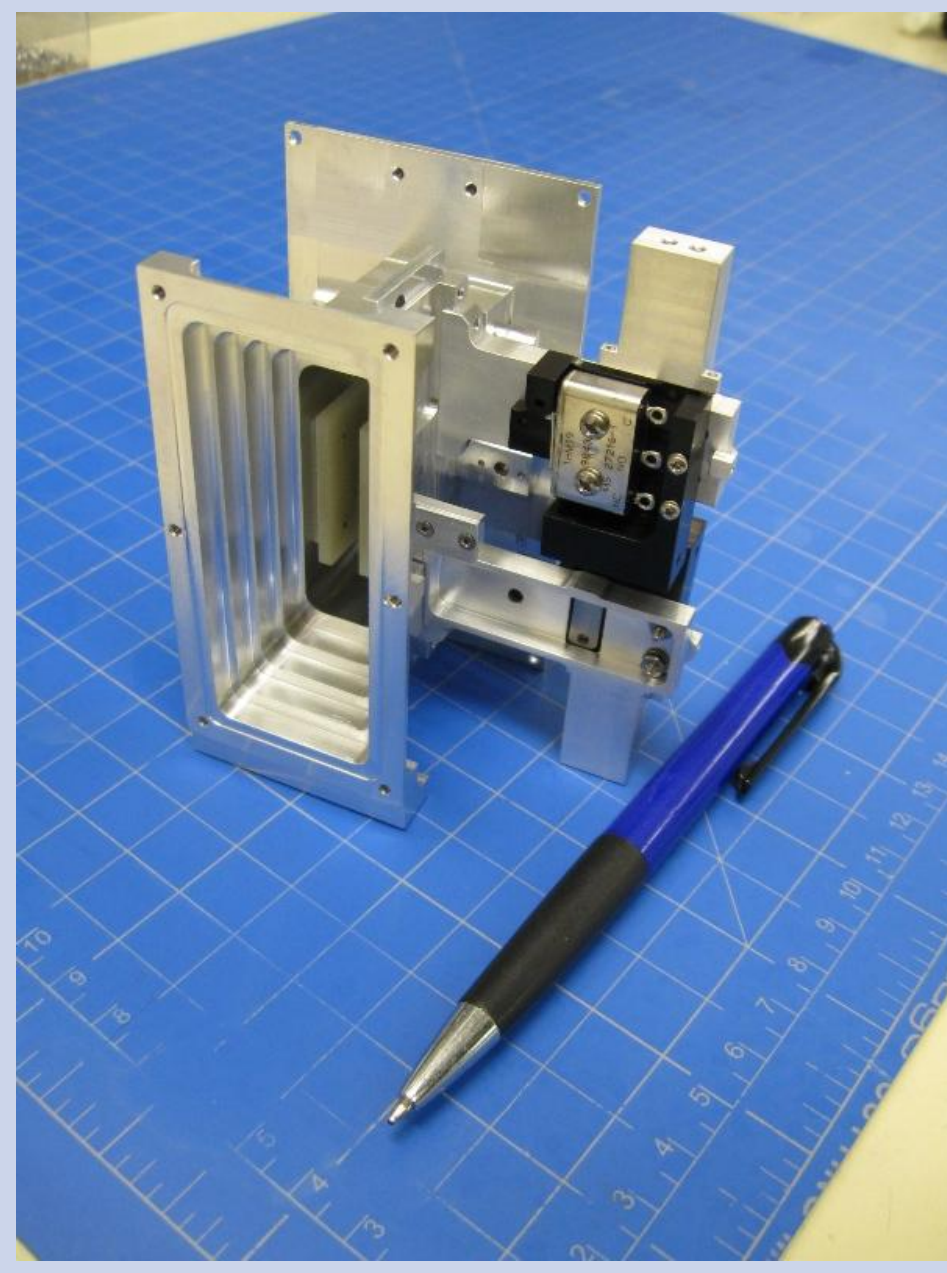


CINEMA

(CubeSat for Ions, Neutrals, Electrons & Magnetic fields)

