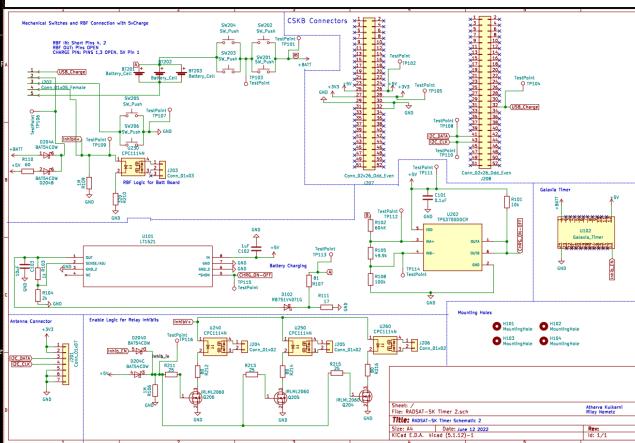
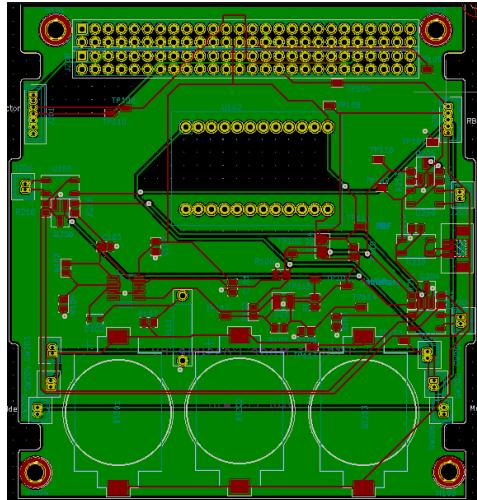


TIMER AND INHIBITS BOARD - RADSAT-SK



What?

- A PCB to count down 30 minutes and **turn the entire satellite on** using **solid-state relays** after 30 minutes have elapsed.
- Has rechargeable coin cells to charge the cells in space, in case of satellite reboots.

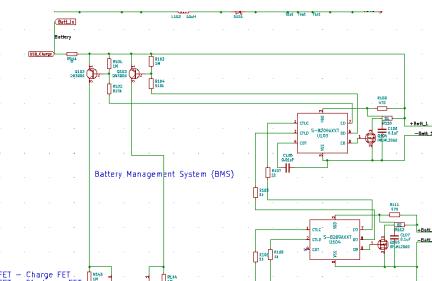
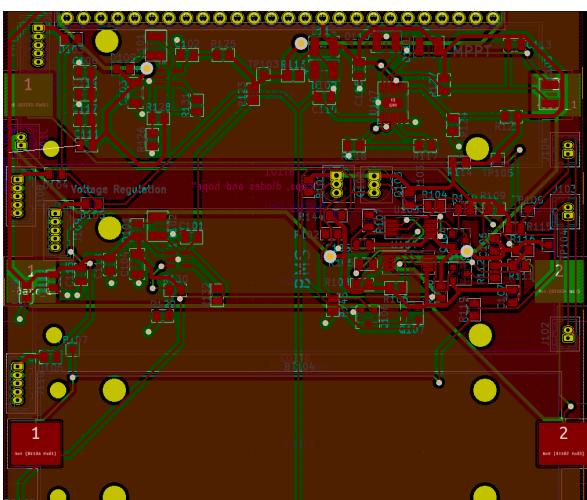
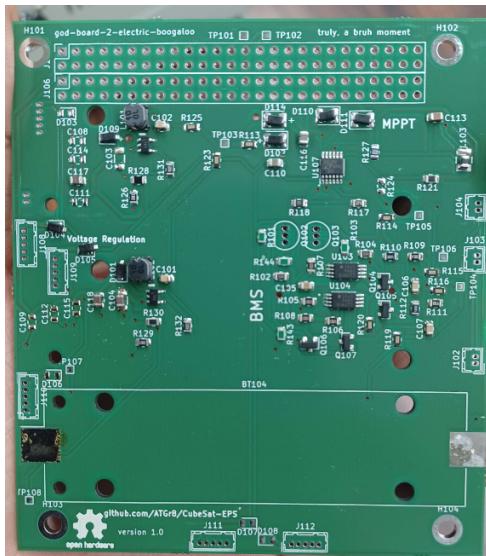
How?

- Used **KiCad** to design the schematic and the PCB layout.
- Performed **Circuit Analysis** on the schematic.

Learning Outcomes

- Learnt **Circuit Design, PCB Design and PCB manufacturing**.
- Learnt how **cell charging/discharging** works.
- Learnt how to use **relays as switches**.

ELECTRICAL POWER SYSTEM/POWER BANK



What?

- PCB that **regulates voltage** to 5V and 3V3, **charges 18650 LiPo Batteries** by taking **maximum point input** from solar panels.

How?

