UNITED STATES SPECIAL OPERATIONS COMMAND
20.1 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 20.1 Program Broad Agency Announcement (BAA). A thorough reading of the "Department of Defense Small Business Innovation Research (SBIR) Program, SBIR 20.1 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 SOCOM20-001	Not to exceed 5 pages	15 page PowerPoint	Not to exceed 6 months	Typically $150,000	Firm-Fixed-Price
Phase I SOCOM20-003	Not to exceed 5 pages	15 page PowerPoint	Not to exceed 6 months	Typically $150,000	Firm-Fixed-Price

Technical Inquiries:

During the Pre-release Period of the DoD SBIR 20.1 Program BAA, all questions must be submitted in writing either by e-mail to sbir@socom.mil or to the online SBIR/STTR Interactive Topic Information System (SITIS). All questions and answers submitted to SITIS 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 4.15.c. of the DoD SBIR 20.1 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 4.15.d of the DoD SBIR 20.1 Program BAA Instructions.

Site visits will not be permitted during the Pre-release and Open Periods of the DoD SBIR 20.1 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 20.1 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 Special 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 3.5 entitled "Foreign Nationals" of the DoD SBIR 20.1 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 DoD Phase I simplified Cost Volume using the DOD on-line form, with a base cost typically $150,000 not to exceed $225,000 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
Required by DoD but not evaluated by USSOCOM.
Volume 5: Supporting Documents
Potential Offerors shall submit a slide deck not to exceed 15 PowerPoint slides.
Volume 6: Fraud, Waste and Abuse Training
Not required by USSOCOM.

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 20.1 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 20.1 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, on 10-11 March 2020 at the SOFWERX facility. All selected firms will be reimbursed $2,000 to offset presentation costs. This presentation will be evaluated by a panel against the criteria listed under Section 6.0 of the DoD SBIR 20.1 BAA. Notifications of selection/non-selection will be completed within the following five business days.

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:

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, within 30 calendar days of receipt of notification of non-selection, for informal feedback. USSOCOM will provide informal feedback within 30 calendar days of an Offeror's written request rather than a debriefing as specified in paragraph 4.10, entitled "Debriefing," of the DoD SBIR 20.1 Announcement.

USSOCOM SBIR Program Point of Contact:

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

USSOCOM SBIR 20.1 Topic Index

USSOCOM SBIR 20.1 Topic Descriptions

SOCOM20-001 TITLE: Platform Agnostic Data Storage Infrastructure

TECHNOLOGY AREA(S): Battlespace, Information Systems

RESEARCH & TECHNOLOGY AREA(S):

ACQUISITION PROGRAM: Mission Support Systems

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 the statement of work in accordance with section 5.4.c.(8) of the Announcement.

OBJECTIVE: The objective of this topic is to develop a scalable platform agnostic data storage system that will allow cross indexing of layered data via the implementation of a common data standard employed through the minimum number of data translations of incoming data streams for the purposes of advanced big data analytics in a dynamic tool environment. Standard data will enable machine-to-machine communication required for advanced technologies including artificial intelligence and deep learning.

DESCRIPTION: USSOCOM is looking to explore options that provide Special Operations Force (SOF) Analysts with a common data standard driven database that can cross index layers based on any data point. The data repository can be utilized to support multiple tool suites allowing the data to be platform agnostic. This will enable SOF analysts to reduce the storage costs incurred by replicating data storage in different tool suites. At full capacity, this system will enable analysts to rapidly identify and extract information of value across all available data sources, significantly reducing the resources allocated to data mining.

Database key features shall include but not limited to the following:

1. Systems architecture must be able to process data from multiple sources, identify the data type, and label it according to the identified Common Data Standard for storage in the database.
2. Database must support multiple tables of data covering all data types common to the analytical work flow.
3. Employ graph database capability to support the cross-table research capability.
4. System must support field level classification and/or classification backed access control.
5. Database must be scalable from disconnected local resources up to fully integrated cloud solution.
6. Depict a potential hardware layout with volumetric estimates.
7. As part of this feasibility study, the offeror shall address all viable overall system design options with respective specifications.

