

MISSION

A United Launch Alliance (ULA) Atlas V 421 rocket will launch the Space Based Infrared System Geosynchronous Earth Orbit (SBIRS GEO) Flight 5 mission for the U.S. Space Force's Space and Missile Systems Center (SMC). Liftoff will occur from Space Launch Complex-41 at Cape Canaveral Space Force Station, Florida. Following liftoff, the Atlas V rocket will deliver the fifth SBIRS satellite to a geosynchronous transfer orbit. The mission also includes two multi-manifest satellite vehicles.

SBIRS GEO-5 consists of a network of GEO satellites and HEO payloads that provide persistent, infrared surveillance – as well as a sophisticated ground



Image Lockheed Martin

control system that manages that data – to support missile warning, missile defense, battlespace awareness and technical intelligence. Equipped with scanning and staring infrared sensors, the SBIRS spacecraft continue to serve as the tip of the spear for global missile warning as ballistic missile threats proliferate around the world.

SBIRS GEO-5, the fifth SBIRS spacecraft built by Lockheed Martin, but the first military space satellite built on the company's modernized LM 2100 Combat Bus™ – an enhanced space vehicle that provides even greater resiliency and cyber-hardening against growing threats, as well as improved spacecraft power, propulsion and electronics.

SMC's Multi Manifest Office, in partnership with the United States Air Force Academy, will be flying the EZ-3 and -4 flight systems on the SBIRS GEO-5 mission. This multi-manifest mission will support the deployment of two 12U Multi-Manifest Satellite Vehicles, TDO-3 and -4, prior to the deployment of the SBIRS GEO-5 satellite. A multi-manifest mission set allows more capability to be placed on orbit, ultimately providing more critical capabilities to the warfighter.

LAUNCH VEHICLE

Payload Fairing (PLF)

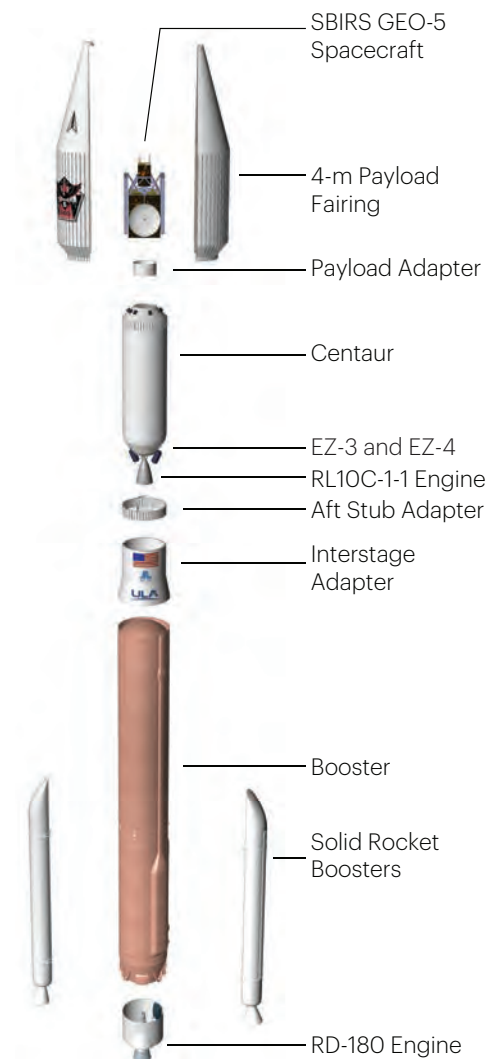
The SBIRS satellite is encapsulated in the 13.7-ft (4-m) diameter extra extended payload fairing (XEPF). The XEPF is a bisector (two-piece shell) fairing consisting of aluminum skin/stringer construction with vertical split-line longerons. The vehicle's height with the XEPF is approximately 194 ft (59.1 m).

Centaur

The Centaur second stage is 10 ft (3 m) in diameter and 41.5 ft (12.6 m) long. 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-1-1 engine producing 23,825 lb (106 kilo-Newtons) 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 electronic interfaces with the spacecraft.

Booster

The Atlas V booster is 12.5 ft (3.81 m) in diameter and 106.5 ft (32.5 m) long. The booster's tanks are structurally stable 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 (3.83 mega-Newtons) of thrust at sea level. Two solid rocket boosters (SRBs) generate the additional power required at liftoff, each providing 348,500 lb (158,076 kg) of thrust. 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



The Atlas V 421 rocket, a unique configuration that includes two solid rocket boosters, provides the optimum performance to precisely deliver a range of mission types. In its nearly 15 years of service, this configuration has been used to launch national security, science and commercial missions.

