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S&T Stakeholders Conference

Project CHLOE

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June 2-5, 2008

PARTNERING FOR A SAFER NATION

HIPS and HITS

- Homeland Innovative Prototypical Solutions (HIPS), which are designed to deliver prototype-level demonstrations of game-changing technologies in two to five years. These projects are moderate to high risk, with high payoff.

- High Impact Technology Solutions (HITS), which are designed to provide proof-of-concept answers that could result in high-payoff technology breakthroughs. These projects have considerable risk of failure, however they also offer the potential for significant gains in capability.

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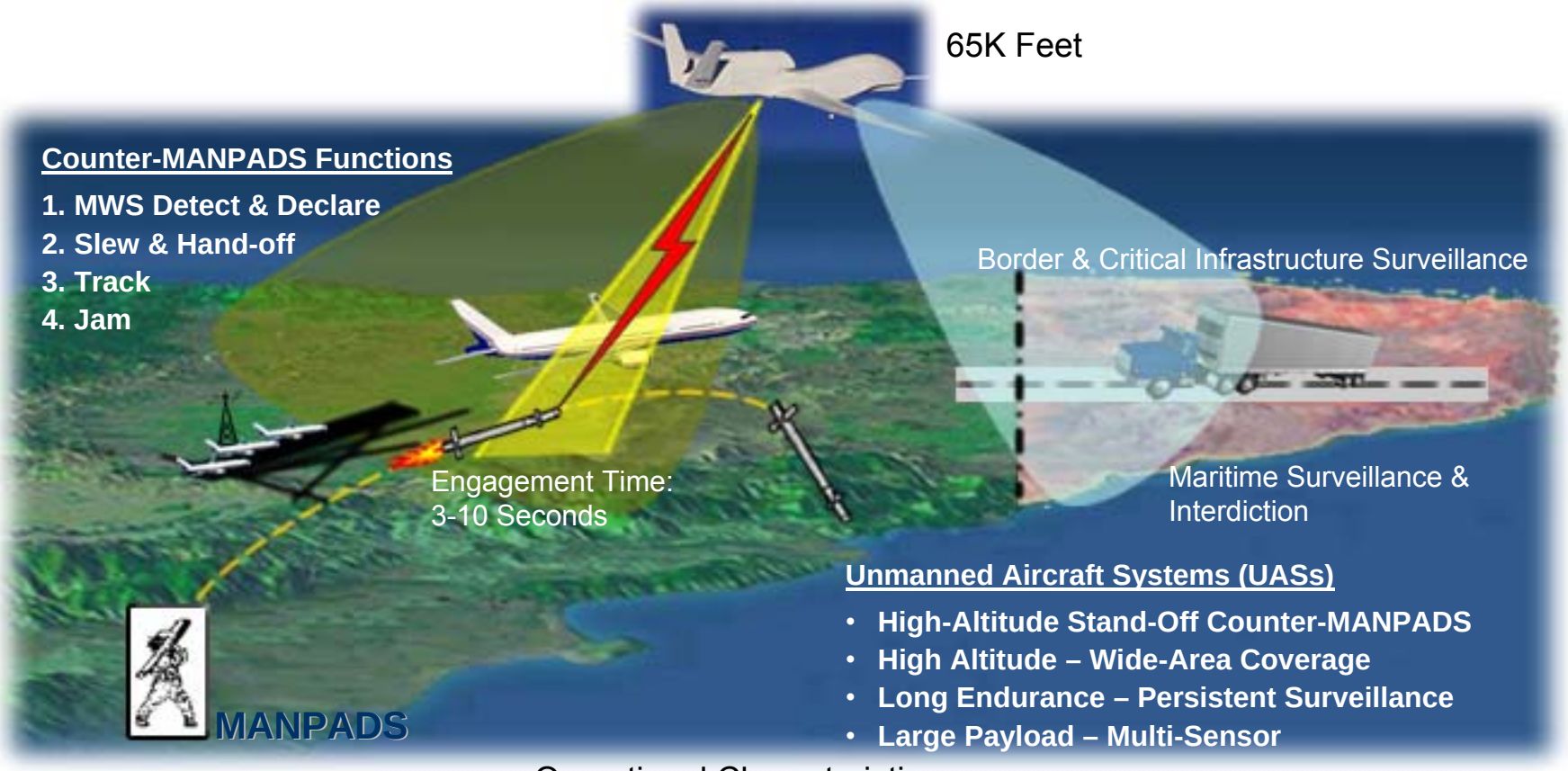
High Altitude Unmanned Counter-MANPADS / Persistent Surveillance



