AeroEagles Launch Day Record

September 19, 2026 | First high-power launch outing

3 launched | 2 recovered | 1 unrecovered

1. What happened

On September 19, 2026, Jack Tommaney, Lucas DiMarco, and Vedarsh Mishra took three AeroEagles rockets to the launch field for the team's first high-power launch outing. All three rockets left the rail successfully.

Two rockets were recovered. Vedarsh's rocket was not recovered after its descent carried it beyond the team's successful search area. The flight itself was strong on ascent, but the recovery sequence did not work as intended.

The day was also a major team milestone: Jack Tommaney successfully earned his Level 1 High Power Rocketry certification during the outing.

2. Team and outcomes

Person	Role in outing	Outcome
Jack Tommaney	AeroEagles launch participant	Rocket launched and recovered; earned Level 1 High Power Rocketry certification.
Lucas DiMarco	AeroEagles launch participant	Rocket launched and recovered.
Vedarsh Mishra	MechaEagles founder / project manager; AeroEagles launch participant	Rocket launched successfully; recovery system did not deploy correctly; rocket remained unrecovered.

3. Vedarsh's rocket: pre-launch configuration

The following values are the launch-day values currently recorded from the OpenRocket model and Vedarsh's recollection. The flight-ready mass is approximate.

Rocket	AeroEagle-1
Flight-ready mass	approximately 1.96 lb (0.889 kg)
Motor	AeroTech H100W
OpenRocket predicted apogee	725 m (about 2,379 ft)
Velocity off rail	21.7 m/s
Predicted maximum velocity	241 m/s
Predicted maximum acceleration	259 m/s^2
Predicted time to apogee	8.74 s
OpenRocket optimum delay	6.34 s

4. Recovery-system issue

The rocket ascended successfully, but the parachute did not deploy correctly during descent. The recovery setup was intended to deploy the parachute at roughly 200 ft altitude; an error in that chute/recovery setup prevented the recovery sequence from working as intended.

After the flight, the team searched for the rocket but did not recover it. Because the vehicle itself was not retrieved, the exact physical failure mode could not be inspected directly after landing. The known result is therefore best recorded as a recovery-system/deployment failure followed by an unrecovered vehicle, rather than attributing the loss to a more specific component failure without evidence.

5. Launch-day sequence

- Arrived at the launch field with three completed rockets and prepared them for flight.
- Completed final pre-launch checks and placed the rockets on the launch rail/pad.
- Launched all three rockets successfully.
- Jack Tommaney completed the flight required for his Level 1 High Power Rocketry certification.
- Two rockets completed recoveries and were retrieved.
- Vedarsh's rocket flew strongly on ascent, but its parachute recovery sequence did not operate correctly.
- The team searched the surrounding area for the missing rocket but was unable to recover it.
- Final launch-day count: three launched, two recovered, one unrecovered.

6. Launch-day images



Figure 1. Rocket prepared on the launch pad.

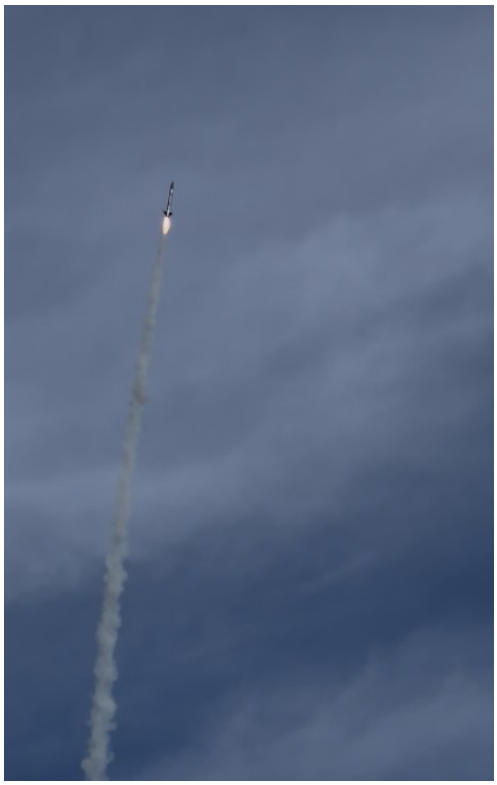


Figure 2. Rocket in powered flight after leaving the rail.

