MULTI-MISSION HIGH ENERGY LASER (MMHEL)

The Multi-Mission High Energy Laser is a Prototype for Maneuver Short Range Air Defense Weapon System

Warfighters face challenges in all aspects of their mission. They must have weapons that offer precision, controllability, predictability and repeatability to meet the threats of today and the future. A laser weapon system offers these attributes enabling enhanced tactical battlefield operation with a cost-per-engagement substantially lower than current systems. The MMHEL is a technology integration and demonstration effort with a solid state laser system, agile beam control system, and supporting laser subsystems, integrated into a combat platform. The goal is to provide a low cost-per-engagement Maneuver – Short Range Air Defense (M-SHORAD) prototype system. M-SHORAD protects maneuvering forces from rocket, artillery and mortar; unmanned aerial system, and fixed- and rotary-wing manned aircraft.

- Will be an Army combat platform with a high energy laser system
- Protect maneuver forces from unmanned aerial systems and limited rockets, artillery and mortar threats
- Conduct intelligence, surveillance and reconnaissance precision targeting and counter-ISR missions
- USASMDC will investigate manned fixed- and rotary-wing aircraft vulnerability to 50 kW-class laser systems

MMHEL

The first mission is to protect maneuvering U.S. and allied forces. High energy lasers will complement conventional offensive and defensive weapons at a significantly lower cost-per-engagement than current systems. The high energy laser system requires only fuel to complete its mission; there is no ordnance logistics burden as with conventional weapons. The MMHEL will be a U.S. Army Space and Missile Defense Command asset that will demonstrate HEL system capabilities to defend maneuvering forces in a operational demonstration.

The MMHEL will consist of a 50 kW-class laser projected through a precision pointing, high-velocity target tracking beam control system. To support the laser and beam control system, the MMHEL will have power and thermal management systems that power and cool all the subsystems and provide sufficient magazine to defeat many targets. The onboard Battle Management, Communications, Command, and Control subsystem will process cues and target engagements. The large-aperture optical system for the laser also provides an excellent system for long range intelligence, surveillience and reconnisance. The precision pointing of the laser system also enables the MMHEL to conduct precision targeting missions against ground targets.

Laser lethality against some rockets, artillery and motor and unmanned aerial systems threats has been proven. USASMDC will investigate laser lethality against manned fixed- and rotary-wing aircraft. The average cost per kill is approximately $30, which shifts the engagement cost equation in favor of U.S. forces.

The MMHEL will conduct a demonstration against a variety of targets in fiscal year 2021. Lethal engagements of a variety of targets is planned for this Technology Readiness Level 7 operational demonstration.

System Architecture	
Laser	50 kW ruggedized fiber laser
Beam Control System	Large aperture telescope, low jitter precision pointing and tracking system
Acquisition and Track Sensors	Infrared-based wide field-of-view (FOV) for target acquisition and IR-based narrow FOV fine target tracker
Operator Interface	Ruggedized computers
Battle Management Command, Control, Communications, Computers, and Intelligence	Modular design with manual/semi-automatic/ automatic target acquisition, aim-point selection, and aim-point management connected to the Army battle management system
Electrical Power	On-board generator(s) and energy storage
Thermal Management	Laser cooling system and standard heating, venting and air conditioning for all other subsystems
Platform – Stryker	Caterpillar C9 engine, Allison 3200SP automatic transmission, 8x8 axle
Crew	Three Soldiers

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