

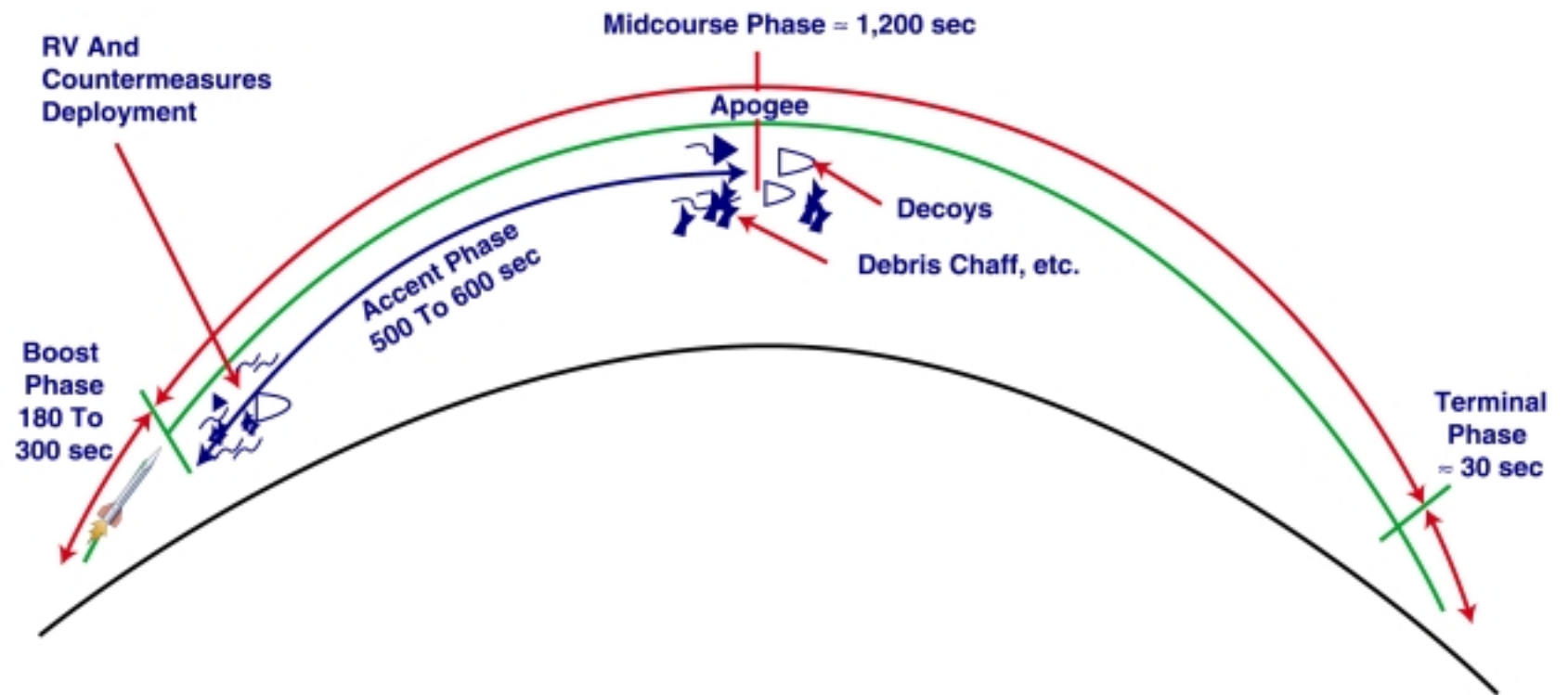
# Ballistic Missile Defense Program



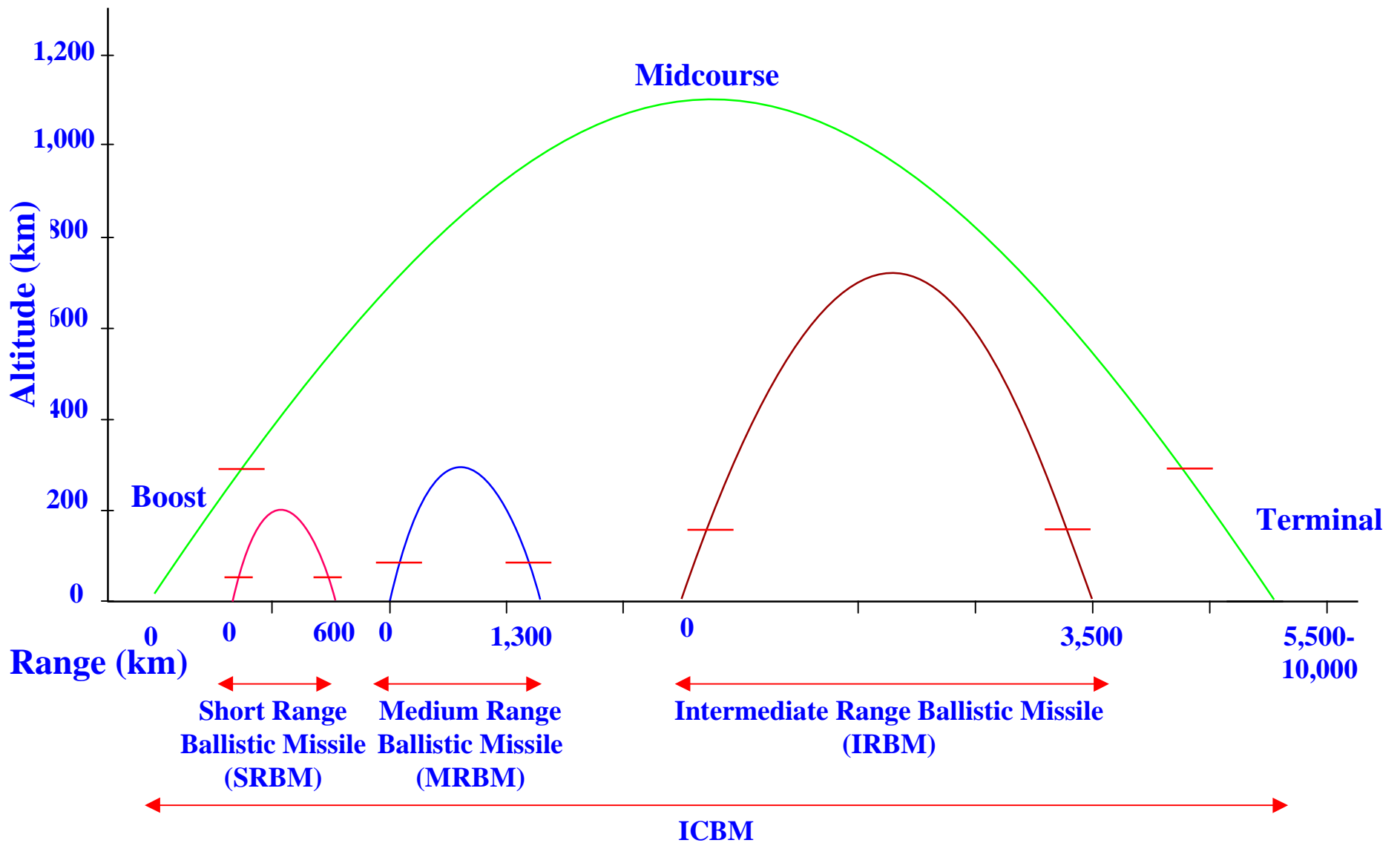
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# ENGAGEMENT PHASES

