UNITED STATES SPECIAL OPERATIONS COMMAND
21.1 Small Business Innovation Research (SBIR)
Phase I Proposal Submission Instructions

Introduction:

The United States Special Operations Command (USSOCOM) seeks small businesses with strong research and development capabilities to pursue and commercialize technologies needed by Special Operations Forces through the Department of Defense (DoD) SBIR 21.1 Program Broad Agency Announcement (BAA). A thorough reading of the "Department of Defense Small Business Innovation Research (SBIR) Program, SBIR 21.1 Program Broad Agency Announcement (BAA)" prior to reading these USSOCOM instructions is highly recommended.

These USSOCOM instructions explain USSOCOM specific aspects that differ from the DoD Announcement and its instructions.

Table 1: Consolidated SBIR Topic Information

Topic	Technical Volume (Vol 2)	Additional Info. (Vol 5)	Period of Performance	Award Amount	Contract Type
Phase I SOCOM211-001	Not to exceed 5 pages	15 page PowerPoint	Not to exceed 6 months	NTE $150,000.00	Firm-Fixed-Price
Phase I SOCOM211-002	Not to exceed 5 pages	15 page PowerPoint	Not to exceed 6 months	NTE $150,000.00	Firm-Fixed-Price
Phase I SOCOM211-003	Not to exceed 5 pages	15 page PowerPoint	Not to exceed 6 months	NTE $150,000.00	Firm-Fixed-Price

Contract Awards:

SBIR awards for topic SOCOM211-002 will be made under the authority of National Defense Authorization Act for Fiscal Year 2020, Section 851, **PILOT PROGRAM FOR DEVELOPMENT OF TECHNOLOGY-ENHANCED CAPABILITIES WITH PARTNERSHIP INTERMEDIARIES.** USSOCOM may use a partnership intermediary to award SBIR contracts and agreements to small business concerns. SOCOM211-002 SBIR contract awards may be done through SOFWERX and result in a commercial contract between the firm and DEFENSEWERX. The Government will evaluate and select for award all SOCOM211-002 proposals. The Government will award all SBIR contracts for SOCOM211-001, and SOCOM211-003.

Proposal Submission:

Firms must upload their proposals to the Defense SBIR/STTR Innovation Portal Proposal Submissions at https://www.dodsbirsttr.mil/submissions/login . Additional USSOCOM specific submission requirements for each volume are detailed below.

Technical Inquiries:

During the Pre-release Period of the DoD SBIR 21.1 Program BAA, all questions must be submitted in writing either by e-mail to sbir@socom.mil or to the online Topic Q&A (formerly SITIS). All questions

and answers submitted to Topic Q&A will be released to the general public. USSOCOM does not allow inquirers to talk directly or communicate in any other manner to the topic authors (differs from Section 4.13.c. of the DoD SBIR 21.1 Program BAA instructions). **All inquiries must include the topic number in the subject line of the e-mail.**

During the Open Period, follow the instructions in section 4.13.d of the DoD SBIR 21.1 Program BAA Instructions.

Site visits will not be permitted during the Pre-release and Open Periods of the DoD SBIR 21.1 Program BAA.

Proposal Volumes:

Volume 1: Cover page required per DoD instructions.

Volume 2: Technical Volume
The Technical Volume page count will include all the required items under section 5.4.c of the DoD SBIR 21.1 instructions and shall not exceed 5 pages. Offerors shall also submit a slide deck not to exceed 15 PowerPoint slides in Volume 5 and there is no set format requirements for the two documents. 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. The Cost Volume (Volume 3) for the Topics will cover the total effort.

The identification of foreign national involvement in a USSOCOM SBIR topic is needed 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 21.1 Announcement) to work on a USSOCOM ITAR topic must possess an export license to receive a SBIR Phase I contract.

Volume 3: Cost Volume
Companies submitting a Phase I proposal under this BAA must complete the USSOCOM Phase I Cost excel spreadsheet, with a base not to exceed $150,000.00 plus Technical and Business Assistance (TABA) cost (if applicable) not to exceed $6,500 over a period of up to six months.

USSOCOM may provide TABA funds in Phase I awards to firms to meet Cybersecurity Maturity Model Certification (CMMC) Level 1 certification requirements. Draft of the CMMC is located at https://www.acq.osd.mil/cmmc/draft.html.

