

DEPARTMENT OF THE ARMY
DoD 22.4 Small Business Innovation Research (SBIR) Annual BAA
Release 6, Proposal Submission Instructions

April 27, 2022: Topic issued for pre-release

May 25, 2022: Army begins accepting proposals via DSIP

June 1, 2022: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET

June 15, 2022: Deadline for receipt of proposals no later than 12:00 p.m. ET

INTRODUCTION

The future Army must be capable of conducting Multi-Domain Operations (MDO) as part of an integrated Joint Force across an array of situations in multiple theaters by 2035. The MDO concept describes how the Army will support the Joint Force in the rapid and continuous integration of all domains of warfare – land, sea, air, and cyberspace – to deter and prevail as we compete short of conflict, and fight and win if deterrence fail. The Army must provide game-changing capabilities to our Soldiers. To capitalize on small business innovation, the Army has implemented an approach to advertise SBIR funding opportunities through the Department of Defense (DoD) Annual BAA process, outside of the three pre-determined BAA cycles. This approach also strives to create a more rapid award time from solicitation to closing.

Topics released under this BAA can deviate from the traditional Army SBIR period of performance, contract award guidelines, and other proposal instructions. Please take note of the contents of the DoD Program BAA instructions, supplemented herein, when preparing proposals. Proposals will only be evaluated in response to an active corresponding Army topic.

Proposers responding to a topic in this BAA must follow all general instructions provided in the DoDSBIR Program BAA. Department of the Army requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below.

Specific questions pertaining to the administration of the Department of the Army SBIR Program and the proposal preparation instructions for this topic should be directed to the Point of Contact identified in the Topic announcement; general questions can be directed to usarmy.apg.devcom.mbx.sbir-program-managers-helpdesk@army.mil.

PHASE I PROPOSAL GUIDELINES

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Technical Volume (Volume 2)

Unless otherwise noted in the topic, the technical volume is not to exceed 10 pages and must follow the formatting requirements provided in the DoD SBIR Program BAA. The Army will not consider pages in excess of this limit.

Proposers can submit an optional slide deck of 10 slides in Volume 5: Supporting Documents. The slide deck can contain information on the technical approach, the team, commercialization plans, or relevant technology/research the proposers have developed, and it can contain additional/complementary information to the technical volume. If a proposer elects to submit a slide deck, it must be submitted as a single .pdf file format and its information will be used in the evaluation process.

Content of the Technical Volume

The Technical Volume will contain three key sections – technical approach, team qualifications and commercialization section. The technical approach section contains details on how the proposer is going to solve the problem. It should detail key elements of your approach, any risks, relevant past work and how you measure success. The team qualifications section should highlight the key personnel working on the project, and the resources that will be brought to bear on solving the problem. The commercialization section includes information on the commercialization strategy within the military, private sector or both. These instructions supersede those stated in section 5.3.c of the DoD Program BAA.

Cost Volume (Volume 3)

Unless otherwise noted in the topic, the Phase I Base amount must not exceed \$200,000 for a 6- month period of performance. Phase I Option plans may be accepted and must not exceed \$50,000 for a 3-month period of performance. If an option is identified in the topic posting, costs for the Base and Option must be separated and clearly identified on the Proposal Cover Sheet (Volume 1) and in Volume 3.

Content of the Cost Volume (Volume 3)

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel costs to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screenshot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds.

If a DCAA Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).

If selected for award, failure to include the documentation with your proposal will delay contract negotiation, and the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs (e.g., cost estimates for equipment, materials, and consultants or subcontractors). It is important to respond as quickly as possible to the Contracting Officer's request for documentation.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5)

Volume 5 is provided for proposers to submit additional documentation to support the Cover Sheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3). In addition to the Volume 5 requirements outlined in the DoD Program BAA, the Department of the Army may accept the following documents in Volume 5:

- o Additional Cost Information
- o Funding Agreement Certification
- o Technical Data Rights (Assertions)
- o Lifecycle Certification

- o Allocation of Rights
- o Other (only as specified in the topic)
- o Optional 10-slide deck. The slide deck can contain information on the technical approach, the team, commercialization plans, or relevant technology/research the proposers have developed, and it can contain additional/complementary information to the technical volume. If a proposer elects to submit a slide deck, it must be submitted as a single .pdf file format and its information will be used in the evaluation process.

