

Solicitation Number: USSOCOM RFI TE 18-2_Technical Experimentation: Optics, Long Range Facial Recognition/Identification, Chemical Attribution, Neuroenhancement, Military Information Support Operations, and Non-GPS based Position, Navigation, and Timing technologies

Notice Type: Special Notice

TYPE: A–Research and Development

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Synopsis:

A. INTRODUCTION: Technical Experimentation (TE)

This Request for Information (RFI) is NOT a solicitation for proposals, proposal abstracts, or quotations. The purpose of this RFI is to solicit technology experimentation candidates from Research and Development (R&D) organizations, private industry, and academia for inclusion in future experimentation events coordinated by the U. S. Special Operations Command (USSOCOM). USSOCOM invites industry, academia, individuals, and Government labs to submit technology experimentation nominations addressing innovative technologies leading to possible Government/Industry collaboration for development of USSOCOM technology capabilities. The intent is to provide participants with the opportunity to gain Special Operations Forces (SOF) insight/perspective on participant technologies.

Technical experimentation will explore emerging technologies, technical applications, and their potential to provide solutions for future SOF capabilities.

This RFI is for TE 18-2:

- Date: 26 through 30 March 2018
- Theme: Optics, Long Range Facial Recognition/Identification, Chemical Attribution, Neuroenhancement, Military Information Support Operations (MISO), and Non-Global Positioning System (GPS) based Position, Navigation, and Timing technologies.
- Location: Camp Atterbury-Muscatatuck Center for Complex Operations (CAMCCO), Indiana Army National Guard (INARNG), IN

B. OBJECTIVE:

1. Technology experimentation events provide an opportunity for technology developers to interact with operational personnel to determine how their technology development efforts and ideas may support or enhance SOF capability needs. The environment facilitates a collaborative relationship between Government, academia, and industry to promote the identification and assessment of emerging technologies.

2. The deadline for nomination package(s) is **12 January, 2018 at 12:00 Noon EST**. After review of the TE nomination submissions, the Government may invite select

candidates to demonstrate their technologies at the USSOCOM sponsored TE event. Experiments will be conducted from 26-30 March 2018, at the **Camp Atterbury-Muscatatuck Center for Complex Operations, Indiana Army National Guard (INARNG), IN**, and will explore emerging technology solutions and revolutionary improvements in relevant technologies. Materiel solutions brought to the event should be between a Technology Readiness Level (TRL) of 3 and 6. Proposed experiments may be between a half day and two days in duration and may be conducted in unimproved expeditionary-like conditions. At the discretion of USSOCOM, respondents may be asked to complete a vendor loan agreement (RFI Notice Attachment 4). There is no intention on the part of USSOCOM to purchase or procure equipment based solely on participation in the TE.

3. Experimentation Focus: The primary intent of this event is to highlight technologies that support optics, long range facial recognition/identification, chemical attribution, neuroenhancement, MISO, and Non-GPS based position, navigation, and timing technologies.

4. Technology areas to explore during the event include the following:

4.1 True color night vision. Presentation of visible spectrum light (approximately 400nm to 750nm – flexible) that aids in target discrimination, mobility, combat identification, identify friend or foe, or situational awareness via a natural appearing manner. The need is from daylight clear sky conditions to night, no moon (approximately 0.001 lux). Day only solutions will not be considered. The technology of interest is one that allows true color at higher illumination and switch or transition to black and white at the lowest illumination (.001 lux). Consideration factors include resolution, sensitivity, latency, size, weight, power, dynamic range, and bits of color at low light. Both analog and digital solutions are of interest.

4.1.1 True color night vision for man portable applications. This includes night vision goggles, rifle scopes, and binoculars. Retrofits to existing kit are considered as well as original full up solutions. For man portable applications; size, weight, and power are important considerations. For head borne applications, latency is of particular concern –though not so much a concern for rifle scopes or binoculars.

