



RCCTO

ARMY RAPID CAPABILITIES AND CRITICAL TECHNOLOGIES OFFICE

RCCTO Overview Brief

08 March 2024

We Deliver to Soldiers

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RCCTO Mission



MISSION: The Rapid Capabilities and Critical Technologies Office will rapidly and efficiently research, develop, prototype, test, evaluate, procure, transition, field, and/or sustain critical enabling technologies and capabilities that address immediate, near-term, and mid-term threats. The Rapid Capabilities and Critical Technologies Office will produce or acquire materiel solutions, consistent with the Army's modernization priorities that maximize Soldiers' capabilities to deploy, fight and win on future battlefields.

Reference: 30 NOV 23 Charter



Hypersonics



Directed Energy



Rapid Acquisition Prototyping



Cyber, Electronic Warfare and Information Dominance



Advanced Concepts Critical Technologies



Counter-small Unmanned Aircraft Systems



RCCTO Governance & Relationships



On 30 November 2023 the Secretary of the Army signed an updated RCCTO Charter.

- ...established as a unique organization to improve the speed of technology and prototyping to enable the Army's implementation of the National Defense Strategy and Army Vision.
- ...must rapidly and efficiently research, develop, acquire, transition, and field critical technologies and combat capabilities for the Army, or coordinate and drive the accomplishment thereof.

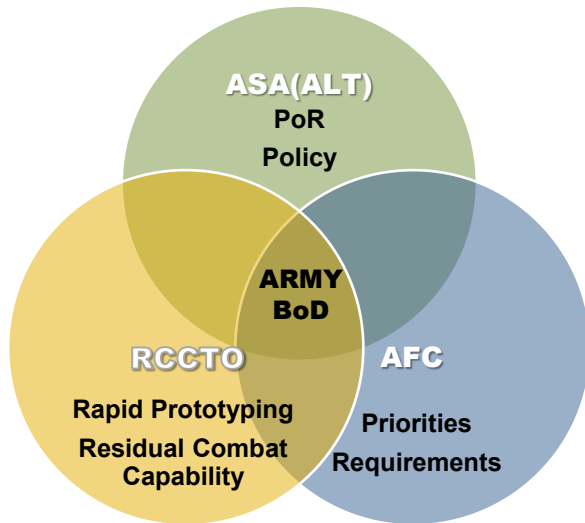


Army Board of Directors	
HON Christine E. Wormuth <i>Secretary of the Army</i>	GEN Randy A. George <i>Chief of Staff of the Army</i>
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HON Douglas R. Bush <i>Assistant Secretary of the Army for Acquisition, Logistics and Technology (ASA (ALT))</i>	GEN James E. Rainey <i>Commanding General, Army Futures Command</i>

