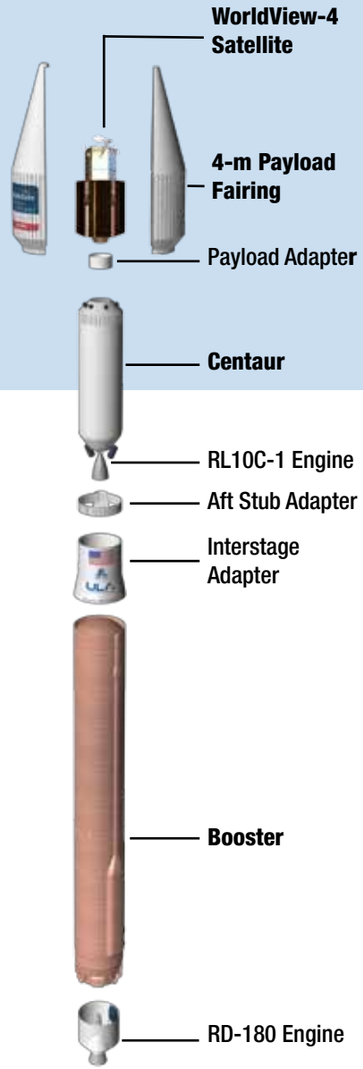
ATLAS V WORLDVIEW-4 MISSION

An Atlas V 401 rocket will deliver DigitalGlobe's WorldView-4 satellite to near sun-synchronous orbit. The United Launch Alliance (ULA) Atlas V rocket is provided to Lockheed Martin Commercial Launch Services. Liftoff will occur from Space Launch Complex-3 at Vandenberg Air Force Base, California.

WorldView-4, a multispectral, high-resolution commercial imaging satellite owned and operated by DigitalGlobe, will help customers around the world see more of our changing planet. The satellite was built by Lockheed Martin Space Systems Company and will provide 31-centimeter panchromatic resolution and 1.24-meter multispectral resolution—the same resolution offered by the WorldView-3 satellite, which launched on an Atlas V rocket in 2014. This industry-leading resolution provides the sharpest view of vital details on the ground, to give customers confidence when making critical decisions.

As the fifth satellite in the DigitalGlobe constellation, WorldView-4 joins WorldView-1, -2, -3, and GeoEye-1. The addition of WorldView-4 means the constellation can image a location on average of 4.5 times per day at 1-meter ground sample distance or less. WorldView-4 has a global capacity to image 680,000 square kilometers per day and will add to the DigitalGlobe image library, which spans 16 years and grows every day.

WorldView-4 also includes industry-leading geolocation accuracy, bi-directional scanning, rapid retargeting, daily revisits and simultaneous capture of high-resolution and multispectral imagery.



Payload Fairing (PLF)

The WorldView-4 spacecraft is encapsulated in the 4-m (14-ft) diameter large payload fairing (LPF). The LPF is a bisector (two-piece shell) fairing consisting of aluminum skin/ stringer construction with vertical split-line longerons. The vehicle's height with the PLF is approximately 194 ft.

Centaur

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

Booster

The Atlas V booster is 12.5 ft in diameter and 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. Atlas 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 860,200 lb of thrust at sea level. The Atlas V booster is controlled by the Centaur avionics system, which provides guidance, flight control, and vehicle sequencing functions during the booster and Centaur phases of flight.

ATLAS V 401

The Atlas V 401 rocket has become the workhorse of the Atlas V fleet, delivering half of all Atlas V missions to date. In its more than 14 years of service, the 401 has delivered 19 national security missions, eight science and exploration satellites, three commercial flights and two resupply missions to the International Space Station.

First Launch: Aug. 21, 2002
Launches to date: 32

Performance to GTO: 4,750 kg (10,470 lb)
Performance to LEO-Reference: 9,800 kg (21,600 lb)