4.1.2 True color night vision solutions for ground mobility visual augmentation systems that are compatible with integration into electro-optic/infrared turrets. The technology should also be applicable to fixed wing/rotary wing/maritime applications which would use the electro-optic/infrared turret. For platform based solutions size, weight, and power needs are not as stringent as man portable solutions though integration is inherently important.

4.2 Undetectable day/night aiming for either assaulters, snipers, beyond iron sight or etched reticle.

4.2.1 Passive aiming methods that provide a cursor for point of aim/point of impact of the rifle shots (typically 5.56mm or 7.62mm) are of interest. The cursor should ideally be viewable by other team members. Ranges include close quarters combat up to 500 meters.

4.2.2 Ability to actively call in and direct close air support through visual cue, illuminate, mark, and/or aim for assaulters, snipers, or Joint Terminal Attack Controllers (JTACs) without detection by opposing force.

4.3 Tactical Surveillance Equipment (TSE)

4.3.1 TSE internet protocol (IP) compatible prototypes that can demonstrate or explore session announcement protocol for broadcasting multicast session information.

4.3.2 TSE prototypes or software that can execute compression of imagery and video with loss that does not result in undue noise or artifacts. This is for low-bandwidth applications, e.g. situations where frame rates times resolution times bit depth is 2 megabytes or less. Ultimately a lossless imagery appearance while with loss compression is utilized.

4.3.3 Technology advancements in detection, recognition, and identification (DRI) for TSE that significantly exceeds current state of the art.

4.3.4 Modular turbulence mitigation software/hardware for TSE that can either be used to retrofit existing equipment or be a new solution.

4.3.5 Software application or an “app” that can calculate necessary information for performing TSE tasks such as facial recognition, DRI, personal identification, ground sample distance, ground resolution distance, or any other evaluation of information that allows for completion of the TSE tasks.

4.4 Cursor on Target (CoT) Integrated Heads-Up Display (HUD). Systems producing CoT are becoming more widely employed to provide battlespace situational awareness (SA) data. JTACs view this SA information to aid in accomplishing their mission. CoT integrated HUD systems which display friendly and enemy positions as well as aircraft positions, call signs, and altitudes as icons on the HUD are of interest. Desired characteristics of a CoT HUD are:

- Integrates into current eye protection equipment or ballistic clear glasses with fusion/panoramic night vision goggles (NVG).
- Integrates with current position, location, information (PLI) data sources (i.e. Android and/or CoT radios).
- Incorporates an intuitive user friendly interface.
- Displays compass direction, distance, and current grid.
- Rapidly enables/disables HUD overlay in case of close quarters combat situations.
- Can be powered off of other equipment with minimal cabling.
- Has wired information assurance or is wireless with information assurance.

4.5 Target engagement and multispectral fused optics

4.5.1 Positive identification of a person of interest at and beyond maximum effective range of sniper rifle calibers such as .338 Lapua Magnum, or .50. Size, weight, power, probability of false alarm and probability of false rejection are of specific concerns.

4.5.2 Multispectral optics and fusion of various bands in an intuitive and value added manner. An optimal balance between information overload and information loss is of interest. Fusion of all optics bands is ideal, fusion of both reflective and emissive bands is a minimum. Technologies that allow for both man portable and/or vehicle mounted operations are of interest.

4.6 Precision Variable Power Scope (P-VPS). A variable power rifle scope with the ability to display data and real time ballistic solution within the scope's field of view (FOV). Of particular interest are features including probability of hit, engagement time, zero retention, optical properties, wireless data transfer capability, and other traits as described below.

4.6.1 The system shall have an optical micro data display for data import capable of displaying the ballistic solution from the ballistic engine. The system should be capable of receiving and displaying external information on an internal micro data display.

4.6.2 System weight should be less than 3.75 lbs. System weight includes optics, laser range finder, weapon orientation sensors, electronics to operate the system, mounting adapters, power source, cables, and controller.

