I. Background and Purpose

The U.S. Army is seeking innovative humanoid technology solutions from eligible small and large businesses across the globe to advance toward fielded militarized humanoid capabilities through the xTechHumanoid competition. This platform offers participants the opportunity to engage with the U.S. Department of Defense (DoD), earn prize money and potentially receive a contract award or agreement of up to $1.25 million.

The U.S. Assistant Secretary of the Army for Acquisition, Logistics and Technology (ASA(ALT)) is partnering with the Humanoid Community of Collaboration, a collaboration with the joint service and DoD, to deliver the xTechHumanoid competition. The U.S. Army recognizes that the U.S. DoD must enhance engagements with industry by (1) understanding the spectrum of 'world-class' technologies being developed commercially that may benefit U.S. DoD; (2) integrating the sector of non-traditional innovators into the U.S. DoD Science and Technology (S&T) ecosystem; and (3) providing expertise and feedback to accelerate, mature, and transition technologies of interest to the U.S. DoD in support of the Soldier.

The xTechHumanoid competition will consist of two rounds:

(1) Call for concept white papers; and
(2) Final experimentation event.

The U.S. Army intends to award up to $490,000 in cash prizes throughout the competition to selected participants. **Up to ten (10) finalists will receive a cash prize of $25,000 each and an opportunity to participate in a live experimentation event with a panel of U.S. Army and DoD subject matter experts (SMEs) in August/September 2026.** Following the experimentation event, up to five (5) final winners of the competition will be selected; up to two (2) baseline humanoid systems will receive an additional cash prize of $75,000 each and up to three (3) advanced humanoid subsystems will receive an additional cash prize of $30,000 each. The Government may award follow-on contracts to one (1) or more winners, with individual awards representing a portion of the total available funding pool of up to $1.25 million. Additional details on prize structure can be found in Section VII.

In addition to non-dilutive cash prizes, participants will have the opportunity to participate in an Army experimentation event and engage with Army and DoD representatives through information-sharing and networking opportunities.

The efforts described in this notice are being pursued under the authorities of 10 U.S.C. § 4025 to award cash prizes and 10 U.S. Code § 4023 for potential follow-on contracts or agreements to only those eligible and selected entities as described in this announcement.

xTech Program competitions are conducted in accordance with 10 U.S.C. § 4025, which authorizes the use of prize competitions to stimulate innovation and identify promising technologies for national security applications. As such, this competition serves as a competitive down select mechanism that enables government organizations to engage with finalists and winners through a variety of follow-on acquisition pathways, including but not limited to:

- 10 U.S.C. § 4114 – Selection of contractors for prototype projects
- 10 U.S.C. § 4022 – Prototype projects
- 10 U.S.C. § 4023 – Procurement for experimental purposes
- 10 U.S.C. § 4001 – Research and development
- 10 U.S.C. § 4021 – Other Transaction Authority (OTA)

- 15 U.S.C. § 3703 – Technology innovation partnerships
- 15 U.S.C. § 638 – Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs

Government organizations are encouraged to consider leveraging these statutory authorities to pursue follow-on awards with companies identified through the xTech competition process. This approach supports rapid technology maturation, accelerates the transition of innovative capabilities to the field, and promotes collaboration with non-traditional and small business performers.

While the authority of this program is 10 U.S.C. § 4025, the xTechHumanoid competition may generate interest by another U.S. Army, DoD or USG organization for a funding opportunity outside of this event. The interested organization may contact the participant to provide additional information or ask for a request for proposal in a separate solicitation. Finalists of the prize competition may have opportunities to submit a separate proposal for further development of their proposed technology solution based on the needs of the Army. The Army may use a contract mechanism of their choice and will notify the participants accordingly.

All xTechHumanoid competition submissions are treated as privileged information and contents are disclosed to government employees or designated support contractors strictly for the purpose of evaluation and program support.

The xTech Program will provide feedback from evaluators to participants during each part of the competition. The purpose of providing this feedback is to help accelerate the transition of the technology to a U.S. Army end-user by providing insight into the best applications for the technology, suggestions for product improvement for U.S. Army use and recommended next steps for development. However, the Government will not respond to inquiries regarding this feedback.

II. Eligibility Requirements

Eligible entities include nonprofit organizations, for-profit organizations (i.e., large and small businesses) both domestic and foreign.