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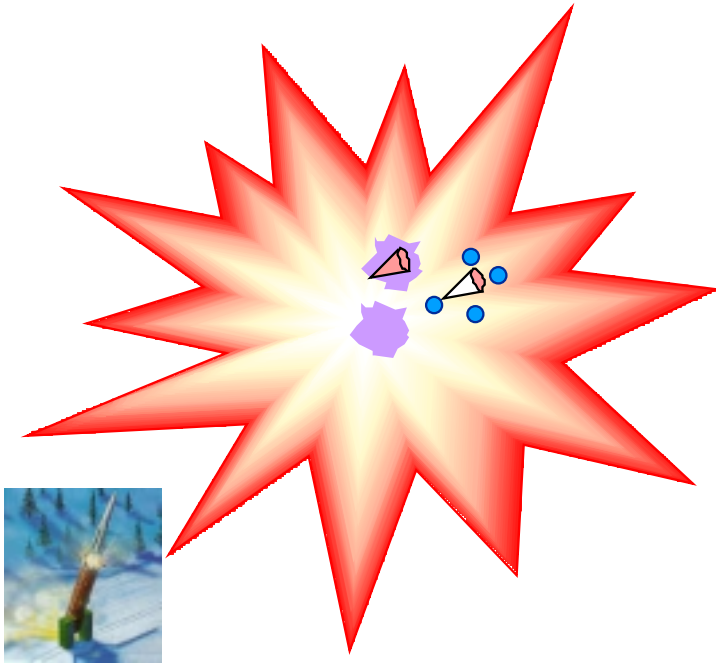


# THE BALLISTIC MISSILE CHALLENGE



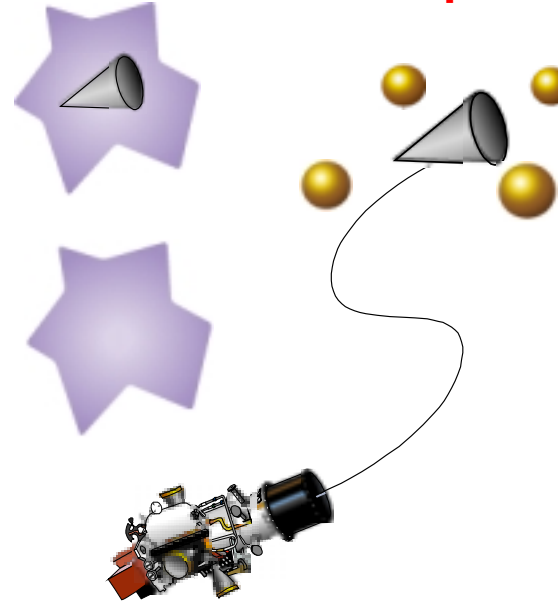
# WHY HIT TO KILL

## Nuclear-tipped Interceptor



- Pros:**
- Discrimination, Precise Terminal Guidance Unnecessary
  - Kill Everything In The Vicinity
- Cons:**
- Environmental Consequences
  - “Nuclear” Politics

## Hit-To-Kill Interceptor



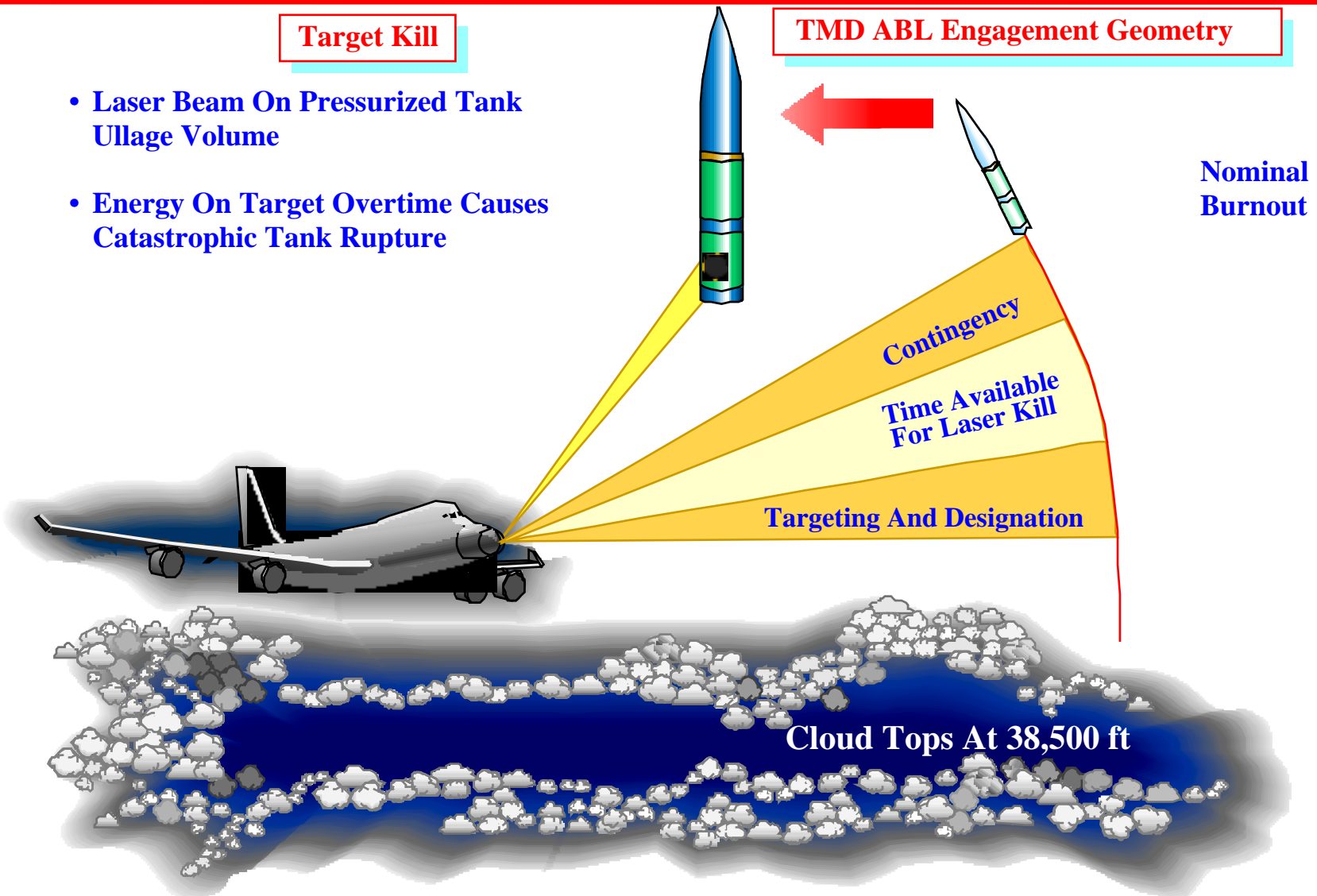
- Pros:**
- Environmentally “Clean” Kill
  - Better Than Blast Fragmentation Against Weapons Of Mass Destruction
  - Energy Proportional To Mass And Square Of Velocity
  - Technology Proven
  - Discrimination, Terminal Guidance
- Cons:**
- Required To Hit And Kill Only The Reentry Vehicle (RV)

# HOW AIRBORNE LASER (ABL) WORKS

## Target Kill

- Laser Beam On Pressurized Tank Ullage Volume
- Energy On Target Overtime Causes Catastrophic Tank Rupture

