

A large, complex directed energy weapon is mounted on the deck of a ship. The weapon features a large, circular lens or aperture in the center, flanked by two green lights. The entire assembly is housed in a grey, industrial-looking structure. The background shows a clear sky and the ship's deck with railings.

ACHIEVING MILITARY DOMINANCE WITH DIRECTED ENERGY WEAPONS

Insight from Lt Gen (Ret.) Henry 'Trey' Obering

Who is Trey Obering?



Trey Obering is a Booz Allen Hamilton Executive Vice President based in McLean, Virginia. He works with clients in the Directed Energy area across the DoD and Intelligence communities. An expert in acquisition and program management, he also works with clients in the Air Force Materiel Command, Air Force Space Command, and Missile Defense markets. Based on his experience, he has led two National Academy of Sciences committees sponsored by the Assistant Secretary of the Air Force (Acquisition) to help the Air Force improve the management of their programs. Prior to joining Booz Allen, he led a comprehensive review of the National Reconnaissance Office for the Director, National Intelligence, which provided a new charter for that organization.

Mr. Obering retired from the US Air Force as a Lieutenant General with more than 35 years of experience in space and defense systems development, integration, and operations. He served as Director of the 8,500-person Missile Defense Agency, Office of the Secretary of Defense.

Mr. Obering entered the Air Force in 1973 after completing the University of Notre Dame's ROTC program as a distinguished graduate. He received his pilot wings in 1975 and flew operational assignments in the F-4E. Later, he was assigned to the Space Shuttle program and participated in 15 space shuttle launches as a NASA orbiter project engineer and was responsible for integrating firing room launch operations.

He received a B.S. degree in Aerospace Engineering from Notre Dame University and an M.S. degree in Astronautical Engineering from Stanford University.

**Read his statement about
Directed Energy Systems...**

In the 1951 science fiction film, "The Day the Earth Stood Still," powerful ray guns are shown vaporising rifles and even tanks. In the "Star Wars" movies, a wide variety of directed energy weapons are depicted, from handheld light sabres and pistols to massive spaceship mounted laser cannons. What exactly is a directed energy weapon? Are these weapons still science fiction? How can they be used? Where are we headed in directed energy weapons development?

Directed energy weapons, specifically high-energy lasers, high-power microwave weapons, and charged- and neutral-particle beams, have long been pursued. They are attractive for their speed of light engagement, deep shot magazine, "stealth-like" performance (quiet and invisible beams), precision targeting for both lethal and non-lethal applications and low cost per shot compared to traditional munitions. High energy lasers can range from a few kilowatts to more than a megawatt of power. In early versions, the laser light was generated by chemical reactions. These lasers were large and heavy. In fact, the megawatt class Airborne Laser developed in the late 1990s and early 2000s required an entire Boeing 747 aircraft to hold the equipment. Between 2000 and 2005, a prototype chemical laser successfully destroyed 46 rockets,

artillery shells and mortar rounds in flight during field tests. And in 2010, the Airborne Laser shot down two missiles in their boost phase.

Today, solid state electrical and hybrid lasers are being developed that are much lighter and smaller. In recent years the U.S. Navy deployed a 30-kilowatt class solid state laser weapon on the destroyer U.S.S. Ponce. It is capable of damaging or destroying fast attack boats, unmanned aerial vehicles and can be used for intelligence, surveillance and reconnaissance. More recently, the U.S. Army deployed a high energy laser on its Stryker vehicles in Europe for testing against unmanned vehicles and other targets. High power microwave weapons can interrupt or destroy electronics and can be used non-lethally against humans to form a defensive perimeter.

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So, for example, directed energy weapons could be used to stop swarms of small adversary boats which have been harassing U.S. ships in international waters or to stop vehicles carrying improvised explosive devices at a safe distance from our personnel. As another example, high energy lasers could be used to protect forward-deployed troops and bases from attacks by unmanned aircraft carrying explosive devices. More powerful high energy lasers mounted on high altitude unmanned aircraft could be used to destroy short to long range missiles while they are still boosting. The U.S. Missile Defence Agency, which I used to lead, has just such a program under development. And imagine how the geo-political calculus would change if an array of directed energy weapons were deployed around Seoul to protect its 10 million inhabitants from North Korea's 14,000 artillery and

rocket launchers which are within striking range.

Directed energy weapons are no longer just science fiction. They are real and are maturing rapidly. In the next several years, the U.S. Army, Navy and Air Force all plan to develop and field these weapons at an increasing pace. They will be deployed on land vehicles, aircraft, helicopters and ships. Even the most conservative market projections for directed energy weapons indicate nearly \$30 billion being spent by the U.S. over the next ten years. They are not the answer to all our challenges, and will not replace kinetic weapons, but they are an essential adjunct to countering specific threats and providing dominance in land, air, sea, and space. The only question in my mind is whether the United States and our allies will achieve that dominance before an adversary does.

**Want to hear more from Lt Gen (Ret) Henry
'Trey' Obering?**

**Join us at Directed Energy Systems 2018,
where he will talk about the need for
development and investment in DEWS in order
to maintain military superiority.**

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