The TABA information must be included in the firm's cost proposal specifically identified as "Discretionary Technical and Business Assistance" and cannot be subject to any profit or fee by the requesting SBIR firm. In addition, the provider of the TABA may not be the requesting firm, an affiliate of the requesting firm, an investor of the requesting firm, or a subcontractor or consultant of the requesting firm otherwise required as part of the paid portion of the research effort (e.g., research partner, consultant, tester, or administrative service provider). Proposed TABA will be evaluated by the USSOCOM SBIR Program office. The proposed amount is in addition to the award amount for Phase I and cannot exceed $6,500. The firm's proposal must (1) clearly identify the need for assistance (purpose and objective of required assistance); (2) provide details on the provider of the assistance (name and point of contact for performer and unique skills/specific experience to carry out the assistance proposed); and (3) the cost of the required assistance (costs and hours proposed or other details on arrangement that would justify the proposed expense).

A minimum of two-thirds of the research and/or analytical work in Phase I must be conducted by the proposing firm. The percentage of work is measured by both direct and indirect costs as a percentage of the total contract cost.

Volume 4: Company Commercialization Report
CCR is required to be submitted with proposals in response to SOCOM 21.1 SBIR topics. Please refer to the DoD 21.1 SBIR BAA for full details.

Volume 5: Supporting Documents
Potential Offerors shall submit a slide deck not to exceed 15 PowerPoint slides.
Volume 6: Fraud, Waste and Abuse Training
Fraud, Waste and Abuse (FWA) training is required for Phase I and Direct to Phase II proposals. Please refer to the DoD 21.1 SBIR BAA for full details.
Phase I proposals shall NOT include:

1) Any travel for Government meetings. All meetings with the Government will be conducted via electronic media.
2) Government furnished property or equipment.
3) Priced or Unpriced Options.
4) A Technical Volume exceeding five pages. USSOCOM will only evaluate the first five pages of the Technical Volume. Additional pages will not be considered or evaluated.
5) "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."
6) Human or animal studies.

Phase I Evaluations:

USSOCOM evaluates Phase I proposals using the evaluation criteria specified in section 6.0 of the DoD 21.1 SBIR Announcement except for:

The Technical Volume and slide deck will be reviewed holistically. Proposals missing the slide deck will not be evaluated. The two-part evaluation process is explained below:

> Part I: The evaluation of the Technical Volume will utilize the Evaluation Criteria provided in Section 6.0 of the DoD SBIR 21.1 BAA. Once the evaluations are complete, all Offerors will be notified as to whether they were selected to present the slide deck portion of their proposal.
>
> Part II: Selected Offerors will receive an invitation to present their slide deck (30 minute presentation time / 30 minute question and answer) in a technical question and answer forum to the USSOCOM evaluation team via electronic media within the evaluation period. This is usually within 15 to 30 days after BAA closure. Selected Offerors shall restrict their presentations to only the 15 page PowerPoint presentation that were submitted with their proposals. There will be no changes or updates to the presentations from what was proposed. This presentation will be evaluated by a panel against the criteria listed under Section 6.0 of the DoD SBIR 21.1 BAA. This will follow with a selection/non-selection notification in a timely manner.

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. Non-Government personnel will not establish final assessments of risk, rate, or rank Offeror's proposals.

These advisors are expressly prohibited from competing for USSOCOM SBIR awards. All administrative support contractors, consultants, and advisors having access to any proprietary data will certify that they will not disclose any information pertaining to this announcement, including any submission, the identity of any submitters, or any other information relative to this announcement; and shall certify that they have no financial interest in any submission. Submissions and information received in response to this announcement constitutes the Offeror's permission to disclose that information to administrative support contractors and non-Government consultants and advisors.

Selection Notifications:

For topic SOCOM211-002 the Defensewerx (also known as SOFWERX) will notify each Offeror whether they have been selected for award. The e-mail notification will be sent to the Corporate Official (Business) identified by the Offeror.

For topics SOCOM211-001 and SOCOM211-003, the Government Contracting Officer will notify each Offeror by e-mail whether they have been selected for award. The e-mail notification will be sent to the Corporate Official (Business) identified by the Offeror.

Informal Feedback:

A non-selected Offeror can make a written request to their respective Contracting Officer, within 30 calendar days of receipt of notification of non-selection, for informal feedback. The respective Contracting Officer will provide informal feedback in response to an Offeror's written request rather than a debriefing as specified in paragraph 4.10, entitled "Debriefing," of the DoD SBIR 21.1 Announcement.

