

MISSION

A United Launch Alliance (ULA) Atlas V 501 rocket will launch the United States Space Force-7 (USSF-7) mission, carrying the sixth flight of an X-37B Orbital Test Vehicle, OTV-6. Liftoff will occur from Space Launch Complex-41 at Cape Canaveral Air Force Station, Florida.

The Department of the Air Force Rapid Capabilities Office continues to push the flight envelope for the X-37B and will build upon its growing collaboration with experiment partners with its sixth mission.

The mission will also deploy FalconSat-8, a small satellite developed by the Air Force Academy and sponsored by the Air Force Research Laboratory to conduct several experiments on orbit. The mission also carries two NASA experiments to study the results of radiation and other space effects on a materials sample plate and seeds used to grow food. Another experiment provided by the Naval Research Laboratory will transform solar power into radio frequency microwave energy which could then be transferred to the ground.



Image Courtesy The Boeing Company

LAUNCH VEHICLE

Payload Fairing (PLF)

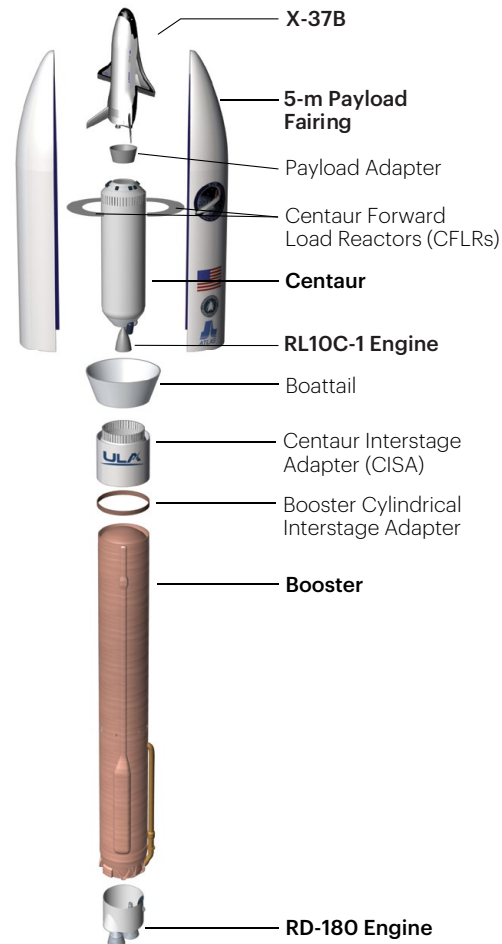
The X-37B is encapsulated in a 5-m (17-ft) diameter short payload fairing. The 5-m PLF is a sandwich composite structure made with a vented aluminum-honeycomb core and graphite-epoxy face sheets. The bisector (two-piece shell) PLF encapsulates both the Centaur and the X-37B. The vehicle's height with the 5-m short PLF is approximately 60 m (197 ft).

Centaur

The Centaur second stage is 3 m (10 ft) in diameter and 12.6 m (41.5 ft) in length. Its propellant tanks are pressure-stabilized and constructed of corrosion-resistant stainless steel. Centaur is a cryogenic vehicle, fueled with liquid hydrogen and liquid oxygen, powered by an RL10C-1 engine producing 10,387.3 kg (22,900 lb) of thrust. The cryogenic tanks are insulated with a combination of helium-purged blankets, radiation shields and spray-on foam insulation (SOFI). The Centaur forward adapter (CFA) provides structural mountings for the fault-tolerant avionics system and structural and electrical interfaces with the spacecraft.

Booster

The booster is 3.8 m (12.5 ft) in diameter and 32.5 m (106.5 ft) in length. The booster's tanks are structurally rigid and constructed of isogrid aluminum barrels, spun-formed aluminum domes and intertank skirts. Booster propulsion is provided by the RD-180 engine system (a single engine with two thrust chambers). The RD-180 burns RP-1 (Rocket Propellant-1 or highly purified kerosene) and liquid oxygen and delivers 3.83 mega-Newtons (860,200 lb) of thrust at sea level. The Centaur avionics system, provides guidance, flight control and vehicle sequencing functions during the booster and Centaur phases of flight.



ATLAS V



The 501 configuration provides Atlas V reliability and performance to unique payloads. Like the 401, the workhorse of the Atlas V fleet, the 501 provides efficient delivery to orbit for spacecraft that require the larger payload accommodations afforded by a 5-meter diameter payload fairing. To date, the 501 has been used exclusively for national security missions.

