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

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

The Army's Long-Range Hypersonic Weapon (LRHW) (**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/a36421213/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 is

intended to 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 is planned to be maneuverable, making it more difficult to detect and intercept and "can travel at Mach 5 or higher ... at least five times faster than the speed of sound or up to 13,000 miles per hour."

LRHW Organization and Units

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

Reportedly, the 5th Battalion, 3rd Field Artillery Regiment at Joint Base Lewis-McChord, Washington, is 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 Pacific-oriented I Corps also stationed at Joint Base Lewis-McChord. 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, understand how various materials perform, and predict aerodynamics at sustained temperatures as high as 3,000° Fahrenheit."

The Army had 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" because 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 and Possible Delay in FY 2023 Fielding

According to a March 10, 2023 *Inside Defense* article, “DOD Scrubs Key Hypersonic Weapons Test, Adding Risk to Army FY-23 Fielding Plans”

On March 5, the Defense Department 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.

The article further suggests “The test is at least six months behind schedule, consuming precious little margin in an effort to field a first prototype Army unit by the end of this year.” It is not known if or when the March 5, 2023 LRHW test might be rescheduled or if DOD or the Army will schedule additional LRHW flight tests as part of Joint Flight Campaign-2.

DOD Inspector General Evaluation of LRHW and Navy Conventional Prompt Strike

On August 8, 2022, the DOD Inspector General (IG) informed the Army and Navy that it would initiate an evaluation “to determine whether the Army Long Range Hypersonic Weapon and the Navy Conventional Prompt Strike Program Offices are meeting their weapons systems development and fielding timelines and milestones.” It is not known when the DOD IG evaluation will be completed and available for congressional review.

LRHW Ground Support Equipment Procurement

In October 2022, the Army reportedly announced it would transition from an Other Transaction Agreement (OTA) acquisition strategy to a traditional Federal Acquisition Regulation (FAR) acquisition strategy for LRHW ground support equipment (LRHW Transporter Erector Launcher [TEL] and Battery Operations Center). By adopting a FAR acquisition strategy, the Army hopes to attract multiple bidders for LRHW ground support equipment. Reportedly, the Army plans to field a prototype LRHW battery in FY2023 and transition to a formal Program of Record and field the second and third batteries in FY2025 and FY2027. There are also plans for technology insertions intended to upgrade the C-HGB in FY2026 and FY2027.

FY2024 LRHW Budgetary Information

Table I. FY2024 LRHW Budget Request

Funding Category	Total Request (\$M)
RDT&E	\$944.355
Procurement	\$156.821

Sources:

RDT&E—Department of Defense Fiscal Year 2024 Budget Estimates, Army Justification Book 2b of 2, RDT&E, Volume II, Budget Activity 4B, March 2023, p. 257 and Department of Defense Fiscal Year 2024 Budget Estimates, Army Justification Book 3d of 3, RDT&E, Volume II, Budget Activity 5D, March 2023, p. 179.

Procurement—Department of Defense Fiscal Year 2024 Budget Estimates, Army Justification Book of Missile Procurement, March 2023, p. 80.

Notes: RDT&E = Research, Development, Test & Evaluation; \$M = U.S. dollars in millions.

Considerations for Congress

Oversight questions Congress could consider include the following:

LRHW Testing and Planned FY 2023 Fielding

As previously discussed, the Army has experienced a number of test delays and “no-tests” since 2021. In addition, the DOD Inspector General has undertaken an evaluation “to determine whether the Army Long Range Hypersonic Weapon and the Navy Conventional Prompt Strike Program Offices are meeting their weapons systems development and fielding timelines and milestones.” Despite these events, the Army seemingly remains publicly committed to fielding its first operational prototype LRHW battery by the end of FY 2023. If the LRHW testing program is “at least six months behind schedule” as has been suggested, policymakers could examine if the Army’s 2023 LRHW fielding plans are realistic and if additional testing to account for “no-test” events and past test failures might be warranted.

LRHW Missile Costs

According to a January 2023 Congressional Budget Office Study (CBO) study, “U.S. Hypersonic Weapons and Alternatives,” purchasing 300 Intermediate-Range Hypersonic Boost-Glide Missiles (Similar to LRHW/IR-CPS) was estimated to cost \$41 million per missile (in 2023 dollars).

A January 2023 Center for Strategic and International Studies (CSIS) report, “The First Battle of the Next War: Wargaming a Chinese Invasion of Taiwan,” when discussing hypersonic weapons, suggests

Their high costs limits inventories, so they lack the volume needed to counter the immense numbers of Chinese air and naval platforms (p. 5).

Given concerns about LRHW costs and how costs could influence LRHW inventories, policymakers might decide to further examine LRHW missile costs as well as quantities of LRHW missiles needed to support potential combat operations in various theaters where LRHW units could be employed.

Andrew Feickert, Specialist in Military Ground Forces

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