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Collider Event

09-11 April 2019

Capability Submission Deadline: 15 February

www.sofwerx.org/collider

On 09 – 11 April, SOFWERX, in collaboration with USSOCOM, will host a Collider event for USSOCOM to acquire industry solutions relevant to the Technology Focus Areas (TFAs) enclosed this packet.

What is a Collider Event?

The Collider Event is a multi-phased, competitive opportunity to present new, novel, or provocative solutions to Government Stakeholders in a one-on-one environment that can lead to a near-term award.

Why Should You Participate?

USSOCOM seeks to enter into non-FAR based agreements with industry partners whose solutions are favorably evaluated by USSOCOM TFA subject matter experts. As such, this event is considered competitive in the same manner as a Broad Agency Announcement (BAA) or Commercial Solutions Opening (CSO), and solutions will be evaluated independently of one another primarily for technical merit.

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Collider Event

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Collider Technology Focus Area

TFA Number: 1

TFA Category: Artificial Intelligence / Machine Learning for MISO

Problem Statement: Special Operations Forces (SOF) Military Information Support Operations (MISO) desire a Machine Learning and Automation Intelligence tool that improves the ability to analyze social media, radio and TV broadcasts.

Operational Use Scenario: USSOCOM Psychological Operations and Civil Affairs community review and analyze social media, radio and TV broadcasts of indigenous populations to facilitate historical and cultural Target Audience Analysis (TAA). This is an analyst intensive endeavor and automated functionality is desired to facilitate the process and increase fidelity for decision making.

General Conditions: TOC, Rear

Unique Conditions: Able to be run from a Media Production Laptop on any network.

Standards/Desirements: Unknown interoperability standards. Interoperable with NIPR and dirty internet. Possible future requirements for classified networks and databases. It needs to be filterable by at least keywords.

Technology Focus Areas: Big data processing and machine learning

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Collider Technology Focus Area

TFA Number: 2

TFA Category: Media Production Manipulation & Forensic Analysis

Problem Statement: Special Operations Forces (SOF) PsyOp community desire Media manipulation such as Video Manipulation, Lip Sync, Deep Fake, and forensic analysis

Operational Use Scenario: USSOCOM PsyOp community seeks improved capabilities to create and modify video message content using existing audio, video and social media material created by indigenous population or terrorist organizations to facilitate historical and cultural Target Audience Analysis (TAA). Modifications should not be detectable.

General Conditions: Rear

Unique Conditions: None

Standards/Desirements: Desired end state is that video manipulation is not detectable by near-peer competitors with similar video manipulation technique(s).

Technology Focus Areas: Media Production manipulation and forensic analysis

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Collider Technology Focus Area

TFA Number: 3

TFA Category: Holographic Displays/Projection

Problem Statement: Special Operations Forces (SOF) desire the capability to display or project holographic images.

Operational Use Scenario: SOF Operators often desire the ability to project holographic displays in various environmental conditions with an undetectable source.

General Conditions: Austere Site, Target

Unique Conditions: None

Standards/Desirements: remote capability, daylight hours, undetectable source, with the ability to display images with no medium 30 meters from the target audience.

Technology Focus Areas: Holographic Display/Projection Capability

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Collider Technology Focus Area

TFA Number: 4

TFA Category: Edge Computing

Problem Statement: Special Operations Forces (SOF) desire edge computing hardware to support artificial intelligence/machine learning and “big data” processing.

Operational Use Scenario: The SOF warfighter requires access to critical data for situational awareness and directed action missions. Sometimes the only information available is data provided to them via multiple communication devices, sensors, and Internet of Things (IoT) that they are carrying or located in their vicinity. Access to cloud data may not be available to them due to limited communications paths or A2/AD actions by an opponent. In this scenario, the SOF operator would have to rely on local processing capabilities to process and interpret data for multiple local IoT.