4.6.3 System shall be able to mount to a MIL-STD-1913 Picatinny rail mount without throw levers.

4.6.4 The system shall have 2000 round endurance on a host sniper weapon.

4.6.5 System length shall be less than or equal to 16.5 inches.

4.6.6 The system finish shall be non-reflective in color.

4.6.7 The system shall enable the operator to identify and acquire targets at a minimum of 1500 meters.

4.6.8 The system shall have first focal plane direct view optic with variable magnification from no greater than 3-7x to no less than 25x with boresight adjustable passive reticle that provides constant aspect ratio within the magnification.

4.6.9 The system must work with Image Intensified, mid-wave, and long wave in-line clip-on targeting devices (e.g. INOD Block III, AN/PVS-30).

4.6.10 System shall incorporate an anti-cant device.

4.6.11 The system must be able to communicate with a laser range finder with eye-safe wavelength.

4.6.12 The system must be able to communicate with the Advanced Weather Station (e.g. Kestrel 5700).

4.6.13 Built-in enablers, e.g. turret tracking sensor displayed in scopes FOV, environmental sensors, and weapon orientation sensors are of interest.

4.6.14 The system shall be capable of immersion to 66 feet for two hours.

4.7 Military Information Support Operations (MISO) Unmanned Aerial System (UAS). MISO forces require the ability to access denied airspace/terrain to conduct

dissemination of MISO products in a tactical environment. This includes precision leaflet drops, carrying and emplacement of WiFi transponders and broadcast equipment in denied areas. Additionally, the ability to use a drone to capture high definition footage in denied areas would assist in enhancing audio visual messaging. The UAS capabilities of interest include the following:

4.7.1 Multicopter design, operable and maintainable by SOF operators in dry, dusty, and arid conditions, as well as humid and rainy conditions. Technologies of interest will also be operable in polar, temperate, arid, tropical, and desert environments in both daytime and nighttime conditions.

4.7.2 Programmable GPS-guided flight beyond the line of sight and beyond the range of the controller.

4.7.3 Capable of carrying up to 10 Kg of leaflets to a target area/release point, with auto-return to a programmed point of origin.

4.7.4 Pre-programmed "React to Contact" capability to recognize and avoid small arms fire.

4.7.5 Ability to use terrain masking and nap of the earth flying techniques to minimize exposure to enemy fire and protect operations security.

4.7.6 Auto-takeoff and auto-landing features to minimize risk during those operations.

4.7.7 Integral high definition camera capable of being aimed for video capture of B-roll footage (GoPro™4k HD-like).

4.7.8 Ability to carry, drop in denied areas, and employ a WiFi transponder to provide internet access to foreign populations.

4.7.9 Ability to carry, drop in denied areas, and employ in flight an AM/FM broadcast node.

4.7.10 Overall flight range of 30km.

4.7.11 Ability to attain and maintain an altitude of 5000 feet.

4.8. Neuroenhancement. Targeted enhancement and extension of cognitive and affective abilities; encompasses pharmacological and non-pharmacological methods of improving cognitive, affective, motor functionality and performance.

4.8.1 Neuromodulation. Medical therapies that target the nervous system for restoration of function, relief of pain, or control of symptoms.

4.9 Long Range Facial Identification. SOF warfighters require compact, high accuracy, long range facial identification capabilities to provide improved surveillance and intelligence on persons of interest. Advanced face identification technologies are emerging that can provide highly accurate face identification performance at ranges of interest with optics compatible with handheld (350 meter range) and man-portable (650 meters to 1 kilometer range). Systems addressing the following capabilities are of interest.

4.9.1 Operable under communications disadvantaged conditions.

4.9.2 Onboard matching against a stored watch list.

4.9.3 Onboard watch list editing (e.g. add/delete images, create new watch list).

4.9.4 Capability to sync/update when communications are available.

4.9.5 Ruggedized, image stabilization for field use.

4.9.6 Capable of making corrections for atmospheric effects, including turbulence for ranges greater than 500 meters.

4.10 Chemical Attribution

4.10.1 Collection devices for the use and transport of collected materials, (bulk and trace material samples).

4.10.2 Technologies to conduct hazardous screening/Identification of materials for explosive, chemical, biological and radiological hazards.