First Launch: Apr. 22, 2010
Launches to date: 6

Performance to GTO: 3,780 kg (8,330 lb)
Performance to LEO-Reference: 8,210 kg (18,100 lb)

MISSION SUCCESS

With more than a century of combined heritage, ULA is the world's most experienced and reliable launch service provider. ULA has successfully delivered more than 135 missions to orbit that provide Earth observation capabilities, enable global communications, unlock the mysteries of our solar system and support life-saving technology.

MISSION OVERVIEW

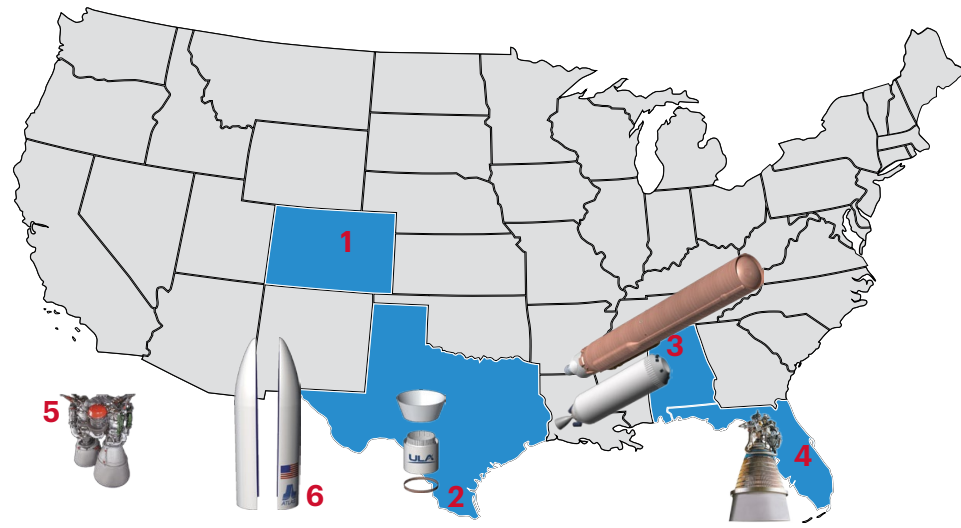
USSF-7 ATLAS V



ulalaunch.com

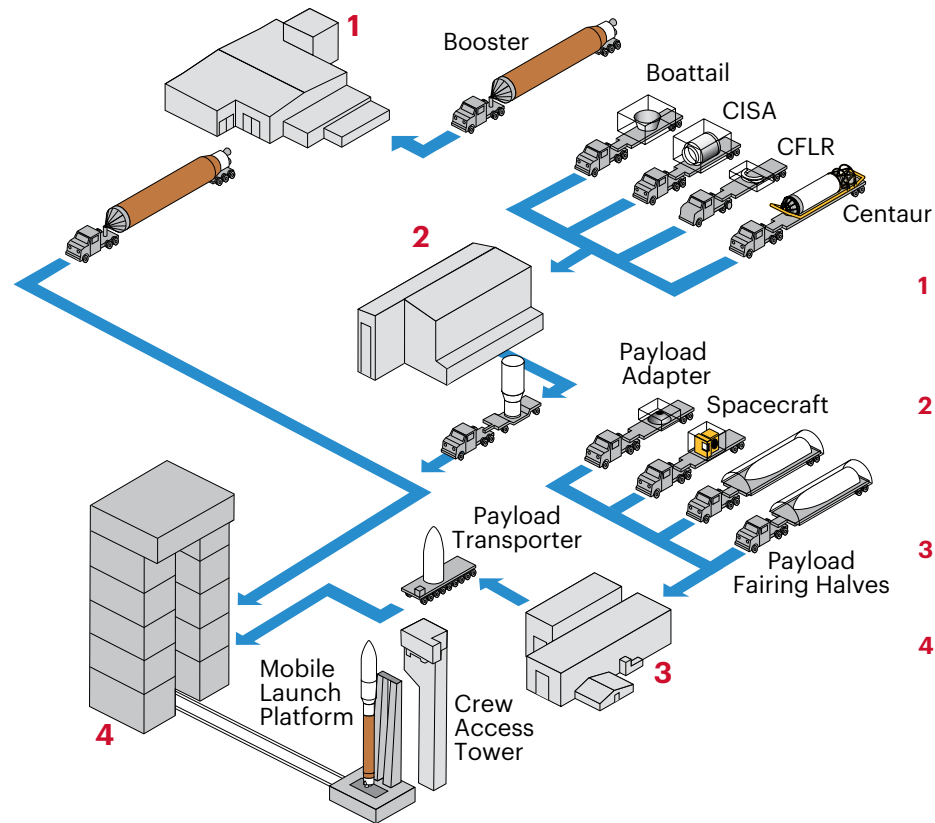
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PRODUCTION



