Solicitation Number: USSOCOM RFI TE 21-2 Technical Experimentation: Next Generation Intelligence, Surveillance, Reconnaissance/Tactically Relevant Situational Awareness, Assault Machine Gun, and Spotting Ammunition

Notice Type: Special Notice

TYPE: A–Research and Development

NAICS: 541715 Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)

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Response Date: 07 Jan 2021, 12:00 Noon Eastern Standard Time (EST)

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 identified in paragraph 4 below. 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 21-2. This event will occur over the period of one week as shown below.

- Dates/Theme/Location:
  - 22-26 March 2021: Assault Machine Gun Military Utility Analysis (MUA), Spotting Ammunition – Camp Atterbury, IN.
  - 22-26 March 2021: Next Generation Intelligence, Surveillance, Reconnaissance (ISR)/Tactically Relevant Situational Awareness – Muscatatuck Urban Training Center, and Jefferson Proving Ground (JPG), 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 **07 Jan, 2021 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 22-26 March 2021, at the **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 or higher as stated in paragraph 4. Proposed experiments may be between a half day and two days in duration and may be conducted in unimproved expeditionary-like conditions. 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 special reconnaissance, surveillance and exploitation related technologies as well as assault machine guns and spotting rounds.

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

- 4.1 Joint Threat Warning Systems
  - 4.1.1 Software defined radios
    - 4.1.1.1 Readily reprogrammable and reconfigurable (to include remotely) radio frequency (RF) sensing receivers
    - 4.1.1.2 Data infiltration and exfiltration for payload information transport
    - 4.1.1.3 Security features for unattended operation
    - 4.1.1.4 Full RF spectrum capabilities and processing against all known signals of interest
  - 4.1.2 Analog and digital receivers
    - 4.1.2.1 Improved sensitivity and efficiency
    - 4.1.2.2 Data infiltration and exfiltration for payload information transport
    - 4.1.2.3 Security features for unattended operation
  - 4.1.3 Advanced antennas for receive (RX) and transmission (TX)
    - 4.1.3.1 Both passive and active
    - 4.1.3.2 Arrays, conformal, omni and steerable directional
    - 4.1.3.3 Beam steering
    - 4.1.3.4 For use on various platforms, man packable and mobile
    - 4.1.3.5 Reduced size
    - 4.1.3.6 Simplified integration
    - 4.1.3.7 Multiband and concealed applications
    - 4.1.3.8 Meta-material solutions
    - 4.1.3.9 Camouflaged

4.1.4 Reduce Operator Workload

4.1.4.1 Automation algorithms (to include machine-learning) for detecting, classifying and exploiting signals in near real time

4.1.4.1.1 Detect simple and complex signals

4.1.4.1.2 Classify signal types and retain a learning baseline

4.1.4.1.3 Identify baseline anomalies

4.1.4.1.4 Characterize previously unknown signals

4.1.4.1.5 Exploit signals in near real time

4.1.4.2 Human Language Technology

4.1.4.2.1 Speaker, Gender, Language, Voice ID, Speech to Text, etc.

4.1.4.3 Automated processing of signals intelligence (SIGINT) data.

4.1.4.4 Advanced data analytics (near real time and post-processing)

4.1.4.5 Improved SIGINT two-way tipping, cueing, and advanced fusion with other intelligence disciplines

4.1.4.6 Augmented Reality (AR)/Virtual Reality (VR) capability infused into SIGINT collection, analysis and dissemination

4.1.4.6.1 VR for training and data manipulation

4.1.4.6.2 AR for location based activities or collaboration

4.1.5 Direction Finding and Locating

4.1.5.1 Advanced signal processing algorithms and hardware

4.1.5.2 Improved fusion of different techniques

4.1.5.3 Cooperative direction finding and time difference of arrival

4.1.5.4 AR/VR infused into direction finding

4.2 USSOCOM is seeking applications for non-overt collection capabilities in support of Sensitive Site Exploitation (SSE) operations. These applications or material solutions should collect useful data for SSE and produce results that support edge computing.

4.2.1 Evaluation Criteria:

- Systems are TRL 6 or higher

4.3 Android Device Integration: USSOCOM is seeking Android compatible applications in support of Sensitive Site Exploitation (SSE) collection capabilities. These applications shall collect data at rest onto an Android type device and/or be able to assist in the transfer of data from an Android device for analysis.

