

**UNITED STATES SPECIAL OPERATIONS COMMAND
22.4 Small Business Innovation Research (SBIR)
Direct to Phase II Proposal Submission Instructions**

August 11, 2022: Topics issued for pre-release

September 1, 2022: USSOCOM begins accepting proposals via DSIP

September 22, 2022: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET

September 29, 2022: Deadline for receipt of proposals no later than 12:00 p.m. ET

Join us for a virtual Q&A with our Technical Point of Contact

August 23, 2022 from 10:00-1:30 ET

<https://events.sofwerx.org/sbir224r2/>

INTRODUCTION

The United States Special Operations Command (USSOCOM) 22.4 Direct to Phase II (DP2) proposal submission instructions cover DP2 proposals only and change/append the Department of Defense (DoD) instructions for Phase II submissions as they apply to USSOCOM Direct to Phase II requirements. The Government will only evaluate responsive proposals.

USSOCOM seeks small businesses with strong research and development capabilities to pursue and commercialize technologies needed by Special Operations Forces (SOF) through the Department of Defense (DoD) SBIR 22.4 Program Broad Agency Announcement (BAA).

Offerors responding to a topic in this BAA must follow all general instructions provided in the DoD SBIR Program BAA and USSOCOM requirements provided in the instructions below. A thorough reading of the "Department of Defense Small Business Innovation Research (SBIR) Program, SBIR 22.4 Program Broad Agency Announcement (BAA)", located at <https://www.defensesbirsttr.mil/> prior to reading these USSOCOM instructions is strongly recommended. The offeror is responsible for ensuring that their proposal complies with all the requirements in the most current version of these instructions and all required documents are uploaded. The website only monitors the progress of the application process, not the completion of the proposal. Prior to submitting your proposal, please review the latest version of these instructions as they are subject to change before the submission deadline.

The USSOCOM SBIR/STTR Program Office will be hosting a virtual USSOCOM Industry Day on August 23, 2022 to further specify requirements and stimulate small business/research institute partnership-building. Please visit <https://events.sofwerx.org/sbir224r2/> for additional information and to sign up.

DIRECT TO PHASE II PROPOSAL GUIDELINES

The topics below are accepting Direct to Phase II (DP2) proposals only.

Offerors interested in submitting a DP2 proposal must provide documentation to substantiate that the scientific and technical merit and feasibility of the objectives described in the Phase I section of the topic have been met and 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 performed and be owned (data rights) by the offeror and/or the Principal Investigator.

USSOCOM will not evaluate the offeror's related DP2 proposal if the offeror fails to demonstrate technical merit and feasibility of the proposed solution has been established or the offeror has failed to demonstrate that work submitted in the feasibility documentation was performed by the offeror 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.

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Offerors 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.

USSOCOM does not provide Discretionary Technical and Business Assistance for Direct to Phase II awards.

Please Note:

1. It is the offeror's responsibility to make sure all DoD and USSOCOM instructions are followed, and proper documentations are submitted. The DSIP (DoD's SBIR/STTR proposal submission website) will NOT be able to ensure your submission is in accordance with both DoD and USSOCOM instructions. The DSIP "100% submitted" means that the upload process is complete; It does NOT mean the proposal submission is in compliance with the stated instructions and that all required documentation is successfully uploaded.
2. USSOCOM doesn't assist offerors with proposal preparation or review of proposals for completeness. We recommend you use your local and state resources for assistance. (See DoD Instructions for resources information.)
3. We have encountered issues while downloading proposals document titles, due to lengthy file names. **The contractor shall not use more than 20 characters to include spaces in any of the proposal documents titles.**

Cover Page (Volume 1) is created as part of the DoD Proposal Submissions process.

Technical Volume (Volume 2)

The technical volume is not to exceed 10 pages and must follow the formatting requirements provided in the DoD SBIR Program BAA instructions. Any additional pages will be deleted from the proposal prior to evaluation, only the first 10 pages will be evaluated.

