This is an example of a Class 3 FAA/AST submittal package.

It is ONLY a guideline. It will not guarantee either acceptance or approval by the FAA. Your project may require more or less information based upon the complexity or goals of your intended flight.

As mentioned previously, if you can tell more with less and still be complete, please do it. The FAA/AST will appreciate your efforts. The key is to speak to each of the information requirements of 101.29 as specifically as you can.

If you choose to generate your own aerodynamic data and 3-sigma 6 degree of freedom dispersion plots, be sure to attach a file providing aero data in tabular form. See the Class 3 write-up for specifics.

No certificate may be issued unless a completed application form has been received (14 C.F.R. 91. 101. and 105).

US Department of Transportation
Federal Aviation Administration

APPLICATION FOR CERTIFICATE OF WAIVER OR AUTHORIZATION

From Approved: O.M.B. No.2120-0027 08/31/2008

APPLICANTS - DO NOT USE THESE SPACES

Region	Date

Action
☐ Approved ☐ Disapproved – *"Explain under "Remarks"*

Signature of authorized FAA representative

INSTRUCTIONS

Submit this application in triplicate (3) to any FAA Flight Standards district office.

Applicants requesting a Certificate of Waiver or Authorization for an aviation event must complete all the applicable items on this form and attach a properly marked 7.5 series Topographic Quadrangle Map(s), published by the U.S. Geological Survey (scale 1:24,000), of the proposed operating area. The map(s) must include scale depictions of the flightlines, showlines, race courses, and the location of the air event control point, Police dispatch, ambulance, and fire fighting equipment. The applicant may also wish to submit photographs and scale diagrams as supplemental material to assist in the FAA's evaluation of a particular site. Application for a Certificate of Waiver or Authorization must be submitted 45 days prior to the requested date of the event.

Applicants requesting a Certificate of Waiver or Authorization for activities other than an aviation event will complete items 1 through 10 only and the certification, item 17, on the reverse.

1. Name of organization	2. Name of responsible person
Tripoli Rocketry Association	John Doe

3. Permanent mailing address	House number and street or route number	City	State and ZIP code	Telephone No.
	222 22rd Avenue SW	Anywhere	State 99999	999-999-9999

4. State whether the applicant or any of its principal officers/owners has an application for waiver pending at any other office of the FAA.

None

5. State whether the applicant or any of its principal officers owners has ever had its application for waiver denied, or whether the FAA has ever withdrawn a waiver from the applicant or any of its principal officers/owners.

None

6. FAR section and number to be waived

101.25 (b)6 Controlled airspace/operating limitations

7. Detailed description of proposed operation *(Attach supplement if needed)*

Launching of Class 3 unmanned rocket into controlled airspace.

To be launched during concurrent FLY HIGH event at Black Rock, NV. Requesting event organizers to administer launch control duties.

Supplemental information attached.

8. Area of operation *(Location, altitudes, etc.)*

Balck Rock, NV - 40 deg 48.5'N; 119deg 09'W 3815' MSL

9a. Beginning *(Date and hour)*		b. Ending *(Date and hour)*	
09/10/2000	08:00:00	09/15/2000	20:00:00

10. Aircraft make and model (a)	Pilot's Name (b)	Certificate number and rating (c)	Home address (Street, City, State) (d)

▶ ***ITEMS 11 THROUGH 16 TO BE FILLED OUT FOR AIR SHOW/AIR RACE WAIVER REQUESTS ONLY.***

11. The air event will be sponsored by:

12. Permanent mailing address	House number and street or route number	City	State and ZIP code	Telephone No.

13. Policing *(Describe provisions to be made for policing the event.)*

14. Emergency facilities *(Mark all that will be available at time and place of air event.)*

☐ Physician ☐ Fire truck ☐ Other - Specify _____

☐ Ambulance ☐ Crash wagon _____

15. Air Traffic control *(Describe method of controlling traffic, including provision for arrival and departure of scheduled aircraft.)*

16. Schedule of Events *(include arrival and departure of scheduled aircraft and other periods the airport maybe open.)*

Hour (a)	Date (b)	Event (c)

If sufficient space is not available, the entire schedule of events may be submitted on separate sheets, in the order and manner indicated above.

Please Read > The undersigned applicant accepts full responsibility for the strict observance of the terms of the Certificate of Waiver or Authorization, and understands that the authorization contained in such certificate will be strictly limited to the above described operation.