Key Military applications: Multi-INT Processing, Exploitation, and Dissemination, Information Operations, Large Scale Analytics

Research/Analysis:

1. Significantly reduce analyst efficiency and effectiveness while simultaneously increasing the value of

returned results through automated correlations.
2. Create feeds into any available tool suite using an application program interface (API), allowing all intelligence disciplines to use current or emerging technologies without restrictions
3. Signature Identification and analysis of Big Data
4. Operational Adaptability and Decision-Making
5. AI assisted research and analysis.

PHASE I: Conduct a feasibility study to assess what is in the art of the possible that satisfies the requirements specified in the above paragraph entitled "Description." To stimulate advances in technology and innovation, solutions including reusable code should be considered as well as re-use of open source code and potential integrations with fielded systems utilizing existing open interfaces and standards.

The objective of this USSOCOM Phase I SBIR effort is to conduct and document the results of a thorough feasibility study 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 known 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. Incorporate user input received during quarterly hands on assessments and evaluations in operationally realistic environments including a government test bed.

PHASE III DUAL USE APPLICATIONS: This data storage infrastructure could be used in a broad range of military applications where SOF and general-purpose forces require large scale common standards data storage for exploitation on virtually all intelligence and operations systems. This capability could also be adopted by first responders, federal law enforcement (Secret Service), and for organizations that require a need to geospatially depict big data sets in common standard format.

REFERENCES:

1. Multi-Cloud Strategy Fuels Need for Agnostic Platforms, https://www.networkcomputing.com/data-centers/multi-cloud-strategy-fuels-need-agnostic-platforms, accessed 30 May 2019

2. Large Scale Data Storage, https://www.sbir.gov/sbirsearch/detail/1308647, accessed 30 May 2019

3. "The Hyper Enabled Operator," Small Wars Journal, https://smallwarsjournal.com/jrnl/art/hyper-enabled-operator#_edn2, accessed 30 May 2019

4. Next Generation Graph, https://www.sbir.gov/sbirsearch/detail/1532125, accessed 30 May 2019

5. “How Mobility Solutions are Transforming Military Tactical Operations and Driving Better Mission Outcomes,” https://insights.samsung.com/2018/12/13/how-mobility-solutions-are-transforming-military-tactical-operations-driving-better-mission-outcomes/, accessed 30 May 2019

6. Improving on the Lambda Architecture for streaming analysis, https://www.oreilly.com/ideas/improving-on-the-lambda-architecture-for-streaming-analysis, accessed 30 May 2019

KEYWORDS: Quantum Computing, Big Data, Data Science, Artificial Intelligence, Deep Learning, Lambda Architecture

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SOCOM20-003 TITLE: Multi-FMV Fusion 3D Capability

TECHNOLOGY AREA(S): Air Platform, Battlespace, Human Systems, Information Systems, Sensors

RESEARCH & TECHNOLOGY AREA(S):

ACQUISITION PROGRAM: Program Executive Office - Special Reconnaissance, Surveillance and Exploitation

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 the statement of work in accordance with section 5.4.c.(8) of the Announcement.

OBJECTIVE: The objective of this topic is to develop an Artificial Intelligence capability to aggregate multiple FMV sensor feeds into a single optimized and geo-rectified 3D FMV feed that can be shared by Special Operations Forces (SOF) operating in forward deployed areas of military operations. The capability will reduce distractions from multiple-FMV feeds and integrate with future 3D Virtual Reality and Augmented Reality visual augmentation systems at the tactical edge.

DESCRIPTION: USSOCOM is exploring options that provide SOF Operators with a “multi-FMV fused and optimized 3D visualization” capability that assimilates multiple UAV feeds into a single georeferenced 3D feed with continuous change detection to provide constant situational awareness of tactical areas. This aggregated single-FMV feed on handheld tactical devices will have the immediate effect of reducing warfighters cognitive burden from visualizing multiple FMV feeds. The single aggregated FMV feed will allow for transmission of the highest resolution 3D into software applications on various handheld devices such as the Android, Windows, and other SOF mobile devices employed in operational environments. The reduction of multi-feed operator distraction while enhancing FMV to 3D with continuous change detection is critical to effectively leverage tactical UAV sensors on the battlefield.