## TMD ABL Engagement Geometry



Nominal  
Burnout

Cloud Tops At 38,500 ft

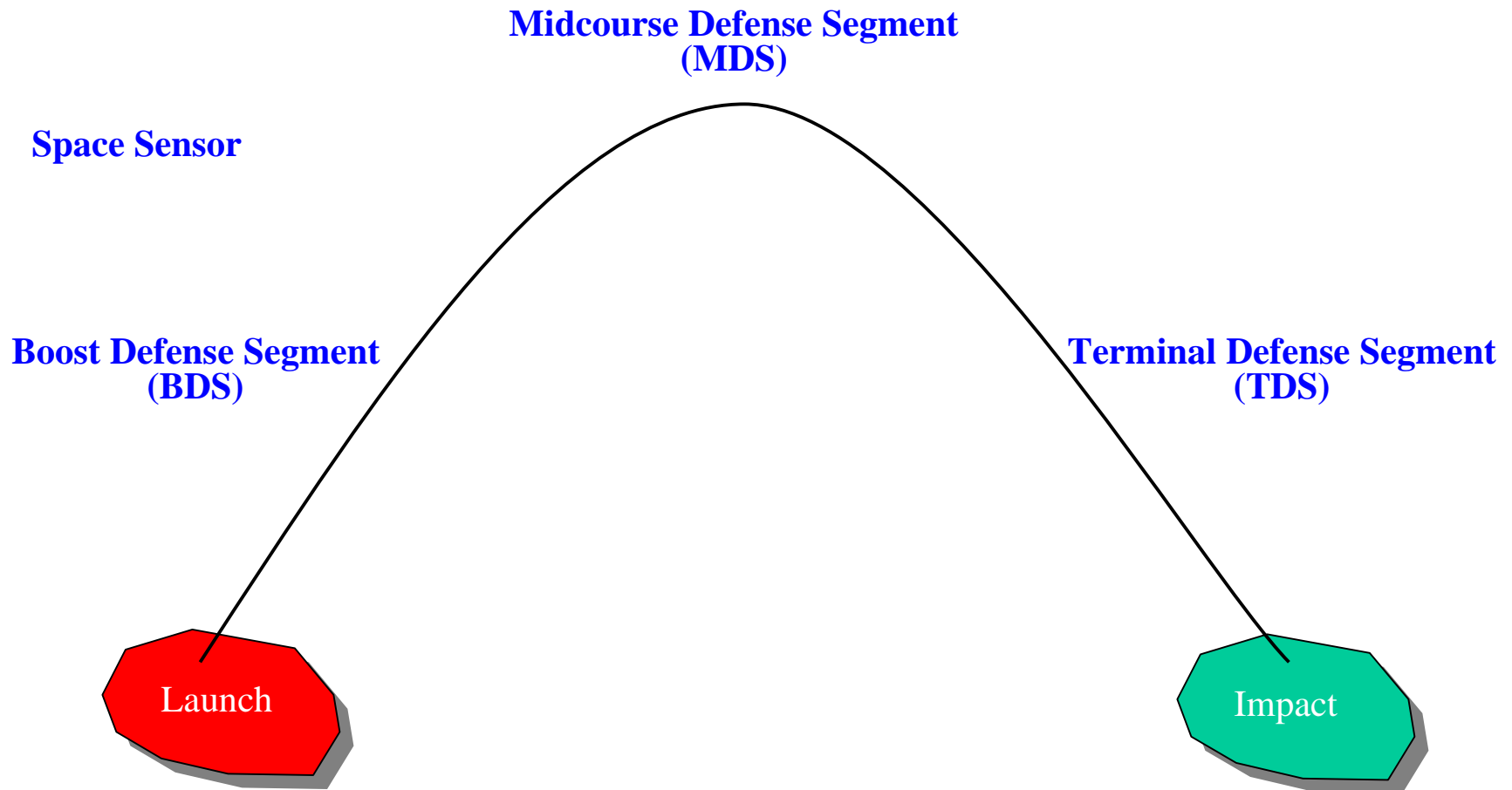
# **SUMMARY OF BALLISTIC MISSILE DEFENSE RDT&E PROGRAM**

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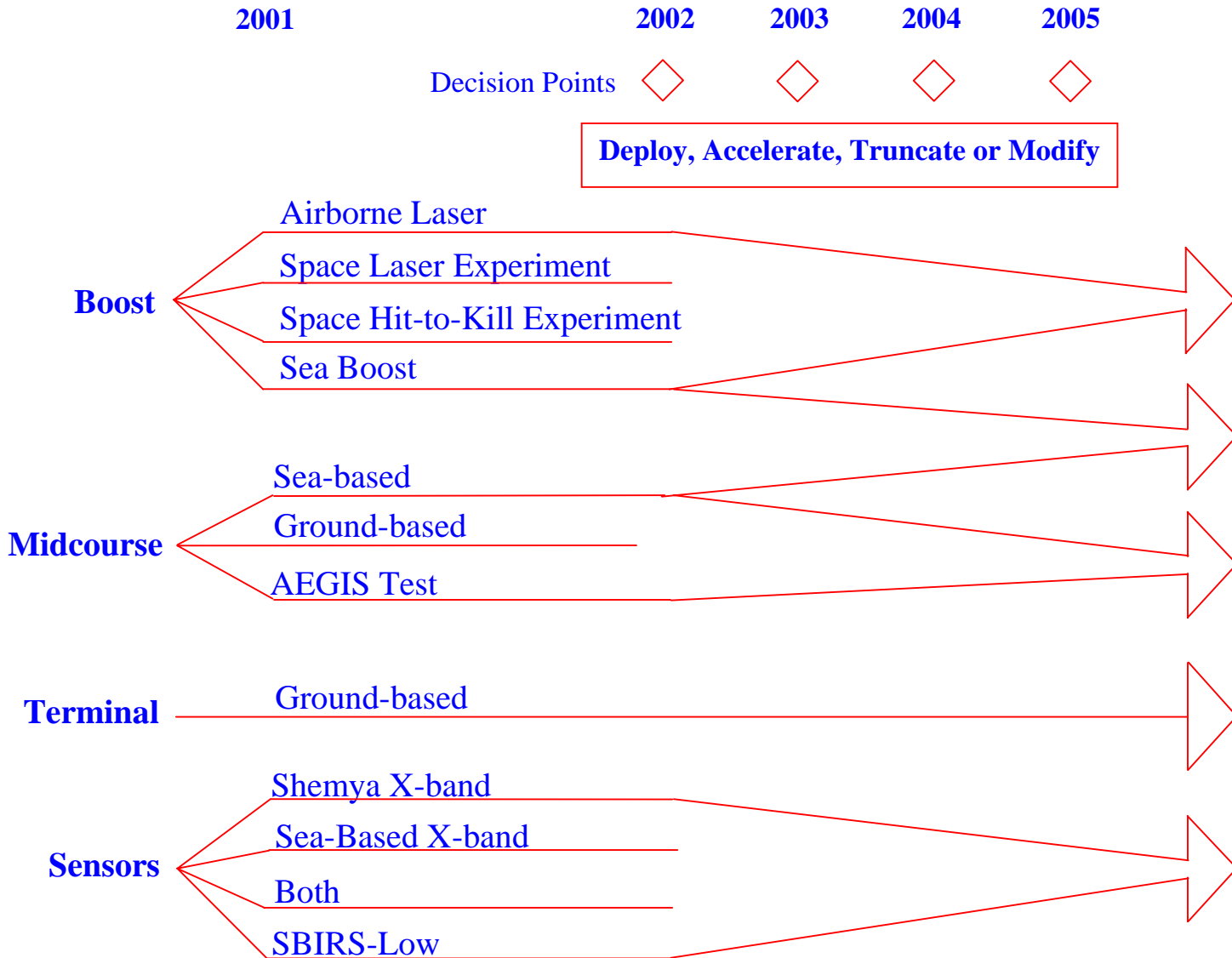
- **Aggressive RDT&E Program**
  - **Without Commitment To A Single Architecture**
  - **With No Procurement Until Ready**
  - **Employs Parallel Risk Reduction Paths To Mitigate Potential Cost/Schedule/Performance Problems**
  - **Capabilities Based Vs. Requirements Based**
  - **Robust Testing**
- **Multilayer, Multi-faceted Development Program**
  - **Protect U.S., Allies, Friends And Deployed Forces**
  - **Managed As One System**
  - **Explores Air, Sea, Ground and Space Concepts**
  - **Designed To Intercept Any Range Of Threat**
  - **Designed To Intercept Threat In Boost, Midcourse, Terminal Phase**
- **Structured To Permit Test Asset For Operational Use On An Interim Basis, If Directed**