USSOCOM SBIR Program Point of Contact:

Inquiries concerning the USSOCOM SBIR Program should be addressed to sbir@socom.mil.

SOCOM 21.1 SBIR Phase I Topic Index

SOCOM211-001 TITLE: Antenna Distribution System

TECHNOLOGY FOCUS AREA: Microelectronics; Network Command, Control and Communications

TECHNOLOGY AREAS: Sensors; General Warfighting Requirements (GWR)

ACQUISITION PROGRAM: Joint Threat Warning System

OBJECTIVE: The objective of this effort is to conduct a feasibility study to develop a capability by which a series of Radio Frequency antennas and access to these antennas can be electrically distributed among a series of Radio Frequency receivers/transmitters in a manner in which the Radio Frequency receiver connected to the antenna distribution system can be connected to any of the antennas connected to the distribution system quickly and efficiently.

DESCRIPTION: Special Operations Forces (SOF) personnel operate a number of mobility platforms and frequently establish fixed deployment sites where a number of Radio Frequency systems must be installed for use in support SOF operations. This results in a requirement for numerous antennas designed to work in different sections of the Radio Frequency spectrum to be installed. This is typically done with each available receiver/transmitter planned for the operation in mind being connected to a single antenna, the design of which is optimized for operation in the section of the spectrum for which the associated receivers/transmitters are configured to operate. This does not support flexibility of the Radio Frequency sensing system. In cases where receivers/transmitters must be reconfigured to operate in different frequency ranges, cables must be reconnected and often new antennas installed in an effort to meet ever changing mission requirements. This often results in a lack of equipment needed to make necessary changes and delay in reconfiguration which may affect the ability to support emergent SOF missions.

PHASE I: Conduct a study to determine the technical feasibility of developing a system that will allow multiple radio receivers/transmitters to access multiple antennas with configuration and reconfiguration accomplished by remote means. USSOCOM has a requirement to distribute Radio Frequency energy received by a number of antennas, each of which is designed to operate optimally in a specific section of the Radio Frequency spectrum, to different Radio Frequency receivers/transmitters, each of which will be configured to operate in a specific section of the Radio Frequency spectrum. Additionally, the requirement is for the receivers/transmitters to be able to retune and switch between antennas for periodic use of any of the antennas connected to the distribution network. The general requirement for this SBIR topic is to enable a series of receivers/transmitters to access various antennas, each designed to operate most efficiently in a specific section of the Radio Frequency spectrum, electrically, electronically or mechanically by a remote operator using control software.

The Offeror shall develop a means by which a series of Radio Frequency antennas, each optimized for performance within a specific section of the Radio Frequency spectrum, can be accessed by a series of Radio Frequency receivers / transmitters:

1. Antennas shall be proposed by the Offeror with the primary focus being electrical performance of each individual antenna. Size, weight and Power consumption (SWaP) are also under consideration as a secondary attribute of each antenna.

2. Receivers/transmitters hardware shall be proposed by the Offeror. It shall be fully compatible with each proposed antenna.

3. This technology pursuit is to develop a method by which each receiver/transmitter in a series can be remotely, a method that does not require "touch maintenance", configured to operate with any of the proposed antennas. There may be cases where more than one receiver/transmitter must access a single antenna and each time this occurs, the secondary receivers/transmitters shall automatically be configured for receive only.

4. This topic automates the reconfiguration process necessary to attach receivers/transmitters to different antennas from its current manual labor method.

5. A final feasibility study report and preliminary design shall be delivered to allow Government acquisition officials the opportunity to make future acquisition decisions on a fully informed basis.

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 an Antenna Distribution System. The prototype will be tested with sensors currently in the SOF inventory to determine level of performance and in an attempt to make the test articles ready for testing in a pseudo-operational environment.

PHASE III DUAL USE APPLICATIONS: This system could be used in a broad range of military applications where radio devises are used. For example, this antenna distribution system could provide a means by which communications devices on a mobility platform, such as an airplane or ship, could make use or an antenna distribution system to reduce the requirement for a number of individual antennas currently required on the platform. In this case, limited physical space can be opened up to other devices as antennas are removed due to the distribution system providing the capability to map specific radios to specific antennas remotely when the connection is needed. This capability can easily be applied to sensor systems such as those used to detect distant RADAR systems or unknown radio transmitters. Upon completion of a successful demonstration of this capability with radio sensors, other Methods of Employment such as RADAR detection of communications support can be tested.