Operating system key features shall include but not limited to the following:
1. Systems architecture must be able to process georeferenced imagery from both commercial Unmanned Aerial Systems (UAS) and U.S. DoD group classified one (1) and two (2) UAS.
2. Assimilate multiple FMV feeds and stream fused and optimized single-FMV depiction in 3D in Open Geospatial Consortium (OGC) compliant formats such as CDB and GeoPackage.
3. Assess the feasibility of prototyping as FMV 3D streaming capability in combination with other emerging capabilities with lower Technology Readiness Levels.
4. Assess feasibility of combining optimized 3D FMV with the AI feature extraction (people, vehicles, weapons) with augmented GEOINT into a fully integrated 3D environment to de-clutter FMV feeds and provide optimal real-time situational awareness via a single FMV depiction for both TOC and warfighter.
5. Determine an accuracy estimate of optimized FMV data in relation to actual position/s on the ground.
6. Assess resolution of single optimized FMV relative to multiple input camera resolution. Provide potential UAS camera recommendations for greater fidelity and resolution in the optimized 3D FMV depiction.
7. As part of this feasibility study, the offeror shall address all viable overall system design options with respective specifications.

Key Military applications: Mission Rehearsal, Exercise, Tactical Operations, Mission Command Planning/Action Mission and Command:
1. Create Common Situational Understanding, Mission Command On-The-Move, Enable Unified Action Partner Collaboration
2. Create, Communicate, and Rehearse Orders
3. Airspace Control in Unified Action Mission Command
4. Operational Adaptability and Decision-Making

PHASE I: Conduct a feasibility study to assess what is in the art of the possible that satisfies the requirements specified in the above paragraph entitled “Description.” To stimulate advances in technology and innovation, solutions including reusable code should be considered as well as re-use of open source code and integrations with fielded SOF systems utilizing existing open standards.

The objective of this USSOCOM Phase I SBIR effort is to conduct and document the results of a thorough feasibility study 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 known 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. Incorporate user input received during quarterly hands on assessments and evaluations in operationally realistic environments.

PHASE III DUAL USE APPLICATIONS: This system could be used in a broad range of military applications where SOF and general purpose forces can de-clutter the view of multiple use organic UAS assets to collect and exploit tactical data to plan operations, conduct rehearsals, and remotely coordinate actions on the objective with organizations that are not collocated with the ground tactical commander. This capability could also be adopted by

first responders, federal law enforcement (Secret Service), and for organizations that require a need to simplify their organic FMV data for a specific area prior to and during execution of a task.

REFERENCES:

1. Ball, J. E., Anderson, D. T., & Chan, C. S. (2017). Comprehensive survey of deep learning in remote sensing: theories, tools, and challenges for the community. Journal of Applied Remote Sensing, 11(4), 042609.

2. Global Integrated ISR Operations, https://www.doctrine.af.mil/Doctrine-Annexes/Annex-2-0-Global-Integrated-ISR-Ops/, accessed 30 May 2019

3. Advanced Hyperspectral Exploitation Using 3D Spatial Information, https://sbir.defensebusiness.org/topics?topicId=30462, accessed 1 Jun 2019

4. “The Hyper Enabled Operator,” Small Wars Journal, https://smallwarsjournal.com/jrnl/art/hyper-enabled-operator#_edn2, accessed 30 May 2019

5. Zhang, Liangpei, Lefei Zhang, and Bo Du. "Deep learning for remote sensing data: A technical tutorial on the state of the art." IEEE Geoscience and Remote Sensing Magazine 4.2 (2016): 22-40.

6. Integrated Sensor Architecture, https://www.cerdec.army.mil/news_and_media/Integrate_Sensor_Architecture/, accessed 30 May 2019

7. Mobile Awareness GEOINT Environment, http://ngageoint.github.io/MAGE/, accessed 30 May 2019

8. “How Mobility Solutions are Transforming Military Tactical Operations and Driving Better Mission Outcomes,” https://insights.samsung.com/2018/12/13/how-mobility-solutions-are-transforming-military-tactical-operations-driving-better-mission-outcomes/, accessed 30 May 2019

KEYWORDS: Tactical Sensor, Austere Environment, Virtualized Data, virtual and augmented reality, artificial intelligence, deep learning, neural networks, human machine interface, surveillance and reconnaissance, Georeferenced Imagery

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