Please only submit documents that are identified in the topic instructions. All other submissions will be disregarded.

DIRECT TO PHASE II PROPOSAL GUIDELINES

Topic# A224-012 is accepting Direct to Phase II (DP2) proposals only. Proposers interested in submitting a DP2 proposal must provide documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator.

The Army will not evaluate the proposer's related Phase II proposal if it determines that the proposer has failed to demonstrate that technical merit and feasibility has been established or the proposer has failed to demonstrate that work submitted in the feasibility documentation was substantially performed by the proposer and/or the PI.

Feasibility documentation cannot be based upon any prior or ongoing federally funded SBIR or STTR work and DP2 proposals MUST NOT logically extend from any prior or ongoing federally funded SBIR or STTR work.

Format of Technical Volume (Volume 2)

The Technical Volume must include two parts, the Feasibility Documentation and the Technical Proposal.

The Technical Volume must be a single Portable Document Format (PDF) file, including graphics. Perform a virus check before uploading the Technical Volume file. If a virus is detected, it may cause rejection of the proposal. Do not lock or encrypt the uploaded file. Do not include or embed active graphics such as videos, moving pictures, or other similar media in the document.

Unless otherwise noted in the topic, the length of the Technical Volume, to include Feasibility Documentation is not to exceed a total of 15 pages. The Government will not consider pages in excess of the page count limitations.

Proposers can submit an optional slide deck of 10 slides in Volume 5: Supporting Documents. The slide deck can contain information on the technical approach, the team, commercialization plans, or relevant technology/research the proposers have developed, and it can contain additional/complementary information to the technical volume. If a proposer elects to submit a slide deck, it must be submitted as a single .pdf file format and its information will be used in the evaluation process.

Number all pages of your proposal consecutively. Font size should not be smaller than 10- point on standard 8-1/2" x 11" paper with one-inch margins. The header on each page of the Technical Volume

should contain your company name, topic number, and proposal number assigned by DSIP when the Cover Sheet was created. The header may be included in the one-inch margin.

Content of the Feasibility Documentation (Volume 2a)

Proposers should substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator.

Content of the Technical Proposal (Volume 2b)

The content of the Technical Volume should address three key areas: the technical approach, the team carrying out the work (and the accompanied resources), and the commercialization strategy. The commercialization strategy should include:

- Company information: Focused objectives/core competencies; specialization area(s); products with significant sales; and history of previous Federal and non-Federal funding, regulatory experience, and subsequent commercialization successes.
- Customer and Competition: Clear description of key technology objectives, current competition, and advantages compared to competing products or services; description of hurdles to acceptance of the innovation.
- Market: Milestones, target dates, analyses of market size, and estimated market share after first year sales and after 5 years; explanation of plan to obtain market share.
- Intellectual Property: Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporal competitive advantage.
- Financing: Plans for securing necessary non-SBIR funding.
- Assistance and mentoring: Plans for securing needed technical or business assistance through mentoring, partnering, or through arrangements with government sponsored (e.g., State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., SBDC), commercial accelerators, DOD Prime Contractors, or other assistance provider.

Proposers are free to structure each section as they like, so long as it provides sufficient detail for evaluators to understand the proposed work, who will carry it out, and how the business plans to commercialize results.

Cost Volume (Volume 3)

Unless otherwise noted in the topic, the Army will accept Direct to Phase II proposals for a cost up to \$1,000,000 for a 12-month period of performance. Proposers are required to use the DSIP online Cost Volume. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

Content of the Cost Volume (Volume 3)

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel costs to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screenshot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's

important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds.

Some items in the cost breakdown may not apply to the proposed project. If that is the case, there is no need to provide information on each and every item.