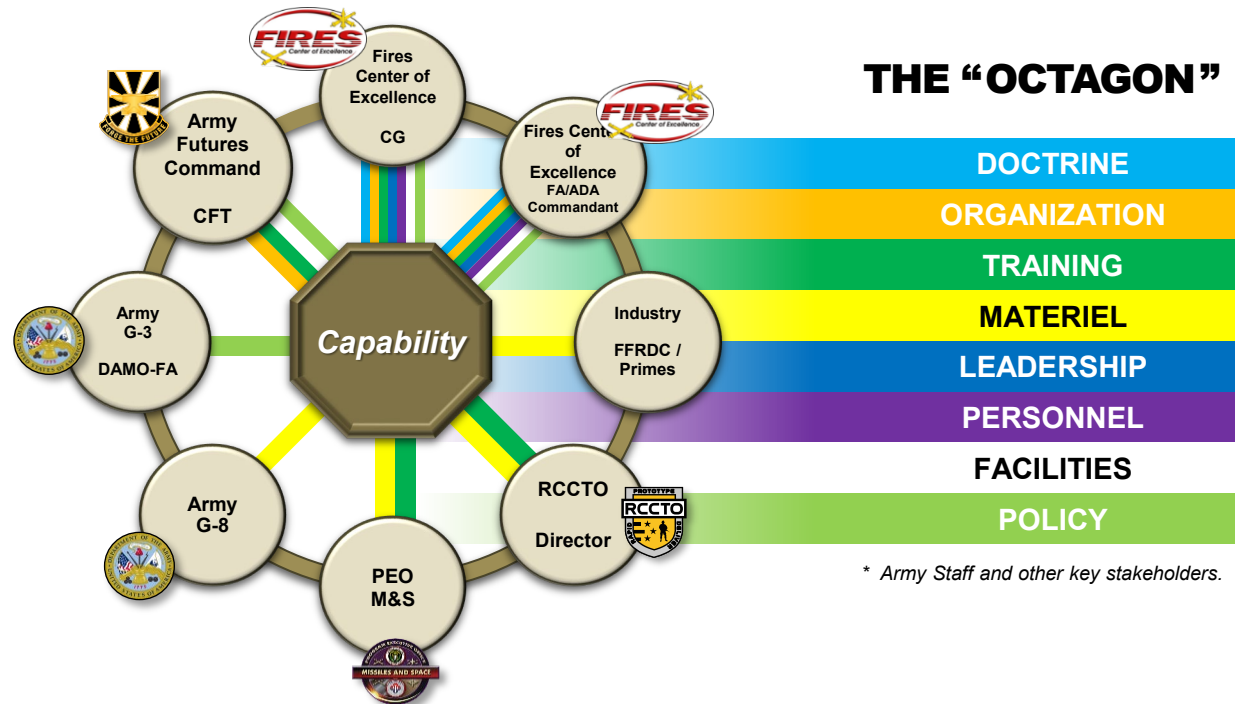
As of 20 DEC 2023

LTG Robert A. Rasch, Jr.
Director

ARMY PARTNERS



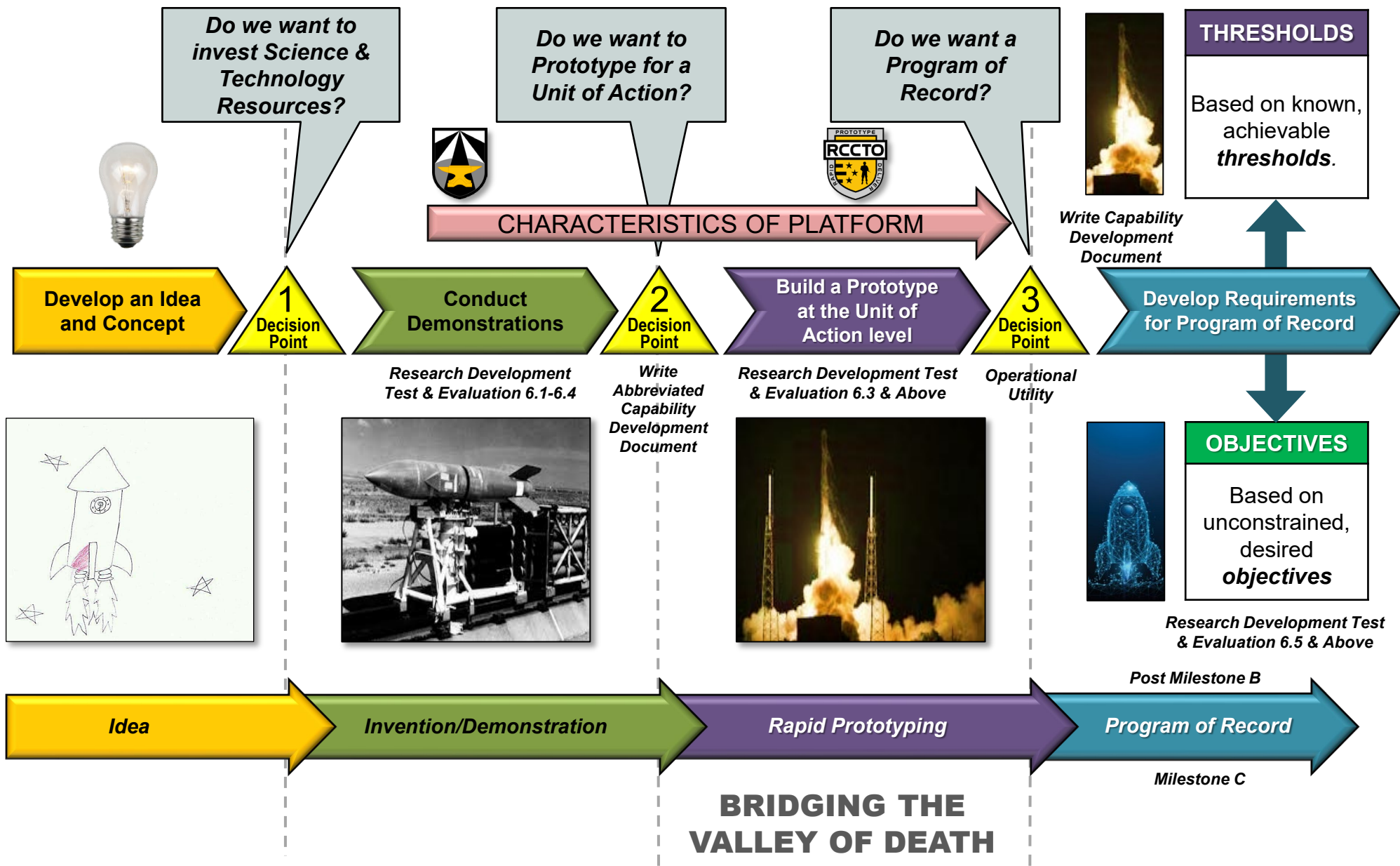
Partnership Transition Teams



* Army Staff and other key stakeholders.



Modernization Continuum





Army Hypersonic Project Office



LRHW: What We Are Delivering



Long-Range Hypersonic Weapon

Mission: Deliver an experimental prototype LRHW with residual combat capability at the Battery Level as part of the Long-Range Fires Battalion in support of Multi-Domain Operations.

