FACT SHEET

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THE HERA TARGET MISSILE

INTRODUCTION

The U.S. Congress and the Department of Defense (DoD) have directed that the Ballistic Missile Defense Organization (BMDO) develop and test defensive missile systems to protect U.S. and allied forces from theater ballistic missile (TBM) attack. Effective tests for theater missile defense (TMD) require ballistic targets to simulate real threats. To be useful for testing, target missiles must be reliable and have more flexible flight paths and ranges than real offensive ballistic missiles. BMDO currently uses four ballistic missile target systems: the STORM, the HERA, the STARS, and the MINUTEMAN II (MM II). The HERA provides intermediate range targets.

THE HERA TARGET MISSILE

The HERA missile has first and second stage solid propellant motors and a target payload. This missile system consists of Minuteman II second and third stage motors, with improved guidance, telemetry, and flight termination systems. The HERA is small compared to many other missiles in common use. It is six times smaller and much simpler than the Titan IV missile and about half the size of the Minuteman intercontinental ballistic missile. Coleman Research Corporation of Orlando, Fla. serves as the primary contractor.

The HERA missile's launch mass is 10,827 kilograms (23,869 pounds) and is composed of two stages and a payload. The first stage, powered by a MMII second stage motor, contains 6,236 kilograms (13,748 pounds) of propellants which burn for approximately 64 seconds. This first stage booster motor drops off at a predetermined altitude and velocity that sends the empty motor case to a designated safe booster impact area. The second stage motor is from a MMII third stage and contains 1,659 kilograms (3,658 pounds) of propellant and can boost the payload for up to 60 seconds. The second stage normally separates from the target payload when propulsion ceases, however, it can remain attached to the payload if required by the test. The second stage thrust can be terminated to control range.

The HERA is intended to perform as a ballistic target vehicle (BTV) as well as a maneuvering target vehicle (MTV). The MTV uses a modified version of the Pershing II Reentry Vehicle (RV) as a baseline, and both it and the BTV are designed to accommodate a bulk or submunition chemical experiment payload. Modifications to the HERA design are being performed in order to better emulate threat characteristics. Some of the modifications being made are in the areas of RV radar cross section (RCS) signature, infrared (IR) signature, and second stage coast/reorientation prior to second stage ignition.

The HERA missile suffered a launch failure on November 17, 1997. Launched from the new Ft. Wingate launch complex at White Sands Missile Range, the second stage failed to ignite following stage separation, resulting in its falling into the booster drop zone. Improvements were made and on March 2, 1998, a HERA was successfully launched from Ft. Wingate into WSMR. Another similar failure occurred at Ft. Wingate on December 18, 1998. The failure was traced to a spurious signal sent between first stage ignition and umbilical separation. The problem has since been corrected.

HERA provides 4 unique targets:

Unitary Configuration
The M57A1 stays attached to the RV during BTV descent

Separating Configuration
The BTV RV descends by itself

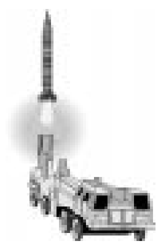
BTV Pile Driver Configuration
The RV remains attached to the M57A1 during descent

The MTV Configuration
The RV separated and can maneuver during descent.*

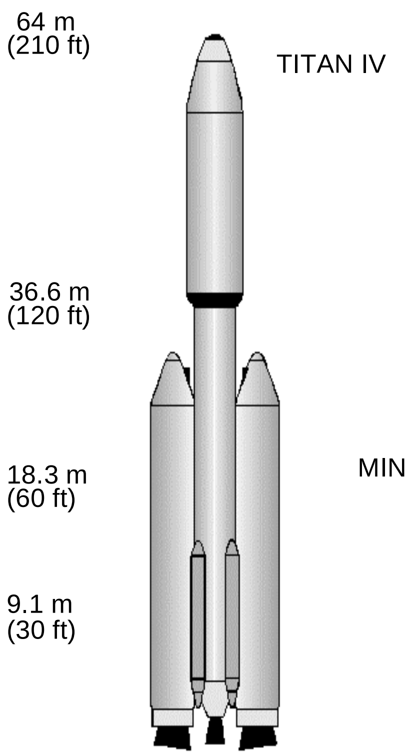
*Lengths for these various configurations range form three to eight meters and all configurations have tailorable RCS and IR signatures. Any MTV or BTV configuration can accommodate either a simulated bulk chemical or submunition payload.

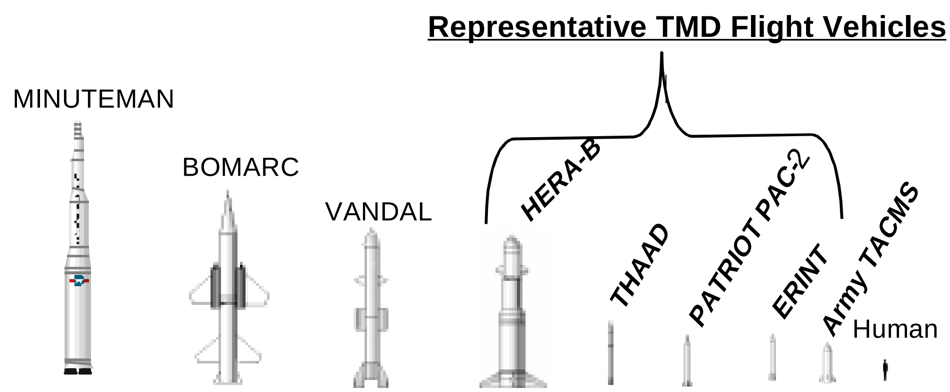
Theater Ballistic Missile Defense Flight Vehicle Comparison

