



Atlas V Launches PAN

United Launch Alliance is proud to be a part of the PAN mission for the Lockheed Martin Space Systems Company and its United States Government customer. The Atlas V rocket, designated AV-018, will launch from Space Launch Complex 41 (SLC-41) at Cape Canaveral Air Force Station (CCAFS) in Florida.

My thanks to the entire Atlas team for their dedication in bringing PAN to launch and to Lockheed Martin for selecting Atlas for this important mission.

Go Atlas! Go Centaur! Go PAN!

Mark Wilkins

Mark F. Wilkins
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Mission Overview

The PAN mission will launch from SLC-41 at CCAFS on an Atlas V launch vehicle flying in the 401 configuration. The 401 configuration consists of a common core booster first stage powered by an RD-180 main engine and a single-engine Centaur upper stage. The payload is encapsulated in a 4-meter diameter large payload fairing and is integrated to the Centaur upper stage using a ULA-supplied payload adapter and separation system.

Launch begins with RD-180 engine ignition at approximately 2.7 seconds before liftoff. Shortly after liftoff, the Atlas V begins its pitch, yaw, and roll program to maintain the proper ascent profile and minimize aerodynamic loads. At 79 seconds into the flight, the launch vehicle reaches Mach 1 and is now traveling at the speed of sound. Maximum dynamic pressure occurs at 91 seconds into the flight at an altitude of approximately 41,000 feet. Approaching booster engine cutoff at approximately 4 minutes into flight, the Atlas V is burning propellant at a rate of more than 1,500 pounds per second, more than 69 statute miles in altitude, 170 statute miles down range, and traveling at a speed of more than 10,000 miles per hour. Centaur separation occurs 6 seconds after booster engine cutoff followed by the first of two Centaur main engine firings and payload fairing jettison. Following first main engine cutoff, Centaur and the PAN spacecraft enter an extended coast phase. At 1 hour 55 minutes, Centaur's main engine is re-ignited for a second and final burn. Following the second Centaur main engine cutoff, Centaur and PAN enter a short coast period in preparation for spacecraft separation. Spacecraft separation occurs at just under 2 hours into the mission.



Mission Events

Event	HR:MIN:SEC
1 Liftoff	00:00:01
1 Start Vehicle Pitch, Yaw, and Roll Maneuver	00:00:17
2 Booster Engine Cutoff (BECO)	00:04:03
2 (Booster) Atlas/Centaur Separation	00:04:09
3 Centaur First Main Engine Start (MES1)	00:04:19
4 Payload Fairing Jettison	00:04:27
5 Centaur First Main Engine Cutoff (MEC01)	00:17:27
5 Start Turn to Park Orbit Coast Attitude	00:17:35
5 Start Turn to MES2 Attitude	01:47:55
6 Centaur 2nd Main Engine Start (MES2)	01:55:10
7 Centaur 2nd Main Engine Cutoff (MEC02)	01:56:36
7 Turn to Spacecraft Separation Attitude	01:56:38
8 Spacecraft Separation	01:59:25

All times are approximate.