U.S. ARMY COMBAT CAPABILITIES DEVELOPMENT COMMAND SOLDIER CENTER

Army Research and Development Programs

Soldier Protection Directorate, Protection Equipment Division

Mr. Kenneth F. Ryan

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AGENDA

- Up Front Key Takeaways
- Who Are We?
- What Do We Do?
- Current Research Program Priorities/Key Platforms
- How To Work With Us
- What's the Benefit

KEY TAKEAWAYS

- **Combat Capabilities Development Command Soldier Center (DEVCOM SC) is the Army focal point for (6.2-6.3):**
  - **Organizational Clothing and Individual Equipment (OCIE)**
  - **Personal Protective Equipment (PPE)**
- **Opportunities for development of actionable knowledge products, test methodologies, novel materials, components and systems**
  - **Technology or product may be transitioned to PEO Soldier for continued development or adoption**
- **https://ccdcsoldiercenter.army.mil/#/workwithus is the best website to go to for points of contact and information on how to work with DEVCOM SC**
- **Program Managers and the Program & Strategic Integrators are the best people to talk with about program opportunities and future technical gaps**

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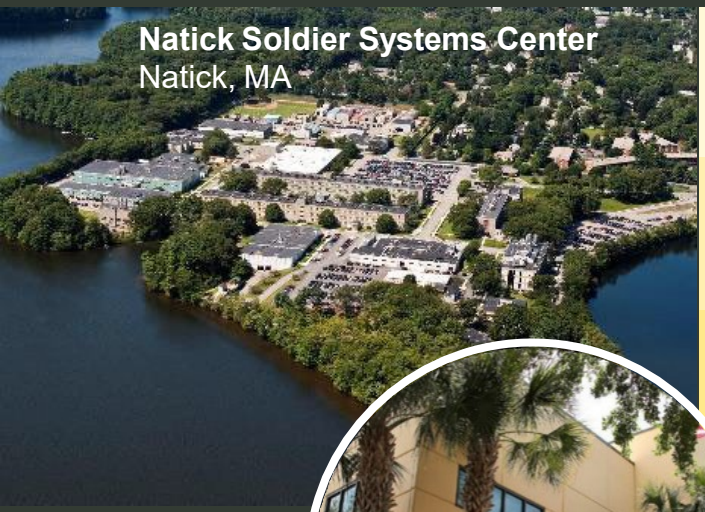

Natick Soldier Systems Center
Natick, MA

Central Florida Research Park
Orlando, FL

MILITARY EMPLOYEES
37

GOVT. CIVILIAN EMPLOYEES
715

CONTRACTORS
153

TOTAL EMPLOYEES
905

822 Natick, 83 Orlando

MISSION

To provide the Army with innovative science and technology solutions to optimize the performance of our Soldiers.

VISION

The DEVCOM Soldier Center is the Soldier's research center – Ensuring dominance through superior scientific and engineering expertise.

Information current as of

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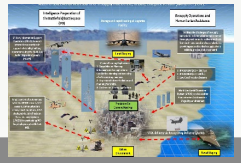
SOLDIER CENTRIC DESIGN

Soldier Sustainment Directorate

- Parachutist Safety and Military Freefall
- Parachute Design and Aircraft Integration
- Airdrop Sensor Integration
- Precision Airdrop
- Airdrop Modeling, Simulation and Data Analytics
- Aerial Delivery Materials Research
- Reduction of Combat Load and Class 1 Logistics
- Nutritional Interventions for Warfighter Performance
- CBRN Protection of Food and Water
- Mechanical & Chemical Engineering for Field Feeding Systems



AAIRDUCT OV-1
Autonomous Aerial Resupply into Dense, Urban, Complex Terrain

CCAR
Close Combat Assault Ration

Soldier Protection Directorate

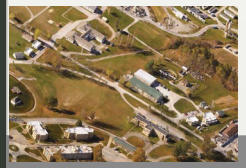
- Composite Materials
- Command & Control Technologies
- Multifunctional Materials
- Camouflage, Concealment & Signature Management
- Ballistic Protection
- Textile Technology and Materials Evaluation
- Collective/ Percutaneous Protective Materials
- Individual Equipment Design
- Ballistic Protection
- Sensory Protection
- Individual Hydration