Each eligible entity:

- Must be able to obtain a CAGE code (U.S. businesses) or NCAGE code (international businesses) to process payments;
- Shall be incorporated in, and maintain, a primary place of business in the U.S. or a foreign country;
- Shall not be a U.S. Federal Government entity, foreign government entity or employ a U.S. Federal Employee acting within the scope of their employment;
- Shall not be currently under contract, agreement or other providing similar capabilities to the Government for work described in the problem statement;
- Shall not be controlled by, funded by, or under the jurisdiction or direction of foreign adversaries.
- Must not be based in a Foreign Country of Concern (FCOC), directly funded by an FCOC government or government-subsidized guidance fund, or under the influence of an FCOC government in any form.

Failure to meet any of the above requirements will result in ineligibility for award. All eligibility determinations are at the sole discretion of the U.S. Government.

III. Topic and Problem Statement

The DoD, including all joint services, anticipates being faced with challenges in executing military operations against technologically advanced, numerically superior, and/or capable peer and near-peer adversaries in unprecedented complex and lethal operational environments. The initial phases of such conflicts will possibly come at significant human cost as well as loss of equipment, platforms, and materiel resources.

Militarized humanoid capabilities, when matured, are expected to deliver combat power options that sustain the U.S. Armed Forces' ability to conduct military operations and enable a broader range of cost-effective, resource-efficient warfighting approaches. These capabilities are intended to augment and operate alongside, rather than replace, Soldiers, Marines, Sailors, and Airmen. Militarized humanoid capabilities are expected to mitigate risk and reduce exposure of warfighters to high-threat environments, ultimately saving lives.

Definition and Distinction

A militarized humanoid is defined as a technological replication of a human warfighter in form, capabilities, and functions. While militarized humanoids share technological foundations with unmanned systems, they are distinct in that they utilize unmanned systems as tools, similarly to human warfighters for purposes such as:

- Acquiring information in areas not directly observable;
- Targeting and delivering effects in locations inaccessible to direct engagement;
- Transporting loads and capabilities across terrains or environments not suitable for human or humanoid presence.

Focus Areas

The U.S. Army is seeking innovative solutions for prototype militarized humanoid capabilities in the following topic areas:

- Baseline Humanoid System
- Advanced Humanoid Subsystems

Baseline Humanoid System

The prototype militarized humanoids will be employed for force augmentation in a broad range of small unit tasks, including but not limited to:

- Security for facilities, check points and lines of communication
- Gap crossings (moving materials, bridge development and assessments, etc.)
- Obstacle reconnaissance, clearing, and reduction
- Chemical, biological, radiological, nuclear, and explosive (CBRNE) reconnaissance and clearing
- Fire fighting
- Sustainment and maintenance
- Forward reconnaissance and surveillance (dismounted, mounted)
- Offensive and defensive missions such as establishing and securing footholds in urban terrain

Advanced Humanoid Subsystems
Proposals for advanced humanoid subsystems should address opportunities to improve on the foundation of baseline militarized humanoid capabilities, such as:

- Advanced EO, thermal/IR, and other sensors (acoustic, radars, x-ray, periscopes, range detection, targeting, chemical-biological-radiological-nuclear-explosive (CBRNE), etc.)
- Tethered/untethered nano or micro unmanned air sensors launched from the militarized humanoid form
- Embedded control mechanisms for employment of nano or micro unmanned air sensors
- Embedded control mechanisms for employment of small unit unmanned air and ground systems and unattended sensor systems
- Advanced autonomy AI for autonomous mission planning and mission execution
- Power supporting independent militarized humanoid operation beyond the baseline and out to 6-months
- Advanced counter detection of physical, thermal, optical, signal, and other humanoid form signatures
- Advanced physical and electronic protection
- Embedded universal control for external unmanned systems
- Other innovative enhancements

Militarized humanoids will eventually be expected to perform basic individual and collective Warrior Skill Level 1 tasks unassisted and as part of small units in concert with other militarized humanoids and human warfighters. Offerors may choose (but are NOT required) to strengthen their submissions by incorporating video presentations of how their militarized humanoid designs will lead to the fulfillment of key tasks as described in Appendix A.

Please see Appendix B for the performance expectations of baseline militarized humanoid system and advanced topic humanoid subsystems that will be evaluated in this xTechHumanoid competition.

