

DEPARTMENT OF THE NAVY (DON)
Small Business Innovation Research (SBIR)
DoW 2026 SBIR BAA Release 2
Direct to Phase II (DP2) Proposal Submission Instructions

IMPORTANT

- **The following instructions apply to Direct to Phase II (DP2) SBIR topic only:**
 - **DON26BZ02-DV051 through DON26BZ02-DV053**
- Submitting small business concerns (SBCs) are encouraged to thoroughly review the DoW SBIR/STTR Program Broad Agency Announcement (BAA) and register for the DSIP Listserv to remain apprised of important programmatic changes.
 - The DoW Program BAA is located at: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/#announcements>. Select the tab for the appropriate BAA cycle.
 - Register for the DSIP Listserv at: <https://www.dodsbirsttr.mil/submissions/login>.
- The information provided in the DON Proposal Submission Instructions takes precedence over the DoW Instructions posted for this BAA.
- A submitting SBC **MUST** use the DP2 Phase I Feasibility proposal template for Volume 2. This template is specific to DON DP2 topics and meets DP2 submission requirements. The DP2 Phase I Feasibility proposal template can be found at https://navysbir.com/links_forms.htm.
- Proposing SBCs that are more than 50% owned by multiple venture capital operating companies (VCOC), hedge funds (HF), private equity firms (PEF) or any combination of these are eligible to submit proposals in response to DON topics advertised in this BAA. Information on Majority Ownership in Part and certification requirements at time of submission for these proposing SBCs are detailed in the section titled ADDITIONAL SUBMISSION CONSIDERATIONS.
- The DON may consider the following FAR and Non-FAR contracting strategies when issuing Phase II awards: Cost Plus Fixed Fee (CPFF), Firm Fixed Price (FFP), Basic Ordering Agreement (BOA), or Prototype Other Transaction (OT).
- This BAA is issued under regulations set forth in Federal Acquisition Regulation (FAR) 35.016 and awards will be made under “other competitive procedures”. The policies and procedures of FAR Subpart 15.3 shall not apply to this BAA, except as specifically referenced in it. All procedures are at the sole discretion of the Government as set forth in this BAA. Submission of a proposal in response to this BAA constitutes the express acknowledgement to that effect by the proposing SBC.

INTRODUCTION

The DON SBIR/STTR Programs are mission-oriented programs that integrate the needs and requirements of the DON’s Fleet through research and development (R&D) topics that have dual-use potential, but primarily address the needs of the DON. More information on the programs can be found on the DON

SBIR/STTR website at www.navy.sbir.com. Additional information on DON’s mission can be found on the DON website at www.navy.mil.

The Department of War (DoW), including the Department of the Navy (DON), may issue an SBIR award to an SBC under Phase II, without regard to whether the SBC received a Phase I award for such project. Prior to such an award, the head of the agency, or their designee, must issue a written determination that the SBC has demonstrated the scientific and technical merit and feasibility of the technology solution that appears to have commercial potential (for use by the government or in the public sector). The determination must be submitted to the Small Business Administration (SBA) prior to issuing the Phase II award. As such, DON issues this portion of the BAA in accordance with the requirements of the Direct to Phase II (DP2) authority. Only those proposing SBCs that are capable of meeting the DP2 proposal requirements may participate in this DP2 BAA. No Phase I awards will be issued to the designated DP2 topic.

For questions regarding this BAA, use the information in Table 1 to determine who to contact for what types of questions.

TABLE 1: POINTS OF CONTACT FOR QUESTIONS REGARDING THIS BAA

Type of Question	When	Contact Information
Program and administrative	Always	DON SBIR/STTR Program Management Office usn.pentagon.cnr-arlington-va.mbx.navy-sbir-sttr@us.navy.mil or appropriate Program Manager listed in Table 2 (below)
Topic-specific technical questions	BAA Pre-release	Technical Point of Contact (TPOC) listed in each topic on the DoW SBIR/STTR Innovation Portal (DSIP). Refer to the Proposal Submission section of the DoW SBIR/STTR Program BAA for details.
	BAA Open	DoW SBIR/STTR Topic Q&A platform (https://www.dodsbirsttr.mil/submissions) Refer to the Proposal Submission section of the DoW SBIR/STTR Program BAA for details.
Electronic submission to the DoW SBIR/STTR Innovation Portal (DSIP)	Always	DSIP Support via email at dodsbirsupport@reisystems.com
Navy-specific BAA instructions and forms	Always	DON SBIR/STTR Program Management Office usn.pentagon.cnr-arlington-va.mbx.navy-sbir-sttr@us.navy.mil

TABLE 2: DON SYSTEMS COMMAND (SYSCOM) SBIR PROGRAM MANAGERS

Topic Numbers	Point of Contact	SYSCOM	Email
DON26BZ02-DV051 to DON26BZ02-DV053	Mr. Jason Schroepfer	Naval Sea Systems Command (NAVSEA)	NSSC_SBIR.fct@navy.mil

Each DON SBIR DP2 topic requires documentation to determine that Phase I feasibility, described in the Phase I section of the topic, has been met.

The DON SBIR DP2 is a two-step process:

STEP ONE: Prepare and Submit a Phase I Feasibility Proposal (instructions and link to template provided below). The purpose of the Phase I Feasibility Proposal is for the proposing SBC to provide documentation to substantiate that both Phase I feasibility and the scientific and technical merit described in the topic have been met. The Phase I Feasibility Proposal must: demonstrate that the proposing SBC performed Phase I-type research and development (R&D) and provide a concise summary of Phase II objectives, work plan, related research, key personnel, transition/commercialization plan, and estimated costs. Feasibility documentation MUST NOT be solely based on work performed under prior or ongoing federally funded SBIR/STTR work. The government will evaluate Phase I Feasibility Proposals and select SBCs to submit a Full DP2 Proposal. Demonstrating proof of feasibility is a requirement for a DP2 award. The SBC must submit a Phase I Feasibility Proposal to be considered for selection to submit a Full DP2 Proposal.

STEP TWO: If selected, the cognizant SYSCOM Program Office will contact the SBC directly to provide instructions on how to submit a Full DP2 Proposal.

DON SBIR reserves the right to make no awards under this DP2 BAA. All awards are subject to availability of funds and successful negotiations. Proposing SBCs must read the topic requirements carefully. The Government is not responsible for expenditures by the proposing SBC prior to award of a contract. For 2026.BZ Release 1 topics designated as DP2, DON will accept only Phase I Feasibility Proposals (described below).

DP2 PROPOSAL SUBMISSION REQUIREMENTS

The following section details requirements for submitting a compliant DON SBIR DP2 Proposal to the DoW SBIR/STTR Programs.

(NOTE: Proposing SBCs are advised that support contract personnel will be used to carry out administrative functions and may have access to proposals, contract award documents, contract deliverables, and reports. All support contract personnel are bound by appropriate non-disclosure agreements.)

DoW SBIR/STTR Innovation Portal (DSIP). Proposing SBCs are required to submit proposals via the DoW SBIR/STTR Innovation Portal (DSIP); and follow proposal submission instructions in the DoW SBIR/STTR Program BAA on the DSIP at <https://www.dodsbirsttr.mil/submissions>. Proposals submitted by any other means will be disregarded. Proposing SBCs submitting through DSIP for the first time will be asked to register. It is recommended that proposing SBCs register as soon as possible upon identification of a proposal opportunity to avoid delays in the proposal submission process. Proposals that are not successfully certified electronically in DSIP by the Corporate Official prior to BAA Close will NOT be considered submitted and will not be evaluated by DON. Proposals that are encrypted, password protected, or otherwise locked in any portion of the submission will be REJECTED unless specifically directed within the text of the topic to which you are submitting. Please refer to the DoW SBIR/STTR Program BAA for further information.

