FDEM PCB

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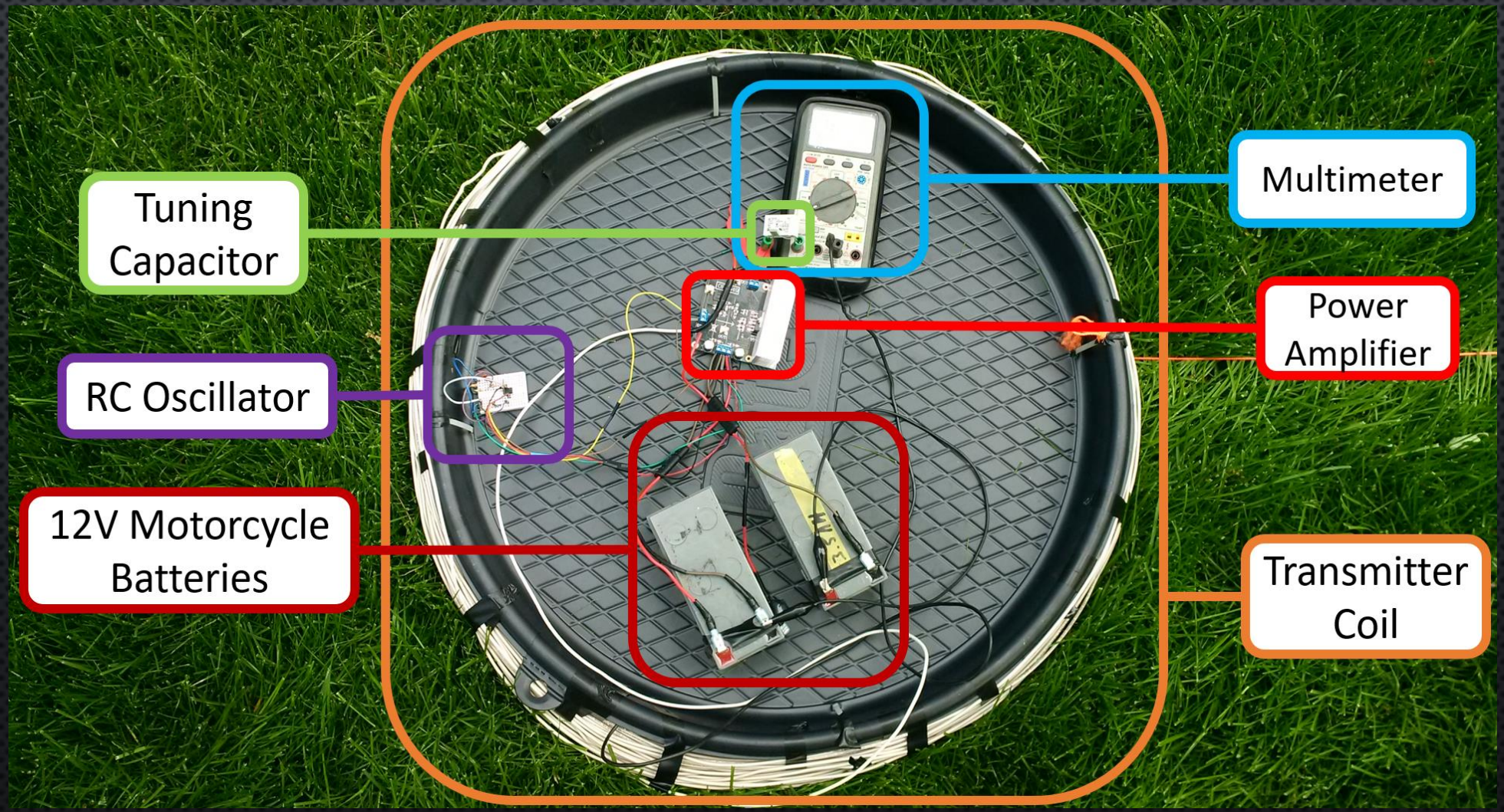
Special Thanks to **Gavin Wilson**

