

MISSION

United Launch Alliance (ULA) will launch an Atlas V 551 rocket to deliver the sixth Advanced Extremely High Frequency (AEHF) communications satellite for the U.S. Space Force Space and Missile Systems Center from Space Launch Complex-41 at Cape Canaveral Air Force Station, Florida.

The AEHF system, developed by Lockheed Martin, provides vastly improved global, survivable, protected communications capabilities for strategic command and tactical warfighters. This jam-resistant system also serves international partners including Canada, the Netherlands, the United Kingdom and Australia.



Image Courtesy of Lockheed Martin

LAUNCH VEHICLE

Payload Fairing (PLF)

The spacecraft 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 satellite. 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 101.9 kilo-Newtons (22,900 lbs) 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.

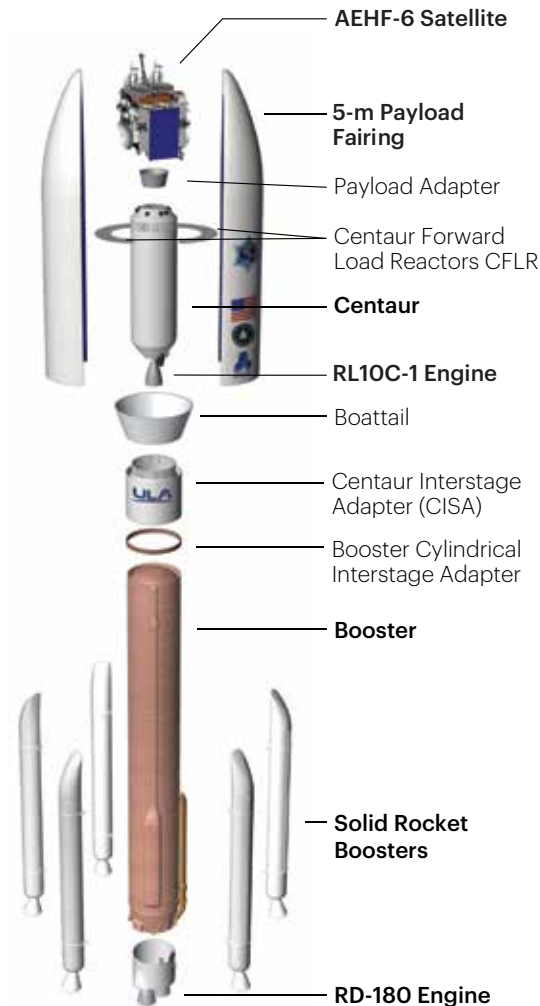
Booster

The booster is 3.8 m (12.5 ft) in diameter and 32.4 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 lbs) of thrust at sea level. Five solid rocket boosters (SRBs) generate the additional power required at liftoff, each providing 1.55 mega-Newtons (348,500 lbs) of thrust. The Centaur avionics system, provides guidance, flight control and vehicle sequencing functions during the booster and Centaur phases of flight.

AEHF-6 will be a protected communications relay to provide the highest levels of information protection to the nation's most critical users. The Lockheed Martin A2100 satellite gives senior leadership a survivable line of communications to military forces in all levels of conflict, including nuclear war. The system features encryption, low probability of intercept and detection, jammer resistance and the ability to penetrate the electro-magnetic interference caused by nuclear weapons to route communications to users on land, at sea or in the air.

The Atlas V 551 rocket will deliver AEHF-6 into an optimized, high-energy geosynchronous transfer orbit. ULA and the AEHF program produced this ascent profile to maximize mission flexibility over the satellite's lifetime.

Atlas V rockets successfully launched the first five AEHF satellites in 2010, 2012, 2013, 2018 and 2019. These satellites were placed in geosynchronous orbit 35,888 km (22,300 miles) above Earth to augment and eventually replace the legacy MILSTAR communications satellite fleet. One AEHF satellite has greater capacity than the entire five-satellite MILSTAR constellation.



