# U.S. BALLISTIC MISSILE DEFENSE PROGRAMS

## Introduction

The global proliferation of ballistic missile technology and weapons of mass destruction is one of the most immediate and dangerous threats to U S national security in the post Cold War era As the use of Scuds during the Persian Gulf war demonstrated, we cannot rely on traditional notions of deterrence to prevent the use of ballistic missiles by hostile countries

The development and deployment of defenses to protect against ballistic missile threats -- initially against theater ballistic missiles and later, if necessary, against long-range threats to the United States that could emerge after the turn of the decade -- are important parts of a U S defense strategy that emphasizes response to a wide spectrum of potential challenges and regional conflicts

Ballistic Missile Defense (BMD) programs are also an integral and complementary part of the U S counter-proliferation strategy.

## Program Objectives

The Department's Ballistic Missile Defense Program is focused on three broad objectives

1) ***Theater Missile Defense (TMD)***
To meet the immediate and growing threat from shorter range theater ballistic missiles, the highest priority is assigned to the development and deployment of TMD. The program is structured to put capability into the field quickly by upgrading existing TMD

### Lessons From The Persian Gulf War

In January 1991, Saddam Hussein commenced his Scud campaign with strikes against troops and civilians in Saudi Arabia and Israel Allied forces responded with the PATRIOT antimissile system and with air strikes against mobile Scud forces Several important lessons were learned about the political and military value of theater missile defense

- Ballistic missiles, even when armed only with conventional warheads, were not only effective terror weapons, but potentially effective military weapons Therefore, protection of civilian population centers and other nonmilitary assets proved to be important
- Traditional notions of deterrence may not always apply in regional conflict situations Instead of being deterred by the possibility of Israeli retaliation against Scud attacks, Saddam sought to provoke such a response, luring Israel into the conflict to change the political dynamics of the war In this type of situation, the presence of defenses can be decisive in avoiding escalation
- Preemption was not an effective strategy against mobile missile systems Despite our air supremacy, we were unable to find the mobile Scud launchers and halt the Scud attacks against Israel and Saudi Arabia

In a world of regional threats to the United States, BMD affords the U S greater freedom of action to protect its interests without fear of coercion BMD can bolster the solidarity of coalitions and alliances, and provides a response to crises that is less

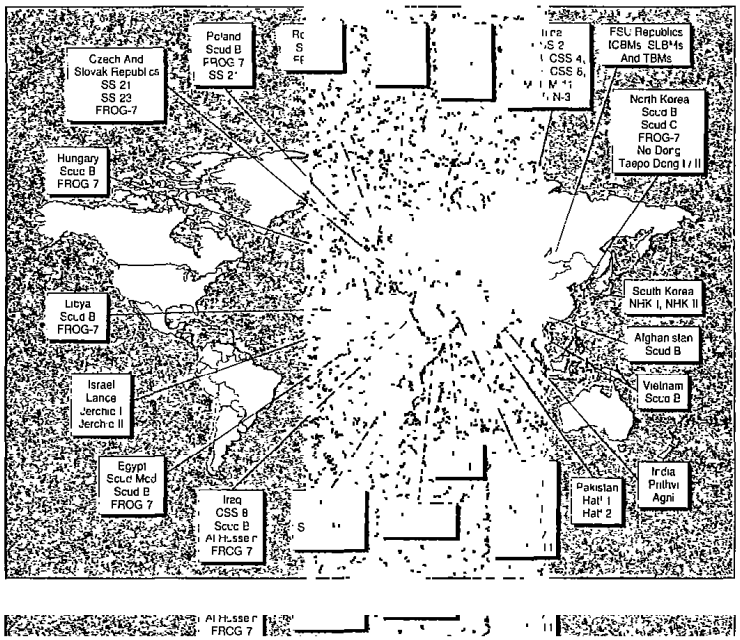
## The Growing Ballistic Missile Threat

- Today, more than 15 third world nations have ballistic missiles, and more have programs in place to develop them Many of the countries that are developing and or acquiring ballistic missiles are also acquiring weapons of mass destruction. These weapon systems pose a threat today that is largely regional in character. However, the trend is clearly in the direction of systems of increasing range, lethality, and sophistication.

