MISSILE DEFENSE AGENCY
MDA In-depth
Making Ballistic Missile Defense A Reality...

# Airborne Laser (ABL)

Destroying missiles shortly after launch is one of the many ways the Missile Defense Agency (MDA) plans to protect the U.S., its forces abroad and Allies. To do this, MDA is developing a layered Ballistic Missile Defense System (BMDS) that will combine several programs into one system that will be able to destroy an enemy missile from shortly after launch to shortly before impact on the intended target. The Airborne Laser (ABL) element is involved in destroying an enemy missile shortly after launch. This system involves putting a weapons class laser aboard a modified Boeing 747 aircraft and using that laser to destroy enemy ballistic missiles. To successfully intercept enemy missiles, the laser must be powerful enough to extend hundreds of miles away to destroy missiles during the first seconds of flight. Advanced sensors aboard the aircraft must also locate the missile, which could be traveling two-thirds of a mile per second, direct the laser, and keep the laser focused on its fast-moving target. Not only is the system following the fast target, but it also has to make adjustments for the atmosphere that typically distorts and spreads a laser beam. All of these factors must work in coordination to successfully intercept an enemy ballistic missile.

The ABL is carried on a Boeing 747 aircraft. The Air Force purchased the plane straight off of the Boeing Commercial Aircraft assembly line in January 2000 and flew it to Wichita, Kansas for modifications and installation of equipment that serves to support the prototype weapon system. These modifications resulted in the virtual rebuilding of the aircraft; installing miles of wiring, grafting large sheets of titanium to the plane's underbelly, and, most noticeable, adding a 12,000 pound front section to house the 1.5 meter optical window through which the laser beams will be fired.

On July 18, 2002, ABL had its first flight after the 24-month major structural modification of the 747. In December of 2002 the aircraft relocated to Edwards Air Force Base, California, for integration and testing of the weapon system components. The integration and test will include assessments of the equipment on the ground in addition to flight tests. In 2005, the ABL will conduct a lethality demonstration (missile shoot-down) against a ballistic missile and deliver one aircraft to integrate into the BMDS. An initial emergency capability may be available as early as 2005, with a fully operational aircraft available later in the decade.

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