

WE DELIVER TO SOLDIERS



Huntsville Aerospace Marketing Association

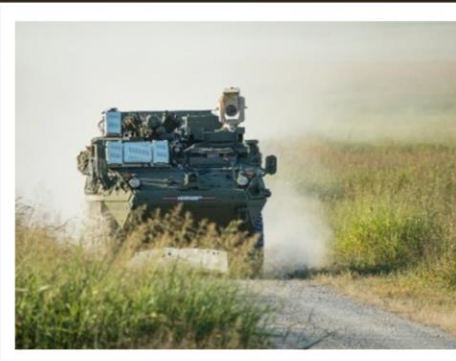
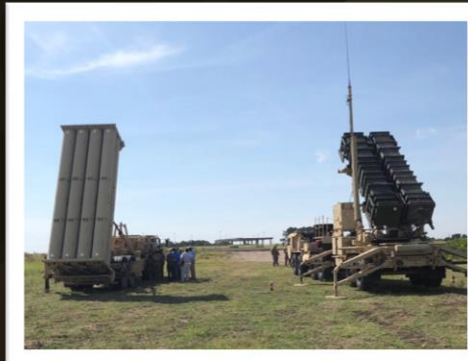
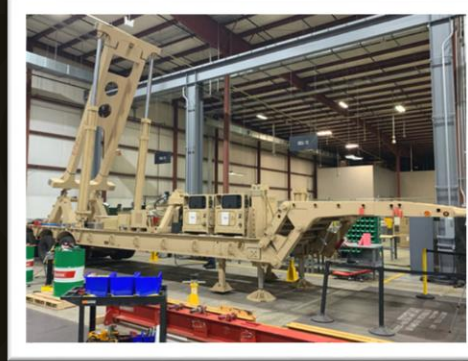
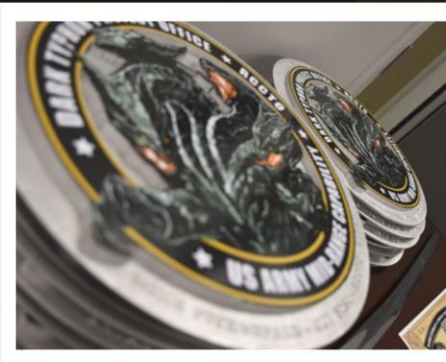
LTG L. Neil Thurgood