Eligibility. Each proposing SBC must:

- Have demonstrated feasibility of Phase I-type R&D work
- Have submitted a Phase I Feasibility Proposal for evaluation

- Meet Offeror Eligibility and Performance Requirements as defined in the Proposal Fundamentals section of the DoW SBIR/STTR Program BAA
- Comply with primary employment requirements of the principal investigator (PI) during the Phase II award including, employment with the SBC at the time of award and during the conduct of the proposed project. Primary employment means that more than one-half of the PI's time is spent in the employ of the SBC
- Register in the System for Award Management (SAM) as defined in the Certifications and Registrations section of the DoW SBIR/STTR Program BAA. To register, visit <https://sam.gov/>

Proposal Volumes. The following seven volumes are required.

- **Proposal Cover Sheet (Volume 1).** As specified in DoW SBIR/STTR Program BAA.
- **Technical Volume (Volume 2).**
 - Technical Proposal (Volume 2) must meet the following requirements or the proposal will be REJECTED:
 - A submitting SBC MUST use the DP2 Phase I Feasibility proposal template for Volume 2. The DP2 Phase I Feasibility proposal template can be found at https://navysbir.com/links_forms.htm.

This template is specific to DON DP2 topics and meets DP2 submission requirements:

- Not to exceed 30 pages, regardless of page content; Phase I Proof of Feasibility portion not to exceed 20 pages, Snapshot of Proposed Phase II Effort portion not to exceed 10 pages
- Single column format, single-spaced typed lines
- Standard 8 ½" x 11" paper
- Page margins one inch on all sides. A header and footer may be included in the one-inch margin.
- No font size smaller than 10-point
- Additional information:
 - A font size smaller than 10-point is allowable for headers, footers, imbedded tables, figures, images, or graphics that include text. However, proposing SBCs are cautioned that if the text is too small to be legible it will not be evaluated.
- **Cost Volume (Volume 3).** The text fields related to costs for the proposed effort must be answered in the Cost Volume of the DoW Submission system (at <https://www.dodsbirsttr.mil/submissions/>), however, proposing SBCs DO NOT need to download and complete the separate cost volume template when submitting the DON SBIR Phase I Feasibility Proposal. Proposing SBCs are to include a cost estimate in the Order of Magnitude Cost Estimate Table (example below) within the Snapshot of Proposed Phase II Effort portion of the Technical Volume (Volume 2). Please refer to Table 3 below for guidance on cost and period of performance. Costs for the Base and Option are to be separate and identified on the Proposal Cover Sheet and in the Order of Magnitude Cost Estimate Table in the Technical Volume (Volume 2).

Order of Magnitude Cost Estimate Table			
Line Item – Details	Estimated Base Amount	Estimated Option Amount	Total Estimated Amount Base + Option
Direct Labor (fully burdened) – Prime			
Subcontractors/Consultants			

Material			
Travel & ODC			
G&A			
FCCM			
Fee/Profit			
TABA (NTE \$25K, included in total amount)			
Total Estimated Costs			

TABLE 3: COST & PERIOD OF PERFORMANCE

Topic Number	Base		Option		Total (NTE)
	Cost (NTE)	POP (NTE)	Cost (NTE)	POP (NTE)	
DON26BZ02-DV051 to DON26BZ02-DV053	\$700,000	12 mos.	\$1,300,000*	24 mos.*	\$2,000,000*

* Step Two: for the Full Phase II submission, if selected, the Phase II Option 1 and Phase II Option 2 to be detailed separately:

- Phase II Option 1: Cost \$700,000, Period of Performance 12 months
 - Phase II Option 2: Cost \$600,000, Period of Performance 12 months
- Additional information:
 - For Phase II a minimum of 50% of the work is performed by the proposing SBC. The percentage of work requirement must be met in the Base costs as well as in the Option costs. The percentage of work is measured by both direct and indirect costs. To calculate the minimum percentage of work for the proposing SBC the sum of all direct and indirect costs attributable to the proposing SBC represent the numerator and the total cost of the proposal (i.e., Total Cost before Profit Rate is applied) is the denominator. The subcontractor percentage is calculated by taking the sum of all costs attributable to the subcontractor as the numerator and the total cost of the proposal (i.e., Total Cost before Profit Rate is applied) as the denominator. **NOTE:** G&A, if proposed, will only be attributed to the proposing SBC.
 - Provide sufficient detail for subcontractor, material, and travel costs. Subcontractor costs must be detailed to the same level as the prime contractor. Material costs must include a listing of items and cost per item. Travel costs must include the purpose of the trip, number of trips, location, length of trip, and number of personnel.
 - Inclusion of cost estimates for travel to the sponsoring SYSCOM’s facility for one day of meetings is recommended for all proposals.
 - The “Additional Cost Information” of Supporting Documents (Volume 5) may be used to provide supporting cost details for Volume 3.
- **Company Commercialization Report (Volume 4).** DoW collects and uses Volume 4 and DSIP requires Volume 4 for proposal submission. Please refer to the Proposal Preparation Instructions and Requirements section of the DoW SBIR/STTR Program BAA for details to ensure compliance with DSIP Volume 4 requirements.
- **Supporting Documents (Volume 5).** Volume 5 is for the submission of administrative material that DON may or will require to process a proposal, if selected, for contract award.

All proposing SBCs must review and submit the following items, as applicable:

- **Majority Ownership in Part.** Proposing SBCs which are more than 50% owned by multiple venture capital operating companies (VCO), hedge funds (HF), private equity firms (PEF), or any combination of these as set forth in 13 C.F.R. § 121.702, are eligible to submit proposals in response to DON topics advertised within this BAA. Complete the certification as detailed under ADDITIONAL SUBMISSION CONSIDERATIONS.
- Additional information:
 - Proposing SBCs may include the following administrative materials in Supporting Documents (Volume 5); a template is available at https://navysbir.com/links_forms.htm to provide guidance on optional material the proposing SBC may want to include in Volume 5:
 - Additional Cost Information to support the Cost Volume (Volume 3)
 - SBIR/STTR Funding Agreement Certification
 - Data Rights Assertion
 - Disclosure of Information (DFARS 252.204-7000)
 - Prior, Current, or Pending Support of Similar Proposals or Awards
 - Foreign Citizens
 - Details of Request for Discretionary Technical and Business Assistance (TAB), if proposed, is to be included under the Additional Cost Information section if using the DON Supporting Documents template.
 - Do not include documents or information to substantiate the Technical Volume (Volume 2) (e.g., resumes, test data, technical reports, or publications). Such documents or information will not be considered.
 - A font size smaller than 10-point is allowable for documents in Volume 5; however, proposing SBCs are cautioned that the text may be unreadable.
- **Fraud, Waste and Abuse Training Certification (Volume 6).** DoW requires Volume 6 for submission. Please refer to the Proposal Preparation Instructions and Requirements section of the DoW SBIR/STTR Program BAA for details.
- **Disclosures of Foreign Affiliations or Relationships to Foreign Countries (Volume 7).** In accordance with Section 4 of the SBIR and STTR Extension Act of 2022 and the SBA SBIR/STTR Policy Directive, the DoW will review all proposals submitted in response to this BAA to assess security risks presented by SBCs seeking a Federally funded award. SBCs must complete the Disclosures of Foreign Affiliations or Relationships to Foreign Countries webform in Volume 7 of the DSIP proposal submission. Please refer to the Proposal Preparation Instructions and Requirements section of the DoW SBIR/STTR Program BAA for details.