17. Certification - I CERTIFY that the foregoing statements are true.

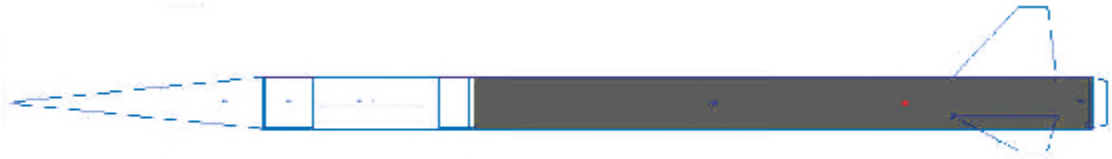
Date	Signature of Applicant
05/15/2000	

Remarks

Tripoli Rocketry Association Safety Code and Research Rules to be followed throughout launch event.

FAA Form 7711-2 (8-08) Supersedes Previous Edition

Supplemental Information for Line 5, FAA Form 7711-2:



Description of All Major Rocket Systems

Propulsion

a. Ammonium Perchlorate Composite Propellant (APCP) – 80% solids; 10% Al

b. 67 inches of characterized propellant in 5.015" diameter Bates grains; phenolic liner and casting tubes; bonded to liner with epoxy; RTV on inside diameter of grains.

c.

Kn: 397-585	Max Pc: 497.3 psi	Vol Loading: 82.8%
Web: 1.73"	Burn Time: 12.26 min	Prop Length: 67"
Mass: 72.261 lbs	Motor Class: P5168	Deivered ISP: 219

From BurnSim v3.0.0.119

d. Motor is 72" long, 6" dia, .1875" wall DOM 6065 T6 Al tubing; graphite nozzle in Al carrier. Nozzle and closure retained by Al rings fastened with 10-32 FH machine screws.

Airframe

a. Fincan is 72" motor (DOM tubing) coupled to 24" G10 avionics/parachute bay.
b. 5:1 ratio 30" long G10 conical nosecone - 4" Al tip. 6.0" dia, 126 " overall length.
c. Fins are .125" (uncanted) hexagonal design with 1" beveled leading and trailing edges
d. Fins are located 108" from nose tip.

Avionics

a. Loki Research ARTS 2 altimeter (accelerometer-based)
b. RDAS compact Altimeter (accelerometer-based)
c. Missileworks PET2 timer
d. Beeline GPS transmitter
e. Walston RF tracker on both fin can and avionics package

Recovery

a. Aerocon 73" cross-form on motor/fin can deployed at apogee (120 fps descent)
b. 36" hemispherical on avionics bay deployed at apogee (120 fps descent)

Highest Altitude (AGL) and Maximum Range (Ft) Expected to be Reached

Highest altitude and maximum range simulations were attained using RASAero aerodynamic data and 2007-8 NOAA AM and PM wind data (Reno station) manually input into RS-Pro v1.2.2f4.

Conditions	Launcher Configuration	Alt (Ft AGL)	Range (ft)
Zero Winds	0 deg AZM; 0 deg Elev	76,826	255
Late Sept Winds 7AM	25 deg AZM; 3 deg Elev	73,049	7,264
Late Sept Winds 4PM	50 deg AZM; 10 deg Elev	72,077	21,056
" " " 7AM	65 deg AZM; 3 deg Elev	74,659	15,765 (Parachute recovery)

Table 1 - Maximum Expected Altitude/Maximum Range

Parameter	Nominal Value
Launch Tower Ht.	144"
Launch Site Altitude	3800'
Landing Site Altitude	3800'
Temperature	68 deg
Baro Pressure	29.92 in-Hg
Latitude	40.485 degrees
Longitude	119.900 degrees

Table 2 – Launch Parameters

Mach Number	CP (in)	Static Margin (Calibers)
.10	102.871	3.76
3.5	90.93	5.65

Table 3 - Static Stability Characteristics

Dynamic Stability Characteristics

Static stability characteristics for the rocket at launch and burnout are shown in **Table 3**. RASAero is used to predict centers of pressure as a function of Mach number. A stable vehicle generally requires a minimum static margin of 1-2 calibers where a caliber is the diameter of the rocket.

