NASA Facts

National Aeronautics and
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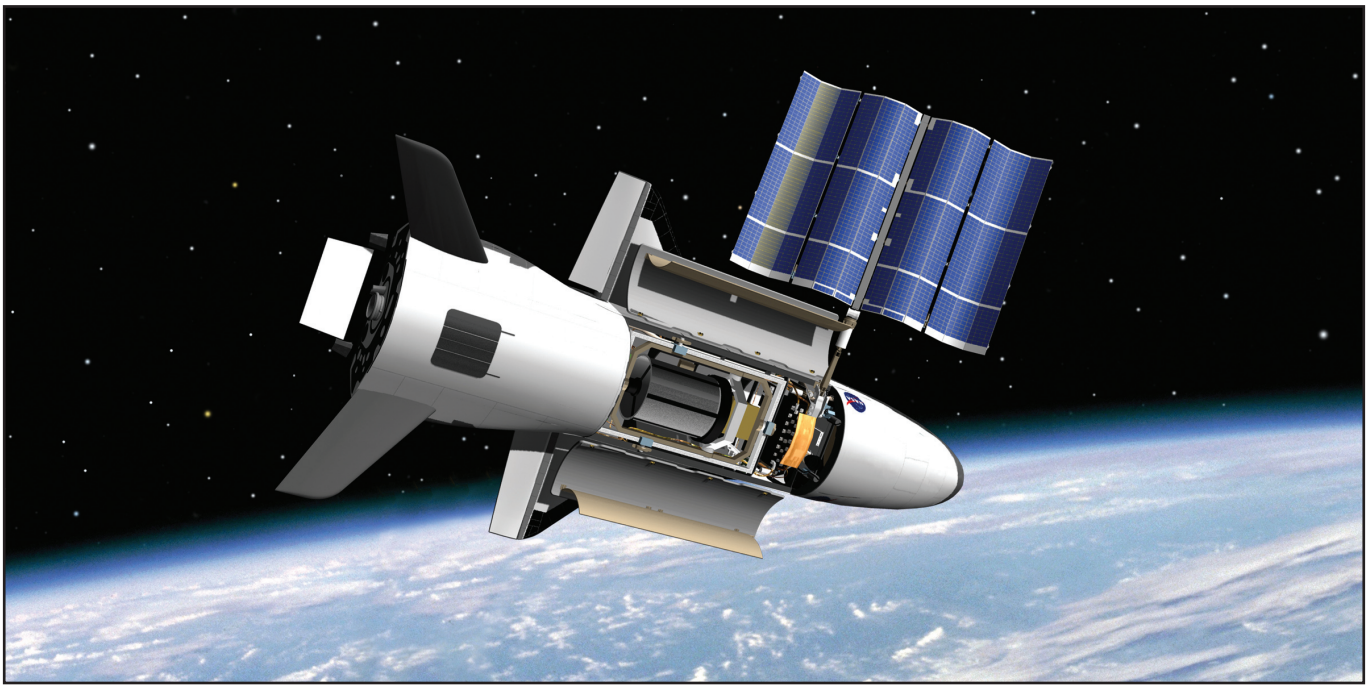
X-37 Demonstrator to Test Future Launch Technologies in Orbit and Reentry Environments



NASA's X-37 is an advanced technology flight demonstrator, which will help define the future of space transportation – pushing technology into a new era of space development and exploration at the dawn of the new century.

The X-37 will test and validate technologies in the environment of space as well as test system performance of the vehicle during orbital flight, reentry and landing. Results from the X-37 will aid in the design and development of NASA's Orbital Space Plane – designed to provide a crew rescue and crew transport capability to and from the International Space Station.

Capable of being ferried into orbit on an expendable launch vehicle, the X-37 will operate at speeds up to 25 times the speed of sound (Mach 25) and test technologies in the harsh environments of space and atmospheric reentry.

