This amendment changes the due date for Phase I Quad Chart submissions. No other changes have been made.

**COMBATING TERRORISM TECHNICAL SUPPORT OFFICE/
Technical Support Working Group
(CTTSO/TSWG)**

BROAD AGENCY ANNOUNCEMENT (BAA)
20S3060

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Anticipated Due Date for Receipt of Phase 1 Quad Charts:

**No Later Than May 4, 2020
All submissions are due by 3:00 p.m.
Eastern Time (ET) on the above date**

**AAC – Advanced Analytic Capabilities
CBRNE – Chemical, Biological, Radiological, Nuclear, and Explosives
IDD/EC – Improvised Device Defeat/Explosives Countermeasures
IFS – Investigative and Forensic Science
IW/ET – Irregular Warfare and Evolving Threats
PP – Personnel Protection
PS – Physical Security
SCOS – Surveillance, Collection, and Operations Support
TOS – Tactical Operations Support
TTD – Training Technology Development**

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The Broad Agency Announcement Information Delivery System (BIDS) is the system in which all submissions and communications will flow. Communications outside of BIDS may result in expulsion from the competition.

TABLE OF CONTENTS

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1. INTRODUCTION.

This is a Combating Terrorism Technical Support Office (CTTSO) Broad Agency Announcement (BAA) issued under the provisions of paragraph 6.102(d)(2)(i) of the Federal Acquisition Regulation (FAR) to provide for the competitive selection of research proposals. Contracts based on responses to this BAA are considered to be the result of full and open competition and in full compliance with the provisions of Public Law (PL) 98-369 Section 2701, "The Competition in Contracting Act." **Awards for submissions under this BAA are planned for Fiscal Year (FY) 2021. No contract awards will be made until appropriated funds are available from which payment for contract purposes can be made.**

[NOTE: Persons submitting proposals are advised that only the Contracting Officer can obligate the Government to any agreement involving expenditure of Government funds.]

1.1. Approach.

A three-phased proposal selection process will be used for this BAA to minimize cost and effort for prospective offerors:

- Phase 1 will consist of the solicitation, receipt, and evaluation of a one-page Quad Chart and a one-page addendum.

- Phase 2 will consist of the solicitation, receipt, and evaluation of a White Paper and applies to only those submissions that have been accepted in Phase 1.

- Phase 3 will consist of the solicitation, receipt, and evaluation of a Full Proposal and applies to only those submissions that have been accepted in Phase 2. Based on the priority of critical requirements and the availability of funding, Phase 1 submissions can be selected for Phase 3 without a Phase 2 submission.

Clarifications to White Papers and Full Proposals may be requested.

1.2. Small Business Set Aside.

The Government encourages nonprofit organizations, educational institutions, small businesses, small disadvantaged business (SDB) concerns, Historically Black Colleges and Universities (HBCU), Minority Institutions (MI), women-owned businesses, and Historically Underutilized Business zone enterprises as well as large businesses and Government laboratories to submit research proposals for consideration and/or to join others in submitting proposals; however, no portion of the BAA will be set aside for these special entities because of the impracticality of reserving discrete or severable areas of research and development (R&D) in any specific requirement area.

1.3. Limitation of Funds.

The Government intends to incrementally fund Cost Reimbursement contracts awarded from this BAA as provided by FAR 52.232-22, "Limitation of Funds." Most contracts awarded are anticipated to be 12 to 24 months in duration and at times may include additional 6 to12 month option(s). To facilitate incremental funding, submissions shall include the cost and schedule by a task-phased structure with clear exit criteria, and shall be inclusive of all work to complete the

effort including any options. It is anticipated that the entire effort will be negotiated with the initial contract award.

[NOTE: Based upon the availability of funding, the Government may have to partially fund Fixed Price contracts in accordance with DFAR 252.232-7007, "Limitation of Government's Obligation." In such cases, milestone payments will need to be a part of the full proposal. Applicability of this issue will be stated in the email asking for a Phase 3 proposal.]

1.4. Technical Evaluation Support.

It is the intent of this office to use contractor support personnel in the review, evaluation, and administration of all submissions for this BAA. All contractor support personnel will have access to proprietary data and shall certify that they: (1) will not disclose any information pertaining to this solicitation including any submissions, the identity of any submitters, or any other information relative to this BAA; and (2) have no financial interest in any submissions evaluated, reviewed, and administered. Submissions and information received in response to this BAA constitutes permission to disclose that proposal data to certified evaluators under these conditions.

1.5. BAA Package Download.

This BAA Package can be downloaded electronically in its entirety from CTTSO BAA Information Delivery System (BIDS), https://bids.cttso.gov/, under Resources. Registration is not required to download the BAA package; however, BIDS registration is required to upload a response to the BAA.

1.6. BAA Contractual and Technical Questions.

All contractual and technical questions regarding this BAA, including the published requirements and instructions, must be posted via either the *BAA and Requirement Questions* feature, accessible from the BIDS homepage via *Have a Question?*, or emailed to BIDSHelp@cttso.gov. No other office personnel will acknowledge, forward, or respond to any inquiries received in any manner concerning the BAA. All questions must be received no later than 14 days after the release of the final BAA. Contractual questions and answers will be posted periodically under BAA Questions. Offerors are encouraged to periodically review *BAA Questions*, accessible from the BIDS homepage via *Have a Question?*.

1.7. BIDS Website Help Requests.

For technical help using BIDS, submit questions to BIDSHelp@cttso.gov or by using the button located under *Have a Question?*. Include a valid email address, your BIDS username, and a detailed description of the question or concern in the comments block. BIDS provides other valuable resources, such as *Doing Business with the Government*. Reference documents noted in this BAA, such as the Quad Chart Sample and CTTSO Cost Proposal Template, are available for download under *Resources* on the homepage menu bar.

A list of BIDS FAQs can be found in the *Have a Question?* section of BIDS.

2. GENERAL INFORMATION.

This section includes information applicable to all awards under this BAA.

2.1. Eligibility.

To be eligible for contract award, a responsible offeror must meet certain minimum standards pertaining to financial solvency and resources, ability to comply with the performance schedule, prior record of satisfactory performance, integrity, organization, experience, operational controls, technical skills, facilities, and equipment. See FAR 9.104.

- All offerors must be registered in the System for Award Management (SAM) database prior to award at https://www.sam.gov.

Other helpful information is provided under *Doing Business with the Government* on the BIDS homepage.

2.2. Procurement Integrity, Standards of Conduct, Ethical Considerations.

Certain post-employment restrictions on former federal officers and employees exist including special Government employees (Section 207 of Title 18, United States Code (U.S.C.)). If a prospective offeror believes that a conflict of interest exists, the offeror should make this known to the Contracting Officer for resolution before time and effort are expended in preparing a proposal.

2.3. Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment.

FAR provision 52.204-24 applies to all BAA requirements. The full text of FAR provision 52.204-24 is below. All contracts awarded from the BAA will include related FAR clauses 52.204-25 and 52.244-6.

52.204-24 Representation Regarding Certain Telecommunications and Video Surveillance Services or Equipment (AUG 2019)

(a) *Definitions.* As used in this provision-

Covered telecommunications equipment or services, *Critical technology*, and *Substantial or essential component* have the meanings provided in clause 52.204-25, Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment.

(b) *Prohibition.* Section 889(a)(l)(A) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (Pub. L. 115-232) prohibits the head of an executive agency on or after August 13, 2019, from procuring or obtaining or extending or renewing a contract to procure or obtain, any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. Contractors are not prohibited from providing -

(1) A service that connects to the facilities of a third-party, such as backhaul, roaming, or interconnection arrangements; or

(2) Telecommunications equipment that cannot route or redirect user data traffic or permit visibility into any user data or packets that such equipment transmits or otherwise handles.

(c) *Representation.* The Offeror represents that -

It [ ] will, [ ] will not provide covered telecommunications equipment or services to the Government in the performance of any contract, subcontract or other contractual instrument resulting from this solicitation.

(d) *Disclosures.* If the Offeror has responded affirmatively to the representation in paragraph (c) of this provision, the Offeror shall provide the following information as part of the offer-

(1) All covered telecommunications equipment and services offered (include brand; model number, such as original equipment manufacturer (OEM) number, manufacturer part number, or wholesaler number: and item description, as applicable);

(2) Explanation of the proposed use of covered telecommunication equipment and services and any factors relevant to determining if such use would be permissible under the prohibition in paragraph (b) of this provision;

(3) For services, the entity providing the covered telecommunication services (include entity name, unique entity identifier, and Commercial and Government Entity (CAGE) code, if known); and

(4) For equipment, the entity that produced the covered telecommunications equipment (include entity name, unique entity identifier, CAGE code, and whether the entity was the OEM or a distributor, if known).

(End of provision)

2.4. Restrictive Markings on Proposals.

All proposals should clearly indicate content disclosure limitations. Submissions can be marked as “Proprietary” or words to that effect; however, markings such as “Company Confidential” or other phrases that could be confused with national security classifications shall not be used. All paragraphs that contain proprietary information must be clearly marked. The Contracting Officer may challenge proprietary markings if they are not substantiated.

2.5. Submission Handling/Rights in Technical Data and Computer Software/Patent Rights.

2.5.1. Procurement Integrity.

The Government shall comply with FAR 3.104 in its treatment of information submitted in response to this BAA solicitation and marked with the individual’s or company’s legend.

2.5.2. Submission Information and FOIA.

Records or data bearing a restrictive legend can be included in the proposal. However, the offeror is cautioned that portions of the proposal are subject to release under the terms of the Freedom of Information Act (FOIA), 5 U.S.C. § 552, as amended. In accordance with FOIA regulations, the offeror will be afforded the opportunity to comment on, or object to, the release of proposal information.

2.5.3. Rights in Technical Data and Computer Software.

Rights in technical data and computer software and software documentation provided in the proposal are treated in accordance with the Department of Defense Federal Acquisition Regulation Supplement (DFARS) 252.227-7016, "Rights in Bid and Proposal Information." Rights in technical data, and computer software and computer software documentation in the resultant contract shall be in accordance with DFARS 252.227-7013 (regarding technical data) and DFARS Section 252.227-7014 (regarding computer software and software documentation). Both clauses (DFARS sections 252.227-7013 and 252.227-7014) will be included in any noncommercial contract exceeding the simplified acquisition threshold. Table 1 contains these and related clauses that may be included in the contract.

Table 1. Contract Clauses

DFARS	Title
252.227-7013	Rights in Technical Data – Noncommercial Items
252.227-7014	Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation
252.227-7016	Rights in Bid and Proposal Information
252.227-7017	Identification and Assertion of Use, Release, or Disclosure Restrictions
252.227-7019	Validation of Asserted Restrictions - Computer Software
252.227-7025	Limitations on the Use or Disclosure of Government-Furnished Information Marked with Restrictive Legends
252.227-7027	Deferred Ordering of Technical Data or Computer Software
252.227-7028	Technical Data or Computer Software Previously Delivered to the Government
252.227-7030	Technical Data - Withholding of Payment
252.227-7037	Validation of Restrictive Markings on Technical Data

2.5.4. Patents.

Patents in existence and patent applications pending at the time of the proposal, which relate to the proposed effort, shall be identified in the White Paper and Full Proposal in accordance with the clauses above.

2.6. Product and Deliverable Requirements.

All proposal phases shall include the costs for products and data deliverable requirements. Minimum data (report) requirements include Monthly Status Reports (MSRs), meeting minutes and a Final Technical Report even if the research is to be continued under a follow-on contract or contract option. MSRs document program, technical, and financial status. The Final Technical

Report summarizes the project and associated tasks at the conclusion of each contract. Include MSRs, the Final Technical Report, and any products and deliverables specific to the performance of the proposed effort (e.g., system specification). The Government will provide the offeror with a full listing of data deliverables (i.e., Contract Data Requirements List) in the request for Phase 3 Full Proposal. Additional products and deliverables could include prototype hardware, software, or systems; test plans; test and technical reports; technical data; specifications; requirements documents; computer programs or software; user manuals; drawings; or other products and data. The number, types, and preparation instructions for products and deliverables will be specified in the contract.

2.7. Distribution/Release Limitations.

The offeror should be aware that all resulting contracts or other awards will contain release limitations for all data resulting from the effort in accordance with DFARS 252.204-7000. This includes products, data, information, and services to be performed. The contractor shall protect all data and information from disclosure, and shall not release any data or information by any method of dissemination without prior Government approval.

2.8. Subcontracting.

Pursuant to Section 8(d) of the Small Business Act (15 U.S.C. § 637(d)), it is the policy of the Government to enable small business and small disadvantaged business concerns to be considered fairly as subcontractors to contractors performing work or rendering services as prime contractors or subcontractors under Government contracts, and to assure that prime contractors and subcontractors carry out this policy.

2.9. Animal or Human Testing Compliance.

The contractor shall comply with all laws and regulations governing the use of animals or human subjects in research projects. Information regarding compliance requirements for using humans and animals in testing is also available on BIDS under Resources.

2.9.1. Animal Testing.

Any contract resulting from this BAA that potentially involves the testing of animals shall include the following language:

> Any contractor performing research on warm blooded vertebrate animals shall comply with the Laboratory Animal Welfare Act of 1966, as amended, 7 U.S.C. §§ 2131 - 2159, and the regulations promulgated thereunder by the Secretary of Agriculture in 9 C.F.R. Parts 1 through 4, pertaining to the care, handling, and treatment of vertebrate animals held or used for research, teaching, or other activities supported by Federal contract awards. In addition, the contractor shall comply with the provisions of Department of Defense Instruction (DoDI) 3216.01, as implemented by SECNAVINST 3900.38C, and DFARS 252.235-7002, "Animal Welfare," which is incorporated into this contract.

2.9.2. Human Subjects Testing.

Any contract resulting from this BAA that potentially involves the use of human subjects

in the research or study shall include the following language:

> The contractor shall comply with all regulations promulgated by the Office of the Secretary of Defense in 32 C.F.R. Part 219, pertaining to the protection of human subjects. In addition, the contractor shall comply with the provisions of DoDI 3216.02. If human subjects are to be used at any time during the project, the contractor shall have a Federal assurance that is acceptable to CTTSO before involving human subjects. Additionally, the protocol shall be approved by a Federally-assured Institutional Review Board (IRB) office named in the institution's assurance. The contractor shall prepare these documents and shall ensure that they are on file with CTTSO prior to the start of research involving human subjects. Collaborators with the contractor, to include IRBs, shall also comply with regulations to protect human subjects for both classified and unclassified research. The contractor shall report all changes in the protocol or consent form to the CTTSO Contracting Officer's Representative as they occur. Release of initial and follow-up funding will be contingent upon initial and continuing reviews, and to other IRB and component requirements.

3. PROPOSAL PREPARATION.

This section provides information and instructions for the preparation and submission of all phases under this BAA. All submissions must meet these requirements including format, content, and structure, and must include all specified information to avoid disqualification, submission rejection, or delays in evaluation.

3.1. BAA Information Delivery System (BIDS).

BIDS at https://bids.cttso.gov/ is used: (1) to provide public access to the BAA package; (2) to collect all unclassified submissions; and (3) to collect placeholder records for all classified submissions. BIDS also provides submission progress tracking, evaluation comment collection, and results notification back to the submitter.

3.1.1. Submitter Registration.

A BIDS submitter registration is required to respond to this BAA. A new BIDS system was activated on February 15, 2020. All vendors who had register before this date, must re-register in the system. Registrations should reflect the offeror's contracting or business authority. The username, created by the offeror, must be unique and is used for BIDS log in and submission tracking. Registration acceptance for submitters is automatic, but takes several seconds to be recognized by BIDS. A success email will be sent to indicate that the username and account are accepted. BIDS is email dependent and uses the registration email as the single point of contact (POC) for all notifications associated with the BAA. This email address should be monitored frequently during the BAA process for the notices. Submitters should periodically check status in their account, not receiving a notification email does not constitute grounds to appeal an evaluation decision. Spam blockers and other email security software may cause a notification email to be rejected; check your account. Email addresses included in the submissions or any other data field in BIDS will not be used for contact and notification purposes.

3.1.2. User Accounts and Password Resets.

Registration account information such as the POC, email, and password can be updated after log in. The *Forgot your Password?* link on the BIDS login page allows registered users with a valid username to automatically reset a password. The system will verify the account username and email and then send a new password to that email.

3.1.3. Registration and Account Help.

BIDS help requests can be emailed to BIDS administrators at BIDSHelp@cttso.gov or submitted via the button located on the *Have a Question?* page.

3.1.4. Document Identifier.

The offeror shall include the document identifier in the header of each submission. Document identifiers must match the BIDS submission record and should be constructed *before* upload to BIDS.

3.1.4.1. Constructing Document Identifiers.

Document identifiers, auto-generated in part by BIDS, are based on Subgroup, the requirement number, the username, and a Vendor Internal Tracking (VIT) number. The underlined portion of the sample shown in Table 2 depicts the segment automatically formed by BIDS.

Table 2. Sample Document Identifier and Components Definition

CB-1112-ABCCORP-10703JT-QC	
From Sample	**Document Identifier Component**
CB	subgroup designation - from BAA
1112	requirement number - from BAA
ABCCORP	username - from BIDS registration
10703JT-**QC**	VIT number - any alphanumeric combination (with no special characters or spaces) created by the submitter for (*submitter*) tracking purposes along with the **document type suffix**

3.1.4.2. Creating Vendor Internal Tracking (VIT) Numbers.

VIT numbers are unique identifiers created by submitters and entered in the submission record during the upload process. VIT numbers can be any alphanumeric combination (no special characters or spaces) chosen by the submitter plus a suffix indicating the document type. BIDS enforces unique VIT numbers and will not allow the submission record to be saved if the VIT number has already been used. Table 3 provides sample VIT numbering formats for each document type.

Table 3. Sample VIT Numbers for an Accepted Submission

Document Type	**Auto-generated by BIDS**	**VIT#**
Quad Chart +1-page addendum	CB-1112-ABCORP	10703JT-QC
White Paper	CB-1112-ABCORP	10703JT-WP
Full Proposal	CB-1112-ABCORP	10703JT-FP

Offerors uploading more than one submission to the same requirement shall create unique identifiers by adding a numbered sequence to the document type suffix. Table 4 offers sample VIT number formats for multiple submissions to the same requirement.

Table 4. Sample VIT Numbers for Multiple Submissions to the Same Requirement

Submission #	Auto-generated by BIDS	VIT# Sample 1	VIT# Sample 2*
Submission 1	CB-1112-ABCORP	10703JT-QC1	QC1
Submission 2	CB-1112-ABCORP	10703JT-QC2	QC2
Submission 3	CB-1112-ABCORP	10703JT-QC3	QC3
* NOTE: If the submitter does not require an internal tracking number, use the document type designation.			

3.2. BIDS Security and Access Control.

All data uploaded to BIDS is secure from public view and download. All submissions will be considered proprietary/source selection sensitive and protected accordingly. The documents can only be reviewed by the registrant and authorized Government and contractor representatives with no conflict of interest.

3.3. Submission Changes.

Changes to uploaded submissions are permitted up to the closing date and time. If a modification is required, update the original file in the source application and save. Convert to an acceptable format (detailed below) if applicable. In BIDS, open the submission record under **Previously Uploaded Proposals**. Only submissions with the **Update Proposal** status can be modified. Changes can be made after clicking on the submission link. Click on the trash icon to delete the old file. Use **Choose File** to select the revised document. Click **Save Proposal** to save the changes. Documents cannot be edited online through the BIDS interface. File names must contain no spaces or special characters. Ensure the file size does not exceed the prescribed limits. To completely remove a submission from consideration, select **Delete Proposal**. Changes after the submission due date and time are not permitted.