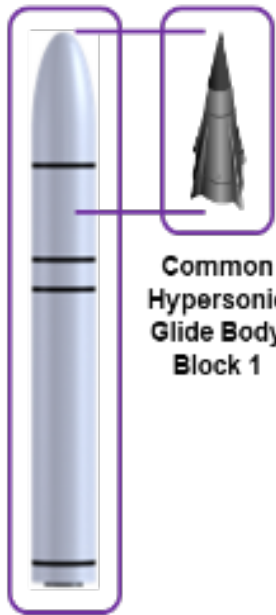
C-17 Load Out



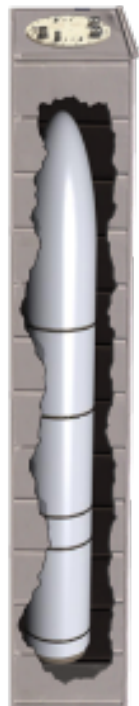
Battery Operations Center System



Notional Depiction



Common Hypersonic Glide Body Block 1



All-Up Round (AUR)



Canister

 = Joint Service Common

Transporter Erector Launchers

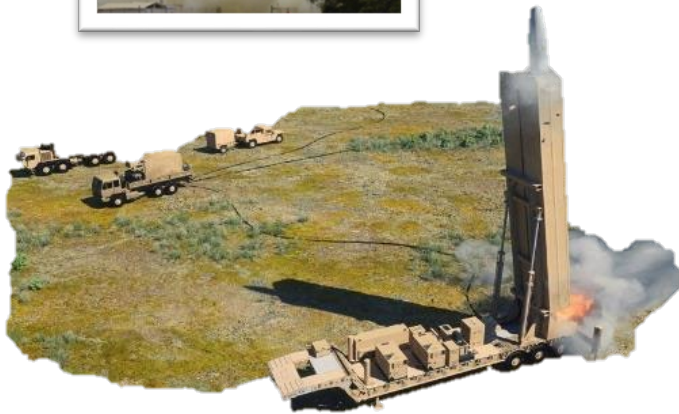


Long Range Hypersonic Weapon



Where we have been:

- Developed, delivered first LRHW Battery's Ground Support Equip. (GSE)
- Established Middle Tier of Acquisition program for LRHW GSE
- Flight test challenges



Where we are going:

