E80 Spring 2014

FIELD TESTS & FLIGHT SAFETY

Before you get on the bus

- Practice the rocket checklist.
- Practice electronics prep.
- Practice recovery and analysis.
- You'll want to do analysis between flights.
- Practice anything else you'll need to do in the field.

Rocket Modifications

- PML Modifications
  - Launch Lugs
  - Motor Retainer

  https://publicmissiles.com/pml/images/Phobosinstructionbooklet.pdf
- Aerotech Modifications
  - Longer Motor Mount
  - Motor Retainer instead of Motor Hook, Thrust Ring, & Thrust Ring Flange
  - Longer or shorter Payload Section

  http://www.aerotech-rocketry.com/customersite/resource_library/Instructions/Kit_Instructions/arreaux_in_8-04.pdf

Flight Dates

- 19 APR 2014
- 26 APR 2014
  - Meet in Parsons Parking Lot
  - Buses leave at 6 AM sharp
  - All teams expected to go
  - Bring your rocket
  - We will have food, water, & sunscreen

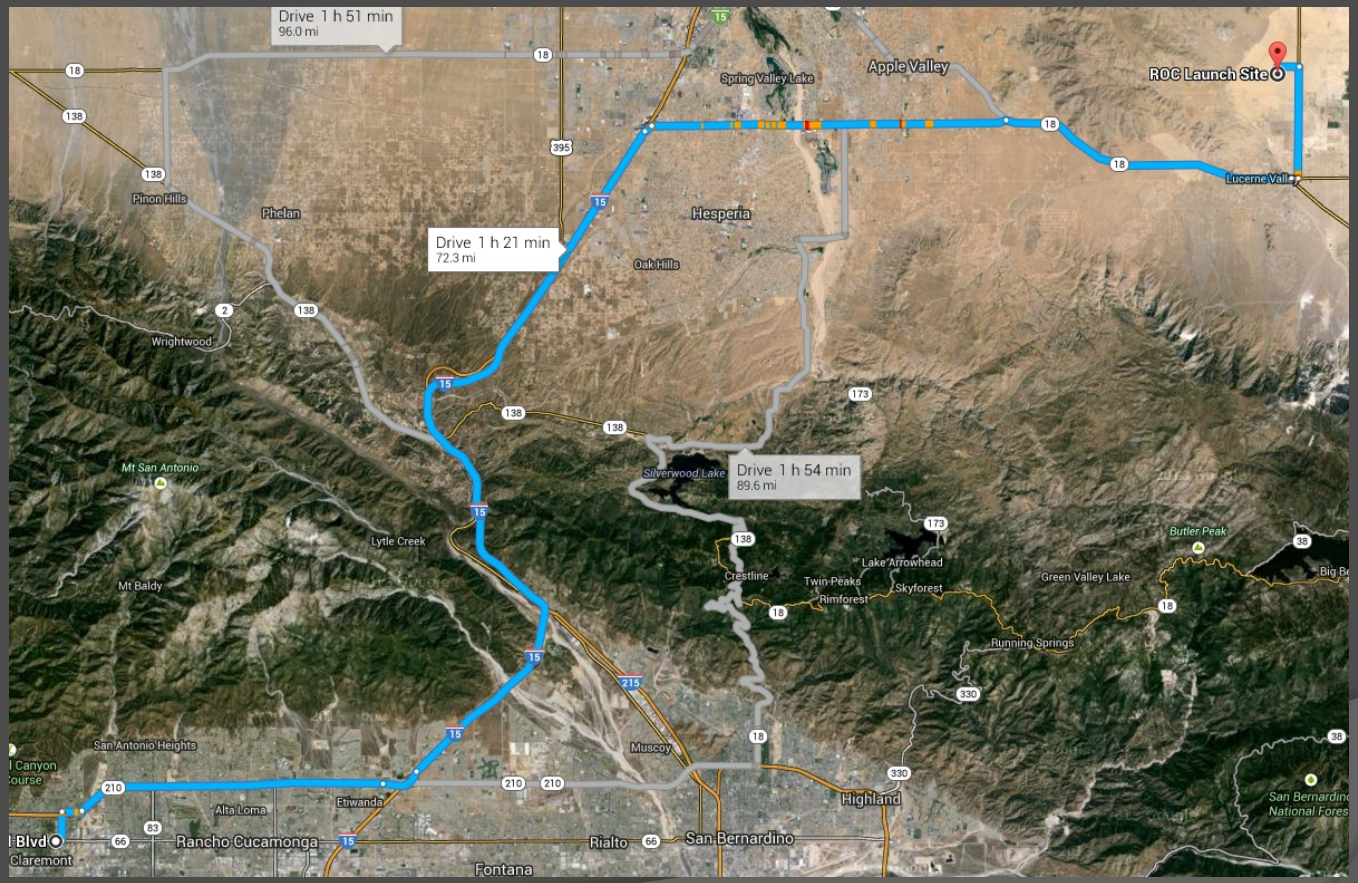
12 APR 2014 (Optional)

- ROC Monthly Launch
- FIll out Liability Waiver and take with you.
- Level 1 cert
- Test Flight
- There are rocket supply vendors on site.
- I will be testing the E80 Temperature Rocket.