3.4. Special Handling Procedures for Classified Information.

If a submission contains classified information, the offeror must first create a placeholder record in BIDS with an unclassified cover page attachment. Identify in the placeholder document that the submission cannot be uploaded due to classification and include the method of delivery (hand-carried, secure fax, secure mail, etc.) as well as the tracking number, if applicable. The BIDS Document Identifier must be clearly identified on the mailed document(s). Classified responses (up to SECRET) must be appropriately and clearly marked (including all paragraphs and pages containing the subject data), packaged, and shipped in accordance with classified material handling procedures and security regulations pertaining to the level of classification for that document.

To obtain mailing instructions for classified submissions, email: BIDSHelp@cttso.gov.

Classified submissions must be received by the applicable due date and time. Classification in no way eliminates the offeror's requirement to comply with all BAA instructions.

3.5. Phase 1 Submissions.

Offerors shall prepare and upload a one-page Quad Chart and a one-page addendum in response to Phase 1 of this BAA. All pages shall be 8 ½ by 11 inches. Use Times New Roman font size 10 point or greater. Single spacing is preferred for the addendum. If more than two pages (i.e., the Quad Chart plus the addendum) are submitted, only the first two pages will be evaluated. Phase 1 submissions do not require a cover page.

3.5.1. Phase 1 Due Date and Time.

All unclassified Quad Charts *must be received electronically through BIDS* **no later than 1500 (3:00 p.m.) Eastern Time (ET) on the date specified on the cover of this document**. Likewise, classified submissions must be received by the same due date and time. Offerors must create a placeholder record in BIDS with an unclassified cover page attachment. Refer to section 3.4. of this BAA for instructions on classified submissions. BIDS does not allow proposals to be uploaded or classified placeholders to be created after the closing date and time. Any proposal, regardless of classification, submitted by any other means, **or that is late, will not be considered** by the Government. Avoid the last minute rush; submit early.

3.5.2. Electronic File Format.

The Quad Chart and addendum shall be submitted in a single file. This file must be in Portable Document Format (.pdf). Adobe Acrobat and MS Word can generate such files. The document must be print-capable, without password, and no larger than 1024 KB. File names cannot contain spaces or special characters. Apple users must ensure the entire file name and path are free of spaces and special characters. Submissions that cannot be opened, viewed, or printed will not be considered.

[NOTE: ZIP files and other application formats, such as Microsoft Office (.docx or .pptx) are NOT acceptable.]

3.5.3. Quad Chart and Addendum Content.

A Quad Chart conveys the essence of the proposed solution for a single requirement. When preparing a submission, the offeror shall ensure that the specific criteria of the requirement are addressed, the solution is clear, and can be accomplished with the proposed technology, cost, and schedule. The Quad Chart includes a document header and four quadrants. The Quad Chart format and sample are provided on BIDS under Resources.

3.5.3.1. Header Information.

Header information shall include the BAA number, the Document Identifier, and the Proposal Title. The date and company name should be included along with the appropriate document markings.

3.5.3.2. Top Left Quadrant, Graphical Depiction.
The top left quadrant is a graphical depiction, photograph, or artist's concept of the proposed solution or prototype. Include labels or brief descriptive text as needed for clarification. Ideally, this will convey the prototype concept, use, capability, and any relevant size or weight relationships based on the published requirement.

3.5.3.3. Top Right Quadrant, Operational and Performance Capabilities.
The top right quadrant contains the operational and performance capabilities summary. Describe any basic, new, or enhanced capabilities the system will provide to meet the published requirement. In bullet form, list key aspects of performance, capability, operational use, relevant software or hardware specifications, and planned interface and/or compatibility.

3.5.3.4. Bottom Left Quadrant, Technical Approach.
The bottom left quadrant contains the proposed technical approach. Specifically, describe the technology involved, how it will be used to solve the problem, actions done to date, and any related ongoing efforts. Briefly describe the tasks to be performed for each phase. A bulleted list is acceptable.

3.5.3.5. Bottom Right Quadrant, Cost and Schedule.
The bottom right quadrant contains the Rough Order of Magnitude (ROM) and Schedule, Products and Deliverables, and Corporate Contact Information. ROM and Schedule shall be proposed by phase and include the cost, period of performance (POP), and exit criteria for each phase. A total cost and POP that combines all phases, all applicable data requirements and minimum data report requirements (e.g., MSR, meeting minutes, Final Technical Report, etc.) shall also be included. Products and Deliverables shall include, by phase, a list of all prototype hardware and software along with the required data as described in "Product and Deliverable Requirements" in section 2.6. of this document. Corporate contact information shall include the submitter's company name, POC, phone number, and email address. Include any significant teaming partner (contact information) relevant to the evaluation.

[NOTE: The contact information in the BIDS registration is used for all notices and contact purposes.]

3.5.3.6. Addendum
The offeror shall use the addendum to describe the technical solution in greater detail.

3.5.4. Phase 1 Notification to Offeror.
The Government will notify the offeror when a submission has been accepted or rejected. Notification of acceptance with a request to submit the next phase document will be emailed to the offeror's contracting authority as entered in the BIDS registration and will indicate the next submission type, clarification requests, and due date and time. Likewise, rejection notifications will be emailed to the address provided in the BIDS registration. **Debriefings for Phase 1 submissions will not be conducted due to the nature of BAAs.** In general, submissions are not considered for further review when they do not

meet the basic requirement, are too costly, or do not fit the mission. All Phase 1 submissions are evaluated in accordance with Section 4, Proposal Evaluation, of this BAA.

3.5.5. Phase 1 Status and Inquiries.

Phase 1 is complete when all submissions have been accepted or rejected in accordance with this BAA. Inquiries outside of the BIDS system (e.g., phone, email, etc.) concerning the status of Phase 1 submissions will not be accepted. After BIDS log on, submitters are able to check the status of their submission(s) under **Previously Uploaded Proposals.**

3.6. Phase 2 White Paper Submissions.

Offerors shall prepare and upload a White Paper with no more than twelve (12) pages plus a cover page in response to Phase 2 of this BAA. The cover page template is provided at the BIDS website under Resources. The cover page is excluded from the White Paper page count. All submission pages shall be 8 ½ by 11 inches, double-spaced with Times New Roman font no smaller than 10 point; all margins shall be one inch. Each page of the submission shall contain the document identifier in the document header. If the White Paper contains more than 12 pages including tables, charts, and figures, only the first 12 pages will be evaluated.

3.6.1. Phase 2 Due Date and Time.

All unclassified White Papers must be received electronically through BIDS no later than the due date and time specified in the Phase 1 Quad Chart acceptance email. Likewise, classified submissions must be received by the same due date and time; offerors must create a placeholder record in BIDS with an unclassified cover page attachment. Refer to section 3.4. of this BAA for instructions on classified submissions. BIDS does not allow proposals to be uploaded or for classified submissions to be created after the due date and time. Any proposal, regardless of classification, submitted by any other means, **or that is late, will not be considered** by the Government.

3.6.2. Electronic File Format.

The White Paper shall be submitted in a single file. This file must be in Portable Document Format (.pdf). Adobe Acrobat and MS Word can generate such files. The document must be print-capable, without password, and no larger than 2048 KB. File names cannot contain spaces or special characters. Apple users must ensure the entire file name and path are free of spaces and special characters. Submissions that cannot be opened, viewed, or printed will not be considered.

[NOTE: ZIP files and other application formats, such as Microsoft Office (.docx or .pptx) are NOT acceptable.]

3.6.3. Phase 2 Document Upload.

To upload a next phase document use the link back to BIDS provided in the acceptance email, or log in to BIDS and navigate to **Requested Proposals** to open the accepted record. Review the checklist then click **Create Proposal** and follow the instructions.

3.6.4. White Paper Content.

White Papers shall provide a description of the technical approach, the specific tasks and deliverables by phase, schedule and cost estimate by phase, intellectual property and government rights, transition planning for production, and a capability statement. The offeror shall incorporate all clarification data requests from the acceptance email into the submission. Indicate clarification entries by footnote and reference the requested item(s) in the footer area. The following White Paper sections and details are required.

3.6.4.1. Cover Page.

A cover page template is provided BIDS under *Resources*. The cover page includes necessary contractual information including the offeror's contracting POC (name, telephone number, email address, facsimile number, mailing address) and business information (Data Universal Numbering System (DUNS) number, Commercial and Government Entity (CAGE) code, business type). Include the proposed contract type, total cost, and the duration of all phases/tasks. The cover page is excluded from the page count.

3.6.4.2. Technical Approach.

Describe the proposed solution relative to the requirement. Focus content on operational capabilities required to address the problem, the underlying theory that supports the operational capability, and suggested concept of operations. Identify end users that could be interested in the proposed solution and describe how the solution will be a benefit. Include drawings, diagrams, charts, and tables needed to explain the effort. Describe if, and where, the proposed technology/solution has been, or is being used. Identify sponsoring agency and funding resources; or if none, so state.

3.6.4.3. Tasks and Deliverables.

Identify the proposed tasks by phase in the order of occurrence. A phase must have clear exit criteria to serve as a "go" or "no-go" decision point to proceed to the next phase. Identify work that will be performed by other organizations or agencies. Identify anticipated technical risks along with planned mitigation efforts. Indicate any Government furnished material (GFM), equipment (GFE), or information (GFI) that will be required with the task and need date; or state if none. For each phase include the exit criteria and all products and deliverables as defined in section 2.6. of this BAA. State if a phase is proposed as an option.

3.6.4.4. Schedule.

Develop a master project schedule preferably in Gantt chart format. The schedule shall indicate the planned start and stop point for each phase with top level subordinate tasks, estimated delivery dates, and completion dates. Indicate the total project POP in months using March 30th as a notional start date through the completion date.

3.6.4.5. Cost.

Provide the proposed, task-phased budgetary estimate inclusive of any proposed options. At a minimum, this estimate shall detail estimated labor hours and costs,

anticipated material costs, product and deliverable costs (see section 2.6. of this BAA), and other costs (e.g., subcontracts, indirect rates, profit or fee rate) for each phase/task. Costs allocated to other organizations (e.g., Government testing) shall be clearly shown; or state if none. Changes in cost from those proposed in the prior submission shall be explained.

3.6.4.6. Intellectual Property, Technical Data, and Software.
Disclose/discuss all intellectual property, technical data, and/or software rights that are intended to be used in connection with this submission. See section 2.5. of this BAA for additional information.

3.6.4.6.1. Patents and Patent Applications.
Identify any existing, applied for, or pending patents that will be used in the conduct of this effort. Provide patent number with date of issue and title or patent application number with filing date and title. Any patent or patent application that resulted from prior government funding should be identified. If no patents or patent applications are relevant, so state. See section 2.5. of this BAA for additional information.

3.6.4.6.2. Rights in Technical Data and Software.
Identify any technical data and/or computer software that will be delivered with less than unlimited rights as prescribed in DFARS 252.227-7013 and DFARS 252.227-7014. State if unlimited rights in technical data are proposed. See section 2.5. of this BAA for additional information.

3.6.4.7. Transition from Prototype to Production.
Describe the overall strategy to transition the results of this development effort to production once the funded effort is concluded. Briefly describe the overall strategy for transition, potential partners, transition issues to include any obvious regulatory, liability, interoperability, or financing issues. Discuss the interaction with representative users and the concept for test and evaluation by those users and follow on support of a product resulting from this effort.

3.6.4.8. Organizational Capability Statement.
Describe the offeror's capability and/or experience in doing this type of work. Identify technical team members or principal investigators and associated expertise. If applicable, include a description of co-participants' capabilities and/or experience. State whether an agreement has been reached (or not) with the co-participants. The offeror is only required to submit past performance information in response to a request for Full Proposal.

3.6.5. Phase 2 Status and Inquiries.
Phase 2 is complete when all submissions have been accepted or rejected in accordance with this BAA. Inquiries outside of the BIDS system (e.g., phone, email, etc.) concerning the status of White Papers will not be accepted. After login to the BIDS website, submitters are able to check the status of their submission(s) under **Previously Uploaded**

Proposals.

3.6.6. Phase 2 Notifications to Offeror.
The Government will notify the offeror when a submission has been accepted or rejected. Notification of acceptance with a request to submit the next phase document will be emailed to the offeror's contracting authority as *entered in the BIDS registration* and will indicate the next submission type, clarification requests, and due date and time. Likewise, rejection notifications will be emailed to the address provided in the BIDS registration. **Debriefings for White Papers will not be conducted due to the nature of BAAs**. In general, submissions are not considered for further review when they do not meet the basic requirement, are too costly, do not fit the mission, or funding is not expected. All White Papers are evaluated in accordance with section 4, Proposal Evaluation, of this BAA.

3.7. Phase 3 Full Proposal Submissions.
Offerors shall prepare and upload a Full Proposal, consisting of a Technical Proposal in **Portable Document Format (.pdf),** a completed CTTSO Cost Proposal template (using the Microsoft Excel format provided by CTTSO) along with a supporting Cost Narrative pdf, plus a cover page, in response to Phase 3 of this BAA. All pages shall be 8 ½ by 11 inches, double-spaced with Times New Roman font no smaller than 10 point; all margins shall be one inch. Each page of the submission shall contain the document identifier in the document header. The Technical Proposal must be no more than 50 pages including tables, charts, and figures. If the document contains more than 50 pages, only the first 50 pages will be evaluated. All paragraphs containing proprietary information must be clearly marked. The Cost Proposal has no page limit; however, unnecessarily elaborate or information beyond those sufficient to present a complete and effective response is not desired.

Disclaimer - To minimize the cost and effort for submitters, Phase 3, Full Proposals, will only be requested for qualifying solutions that have a high probability of award; however, the Government reserves the right to cancel requirements, or any request for proposals for this solicitation, at any time prior to award and shall not be liable for any cost of proposal preparation or submission.

3.7.1. Phase 3 Due Date and Time.
All unclassified Full Proposals must be received electronically through BIDS no later than the due date and time specified in the acceptance email. Likewise, classified submissions must be received by the CTTSO Security Office by the due date and time; offerors must create a placeholder record in BIDS with an unclassified cover page attachment.Refer to section 3.4. of this BAA for instructions on classified submissions. BIDS does not allow proposals to be uploaded or classified placeholders to be created after the due date and time. Any proposal, regardless of classification, submitted by any other means, **or that is late, will not be considered** by the Government.

3.7.2. Electronic File Format.
The technical proposal must be submitted in in **Portable Document Format (.pdf).** The CTTSO Cost Proposal Template (MS Excel) must be completed and submitted with

formulas visible and the document unlocked. A supporting cost narrative must be submitted in **Portable Document Format (.pdf).**

The document must be print-capable, without password, and no larger than 2048 KB. File names cannot contain spaces or special characters. Apple users must ensure the entire file name and path are free of spaces and special characters. Submissions that cannot be opened, viewed, or printed will not be considered.

3.7.3. Phase 3 Document Upload.

To upload a next phase document, locate and open the accepted record under **Requested Proposals**. Review the checklist then click **Create Proposal** and follow the instructions**.**

3.7.4. Full Proposal Components.

Full Proposal shall consist of three major sections (Technical Proposal and Cost Proposal with a supporting Cost Narrative) described in this document, and can be uploaded to BIDS as three separate files each limited to 2048 KB.

- The first section is the technical proposal and shall include all information related to the proposal as specified in this BAA including figures, charts, and tables plus the cover page.

- The second section is the cost proposal, which will show a breakdown of costs by CLIN as well as phase using the CTTSO Cost Proposal template. **This template is available on the Resources page of BIDS**.

    - Part of the cost proposal is a cost narrative that includes all cost data as well as an explanation of changes in cost from those proposed in the prior submission. Additionally, the offeror will include a cover page as follows:

      A cover page template is provided at the BIDS website under Reference Materials. The cover page includes necessary contractual information including the offeror's contracting POC (name, telephone number, email address, facsimile number, mailing address) and business information (DUNS number, CAGE code, business type). Include the proposed contract type, total cost, and the duration of all phases/tasks.

3.7.5. Technical Proposal Content.

The Technical Proposal shall provide a technically detailed solution of the problem addressed in the requirement and fully expand the technology proposed in the prior submissions. The following sections and associated data are required. The offeror shall incorporate all clarification data requests in the Phase 2 acceptance email. Indicate clarification entries by footnote and reference the requested item(s) in the footer area.

3.7.5.1. Table of Contents.

The technical proposal shall include a table of contents noting the page number of each section detailed below. The table of contents is excluded from page count.

3.7.5.2. Abstract.

The abstract is a one-page (or less) synopsis of the proposal that includes the title and the basic approach to satisfy the requirement. Describe the overall scope of work to be performed for the entire period of performance, inclusive of options. The abstract shall stand alone and be suitable for release under the Freedom of Information Act, 5 U.S.C. § 552, as amended.

3.7.5.3. Executive Summary.

An executive summary is a concise description of the technology and solution being proposed. Include key information that demonstrates how the proposed solution meets the published requirement. The executive summary should not introduce any new information not covered in the subsequent content.

3.7.5.4. Technical Approach.

Describe the technical approach for the proposed solution to meet the requirement. Include technical details of the solution and fully expand the technology proposed in the prior phase submission. Include the methodology, underlying theory, system components, and operational scenario for the intended users. Include drawings, diagrams, charts, and tables needed to explain the effort. Describe relevant prior application of the proposed technology and/or solution, how it is being used, and by whom. Identify sponsoring agency and funding resources; or if none, so state. If subcontractors are proposed, include a detailed description of the effort that they will be performing in support of or in addition to the prime.

3.7.5.5. Project Plan.

The project plan shall be organized by phase and describe the work to be performed along with all associated requirements to successfully complete the proposed effort. Include a summary of the individual phases to follow.

3.7.5.5.1. Phases.

Phases shall be defined by the subset of tasks to be performed, phase objectives to be accomplished, and the required POP to completion. Phases shall be listed in order of occurrence. Identify phases that are optional. Each phase must contain clear exit criteria that is measurable evidence of completion and serves as a “go” or “no-go” decision point. Each phase shall include a total cost.

3.7.5.5.2. Tasks within a Phase.

For each task, provide a detailed description of the work to be performed. Identify any work that will be performed by other organizations or agencies; or if none, so state. Indicate if an agreement is in place for the resources.

3.7.5.5.3. Products and Deliverables.

Identify all deliverables - products as well as documentation and reports - for each Task/Phase. Refer to section 2.6. of this BAA for minimum reporting requirements, and additional products and deliverables in performance of the effort proposed.

3.7.5.6. Master Schedule.
Develop a master project schedule that includes phase start and stop dates as well as major milestones, critical tasks, and report and product delivery dates. Assume a start date of March 30th. Indicate any optional phases.

3.7.5.7. Government Furnished Equipment.
Reasonably identify all Government furnished equipment (GFE), materials, facilities, or information with the need date and suggested source at the time of proposal submission. GFE includes, but is not limited to: Government email accounts, SIPRNET access, Common Access Cards (CACs), and/or space at a CTTSO facility (e.g., permanent residence, temporary residence, or testing). Upon identifying GFE, if an offeror's proposal is selected for contract award, the proposed GFE will be identified in the resulting contract. Failure to adequately identify necessary GFE may result in contract termination due to the offeror's inability to perform under this competitive source selection. State if Government equipment, materials, facilities, or information are not required.

3.7.5.8. Project Risks and Mitigation.
Identify anticipated technical and management risks along with planned mitigation efforts. Indicate the risk assessment as high, medium, or low.

3.7.5.9. Organizational Capability Statement.
Include a brief description of the offeror's organization. Describe the offeror's capability and/or experience in doing the type of work being proposed. If applicable, include a description of co-participants' capabilities and/or experience. State whether an agreement has been reached with the co-participants. Provide at least three references, to include points of contact, for like or similar work.

3.7.5.10. Organizational Resources.
Identify key technical personnel and principal investigator(s) including alternates and co-participants, if applicable. Include a brief biography, relevant expertise, and a list of recent publications for each. Identify any team members with potential conflicts of interest. Possible conflicts of interest include personnel formerly employed by the federal Government within the past two years from the date of proposal submission. Provide name, duties, employing agency, and dates of employment; or state if none

3.7.5.11. Intellectual Property, Technical Data, and Software.
All anticipated intellectual property, technical data or software rights shall be disclosed. See section 2.5. of this BAA for additional information.