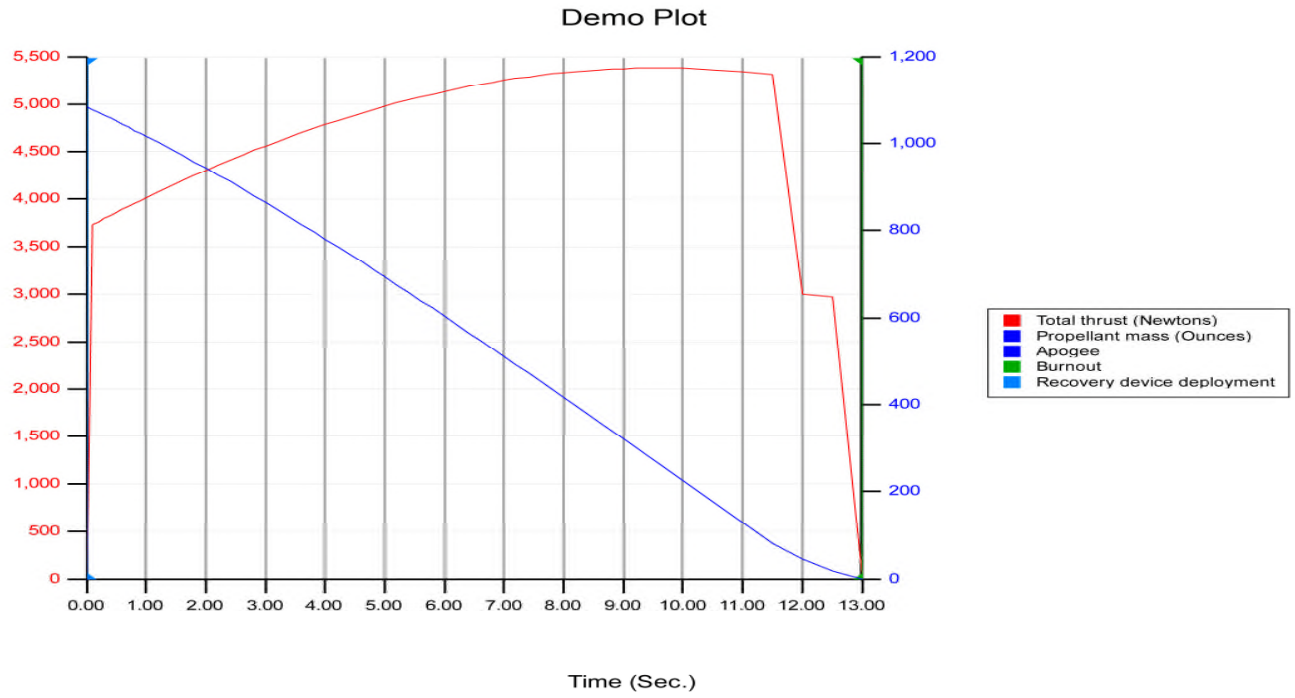


Figure 1 – Thrust & Mass Flow vs Time (sec)

