ENGINEERING VICTORY

ARDEC

# *Firepower Symposium*

# *Arming Robotic Systems*

# *12 June 2007*

***Ms. Kim Jones/Mr. Leon Manole***
***Armed Unmanned Vehicle & Remote Armament System Business Area Manager (acctg.)***
***Armaments Research, Development and Engineering Center (ARDEC)***
*973-724-5072*

# Briefing Outline

- Introduction
- Armaments for Unmanned Ground Systems
- Armaments for Unmanned Air Systems
- Network Lethality
- Future Needs for Armed Unmanned Systems
- Summary

# Introduction

- Remote Armament Systems (RAS) is one of ARDEC's Key Investment Initiatives
- ARDEC's RAS Market Development Team (MDT) is the Focal Point for this Initiative
- The MDT is Focused on the Development and Integration of RAS (i.e. Munition, Weapon, Fire Control, Energetic, Fuze and Precision Armament Systems) onto all Platforms (manned and unmanned systems).
- Today's Briefing will Focus on ARDEC's Innovative RAS Technologies

# Armaments for Unmanned Ground Systems

ENGINEERING VICTORY ARDEC

# Special Weapons Observation Remote recon Direct Action system (SWORDS)

- First U.S. Army Armed Unmanned Vehicle to Receive a Safety Confirmation
- Presently Performing Surveillance/Guarding Facilities
- Light Class Approximately 200 pound Armed Unmanned Ground System
- Ultralight Remote Armament System TRAP Mount

ENGINEERING VICTORY

ARDEC

# Pyrotechnic Devices for Anti-Tampering

- Providing Non-Lethal Mechanisms To Protect The Unmanned System
- Flash-bang, Smoke, Noise, etc  Devices Being Designed and Demonstrated
- Applicable to All Classes of Unmanned Ground Systems

ENGINEERING VICTORY ARDEC

# Weaponization of Medium Weight Class Tactical Amphibious Ground System (TAGS)

- ARDEC is Integrating various, Unique Remote Armament Systems Onto Medium Class UGS
- Teamed with TACOM/TARDEC to Weaponize Various Platforms Including TAGS
- Illustration below shows Picatinny Lightweight Integrated Onto TAGS

ENGINEERING VICTORY ARDEC

# Weaponization of Large Weight Class Unmanned Ground Systems (UGSs)

- ARDEC is currently Developing/Testing Unique Armament Systems for Large Weight Class UGS
- Illustrated Below is Robotic Mortar Being Developed for Manned and Unmanned Platforms

