



Soldier Requirements Division



Soldier Systems Branch April 5, 2023





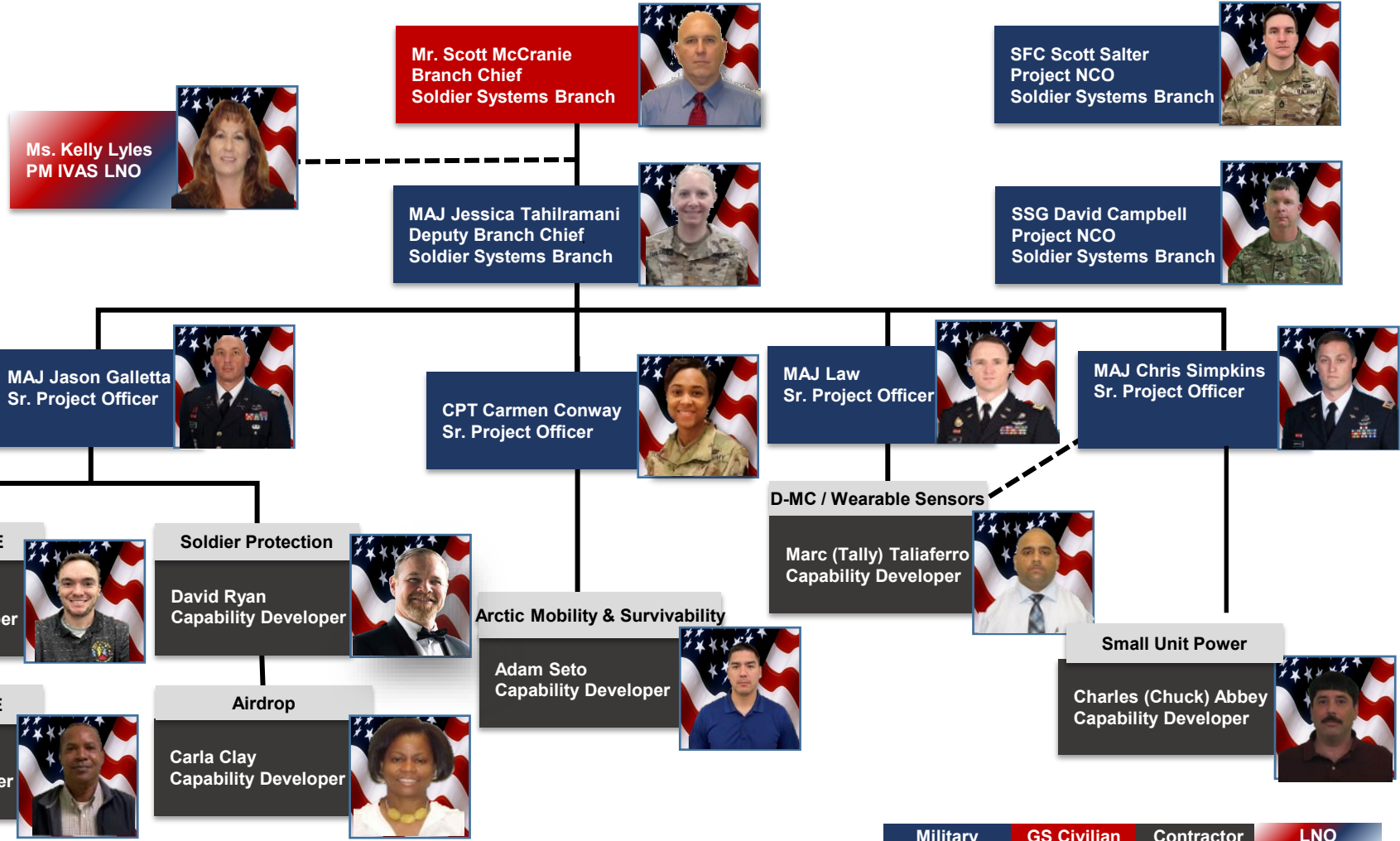
Agenda



- Organizational Chart
- Mission Statement
- Portfolio Overview
- Organizational Clothing & Individual Equipment
- Soldier Protection
- Arctic Mobility & Sustainability
- Air Drop Equipment
- Dismounted Mission Command / Power
- Soldier Tactical Power
- Soldier Wearable Sensors
- Questions



Soldier Systems Branch Organization



Military
GS Civilian
Contractor
LNO



Soldier Systems Branch

MISSION STATEMENT



Soldier Systems Branch designs the Army of 2040 and delivers the Army of 2030 by developing future requirements, integrating, and managing Soldier capabilities across all formations, with a primary focus on the lethality, mobility, and survivability of Maneuver Company/Troops, Platoons, and Squads, in order to provide the Army with the best trained and capable Soldiers in the world.