First Launch: Oct. 10, 2007
Launches to date: 7

Performance to GTO:
15,180 lb (6,890 kg)

Performance to LEO-Reference:
29,980 lb (13,600 kg)

MISSION SUCCESS

With more than a century of combined heritage, ULA is the nation's most experienced and reliable launch service provider. ULA has successfully delivered more than 140 missions to orbit that aid meteorologists in tracking severe weather, unlock the mysteries of our solar system, provide critical capabilities for troops in the field, deliver cutting-edge commercial services and enable GPS navigation.

MISSION OVERVIEW



ATLAS V
SBIRS
GEO FLIGHT 5

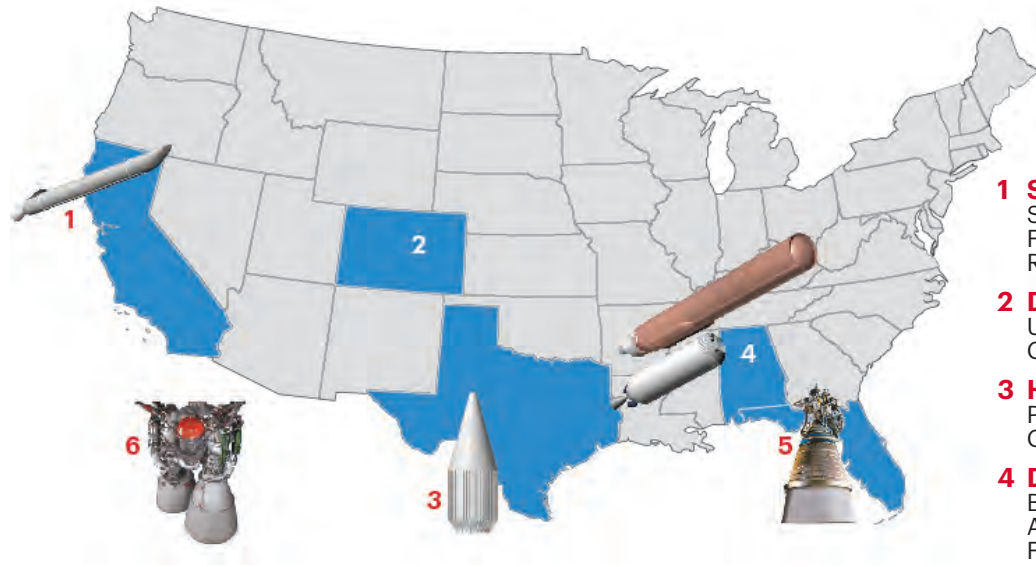


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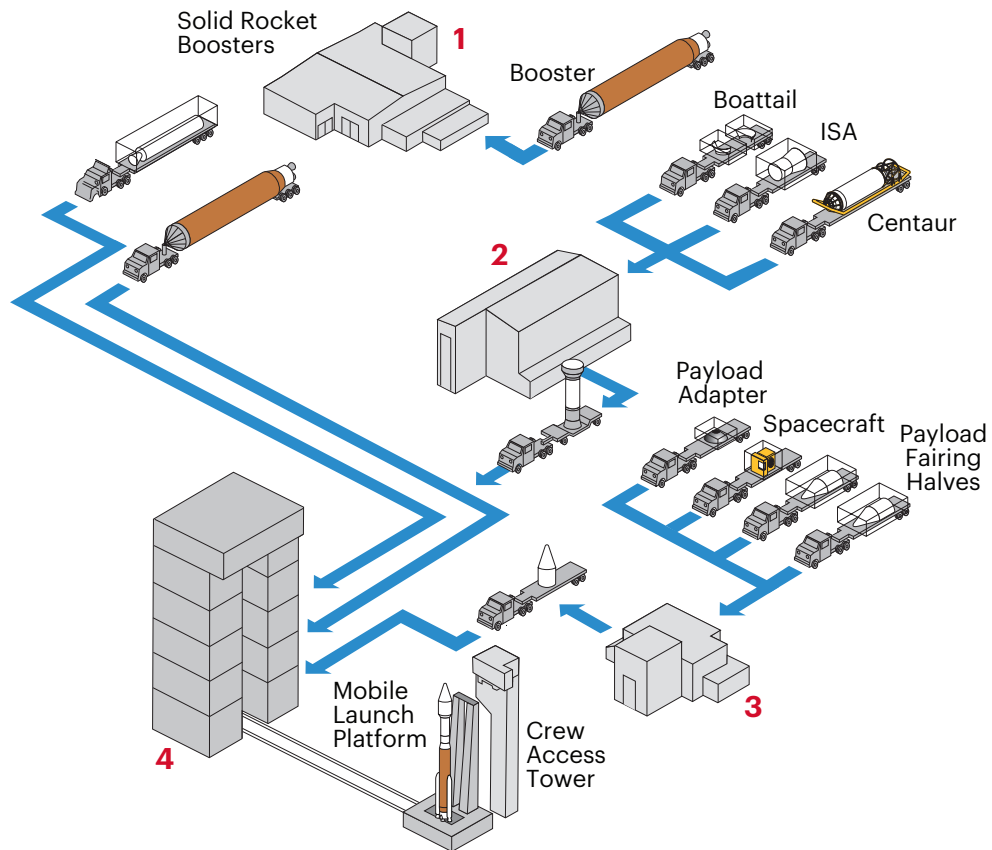


