MISSION

A United Launch Alliance (ULA) Delta II 7920-10 rocket will deliver the Joint Polar Satellite System-1 (JPSS-1) spacecraft to a 444-nmi (822-km) near-circular polar orbit. Liftoff will occur from Space Launch Complex-2 at Vandenberg Air Force Base, California.

The National Oceanic and Atmospheric Administration's (NOAA) JPSS program provides the nation's next generation polar-orbiting operational environmental satellite system. JPSS provides continuity of critical Earth and environmental observations of our vast atmosphere, oceans, land and cryosphere. JPSS delivers key observations for the nation's essential products and services, including forecasting severe weather in advance and assessing environmental hazards.


Image Ball Aerospace & Technologies Corp.

The JPSS mission is a collaborative program between NOAA and NASA. The JPSS-1 mission is implemented by NASA's Goddard Space Flight Center (GSFC). Ball Aerospace & Technologies Corporation (BATC) built the spacecraft. NASA's Launch Services Program at Kennedy Space Center in Florida is responsible for launch management.

In addition to JPSS-1, this mission includes five CubeSats which will launch from dispensers mounted to the Delta II second stage. The CubeSats were designed and built by Northwest Nazarene University, the Massachusetts Institute of Technology, the University of New South Wales, the Australian National University, Embry-Riddle Aeronautical University and Vanderbilt University. The miniaturized satellites will conduct research in 3D-printed polymers for in-space manufacturing, weather data collection, bit flip memory testing, radar calibration and the effects of space radiation on electronic components.

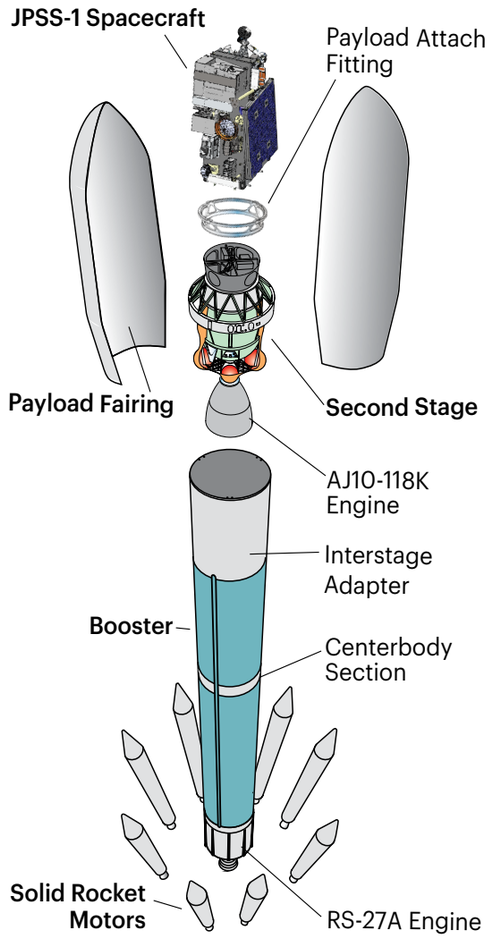
LAUNCH VEHICLE

Payload Fairing (PLF)
The PLF is a composite bisector (two-piece shell) 10-ft diameter fairing. The PLF encapsulates the spacecraft to protect it from the launch environment on ascent. The vehicle's height with the 10-ft PLF is approximately 132 ft.

Second Stage
The second stage propellant tanks are constructed of corrosion-resistant stainless steel. The Delta II second stage is a hypergolic-(Aerozine 50 and Nitrogen Tetroxide) fueled vehicle. It uses a single AJ10-118K engine producing 9,850 lb of thrust. The second stage's guidance section provides the structural support for the second–stage propellant tanks, the PLF, mountings for vehicle electronics and the structural and electronic interfaces with the spacecraft.

Booster
The Delta II booster is 8-ft in diameter and approximately 87-ft in length. The booster's fuel and oxidizer tanks are structurally rigid and constructed of stiffened isogrid aluminum barrels and spun-formed aluminum domes. The booster is completed by the centerbody, which joins the fuel and oxidizer tanks and the LO2 skirt. Propulsion is provided by the RS-27A engine which burns RP-1 (Rocket Propellant-1 or highly purified kerosene) and liquid oxygen, and delivers 200,000 lb thrust at sea level. The booster is controlled by the second-stage avionics system which provides guidance and flight control during flight.