Cost Breakdown Guidance:

- List all key personnel by name as well as by number of hours dedicated to the project as direct labor.
- Special tooling and test equipment and material cost may be included. The inclusion of equipment and material will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation and/or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the Army; unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the Army.
- Cost for travel funds must be justified and related to the needs of the project.
- Cost sharing is permitted for proposals under this announcement; however, cost sharing is not required, nor will it be an evaluation factor in the consideration of a proposal.
- All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc. Provide detailed substantiation of subcontractor costs in your cost proposal. Enter this information in the Explanatory Material section of the on-line cost proposal form. The Supporting Documents Volume (Volume 5) may be used if additional space is needed.

If a DCAA Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).

If selected for award, failure to include the documentation with your proposal will delay contract negotiation, and the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs (e.g., cost estimates for equipment, materials, and consultants or subcontractors). It is important to respond as quickly as possible to the Contracting Officer's request for documentation.

For more information about cost proposals and accounting standards, see the DCAA publication titled "Audit Process Overview – Information for Contractors" available at: <http://www.dcaa.mil>.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5)

Volume 5 is provided for proposers to submit additional documentation to support the Cover Sheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3). In addition to the Volume 5 requirements outlined in the DoD Program BAA, the Department of the Army will accept the following documents in Volume 5:

- Additional Cost Information

- Funding Agreement Certification
- Technical Data Rights (Assertions)
- Lifecycle Certification
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- Other (only as specified in the topic)
- Optional 10-slide deck. The slide deck can contain information on the technical approach, the team, commercialization plans, or relevant technology/research the proposers have developed, and it can contain additional/complementary information to the technical volume. If a proposer elects to submit a slide deck, it must be submitted as a single .pdf file format and its information will be used in the evaluation process.

Please only submit documents that are identified in the topic instructions. All other submissions will be disregarded.

PHASE II PROPOSAL GUIDELINES

Phase II proposals may only be submitted by Phase I awardees. Phase II proposal submission window, notification process, expected budget/duration structure and additional instructions will be provided in the Phase I contract or by subsequent notification.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

Discretionary Technical and Business Assistance (TABA) will not be offered for this Army topic.

EVALUATION AND SELECTION

All proposals will be evaluated in accordance with the evaluation criteria listed in the DoD Program BAA. It is the policy of the Army to ensure equitable and comprehensive proposal evaluations based on the evaluation criteria listed above and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals.

All proposal evaluations will be based solely on the above evaluation criteria. The Army will conduct an evaluation of each conforming proposal. Proposals that do not comply with the requirements detailed in this BAA and the research objective(s) of the corresponding opportunity are considered non-conforming and therefore will not be evaluated nor considered for award.

Using the evaluation criteria, the Government will evaluate each proposal in its entirety, documenting the strengths and weaknesses relative to each evaluation criterion, and, based on these identified strengths and weaknesses, make a determination of the proposal's overall selectability. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding opportunity.

Awards will be made to proposers whose proposals are determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the BAA herein, subsequent opportunities issued, and availability of funding. Given the limited funding available for each opportunity, not all proposals considered selectable will be necessarily selected for funding.

For the purposes of this proposal evaluation process, a selectable proposal is defined as follows:

Selectable: A selectable proposal is a proposal that has been evaluated by the Government against the evaluation criteria listed in the DoD Program BAA, and the strengths of the overall proposal outweighs its weaknesses. Additionally, there are no accumulated weaknesses that would require extensive negotiations and/or a revised proposal.

For the purposes of this proposal evaluation process, a non-selectable proposal is defined as follows:

Non-Selectable: A proposal is considered non-selectable when the proposal has been evaluated by the Government against the evaluation criteria listed in the DoD Program BAA and the strengths of the overall proposal do not outweigh its weaknesses.

Proposing firms will be notified via email of selection or non-selection status for a Phase I or direct to Phase II award within 30 days of the closing date of the BAA. The notification will come from the Army SBIR Program Office PoC mailbox sent to the Corporate Official listed on the proposal cover sheet. The Army promotes transparency regarding the technical evaluation for all Army SBIR proposals. The Army will provide a technical evaluation narrative to the proposer in accordance with the SBA Policy Directive, Appendix I, paragraph 4. The selection decision notice contains instructions for retrieving the technical evaluation narrative.