PRODUCTION



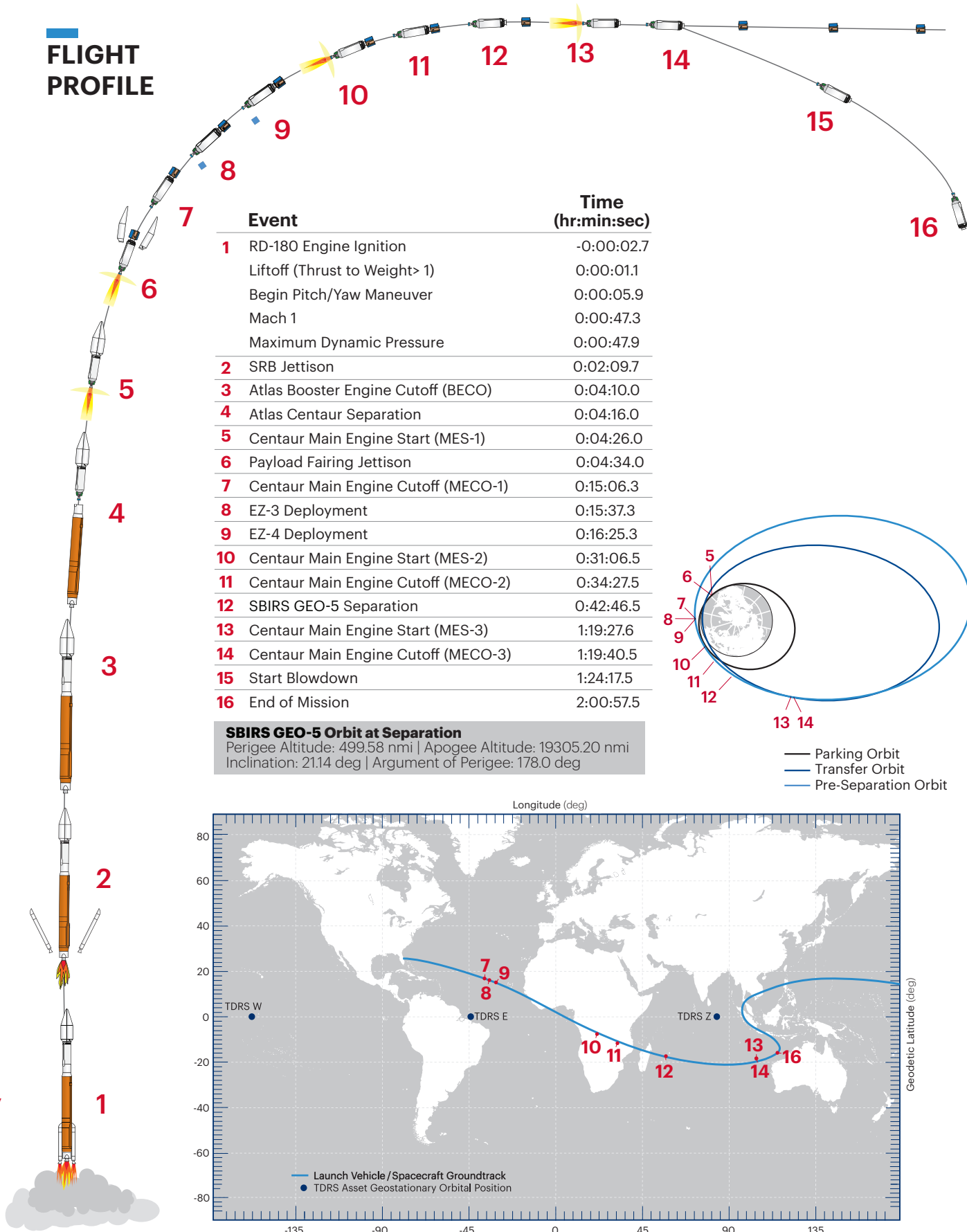
- 1 Sacramento, CA**
Solid Rocket Booster
Fabrication at Aerojet
Rocketdyne
- 2 Denver, CO**
ULA Headquarters & Design
Center Engineering
- 3 Harlingen, TX**
Payload Fairing, Adapter &
Centaur Fabrication
- 4 Decatur, AL**
Booster Fabrication & Final
Assembly Centaur
Final Assembly
- 5 West Palm Beach,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

