



Updated March 27, 2025

The U.S. Army's Long-Range Hypersonic Weapon (LRHW): Dark Eagle

What Is the Army's Long-Range Hypersonic Weapon?

The Army's Long-Range Hypersonic Weapon (LRHW), also known as Dark Eagle (Figure 1), with a reported range of 1,725 miles, consists of a ground-launched missile equipped with a hypersonic glide body and associated transport, support, and fire control equipment. According to the Army,

This land-based, truck-launched system is armed with hypersonic missiles that can travel well over 3,800 miles per hour. They can reach the top of the Earth's atmosphere and remain just beyond the range of air and missile defense systems until they are ready to strike, and by then it's too late to react.

Figure 1. Artist Rendition of a Notional LRHW Unit



Source: <https://www.popularmechanics.com/military/weapons/a3642123/army-hypersonic-weapon-1700-mile-range/>, accessed November 18, 2021.

The Army further notes,

The LRHW system provides the Army a strategic attack weapon system to defeat Anti-Access/Area Denial (A2/AD) capabilities, suppress adversary long-range fires, and engage other high payoff/time critical targets. The Army is working closely with the Navy in the development of the LRHW. LRHW is comprised of the Common Hypersonic Glide Body (C-HGB), and the Navy 34.5-inch booster.

LRHW Components

Missile

The missile component of the LRHW is reportedly being developed by Lockheed Martin and Northrop Grumman. When the hypersonic glide body is attached, it is referred to as the Navy-Army All Up Round plus Canister (AUR+C). The missile component serves as the common two-stage booster for the Army's LRHW and the Navy's

Conventional Prompt Strike (CPS) system, which can be fired from both surface vessels and submarines.

Common Hypersonic Glide Body (C-HGB)

The C-HGB is reportedly based on the Alternate Re-Entry System developed by the Army and Sandia National Laboratories. Dynetics, a subsidiary of Leidos, is currently under contract to produce C-HGB prototypes for the Army and Navy. The C-HGB uses a booster rocket motor to accelerate to well above hypersonic speeds and then jettisons the expended rocket booster. The C-HGB, which can travel at Mach 5 or higher on its own, is planned to be maneuverable, potentially making it more difficult to detect and intercept.

LRHW Organization and Units

The LRHW is organized into batteries. According to the Army "a LRHW battery consists of four Transporter Erector Launchers (TELs) on modified M870A4 trailers, each equipped with two AUR+Cs (eight in total), one Battery Operations Center (BOC) for command and control, and a BOC support vehicle."

The 5th Battalion, 3rd Field Artillery Regiment at Joint Base Lewis-McChord, WA, was designated to operate the first battery of eight LRHW missiles. The battalion, also referred to as a Strategic Long-Range Fires battalion, is part of the Army's 1st Multi Domain Task Force (MDTF), a unit in the Indo Pacific-oriented I Corps stationed at Joint Base Lewis-McChord, WA. Other LRHW batteries are planned for Strategic Long-Range Fires battalions in the remaining MDTFs scheduled for activation.

LRHW Testing and Program Activities

According to a 2023 Congressional Budget Office (CBO) Study, "U.S. Hypersonic Weapons and Alternatives," "Extensive flight testing is necessary to shield hypersonic missiles' sensitive electronics, to understand how various materials perform, and predict aerodynamics at sustained temperatures as high as 3,000° Fahrenheit." The Army originally planned for three flight tests of the LRHW before the first battery fielding in FY2023. On October 21, 2021, the booster rocket carrying the C-HGB vehicle reportedly failed a test flight, resulting in what defense officials characterized as a "no test" as the C-HGB had no chance to deploy. Reportedly, a June 2022 test of the entire LRHW missile also resulted in failure.

Flight Test Delays

In October 2022, it was reported the Department of Defense (DOD) delayed a scheduled LRHW test in order to "assess the root cause of the June [2022] failure." Reportedly, the delayed test would be rescheduled to the first quarter of FY2023.

March 2023 LRHW Test Scrubbed

On March 10, 2023, it was reported,

On March 5, DOD was preparing to execute Joint Flight Campaign-2 featuring the Army version of the prototype weapon launched at Cape Canaveral Space Force Station, FL, when the countdown was halted.... As a result of pre-flight checks during that event, the test did not occur.