Soldier Portfolio Programs



Soldier Systems Branch

Soldier Protection



Wearable Sensors



Dismounted Mission Command + Small Unit Power



Arctic Mobility & Survivability



Organization Clothing & Individual Equipment



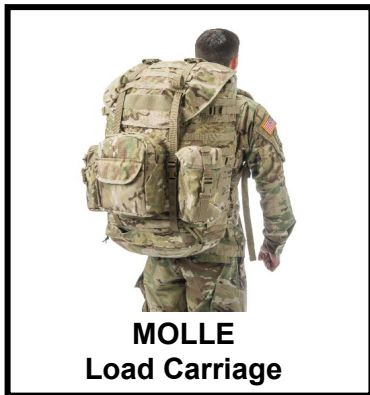
Airdrop Equipment





SSB Portfolio Programs

Organizational Clothing & Individual Equipment



**MOLLE
Load Carriage**



Army Combat Boots



**Individual Water
Treatment Device (IWTD)**



Sleep System & Individual Tent

Army Combat Shirt (ACS)

Army Combat Pant (ACP)

Army Uniforms – Service Uniforms

Improved Combat Vehicle Crewman Coverall



**Army Combat Gloves
Cold Weather Gloves**



**GEN III Extended Cold Weather
Clothing System (ECWCS)**



Improved Ghillie System (IGS)



Organizational Clothing & Individual Equipment Challenges



- Compatibility of Soldier Components and Systems
- Detection by enemy forces – Signature Management and Spectral Mitigation
- Reduced weight/size/bulk/layers of all OCIE increasing dismounted mobility and maximizing personnel capacity on all platforms (Vehicles/Aircraft/Vessels)
- Variety of uniforms for specific purposes and Climatic Zones
- Equipment fails in extreme cold (-40°F and below)
- Power and data distribution on the Soldier



Organizational Clothing & Individual Equipment Desired Capabilities



- 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 **signature management** to obscure the enemy's ability to locate, see, hear, and monitor friendly forces in all spectrums and across all domains while maintaining the ability to maneuver freely (advanced textiles)
- Lightweight, multi-purpose equipment/clothing systems
- Multi-purpose Uniform – what is the best uniform for training and combat?
- Integrated power and data through clothing and equipment (embedded textiles)



SSB Portfolio Programs

Soldier Protection



Torso and Extremity Protection (TEP)



Ballistic Combat Shirt (BCS)



Modular Scalable Vest (MSV)

Blast Pelvic Protector (BPP)

Tactical Communications and Hearing Protection



Integrated Head Protection System (IHPS)



Vital Torso Protection (VTP)



Enhanced Small Arms Protective Insert



X-Threat Small Arms Protective Insert



Enhanced Side Ballistic Insert



X-Threat Side Ballistic Insert



Soldier & Hearing Protection Challenges



- Compatibility of Soldier Components and Systems
- Detection by enemy forces – *Signature Management and Spectral Mitigation*
- Reduced weight/size/bulk/layers; increasing dismounted mobility and maximizing personnel capacity on all platforms (Vehicles/Aircraft/Vessels)
- Combat Vehicle Crewman Helmet (CVCH) replacement
- Weight of all head borne equipment (helmet, NVGs, power/cables). Current weight is 5.4lbs with IHPS and ENVG-B's
- Power and data distribution on the Soldier
- Form/Fit/Function of over the ear hearing protection with IHPS/NG Head Protection



Soldier & Hearing Protection Challenges Cont.



Protective Helmet System

- Discomfort of head gear and padding system
- Heavy and unbalanced when equipped with NVGs

Vital Torso Protection

- Lack of mobility while maintaining/increasing Soldier protection
- OCIE and protection items compatibility issues

Tactical Hearing Protection

- Vehicle Communication Systems don't work with dismounted headsets
- Over-The-Ear (OTE) Headsets don't use common mounting
- Radio audio connectors lack commonality, driving cable costs as well as the amount of different cables required
- There is no In-the-Ear (ITE) and OTE solutions for a Headset Kit that work independently of each other with the same functionality