CCSM
Camouflage, Concealment & Signature Management

CAPE & IMHS
Combat Protective Ensemble & Integrated Multi-threat Headborne System

Soldier Effectiveness Directorate

- Mixed and Augmented Reality
- Synthetic and Natural Environments
- Live Training
- Medical Technology
- Artificial Intelligence
- Adaptive Training
- Distributed Simulation
- Training Effectiveness
- Cyber Training Simulations
- Monitoring & Predicting Performance
- Optimizing/ Enhancing Performance
- Human Augmentation



OWT
One World Terrain

MASTR-E
Measuring and Advancing Soldier Tactical Readiness and Effectiveness

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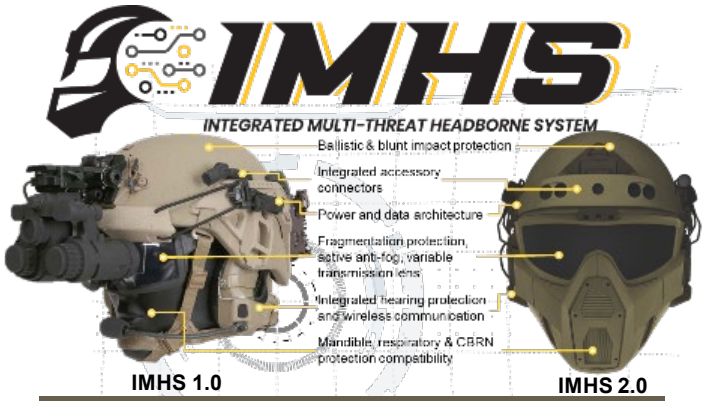
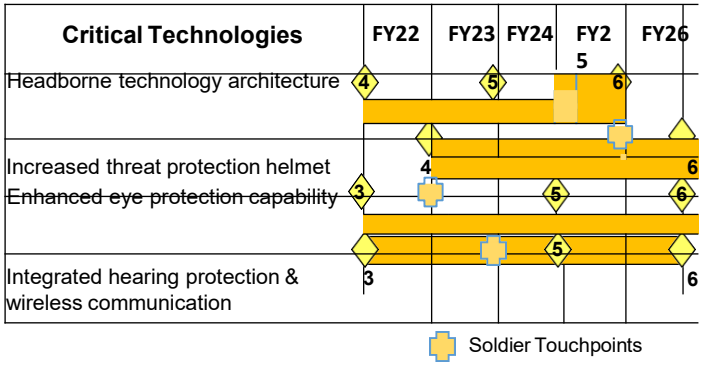
INTEGRATED MULTI-THREAT HEADBORNE SYSTEM (IMHS)



Optimize headborne technology integration for increased Soldier protection, lethality & situational awareness



Problem: Combat headborne equipment is not integrated with the helmet from a systems engineering perspective, resulting in system that is heavy and unbalanced on the head, burdening the Soldier with neck strain that degrades Soldier Lethality. Also, headborne ballistic protection is not sufficient for increased threat levels.

Purpose: Develop a **headborne technology architecture** enabling integration paths for current and future advancements focused on increasing Soldier protection, lethality and situational awareness in the Multi-Domain Operations (MDO) battlefield

Results/Products:

- Headborne open architecture **Interface Control Document (ICD)**
  - **Government Owned electrical / mechanical interfaces**
  - Power/data specifications
  - System center-of-gravity & moment of inertia specifications
- Technical data packages (TDPs) for ICD-compliant **prototypes** demonstrated via **Soldier touchpoints**
  - Helmet shell with increased threat level protection
  - Eyewear with increased fragmentation protection, active anti-fog & variable transmission lens
  - Integrated hearing protection & wireless communication

Payoff:

- Increased Soldier protection
- Enhanced lethality and situational awareness:
  - Enable active technology integration
  - Optimized power/data management: reduced number of batteries, easier to use, reduced cable snag hazards
  - Improved system balance, reduced neck torque & weight
- Reduced procurement costs due to greater competition enabled by compatibility across multiple industry partners

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COMBAT PROTECTIVE ENSEMBLE (CAPE)