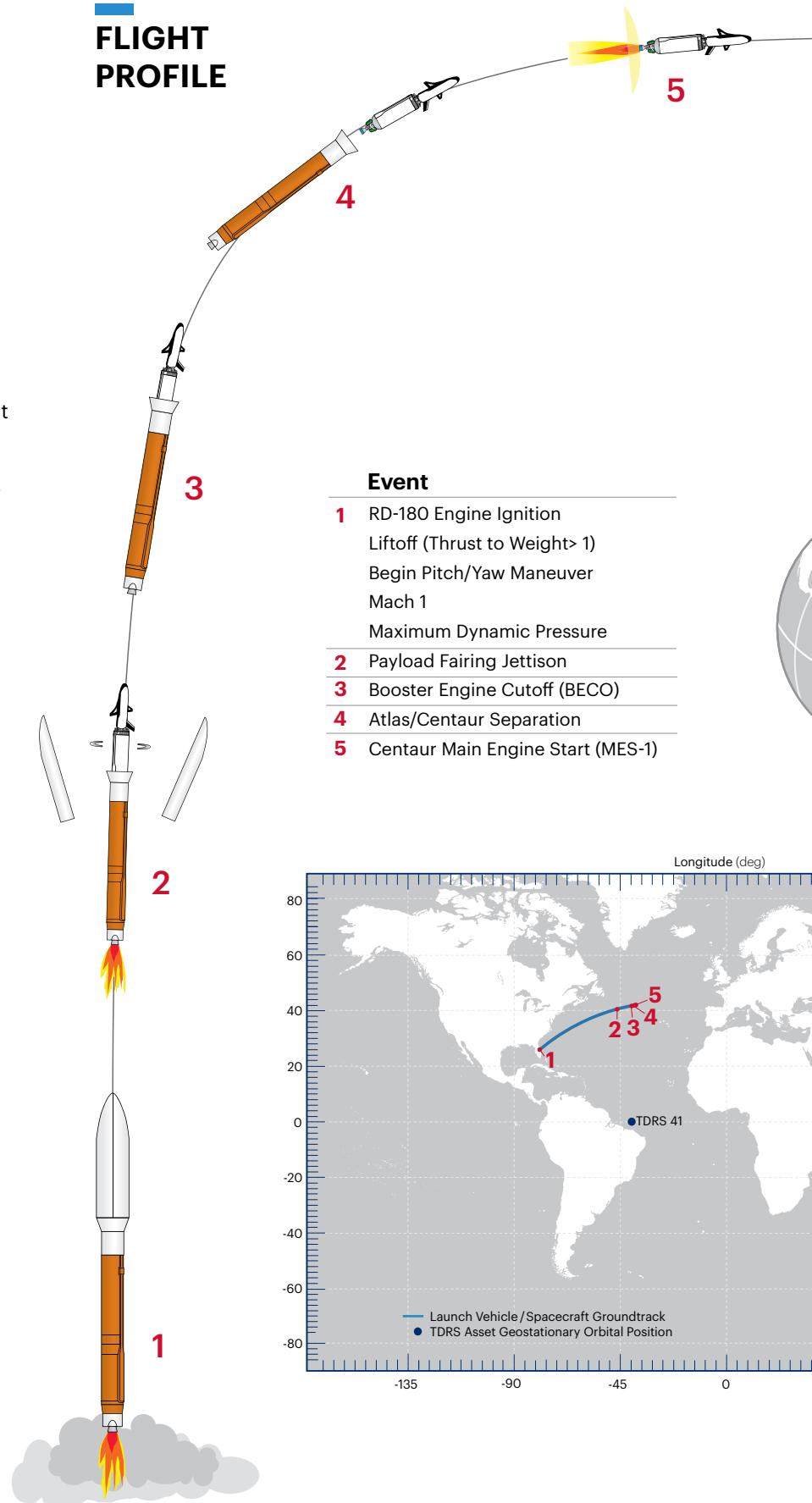
- 1 Denver, CO**
ULA Headquarters & Design
Center Engineering
- 2 Harlingen, TX**
Payload Adapter, Booster
Adapter & Centaur
Adapter Fabrication
- 3 Decatur, AL**
Booster Fabrication & Final
Assembly, Centaur Tank
Fabrication & Final Assembly
- 4 West Palm Beach, FL**
RL10C-1 Engine Fabrication at
Aerojet Rocketdyne
- 5 Khimki, Russia**
RD-180 Engine Fabrication at
NPO Energomash
- 6 Zurich, Switzerland**
5-m Payload Fairing
Fabrication at RUAG Space