IV. Program Submission

The xTechHumanoid competition is voluntary and open to all entities that meet the eligibility requirements listed in Section II (Eligibility Requirements). **All submissions must be in English.**

Only one (1) submission per eligible entity is permitted. If an entity has solutions addressing **both the Baseline Humanoid System** and **Advanced Humanoid Subsystems**, these should be combined and submitted in a single white paper.

The registration information and submission upload must be received by **5:00 PM ET on October 1, 2025**. Submissions received after the deadline will not be considered.

Register now by selecting the xTechHumanoid competition image at:
https://www.xtech.army.mil/

V. xTechHumanoid Competition Structure

Part 1: Concept White Paper

All eligible entities shall submit a **five-page concept white paper** and an *optional pre-recorded three-minute video* that demonstrates the technology and its readiness to participate in a live experimentation event. The white paper should outline their technology, potential impact on the Military, technical approach, technical maturity, technical maturation plan and company viability. Submissions will be evaluated by DoD experts across the S&T ecosystem including warfighter, acquisition, and research and development SMEs.

All concept white papers and optional videos must adhere to the following requirements:

- Concept white papers **must be submitted using the template found on the** Valid Eval registration page, "Template_ xTechHumanoid_White_Paper.docx". ***Any proposals submitted in a format other than that provided by the template will not be reviewed.***
- List your company name, country name and proposal title **EXACTLY** how you would like them to appear in any contest marketing materials. Use a clear and concise proposal title to give readers and potential stakeholders an understanding of how your technology would benefit the U.S. Army.
- Specify in the submission that it addresses (1) the baseline militarized humanoid form expectation(s); or (2) one or more advanced topics. Please follow this delineation in the proposal discussion.
- Proposals by offerors should describe their approach to accomplishment of the expectations using concise narratives. The discussions should also (1) describe their proposed pathways, schedules, and considerations that will achieve the baseline and advanced topic subsystem expectations not fully addressed by current technologies and (2) the approach for integration of disparate technologies into a consolidated offering that satisfies the xTechHumanoid competition goal and objectives.
- For the optional video, provide a URL on the contest registration linking to the video (preferably hosted on Vimeo). Video production quality will not influence evaluation scores. Videos should serve to clarify or illustrate concepts from the white paper and must not exceed three minutes in length.

Evaluators will review and score concept white papers using the following scoring criteria (further details on each scoring dimension can be found on the xTechHumanoid competition registration page):

Criterion	Weight
Introduction	7%
Military Benefits	20%
Technical Approach	15%
Current Technical Maturity	20%
Technical Maturation Plan	25%
Company Viability	10%
Proposal Quality	3%

Upon conclusion of the concept white paper evaluation period, the xTech Program will select **up to ten (10) applicants (up to six (6) baseline humanoid systems and up to four (4) advanced humanoid subsystems) to receive a cash prize of $25,000 each** and advance to

Part 2: Finals.

Strategic Collaboration Opportunities

Selected participants from Part 1 will have an opportunity to explore strategic collaborations with other finalists or industry partners beyond the competition to form teams in order to bring forward innovative humanoid solutions.

We strongly encourage participants to consider teaming up to deliver a comprehensive solution for Part 2: Finals and beyond—whether as independent entities providing a piece of a larger solution or as a unified team. While collaboration is highly encouraged, it remains optional and will not influence selection decisions. The Government will not play a role in forming teams or structuring partnerships.

Part 2: Finals

Selected participants from Part 1 will participate in a live experimentation event with a panel of Army and DoD SMEs in August/September 2026. The xTech Program will provide additional instructions, detailed evaluation criteria, exact dates, and location for the finals event at a later date.

Prior to the experimentation event, finalists will have the opportunity to engage with Army and DoD subject matter experts to prepare and discuss finals event expectations.

Dates and times are subject to change.

Upon conclusion of the finals, the xTech Program will select **up to five (5) final winners of the competition to receive the following non-dilutive cash prize** and a potential opportunity for a follow-on contract or agreement of up to $1.25 million to deliver their prototype system(s):

- **Up to two (2) Baseline Humanoid Systems** will receive a prize of $75,000 each
- **Up to three (3) Advanced Humanoid Subsystems** will receive a prize of $30,000 each

VI. Proposed Schedule

The proposed schedule is outlined below and subject to change without notice.