U.S. Army

Director of Hypersonics, Directed Energy, Space and Rapid Acquisition



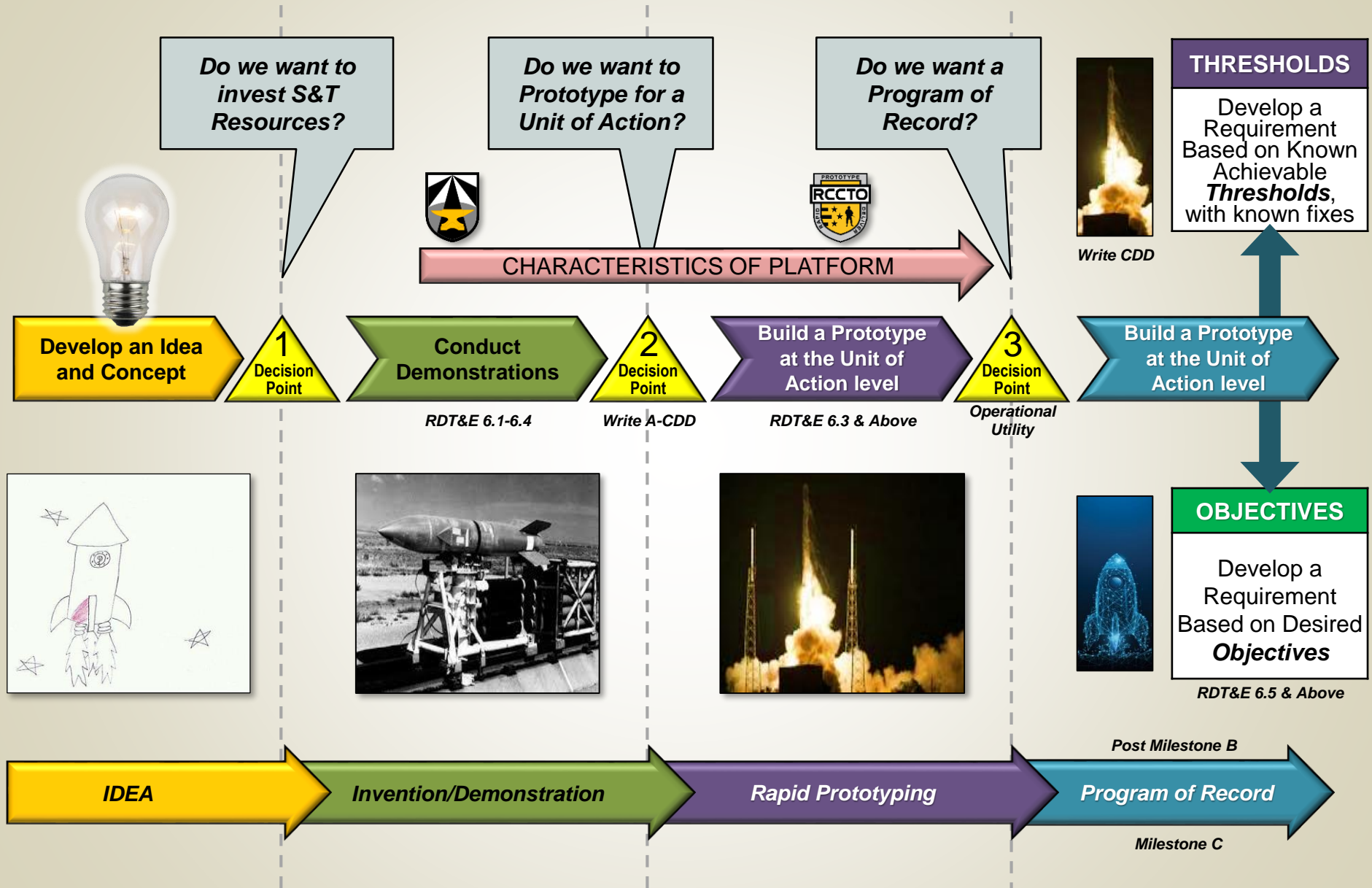
Thank You for Your Support



Partnership, Transparency, and Building on Shared Visualization and Common Understanding is Key to Our Success.



Modernization Continuum





Army Rapid Capabilities and Critical Technologies Office Mission

Aligned with Army Modernization Priorities

SPEED + RANGE + CONVERGENCE = DECISION DOMINANCE & OVERMATCH

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

Reference: 29 July 2020 Charter



Hypersonics



**Directed
Energy**



**Mid-Range
Capability**



**Rapid
Acquisition**



CESD*



ACE**



C-sUAS***

STRATEGIC OUTCOMES

CRITICAL OUTCOMES

JOINT OUTCOMES

* Computing and Electronics Security Dominance (CESD)