Solid Rocket Motors (SRMs)
The Delta II 7920-10 launch vehicle uses nine SRMs, approximately 40 in. in diameter and 42-ft in length. The SRMs are constructed of a graphite-epoxy composite and are jettisoned by structural thrusters.



DELTA II

For nearly 30 years, the dependable Delta II rocket has been an industry workhorse, launching critical capabilities for customers around the world. From its origin as the launch vehicle for the first Global Positioning System (GPS) satellites to NASA's Earth observing, science and interplanetary satellites, including Mars rovers Spirit and Opportunity to vital commercial communication and imaging satellites, the Delta II rocket has truly earned in its place in space history.

First Launch: February 14, 1989
Launches to date: 153

MISSION SUCCESS

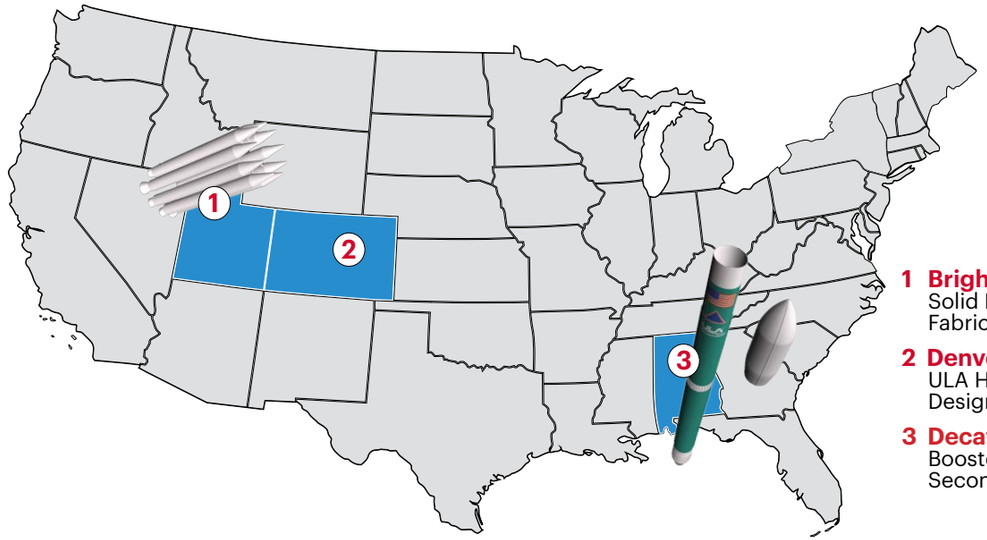
With more than a century of combined heritage, United Launch Alliance is the nation's most experienced and reliable launch service provider. ULA has successfully delivered more than 120 satellites to orbit that provide critical capabilities for troops in the field, aid meteorologists in tracking severe weather, enable personal device-based GPS navigation and unlock the mysteries of our solar system.