REFERENCES:

1. Technical Standard for Sensor Open System Architecture (SOSA) Reference Architecture, Edition 1 Version 3 Copyright 2020. This document is valid through 28 February 2021: https://publications.opengroup.org/standards/sosa

KEYWORDS: Antenna Distribution System; Antenna

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SOCOM211-002 TITLE: Enterprise Data Fusion Visualization

TECHNOLOGY FOCUS AREA: General Warfighting Requirements (GWR); Artificial Intelligence/ Machine Learning;

TECHNOLOGY AREAS: Information Systems

ACQUISITION PROGRAM: SOF Digital Ecosystem

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 section 3.5 of 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 a user interface application providing an intuitive user interface for entering search criteria and presenting search results based on a wide range of data sources. The interface network will provide obfuscated connection services. Results will be correlated, relationships identified, relevant anomalies highlighted and graphical presentation utilized to allow rapid assessment by users. This product will also assist with the US Government's compliance to applicable laws and regulations for data collection and retention.

DESCRIPTION: As a part of this feasibility study, the proposers shall address all viable overall system design options with respect to optimization of man-to-machine interface, potential benefits to be gained through the use of machine learning, and tools/techniques for masking the source of a data query.

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." Identify how machine learning might enhance the proposed capability.

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 data fusion and visualization application.

PHASE III DUAL USE APPLICATIONS: This system could be used in a broad range of military applications where current publicly available and commercially available information can assist with

decision making. In these instances, an element of non-attribution is important not to project a specific area of focus. The commercial market likely have similar instances where rapidly analyzing information on a specific topic from a wide variety of sources would aid in business decision making.

REFERENCES:

1. "How to Stay Anonymous on Line": https://www.digitaltrends.com/computing/how-to-be-anonymous-online/

KEYWORDS: Publicly Available Information; Commercially Available Information, Data Correlation, Data Fusion, graphical data presentation, anonymous data search

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SOCOM211-003 TITLE: Wideband and Analog Radio Frequency Fingerprinting At a Distance

TECHNOLOGY FOCUS AREA: Artificial Intelligence/ Machine Learning; Network Command, Control and Communications;

TECHNOLOGY AREAS: Sensors; Electronics; Battle Space

ACQUISITION PROGRAM: Near Vertical Direction Finding

OBJECTIVE: The objective of this topic is to develop applied research toward an innovative capability to dramatically increase Radio Frequency (RF) sensitivity, with the purposes of developing a method to preform passive, analog RF fingerprinting of individual, modern communications devices in real-time at a standoff range.

DESCRIPTION: As a part of this feasibility study, the proposers shall address all viable overall system design options with respective specifications on RF linearity, frequency resolution, operational ranges, discrimination capability and protocols and standards in which specified techniques are effective or ineffective. Specifically, this SBIR topic is asking for technologies which go beyond protocol identification by analog characteristics, but rather asking for technology candidates which can delineate individual emitters, within a given protocol. The potential proposers will then study the feasibility of these techniques of a list of the most widely used commercial protocols. Of additional interest is the ability to perform this discrimination across a wide instantaneous bandwidth, across multiple protocols simultaneously. The detection and discrimination should be performed at a standoff range which is to imply that the device being identified is at a distance in which visual identification is not possible.

The attached reference presents a good overview, but this SBIR is asking to preform one level deeper of discrimination and at a standoff range.

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 stand-alone system. The device should be capable of determining individual emitters by their analog characteristics in real-time. These systems may be considered for shipboard, airborne or ground-based applications.

PHASE III DUAL USE APPLICATIONS: This system could be used in a broad range of military applications where the need for additional sensitivity of RF emissions is required. This could be used to

develop unique broadband signatures using unique broadband signatures (URE) of non-RF devices – (i.e Broadband signature of Tesla vs Honda by unique URE of engine systems) or to increase detection ranges.

REFERENCES:

1. Laput, G., Yang, C., Xiao, R., Sample, A. and Harrison, C. 2015. EM-Sense: Touch Recognition of Uninstrumented, Electrical and Electromechanical Objects. In Proceedings of the 28th Annual ACM Symposium on User interface Software and Technology (Charlotte, North Carolina, November 8 – 11, 2015). UIST '15. ACM, New York, NY. 157-166: https://la.disneyresearch.com/publication/emsense/ or https://dl.acm.org/doi/10.1145/2807442.2807481

KEYWORDS: RF Fingerprinting; EMI analysis; RF technology; Radio Frequency; RF

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