

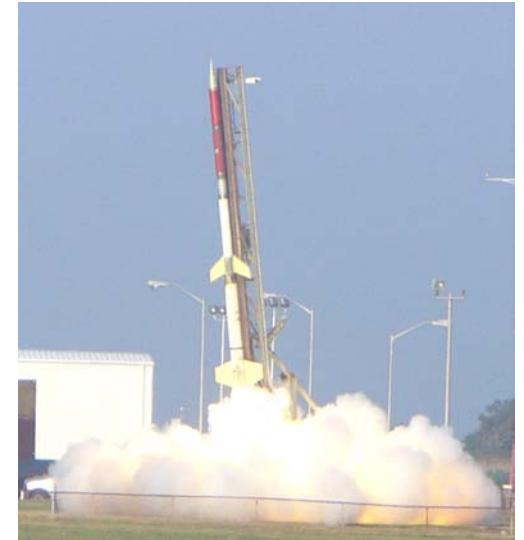
Suborbital Rocketry: Payload Design and Involvement

Greater Midwestern Space Grant Conference



How to get involved

- ▶ Hobby rocketry
 - amateur
 - professional
- ▶ Student design
- ▶ RockOn!
- ▶ RockSat

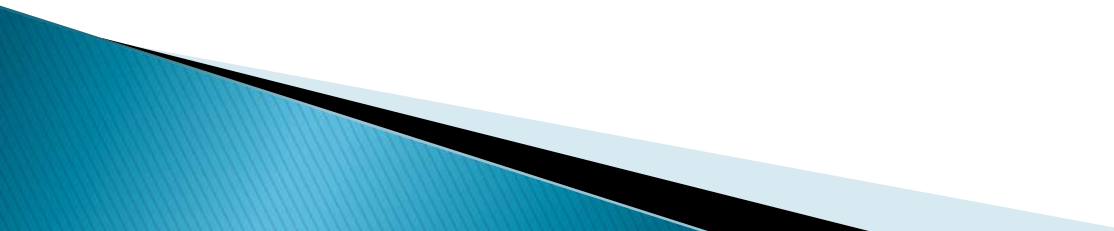


RockOn!

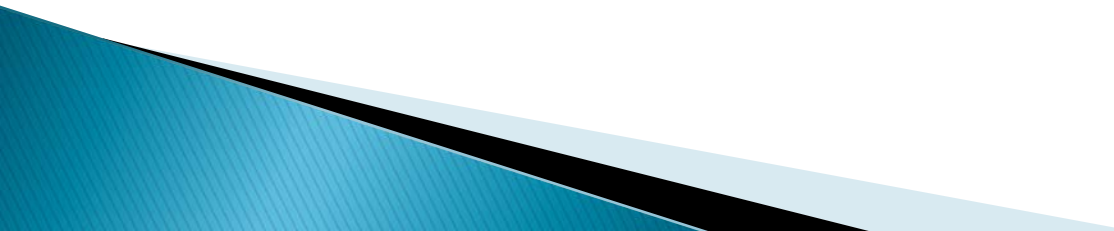
- ▶ Created in 2007
- ▶ A program created by Chris Koehler and NASA for organizations interested in payload design
- ▶ Great way to jump on board
- ▶ A precursor to RockSat– the next step



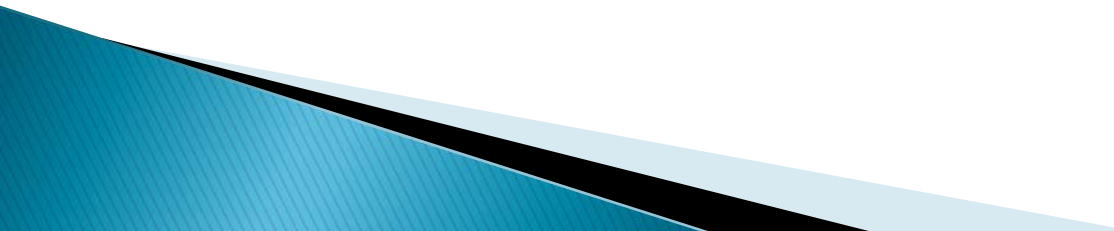
RockSat C

- ▶ An open ended program in which students have the chance to create their own payload
 - ▶ Starts in September (IFF, design reviews), Launch in June
 - ▶ The year is spent developing the payload, design and build!
 - ▶ A real-world design process with strict deadlines and reviews
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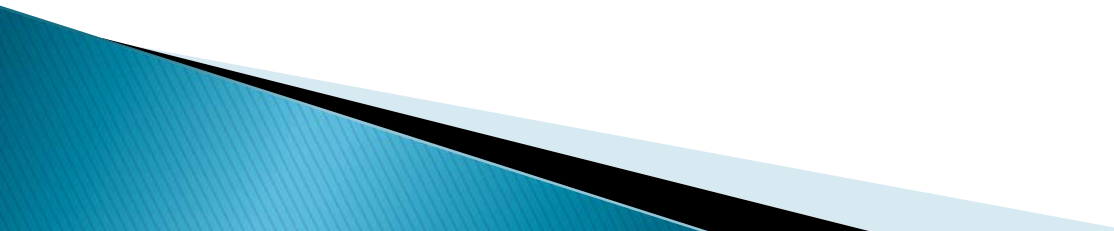
How I got involved