Content of the Technical Volume

Direct to Phase II Technical Volume (Volume 2) instructions are the same as the Phase I DoD SBIR Program BAA Technical Volume instructions. Reference section of the DoD SBIR Program BAA titled "Content of the Technical (Volume 2)", which can be located/accessed at <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities#announcements> under Current Funding Opportunities.

The Statement of Objective (SOO), with the list of Contract Data Requirement List (CDRL)s are provided and can be downloaded from <https://www.socom.mil/SOF-ATL/Pages/sbir-22-4-PhaseII.aspx>. The technical proposal shall include a non-proprietary Statement of Work (SOW) with the planned tasks and descriptions to meet the Statement of Objectives (SOO) goals detailed. Do not upload the whole SOO as

your SOW with your proposal. The SOO and CDRL are provided to help the offerors consider the required goals, scope, and deliverables when developing the proposal. It is the offeror's responsibility to provide fully responsive, complete, and clear submissions. Exceptions to the requirements need to be identified/explained.

If an offeror is selected for award, the offeror will be required to submit a separate non-proprietary SOW with the planned tasks and descriptions from the proposal and all other applicable sections of the SOO and it shall include no proprietary information, data, or marking. The provided SOW will become Attachment 3 of the resulting OTA, incorporating any agreed upon changes if necessary.

Note: The Phase I Feasibility Appendix (Appendix A), documenting the results of the offeror's internal Feasibility Study, is required for the Direct to Phase II proposal and is specified in Volume 5 of these instructions.

Cost Volume (Volume 3)

Offerors must read the instructions before completing the cost volume. The Phase II Cost Volume template is posted on the USSOCOM Portal at <https://www.socom.mil/SOF-ATL/Pages/sbir-22-4-PhaseII.aspx>.

For the Direct to Phase II topics in this announcement, the total price limit to provide a testable prototype is listed in Table 1 titled "Consolidated SBIR Topic Information". **Any proposal submitted with a total price above the provided limit will not be evaluated or considered for award.**

The final price of a USSOCOM Phase II SBIR contract/Other Transaction Agreement (OTA) will be negotiated as necessary to reach a determination of price fairness and reasonableness commensurate with the magnitude and complexity of the required research and development effort. The resulting agreement will be a firm priced agreement.

Proposal information should include the itemized listing (a-h) specified below. The proposal information must include a level of detail that would enable the Government personnel to determine the purpose, necessity, and reasonableness of the proposal and show an understanding of the scope of the work. It is requested that a breakdown of labor hours per labor category and other associated costs be provided **by task**. The Agreements Officer may request additional information to support price analysis or understand the approach if needed.

a. Special Tooling and Test Equipment and Material: The inclusion of equipment and materials will be carefully reviewed relative to need and appropriateness of 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 relate directly to the specific effort. They may include such items as innovative instrumentation and/or automatic test equipment. The reason for the requirement and the intention of offeror on disposition of the special material/equipment shall be documented in the proposal as well as the reason on why said equipment is charged directly to the effort rather than in the indirect cost of the business.

b. Direct Cost Materials: Justify costs for materials, parts, and supplies with an itemized list that includes item description, part number, quantities, and price.

c. Other Direct Costs: This category of costs includes specialized services such as machining or milling, special testing or analysis, and costs incurred in obtaining temporary use of specialized equipment.

Proposals that include leased hardware must provide an adequate lease vs. purchase justification or rationale.

d. Direct Labor: For each individual, include the number of hours, and loaded rate to include all indirect costs. Identify key personnel by name if possible and labor category.

e. Travel: Travel costs must relate to the needs of the project. Proposed travel cost must be in accordance with the Federal Travel Regulation (FTR).