- Conduct rigorous analysis and ground tests to return to flight test
- Provide first combat capability: Battery #1
- Deliver Battery #2 and Battery #3
- Add new capability via Technology Insertions (TIs)



Directed Energy Prototyping Office

Directed Energy Prototyping Office (DEPO) Efforts

APPROVED FOR PUBLIC RELEASE



Supports JCO

Maneuver / Mobile Air Defense

Fixed and Semi-fixed Base Defense

Palletized-High Energy Laser (P-HEL)



Notional Depiction

Palletized 10kW and 20kW-class Laser weapon systems, including on-board target tracking and FAAD C2 interoperability, with residual combat capability.

Army Multi-Purpose High Energy Laser (AMP-HEL)



Notional Depiction

20kW-class Laser weapon system mounted on the existing Infantry Squad Vehicle (ISV), including on-board target tracking and FAAD C2 interoperability, with residual combat capability.

Directed Energy Maneuver-Short Range Air Defense (DE M-SHORAD)



Notional Depiction

50kW-class Laser weapon integrated on a Stryker platform, including on-board target tracking and FAAD C2 interoperability, with residual combat capability.

Indirect Fire Protection Capability-High Energy Laser (IFPC-HEL)



Notional Depiction

300kW-class Laser weapon system designed to fit on an Army truck, including on-board target tracking and IBCS integration, with residual combat capability.

Indirect Fire Protection Capability-High Power Microwave (IFPC-HPM)



Notional Depiction

High Power Microwave weapon system, including FAAD C2 interoperability, with residual combat capability.

MISSION

RCCTO, in coordination with the JCO, demonstrated and deployed low-cost C-sUAS prototype laser weapon systems in FY22 -FY24.

MISSION

RCCTO will deliver prototypes in FY24.

MISSION

RCCTO delivered the first prototype platoon in FY23. RCCTO will continue with additional prototypes and set conditions for transition in support of future acquisition activities.

MISSION

RCCTO will deliver prototypes in FY25 and set conditions for approved acquisition pathway.

MISSION

RCCTO will deliver prototypes in FY24 set conditions for approved acquisition pathway.

USE OR DISCLOSURE OF DATA CONTAINED ON THIS PAGE IS SUBJECT TO RESTRICTIONS ON TITLE PAGE



Rapid Acquisition Prototyping Project Office

Rapid Acquisition Prototyping Project Office (RAPPO)



Mission: Rapidly and efficiently research, develop, test, evaluate, procure, transition, and/or field critical enabling technologies and capabilities as prototypes that address near-term, and mid-term threats.

Operating Principles:

- 1) Field **experimental prototypes** with **residual combat capability** to Soldiers.
- 2) Provide options to the Army's "unit of action" level that are **postured for transition** into a Program of Record.

Conducts accelerated acquisition and technology assessments to transition prototypes through the RCCTO and deliver into the hands of Soldiers

Hybrid Electric Vehicles (HEVs)



- Increase operational effectiveness through reduced signatures.
- Increase onboard electrical power generation, add off-platform export power capability.
- Increase automotive performance.



***M2A2 Bradley
Fighting Vehicle***



***M1151 A1 Up-Armored High
Mobility Multipurpose
Wheeled Vehicle***



***M1281 Close Combat
Weapons Carrier Joint
Light Tactical Vehicle***

Where we have been:

- Bradley HEV: Delivered 2.
- HMMWV HEV: Test Readiness Review.
- JLTV HEV: Interim Integration and Build completed.

Where we are going:

- Bradley HEV: Transfer knowledge to PEO GCS.
- Prototype: 2 X HMMWV HEV, 3 X JLTV HEV, and 4 X Stryker HEV.



