ESS472/575 Win

Advanced Rocket Systems

Flight: Spring Break

Tentative Dept Date

March 17 (Sat)- March 22 (Thurs)

Black Rock Nevada

Back up Dates April 26-29

Black Rock
(13 hr drive from Seattle)

- It will be cold and below freezing at night
- You will be in a tent
- Nearest town is 20 miles away
- Learn self reliance
- Good company, good hiking (mediocre food)
- Experience not to be forgotten

Objective:
Exceed Last Year's Performance

- Mach 2
- > 20,000 ft
- Carried simple imaging system
- Get GPS data

Ground Control System

900 MHz; Wireless ignition at 1000 ft
Enable, Fire Sequence

Telemetry System:

433 MHz

900 MHz(later can have a test mode; No transmissions during ignition)

2.4 GHz for Wireless camera

Ian-
Flight
Aaron

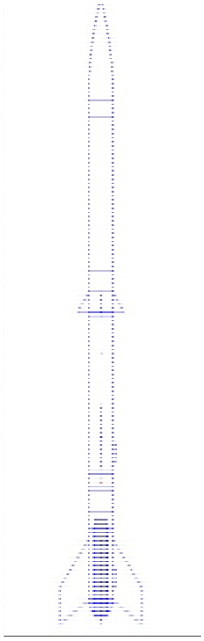
Telemetry
(Sustainer/Balloon)
433/900 MHz

Science Payload
433/900/2400 MHz

Telemetry (Booster)
900/433 MHz
(optional)

Ground Control
900 MHz

Launch Rail System



Project 1. L1/2 Flights

- Capable of about 3000 ft & 0.5 Mach
- Build and Construct standard high-power model rocket
- Build radio tracking system
- Launch and recover.
- Some students have become certified to fly their own rockets

L2: Nadia: Chad
Ian J. Sara
Aaron,Chris

Project 2. Night Launches

- First attempt by the class
- Requires 2 light beacons for FAA
- Good tracking to recover rocket at night

Erin and Sara Leads

Project 3. Supersonic Rockets

Minimum Diameter
2 or 3 in
Carbon fiber/
Jacob:3in
Nadia:L2 4in; 2in

Motor Sizes: Level 2 to 3

Propellant:
Fiberglass
Cin-Al/Metal
Manufactured solid
Hybrid
Student build solid

Various leads

Project 4: Two Stage Rocket

3 in booster

3 in sustainer

More thrust than a single stage but more complicated electronics And mechanical issues

Lead: Chris V.

Project 5: Cluster Rocket System's

3-4 motors

K550 sustainer
1700 Ns

Failure to light all motors At the same time;

Leads: Aaron & Sara

Project 6: Rockoon

Launch a Rocket from a Balloon

Why? Less air drag

Higher launch altitude

Access to Near Space

Technically challenging:

FAA – Two cut down mechanisms

Radar Reflector; Remote Fire Control;

Real Time Positioning; Tether deploy and rewind.

Leads: Ian Johnson

Science Payload??

3-D Camera System

Leads: Ben

Night Camera

Leads: Erin and Sara

Students

- Need to join at least one rocket group
- Need to participate in development/training on flight system or launch control system
- Students from last qtr can skip the first 2 lectures;
- Grade is dependent on
  - group write up of construction process (needs to identify student participation)
  - meeting schedule
  - performance of flight.