Milestone Timeline	FY20	FY21	FY22	FY23	FY24	FY25
Capability Gap Front End Analysis		K				
Load Management Improvements (Load Frame and Hydration System)		5			6	
Individual Desalination Capability			4		6	
Environmental Protection Enhancements for Temperate to Hot and Temperate to Cold OE			4		6	
Multi-spectral Signature Management Integration in each OE ensemble		4			6	
Body Armor Integration in each OE ensemble		4			6	
Sub-system integration evaluation in each OE ensemble			5		6	
Systems integration evaluation of each optimized OE ensemble						6

Purpose:

- Dichotomy of component level ensemble capability enhancements:
  - Ensemble enhancements can improve lethality and survivability
  - Ensemble compatibility challenges can have a detrimental impact on the ability of a Soldier to perform their mission
- CAPE objectives:
  - Develop new Soldier ensemble components and systems that integrate load carriage, hydration, power and data distribution, and environmental protection enhancements, considering size and weight of the system
  - Integrate mature signature management and blast/ballistics protection technologies
  - Establish an integration standard operating procedure (SOP) that evaluates the level of platform integration through Soldier touchpoints (STPs) in relevant environments

Results/Products:

- Reports, technical data packages, and prototypes of the developed components and their integration demonstrations:
  - Load frame
  - Hydration system
  - Individual desalination device
  - Environmental protection enhancements
  - Integration of signature management and blast/ballistics technologies
  - Fragmentation protection improvements
- Integration evaluation SOP

Payoff:

- Improved Soldier lethality and survivability through integrated enhancements in ensemble architecture and performance, body armor, and signature management
- A hydration system that minimizes or eliminates the need for potable water re-supply
- Enduring process to evaluate integration efficacy of ensembles

TECHNOLOGY TRANSFER MECHANISMS

Flexibility through ***non-funded*** federal partnering agreements

Cooperative Research and Development Agreements (CRADAs)	• One or more federal laboratories working with one or more non-federal partner(s) toward a common R&D objective.
Testing Service Agreements (TSA)	• Straight fee-for-service testing, not a collaborative effort. • Customer owns all test data, Gov't release is prohibited
Patent License Agreements (PLAs)	• Non-exclusive, partially exclusive, or exclusive.
Educational Partnership Agreement (EPA)	• For the purpose of encouraging and enhancing study in scientific disciplines at all levels of education.

COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENTS (CRADA)

Presumes alignment of government and commercial/academic technical objectives

- Federal partners can provide personnel, services, facilities, equipment, *but no funds to non-federal partners*.
- Non-federal partners can provide personnel, services, facilities, equipment, and funds.
- Each party retains ownership of solely invented IP and joint inventions will be jointly owned.
- Federal government retains a non-exclusive license to all IP arising under the CRADA, for use by or on behalf of the government.
- Government agrees to negotiate a royalty bearing exclusive license to government owned IP arising under the CRADA.

TESTING SERVICE AGREEMENTS

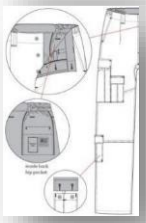
Unique federal laboratory facilities/capabilities are available to the private sector for testing purposes

- A Testing Service Agreement (TSA) is a simple two party agreement that can be turned around in a few days.
- Cost to the purchaser is equal to the laboratory's cost to provide the service.
- The purchaser retains sole ownership of the test results and the government is prohibited from disclosing data to third parties.
- The government does not derive any rights in or to the purchaser's Intellectual Property.
- The government is ***prohibited from directly competing*** with private testing service companies.

UNIQUE CAPABILITIES & FACILITIES

Environmental Protection Testing Facility
One of only four ASTM F1930 test systems operational in North America, the only one in a DoD facility

High Performance Fiber & Textile Facility
Novel yarn and textile production on a research level; fiber processing, weave, knit, braid, or twist yarns to produce and evaluate multifunctional properties

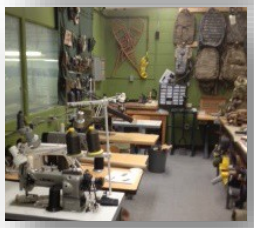


Design, Pattern, & Prototype Shop
Original concept design, product improvements, grading and construction of prototype clothing & individual protection; preparation for manufacturing scale-up

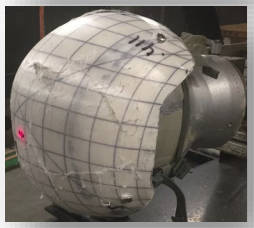
Footwear Performance Lab
Only DoD-operated footwear testing laboratory uses industry and military unique test methods