1. Per Diem Rates can be obtained at: <http://www.gsa.gov/perdiem>

2. The following information shall be documented –

(i) Date (estimated), length and place (city, town, or other similar designation) of the trip;

(ii) Purpose of the trip; and

(iii) Number of personnel included in the estimate.

f. Cost Sharing: Cost sharing is permitted. However, cost sharing is not required, nor will it be an evaluation factor in the consideration of a proposal. Please note that cost share contracts do not allow fees/profit.

g. Subcontracts: Involvement of university or other consultants in the planning and/or research stages of the project may be appropriate. If the offeror intends such involvement, describe in detail and include information in the cost proposal. The proposed total of all consultant fees, facility leases or usage fees, and other subcontract or purchase agreements may not exceed one-half of the total contract price or cost, unless otherwise approved in writing by the Agreements Officer.

Support subcontract costs with copies of the subcontract agreements. The supporting agreement documents must adequately describe the work to be performed (i.e., cost proposal) or provide a statement of work with a corresponding detailed proposal for each planned subcontract.

h. Consultants: Provide a separate agreement letter for each consultant. The letter should briefly state what service or assistance will be provided, the number of hours required and hourly rate.

SBIR program requires the offerors must do at least 50% of the PHASE II SBIR work. To determine eligibility for award based on this requirement, USSOCOM will divide the overall price submitted/negotiated minus the total cost of subcontractors/consultants amount (with applied indirects), by the total price of the proposal. To qualify for award, the resulting offeror percentage of work shall be 50% or higher. If the percentage is lower, the proposal will not be evaluated.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR 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 USSOCOM during proposal evaluations.

Supporting Documents (Volume 5)

In addition to the documentation outlined in the DoD SBIR Program BAA, the following USSOCOM documents **must** also be included in Volume 5: the (1) PowerPoint Presentation, (2) Feasibility Study (Appendix A), (3) section K and (4) resumes.

- (1) PowerPoint Presentation: Potential offerors shall submit a slide deck not to exceed 15 PowerPoint slides (inclusive of the cover sheet). There is no set format for this document. It is recommended (but not required) that more detailed information is included in the technical volume and higher-level information is included in the slide deck suitable for a possible presentation. Refer to the “Direct to Phase II Evaluations” Section of this instruction for more details.
- (2) Feasibility Study: Offerors **must provide documentation to satisfy the feasibility requirement explaining the previously done research and how it applies to the topic as specified in the Phase I topic write-up**. The file with the documentation shall be named “Feasibility Appendix” and uploaded in this volume. Offerors are required to provide sufficient information to determine, to the extent possible, the scientific, technical, and commercial merit and feasibility of ideas submitted, and that the feasibility assessment was performed by the offeror and/or the Principal Investigator. **If the offeror fails to demonstrate the scientific and technical merit, feasibility, and/or the source of the work, USSOCOM will not continue to evaluate the offeror's proposal.** Refer to the topic’s Phase I description associated with the Direct to Phase II topic to review the minimum requirements needed to demonstrate feasibility. There is no minimum or maximum page limitation for the Feasibility Appendix (Appendix A).
- (3) Section K - Titled “Representations, Certifications, and other statements of Offerors”: The proposal must also include a completed Section K which does not count toward the page limit and should be uploaded with this volume. The identification of foreign national involvement in a USSOCOM SBIR topic is required to determine if a firm is ineligible for award on a USSOCOM topic that falls within the parameters of the United States Munitions List, Part 121 of the International Traffic in Arms Regulation (ITAR). A firm employing a foreign national(s) (as defined in paragraph 3.7 entitled “Foreign Nationals” of the DoD SBIR 22.4 Announcement) to work on a USSOCOM ITAR topic must possess an export license to receive a SBIR Phase II contract.
- (4) Resumes: Include resumes as required.

Fraud, Waste and Abuse Training (Volume 6)

Fraud, Waste and Abuse (FWA) training is required for Phase I and Direct to Phase II proposals. Please refer to the DoD SBIR Program BAA for full details.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TAB A)

USSOCOM does not provide Discretionary Technical and Business Assistance for Direct to Phase II awards.