4.3.1 Evaluation Criteria

- Systems are TRL 6 or higher

4.3.2 Intuitive Data Visualization

4.3.3 Standoff voice collection and identification

4.3.4 Remote emplacement of beacons or tracking systems

4.3.5 Remote collection of fingerprints or DNA

4.3.6 Collection of effluents or other novel biometric identifiers

4.3.7 Dynamic sensors/Group 1 Unmanned Aerial Systems (Small, 0-20 Lbs.) able to conduct surveillance of moving vehicles or people

4.3.8 Autonomous system emplacement via air delivery and servicing

4.3.9 Advanced communications for enhanced survivability.

4.4 Hostile Forces – Tagging, Tracking, Locating Technologies

4.4.1 Tags that integrate microelectromechanical systems (MEMS) to supplement GPS when spoofed or jammed with the ability to operate on vehicles and dismounted personnel autonomously.

4.4.2 Systems that employ low signature signals for ranging/locating tags able to operate from an UAS.

4.4.3 Frequency agile tags that make use of Software Defined Radios while maintaining low size, weight and power (SWaP).

4.4.4 Capabilities for tracking and locating vehicles leveraging infotainment systems organic to a vehicle or hosted by phone.

4.4.5 Capabilities to extract Position Location Information (PLI) from phones through remote means.

4.4.6 Tags for maritime (wood/ferrous metal/fiberglass) employment at or below the waterline with over-the-horizon command/control, and data exfil.

4.4.7 Tags/systems that take advantage of existing satellite constellations for Precision Navigation and Timing (PNT) independent of GPS.

4.4.8 Tags/systems that take advantage of multiple Global Navigation Satellite Systems (GNSS) for PNT simultaneously.

4.4.9 Systems that leverage signals of opportunity for tracking/locating (i.e. Automatic Dependent Surveillance-Broadcast, Wi-Fi, Cell).

4.4.10 Tags/systems that allow for tracking in subterranean environments.

4.5 Tactical Video Systems/Reconnaissance, Surveillance, Target Acquisition

4.5.1 Small, low-profile, cost effective pan-tilt-zoom camera systems.

4.5.1.1 Easily programmable and reconfigurable (to include remotely) via both embedded Line of Sight (LOS) radio frequency (RF) and Internet Protocol (IP) hard-wire ports for wireless control.

4.5.1.2 Systems should have bi-directional Command and Control (C^2) as well as a video feed through both direct hard-wired and wireless input/output to the system.

4.5.1.3 Systems should include a hand-held video viewing, recording, still capture, C^2 controller and be able to remotely accomplish the same tasks through the use of wireless connectivity between the systems and the hand-held controller, as would be if the hand-held controller was directly connected to the system through hard-wire with no RF emissions.

4.5.1.4 Video imaging apparatus should be a minimum of High Definition (HD) color for daytime operations and up to HD low-light/night in mid-wave infrared (MWIR), long-wave infrared (LWIR), short-wave infrared (SWIR) with applicable illuminator, or other technology that equates to an operators discernment of personnel activity within 1,000 meters between emplaced system and that activity.

4.6 Sensor Data Exfiltration (Exfil)

4.6.1 Intermittent exfil includes: sensor hit info, still images, and video clips.

4.6.1.1 Requires signature reduction capability for use in high threat areas.

4.6.1.2 Both LOS and Over the Horizon (OTH) options are desired. Preferences is for systems not dependent on 3rd party infrastructure.

4.6.1.3 All interfaces are public or have government rights with a preference for the use of open standards. Hardware should be addressable over a hardware IP port for ease of integration.

4.6.1.4 Capability is small (including antenna), low power (long duration battery powered), cost effective and a modular add on to other systems.

4.6.1.5 Low bit rate systems may be acceptable provided small still images are transferred in near real time.

4.7 Ground ISR Systems. USSOCOM is seeking long-range, ultra-high-resolution, image stabilized, electro-optical/infrared and thermal imaging ground ISR systems with long-range standoff in a single man-portable, low SWaP package.

4.7.1 Evaluation Criteria:

- Conduct positive identification of man-sized targets from 4 km to over 10 km both day and night

- Conduct positive identification of vehicle targets from 6 km to over 12 km both day and night
- Operate and view the sensor feed from 500m to over 1 km away via hard data transfer in a RF denied environment
- Operate and view the sensor feed from 5 km to over 10 km away via RF data transfer with no degradation in signal quality at remote viewing location.
- Conduct remote targeting using on-board range finding and geolocation
- Open standards for data feed use by the intelligence community
- Capable of unattended/remote operation for 24 continuous hours or 24 intermittent hours in a duty cycle or trigger mode on an external battery

4.8 Automated persistent ISR coverage with small to micro unmanned drones and multi-int sensors coverage.

4.8.1 Smart platforms that are resilient, self-aware, self-healing or can replace themselves without human intervention

4.8.2 Smart platform that can adjust focal area based on identified activity, while simultaneously coordinating secondary coverage of the original area.