DP2 EVALUATION AND SELECTION

The following section details how the DON SBIR/STTR Programs will evaluate Phase I Feasibility proposals.

Proposals meeting DSIP submission requirements will be forwarded to the DON SBIR/STTR Programs. Prior to evaluation, all proposals will undergo a compliance review to verify compliance with DoW and DON SBIR/STTR proposal eligibility requirements. Proposals not meeting submission requirements will be REJECTED and not evaluated.

- **Proposal Cover Sheet (Volume 1).** The Proposal Cover Sheet (Volume 1) will undergo a compliance review to verify the proposing SBC has met eligibility requirements and followed the instructions for Proposal Cover Sheet as specified in the DoW SBIR/STTR Program BAA.
- **Technical Volume (Volume 2).** The DON will evaluate and select Phase I Feasibility proposals using the evaluation criteria specified in the Method of Selection and Evaluation Criteria section of the DoW SBIR/STTR Program BAA, with technical merit being most important, followed by qualifications of key personnel and commercialization potential of equal importance. The information considered for this decision will come from Volume 2. This is not a FAR Part 15 evaluation and proposals will not be compared to one another. Cost is not an evaluation criterion and will not be considered during the evaluation process; the DON will only do a compliance review of Volume 3. Due to limited funding, the DON reserves the right to limit the number of awards under any topic.

The Technical Volume (Volume 2) will undergo a compliance review (prior to evaluation) to verify the proposing SBC has met the following requirements or the proposal will be REJECTED:

- A submitting SBC MUST use the DP2 Phase I Feasibility proposal template for Volume 2. The DP2 Phase I Feasibility proposal template can be found at https://navysbir.com/links_forms.htm.

This template is specific to DON DP2 topics and meets DP2 submission requirements:

- Not to exceed 30 pages, regardless of page content; Phase I Proof of Feasibility portion not to exceed 20 pages, Snapshot of Proposed Phase II Effort portion not to exceed 10 pages
 - Single column format, single-spaced typed lines
 - Standard 8 ½" x 11" paper
 - Page margins one inch on all sides. A header and footer may be included in the one-inch margin.
 - No font size smaller than 10-point, except as permitted in the instructions above.
- **Cost Volume (Volume 3).** The Cost Volume (Volume 3) will not be considered in the selection process and will undergo a compliance review to verify the proposing SBC has met the following requirements or the proposal will be REJECTED:
 - Must not exceed values for the Base and Option (refer to Table 3).
 - Must meet minimum percentage of work; a minimum of 50% of the work is performed by the proposing SBC. The percentage of work requirement must be met in the Base costs as well as in the Option costs.
- **Company Commercialization Report (Volume 4).** The CCR (Volume 4) will not be evaluated by the DON nor will it be considered in the award decision. However, all proposing SBCs must refer to the DoW SBIR/STTR Program BAA to ensure compliance with DSIP Volume 4 requirements.
- **Supporting Documents (Volume 5).** Supporting Documents (Volume 5) will not be considered in the selection process and will only undergo a compliance review to ensure the proposing SBC has included items in accordance with the DP2 SUBMISSION INSTRUCTIONS section above.
- **Fraud, Waste, and Abuse Training Certificate (Volume 6).** Not evaluated.
- **Disclosures of Foreign Affiliations or Relationships to Foreign Countries (Volume 7).** Disclosures of Foreign Affiliations or Relationships to Foreign Countries (Volume 7) will be assessed as part of the Due Diligence Program to Assess Security Risks. Refer to the DoW SBIR/STTR Program BAA to ensure compliance with Volume 7 requirements.

ADDITIONAL SUBMISSION CONSIDERATIONS

This section details additional items for proposing SBCs to consider during proposal preparation and submission process.

Due Diligence Program to Assess Security Risks. The SBIR and STTR Extension Act of 2022 (Pub. L. 117-183) requires the Department of War, in coordination with the Small Business Administration, to establish and implement a due diligence program to assess security risks presented by SBCs seeking a Federally funded award. Please review the Certifications and Registrations section of the DoW SBIR/STTR Program BAA for details on how DoW will assess security risks presented by SBCs. The Due Diligence Program to Assess Security Risks will be implemented for all Phases.

Discretionary Technical and Business Assistance (TABA). The SBIR and STTR Policy Directive section 9(b) allows the DON to provide TABA (formerly referred to as DTA) to its awardees. The purpose of TABA is to assist awardees in making better technical decisions on SBIR/STTR projects; solving technical problems that arise during SBIR/STTR projects; minimizing technical risks associated with SBIR/STTR projects; and commercializing the SBIR/STTR product or process, including intellectual property protections. Proposing SBCs may request, in their Cost Volume (Volume 3), to contract these services themselves through one or more TABA providers in an amount not to exceed the values specified below. The Phase II TABA amount is up to \$25,000 per award, is to be included as part of the award amount and is limited by the established award values for Phase II by the SYSCOM (i.e., within the \$2,000,000 or lower limit specified by the SYSCOM). The amount proposed for TABA cannot include any profit/fee by the proposing SBC and must be inclusive of all applicable indirect costs. TABA cannot be used in the calculation of general and administrative expenses (G&A) for the SBIR proposing SBC. A Phase II project may receive up to an additional \$25,000 for TABA as part of one additional (sequential) Phase II award under the project for a total TABA award of up to \$50,000 per project. A TABA Report, detailing the results and benefits of the service received, will be required annually by October 30.

Request for TABA funding will be reviewed by the DON SBIR/STTR Program Management Office.

If the TABA request does not include the following items the TABA request will be denied.

- TABA provider(s) (firm name)
- TABA provider(s) point of contact, email address, and phone number
- An explanation of why the TABA provider(s) is uniquely qualified to provide the service
- Tasks the TABA provider(s) will perform (to include the purpose and objective of the assistance)
- Total TABA provider(s) cost, number of hours, and labor rates (average/blended rate is acceptable)

TABA must **NOT**:

- be subject to any indirect costs, profit, or fee by the SBIR proposing SBC
- propose a TABA provider that is the SBIR proposing SBC
- propose a TABA provider that is an affiliate of the SBIR proposing SBC
- propose a TABA provider that is an investor of the SBIR proposing SBC
- propose a TABA provider that is a subcontractor or consultant of the requesting SBC otherwise required as part of the paid portion of the research effort (e.g., research partner, consultant, tester, or administrative service provider)

TABA requests must be included in the proposal as follows:

- Phase II:
 - DON Phase II Cost Volume (provided by the DON SYSCOM) - the value of the TABA request.

- Supporting Documents (Volume 5) – a detailed request for TABA (as specified above) specifically identified as “TABA” in the section titled Additional Cost Information when using the DON Supporting Documents template.