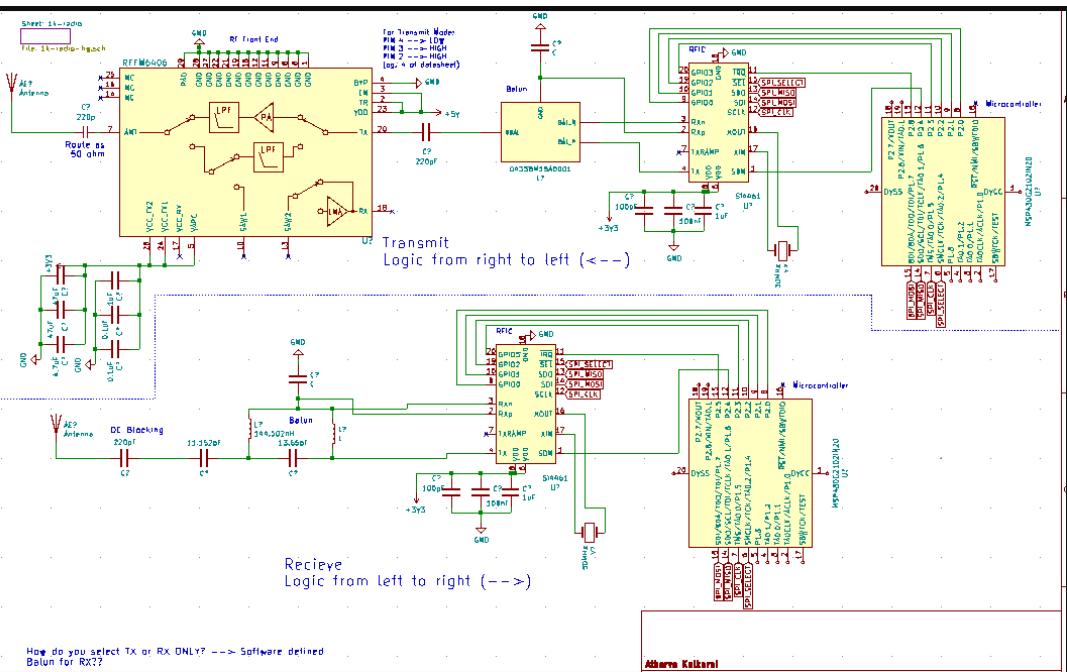
- Designed on **KiCad**.
- Reflowed SMD components**.

Learning Outcomes

- Battery charging, Buck boosting and MPPTs.
- Complicated tracing on PCB.
- Tracing **Mixed signals PCB**.

ATHARVA K.

TRANSCEIVER (RF BOARD)



What?

- **Full duplex RF Transceiver.** Range 100-1050 MHz.
- UHF and VHF bands.
- **To be used on a rocket** by the Usask Rocketry team.

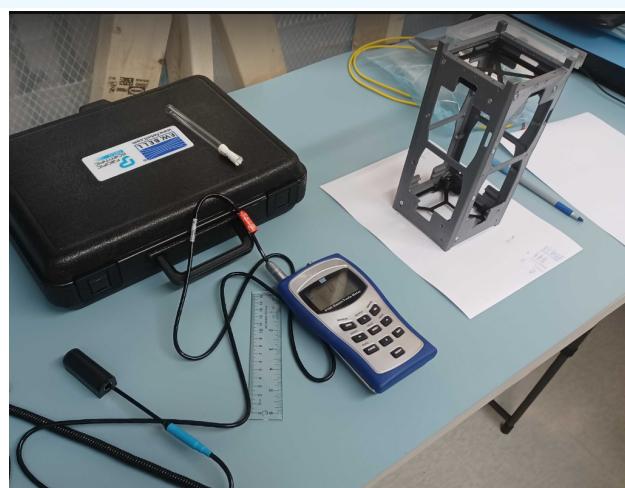
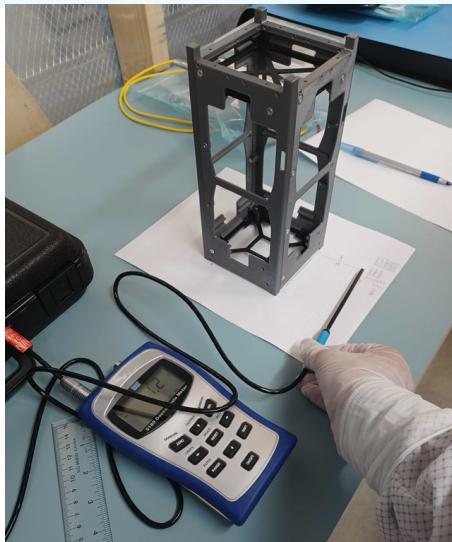
How?

- Used **KiCad** to draw schematic.
- Software in progress - written in C.

Learning Outcomes

- RF design.
- Baluns and **impedance matching**.

PERMANENT MAGNET TESTING - RADSAT-SK



How?

