

Airborne Tactical Laser (ATL) Feasibility for Gunship Operations

Abstract

The *Airborne Tactical Laser (ATL) Feasibility for Gunship Operations* study was chartered to assess the current state of airborne laser technologies and identify integration issues including size, weight, power requirements, thermal management, aero optical effects, and impacts on aircraft performance. The Study Panel was directed to examine gunship operations and tactics to identify potential offensive and defensive scenarios in which a laser gunship could play a role, and to identify the operational, logistics, and sustainment requirements that might limit laser weapons employment. In addition, the Panel was to assess potential vulnerabilities and possible countermeasures against laser weapons. Finally, the Panel was to recommend technology options consistent with laser weapon-aircraft integration realities that could be implemented in the near-, mid-, and far-term. The Air Force Scientific Advisory Board study panel conducted this study in response to a request by the Secretary of the Air Force and the Chief of Staff of the Air Force.

The Study Panel received a number of briefings from industrial defense contractors, Air Force Research Lab personnel, and other military and government organizations. The team also visited and interacted with operators and maintainers of the AFSOC AC-130 series of gunship aircraft.

The Study Panel made the following findings and recommendations:

The Panel found that careful engineering system trades regarding implementation of a laser weapon in an airborne platform have not been performed. The Panel recommends that the Air Force ensure that near-term technology developments are consistent with system requirements, based on a comprehensive system engineering program to integrate a laser weapon system on a Gunship. The Panel further recommends that the Air Force mature solid state laser technologies, and pursue the related system improvements in beam control, lightweighting, power sourcing, and thermal management.

The Panel found that a laser augmented Gunship is potentially feasible, and recommends that the Air Force incorporate future laser weapon system technologies for a Gunship into its laser weapon roadmap, focusing the technology investments into developing a fieldable laser gunship.

The Panel found that there is no operational utility of the NC-130 Advanced Tactical Laser Advanced Concept Technology Demonstrator (ATL ACTD), but that there are some key measurements that could be obtained from this platform to inform future laser gunship development efforts. The Panel recommends milestones that could be pursued during the ATL ACTD Extended User Evaluation (EUE).

The Panel found that the acceptability of using a tactical laser as a lethal weapon against enemy combatants has not been established. The Panel recommends that the Air Force address, and drive to settlement, the issues surrounding killing personnel with laser weapons.