



FACT SHEET

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YAL-1A ATTACK LASER

The World's First Laser-armed Combat Aircraft



YAL-1A on its maiden flight, Wichita, Kan., July 18, 2002

On a brisk afternoon in January 2000, an Air Force Reserve major named Gerry Elwell guided an off-the-assembly line Boeing 747-400F to a flawless landing on the table-flat runway at McConnell Air Force Base, Kansas, then smoothly taxied the aircraft to the aircraft manufacturer's modification facility a short distance away.

Within hours, the aircraft was towed inside the huge hangar where workers swarmed over its front end, amputating its nose in a series of swift, surgical-like moves. That marked the beginning of the aircraft's dramatic transition from a standard, everyday freighter to a fearsome military machine which many experts predict will forever change the way that wars are fought.

Over the next 24 months, the aircraft was fundamentally changed. Support beams were added to the aft section; a titanium belly skin was attached to cover the hole left by the removal of long strips of aluminum; an extra door was put in; an airtight bulkhead was built and installed to divide the interior



Airborne Laser at Boeing's Wichita facilities

into separate compartments: one for the crew; the other for equipment. Workers punched holes in the sides, front, and rear of the plane to position infrared tracking sensors. A torpedo-shaped device was bolted onto the aircraft's distinctive hump. All told, it was the largest modification job ever undertaken by Boeing, which has been making military-requested changes to its basic products for more than a quarter of a century.

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The result is the Airborne Laser (ABL), a bulbous-nosed aircraft unlike anything else in any military air fleet in the world. A specialty project from its beginning in 1992, ABL has one primary mission: destroy enemy ballistic missiles during their vulnerable boost phase.

The product of a closely knit team composed of the Missile Defense Agency, the United States Air Force, Boeing, Lockheed-Martin and TRW, ABL combines a number of distinct technologies and hardware developed for other purposes to create a weapons system that many say will be as revolutionary as the nuclear bomb.

In addition to the modified aircraft, ABL will utilize a series of specialized devices including:

- Infrared heat detectors that first saw action on the U.S. Navy's F-14 Tomcat fighter;
- A unique turbopump to circulate laser fuel through the megawatt class laser; a pump with enough power to fill an ordinary home swimming pool in 10 minutes;
- Two solid state kilowatt-class lasers;
- A liquid and gas-fueled high-energy laser system called the Chemical Oxygen Iodine Laser (COIL);
- A beam-steering configuration that incorporates the use of the relatively new science of adaptive optics.



Each of these systems has proved effective in their specialized fields. But when they are installed on the YAL-1A aircraft during the prototype weapon system's integration phase, it will mark the first time they have been used together.

As they are installed, they will be tested individually and then as part of the ABL system, both on the ground at the ABL Integrated Test Force facility at Edwards Air Force Base, California, and in the air. The integration and test phases will culminate in late 2004 when ABL shoots down its first boosting ballistic missile.



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