General Conditions: Austere Site, TOC

Unique Conditions: Limited SWaP

Standards/Desirements:

- Sizes: (1) Body Worn, (2) small vehicle - 1 person, (3) medium vehicle - 4-6 persons, (4) large vehicle - 10+ persons
- Weight – TBD/Various considerations
- Power - Body worn power source 5-24Vdc, vehicle 5-48Vdc, 120 AC (converter)
- Compute - Processor - x86(AMD/INTEL), ARM/other
- Memory >16Gbps
- Storage > TBD/Various considerations
- Network >= 1 Gbps per interface minimal of 2 interfaces; Wireless (only if WPA2 Enterprise is option)
- USB 2.0 and 3.0 interfaces, C considered for growth, Serial interface (Objective)
- Display (interface requirements (HDMI, VGA,))
- Hardware encryption root

Technology Focus Areas: IoT, Edge Computing

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Collider Technology Focus Area

TFA Number: 5

TFA Category: Maritime Operations Enabling Technologies

Problem Statement: Special Operations Forces (SOF) perform maritime operations in various, harsh environmental conditions. SOF desires improved component technologies for these various maritime vessel operations. This can include innovative wet-mateable connector technologies for power/data transfer; novel coatings for drag reduction and corrosion resistance; and high-efficiency air conditioning & humidity control technologies for small submersibles.

Operational Use Scenario: SOF maritime equipment must operate across the full range of environmental conditions presented by the ocean, no matter how challenging. Technologies that can increase the ease with which operations can be conducted, reduce corrosion, improve reliability, or improve operating conditions or habitability within the manned spaces of SOF maritime craft can improve operator comfort and the likelihood of mission success. SOCOM seeks innovative technologies to facilitate day to day operations of small surface craft, small undersea craft, unmanned undersea vehicles, and/or SOF combat divers for increased efficiency and effectiveness. Specific technologies of interest include: innovative wet-mateable connector technologies for power/data transfer; novel coatings for drag reduction and corrosion resistance; high-efficiency air conditioning, humidity control technologies suitable for small submersibles. Technologies should minimize SWAP (size, weight, and power) requirements to maximize suitability.

General Conditions: Austere Site, Target, TOC, Rear

Unique Conditions: Highly corrosive and environmentally challenging maritime environment, with a requirement to withstand immersion at depth for those technologies developed for undersea application unless inside craft pressure vessel

Standards/Desirements: Various - technology dependent but must address the ability to optimize operations in maritime environment.

Technology Focus Areas: wet-mateable connectors, drag and corrosion coatings, air conditioning for confined spaces

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Collider Technology Focus Area

TFA Number: 6

TFA Category: Commercial Communications / Hotspots

Problem Statement: Special Operations Forces (SOF) desire commercially available communications, integrated Unmanned Aerial Systems (UAS) and Wireless Hotspots.

Operational Use Scenario: During Remote Advise and Assist (RAA) Operations, US SOF requires the ability to enhance the capabilities of our Partner Forces while mitigating constrained manpower and resources. In a RAA scenario, Operators should be able to see, hear, and direct the actions of a Partner Force from a distant location, staying out of the line of fire. SOF seeks solutions that can improve the distance of current communications, integrate UAS networks, and provide man-portable hot spots.

General Conditions: Austere Site, Target, TOC, Rear

Unique Conditions: Because this equipment will be used by foreign forces, all equipment must be commercially-available, not restricted by the International Traffic in Arms Regulation (ITAR).

Standards/Desirements: Proposed solutions must be an improvement over (or augment with) currently fielded systems; current kits include ShoutNano's, Samsung Galaxy phones and tablets, and a vehicle-mounted wireless hotspot. Desired solutions may be required to integrate with ATAK.civ. Solutions should provide the ability to send data, text, voice, and pictures in environments via multiple options: GSM, SATCOM, mesh, etc.

Technology Focus Areas: commercial data-text-voice, UAS & integration/interoperability schemes, wireless hot spots/networking

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Collider Technology Focus Area

TFA Number: 7

TFA Category: Lightweight Machine Gun - Medium (LMG-M)

Problem Statement: Special Operations Forces (SOF) desire a LMG-M with reduced weight and increased accuracy over the current 50cal machine gun.