A Contracting Officer (KO) may contact applicants, when the Army SBIR Office has recommended a proposal for award, in order to discuss additional information required for award. This may include representations and certifications, revised budgets or budget explanations, certificate of current cost or pricing data, subcontracting plan for small businesses, and/or other information as applicable to the proposed award. The anticipated start date will be determined at that time.

Proposers must not regard the notification email as an authorization to commit or expend funds. Until a Government KO signs the award document (i.e. contract), no obligations to provide funding are made. The award document signed by the Government KO is the official and authorizing award instrument (i.e. contract). The KO will email the signed, authorizing award instrument to the principal investigator (PI) and/or an authorized organization representative.

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement. As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award should be submitted to usarmy.apg.devcom.mbx.sbir-program-managers-helpdesk@army.mil.

Army SBIR 22.4 Topic Index
Release 6

A224-011 Aircraft Survivability for Countering Directed Energy Weapon Threats (C- DEW)
A224-012 SoldierSync

A224-011 TITLE: Aircraft Survivability for Countering Directed Energy Weapon Threats (C-DEW)

OUSD (R&E) MODERNIZATION PRIORITY: General Warfighting Requirements (GWR)

TECHNOLOGY AREA(S): Sensors, Battlespace, Weapons

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), 22 CFR Parts 120-130, which controls the export and import of defense-related material and services, including export of sensitive technical data, or the Export Administration Regulation (EAR), 15 CFR Parts 730-774, which controls dual use items. Offerors must disclose any proposed use of foreign nationals (FNs), their country(ies) of origin, the type of visa or work permit possessed, and the statement of work (SOW) tasks intended for accomplishment by the FN(s) in accordance with the Announcement. Offerors are advised foreign nationals proposed to perform on this topic may be restricted due to the technical data under US Export Control Laws.

OBJECTIVE: The objective of this SBIR is to advance the state-of-the-art of counter directed energy weapons technologies and develop countermeasures for high energy lasers and/or high power microwave weapons systems in the future with specific application to aircraft through the application of coatings technologies. Specifically, this SBIR seeks to develop specific items for any U.S. weapon system, or systems, to improve the survivability characteristics of aircraft, to provide protection and maintain established performance capabilities when attacked by High Energy, Directed Energy Weapons (DEW), with minimal time to employ, apply, conduct maintenance on, or avoid cost or have significant performance system impacts.

DESCRIPTION: With improved performance in both high energy lasers (HEL) and High Power Microwaves (HPM), the susceptibility of aircraft, their stores, weapons systems and their sensors used in seekers or targeting system could be seen as degraded in a war fighting environment when they encountering high power DEW effects. Recent interest in protection of both Manned Air Platforms and Unmanned Aircraft Vehicles (UAV) and their sensor suites is of particular interest. Existing protection solutions are often taken on a case by case basis, and not cost effective or easily replicated/produced. Recently, a focus on quick reaction, “fat fieldable” solutions that utilize paints, “stick on” coverings, or other applied coating methods have been growing in interest. In fact, a limited capability that could be extended may provide services an immediate solution – while enhancements are co-developed and tested with the government resources. Many military requirements as well as commercial protection requirements for electromagnetic radiofrequency interference (EMI/RfI) shielding – such as electrical conductive tapes or electromagnetic paints used in reproduction industries. Therefore, innovations in thin, easy to apply, small, low-density (kg/cm^3), with efficient “in field” application for aircraft protection that has a commercial analog or that leverages similar EMI/RfI applications trade space is highly desirable.