GOAL

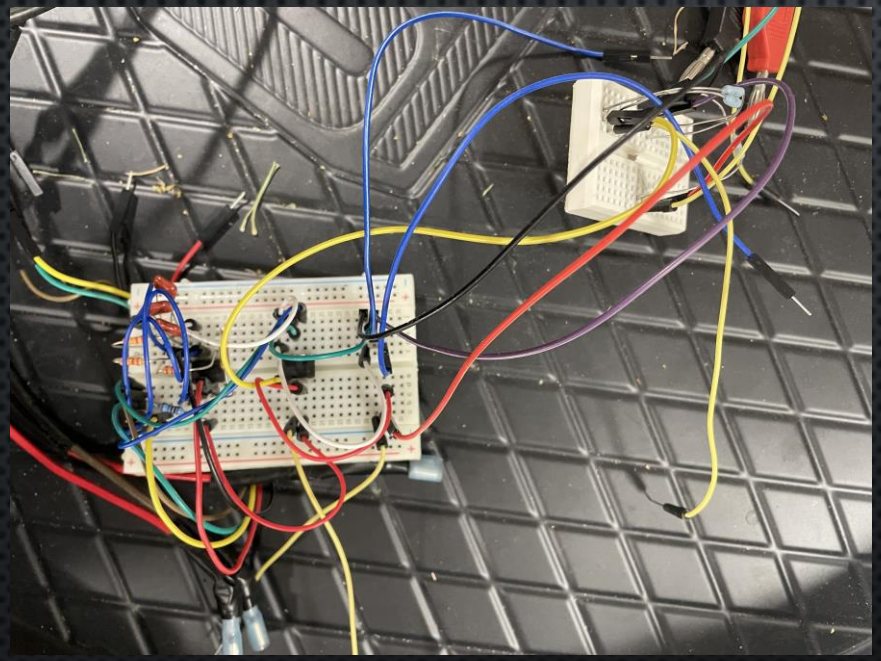
- Learn how to use the voltera V1
  - To help future geophysics students at mines
- Print circuit from gavins frequency domain electromagnetic instrument
  - To decrease the cost and complexity as a step towards mass producing the instrument