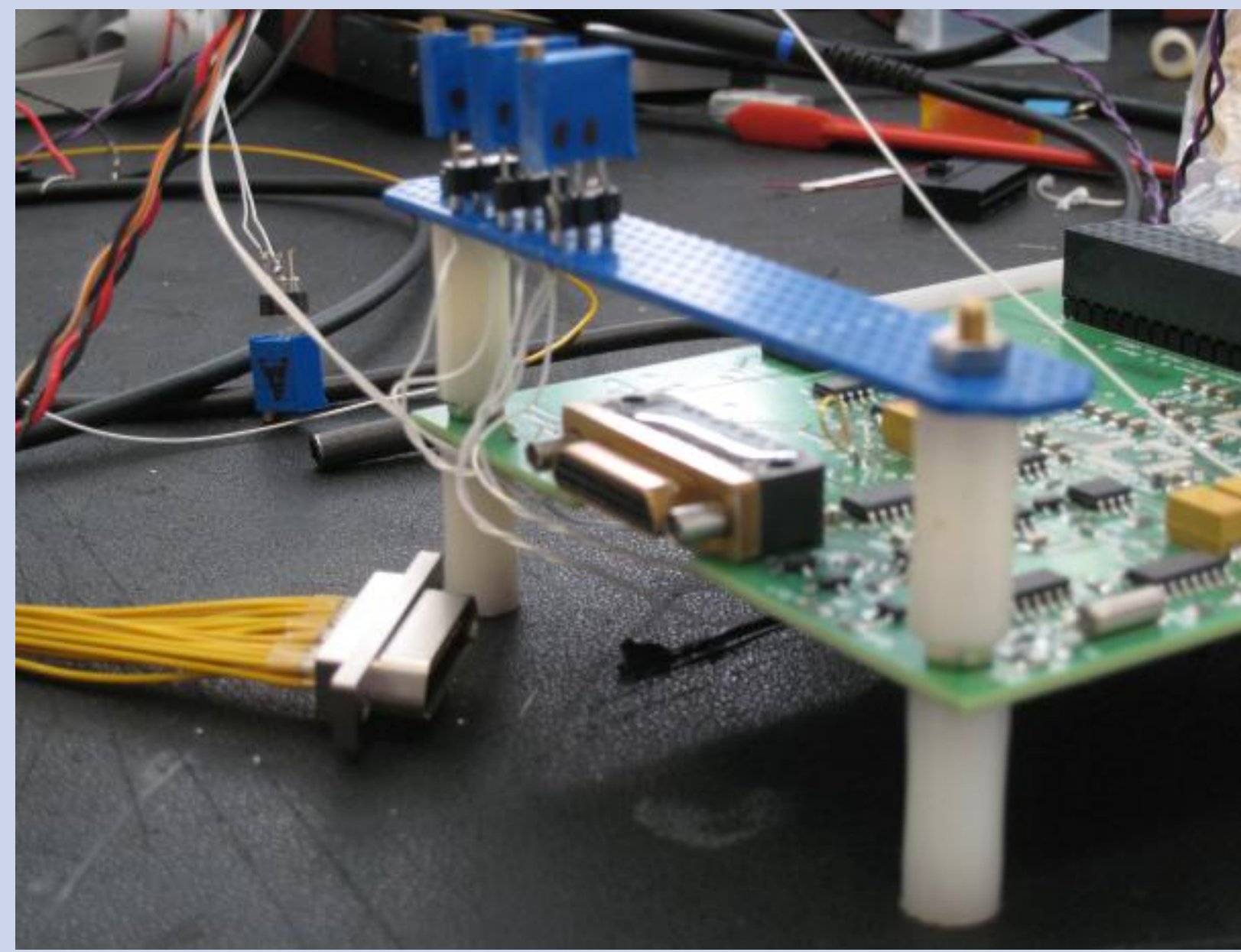
Jerry Kim*
David Glaser†
Thomas Immel‡

STEIN (SupraThermal Electrons, Ions, Neutrals)