Human-Machine Integrated Formations



Background



- **Army senior leadership directed RCCTO to evaluate Robotics and Autonomous Systems (RAS) support constructs**
- **RCCTO established an Army wide Integrated Solutions Team (IST) to provide recommendations on HMIF concepts**
- **RCCTO recommended fielding integrated robotic formations:**
 - One Light Human-Machine Integration (HMI) Platoon to an Infantry Brigade Combat Team (IBCT)
 - One Heavy HMI Platoon to an Armored Brigade Combat Team (ABCT) with an accelerated timeframe
- **RCCTO directed to execute HMIF operational prototype**
 - Provide two HMIF formation sets (Heavy and Light) for rapid prototyping and leave-behind capability at two United States Army Forces Command (FORSCOM) units for learning, iterative refinement, and operational deployment
 - Three-year prototyping effort

Human-Machine Integrated Formations (H-MIF): Leadership Intent

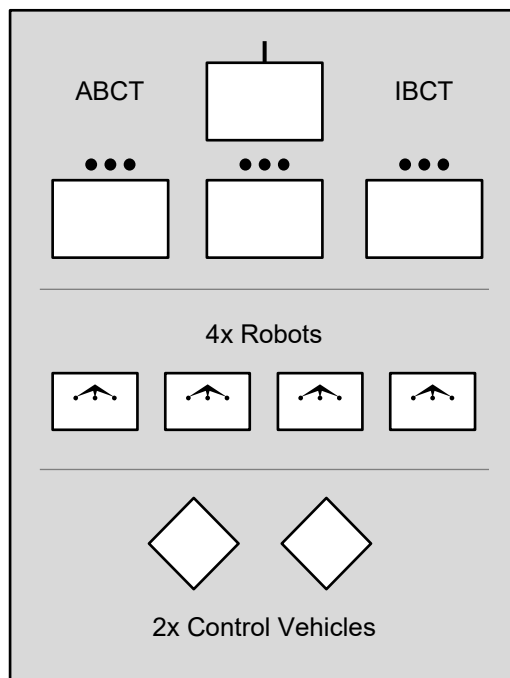


Task: Develop a RCCTO-led, total Army Integrated Solutions Team (IST) developing Human-Machine Integrated Formations (H-MIF), integrating cross-Army autonomous and robotics initiatives into operationally deployable prototypes.

Intent

- Focus on Human-Machine Integration, not Human-Machine Teaming
- Optimize capabilities of both Human and Machine
- Formation-based Thinking
- Place into the hands of Soldiers to receive innovation feedback
- Start small (1-2 PLTs) of Mechanized and Light, then scale to other formations

Initial Formation(s)



HEAVY &
LIGHT

Deliverables

Pull From Enterprise:

- Initial Platform(s)
- Initial Payload(s)
- Autonomous Behaviors

Rapid Prototyping:

- Additional Platforms
- H-MIF Architecture
- Resilient Network/Enablers
- Integrated Formation Capabilities
- Enhanced Platforms / Payloads/Behaviors

“Think big, start small, go fast!”



What Do We Hope to Accomplish with HMIF?



- **Baselined autonomous package to begin learning**
- **Overall goal ➡ How do we increase lethality and survivability of our maneuver formations**
- **Decrease complexity while adding capability**
 - Capability ➡ $1 + 1 = 3$
 - Complexity ➡ $1 + 1 = 1.1$
- **Incentivize industry to move towards common standards:**
 - Autonomy
 - Robotics Platforms
 - Payloads