- ▶ RockSat C, 2008/09– U of M's team
MinnRock
 - ▶ A simple payload with video camera, accelerometers, magnetometer, and light sensor
 - ▶ GPS receiver, scratched prior to flight
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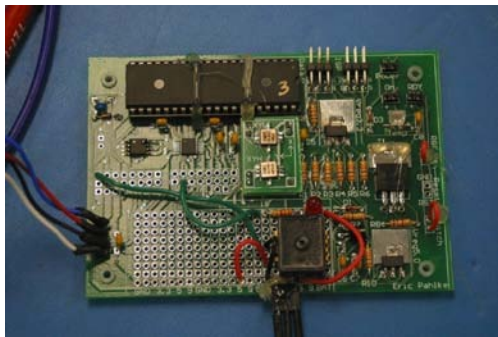
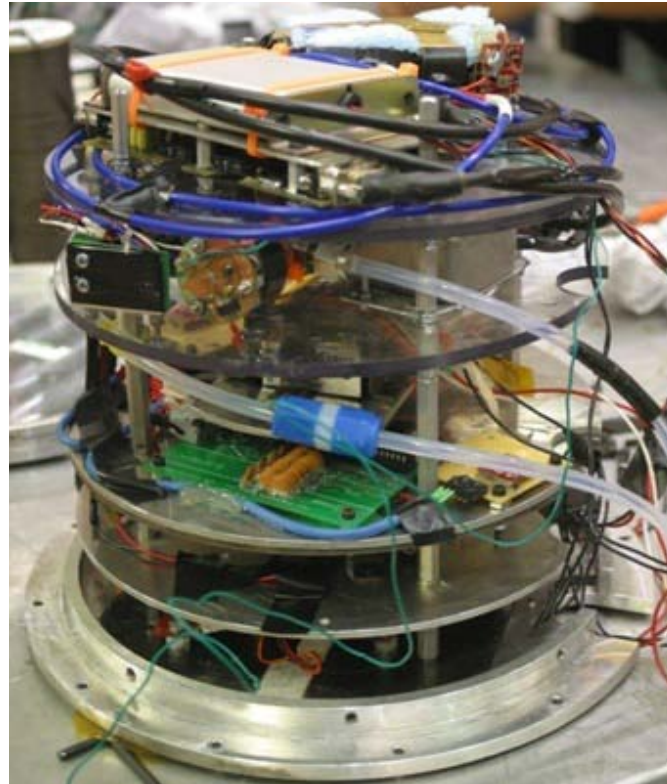
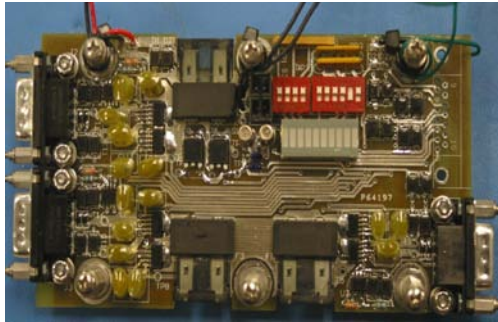
Results

- ▶ Accelerometers and other analog sensors worked as planned.
 - ▶ The on board camera failed to record video.
 - ▶ The light sensors captured good data and recorded spin rate.
 - ▶ NASA's rocket took on water.
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2009/10– MinnSpec

- ▶ MinnSpec is the University of Minnesota's RockSat team
 - ▶ Minnesota Spectroscopy– 2 forms of laser spectroscopy
 - ▶ Student driven team with a modular concept
 - ▶ MinnSpec is made up of three teams...
MinnLase, AugSpec, MinnRock II
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Payload components