# AN APPROACH TO BALLISTIC MISSILE DEFENSE

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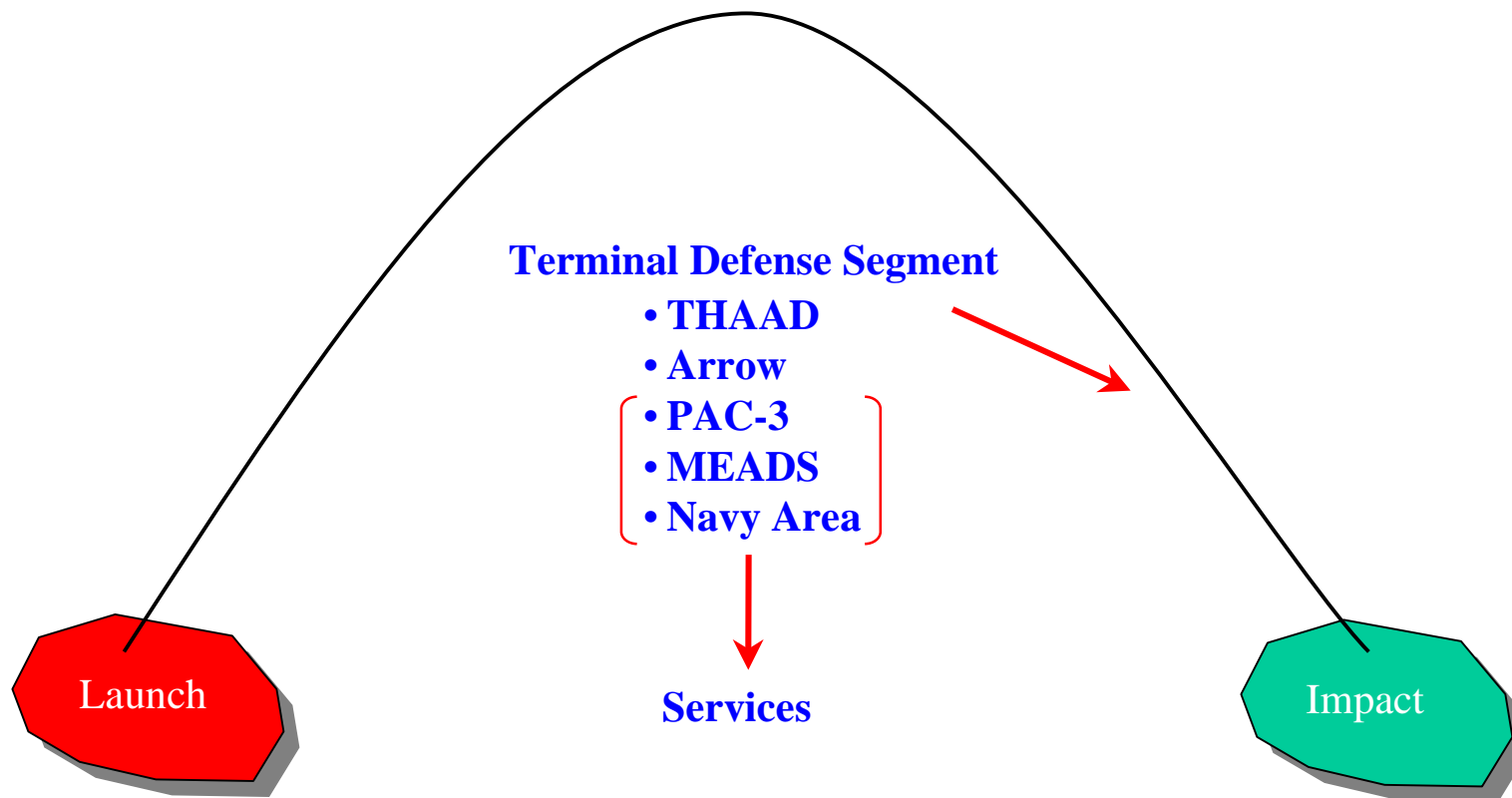
# MANAGING THE BALLISTIC MISSILE DEFENSE EFFORT AS ONE PROGRAM





# AN APPROACH TO BALLISTIC MISSILE DEFENSE

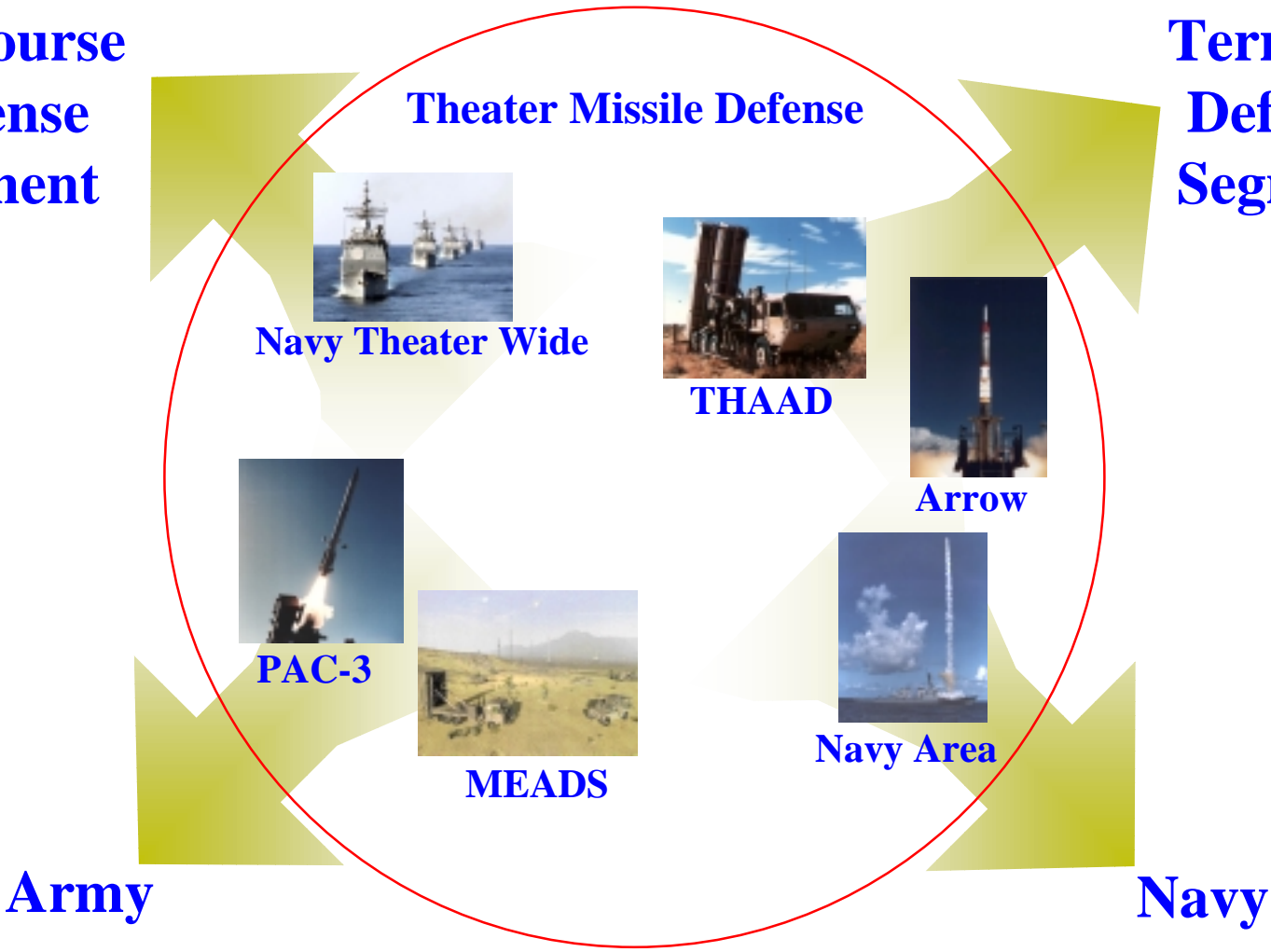
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# TERMINAL DEFENSE SEGMENT TRANSITION PLAN