Date	Activity
August 6, 2025 – October 1, 2025	Concept white paper submission period
November 20, 2025	Finalists announced
August/September 2026	Part 2: Final experimentation event
October 2026	Final winners announced

VII. Prizes and Incentives

Prizes will be offered under 10 U.S.C. § 4025 (Prize competitions). The total prize pool is $490,000. **The follow-on contract award/agreement will be offered under 10 U.S. Code § 4023 and is separate from the prize competition.** Other non-monetary incentives are provided through the xTechHumanoid competition to help industry engage with the U.S. Army.

Phase	Winners	Prize	Contract Award
Part 1: Concept White Paper	Up to 10	$25,000 each	N/A
Part 2: Finals	Up to 5	Baseline Humanoid Systems: $75,000 each; Advanced Subsystems: $30,000 each	Potentially up to $1,250,000
	Total	$490,000	$1,250,000

VIII. Disclaimers

Registered participants shall be required to assume any and all risks and waive claims against the Federal Government and its related entities, except in the case of willful misconduct, for any injury, death, damage, or loss of property, revenue, or profits, whether direct, indirect, or consequential, arising from their participation in this prize competition, whether injury, death, damage, or loss arises through negligence or otherwise.

IX. Intellectual Property

The Army is a strong proponent of deliberate intellectual property (IP) rights and management by the private sector and DoD.

For the xTechHumanoid competition:

- The Federal Government may not gain an interest in IP developed by a participant without the written consent of the participant;
- Nothing in this xTechHumanoid prize competition shall diminish the Government's rights in patents, technical data, technical information, computer software, computer databases, and computer software documentation that the Government had prior to this xTechHumanoid prize competition, or is entitled to, under any other Government agreement or contract, or is otherwise entitled to under law; and
- The Federal Government may negotiate a license for the use of IP developed by a registered participant in the prize competition.

Register now by selecting the xTechHumanoid competition tile at:
https://www.xtech.army.mil/

X. Point of Contact

The Army xTech Program Office
Office of the Deputy Assistant Secretary of the Army, Research and Technology
Email: usarmy.xtech@army.mil
Website: https://www.xtech.army.mil/

APPENDIX A – Key Humanoid Tasks

The collective tasks contained in this appendix spell out primary individual tasks to be demonstrated in the context of a military small unit mission conducted in a combat situation. Offerors should highlight performance of additional individual tasks. They should also highlight their interpretation of specified performance steps and the implied performance steps required to accomplish specified individual and collective tasks that aggregate to accomplish the military small unit task(s) required to accomplish the mission.

Some of the tasks and performance steps, e.g. alerts, are conducted by the militarized humanoid internally using information from detection sensors to enable analysis, calculations, trigger alert notification when thresholds are breached, and drive response performance steps. Offerors should provide a means to verify and validate data generated at process phases and for expected outcomes of performance steps at check points during task execution.

An example is navigating between two points. Notifications might be presented as warning to leaders in the formation on their Nett Warrior or other End User Device (EDU) about movement along a route and a condition encountered. The offeror should provide a means to observe the route, estimate time required to move between the points, and track metrics while the performance steps are progressing.

The Warrior Tasks Level 1 can be found at the link below (copy and paste into your search engine's navigation function): Soldier's Manual of Common Tasks - Warriors Skills Level 1

Offerors can use the following situation as an operational context for execution of collective and individual tasks, including specified and implied performance steps, to inform development and demonstration their prototype militarized humanoid capabilities. Offerors may use video presentations to compliment, but not replace, their proposal explanations of tasks and expectations being executed by militarized humanoids individually and collectively with other humanoids and humans.

Offerors should select, prioritize, highlight additional task(s), complimentary expectation(s), specified and implied performance steps required to accomplish the collective tasks.

Situation: A small reconnaissance unit organized with combinations of human and humanoid warfighters moves to a named area of interest to establish persistent surveillance of a probable enemy avenue of approach. The platoon moves approximately 5km through open fields, deciduous forested stands, moderate rocky and elevating terrain, and potentially through urban villages. Movement is initiated during daylight and concludes at night. Intermittent periods of precipitation are expected. Enemy observation is possible and contact directly or indirectly is possible.

Collective, primary individual tasks, and performance steps are provided as guidance and context for demonstration of militarized humanoid expectations for prototype militarized humanoid offerings. Offerors should select, prioritize, highlight additional task(s), complimentary expectation(s), specified and implied performance steps demonstrated to accomplish the collective tasks.

