Ground-Based Air Defense (GBAD) Directed Energy On-The-Move

AT A GLANCE

WHAT IS IT?

GBAD consists of a vehicle-mounted, high-energy laser (HEL) as well as command, control, and communications (C3) and a volumetric surveillance radar.

HOW DOES IT WORK?

The volumetric search RADAR locates unmanned aerial system (UAS) targets of interest and passes the information to the C3 platform. The C3 platform performs an analysis of the threat and passes the radar information to the laser platform, which then locates and begins tracking the UAS utilizing a day/night capable sensor system. This then allows the C3 platform to perform visual confirmation and aim point selection. If a kill decision is made, the threat is lased until destruction.

WHAT WILL IT ACCOMPLISH?

GBAD will demonstrate the capability of a rugged, expeditionary HEL system that can be cued by a radar capable of detecting low radar cross-section threats. It will be able to perform hard kills of UASs to prevent reconnaissance, surveillance, targeting and acquisition of expeditionary forces. It also will demonstrate a C2 interface that is optimized for operational use.

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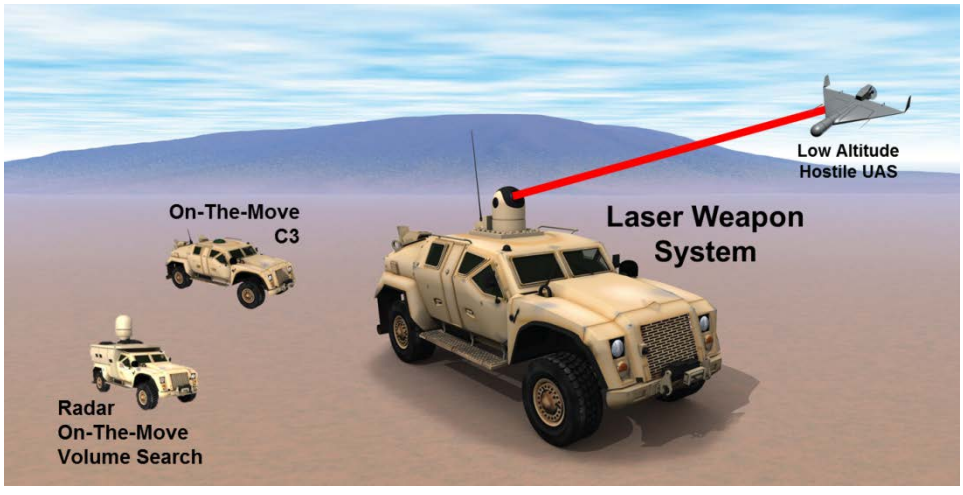

GBAD uses several science and technology development efforts from within the Office of Naval Research, and leverages innovations from the High Energy Laser-Joint Technology Office (HEL-JTO).

The Naval Surface Warfare Center Dahlgren Division serves as the lead system integrator for the GBAD program and is working with industry partners to develop, mature, and integrate novel key components and subsystems that improve state-of-the-art performance.

Significant laser and vehicle modeling and simulation, coupled with a detailed trade-off analysis, led to a sophisticated design strategy. This led to the selection of a palletized laser weapon system design using a planar wave guide laser for 30 kW nominal power; a lightweight reflective beam director; on-board vehicle power enhancements; lithium Ion batteries for power storage; and phase-change material cooling systems that conform to the size, weight and power constraints of using a tactical vehicle platform.

This five-year development effort includes three key demonstrations of increased capabilities and culminating in an on the move end-to-end engagement of UASs in FY17.

- FY15: Completely stationary end-to-end engagement
- FY16: Demonstrate an at-the-halt single engagement, with mobile cueing / tracking
- FY17: Demonstrate full mobility between multiple engagements