Specifications for such an application are as follows:

- Low cost to manufacture in small quantities: (goal) Less than \$10,000 per application/unit or aircraft (e.g. JSF/F-35 or Blackhawk/H-60) in lots of tens (maximum) or less than \$100,000 per unit in lots of one hundred.
- Low time to install: (goal) None, (maximum) Less than 1 day/unit
- Ease of application (Goal: in field by untrained or minimally trained staff, in hangar/protected bay)
- Operating Environment: (goal) >100 deg. C, (minimum) -40 deg. C, 100% humidity
- Cooling: (goal) none, (possibly) conductively cooled by air
- Power Consumption: (goal) environmentally powered or none

PHASE I: In Phase I of this effort the contractor shall assess the various approaches identified for their specific proposal on Counter DEW Techniques. They will provide a trade analysis on the costs and benefits of these approaches relative to size, weight, efficiency, cooling requirements, production potential and cost. Based upon the findings of the trade study, a detailed design for such a device with performance projections shall be developed. For example, a sample device or test panel (60cm x 60cm x 5cm thick) could be submitted to the government for testing at the end of Phase I. The test item or section shall be designed to meet expected air platform operational performance requirements after being tested for HPM & Rf protective properties. The government will use MIL-STD-464 applicable field levels and HPM pulse characteristics for testing, which shall be determined by the government testing activity based on operational scenarios, tactics, and mission profiles using authenticated threat and source data such as Capstone Threat Assessment Reports. Classified threat information shall not be shared in Phase I. Further, testing is not a requirement, and may be applicable only if specifically invoked by the interested service or procuring activity, and only then will be coordinated after Phase I is completed and the submission of the deliverable test article or panel. Compliance shall be verified by system, subsystem, and equipment level tests, analysis, or a combination thereof. The phase I design descriptive will be a deliverable that shall describe the techniques used to mate or install the proposed system into the platform or test article and document expectations (e.g. reduction of dB of shielding vs. frequency) for performance, as well as the cost impact of the solution when compared to the baseline "all up round production cost" (AURPC) for an unimproved aircraft or platform. In general, documented cost goal increases of less than 1.5% are encouraged per AURPC in order to enable transition to an acquisition program office. Trend analysis and projections shall be presented against generic commercially available systems whenever available. Unique characteristics of the protection scheme may outweigh some systems performance expectations, and are encouraged for submission for consideration under service Science and Technology (S&T) program funding. Leveraging of other SBIR products is also encouraged. The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), which controls the export and import of defense-related material and services. Offerors must disclose any proposed use of foreign nationals, their country of origin, and what tasks each would accomplish in their statement of work in Phase I. Considerations for future collaborations with the United Kingdom, Australia, Canada, and/or New Zealand in the Phase I is a potential, but may, depending on the technology, not be possible.

PHASE II: In Phase II of this effort the contractor shall build a suitable number of prototype devices or unit amounts (e.g. liters) to allow for experimentation, testing and demonstration. A demonstration of the developed units/devices/coatings must show that the specified minimum requirements, specifically for spectral and spatial properties, are either met or exceeded. Application method testing to multiple government specified or provided test articles is expected. Depending on the application, the effort may make several, or only a few prototypes to prove and test the effectiveness of various techniques used.

In some cases, the development of a material countermeasure or counter-technique may require access to classified information, and therefore may become classified in Phase II. In those cases, an establishment of a "need to know" and a suitable Department of Defense, Contract Security Classification Specification, Form DD254, will be executed. This may not be required in every case, but is expected for most circumstances and implementation discussions.

PHASE III DUAL USE APPLICATIONS: In Phase III, the contractor shall work with the government to conduct a low rate initial production (LRIP) study on a specific design or designs resulting from the developed solution sets in Phase I & II, possibly using representative DEW systems intended to defeat air platforms or weapons systems at kilometers of distance.

In some cases, the development of a material countermeasure or counter-technique may require access to classified information, and therefore the Phase III effort may also become classified. In those cases, an

establishment of a "need to know" and a suitable Department of Defense, Contract Security Classification Specification, Form DD254, shall be executed.

PRIVATE SECTOR COMMERCIAL POTENTIAL/DUAL-USE APPLICATIONS: Laser eye safety and HPM protection systems are required for numerous civil and commercial applications including telecommunications. This work is currently performed with Rf, EM and eye hazardous laser sources, which force systems to be protected or operators to fly at altitudes that keep the eye hazard to a minimum, or use other bulky and expensive protection for electronics, such as EMI faraday cages in flight avionics bays. A simple, easy to apply protection capability for safely working around high power microwaves or high energy laser sources would positively impact this business area.