3.7.5.11.1. Patents and Patent Applications.
Identify any existing, applied for, or pending patents that will be used in the conduct of this effort. Provide patent number or application number and title. Any patent that resulted from prior Government funding should be identified. State if no patents or patent applications are relevant.

3.7.5.11.2. Rights in Technical Data.

State if unlimited rights in technical data are proposed. If not, identify any technical data and/or computer software that will be delivered with less than unlimited rights as prescribed in DFARS 252.227-7013 and DFARS 252.227-7014. When less than unlimited rights are proposed, a data rights assertion table shall be provided as prescribed in DFARS 252.227-7017.

3.7.5.12. Transition from Prototype to Production.

Describe the approach and issues related to transition or commercialization of the results of this effort to an operationally suitable and affordable product for the intended users to include the following. The cost to prepare the Transition Plan should be included in the proposed costs. The cost to prepare the Transition Plan should be detailed in the cost proposal. Additional information regarding the Transition Plan can be found in the CTTSO Technology Transition Handbook located on BIDS under Resources.

[NOTE: If the specific requirement will not reasonably result in a prototype (e.g., study, service requirement) so state "Not Applicable to this Requirement" and justify why.]

3.7.5.12.1. Transition Strategy.

Provide the overall strategy for transition to production (licensing, partnering, or venturing) along with the associated timelines for actions associated with the transition. Describe the roles of current development partners, subcontractors, or other organizations that will be leveraged. If the offeror is not a commercial entity, indicate if a commercial partner has been identified. Discuss barriers to commercialization, such as anticipated regulatory issues (such as environmental, safety, health, and transportation), liability issues, interoperability, and financing, and planned steps to address these barriers.

3.7.5.12.2. Transition Approach.

Describe the type and level of effort envisioned to take the technology from its state at the end of the development effort to a production ready, affordable, operationally suitable product (such as size and/or weight reduction, packaging, environmental hardening, integration, additional test and certification). Provide an estimate of any costs to transition the prototype to low rate initial production. Provide the estimated production unit price for the end users.

3.7.5.12.3. Test and Evaluation.

Describe the plan to involve representative users during the design and development process and the general plan for test and evaluation by representative end users. If the phases of performance include representative user test and evaluation: (1) ensure coordination of user participation is thoroughly discussed in the technical approach; and (2) state "Representative User Participation will occur during contract performance."

3.7.5.12.4. Operational Support.

Describe the estimated level of training needed to prepare users to utilize the product in an operational environment. Discuss the anticipated support concept such as level(s) of repair, spare parts, warranties, operation and maintenance technical manuals, simulators, and other logistics considerations.

3.7.5.13. Human Subjects and Animal Testing.

The proposal shall provide a statement regarding the anticipated use of human subjects or animals in testing; or state if none. If yes, procedures for complying with all laws and regulations governing the use of animals or human subjects in research projects shall be included in the technical proposal. See section 2.9, "Animal or Human Testing Compliance" in this document for details.

3.7.5.14. Environmental Impact.

The proposal shall provide a statement regarding the impact of the work proposed on the environment. State if no impact exists.

3.7.5.15. Classification and Security.

If the offeror is proposing to perform research in a classified area, indicate the level of classification of the research and the level of clearance of the potential principal investigator and all proposed personnel. The contractor shall include facility clearance information. Also, the contractor shall indicate the Government agency that issued the clearances. State if the proposed effort is unclassified.

3.7.5.16. Subcontracting Plan.

If the total amount of the proposal exceeds $700,000 and the offeror is not a small business, the offeror shall submit a subcontracting plan for small business and small socially and economically disadvantaged business concerns. A mutually agreeable plan will be included in and made a part of the resultant contract. The contract cannot be executed unless the contracting officer determines that the plan provides the maximum practicable opportunity for small business and small disadvantaged business concerns to participate in the performance of the contract. The Subcontracting Plan/information is excluded from page count.

3.7.6. Cost Proposal.

The offeror and each significant subcontractor, if any, shall fill out the CTTSO Cost Proposal Template (available on BIDS under Resources) and submit all supporting cost or pricing data along with any other supporting attachments. All prepared spreadsheet formulas must be accessible. As soon as practicable after agreement on price, but before contract award, the offeror shall submit a Certificate of Current Cost or Pricing Data for contracts exceeding $2,000,000 as prescribed by FAR 15.406-2.

[NOTE: To determine the reasonableness of the cost proposal, the Government may request additional supporting documentation for proposed costs.]

3.7.6.1. Cost Narrative.

Provide a narrative discussing/substantiating elements of the cost proposal. Provide a separate summary of the total cost for each phase and for the total of the entire effort proposed. Indicate optional phases. Explain changes in cost from those proposed in the previous submission. The Cost Narrative must be submitted in PDF (.pdf) format with Times New Roman font no smaller than 10 point.

3.7.6.1.1. Table of Contents.

The cost narrative shall include a table of contents noting the page number of each section detailed below.

3.7.6.1.2. Direct Labor Costs.

Detail the direct labor cost estimate by showing the breakdown of labor hours, rates, cost for each category, and furnish the basis for the estimates.

- *Labor Category.* Include a detailed description of the category.
- *Labor Hours.* Include a Basis of Estimate for the proposed hours. Detail hours to be worked by each labor category proposed per each task, per each fiscal year and cumulatively.
- *Labor Rates.* Rates shall be in accordance with established rate agreements. If no rate agreement exists, use payroll data with actual rates to substantiate the proposed rates. If fully loaded rates are proposed, the offeror shall identify the base rate and build up.
- *Escalation.* Identify the escalation rate, how the rate is applied, and provide justification for the rate used.

3.7.6.1.3. Indirect Costs.

Indicate how the offeror has computed and applied offeror's indirect costs (e.g., overhead, G&A, material burden). Indicate the rates used and provide an appropriate explanation.

3.7.6.1.4. Other Direct Costs.

Identify all other costs directly attributable to the effort and not included in other sections (e.g., special tooling, travel, computer and consultant services, preservation, packaging and packing, spoilage and rework) and provide the basis for pricing.

- *Travel.* The basis for travel estimates will include trip purpose, departure site and destination, number of persons traveling, number of days, ground transportation requirements, and detailed costs for airfare, hotel, rental cars, and per diem allowances per Federal Travel Regulations (FTR).
- *Materials.* Submit a detailed Bill of Materials identifying each discrete material component. **Backup documentation must be submitted to explain the basis of estimate for at least 80 percent of the total material cost proposed**. Backup documentation may include: actual production costs, catalog listings, supplier quotes, actual invoices, or other documentation from a third-party source which verifies the proposed price.

- *Consultants.* If any consultants are to be used, the offeror shall submit consultant quotes for hourly rates, estimated number of hours required, and justification.
- *Subcontractors.* If any subcontractors are to be used, the offeror shall submit complete subcontractor quotes or proposals as part of the proposal. Subcontractor proposals will be evaluated along with the prime's proposal, and they are expected to contain the same level of detail as a prime proposal. Subcontractors providing commercial items may submit a commercial quote instead of a detailed proposal.
  [NOTE: In order to protect proprietary data, subcontractors may submit their detailed cost proposals directly to the Contracting Officer instead of submitting to the prime contractor. If this occurs, the prime is responsible for ensuring subcontractor's submission is timely and is completed in accordance with these instructions.]

3.7.6.1.5. Government Furnished or Contractor Acquired Equipment.
Identify the external property or materials required to perform the task in the summary. Separate items to be acquired with contract funds and those to be furnished by the Government. Reasonably provide the description or title and estimated unit and total costs of each item (i.e., manufacturer, catalog price, or previous purchase price). When such information on individual items is not available, the items should be grouped by class and estimated values indicated. In addition, the offeror shall include a statement of the extent to which the offeror is willing to acquire the items.

[NOTE: The FAR generally prohibits providing an industrial contractor with facilities (including plant equipment and real property) with a unit acquisition cost of less than $10,000.]

3.7.6.1.6. Profit or Fee.
Include the profit or fee proposed for this effort. State if no profit or fee is proposed. Include a discussion, in the summary, of risk, technical difficulty, need for management/oversight, exceptional circumstances, etc.

3.7.6.1.7. Competitive Methods.
For those acquisitions (e.g., subcontract, purchase orders, material orders) over $250,000 priced on a competitive basis, also provide data showing degree of competition and the basis for establishing the source and reasonableness of price. For inter-organizational transfers priced at other than cost of the comparable competitive commercial work of the division, subsidiary, or affiliate of the contractor, explain the pricing method (See FAR 31.205-26(e)).

3.7.6.1.8. Established Catalog or Market Prices/Prices Set By Law or

Regulation.
When an exemption from the requirement to submit cost or pricing data is claimed, whether the item was produced by others or by the offeror, provide justification for the exemption.

3.7.6.1.9. Royalties.
If more than $250, provide the following information on a separate page for each separate royalty or license fee:

- Name and Address of Licensor.
- Date of the License Agreement.
  [NOTE: A copy of the current license agreement and identification of applicable claims of specific patents shall be provided upon request by the contracting officer. See FAR 27.204 and FAR 31.205.37.)
- Patent numbers, patent application serial numbers, or other basis on which the royalty is payable.
- Brief description (including any part or model numbers of each contract item or component on which the royalty is payable).
- Percentage or dollar rate of royalty per unit.
- Unit price of contract item.
- Number of units.
- Total dollar amount of royalties.

3.7.6.10. Facilities Capital Cost of Money.
When the offeror elects to claim facilities capital cost of money as an allowable cost, the offeror must submit Form CASB-CMF and show the calculation of the proposed amount. See FAR 31.205-10.

3.7.6.11. Other Funding Sources.
The proposal shall provide the names of other federal, state, or local agencies, or other parties receiving the proposal and/or funding or potentially funding the proposed effort. State if no other funding sources or parties are involved.

3.7.6.12. Additional Information/Documents.
Additional information/documents to be included in the Cost Narrative:

- *Business/Cost Checklist.* The offeror shall complete and include a copy of the Business/Cost Checklist found at the BIDS website under Resources. Information and documents required in the Business/Cost Checklist shall be included in this proposal.
- *Terms & Conditions.* The offeror shall identify any anticipated/proposed contract terms and conditions in the proposal summary.
- *Proposal Validity.* The proposal shall remain valid for a period of no less than 180 days from submission.
- *Forward Pricing Rate Agreement.* If the offeror has an applicable rate agreement with DCAA (or another Federal Agency, e.g., HHS), please

include a copy of the agreement and provide a point of contact to your cognizant DCAA office. If the offeror has not previously been audited by DCAA, the procuring office may request an audit to verify the proposal labor direct and indirect rates. This applies to both prime contractors and subcontractors.

- *ACH Form.* The offeror will submit a completed ACH Form. (Found on BIDS under Resources).
- *VETS-4212.* The offeror will submit the most recent VETS-4212 filing confirmation.
- *Subcontracting Plan.* If the offeror is a large business and work will be performed in the United States, a Small Business Subcontracting Plan shall be submitted if the contract is expected to exceed $700,000.
- *Past Performance.* The offeror shall provide information on previous Federal Government prime or subcontracts featuring endeavors relevant (i.e., within the past three years and of similar size and complexity) to the specific requirement.

3.7.8. Phase 3 Notifications to Offerors.
Notification of acceptance or rejection of a Phase 3 submission will be sent via email to the offeror's principal contact as entered in the BIDS registration. Acceptance of a Full Proposal does not guarantee a contract will be awarded. If the Government does not accept the Phase 3 proposal, the offeror may request a formal pre-award debriefing.

3.7.9. Phase 3 Protests.
Offerors are encouraged to see resolution within the agency before filing a protest. Offerors who choose to submit any protest, must do so directly to the CTTSO Contracting Officer. All such protests will be processed under procedures that depend on whether the protest is directed to the agency, or to the Government Accountability Office (GAO) or to the Court of Federal Claims. Should the offeror choose to submit a protest, the Offeror must clearly label whether such protest is to the agency, GAO or the Court of Federal Claims. The Government will deem receipt of the protest by the Contracting Officer as constituting receipt or purposes of determining timeliness. Addresses for receipt confirmation can be requested via the BIDS Help function.

3.7.10. Phase 3 Status and Inquiries.
Phase 3 is complete when the Government concludes technical evaluations of all submissions and awards any contracts considered under this BAA. Inquiries by phone concerning the status of Full Proposals will not be accepted. After log in to the BIDS website, submitters are able to check the status of any submission under **Previously Uploaded Proposals.**

3.8. Clarification Requests.
Should the offeror be asked to submit clarifications to a Phase 2 White Paper or a Phase 3 Full Proposal, the BIDS email from the Contracting Officer will contain instructions on the specific request and associated requirements. BIDS will use CL (Clarification) instead of WP (White Paper), or FP (Full Proposal) as the Document Identifier designation (e.g., ***CL*** CB-1112-

ABCORP–xxxx-CL; where xxxx-CL is the VIT entered by the submitter). The request will contain the due date and time and *can be less than the standard 30-day response* time depending on the nature of the request.

3.9. Instructions for Offeror "No-bid" and Submission Withdrawal.

From time to time an offeror decides not to submit a subsequent Phase 2 or Phase 3 submission. If this is the case, the offeror shall indicate in BIDS that they are not providing the subsequent submission. The offeror shall follow the steps identified in BIDS to upload a submission and attach a document to indicate the withdrawal of the previous submission(s) and the intent to not participate in further submissions. If possible, the Document Identifier should reflect the submission status (e.g., CB-1112-ABCORP–xxxx-WD or xxxx-NoBid). To withdraw a submission after the due date and time, notify the contracting officer at BIDSHelp@cttso.gov.

4. PROPOSAL EVALUATION.

This section describes the criteria that will be used to evaluate each submission. The phase of the submission will determine the extent that each criterion applies based on the information requirements described in Section 3. Criteria are not weighted, and submissions are not ranked.

4.1. Evaluation Criteria.

The criteria used to evaluate and select proposals for projects are described as follows. **Each proposal will be evaluated on its own merit** and relevance to the program requirements rather than against other proposals in the same general research area.

4.1.1. Basic Requirement.

The proposed solution must meet the letter and intent of the stated requirement; all elements within the proposal must exhibit a comprehensive understanding of the problem and the requirements of intended end users. The proposed solution must meet multiple user (U.S. Government or commercial) needs and be fully compliant with all elements of the solicitation including format, content, and structure as well as all BAA instructions.

4.1.2. Technical Performance.

The proposed technical approach must be feasible, achievable, complete, and supported by a proposed technical team that has the expertise and experience to accomplish the proposed tasks. Task descriptions and associated technical elements are to be complete and in a logical sequence. All proposed deliverables must clearly define a final product that meets the requirement and can be expected as a result of the award. The proposal must identify and clearly define technical risks and planned mitigation efforts. Those risks and the associated mitigation must be defined, feasible, and reasonable. The roles of the prime and other participants required must be clearly distinguished and pre-coordination with all participants (including Government facilities) fully documented.

The requirement for and the anticipated use or integration of Government Furnished Equipment/Information/Property (GFE/GFI/GFP) including all equipment, facilities, and information, must be fully described including dates when such GFE/GFI/GFP will be

required. Intellectual property ownership and the planned transition to production must be adequately addressed, including a support concept for the product described. Similar efforts completed by the offeror in this area must be fully described including identification of other Government sponsors.

4.1.3. Cost.

The proposed costs must be both reasonable for the work proposed and achievable. The proposal must document all anticipated costs including those of associate, participating organizations. The proposal must demonstrate that the offeror has fully analyzed budget requirements and addressed resulting cost risks. The proposal must indicate all cost-sharing and leveraging opportunities explored and identified and the intellectual property expectations associated with that cost-sharing. Other sponsors who have funded or are funding this offeror for the same or similar efforts must be identified by agency, program manager name, phone number and email address.

4.1.4. Schedule.

The proposed schedule must be reasonable, achievable, and complete. The proposal must indicate that the offeror has fully analyzed the project's critical path and has addressed the resulting schedule risks.

4.1.5. Contractor Past Performance.

Past performance is a confidence assessment based upon the probability of successfully performing the requirement. The offeror's past performance in similar efforts must clearly demonstrate an ability to deliver products that meet the proposed technical performance requirements within the proposed budget and schedule. The proposed project team must have demonstrated expertise to manage the cost, schedule, and technical aspects of the project. At Phase 3, the Government's evaluation of past performance will rely on evidence provided directly by offerors as well as independent sources of information. If applicable, the offeror shall state if it has no relevant past performance.

[NOTE: Past performance information may be used in the technical evaluation if the vendor has relevant past performance with the Government. However, having no relevant past performance with the Government will not be held against a vendor.]

Remainder of this page intentionally left blank.

5. TECHNOLOGY DEVELOPMENT REQUIREMENTS.

This section provides the requirement descriptions and overall technical objectives. The intent of this BAA is to identify technologies and approaches that provide near-, mid-, and long-term solutions that enhance the capabilities of the U.S. Government to combat or mitigate terrorism. The main objective is to provide rapid prototype development focused on current and future critical multi-agency counterterrorism and antiterrorism requirements.

5.1. Advanced Analytic Capabilities (AAC)

R4466 Person-Borne IED Detection

Develop, test, and evaluate a means of detecting person-borne improvised explosive devices (PBIEDs), leveraging machine-learning algorithm(s) to understand emerging patterns and trends in an urban environment from overhead full motion video (FMV) via unmanned aerial surveillance. The capability shall include both a means for detecting physical characteristics of individuals that are indicative of carrying or transporting IEDs, and a means of detecting indicators from crowd dynamics and atmospherics to the potential presence of an IED in an urban environment. The capability shall harness commercial-off-the-shelf machine-learning algorithm(s) to enable the processing and analysis of user-specified or live FMV. Computing tasks shall be performed "at-the-edge" either on mobile devices receiving streamed FMV from a UAV-mounted sensor, or computing can be performed on a processor that is a part of the UAV payload. The vendor must procure all necessary training data for the algorithms. The implemented solution shall have the following capabilities:

- When a tactical level unit (e.g., team, platoon, squad, special agent) is operating in crowded urban terrain and is surrounded by the indigenous population, they should receive real-time warnings via mobile device on the potential presence of PBIEDs:
    - In their immediate proximity;
    - Being carried and/or concealed by person(s) that are attempting to approach them; and
    - Being concealed within the crowd.
- PBIED threats shall be identified using machine-learning algorithms that leverage:
    - Known characteristics of IEDs;
    - Crowd dynamics;
    - Body measurements of individuals; and
    - Analytics of individual behavior.
- The delivered capability must be able to cope with false positives, discriminating between individuals who stand out in a crowd for a variety of innocent reasons and real threats.
- The delivered capability should take into consideration a variety of environments where culture may alter crowd dynamics, changing the indicators of a potential threat. For example:
    - A Boston Marathon style bombing might be characterized by a crowd that is unaware of an individual's desire to do harm;
    - A protest crowd in Eastern Jerusalem may be aware that an individual is carrying a PBIED and is attempting to aid his movement or to distance itself from the blast.

A firm fixed price proposal is preferred; twelve (12) month base contract period of performance.