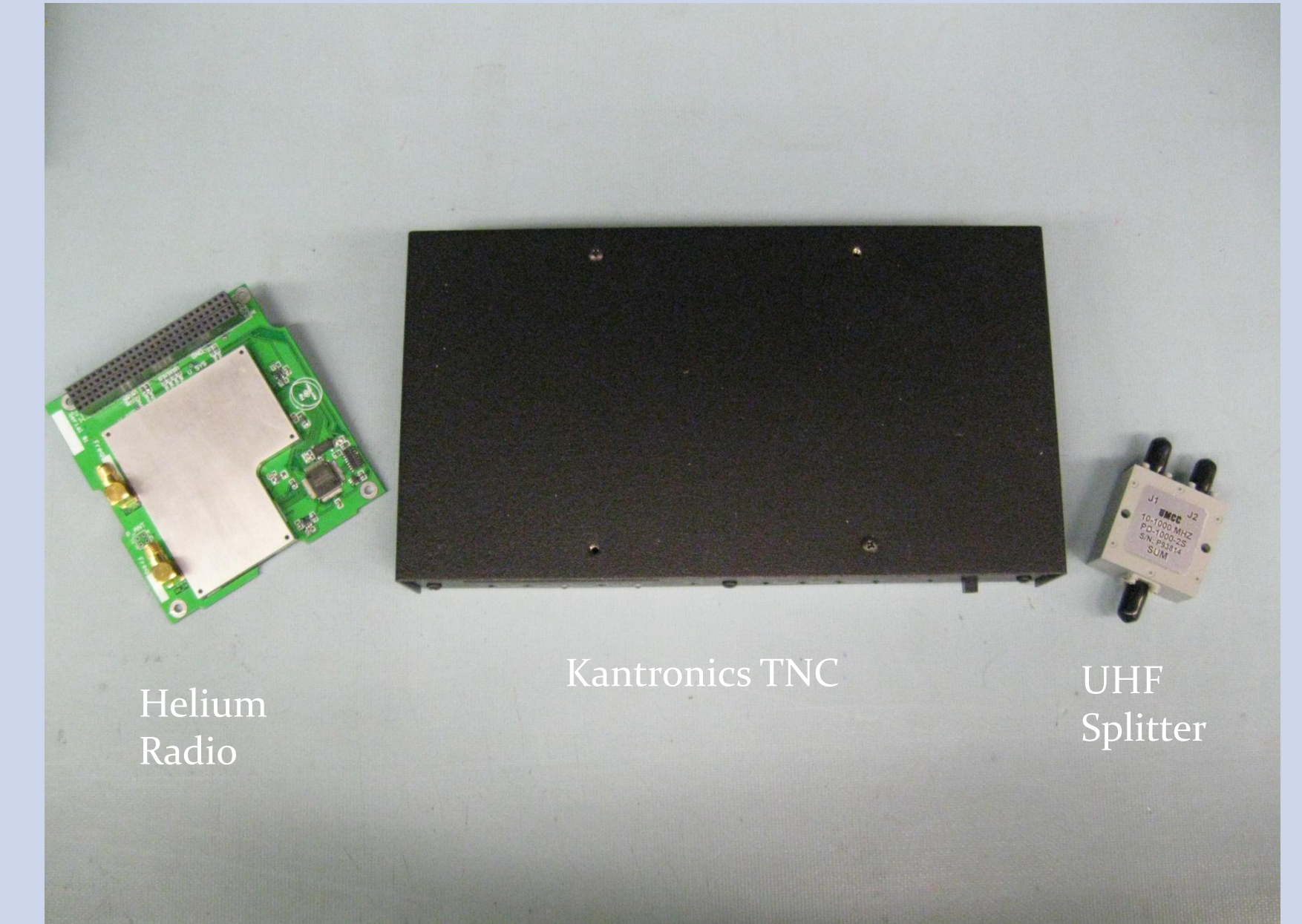
- | Intro | Progress |
|---|--|
| <ul style="list-style-type: none"> Heritage: <ul style="list-style-type: none"> STEREO STE Sensor With Electrostatic Deflection Mechanical Attenuator Reduces Particle Count by 10^2 Trajectories: <ul style="list-style-type: none"> Low Energy Electrons Neutrals, High Energy Electrons and Ions Low Energy Ions | <ul style="list-style-type: none"> Development <ul style="list-style-type: none"> ETU <ul style="list-style-type: none"> Vibe Test Flight Model <ul style="list-style-type: none"> Design: In Progress Fabrication: In Progress |

MAGIC (MAGnetometer from Imperial College)



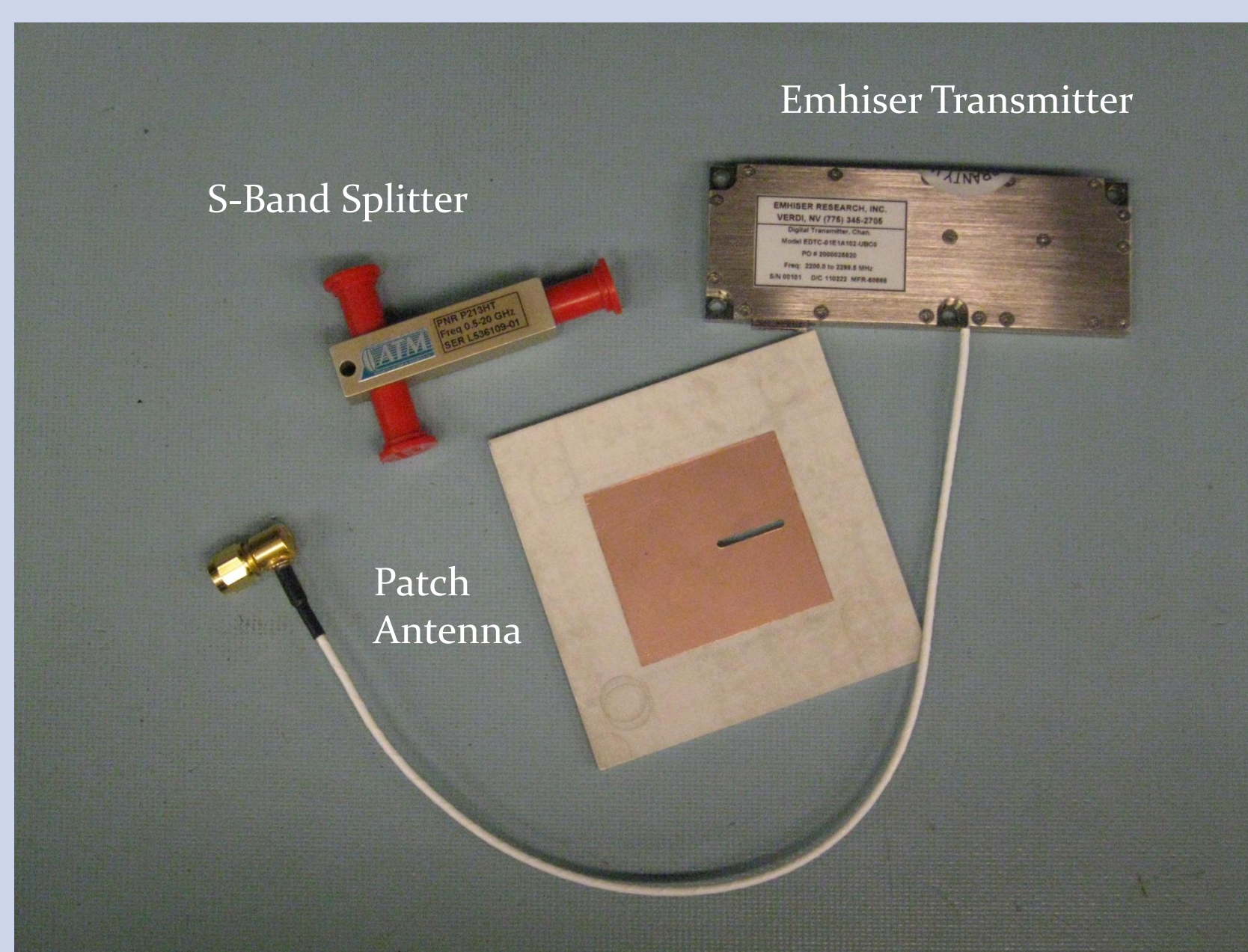
- | Intro | Progress |
|---|---|
| <ul style="list-style-type: none"> Magneto-resistive Technology Inboard + Boom Deployed <ul style="list-style-type: none"> Calibration Spacecraft Induce Field Measurement Sensitivity: 0.25 nT Resolution <ul style="list-style-type: none"> Science Mode (200 mW) <ul style="list-style-type: none"> 2 to 10 nT ACS Mode (~100 mW) <ul style="list-style-type: none"> 25 nT | <ul style="list-style-type: none"> Development <ul style="list-style-type: none"> ETU <ul style="list-style-type: none"> Single Axis: Complete 3-Axis: In Progress Flight Model <ul style="list-style-type: none"> Design: In Progress Fabrication: In Progress |

