



MOBILE EXPERIMENTAL HIGH ENERGY LASER (MEHEL)



The Mobile Experimental High Energy Laser is a science and technology prototype for Warfighter familiarization and training

The Mobile Experimental High Energy Laser is a technology integration and experimentation effort with a solid state laser system, agile beam control system, supporting laser subsystems, a Ku-band radar, and Counter-Unmanned Aerial System Mobile Integrated Capability, or CMIC, components integrated into a combat vehicle. The goal is to enable Warfighters to gain hands-on experience operating a high energy laser system that will support development of tactics, techniques and procedures, as well as develop requirements for future combat platform-based HEL weapons.

- Army's first solid state high energy laser on a combat platform
- Modular system for simplified upgrade as technologies mature
- Additional counter-unmanned aerial system capabilities
- Control interfaces for Warfighter operation
- Warfighter hands-on experience to learn how high energy laser systems function



MEHEL

Purpose

The Mobile Experimental High Energy Laser is a U.S. Army Space and Missile Defense Command asset that provides Warfighters hands-on experience operating a high energy laser integrated in a combat vehicle.

It enables Warfighters to begin developing techniques, tactics and procedures for future HEL weapon systems, as well as inform requirements for future HEL weapon systems.

Components

USASMDC obtained a Stryker chassis for this risk-reduction effort. The first version of the MEHEL had a 2 kW laser with a 10 cm aperture beam director. That configuration, the first solid state HEL on a combat platform, demonstrated HEL capability in fiscal year 2016.

The laser was upgraded to a 5 kW system in December 2016. At the same time, the Ku-band radar and Counter-Unmanned Aerial System Mobile Integrated Capability, or CMIC, components were integrated. The CMIC components were developed by the Army's Aviation and Missile Research Development and Engineering Center.

The Ku-band Acquisition and Track Sensor enables MEHEL to autonomously sense and acquire targets. The laser was upgraded to a 10 kW system in August 2018 to provide longer effective range or reduce defeat time of a target at the same range.

Demonstrations and Warfighter Experimentation

The 2 kW configuration of the MEHEL participated in the Fires Center of Excellence-sponsored Maneuver Fires Integration Experiment, or MFI, 2016. There it downed a number of small rotary-wing unmanned aircraft systems.

After the laser was upgraded to 5 kW, the MEHEL participated in the Joint Improvised-Threat Defeat Organization's Counter-Unmanned Aerial System Hard-Kill Challenge in March-April 2017. The contractor operators defeated a number of small rotary- and fixed-wing unmanned aircraft systems. Following this event, Soldiers were trained to operate the MEHEL.

Training took place at Fort Sill, Oklahoma, just before MFI-17. During MFI-17, Soldiers shot down an unmanned aircraft system with a laser for the first time. Since that time, the 5 kW MEHEL has been Soldier-operated at both MFI-18 and Joint Warfighter Assessment 18.1.

The 10 kW MEHEL was Soldier-operated at MFI-19.

Over the course of several demonstrations, Soldier operators have defeated a large number of small rotary- and fixed-wing unmanned aerial systems.

| Current System | |
|---|--|
| Laser | 10 kW ruggedized commercial fiber laser |
| Beam Control System | Approximately 10 cm aperture telescope, low jitter precision pointing and tracking system |
| Acquisition and Track Sensors | Infrared-based wide field-of-view for target acquisition and IR-based narrow field-of-view fine target tracker and Ku-band radar |
| Operator Interface | Mounted Family of Computer Systems (MFoCS) |
| Battle Management Command, Control, Communications, Computers, and Intelligence | Maneuver Aviation Fires Integrated Application Battle Operating Software Suite (MAFIA BOSS) |
| Electrical Power | Stryker generator charging 28 VDC batteries |
| Thermal Management | Advanced Vapor Compression with polyglycol/water mixture |
| C-UAS Mobile Integrated Capability (CMIC) components | Additional counter-air and fire support capability |
| Minimum crew | Three |



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