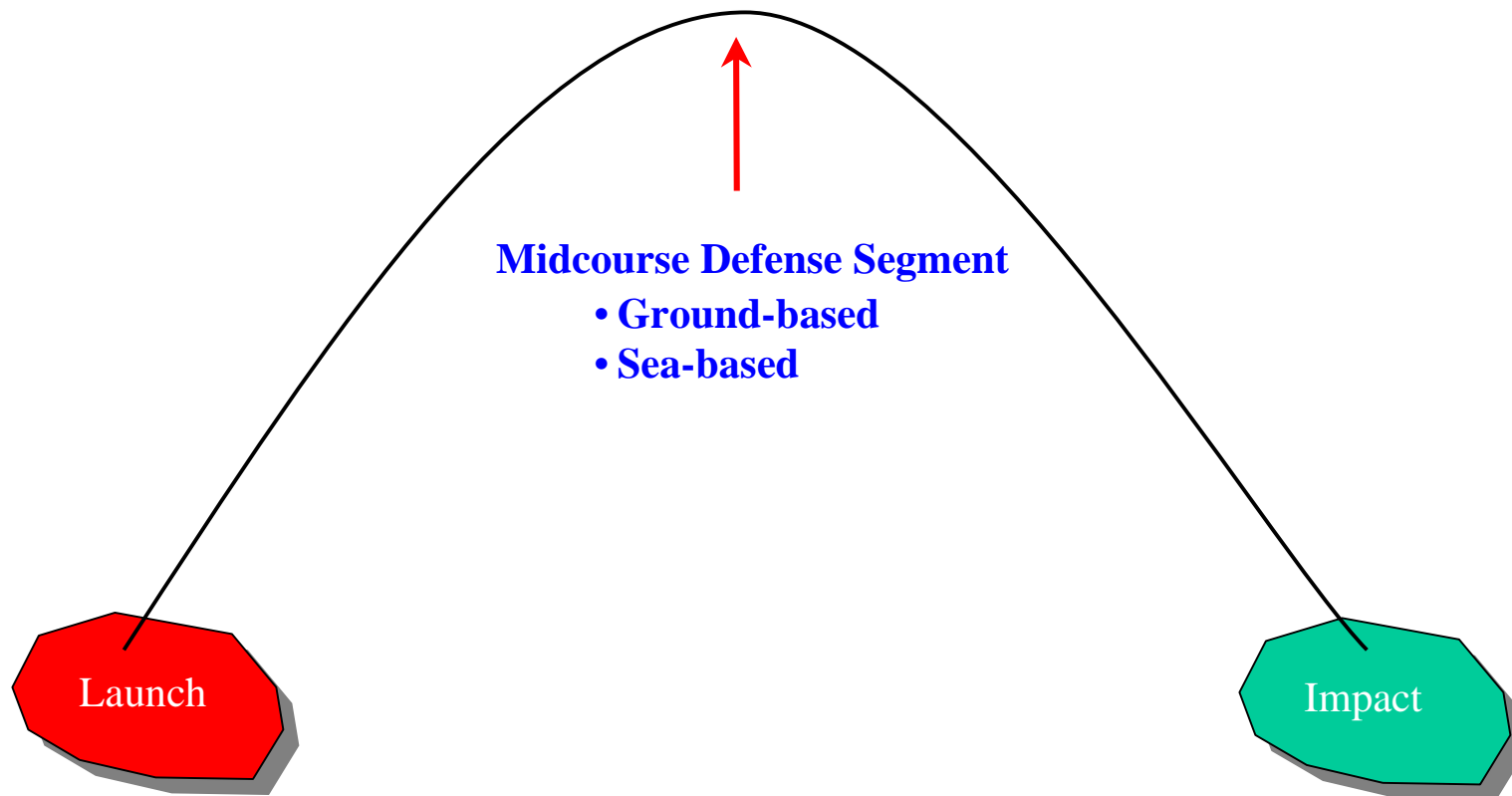
**Midcourse  
Defense  
Segment**

**Terminal  
Defense  
Segment**



# AN APPROACH TO BALLISTIC MISSILE DEFENSE

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# MIDCOURSE SEGMENT ELEMENTS