Figure 2 – CNa, CP and Drag vs Mach

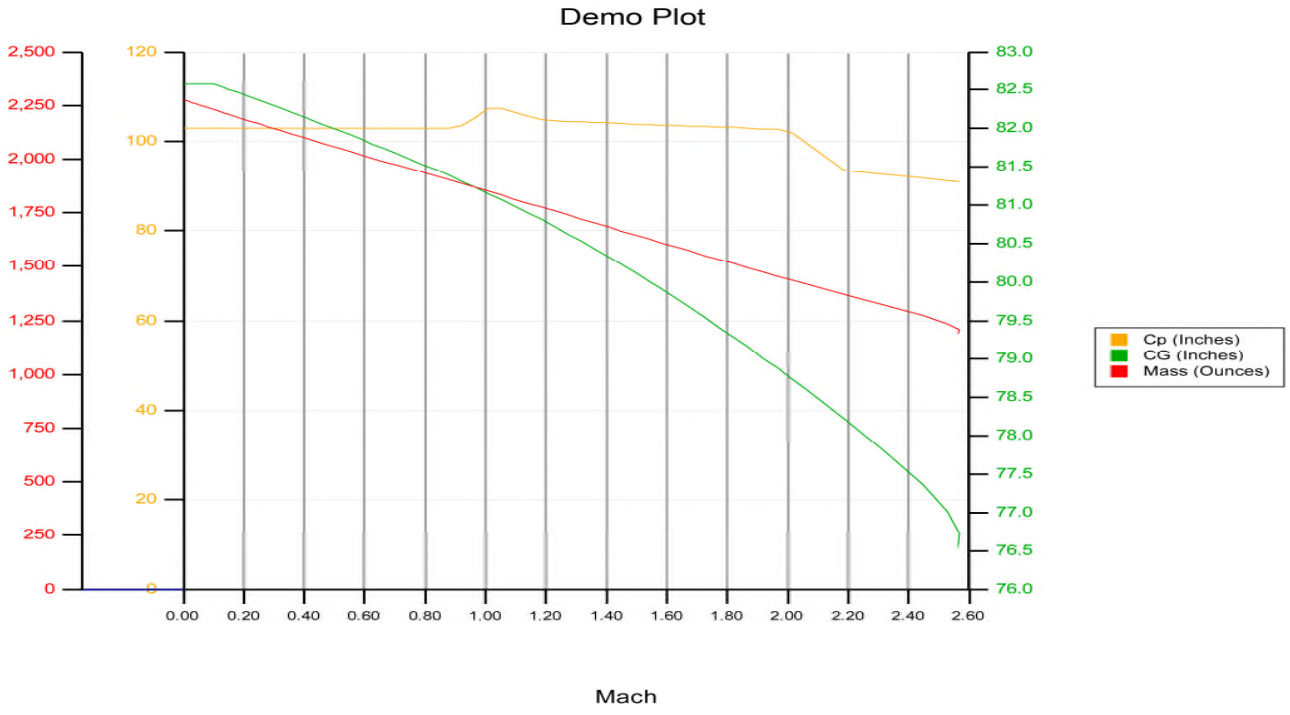


Figure 3 – CP,CG and Mass vs Mach

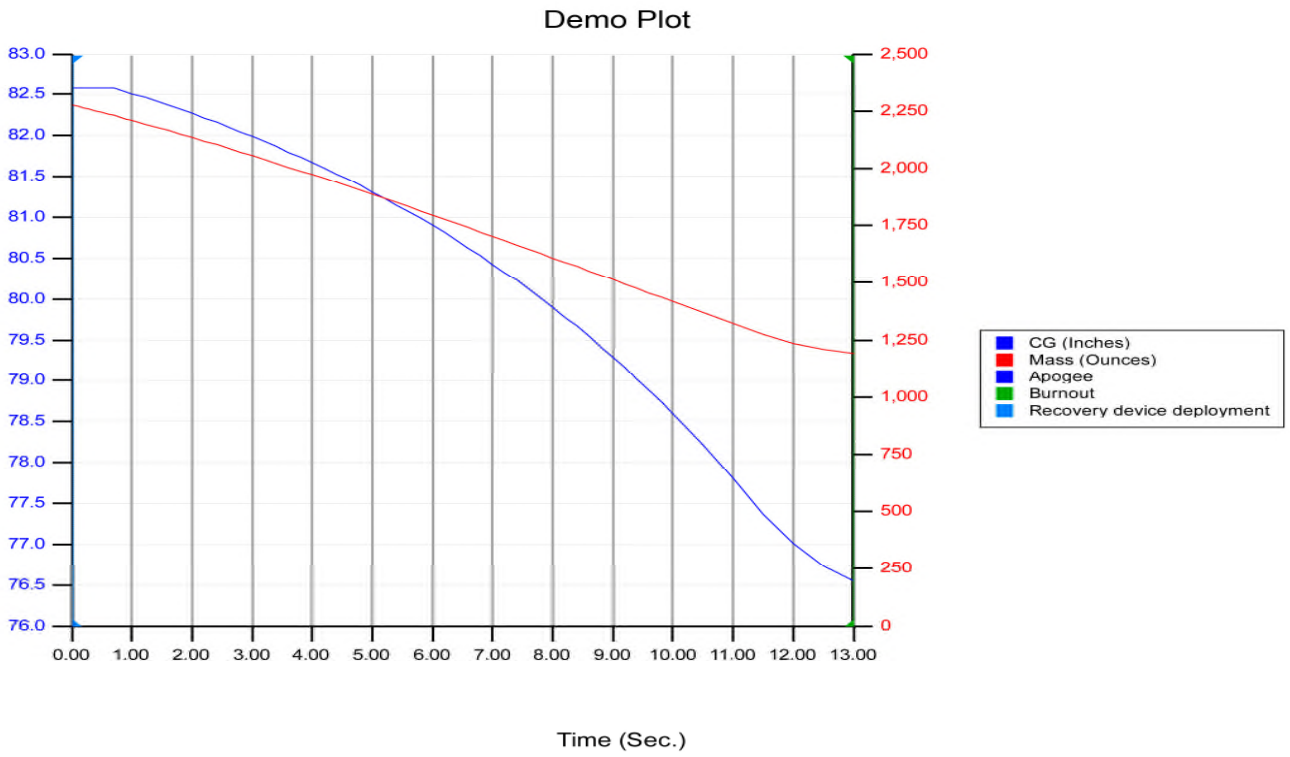