Proposed values for TABA must NOT exceed:

- Phase II: A total of \$25,000 per award, not to exceed \$50,000 per Phase II project

Disclosure of Information (DFARS 252.204-7000). In order to eliminate the requirements for prior approval of public disclosure of information (in accordance with DFARS 252.204-7000) under this award, the proposing SBC shall identify and describe all fundamental research to be performed under its proposal, including subcontracted work, with sufficient specificity to demonstrate that the work qualifies as fundamental research. Fundamental research means basic and applied research in science and engineering, the results of which ordinarily are published and shared broadly within the scientific community, as distinguished from proprietary research and from industrial development, design, production, and product utilization, the results of which ordinarily are restricted for proprietary or national security reasons (defined by National Security Decision Directive 189). An SBC whose proposed work will include fundamental research and requests to eliminate the requirement for prior approval of public disclosure of information must complete the DON Fundamental Research Disclosure and upload as a separate PDF file to the Supporting Documents (Volume 5) in DSIP as part of their proposal submission. The DON Fundamental Research Disclosure is available on https://navysbir.com/links_forms.htm and includes instructions on how to complete and upload the completed Disclosure. Simply identifying fundamental research in the Disclosure does **NOT** constitute acceptance of the exclusion. All exclusions will be reviewed and, if approved by the Government Contracting Officer, noted in the contract.

Majority Ownership in Part. Proposing SBCs that are more than 50% owned by multiple venture capital operating companies (VCOC), hedge funds (HF), private equity firms (PEF), or any combination of these as set forth in 13 C.F.R. § 121.702, **are eligible** to submit proposals in response to DON topics advertised within this BAA.

For proposing SBCs that are a member of this ownership class the following must be satisfied for proposals to be accepted and evaluated:

- a. Prior to submitting a proposal, proposing SBCs must register with the SBA Company Registry Database.
- b. The proposing SBC within its submission must submit the Majority-Owned VCOC, HF, and PEF Certification. A copy of the SBIR VC Certification can be found on https://navysbir.com/links_forms.htm. Include the SBIR VC Certification in the Supporting Documents (Volume 5).
- c. Should a proposing SBC become a member of this ownership class after submitting its proposal and prior to any receipt of a funding agreement, the proposing SBC must immediately notify the Contracting Officer, register in the appropriate SBA database, and submit the required certification, which can be found on https://navysbir.com/links_forms.htm.

System for Award Management (SAM). It is strongly encouraged that proposing SBCs register in SAM, <https://sam.gov>, by the Close date of this BAA, or verify their registrations are still active and will not expire within 60 days of BAA Close. Additionally, proposing SBCs should confirm that they are registered to receive contracts (not just grants) and the address in SAM matches the address on the proposal. An SBC selected for an award **MUST** have an active SAM registration at the time of award or they will be considered ineligible.

Cybersecurity Maturity Model Certification (CMMC) Program. DoW has established the CMMC Program to verify that awardees have implemented required security measures necessary to safeguard

Federal Contract Information (FCI) and Controlled Unclassified Information (CUI). CMMC Level requirements are identified within each topic and must be met prior to award. Proposing SBCs should carefully review and consider the CMMC requirements as compliance may impact proposed costs and technical approach. Please review the DoW SBIR/STTR Program BAA for additional information on the CMMC Program.

Notice of NIST SP 800-171 Assessment Database Requirement. The purpose of the National Institute of Standards and Technology (NIST) Special Publication (SP) 800-171 is to protect Controlled Unclassified Information (CUI) in Nonfederal Systems and Organizations. As prescribed by DFARS 252.240-7997, in order to be considered for award, an SBC is required to implement NIST SP 800-171 and shall have a current assessment uploaded to the Supplier Performance Risk System (SPRS) which provides storage and retrieval capabilities for this assessment. The platform Procurement Integrated Enterprise Environment (PIEE) will be used for secure login and verification to access SPRS. For brief instructions on NIST SP 800-171 assessment, SPRS, and PIEE, please visit <https://www.sprs.csd.disa.mil/nistsp.htm>. For in-depth tutorials on these items please visit <https://www.sprs.csd.disa.mil/webtrain.htm>.

Human Subjects, Animal Testing, and Recombinant DNA. If the use of human, animal, and recombinant DNA is included under a DP2 proposal, please carefully review the requirements at: <https://www.nre.navy.mil/work-with-us/how-to-apply/compliance-and-protections/research-protections>. This webpage provides guidance and lists approvals that may be required before contract/work can begin.

International Traffic in Arms Regulation (ITAR). For topics indicating ITAR restrictions or the potential for classified work, limitations are generally placed on disclosure of information involving topics of a classified nature or those involving export control restrictions, which may curtail or preclude the involvement of universities and certain non-profit institutions beyond the basic research level. Small businesses must structure their proposals to clearly identify the work that will be performed that is of a basic research nature and how it can be segregated from work that falls under the classification and export control restrictions. As a result, information must also be provided on how efforts can be performed in later phases if the university/research institution is the source of critical knowledge, effort, or infrastructure (facilities and equipment).

SELECTION, AWARD, AND POST-AWARD INFORMATION

Notifications. Email notifications for proposal receipt (approximately one week after the Phase I BAA Close) and selection are sent based on the information received on the proposal Cover Sheet (Volume 1). Consequently, the e-mail address on the proposal Cover Sheet must be correct.

Debriefs. Requests for a debrief must be made within 15 calendar days of select/non-select notification via email as specified in the select/non-select notification. Please note debriefs are typically provided in writing via email to the Corporate Official identified in the proposal of the proposing SBCs within 60 days of receipt of the request. Requests for oral debriefs may not be accommodated. If contact information for the Corporate Official has changed since proposal submission, a notice of the change on company letterhead signed by the Corporate Official must accompany the debrief request.

Protests. Interested parties have the right to protest in accordance with the procedures in FAR Subpart 33.1.

Pre-award agency protests related to the terms of the BAA must be served to: osd.ncr.ousd-r-e.mbx.SBIR-STTR-Protest@mail.mil. A copy of a pre-award Government Accountability Office (GAO) protest must also be filed with the aforementioned email address within one day of filing with the GAO.

Protests related to a selection or award decision should be filed with the appropriate Contracting Officer for an Agency Level Protest or with the GAO. Contracting Officer contact information for specific DON Topics may be obtained from the DON SYSCOM Program Managers listed in Table 2 above. For protests filed with the GAO, a copy of the protest must be submitted to the appropriate DON SYSCOM Program Manager and the appropriate Contracting Officer within one day of filing with the GAO.

Awards. Due to limited funding, the DON reserves the right to limit the number of awards under any topic. Any notification received from the DON that indicates the proposal has been selected does not ultimately guarantee an award will be made. This notification indicates that the proposal has been selected in accordance with the evaluation criteria and has been sent to the Contracting Officer to conduct cost analysis, confirm eligibility of the proposing SBC, and to take other relevant steps necessary prior to making an award.

Contract Types. The DON will consider the following for award: Cost Plus Fixed Fee (CPFF), Firm Fixed Price (FFP), Basic Ordering Agreement (BOA), or Prototype Other Transaction (OT).

Contract Deliverables. Contract deliverables are typically progress reports and final reports. Required contract deliverables must be uploaded to <https://www.navysbirprogram.com/navydeliverables/>.

Transfer Between SBIR and STTR Programs. Section 4(b)(1)(i) of the SBIR and STTR Policy Directive provides that, at the agency's discretion, projects awarded a Phase I under a BAA for SBIR may transition in Phase II to STTR and vice versa.

