NG-15 Mission

Delivering Cargo to the International Space Station

Launch Profile

9 Payload Separation
Time: 8 min 52 sec
Orbit Altitude: 178.1 km (110.6 mi.)

Stage Two Ignition
Time: 4 min 7 sec
Orbit Altitude: 118 km (73.3 mi.)

Interstage Separation
Time: 3 min 59 sec
Orbit Altitude: 114 km (70.8 mi.)

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8

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Stage Two Burnout/Orbit Insertion
Time: 6 min 52 sec
Orbit Altitude: 178.3 km (110.8 mi.)

5 Fairing Separation
Time: 3 min 54 sec
Orbit Altitude: 111 km (68.9 mi.)

4 Stage One Separation
Time: 3 min 24 sec
Orbit Altitude: 88.9 km (55.2 mi.)

3 Main Engine Cut-Off (MECO)
Time: 3 min 18 sec
Orbit Altitude: 83.9 km (52.1 mi.)

2 Lift Off
Time: 3.7 sec
Orbit Altitude: 0 km (0 mi.)

1 Stage One Ignition
Time: 0 sec
Orbit Altitude: 0 km (0 mi.)

*not drawn to scale

Mission Parameters

Launch Vehicle:
Antares 230+

Cargo Spacecraft:
Cygnus

Launch Site:
MARS Pad 0A,
Wallops Island, Virginia

Ascent Cargo Mass:
Up to 3,729 kg (8,200 lb.)

Descent Cargo Mass:
Up to 3,729 kg (8,200 lb.)

Initial Orbit Altitude:
171 km x 295 km

Inclination:
51.63°

Transit to Station:
Two Days

Duration at Station:
Up to 90 Days Berthed
Up to two weeks on orbit

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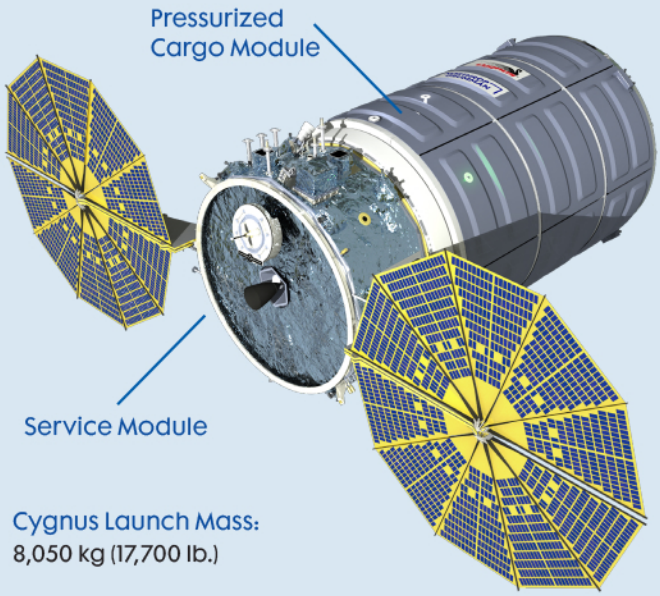
Mission Description

For the NG-15 mission, the Cygnus spacecraft will deliver approximately 3,729 kg. (8,200 lb.) of cargo to the space station. Cygnus is comprised of two primary components, the Pressurized Cargo Module and the Service Module. In keeping with company tradition, each spacecraft is named after an important figure in the aerospace industry. Northrop Grumman is honored to name the NG-15 Cygnus spacecraft after Katherine Johnson, a NASA mathematician who broke through barriers of gender and race, and whose work was critical in sending the first Americans into space. The S.S. Katherine Johnson will be launched into orbit using an Antares 230+ rocket from Virginia Space's Mid-Atlantic Regional Spaceport (MARS) Pad 0A on Wallops Island, Virginia. Northrop Grumman will once again load critical cargo into Cygnus 24 hours before the scheduled launch.

Upon arrival at the International Space Station, the cargo will be unloaded from Cygnus. The S.S. Katherine Johnson will deploy a number of CubeSats via Slingshot and Nanoracks deployers, including Dhabisat, the second CubeSat developed by Khalifa University in Abu Dhabi, United Arab Emirates. Dhabisat was developed as part of Khalifa's Space Systems and Technology Concentration, a joint program established in 2015 with UAE-based satellite operator Al Yah Satellite Communications Company (Yahsat) and Northrop Grumman. Launching aboard Antares with Cygnus will be 30 ThinSats as part of a STEM outreach program for grades 4-12 by the Virginia Commercial Space Flight Authority. Once its mission has been completed, Cygnus will perform a safe, destructive reentry into Earth's atmosphere over the Pacific Ocean.

Cygnus Spacecraft



Cygnus Launch Mass:
8,050 kg (17,700 lb.)

Propellant Mass:
800 kg (1,764 lb.)

Ascent Cargo Mass:
Up to 3,729 kg (8,200 lb.)

Pressurized Volume:
27 m^3

Height:
6.39 m (21 ft.)

Power Generation:
2 fixed wing UltraFlex™ solar arrays, ZTJ gallium arsenide cells

Descent Cargo Mass:
Up to 3,729 kg (8,200 lb.)

Antares Launch Vehicle

Diameter:
3.9 m (12.8 ft.)

Height:
42.5 m (139.4 ft.)

Mass:
290,000 - 310,000 kg (639,341 - 683,433 lb.)

Cygnus Advanced Maneuvering Spacecraft

Stage 2
Northrop Grumman CASTOR® 30XL solid motor with thrust vectoring

Stage 1
Liquid oxygen/kerosene fueled

Northrop Grumman responsible for system development and integration

Core tank designed and verified by KB Yuzhnoye (Zenit-derived heritage)

Core tank production by Yuzhmash

Two Energomash RD-181 engines each with independent thrust vectoring

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