19, 26 APR 2014

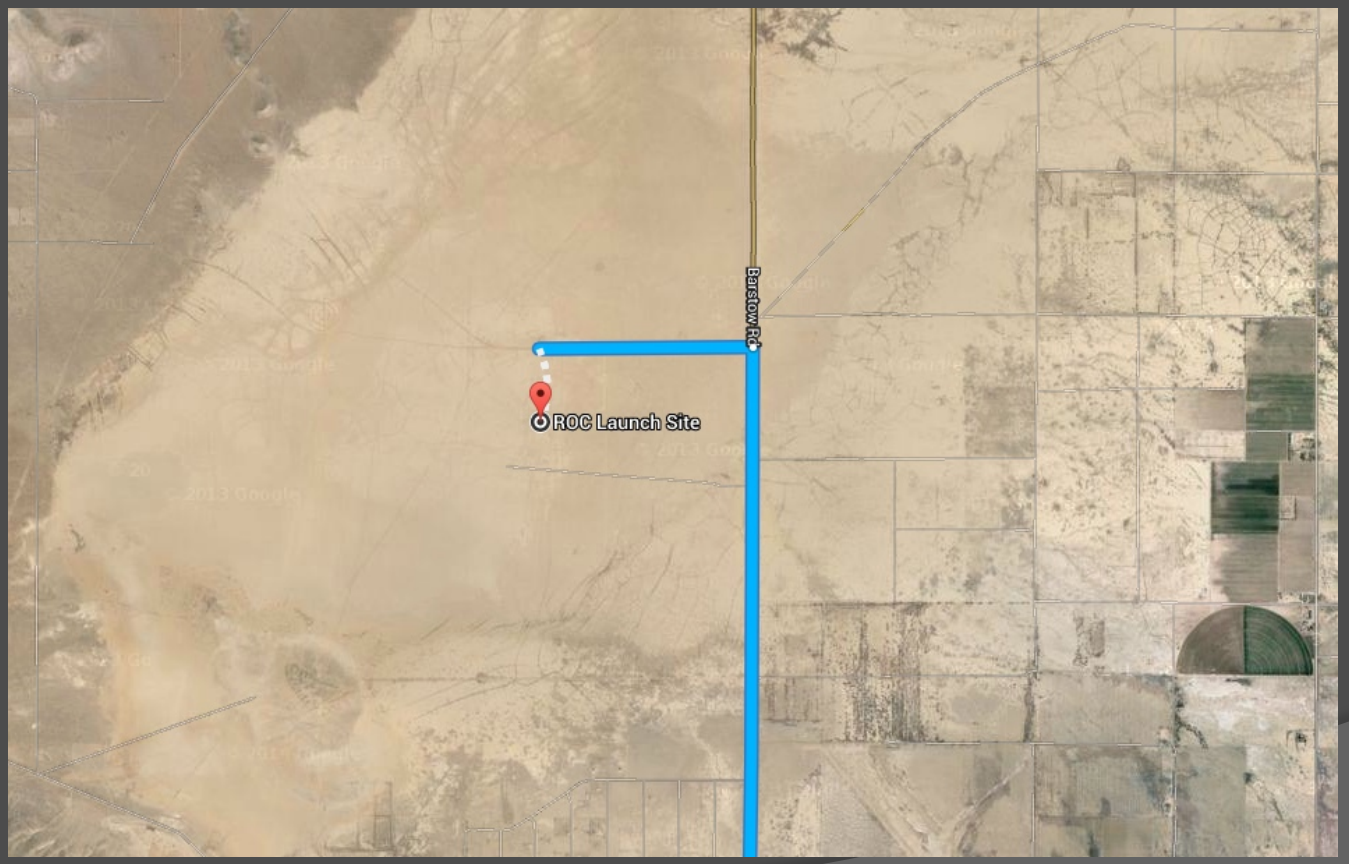
- Must fill out checklist & E80 Flight Card.
- Might want team checklist.
- You may launch personal projects after your team finishes their launch.
- We will have set up:
  - Tables
  - Computers
  - Canopies
  - Low power and high power launch stands
  - PA system

Launch Site



https://goo.gl/maps/Wfgqg

Lucerne Valley Dry Lake Bed



https://goo.gl/maps/Wfgqg

Weather Conditions

- Can range from cold (upper 20's) to hot (mid 80's)
- Usually sunny and clear (high to very high UV index)
- We cannot launch if:
  - Wind >20 mph
  - Precipitation
  - Clouds lower than 5000 feet AGL