ATLAS V



The Atlas V 551 rocket is the most powerful in the Atlas V fleet. In its more than 10 years of service, the 551 rocket has launched groundbreaking missions for our nation—from the critically important MUOS constellation to historic science missions including New Horizons, the first mission to Pluto, and the Juno mission to Jupiter.

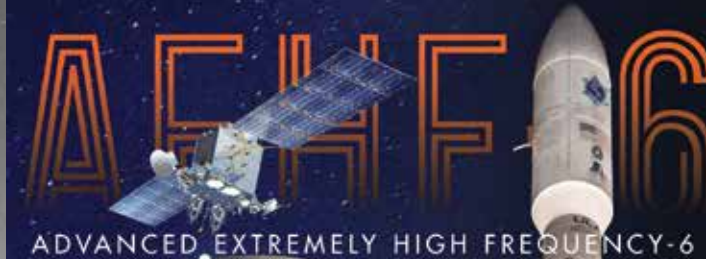
First Launch: Jan. 19, 2006
Launches to date: 10

Performance to GTO:
8,900 kg (19,620 lbs)
Performance to LEO-Reference:
18,850 kg (41,570 lbs)

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



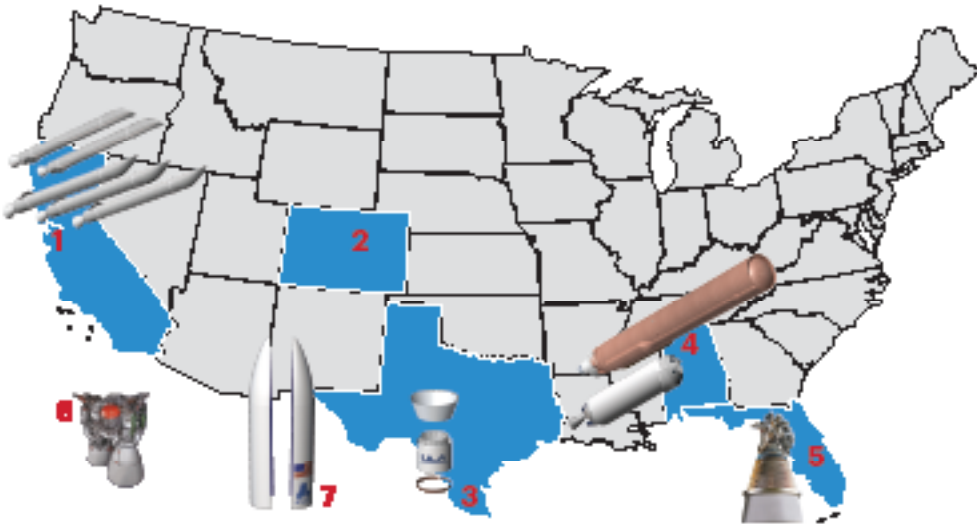
ADVANCED EXTREMELY HIGH FREQUENCY-6



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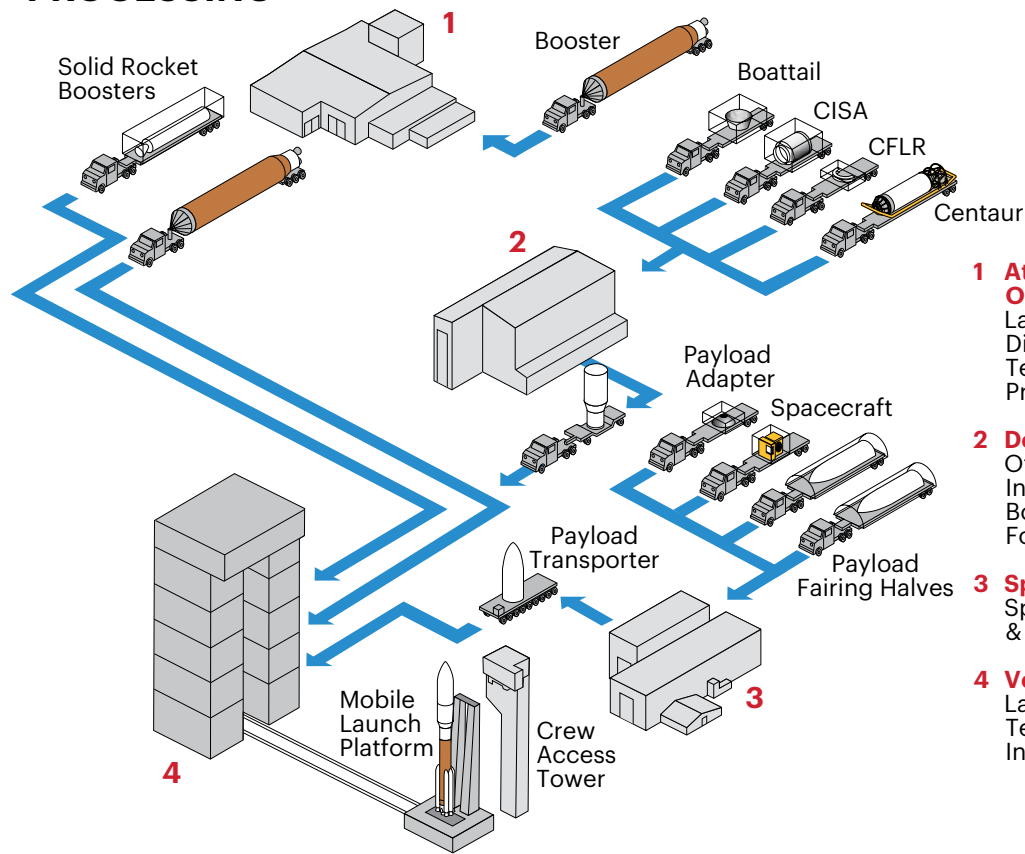
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PRODUCTION