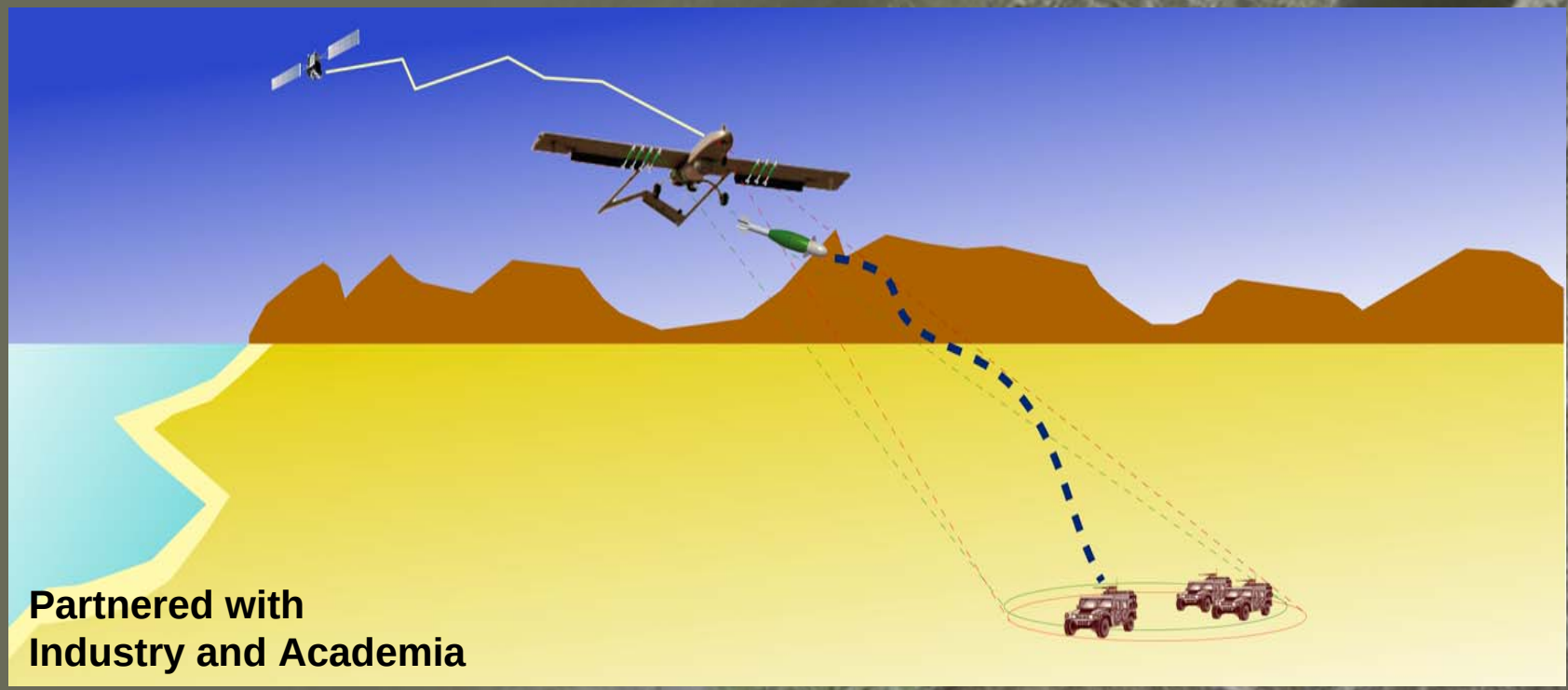
# Developing Various Non-Lethal Technologies

- **Modular Crowd Control Munition (MCCM) for UGV's**
- **Self-Protection/Anti-Tampering for All Weight Classes UGVs**

# Armaments for Unmanned Air Systems

# UAS Dropped Guided Mortar

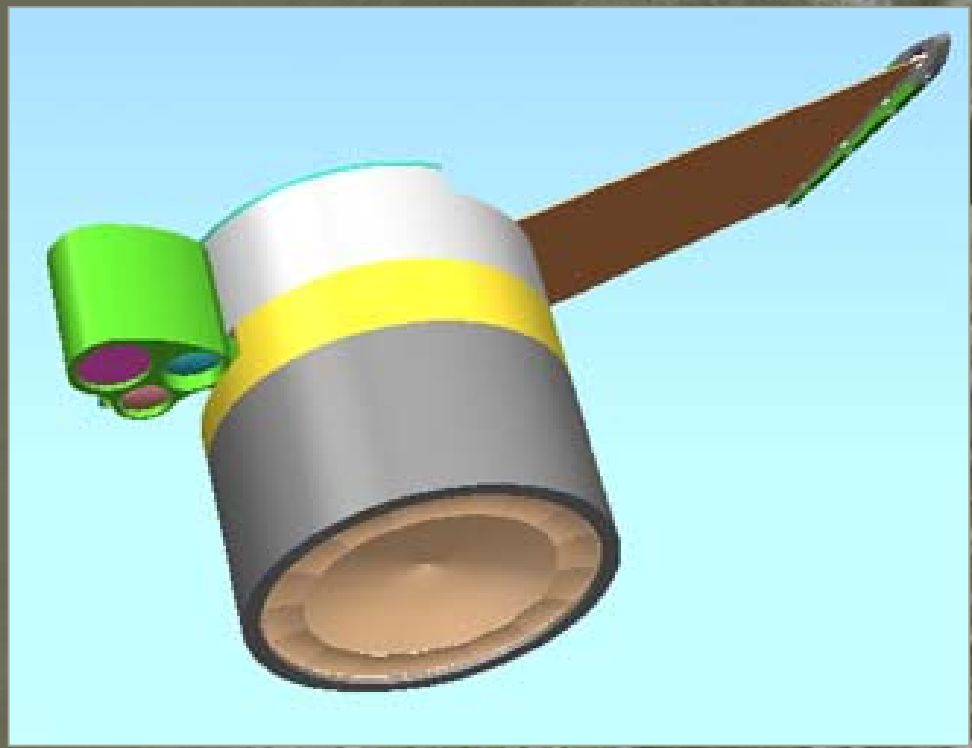
- GPS-seeker Guidance Solution for 60-120 mm Dropped Mortar
- Providing UAS with Low Cost/Collateral Damage Capability to Defeat Targets