R4469 Civil Affairs Survey Assistant (CASA)
Develop, test, and evaluate software solutions that leverage vision-based machine-learning algorithms capable of capturing civil information and populating standardized survey questions in Esri Survey123 forms. The vision-based machine-learning algorithm must be capable of interfacing with Esri Survey123 collection software and Esri ArcGIS Online, and must discover and capture data from satellite imagery and unmanned aerial surveillance imagery. The Esri Survey 123 dictates the schema of civil information that must be captured. The integrated software solution must allow the user to increase both the accuracy of collected data and the volume of collected data through an efficient user interface that optimizes workflow in order to better support Command understanding of designated areas of interest. The implemented solution shall have the following capabilities:

- High count accuracy for ground entities (e.g., number of hangars on an airfield, number of structures in a compound, etc.);
- High accuracy measurement data for ground entities (e.g., lengths and widths of identified runways, area of terminal buildings, length and width of main thoroughfares and roads, etc.); and
- High object identification accuracy for ground entities (e.g., buildings, runways, roads, railways, power plants, transformers and power lines, communications towers, canals, bridges, and other civil infrastructure).

A firm fixed price proposal is preferred; twelve (12) month base contract period of performance.

5.2. Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE)

R4513 Rapid Bio-Detection and Identification
Develop a rugged fieldable handheld system for rapid detection and identification of biological agents. Only solutions that meet or exceed threshold requirements are considered, and ideal solutions shall also meet or exceed the objective requirements.

The performer shall develop a system capable of identifying at least the following agents at the stated limits of detection (threshold, except where otherwise noted):

1. *Clostridium botulinum* toxins (50 ng/ml)
2. *Ricinus communis* (20 ng/ml)
3. *Yersinia pestis* (10 ng/ml)
4. *Rrancisella tularensis* (10 ng/ml)
5. *Bacillus anthracis* spores (10 ng/ml)
    - *Bacillus anthracis* spores (10 ng/ml) vegetative and spores (objective)

Ideal solutions shall be able capable of identifying additional agents, such as those on the Center for Disease Control and Prevention (CDC) Bioterrorism Agent Category A List (objective).

The device shall be able to perform detection and identification of agents from liquids, powders, gels, swabs, and bodily fluids (threshold) and ideally s soil samples as well (objective). The platform shall only require consumption of ≤ 200 µl or ≤ 0.2 g of samples.

Operation of the system shall not require users to perform any manual sample preparation steps. If required, the only acceptable consumable shall be small quantities of phosphate buffered saline.

Sample introduction, preparation, and identification shall occur on the same platform though it may use up to two changeable cartridges to identify the five required agents. Operator shall be able to use the solution while in protective equipment, including gloves.

Identification shall occur in ≤ 5 minutes of sample introduction and not require scientific expertise to interpret results. Visualization of results occur directly on a smart phone. Results shall clearly indicate the presence and identity of an agent on the system (threshold) and ideally provide quantitative information as well (objective).

The total system, consisting of the identification platform and any associated cartridges, shall be capable of fitting into a regular cargo pocket (7.5 inches × 2.5 inches) and weigh ≤ 1 pound. The system shall not have any unique power requirements and have an operating life of at least 12 straight operable hours without changing batteries or recharging.

The performer shall demonstrate consistent true positive identification ≥ 80% with false positives ≤ 20%.

The platforms shall be ruggedized and operational in a temperature range of 0 °C to 40 °C and up to 95% relative humidity; able to be stored in temperatures ranging from 4 °C to 40 °C and up to 95% relative humidity. The shelf life of the platforms shall be ≥ 365 days at room temperature.

A firm fixed price proposal is preferred; eighteen (18) month base contract period of performance.

R4514 Chemical Warfare Agents (CWA) Colorimetric Tape

Develop a detection tape that can detect and classify liquids and aerosol Chemical Warfare Agents (CWAs). The solution shall provide equivalent or greater selectivity and sensitivity performance of currently fielded M9 papers. In addition, the detection tape shall be able to classify CWAs H, G, V, and A agents. CWA targets of interest include HD, HN, GA, GB, GD, GF, VX, VR, and VS, and non-traditional A series agents.

The CWA colorimetric tape shall have:

- The ability to detect droplets ≥ 100 micrometers in diameter of neat agent;
- Eye readable results;
- A maximum total detection time of less than one minute;
- No sample preparation and shall include no additional equipment to support sample introduction to the tape;
- The same adhesive capabilities as the currently fielded M9 tape. The incorporated adhesive formulation must not affect the detection or classification of the CWA;

- The paper and adhesive not affected by water;
- Shelf life of at least 6 years (threshold) and 10 years (objective) packaged and stored in uncontrolled conditions. Reference MIL-STD-810, ASTM F1980-02, ISO 9001:2015, and ISO 17025 for standards and accreditation to support shelf life testing;
- A commercialization strategy identified for mass production;
- A fast enough color change so that a user can see that a threat is present within one minute and will be able to see what threat class is present within five minutes;
- Have an operational life of at least 24 hours (threshold), and is preferred to have an operational life of up to 1 week (objective) to allow the tape to be left in place for passive detection.

The CWA colorimetric tape must be operational in a temperature range of −28 °F to 134 °F and up to 95 percent relative humidity. Additionally, the CWA colorimetric tape shall be able to be stored in temperatures ranging from −32 °F to 160 °F and up to 95 percent relative humidity.

A firm fixed price proposal is preferred; eighteen (18) month base contract period of performance.

R4515 Chemical Biological (CB) Self-Contained Breathing Apparatus (SCBA) Protective Cover

The National Fire Protection Association (NFPA) 1994, Standard on Protective Ensembles for First Responders to Hazardous Materials Emergencies and Chemical, Biological, Radiological, Nuclear (CBRN) Terrorism Incidents, Class 1, has led to the increased use of Self-Contained Breathing Apparatus (SCBA) worn as part of a non-encapsulating protective ensemble design. SCBAs positioned outside the Class 1 protective suit garments may be exposed to hazardous materials, and some SCBA textiles (e.g., straps, harnesses, etc.) may retain hazardous materials even after decontamination.

Develop a reusable low-cost CB protective cover for SCBA and SCBA components (e.g., strap covers, harness straps, etc.) to eliminate residual contamination. The cover shall demonstrate that it does not hinder operator maneuverability, and shall provide the operator the ability to see the SCBA gauges while secured within the cover. The SCBA protective cover design shall:

- Allow the SCBA to remain compliant with NFPA 1981-2018 or NFPA 1986-2017, and National Institute for Occupational Safety and Health (NIOSH) 42 Code of Federal Regulations (CFR) Part 84–certified (CBRN);
- Be constructed of a material that demonstrates protective integrity, both against physical damage and hazard permeation, equivalent to NFPA 1994 (2018 edition) for Class 1 protection;
    a. ‘Class 1 Garment Element Requirements’ (Section 7.1.2) and
    b. ‘Viral Penetration Resistance’ (Section 7.2.2.7)
- Develop a design that demonstrates protective system integrity against hazard permeation;
- Permit operators to open the SCBA cover in order to perform operations (e.g., bottle swap) and re-secure the SCBA cover;

- Provide a cover for SCBA with components that can be rapidly decontaminated and returned to service with no future risk to the user from off-gassing or leaching; and
- Designs shall function with three different SCBA products identified by the Government
    a. Include an option to design SCBA covers that function with two additional next generation SCBAs identified by the Government.

A firm fixed price proposal is preferred; six (6) month base contract period of performance with additional time for certification.

R4520 Explosive Trace Collection Training Tool
Effective swabbing and trace collection is critical to the success of explosive trace detection. In order to employ effective trace collection, users require initial training on the proper technique as well as regular refresher training to reinforce concepts and check performance. However, the nature of trace (not visible) collection makes it challenging to users to visualize their performance and to understand how their technique impacts their results.

Develop an explosive trace collection training **tool** that provides collection efficiency feedback to users as they practice hands-on trace collection. The training tool shall be able to enhance initial training as well as provide student self-guided refresher training. The tool shall leverage existing best practices in effective swabbing techniques to include swabbing the full area of interest in the correct pattern while using an appropriate amount of force. The training tool shall be compatible with and without swabbing wands. It is highly desirable to have a low-cost robust tool that will be compatible with rough handling and will not require consumables. If consumables are used, they shall be low cost and not need to be replaced or replenished for at least one year.

A firm fixed price proposal is preferred; eight (8) month base contract period of performance.

5.3. Improvised Device Defeat/Explosives Countermeasures (IDD/EC)

R4503 Aftermarket Camera Retrofit Kit for Robots
Develop the capability to attach aftermarket commercial-off-the-shelf (COTS) cameras to currently fielded bomb squad robot platforms. The operator should have the flexibility to identify where on the platform mounting of the COTS camera is to be performed, and do the mounting in field conditions if necessary. The operator shall be able to control the features of the aftermarket camera via the kit's retrofit interface system. To the greatest extent possible, the interface shall utilize the stock communications and operator control unit of each robot platform. However, because legacy robot platforms may not have communications capability sufficient to transmit a high-resolution data-stream, or a digital display capable of displaying high-resolution imagery, this requirement does not preclude the incorporation of an auxiliary communication system and/or display screen. No components of the retrofit interface shall diminish or interfere with the stock functions of the robot platform. In order to minimize the need for proprietary robot platform integration, there shall be no platform-specific interfaces except for unique cable connections.

A firm fixed price proposal is preferred; twelve (12) to eighteen (18) month base contract period

of performance.

R4508 Illuminating Signal Dispenser

Develop a dispensable luminous marking substance (e.g., spray, foam, gel, etc.) and dispenser. The substance shall be available in at least three (3) separate luminous visible colors and a separate infrared (IR) variant. All variants shall include a non-luminous pigment for daylight visibility. The substance shall maintain visibility for two (threshold) to six (objective) hours. The substance shall be self-decomposing after the visibility period, small amounts of residue or staining on the marked object is acceptable. The substance shall adhere to vertical and horizontal surfaces (including overhead surfaces) that include common construction materials, soiled/oily materials, and various types of foliage. The substance shall be able to adhere to surfaces in high humidity and wet environments. The dispenser shall produce a controlled spray that limits overspray and allows the user to mark from a distance of four feet. The capability shall also be resistant to the shock and vibration encountered during military ground and air transport. The capability shall function in extreme operational and storage temperature conditions (between -26 degrees F and 160 degrees F). The dispenser shall have a form factor that allows it to be carried in a closed cargo pocket, on a tactical vest/belt using a pouch, and hung on Pouch Attachment Ladder System (PALS) webbing using a clip. The objective size for the dispenser shall be approximately 2.5 inches by 2.5 inches by 8 inches and shall produce enough substance to adequately cover 10 square feet to 20 square feet. The dispenser shall make minimal noise during operation, including any mixing of the substance before use. The objective noise level shall be below 30 decibels (dBA) with a threshold noise level of 45 decibels (dBA). The dispenser shall also have a locking and retained lid that prevents accidental activation. The substance and dispenser shall be shelf-stable at room temperature for a minimum of one year (threshold) with three years being the objective period for shelf stability. The substance shall be nonflammable, non-corrosive, non-combustible, non-toxic, non-polluting, and the material shall not constitute a hazardous material.

A firm fixed frice proposal is preferred; six (6) to twelve (12) month base contract period of performance.

R4509 Compliant Humanoid Robotic Arm

Develop an open architecture protocol (IOP)-compliant end-effector payload for commercial EOD robot platforms. The payload module shall consist of bi-lateral dual-arm manipulators, which exhibit human-like articulation and strength. The arms shall be able to exert a combined lift force of one-hundred (100) pounds. Each hand shall exert a maximum grip force up to ninety (90) pounds and combine to exert a maximum torque of ten (10) pounds, for unscrewing container lids. The robot arms shall have the ability to grasp, hold, and rotate an object with finesse. The appendages may use task-based or semi-autonomous operation, but shall include provisions for full tele-operation by the robot operator. The payload shall utilize object compliance to minimize unintended damage to the hardware or the operating environment and provide operator feedback via visual cues. The module shall also integrate with the operator control unit (OCU) display for the selected commercial robotic platform, to include a graphic user interface to communicate end effector proximity to objects and forces exerted on appendages and the items being manipulated. The module shall weigh less than ninety (90) pounds and utilize a payload mounting system that allows for rapid mounting/dismounting from

the robotic platform without the use of specialized tools. A trained two-person team shall be able to mount the payload in twenty (20) minutes or less (threshold) with a goal of less than ten (10) minutes (objective). The mounted payload must not substantially impact the stock capability of the commercial robotic platform to climb stairs and maneuver due to changes in weight distribution and center of gravity.

A firm fixed frice proposal is preferred; twelve (12) month base contract period of performance.

R4510 Next Generation Dearmer and Ammunition

Develop a new ballistic disruptor/ordnance dearmer that is capable of firing a variety of different projectiles. The intent of the tool is the precision de-arming/de-fuzing of military ordnance and disruption of improvised threats. The tool shall incorporate an aim assist capability to achieve consistent, pinpoint accuracy, and performance at standoff distances ranging from eighteen (18) inches (threshold) to fifty (50) feet (objective). At a minimum, the ammunition must include the ability to deliver a frangible slug and a hard target-penetrating slug. The frangible slug shall disintegrate on impact with dense materials, so as to minimize secondary kinetic effects. The target-penetrating slug shall maintain ballistic stability throughout its flight, and completely penetrate one-quarter (1/4) inch thick steel plate. The target-penetrating slug must maintain its aimed trajectory following penetration of light barrier materials to include five-eighth (5/8) inch plywood, nylon backpack fabric, cardboard shipping box, and laminated auto glass. Additional slugs of interest include low-velocity/high mass, and ultra-velocity. The tool must include a robot mount, be easily adaptable to a variety of mid-sized commercial robotic platforms, and it must actuate using a common commercial remote firing device. The maximum weight of the entire kit shall not exceed fifty (50) pounds. A single, trained individual shall be able to assemble and configure the tool in under ten (10) minutes.

A firm fixed price proposal is preferred; eighteen (18) month base contract period of performance.

R4511 Dual-Action Remote Door Opener

Develop a remote or semi-remote tool with a rope/line and attachment kit that gives users the ability to open push-button style storm door latches, screen door handles, lever latches, car door handles, and glove box handles. The tool shall allow a user to attach the tool using various specialty tools included in the kit and then activate it with either a pull, or release of tension, on the rope/line. The tool shall allow a user to control the force exerted by the tool using rope/line tension. The tool shall be multi-directional and shall allow the user to adjust the angle from which the rope is pulled. The tool shall be small enough to be carried in a cargo pocket and the user shall have the option to select different types of attachments based on the type of latch, lever, or handle encountered. The tool shall weigh one pound or less (objective) with a five pound threshold for a single tool/component. The entire kit shall fit in a tactical backpack and not weigh more than 35 pounds (not including the line and reel).

A firm fixed price proposal is preferred; twelve (12) month base contract period of performance.

R4512 Critical Incident Response Technology Seminars

THIS REQUIREMENT IS NOT FOR THE DEVELOPMENT OF A TRAINING COURSE.

Develop Critical Incident Response Technology Seminars (CIRTS) to challenge U.S. Joint Service Explosive Ordnance Disposal (EOD) and Public Safety Bomb Technicians (PSBT) with analyzing, interpreting, and defeating current and emerging improvised explosive device (IED) threats. The seminars shall focus on real world threats, tactics, and case studies from incidents occurring worldwide. The seminars will create a platform to develop, evaluate, and test current and emerging technologies in real world scenarios – giving bomb technicians from different backgrounds access to new tools and equipment that they would not have had access to otherwise. Each seminar shall be approximately forty (40) hours in length, and include hands-on exercises and realistic threat scenarios. The vendor shall provide inert training aids and conduct threat briefings. Furthermore, the vendor shall brief participants on current improvised device defeat advanced technology research and development efforts. The vendor shall be qualified to purchase explosives when necessary, and shall coordinate with bomb squads for the use of an explosives range for each seminar. The vendor shall be responsible for coordinating up to four (4) seminars per year, with up to one (1) event occurring per quarter. The vendor shall be responsible for logistics associated with all events, to include travel and lodging for up to twenty-five (25) domestic participants. Prior to each event, the vendor shall provide the Government with detailed plans of scenarios, and schematics of proposed training aids to be used during the seminar, and gain approval before implementation of the plan begins, or any items are purchased for a specific event. The vendor shall collect and document feedback from participants on operational and technology needs identified during each seminar, and deliver a final report after each event. The final report shall include lessons learned, and a list of operational needs identified during the seminar. In addition, an annual report on program activities and a compiled list of operational needs identified during all of the events within the year, shall be provided to the Government. Special consideration shall be given to novel approaches to collecting, documenting, and analyzing data gathered during scenarios. Estimated cost per seminar shall be included in the quad chart submission.

A firm fixed price proposal is preferred; twelve (12) month base contract period of performance.

5.4. Investigative and Forensic Science (IFS)

R4438 Defense Biometrics Software Development Kit (B-SDK)

Biometrics (face, finger, iris, etc.) are a major player in the national defense strategy against terrorism. There are currently no free, government-off-the-shelf (GOTS) biometrics Software Development Kits (SDKs) available that support U.S. Government (USG) biometric file types in modern programming languages. Procuring, training, and developing with existing commercial-off-the-shelf (COTS) products significantly limits and delays deployment of biometric capabilities to the warfighter as well as adds cost, complexity and manpower to sustainment of USG biometric repositories. This effort shall develop and deliver a platform and programming language neutral SDK including all information required for a software developer user to easily integrate into an existing application or system of systems. The SDK shall allow the Department of Defense (DoD) to rapidly develop and integrate multi-modal biometric systems for identification purposes and improve interoperability between USG agencies that maintain biometric repositories free of cost to system integrators. The objective of this technology shall allow DoD and USG agencies engaged in biometric operations to develop customized solutions that are open, flexible, extensible, and can be readily maintained without

being reliant on commercial developers and licensing costs.

REQUIRED ATTRIBUTES:

The software tool shall:

- Be compatible across common operating systems such as Linux, Android, Windows, and macOS;
- Support C, C#, Java, and Python programming languages including detailed SDK specification documentation;
- Provide sample code, build, compile, and run instructions and examples for all programming languages;
- Read, modify, and write data in known USG biometric file types including but not limited to DoD Electronic Biometric Transmission Specification (EBTS) 1.2 and 4.1, FBI EBTS 10 in .EFT file format, DHS IDENT eXchange Message (IXM) in .xml file format, and North Atlantic Treaty Organization (NATO) Standardization Agreement (STANAG) 4715;
- Import and export of known image types of USG biometrics records including image conversion to Wavelet Scalar Quantization (WSQ) and Joint Photographic Experts Group (JPEG) 2000 format.

The deliverables must include 12 months of software maintenance support past product delivery to reduce transition risk and support new system customer integration efforts. Software maintenance support must be provided within 24 hours (8 business hours).

The U.S. Government must receive unlimited intellectual property and use rights to the system, software, source code, applications, and data developed or delivered during this project.

A firm fixed price proposal is preferred; eighteen (18) month base contract period of performance.

R4439 Forensic Internet of Things (F-IoT)

As the number and types of IoT devices continue to proliferate, federal, state, local, territorial, and tribal (FSLTT) law enforcement (LE) organizations require a capability to continually inform forensic examiners, investigators, and operators of devices of interest to identify and acquire as they execute their missions. Information forensically derived from these devices has the potential to be of significant value – from corroborating involvement in criminal or terrorist activities; identifying accomplices/associates; or just identifying new leads to pursue. This effort shall design and implement a capability that allows FSLTT LE organizations to submit, search, comment on, and rate forensic reports on IoT devices. The required capability shall be hosted on an existing U.S. Government information sharing platform that can limit access to vetted/validated FSLTT LE personnel. The capability shall provide LE users with a centralized repository to capture and share the forensic examination techniques used to exploit encountered devices and recognize the potential evidentiary value from the acquired data.

The capability shall:

- Ingest forensic reports submitted by users in their original format (e.g., .pdf, .docx, .pptx, .jpg, etc.).
- Provide instructions on the level of content and detail expected for submitting forensic reports.
- Identify forensic reports in the repository based on searches of make, model, and other relevant characteristics of the device.
- Allow users to download forensic reports relevant to end user queries.
- Support a self-moderating forum allowing end users to:
    - Post comments or questions on submitted reports and provide peer review.
    - Rate reports based on relevant criteria (e.g., accuracy, thoroughness, positive results, etc.).
- Enable "moderators" with authorizations to edit and delete content.
- Log and report relevant metrics concerning reports and queries.
- Allow users to subscribe to e-mail notifications when:
    - New reports are posted.
    - Comments are added to reports posted by the user.
    - Replies are made to comments made by the user.