ATLAS

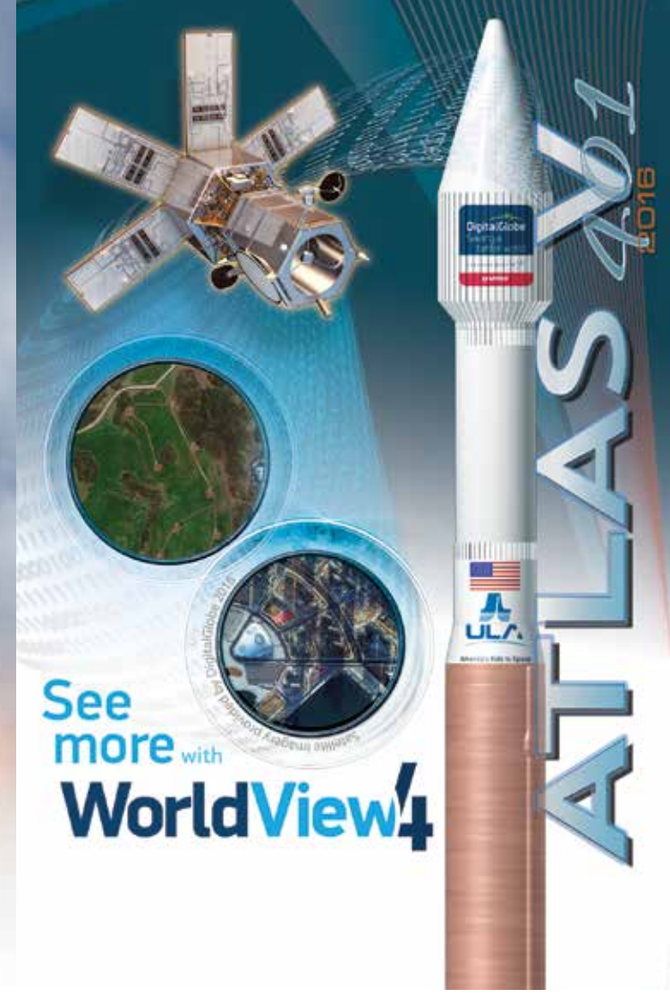
ULA™

America's Ride to Space

With more than a century of combined heritage, United Launch Alliance is the nation's most experienced and reliable launch service provider. ULA has successfully delivered more than 100 satellites to orbit that provide critical capabilities for troops in the field, aid meteorologists in tracking severe weather, enable personal device-based GPS navigation and unlock the mysteries of our solar system.

Join the conversation:

ULALaunch.com



MISSION OVERVIEW

– 66th Atlas V Launch

– 112th ULA Launch

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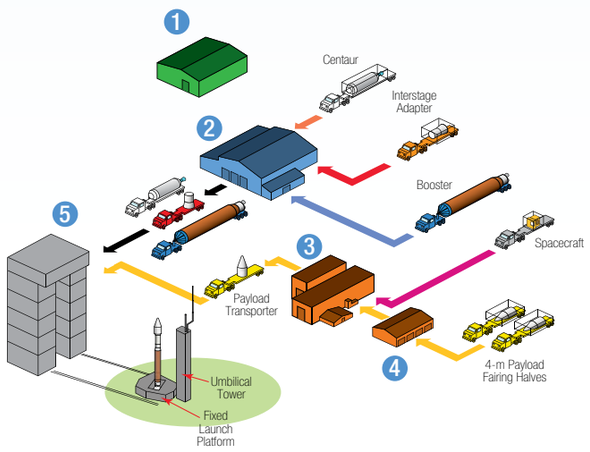
America's Ride to Space

LOCKHEED MARTIN

ATLAS V PRODUCTION AND LAUNCH

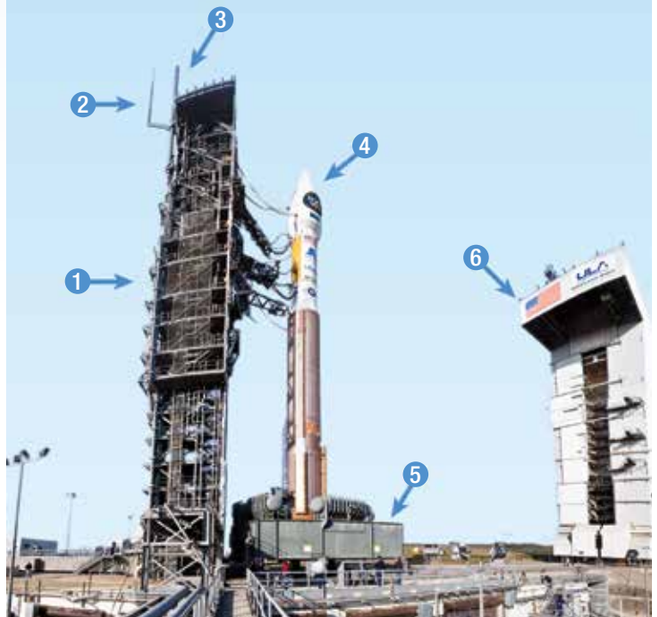
1. **Denver, CO**
   – ULA Headquarters & Design Center Engineering
2. **Harlingen, TX**
   – Payload Fairing, Boattail, Centaur Forward Adapter, Aft Stub Adapter & Launch Vehicle Adapter Fabrication
3. **Decatur, AL**
   – Booster Fabrication & Final Assembly, Centaur Tank Fabrication & Centaur Final Assembly
4. **West Palm Beach, FL**
   – RL10C Engine Fabrication at Aerojet Rocketdyne
5. **Khimki, Russia**
   – RD-180 Engine Fabrication at NPO Energomash