## Ground-Based

**Space Based Infrared System / Low Component**

**Defense Support Program/ Space Based Infrared System High Component**

**Battle Management / Command, Control**

**Early Warning Radars**

**X-band Radar**

**Kill Vehicle**

**Missile Defense Communications Net**

**Interceptor**

## Sea-Based

**Command & Control Tactical Data Link Networks**

**Aegis Weapon System**

**SPY-1 Radar**

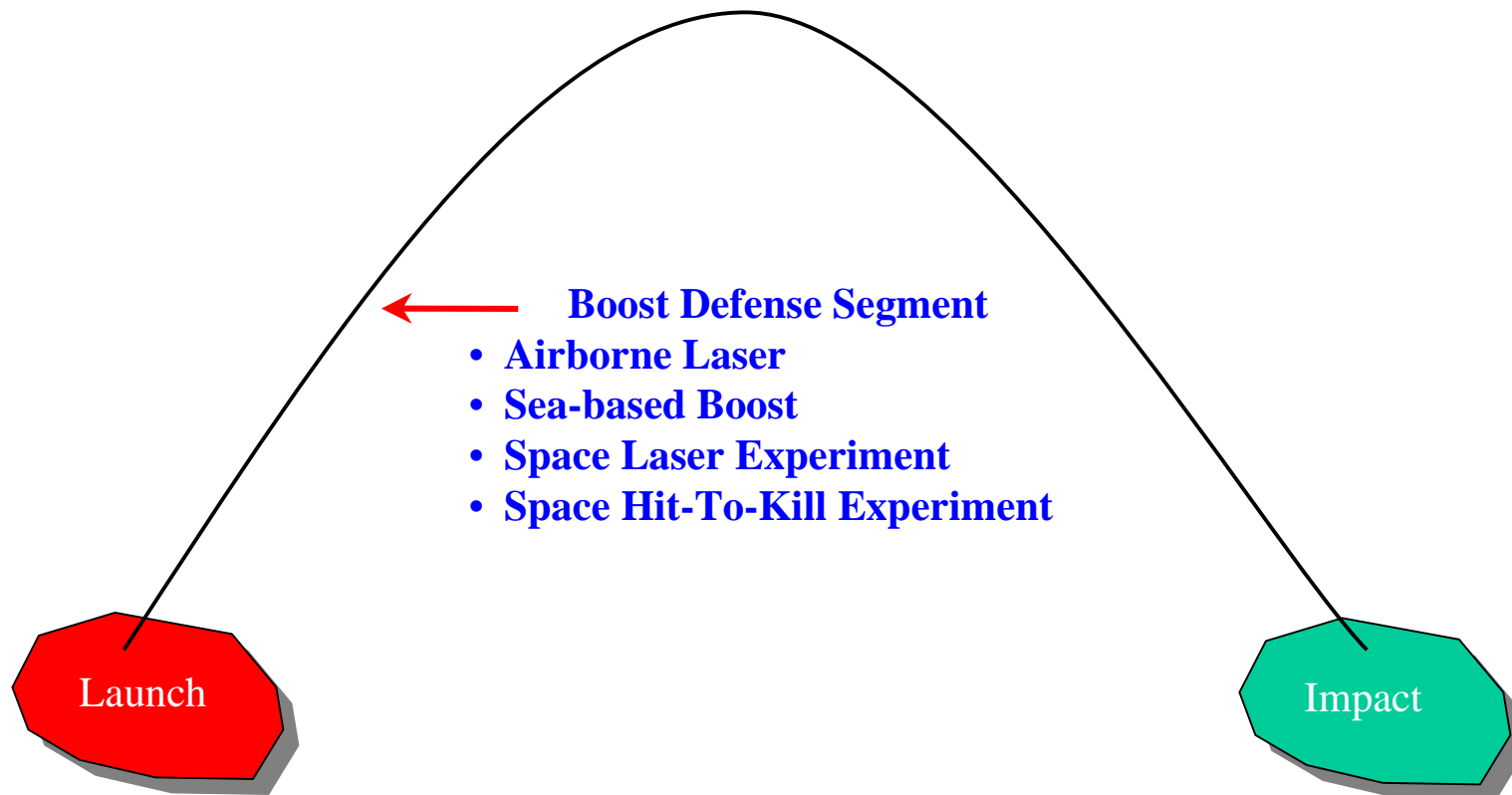
**Vertical Launching System**

**Maintenance & Training**

**STANDARD Missile (SM-3) Four