

Boeing Defense, Space & Security
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Airborne Laser Test Bed

Description and Purpose:

The Airborne Laser Test Bed (ALTB) provides speed-of-light capability to support the advancement of directed energy technology and the understanding of directed energy applications.

Customer:

U.S. Missile Defense Agency

General Characteristics:

The ALTB program places battle management equipment, a beam control/fire control system, and a high-energy Chemical Oxygen Iodine Laser (COIL) on a modified Boeing 747-400F aircraft to support the potential application of directed energy for missile defense.

Boeing provides the aircraft, battle management, overall systems integration and testing. Northrop Grumman supplies the megawatt-class, high-energy laser and one of the low-power illuminator lasers used for targeting. Lockheed Martin provides the beam control/fire control system.

Background:

On Feb. 11, 2010, Boeing, industry teammates and the Missile Defense Agency successfully demonstrated the speed, precision and breakthrough potential of directed-energy weapons when the Airborne Laser Test Bed engaged and destroyed a boosting ballistic missile.

According to MDA, the experiment began at 8:44 pm Pacific Standard Time when “a short-range threat-representative ballistic missile was launched from an at-sea mobile launch platform. Within seconds, the ALTB used onboard sensors to detect the boosting missile and used a low-energy laser to track the target. The ALTB then fired a second low-energy laser to measure and compensate for atmospheric disturbance. Finally, the ALTB fired its megawatt-class, high-energy laser, heating the boosting ballistic missile to critical structural failure. The entire engagement occurred within two minutes of the target missile launch, while its rocket motors were still thrusting.”

During the experiment, the aircraft took off from Edwards Air Force Base and focused its high-energy laser at the missile target during its boost phase as the aircraft flew over the Western Sea Range off the coast of California.

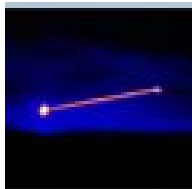
This experiment marks the first time a laser weapon has engaged and destroyed an in-flight ballistic missile, and the first time that any system has accomplished it in the missile's boost phase of flight. ALTB has the highest-energy laser ever fired from an aircraft, and is the most powerful mobile laser device in the world.

Eight days earlier, on Feb. 3, 2010, ALTB completed its first intercept of an airborne target by destroying a Terrier Black Brant sounding (research) rocket launched from the ground on San Nicolas Island, Calif.

MDA officially recognized directed energy's warfare-changing potential in March 2009, when it awarded its Technology Pioneer Award to three Boeing Airborne Laser Test Bed engineers and three of their government and industry teammates for advancing key ALTB technologies.

In September of 2010, the Air Force Association (AFA) honored the ALTB team with the Theodore Von Karman Award. This industry award, the AFA's highest honor in the field of science and engineering, was presented in recognition of the team's achievements in directed energy research and development.

Feb. 11, 2010 - An infrared image of the Airborne Laser Test Bed (right) destroying a threat representative short-range ballistic missile (left).



Feb. 11, 2010 - This sequence of images shows a threat-representative ballistic missile's breakup resulting from a high-energy laser engagement by the Airborne Laser Test Bed.



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September 2011