Textile Material Evaluation Facility
State-of-the-Art, ISO 9001 certified testing laboratory capable of over 100 standard textile test methods for research and development

Camouflage Evaluation Facility
Calibrated light and realistic renderings for the evaluation of signature in four vignettes



Load Carriage Prototype Shop
Expert design and fabrication of load carriage equipment, pouches and tactical gear



Ballistic & Blunt Impact Laboratory (NEW!)
Material evaluation and process improvement for fabricating lightweight armor

COOPERATIVE AGREEMENT FUNDING OPPORTUNITY

Under a Cooperative Agreement, a principal purpose is to transfer a thing of value to the recipient to carry out a public purpose of support or stimulation authorized by law of the U.S. instead of acquiring property or services for the direct benefit or use of the U.S. government

Cooperative Agreement (CA)	• Public Benefit • Substantial involvement is expected between the agency and the recipient • Funding Agreement • Rigid Patent Rights

OPPORTUNITIES FOR FUNDED CONTRACTS

BAA and Unsolicited Proposals must comply with the FAR but still provide the offeror with more flexibility than a typical contract solicitation.

BAA and UP are always subject to availability of appropriate agency research funds in a fiscal year. Funds are limited, and we typically plan spending 1-2 years in advance.

Broad Agency Announcement (BAA)

- The BAA is an open solicitation for proposals.
- It is funded to fulfill requirements for scientific study and experimentation.
- The BAA does not focus on specific systems or hardware.
- The solicitation is divided into topic groups that are of interest to the sponsoring lab and identifies a POC for that area.

Unsolicited Proposals (UP)

- Innovative and unique;
- Independently originated and developed by the offeror;
- Prepared without Government endorsement or involvement;
- Include sufficient detail to permit a proper evaluation;
- Not be an advance proposal for a known agency requirement;
- Not address a previously published agency requirement.

Small Business Innovative Research Program

Small Business Innovative Research (SBIR) Program
https://www.dodsbirsttr.mil/

- For Independent Small Business (less than 500 employees)
- Phase I determines the scientific, technical and commercial merit and feasibility of the ideas submitted. Typically $150,000 over a period of six months.
- Phase II is the major R&D effort, contracts are up to $1 million and usually span 24 months.
- Phase III (commercialization) is the ultimate goal of the SBIR program.

BROAD AGENCY ANNOUNCEMENT (BAA)

B. SOLDIER PROTECTION AND SURVIVABILITY

Warfighter Systems Technologies

1. *Integrated Protective Headborne Equipment and Injury Diagnostic/Assessment Tools*
2. *Modular Personal Protection Equipment (MPPE) and Injury Diagnostic Assessment Tools*
3. *Chemical/Biological Protection for Individuals*
4. *Flame and Thermal Protection for the Individual Soldier*
5. *Counter Surveillance*
6. Body Worn Interactive Materials
7. *Materials Nanotechnology*
8. Advanced Protection, Integration Technologies/Systems and Assessment Methods
9. *Integrated Sound, Light and Blast Management for the Ears and Eyes*

Textile Technologies

1. *Multi-Functional Materials*
2. *High Performance Multi-Component Fibers*

Modeling and Simulation

1. *Individual Ground Soldier and Small Unit Operational Effectiveness and Survivability*


U.S. ARMY NATICK SOLDIER RESEARCH, DEVELOPMENT AND ENGINEERING CENTER

BROAD AGENCY ANNOUNCEMENT (BAA) FOR BASIC AND APPLIED RESEARCH

Solicitation Number: W911QY-20-R-0022

Effective from 1 March 2019 - 28 February 2020

"THE LEADER IN EMPOWERING THE WORLD'S MOST [illegible]"

Additional Information and POCs for each area are listed in the BAA

https://sam.gov/opp/3c626456ada845628790f50ccc306e47/view?keywords=W911QY20R0022&sort=-relevance&index=opp&is_active=true&page=1

https://ccdcsoldiercenter.army.mil/#/workwithus

BENEFIT

- **Programs will improve Soldier Lethality and Survivability (Protected, Optimized & Lethal)**
- **Programs will improve Soldier Quality of Life in the Field and After Deployment**
- **Programs are a source of Revenue with Potential for follow on Production Contracts**

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OUR SOLDIERS

Protected

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