Dress Code

- Long pants required, cotton recommended
  (I know, just deal with it)
- Close-toed shoes required
- Hats recommended
- Sunglasses recommended
- Safety glasses required around motors and loaded rockets
- We will bring sunscreen

High Power Safety Codes

- Tripoli Rocketry Association(TRA)
- National Association of Rocketry (NAR)

Distance Table

Installed Total Impulse (N-sec)	Equivalent Motor Type	Minimum Site Dimensions (ft.)	Minimum Personnel Distance (ft.)	Minimum Personnel Distance (Complex Rocket) (ft.)
1.25	1/4A, 1/2A	50	15	15
2.50	A	100	15	15
5.00	B	200	15	15
10.00	C	400	15	15
20.00	D	500	15	15
40.00	E	1,000	30	30
80.00	F	1,000	30	30
160.00	G	1,000	30	30
320.00	H	1,500	100	200
640.00	I	2,500	100	200
1280.00	J	½ max alt	100	200
2560.00	K	½ max alt	200	300

Our Safety Rules

- Follow the checklist (PML or Aerotech).
- Obey all PA announcements.
- Drink plenty of water.
- Wear safety glasses around motors, black powder, and loaded rockets.
- Never point loaded rocket at anyone.
- Igniter goes in motor as last thing on launch pad.

From countdown until safe ’chute deployment

- Everyone on their feet
- Everyone watches rocket

Flight Safety Video

The Delay Grain

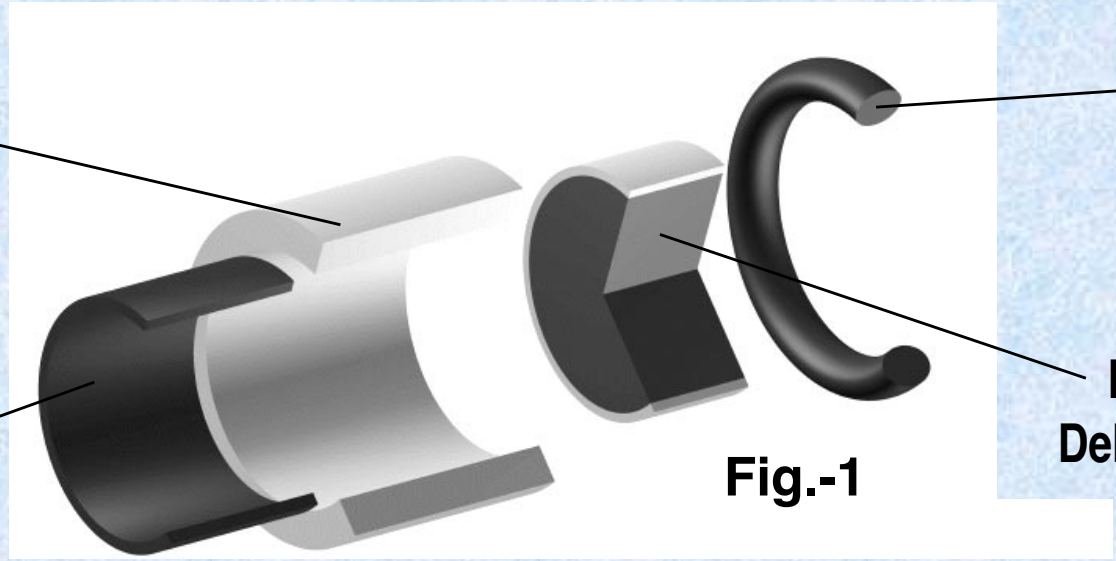


Fig.-1

Don’t get grease on the Delay Element.

http://www.aerotech-rocketry.com/customersite/resource_library/Instructions/HP-RMS_Instructions/29mm/29_120-240w_in_20051.pdf

The Delay Grain (cont.)