Uplink: UHF (Ultra High Frequency)



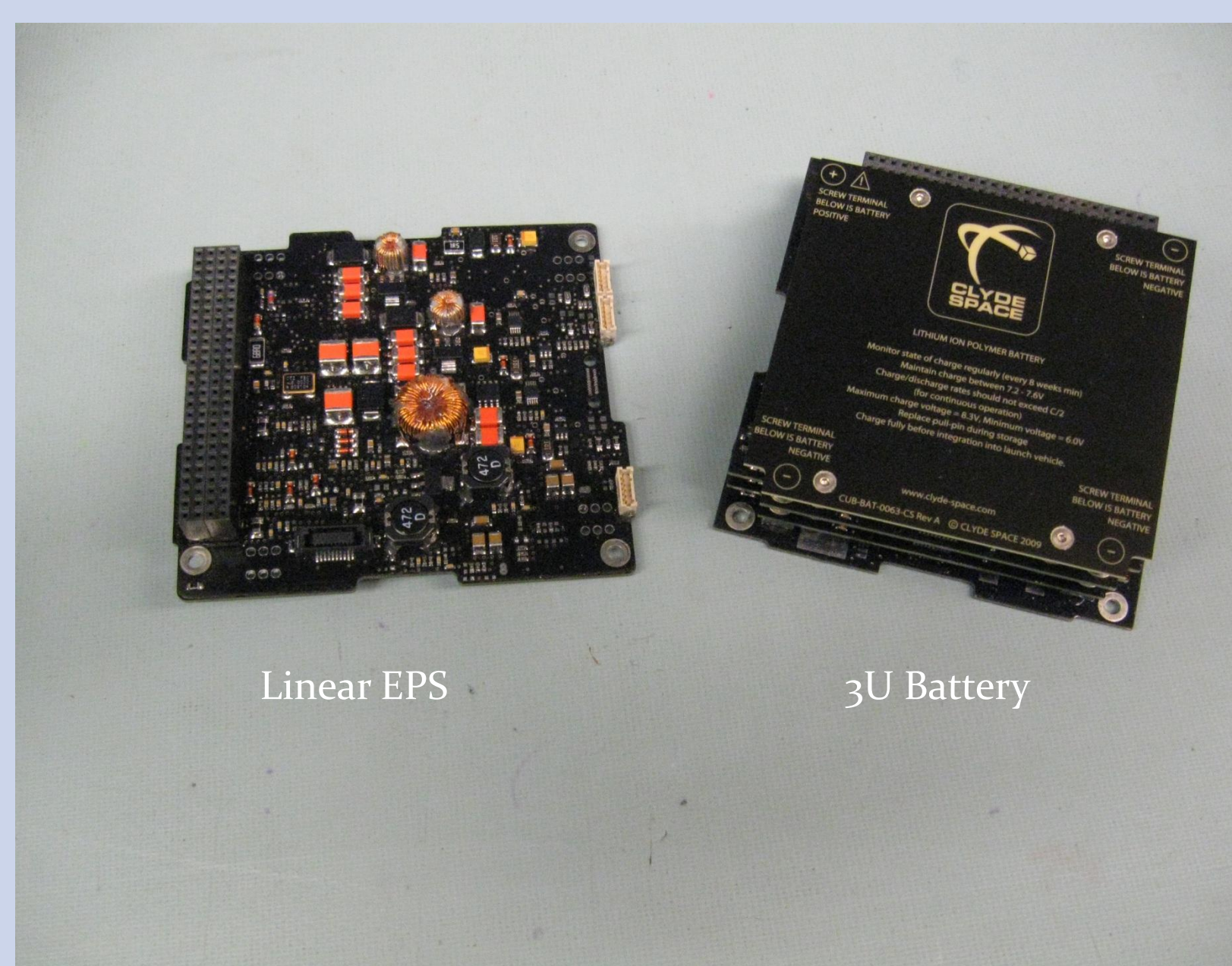
- | Intro | Progress |
|--|---|
| <ul style="list-style-type: none"> Comprised of: <ul style="list-style-type: none"> (1) Kantronics TNC (1) Custom-designed UHF Whip Antenna (1) Astrodev Helium-100 Radio (1) UMCC PD-1000-2S Power Splitter RG/316 Coaxial Cable | <ul style="list-style-type: none"> Development <ul style="list-style-type: none"> ETU <ul style="list-style-type: none"> Complete Flight Model <ul style="list-style-type: none"> Design: In Progress Fabrication: In Progress |

