

UNITED STATES SPECIAL OPERATIONS COMMAND
20.3 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 20.3 Program Broad Agency Announcement (BAA). A thorough reading of the “Department of Defense Small Business Innovation Research (SBIR) Program, SBIR 20.3 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
<i>Phase I</i> SOCOM203-001	Not to exceed 5 pages	15 page PowerPoint	Not to exceed 6 months	NTE \$150,000.00	Firm-Fixed-Price
<i>Phase I</i> SOCOM203-002	Not to exceed 5 pages	15 page PowerPoint	Not to exceed 6 months	NTE \$150,000.00	Firm-Fixed-Price
<i>Phase I</i> SOCOM203-003	Not to exceed 5 pages	15 page PowerPoint	Not to exceed 6 months	NTE \$150,000.00	Firm-Fixed-Price
<i>Phase I</i> SOCOM203-004	Not to exceed 5 pages	15 page PowerPoint	Not to exceed 6 months	NTE \$150,000.00	Firm-Fixed-Price
<i>Phase I</i> SOCOM203-005	Not to exceed 5 pages	15 page PowerPoint	Not to exceed 6 months	NTE \$150,000.00	Firm-Fixed-Price
<i>Phase I</i> SOCOM203-006	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 SOCOM203-004 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. SOCOM203-004 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 SOCOM203-004 proposals. The Government will award all SBIR contracts for SOCOM203-001, SOCOM203-002, SOCOM203-003, SOCOM203-005 and SOCOM203-006.

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 20.3 Program BAA, all questions must be submitted in writing either by e-mail to sbir@socom.mil or through 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 20.3 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 20.3 Program BAA Instructions.

Site visits will not be permitted during the Pre-release and Open Periods of the DoD SBIR 20.3 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 20.3 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 20.3 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 (TAB A) cost (if applicable) not to exceed \$6,500 over a period of up to six months.

USSOCOM may provide TAB A 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 TAB A 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 – Not in use for 20.3 BAA

Not Required by DoD for 20.3 BAA and 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.

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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 20.3 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 20.3 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, in November 2020 via electronic media. 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 20.3 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 SOCOM203-004 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 SOCOM203-001, SOCOM203-002, SOCOM203-003, SOCOM203-005 and SOCOM203-006, 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 20.3 Announcement.

USSOCOM SBIR Program Point of Contact:

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

USSOCOM SBIR 20.3 Topic Index

SOCOM203-001	Positioning, Navigation and Timing for Target Acquisition
SOCOM203-002	Handheld Celestial Navigation System
SOCOM203-003	High-Performance Multi-Platform / Sensor Computing Engine
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SOCOM203-005	Novel Antennas for Nanosatellite ISR and Communications
SOCOM203-006	Ground Based Antenna for Tactical Edge Communication with SOF Space Assets

SOCOM203-001

TITLE: Positioning, Navigation and Timing for Target Acquisition

RT&L FOCUS AREA(S): Network Command, Control and Communications

TECHNOLOGY AREA(S): Ground Sea; Information Systems; Sensors; Electronics; Battlespace

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 an innovative algorithm (injectable software) that is optically agnostic allowing any VAS systems to calculate a more accurate position with reference to height above ellipsoid (HAE). This will assist current global positioning systems (GPS) eliminate the associated error and/or assist with assured navigation while being jammed or spoofed.

DESCRIPTION: Participants are expected to account for astronomical formations that can be identified from earth's surface. Once the celestial mapping is complete, participants will determine a 'system' that allows for specific optical parameters, allowing for any capable VAS system to be used. As a part of this feasibility study, offerors shall address all viable overall system design options with respective specifications, determining what requirements will be necessary to determine 'capable VAS systems'. Please take note: determining the factors that will be needed to ensure software can be ingested into VAS systems will be step one. Evaluators must be able to discern what system requirements (processing power, optical pathways, etc.) will be needed before moving forward. Currently, several industry partners are moving toward a celestial solution for their specific VAS systems.

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."

PHASE II: Develop, install, and demonstrate a prototype system determined to be the most feasible solution during the Phase I feasibility study on the Celestial Assured Navigation.

