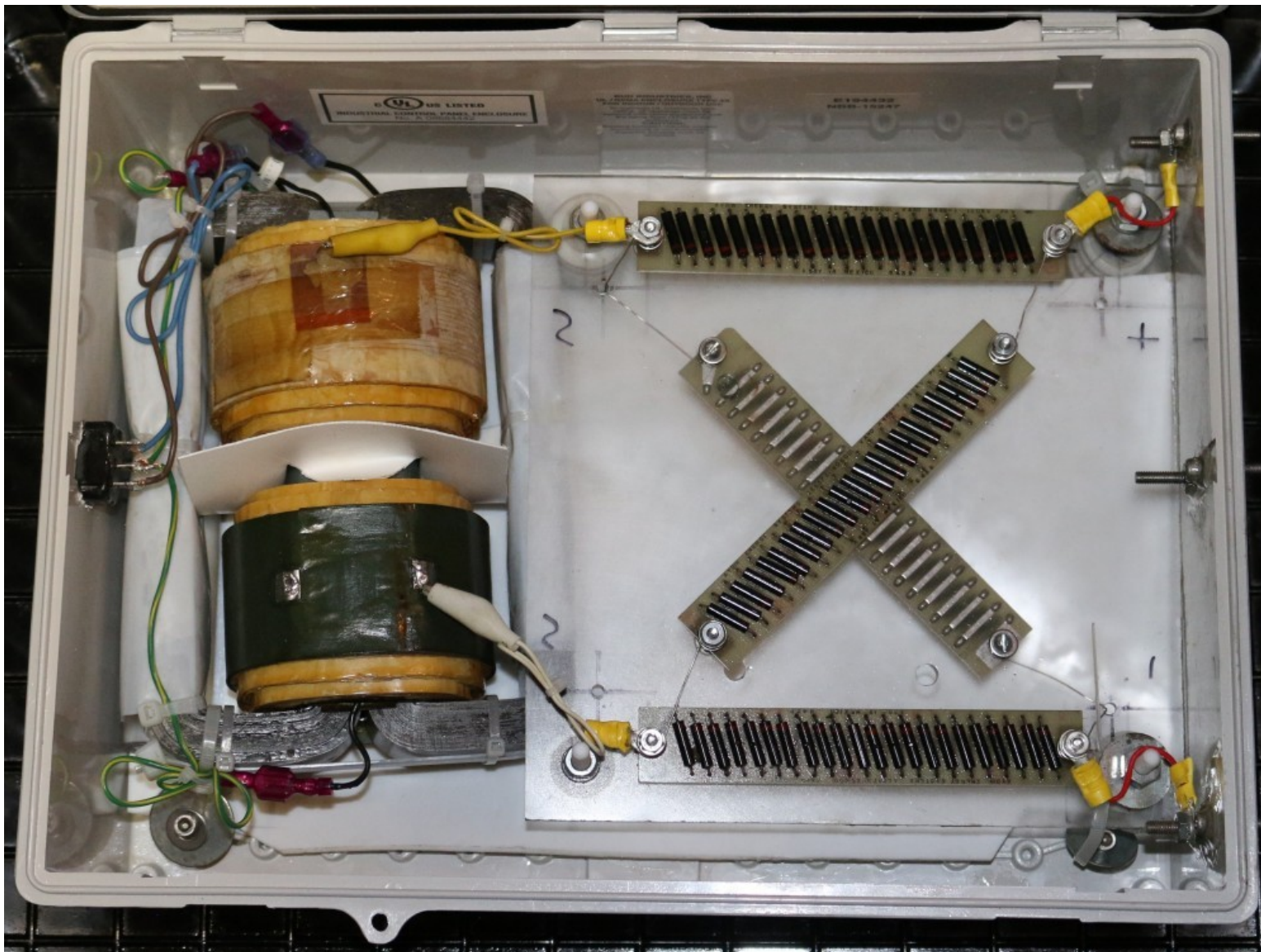
# Prototype: capacitor (2/2)