Offerors should also discuss the following for each area (recommended format):

Current Status:

- **Technology Readiness:** (Example TRL 5-6) See Appendix C
- **Integration Readiness:** (Example IRL 3-4) See Appendix C

Expected Status – July 31, 2026:

- **Technology Readiness:** (Example TRL 7-8)
- **Integration Readiness:** (Example IRL 7-8)

Discussion:

Succinctly address the following information:

- The other individual task(s) selected to accomplish the collective task
- Performance, limitations, constraints in environments (open, complex, and urban) and/or conditions (illumination, heat-humidity, others)
- Partnerships, if any, addressing baseline and/or advanced topic expectation
- TRL risks classified as technical, supply chain, schedule, or other
- IRL risks classified as technical, administrative, schedule, or other
- Pathway to achieving expectations, individual Warrior Tasks, and Collective Tasks

Task Details:

Collective Task: 071-326-0501 Move as a Member of a Fire Team
Primary Individual Task(s): 071-329-1006 Navigate from One Point on the Ground to Another Point While Dismounted
Expectation Area(s): HAW 006 Navigation and HAW 008 Behaviors
NOTE: The militarized humanoid enabled element provides flank security for the platoon during movement. A focus of this task group is for the humanoid to demonstrate survivable navigation without GPS, periodic verification of location using GPS, and movement continuation or correction in response to dynamic conditions, including repositioning of other entities in the formation. The other focus of this task group is for the militarized humanoid to move in an appropriate formation (line, wedge, other) and method (traveling, traveling overwatch, bounding overwatch) and maintain appropriate distances between entities and at relative movement speeds.

Collective Task: 071-331-0001 Perform as a Member of a Patrol
Primary Individual Task(s): 113-571-1022 Perform Voice Communications
Expectation Area(s): HAW 010 Interface and HAW 008 Behaviors
NOTE: The militarized humanoid enabled element provides flank security for the platoon during movement. Communication between the militarized humanoid and human warfighters is a focus of this task group. The other focus and intent is for the militarized humanoid to demonstrate the ability to ingest, interpret, convert, and execute verbal instructions (e.g., “move left 10 meter to cover and concealment”) in concert with other entities in the formation.

Collective Task: 071-331-0001 Perform as a Member of a Patrol

Primary Individual Task(s): **071-326-0502 Move Under Direct Fire**
Expectation Area(s): **HAW 006 Navigation, HAW 010 Interface, and HAW 005-A Advanced Topic – Best-In-Breed: Information Acquisition Sensors**
NOTE: The militarized humanoid enabled element provides flank security for the platoon during movement. The focus of this task group is for the militarized humanoid to detect, recognize, and make a survivable response to contact with a threat employing direct fire at and around the individual militarized humanoid location and in proximity of the small unit. The other focus of this task is for the militarized humanoid to execute the response in concert with other entities in the formation, including acquisition or generation and sharing of information about the threat with others in the formation (e.g., direct fire type, point of origin).

Collective Task: **071-331-0001 Perform as a Member of a Patrol**
Primary Individual Task(s): **071-326-0510 React to Indirect Fire While Dismounted**
Expectation Area(s): **HAW 006 Navigation, HAW 010 Interface, and HAW 005-A Advanced Topic – Best-In-Breed: Information Acquisition Sensors**
NOTE: The militarized humanoid enabled element provides flank security for the platoon during movement. The focus of this task group is for the militarized humanoid to detect, recognize, and make a survivable response to a threat employing indirect fire around the individual militarized humanoid location and in proximity of the small unit. The other focus of this task is for the militarized humanoid to execute the response in concert with other entities in the formation, including acquisition or generation and sharing of information about the threat with others in the formation (e.g., incoming indirect fire detection, alert, information about potential direct of origin). This may also be applicable to incoming threat unmanned air systems (reconnaissance and surveillance, first person view) using a detection capability such as radar like counter-mortar radar currently fielded.