4.10.3 Technologies to conduct attribution for explosive, chemical, biological and radiological hazards by measuring signatures of impurities, un-reacted precursors, additives, by-products, physical and chemical characteristics, and other anomalies that persist in a chemical agent or its degradation products that can be used for forensic purposes such as associating samples collected from chemical events.

4.11 Non-GPS based Position, Navigation, and Timing (PNT) technologies. Technology solutions that provide PNT capabilities while mounted on ground vehicles without the presence of a GPS signal.

5. Security/Classification Requirements: Technology developers shall not submit classified information in the technology experimentation nominations.

6. Safety Requirements: All respondents shall review TE Safety Guide (RFI Notice Attachment 2). Those respondents who are invited to demonstrate their technologies must complete a Deliberate Risk Assessment Worksheet (Department of Defense Form 2977) (RFI Notice Attachment 3) in accordance with MIL-STD-882E and the Department of the Army Techniques Publication No. 5-19 (ATP 5-19). Risk assessments shall be emailed directly to the **tech_exp@socom.mil** by **2 Mar 2018**. Respondents should include instructions that describe the safe operation of the device nominated for the experiment. Respondents wishing to conduct experiments of a kinetic or energetic nature are responsible for ammunition and/or explosives shipments to include an Interim Hazard Classification (IHC) or Final Hazard Classification (FHC) and coordination for receipt and storage at Camp Atterbury, IN. A point of contact for coordination will be provided with the invitation to participate in the technical experimentation event.

7. Frequency Requirements: If your experiment will be radiating on a given frequency or frequency band, you must have prior approval to transmit on that frequency. Prior approval may include compliance with Federal Communications Commission (FCC) Title 47, Part 15 or a **Special Temporary Authority (STA) from the FCC**. You must have National Telecommunications and Information Administration (NTIA) frequency approval if your experiment includes Government-owned equipment

and you will be operating within a Federal Band. **Respondents are advised to not wait for confirmation of selection/invitation to the event before requesting a STA from the FCC.** Your authority to radiate must be emailed directly to **tech_exp@socom.mil** by **24 February 2018**. All frequency questions shall be directed to the USSOCOM Technical Experimentation team at the email above. **Respondents shall not contact the Indiana Army National Guard Frequency Manager directly.**

8. Other Special Requirements: DO NOT SUBMIT PROPOSALS OR MARKETING DEMONSTRATIONS. SUBMIT TECHNOLOGY EXPERIMENTATION NOMINATIONS ONLY. EXPERIMENTATION NOMINATION SUBMITTALS FOR THIS RFI WILL ONLY BE ACCEPTED UNTIL THE CLOSING DATE OF **12 January 2018, 12:00 Noon EST**, for the requirements stated above. No contracts will be awarded based solely on this announcement or any subsequent supplemental RFI announcements.

C. SUBMISSION INSTRUCTIONS:

Technology experimentation nominations shall be submitted electronically via USSOCOM webpage, <https://www.socom.mil/SOF-ATL/Pages/technical-experimentation.aspx>, by the respective deadline. Associated technology experiments with distinctly different uses or applications should have a separate nomination submitted by each respondent. USSOCOM personnel will review submissions to determine whether an experiment submission will be accepted for invitation to attend the TE event.

A complete submission consists of:

- Completely filling in the online nomination application.
 - Devices with radio frequency emissions must state the intended frequency or frequencies used by the device(s).
- Instructions on how to safely use the technology (as needed).
- A FCC STA or NTIA document (for developmental radio frequency emitting devices). If neither is available at the time of submission, provide status of your FCC/NTIA request.
- Experiment plan.
- If applicable, a picture of the device with a short description of the size (shows the dimensions or places the device next to a ruler, currency, or man-sized object for comparison).