# 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

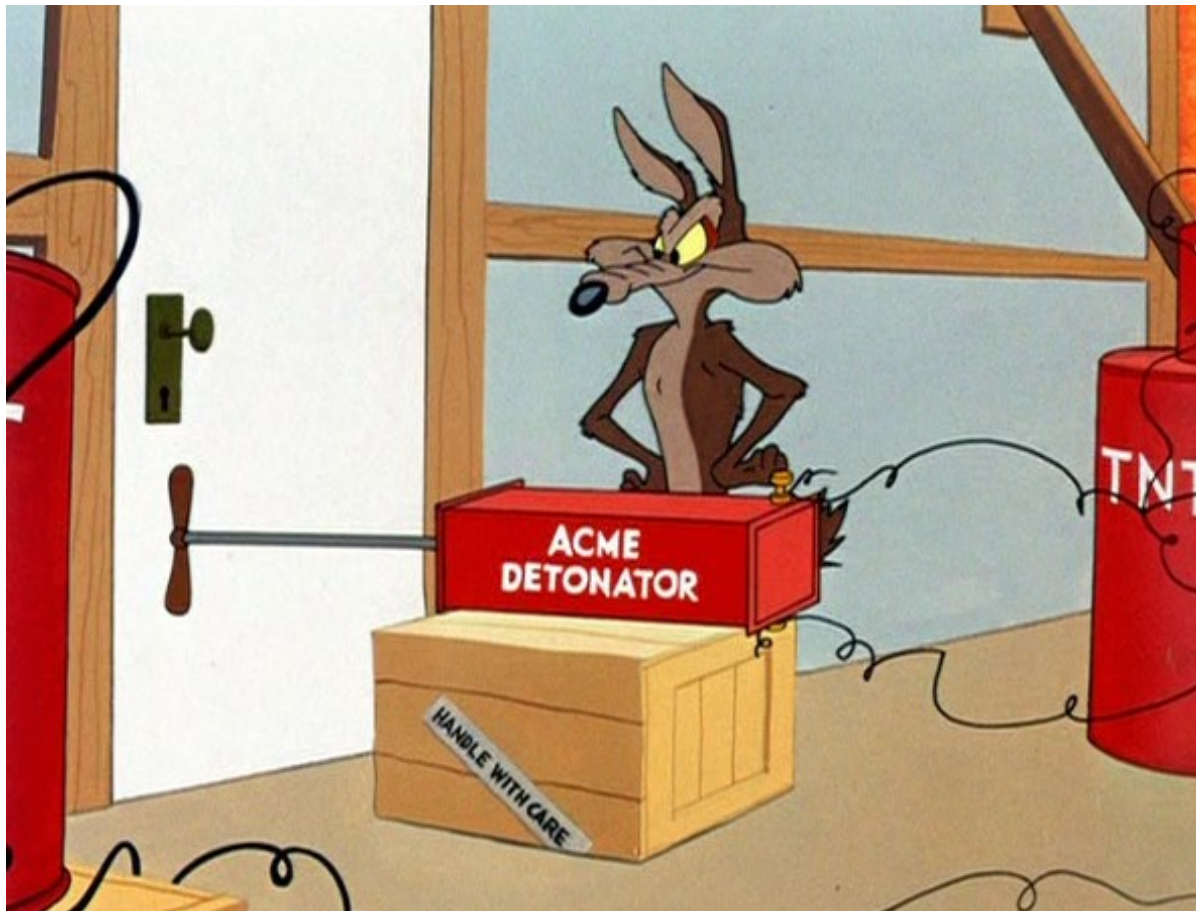


# PS: polishing



# Detonator: improvements

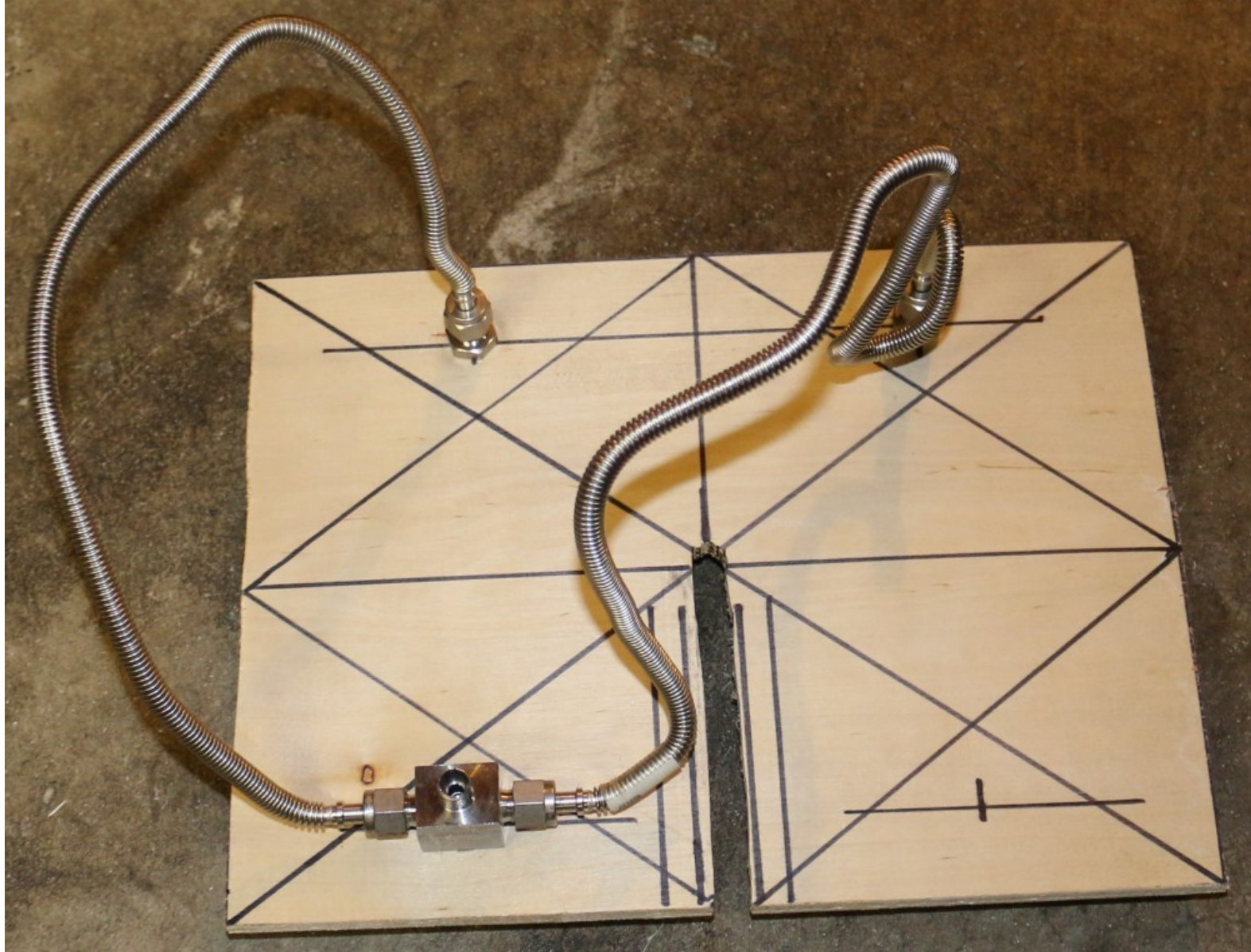
- Problem: compressor heavy, no reset
- Idea: bicycle pump like ACME TNT detonator



