

***FLIGHT TESTS FOR GROUND-BASED MIDCOURSE MISSILE DEFENSE'S  
BOOST VEHICLE***

\*\* The matrix below is a summary of the major flight tests of the booster rocket being developed for the Missile Defense Agency's ground-based midcourse missile defense system.\*\*

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Flight Test Number	Date	Intercept?	Notes
Boost Verification (BV)-1	April 28, 2001	N/A	This was a "pathfinder" ground test to check all the procedures that lead up to an actual flight test and included booster ground handling, safety and flight termination system checks, and all launch and safety steps. The missile was not intended to be launched.
BV-2	Aug. 31, 2001	N/A	The flight test was 18 months behind schedule. The three-stage Boeing rocket tested with a mass-simulated kill vehicle payload, did not attempt a missile intercept. It appears there was an anomaly in vehicle roll control in first-stage operation beginning at about 33 sec. into the mission and that could affect kill vehicle performance in an operational scenario. The second- and third-stage motors performed normally.
BV-3	Dec. 13, 2001	N/A	Failure. The BV veered off course 30 seconds after launching and was ordered to self-destruct. It landed in the Pacific Ocean off of Vandenberg AFB, CA.
BV-4	Unknown	N/A	This test has apparently been cancelled.
BV-6	Aug. 16, 2003	N/A	This was a test of OBV, Orbital's alternate boost vehicle. Because the boost vehicle program had undergone so many problems, Orbital was awarded a contract in March 2002 to develop a new alternate boost vehicle. The MDA claims it will continue to follow a dual-booster program, but for now, it plans to use Orbital's rocket for the 10 interceptors of the October 2004 initial deployment and for four flight tests. Orbital's rocket is based on its commercial boost vehicles, the Pegasus and the

			<p>Taurus. BV-6 was not a designated intercept test and did not demonstrate functionality between the payload and the booster. The three-stage rocket was launched out of Vandenberg Air Force Base at 11:01 AM, flew for about 25 minutes, reached an altitude of about 1,165 miles, and ranged about 3,300 miles. BV-6 was first supposed to be held on Aug. 15 but had to be delayed 24 hours when a software anomaly arose during preflight preparation, necessitating the system's reboot.</p>
BV-5	Jan. 9, 2004	N/A	<p>Lockheed Martin is developing the BV-Plus, a modified version of the three-stage commercial-off-the-shelf boost vehicle being developed by Boeing. BV-5 was not a designated intercept test and did not demonstrate functionality between the payload and the booster. In the test, Lockheed Martin's three-stage booster was launched from Vandenberg AFB over the Pacific Ocean. Diagnostics are being held to determine whether it was a success. This test was originally scheduled to be held in August 2003. However, technical problems kept pushing the test back. The latest slip occurred in December 2003. BV-5 was supposed to have been held Dec. 15, but pre-testing found what MDA officials termed an "extremely minor" electronic glitch in one of the third-stage rocket motor's circuit boards. The board had to be replaced before BV-5 could be held. None of the interceptors to be deployed by October 2004 are expected to use the Lockheed Martin booster. This decision came out of an investigation of two manufacturing accidents at the Pratt and Whitney facility which mixes propellant for the Lockheed Martin booster. On Aug. 7, 2003, an ignition which occurred during propellant mixing set off a fire that overtook 36 or 37 acres. No one was seriously injured, unlike during the second accident. On Sept. 12, James Franklin Spotts was killed when an explosion occurred while he was adjusting a propellant mixer.</p>

Sources:

BV-1: "BMDO conducts first verification test of new missile defense booster," *Defense Daily*, May 2, 2001

BV-2: "Anti-missile concepts jockey for position," *Aviation Week & Space Technology*, Sept. 10, 2001  
BV-3: "A setback for missile shield as booster rocket fails test," *New York Times*, Dec. 14, 2001

BV-6: "Pentagon signs Orbital to build defense rocket," *The Washington Times*, March 5, 2002; "Boeing finalizes development, test plan for new missile defense boosters," *Defense Daily*, July 10, 2002; *MDA RDT&E, Defense-Wide Budget Documentation, FY 2004 Budget Request*; "MDA Reports Tight Schedule For New Booster Development and Test," *Defense Daily*, May 19, 2003; "Midcourse Missile Defenses Advance On Interceptor Fronts," *Aerospace Daily*, Aug. 19, 2003; "MDA Test Flies Orbital Sciences Booster For GMD Program," *Defense Daily*, Aug. 19, 2003

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*Victoria Samson*  
*CDI Research Analyst*  
*vsamson@cdi.org*

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*www.cdi.org*  
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