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GroundSat

Maggie Hayes

maggie.hayes@valpo.edu

Christopher D. Gutschlag

chris.gutschlag@valpo.edu

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GroundSat

Maggie Hayes and Chris Gutschlag

A dark blue diagonal gradient bar that starts from the bottom left corner and extends towards the top right corner, covering the lower half of the slide.

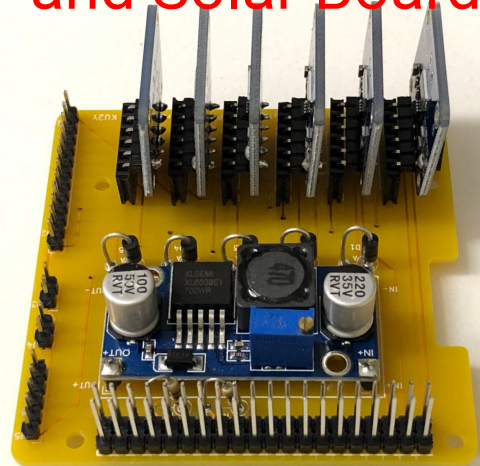
What is a GroundSat?

- AMSAT(Amateur Satellite) CubeSat Simulator
- Earth-based, outdoor version
- Interacts through wireless communication
- Powered through batteries charged with solar panels
- Raspberry Pi Zero