Figure 4 – CG and Mass vs Time at BU

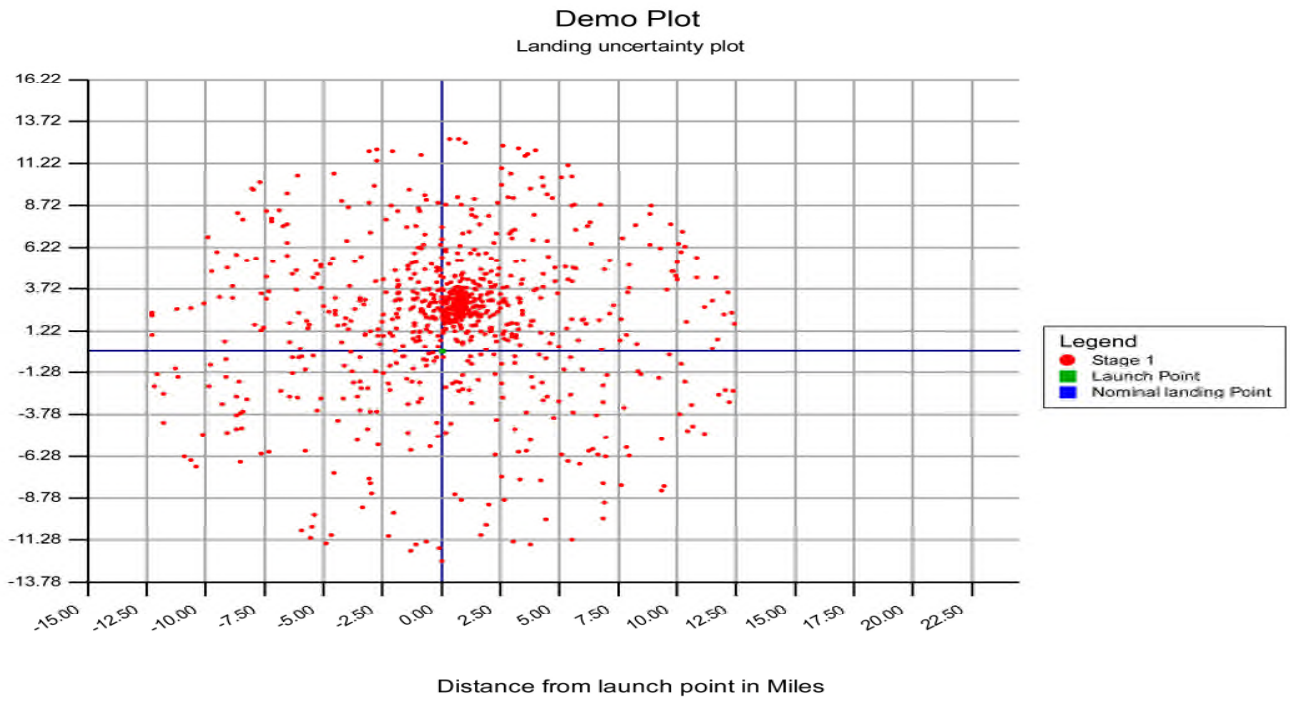


Figure 5 – 3–Sigma Dispersion Zero Wind (No Recovery)