- Several nations with space launch capabilities could modify those launchers to acquire a long-range ballistic missile capability

- Nations potentially hostile to the U S could acquire the means of attacking the United States through purchase of entire weapons and long-range delivery systems

**Representative Ballistic Missile Capability**
**(Rest Of World)**




*"We can confirm that the North Koreans are "* *After the turn of the century, some countries that*

## Theater Missile Defenses - The Core Program

To counter the existing and emerging ballistic missile threat, we plan to improve our current active defense capability on an incremental basis while developing advanced systems capable of significantly enhancing our theater ballistic missile defenses

## PATRIOT System

**Mission**

A point or limited area defense system originally built to intercept aircraft. PAC-3 improvements, which will give it greater capability against theater ballistic missiles, include upgrades to the radar and an improved hit-to-kill missile known as ERINT

**Available in the late 1990's**

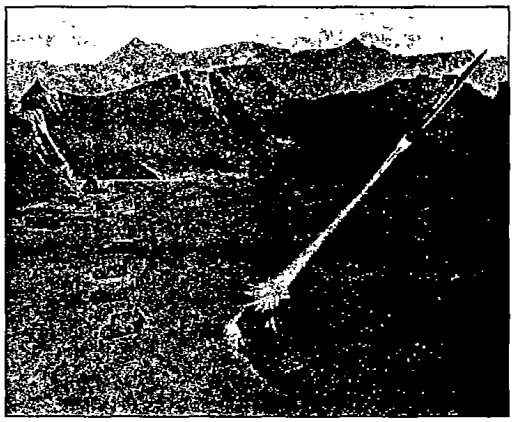
## Theater High Altitude Area Defense (THAAD)

**Mission**

A ground based, air transportable interceptor system that will provide wide area defense capability by intercepting longer range theater ballistic missiles at higher altitudes and at greater distances Will provide an overlay or "upper tier" to point defenses such as PATRIOT The system includes TMD-GBR (Ground Based Radar), a ground based sensor that provides search, tracking and discrimination capabilities for THAAD

**Available in the early 2000's**

(Operational prototype available in late 1990's)



## AEGIS / SM-2 Block IVA

## TMD Advanced Concepts (Year 2002+)

Additional TMD efforts will involve concept exploration activities for the following systems

*Navy Upper Tier TMD*

Whereas the Navy lower tier system provides limited area defense, this sea based system could provide extensive theater-wide protection, intercepting theater ballistic missiles outside the atmosphere as well as in the ascent and decent phases of a ballistic missile's flight

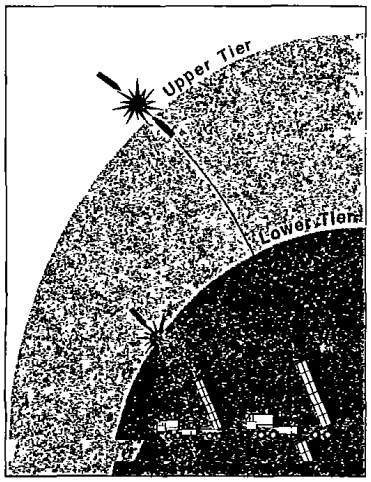
*Corps SAM*

This new mobile air and lower tier missile defense system would protect Army or Marine forces on the move against theater ballistic missiles and advanced cruise missiles

*Airborne Boost Phase Intercept*

To intercept ballistic missiles during their boost phase (when they are most vulnerable). we are looking at concepts which employ Air Force and Navy high performance aircraft carrying high-speed TMD systems for attacking missiles as they lift off the ground.

The BMDO budget is expected to support initiation of one new acquisition program in fiscal year 1998.




## Ballistic Missile Defense-in-Depth

An effective theater ballistic missile defense requires multiple tiers or layers of interceptors

A boost or ascent phase interceptor engages missiles shortly after launch -- destroying them over enemy territory

An upper tier engages missiles at long-range and high altitude (sometimes outside the atmosphere), and provides protection for a very large area. This is especially important if the attacking missile is carrying a nuclear, chemical or biological warhead.