# Detonator: planning



# Detonator: reset



# Detonator: assembling

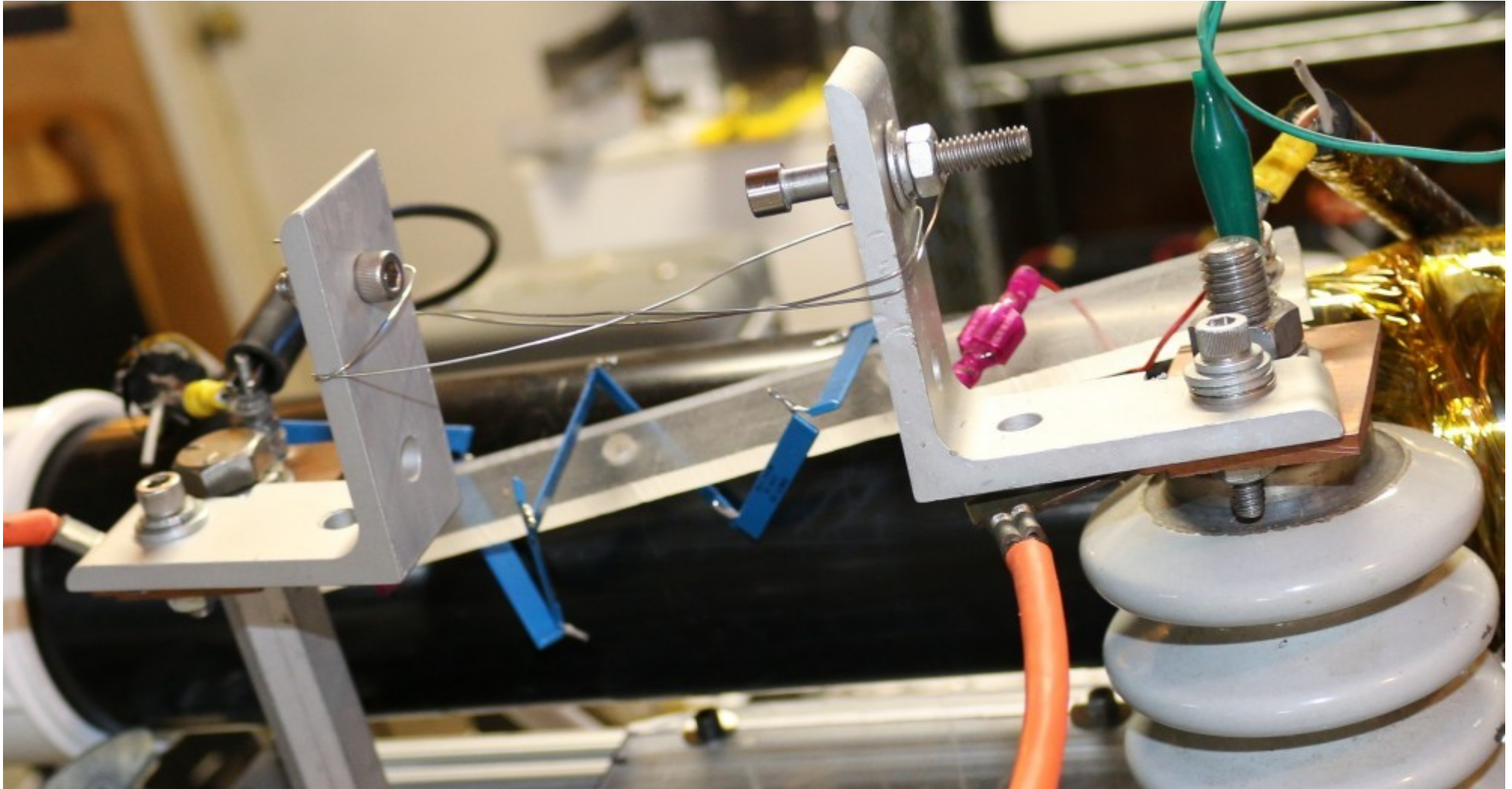


# Detonator: complete

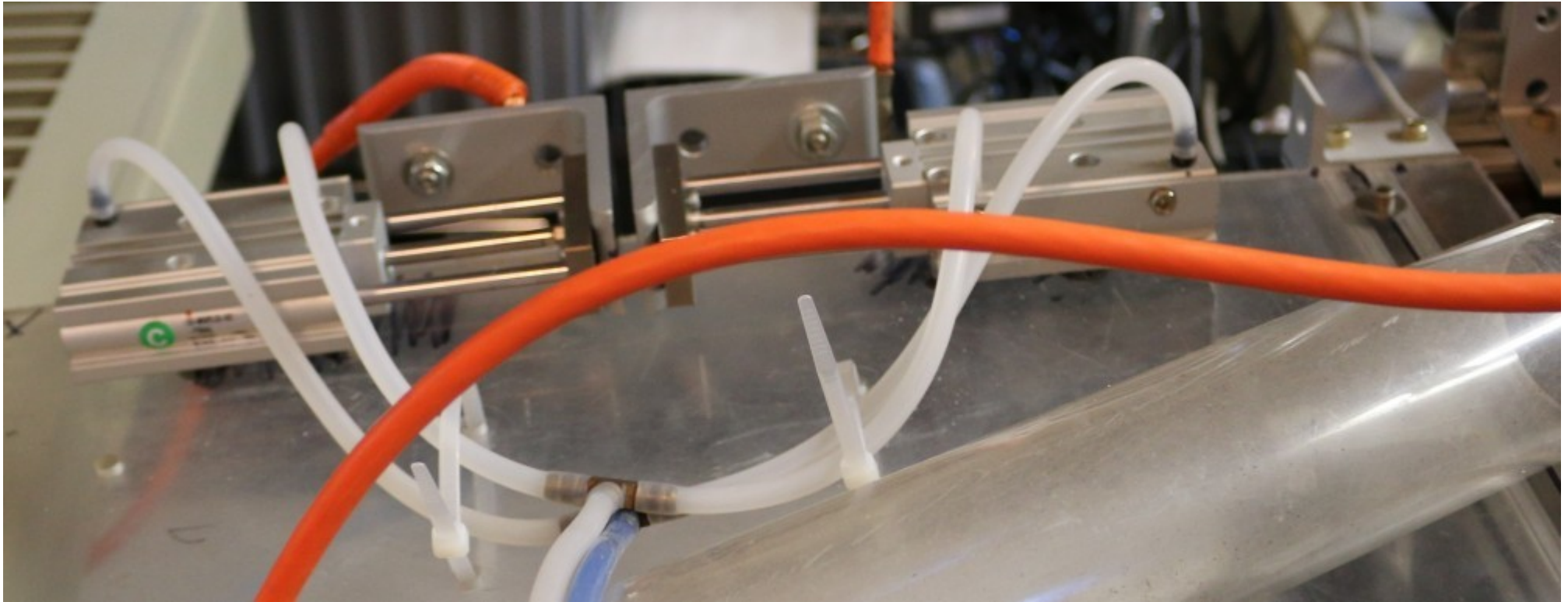




