Army Robotics Modernization
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Agenda

• New Developments

• Robotics and Autonomous Systems Capabilities

• Army Robotics and Autonomous Systems Strategy

• Army Requirements Oversight Council (AROC)

• Resourcing

• Innovation

• Challenges
New Developments in Robotics

- Army Staff Consolidation for Requirements and Resources
- Army Science Board Study on The Role of Advanced Autonomy Within Army Formations (Tactical Wheeled Vehicle, Dismounted, and Armored)
- Extended Warfighter Experiment for Leader-Follower Technology
- Army Warfighter Assessment for Leader-Follower Technology
- Programs of Record Requests for Proposal release
- Emerging Requirements Documentation
1. Protecting the force
2. Maintaining overmatch during combined arms operations
   a. Improve situational awareness and persistently monitor the environment
   b. Lighten physical and cognitive workloads
   c. Sustain with increased distribution, throughput, and efficiency
   d. Facilitate movement and maneuver

- Army Operating Concept (AOC) published November 2014
- Joint Capabilities Robotics and Autonomous Systems (JCRAS) to be published Aug 16

Robotics and Autonomous Systems (RAS) extend the area and time over which a force can be effective.
Victory Starts Here!

Robotic and Autonomous Systems Strategy

Purpose: The strategy synchronizes Army RAS activities, fosters unity of effort, and identifies opportunities to accelerate RAS capabilities in a resource-constrained environment. The Army will employ RAS to protect Soldiers and increase capabilities to maintain overmatch. This vision has **realistic objectives** in the near-term, **feasible objectives** in the mid-term, and **visionary objectives** for the far-term.

Near-Term Objectives:
- Protecting the force at increased standoff distances
- Improving sustainment through Automated Ground Resupply
- Lighten the Soldier load
- Improve situational awareness
- Facilitating movement and maneuver

Mid-Term Objectives:
- Improve the autonomy of unmanned ground systems
- Unmanned air cargo delivery
- Increase payloads for ground and air platforms
- Introduce exoskeleton technology

Far-Term Objectives:
- Machine intelligence, perception, reasoning
- Provide information that facilitates onward movement of early entry forces
- Operate in advance of maneuver forces to establish network, provide long-range fire data and local security

Sources for objectives:
- Army Operating Concept, App C-2
- TRADOC S&T Imperatives
- Capability Needs Analysis
- RDECOM S&T Focus Areas
CSA guidance:
- AROC is a decision making forum for the CSA/VCSA on all matters of requirements and modernization
- AROC will be driven by commanders (mainly TRADOC, FORSCOM, and AMC)
- AROC will be held every Friday
- CSA/VCSA are the only authority to cancel or delay AROC
- CSA/VCSA are the only authority for approving requirements and changes to requirements

Operating Rules:
- AFC’s goal is to ensure AROC issues are clearly articulated and presented for AROC decisions => Consensus is NOT the goal
- Non-concurs will be noted and will not slow the process
- Voting members must be prepared and be empowered to represent the command’s position
- Votes will be by name from all commands and agencies
- G8 Hardware Divisions will maintain control of the briefing slides and products
- Pre-briefs are responsibility of each command/agency
Robotics Funding

Robotics Funding FY 14 - FY 21 ($M)

FY 18-22
- Ground Robotics
- Robotics Architecture
- MTRS Inc II
- Common Robotic System - Individual (CRS-I)
- Heavy EOD Robot
- Squad Multi-Purpose Equipment Transport (SMET)
- Robotics Enhancement
- Robotics Development
- Family of Heavy Tactical Vehicles
- Leader Follower
- Autonomous Convoy Operations (ACO)
- M160 Light Flail
- Small Unit Power (SUP)

FY 17-21
- Man Transportable Robotic System (MTRS) Inc II
- Tactical Unmanned Ground Vehicle (TUGV)
- Family of Heavy Tactical Vehicles
- M160 Light Flail
- Small Unit Power (SUP)
Integrated Defense Acquisition, Technology, and Logistics Life Cycle Management System

Needs Driven
- DOTMLPF Analysis
- CBA
- ICD
- MDD
- DCR

Event Driven
- Analysis of Alternatives
- CDD
- Engineering Manufacturing Development
- CPD
- Production and Deployment

Good idea to initial fielding averages seven years!

Calendar Driven

Where can we accelerate?

<table>
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<tr>
<th>2015</th>
<th>2016</th>
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<td>Oct</td>
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- **FY16 Budget Execution**
  - POM 17-21 OSD Review
  - FY17 OMB Review
  - FY17 Congressional Budget Hearings
  - FY17 Congressional Budget Markups
  - POM 18-22 Requests / Prioritization
  - POM 18-22 PEG Build
  - POM BES 18-22 Build
  - LIRA 19-47 Build

- **Where can we accelerate?**
  - Sponsor Activity
  - JCIDS Document
  - Acquisition Decision

- **Calendar Driven**

- **Needs Driven**
  - DOTMLPF Analysis
  - CBA
  - ICD
  - MDD
  - DCR

- **Event Driven**
  - Analysis of Alternatives
  - CDD
  - Engineering Manufacturing Development
  - CPD
  - Production and Deployment

- **No Requirement in FY15 = No Money in FY18 = No Program**
Challenges to Developing PoR

• The establishment of Programs of Record (PoR) requires the synchronization of technology development, requirements, and resources

• S&T technology development (Conditions based):
  – Understanding the Environment / Perception
  – Human-Robotic Interaction
  – Object Manipulation
  – Mobility
  – Machine Intelligence

• Operational Concepts and Requirements (Conditions based)
  – Force 2025 and Beyond
  – Improved protection, persistence, and endurance across the Warfighting Functions
  – Manned – Unmanned Teaming
  – Role of increased autonomy within formations; RAS transition from tool to team member
  – Government Owned Interface Standards / Specifications
  – Interoperability / Commonality / Modularity
  – Capability thresholds

• Resources (Calendar based):
  – Force Structure
  – Budget cycle
  – Approved Requirement documentation and supporting analysis
  – Affordability thresholds
  – Increased competition to reduce cost
  – Congressional Support
Questions ?