SPACE LAUNCH COMPLEX-41 PROCESSING

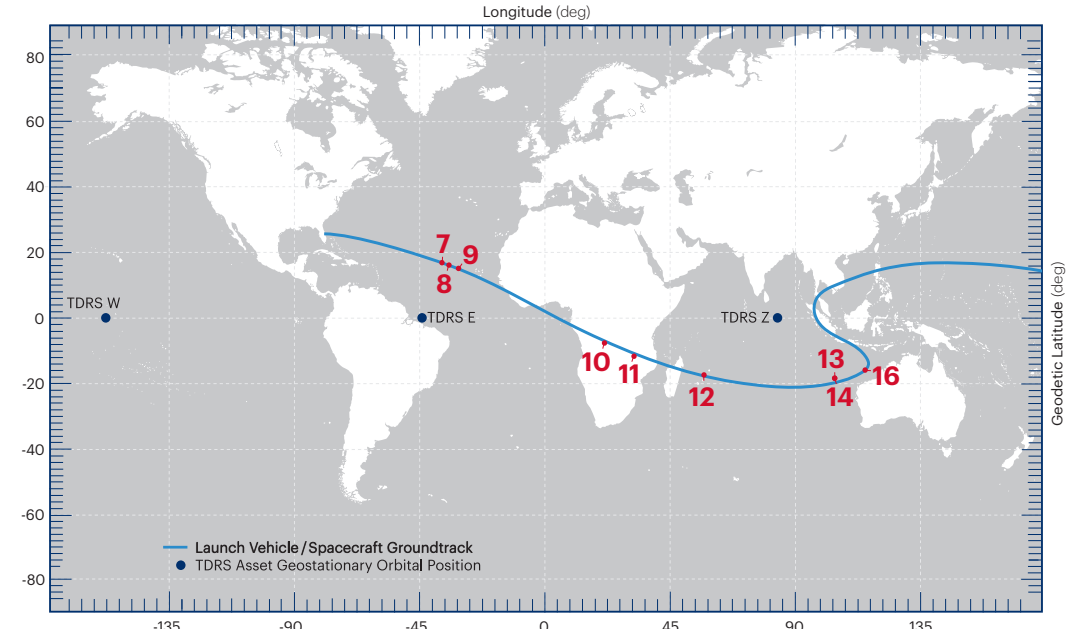
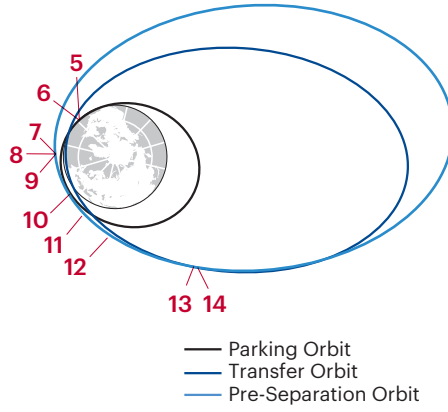


- 1 Atlas Spaceflight Operations Center (ASOC)**
Launch Control Center &
Mission Director's Center
- 2 Delta Operations Center**
ISA, Centaur, Boattail & Vertical
Integration
- 3 Spacecraft Processing Facility**
Spacecraft Processing, Testing
& Encapsulation
- 4 Vertical Integration Facility**
Launch Vehicle Integration &
Testing, Spacecraft Mate &
Integrated Operations

FLIGHT PROFILE



SBIRS GEO-5 Orbit at Separation
 Perigee Altitude: 499.58 nmi | Apogee Altitude: 19305.20 nmi
 Inclination: 21.14 deg | Argument of Perigee: 178.0 deg



All Values Approximate