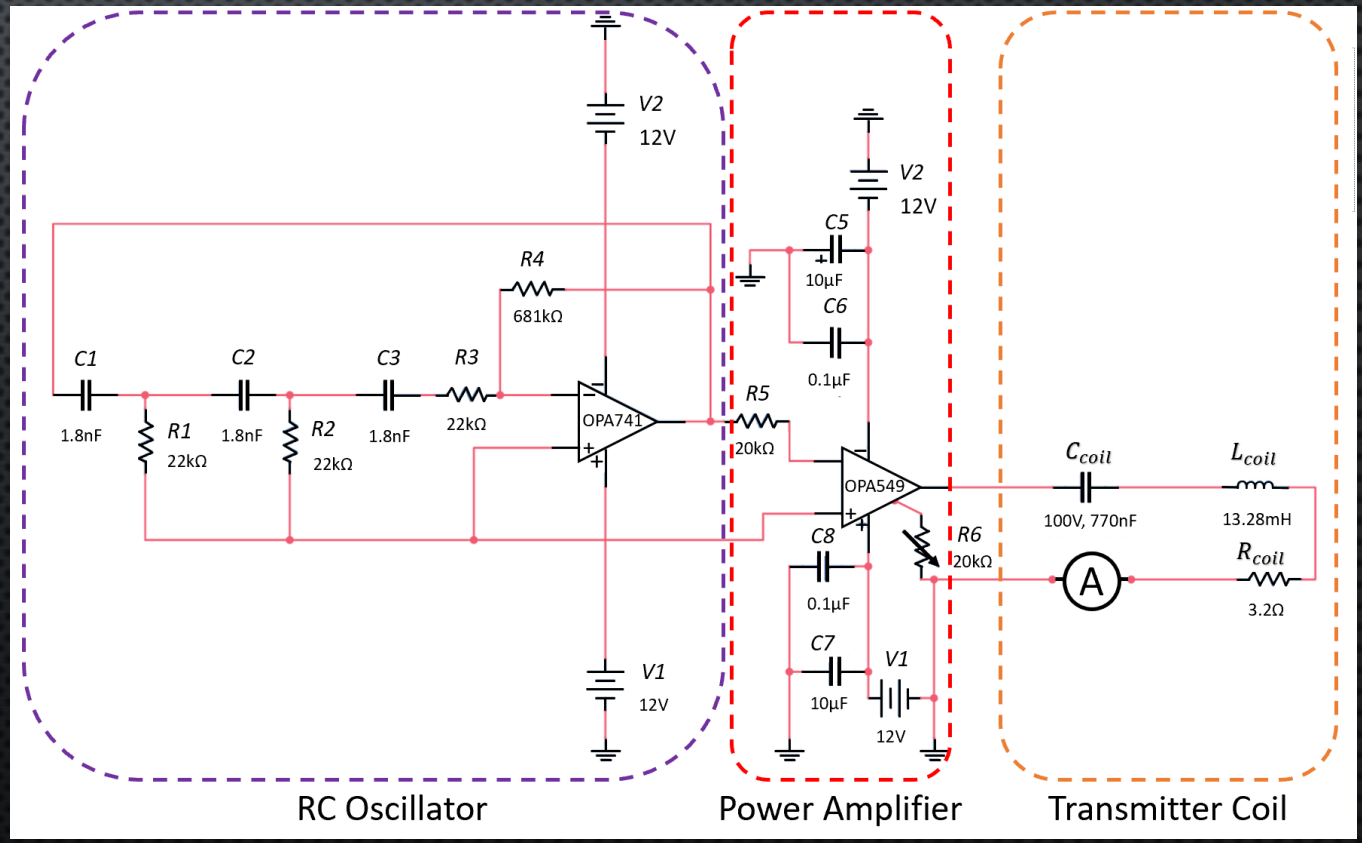
FREQUENCY DOMAIN EM



DESIGN

- OUR GOAL WAS TO PRINT THE RC OSCILLATOR COMPONENT OF THE SCHEMATIC





EAGLE

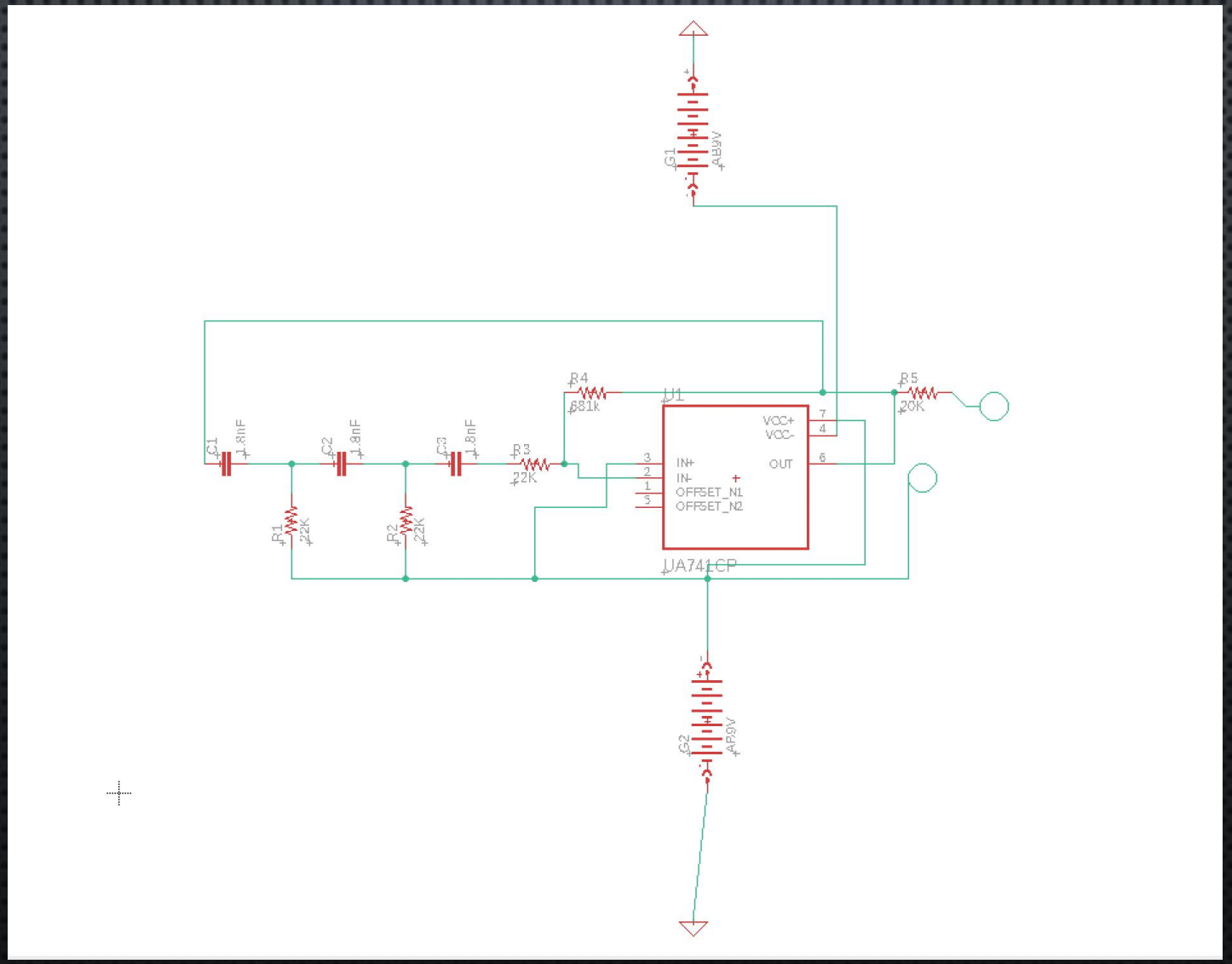
Pros

- Generates CAM data
- Free version

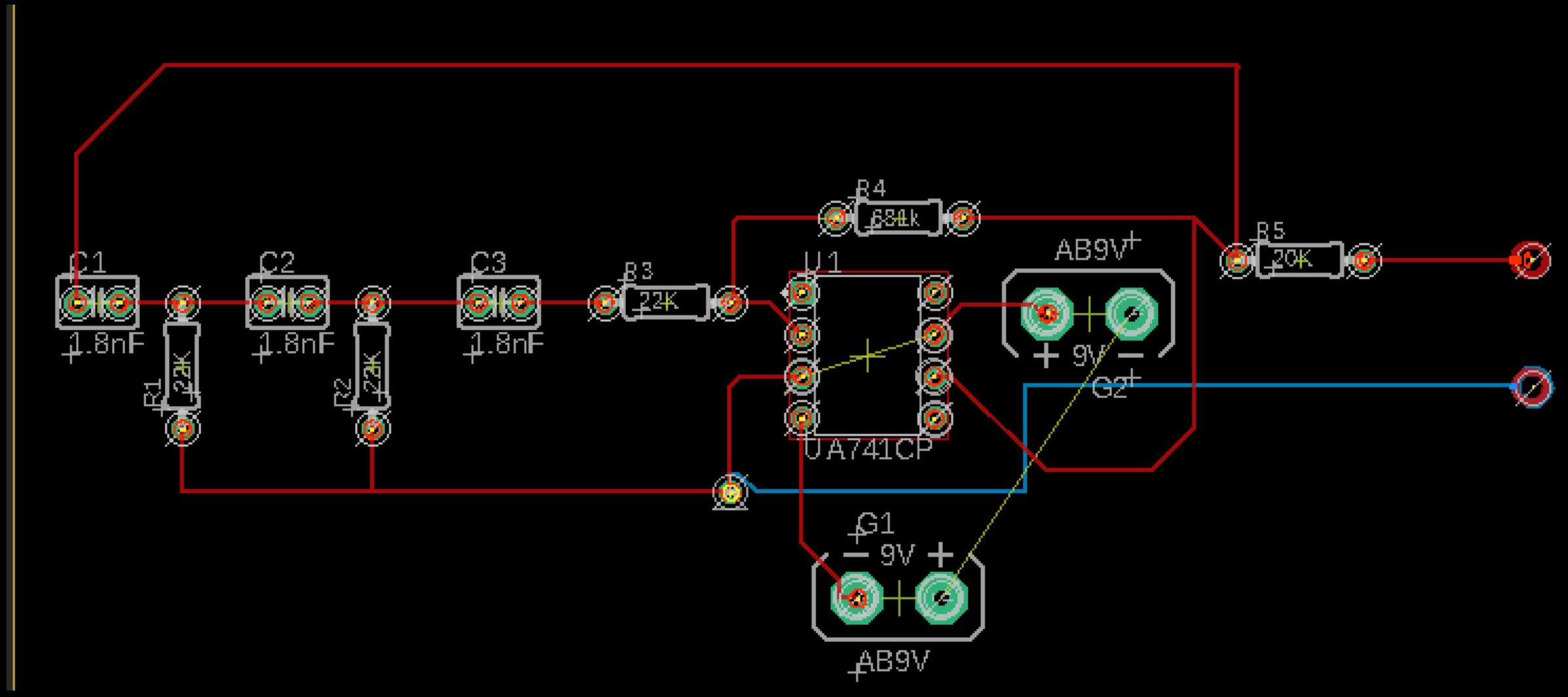
