Boeing Delta II Launches NASA Spacecraft into Deep Space

A NASA spacecraft designed to test 21st century technology began its mission into deep space at 8:08 a.m. EDT today aboard a Boeing [NYSE: BA] Delta II rocket.

The mission is the first deep space launch by NASA to have technology, rather than science, as its key focus. The term deep space generally refers to all space beyond the Earth-moon system or some 240,000 miles altitude. In addition to the primary payload, Deep Space 1 (DS1), the Delta II also carried a microsatellite designed and built by students at the University of Alabama in Huntsville.

Deep Space 1 will be the first spacecraft to use an ion thruster to provide solar electric propulsion for its primary source of thrust. Large solar arrays will give a positive electrical charge to atoms of xenon gas and accelerate them to a very high speed.

If Deep Space 1 expends its full load of 180 pounds of propellant, it would be able to change its speed by 10,000 miles per hour. That enormous change, however, would require thrusting for 20 months. Conventional spacecraft accelerate faster, but typically require 10 times more propellant.

Deep Space 1, is also the first mission in NASA's New Millennium Program, to test and validate new technologies to be used on 21st century spacecraft. Among the technology carried aboard the spacecraft is software that tracks celestial bodies that allow Deep Space 1 to make navigation decisions without assistance by ground controllers.

Although much of the testing will be completed during the first eight weeks of the mission, Deep Space 1 will attempt an encounter with asteroid 1992 KD in July 1999, as a final demonstration of its technologies by observing a scientifically interesting body.

"Today's Delta launch provides an excellent beginning to DS1's mission of validating important technologies," said Dr. Marc Rayman, Deep Space 1 chief mission engineer. "We greatly appreciate Boeing's launch service and the smooth delivery of our spacecraft to its orbit around the Sun," he added.

"The successful flight of this new version of the Delta II, carrying two spacecraft, is an important step in NASA's move toward the use of smaller, more affordable launch vehicles for its science missions," Dr. Rayman concluded.

"The Deep Space 1 mission continues the tradition of the Delta launch vehicle family, which since 1960 has lifted 76 scientific payloads into space," said Darryl Van Dorn, Boeing director of NASA and Commercial programs. "This mission is particularly significant because it will be the first time that ion propulsion is being used as the primary propulsion system for a spacecraft traveling in deep space," he added. The 85-pound secondary payload, Students for the Exploration and Development of Space Satellite (SEDSAT) satellite, was delivered to orbit following deployment of Deep Space 1.

An objective of SEDSAT is to further space science and engineering education through hands-on experience. Other objectives include providing packet and repeater communication services to the amateur radio community, providing a public internet-accessible multispecteral Earth imaging system, and conducting experiments in attitude determination, stabilization, battery technology, and radiation-tolerant computer design.

Delta launch vehicles have carried a variety of critical scientific payloads for NASA, the most recent include the Advanced Composition Explorer, Near Earth Asteroid Rendezvous, Mars Pathfinder and Mars Global Surveyor.

The Deep Space 1 launch is a part of the Medium-Light Expendable Launch Vehicle Services (Med-Lite) contract with NASA. In December, a Delta II will launch NASA's Mars Orbiter spacecraft to be followed by five additional NASA missions in 1999 and two in 2000. Five options remain in the Med-Lite contract.

The Delta II is a medium capacity rocket which is manufactured in Huntington Beach, Calif., with final assembly in Pueblo, Colo., and is powered by the RS-27A engine built by Boeing in Canoga Park, Calif. The launch team at Cape Canaveral Air Station handled launch coordination for the mission.

Alliant Techsystems, Magna, Utah, builds the graphite epoxy motors for boost assist; Aerojet, Sacramento, Calif., supplies the second-stage engine; Cordant Technologies, Elkton, Md., builds the upper-stage engine; and Allied Signal, Teterboro, N.J., provides the guidance and flight control system.

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