Design and performance specifications:

- Maintenance of the content in the repository should require less than four hours per week for each submitting organization. The developer shall not be responsible for maintaining the capability.
- Ensure the system is intuitive and may be operated by a non-technical end user.
- The capability shall process and store 0.5 TB per year for reports and comments/discussion on reports and shall be able to scale annually.
- The capability shall be able to display a web page within 0.5 seconds and provide search returns to the user within 2 seconds.

The U.S. Government must receive unlimited intellectual property and use rights to the system, software, applications, and data developed or delivered during this project.

A firm fixed price proposal is preferred; twelve (12) to eighteen (18) month base contract period of performance.

R4440 Gait Recognition from Video (GAIT)

Members of the U.S. military, law enforcement, and intelligence communities require the ability to identify persons of interest or high value targets in video at a distance for tactical biometrics as well as forensic video analytics applications. Gait recognition shows promise in achieving identification at long distances where other biometric modalities are limited by resolution. Past efforts in gait recognition have achieved some level of success matching gait signatures of individuals walking across the field of view (FOV), but has not proven to be sufficiently effective matching gait signatures of individuals walking towards or away from the camera and across views. Furthermore, intra-subject variations in the gait signature induced by clothing, shoe wear, and load further confound gait recognition performance. Currently, there is no robust view-invariant method to match video-based gait signatures of individuals for biometrics and forensics applications. This effort shall design and develop a view-invariant gait recognition

software application that provides accurate matching of gait signatures across camera perspectives.

REQUIRED ATTRIBUTES:

The software shall be able to:

- Process videos from CCTV networks and narrow field of view sensors (e.g., digital rifle scope) under daytime conditions.
- Detect and segment human(s) in the video sequence.
- Extract a discriminative feature vector (i.e., gait template) and enroll gait signatures taken at frontal, oblique, side, and rear perspectives/views acquired outdoors under non-cooperative conditions.
- Extract and enroll gait signatures from video sequences as short as 3 seconds, to include all necessary preprocessing stages such as person detection and segmentation as part of the overall gait analysis software package.
- Capture and extract gait signatures for walking speeds varying from 2 miles per hour (mph) to 5 mph, recorded in video at no less than 10 frames per second.
- Extract gait signatures from videos containing humans with height as small as 100 pixels at distances varying from 20 m to 100 m.
- Capable of processing recorded videos in forensics mode and real-time video streaming from a single camera feed.
- Process high-definition video sequences as long as 1 hour, extracting gait signatures from one or more individuals appearing in the video sequence and search signatures against the enrolled gait gallery.
- Operable on a Linux standalone system with a single GPU. Software must also be portable to a similar compute cloud instance.
- Perform near real-time end-to-end processing (i.e., ingestion, detection, segmentation, encoding, searching) on a machine/instance with a single GPU.
    - Match an extracted gait signature against a gallery of 100 individuals in 10 ms.
    - Process a one-minute video sequence on a single GPU machine in 2 minutes, extracting gait signatures from all detected humans. Processing time is expected to scale linearly with respect to video length.
- Capable of batch processing on a machine/instance with multiple GPUs.
- Graphical user interface (GUI) must be intuitive and may be operated by a non-technical end user. For enrollment, GUI must allow user to upload videos and specify a corresponding segment of video to extract and enroll a gait signature into the gallery. GUI must allow user to create a gallery consisting of up to 1000 individuals. For inference, GUI must allow user to upload a video sequence, and return individuals who match against the enrolled gallery, with corresponding confidence/similarity scores.
- Conduct an outdoors gait data collection of 100 subjects to 300 subjects for algorithm training and validation:
    - Dataset collection shall be conducted in accordance with Institutional Review Board-approved protocols.
    - Gait signature for each subject shall be captured outdoors using visible and infrared sensors at similar distances (20 m, 50 m, and 100 m) and at camera pitch angles of 0 degrees (e.g., at ground level) down to −45 degrees.

- Videos of gait signatures shall be collected at a minimum of 30 frames per second with duration of at least 10 seconds. Subsequently, segments with varying frame rates and durations shall be extracted for algorithm development and testing.
- Dataset must be releasable for government and research-related consumption upon completion of contract.

Other required features and capabilities of the software are:

- Must be robust to foot wear variations (e.g., sandals, athletic shoes, boots), clothing variations (e.g., t-shirt and shorts, sweaters, coats, and jeans) and load carried by humans varying from 0 pounds to 30 pounds, achieving the following accuracy at camera pitch angles of 0 degrees down to −45 degrees:
  - Rank-1 accuracy shall exceed 60% when matching across views (e.g., frontal to side) and shall exceed 75% when matching same views (e.g., frontal to frontal or side to side), on a gallery/watch list containing 100 individuals.
- Must be robust to environmental lighting and shadow conditions.
- Training end users on the software application must not exceed 2 hours.
- Ingest common video formats such as MPG, MP4, AVI, and WMV.

DESIRED ATTRIBUTES:

- Capable of processing videos with groups of people (up to 10 individuals) in a scene to extract gait signatures of individuals across a video sequence from a single camera at a given time.
- Able to extract and match gait signatures from video acquired from unmanned aerial vehicle (UAV) sensors at the required performance goals.
- Operational in a CPU-only configuration.
- Able to extract and match gait signatures from videos in the visible (daytime) as well as infrared spectrum (nighttime) at the required performance goals.
- Portable to an on the edge device (e.g., embedded AI computing device; Jetson TX2).

The U.S. Government must receive unlimited intellectual property and use rights to the source code, system, software, applications, and data developed or delivered during this project.

A firm fixed price proposal is preferred; eighteen (18) month base contract period of performance.

R4441 Identification of Polygraph Countermeasures

Design and develop a software application that evaluates polygraph data to determine if countermeasures are being employed by the examinee. The application shall utilize artificial intelligence and machine learning (AI/ML) and other statistical techniques to evaluate polygraph physiological data to determine the presence or absence of atypical physiology indicating deliberate use of countermeasures, regardless of motivation, with the intent to impact the outcome and final determinations of any type of polygraph examination. The application through its determination of the presence or absence of countermeasures must provide a more accurate and objective evaluation of the interviewee’s credibility during the examination than existing standards.

The software product shall read polygraph signals, measurements, and data acquired during all standard types of polygraph tests. The application shall process converted ASCII format (standard format) for up to ten physiological parameters. These parameters shall be paired with known solution countermeasure and non-countermeasure cases to allow the AI/ML processes to search for physiological distinctions between these groups in the algorithm development process. The application shall identify the specific atypical physiologies detected and determine the likelihood that deliberate countermeasures are being employed. The U.S. Government shall provide countermeasure and non-countermeasure cases and associated data for use in this project. For any model developed, the developer must conduct a cross-validation process to ensure a statistically valid and reliable application with high accuracy.

Other features and capabilities that the application shall have are:

- Compatibility with Microsoft systems and existing network platforms within the federal government.
- Provide through the algorithms an evaluation in less than five minutes that indicates the presence or absence of countermeasures and the specific countermeasure signature identified.
- Ability to protect access to the algorithms from outside of the United States Government.
- Take less than eight hours for currently certified federal polygraph examiners to be trained on the application.
- Must clearly state the probability of countermeasure activity.
- The error rate must be less than 20% with cross validation.
- Operate in stand-alone capability without requiring connection to any network or cloud environment.

No proposal shall be accepted that does not grant to the U.S. Government full unlimited intellectual property rights to the all data, reports, results, and final deliverables.

A firm fixed price proposal is preferred; twelve (12) to eighteen (18) month base contract period of performance.

R4442 Evidence Disclosure Strategies in Investigative Interviews

Research and develop a comprehensive model and set of techniques that optimize the disclosure of evidence and information during investigative interviews to elicit the maximum amount of truthful information from the interviewee. This effort shall also include a validated training course to teach the model and techniques. The model and techniques shall be developed by using empirical evidence and available research literature on employing non-coercive, rapport-based, non-accusatorial interviewing techniques that have been demonstrated to be effective (e.g., the Strategic Use of Evidence, the Scharff technique). None of the tactics and procedures shall require the use of any equipment or hardware. New research shall also be conducted that refines, validates, and further develops the model and techniques.

The research and development of the model and set of techniques shall identify and describe the following:

- The best time during the interview for the interviewer to disclose evidence/information in order to optimize elicitation of accurate information from the interviewee, and how to disclose that evidence/information.
- Different methods to employ over a wide range of types of evidence/information and investigative settings.
- Alternative methods to full disclosure when evidence/information is classified or sensitive.
- Actions and behaviors by interviewers that are counterproductive to eliciting truthful information when disclosing or not disclosing evidence/information during interviews.

Other features and requirements of the research, model, and techniques shall include the following:

- Methodology that is scientifically sound and directly applies to operational environments especially combating terrorism settings.
- Application of appropriate statistical techniques to analyze, test, and validate all research data and results.
- Comprehensive documentation of all research, methods, findings, and results regarding the model, techniques, and procedures.
- A validated training course providing thorough instruction of the model and the use of all related interview techniques and procedures.
- Comprehensive instructor and student manuals for the training.

All techniques, procedures and tactics must be directly employable during investigative interviews. No proposal shall be accepted that does not grant to the U.S. Government full unlimited intellectual property rights to the all data, reports, results, and final deliverables.

A firm fixed price proposal is preferred; twelve (12) to eighteen (18) month base contract period of performance.

R4443 Laser Latent Print Scanning System

Traditionally latent print examiners (LPEs) have utilized a white-light flatbed scanner to successfully process post-treated latent prints that are visible in white light only. Over half of the chemical or physical latent print processing techniques utilized in the field today require an alternate wavelength of light for proper visualization of the latent print. Currently, no technology exists utilizing an automated flatbed scanner system to exploit latent prints that require an alternate light source for visualization. This effort shall design, develop, and validate a self-contained all-in-one laser light scanning system to capture both pre- and post-processed latent prints. The system shall have the ability to capture fluorescent latent prints at various wavelengths of light. The scanning system shall operate similarly to a traditional flatbed scanner. The system shall include variable band-pass filters and a software application to capture the images.

The objective of this technology shall allow the operational user to place the evidence onto the imaging surface and perform an overall scan of the evidence at a lower resolution setting and use an appropriate light source and filter. After the overall scan is complete, particular areas of interest shall be selected on the built-in digital display and converted to examination grade, high-

resolution images. This technology shall provide the military or law enforcement end user the ability to capture latent prints, which are not visible under white light and require a laser/alternate light source for further visualization, in non-laboratory environments.

For a field use scenario, the digitally recorded images shall be stored on an SD card, USB card, or other removable media for digital transfer. For a laboratory scenario, the scanner shall have a direct USB connection to a computer station. The scanner shall be portable for field use and robust enough to survive a drop from 4 feet and be able to endure contact with dirt or sand and be easily decontaminated. The speed of image capturing shall be similar to the image capture speeds of other traditional flatbed scanners.

Other features and capabilities that the system shall have are:

- The resolution setting for the capture of these images shall be tunable with a minimum resolution of 1000 dpi for the examination grade images.
- Develop a white light and at least one laser source for the system's light source.
    - User shall have the ability to select from multiple wavelengths (white light, green, and blue as primary options).
    - Wavelengths shall be as close to monochromatic light as possible.
- The light source shall capture latent prints that have been processed with chemicals such as Cyanoacrylate Ester, Rhodamine 6G fluorescent dye stain (R6G), ninhydrin, 1,2 – indanedione, and others.
- Incorporate a band-pass filter, which shall be readily interchangeable by the user, to be used appropriately with chemical processing techniques and various lighting specifications.
- Light sources shall be contained inside the scanner to ensure safety for operational users and limit any radiation risk.
- Design an adjustable aperture setting for various surfaces, to include flat and curved (e.g., latent print on a soda can).
- Develop an attached large LCD touch screen and a computer processor to allow for user interface features such as scanning overall images, selecting lower or higher resolution images, selecting "save as" locations, editing file names, selecting lighting modes, making aperture adjustments, applying time stamps to files, recording metadata, and other relevant settings to ensure image quality.
    - The system shall record metadata from image capture data to include: resolution settings, any enhancements, wavelength of light, crop coordinates, and date/time stamping.
- Develop an automated and user-friendly interface for the scanning system to allow for quick and simple operational training.
- The software shall perform minimal to no image adjustments or manipulation; if done, adjustments shall be traceable (metadata).
- The scanner warm-up time shall be less than one minute.
- The scanning system shall be compatible with removable drives for digital transfer.
- Images shall be saved and opened in lossless and lossy file formats which include but are not limited to RAW, BMP, TIFF, JP2, JPEG.
    - The system shall save examination grade images in lossless format.

- The fast-scanned image shall display areas from the entire surface of the scanner on the built-in touchscreen. Latent prints of interest requiring higher levels of resolution and higher quality image file types can be cropped scanned in tandem.
- Images shall be obtained in a one-to-one size ratio and adhere to resolution requirements for AFIS searches.
- The instrument shall be lightweight enough for one individual to readily move and reposition. The scanner shall weigh no more than 30 pounds.
- Both operations and maintenance manual(s) are required deliverables, to include a transfer protocol to a separate computer.
- The preventative maintenance of the system shall be minimal.
- The mean time to failure for the scanning system shall be no less than one year.

The U.S. Government must receive unlimited intellectual property and use rights to the system, software, applications, and data developed or delivered during this project.

A firm fixed price proposal is preferred; twelve (12) to eighteen (18) month base contract period of performance.

R4444 Minimal Contact Credibility Assessment

Design and develop sensors that are minimal contact or non-contact with the human body and can acquire physiological measurements for credibility assessment. The associated software to process and analyze the measurements shall also be developed. The sensors shall collect the information obtained in the traditional polygraph measurements of blood pressure and pulse, breathing rate and depth, and electro-dermal activity. In addition, the sensors shall acquire pupillary measurement data relating to dilation size and changes. Additional psychophysiologic data may also be incorporated, if useful, but all sensors must be easily applied to fully clothed individuals, shall eliminate any discomfort and distraction of the presently used sensors, and attain the same or improved accuracy as present polygraph measurements. Signals from the sensors shall preferentially be sent wirelessly but wired sensors are also acceptable, if necessary, to increase quality or minimize cost. The display instrument shall contain all required software for processing. Commercial-off-the-shelf (COTS) components are preferred whenever possible. All research and testing shall be approved by a sanctioned Institutional Review Board.

Features and capabilities of the sensors and the overall system shall include:

- All sensors having an accuracy when the examinees are in the seated position that is unaffected and consistent regardless of gender, race, ethnicity, skin tone and reflectance, and age (18 through 65).
- Capable of continuous, long-duration measurements of at least 60 minutes.
- Mobile and easily portable, quickly applied, and made ready to operate with full functionality in rugged harsh environments.
- All software fully functional and insertable into:
    - National Center for Credibility Assessment, Automated Interview System (AIS) via National Instrument's LabVIEW software and its Application Programming Interface. This shall be provided by the Government.

  - The four commercially available polygraph instruments: Axciton Systems, Lafayette Instrument, Limestone Technologies, and Stoelting.
- Software interface that provides real time and playback data visualization, functionalities to record, and receive feedback from the users.
- Algorithms within the software that extract and process data from all sensors to provide the needed parameters that are meaningful to identify physiological signatures associated with credibility.
- Display results on a polygraph instrument and/or tablet/laptop device that is easily portable, operates in rugged and harsh environments, and is powered by 110/220 volt alternating current, 60/50 cycle, and by an internal rechargeable battery that operates continuously for 2 hours.
- A non-contact blood pressure measurement sensor and system that can replace the current ausculatory cuff used in federal polygraph examinations.
- Non-contact solutions must be capable of beat-to-beat blood pressure measurements using sensing modalities such as, but not limited to, transdermal optical imaging, thermal imaging, or laser Doppler imaging.
- Accurate static and dynamic beat-to-beat blood pressure measurements relative to intra-arterial blood pressure with precision to the nearest mmHg and capable of continuous, long-duration measurements.
- Measures of beat-to-beat systolic, diastolic, and mean arterial blood pressure in addition to inter-beat interval and instantaneous heart rate with accuracy comparable the Finapres Medical Systems NOVA monitoring system.
- Breathing rate sensor that is minimal or non-contact and that eliminates the present respiratory strain gauge in present polygraphy systems.
- Electro-dermal sensor that is minimal or non-contact with the accuracy of the present polygraph sensor.
- Minimal or non-contact sensors that measure pupil dilation and changes.
- Display of the pupil dilation measurement along with the measurements and results of the other acquired physiology on an easy to read display screen.
- Integration of external non-physiological information such as when questions are asked, clock time, and running time which can be controlled by the operator.

The sensors and the software with their associated hardware shall be thoroughly and comprehensively tested in realistic scenarios by the developer. They shall be provided to certain end users for a 60 day testing period. Modifications based on the testing shall be required to be completed before final delivery.

No proposal shall be accepted that does not grant to the U.S. Government full unlimited intellectual property rights to the all data, reports, results, and final deliverables developed during the project.

A firm fixed price proposal is preferred; twelve (12) to eighteen (18) month base contract period of performance.

R4445 Overcoming Resistance in Intelligence Interviews

Develop a comprehensive model of resistance employed by subjects during intelligence

interviews and interrogations to include specific approaches for the interrogation/interview team to understand, identify, reduce, and overcome subject resistance. This effort shall also include a validated training course to teach the model of resistance and techniques to overcome resistance. The model and techniques shall be developed by using empirical evidence and available research literature on employing non-coercive, rapport-based, non-accusatorial interviewing techniques that have been demonstrated to be effective. None of the tactics and procedures shall require the use of any equipment or hardware. New research shall also be conducted that refines, validates, and further develops the model and techniques; and validates the developed training approach.

The effort shall identify and describe the following:

- Comprehensive model of resistance including techniques and tactics in identifying and understanding the different types of resistance encountered during intelligence interviews, the motivations underlying the resistance, and approaches to take to counter the resistance.
- Methods and procedures that enable interviewers to apply the model in real-time during interviews to determine each specific type of resistance and the best courses of action to follow.
- Specific approaches and tactics that overcome each type of resistance employed by a subject and increase the yield of accurate, truthful information from the subject.
- Best practices to use when subjects have been trained in counter-interrogation procedures.
- Actions and behaviors by interviewers that are counterproductive when determining and overcoming resistance during interviews.

Other features and requirements of the research, model, and techniques shall include the following:

- Methodology that is scientifically sound and directly applies to operational environments especially combating terrorism settings and enables users to identify the type of resistance in real time and based on observations.
- Compatibility with other evidence-based, non-coercive, rapport-based interview and interrogation strategies and techniques.
- Application of appropriate statistical techniques to analyze, test, and validate all research data and results.
- Comprehensive documentation of all research, methods, findings, and results regarding the model, techniques, and procedures.
- A validated training course providing thorough instruction of the model and the use of all related interview techniques and procedures including comprehensive instructor and student manuals.

All techniques, procedures and tactics must be directly employable during intelligence interviews. No proposal shall be accepted that does not grant to the U.S. Government full unlimited intellectual property rights to the all data, reports, results, and final deliverables.

A firm fixed price proposal is preferred; twelve (12) to eighteen (18) month base contract period of performance.

5.5. Irregular Warfare and Evolving Threats (IW/ET)

R4506 Synthetic Text Detection

Synthetic text generation has emerged as a fundamental threat to information security, with significant applications for adversary disinformation and propaganda. With little effort and training, adversaries can develop genuine-looking synthetic text, such as synthetic news articles, at machine speed and scale. Given the difficulty for human readers to differentiate between genuine or synthetic text, the accelerating nature of technical development, and the ease with which current detection tools can be fooled through minimal editing (especially when compared to imagery and video manipulation), there is high potential for disinformation as synthetic text capabilities erode trust in information sources.