Navy SBIR Transition Program (STP). Phase II awardees have the opportunity to participate in the virtual Navy STP Kickoff during the first or second year of the Phase II contract. While there are no travel costs associated with this virtual event, Phase II awardees should budget time of up to a full day to participate. STP information can be obtained at: <https://navystp.com>. Phase II awardees will be contacted separately regarding this program.

PHASE III GUIDELINES

A Phase III SBIR/STTR award is any work that derives from, extends, or completes effort(s) performed under prior SBIR/STTR funding agreements, but is funded by sources other than the SBIR/STTR programs. This covers any contract, grant, or agreement issued as a follow-on Phase III award or any contract, grant, or agreement award issued as a result of a competitive process where the awardee was an SBIR/STTR firm that developed the technology as a result of a Phase I or Phase II award. The DON will give Phase III status to any award that falls within the above-mentioned description. Consequently, DON will assign SBIR/STTR Data Rights to any noncommercial technical data and noncommercial computer software delivered in Phase III that were developed under SBIR/STTR Phase I/II effort(s). Government prime contractors and their subcontractors must follow the same guidelines as above and ensure that companies operating on behalf of the DON protect the rights of the SBIR/STTR firm.

NAVY SBIR DOW 2026 BAA
Topic Index
Release 2
Direct to Phase II

- DON26BZ02-DV051 DIRECT TO PHASE II: Resonant Cavity Infrared Detector Incorporating an Avalanche Photodiode Active Region
- DON26BZ02-DV052 DIRECT TO PHASE II: Non-tactical Replacement of AN/UYK-43 in a Laboratory Environment
- DON26BZ02-DV053 DIRECT TO PHASE II: Innovative Camera Technology for Advanced, Simultaneous Imaging in the Extended Short Wave and Mid Wave Infrared Bands

DON26BZ02-DV051 TITLE: DIRECT TO PHASE II: Resonant Cavity Infrared Detector Incorporating an Avalanche Photodiode Active Region

OUSW (R&E) CRITICAL TECHNOLOGY AREA(S): Quantum and Battlefield Information Dominance (Q-BID)

COMPONENT TECHNOLOGY PRIORITY AREA(S): Integrated Sensing and Cyber

PROJECTED CMMC LEVEL REQUIREMENT: Level 2 (Self)

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), 22 CFR Parts 120-130, which controls the export and import of defense-related material and services, including export of sensitive technical data, or the Export Administration Regulation (EAR), 15 CFR Parts 730-774, which controls dual use items. Offerors must disclose any proposed use of foreign nationals (FNs), their country(ies) of origin, the type of visa or work permit possessed, and the statement of work (SOW) tasks intended for accomplishment by the FN(s) in accordance with the Announcement. Offerors are advised foreign nationals proposed to perform on this topic may be restricted due to the technical data under US Export Control Laws.

OBJECTIVE: Develop and demonstrate an array of highly sensitive, wavelength tuned, discrete photo-detectors with avalanche photodiode active regions and incorporating resonant cavity structures.

DESCRIPTION: The Navy is developing and deploying a suite of imaging sensors (cameras) operating across both visible and infrared (IR) wavelengths. This includes wide field of view (WFOV) cameras that provide panoramic surveillance, situational awareness and, due to their high resolution, target detection. Camera sensors, even those operating in the IR, provide information (video imagery) to the ship's crew that is fundamentally familiar, intuitive, and contextual. However, imagery in the visible band has an advantage in that it includes color. Color is useful in identifying well-resolved objects and is also useful in detecting targets that might otherwise go unnoticed, assuming that the scene is relatively clear and illuminated by visible light. The visible spectrum extends in wavelength from roughly 380 nm to 750 nm, a bandwidth of less than 0.4 μm . By contrast, the near to short wave IR bands extend from 750 nm to 3 μm (2.25 μm) and the mid-wave IR (MWIR) extends from 3 μm to 5 μm (2.0 μm). The MWIR band therefore contains five times as much spectral content as the visible band, all invisible to the human eye.

Though invisible, spectral content in the IR is just as useful as in the visible bands, if it is properly resolved. While imaging in the visible, near, and short-wave IR makes use of reflected light, imaging in the MWIR uses light that is emitted by bodies in the scene due to their temperature. And while MWIR images are sometimes colorized (known as false color images), the most commonly available MWIR cameras assign colors according to the infrared intensity, which corresponds to the temperature of the object being imaged. These cameras are typically referred to as thermal imagers and the images they produce as heat maps. While these instruments have obviously widespread utility, the spectroscopic information is lost. As with other bands, spectroscopic measurement in the MWIR has distinct uses, notably in detecting differences in vegetation and identifying certain minerals and manmade materials and chemicals by their characteristic spectral signature. For example, MWIR detectors with spectral discrimination have been proposed for machine vision systems intended to distinguish between and identify (for sorting) various classes of common plastics.

Precise identification of specific materials (understood to include chemical compounds, minerals, gases, etc.) can be accomplished by characterization of the light reflected or emitted by the material using a spectrometer. Large, expensive, laboratory spectrometers accurately measure very narrow spectral lines across the entire width of the material's signature. Small, portable spectrometers, with less functionality or for specific applications, are also available at much less cost (mainly in the visible spectrum). In both cases,

a sample of the material to be characterized is required. Light from distant objects can be analyzed spectroscopically, as in the case of astronomical spectroscopy, but this requires a more sophisticated (and expensive) machine. In all these cases however, the spectrometer is based on separation of the light by prisms or gratings prior to detection of the individual component wavelengths. This precludes incorporation of a spectroscopy capability into an imaging sensor (camera) system without greatly increasing system complexity, size, and cost. Many applications do not require precise identification of the material composition of objects in an imaged scene however – just interpretation of sufficient spectral content to differentiate between broad classes of materials (different types of plastics, polymer versus metal, asphalt versus concrete, vegetation versus manmade materials, etc.). However, it is desirable that this be done remotely (that is, at some stand-off distance) in conjunction with an imaging sensor, especially in the MWIR band.

The MWIR band has several characteristics that make it attractive for imaging under certain conditions. It also presents certain challenges. Mainly, photo-sensitive semiconductor materials in the MWIR band require cooling to cryogenic temperatures in order to achieve good performance. The materials are fundamentally broad band in nature, responding to light across the MWIR spectrum and capturing the imaged scene in terms of total intensity, regardless of finer spectral content. Finally, a great deal of the MWIR band is heavily absorbed by constituents of the atmosphere and effectively absent at any practical distance from the source. The resulting, useful portion of the MWIR band is marked by gaps and sharp discontinuities and any detector technology tuned to detect spectral content in these regions is effectively wasted.

One technology for detection of MWIR radiation in a very narrow band is the resonant cavity infrared detector (RCID). The RCID uses a conventional photodetector “sandwiched” between two reflective interfaces. The reflective interfaces form an optical resonant cavity with the cavity length (and hence, the resonant wavelength) determined by the intrinsic thickness of the detector layers and any spacer layer added to adjust the cavity length. The active region of the detector is sensitive to the broad MWIR band but the resonant cavity structure supports only those wavelengths in a very narrow band determined by the quality factor of the resonant structure and centered at the resonant wavelength. If the length of the cavity can be carefully varied and controlled by design and process, then an entire range of photodetectors can be produced, each at a desired wavelength, and carefully chosen for regions of particular interest in the parts of the MWIR band exhibiting maximum atmospheric transmission. Conceivably, the outputs from individual RCID elements can then be processed to interpret the spectral content present in a particular imaged scene. Individual RCID elements have been successfully demonstrated with detectors of n-type absorption layer, Barrier layer, and n-type contact layer (nBn) construction.