** Advanced Concepts & Experimentation (ACE)

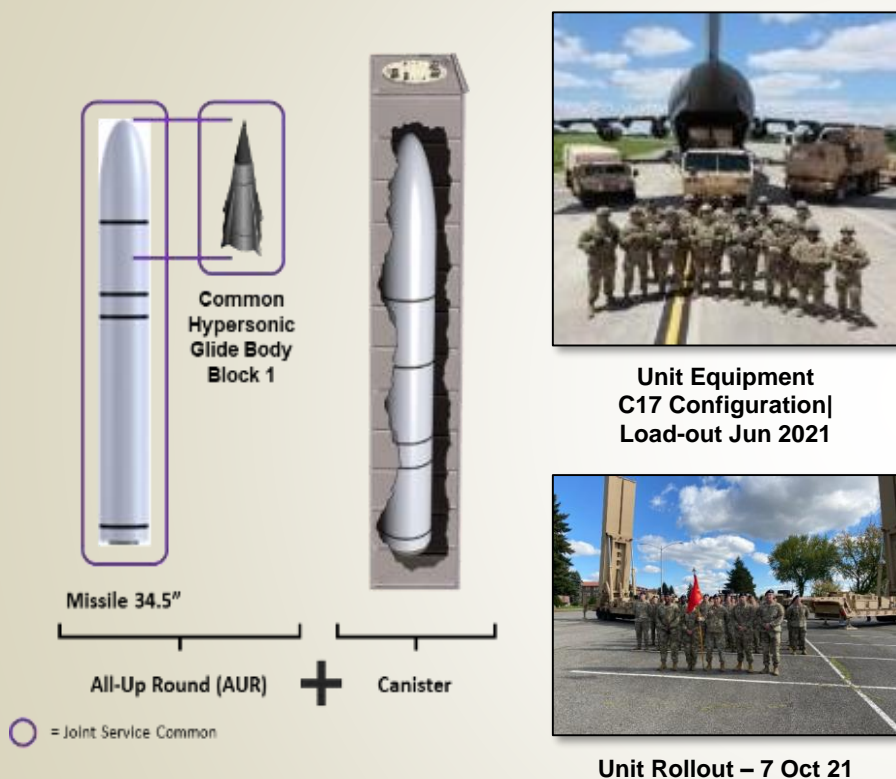
***Counter-small Unmanned Aircraft Systems (C-sUAS)



"Dark Eagle": What We Are Delivering

Long Range Hypersonic Weapon (LRHW)

Mission: Deliver an experimental prototype LRHW with residual combat capability NLT FY23 at the Battery Level as part of the Long Range Fires Battalion in support of Multi-Domain Operations



Battery Operations Center (BOC) System

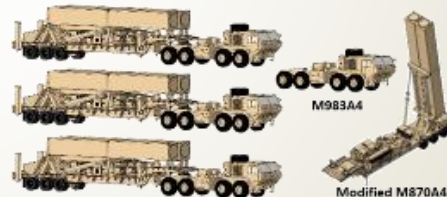


BLK 1 Integration:
AFATDS 7.0



Battery
Operations Center

Transporter Erector Launchers (TEL)

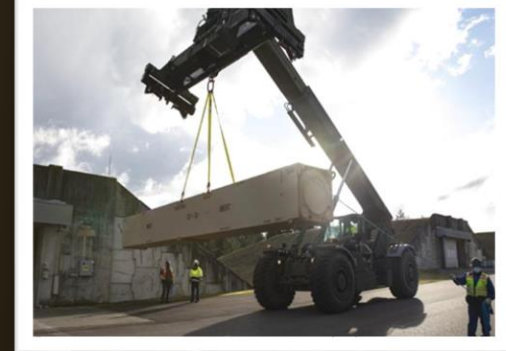
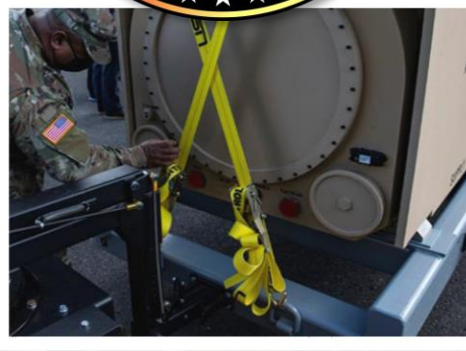


Transition Team

The Embedded Transition Team plans, programs, and synchronizes all activities associated with the development and sustainment of the LRHW Program of Record (PoR)