Operational Characteristics

- Real-time sensor fusion/dissemination
- Multi-user / border surveillance requirements
- Commercial Aircraft MANPADS protection
- Automatic target detection/recognition
- Persistence (18/7, all-weather coverage)

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Basic Program Objectives

- 2-5 year Homeland Innovative Prototypical Solution (HIPS) Process
  - Rapid prototype and demonstration
  - Start at TRL ≥ 3, finish at TRL ≥ 7
- Investigate & demonstrate the feasibility of persistent stand-off Counter-MANPADS protection
  - One or multiple Unmanned Aircraft System (UAS) with Missile Warning System (MWS) and countermeasures (CM) stationed over airports
  - Autonomous coverage for all aircraft within MANPADS threat envelope
- Investigate & demonstrate DHS missions and payloads that are compatible with *CHLOE* technology platform and operating environment
  - Emergency/disaster relief support (e.g., Communications Relay)
  - Border and Coastal Security (e.g., EO/IR/SAR Imaging payloads)
  - Critical Infrastructure monitoring
- Interface to Air Traffic Control (ATC) and law enforcement for Situational Awareness (SA)

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Key CHLOE Capability Requirements

- Airspace management and MWS Field of Regard (FOR) require high altitude platform for Counter-MANPADS mission
  - 40 – 65kft ops likely
- $18^{+}/7$ persistence requires unmanned platform(s)
- Coverage required out to 65nm (minimum) from airport
  - All axis coverage of commercial aviation within MANPADS threat envelope
- Capable of countering multiple threats
  - Generation 1-3 MANPADS
  - Off-axis capability
- All weather
- Ground-safe (eye safety)
- Real-time situational awareness and reporting
  - ATC, law enforcement, supported agencies for alternate missions

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Program Approach

- Rapid prototype and demonstration of DRS two-color Infrared (IR) MWS
  - Leverage Naval Research Laboratory (NRL) Tactical Aircraft Directable Countermeasures (TADIRCM) design
  - Evaluate feasibility of MWS from high altitude (> 50,000 feet)
    - Manned surrogate for risk reduction
  - Demonstration complete October 2007
  - Data analysis to determine potential, identify performance gaps, and define requirements
- Broad Agency Announcement (BAA) to industry for Off-board Counter-MANPADS solution awarded to NGC Rolling Meadows
  - Refine Concept of Operations (CONOPS)
  - Evaluate alternate high altitude MWS prototypes
    - Evaluate MWS/counter-measure handoff timing and network requirements
  - Evaluate CM prototypes
  - Door left open for Alternate Mission Payload demonstrations
  - Energy on Dome Demonstration November 2008

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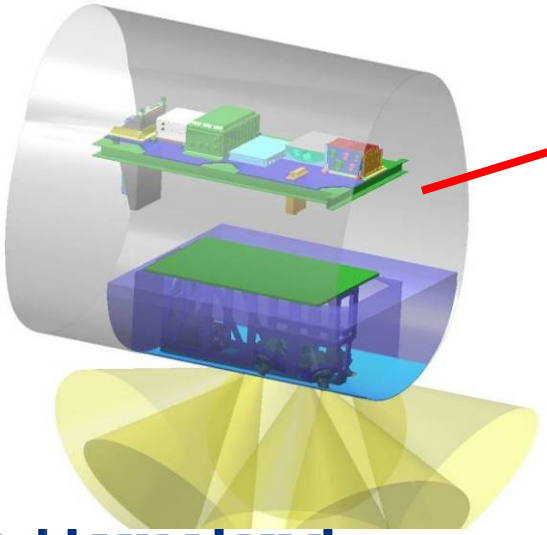
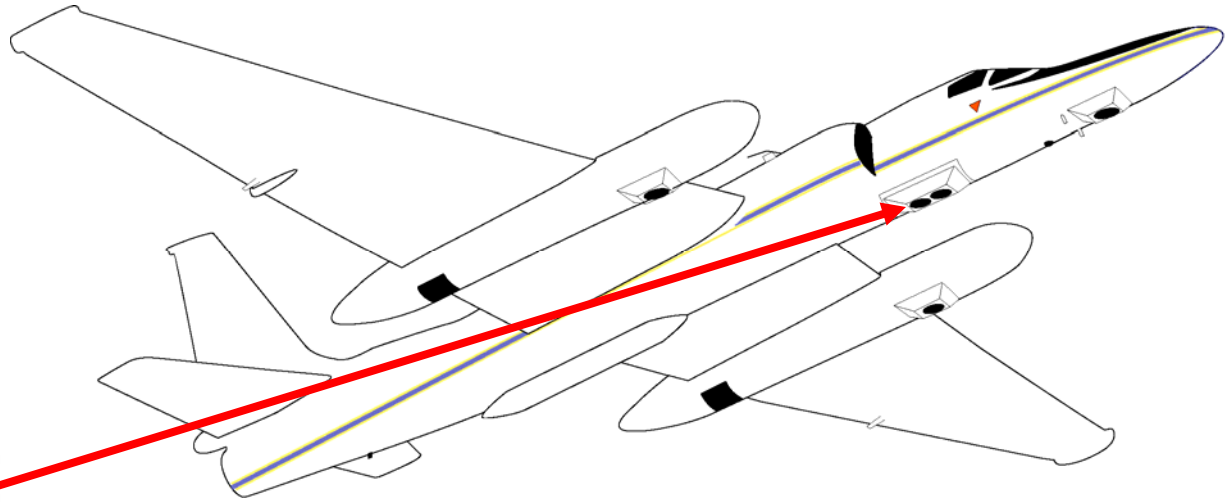
High Altitude MWS Using 2-Color IR