Cons

- Adding parts is complicated
- Library for parts is not predictive
- Very awkward user experience

EAGLE SCHEMATIC



Eagle Board


C1
1.8nF
C2
1.8nF
C3
1.8nF
R1
22K
R2
22K
R3
22K
R4
68K
U1
UA741CP
R5
20K
AB9V
+ 9V −
G2
G1
− 9V +
AB9V

V-One

File View Account Help

Connected
21.0°C
X: 0.00 Y: 0.00 Z: 0.00

Latest Community Posts

Why no milling?	2
Replacement parts	2
Ground plane alternative	2

VOLTERA

PRINT SOLDER HEAT DRILL

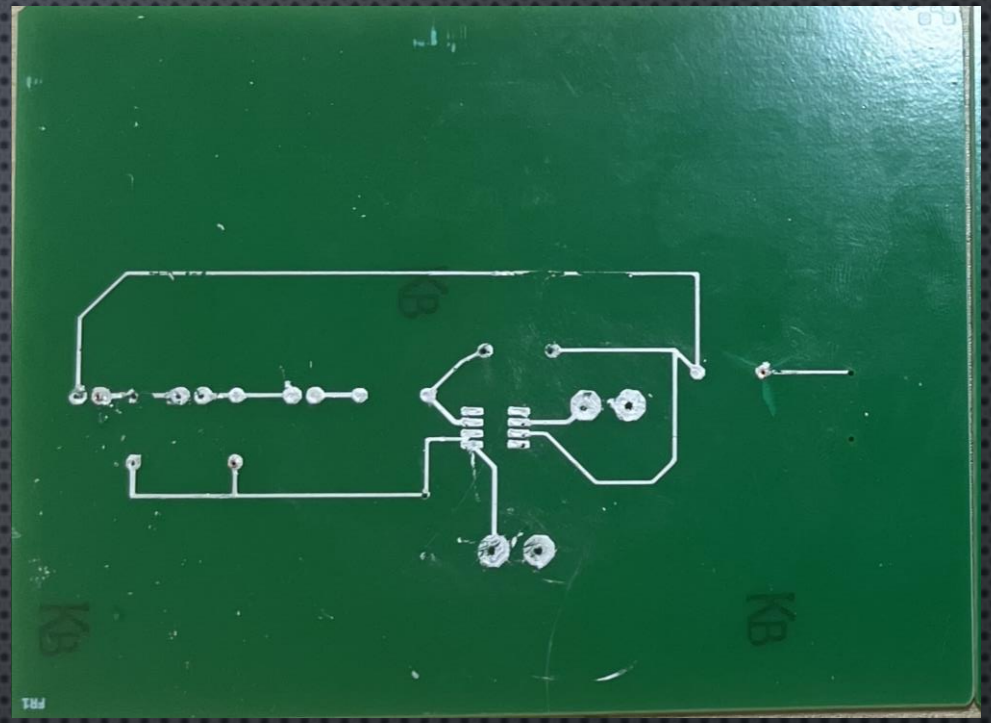
v3.9.0 (up to date)

