



**Homeland
Security**

S&T Stakeholders Conference

Emerging Counter-MANPADS Technology (ECMT)

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PARTNERING FOR A SAFER NATION

ECMT Program & Technical Objectives

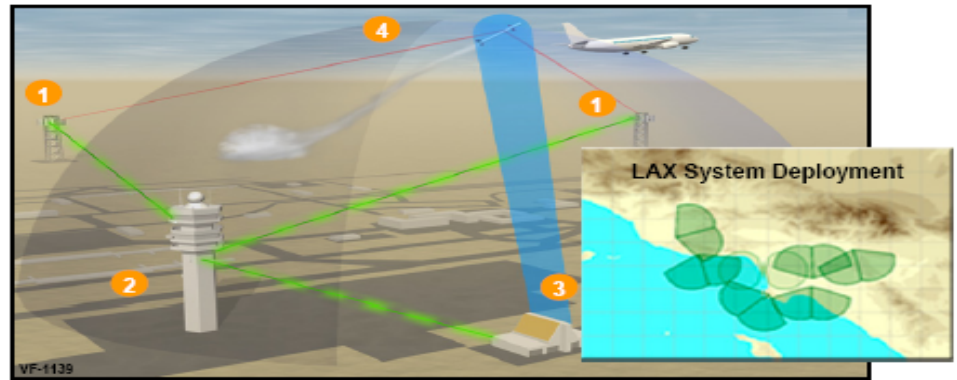
- 1. Assess Emerging Countermeasure System Alternatives to Defeat MANPADS, evaluate Attendant CONOPS and Life Cycle Costs:**
 - Broad Agency Announcement (BAA – FY 06)
 - Multiple awards for 18 months
 - Other than aircraft-borne Directed Infrared Countermeasures (DIRCM)
 - Assess maturity of existing component/subsystem technologies and system approach of Ground-based, aircraft-borne, and possible hybrids (ground + airborne)
 - Scope limited to system mature (TRL 6+) approaches
- 2. Report findings to Congress**
- 3. Determine the Suitability and Interoperability with the Civilian Environment**
 - Establish Effectiveness Levels
- 4. Develop T&E Plan for Data Gaps And Perform Limited T&E Under BAA Effort**
- 5. Develop Detailed System Approach, Life Cycle Cost, And CONOPS**



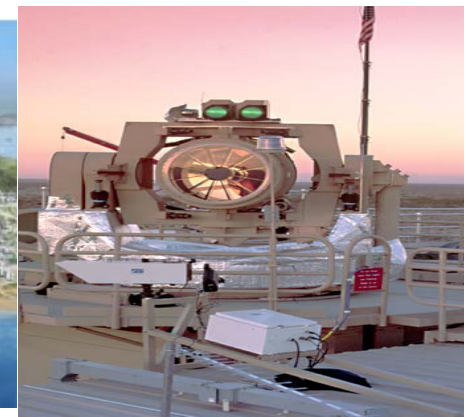
**Primary objective:
Assess suitability in civil aviation environment**

ECMT Funded Efforts

Raytheon: To evaluate suitability of a high powered microwave countermeasure system. Phased array antenna countermeasure with distributed missile warning sensor (MWS) grid.



Northrop Grumman: To evaluate suitability of a high energy laser countermeasure system. System is a shoot-to-kill laser with co-located missile warning system. Laser suitability, and missile warning system testing will be conducted.



L3/Avisys: Evaluate existing pulse-Doppler, and other radar missile warning concepts for suitability in the civilian airport environment.



Raytheon – Vigilant Eagle

1. Suitability Assessment of High-Power-Microwave Amplifier Transmitter (HAT) Countermeasure

- Electromagnetic Safety, Compatibility, and Interoperability assessments

2. Passive IR Camera Test

- 2 passive IR cameras (missile detection system) installed on an airport to collect airspace data.
- Attempt to assess air picture and false alarm rate.

3. Live Fire Tests

- 2 passive IR cameras observed tests at White Sands Missile Range during the Counter-MANPADS Program Office Live Fire Tests

4. Development of LCC & CONOPS

5. Laydown Analysis – HAT and MDT



HAT



C2



MDT Camera



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Northrop Grumman – Skyguard

1. Laser Effects Analysis

- Effects on aircraft windows, buildings structures/materials, and human exposure

2. Missile Warning Sensor (MWS) Data Collection

- MWS installed on/around 2 airports to passively collect data.
- Objective: Collect sensor imagery/data from various airports to evaluate P_{declare} , False Alarms, detection ranges, declaration times

3. Live Fire Tests

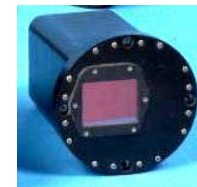
- MWS observed tests at White Sands Missile Range during the Counter-MANPADS Live Fire

4. LCC & CONOPS Development

5. Laydown Analysis – HEL and MWS



Fine Tracking and High Energy Laser Countermeasure



Missile Detection & Tracking by the MWS and Mini-Pointer Tracker

L-3 Avisys— Pulse Doppler Radar MWS

1. Suitability Assessment of Pulse Doppler Radar Missile Warning Sensors (MWS)
 - Feasibility Assessment providing technical details and performance predictions
 - Cost Estimate to develop an operationally effective pulse doppler radar MWS for civil operations
2. NTIA Guidance
 - Requested guidance from NTIA on recommended bands for MWS operation
3. Millimeter Wave (MMW) Analysis
 - Preliminary Analysis of the feasibility MMW for MWS operation
4. Analysis of Missile Radar Cross Sections (RCS)
 - Sensitivity analysis of the modified MWS



Thales MWS-20

Government T&E Efforts

1. FDA Electromagnetic Suitability Testing

- Independent assessment of electromagnetic compatibility and potential risks to medical devices and the general public that may be associated with operating a high power microwave in the civilian environment.



2. Missile Radar Cross Section (RCS) Measurements

- RCS tests conducted by Naval Air Warfare Center Weapons Division at Point Mugu



3. Special Materials Aero Urban Decoy (SMAUD) Flare Testing

- Objective: Evaluate the potential for SMAUD decoys to protect commercial aircraft from MANPADS attacks.





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