CubeSat: High School Students Building Satellites

Merritt Island High School
Experience
Education
Space Act Agreement
“The MIHS Cubesat project is in many ways just as complex as my undergraduate engineering school senior design project was. It is an excellent multi-discipline learning opportunity for the students who chose to be a part of it.”

-Mentor R.A. Thompson

“I was drawn to help with this project because I wish I had had this kind of opportunity back in high school.... This is what STEM is all about.”

–Mentor Shaun Daly

“I've never done what the students are doing, even as a Satellite Mission Manager. I want to inspire the next generation.”

-Teacher Sponsor Tracey Beatovich
Team Goals

Quantify Flight Environment

RF Transmission

Separation Dynamics
Concept of Operations - In Flight

P-POD

Measure Shock & Vibration

CalPoly- CP9

Merritt Island- StangSat
Concept of Operations

Record image of the aft face, and Separation Dynamics of 'StangSat

Merritt Island-StangSat

CalPoly-CP9

EOM

Downlink Data

Ground Station
Schedule

MCR/Pre-SRR Presentation 3/27/2011

Phase B Start 5/2011

1 year 3 months

Phase B
Design

PDR 8/28/12

Phase C Start 8/28/2012

10 months

Phase C
Build & Test

CSLI Submittal 11/2012

Delta PDR 1/2013

Garvey Launch 4/2013

Phase D
Final Verification

CDR 5/2013

Phase D Start 5/2013

Final Delivery to NASA 11/2013

6 months
Project Purpose

Reasonable Shock Levels

Future CubeSat Teams

Mount Carmel High School Amateur Radio Club

University of Madrid
We are partnered with California Polytechnic State University
System Engineering

**Requirements**

1. **Education Expectations & Outcomes**  
   Document #: In-Work, Signed & Dated: TBD

2. **Calpoly CubeSat Design Specification**  
   Document #: Rev. 12, Signed & Dated: 8/1/09

3. **Requirements Matrix — From Launch Services Program (KSC-Sat1)**  

Requirements to be added in the future:

4. **CubeSat to P-POD ICD**  
   Document #: 1.0/A-72.01, Signed & Dated: 6/29/10
   Note: Additional updates will soon be made to include the following requirements:  
   - Ability to have the 1U CubeSat powered during ascent.
   - Ability to have the 1U CubeSat transmit wirelessly inside the P-POD.
   - Random Vibration Profiles and Duration along with Shock Profile and Test Specifications (these will be obtained from a NASA document (GEVS) and added as an appendix to the P-POD ICD).

5. **2U to 1U ICD**  
   Document #: TBD, Signed & Dated: Most likely early 2012

**Note:** Applicable Documents (within the P-POD ICD)  
- KSC mentors will further help Merritt Island in determining applicable sections.
Current Testing
Laboratory
The Future – Garvey Test Flight
Contributing Organizations

StangSat

Launch Services Program

Lockheed Martin

Kennedy Space Center

Craig Technologies

California Polytechnic State University

Florida Institute of Technology
Thank You

Please see one of our team members if you or your organization is interested in supporting our group financially.

Any help is much appreciated!