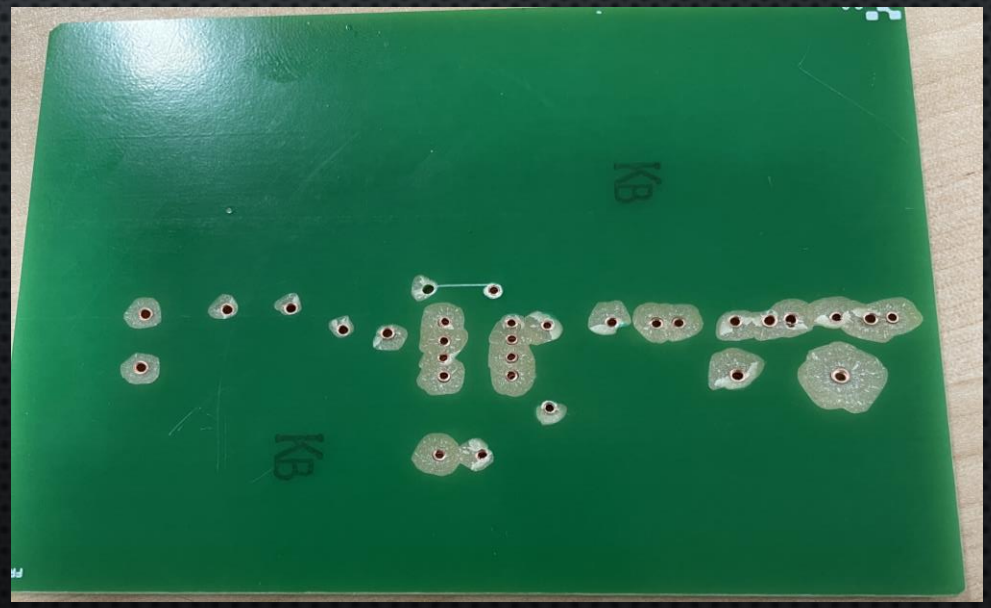
Work Flow

- Load drilling file and circuit file from eagle CAM data
- Check circuit dimension on board
- Drill holes
  - Place sacrificial board
  - Use KB surrogate board
- Print conductive ink
- Bake circuit
- Load bottom of circuit
- Print Conductive Ink
- Bake Circuit
- Rivet
- Place Parts
- Solder

ISSUES

- Soldering
  - 356 °F (180 °C)- 400 °F (205 °C)
  - Soldering iron 392 °F (200 °C)
  - Silver scavenging
- Electrical components
- Time
- Printing bottom
- Riveting
- Drilling depth
- Voltera community