Soldier & Hearing Protection Desired Capabilities



- Conformable Body Armor that meets or exceed current ballistic threat protection
- Integrate **signature management** to obscure the enemy's ability to locate, see, hear, and monitor friendly forces in all spectrums and across all domains while maintaining the ability to maneuver freely (NIR, SWIR, MWIR, LWIR, and thermal mitigation 50-250m)]
- Ballistic protection materials that reduce weight and increase threat protection (Helmet and Body Armor)



SSB Portfolio Programs

Arctic Mobility & Sustainability



- Army Mountaineering Kit (AMK)
- Cold Weather Glove System
- Cold Weather Combat Boots
- Cold Weather Mobility
- Cold Weather Canteen





Arctic Mobility & Sustainability Challenges



The current equipment associated with mobility for extreme cold weather environments require updates to ensure Soldiers continue to operate efficiently and effectively in Arctic conditions.

- Mobility over snow and ice terrain is not compatible with current Soldier kit
- Units lack a centrally sustained common materiel solution
- Equipment commonly fails in temperatures nearing -40°F and below
- Heavy and bulky equipment
- *Requirement pending will replace unit procured equipment*
- Current sustainable items are not as durable (Flame resistant tents, heaters, etc.)



Arctic Mobility & Sustainability Desired Capabilities



Boots that protect Soldiers down to -40°F and below, and are compatible with bindings for skis and snowshoes

- Ability to operate independently from skis/snowshoes (VB Boot replacement which will no longer be produced)
- Bindings that integrate with all Army cold weather boots and have universal compatibility with skis and snowshoes

Skis that provide adequate flotation for a Soldier and gear, as well as being easily trained

Lightweight equipment/systems

Compatible items that work as a system or standalone



Arctic Mobility & Sustainability Desired Capabilities



A Scow Sled System that can easily be maneuvered bilaterally in extreme cold temperatures (-40° F and below) and harsh environments

- Towable by both dismounted Soldiers and snowmobiles/motorized vehicles
- Lightweight design that is rigid and durable with all parts able to be repaired (Ex. runners, canvas tarp, handles)
- Heaters able to operate on any available liquid fuels
- Material of the tent should be durable, thermal insulated and flame resistant
- Provides storage room for all basic issue items(BII) that come with the sled (items to consider):
 - a. (FR) Tent 5 and 10-man, with pole board
 - b. Door Poles (optional)
 - c. Space Heater
 - d. 5 gal fuel can
 - e. 5 gal water can
 - f. D-handle coal shovels(x2)
 - g. Machetes with sheath (x2)
 - h. Squad cook sets (x2)
 - i. Squad stoves (x2)
 - j. Fuel bottles (x2)
 - k. Bow saw
 - l. Ax
 - m. Hammers 2lbs (x2)
 - n. 50 or 60m static rope or Army 120' Greenline
 - o. Trace, Pulling, 9ft (x4)
 - p. Tow Rope 18ft
 - q. Harness, Man's, Sled (x4)
 - r. Aluminum oval carabiners (towing and rescue) (x8)
 - s. Aluminum locking pear shaped carabiners (rescue) (x2)
 - t. 25' 1-inch tubular nylon webbing
 - u. 6' 7mm cordelette (x2)
 - v. Fire Extinguisher
 - w. Survival Blanket

Must be usable in all conditions likely to be found in Arctic regions: Ice and frozen lakes; powdered, packed, granular, crusted and heavy snow; rocks, boulders and frozen aggregate earth; large logs, tree deadfall and woodland debris; cross country, mountainous, open, and restrictive terrain



SSB Portfolio Programs

Airdrop Equipment



- Modular Airborne Weapons Case (MAWC)
- Personnel Parachute System T-11
- T-11R Single Pin Reserve Parachute
- Parachutist Flotation Device (PFD)
- Main Canopy MC-6 (Maneuverable) (MC-6)
- Advanced Emergency Bailout Parachute (AEBP)
- Parachute Emergency Release System (PERS)



MAWC



T-11



PFD



MC-6



Reserve



Towed Jumper

PERS Deployed



PFD Activated



AEBP



PERS



Airdrop Equipment Challenges



How does the Army safely and expediently execute mass tactical airborne operations via a static line parachute system that accommodates increasing weight of jumpers and equipment without causing fatigue and maximizing personnel on aircraft?