Closing Comments / Questions



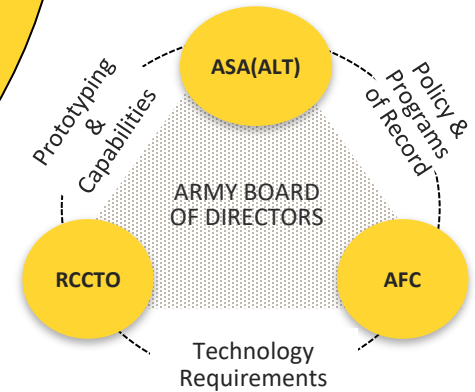
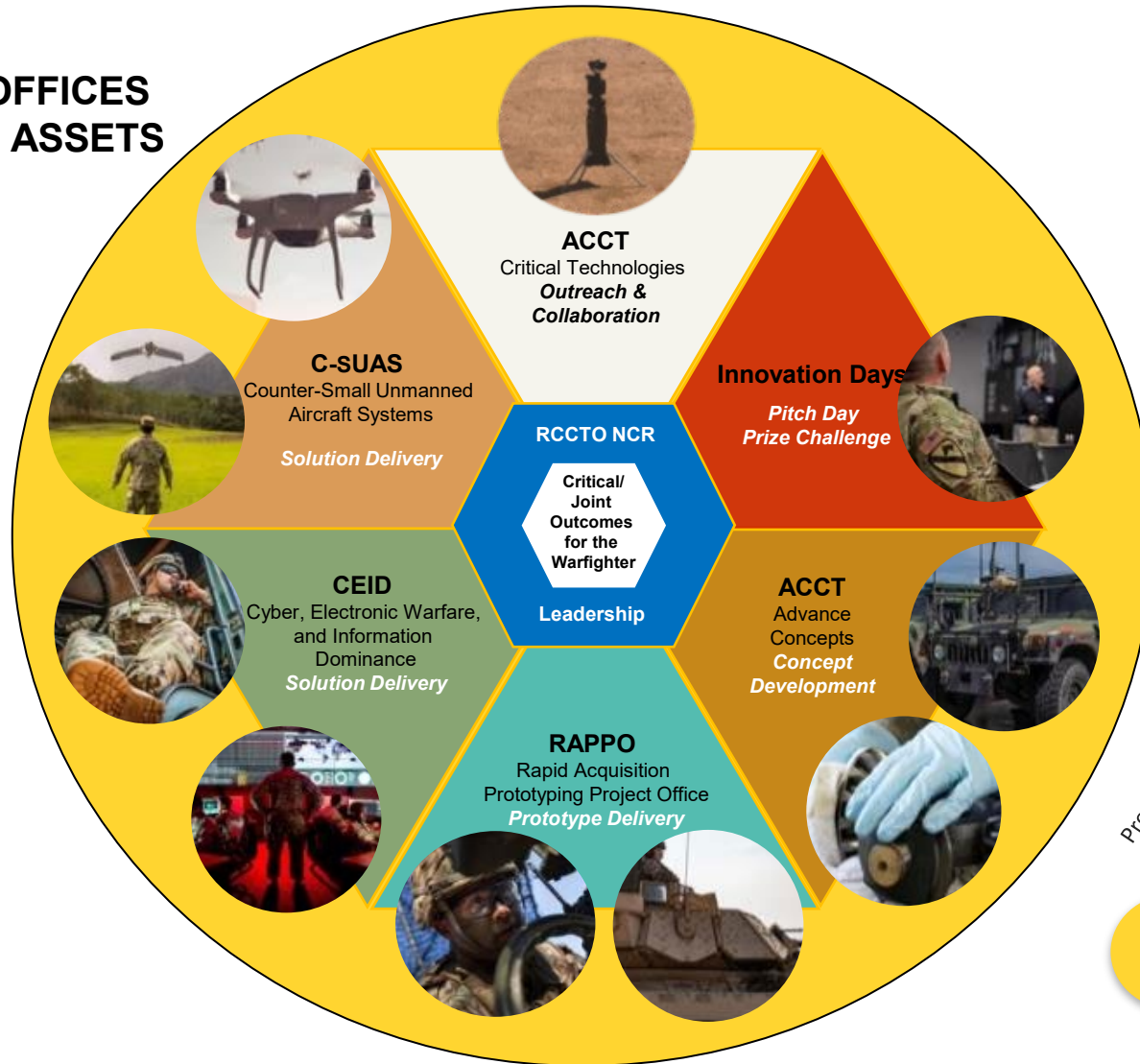
BACKUP



RCCTO Efforts



UNIQUE PROGRAM OFFICES AND MODERNIZATION ASSETS



Identify, Research, Develop, Prototype, Test, Evaluate, Procure, and Transition Critical Technologies to Address Near-term Threats.



Soldier Interaction



- **Soldier Centered Design / Operator Centered Design**

- Early Interaction with Users
- System Usability
- Developer Motivation
- Early Design Confidence



- **Early Provision of Ground Equipment**

- Critical to the development of tactics, techniques, procedures
- Work the wrinkles of communications paths and message formats

- **Soldiers Interactions with Developers**