ulalaunch.com

MISSION OVERVIEW

ULA™

PRODUCTION

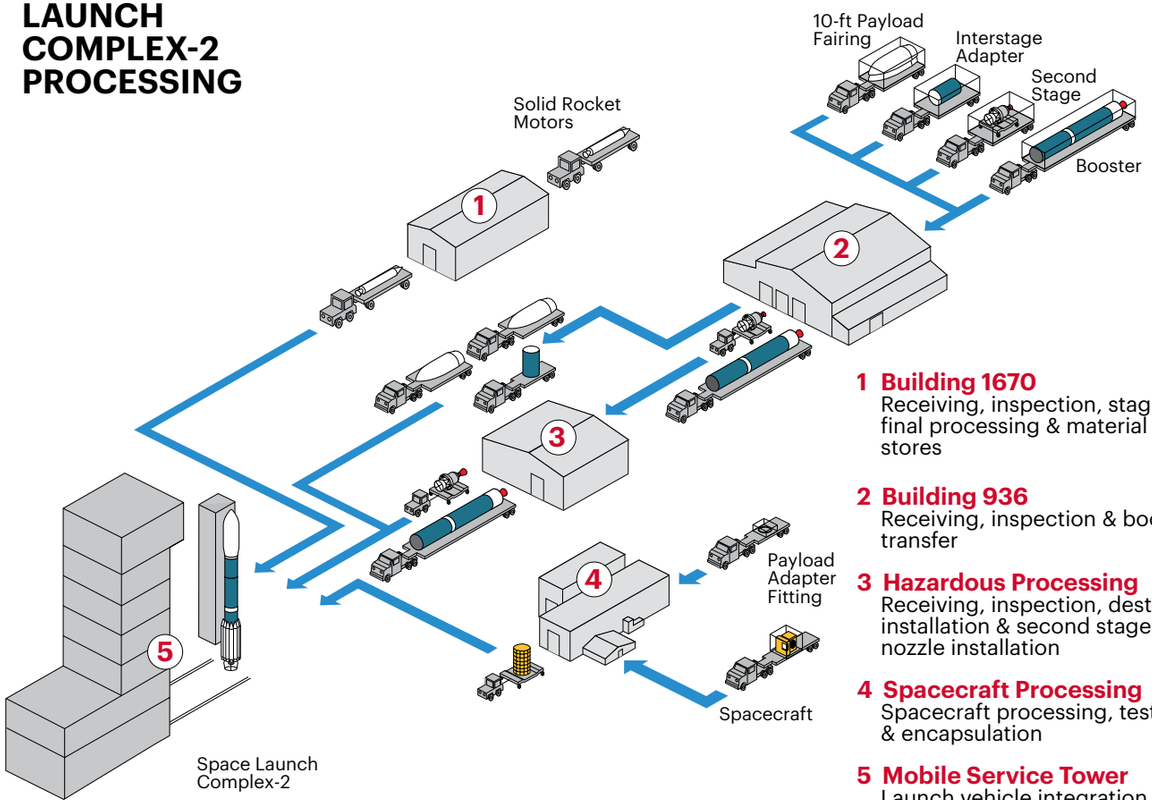


1 Brigham City, UT
Solid Rocket Motor Fabrication at Orbital ATK

2 Denver, CO
ULA Headquarters & Design Center Engineering

3 Decatur, AL
Booster, Payload Fairing & Second Stage Fabrication

SPACE LAUNCH COMPLEX-2 PROCESSING



1 Building 1670
Receiving, inspection, staging, final processing & material stores

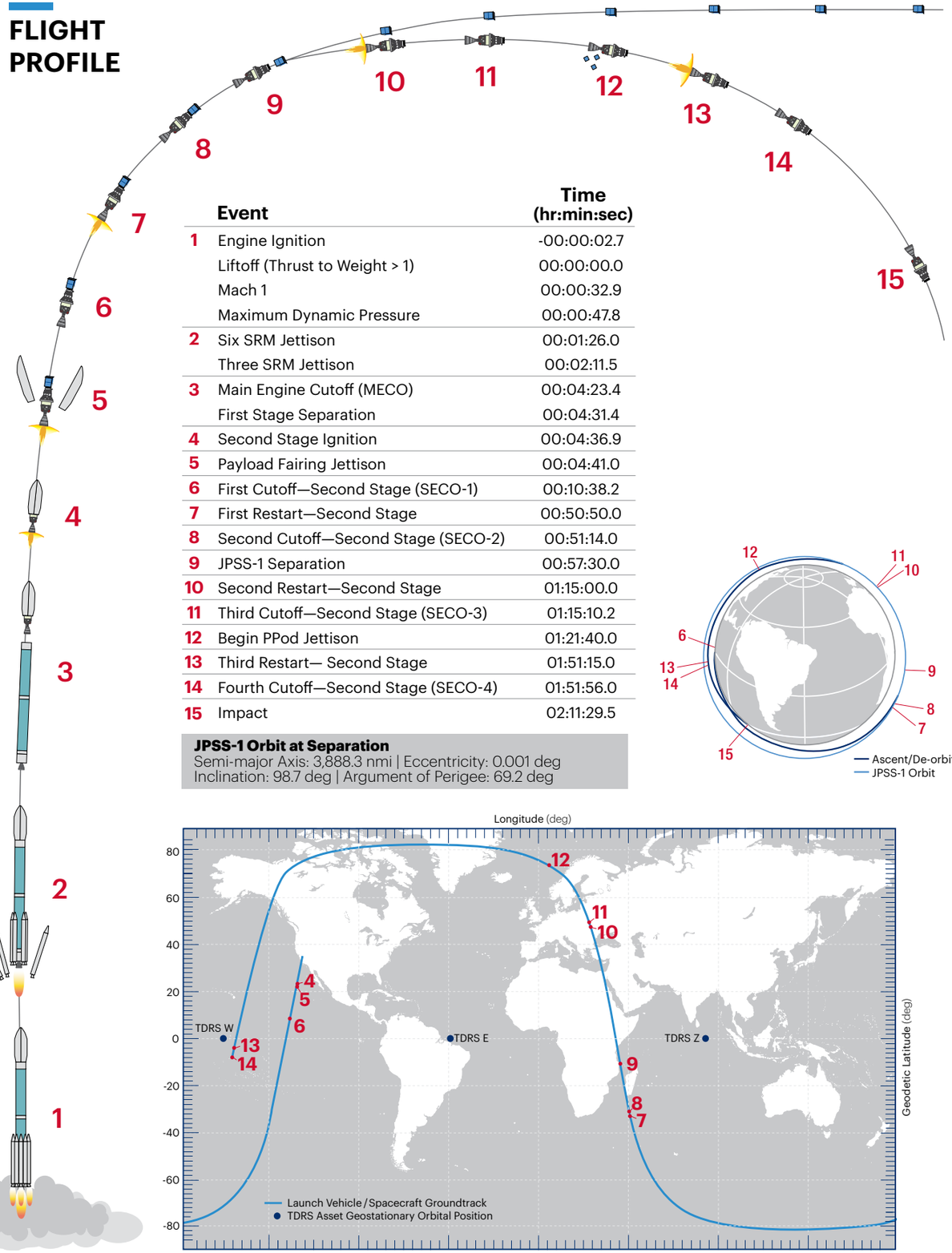
2 Building 936
Receiving, inspection & booster transfer

3 Hazardous Processing
Receiving, inspection, destruct installation & second stage nozzle installation

4 Spacecraft Processing
Spacecraft processing, testing & encapsulation

5 Mobile Service Tower
Launch vehicle integration & testing, spacecraft mate & integrated operations

FLIGHT PROFILE



	Event	Time (hr:min:sec)
1	Engine Ignition	-00:00:02.7