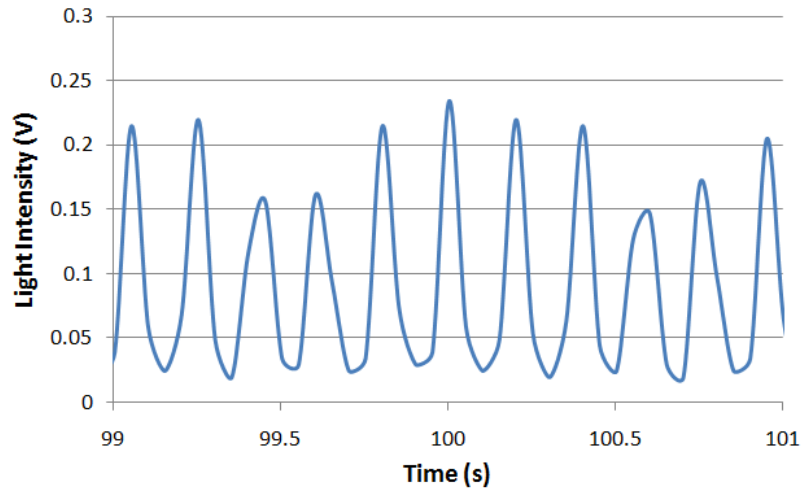
Results

- NASA's rocket suffered a mechanical failure and lost pressure during flight, causing a water to flood payloads
- Both spectrometers did not return any readable data
- Other analog sensors like accelerometers, light sensor, pressure sensor worked as designed

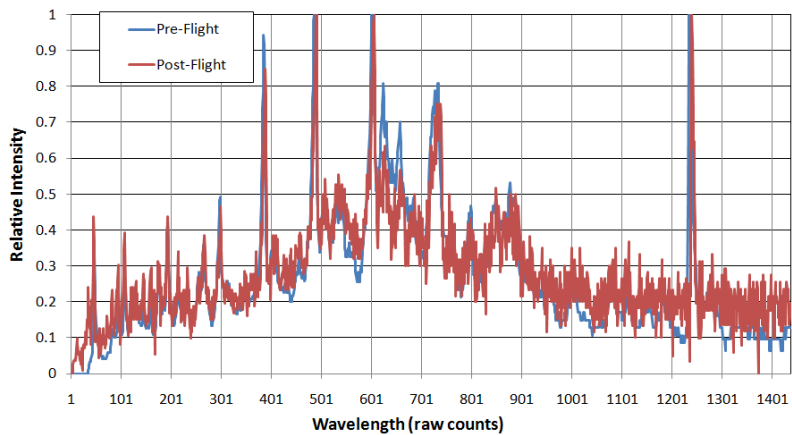
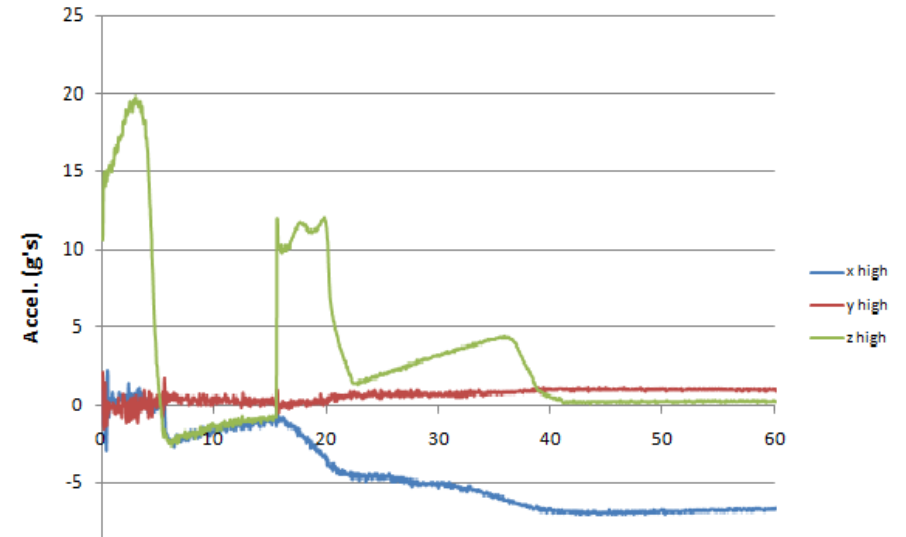


Data

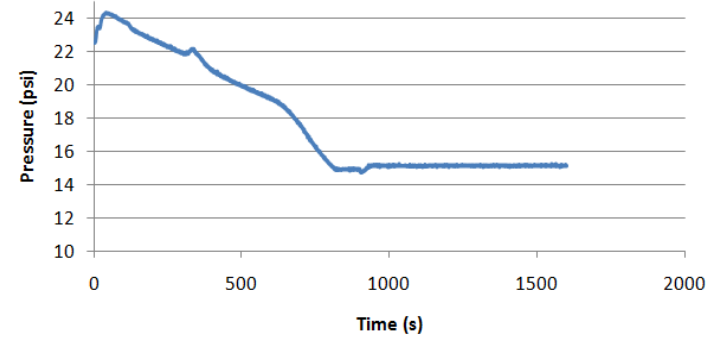
Light Intensity vs. Time



High Accelerometers



Interior Pressure vs. Time



Launch