INQUIRIES

USSOCOM does not allow direct communication with the topic authors (differs from the DoD SBIR Program BAA instructions).

During the Pre-release and Open Periods of the DoD SBIR Program BAA, all, and only technical questions, that enhance the offeror’s understanding of the topics requirements, must be submitted to the online **Defense SBIR/STTR Innovation Portal (DSIP) Topic Q&A**. All questions and answers submitted to DSIP Topic Q&A will be released to the general public.

Only questions pertaining to the proposal preparation instructions should be directed to: sbir@socom.mil. All inquiries must include the topic number in the subject line of the e-mail. **Consistent with DoD SBIR instructions, USSOCOM will not answer programmatic questions, such as who the technical point of contact is, the number of contracts to be awarded, the source of funding, transition strategy.**

Physical site visits will not be permitted during the Pre-release and Open Periods of the DoD SBIR Program BAA.

EVALUATION AND SELECTION

All proposals will be evaluated in accordance with the evaluation criteria listed in the DoD SBIR Program BAA.

The Government will evaluate only responsive proposals.

1. Proposals missing Technical Volume (Volume 2), Feasibility Appendix (Appendix A), Cost Volume (Volume 3), or slide deck (Volume 5) will not be evaluated or those that exceed the maximum price allowed as per Table 1 of this instructions. Those proposals will be considered non-responsive.
2. Feasibility determination. The Feasibility Appendix (Appendix A) to the Phase II proposal will be evaluated first to determine that the offerors demonstrated they have completed research and development to establish the feasibility of the proposed Phase II effort based on the criteria outlined in the topic description of Phase I. **USSOCOM will not continue evaluating the offeror's related Direct to Phase II proposal if it determines that the offeror failed to demonstrate that feasibility has been established or the offeror failed to demonstrate work submitted in the feasibility documentation was substantially performed by the offeror and/or the Principal Investigator.**

Refer to the Phase I Topic description associated with the Direct to Phase II topic Statement of Objectives to review the minimum requirements that need to be demonstrated in the feasibility documentation.

3. The technical evaluation will utilize the Evaluation Criteria provided in the DoD SBIR Program BAA instructions. The Technical Volume and slide PowerPoint Presentation will be reviewed holistically. The technical evaluation is performed in two parts:

Part I: The evaluation of the Technical Volume will utilize the Evaluation Criteria provided in the DoD SBIR Program BAA. Once the evaluations are complete, all offerors will be notified in a timely manner.

Selected offerors **may** receive an invitation to present their slide deck (30 minute presentation time / 30 minute Government question and answer period) to the USSOCOM technical evaluation team, using virtual teleconference. This will be a technical presentation of the proposed solution ONLY. The key personnel listed in the proposal should represent the presentation and responding to the questions of the evaluation team. This presentation is NOT intended for business development personnel, it is purely technical. Selected offerors shall restrict their Pitch Day presentations to the 15-page PowerPoint presentations ONLY that were submitted with their respective proposals. There will be no changes or updates to the presentations from what was

proposed. Selected firms may be asked to provide teleconference information for the presentation. This presentation will complete the evaluation of the proposal against the criteria listed in the DoD SBIR Program BAA. Notifications of selection/non-selection for Phase I award will be completed within a timely manner.

Part II: The Cost Volume award amount is set at a not to exceed (NTE) amount and a technical evaluation of the proposal cost will be completed to assess price fair and reasonableness. Proposals above the established NTE for the Phase I effort will not be considered for award. The team will assess the technical approach presented for the effort based on the number of labor hours by labor categories, the key personnel level of involvement, materials, subcontractors and consultants (scope of work, expertise, participation and proposed effort), and other direct cost as proposed.