Downlink: S-Band



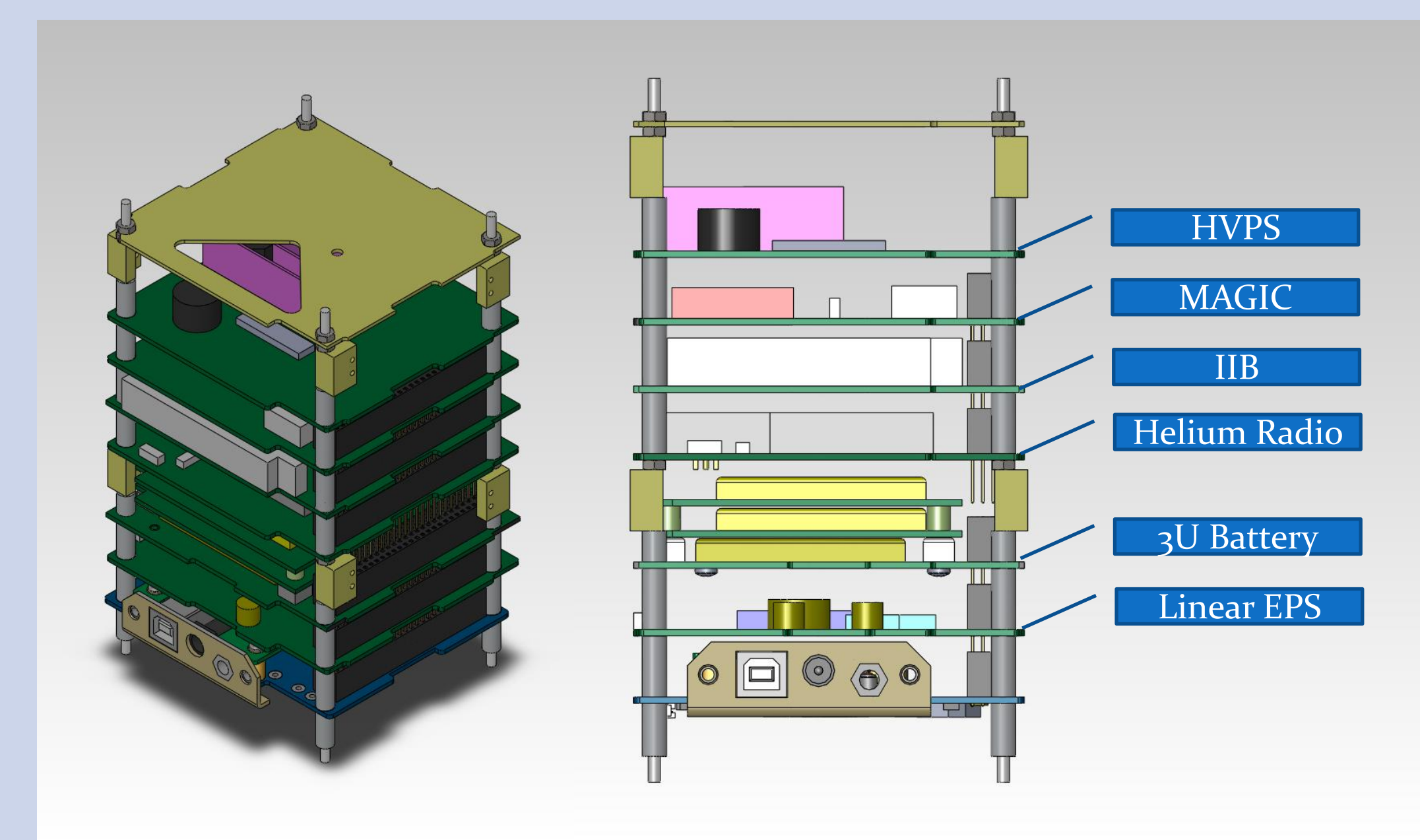
- | Intro | Progress |
|--|---|
| <ul style="list-style-type: none"> Comprised of: <ul style="list-style-type: none"> (1) Emhiser S-Band Transmitter (1) ATM P213HT Power Splitter (2) Custom-designed Patch Antennas RG/316 Coaxial Cable | <ul style="list-style-type: none"> Development <ul style="list-style-type: none"> ETU <ul style="list-style-type: none"> Complete Flight Model <ul style="list-style-type: none"> Design: In Progress Fabrication: In Progress |