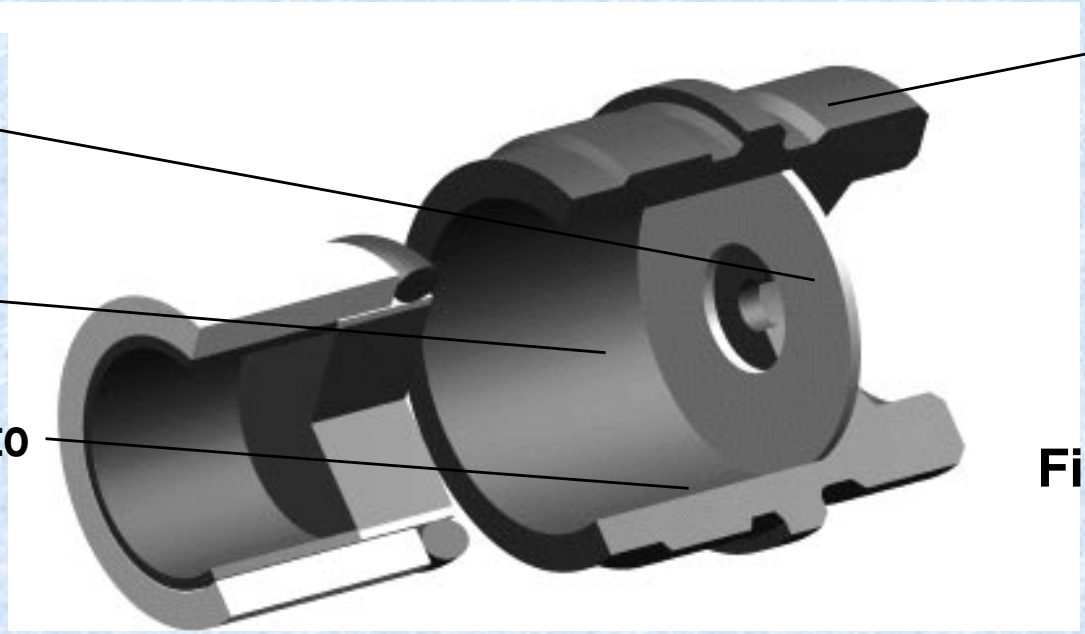


Fig.-2

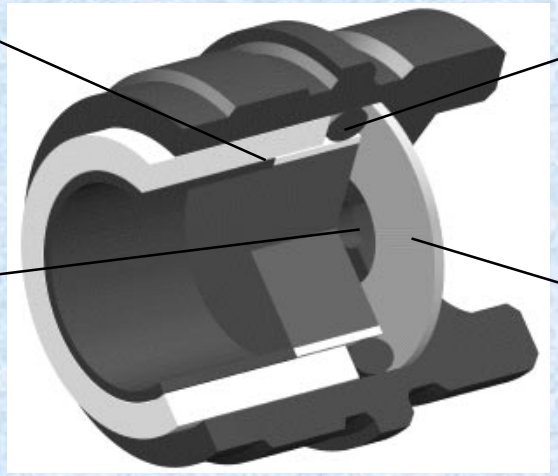
Don’t get grease on the Forward Delay Spacer.

http://www.aerotech-rocketry.com/customersite/resource_library/Instructions/HP-RMS_Instructions/29mm/29_120-240w_in_20051.pdf

The Delay Grain (cont.)