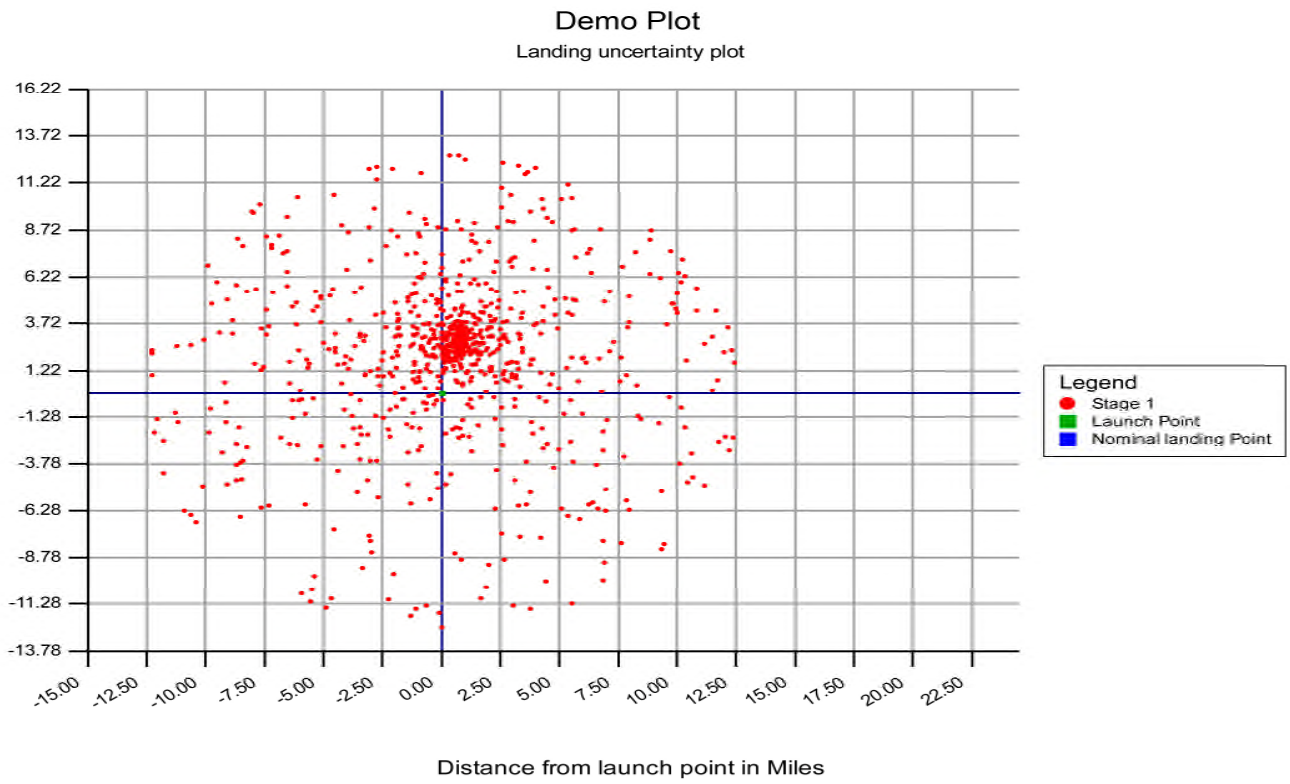


Figure 6 – 3–Sigma Dispersion 7AM Black Rock, NV Wind (No Recovery)