Power System



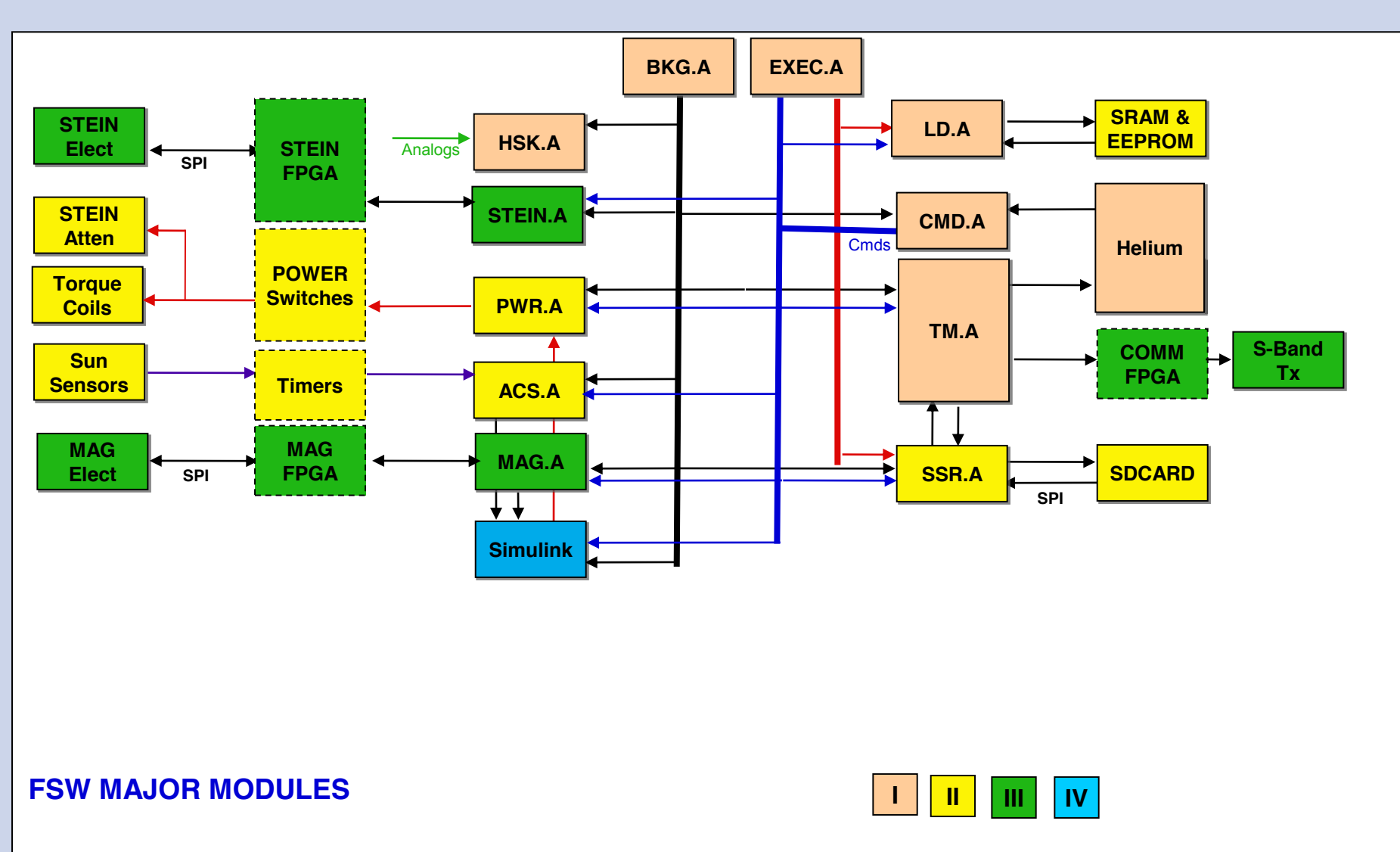
- | Intro | Progress |
|---|--|
| <ul style="list-style-type: none"> Comprised of: <ul style="list-style-type: none"> (10) Custom-designed Solar Panels (24) TASC Cells (1) Clyde Space Linear EPS (1) Clyde Space 3U Battery | <ul style="list-style-type: none"> Development <ul style="list-style-type: none"> Solar Panel ETU <ul style="list-style-type: none"> Vibe Test TVAC (-60 to +94 °C) Flight Model <ul style="list-style-type: none"> Design: In Progress Fabrication: In Progress |