Hypersonics: First Delivery to Soldiers



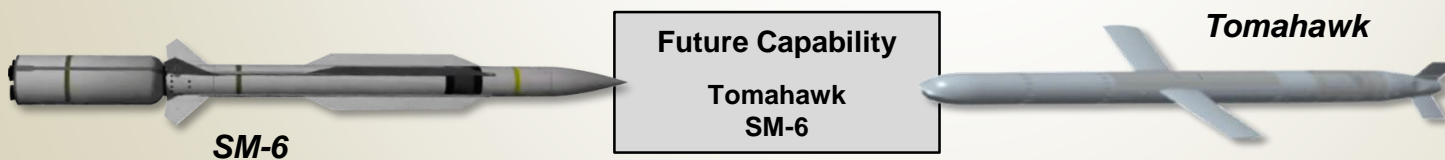
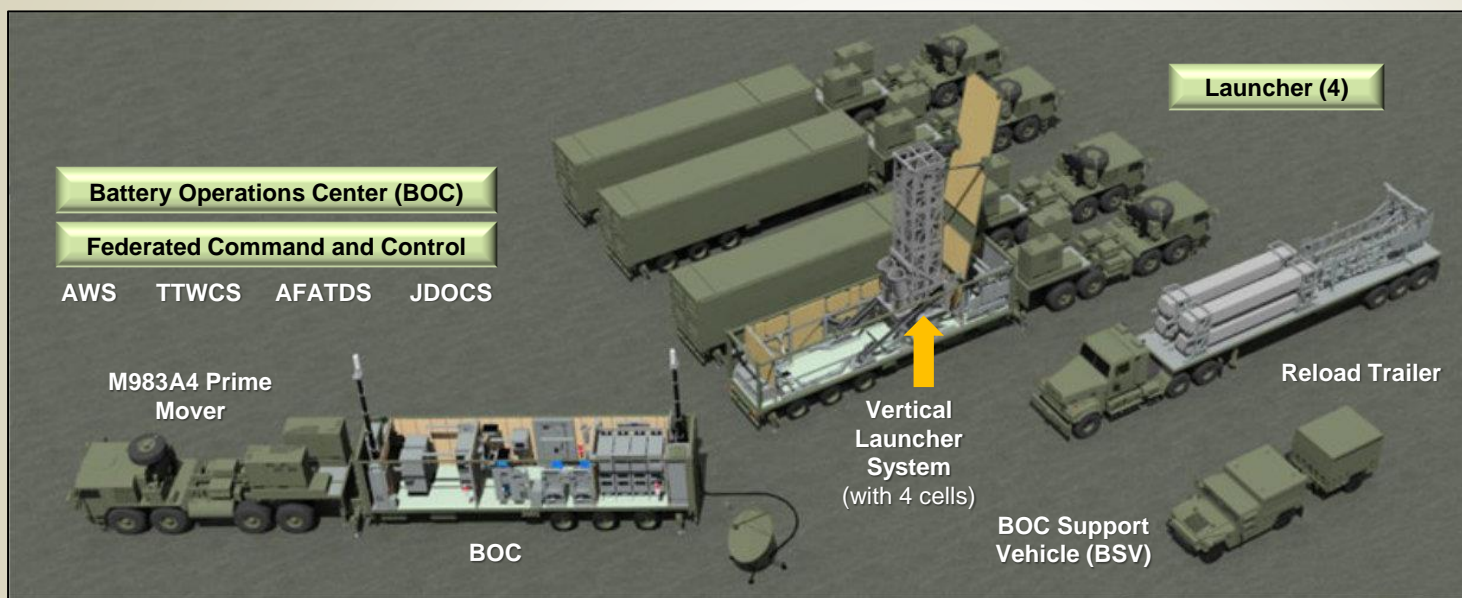
Delivered September 2021



"Typhon": What We Are Delivering

Mid-Range Capability (MRC)

Mission: Deliver an initial prototype MRC NLT 4QFY23 at the Battery Level as part of the Long Range Fires Battalion in support of Multi-Domain Operations