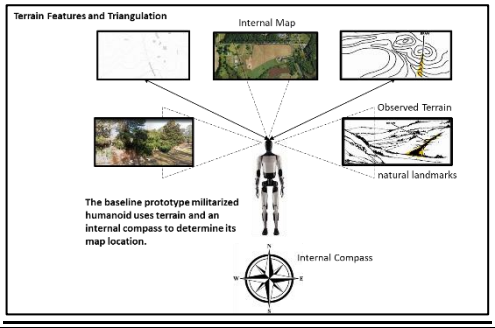
Collective Task: **071-420-0021 Conduct a Movement to Contact by a Platoon**
Primary Individual Task(s): **093-401-5040 React to Unexploded Ordnance Hazards**
Expectation Area(s): **HAW 006 Navigation, HAW 010 Interface, and HAW 005-A Advanced Topic – Best-In-Breed: Information Acquisition Sensors**
NOTE: The militarized humanoid enabled element provides flank security for the platoon during movement. The focus of this task group is for the militarized humanoid to detect and recognize an unexploded ordinance (UxO) and an unknown chemical agent after recognition of the UxO using external and/or internal sensor and make a survivable response.

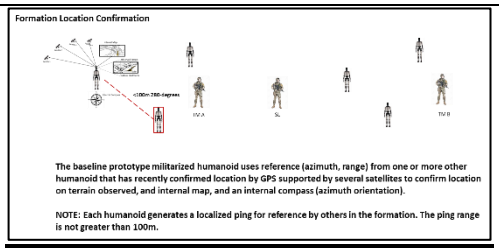
Collective Task: **071-420-0021 Conduct a Movement to Contact by a Platoon**
Primary Individual Task(s): **301-348-1050 Report Information of Potential Intelligence Value and 301-371-1000 Report Intelligence Information**
Expectation Area(s): **HAW 004 Range Detector, HAW 009 Signal**
NOTE: The militarized humanoid enabled element establishes surveillance of a named area of interest. The focus of this task group is for the militarized humanoid to recognize and make a survivable response to acquisition of a target and activity of interest, including reporting the information outside of the small unit.

APPENDIX B – Militarized Humanoid Form Expectations

Purpose: Provide offerors a fundamental awareness of joint service and DoD expectations for protype military humanoid capability that enables execution of individual and collective tasks articulated in Appendix A.

HAW Expectation	Baseline	Advanced (Best In Breed)
Form (HAW 001)	Operational Dimensions (max): Height: 6-ft Width: 3-ft Depth: 3-ft Area: 54-ft^3 Stow Dimensions (max): Height: 3-ft Width: 3-ft Depth: 3-ft Area: 27-ft^3 Weight: 200-lbs (including organic power source) Positions: standing, crouching, squatting, sitting, kneeling, prone. Exterior Surface: adaptable to military camouflage pattern and advanced strength materials or plates.	**Manipulation Interfaces and Tools (HAW 001-A)** Additional appendages (sniffers, x-rays, tools, other); Ability to de-energize, release, replace, re-energize and continue the mission; collect and relay information (data, video) during progression of task(s).
Mobility (HAW 002)	Primary Posture: Bi-ped upright Speed: Administrative – up to 2-mph Tactical - up to 6-mph Cover-to-cover - >6-mph Load: 50-lbs Alternate Posture: Multi-ped when required or instructed Speed: Same as bi-ped Load: 70-lbs	
Visual Sensors (HAW 003)	Visual electro-optical Daylight detection (95% probability, >400 lux) – human at 75m, vehicle 300m. Darkness detection (95% probability, < 0.3 lux) – human at 25m, vehicle at 100m. Will enable/support negative terrain detection and navigation.	**Periscope (HAW 003-A)** Extending/retractable 12-inch periscope providing 180-degree horizontal plain and 360-degree vertical plain electro-optical and thermal/infra-red views.

HAW Expectation	Baseline	Advanced (Best In Breed)
	Audio sensors, radars, etc. integrated and used to determine human, vehicle, and UAS direction of approach.	
Range Detection (HAW 004)	Determine range to objects 0.2m CPE out to 300m.	**Low-No Signature (HAW 004-A)** Range detector signature is undetectable.
Audio Sensors (HAW 005)	Detect moving vehicle emanating 65-decibles ≤100m distance, stationary vehicle ≤ 50m distance.	**Information Acquisition Sensors (HAW 005-A)** Integrate advanced audio, signal, haptic, barometric, CBRNE sniffers, surface penetrating x-Ray, radars and others.
		Nano Unmanned Aircraft System (HAW 005-B) Integrate one or more tethered, releasable, retrievable nano UAS for information acquisition out to 100m, 15min endurance in complex and urban terrain.
Navigation (HAW 006)	Visual and audio reference navigation using terrain and activity noise characterization and references to locate and sustain awareness of geographic position within 4.9m CPE. Relative position maintenance to other humanoids and humans in a stationary or moving small unit. Report position. Periodically activate and employ GPS to confirm location or position in formation. 	