Cancelled September 2023 LRHW Test and Program Delay

On September 6, 2023, it was reported,

The DOD planned to conduct a flight test at the Cape Canaveral Space Force Station, Florida, to inform hypersonic technology development. As a result of pre-flight checks, the test did not occur.

On September 14, 2023, in an Army statement to Bloomberg News, the Army reportedly acknowledged it would not be able to meet its goal of deploying the LRHW by the end of FY2023.

LRHW Fielding Delayed Until FY2025

According to a June 2024 Government Accountability Office (GAO) report to Congress,

The Army missed its goal of fielding its first LRHW battery—including missiles—by fiscal year 2023 due to integration challenges. Based on current test and missile production plans, the Army will not field its first complete LRHW battery until fiscal year 2025. Before the Army can field an operational system, it must conduct a successful end-to-end missile flight test using the Army's launch system.

GAO further notes,

The LRHW integration issues discovered during testing also affect missile production. The Army cannot complete the missiles for the first battery until a successful test demonstrates that the current design works. LRHW officials stated that once a successful flight test is achieved, the first production missile will be delivered within approximately six weeks and the first battery of eight missiles will be delivered within approximately 11 months.

Successful LRHW Flight Test

On June 28, 2024, DOD announced,

The U.S. Navy and U.S. Army recently completed an end-to-end flight test of a hypersonic missile from the Pacific Missile Range Facility, Kauai, HI.

Reportedly, the two-stage missile was launched from a ground stand from Hawaii across the Pacific Ocean more than 2,000 miles to a test range in the Marshall Islands, with the missile flying its intended course and releasing the C-HGB, which flew to the target.

December 2024 LRHW Flight Test

On December 12, 2024, DOD announced,

The U.S. Army's Rapid Capabilities and Critical Technologies Office, in collaboration with the U.S. Navy Strategic Systems Programs, recently completed a successful end-to-end flight test of a conventional hypersonic missile from Cape Canaveral Space Force Station, Florida.

"This test builds on several flight tests in which the Common Hypersonic Glide Body achieved hypersonic speed at target distances and demonstrates that we can put this capability in the hands of the warfighter," said Secretary of the Army Christine Wormuth.

This is the second successful end-to-end flight test of the All Up Round (AUR) this year and was the first live-fire event for the Long-Range Hypersonic Weapon system using a Battery Operations Center and a Transporter Erector Launcher.

Tentative LRHW Fielding Plans

Reportedly as of February 2025, the Army intended to field the LRHW to the first unit by the end of FY2025. It is not known if the first LRHWs will be deployed to the Indo-Pacific aligned 1st Multi-Domain Task Force (MDTF), 5th Battalion, 3rd Field Artillery Regiment, 17th Field Artillery Brigade unit at Joint Base Lewis-McChord, WA, as originally planned.

Pending Army Leadership LRHW Fielding Decision

Reportedly, senior Army leaders "have not yet blessed a roadmap for getting the delayed Dark Eagle hypersonic weapon into soldiers' hands, but that decision could be coming shortly." According to the article, with a new Secretary of the Army and other key Army acquisition officials, LRHW program officials have not yet been able to brief them on the program and decisions on when LRHW is to be fielded and when initial operational capability is to be achieved "have to be vetted."

Consideration for Congress

A possible oversight consideration for Congress could include the following:

LRHW Missile Costs and Stockpile

According to a January 2023 CBO study, "U.S. Hypersonic Weapons and Alternatives," purchasing 300 Intermediate-Range Hypersonic Boost-Glide Missiles (similar to the LRHW) was estimated to cost \$41 million per missile (in 2023 dollars). Since this 2023 CBO cost estimate, little has been said about the actual per missile cost of the LRHW. With the Army planning to field LRHWs to units by the end of FY2025—if the Army's new leadership team concurs—an actual per missile cost should be available for policymakers. With an established per missile cost, the Army should also be able to provide Congress with details about the total LRHW stockpile it intends to procure and how long it will take to "grow" the LRHW stockpile.

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