1. **Building 8510** | Launch Control Center and Mission Director's Center
2. **Building 7525** | Receiving, inspection
3. **Payload Processing Facility** | Spacecraft processing, testing and encapsulation
4. **Building 8337/7525** | Payload fairing/adapter receiving and inspection
5. **Mobile Service Tower** | Launch vehicle integration and testing, spacecraft mate and integrated operations

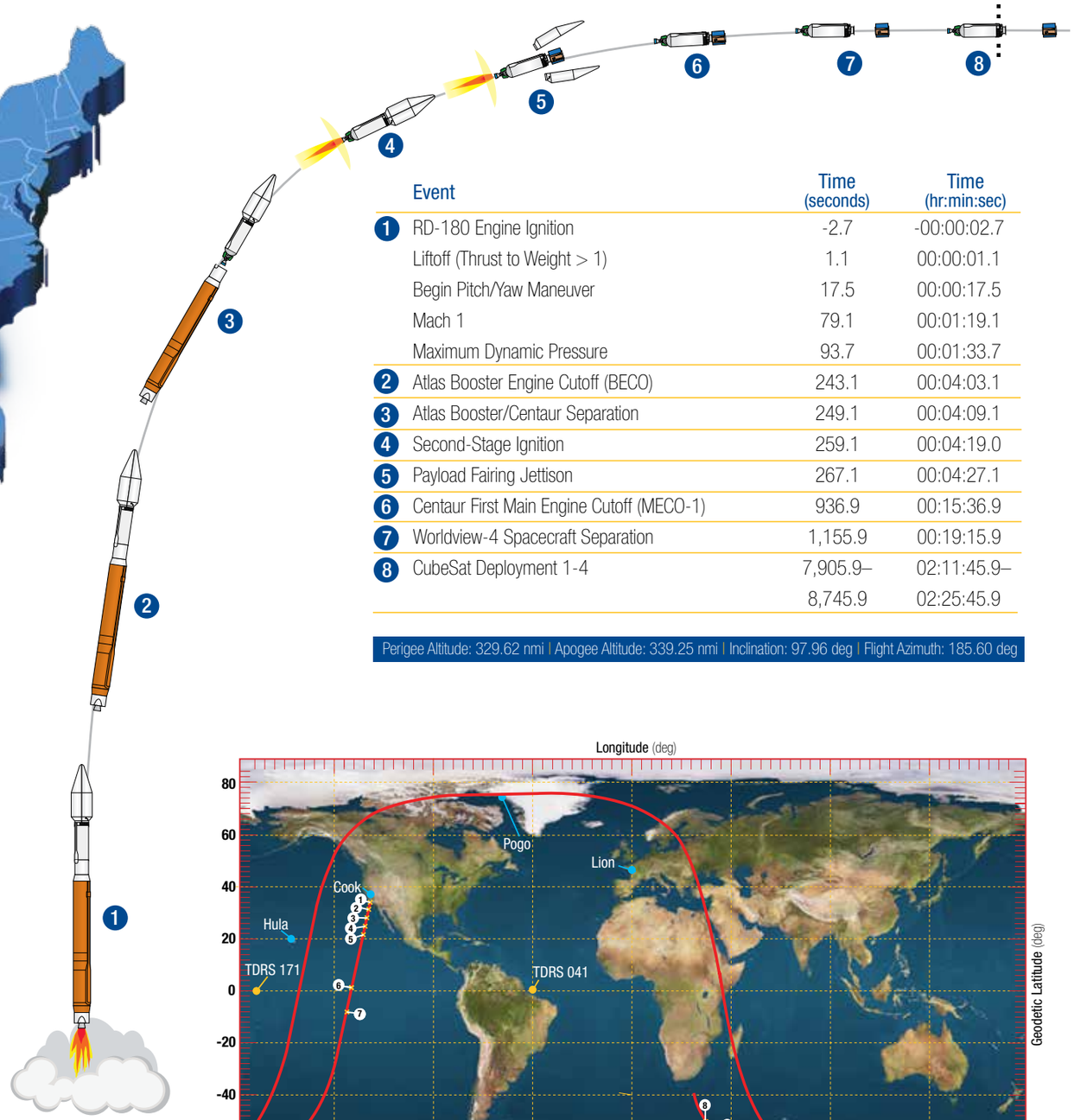


Space Launch Complex-3

1. Umbilical Tower
2. Lightning Mast
3. Hydrogen Vent Stack
4. Launch Vehicle
5. Launch Platform
6. Mobile Service Tower (MST)

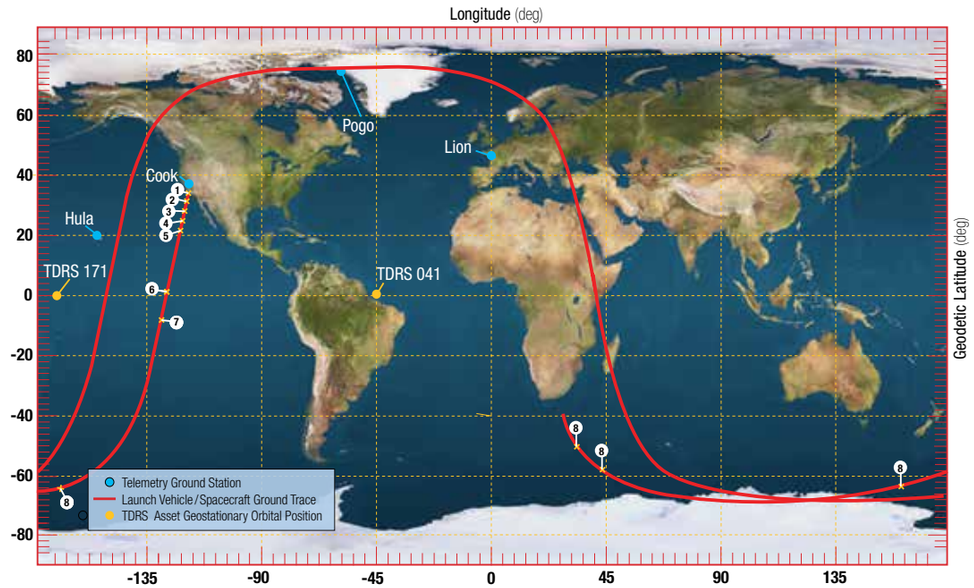


MISSION PROFILE AND GROUND TRACE



	Event	Time (seconds)	Time (hr:min:sec)
1	RD-180 Engine Ignition	-2.7	-00:00:02.7
	Liftoff (Thrust to Weight > 1)	1.1	00:00:01.1
	Begin Pitch/Yaw Maneuver	17.5	00:00:17.5
	Mach 1	79.1	00:01:19.1
	Maximum Dynamic Pressure	93.7	00:01:33.7
2	Atlas Booster Engine Cutoff (BECO)	243.1	00:04:03.1
3	Atlas Booster/Centaur Separation	249.1	00:04:09.1
4	Second-Stage Ignition	259.1	00:04:19.0
5	Payload Fairing Jettison	267.1	00:04:27.1
6	Centaur First Main Engine Cutoff (MECO-1)	936.9	00:15:36.9
7	Worldview-4 Spacecraft Separation	1,155.9	00:19:15.9
8	CubeSat Deployment 1-4	7,905.9–8,745.9	02:11:45.9–02:25:45.9

Perigee Altitude: 329.62 nmi | Apogee Altitude: 339.25 nmi | Inclination: 97.96 deg | Flight Azimuth: 185.60 deg



All Values Approximate