HAW Expectation	Baseline	Advanced (Best In Breed)
		
Protection (HAW 007)	Repel equivalent 5.56 projectiles from penetrating main form to protect sensitive internal and mobility infrastructure. Protect from environmental factors – humidity, precipitation, ambient temperature extremes <120F^{o} and >05 F^{o}. Protection from natural and manmade electro-magnetic, signal, micro-wave effects.	**Visual Acquisition Defeat (HAW 007-A)** Integrate materials that reduce or eliminate visual, electro-optical, and thermal/infra-red acquisition of the form. **Thermal/Infra-red Acquisition Defeat (HAW 007-B)** Integrate materials that reduce or eliminate thermal/infra-red acquisition of the form, including spectrum and density differentiation techniques.
Behaviors (HAW 008)	Replicate military human behaviors and processes using “theory of mind” (level 3) Artificial Intelligence (AI). This level of AI will enable the humanoid to Ingest and analyze military orders and plan execution of in the context of guidance (e.g., ROE). This level of AI will enable the humanoid to continuously monitor, form, and update representations of its environment, other entities, and situations encountered, assess the	**Artificial Intelligence Enabled Mission Command (AIEM) (HAW 008-A)** Locate, request, ingest, analyze mission critical information to develop, dynamically update, and implement tactical plans that accomplish mission goals and objectives.

HAW Expectation	Baseline	Advanced (Best In Breed)
	representations with respect to its goals, tasks, and purpose considering the context of the representations, then plan and execute response behaviors while recognizing and adjusting to changes to achieve the goals. This level of AI will enable the humanoid to continuously monitor and recognize discrete environmental and tactical factors to characterize local, on the move, and destination conditions to plan, synchronize with others in the formation, and accomplish the assigned individual and collective task(s), both specified and implied.	**Artificial Intelligence Enabled Autonomy (AIEA) (HAW 008-B)** Tactical implementation of mission plans, dynamic updates based on local environmental and tactical conditions, and implementation of tactical individual and collective actions that accomplish mission goals and objectives.
Signal (HAW 009)	Send and receive information via a surrogate small unit communications network out to 100m, and with external nodes 100m-3km, and beyond 3km. NOTE: transmission and reception of data, video, etc. is key.	**Imbedded Robotic Control (HAW 009-A)** Adaptation and integration of internal unmanned system control hardware and software to enabled employment of the systems IAW universal controller (Warfighter Machine Interface (WMI) and control principals, information collection, standard military reporting, etc.
Interface (HAW 010)	Communicate with other humanoids and humans in audible English. Ingest and translate communications in English to information and/or actionable data and instructions. Communicate with other humanoids and humans in regionally relevant foreign languages and dialects. Prepare and transmit or receive and translate text and other forms of digital communication. Recognize and respond to or generate dismounted and mounted arm-and-hand signals.	**Integrated Tactical Network (ITN) Adoption (HAW 010-A)** Adaptation and integration with DoD networks.

HAW Expectation	Baseline	Advanced (Best In Breed)
Power (HAW 011)	24 hours of active (60% sensing, computing, communicating, mobility) and passive (40% sensing, computing, communicating) behaviors in field/tactical operations. Power restoration using a range or sources. Carried power for restoration or augmentation of required energy. Power hot swap when power source changes.	**96 hours of Operational Power (HAW 011-A)** Supporting 96 hours of active and passive behaviors in field/tactical operations. **Six (6) months of Operational Power (HAW 011-A)** Supporting 6 months (180 days) of active and passive behaviors in field/tactical operations.
Maintainability (HAW 012)	Modular design enabling component part and appendage replacements without shutting the humanoid form down completely. Built-in-tests (BITs) for self-diagnosis and self-repair or sustainment.	
Training (HAW 013)	New Equipment Training (NET) for military personnel that serve in roles that directly work with and supervise the forms. NET for the baseline militarized humanoid form will address operation, use, troubleshooting, and maintenance of form components and systemic capabilities.	
Leader Development (HAW 014)	Leader training and development implementing Humanoid Augmented Warfare (HAW) Concept of Operation.	