Delay Charge Assembly Inserted Completely Into 29mm Forward Closure

Fill with grease when using *plugged* forward closure ONLY



Delay O-Ring

Forward Delay Spacer

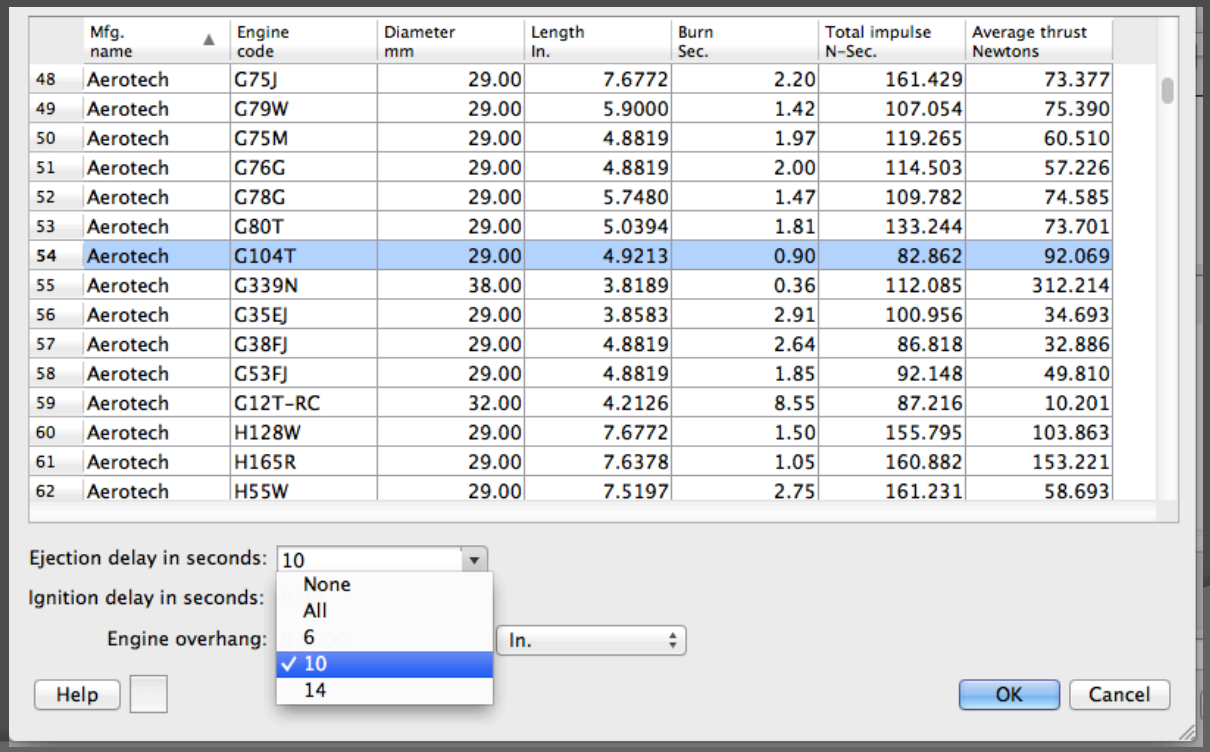
Fig.-3

Make sure the Aft Delay Spacer is behind the Delay Grain.

http://www.aerotech-rocketry.com/customersite/resource_library/Instructions/HP-RMS_Instructions/29mm/29_120-240w_in_20051.pdf

How to Set the Delay Time (1)

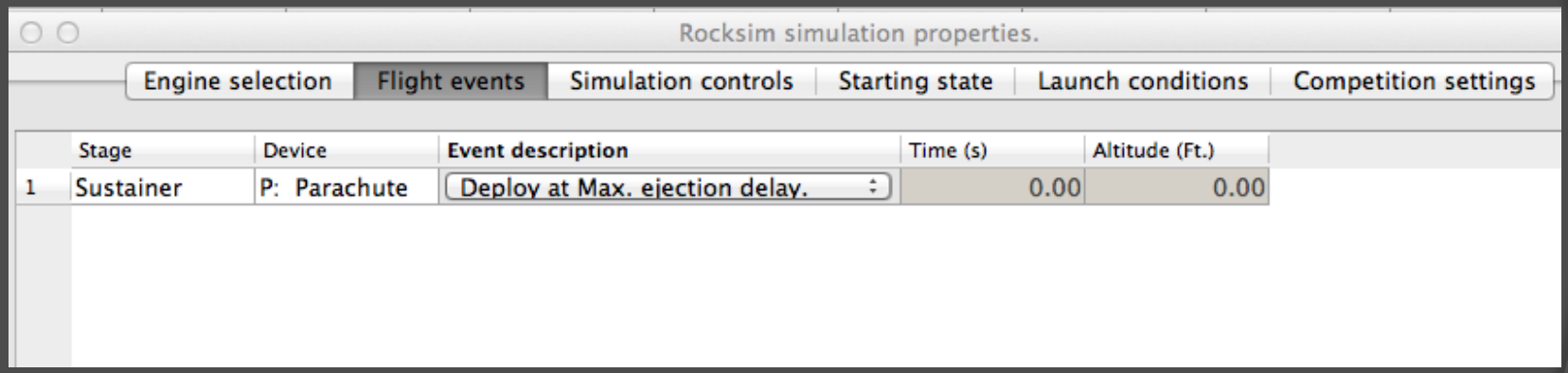
- Set the delay time to “M” (10 seconds)



	Mfg. name	Engine code	Diameter mm	Length In.	Burn Sec.	Total impulse N-Sec.	Average thrust Newtons
48	Aerotech	G75J	29.00	7.6772	2.20	161.429	73.377
49	Aerotech	G79W	29.00	5.9000	1.42	107.054	75.390
50	Aerotech	G75M	29.00	4.8819	1.97	119.265	60.510
51	Aerotech	G76G	29.00	4.8819	2.00	114.503	57.226
52	Aerotech	G78G	29.00	5.7480	1.47	109.782	74.585
53	Aerotech	G80T	29.00	5.0394	1.81	133.244	73.701
54	Aerotech	G104T	29.00	4.9213	0.90	82.862	92.069
55	Aerotech	G339N	38.00	3.8189	0.36	112.085	312.214
56	Aerotech	G35EJ	29.00	3.8583	2.91	100.956	34.693
57	Aerotech	G38FJ	29.00	4.8819	2.64	86.818	32.886
58	Aerotech	G53FJ	29.00	4.8819	1.85	92.148	49.810
59	Aerotech	G12T-RC	32.00	4.2126	8.55	87.216	10.201
60	Aerotech	H128W	29.00	7.6772	1.50	155.795	103.863
61	Aerotech	H165R	29.00	7.6378	1.05	160.882	153.221
62	Aerotech	H55W	29.00	7.5197	2.75	161.231	58.693