Synthetic text generation capabilities currently outpace synthetic text detection capabilities. Commercially available detectors are imperfect, able to be fooled, and useful only to experts. A more robust system needs to be developed for use by a wide range of non-technical experts: analysts, OSINT collectors, government public affairs officers, Foreign Service Officers, and others within the interagency who work to combat disinformation but are not technical specialists. The government requires development of a reliable synthetic text detection application, with flexibility for upgrades, which can support operational experimentation while also being open to modification based on user feedback. The government retains the right to pursue a single or multiple solutions, as needs dictate.

This project will equip non-technical experts with an application, tool, plug-in, or other similar technical solution that can be standalone, updateable, and capable of identifying synthetically generated text, even after it may have been edited or further enhanced by humans. If successful, this project would represent an extreme enhancement over current human (manual) analysis. The solution shall:

1. Ingest at least twelve (12) to fifteen (15) paragraphs worth of text in under five (5) seconds; enough for a journal article, news post, or blog post to be quickly analyzed and refuted, if necessary.
2. Be based on current generation cloud IT infrastructure, with the ability to operate on a standalone desktop or edge hardware for periods of time if necessary.
3. Ideally be as passive as possible, requiring little to no interaction on behalf of the user, but at the very least be a simple “copy and paste” solution.
4. Indicate the result’s confidence level.
5. Highlight the synthesized text and explain the rationale behind this highlight.
6. Be technically compatible with other leading technical solutions currently on the market.
7. Maintain, or at least generate, a log of its performance for review.
8. Be delivered with a technical log of its development, for maintenance down the line.
9. Support at least two (2) extreme programming sessions with prospective end users during the project lifecycle, so they can highlight updates or changes they would like to see, along with a separate end of project exercise or demonstration. For these sessions, the government will provide **some** examples, in the form of Government Furnished Information/Data, against which the system may be tested. Additional examples shall be procured by the vendor.

10. Provide requisite end user instructional materials in the form of a training support package and iterative refinement of these materials in conjunction with end-of-project exercise(s) or demonstrations.

A firm fixed price proposal is preferred; twelve (12) to eighteen (18) month base contract period of performance.

5.6. Personnel Protection (PP)

R4474 Eye Protection Against High Powered Lasers

U.S. forces face increasing aggression and violence during protests and demonstrations. Operators do not know all of the threats they will encounter until they are on scene, and their equipment must protect against the most likely and injurious hazards. A hazard that is being encountered more frequently is commercial high-powered, hand-held lasers that can distract, disorient, and blind (temporarily or permanently) the operator. These lasers are inexpensive, easy to obtain, easy to conceal and carry, and easy to use. Eye protection is needed that will prevent the transmission of multiple portions of the electromagnetic spectrum, while minimally reducing visible light transmission. Develop eye protection (e.g., face shield, glasses) that shall provide the operator protection from frequencies of laser light while allowing enough visible light for the operator to see. The eye protection shall be compatible with currently fielded personal protective equipment (PPE) including but not limited to helmets, face shields, and communications equipment. The eye protection shall provide protection against red (620 nm–750 nm) (Threshold (T)), green (495 nm–570 nm) (T), blue (450 nm–495 nm) (Objective (O)), and violet (380 nm – 450 nm) (O). The eye protection shall allow 40% (T), 80% (O) visible light through to minimize the impact on the operator. Achievable optical density shall be declared.

A firm fixed price proposal is preferred; twelve (12) to eighteen (18) month base contract period of performance.

R4475 Discreet Personnel Tracking Device

U.S. forces are deployed to dense urban environments where communication pathways and GPS may be degraded or denied. In these harsh environments for communication and GPS, it becomes increasingly difficult to track personnel without existing infrastructure. To overcome this, it usually requires a very large device with multiple antennas and can limit the capability of the operator. A wearable tracking device that works in these harsh or denied GPS environments is needed. Develop a wearable unobtrusive tracking unit that shall integrate into normal attire (for example, within items of footwear). The system shall operate with no additional equipment (e.g., geo-located tags, repeaters, signal boosters). The tracking unit shall not change the visual appearance of the operator. The tracking unit shall not be easily discovered during a physical search (e.g., standard pat down). The tracking units shall be environmentally sealed (minimum of IPx6), and powered with a rechargeable battery that can be inductively charged. The system shall provide location information with < 20 m accuracy (Threshold (T)), < 5 m accuracy (Objective (O)) across an entire mission (minimum 2 hours). The tracking unit shall have the processing power and enough storage to maintain the data from an entire mission if there is no exfiltration path available. If an exfiltration path is available, the tracking unit shall forward location data to an external common operating picture. The exfiltration path shall be IEEE 802 compliant. The

data output from the tracking data shall be compatible with common C2 mapping tools (e.g., Cursor on Target, TAK). The system shall operate for up to 2 hours in GPS-denied and/or -disadvantaged environments from first initial loss of GPS.

A firm fixed price proposal is preferred; twelve (12) to eighteen (18) month base contract period of performance.

R4479 Advanced Transparent Armor for Non-Tactical Vehicles

The Department of Defense and the Department of State currently field over 4,000 non-tactical armored vehicles around the world. These vehicles consist of non-standardized transparent armor varying widely in thickness and weight with a normal ballistic resistance rating of VPAM VR7 or VR9. The current service life of installed transparent armor is approximately two years, due to normal wear or delamination of the glass. This effort shall standardize the transparent armor across its fleet with a 30% reduction in weight and thickness while achieving a ballistic rating of VPAM VR9. Threshold thickness shall be 1.4 inches with an objective thickness of equal to or less than 1.25 inches. Threshold weight shall be 15 pounds per square foot with an objective weight equal to or less than 13.5 pounds per square foot. The armor shall have improved delamination resistance with an objective five years operational use. Armor will conform to ATPD 2352R and have the ability to be fabricated with curvatures that can replicate the glass curvatures of civilian sedans, SUVs and vans.

A firm fixed price proposal is preferred; twelve (12) to eighteen (18) base contract period of performance.

R4481 Enhanced Ballistic Spectacle

Current USSOCOM Ballistic Spectacles have a lower ballistic resistance than full seal googles. Develop and demonstrate spectacle lenses capable of achieving goggle ballistic requirements (.22 cal, 17 grain t37 shaped projectile at 580 fps–590 fps) while maintaining current spectacle form factor and weight. Spectacles must be compatible with current SOF helmets, Visual Augmentation Systems, communications and weapons systems. The Ballistic Spectacles shall provide a non-corrosive, hydrophobic, interchangeable lensed system suitable for day/night operations that meets optical impact ballistic protection against 17 grain Fragment Simulating Projectile (FSP .22 cal) at 580 ft/s–590 ft/s and provides maximum unobstructed eye protection from sun, wind, dust, UV light, and saltwater sea spray while minimizing fogging in accordance with MIL PRF 32432A and ANSI z87.1Reduce IR laser threats (objective). Additionally, the spectacles shall provide improved scratch resistance over current Special Operations Eye Protection systems (objective).

A firm fixed price proposal is preferred; twelve (12) to eighteen (18) base contract period of performance.

R4490 Acoustic Drone Detection

Adversary UAS operations are a present and on-going threat to US forces around the world. One detectable signature that is created by all UAS devices are their acoustic signatures. Develop an open architecture system capable of detecting Group 1 and 2 UAS acoustic signatures capable of being integrated in current DoD RF/Optical detection systems. The system shall provide

360- degree coverage and shall be able to determine relative direction of the threat (35 degrees threshold, 15 degrees objective). The system shall detect at a range of 500 meters in open terrain and 250 meters in an urban environment. System shall utilize advanced machine learning to assist in the detection of threats and the elimination of noise/clutter in the environment. System shall be capable of operating alone or integrating into currently fielded DOD Counter UAS systems. The vendor shall use an open architecture and deliver an interface control document to facilitate future integration into DoD counter UAS systems. The system shall initially demonstrate capability as a static platform with the objective of a mobile capability.

A firm fixed price proposal is preferred; twelve (12) to eighteen (18) month base contract period of performance.

5.7. Physical Security (PS)

R4482 Portable Vehicle Barrier

Terrorists use vehicle ramming attacks to inflict casualties and property damage in crowded spaces. These attacks are difficult to prevent, have high-impact, and require minimal training and resources. Current countermeasures such as concrete barriers are time-consuming to deploy and do not allow authorized vehicles to pass if needed. This effort is to design and develop a modular, rapidly-deployable active barrier system to stop a 15,000-lb vehicle traveling at 30 mph. The system shall be designed so that multiple modules can be connected for protection of one or more lanes of traffic, and capable of stopping cars and trucks to protect crowds at sensitive locations and special events.

System specifications:

- Each module must stop a 15,000-lb diesel truck traveling at 30 mph (Threshold (T)), with penetration no greater than 20 feet. Each module must stop a 65,000-lb vehicle traveling at 50 mph (Objective (O)).
- The system shall be modular such that multiple modules can be connected to secure a multi-lane road. The connected modules must meet the stopping specification above to stop a 15,000-lb diesel truck traveling at 30 mph, with penetration no greater than 20 feet. The system must still meet the specification at points where two modules are joined.
- A single module shall be no greater than 11 feet wide when deployed. A single module may less than 11 feet wide and fold or collapse to be movable by 10,000-lb capacity forklift.
- A single module shall be deployable by two people and a 10,000-lb capacity forklift within 30 minutes.
- The system shall have the ability to be activated and deactivated to allow authorized vehicles to pass.
- In the deactivated position, the system shall allow heavy vehicles to pass, such as fire trucks and ambulances without affecting barrier capability. System must withstand an axle weight of (T) 32,000 pounds or (O) 50,000 pounds.
- The system shall not be anchored or require any alteration to infrastructure (e.g., roads, sidewalks, dividers).

A firm fixed price proposal is preferred; eighteen (18) month base contract period of performance.

5.8. Surveillance, Collection, and Operations Support (SCOS)

R4463 RF/DF Target Location and Classification Sensor Payload for Small UAS
Naval Special Warfare (NSW) lacks an Information Operations (IO) Electronic Warfare (EW) payload(s) for small unmanned aerial systems (sUAS). Payload(s) shall be capable of collecting radio frequencies (RF), full spectrum data and geolocation analysis of selected targets using direction finding (DF) of the target RF emissions. This capability shall provide Commanders with an electronic picture of hidden and camouflaged targets using RF emissions within the operational battlespace.

The Radio Find/Direction Find **(**RF/DF) payload(s) sensor kit shall be interoperable with Expeditionary Organic Tactical Airborne Intelligence, Surveillance and Reconnaissance (AISR) Capability Set (EOTACS) Group 1 sUAS host platform, specifically for FLIR R80D SkyRaider payloads. The sensor kit shall provide RF/DF survey capability with geo-location and be interoperable with android tactical assault kit (ATAK) (Threshold (T)) and RaptorX (Objective (O)). Sensor kit may have several subcomponents but shall be reconfigurable to operate as a sUAS payload capable of conducting electronic warfare orbits (T), and as a man-carried stationary payload(s) (O). The sensor kit may combine the direction information from two or more suitably spaced payload receivers or a single mobile receiver to locate the transmission via triangulation. A sensor payload kit shall consist of several subcomponents that shall include hardware and software. These subcomponents shall consist of RF/DF sensor(s) with geolocation processor and onboard loadable library, internal organic power supply, payload transmitter capable of Mesh Network (MANET) IP data communications, connection cable to enable wired data input with micro-USB type connector (this shall also double as a port for auxiliary power) and shall include all applicable scalable antenna arrays (phased, beamforming, and directional) as necessary for receiving the required range of electrometric emissions. The required frequencies shall include High Frequency (HF) (3 MHz –30MHz), Very High Frequency (VHF) (30 MHz–300MHz), Ultra High Frequency (UHF) (300 MHz–3 GHz), and Super High Frequency (SHF) (3 GHz–30 GHz); tactical and civilian electromagnetic emissions including commercial cellular (700 MHz–3 GHz), telematics frequencies (primarily 2.4 GHz and 5 GHz but may include 5 MHz–8 GHz), threat air search and targeting radars associated with mobile missile sites, and threat ground surveillance radars. When the sensor kit is put into operation for either mobile or stationary use the vendor shall use as few sensors and antennas as possible. The sensor payload kit shall be capable of surveying, classifying, and RF/DF of threat emitters from the listed frequencies described in the Key Performance Parameters (KPPs). The sensor kit is not required to cover all the frequencies listed concurrently.

Proposed Specifications and KPPs:

1. RF/DF Sensor(s) kit shall be interoperable with EOTACS Group 1 sUAS host platform, FLIR R80D SkyRaider.
2. Sensor(s) kit shall provide specific threat signal passive detection, collection, direction-finding (DF) and geo-location processing via ATAK (T) and RaptorX (O) protocols.

3. Sensor(s) kit shall perform geo-location computation and output target location within thirty (30) meters circular area of probability (CEP) within five (5) minutes of signal detection (T) or within ten (10) meters CEP within one (1) minute of signal detection (O).
4. Sensor payload(s) kit and antennas shall be man-packable and transported in a standard rucksack by 1 SOF operator.
5. Sensor(s) kit shall be reconfigurable. It shall be able to operate as a sUAS payload (T) or configurable as a sUAS payload and as a man carried device capable (O).
6. Each individual sensor payload(s) and required antenna array(s) that shall attach to the sUAS shall weigh less than 4.4 pounds per payload package (T) or less than 3 pounds (O).
7. Each sensor payload(s) shall be configured on EOTACS sUAS host platform, FLIR R80D SkyRaider for operation by 1 SOF operator without tools in less than 5 minutes (T) or less than 3 minutes (O).
8. Sensor payload kit:
    8.1. RF/DF sensor(s) with geolocation processor, and library storage.
    8.2. Each individual sensor(s) shall have 1 hour of internal organic power supply for individual sensor payload(s) attached to the sUAS (T) and shall be scalable with auxiliary power ports for the man packable carry configuration that may attach to both commercial and military power sources (O).
    8.3. Payload shall have a transmitter capable of communicating within any mobile ad hoc network (MANET) (T) or a MANET and Commercial Sim Card Cellular Network (O).
    8.4. The connection cable to enable wired data input shall be a micro-USB connector.
    8.5. Payload shall be able to operate in all weather conditions, as stated in the IP67 standard (T) or as stated in the IP68 standard (O).
9. Sensor kit capabilities
    9.1. Sensor(s) RF/DF/geo-location of threat spectrum range shall provide frequency and classification of signals 30 MHz–30 GHz (T) as the priority.
    9.2. The radio signal classifications are as follows: HF (3 MHz–30 MHz), VHF (30 MHz–90 MHz), and UHF tactical (90 MHz–400 MHz), commercial cellular and Wi-Fi communications (800 MHz–2000 MHz).
    9.3. The microwave signal classifications are as follows: threat air search and targeting radars associated with mobile missile sites through 12 GHz and threat ground surveillance radars through SHF (30 GHz).
    9.4. Payload(s) shall contain a programmable, operator/user defined at the edge, non-proprietary, library of threat emitter modes for automatic identification that can be imported and exported and that holds at least 5,000 user-defined communication and radar threat signals based upon Electronic Warfare Reprogrammable Library (EWRL) parameters (T), or 10,000 user-defined communications and radar threat signals based upon EWRL parameters (O).
    9.5. Payload(s) shall be aimed manually while receiving signals during sUAS and man packable operations (T) or utilized as an autonomous RF/DF sensor while receiving signals during sUAS and man packable operations (O).

A firm fixed price proposal is preferred; twelve (12) to (18) month base contract period of performance.

5.9. Tactical Operations Support (TOS)

R4491 Low Cost VTOL Precision Strike System (LC VTOL PSS)

Tactical Operators require a Low Cost (LC), hand launched Vertical Take Off and Landing (VTOL) Precision Strike System (PSS) to organically detect, confirm and destroy targets at extended ranges. Easily deployed by a single Tactical Operator, LC VTOL PSS will provide an extremely fast moving, combined ISR and precision strike capability for offensive operations with the advanced capability to engage multiple targets behind cover, in defilade, surrounded by substantial vertical obstacles, and also threats maneuvering in channelized areas that are found in complex urban terrain. Fielded capabilities and those currently under development require a rail or canister to launch, are cost-prohibitive, and require multiple operators for employment and command and control. The LC VTOL PSS will be deployed without a rail or canister, operate on an approved Advanced Encryption Standard (AES) 256 network data link, and be able to conduct aerial surveillance for up to 12 minutes prior to attacking a threat, increasing lethality and survivability of Small Tactical Teams.

LC VTOL PSS shall:

1. Be backpackable and weigh less than 15 pounds with battery (Threshold (T)); less than 10 pounds (Objective (O)).
2. Be transported by a single operator via an issued backpack during a foot movement, hand launched and operated without the assistance of a second operator. (T=O).
3. Require only one (1) operator to conduct fully automatic takeoff, navigate along pre-planned way points, arm and disarm the system, manually select the target, abort or wave-off during an attack and return home, if not used, for follow on missions. (T=O)
4. Take off and land within a confined space of one (1) square meter (m^2) (T) or ½ m^2 (O).
5. Use an AES 256 encrypted data link that complies with DoD policies. (T=O)
6. Allow a vertical hand-launch take-off and landing that can be performed from behind a cover and concealed location, doorway or window. (T=O)
7. Not require a rail or canister for a successful launch. (T=O)
8. Be compliant with American Security Drone Act (ASDA 2019). (T=O)
9. Have an operational flight time of 12 minutes (T); 20 minutes (O).
10. Have an electro optic (EO) capability (T); shall have the ability to switch from EO to IR or CMOS prior to operational employment (O).
11. Engage stationary and moving targets from 50 meters to 7 kilometers (T); 20 meters to 10 kilometers (O).
12. Have an attack speed of 150 mph (T); 200 mph (O).
13. Be able to hover, and positively identify (PID) targets from the hover. (T=O)
14. Have a payload with lethal effects equivalent to 60mm mortar round. (T=O)
15. Have a fire control unit (FCU) that is windows based, open architecture and be ATAK compatible. (T=O)
16. Operate in rain up to one-eighth (1/8) inch per hour (T), operate in rain up to one-quarter (1/4) inch per hour (O).
17. Have no audible detection from target at 400 meters (T), 200 meters (O).
18. Operate in the following flight modes:
    a. Standard pilot-controlled flight with assistive software enhancements (T).
    b. Point and click map-based navigation (T).

c. Point and click full motion video sensor navigation (T).
d. GPS-based waypoint navigation (T).
e. Automatic take off and recovery (T).
f. Vision-based navigation systems (O).

19. Be capable of housing a 1 kg warhead (T), 2 kg warhead (O), in the warhead bay.
20. Provide Electronic Safe and Arm Device (ESAD) and Fuse integration for impact (T), impact and proximity (O). Provide recommendations and cost estimates for Electronic Safe and Arm Device (ESAD) and Fuse integration for impact, impact and proximity.
21. Be hard case packaged in order to sustain a five (5) foot drop test. (T=O)
22. Be contained in ruggedized transport case (all kit components). (T=O)
23. Operate from a rechargeable, hot swappable power pack, OR, batteries that are United Nations (UN) certified for hazardous material transport, and UL certified for safety before delivery to the Government. (T=O)
24. Low Cost VTOL Precision Strike System (LC VTOL PSS) shall contain the following: (T=O)
    a. One (1) Ground Control Station (GCS)
    b. Four (4) full missiles with EO sensors
    c. One (1) charger
    d. Six (6) power packs; four (4)-one (1) for each missile and two (2) spares
    e. Spare parts
25. Include operations, maintenance manual, quick reference card, instructional video (T=O)

Deliverables:

Base Contract:

Phase 1: Deliver ten (10) LC VTOL PSS prototypes (ISR only) and CONUS training for operational testing and evaluation (OT&E).

