Extended Area Protection and Survivability (EAPS) ATO

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EAPS ARDEC APO

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Distribution A: Unlimited Distribution
A. Program Overview & Update

B. Flight Body Evolution of EAPS Interceptor
• Goal is to Develop Technologies for 360 Degree Mobile Air Defense Against Rockets, Artillery and Mortars (RAM)

• ARDEC ATO Program Pursuing Gun Based Solution for Short Range Inner Tier – Need to fill range Gap of present systems

Target List
- Rockets: 107 mm-240 mm
- Artillery: 122 mm-152 mm
- Mortars: 60 mm – 120 mm
EAPS Gun Baseline Concept

50mm Bushmaster Cannon

RF Data Link

Radar Track

Forward Fragmentation Warhead Detonation

Mid-Flight Course Correction

Dual Barrel, 10 Round Burst at 200 Shots per Minute Per

50mm Course Corrected Projectile

Distribution A: Unlimited Distribution
• Demonstrate a prototype 50mm auto cannon that fires at 200 rds/min w/ a feed system for a ten round burst.

• Demonstrate a fire control sensor & commo station to simultaneously track burst of ten interceptors and two threats and command the ten interceptors to maneuver and warhead function.

• Demonstrate a 50mm cartridge to meet threshold performance.

Demonstrate integrated system (System Level TRL-6) by defeating two stationary threats in a simultaneous emulated scenario.
EAPS Gun ATO
Integrated Demo Roadmap

Technology Demonstration Plan
Baseline Gun (112rds/min) Baseline Projectile Design New E-Scan Radar

Fixed Gun, Stationary Targets Demo

Performance Demonstration Plan
Revisit Syst Study For Optimum Caliber

High Rate Gun (200rds/min) Optimized Projectile Design New E-Scan Radar

Indiv Component Demo

Smaller Battery MEMS S&A Reduced Antennae Smaller Electronics More Lethal Warhead

FY14
EAPS Gun System
HEMTT Mount

- C5, C17, C130 Transportable
- Meets Mobility Requirements
- More Cost Effective Than the Stryker – Stryker Also An Option
Technovative Applications
EAPS Fire Control System

512-element Transmit Antenna based on PPS with improved cooling

512-element Receive Antennas (3) based on PPS

1 meter interferometer baseline for high angular accuracy

PPS electronics group with upgraded processors

Fire control software adapted from PPS

Multi-target tracking and RF communications
FLIGHT DESIGN REFINEMENT TO REDUCE AEROBALLISTIC DRAG
Original Ogive Design

Flight Design, Nov 2007
Spike Nose Fix – Demo Round

Flight Design from Feb 2008 to Mar 2009, Demo

Velocity Comparison

Increased Stability at the Expense Of Drag
Identified Spike & Boom Lengths & Fin Design As Variables for Drag Reduction
Test 405 Matrix

1.5 Caliber Spike

1.5 Caliber Shorter Boom, T-Tab Fin

1.5 Caliber Spike, No T-Tab Fin

<table>
<thead>
<tr>
<th>Interceptor description</th>
<th>@ Mach 2.5</th>
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<tbody>
<tr>
<td></td>
<td>Prediction</td>
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<tr>
<td>1.5 caliber spike nose</td>
<td>0.57</td>
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<tr>
<td>No T-Tab fin</td>
<td>0.61</td>
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<tr>
<td>1.5 caliber spike + no T-Tab fin</td>
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**Drag Reduction Summary**

**Velocity @ 1000 m [m/s]**

<table>
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<tr>
<th></th>
<th>Velocity</th>
<th>Difference from test 303 [m/s]</th>
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<tr>
<td>Test 303</td>
<td>567</td>
<td>-</td>
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<tr>
<td>1.5 caliber spike</td>
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<tr>
<td>No T-Tab fin</td>
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<td>+18</td>
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<td>1.5 caliber spike + no T-Tab fin</td>
<td>658</td>
<td>+91</td>
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**Gained Back Lost Velocity**
Fire Control Sensor Contractor Allows Program to Move Toward Integration Phase Demonstration in FY14.

Interceptor Optimization (still ongoing) Will Meet Performance Requirements

- Lethality Assessment tests to optimize warhead design.
- System study to select optimum caliber.
- Flight design and refinement to reduce aeroballistic drag.