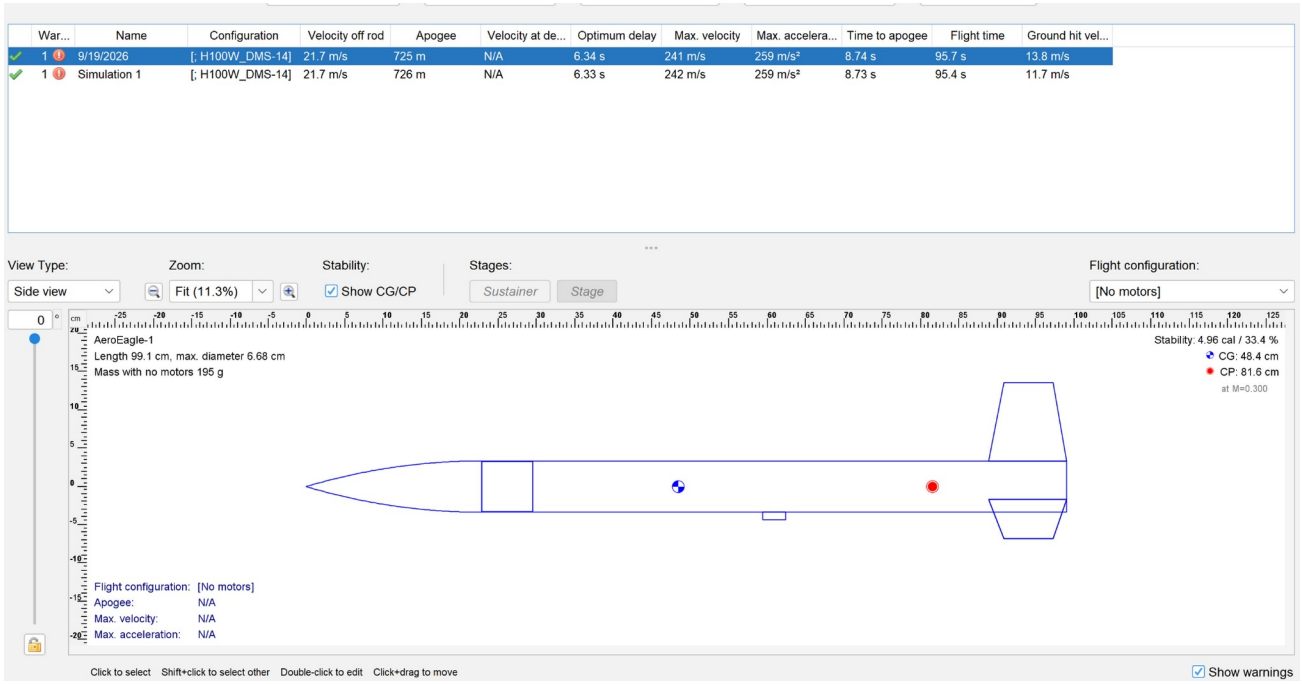


Figure 3. OpenRocket flight-simulation table used for the launch configuration.

7. Engineering takeaways / next iteration

- Keep the model-to-test loop: predict the flight, launch, compare observed behavior with the model, and update the next design.
- Treat the recovery system as a mission-critical subsystem and verify deployment logic, hardware, packing, and trigger conditions independently before flight.

- Record a complete flight-ready configuration before launch, including measured mass, loaded CG, CP/stability margin, motor, recovery configuration, and launch conditions.
- Where practical, add a tracking method or beacon to improve the odds of recovering a vehicle that lands outside the expected search area.
- Preserve launch photos, simulation files, scratch calculations, and post-flight notes as the baseline for the next AeroEagles vehicle.

8. Financial / revenue record

No financial revenue figures, sales, sponsorship income, reimbursements, or launch-day income amounts were provided for this record. This document therefore does not invent or estimate revenue. If those figures are added later, they should be appended here with the source and date for each amount.

Record note

This document is a factual reconstruction from the launch information currently available. Values explicitly described as approximate, especially the 1.96 lb flight-ready mass, should be replaced with measured values if the original launch log or scale record is recovered. The exact launch-site name is intentionally omitted here because it was not confirmed in the information used to prepare this record. The calculation appendix distinguishes measured/recalled values from OpenRocket predictions and flags the no-motor stability screenshot so it is not mistaken for a loaded-flight result.

Calculation Appendix

These pages collect the numerical checks discussed for AeroEagle-1. They preserve the reasoning behind the flight while separating measured/recalled values from OpenRocket predictions and reference data.

A1. Launch mass and basic conversions

Measured/recalled flight-ready mass

$$m = 1.96 \text{ lb} \times 0.453592 \text{ kg/lb}$$

$$m = 0.889 \text{ kg}$$

$$W = mg = (0.889 \text{ kg})(9.807 \text{ m/s}^2)$$

$$W = 8.72 \text{ N}$$

At launch, the rocket was remembered as weighing approximately 1.96 lb flight-ready. That is about 0.889 kg, corresponding to a weight of roughly 8.72 N.