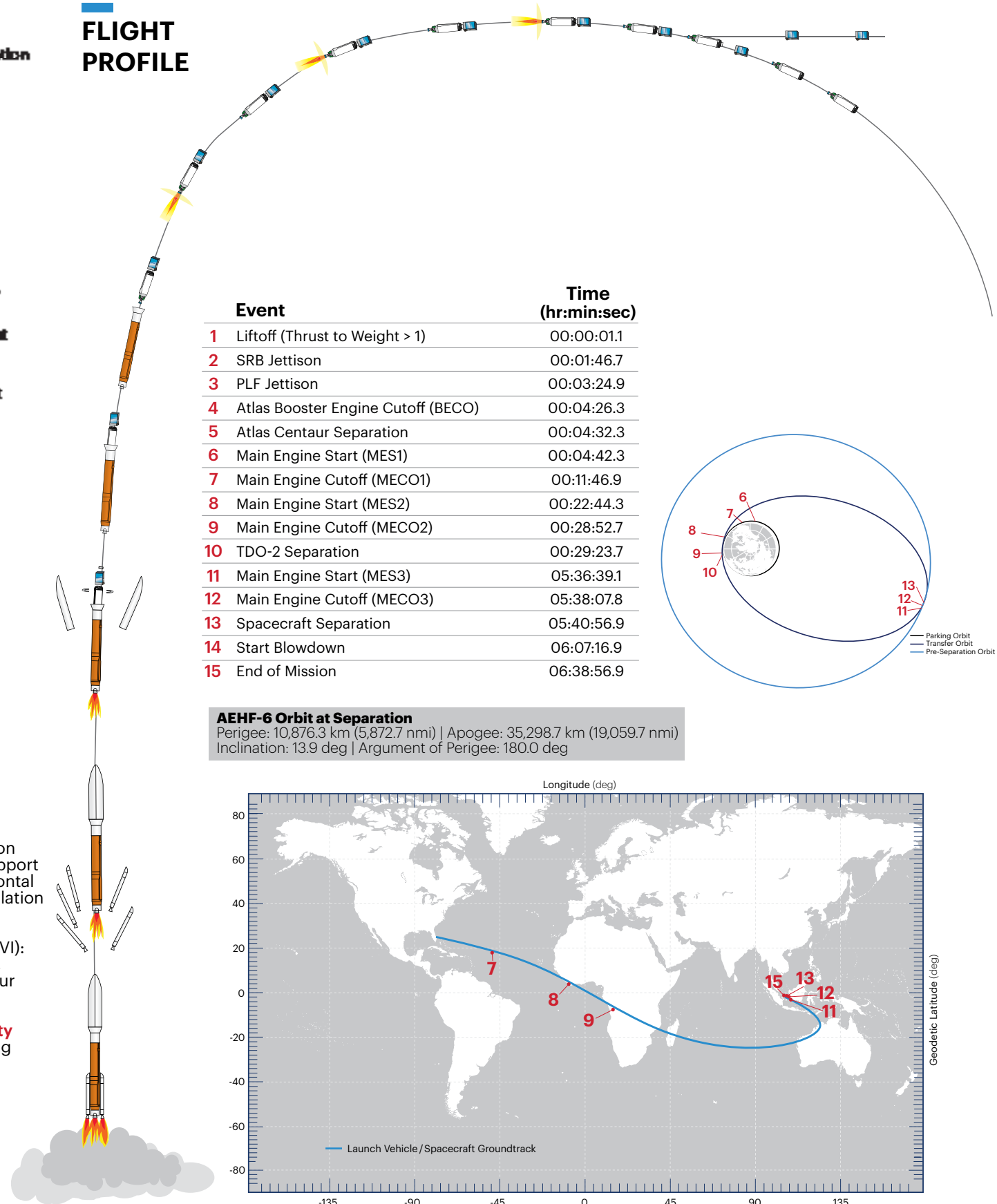
- 1 Sacramento, CA**
Solid Rocket Booster Fabrication at Aerojet Rocketdyne
- 2 Denver, CO**
ULA Headquarters & Design Center Engineering
- 3 Harlingen, TX**
Payload Adapter, Booster Adapter & Centaur Adapter Fabrication
- 4 Decatur, AL**
Booster Fabrication & Final Assembly, Centaur Tank Fabrication & Final Assembly
- 5 West Palm Beach, FL**
RL10C-1 Engine Fabrication at Aerojet Rocketdyne
- 6 Khimki, Russia**
RD-180 Engine Fabrication at NPO Energomash
- 7 Zurich, Switzerland**
6-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, Mission Support Teams, Launch Vehicle Horizontal Processing & Ordnance Installation
- 2 Delta Operations Center**
Offline Vertical Integration (OVI): Interstage Adapters, Centaur, Boattail, Base Module & 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	Time (hr:min:sec)
1 Liftoff (Thrust to Weight > 1)	00:00:01.1
2 SRB Jettison	00:01:46.7
3 PLF Jettison	00:03:24.9
4 Atlas Booster Engine Cutoff (BECO)	00:04:26.3
5 Atlas Centaur Separation	00:04:32.3
6 Main Engine Start (MES1)	00:04:42.3
7 Main Engine Cutoff (MECO1)	00:11:46.9
8 Main Engine Start (MES2)	00:22:44.3
9 Main Engine Cutoff (MECO2)	00:28:52.7
10 TDO-2 Separation	00:29:23.7
11 Main Engine Start (MES3)	05:36:39.1
12 Main Engine Cutoff (MECO3)	05:38:07.8
13 Spacecraft Separation	05:40:56.9
14 Start Blowdown	06:07:16.9
15 End of Mission	06:38:56.9

AEHF-6 Orbit at Separation
 Perigee: 10,876.3 km (5,872.7 nmi) | Apogee: 35,298.7 km (19,059.7 nmi)
 Inclination: 13.9 deg | Argument of Perigee: 180.0 deg