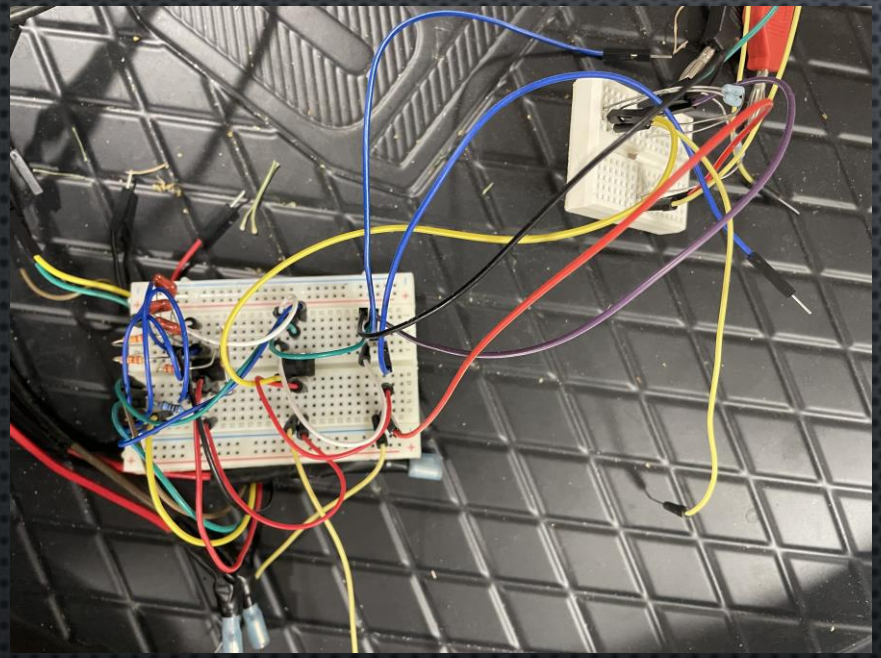


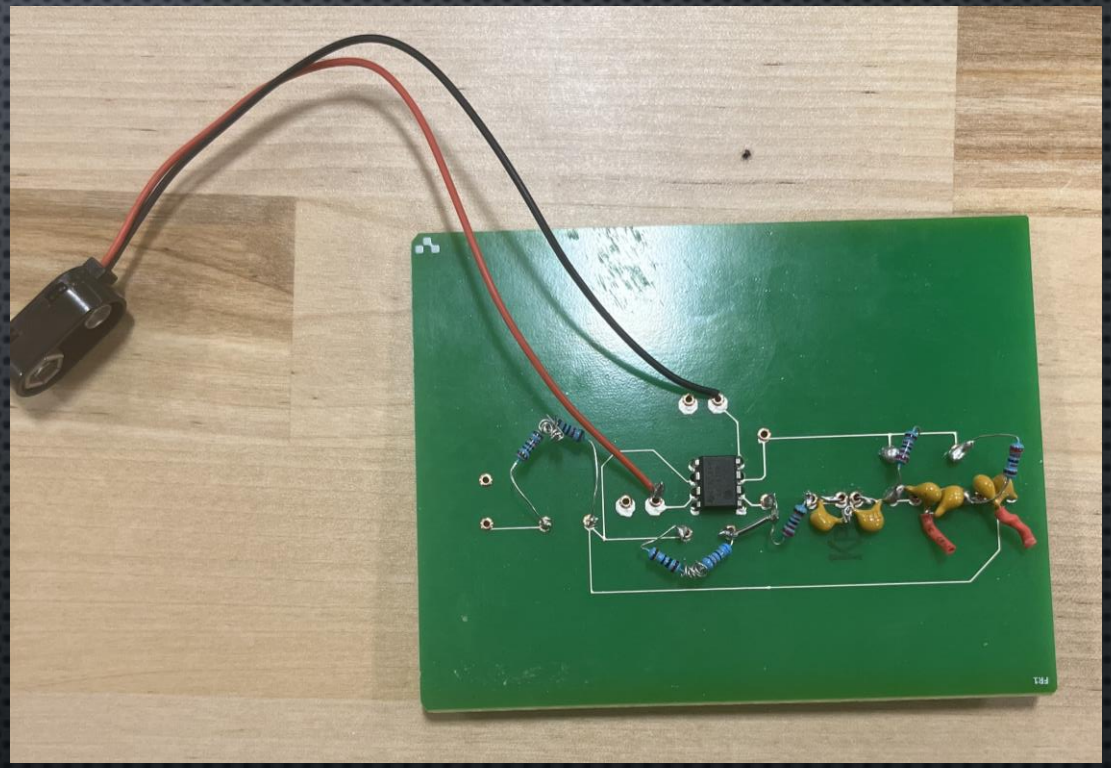


TEST CIRCUITS

- UNDERSTANDING V ONE
- TESTING SOLDERING METHODS
- METHODS
  - SOLDERING
  - SOLDERING PASTE

RESULTS





Results/Future Work

- Successful use of Voltera V-one
  - Printing
  - Drilling
  - Soldering
- Testing
  - PCB design with power amplifier and transmitter coil
- Arduino implementation