While the spectral information obtained from a series of wavelength-specific detectors is significant, the energy received is now spread over all the detector elements with any wavelengths falling between the resonances of the individual detector elements not detected. So, the IR light received by any one detector is now greatly reduced. This presents the risk that the MWIR signature emitted by dim or distant objects might no longer be detectable. This fundamental reduction in incident signal power can only be compensated for by increasing the sensitivity of the detector. The avalanche photodetector (APD) has been proposed as a means of increasing detector sensitivity as it is inherently more sensitive than nBn type photodetectors.

The Navy desires an innovative detector technology that combines the relatively new RCID topology with the proven APD to demonstrate fixed wavelength-selectable detectors with high sensitivity in the MWIR band. The goal is to achieve a minimum increase in sensitivity of two orders of magnitude over that possible with state-of-the-art nBn type detectors. This may be shown by direct comparison to published work. Wavelength selection shall be shown possible by design and process control over the full MWIR band, excluding those sub-bands of atmospheric absorption. Demonstration of a full two-dimensional (NxM)

focal plane array of detector elements is not expected from this effort. Demonstration of linear arrays or partial two-dimensional arrays of elements is sufficient. However, the ability to construct multiple RCID-APD detectors, each with different tuned wavelengths, together and closely spaced on the same substrate is required. The ability to arbitrarily tune individual RCID elements, independent of position in the array and independent of adjacent elements is highly desirable.

Incorporation of a read-out integrated circuit in the solution is not required. However, electrical contacts must be included in the design and fabricated into the prototype such that the performance of each individual RCID element can be measured. The prototype is expected to be a single substrate (chip) containing multiple RCID elements with all required electrical contacts integrated, and with the substrate mounted on a suitable test structure. Since operation in MWIR requires the detector to be cooled, the solution shall also include a means to test the prototype at the designed operating temperature. A minimum of four prototypes must be produced and tested. At completion of the effort, the prototypes will be delivered to the Naval Research Laboratory.

Work produced in Phase II may become classified. Note: The prospective contractor(s) must be U.S. owned and operated with no foreign influence as defined by 32 U.S.C. § 2004.20 et seq., National Industrial Security Program Executive Agent and Operating Manual, unless acceptable mitigating procedures can and have been implemented and approved by the Defense Counterintelligence and Security Agency (DCSA) formerly Defense Security Service (DSS). The selected contractor must be able to acquire and maintain a secret level facility and Personnel Security Clearances. This will allow contractor personnel to perform on advanced phases of this project as set forth by DCSA and NAVSEA in order to gain access to classified information pertaining to the national defense of the United States and its allies; this will be an inherent requirement. The selected company will be required to safeguard classified material during the advanced phases of this contract IAW the National Industrial Security Program Operating Manual (NISPO), which can be found at Title 32, Part 2004.20 of the Code of Federal Regulations.

PHASE I: For a Direct to Phase II topic, the Government expects that the small business will have accomplished the following in a Phase I-type effort and developed a concept for a workable prototype or design to address, at a minimum, the basic requirements stated in the Description. The following actions would be required in order to satisfy the requirements of Phase I:

- Identification and selection of a specific RCID architecture compatible with incorporation of an APD structure.
- Identification and selection of a specific RCID semiconductor family compatible with an APD photodetector.
- Identification and selection of an RCID and APD compatible fabrication process.
- Successful demonstration of feasibility of an RCID design. This may have been done through modelling and simulation, analysis, or initial prototype testing of a comparable RCID.
- A performance baseline for an RCID. The performance baseline may be based on modelling and simulation, analysis (including analysis of other reported work), or initial prototype testing of a comparable RCID.
- Identification of technical risks associated with insertion of an APD into an RCID structure and associated approaches for addressing those risks.

FEASIBILITY DOCUMENTATION: Offerors interested in participating in Direct to Phase II must include in their response to this topic Phase I feasibility documentation that substantiates the scientific and technical merit and Phase I feasibility described in Phase I above has been met (i.e., the small business must have performed Phase I-type research and development related to the topic NOT solely based on work performed under prior or ongoing federally funded SBIR/STTR work) and describe the potential commercialization applications. The documentation provided must validate that the proposer has completed development of technology as stated in Phase I above. Documentation should include all relevant information including,

but not limited to technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the offeror and/or the principal investigator (PI). Read and follow all the DON SBIR Direct to Phase II Broad Agency Announcement (BAA) Instructions. Phase I proposals will NOT be accepted for this topic.

PHASE II: Develop and demonstrate a prototype APD-based RCID consistent with the Description. Demonstrate wavelength selection, by design and process, through fabrication and testing of prototype arrays of APD-based RCIDs. Demonstrate that the APD-based RCIDs have improved sensitivity and can be designed, fabricated, and employed across the usable MWIR band. Provide test structures, bias circuitry, output circuitry, and cooler vessels necessary to operate and test the prototype RCID arrays. Provide complete test data, operating instructions, and test instructions necessary for independent evaluation of the prototype RCID arrays.

It is probable that the work under this effort will be classified under Phase II (see Description section for details).

PHASE III DUAL USE APPLICATIONS: Support the Navy in transitioning the prototype developed in Phase II to Navy use. Scale the RCID technology to larger array formats required for system use. Design, integrate, and demonstrate compatible bias and read-out circuitry. Reduce and optimize detector pitch. Mature manufacturing processes and increase yield. Implement cost reduction measures and prepare documentation and process controls for large-scale production. Assist the Navy in integrating the technology into specific sensor systems. The technology has multiple potential system applications throughout the Departments of Defense, Homeland Security, and NASA. Commercial applications include materials identification for applications such as the automatic sorting of recyclables, remote (overhead) monitoring of crops and vegetation, and the field detection of chemicals and chemical residues, as well as other scientific uses.

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1. Jackson, E. M., et al. "Midwave Infrared Cavity Detectors with >70% Quantum Efficiency." *Applied Physics Letters*, 17 December, 2024. <https://pubs.aip.org/aip/apl/article/125/25/251105/3326525/Midwave-infrared-resonant-cavity-detectors-with-gt>
2. Pedrazzani, Janet R. "Characteristics of InAs-Based nBn Photodetectors Grown by Molecular Beam Epitaxy." PhD Dissertation, University of Rochester, Rochester, New York, 2010. <https://urresearch.rochester.edu/institutionalPublicationPublicView.action?institutionalItemId=12336>
3. National Industrial Security Program Executive Agent and Operating Manual (NISP), 32 U.S.C. § 2004.20 et seq. (1993). <https://www.ecfr.gov/current/title-32/subtitle-B/chapter-XX/part-2004>

KEYWORDS: Resonant Cavity Infrared Detector; Avalanche Photodetector; nBn Photodetector; Spectroscopy; Mid-Wave Infrared; Wavelength Selection

DON26BZ02-DV052 TITLE: DIRECT TO PHASE II: Non-tactical Replacement of AN/UYK-43 in a Laboratory Environment

OUSW (R&E) CRITICAL TECHNOLOGY AREA(S): Applied Artificial Intelligence (AAI)

COMPONENT TECHNOLOGY PRIORITY AREA(S): Sustainment

PROJECTED CMMC LEVEL REQUIREMENT: Level 2 (Self)

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), 22 CFR Parts 120-130, which controls the export and import of defense-related material and services, including export of sensitive technical data, or the Export Administration Regulation (EAR), 15 CFR Parts 730-774, which controls dual use items. Offerors must disclose any proposed use of foreign nationals (FNs), their country(ies) of origin, the type of visa or work permit possessed, and the statement of work (SOW) tasks intended for accomplishment by the FN(s) in accordance with the Announcement. Offerors are advised foreign nationals proposed to perform on this topic may be restricted due to the technical data under US Export Control Laws.