**Partnered with**
**Industry and Academia**

# Payloads for UAS

- Developing Unique Payloads
- Pictured Below is the Common Smart Submunition



ENGINEERING VICTORY

ARDEC

# Unique Energetic Solutions for UAS

- Showcases ARDEC Novel Energetics
- Various  Munitions and Energetic Capabilities are Being Developed for UAS
- Capability to Weaponize From Ultralightweight To the Largest Weight Class UAS

ENGINEERING VICTORY ARDEC

# Defense Against Autonomous Air, Water & Ground (DA3WG) Devices

- **Defining Ways to Counter Unmanned System Threats**
- **Working on Detection and Defeat of Swarms of Unmanned Systems Utilizing ARDEC Armaments**

# Network Lethality

ENGINEERING VICTORY

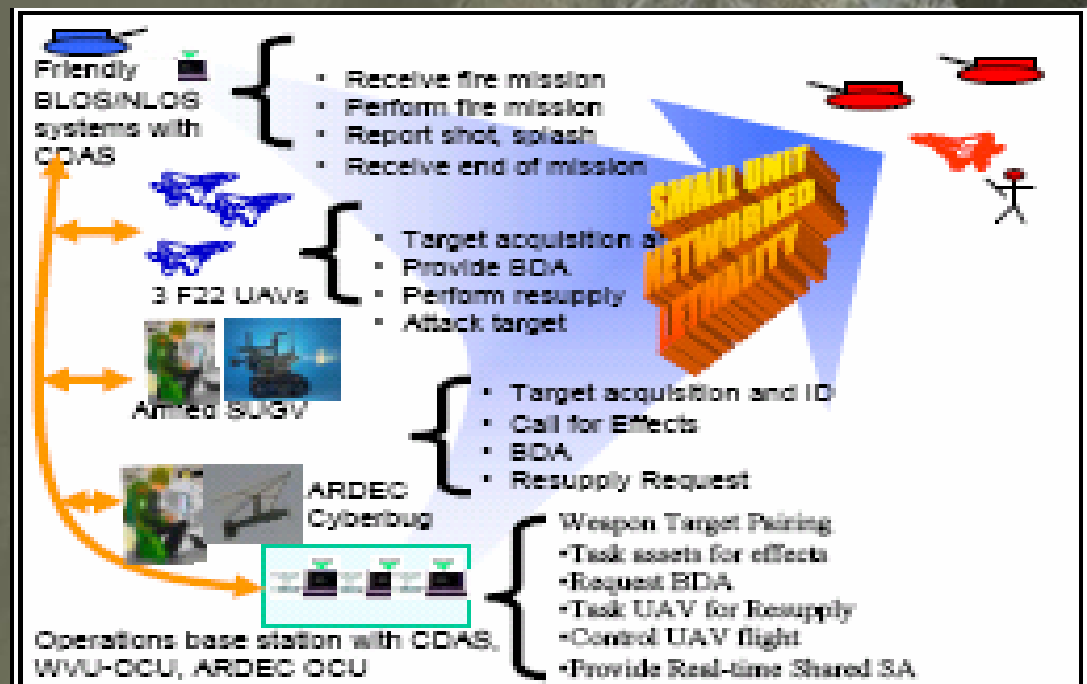
ARDEC

# Network Lethality Capability

- **ARDEC is Teamed With OGAs and Private Industry To Incorporate Network Lethality Solutions for UGS/UAS/Manned Systems as a Force Multiplier**