PHASE III DUAL USE APPLICATIONS: This system could be used in a broad range of military applications where navigation and targeting devices are used both for increased accuracy and for operation in jammed and spoofed environments.

REFERENCES:

1. "Celestial navigation": https://en.wikipedia.org/wiki/Celestial_navigation

2. "Celestial Navigation - Sextant Sight Reduction", by Dr. Harald Merkel:

<https://apps.apple.com/us/app/celestial-navigation/id1458513224>

3. Joint Effects Targeting System (JETS) Target Location Designation System (TLDS):

[https://asc.army.mil/web/portfolio-item/soldier-](https://asc.army.mil/web/portfolio-item/soldier-jets/#:~:text=The%20Joint%20Effects%20Targeting%20System%20%28JETS%29%20Target%20Lo)

[jets/#:~:text=The%20Joint%20Effects%20Targeting%20System%20%28JETS%29%20Target%20Lo](https://asc.army.mil/web/portfolio-item/soldier-jets/#:~:text=The%20Joint%20Effects%20Targeting%20System%20%28JETS%29%20Target%20Lo)
[cation,improve%20the%20effectiveness%20of%20engagement%20with%20unguided%20munitions.](https://asc.army.mil/web/portfolio-item/soldier-jets/#:~:text=The%20Joint%20Effects%20Targeting%20System%20%28JETS%29%20Target%20Lo)

4. "Celestial navigation": https://en.wikipedia.org/wiki/Celestial_navigation

5. “Celestial Navigation - Sextant Sight Reduction”, by Dr. Harald Merkel:

<https://apps.apple.com/us/app/celestial-navigation/id1458513224>

6. Joint Effects Targeting System (JETS) Target Location Designation System (TLDS):

<https://asc.army.mil/web/portfolio-item/soldier-jets/#:~:text=The%20Joint%20Effects%20Targeting%20System%20%28JETS%29%20Target%20Location,improve%20the%20effectiveness%20of%20engagement%20with%20unguided%20munitions.>

KEYWORDS: Celestial Navigation, Precision Navigation Timing (PNT), Targeting

TPOC-1:

Email: sbir@socom.mil

TECHNOLOGY AREAS: Electronics

ACQUISITION PROGRAM: Handheld Celestial Navigation System

Description of technology to respond to this topic and 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 solicitation. Additionally, Offerors will describe compliance mechanisms offerors have in place or will put in place to address any ITAR issues that arise during the course of agreement administration.

OBJECTIVE: The objective of this topic is to develop innovative approaches to celestial navigation in order to provide non-GPS (Global Positioning System) navigation capabilities to Soldiers on the ground.

DESCRIPTION: Modern navigation systems are heavily reliant on communication with orbital satellites to maintain positional awareness and orientation. This topic seeks innovative research and development to provide feasible celestial-based navigation options, in a light weight, handheld form factor, to serve as an alternate when primary GPS systems are denied (due to a variety of situations such as intentional or unintentional radio frequency interference, signal attenuation from local terrain, or malfunctions on the satellite). Design considerations include:

1. Minimize form factor (size, weight, and power) to maximize portability.
2. Maximize compatibility with commonly used navigation visualization tools (cell phone, laptop, etc.)
3. Minimize external power requirements; maximize use of common battery types.
4. Maximize all-weather operations and ensure day/night usability.
5. Maximize accuracy of internal clock, absolute location, velocity, elevation and heading determination.
6. Maximize ability to navigate on the move, with low latency.
7. Develop position solution requiring no GPS inputs.
8. Require no specialized celestial navigation training (i.e. simple for common operator to use).
9. Capable of developing solution without connection to network or cloud infrastructure.
10. Minimize time from system startup to position acquisition (i.e. maximize system processing ability).
11. Maximize ability to operate system from diverse land-based environments.

PHASE I: Conduct a feasibility study to assess what is in the art of the possible that addresses the design considerations included in the above paragraph entitled "Description." As a part of this feasibility study, the Offerors shall evaluate system concepts that provide a compact form factor "celestial navigator" to provide Special Operations Forces with a supplemental navigation mechanism capable of autonomously (or with minimal user input) determining absolute location by referencing celestial body positions.