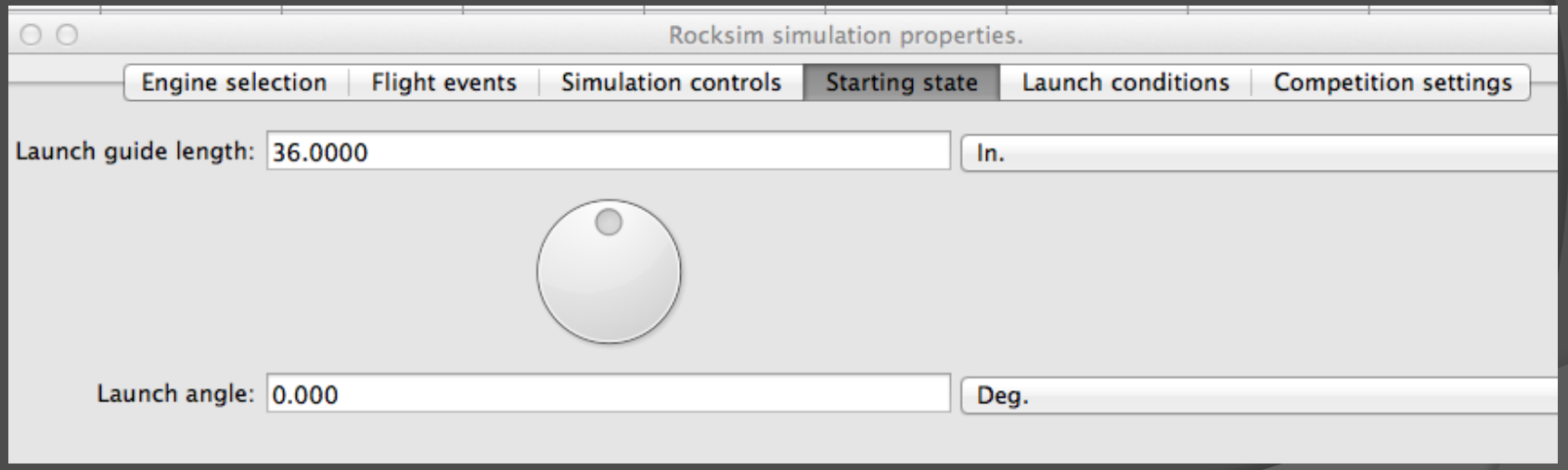
How to Set the Delay Time (2)

- Set Flight Event to Deploy at Max. ejection delay



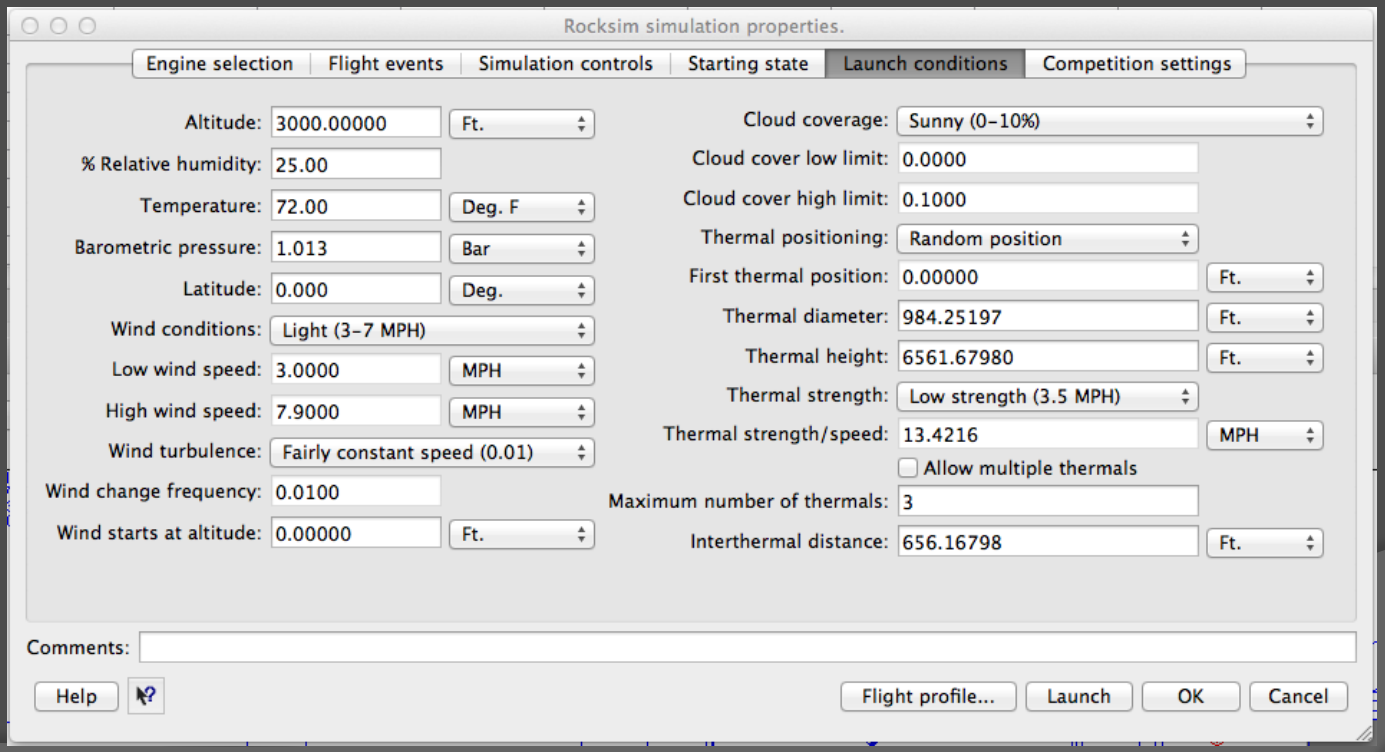
How to Set the Delay Time (3)