Transition Team

The Embedded Transition Team plans, programs, and synchronizes all activities associated with the development and sustainment of the MRC Program of Record (PoR)



Directed Energy Efforts

Maneuver Air Defense




DE M-SHORAD (Guardian)



Notional
Depiction

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

Threat Set

-  Groups 1-3 UAS
-  Rotary-Wing
-  Rockets, Artillery, Mortars

MISSION

RCCTO will deliver the first prototypes at the platoon level in 4QFY22. RCCTO will continue to deliver prototypes in FY23 and FY24 until transition to PEO MS in FY25.

Fixed and Semi-fixed Base Defense






IFPC-HEL (Valkyrie)



Notional
Depiction

300kW-class Laser system designed to fit on an Army truck, including on-board target tracking and FAAD C2 integration, with residual combat capability

Threat Set

-  Groups 1-3 UAS
-  Rockets, Artillery, Mortars
-  Cruise Missiles
-  Fixed Wing
-  Rotary-Wing

MISSION

RCCTO will deliver the first prototypes at the platoon level in 4QFY24 until transition to PEO MS in FY25.


IFPC-HPM



Notional
Depiction

Air Force developed High Power Microwave platform, including FAAD C2 interoperability, with residual combat capability

Threat Set

-  1-2 UAS Groups or Swarms

MISSION

RCCTO will deliver the first prototypes at the platoon level in 4QFY24 until transition to PEO MS in FY25.

DE C-sUAS (Supports JCO)



Notional
Depiction

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

Threat Set

-  Groups 1-2 UAS

MISSION

RCCTO, in coordination with the JCO, will demonstrate two low-cost C-sUAS prototype laser weapon systems in FY22 with the ability to detect, track, identify, and enable hard kill defeat of Group 1 and 2 UAS threats.



Critical Directed and Disruptive Technology Efforts

Current Efforts

RAPPO

Bradley Hybrid Electric Vehicle

- Hybrid Power Solutions, increased survivability, lethality

Family of Counter UAS Systems (FoCUS)

- Platform agnostic terrestrial next generation passive detection suite execution of Cyber, Electronic Warfare, and Information Operations missions

nUAS Batteries

- Deliver a novel nUAS battery lithium-ion solution for a TBD Army nUAS, using High Active cathode and silicon composite anode with a Nano-Whisker structure, & which is capable of significantly increasing the specific energy of existing comparable batteries while maintaining safety performance.

nUAS Batteries

- Deliver a novel battery solution for the Soldier Borne Sensor (SBS) Black Hornet nUAS using silicon anode materials and high-energy density lithium-ion batteries to double the specific energy of the Black Hornet while maintaining safety performance.



ACE

Spherical Brakes

- Novel brake system enabling reduced logistics burden & cost while providing easier/faster brake replacement & longer replacement period

Virtual Assistant for Mission Operations (VAMO)

- Tactical voice & text enrichment AI services for processing of audio & unstructured text to reduce Warfighter's cognitive load in CPCE

Virtual Multi-Domain Command and Control (VMDC2) Tool

- Innovation Day contract for a Virtual Reality / Desktop real-time collaboration Multi-Domain COP

Stratolite Multi-Function RF

- Innovation Day contract for a multi-use SDR/RF system supporting persistent ISR

Roof Guard

- Innovation Day contract for a low SWaPC tactical counter surveillance for Army ground forces

Edge Processor Aided Target Recognition (ATR)

- Army Strategic Rapid Acquisition (AStra)/Innovation Day contract to prototype tactical edge ATR on SWaP constrained devices

Edge Processor Exploitation and Dissemination (EdgePED)

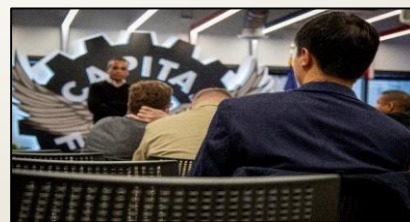
- AStra/Innovation Day contract to prototype artificial intelligence/machine learning customizable ATR capabilities