Analysis shall also address performance attributes including:

1. Notional Celestial Navigator directivity
2. Notional Celestial Navigator accuracy
3. Notional Celestial Navigator processing speed
4. Notional Celestial Navigator compatibility with existing navigation architectures (Military Grid Reference System, Android Tactical Assault Kit plugin, etc.)
5. Notional Celestial Navigator operational environments

6. Notional Celestial Navigator update rate

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.

PHASE III DUAL USE APPLICATIONS: This system could be used in a broad range of military applications. Additional applications include U.S. law enforcement, U.S. border patrol, and search and rescue of persons by U.S. first responders in local / state / or federal capacity.

REFERENCES:

1. Full listing of Army Field Manuals; <http://www.enlistment.us/field-manuals>.
2. Army Field Manual 3-25.26, Map Reading and Land Navigation, July 20, 2001; <https://www.radford.edu/content/dam/colleges/chbs/rotc/Forms/fm/FM%203-25.26%20Map%20Reading%20and%20Land%20Navigation.pdf>

KEYWORDS: Celestial, Navigation, GPS-Denied, Position, Timing, Automated, Handheld, Day/Night

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RT&L FOCUS AREA(S): Microelectronics; General Warfighting Requirements (GWR)
TECHNOLOGY AREA(S): Sensors; Electronics

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 a next generation multi-platform & multi-sensor capable Artificial Intelligence-Enabled (AIE), high performance computational imaging camera with an optimal Size, Weight and Power – Cost (SWaP-C) envelope. This computational imaging Camera can be utilized in weapon sights, surveillance and reconnaissance systems, precision strike target acquisition, and other platforms. This development should provide bi-directional communication between tactical devices with onboard real-time scene/data analysis that produces critical information to the SOF Operator. As a part of this feasibility study, the Offerors shall address all viable overall system design options with respective specifications on the key system attributes.

DESCRIPTION: A system-of-systems approach “smart-Visual Augmentation Systems” and the integration of an next generation smart sensor enables information sharing between small arms, SOF VAS and other target engagement systems. Sensors and targeting that promote the ability to hit and kill the target as well as ensuring Rules of Engagement are met and civilian casualties/collateral damage is eliminated. The positive identification of the target and the precise firing solution will optimize the performance of the operator, the weapon, and the ammunition to increase precision at longer ranges in multiple environments. This system could be used in a broad range of military applications where Special Operations Forces require: Faster Target Acquisition; Precise Targeting; Automatic Target Classification; Classification-based Multi Target Tracking; Ability to Engage Moving Targets, Decision Support System; Targeting with Scalable Effects; Battlefield Awareness; Integrated Battlefield (Common Operating Picture with IOBT, ATAK, COT across Squad, Platoon).

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”.

PHASE II: Develop and demonstrate a prototype system on a weapon sight or handheld binocular.

PHASE III DUAL USE APPLICATIONS: This technology could also be adopted by automobile industry for autonomous navigation.

REFERENCES:

1. The Hyper Enabled Operator,” Small Wars Journal, https://smallwarsjournal.com/jrn/art/hyperenabled-operator#_edn2;
2. AI Benchmark: All About Deep Learning on Smartphones in 2019”, 2019 IEEE/CVF International Conference on Computer Vision Workshop (ICCVW), <https://arxiv.org/pdf/1910.06663.pdf>

KEYWORDS: Visual Augmentation, Computational Imaging Camera, Hyper Enabled, Artificial Intelligence, Machine Learning, Multi-Platform, Multi-Sensor,

TPOC-1:

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RT&L FOCUS AREA(S): Network Command, Control, Communications

TECHNOLOGY AREA(S): Information Systems; Sensors; Battlespace; 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 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 standardized integrations between cyber assessment, monitoring, and exploitation tools with existing and emerging situational awareness / common operational picture (COP)/Mission Command platforms at tactical, operational, and strategic levels. The need for these standardized integrations arises from the convergence of computer, telecommunications, and other networks along with global acceleration of information systems capabilities and proliferation of agents who exploit these systems that has resulted in the modern and future operational environment, including abstract digital domains, co-existing with the physical environment.