Avionics Stack



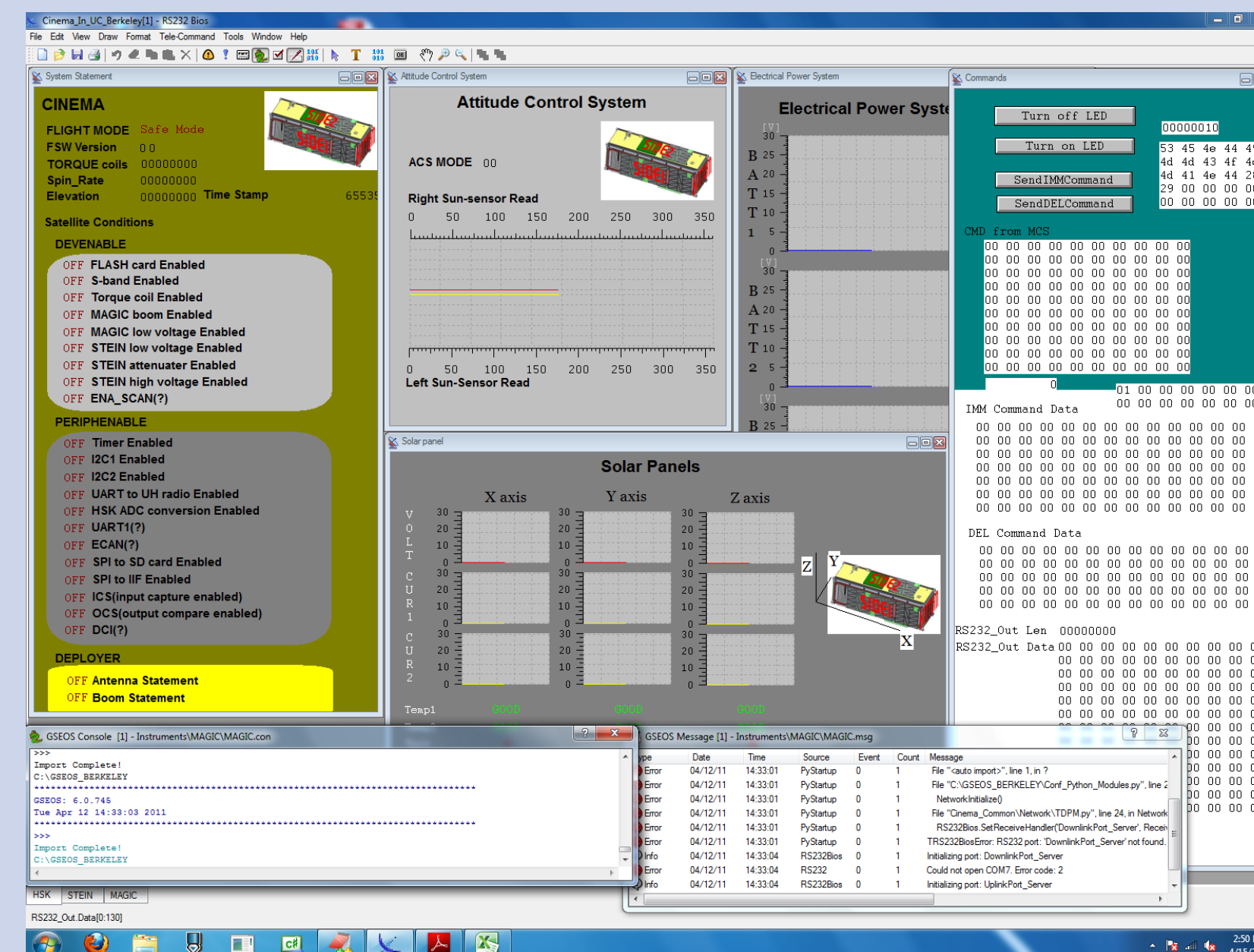
- | Intro | Progress |
|--|---|
| <ul style="list-style-type: none"> Comprised of: <ul style="list-style-type: none"> (7) PCBs (4) M3 AISI 316 Threaded Rods (32) 6 mm Diameter Tubular Unthreaded Spacers (8) Custom-designed Stack Center Brackets (1) Remove-Before-Flight (RBF) Bracket (12) M3 Nuts | <ul style="list-style-type: none"> Development <ul style="list-style-type: none"> ETU <ul style="list-style-type: none"> Complete Flight Model <ul style="list-style-type: none"> Design: In Progress Fabrication: In Progress |

FSW (Flight SoftWare)