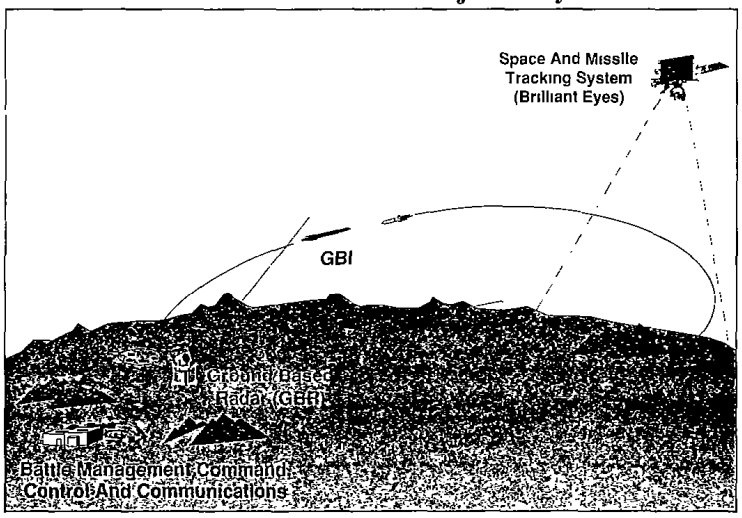
The lower tier intercepts missiles that leak through the other tiers and those short-range, low altitude ballistic missiles that can underfly the upper tier This tier also serves to provide defense against cruise missiles and aircraft Future lower tier systems will generally be more mobile. so they can better support our troops on
underfly the upper tier This tier also serves to provide defense
the move

# National Missile Defense (NMD) Technology Readiness Program

To hedge against the emergence of a long-range ballistic missile capability by a hostile nation, National Missile Defense (NMD) efforts are focused on achieving and maintaining technical readiness The objective is to provide the ability to rapidly (within 2-4 years) develop and deploy ABM Treaty compliant ballistic missile defenses for the United States, given adequate funding

While notionally consisting of a Ground Based Interceptor (GBI). Ground Based Radar (GBR), Space And Missile Tracking System (Brilliant Eyes), and associated Battle Management / Command, Control, and Communications (BM/$C^3$), the NMD Technology Readiness Program is structured to be flexible to changes in technology, the emerging threat, and national requirements

**National Missile Defense - Objective System**




## Concept Of Operation

After warning of a hostile launch by early warning systems, Brilliant Eyes and GBR detect and track threatening ballistic missiles and warheads. GBI is launched, acquires its target and guides itself into the path of the oncoming warhead. using its high speed (kinetic energy) to destroy the target

After warning of a hostile launch by early warning systems. Brilliant Eyes and GBR detect and track

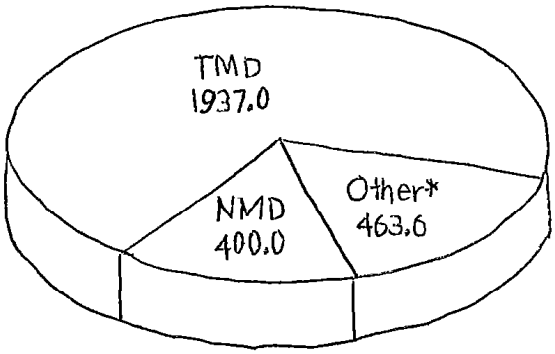
## International TMD Participation

International participation in TMD builds on an earlier foundation of bilateral ballistic missile defense research and development programs Many nations now recognize the existing and potential threat of ballistic missile attack and, as a consequence, discussions and planning for TMD are increasing Moreover, recognizing reductions in the defense budget and the commonality of interest among allies regarding the need for missile defenses, the Administration has given high priority to TMD-related armaments cooperation

## Funding

**$ In Millions**

FY 95 Appropriation




*Includes Advanced Technology Programs, Management And Military Construction