DESCRIPTION: USSOCOM is exploring options that provide Special Operations Forces (SOF) with a fused COP for exercising mission command. Integrating digital network topography, assets, and known vulnerabilities into a GEOINT context will expand real-time situational awareness to include visualization of computer systems, networks, network-enabled systems, electromagnetic spectrum, and related capabilities that are becoming critical to battlefield operations. This will inform decision-making required for execution of operations and will enable rapid deployment of offensive and defensive cyber capabilities by SOF operating at the tactical level. By making the invisible visible, this capability adds to the Hyper-Enabled Operator's immediate situational awareness and rapid decision-making ability. Standardized formats and protocols are key to rapid information sharing between operational echelons and among partner forces. The ability to include data from the cyberspace domains as a new type of standardized sensor or information feed into the COP will enable these assets and capabilities to be seamlessly included in mission rehearsal and mission preparation as well as decision support before and during an operation.

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.

PHASE II: Develop, install, and demonstrate a prototype system determined to be the most feasible solution during the Phase I feasibility study.

PHASE III DUAL USE APPLICATIONS: Once mature, this system could be used in a broad range of military, government, and commercial applications where geospatially-oriented cyber systems and capabilities data can enhance decision support for military operations or civilian cyber security awareness and response.

REFERENCES:

1. "Can Cyberspace be Mapped?", C4ISRNET, <https://www.c4isrnet.com/intel-geoint/2016/05/18/can-cyberspace-be-mapped-nga-s-working-on-it/>, accessed 4 June 2020

2. "CYBERCOM Official Calls Data Fusion 'Critical' Among Intel Agencies," MeriTalk, <https://www.meritalk.com/articles/cybercom-official-calls-data-fusion-critical-among-intel-agencies/>, accessed 4 June 2020
3. "Cyberspace Operations," Joint Publication 3-12, https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/jp3_12.pdf, accessed 4 June 2020
4. "The U.S. Army Concept Capability Plan for Cyberspace Operations 2016-2028", U.S. Army Stand-TO!, https://www.army.mil/article/37870/the_u_s_army_concept_capability_plan_for_cyberspace_operations_2016_2028, accessed 4 June 2020
5. "The United States Army's Cyberspace Operations Concept Capability Plan 2016-2028", TRADOC Pamphlet 525-7-8, <https://fas.org/irp/doddir/army/pam525-7-8.pdf>, accessed 4 June 2020
6. "Geospatial Intelligence and Cyberspace," Penn State College of Earth and Mineral Sciences courseware, <https://www.e-education.psu.edu/geog479/node/4>, accessed 4 June 2020
7. "The Hyper Enabled Operator," Small Wars Journal, https://smallwarsjournal.com/jrnl/art/hyper-enabled-operator#_edn2, accessed 4 June 2020

KEYWORDS: Cyberspace, Cyber-security, Virtualized Data, Human Machine Interface, Non-traditional ISR, Georeferenced Network Data

TPOC-1:

Email: sbir@socom.mil

RT&L FOCUS AREA(S): Control and Communications
TECHNOLOGY AREA(S): Electronics

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OBJECTIVE: The objective of this effort is to develop antenna technology supporting performant, wideband antennas that can be integrated into compact (1-3 U) nanosatellite (<10 kg) payloads.

DESCRIPTION: USSOCOM is interested in improving its capabilities in radio frequency (RF) intelligence collection, surveillance, and reconnaissance (ISR) from nanosatellite platforms. Although a number of national assets and commercial services can provide RF ISR support, there is a desire to achieve these ends in a modular concept supporting new levels of flexibility in design and integration of satellite payloads. A constellation of multiple satellites is envisioned, potentially hosting a wide array of ISR payloads. This breadth of collection and communications payloads will be supported by operationally flexible, wideband, performant antennas amenable to the nanosatellite concept.

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."