Operational Use Scenario: The SOF Operator has a need to maneuver in an environment on foot. Therefore require a lighter weight machine gun with the capability to engage adversaries in a direct and more lethal capacity.

General Conditions: Target

Unique Conditions: None

Standards/Desirements: 30% lighter weight than current 50cal. Ability to fire .338 NM rounds in a belt-fed configuration.

Technology Focus Areas: Weapons

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Collider Technology Focus Area

TFA Number: 8

TFA Category: Medium Range Gas Gun (MRGG)

Problem Statement: Special Operations Forces (SOF) desire two variants of the MRGG, (1) a lighter weight MRGG-Sniper Support (MRGG-S) weapon with increased lethality, and (2) a lighter weight MRGG-Assault (MRGG-A) weapon.

Operational Use Scenario: SOF operators have a need for a lighter weight MRGG-S with the increased lethality of firing 6.5 CR caliber rounds, and an MRGG-A that is lighter weight and maintains the ability to fire 7.62 rounds for increased mission flexibility.

General Conditions: Target

Unique Conditions: None

Standards/Desirements:

- MRGG-S: 15% lighter than the MK20 with the ability to fire 6.5 CR caliber rounds, greater range and lethality is desired, can be fired in automatic and semi-automatic.
- MRGG-A: 15% lighter than the MK17 (SCAR) maintaining the ability to fire 7.62 rounds, greater range and lethality is desired, can be fired in automatic and semi-automatic.

Technology Focus Areas: Weapons

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Collider Technology Focus Area

TFA Number: 9

TFA Category: Data Visualization

Problem Statement: Special Operations Forces (SOF) desire the tools, techniques, and methodologies to optimize data visualization for the SOF operator. Potentially adopting some of the gaming industry's technologies and commercial display mechanisms for SOF unique applications.

Operational Use Scenario: The SOF Operator has access to, or desires access to numerous types and disparate amounts of information at the tactical edge, which must be visually ready, subsumable and understood. SOF Operators will require an Interactive data visualization schema that supports multiple, specified end users for hyper enabled operations at the edge. Data must be displayed in an intuitive, visually appealing format that considers the human factors of working and making decisions in a high optempo, disadvantaged environment.

General Conditions: Austere Site, Target, TOC, Rear

Unique Conditions: None

Standards/Desirements: Human-Systems Interface standards to be developed based on performance metrics such as accuracy, workload, situational awareness and cognitive function.

Technology Focus Areas: gaming technology, data visualization, immersive/cognitive displays

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Collider Technology Focus Area

TFA Number: 10

TFA Category: Human Performance Optimization

Problem Statement: Special Operations Forces (SOF) desire the ability to increase human performance and/or resiliency for the warfighter.

Operational Use Scenario: SOF Operators must perform at very high levels for long durations while processing information and making critical decisions in real time. Human performance improvements are needed to increase individual operator effectiveness and ensuring overall force resiliency. The Preservation of The Force and Family (POTFF) Human Performance Program (HPP) is designed to enhance SOF Operator physical and mental conditioning and to mitigate injury and maintain peak performance throughout their career.

SOF is interested in any technologies or techniques that enhance human performance, accurately assess operator physical or psychological states and improve physical or psychological recovery.

Optimization efforts could include nutrition and supplementation, achieving results of exercise via alternative methods, maximizing neurocognitive performance, musculoskeletal injury prediction, sleep restoration (e.g. restorative effects of sleep) and holistic assessment (e.g., physical/cognitive metrics, biomarkers, and genomics). HPP would consider other technologies or techniques as appropriate to human performance and resiliency.

General Conditions: Austere Site, Target, TOC, Rear

Unique Conditions: USSOCOM requires SOF Operators to withstand extraordinary physical demands and psychological stress to complete their missions.

Standards/Desirements: Valuable submissions should increase or enhance human performance and/or resiliency.

