Kentucky Space: A Multi-University Small Satellite Enterprise

Daniel Erb
Twyman Clements
Dr. James Lumpp
University of Kentucky

Dr. Benjamin Malphrus
Morehead State University

SmallSat
13 August 2009
Overview

- Introduction
- Goals
- Missions
- Infrastructure
- Challenges
- Conclusions
Kentucky Space Enterprise
Kentucky Space Enterprise
Kentucky Space Enterprise
Goals

- Workforce Development
- Outreach to all ages with an emphasis on education, specifically STEM
- Student led multi-university team
- Establish infrastructure to design, test, develop, and operate small spacecraft
Kentucky Space

- Near-Space
- Sub-Orbital
- Orbital
High Altitude Balloons
Space Express
Garvey P12A

![Prospector 12 Flight Test](image1)

![Rocket Launch](image2)
KySat-1
Other Activities
Facilities and Infrastructure

- Thermal Vacuum Chamber
- Vibration Facility
- Clean Room
- UHF/VHF Earth Stations
- 21 Meter Parabolic Antenna
- Antenna Test Facility
Challenges

- Complex Systems Engineering
- Geographically Distributed Team
- Students
  - Lead
  - Design
  - Build
  - Test
  - Operate
- Delays and Setback Happen

13 August 2009
Overcoming Challenges

- Large Student Pool
- Industry and Academic Mentors
  - Leadership
  - Systems Engineering
- Collaboration Tools Shrink Distances
  - Teleconferences
  - Wiki
  - SVN
  - File Server
- Multiple Missions Means Always Working
Conclusion

- Student-Led, Student-Driven, Multi-University Enterprise
- Multiple Successful Missions with Several to Follow
- Outreach to All Ages Including Exposing Hundreds of Graduate and Undergraduate Students to Aerospace Engineering
- Infrastructure, Knowledge, and Experience Gained Allows Kentucky Space to Work in Multiple Strata with Multiple Partners