REFERENCES:

1. Journal of Aircraft Survivability, published by the Joint Aircraft Survivability Program Office (<https://www.jasp-online.org/asjournal/>)
2. Journal of Directed Energy, available from the Directed Energy Professional Society, (<http://www.deps.org/DEPSpages/DEjournal.html>)
3. Mil-STD-464 "DEPARTMENT OF DEFENSE INTERFACE STANDARD: ELECTROMAGNETIC ENVIRONMENTAL EFFECTS, REQUIREMENTS FOR SYSTEMS"
4. "Laser Illumination in the Cockpit: prank or terrorism?" Connor, C. W. , Aviation Security International 11, no. 1 (February 2005): 8-12
5. Jane's Unconventional Weapons Response Handbook. Sullivan, John P. et al.
6. High Energy Laser (HEL) Lethality Data Collection Standards; Jorge Beraun, Charles LaMar, J. Thomas Schriempf, Robert Cozzens, William Laughlin, David Loomis, Barry Price, Ralph Rudder, and Craig Walters; Directed Energy Professional Society, Albuquerque, New Mexico (2007)
7. High Power Microwaves, Second Edition ; James Benford, Edl Schamiloglu; CRC Press, New York (2007), ISBN-13: 9780750307062
8. Proceedings, Seventh Annual Directed Energy Test and Evaluation Conference, available from the Directed Energy Professional Society, (<http://www.deps.org/DEPSpages/DEjournal.html>) Albuquerque, NM, 2008

KEYWORDS: Aircraft, Survivability, Protection, Electromagnetics, High Power Microwave; HPM; Directed Energy, Weapons (DEW); Counter Directed Energy (CDEW), Weapons, Lasers; High Energy Lasers; HEL; Laser Protection

TPOC-1: Zach Harrell

TPOC-2: Daniel Hilty

*During the pre-release period, proposing firms have an opportunity to contact topic authors through <https://calendly.com/zach-harrell-aal> to schedule a time to ask technical questions about this topic. Proposing firms will also have the opportunity to attend a scheduled Webinar that will be hosted by AAL and will address the topic in detail along with technical experts and SBIR program experts. Signing up for the webinar can be done at <https://www.eventbrite.com/o/army-applications-laboratory-aal-20258579285>

OUSD (R&E) MODERNIZATION PRIORITY: Autonomy

TECHNOLOGY AREA(S): Information Systems, Human Systems

OBJECTIVE: Develop a solution that passively uploads wearable data from assigned commercial off-the-shelf (COTS) wearables on DoD personnel to a human performance data management system that replaces a traditional intermediary device (i.e. mobile phone, tablet, etc.) with a hotspot (or designated location/base station). Solution may be hardware and software based. Primary concern is service members with wearable sensors not syncing their devices to personal phones or direct connection via USB. Providing a proximity-based solution that pulls the associated data within its range allows for consistent data ingest and reduces human error. Potentially, solution should eliminate the need for personal-use device (i.e. mobile phone, tablet, etc.) or manual USB upload for future commercial wearables needed in a training environment.

DESCRIPTION: Key capabilities of this system could include but are not limited to:

1. Physical solution, hub, or hotspot that is mobile and has a maximum range through Bluetooth or other acceptable connection for a wide range of COTS wearables
2. Hub capable of identifying assigned wearables, connects & pulls cached information from the device, and pushes the collected information to a human performance data management system or designated storage mechanism (local/remote) on associated CSP.
3. Data push likely from associated APIs to assigned COTS wearables
4. Able to extract data from the wearable sensor without the human activating the device, thereby removing the human element from the loop to upload information.