4. The Cost Volume (Volume 3) evaluation:

For these Direct to Phase II efforts, the award amount is set with not to exceed (NTE) amount. Technical evaluation of the proposal's cost will be completed to assess the probability of success to obtain a working prototype. Proposals above the set NTE for the effort **will not** be considered for award. The team will assess the probability of success of the technical approach, presented for the efforts. The technical team will assess number of labor hours, labor categories, key personnel expertise and level of involvement, materials, equipment, subcontractors and consultants (scope of work, expertise, participation and proposed effort), travel and other direct cost to successfully complete the effort as proposed.

The resulting award/s will be a fixed price prototyping agreement and a successful prototype may lead to follow on production. Follow on production awards may be FAR based, Fixed Price or Cost-Plus Fixed Fee contracts. A Defense Contracts Audit Agency approved accounting system will be required to issue a Cost-Plus Fixed Fee contract.

Additionally, input on technical aspects of the proposals may be solicited by USSOCOM from non-Government consultants and advisors who are bound by appropriate non-disclosure requirements. When appropriate, non-government advisors may have access to Offeror's proposals and may be utilized to objectively review a proposal in a particular functional area and provide comments and recommendations to the Government's decision makers. They may not establish final assessments of risk, rate or rank Offerors' proposals. All advisors shall comply with procurement Integrity Laws and shall sign Non-Disclosure and Rules of Conduct/ Conflict of Interest statements. The Government shall take into consideration requirements for avoiding conflicts of interest. Submission of a proposal in response to this request constitutes approval to release the proposal to Government support contractors.

Proposing firms will be notified of selection or non-selection status for a Direct to Phase II award within 90 calendar days of the closing date of the BAA by the USSOCOM Contracting Office. This notification will come by e-mail to the Corporate Official identified by the Offeror during proposal submission. The Government will also notify the Offerors if their proposal is considered non-responsive (disqualified).

A non-selected Offeror can make a written request to the Contracting Officer, within 30 calendar days of receipt of notification of non-selection, for informal feedback. The Contracting Officer will provide informal feedback after receipt of an Offeror's written request rather than a debriefing as specified in the DoD SBIR Program BAA instructions.

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: sbir@socom.mil.

AWARD AND CONTRACT INFORMATION

Table 1: Consolidated SBIR Topic Information

Topic	Technical Volume (Vol 2)	Additional Info. (Vol 5)	Period of Performance	Award Amount	Contract Type
SOCOM224-D005	Not to exceed 10 pages	15 page PowerPoint	Not to exceed 18 months	NTE \$1,225,000	Firm-Fixed-Price
SOCOM224-D006	Not to exceed 10 pages	15 page PowerPoint	Not to exceed 18 months	NTE \$1,225,000	Firm-Fixed-Price

SBIR awards for the Direct to Phase II topics will be awarded as a fixed price (level of effort type), Other Transactions Agreements (OTA). Successful completion of the prototype under an OTA may result in a follow-on production OTA or contract. Successful completion of the prototype is defined as meeting one or more threshold requirements. Firms may download the template at <https://www.socom.mil/SOF-ATL/Pages/sbir-22-4-Phasell.aspx>. The general terms and conditions are included in the draft OTA template provided in this solicitation. The terms and conditions of the Template OTA and the latest version of the OTA may be revised prior to execution. The document deliverables required for the effort are listed in the uploaded Statement of Objectives (SOO) for each topic. The OTA template uploaded is a basic draft and not tailored to the specific topic and is not the final document to be use in the award. Offerors must review these documents to develop their proposal.

The OTA template needs to be completed by only those offerors selected for award and will be submitted directly to the Agreements Officer identified in the notification. The specific OTA template for each topic will be sent to those selected to present the PowerPoint Presentation. Providing the completed OTA for those invited to present, is desirable but not required.

Those selected for award would be required to enter their company information, expected milestones (Attachment 1), and provide a non-proprietary Statement of Work (SOW) following the format of the Statement of Objectives (SOO) (Attachment 3).