SPACE LAUNCH COMPLEX-41 PROCESSING

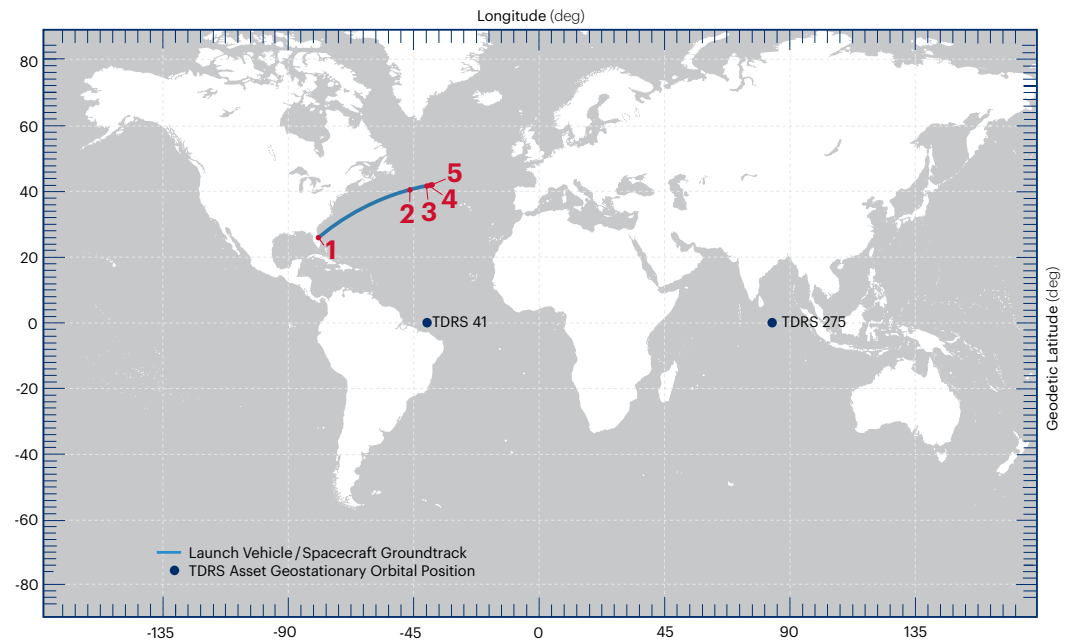
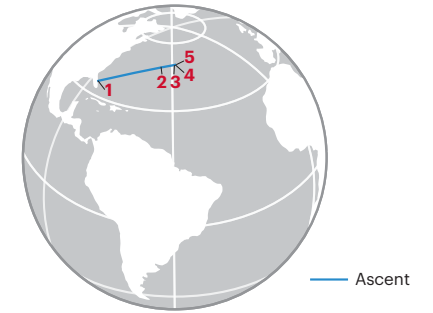


- 1 Atlas Spaceflight Operations Center (ASOC)**
Launch Control Center & Mission
Director's Center
- 2 Delta Operations Center**
Offline Vertical Integration (OVI):
Interstage Adapters, Centaur,
Boattail, Base Module and Centaur
Forward Load Reactor Deck
- 3 Spacecraft Processing Facility**
Spacecraft Processing, Testing
& Encapsulation
- 4 Vertical Integration Facility**
Launch Vehicle Integration &
Testing, Spacecraft Mate &
Integrated Operations

FLIGHT PROFILE



- | Event |
|---|
| 1 RD-180 Engine Ignition
Liftoff (Thrust to Weight > 1)
Begin Pitch/Yaw Maneuver
Mach 1
Maximum Dynamic Pressure |
| 2 Payload Fairing Jettison |
| 3 Booster Engine Cutoff (BECO) |
| 4 Atlas/Centaur Separation |
| 5 Centaur Main Engine Start (MES-1) |



All Values Approximate