

The US Navy Bought Its First Big Laser Cannon

New, drone-frying weapon could go to sea in 2020.

[David Axe](#) Feb 7 2018



The U.S. Navy Afloat Forward Staging Base (Interim) USS *Ponce* (ASB(I)-15) conducts an operational demonstration of the Office of Naval Research (ONR)-sponsored Laser Weapon System (LaWS) while deployed to the Arabian Gulf. Image: U.S. Navy photo by [John F. Williams](#)/Wikimedia Commons

In late January, the US Navy [dropped](#) \$150 million on a pair of new laser cannons. One of the so-called "High Energy Lasers," built by Lockheed Martin, is destined for testing on land.

The other is going to sea aboard an *Arleigh Burke*-class destroyer as early as 2020, potentially making it the world's first large, war-ready "directed-energy" weapon.

Lockheed's laser reportedly draws as much as 150 kilowatts of power per shot—enough to fry boats and unmanned aerial vehicles. Upgrading the laser to 300 kilowatts, thus boosting its range and power, [could allow it](#) to also destroy fast-moving, incoming missiles before they can strike their targets.

A laser fires more quickly and more cheaply, per shot, than today's missile launchers and conventional guns. The Navy is counting on inexpensive, quick-firing lasers to help it match a rapidly-modernizing Chinese fleet.

The Navy announced its purchase of the directed-energy cannons on January 26, a little less than a year after first [taking bids](#) for a "proven laser weapon" that could be installed on destroyers in the "shortest timeframe possible." Four companies bid on the contract.

The contract award came just a few days before photos [circulated](#) online apparently depicting a prototype electromagnetic railgun on the deck of a Chinese warship at a port on the Yangtze River. A railgun uses magnetism rather than gunpowder to propel a shell, giving the munition greater range and power.

The US Navy has been experimenting with railguns on land, but has yet to send one to sea. With its surprise railgun installation, China has pulled ahead of the United States in one key military technology. The new laser weapon could help the Americans catch up.

Electromagnetic and directed-energy weapons are different in many ways but do some of the same things. Both rely on electrical power rather than gunpowder, making them faster-acting than old-style guns. Both can destroy attacking boats, missiles and aircraft, making them potentially powerful defensive weapons.

Whereas missiles can cost a million dollars or more apiece and even railguns fire expensive shells, lasers don't need projectiles at all. Each shot costs just a few dollars. That's an important consideration during wartime.

"In combat scenarios ... against a country such as China that has many UAVs and anti-ship missiles and a capacity for building or acquiring many more, an unfavorable cost-exchange ratio can become a very expensive—and potentially unaffordable—approach to defending Navy surface ships," Ronald O'Rourke, a naval expert with the Congressional Research Service, wrote in a November [report](#).

The Navy is betting on lasers to alter that defensive calculation. "Low-cost directed energy weapons have to be part of our future," Adm. William Moran, then Vice Chief of Naval Operations, [said](#) at an industry conference in 2016. "If we have to continue to rely on projectiles, we will run out of the ability to defend ourselves."

The Navy installed an experimental, 30-kilowatt laser aboard the amphibious ship USS *Ponce* in 2014 and tested it at short range against flimsy target drones and boats. Defense contractor Kratos quickly cobbled together that initial laser using existing components.

It was unimpressive. The tests "reminded me of an old cartoon in which someone shot an arrow at the side of a barn, then painted a bulls-eye around the spot where the arrow landed," Subrata Ghoshroy, an MIT researcher, [wrote](#) for *Bulletin of the Atomic Scientists*.

But *Ponce's* laser helped the Navy to figure out what it wanted from a combat-ready directed-energy weapon. "The acquired expertise and know-how will enable the subsequent development and confidence for a notional naval maritime laser-based weapon system," the Naval Research Laboratory explained on its [website](#).

The Navy clearly expects Lockheed's new laser to be a much more effective weapon, and is already anticipating ordering more copies. The January deal includes contract options worth an additional \$800 million. That's enough to buy another 10 weapons and arm more than 10 percent of the fleet's destroyers.