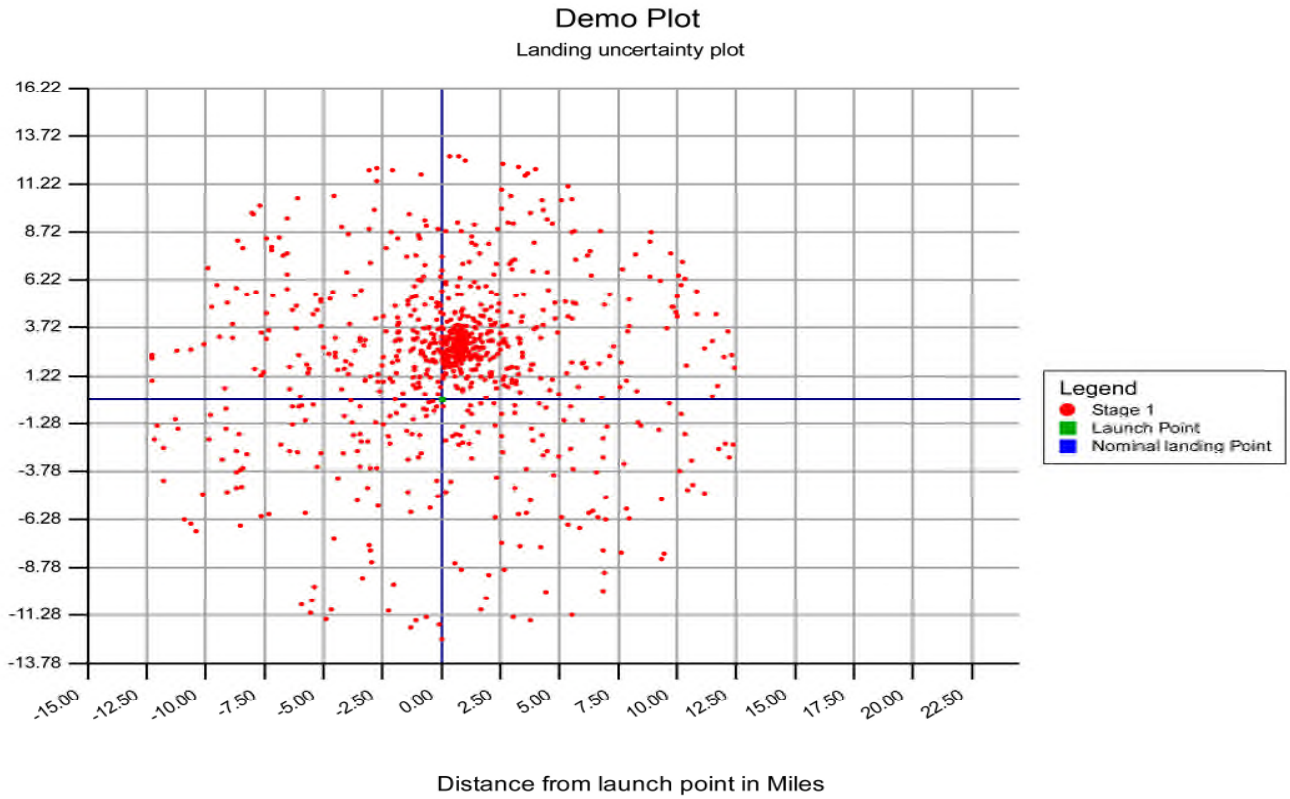


Figure 7 – 3–Sigma Dispersion 4PM Wind (With Recovery)

All Nominal Impact Areas within Three Standard Deviations

Dispersion plots for ballistic and recovered impacts have been generated using RASAero aerodynamic rocket data manually input to RS-Pro 6 DOF trajectory simulation.

1-Sigma uncertainties for RS-Pro are as follows:

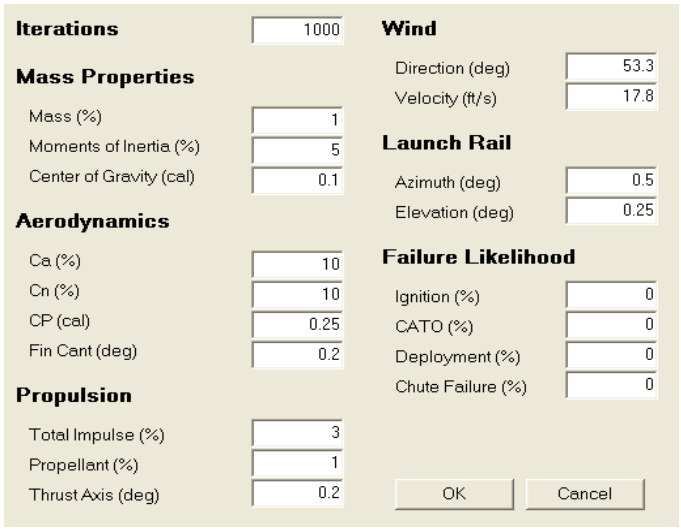


Figure 6 – 1-Sigma Uncertainties for RS-Pro 6-DOF Dispersion Analysis

Support Equipment

a. Tracking equipment includes RF receivers, GPS receivers, antennae, computers, extra batteries and cabling.

b. FRS radios are used between team members, support personnel and launch organizers.

Safety Procedures

a. Range safety, launch preparation, launch event and post-launch checklists will be used.

b. Two-way communication via FRS radios is critical for communicating activity to event staff. Team members communicate launch prep and launch status to event organizers. Event Launch Control Officer directs sequence of launches and uses event public address system to inform attendees.

Mishap Procedures/Emergency Facilities

a. Local first aid and emergency management available from team support personnel (Family Practice Physician) as well as AHPRA launch Organizers and emergency personnel in Gerlach, NV.

b. Nearest hospital is located in Reno, NV.