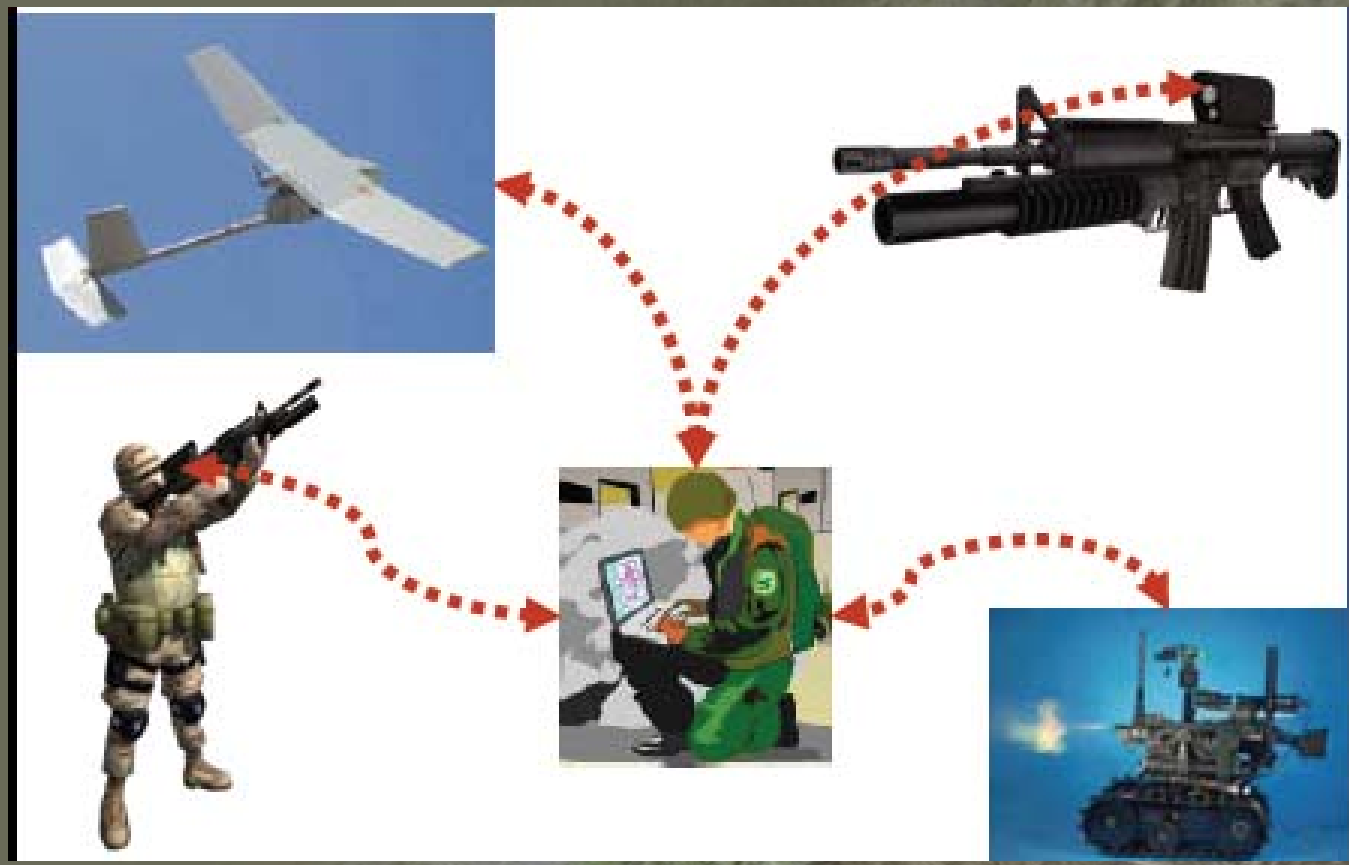
- **ARDEC's Role is Developing Weapon Systems that are Networked Capable and Providing the Proper Weapon Solutions/Fire Control During an Encounter**

- **Currently ARDEC is Demonstrating a Network Lethality Scenario Consisting of Armed Manned and Unmanned Systems with the Soldier-In-The-Loop**



# Networked Smart Sight

- **Fire Control Sight System for Networking to all Platforms**
- **Manned/Unmanned Targeting/Engagement**



# Future Needs for Armed Unmanned Systems

- Safety
  - Testing
  - Certification
  - Release
- Requirements
  - Identification
  - Generation
- Networking
- Soldier-In-The-Loop

# Summary

- ARDEC actively working Remote Armament System Solutions.
- ARDEC Foresees Lethality Options for Unmanned Vehicles. Future needs:
  - Networking
  - Safety
  - Requirements
- ARDEC Strongly Desires to Develop Joint Technology Programs with OGA, Industry and Academia.