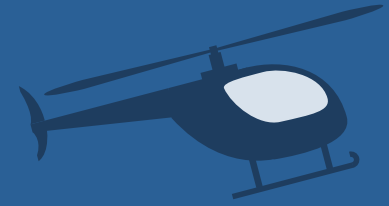


TRACKING THE LATEST MILITARY DEVELOPMENTS IN DIRECTED ENERGY SYSTEMS

PROGRESSING FROM RESEARCH TO IMPLEMENTATION

Prior to the upcoming **Directed Energy Systems Summit** this June 25th - 27th in Washington DC, we took a look at some of the latest developments taking place in the directed energy space. There has yet to be significant progress in directed energy weapons and although the technology for the most part is here, lasers have to get more efficient and reliable for contracts to be issued and operational implementation to begin. Congress has authorized roughly \$2.4 billion on R&D work into new weapon technologies for 2018. This huge amount of funds is working to make lasers and railguns a reality. Below is a timeline of what the US Military is currently developing to maintain its status as the world's military leader.



2017

HIGH ENERGY MOBILE DEMONSTRATOR (HEL MD)

Back in 2014, the U.S. Army awarded Lockheed Martin a **\$25 million** contract to design, construct and test a 60-kilowatt electric laser to be integrated and tested in a truck-mounted weapon system demonstrator. The laser weapon is designed to significantly improve the warfighters' ability to counter rockets, artillery, mortars and unmanned aerial threats. Under the contract, managed by the U.S. Army Space and Missile Defense Command's Technical Center, the laser will be integrated on the High Energy Laser Mobile Demonstrator (HEL MD). This rugged laser builds on the current Robust Electric Laser Initiative (RELI). The 60 kilowatt High Energy Laser Mobile Demonstrator (HEL MD) was delivered in 2017 for field testing.

2017

HIGH ENERGY LASER FOR U.S. ARMY APACHE AH-64

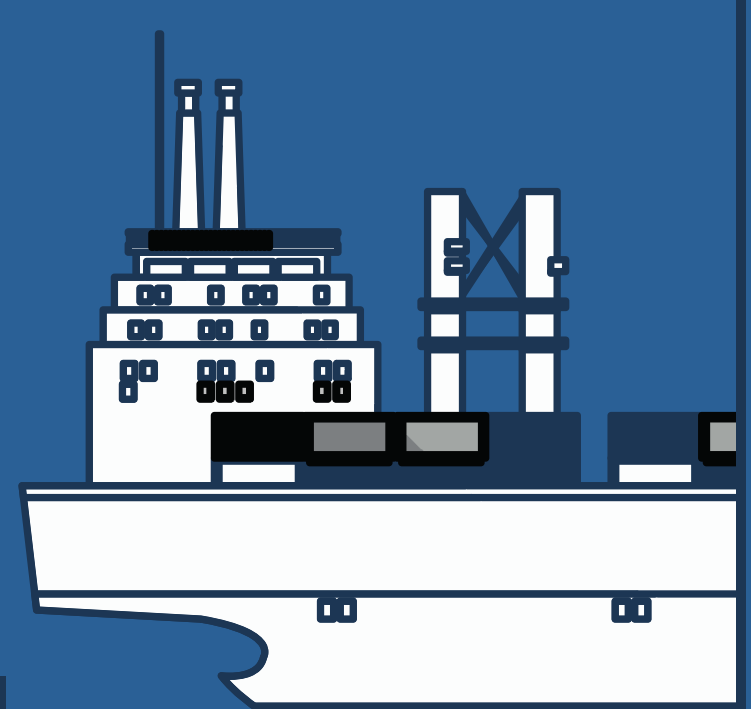
In June of 2017, Raytheon bolted a laser to a U.S. Army Apache AH-64 helicopter and zapped an unmanned target at the White Sands Missile Range in New Mexico. According to Raytheon, the weapons test marked the first time a "fully integrated laser system" had successfully located and shot a target from a rotary-wing aircraft "over a wide variety of flight regimes, altitudes and air speeds." The goal of the experiment, conducted in collaboration with U.S. Special Operations Command, was to see how well the Apache could fire the weapon given the vibration of the helicopter, the dust kicked up by the rotating blades and the vehicle's "downwash," or downward airflow.



2018

HIGH ENERGY LASER WEAPON SYSTEM ONBOARD A POLARIS MRZR

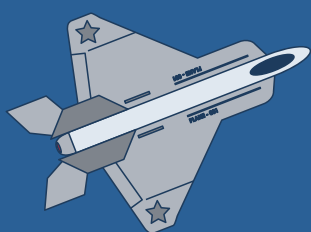
In January of 2018, Raytheon combined a high energy laser with an advanced variant of a Multi-spectral Targeting System – a sophisticated package of electro-optical and infrared sensors – and installed it on a Polaris MRZR. On a single charge from a standard 220v outlet, the HEL system onboard the Polaris MRZR delivers four hours of surveillance, intelligence, and reconnaissance capability and 20 to 30 laser shots. Raytheon began field testing the HELWS MRZR in January, and is scheduled for a demonstration at the U.S. Army's Maneuver Fires Experiment at Fort Sill, Oklahoma, in December 2018.



2020

SURFACE NAVY LASER WEAPON SYSTEM

In January of 2018, the U.S. Navy awarded Lockheed Martin a **\$150 million** contract, with options worth up to **\$942.8 million**, for the development, manufacture and delivery of two high power laser weapon systems. These laser weapons will have intelligence, surveillance and reconnaissance (ISR) and counter-Unmanned Aerial System (counter-UAS) capabilities, to be complete by 2020. With the High Energy Laser and Integrated Optical-dazzler with Surveillance (HELIOS) system, the Navy take a significant step forward in its goal to field laser weapon systems aboard surface ships.



2021

HIGH ENERGY LASER SYSTEM FOR TACTICAL FIGHTER JETS

In 2017, the Air Force Research Lab awarded Lockheed Martin a **\$26 million** contract to develop a high-energy laser system to test on a tactical fighter jet by 2021. Officials declined to specify the laser's capabilities or to identify which aircraft the service will use to test it.

INTERESTED IN LEARNING ABOUT THE UPCOMING DIRECTED ENERGY SYSTEMS SUMMIT?

Future weapons, including directed energy weapons have been in the Research & Development phase for the past several years. As the US armed forces, continue to develop and innovate in order to achieve battlefield overmatch and superiority, the Directed Energy weapon systems are making their way from the R&D phase to DoD and Military programs as the next step before acquisition and force integration.

Over the three-day summit we will examine the latest DE advancements, initiatives and plans regarding technology, acquisition and service roadmaps. This venue will bring together thought leaders, acquisition executives, industry solution providers, and academia in order to tackle some of the challenges that face this community in the near, mid, and far term fight. We will look to gain insight and lessons learned from warfighter perspectives on the operational challenges and requirements of DES that will influence the capabilities of this game-changing technology.

For more information:

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