Flight-ready mass vs. reference listing

$$1.96 \text{ lb} \times 16 \text{ oz/lb} = 31.36 \text{ oz}$$

Reference listing: 22 oz = 1.375 lb

$$\text{Difference} = 31.36 - 22 = 9.36 \text{ oz}$$

$$\text{Percent above reference} = (0.585/1.375) \times 100 = 42.5\%$$

Engineering note: The 22 oz value in the reference listing is not the launch-ready mass. Motor, recovery hardware, adhesives, paint, and other build choices can shift the real mass. Future simulations should use a measured, fully flight-ready mass.

A2. OpenRocket flight predictions and sanity checks

Quantity	OpenRocket value	Conversion / interpretation
Predicted apogee	725 m	2,379 ft
Velocity off rail	21.7 m/s	48.5 mph
Maximum velocity	241 m/s	539 mph; approx. Mach 0.70
Maximum acceleration	259 m/s^2	approx. 26.4 g
Time to apogee	8.74 s	average ascent rate approx. 83.0 m/s
Optimum motor delay	6.34 s	OpenRocket recommendation; counted from motor burnout

First-order ascent check

Average ascent rate = apogee / time to apogee

= 725 m / 8.74 s

= 83.0 m/s

Scale of the predicted maximum-speed state

KE_max = 1/2 m v^2

= 0.5(0.889 kg)(241 m/s)^2

= 25.8 kJ

p_max = mv = (0.889)(241) = 214.3 kg*m/s

Engineering note: These values use the 241 m/s OpenRocket prediction, not measured onboard data. They are useful for scale and design intuition, not as proof of the actual flight speed.

A3. Stability check: what can and cannot be claimed

The design screenshot displayed CG = 48.4 cm, CP = 81.6 cm, and maximum body diameter = 6.68 cm while the flight configuration was explicitly set to “[No motors].” The static-margin calculation from that screenshot is:

Static margin (calibers) = (CP - CG) / body diameter

= (81.6 cm - 48.4 cm) / 6.68 cm

= 4.97 calibers

This reproduces the approximately 4.96-caliber value shown by OpenRocket, so the arithmetic is internally consistent with that screenshot.

Engineering note: This is NOT the flight-ready stability margin. Adding the H100W motor and launch hardware shifts the center of gravity. The true flight value requires the loaded CG and CP from the actual H100W configuration. Until that is recovered from the .ork file or a launch-day screenshot, 4.96 calibers should be labeled “no-motor model only.”

What should be recorded next time

- Measured flight-ready mass with motor and recovery system installed.
- Loaded center of gravity (CG), measured physically and compared with OpenRocket.
- Center of pressure (CP) from the actual flight configuration.
- Static margin in calibers using the loaded CG.
- Launch rail length, wind speed/direction, launch angle, and temperature.
- Motor configuration and delay setting actually flown.

A4. Recovery-system timing and post-flight reasoning

The recovery setup was intended to command parachute deployment at about 200 ft above ground level. The parachute did not deploy correctly, and because the rocket was not recovered, the precise failure could not be inspected afterward.

Simple 200-ft timing illustration

200 ft x 0.3048 m/ft = 60.96 m

If descent speed were 13.8 m/s, then t = h/v

t = 60.96 m / 13.8 m/s = 4.4 s

Engineering note: The 4.4 s result is only a rough illustration using the OpenRocket ground-hit velocity shown in the simulation table. The actual descent speed during the failed recovery is unknown. The point is that a 200-ft deployment command leaves a short time window, so sensing, logic, release hardware, packing, and inflation all need margin.

Recovery chain to verify before the next flight

- Altitude sensing / trigger logic: verify the 200-ft condition and any arming rules.
- Electrical continuity: confirm the complete deployment circuit before launch.
- Mechanical release: ground-test the chute retention and release mechanism repeatedly.
- Parachute packing: verify the chute can physically exit and inflate without snagging.
- Backup recovery path: use an independent or redundant method when appropriate and permitted by launch rules.
- Tracking: add a beeper, RF tracker, GPS-capable tracker, or another recovery aid appropriate for the vehicle and launch rules.

Post-flight comparison

Item	Prediction / intent	Observed
Powered ascent	Stable flight; 725 m predicted apogee	Strong ascent observed; exact apogee not measured
Recovery trigger	Parachute deployment around 200 ft AGL	Parachute did not deploy correctly
Vehicle recovery	Rocket recovered after descent	Rocket not recovered
Model validation	Compare predicted and measured flight data	Limited by lack of onboard telemetry / unrecovered vehicle

Bottom line: the ascent worked, the recovery did not. The next priority is to preserve the ascent model, rebuild and ground-test the recovery chain with more margin, and instrument the next vehicle well enough to compare prediction with measured flight data.