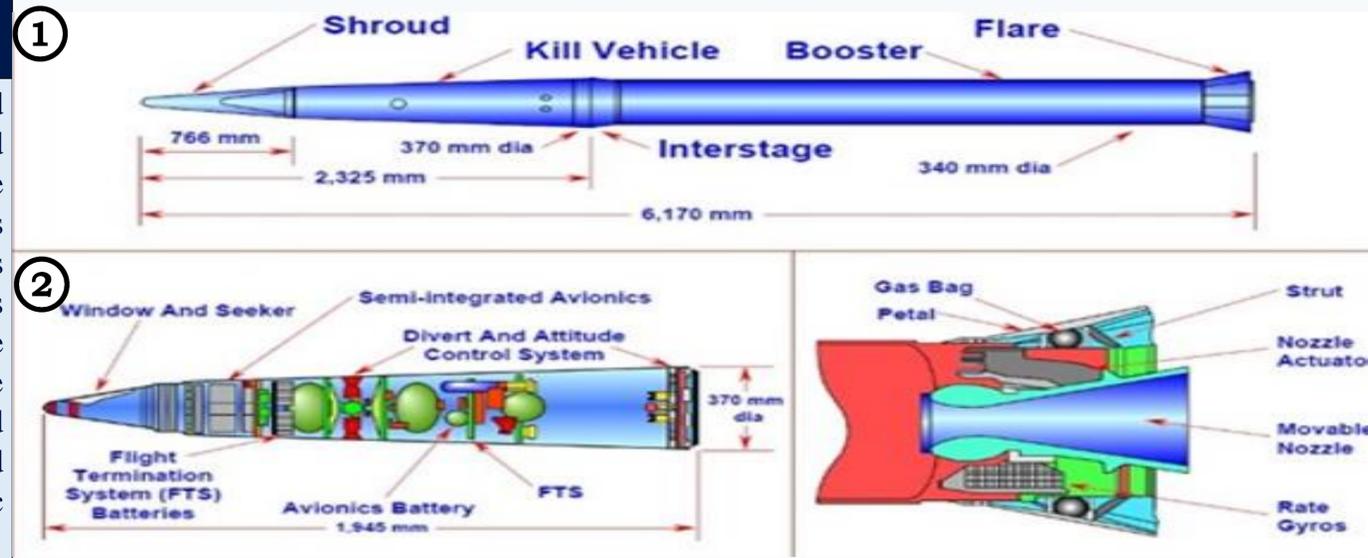


THAAD: FACING THE COMPLEX BALLISTIC MISSILE THREAT

The Threat

Over the past two decades, the United States and its allies have been faced with rapidly growing ballistic missile threats from many countries such as North Korea and Iran. To confront this growing threat, the United States military has recently deployed the Terminal High Altitude Area Defense (THAAD) system, designed and produced primarily by Lockheed Martin, as an integral part of its ballistic missile defense infrastructure.



Vulnerabilities

Cost

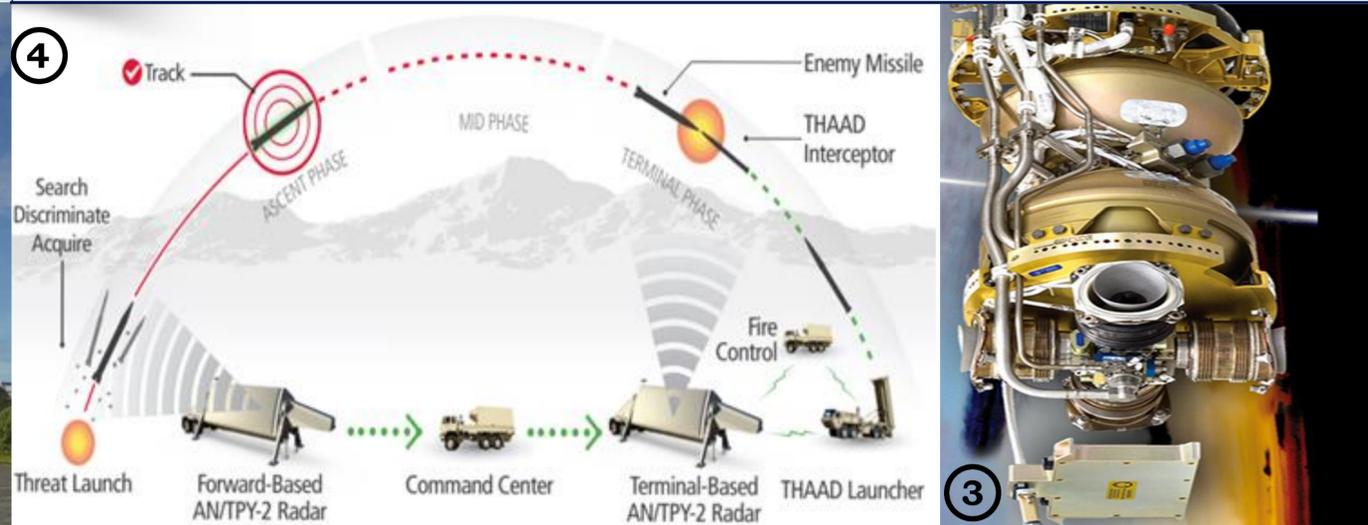
One THAAD battery including six launchers, a total of 48 interceptors along with an AN/TPY-2 radar system costs around \$800 million.

Large Scale-Attacks

Due to the limited number of available interceptors, it is possible for a large-scale attack to overwhelm the THAAD system.

Range

Currently, a THAAD battery can defend an area within approximately 200 km of its location. Greater range would allow for increased protection.



Sustainability and Societal Impact

- As a result of North Korea's continued testing and development of ballistic missiles within the past several years, the United States has deployed a THAAD battery to South Korea and may deploy another.
- Shown below is a computer generated approximation of the area in which this THAAD system is able to eliminate incoming threats.
- While the THAAD system may not seem to provide a direct improvement to the quality of life of those in society, the role that it plays in national defense has critical societal consequences. The THAAD system serves as a strong deterrent against nuclear and non-nuclear ballistic missile strikes.

THAAD Missile Components

1. Interceptor

- The interceptor serves as a transport for the kill vehicle, placing it in the path of the hostile ballistic missile. The THAAD interceptor is approximately six meters in length and weighs roughly 900kg.
- The interceptor utilizes a solid fuel rocket motor, developed by Pratt and Whitney.

2. Kill Vehicle

- THAAD is designed as a hit-to-kill interceptor, which means that it destroys a hostile missile by using the kinetic energy of its kill vehicle to smash into and destroy the hostile missile in flight. The kill vehicle is guided by an infrared seeker module in the nose of the missile.
- The kill vehicle is guided towards its target at astonishing speeds of up to Mach 8.2, or approximately 2.8 kilometers per second.

3. Divert and Altitude Control System

- The DACS, designed and produced by Aerojet Rocketdyne, is comprised of six liquid-fueled rocket thrusters.
- These thrusters can be individually actuated, which allows for precise positioning of the kill vehicle.
- In the final moments of flight, the DACS precisely guides the kill vehicle to interception with the hostile ballistic missile.

4. AN/TPY-2 Radar

- The Army Navy/ Transportable Radar Surveillance (AN/TPY-2) system, is designed and produced by Raytheon.
- The figure above shows how a system of AN/TPY-2 radars assist THAAD in tracking hostile missiles.
- Without the advanced capabilities of THAAD's AN/TPY-2 radar, the system would be unable to defend against threats, even with its advanced interceptors and kill vehicles.

