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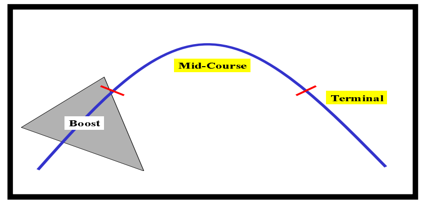
BOOST PHASE MISSILE DEFENSE

INTRODUCTION



In Boost Phase Missile Defense, ballistic missiles are intercepted prior to termination of powered flight during a time when it is moving relatively slowly and has a highly visible plume. Boost Phase Missile Defense will be most effective when the enemy is deprived of safe-havens to launch ballistic missiles. Safe-havens are those regions inside the enemy territorial borders that are out of reach of boost phase missile defense elements.

An effective boost phase capability could contribute to the robustness and flexibility of the overall BMD system by occupying a defensive niche that is currently underdeveloped.

MDA will explore potential technologies and approaches to develop operational boost defense concepts, experiments, and necessary infrastructure. At the same time, MDA is mitigating risk by rigorous managment of competing technologies and systems on parallel development tracks. For the boost segment, MDA will explore kinetic energy (KE) and directed energy (DE) concepts using basing modes at sea (KE), in the air (ABL), and in space (KE and SBL). The boost defense efforts will result in an ABL boost phase lethal demonstration by 2004, a KE intercept by 2005, and an SBL demonstration by 2012.

DESCRIPTION

The ability to defeat missiles during their boost phase requires quick reaction times, continuous monitoring and vigilance, and high confidence in decision-making. Boost engagement time is relatively short. Because most of boost phase takes place in the atmosphere, weather can play a decisive role in obscuring some sensors in the early stages of boost phase. This increases the stress on human reaction times, and potentially interferes with the time the KE interceptor needs to fly to the intercept point.

ADVANTAGES

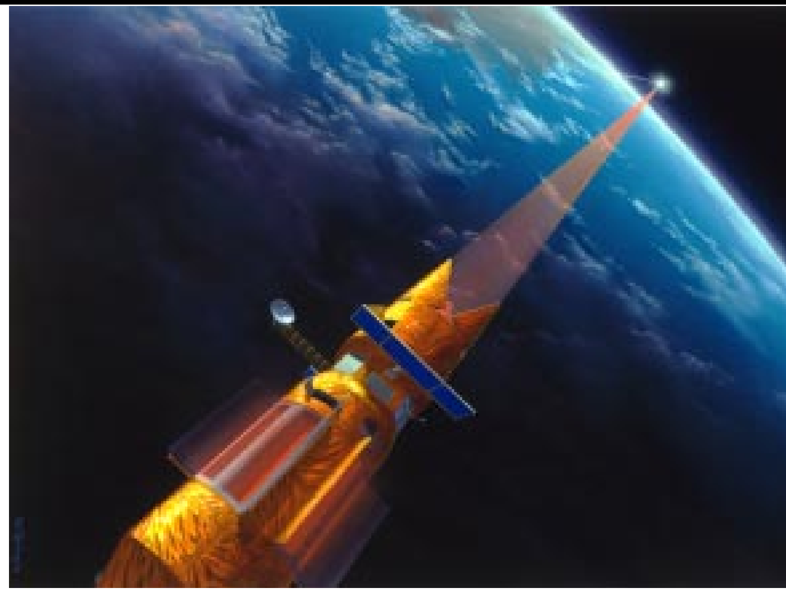
A boost phase intercept capability is desirable because the missile exhaust plume can be readily detected, a missile is of higher value, and countermeasures haven't been deployed. Although it is accelerating, the missile travels relatively slowly. Also, it is a relatively large target. A successful boost phase intercept would cause debris to fall short of its intended target, and possibly on enemy territory.

ACTIVITIES

ABL (Airborne Laser)

The ABL element is a high energy chemical oxygen iodine laser system mounted on a 747-400F that will operate at altitudes above the clouds where it can acquire and track ballistic missiles during their boost flight. The ABL then accurately points the laser beam that projects enough energy to initiate destruction of the missile. With onboard sensors, each ABL aircraft will conduct long-range, wide-area surveillance of regions from which threat missiles might launch. ABL will conduct a flight test in early 2002 and has a lethal demonstration planned for late 2003.

SBL (Space Based Laser)



A future SBL element would be composed of a constellation of high energy laser patforms operating from space. Similar to the ABL, the SBL would destroy ballistic missiles by focusing and maintaining a high-powered laser beam on a target until it causes catastrophic destruction.

An operational SBL system could provide a highly-effective, flexible defense against ballistic missile attack through inherent features of boost-phase capability and continuous, global availability. Near-term SBL activity will focus on design validation and risk reduction activities supporting an Integrated Flight Experiment (IFX), intended to provide an on-orbit lethal demonstration of SBL technologies by 2012. In parallel , other enabling technologies supporting an operational SBL, such as large lightweight deployable optics, will be developed and demonstrated through ground testing. The SBL IFX project builds on many years of component development, high power laboratory integration and legacy flight experiment designs.

Kinetic Energy

The kinetic energy concepts activity aggressively melds operational concepts with risk reduction to produce experiments and system to deliver concrete demonstrations by FY2005. Kinetic boost phase intercept is a challenge because the threat missile must be detected and confirmed within a few seconds of launch. It then becomes a race between an accelerating ballistic missile and the interceptor. Another technical challenge is designing a kill vehicle that can detect and track the target following missile-staging events and then collide into the missile hard body in the presence of an intense plume.

The object of this work is to make product line decisions in the next two or three years that would deliver useful initial boost defense capability by 2010, either from a mobile sea-based or a space-based platform. Our acquisition strategy involves extensive risk reduction to resolve critical technological risks associated with candidate boost systems and the development of a concept of operations through war-gaming and other planning activities. MDA will test a sea-based kill vehicle against a threat representative target that could put us on the path to an operational sea-based intercept capability in the 2005 timeframe as part of Block 2006. This activity will simultaneously support a space-based experiment (SBX) using a space-based kinetic energy kill vehicle.

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