- Set Launch guide length to 48 or 60 In.



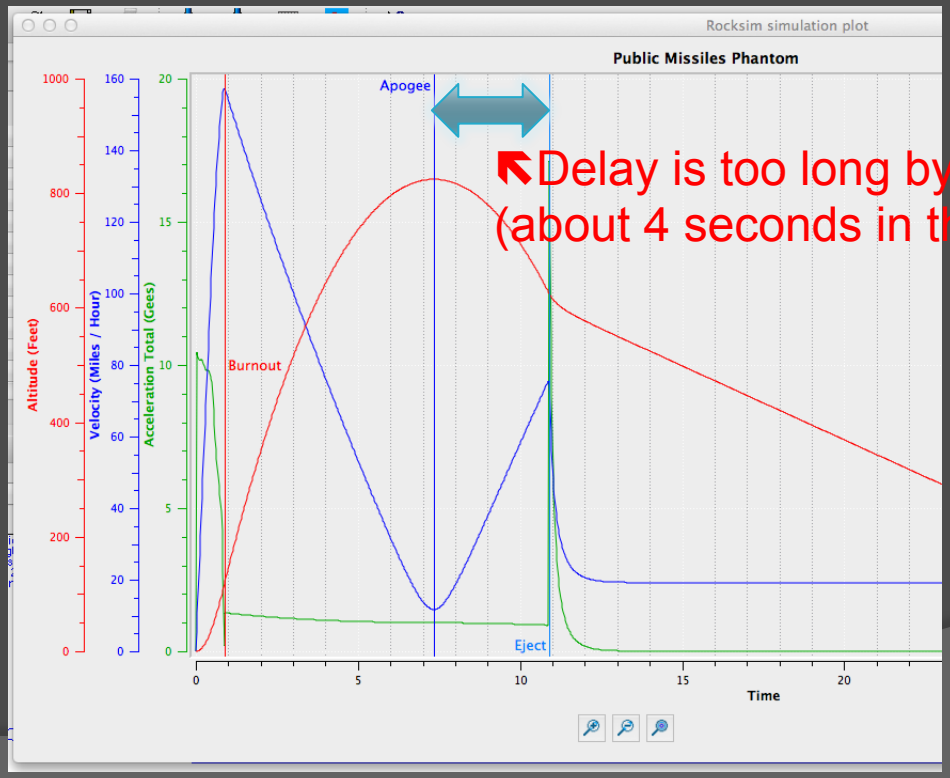
How to Set the Delay Time (4)

- Set Launch conditions to those at your launch site.



How to Set the Delay Time (5)

- Click Launch and then plot your results.



How to Set the Delay Time (6)

- Use the Delay Drilling Tool on your delay grain.
- The drilled end faces the propellant grain(s).

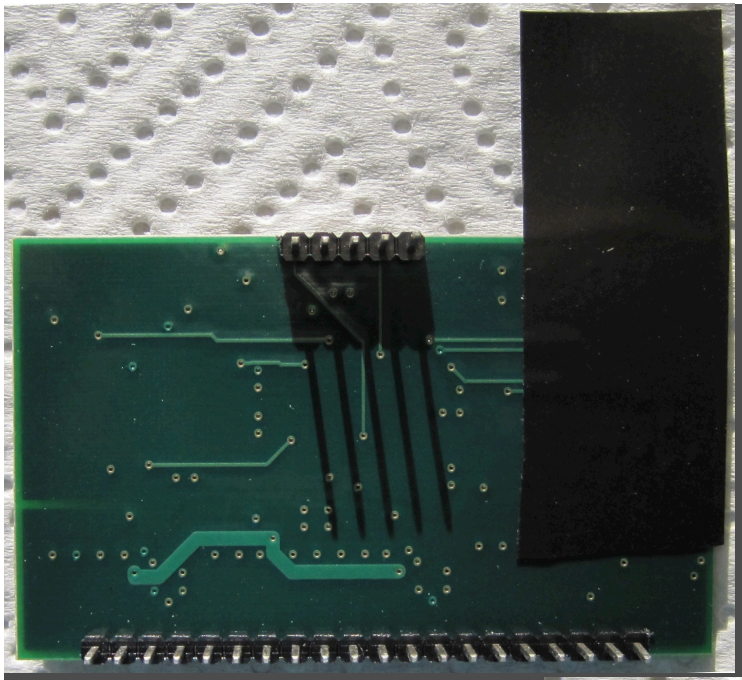
http://www.aerotech-rocketry.com/uploads/76469aad-577b-4972-a6b6-6f955effb89b_Drill%20Tool%201_640.jpg