Target Missiles are Necessary to Simulate Real Threats



This type of mobile Scud- missile launcher came into prominence during the Persian Gulf War (1990). Iraq modified their Soviet made Scuds to double the Scud's range to 650 km. Without an effective warhead, Scuds are primarily weapons of fear and terror. However, their mobility makes them extremely difficult to find and eliminate.





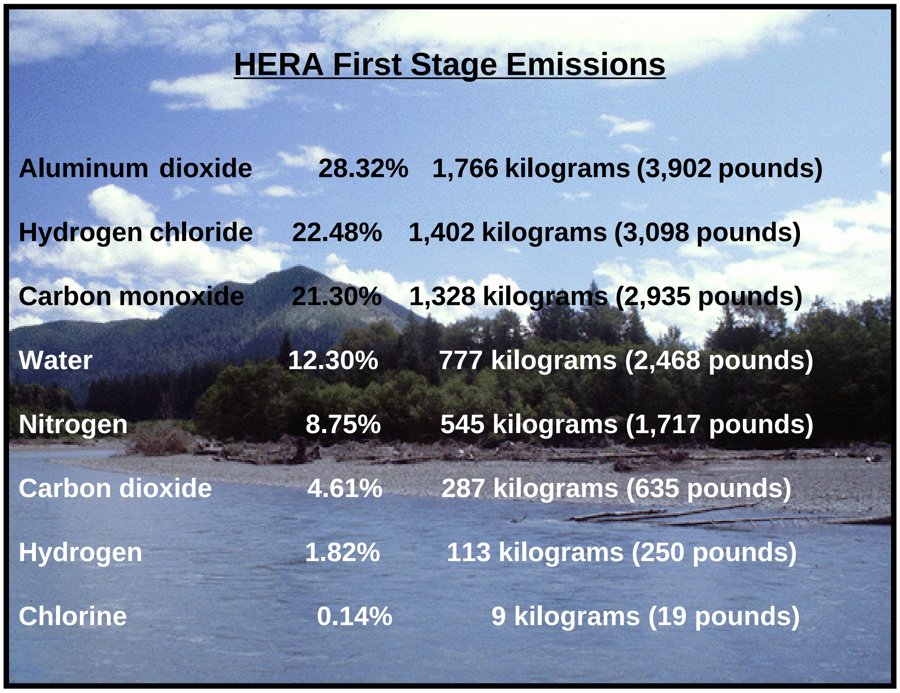
THE HERA TARGET MISSILE AND ENVIRONMENTAL SAFETY

The first stage flies the missile through the troposphere (11 kilometers/ 7 miles) into space. The second stage operates in space. In the course of its burn, the first stage rocket motor exhausts about one-half of its emissions in the troposphere and about one-half above the troposphere. All emissions are nontoxic in small concentrations. Atmospheric wind transport models and other analytic tools are used to predict ground level concentrations of emissions and their effect on humans and the environment. During launches, air samples are taken to measure actual concentrations as an extra precaution.

The possibility of catastrophic events such as accidental booster motor explosion must be prevented. HERA managers focus considerable effort on finding and correcting flaws in booster motors and other missile components to prevent failure. Booster motors undergo extensive testing including X-rays, refurbishing, and replacement of any suspected defective components.

The Flight Termination System (FTS) employs redundant telemetry links and disabling techniques to ensure missiles fall safely should test events deviate from the test plan. The FTS has proven reliable in both test evaluations and actual use. This system incorporates redundant elements to ensure that failure of an individual component will not prevent proper flight termination from occurring. The HERA FTS design allows flight termination in three ways: splitting the first stage booster case, splitting the second stage case, or thrust termination of the second stage booster. Thrust termination allows the HERA's second stage and payload to descend in one piece, minimizing the spread of debris.

The HERA payload must closely simulate real threats for effective interceptor testing. The payloads contain no explosives but are configured in size, shape, weight, and physical properties to behave like actual threats. Payload alternatives include inert weights, water, and chemical simulants. The HERA FTS, upon command, dispenses the payload to ensure that measurable concentrations of any chemical simulant do not reach the ground.



HERA First Stage Emissions

Aluminum dioxide	28.32%	1,766 kilograms (3,902 pounds)
Hydrogen chloride	22.48%	1,402 kilograms (3,098 pounds)
Carbon monoxide	21.30%	1,328 kilograms (2,935 pounds)
Water	12.30%	777 kilograms (2,468 pounds)
Nitrogen	8.75%	545 kilograms (1,717 pounds)
Carbon dioxide	4.61%	287 kilograms (635 pounds)
Hydrogen	1.82%	113 kilograms (250 pounds)
Chlorine	0.14%	9 kilograms (19 pounds)

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