OBJECTIVE: Develop a non-tactical replacement for the UYK-43 computer system to ensure land-based testing remains viable for Aegis computer programs before deployment on board ships.

DESCRIPTION: The AN/UYK-43 (UYK-43) computer system is used to run certain baselines of the Aegis computer program. The UYK-43 is no longer manufactured. Operational UYK-43's and spare parts are prioritized for operational fleet use and not testing. The Navy needs a replacement for the UYK-43 to enable land-based testing as there is no commercially available computer that is compatible with or emulates the UYK-43.

The solution must be binary compatible, provide compatible input/output capabilities, and have equivalent performance to the UYK-43. The computer programs of the Aegis Weapon System are commonly described as real-time embedded computer software. To ensure compatibility with the real hardware and guarantee that computer programs tested on the emulator work aboard ship, the input/output latency and throughput, memory and persistent storage capacity, and instruction timing must be matched precisely.

Compiler Monitor System (CMS)-2Y is a computer software language developed for tactical operations for Fleet Computer Programming Center - Pacific (FCPCPAC) to support Naval Tactical Data Systems (NTDS) operations. The language continues to be developed in use, eventually supporting several combat system computers including the UYK-43 which became the standard 32-bit computer of the Navy for surface ship and submarine platforms.

The solution will develop an emulator of the UYK-43, using open-source code and Commercial Off-the-Shelf (COTS) hardware to facilitate testing critical updates of Aegis ships operating with CMS-2Y tactical code. The emulator must execute the 32-bit CMS-2Y tactical code on a COTS computer system running a common operating system. The translated CMS-2Y code must perform similarly to UYK-43 to support various test requirements and scenarios in a laboratory environment. The emulation will be evaluated in a Navy land-based test facility using operational data to verify and validate emulator functionality.

Work produced in Phase II may become classified. Note: The prospective contractor(s) must be U.S. owned and operated with no foreign influence as defined by 32 U.S.C. § 2004.20 et seq., National Industrial Security Program Executive Agent and Operating Manual, unless acceptable mitigating procedures can and have been implemented and approved by the Defense Counterintelligence and Security Agency (DCSA) formerly Defense Security Service (DSS). The selected contractor must be able to acquire and maintain a secret level facility and Personnel Security Clearances. This will allow contractor personnel to perform on advanced phases of this project as set forth by DCSA and NAVSEA in order to gain access to classified information pertaining to the national defense of the United States and its allies; this will be an inherent

requirement. The selected company will be required to safeguard classified material during the advanced phases of this contract IAW the National Industrial Security Program Operating Manual (NISPOM), which can be found at Title 32, Part 2004.20 of the Code of Federal Regulations.

PHASE I: For a Direct to Phase II topic, the Government expects that the small business would have accomplished the following in a Phase I-type effort and developed a concept for a workable prototype or design to address, at a minimum, the basic requirements of the stated objective above. The below actions would be required in order to satisfy the requirements of Phase I:

- Developed a concept UYK-43 emulator
- Demonstrated the concept meets all parameters in the Description.
- Demonstrated feasibility in meeting the requirements in the Description to support the test and operational environments.
- Feasibility established through analysis and modelling.

FEASIBILITY DOCUMENTATION: Offerors interested in participating in Direct to Phase II must include in their response to this topic Phase I feasibility documentation that substantiates the scientific and technical merit and Phase I feasibility described in Phase I above has been met (i.e., the small business must have performed Phase I-type research and development related to the topic NOT solely based on work performed under prior or ongoing federally funded SBIR/STTR work) and describe the potential commercialization applications. The documentation provided must validate that the proposer has completed development of technology as stated in Phase I above. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the offeror and/or the principal investigator (PI). Read and follow all of the DON SBIR Direct to Phase II Broad Agency Announcement (BAA) Instructions. Phase I proposals will NOT be accepted for this topic.

PHASE II: Develop, demonstrate, validate, and deliver a prototype UYK-43 emulator based on the results of Phase I. The application will be implemented in an existing Government-approved and provided modeling and simulation environment to validate performance. It will be evaluated by Government subject matter experts for validation.

It is probable that the work under this effort will be classified under Phase II (see Description section for details).

PHASE III DUAL USE APPLICATIONS: Support the Navy in transitioning the prototype UYK-43 emulator to allow for further experimentation and refinement. The prototype emulator will be incorporated into the testing for Aegis baseline modernization process. This will consist of integration into a baseline definition, incorporation of the baselines existing and new threat capabilities, validation testing, and combat system certification.

Computer science and computer engineering professions will benefit from learning to make computer programs written for legacy computer systems run on modern instruction set architectures; learning how to ensure timing of computer programs is maintained on a foreign computer architecture; learning to ensure input/output is compatible between legacy and modern computers.

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2. "UYK-43(V) – Archived 6/2007."
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KEYWORDS: AN/UYK-43 emulator; CMS-2Y tactical code; Real-Time Embedded Computer Software; Aegis Computer Programs; Land-Based Test Facility; Obsolete Hardware

DON26BZ02-DV053 TITLE: DIRECT TO PHASE II: Innovative Camera Technology for Advanced, Simultaneous Imaging in the Extended Short Wave and Mid Wave Infrared Bands

OUSW (R&E) CRITICAL TECHNOLOGY AREA(S): Quantum and Battlefield Information Dominance (Q-BID)

COMPONENT TECHNOLOGY PRIORITY AREA(S): Integrated Sensing and Cyber

PROJECTED CMMC LEVEL REQUIREMENT: Level 2 (Self)

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), 22 CFR Parts 120-130, which controls the export and import of defense-related material and services, including export of sensitive technical data, or the Export Administration Regulation (EAR), 15 CFR Parts 730-774, which controls dual use items. Offerors must disclose any proposed use of foreign nationals (FNs), their country(ies) of origin, the type of visa or work permit possessed, and the statement of work (SOW) tasks intended for accomplishment by the FN(s) in accordance with the Announcement. Offerors are advised foreign nationals proposed to perform on this topic may be restricted due to the technical data under US Export Control Laws.

OBJECTIVE: Develop and demonstrate a dual-band camera, operating across the extended short-wave and mid-wave infrared bands, incorporating a single large format, small pitch, focal plane array and corresponding digital readout integrated circuit suitable for video imaging in a maritime environment.

DESCRIPTION: The Navy is developing and deploying a suite of imaging sensors (cameras) operating across both visible and infrared wavelengths to provide panoramic surveillance, situational awareness, and target detection. Collectively, these cameras are required to yield high resolution, multi-spectral, video imagery over large fields of regard in challenging maritime environments. Consequently, a complete system necessarily incorporates multiple optical apertures and multiple, large format, small pitch, focal plane arrays (FPAs), each covering a wavelength band of interest and each with its own video readout and data interface. The full system is largely just a collection of individual cameras, mounted together and aligned and coordinated through a common controller. The size, weight, and cost are essentially the sum of the size, weight, and cost of the individual cameras. The system performance is fundamentally limited by the performance of the individual cameras as well. Other than the quality of the optics, individual camera performance is determined by the focal plane array (FPA) and the digital readout integrated circuit (DROIC), which are typically specific to the particular wavelength band. True multi-spectral sensing at the FPA level would reduce the size, weight, and the cost of the overall system. Alignment and synchronization issues between bands would also be eliminated.