PHASE I: Design proof of concept solution for a physical hub that passively collects & uploads wearable data from assigned commercial off-the-shelf wearables on DoD personnel to a human performance data management system that replaces a traditional intermediary device (i.e. mobile phone, tablet, etc.). Design should include hardware and software integration, communication solution to commercial cloud services with potential to move to military networks. Solution should eliminate the need for personal-use devices (i.e. mobile phone, tablet, etc.) or manual USB upload for current & future commercial wearables needed in a training environment. Final deliverable will be a concept design presentation, proof of technology demonstration inclusive of compatibility with assigned commercial COTS wearables provided by the Army, and plans for follow-on Phase 2 work.

This topic is accepting Direct to Phase II (DP2) proposals only. Proposers interested in submitting a DP2 proposal must provide documentation to substantiate that the scientific and technical merit and feasibility described in above has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results.

PHASE II: Demonstrate a prototype physical hub that passively collects & uploads wearable data from assigned commercial off-the-shelf wearables on DoD personnel to a human performance data management system that replaces a traditional intermediary device (i.e. mobile phone, tablet, etc.). Vendor will embed and develop said prototype to conform to listed parameters throughout a 12 month process. It is incumbent on the vendor to provide proposed, iterative deliverables over 12 months (or sooner) to complete the identified solution. Vendors will incur payment over time based on known deliverable checkpoints. Deliverables can include discovery work with the unit up to 60 days into the

scope. Vendors will interact with a battalion size unit (~600 soldiers) in the 10th Mountain Division at Fort Drum, NY that are equipped with an Oura Ring, Polar Grit X, and Readiband. All of these assigned wearables need to have information pulled via hub and transferred to the associated human performance data management system, Smartabase. Potential solutions can iterate and the ability to test potential solutions with the unit is available free of charge. Solutions will be evaluated on ease of setup, security, consistency of capture, adaptability to wearable devices, and potential for military network accessibility. Access to Soldiers during the touchpoints for feedback is free of charge, and companies should include the estimated cost of travel (assume monthly multi day trips to Fort Drum, NY for set-up, iterative prototyping, final product delivery & testing) to these touchpoints in their budget. Companies should also include a two-day trip for an in-person outbrief to Natick, MA. In addition, virtual touch points with other relevant Army stakeholders will occur throughout the period of performance.

In addition to the Phase II deliverable of a prototype for extended Soldier touch points, companies will provide deliverable and final reports detailing performance and associated deliverables, any iterative adjustments based on user feedback, and final product details. The final report should also include plans to adopt solution onto a military network with associated security protocols and logical access points.

PHASE III DUAL USE APPLICATIONS: The objective of Phase III, where appropriate, is for the small business to pursue commercialization objectives through the effort. Companies will iterate on the physical prototype as needed, make modifications to adapt to the required COTS wearables as identified through extended Soldier touch points and create a usable hub for transfer of COTS wearable data to the data management system without personal-use devices.

Phase III deliverables include a demonstrable prototype of a physical hub that passively collects & uploads wearable data from assigned commercial off-the-shelf wearables on DoD personnel to a human performance data management system that replaces a traditional intermediary device (i.e. mobile phone, tablet, etc.).

REFERENCES:

1. AI and the Future of Retail - <https://corporate.walmart.com/IRL/>
 - o Walmart Unveils New AI-Powered Store to Monitor Inventory (But No Cashierless Checkout) <https://thespoon.tech/walmart-unveils-new-ai-powered-store-to-monitor-inventory-but-no-cashierless-checkout/>
2. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3274182/>
3. Leveraging Cognitive Services to simplify inventory tracking | Azure Blog and Updates - <https://azure.microsoft.com/en-us/blog/leveraging-cognitive-services-to-simplify-inventory-tracking/> (ID different drills on construction sites)

KEYWORDS: Human performance optimization, HPO, Team sync, wearables, sensors, sensor synchronization, data upload, data sync

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*During the pre-release period, proposing firms have an opportunity to contact topic authors through <https://calendly.com/ak-rockwell-aal/team-sync-tpoc-calls> to schedule a time to ask technical questions about this topic. Proposing firms will also have the opportunity to attend a scheduled Webinar that will be hosted by AAL and will address the topic in detail along with technical experts and SBIR program experts. Signing up for the webinar can be done at <https://www.eventbrite.com/o/army-applications-laboratory-aal-20258579285>