MISSILE DEFENSE AGENCY

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Fact Sheet

The Airborne Laser

The Airborne Laser is an intregal part of the Ballistic Missile Defense System designed to protect the United States, its allies, and its deployed troops from ballistic missile attack. Using a megawatt-class Chemical Oxygen Iodine Laser housed aboard a modified Boeing 747-400 Freighter, the Airborne Laser's mission is to detect, track, target and destroy ballistic missiles during their boost-phase, or shortly after launch. Its revolutionary use of directed energy makes it unique among the world's weapon systems, displaying a capability to attack at the speed of light at a range of hundreds of kilometers.

Overview

- The Airborne Laser program brings together a combination of technologies: a dependable aircraft, advanced detection and tracking devices including three lower powered lasers, infrared sensors, adaptive optics, and the state of the art in high energy laser configuration
- These varied components have never been joined together into a single integrated weapon system

Operational Sequence

1) The Airborne Laser uses six infrared sensors located in the front, rear and sides of the aircraft to detect the plume of a boosting missile.
2) Once a target is detected, the Airborne Laser's automated beam control/fire control process kicks in.
   - First, a laser located on top of the aircraft locks onto the missile to provide accurate location information;
   - Then, another laser called the Track Illuminator calculates a precise aim point on the missile;
   - Meanwhile, a third laser called the Beacon Illuminator measures any disturbances in the atmosphere between the aircraft and the target.
   - All this information is used to accurately point and focus the high energy laser at its intended target.
2) Using a very large telescope located in the nose turret, the beam control/fire control system focuses the high energy Chemical Oxygen Iodine Laser beam onto the fuel-tank area of the boosting missile, holding it there until the concentrated energy causes the missile to rupture.

Development:

- The Chemical Oxygen Iodine Laser, in its six-module configuration, produced photons for the first time on Nov. 10, 2004, proving that the high energy laser works as designed
- The aircraft returned to flight with the beam control system aboard on Dec. 3, 2004