Contract Options:

- Phase 2: Deliver ten (10) LC VTOL PSS prototypes (ISR and lethal payload) and CONUS training for operational testing and evaluation (OT&E).
- Phase 3: Deliver up to fifty (50) additional LC VTOL PSS prototypes (ISR and lethal payload) and CONUS training for OT&E.

A firm fixed price proposal is preferred; twelve (12) month base contract period of performance.

Responses to this requirement should include a proposed post-development end-unit ROM cost for the following:

- *LC VTOL PSS variant with ISR capability only*
- *LC VTOL PSS variant with both ISR and lethal payload capabilities*

R4492 Affordable Reconfigurable Micro-VTOL sUAS (ARMS)

Small Tactical Team Operators require a small, affordable, and reusable sUAS with lethal and non-lethal payload options. Current sUAS are non-compliant with American Security Drone Act (ASDA 2019), do not allow for multiple engagements, are cost prohibitive, and rely on non-secure flight platforms, components and RF telemetry. ARMS will deliver an ASDA compliant Micro-VTOL platform, purposely designed to accommodate reloadable munitions and

sensor payloads. ARMS will be reusable, reloadable, reconfigurable and capable of concurrently performing day and night airborne ISR and lethal air-to-ground delivery of munitions without adversely affecting the flight vehicle. To the maximum extent possible, the system will use available government-off-the-shelf (GOTS) standard and non-standard approved for use weapons and ammunition to reduce safety risk; and or commercial-off-the-shelf (COTS) available weapons and ammunition to reduce time to field, and overall cost. Purposefully designed to accommodate existing munitions, ARMS will possess enough endurance and adequate sensors to find, fix, and finish targets in a single, affordable, man-portable platform. ARMS will provide the individual Tactical Operator with increased lethality and survivability through a surgical precision-fire capability that allows for much greater standoff distances from threat targets.

ARMS shall:

1. Each ARMS kit shall include two (2) airframes (Threshold (T)), one (1) airframe (Objective (O)).
2. Air vehicle maximum gross take-off weight (MGTOW) shall be less than 7 pounds (T); less than 2 pounds (O).
3. In its tactical employment configuration, the entire system kit shall weigh less than 15 pounds (T); less than 7 pounds (O).
4. Telemetry link between Ground Control Station (GCS) and airframe shall be digital, auto and/or user selectable multi-frequency with AES-256 bit commercial encryption (T); mobile ad hoc network (MANET) or LTE network with NSA Type 1 Suite B encryption in a GPS denied environment (O).
5. Provide Electronic Safe and Arm Device (ESAD) and Fuse integration for impact (T), impact and proximity (O). Provide recommendations and cost estimates for Electronic Safe and Arm Device (ESAD) and Fuse integration for impact, impact and proximity.
6. Shall be controlled via TAK using Drone TAK plug in (T); Incorporate Augmented Reality to provide operator with a simplified interface that interacts with the real world (O).
7. Shall utilize an integrated GCS and fire controller in the form of a small tablet docked to a modular radio agnostic frame with the option for touch and/or tactile control inputs (T=O)
8. Size shall allow a single operator to transport entire kit on foot using only a rucksack or 3-day assault backpack (T); mounted to the operator via MOLLE attachment pouches(s) (O).
9. Launched and operated in all modes by a single operator during dismounted maneuvers (T=O).
10. Shall have a combat endurance of 25 minutes (T); 1 hour (O).
11. The GOTS and/or COTS standard or non-standard developed weapon(s) and ammunition(s) used for lethality shall be of small arms caliber (T=O); modifications to achieve lightweight packaging is acceptable.
12. Shall be capable to engage stationary and moving targets from 50 meters to 5 kilometers (T); 20 meters to 10 kilometers (O).
13. Shall allow for Vertical Takeoff or Landing (VTOL) with no external launching or recovery mechanism/ and capable of direct attack, mid-course navigation based on target coordinates and direct controller input, and hover (T=O).

14. Shall be capable of transitioning, without pause, from outdoor flight through an open door or window in order to engage targets in a standard 10 foot × 10 foot room (T); 20 foot × 20 foot room (O).
15. Shall be capable of transitioning, without pause, from indoors to outdoors. (T=O).
16. Shall be capable of engaging dismounted threat stationary and moving targets at distances from seven (7) to twenty-five (25) meters, when moving up to 15 miles per hour (mph); with a track crossing angle (TCA) of forty-five (45) degrees (T) and ninety (90) degrees (O), with a probability of hit (PHit) of 70% (T) and 90% (O) with a lightweight small arms weapon and ammunition mounted payload.
17. Shall include Electronic Safe and Arming Device (ESAD) with controller used by a separate operator (T); ESAD built into platform controller and used by same operator (O).
18. Industry shall provide an effective means of lightweight, highly accurate target acquisition to achieve shot accuracy 70% (T) and 90% (O) with a lightweight small arms weapon and ammunition mounted payload.
19. Platform shall be recoverable, reloadable, reusable, and capable of return to base if engagement not required (T); platform shall be recoverable, reloadable, reusable, and capable of return to base after engagement (O).
20. ARMS development will be in accordance with ASDA 2019 (T=O).
21. High Resolution fully stabilized (mechanical and digital) EO/IR gimbal (2 axis minimum) for real time Man-in-the-loop Situational Awareness (MITL SA) with a Ground Resolved Distance (GRD) of three (3) inches for day and night reconnaissance, targeting and weapons aiming/guidance (T=O).
22. Shall provide full array of user installed payloads with a first effort focus on a modular offensive payload that is reloadable, reusable and non-destructive to the flight platform (T=O).
23. Shall allow an individual Tactical Operator to simultaneously control two (2) kit airframes from the same integrated GCS and fire controller (T); to perform simultaneous attacks (O).
24. Shall be capable of operating and engaging targets in a GPS denied environment (T); shall have the capability to use non-GPS satellite navigation (e.g., GLONASS, Baidou, Galileo) to correlate accuracy of GPS in a potential jamming environment (T=O).
25. Shall be capable of autonomously disarming and returning to the Tactical Operator's or designated location upon loss of control data link (T=O).
26. Shall incorporate Artificial Intelligence (AI) to interact with environment for obstacle avoidance and navigation, and to assist operator with scene interpretation (T); incorporate AI to assist operator with target location, target identification, weapon aiming, and weapons employment (O).
27. Shall be obstacle avoidance capable; maintains stationary flight through three dimensional positioning indoors and outdoors (T=O); shall operate in wind speeds up to twenty-five (25) knots (T), thirty-five (35) knots (O).
28. Obstacle avoidance capability can be turned off and on while in flight (manual override) (T=O)
29. Systems shall include operations and maintenance manual, quick reference card, instructional video (T=O).

Deliverables:

- Base Contract: Deliver Twelve (12) Affordable Reconfigurable Micro-VTOL sUAS prototype systems and CONUS training for Operational Testing and Evaluation (OT&E).
- Contract Options: Deliver up to forty (40) Affordable Reconfigurable Micro-VTOL sUAS prototype systems (in groups of four (4)) and CONUS training OT&E.

A firm fixed price proposal is preferred; twelve (12) month base contract period of performance.

Responses to this requirement should include a proposed post-development end-unit ROM cost for ARMS.

R4494 Ballistically Matched Enhanced Performance Round (BM-EPR)
Currently snipers do not have the ability to switch mid-mission from standard issue match-grade ammunition, without re-zeroing their weapon, to use Enhanced Performance Round (EPR) ammunition. EPR and sniper match ammunition perform differently. Enhanced Performance Rounds (EPR), by design, are superior at penetrating light armor and still provide enough energy and cavitation to increase lethality on the target. A new higher performing EPR ammunition round must be further developed to be ballistically identical to match ammunition to provide this capability.

BM-EPR shall:

1. Develop Ballistically Matched (BM-EPR) ammunition for the following Program Sniper Calibers:
    1.1 AC58 6.5mm140gr Berger Hybrid Target Round (G1 Ballistic Coefficient (BC) .601) SOCOM Program Ammunition Specifications; Average muzzle velocity (MV) 2750 feet per second (fps) ±50fps (Threshold (T) = Objective (O)); MV 16fps standard deviation (SD) as fired from M110 Knights Armament Rifle with 22 inch barrel with a 1:8 twist (T=O). SOCOM 14.5 inch barrel with 1:7.5 twist variant average MV 2500fps MV and 16 fps SD (T=O).
    1.2 AC33 .300 Norma Magnum 215gr Berger Tactical Hybrid round (G1 BC .700) SOCOM Program Ammunition Specifications: Average MV 3000fps ±50fps MV 16fps SD as fired from MK22 MRAD with a 26 inch barrel with 1:8 Twist (T=O)
    1.3 AC32 .338 Norma Magnum 300gr Sierra Match King round (G1 BC .747) SOCOM Program Ammunition Specifications: Average MV 2700fps ±50fps MV 15fps SD as fired from MK22 MRAD with a 27 inch barrel with a 1:9.4 Twist (T=O).
2. BM-EPR Ammunition in each caliber will match Drop and Wind Drift within .5 Minute of Angle (MOA) of the mean point of impact of the surrogate round to 1000m (T), .5 MOA to 2000m (O). This will be validated with five (5) each five (5) round groups at 1,000m (T=O).
3. BM-EPR Ammunition shall match within 2% of the time of flight at 500m, 1000m, 1500m and 2000m. (T), within 1% at 500m, 1000m, 1500m and 2000m (O) of the surrogate round.
4. Muzzle Velocity: shall not exceed ±50fps Extreme Spread (ES); 16fps SD (T=O).
5. Ballistic Coefficient consistency: 2% ES (T) SD, less than 0.5% ES (O) SD.
6. Accuracy at 100m: 1 MOA (T), less than .5 MOA (O). This will be validated with five

(5) each five (5) round groups at 100m (T=O).

Quad charts shall specify manufacturer-specific approaches to reduce variances on the following variables as performance characteristics in manufacturing techniques:

7. Concentricity
8. Cartridge Base to Ogive (CBTO)
9. Powder:
    - 9.1 Powder moisture content
    - 9.2 Powder grain size
    - 9.3 Powder homogeneity
10. Cartridge case consistency (thickness and volume)
11. Neck tension
12. Projectile meplat consistency
13. Projectile surface finish

Deliverables:

Base Contract:

- Phase 1: Develop and deliver 5,000 6.5 Creedmoor BM-EPR prototypes for CONUS operational testing and evaluation (OT&E).
- Phase 2: Develop and deliver 5,000 .300 Norma Magnum BM-EPR prototypes for CONUS OT&E.
- Phase 3: Develop and deliver 5,000 .338 Norma Magnum BM-EPR prototypes for CONUS OT&E.

Contract Options:

- Option 1: Up to 15,000 additional of 6.5 Creedmoor BM-EPR prototypes for CONUS OT&E.
- Option 2: Up to 15,000 additional of .300 Norma Magnum BM-EPR prototypes for CONUS OT&E.
- Option 3: Up to 15,000 additional of .338 Norma Magnum BM-EPR prototypes for CONUS OT&E.

A Firm Fixed Price proposal is preferred; 12 months or less period of performance.

Responses to this requirement should include a proposed post-development end-unit ROM cost per round for 6.5 Creedmoor BM-EPR, .300 Norma Magnum BM-EPR, and .338 Norma Magnum BM-EPR prototypes.

R4497 Hand Held Precision Target Location Device (HHPTLD)

Small Tactical Units on the move require a hand-held means to rapidly calculate and determine precise, Category 1 (CAT1) through Category 3 (CAT3) grid coordinates of observed enemy locations for immediate targeting. The Hand Held Precision Target Location Device (HHPTLD) will provide Line of Sight (LoS) CAT1 through CAT3 grid coordinates for all targeting applications to ensure overmatch in speed of engagement and destruction while substantially reducing risk of fratricide and collateral damage. Military personnel using the HHPTLD are expected to be mobile immediately before and after determining a coordinate, and thus any

potential solution requiring use of a stationary tripod is expected to be operationally unacceptable; located near ferrous materials or in a magnetically dynamic environment, and thus any potential solution using Earth's magnetic field is expected to be unreliable; and finally, located in diverse conditions where lines, vines, branches, buildings, clouds, or aircraft may be partially obstructing a view of the sky/stars above. Solutions utilizing a view of the sky/stars are expected to overcome these partially obstructed views.

HHPTLD shall:

1. Be hand-held, stabilized, and operated by a single user (Threshold (T) = Objective (O)). System shall not be required to be stationary mounted on a tripod in order to meet the accuracy requirements described above.
2. Including battery, weigh less than 6 pounds (T), weigh less than 4 pounds (O).
3. The summation of the system's length, width, and height shall be less than or equal to 21 inches (T=O).
4. The system shall allow for continuous hours of observation while providing 30 targeting solutions within that time (T). The system shall allow for eight continuous hours of observation while providing 60 targeting solutions within that time (O).
5. The system shall meet the performance in Table 1 at ranges of 1000 meters or more.
6. The system shall meet the performance in Table 1 under the modeled conditions outlined in Tables 2 and 3 for day and night performance:

Table 1: Target Location Accuracy

	GPS Unavailable	**Sky Obstructed**	**No Pre-Planned Reference Points**	**Inability to Generate Reference Points**	**TLE – SE90 Threshold**	**TLE – SE90 Objective**
Scenario 1					< 6.4 meters	T=O
Scenario 2	X				< 6.4 meters	T=O
Scenario 3		X			< 6.4 meters	T=O
Scenario 4			X		< 6.4 meters	T=O
Scenario 5				X	< 6.4 meters	T=O
Scenario 6	X	X			< 15.5 meters	< 6.4 meters
Scenario 7	X		X		< 15.5 meters	< 6.4 meters
Scenario 8	X			X	< 15.5 meters	< 6.4 meters
Scenario 9		X	X		< 15.5 meters	< 6.4 meters

	GPS Unavailable	Sky Obstructed	No Pre-Planned Reference Points	Inability to Generate Reference Points	TLE – SE90 Threshold	TLE – SE90 Objective
Scenario 10		X		X	< 15.5 meters	< 6.4 meters
Scenario 11			X	X	< 15.5 meters	< 6.4 meters
Scenario 12	X	X	X		≤ 304.8 meters	< 6.4 meters
Scenario 13	X	X		X	≤ 304.8 meters	< 6.4 meters
Scenario 14	X		X	X	≤ 304.8 meters	< 6.4 meters
Scenario 15		X	X	X	≤ 304.8 meters	< 6.4 meters
Scenario 16	X	X	X	X	nothing required	< 6.4 meters

Definitions:

GPS Unavailable – Position of the device is not available from the Global Positioning System.

Sky Obstructed – The sky is fully obstructed from the device's position.

No Pre-Planned Reference Points – The system does not have any pre-planned reference points loaded or the pre-planned reference points are not in view.

Inability to Generate Reference Points – The horizon is obstructed and/or there are no recognizable, mapped structures in view from the device's position. The user cannot generate new reference points.

Table 2: Day/Night Requirements

Parameter	Day	Night
Illumination	Overcast Sunlight	Clear Starlight
Threshold Performance	≥ 1.5 km	≥ 0.5 km
Objective Performance	≥ 5.0 km	≥ 3.0 km

Table 3: NV-IPM Model Parameters

Parameter	Emissive (MWIR/LWIR)	Reflective (VIS/SWIR/NIR)
Task Difficulty (V50)	4.0	3.0
Target Contrast	2 degrees Celsius	40% target / 20% background (reflectivity)

Target Size	0.25 meters × 0.25 meters
Probability	70% probability of recognition
Atmosphere	Modtran
Atmosphere Model	Mid-Latitude Summer
Aerosol Model	Rural (Visibility = 23 km)
Atmospheric Turbulence	1e-15 $m^{-2/3}$
Sky to Ground ratio	3.0
Display Brightness (Modeling only)	70 cd/m^2
Minimum Frame Rate	30 Hz
Display Contrast	0.25 (RSS Contrast Level)
Observer Mode	NV-IPM observer model (2013)

7. Provide feedback to the operator by displaying the Target Location Error (TLE) by category:
    a. The system shall report "CAT 1" if TLE is ≥ 0 meters and < 6.4 meters, Spherical Error 90% (SE90).
    b. The system shall report "CAT 2" if TLE is ≥ 6.4 meters and < 15.5 meters, SE90.
    c. The system shall report "CAT 3" if TLE is ≥ 15.5 meters and < 30.7 meters, SE90.
    d. The system shall report "CAT 4" if TLE is ≥ 30.7 meters and < 91.7 meters, SE90.
    e. The system shall report "CAT 5" if TLE is ≥ 91.7 meters and < 304.8 meters, SE90.
8. The system shall be able to see a person carrying an object, at the distances described below, in all possible conditions that allow a clear LOS. The system shall allow the user to differentiate between a rifle and a two-handed object. The system is not required to allow the user to differentiate one type of weapon from another, or perform facial recognition.
    a. 1,500 meters daytime and 500 meters at night (T)
    b. 5,000 meters daytime and 3000 meters at night (O)
9. The system shall accept, and be able to read to and write from, a commercially available and commonly used removable storage device. Primary use will be for storage of picture/video, maps, and software upgrades.
10. Shall have an internal ranging system to ensure accuracy while lasing the intended target in order to meet Target-to-Observer line requirements. (T=O).
11. Target position location information needs to be generated in Cursor-on-Target (CoT) message format (T=O).
12. The system will interoperate with ATAK. The targeting information from the system will be transmittable to ATAK (T=O).

13. Shall be IP67 compliant (T=O).
14. Shall have the ability to mount a MIL-STD-1913 (1) rail system for additional sensors (T=O).
15. In accordance with MIL-STD-461F, the system performance shall not be affected by electromagnetic emissions from battlefield electronic devices operating in the immediate vicinity (up to 3 meters) of the system nor experience performance degradation when subjected to the electric fields outlined in the table below. Per MIL-STD-461F, all referenced field strengths are measured at the device under test. (T=O).

Table 4: Electromagnetic Radiated Susceptibility

Frequency Range (MHz)	RMS Field Strength (V/M)	Polarity
2 MHz – 30 MHz	50	Vertical
30 MHz – 100 MHz	50	Vertical + Horizontal
100 MHz – 1 GHz	50	Vertical + Horizontal
1 GHz – 18 GHz	50	Vertical + Horizontal
18 GHz – 40 GHz	n/a	n/a

16. Vibration: In accordance with MIL-STD-810G(1) Method 514.7: The system will be able to withstand the vibration effects during transport in accordance with below table. System can be enclosed within its field-carry case during this testing.

Table 5: Vibration Table

Transport Type	**Category**	**Test Name**	**Procedure**
Trucks and Trailers	4	Secured Cargo	I
	5	Loose Cargo	II
Aircraft	7	Jet	I
	8	Propeller	I
	9	Helicopter	I

17. Low Temperature: In accordance with MIL-STD-810G(1) Method 502.6:
    - Storage temperature, Procedure I: the system will operate without malfunction, damage, or degradation of performance following storage at −40 °C.
    - Operating temperature, Procedure II: The system will operate without malfunction, damage, or degradation of performance during exposure to temperatures as low as −19°C.
18. High Temperature: In accordance with MIL-STD-810G(1) Method 501.6:

- Storage temperature, Procedure I: The system will operate without malfunction, damage, or degradation of performance following storage at 71 °C.
- Operating temperature, Procedure II: The system will operate without malfunction, damage, or degradation of performance during exposure to temperatures as high as 49 °C.