As part of the X-37 project, the Boeing Company's Phantom Works division of Huntington Beach, Calif., is developing two vehicles: the X-37 Approach and Landing Test Vehicle and the X-37 Orbital Vehicle. These autonomous space planes, which have no crew, will play a key role in NASA's effort to dramatically reduce the cost of sending humans and payloads into space.

The Approach and Landing Test Vehicle (ALTV) will validate system performance of the approach, landing, and turnaround operations needed for flight. It will demonstrate an integrated Flight Operations Control Center, range and vehicle flight test operations. In addition, the vehicle will validate aerodynamic stability and structural integrity. Finally, this vehicle will demonstrate autonomous, or unmanned, operations in the approach and landing range environment. The X-37 test vehicle will be released from a B-52 plane at altitudes of up to 46,000 feet to demonstrate descent and landing. The trajectory will duplicate to the maximum extent possible the expected reentry trajectory of the Orbital Vehicle. Five flight tests for this test vehicle are scheduled to begin in the summer of 2004.

Based upon the X-37 Approach and Landing Test Vehicle, the X-37 Orbital Vehicle will test key, embedded technologies and flight experiments in relevant environments of ascent, on-orbit, reentry and landing phases of flight. Technologies to be tested include propulsion, advanced guidance, navigation and control, thermal protection systems, avionics, high temperature structures, conformal reusable insulation, and high-temperature seals. In addition, the X-37 Orbital Vehicle will demonstrate autonomous orbital flight, reentry and landing. The X-37 Orbital Vehicle is being designed so that it is capable of orbital operations for periods of up to nine months. Several locations are being studied for the landing site. The orbital flight test is scheduled for summer 2006.

In July 1999, Boeing Phantom Works began work to develop the X-37 via a four-year cooperative agreement with NASA. In November 2002, Boeing was awarded a $301 million contract to continue the development of the X-37 flight demonstrator. The contract includes the development of an X-37 Approach and Landing Test Vehicle with a progressive series of approach and landing tests and the development of an X-37 Orbital Vehicle with an orbital flight test.

The X-37 is nearly 27.5 feet long and weighs about 5 tons at launch. Its wingspan is approximately 15 feet, and it contains an experiment bay 7 feet long and 4 feet in diameter.

The X-37's shape is a 120 percent scale derivative of the Air Force's X-40A, also designed and built by Boeing. The X-40A lacks the X-37's advanced thermal protection materials, propulsion system, experiment bay and other spacecraft systems. To reduce technical risk before flight-testing the X-37, the X-40A was released from a U.S. Army Chinook helicopter for seven free flight tests in 2001, and it completed each of the seven successfully.

The X-37 government team, led by NASA's Marshall Space Flight Center in Huntsville, Ala., also includes NASA's Ames Research Center, Moffet Field, Calif.; Kennedy Space Center, Fla.; Goddard Space Flight Center, Greenbelt, Md.; Johnson Space Center, Houston, TX.; Langley Research Center, Hampton, Va.; Dryden Flight Research Center and the U.S. Air Force Flight Test Center, both at Edwards Air Force Base, Calif.

The X-37 industry team is led by The Boeing Company of Huntington Beach, Calif. Boeing facilities participating in the program are located in Seattle, St. Louis and Palmdale, Calif.

Flight demonstrators, like the X-37, have a critical role in demonstrating technologies that cannot be validated on the ground. NASA is pursuing technologies that will enable the Agency to achieve its goals of establishing safe, reliable, affordable access to space.

The X-37 project is part of NASA's new innovative business strategy to dramatically reduce the cost of space transportation. For the first time, NASA will be able to readily test and validate new, state-of-the-art space transportation technologies on orbit during the orbital and reentry phase of flight.

The X-37 project office at the Marshall Center, manages the X-37 project for the Orbital Space Plane Program. For more information on flight demonstrators and the Orbital Space Plane program, visit its Web site at

http://www.slinews.com

For more information and electronic images on the X-37 and other Marshall Center activities, contact the Marshall Media Relations Department at (256) 544-0034 or visit Marshall's News Center on the Web at

http://www.msfc.nasa.gov/news

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