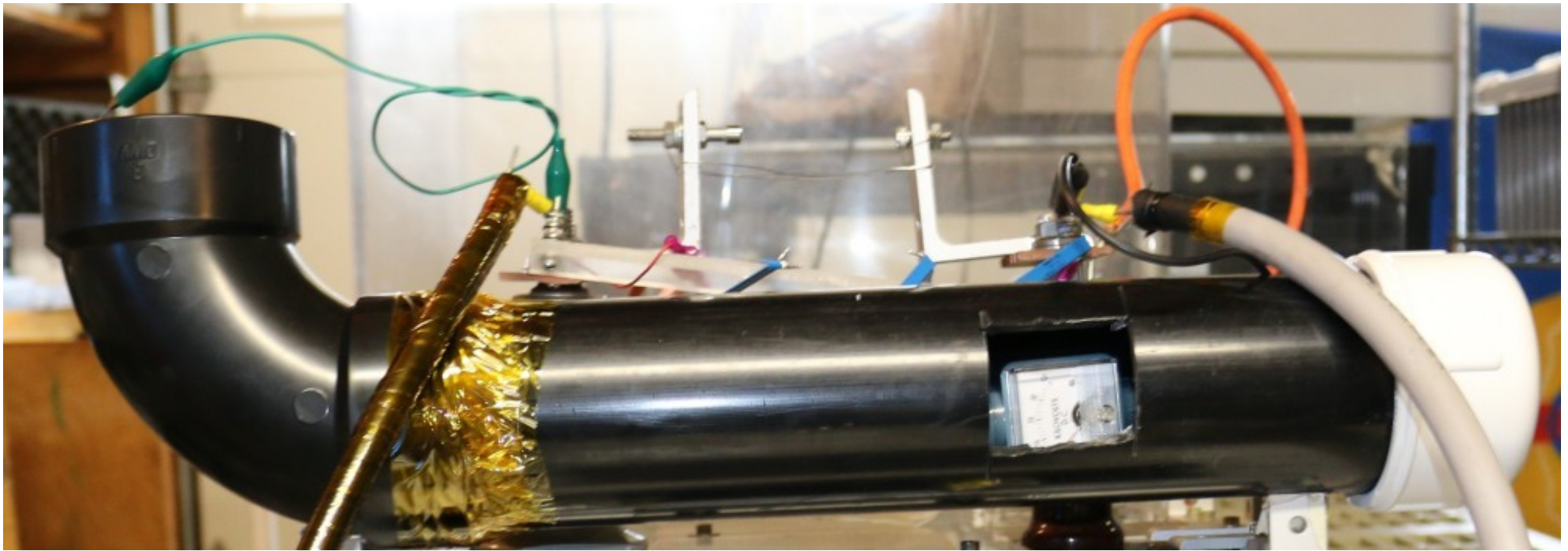
# Improved safety gap



# 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](mailto:JohnDMcMaster@gmail.com)