Selected respondents will be invited to participate in USSOCOM experiments. USSOCOM shall provide venues, supporting infrastructure, and assessment (operational and technical, based on availability of resources and written request as discussed above) personnel at no cost to invited respondent(s). **All respondents' submission costs, travel costs, technology experiments, and experimentation associated costs will be at the respondents' expense.** The TE venue will only provide basic access to training areas or ranges (if approved and applicable) to conduct experiments, a facility to connect to the internet, basic venue infrastructure including frequency coordination/deconfliction, and shore power. Invited respondents must be prepared to be self-sufficient during the execution of their experiments and not dependent on venue resources. On a case-by-case basis and at the discretion of

USSOCOM, respondents invited to the event may be asked to complete a Vendor Loan Agreement (VLA) (RFI Notice Attachment 4). Do not submit the VLA form unless instructed by USSOCOM to do so.

Time and space will be made available for technology developers to conduct real-time modifications and updates to technologies. Technology developers are advised to bring all tools and equipment necessary to present/operate their technology at the event.

D. BASIS FOR SELECTION TO PARTICIPATE:

Selection of respondents to participate shall be based on the extent to which the technology represents a potential capability increase to Special Operations Forces.

Other considerations include:

- Technical maturity
- Relevance of or adaptability to military operations/missions
- Relevance to current operational needs
- Relevance to Event Focus Area

E. ADDITIONAL INFORMATION: All efforts shall be made to protect proprietary information that is clearly marked in writing. Lessons learned by USSOCOM from these experiments may be broadly disseminated, but only within the Government. If selected for participation in Technical Experimentation, developers may be requested to provide additional information that will be used in preparation for the experiments.

Future TE events with TENTATIVE themes/focus areas, locations, ANTICIPATED dates and RFI open periods are as follows:

Number	Theme/Focus Area	Location	Event Dates	RFI Open Period
TE18-3	Command, Control, Communications, Computers (C4) and Cyber, Intelligence, Surveillance, Reconnaissance (ISR), Small Unmanned Aerial Systems, Mobility	Fort A.P. Hill, VA	17-21 July 2018	March-April 2018

Technology developers invited to this event are encouraged to contact each other using the social media through USSOCOM Technical Experimentation. While USSOCOM Technical Experimentation has access to several social media, the preferred collaboration social media link is LinkedIn www.tinyurl.com/LinkedIn-SOCOMTE.

F. USE OF INFORMATION: The purpose of this notice is to gain information leading to Government/Industry collaboration for development of USSOCOM technology capabilities and to assist in accelerating the delivery of these capabilities to the SOF

warrior. All proprietary information contained in the submission and technology experimentation shall be appropriately marked. The Government will not use proprietary information submitted from any one firm to establish future capability and requirements.

G. SPECIAL NOTICE:

1. Federally Funded Research and Development Centers (FFRDCs) or contractor consultant/advisors to the Government will review and provide support during evaluation of submittals. When appropriate, non-Government advisors may be used to objectively review a particular functional area and provide comments and recommendations to the Government. All advisors shall comply with procurement integrity laws and shall sign non-disclosure statements. The Government shall take into consideration requirements for avoiding conflicts of interest and ensure advisors comply with safeguarding proprietary data. Submission in response to this RFI constitutes approval to release the submittal to approved Government support contractors.

2. There will be foreign military attendees, who are interested in the capabilities being demonstrated at the TE event. Technology developers are ultimately responsible for complying with all International Trafficking in Arms (ITAR)/Export Administration Regulations (EAR) requirements associated with their equipment. USSOCOM event organizers will restrict access as necessary to assist in protecting ITAR/EAR related technology demonstrations.

H. Per Federal Acquisition Regulation (FAR) 52.215-3, Request for Information or Solicitation for Planning Purposes (Oct 1997):

1. The Government does not intend to award a contract on the basis of this RFI notice or to otherwise pay for the information.

2. Although "proposal" and "respondent" are used in this RFI, your responses will be treated as information only. It shall not be used as a proposal.

3. In accordance with FAR 15.209(c), the purpose of this RFI is to solicit technology experimentation candidates from research and development organizations, private industry, and academia for inclusion in future experimentation events coordinated by USSOCOM.

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