4.9 Modular Open System Components for integrating tactical and operational data to provide a unified SOF Common Operational Picture. TRL 5-6.

4.9.1 Technologies to load TAK (Tactical Assault Kit) globe and render data seamlessly on desktop and/or web using TAK user interface/user experience to provide tactically relevant situational awareness across C2 echelons

4.9.2 Bi-directional information exchange and data synchronization

4.9.3 Cross platform capabilities using common API and re-usable code

4.9.4 Out-of-the-box tools for globally federated collaboration

4.9.5 Timely access via data-centric services including AI-enabled data visualization, advanced fused analytics, and auto-correlation of SOF-peculiar disparate data sets

4.10 Assault Machine Gun (AMG). During the TE21-2 event, USSOCOM will conduct a MUA of AMG alternative concepts, designs, and materials to meet the objectives stated below, refine requirements, and assess the Technology Readiness / Manufacturing Readiness levels of candidate systems. Of interest are AMG systems that are belt fed 7.62 NATO/6.5mm/6.8 CM machine gun weighing 14-16 lbs., cyclic rate 500-600 rpm, 250 rpm for 2000rds sustained rate, 800m-1200m effective range.

4.10.1 Evaluation criteria

- Increased life of critical components, self-cleaning gas system, and active cooling.

- Recoil mitigation, reduced within burst dispersion, reduced cyclic rate, and solid M1913 Machine Gun Optic mount to support effective aimed automatic fire.
- Optimize weight, balance, ergonomics to enable effective fire from standing, kneeling unsupported, from the shoulder moving, and prone of bipod.
- Potential to overmatch the PKM/PKP systems.

4.11 Spotting Ammunition. Of specific interest is 7.62 x 51 mm. In conjunction with the AMG MUA, USSOCOM will conduct a MUA of 7.62x51mm ammunition that provides a distinct visual indication of impact visible day/night at 600-1200m. The concept is to replace tracers used in adjusting the trajectory of machine gun fire with spotting rounds to adjust the point of impact without compromising the location of the gun.

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

6. Safety Requirements: All respondents shall review the TE Safety Guide (RFI Notice Attachment 3). Those respondents who are invited to demonstrate their technologies must complete a Deliberate Risk Assessment Worksheet (Department of Defense Form 2977) (RFI Notice Attachment 4) 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 **1 Mar 2021**. 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 includes 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 **22 February 2021**. 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. Human Subjects. It is not anticipated that activities being conducted in this TE event will require the use of research or experimentation involving human subjects.

Technology experiment submissions will be reviewed for potential research or experimentation involving human subjects. Any submission that is determined to potentially include research or experimentation involving human subjects will be required to adhere to DoD Instruction 3216.02 “Protection of Human Subjects and Adherence to Ethical Standards in DoD Supported Research” and ensure appropriate Institutional Review Board and DoD Human Research Protections Office approvals prior to conducting those activities.

9. 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 **07 Jan 2021**, **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 by creating a Scout Card in the Atlas system at: https://atlas-sof.com by the respective deadline. **Scout Cards should be created within the TE 21-2 Technical Experimentation: Next Generation Intelligence, Surveillance, and Reconnaissance/Tactically Relevant Situational Awareness, Assault Machine Gun, and Spotting Ammunition event**. The Atlas system is best accessed by using Firefox or Google Chrome browsers. 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:

- Creating a Scout Card in the Atlas system as described above.
- Completely filling in the Supplemental Sheet (RFI Notice Attachment 2) and attaching it to the Scout Card.
- Devices with radio frequency emissions must state the intended frequency or frequencies used by the device(s).
- A FCC STA, Experimental License, 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.
- Instructions on how to safely use the technology (as needed).
- 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.

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 SOF.

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**
TE21-3	Maritime Combatant Craft	Little Creek, VA	12-16 July 2021	March 2021

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 attendees (military, government or industry partners), who are interested in the capabilities being demonstrated at the TE event. Respondents are ultimately responsible for complying with all International Trafficking in Arms (ITAR) /Export Administration Regulations (EAR) requirements associated with their equipment. Before declaring their ITAR/EAR status, respondents to this RFI should verify the ITAR/EAR status of their technology by visiting the US Department of State Directorate of Defense Trade Controls (ITAR) website at: (https://www.pmddtc.state.gov/ddtc_public) and the US Department of Commerce Bureau of Industry and Security website (https://www.bis.doc.gov/) for more information on Export Administration Regulations (EAR). 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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MacDill AFB, Florida 33621-5323

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