Stage Hit-to-Kill Missile**

# AN APPROACH TO BALLISTIC MISSILE DEFENSE

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# BOOST PHASE DEFENSE

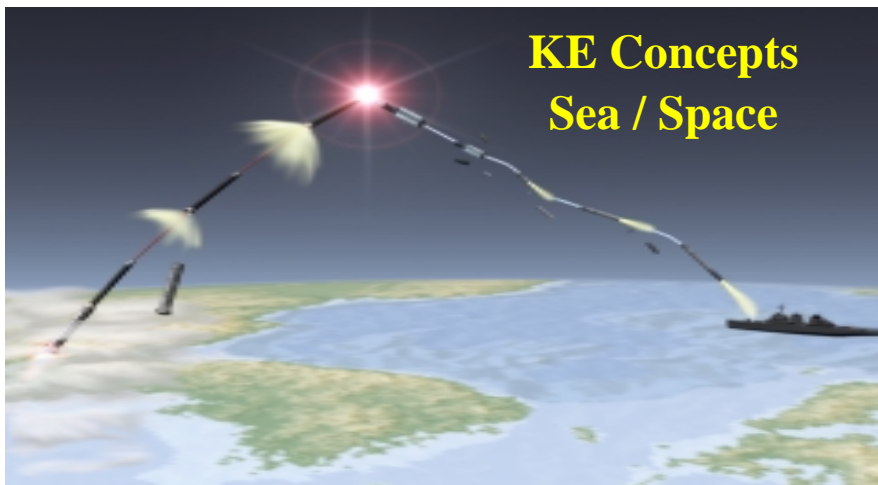
**ABL**



**SBL Integrated Flight Experiment**



**KE Concepts  
Sea / Space**

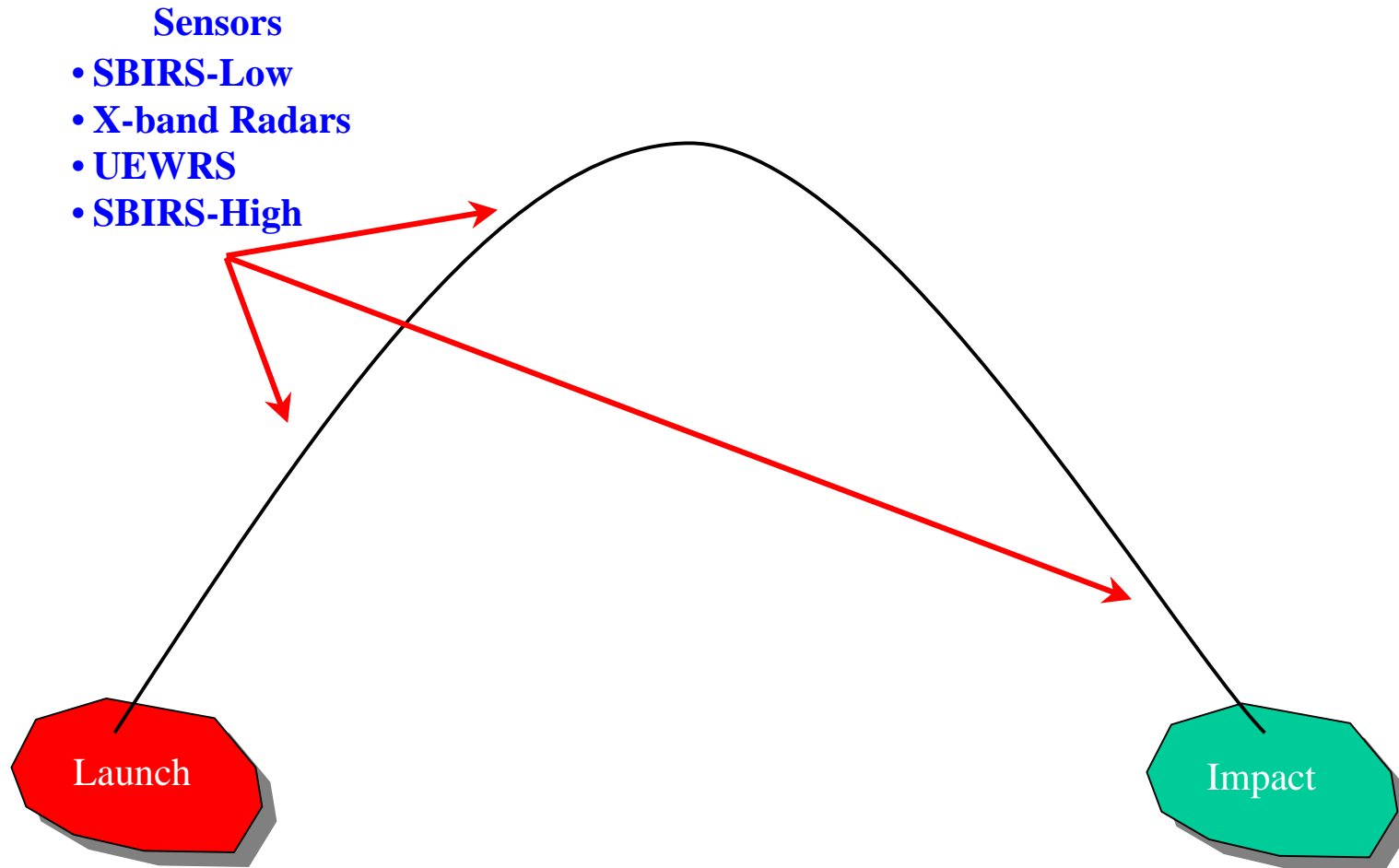


**Space Based  
Experiment SBX**



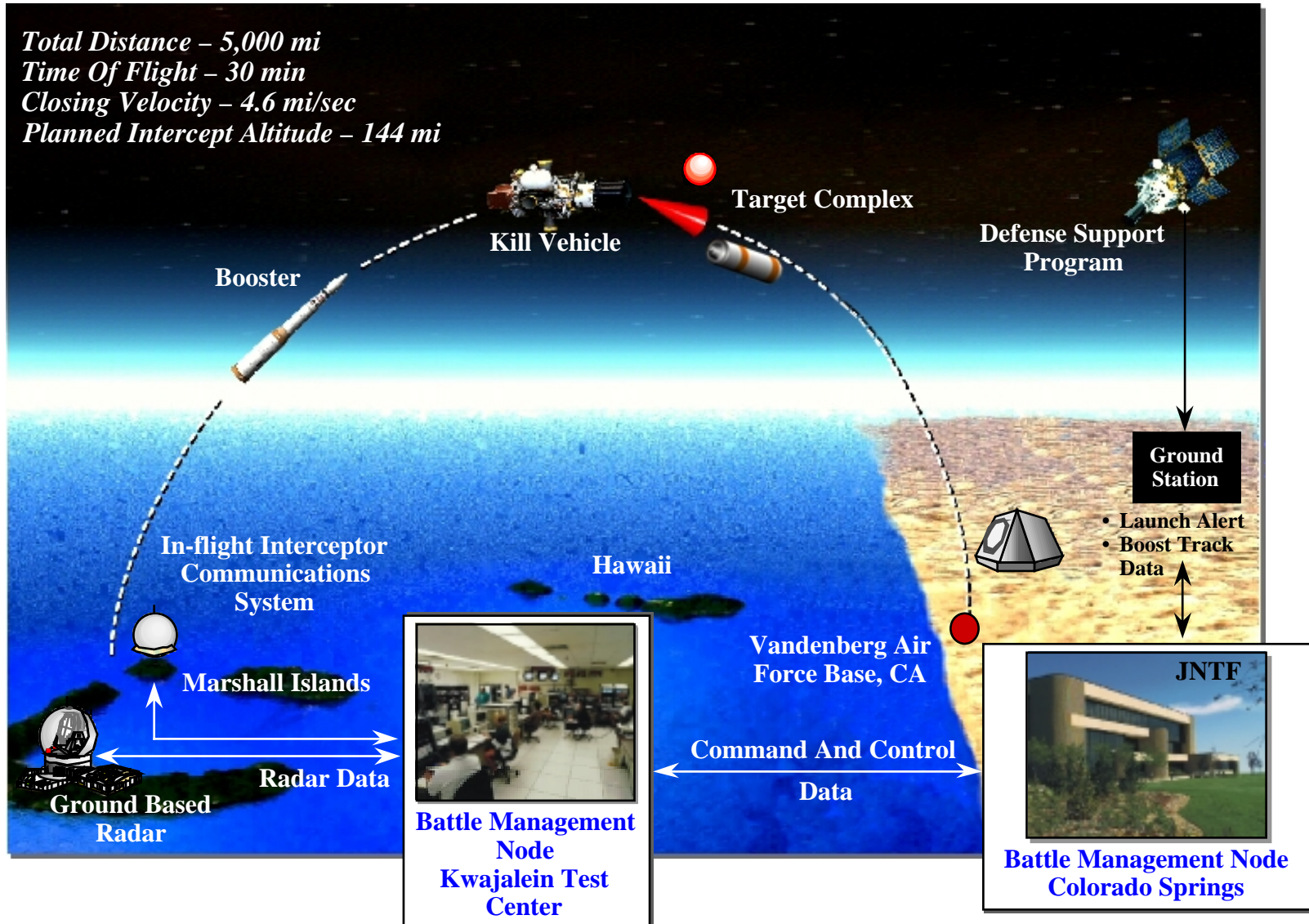
# AN APPROACH TO BALLISTIC MISSILE DEFENSE

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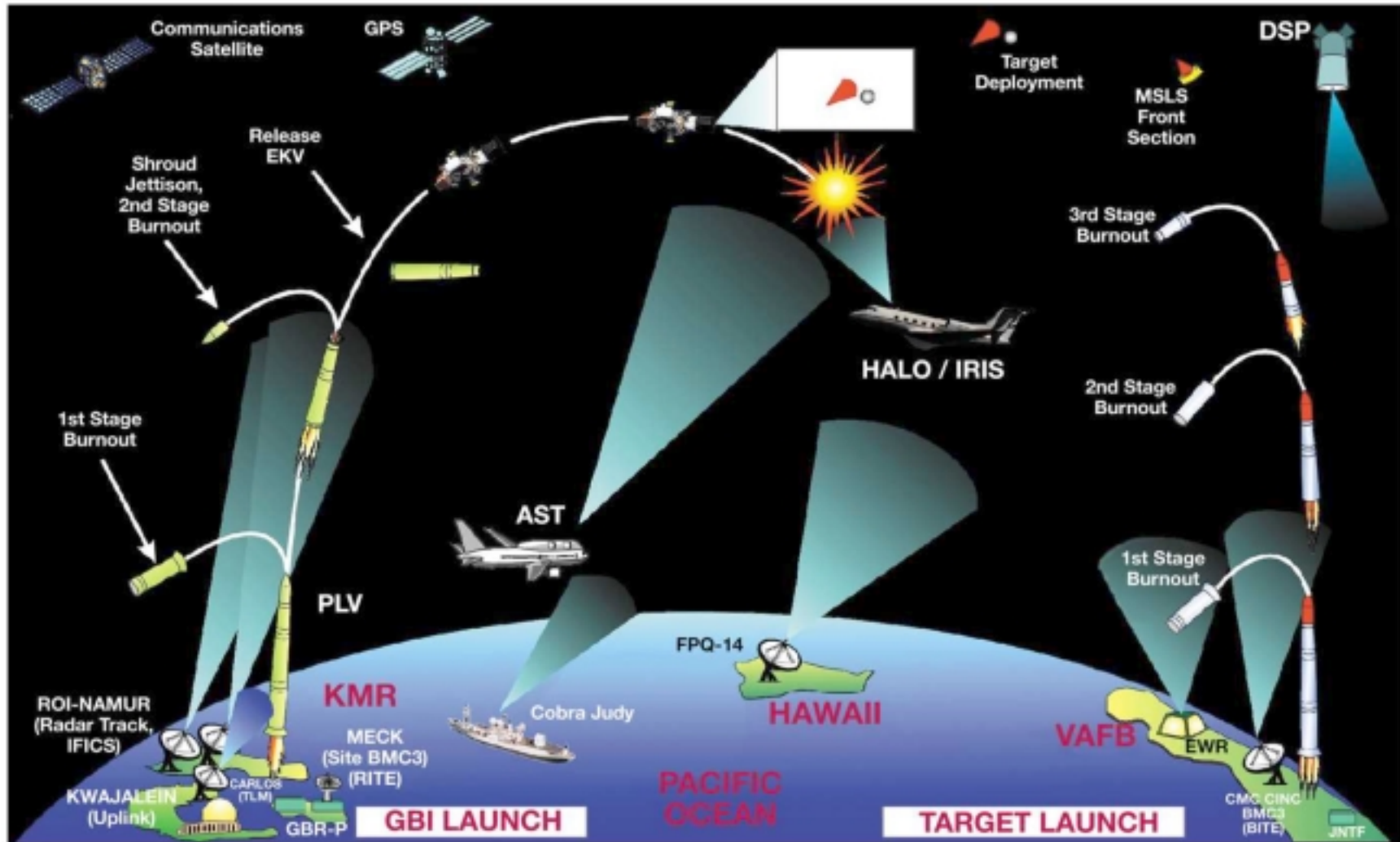