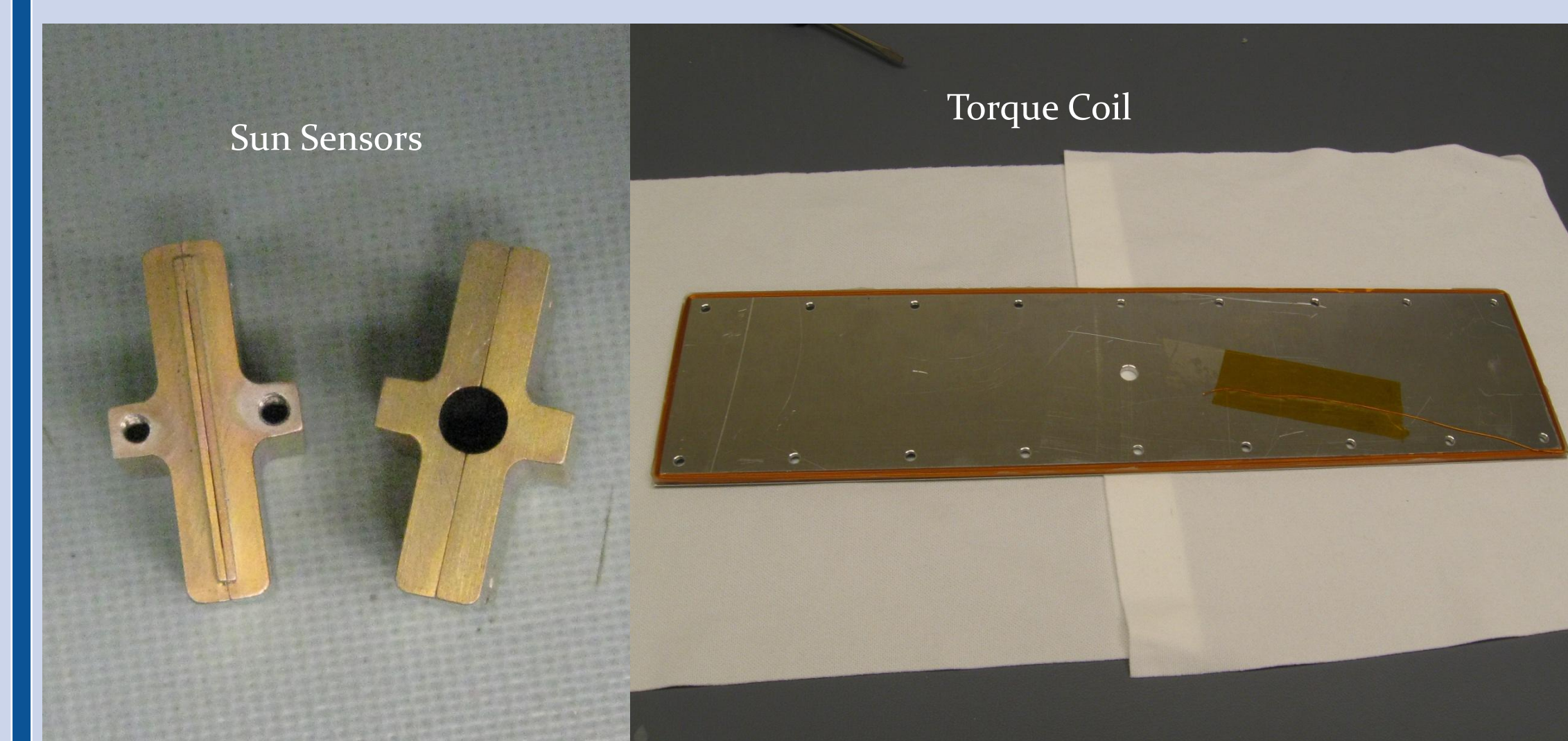
- | Intro | Progress |
|--|---|
| <ul style="list-style-type: none"> Foreground Tasks <ul style="list-style-type: none"> Run async. in available time No hard limit on exec. time Configurable by gnd cmds Freq. interrupt by BKG tasks Background (BKG) Tasks <ul style="list-style-type: none"> Interrupts fired @ 1024 Hz Run at specific times Must complete before next interrupt (~9700 instructions) | <ul style="list-style-type: none"> Development: <ul style="list-style-type: none"> Completed & Tested: <ul style="list-style-type: none"> BKG module EPS Module In Progress: <ul style="list-style-type: none"> SD Card Drivers Transmission Module Future: <ul style="list-style-type: none"> Final Review of CTM Verification of Software with Hardware |

GSEOS (Ground Support Equipment Operating System)



- | Intro | Progress |
|---|--|
| <ul style="list-style-type: none"> GSEOS <ul style="list-style-type: none"> Integration/Test Software for Small Satellites GUI (Graphic User Interface) Supports Python Language Tasks <ul style="list-style-type: none"> Data Transmission Communication Network with Other Subsystems Store Telemetry | <ul style="list-style-type: none"> Development <ul style="list-style-type: none"> Transmission Complete Network: In Progress Storage: In Progress Integration Test <ul style="list-style-type: none"> FSW: In Progress Radio: TBD |

ACS (Attitude Control System)



- | Intro | Progress |
|--|--|
| <ul style="list-style-type: none"> Comprised of: <ul style="list-style-type: none"> ACS Software (2) Torque Coils (2) Sun Sensors (1) Magnetometer | <ul style="list-style-type: none"> Development <ul style="list-style-type: none"> ETU <ul style="list-style-type: none"> Complete Flight Model <ul style="list-style-type: none"> Design: In Progress Fabrication: In Progress ACS <ul style="list-style-type: none"> FSW Integration: In Progress |

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