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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 Indo 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 FY2023 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.”

Cancelled September 2023 LRHW Test and Program Delay

On September 6, 2023, it was reported

The Department of Defense 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. The Department was able to successfully collect data on the performance of the ground hardware and software that will inform the continued progress toward fielding offensive hypersonic weapons.

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

It is not uncommon for fielding dates to adjust based on real-time developments. We continue to aggressively pursue the testing and fielding of long-range hypersonic weapons. Our goal is to field the system as soon as possible following a successful test. It is a top modernization priority for the Army and for the Department of Defense.

If this statement is taken literally, the Army intends to field the LRHW after a single successful flight test. No further information was provided on future LRHW testing, including possible dates and a test plan.

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

LRHW Testing and Fielding Plans

The Army has experienced a number of test delays and “no-tests” since 2021. Despite this, the Army remained publicly committed to fielding its first LRHW battery by the end of FY2023. The cancellation of the September 6, 2023, test flight, the admission that the Army would not meet its end of FY2023 deployment goal, and the apparent plan to field the LRHW upon the successful completion of a single test flight arguably raise possible questions for policymakers on the Army’s current testing and fielding plans for the LRHW.

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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