19. Low Pressure (Altitude): In accordance with MIL-STD-810G(1) Method 500.6, the system will operate without malfunction, damage, or degradation of performance following exposure up to 35,000 feet Above Sea Level (ASL) (T). The system will operate without malfunction, damage, or degradation of performance during exposure up to 25,000 feet ASL (T). The system will operate without damage or degradation during exposure up to 50,000 feet ASL. (O).
20. Immersion: In accordance with MIL-STD-810G(1) Method 512.6 Procedure I, the system will be capable of operating without malfunction, damage, moisture intrusion, or degradation to performance following exposure to fresh water depth of 1 meter for 30 minutes. The device switches will not be inadvertently activated or damaged during immersion testing.
21. Blowing Sand and Dust: In accordance with MIL-STD-810G(1) Method 510.6, the system will operate without malfunction, damage, or degradation of performance after exposure to blowing sand and dust as encountered in current military operational environments. Exit-port covers and connector covers may be used during the test.
22. Each device shall include an individual tactical carry and padded transport/storage case (T=O).
23. Each device shall include multiple lens covers with lanyard, quick reference manual and distance learning web-based training video. (T=O).

Deliverables:

- Base Contract: Deliver four (4) Hand Held Precision Target Location Device (HHPTLD) prototypes with training for CONUS operational testing and evaluation (OT&E).
- Contract Options: Deliver up to twenty (20) additional HHPTLD prototypes (in groups of two (2)) with training for CONUS OT&E and Combat OPEVALs.

A firm fixed price proposal is preferred; 18 months or less period of performance.

Responses to this requirement should include a proposed post-development end-unit ROM cost.

R4498 .338 Signature-on-Target (SoT) Round

Crew-Served machine gunners require the ability to see the impact of their rounds fired day and night out to 2,000 meters to enable rapid adjustment of fires to the desired point of impact without exposing their location. The development of a .338 Norma Magnum (.338NM) Lightweight Medium Machine Gun (LWMMG) Signature-on-Target (SoT) round will provide machine gun operators with this advanced capability increasing Small Tactical Team lethality.

.338 Signature-on-Target (SoT) Round shall:

1. Match the trajectory of .338NM General Purpose (GP) Round (i.e., SoT round impacts within beaten zone/cone of fire of other .338NM GP rounds).
2. Have a minimum mean muzzle velocity, from a 24 inch Barrel with brass cartridges conditioned at 70 ° ± 5 °F of 2,600 fps (T), 2700 fps (O). The standard deviation of the muzzle velocity at 70° ± 5° F shall not exceed 25 fps (T), 10 fps (O). Have a cartridge overall length of 3.600" ± .007" (T=O), projectile weight of 272gr (T=O), propellant SMP®OBP 718, 94.5gr (T=O) and confrmal pressure at 70 ° ± 5 °F of ~54,000psi (T=O).
3. Be visible to the unaided eye out to 900 meters day, 1,500 meters night (T=O).
4. Be visible to the Night Vision aided eye out to 900 meters (T); 1500 meters (O).
5. Be visible with Visual Augmentation Systems (VAS) - (daylight with ELCAN 6x Machine Gun Optic) 1500 (T); 2200 (O).
6. Provide Hard Target (e.g., vehicle, building) signature initiation of 90% (T); 100% (O).
7. Provide Soft Target (e.g., sand, dirt) signature initiation of > 90% (O).
8. Have overall cartridge length not to exceed .338NM GP round (T=O).
9. Have no visual or NIR signature from muzzle exit until it strikes a target surface (no signature in flight) (T=O).
10. Be able to be fired from an open bolt, belt fed weapon system without inducing malfunctions (Weapon Compatibility) (T=O).

Deliverables:
Base Contract:

- Phase 1: Deliver four thousand (4,000) .338NM Signature-on-Target (SoT) rounds for CONUS safety and operational testing and evaluation (OT&E).

Contract Options:

- Phase 2: Deliver up to sixty thousand (60,000) additional .338NM Signature-on-Target (SoT) rounds (in groups of ten thousand (10,000) rounds) for CONUS safety certification, OT&E, and Combat Operational Evaluations (OPEVALs).
- Phase 3: Deliver up to ten (10) .338 NM LWMMG weapon system prototypes in groups of two (2) each.

A firm fixed price proposal is preferred; twelve (12) month base contract period of performance.

Responses to this requirement should include a proposed post-development end-unit ROM cost for weapons and SoT ammunition (per round).

R4500 Optic Mounted Recon Camera Device (OMRCD)
Tactical Operators require the ability to record images and video through use of their rifle optics while maintaining ability to stay on the rifle to maintain security and effectively engage threats. Optic Mounted Recon Camera Device (OMRCD) will provide this enhanced capability to Small Tactical Teams when conducting reconnaissance and surveillance to collect information on designated targets. This device will allow Tactical Operators to capture imagery while on target and use ATAK or other means to send real-time imagery to other operators, commanders and tactical operations centers. Also, important for training, Sniper Instructors currently do not have the capability to see what shooter-trainees are doing in their scopes, real-time in terms of hold overs, wind calls, and other long range shooting fundamentals. OMRCD will enable Sniper

Instructors the enhanced training capability to observe what students see in their scopes, real-time, on ATAK, a tablet or smart phone, in order to provide immediate feedback on the range, or follow-on classroom training environments.

OMRCD shall:

1. Capture state of the art resolution digital still imagery and Full Motion Video when mounted on rifle optics (T=O).
2. Collect imagery both day and night with the use of clip on night vision devices. (T=O).
3. Store onboard imagery collected on a micro SD card (T=O). Imagery collected must also be able to be passed to ATAK application through hardwire (T), wireless (O).
4. Enable tactical operators the ability to observe collected imagery in combat environment, four (4) shooters simultaneously (T), eight (8) shooters simultaneously (O), on one tablet or smart phone with the ability to toggle between split screens; via ATAK (T=O).
5. Provide Shooting Instructors the ability to remotely observe collected imagery of shooter's rifle scopes in training, individually, or simultaneously, four (4) shooters simultaneously (T), eight (8) shooters simultaneously (O) on one tablet or smart phone; with the ability to toggle between split screens; via ATAK (T), Wireless (O).
6. Be easily installed/removed on an assortment of rifle optics without use of tools (T=O).
7. Include adaptable attachment that does not interfere with best training practices of the rifle, and provide sizing mechanism to accommodate the variety of rifle optics used (T=O).
8. Integrate a shoot-through capability without impeding the shooters ability to directly engage targets (T=O).
9. Not degrade resolution of the rifle optic or night vision clip-on device (T=O); the device shall not optically degrade the shooters view of the scope reticle scale or magnification (T=O).
10. Provide an on-off record switch that does not interfere with normal shooter activities, and enables the shooter to maintain continuous eyes on target (T=O).
11. Be powered by a COTS available 3V lithium or AA battery with the ability to run for 8 hours (T), 16 hours (O); the device must be a single unit with the ability to change batteries while mounted (T=O).
12. OMRCD total weight including battery, 16 ounces (T), 8 ounces (O).
13. Not exceed 4 inches in length (T), 3 inches (O).
14. Not extend more than 1.25 inch (T), 0.5 inch (O) from the scope's ocular lens.
15. Easily and immediately delete all imagery collected by the device and zeroize all user selectable settings (T=O).
16. Be able to function in all weather conditions without fogging; be rugged for operational use; in accordance with Military Standard 810 G&H, MIL Standard 461F, and IP67 rated (T=O).
17. OMRCD shall not illuminate the shooter or shooter's position; and not incur off axis detectability of shooter or shooter's position (T=O).
18. Shall include transportation storage case, accessories, operations and maintenance manual, quick reference card, instructional video (T=O).

Deliverables:

- Base Contract: Deliver ten (10) Optic Mounted Recon Camera Device prototypes and

CONUS training for operational testing and evaluation (OT&E).

- Contract Options: Deliver up to forty (40) additional Optic Mounted Recon Camera Device prototypes (in groups of (4)) and CONUS training for OT&E.

A firm fixed price proposal is preferred; twelve (12) months or less period of performance.

Responses to this requirement should include a proposed post-development end-unit ROM cost.

R4501 Affordable Wireless Detonating Device (AWiDD)

Tactical operators require a low-cost, battery-operated, wireless detonating device consisting of a durable transmitter and programmable paired receiver. The transmitter must be able to pair with four or more receivers utilizing a multi-modal, uniquely encrypted signal to prevent exploitation by adversaries. The device must have shielding to protect against RF interference and electronic warfare. Affordable receivers will be reusable in inert training, and expendable in combat operations, not reusable by adversaries if recovered.

The AWiDD shall:

1. Be able to pair with four (4) receivers simultaneously (Threshold (T)), ten (10) receivers simultaneously (Objective (O)) using multi-modal, uniquely encrypted signal; additional receivers can be paired, as needed, for follow-on operations.
2. Be compatible with current DoD standard and non-standard operational and training demolition stocks (T=O).
3. Be capable of transmitting in complex urban high-noise RF environments and detonating Non-Line of Sight (NLOS) at distances of 50 meters (T), 200 meters (O).
4. Provide a multi-modal capability (T=O); enabling the Tactical Operator with redundant means to transmit and initiate explosives in high-noise RF environments (submit recommendations).
5. Be capable of transmitting in high-noise RF environments and detonating LOS at distances from 800 meters (T) to 1500 meters (O).
6. Transmitter must have cover to protect firing button; once exposed, firing button must flip from arm to safe (T=O). Transmitter shall be durable and reusable (T=O).
7. Transmitter total weight with batteries shall not exceed 2.0 lbs. (T); 1.25 lbs. (O); Shall not exceed eight (8) inches length × three (3) inches width × one (1) inch height (T=O).
8. Transmitter shall be powered by two (2) each CR123 COTS batteries that can be replaced without deleting user selectable settings (hot swappable) (T=O).
9. To achieve range requirements, Transmitter may have a telescoping antenna.
10. Receivers shall have dual safeties, be retrievable, with a removable protective cap insulator to allow for safe charge construction and integration, transportation, and rapid employment. Receivers shall be reusable in inert training, affordable and expendable for live fire training and combat operations (T=O).
11. Receiver shall initiate detonation only upon command from transmitter (T=O).
12. Receiver shall have a variable time delay before detonating (T=O).
13. Conduct system low-voltage circuit testing to verify connectivity from transmitter to receiver(s) without causing premature detonation; shall not arm until after a circuit test is successfully performed (T); shall provide indication of connectivity to, and status of, receivers once armed.

14. Shall have shielding to protect against RF interference and electronic warfare (T); able to work in vicinity of, and at the same time as, RF jammers (O).
15. Be able to return to safe mode for disassembly and re-use (T=O).
16. Be used in simultaneous dual-priming and dual-initiated demolition operations (T=O).
17. Be MIL-STD-1316, and MIL-STD 810G Compliant (T=O).
18. System kit shall contain one (1) Transmitter (T), two (2) Transmitters (O), and ten (10) receivers, transportation storage case, and accessories, operations and maintenance manual, quick reference card, instructional video (T=O).
19. Affordable Wireless Detonating Device system shall cost less than $500 (T), $100 (O) per complete system.

Deliverables:

- Base Contract: Deliver twelve (12) AWiDD prototypes for operational testing and evaluation (OT&E) and CONUS training.
- Contract Options: Deliver up to an additional twenty-four (24) AWiDD prototype systems for OT&E and CONUS training.

A firm fixed price contract proposal is preferred; twelve (12) month base contract period of performance, and six (6) months for options.

Responses to this requirement should include a proposed post-development end-unit ROM cost.

R4502 Advanced-Radio Agile Integrated Device (A-RAID)

Tactical Operators require a new communications hub containing multiple radios that when tethered to an End User Device (EUD) or Field Computer Device-Wearable (FCD-W) by way of a single cable, allows the EUD/FCD-W to be positioned anywhere on the body (vs. current chest mounted solutions), and allow the EUD/FCD-W to serve as the keypad display unit (KDU) for each of the included radio modules. The radio modules will be contained within a housing the size of a medium Small Arms Protective Insert (SAPI) plate that will be worn to the rear of the operator. This capability shall make the active components of the system available to the front of the wearer, passive components in the back, and significantly improve Tactical Unit Operator mobility.

The A-RAID shall:

1. Not exceed the dimensions of a shooter's cut Generation V Ballistic plate (size Medium, 10 inches × 12 inches) (Threshold (T) = Objective (O)).
2. Contain four (4) (T); six (6) (O) slots to accommodate the following software-defined RF modules:
    a. VHF (T)
    b. UHF (T)
    c. SATCOM (T)
    d. LTE (T)
    e. MANET Radio (O)
    f. Shall incorporate Video Downlink (i.e., Tac Rover-E with encryption capability) (O)
3. Modules shall support NSA Type 2 encryption (T); NSA Type 1 encryption (O).

4. A-RAID shall include state of the art EUD controller that is the current Program of Record (POR) Samsung Galaxy or Note smartphone with ATAK plugin to function as the radio Keypad Device Unit (KDU) (T=O).
5. Easily opened to allow the communicator to tailor the embedded radio modules based on mission needs (T=O).
6. Provide external plug-and-play antenna ports on the exterior top portion of the hub for radios in use; antennas shall be easily attached and detached (T=O).
7. Contain internally consolidated cables and connections between modules so that a single cable connects the hub, EUD/FCD-W, and headset (T=O).
8. Provide a method to prevent RF bleed over of the selected concurrently used embedded radio modules (T=O).
9. Hub shall be constructed of internal material that will provide adequate heat dissipation for concurrent use of multiple embedded radio modules as well as dual-purpose internal component shock and vibration protection (T=O).
10. Hub shall be ingress protected to IP65 rating (T=O).
11. Hub shall be worn on the Operator's back; MOLLE attachment points will be included on the hub exterior design (T=O).
12. Not interfere with emergency donning and doffing procedures (T=O).
13. Shall include an internal, replaceable and hot swappable battery that supports full operational system use for (4) hours on single charge (T); (6) hours or more on a single charge (O).
14. Shall have a charging port that allows for AC/DC charging in vehicles and standard power outlets (110/220V) (T); wireless charging dock (O).
15. Shall support a universal charging port (such as USB-C) (T=O).
16. Shall be fully integrated with Android Tactical Applications Kit (ATAK) suite (T=O).
17. System kit shall contain a transportation storage case, accessories, operations and maintenance manual, quick reference card, and training video (T=O).

Deliverables:

- Base Contract: Deliver twenty (20) Advanced-Radio Agile Integrated Device operational testing and evaluation (OT&E) prototypes with two (2) year warranty and support, and CONUS training.
- Contract Options: Deliver up to an additional forty (40) Advanced-Radio Agile Integrated Device OT&E prototype systems (in groups of four (4)) and CONUS training.

A firm fixed price proposal is preferred; eighteen (18) month base contract period of performance, and six (6) months for options.

Responses to this requirement should include a proposed post-development end-unit ROM cost.

5.10. Training Technology Development (TTD)

R4473 Military Free-Fall Jumpmaster Simulator (MFF-JM Sim)
Military Free-Fall (MFF) operations provide the Special Operations Forces (SOF) community

with a critical method of infiltration, but require a high level of training to execute properly and safely. Currently, units perform the majority of their training and rehearsals using aircraft mock-doors, with limited training time on inflight aircraft. The MFF-JM Sim shall enable MFF instructors and JMs to enhance classroom training and rehearsal of spotting techniques and aircraft procedures over virtual drop zones (DZ) modeled after real world DZs prior to going up in the air.

The purpose of the MFF-JM Sim is as follows: (1) provide MFF JM students the ability to safely and realistically practice the unique spotting techniques and interactions of MFF JM operations through virtual training scenarios; (2) integrate methodologies and tools for evaluating MFF Basic and JM students; (3) ensure correct Emergency Procedures (EPs) execution in the event of a MFF malfunction; (4) improve the MFF JM's spotting techniques and procedures on modeled DZs prior to going up in an actual aircraft; (5) build muscle memory and confidence in MFF JMs. This simulator shall support and be integrated into the current MFF JM Training Course, will be employed by Mobile Training Teams for use in initial and refresher training, and be used by operational MFF teams for mission rehearsal.

The MFF-JM Sim shall ensure key JM training tasks can be conducted in the environment through realistic replication of the inside of an aircraft, as well as realistically displaying terrain features outside of the aircraft using real world mapping and geospatial images. The MFF- JM Sim should incorporate the latest gaming technology, gaming software, Government Furnished ground terrain modeling, and programming tools to replicate aircraft system states, functionality, environment models, and human interactions typical of a MFF operation and environment. The MFF-JM Sim shall meet, but not be limited to, the following requirements:

- Replicate MFF operations for the following aircraft: CASA 212, C-27, C-130, CH-47, and V-22.
- Allow the MFF JM trainee to see and control aircraft flight path and ground drop zone approach via communication with Loadmaster or Aircrew.
- Allow the MFF JM trainee to see and interact with MFF parachutists, whether additional students or simulated characters. Simulated parachutists shall display realistic responses to a finite number of properly executed MFF JM trainee commands.
- Accurately display body, arm, and hand positions and movements in accordance with ATP 3-18.11 U.S. Army Special Forces Military Free-Fall Operations Manual. These shall include, but not be limited to, such example movements and positions as reaching out and issuing jump commands; issuing aircraft corrections to the Loadmaster/Aircrew; physically holding onto the aircraft while kneeling on the ramp; and looking out of the jump door, while able to see own hands, fellow jumpers, and Aircrew.
- Integration of Government issued helmet and oxygen mask, or replicated versions, with commercial-off-the-shelf Head Mounted Display, such as VR or AR goggles.
- Represent aircraft features virtually, as well ensure there is adequate physical infrastructure to provide realistic tactile sensation and interaction with the physical environment. Depending on the level of immersion, this could include a rudimentary or simple mock-up of the aircraft door and ramp, which can be felt, grasped, and leaned against.
- Ability for students to see and hear realistic operations in the aircraft, including ambient

noise, flight maneuvers, weather effects, wind, aircraft speed, and changes to key terrain features.

- Incorporate realistic terrain data supplied as Government Furnished Information (GFI).
- Capture and record the entire training event (i.e., the students' actions in the physical environment and the virtual training environment from the MFF JM's perspective) of all activities associated with an individual's MFF JM actions for later playback and after action review.
- Ability to build and save select scenarios which replicate parachute equipment, rigging errors, incorrect MFF JM tasks within sequence of events, MFF JM and students' potential safety violations, and in-flight emergencies.
- Ability to evaluate students' key performance metrics on executing the correct sequence of MFF JM commands and additional pre-jump control measures.
- Allow the primary instructor to view and control the evaluation scenario (via laptop or tablet) and allow one additional instructor to observe and interact with the simulation using virtual headset/goggles. The additional instructor will also perform the duties and role of Loadmaster or aircrew in the simulation.
- Allow additional personnel to observe the evaluation at a separate, but adjacent location. This shall not require interaction with the simulation.
- Be designed for easy set up and operation by end users and require limited maintenance
- Portable and capable of being set up and function in a multitude of physical environments (i.e., different sized rooms in various locations).
- System hardware that shall not restrict the mobility of the user in a manner as to cause altered actions in the aircraft due to limited mobility.

The Offeror shall support an evaluation of the prototype system by the Government on system usability and effectiveness in achieving the training objectives and make necessary updates and changes. The Offeror shall work with the Government to coordinate instructor and student participation and developmental evaluation. The final product shall be delivered and installed by the Offeror at the Government end user site with training on proper operation and maintenance of the system. Offeror shall provide the Government with training manuals, job-aids, and other reference materials for starting, running, maintaining, and storing the system.

The Offeror shall deliver the MFF JM Sim in accordance with DoDI 8510.01 "*Risk Management Framework (RMF) for DoD Information Technology (IT),*" and DoDI 8500.01, "*Cybersecurity*." This shall include coordinating with the Government on necessary steps to obtain the Authority to Test, Authority to Connect, and Interim Authority to Operate for integration into the USSOCOM Special Operations Forces Training Enterprise Network architecture for networked simulation.

A firm fixed price proposal is preferred; no more than eighteen (18) month base period of performance.