PHASE II: Develop, install, and demonstrate a prototype system determined to be the most feasible solution during the Phase I feasibility study on the Novel Antennas for Nanosatellite ISR and Communications effort. The objective of this phase is to advance the technology readiness of the antenna as much as possible, by refining the design, building a prototype antenna, and testing the prototype in a relevant environment. The proposer should suggest a suitable nanosatellite host bus, and one outcome of this phase would be the integration of the prototype antenna with hardware and software equipment representative of the selected host bus. Subject to USSOCOM funding and user interest, a flight demonstration mission will also be considered under the scope of this phase.

PHASE III DUAL USE APPLICATIONS: This system could be used in a broad range of military applications where there are requirements for timely collection of ISR data from spaceborne assets. A potential transition path could involve fielding of this antenna on tens or hundreds of satellites in a coordinated multi-plane constellation, achieving frequent contact times and unprecedented reductions in data delivery latencies. Depending on the nature and specifics of the antenna, the capabilities developed could also be used in other missions by commercial companies or other government organizations.

REFERENCES:

1. CubeSat Design Specification, California Polytechnic State University, <http://cubesat.org/>;
2. NASA General Environmental Verification Standard (GEVS), GFSC-STD-7000, Rev A, Goddard Space Flight Center, <https://standards.nasa.gov/standard/gsfsc/gsfsc-std-7000>

KEYWORDS: USSOCOM, space, satellite, nanosatellite, cubesat, antenna, remote sensing, ISR, RF location

TPOC-1:

Email: sbir@socom.mil

SOCOM203-006
Assets

TITLE: Ground Based Antenna for Tactical Edge Communication with SOF Space

RT&L FOCUS AREA(S): Control and Communications

TECHNOLOGY AREA(S): Electronics

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 antenna technology supporting compact, ground based systems to communicate with SOF space assets.

DESCRIPTION: USSOCOM is interested in improving its capabilities to communicate with their space based intelligence collection, surveillance, and reconnaissance (ISR) cubesat platforms using a compact, ground based antenna system. Although existing national assets and commercial services can provide ISR data to USSOCOM users, USSOCOM requires more abundant SOF peculiar capabilities for rapid collection and dissemination of actionable data at the tactical edge. Special Operations Forces (SOF) place a premium on technologies that are small, lightweight, rugged, modular, multiuse, easy to use, have low power consumption, require minimum maintenance, and that are designed for operation in extreme environments (examples include: temperature, line of sight blockages such as trees, mountains, buildings, Electromagnetic Interference (EMI), wind, rain and snow).

PHASE I: Offerors shall conduct a feasibility study to assess the art of the possible to satisfy the requirements specified in the above "Description" section. As an outcome of this feasibility study, Offerors should include a concept of operations and analyze/quantify potential data that can be provided. Offerors should also include a preliminary antenna design and address all viable system design options with respective specifications. Offerors should justify the scientific and technical merit of the technology, especially for components that are innovative or otherwise higher-risk.

PHASE II: For the Phase II effort, Offerors shall develop and demonstrate the prototype system determined to be the most feasible solution during the Phase I feasibility study. The objective of this phase is to advance the technology readiness of the ground based antenna system as much as possible, by refining the design, building a prototype, and testing the prototype in a relevant environment. USSOCOM will coordinate with the Offeror to identify suitable ground station hardware and software for integration of the prototype antenna with representative.

PHASE III DUAL USE APPLICATIONS: This system could be used in a broad range of military applications where there are requirements for timely receipt of data through communications with spaceborne assets from remote, austere or unimproved locations. A potential transition path could involve fielding of this antenna to communicate with on tens or hundreds of satellites in a coordinated multi-plane constellation, achieving frequent contact times and unprecedented reductions in data delivery latencies. Depending on the nature and specifics of the antenna, the capabilities developed could also be used in other missions by commercial companies or other government organizations.

REFERENCES:

1. CubeSat Design Specification, California Polytechnic State University, <http://cubesat.org/>; 2. NASA General Environmental Verification Standard (GEVS), GFSC-STD-7000, Rev A, Goddard Space Flight Center, <https://standards.nasa.gov/standard/gsfsc/gsfsc-std-7000>

KEYWORDS: USSOCOM, ground, antenna, communication, satellite, nanosatellite, cubesat

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