# PLANNED INTEGRATED FLIGHT TEST-6 PROFILE





# Integrated Flight Test Assets Overview



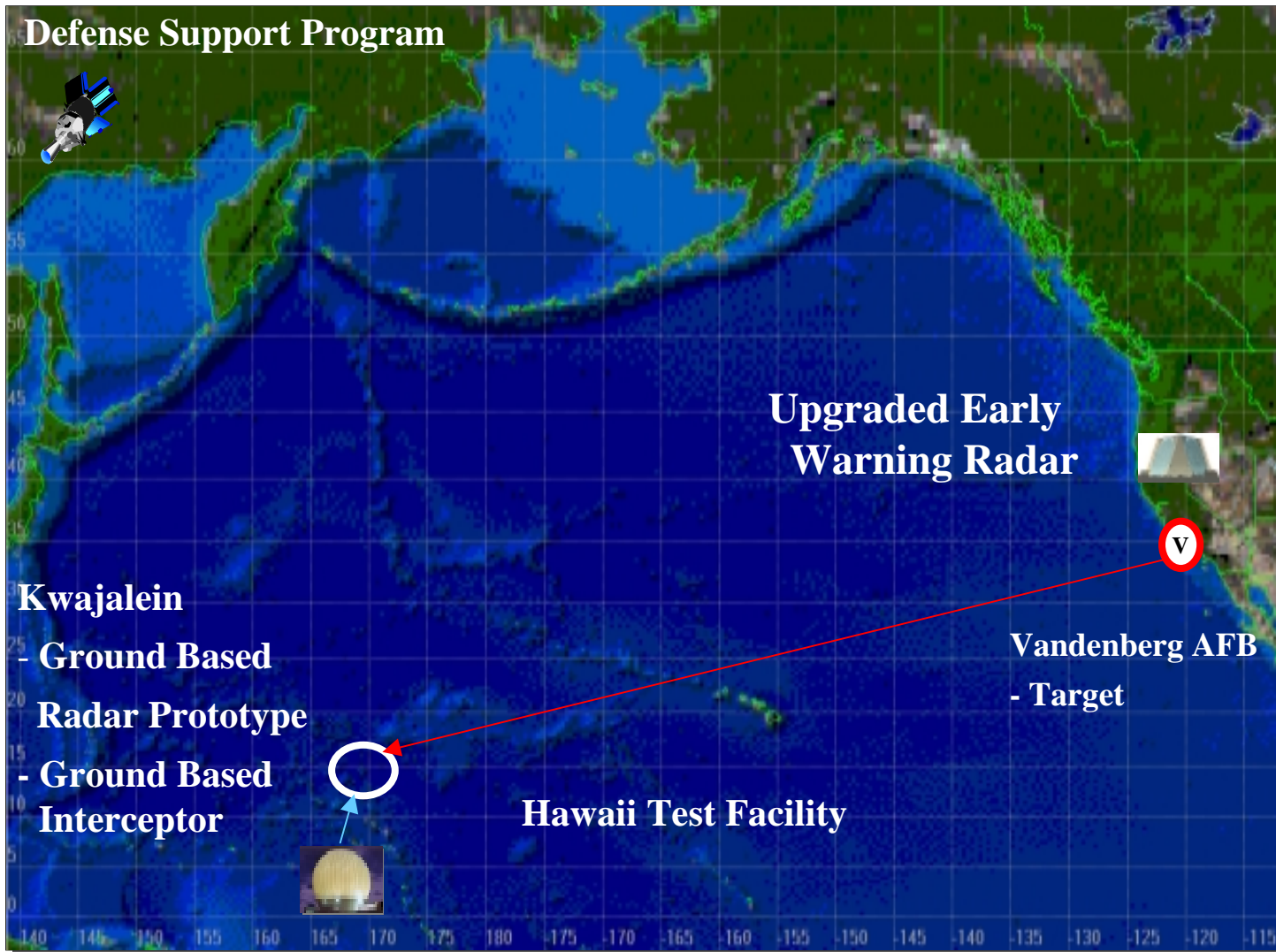
GPS — Global Positioning Satellite  
 EKV — Exoatmospheric Kill Vehicle  
 PLV — Payload Launch Vehicle

KMR — Kwajalein Missile Range  
 IFICS — In-Flight Interceptor Communication System  
 AST — Airborne Surveillance Testbed

MSLS — Multi-Service Launch System  
 DSP — Defense Satellite Program  
 EWR — Early Warning Radar

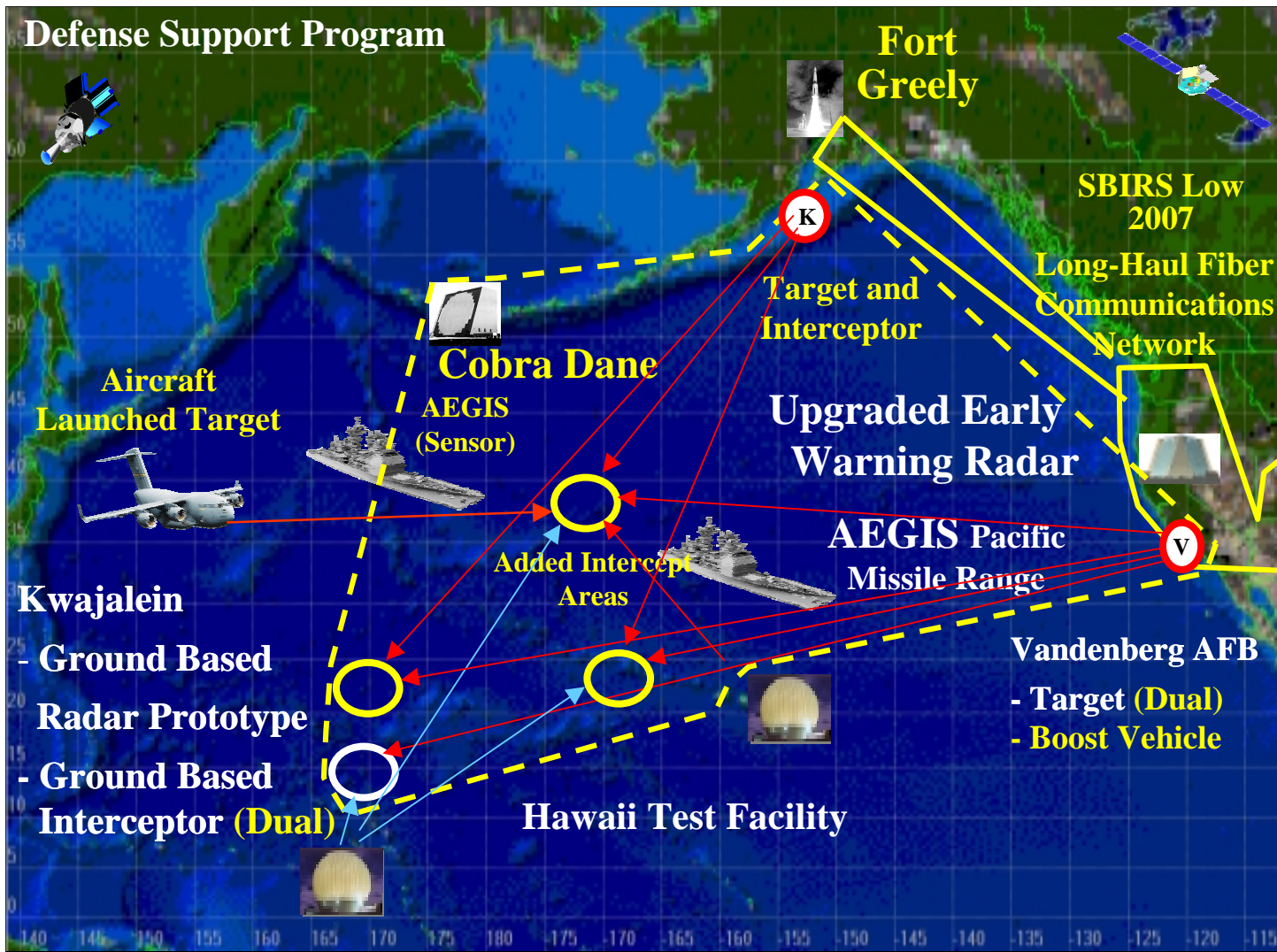
JNTF — Joint National Test Facility

# CURRENT TEST INFRASTRUCTURE



Key: Current

# MIDCOURSE TEST BED



**Key: Current**

**Enhanced**

**SBIRS Low**

**Viewing**

- **Common Test Bed for Ground and Sea Based Elements**
- **Expandable to Boost and Terminal Segments**
- **Adds Realism to Test**
- **Allows Multiple Engagements**
- **Adds Additional Intercept Areas**
- **Enhances Ground Test Capability**
- **Adds SBIRS High and Low Testing**



# **BMD PROGRAM APPROACH**

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- **Single BMD Research And Development (R&D) Program With Goal Of Entering Into Acquisition As Soon As Directed**
- **Start With What We Know – Build On The Technical Progress Made To Date Without Losing Focus**
- **Prove Capability Through Realistic Testing – Expand Test Bed**
- **Transition Capabilities To Services For Production, Deployment, And Support**
- **Add Capability In Block Increments Over Time**
- **Aim For An Initial Capability In The 2004-2008 Time Frame**
- **Move To A Layered Defense Soonest**
- **Extend To Allies And Friends When Appropriate**

**The Program Is A Bold Move To Develop An Effective, Integrated Layered Missile Defense Against All Ranges Of Threats**