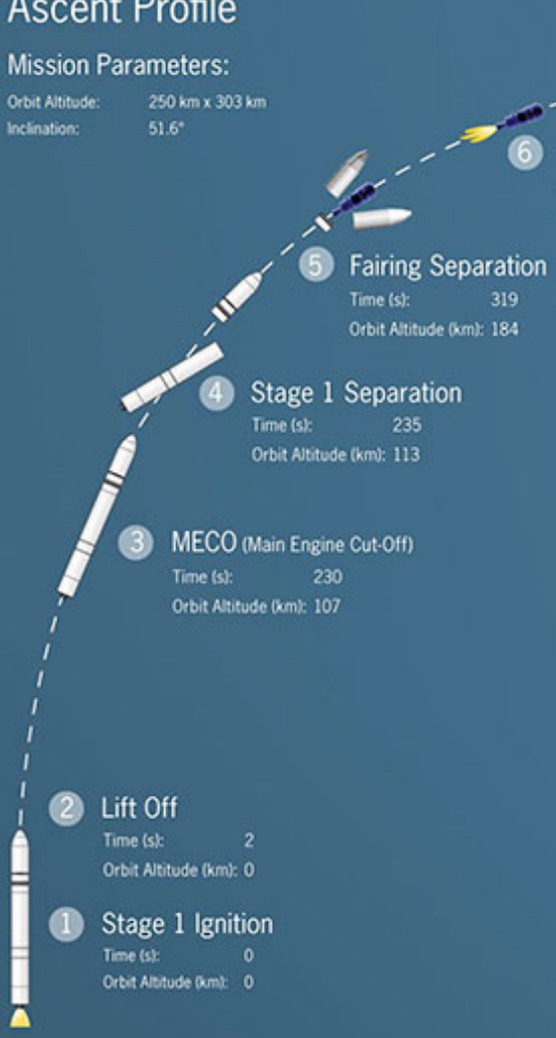
Antares A-ONE Test Launch Mission

The Antares A-ONE test launch mission will validate the Antares medium-class launch system. Originating from Orbital's new Wallops Island, Virginia launch facility, the mission will boost a simulated payload to a target orbit of 250 km x 300 km with an inclination of 51.6 degrees. The goal of the A-ONE mission is to demonstrate the operational Antares launch system from roll-out of the rocket from its integration facility, through emplacement on the pad and fueling, to launch and delivery of the payload into orbit. The test launch will be the final development operation leading to Orbital's demonstration of cargo delivery to the International Space Station (ISS) under the NASA Commercial Orbital Transportation System (COTS) agreement. Following the successful completion of the COTS mission, Orbital is slated to deliver up to 20,000 kg of supplies to the ISS under the Commercial Resupply Services (CRS) contract with NASA. The demonstration mission represents the culmination of Orbital's largest product development in the company's 30-year history.

Ascent Profile

Mission Parameters:

Orbit Altitude: 250 km x 303 km
Inclination: 51.6°



8 Payload Separation
Time (s): 603
Orbit Altitude (km): 255

7 Stage 2 Burnout
Time (s): 483
Orbit Altitude (km): 256

6 Stage 2 Ignition
Time (s): 328
Orbit Altitude (km): 189

5 Fairing Separation
Time (s): 319
Orbit Altitude (km): 184

4 Stage 1 Separation
Time (s): 235
Orbit Altitude (km): 113

3 MECO (Main Engine Cut-Off)
Time (s): 230
Orbit Altitude (km): 107

2 Lift Off
Time (s): 2
Orbit Altitude (km): 0

1 Stage 1 Ignition
Time (s): 0
Orbit Altitude (km): 0

Mission Description

The Antares space launch vehicle, utilizing a liquid-fueled first stage powered by two AJ26 engines and a solid motor CASTOR 30 upper stage will lift off from Pad 0A at Wallops Island, Virginia. After lift off, the first stage will fire for approximately four minutes, propelling the launch vehicle to an altitude of approximately 113 kilometers, before separating from the rocket. The "upper stack" (Stage 2, the payload fairing and the payload) will continue on an unpowered trajectory for 93 seconds, during which the payload fairing will separate from the vehicle, before ignition of the second stage. The second stage will burn for a little more than two minutes before burning out at an orbit altitude of approximately 256 kilometers. A little less than ten minutes from lift off, the simulated Cygnus payload will be separated from the launch vehicle at its target orbit.

Launch Facilities at Wallops Island, Virginia

The Antares launch system utilizes a number of assets located at the NASA Wallops Flight Facility. Antares is integrated and tested in the Horizontal Integration Facility (HIF) developed in association with NASA, located approximately one mile north of the Antares launch pad. Orbital developed Pad 0A in association with the Mid-Atlantic Regional Spaceport (MARS) and the Virginia Department of Transportation as the primary Antares launch site for mid-inclination missions.

Antares A-ONE Vehicle Configuration

Payload Fairing

Diameter:	3.9 meters
Height:	9.9 meters
Structure:	Honeycomb core, composite face
Separation:	Non-contaminating frangible ring

Stage 2

Designation:	CASTOR 30
Diameter:	2.36 meters
Thrust:	293.4kN (Avg) 395.7kN (Max)
Attitude Control:	Electromechanical TVC
Separation:	Non-contaminating frangible ring

Cygnus
Mass Simulator

Stage 1

Tank Structure:	Aluminum
Propulsion:	Dual AJ26-62
Propellant:	LOX/RP
Thrust:	3,265kN (S.L.) 3,630kN (Vac)
Pressurization:	Helium gas
Attitude Control:	Hydraulic TVC
Separation:	Hold down bolt release

Cygnus™ and International Space Station Resupply

In addition to the Antares rocket, Orbital has developed the Cygnus advanced maneuvering spacecraft to deliver cargo to the International Space Station (ISS). Incorporating technologies from Orbital's flight-proven LEOStar™ and GEOStar™ spacecraft, the Cygnus spacecraft consists of a Service Module (SM), housing the propulsion, power and navigation systems, and a Pressurized Cargo Module (PCM) that will contain the supplies for the ISS. The SM is assembled and tested at Orbital's Dulles, Virginia satellite manufacturing facility and the PCM is manufactured by Thales Alenia Space in Italy. The SM and PCM are mated and fueled at NASA facilities at Wallops Flight Facility and integrated with Antares rocket in the HIF. Orbital is currently scheduled to conduct eight pressurized cargo delivery missions starting in 2013 in addition to the COTS demonstration mission.

Orbital
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