ADDITIONAL INFORMATION

Direct to Phase II proposals shall NOT include:

1. "Basic Research" (or "Fundamental Research") defined as a "Systematic study directed toward greater knowledge or understanding of the fundamental aspects of phenomena and/or observable facts without specific applications toward processes or products in mind."
2. Discretionary Technical and Business Assistance

USSOCOM SBIR 22.4 Topic Index
Release 3

SOCOM224-D005	Artificial Intelligence-Driven Voice Control at the Edge
SOCOM224-D006	Canine In-Ear Hearing Protection

SOCOM224-D005

TITLE: Artificial Intelligence-Driven Voice Control at the Edge

OUSD (R&E) MODERNIZATION PRIORITY: Control and Command, Control and Communications; Artificial Intelligence/ Machine Learning. Communications; Artificial Intelligence/ Machine Learning; General Warfighting Requirements (GWR)

TECHNOLOGY AREA(S): Air Platform; Sensors; Electronics; Battle Space; Human Systems.

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 topic is to develop applied research toward an innovative capability to enable voice control and interaction with a variety of organic sensors and data processing systems employed by soldiers at the operational tactical edge.

DESCRIPTION: This topic seeks innovative research and development efforts that reduce the cognitive burden associated with control and interaction with a variety of electronic systems employed by Special Operations formation at multiple echelons from a forward deployed small unit up to a Company level command post. As a part of this feasibility study, the proposers shall address all viable overall system design options and considerations with respective specifications related to key system attributes. Key system attributes include:

1. Voice control achieved organically (without reach back to second order data processing).
2. Robust audio processing to achieve effective control in the presence of background noise and imprecise voice commands.
3. Data processing on small form factor, commercially available data processing circuits.
4. Flexible software architecture to allow application to multiple electronic system with minimal adaptation.
5. Provide an audio feedback loop to confirm commands and actions.

PHASE I: Conduct a feasibility study to assess what is in the art of the possible that satisfies the general requirements specified in the above paragraphs entitled "Objective" and "Description."

The objective of this USSOCOM Phase I SBIR effort is to conduct and document the results of a thorough feasibility study ("Technology Readiness Level 3") to investigate what is in the art of the possible within the given trade space that will satisfy a needed technology. The feasibility study should investigate all options that meet or exceed the minimum performance parameters specified in this write up. It should also address the risks and potential payoffs of the innovative technology options that are investigated and recommend the option that best achieves the objective of this technology pursuit. The funds obligated on the resulting Phase I SBIR contracts are to be used for the sole purpose of conducting a thorough feasibility study using scientific experiments and laboratory studies as necessary. Operational prototypes will not be developed with USSOCOM SBIR funds during Phase I feasibility studies.

Operational prototypes developed with other than SBIR funds that are provided at the end of Phase I feasibility studies will not be considered in deciding what firm(s) will be selected for Phase II.

PHASE II: Develop, install, and demonstrate a prototype voice control system determined to be the most feasible solution during the Phase I feasibility study on a small to medium unmanned aerial platform (integrated on either the ground control system or aerial platform) and/or an Android Tactical Assault Kit (ATAK) application.

PHASE III DUAL USE APPLICATIONS: This system could be used in a broad range of military applications where the soldier must interface rapidly electronic equipment in a high stress situation.

REFERENCES:

1. Multiple scholarly articles are available under internet search for "Voice Control of Unmanned Aerial Systems";
2. SkyRaider Product Information; <https://www.flir.com/products/r80d-skyraider/?vertical=uas&segment=uis>; Black Hornet Product Information;
3. <https://www.flir.com/products/black-hornet-prs/?vertical=uas-norway&segment=uis>;
4. The Open Standards for Drone Hardware, 2019; <https://Pixhawk.org>

KEYWORDS: Voice control; artificial intelligence; machine learning; human-machine interaction; uncrewed aerial system; un-manned aerial system; uncrewed ground system; un-manned ground system.