- Weight, Size, and Bulk
 - Reduced number of jumpers able to fit on the aircraft at one time
 - Weight distribution of system on body
 - Deployment/inflation process too long
 - In air exposure time too long
 - Inability to tactically shift or slip to avoid collision (move away from fellow jumpers)/obstacles
- Malfunctions (entanglements, cross corner inversions)



Airdrop Equipment Desired Capabilities



A parachute system that enables mass tactical combat operations, delivers 400lbs+ jumpers with a combat load, safely and expediently, without causing fatigue.

- Weigh ~ 40lbs
- Balanced weight distribution to jumper's Core
- Deliver jumper at combat drop altitude with rate of descent about or <18 fps
- Deployment impervious to poor exits and wind factors
- Able to move away from fellow jumpers and avoid obstacles

Maintain:

- Compatibility with all current and future static line airborne approved aircraft
- No oscillation
- Compatibility with current and future weapons' cases



SSB Portfolio Programs

Dismounted Mission Command



Common Operating Environment





Dismounted Mission Command Challenges



How do we optimize data at the tactical edge to facilitate Dismounted Mission Command?

- Two-way transfer of information across security enclaves (cross-domain solution)
- Data analysis at the Tactical Edge
 - Artificial Intelligence and Machine Learning at the Tactical Edge
 - Current solutions stress the system
- Dismounted network range extension



Dismounted Mission Command Desired Capabilities



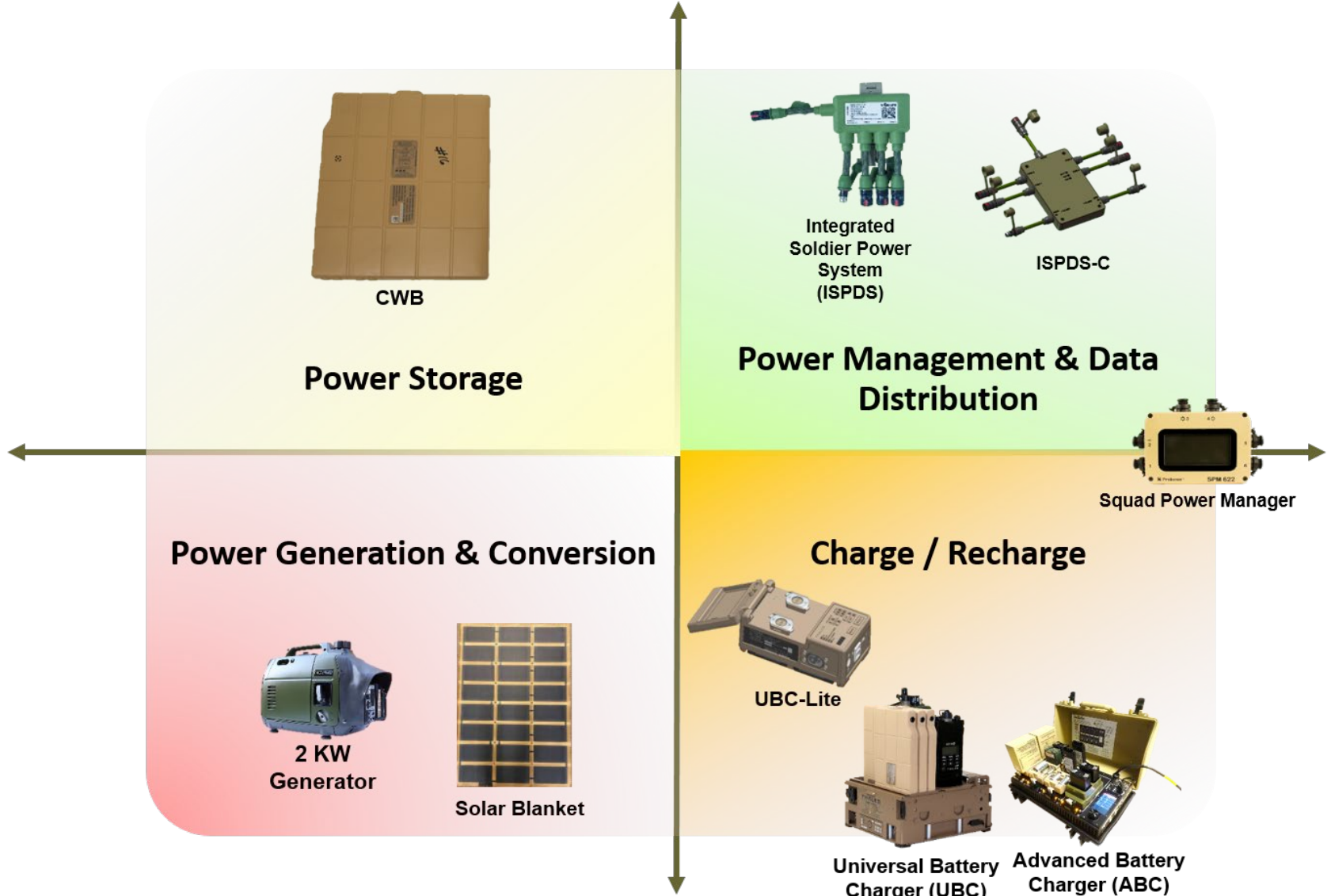
Provide integrated data centric Dismounted Mission Command at the Tactical Edge