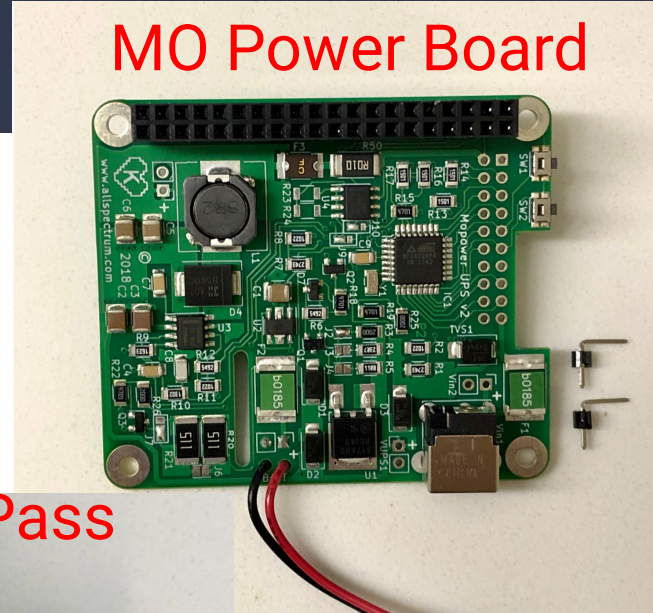
Main Components



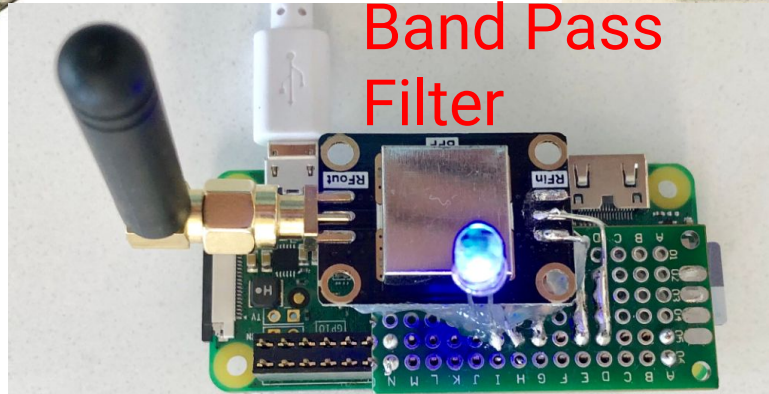
Solar Panels
and Solar Board



Raspberry Pi
Zero W



MO Power Board



Band Pass
Filter

Power

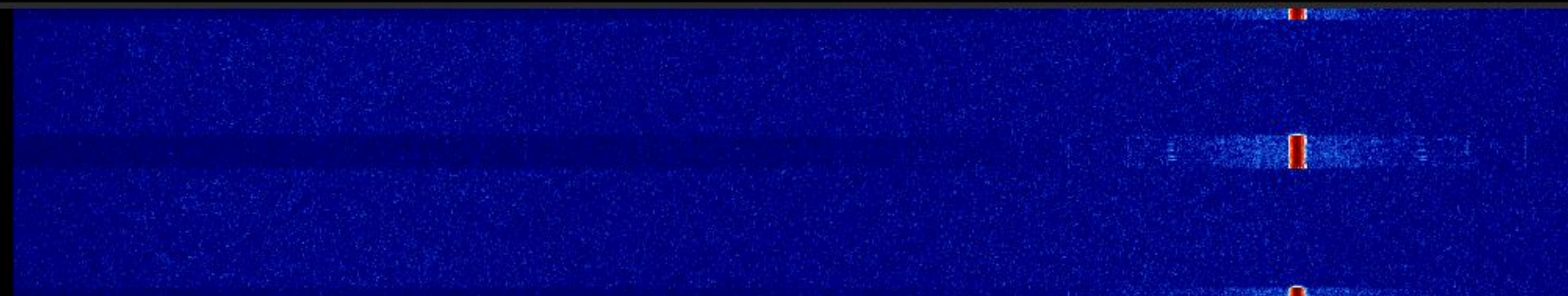
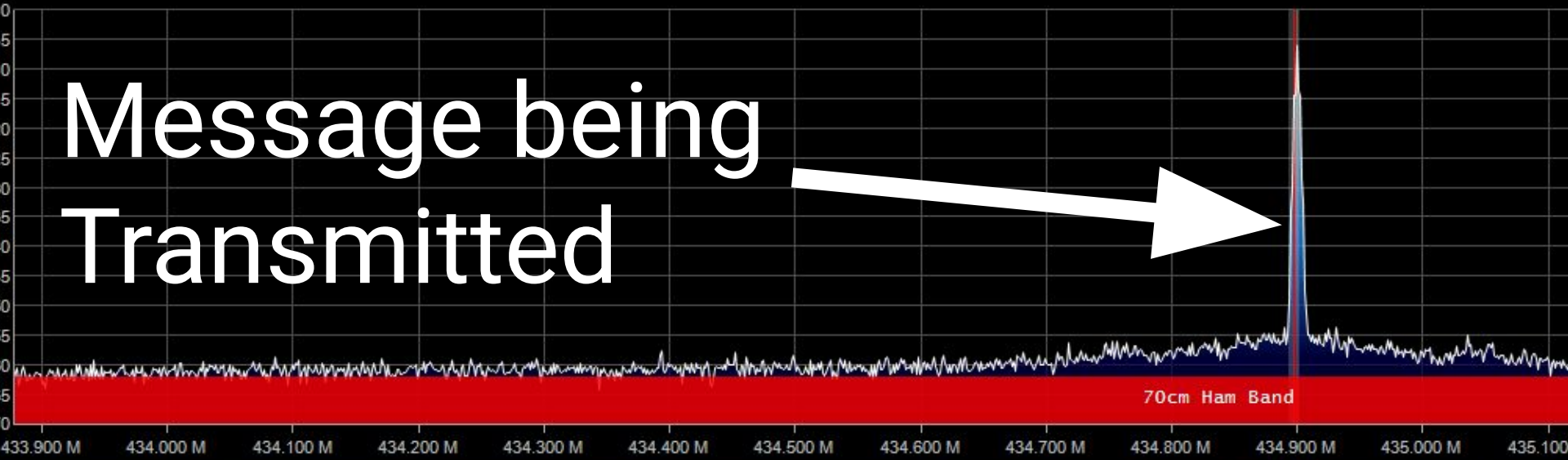
| Part Name | Operating Mode | Number of Parts | Current (mA) | Voltage (V) | Duty Cycle (%) | Power (A) |
|-----------------------|-------------------------|-----------------|--------------|-------------|----------------|-----------|
| Pi Zero W | Standby | 1 | 100 | 5 | 80% | 0.4 |
| | Transmit | 1 | 140 | 5 | 20% | 0.14 |
| MoPower Board | Normal (90% efficiency) | 1 | 100 | 9 | 100% | 0.9 |
| DC-DC Boost Converter | Normal | 1 | 100 | 3.5 | 100% | 0.35 |
| | | | | | Total Power | 1.79 |