- Using a **Gauss Meter** and 3D printed Satellite Frame,

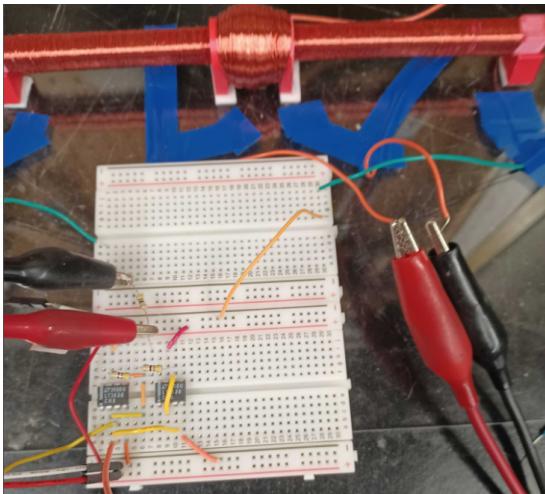
What?

- Test permanent magnets going to be put on the RADSAT-SK satellite for ADCS.
- **Measure the strength of magnetic field** in each axis 10 cm away from the satellite.
- Make sure it **meets Nanoracks and CSA requirements**.

Learning Outcomes

- Magnetic Fields.
- **Passive ADCS system** design.

HYSERESIS RODS TESTING - RADSAT-SK

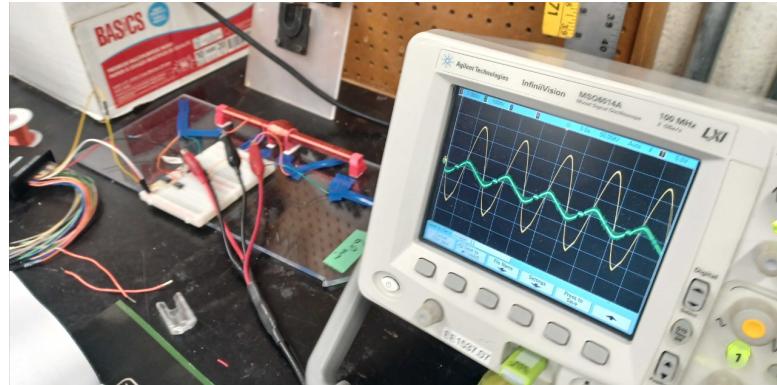


What?

- Hysteresis rods are being used on the RADSAT-SK as a way of passively stabilizing spin.
- Tests to measure hysteresis properties of the hysteresis rods.

How?

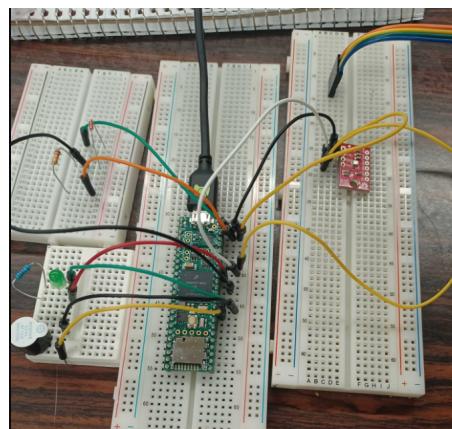
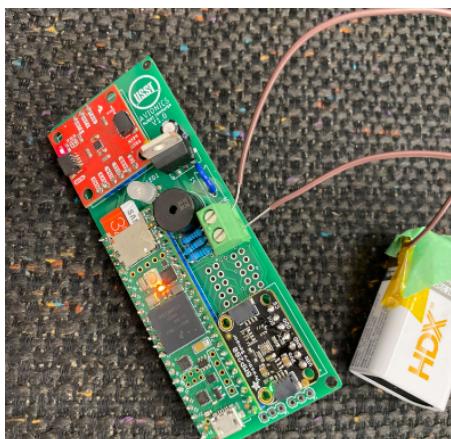
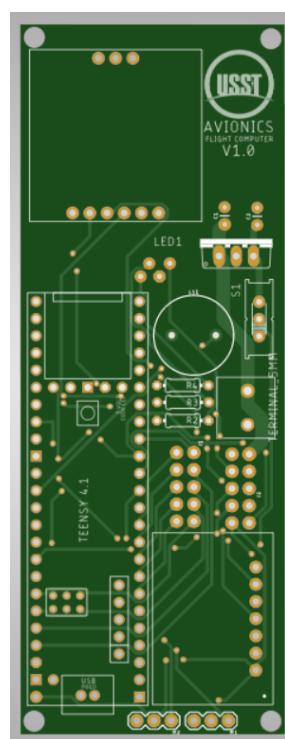
- **Breadboard circuit.**
- **Oscilloscope** for data collection.
- ADLM2000 for **signal generation**.
- Used python to graphically plot raw data.



Learning Outcomes

- Op-Amps for Current Amplification.
- Circuits with an inductive load.
- Data Analysis.

ROCKET AVIONICS



What?

- **Flight computer** for the Usask's Rocketry Team's **rocket**.
- Prototype PCB. Using a **Teensy 4.1** as the **computation unit** and various **sensors**.

How?

- Designed in **EAGLE**.
- Breadboard prototyped before making the PCB.

Learning Outcomes

- Software for the BMU and IMU sensors.
- Linear voltage regulators.