Technology Focus Areas: Human performance optimization, monitoring and recovery focus areas

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Collider Technology Focus Area

TFA Number: 11

TFA Category: Business Information and Execution System

Problem Statement: Special Operations Forces (SOF) desire Business Information and Execution Software that more readily integrates, manages and displays the management and execution processes of more than 300 individual acquisition programs.

Operational Use Scenario: SOF Acquisitions, Technology and Logistics (AT&L) utilizes an enterprise business solution to track business information important to Special Operations Forces. It is currently used to track the following types of web-based information:

- 1) Program information: Cost, schedule/milestones, performance, program description, risks, program documentation (i.e. System Acquisition Management Plan, Acquisition Program Baseline, Acquisition Decision Memorandum).
- 2) Financial information: Commitments, obligations, expenditures, forecasting, cost of doing business, realignment and reprogramming of funds, track contractual data and the ability to track money through its lifecycle.
- 3) Contracting information: Procurement Administrative Lead Time (PALT) and obligation reporting.
- 4) Logistics information: Program/system fielding dates, locations and quantities, sustainment status.

The current system is latent and is not user-friendly requiring users to create workarounds. Information does not always flow from the authoritative source to the current system, requiring the manual input of additional information.

General Conditions: Acquisition managers located at MacDill AFB and other locations would use the system daily to manage acquisition processes and actions for over 300 programs. The system would be used by leaders to make decisions based on cost, schedule, performance and risk.

Unique Conditions: The system would be used by functional areas to include program management, contract management, financial management, and logistics management personnel.

Standards/Desirements:

- 1) The system would be used by different functional areas to include program management, contract management, financial management, and logistics management, and should have the ability to customize user permissions based on roles and responsibilities.
- 2) The system should be flexible enough to be modified or adapted to information needs or process improvements.
- 3) The system should generate "real-time" information and allow for routine and non-routine reports based on schedule, financial, contract, and logistics data.
- 4) The system should generate information and reports to support program and executive level reviews.
- 5) The system should routinely interface with other DoD systems and databases to include Program, Budget and Accounting System (PBAS), Defense Enterprise Accounting and Management System (DEAMS) and Standard Operation and Maintenance Army Research and Development System (SOMARDS) to pull and share real-time information.
- 6) The system should be accessible by government computers on government networks, including networks outside of the primary domain.
- 7) The system will be secured to manage and protect classified, For Official Use Only (FOUO) and proprietary data dependant on the network.
- 8) The system will be scalable and responsive, optimized for low latency and intuitive user experience.

Technology Focus Areas: business information and visualization software

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Collider Technology Focus Area

TFA Number: 12

TFA Category: Virtual Reality Solutions for Combat Pilot Training

Problem Statement: Special Operations Forces (SOF) desire AR/VR tools to assist pilot training for the AC130J and U-28 platforms. This may include the development of gaming environments to integrate with the current training program to improve training or to streamline training program requirements by reducing the need for aircraft availability.

Operational Use Scenario: Utilization of SOF unique airborne platforms requires that SOF operators undergo both initial and currency training in high optempo environments with limited asset availability. To ensure mission success and to create a higher velocity training pipeline, virtual reality/gaming environments are being considered to enhance existing training and create additional training opportunities, while mitigating the need for utilizing operational aircraft during these training scenarios.

To do this effectively, the AC-130J and U-28A crew stations will need to be modeled in an immersive and interactive 3D gaming engine environment.

General Conditions: Rear echelon use in a training environment

Unique Conditions: None

Standards/Desirements: All AC-130J and U-28A crew stations modeled in an immersive and interactive 3D virtual gaming engine environment. This vrCMTD gaming engine environment will include programming that enables automated and intelligent instruction and performance evaluation (traditional courseware conversion) on the ground and inflight checklist for all crewmembers.

The desired end state is that these systems will provide formal training unit's (FTU) and operational unit's tools to conduct initial mission qualification training (IQT)—students readiness and combat mission ready (CMR) crews the ability to participate in mission tasks rehearsals, currency, and proficiency for downrange employments.

Technology Focus Areas: 3D gaming visualization and engines, simulation software and modelling.

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