Multi-Function RF-Photonic Antenna (MFA)

- AStra/Innovation Day contract to prototype a wideband multi-function RF-Photonic phased array antenna

Small Form Factor Cross Domain Solution (Small CDS)

- AStra/Innovation Day contract to prototype ultra small form factor soldier-wearable CDS devices



CESD

Enhanced Vehicle Security System (EVSS)

- Innovation Day contracts for enhanced cyber resilience, increased platform assurance, supply chain integrity, and security against cyber attacks

Tactical Cyber System (CATO)

- Innovation Day contract for a framework for conducting EW and offensive operations.

Tactical Cyber System (Orca)

- Innovation Day contract for a mounted or body worn tactical cyber tool that passively identifies and geo-locates Radio Frequency emitters enabling cyberspace ISR and tactical standoff from the adversary

Balanced RF Resource Allocator for Heterogeneous Multi-Objective Systems (BRAHMS)

- Mission planning and execution for cyber electromagnetic activities

Army Responsive Tactical ISR Testbed (ARTIST)

- Intelligence, surveillance and reconnaissance (ISR) collaborative platform





Hybrid Electrification

- **Bradley Hybrid Electric Vehicle (BHEV)**

- RCCTO will develop two prototype Bradley M2A2 ODS
- Each prototype will consist of a hybrid electric drive, generator set and high-output batteries
- Turns engine power into electricity for greater mobility and performance
- Deliver two prototype BHEV vehicles by June 2022



Bradley Fighting Vehicle

- **Tactical Hybrid Electric Vehicle (THEV)**

- RCCTO will design and develop hybrid electric HMMWVs and Joint Light Tactical Vehicles (JLTVs)
- THEV will provide silent mobility and reduce heat signature and sound while in silent watch
- Our goal is to improve performance, fuel efficiency and extend the operational life while reducing sustainment costs
- Our performance targets aim to increase acceleration, power generation, and range



***M1151 A1
Up-Armored HMMWV***



***M1281 Close Combat
Weapons Carrier JLTV***



Executing Innovation

Bring Your Most Innovative Ideas – The Army is Listening

- **Army Strategic Rapid Acquisition (AStRA): Concept, Prototype, and Deliver**

- RCCTO hosts recurring “pitch day” events in various locations, to find new technology ideas and accelerate them into prototypes that could quickly reduce near- and mid-term operational risks.
- AStRA is open to companies and academic institutions who want to share their best ideas for emerging military technology.
- Resembles commercial investor “pitch days” with follow-on awards
- Upcoming Events: AStRA 4 at Fort Bragg, NC in March 2022

- **C-sUAS Semi-Annual Demonstration**

- **#1: 5-9 April 2021**

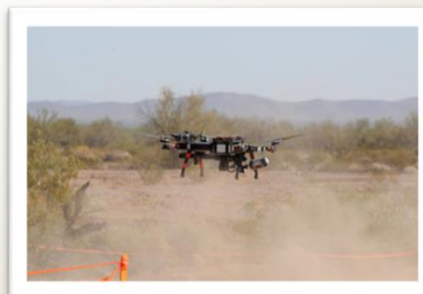
- Topic: Low Collateral Effects Interceptor
- 37 total white papers submitted
- Oral Presentations: February 8-9, 2021
- 4 Systems selected for Demonstration

- **#2: September 2021**

- Topic: Low-cost Ground Based Aerial Denial and Handheld/Dismounted solutions
- 49 white papers submitted; 10 vendors selected
- Systems selected for Demonstration will be evaluated and inform future Service led development efforts

- **#3: April 2022**

- Topic: High Power Microwave (HPM) Ground-Based Aerial Denial systems and C-sUAS as a Service (CaaS)





Closing Comments/Questions?



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