Of particular interest are the mid-wave infrared (MWIR) band of 3-5 microns wavelength and what is commonly referred to as the "extended" short-wave infrared (e-SWIR) band of 1-2.5 microns wavelength. The bands are adjacent, except for a small atmospheric absorption gap, and large format (16+ megapixel) small pitch (less than 8 micron) FPAs are desired for both bands.

The bands are therefore naturally suited to dual-band sensor architectures. It should also be noted that true dual-band sensing utilizing these two bands (as opposed to wide-band sensing or sensing each band separately with two, band-specific FPAs) is expected to yield superior performance, offering increased range and improved clutter rejection for overall enhanced situational awareness. This is a collateral benefit, not a topic requirement, and it assumes that implementation of the dual-band FPA architecture does not compromise or otherwise degrade other key performance measures, such as noise and resolution.

The Navy desires an innovative camera technology capable of providing dual-band e-SWIR and MWIR video imagery data in separate channels via a Camera Link serial protocol standard (or equivalent) interface. There is no known technology commercially available today that meets the Navy's current needs.

The prototype camera shall incorporate a focal plane array comprised of a bias-selectable dual-band sensor and integrated digital readout integrated circuit (DROIC) or digital pixel readout integrated circuit (DPROIC). The focal plane array should be installed in an integrated Dewar-Cooler assembly operating at 100-160 Kelvin, with cold shield and optics of f1.5 or faster with a 1-5 micron optical transmission band. The camera should have an instantaneous field of view (FOV) no greater than 200 micro-radians. For purposes of demonstration, the prototype FPA is only required to have 2000 x 2000 (or equivalent) pixel format, but no larger than 8-micron pixel pitch. However, the technology should be fundamentally capable of extension to larger formats. A path to a smaller pitch is also highly desirable. The design should address performance issues such as noise equivalent irradiance performance, saturation/dynamic-range, and other DROIC-defined parameters. The DROIC/DPROIC should support 30 Hz full frame rate operation. While it is not necessary that it be demonstrated under this Phase II effort, the DROIC design should be capable of supporting higher frame rate windowing in multiple sub-windows. The prototype shall be tested in a manner and under conditions that clearly demonstrate the performance improvements obtained by the dual-band approach.

Work produced in Phase II may become classified. Note: The prospective contractor(s) must be U.S. owned and operated with no foreign influence as defined by 32 U.S.C. § 2004.20 et seq., National Industrial Security Program Executive Agent and Operating Manual, unless acceptable mitigating procedures can and have been implemented and approved by the Defense Counterintelligence and Security Agency (DCSA) formerly Defense Security Service (DSS). The selected contractor must be able to acquire and maintain a secret level facility and Personnel Security Clearances. This will allow contractor personnel to perform on advanced phases of this project as set forth by DCSA and NAVSEA in order to gain access to classified information pertaining to the national defense of the United States and its allies; this will be an inherent requirement. The selected company will be required to safeguard classified material during the advanced phases of this contract IAW the National Industrial Security Program Operating Manual (NISPOM), which can be found at Title 32, Part 2004.20 of the Code of Federal Regulations.

PHASE I: For a Direct to Phase II topic, the Government expects that the small business will have accomplished the following in a Phase I-type effort and developed a concept for a workable prototype or design to address, at a minimum, the basic requirements stated in the Description. The following actions would be required in order to satisfy the requirements of Phase I:

- Identification and selection of specific FPA architecture.
- Identification and selection of a specific FPA semiconductor family.
- Performance estimates based on modelling and simulation, analysis, or initial scaled prototype element testing of the selected FPA (or substantially similar) architecture, demonstrating feasibility.
- Initial design requirements for DROIC or DPROIC compatible with and suited for the selected FPA architecture.
- Performance estimates for an initial prototype camera design (FPA, DROIC/DPROIC, optics, etc.) based on the selected FPA architecture, consistent with the demonstration of feasibility.
- Identification of technical risks and associated approaches for addressing those risks.

FEASIBILITY DOCUMENTATION: Offerors interested in participating in Direct to Phase II must include in their response to this topic Phase I feasibility documentation that substantiates the scientific and technical merit and Phase I feasibility described in Phase I above has been met (i.e., the small business must have performed Phase I-type research and development related to the topic NOT solely based on work performed under prior or ongoing federally funded SBIR/STTR work) and describe the potential commercialization applications. The documentation provided must validate that the proposer has completed development of technology as stated in Phase I above. Documentation should include all relevant information including, but not limited to technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the offeror and/or the principal investigator (PI). Read and follow all the DON SBIR Direct to Phase II Broad Agency Announcement (BAA) Instructions. Phase I proposals will NOT be accepted for this topic.

PHASE II: Develop and demonstrate a prototype consistent with the Description above, of a monolithic, bias selectable, e-SWIR/MWIR dual-band camera with integral high-speed readout integrated circuit having independent gain and integration times for each band. The DROIC/DPROIC will maintain a pixel pitch of 8 microns or less, have a minimum size of 4 megapixels, and be capable of scaling (and/or tiling) to larger formats. The camera must be packaged in a fully integrated Dewar cooler assembly capable of stable operation anywhere from 100-160 Kelvin and equipped with optics having 1.5 or faster f-number with uniform IR transmission from 1-5 microns and 200 micro-radian instantaneous FOV (or less). The camera must include a Camera Link or equivalent data interface.

Develop and execute a test plan that fully characterizes the camera performance, especially highlighting the performance specific to the dual-band architecture. Deliver, to the Naval Research Laboratory, the prototype camera in a ready-to-use configuration and condition with user instructions and interface descriptions provided, including Camera Link (or equivalent) data output format with protocols defined and documented. Prepare an assessment of the technology readiness level (TRL) and manufacturing readiness level (MRL) and include in the Final Report.

It is probable that the work under this effort will be classified under Phase II (see Description section for details).

PHASE III DUAL USE APPLICATIONS: Support the Navy in transitioning the prototype developed in Phase II to Navy use. Scale the camera technology (i.e., FPA, readout integrated circuit, optics) to the large formats required for system use. Reduce and optimize pitch. Implement high frame rate windowing capability. Develop specific large format designs suited to and ruggedized for Navy use. Mature manufacturing processes and increase yield. Implement cost reduction measures and prepare documentation and process controls for large-scale production. Assist the Navy in integrating the technology into surface ship situational awareness multi-spectral camera systems.

The technology has multiple potential system applications throughout the Departments of Defense and Homeland Security. Commercial applications include sophisticated surveillance cameras for law enforcement and scientific uses such as aerial assessment of vegetation and land use, and wildlife detection, identification, and tracking.

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4. National Industrial Security Program Executive Agent and Operating Manual (NISPEM), 32 U.S.C. § 2004.20 et seq. (1993). <https://www.ecfr.gov/current/title-32/subtitle-B/chapter-XX/part-2004>

KEYWORDS: Imaging Sensors; Dual-Band Camera; Focal Plane Array; Digital Readout Integrated Circuit; Extended Short-Wave Infrared; Mid-Wave Infrared; MWIR