UP Aerospace

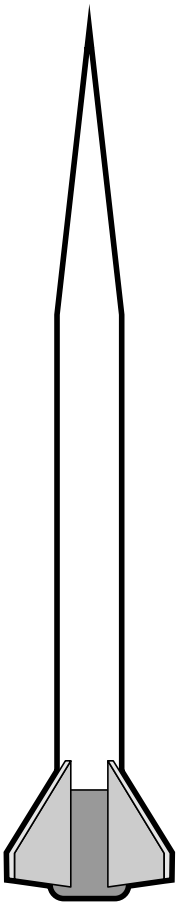
SPACELOFT

NASA TECHRISE STUDENT CHALLENGE

Vehicle Summary

UP Aerospace SpaceLoft flights can demonstrate microgravity in excess of 3 minutes to an altitude of 120 km. Lift-off begins with the solid rocket motor ignition after which the vehicle is spun aerodynamically using its four canted fins. At approximately one minute into flight, the vehicle is despun. Microgravity experimentation usually begins just after de-spin completion. As the vehicle re-enters Earth's atmosphere, the payload section is separated from the booster before deploying the drogue and main parachute. All missions are flown from Spaceport America and land on White Sands Missile Range. This flight profile will enable NASA TechRise students to use SpaceLoft as a platform to conduct microgravity experiments and technology demonstrations.

Flight Integration Details



UP AEROSPACE SPACELOFT

Requirements	UP AEROSPACE + NASA TECHRISE
Maximum Size	4 in x 4 in x 8 in (10.16cm x 10.16cm x 20.32 cm)
Total Maximum Weight	1.1 pounds (0.5 kilograms)
Provided Flight Box Weight	Approximately 0.4 pounds (180 grams)
Liquids	150ml non-hazardous liquid; Double containment required
Biologics	Experiments that grow or monitor living organisms are not allowed; Seeds or plant substrates (e.g.: soils, artificial soils) are allowed
Extra Batteries	No. Please rely on the vehicle power outlined below
Wireless Communications	No Bluetooth, Wi-Fi, or other RF communications
Lasers	Yes. Small Class 1 and 1M lasers are allowed
Power & Data	
Connector	DB - 9
Voltage	9 V
Current	1A
Vehicle Data	Yes, vehicle telemetry is streamed to each experiment as serial data
Key Event Triggers	Yes, key events will be provided as serial data packets during flight and can be used to trigger your flight experiment; Events are described on Page 2
Environmental Conditions	
Overview	Experiment is inside a vented rocket frame
Flight Location	SpacePort America, New Mexico
Temperature	Aerodynamic heating during flight causes increased internal temperature 30C to 85C (Microgravity portion is typically 30-60C)
Line of Sight	No line of sight to the exterior
Pressure	Ambient with atmosphere (14.69 psi to 0 psi above Karman Line)
Acceleration	Up to 18 g axially and 18.5 g radially
EMI	Upon request: support@futureengineers.org
Vibration	Upon request: support@futureengineers.org
Shock	Upon request: support@futureengineers.org

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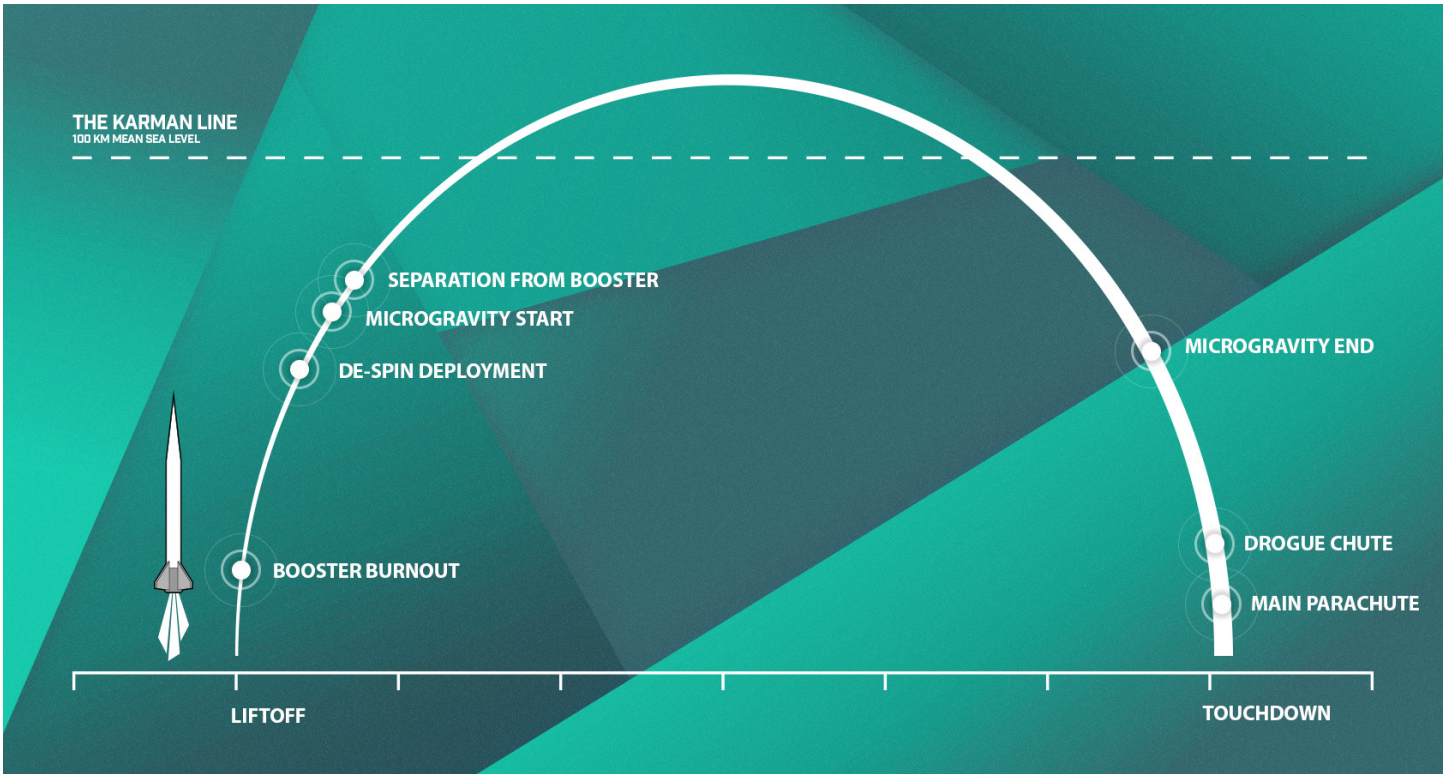
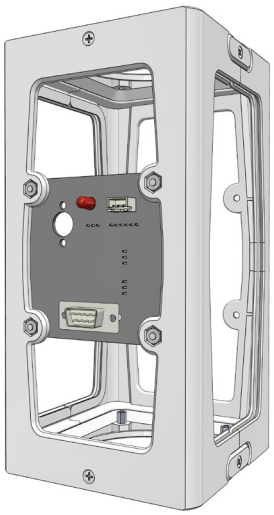
FLIGHT DETAIL, KEY EVENTS & SIMULATOR



FLIGHT BOX

Winning teams assigned to suborbital rocket flights will receive a 3D-printed Flight Box and a Technical Development Setup Guide.



FLIGHT EVENTS

Liftoff
Booster Burnout
Despin Deployment
Microgravity Start
Booster Separation
Microgravity End
Drogue Deployed
Main Chute Deployed

VIDEOS