New Solid-State Laser Developed For Airborne Laser Program

Team Airborne Laser (ABL) has achieved a crucial milestone in the development of the Beam Control/Fire Control system for the U.S. Air Force's ABL program. The Beam Control/Fire Control system will aim and fire a high-energy laser at a target missile in its boost phase.

Boeing is lead contractor of Team ABL. Other team members are Lockheed Martin and TRW.

Lockheed Martin Space Systems Company subcontractor Raytheon late last week conducted a "first light" test of the Track Illuminator Laser (TILL) one week ahead of schedule at its High Energy Laser Center in El Segundo, Calif. The TILL, one of four critical lasers to the Airborne Laser program, is the first solid-state laser to achieve this milestone.

"The 'first light' test is significant because the TILL is the heart of the Beam Control/Fire Control system," said Paul Shattuck, Lockheed Martin ABL program manager. "This is a brand new technology and the test proves the design is valid."

This laser is an integral part of the Beam Control/Fire Control system and will project rapid, powerful pulses of light on a small section of a boosting target missile. The light will be reflected back to an extremely sensitive camera. The reflected light data is interpreted as information about the target's speed, elevation and probable point of impact.

Raytheon's test showed that the TILL should have plenty of power to meet the signal needs of the Fine Tracker/Ranger. According to Lockheed Martin Chief Systems Engineer Marya Andrepont, the test is a significant step in proving the technology.

"We were expecting the laser to run for a few seconds, and they ran it for 30 minutes. I have great confidence that Raytheon will deliver a laser module that meets our needs," she said.

The TILL is scheduled to be delivered later this year to Lockheed Martin's Beam Control/Fire Control Integration and Test Facility in Sunnyvale, Calif.

"Team ABL is working hard to meet all of the system's technical challenges," said Steve Sauve', Boeing ABL program director and overall team leader. "We are gratified and excited to see the program meeting each of our outlined milestones in 2001."

Boeing is the team lead for weapon system integration, and supplies the 747-400 freighter aircraft and the battle management, command and control system. TRW provides the high-energy laser, which is a chemical-oxygen-iodine laser. Lockheed Martin is designing, developing, and building the Beam Control/Fire Control system, which will acquire the target, then accurately point and fire the laser with sufficient energy to destroy a missile while it is still in the boost phase.

The team is developing the world's first boost-phase defense against theater ballistic missiles of the type that were used against U.S. troops during the Gulf War. Unlike ground-based systems, ABL will operate from hundreds of miles away and will be able to lock onto enemy missiles shortly after they lift off. ABL will fire an intense beam of heat that causes the missile's skin to rupture and its fuel to gush and explode. Since the missiles are still rising, the warheads will fall onto or near the enemy's territory.

The principal parts of the system - including its four lasers, its beam control system, its computerized battle management component and the aircraft - currently are being assembled. Once modifications to the 747-400 Freighter aircraft are completed at Boeing in Wichita, Kan., and the battle management system has been installed there, the beam control system and the lasers will be installed at Edwards Air Force Base, Calif. ABL is expected to begin flight tests in early 2002. A fleet of seven aircraft is scheduled to be ready by 2009.

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