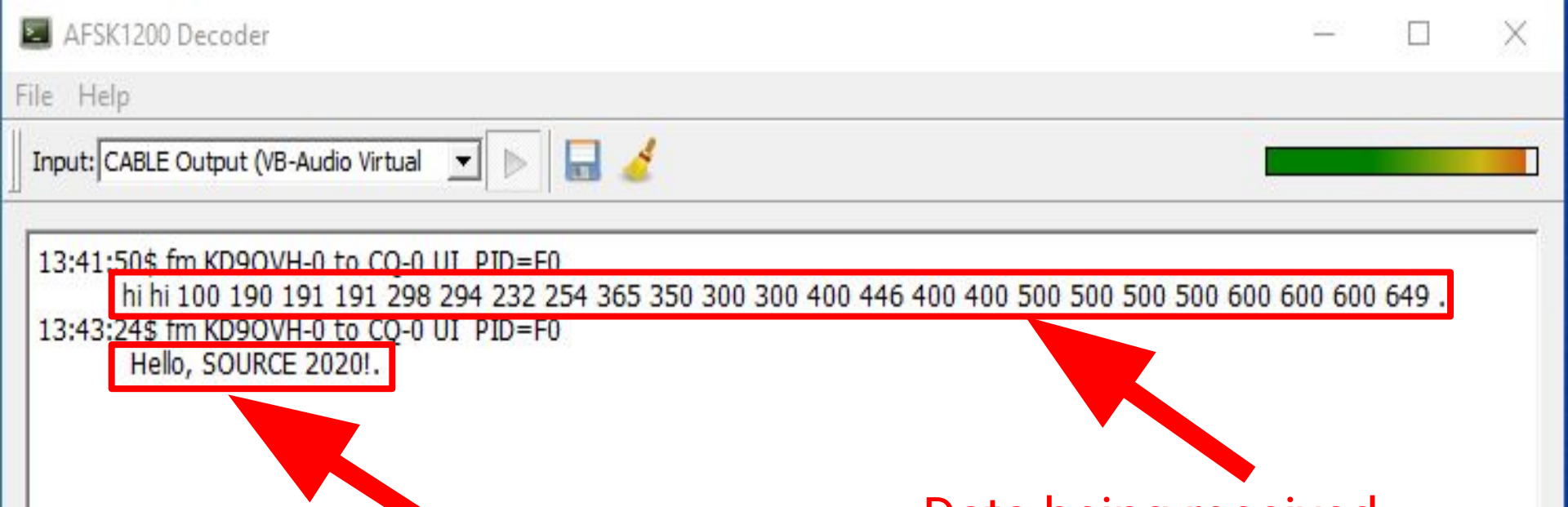
Transmitting and Receiving Data

- 433 MHz, 2 MHz Bandwidth Band Pass Filter
- Radio Frequency Transmission
- Receive through antenna and SDR Sharp
- Telemetry: AFSK Decoder
- Example: 'Hello, Source 2020!'

000.434.897.000 ◀▶

Message being Transmitted





Message transmitted
being read

Data being received

Purpose and Future Plans

- Have something for kids to start getting involved with amateur radio and STEM
- Due to COVID-19, we were unable to put this in a weatherproof box and out on a pole in front of Gellersen to test
- Kits for kids
 - Take selfies from space
 - Scratch Programming
 - Play the radio