



FACT SHEET

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TESTING: PAVING THE WAY TO MISSILE SHOOTDOWN



Now comes the fun part. After years of planning and organization, months of assembling and connecting hardware, and weeks of flying an almost empty airplane, Airborne Laser (ABL) developers are on the verge of proving that the revolutionary aircraft is capable of *destroying* something, most notably a likely enemy ballistic missile or, in militaryese, a Foreign Military Asset (FMA).

Built to protect the United States, the country's allies, and American troops stationed abroad, ABL is entering its most demanding phase: Confirming its ability to obliterate ballistic missiles during their most vulnerable time, shortly after launch when they are traveling along a foreseeable path and accelerating at a relatively predictable rate.

In a combat situation, ABL is designed to lock onto an enemy missile with its megawatt-class Chemical Oxygen Iodine Laser (COIL), heating the missile's skin surface until it cracks. That causes the missile to vent and essentially kill itself. Since the missile is in a near-vertical position during its boost or launch phase, the warhead likely will fall on or near the launch site.

One phase of the ABL capability already has been demonstrated. While the aircraft – officially the prototype Attack Laser model 1-A (YAL-1A) – was still undergoing flight tests in the Autumn of 2002, it confirmed it could find and track a ballistic missile. During a Missile Defense Agency test of a kinetic energy system over the Pacific Ocean, ABL locked onto the missile when it broke through the clouds off the southern California coast and held that lock until the missile's fuel was exhausted some 500 kilometers (311 miles) from its launch point. Since YAL-1A was flying without its lasers at the time it was unable to actually fire at the missile.

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Shortly after the Pacific demonstration, ABL was seclued in a hangar at Edwards Air Force Base in California pending testing of its lasers and the extremely intricate optical system. Once those elements have been certified operational they will be installed in the aircraft.

After installation, the ABL team will wring out the system during an extensive series of exercises ranging from open-air ground testing through non-lethal flight testing to the shutdown of the first of five ballistic missiles it has acquired for the test phase.

The open-air ground testing, which will be conducted across the dry lakebeds at Edwards AFB, will be the first step in understanding the capabilities of two of ABL's main lasers – the Target Illuminator Laser (TILL), which determines the aim spot on the missile, and the Beacon Illuminator Laser (BILL), which measures the amount of atmospheric disturbance between the aircraft and the target. In this case, the target will be a windmill-like device called a rotoplane.

Flight testing starts with missions involving the exotic Proteus aircraft (right), which will be carrying a highly-instrumented target board. Looking much like a large golf-pencil, the Proteus' ballistic missile-sized target board will provide the first in-flight capabilities of the TILL and BILL. Since the Proteus aircraft will be manned, the megawatt-class COIL can't be fired against it. Instead, ABL will be using a Surrogate High Energy Laser (SHEL), which has the same wavelength and optical characteristics as the COIL but none of its destructive power.



After tests with the Proteus, ABL will go against a Lance missile. This provides a representative ballistic missile target at relatively low cost while allowing incremental increases in test complexity.

Progressing from the Lance, ABL's final targets before the shutdown attempt of the first FMA will be against a unique, balloon-dropped target board called the Missile Alternative Range Target Instrumentation (MARTI). Initially, ABL will fire at the MARTI with the TILL, BILL, and SHEL. Then, in final preparation for the ballistic missile shutdown, a high-power variant of the MARTI will be used to test the high energy COIL.



All ground tests – but no air tests – are scheduled to be conducted at Edwards AFB. The air tests involving the MARTI and Lances will be conducted over the White Sands Missile Range in New Mexico. All FMAs (example on left) will be launched from Vandenberg AFB in California and destroyed off the coast so the debris will fall in the Pacific Ocean.

In between ballistic missile shutdowns, ABL will refine its capabilities by again targeting the Proteus, MARTI and several Lances.

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