- Adequate Volume in ER-2 Q-Bay
- Adequate Power available
- Locate Missile Launch Site
- Cue Jammer
  - IR/ RF





High altitude data collection during Counter-MANPADS Missile Live Fire

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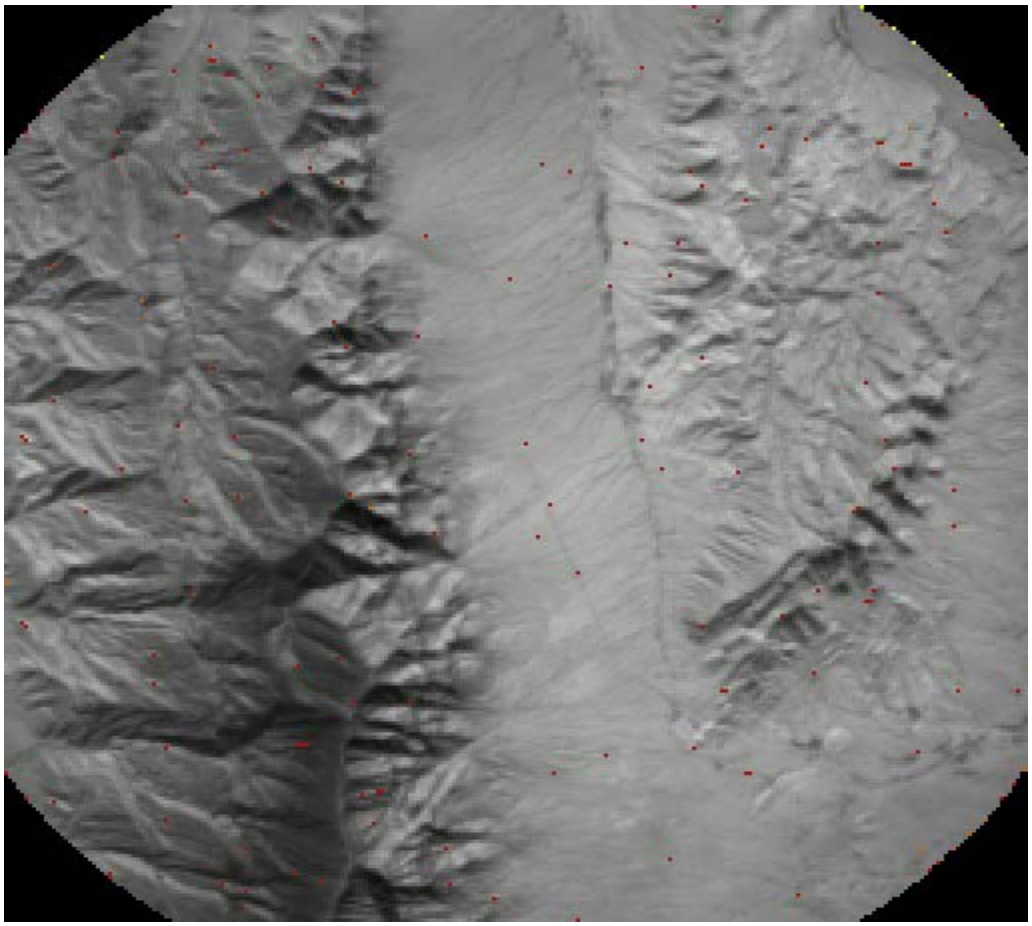
CHLOE Live Fire Video



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