We have the following Long Delays (14 seconds)

- RDK-06 – H238T, H165R
- RDK-07 – H128W, G79W
- RDK-12 – H242T, I357T
- RDK-13 – I245G
- RDK-14 – H148R, I218R
- RDK-15 – H123W, I161W

Securing your microSD card

1. Attach electrical tape on the underside of your data logger.
2. Insert the microSD card part way.
3. Wrap the tape around the card to fully insert it.
4. Secure the tape on top of the card holder.



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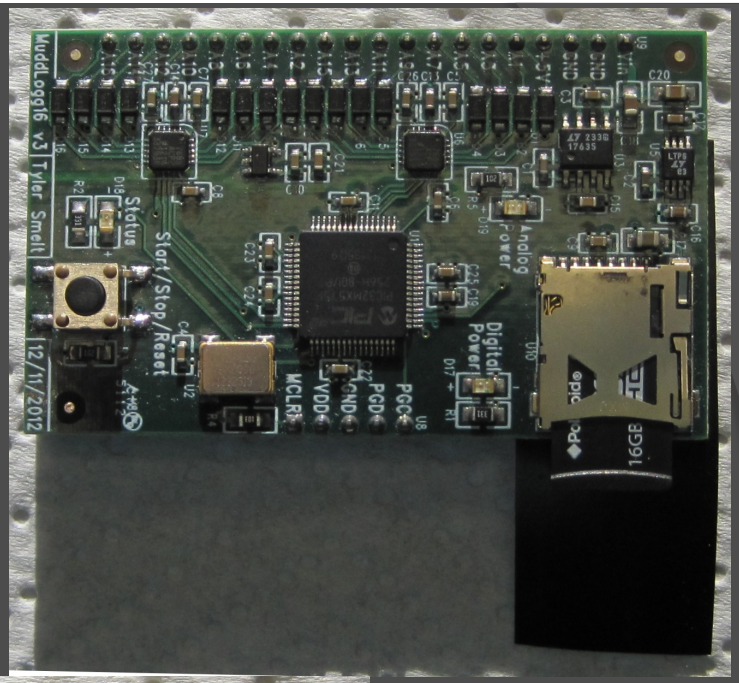
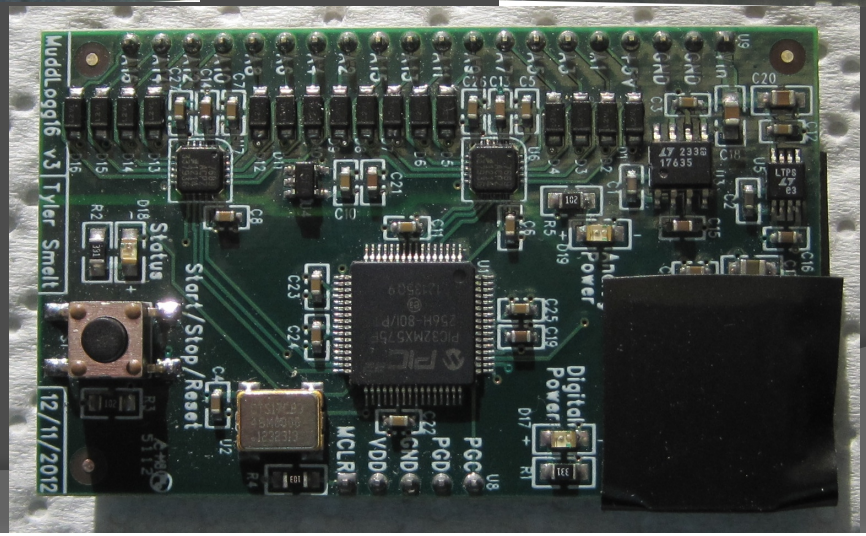

MuddLogg16 v3 Tyler Smelt
12/11/2012
Status
Start/Stop/Reset
Analog Power
Digital Power
MCLR
VDD
GND
PGD
PGC
16GB

2


MuddLogg16 v3 Tyler Smelt
12/11/2012
Status
Start/Stop/Reset
Digital Power
MCLR
VDD
GND
PGD
PGC

4

Questions for you

- How many teams want a stand-alone altimeter?
- How many potential Level 1 Certs do we have?

Your Questions?

- Data Logger?
- PC Board layout?
- $50 Budget?
- Calibration?