- Data transfer of timely and relevant information across multiple echelons and security enclaves at extended ranges
- Edge compute and advance networking capability
 - Use real-time and post mission data
 - Seamless sharing of information between unmanned systems and users to the cloud and back
 - Increased computing power to aid decision-making, leveraging AI/ML processes at the tactical edge to reduce cognitive load



SSB Portfolio Programs

Soldier Tactical Power





Soldier Tactical Power Challenges



The deficit between the energy available and the power demanded by Infantry Platoon equipment continues to increase. Current operations require significant logistical efforts to support the energy needs of our Platoons.

- Increasing number of electronic devices
- Power Generation concentrated at echelons above Company
- Energy production and distribution use traditional fuels and are not optimized for portability
- A variety of single use and rechargeable batteries power Soldier devices creating architecture and logistics challenges for extended dismounted operations
- Lack of small portable power generation and battery charging devices concentrated at Platoon and below
- Battery power operations in extreme climatic conditions

Soldier Tactical Power Desired Capabilities



Energy Storage:

- Increased Energy Densities
- Decreased Recharging Time
- Common Family of Batteries

Power/Data Management & Distribution

- Support Reconfigurable power Usage
- Seamlessly share power consumption and management data with any platform or peripheral device

Power Generation and Conversion

- Small, efficient on-the-move Soldier Generator
- Small, efficient carried "Soldier Borne" Squad Generator
- Small, efficient, man portable bulk generators (>3kW)

Charge/Recharge Batteries

- Quick Charge/Recharge of multiple battery types rapidly and efficiently at the Small Unit Level
- Smart-Grid Compliant Chargers

Operation in extreme climatic conditions

- Arctic - operate in Arctic, ECW, and HA conditions down to -40°F and below
- Arid/Humid - operate electronic equipment in extreme Heat and/or Humid and HA conditions up to 140°F without a degradation in effectiveness
- High Altitude - operate electronic equipment at and above 9,000 ft from sea level



SSB Portfolio Programs

Soldier Wearable Sensors





Soldier Wearable Sensors Challenges



- Army wearables continues to be dispersed across **multiple organizations** with lack of formal common requirements. This disrupts and delays capability development
- **Soldier concerns** regarding security, privacy (tracking/anonymity) in garrison reduces adoption and confidence of wearables
- Lack of support (desire) from commercial device providers to support a **Modular Open System Architecture (MOSA)**
- **Lack of wearables sensor standards**, software, hardware, and network architecture permits development of multiple incompatible solutions that increases cost, reduces performance, and lengthens schedules
- For best results, wearables require skin contact making **placement and skin irritation** a concern
- Hardware and network solutions in **tactical environment differ from garrison** environment
- Potential need for **multiple sensors required** to meet operational requirement



Soldier Wearable Sensors Desired Capabilities



Human Performance Centric

- Core temperature estimation - Heat illness/injury risk
- Illness - Early detection and spread of infection
- Sleep quality - Characterize sleep quality; alertness
- Gait abnormality - Overloading, musculoskeletal overuse/injury
- Fluid intake - Under hydration or overdrinking/hyponatremia risk
- Hypoxia (low blood oxygen) - Acute altitude sickness/respiratory compromise
- Device pushes data through bring-your-own-device (BYOD) or through mid-tier receiver in garrison environment

Tactical Employment

- CBRNE Agents - Pre-symptomatic detection
- Illness - Early detection spread of infection
- Injury - Indication of gunshot wound/Noise exposure
- Individual Gunshot Detection - Distance and direction
- Blast overpressure - Traumatic brain injury (TBI) (mild-severe) risk
- Toxic Industrial Chemicals/Materials (TICs/TIMs) - Early exposure warning
- Device communicates through Bluetooth low energy/tactical network (Nett Warrior)



Soldier Systems Branch

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Questions?