TPOC-1: SOCOM SBIR
Email: SBIR@SOCOM.mil

SOCOM224-D006 TITLE: Canine In-Ear Hearing Protection

OUSD (R&E) MODERNIZATION PRIORITY: Biotechnology Space

TECHNOLOGY AREA(S): Biomedical; Electronics

OBJECTIVE: The objective of this topic is to develop applied research toward an innovated capability to optimize auditory performance of working dogs. This will be accomplished through development of an in-ear hearing protection device capable of providing the necessary protection while still allowing environmental awareness as well as effective communication between the dog and handler.

DESCRIPTION: The ability to provide in-ear hearing protection for an MPC while still allowing effective environmental awareness as well as communication between the dog and handler will significantly improve their operational effectiveness and ensure long-term health through reduction of hearing loss. As a part of this feasibility study, the proposers shall address all viable overall system design options with respective specifications on the key system attributes:

- The ability to attenuate frequencies below 1000Hz.
- Allow dogs to retain the ability to hear within the frequency range of 2000-4000Hz.
- Capable of automatic gain control.
- Capable of automatic noise cancellation.
- Capable of receiving communication from a radio or other device utilized to remotely give commands to the MPC.
- Ability to operate in all environmental conditions.
- Will not interfere with natural ear movement so it will not affect MPCs ability to move their ears to maximize reception and help direct and amplify sound.
- Hearing protection material must not cause tissue reactivity or other harm to MPC ears.
- Available in variety of sizes to accommodate different size ears and MPCs; custom molding being required is acceptable
- Ability to be retained in the ear canal and maintain an adequate seal for providing hearing protection

PHASE I: Conduct a feasibility study to assess what is in the art of the possible that satisfies the requirements specified in the above paragraphs entitled "Objective" and "Description."

The objective of this USSOCOM Phase I SBIR effort is to conduct and document the results of a thorough feasibility study ("Technology Readiness Level 3") to investigate what is in the art of the possible within the given trade space that will satisfy a needed technology. The feasibility study should investigate all options that meet or exceed the minimum performance parameters specified in this write up. It should also address the risks and potential payoffs of the innovative technology options that are investigated and recommend the option that best achieves the objective of this technology pursuit. The funds obligated on the resulting Phase I SBIR contracts are to be used for the sole purpose of conducting a thorough feasibility study using scientific experiments and laboratory studies as necessary. Operational prototypes will not be developed with USSOCOM SBIR funds during Phase I feasibility studies. Operational prototypes developed with other than SBIR funds that are provided at the end of Phase I feasibility studies will not be considered in deciding what firm(s) will be selected for Phase II.

PHASE II: Develop, install, and demonstrate a prototype system determined to be the most feasible solution during the Phase I feasibility study on a canine in-ear hearing protection device.

PHASE III DUAL USE APPLICATIONS: This system could be used in a broad range of military applications where canine in-ear hearing protection while still allowing environmental awareness as well as effective communication between the dog and handler is required. Other applications include various federal and state agencies, law enforcement, sporting, hunting, agility training, and veterinary medicine.

REFERENCES:

5. "Canine Hearing Loss Management." Vet Clinics of North America Small Animal Practice. November 2012.
https://www.researchgate.net/publication/232810805_Canine_Hearing_Loss_Management;
6. "Companion animals, their biology, care, health and management." Pearson Prentice Hall 2005;
7. "Noise-Induced Hearing Loss in 3 Working Dogs." December 2019.
<https://pubmed.ncbi.nlm.nih.gov/31837756/>;
8. Evidence of Noise-Induced Subclinical Hearing Loss using BAER and objective measure of hearing loss in humans." January 2018. <https://pubmed.ncbi.nlm.nih.gov/29370962/>

KEYWORDS: Dog; Canine; Hearing Protection; In-Ear; AGC; ANC; Remote communication

TPOC-1: SOCOM SBIR
Email: SBIR@SOCOM.mil