	Liftoff (Thrust to Weight > 1)	00:00:00.0
	Mach 1	00:00:32.9
	Maximum Dynamic Pressure	00:00:47.8
2	Six SRM Jettison	00:01:26.0
	Three SRM Jettison	00:02:11.5
3	Main Engine Cutoff (MECO)	00:04:23.4
	First Stage Separation	00:04:31.4
4	Second Stage Ignition	00:04:36.9
5	Payload Fairing Jettison	00:04:41.0
6	First Cutoff—Second Stage (SECO-1)	00:10:38.2
7	First Restart—Second Stage	00:50:50.0
8	Second Cutoff—Second Stage (SECO-2)	00:51:14.0
9	JPSS-1 Separation	00:57:30.0
10	Second Restart—Second Stage	01:15:00.0
11	Third Cutoff—Second Stage (SECO-3)	01:15:10.2
12	Begin PPod Jettison	01:21:40.0
13	Third Restart— Second Stage	01:51:15.0
14	Fourth Cutoff—Second Stage (SECO-4)	01:51:56.0
15	Impact	02:11:29.5

JPSS-1 Orbit at Separation
Semi-major Axis: 3,888.3 nmi | Eccentricity: 0.001 deg
Inclination: 98.7 deg | Argument of Perigee: 69.2 deg

All Values Approximate