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DEPARTMENT OF THE NAVY (DON) 21.3 Small Business Innovation Research (SBIR) Proposal Submission Instructions

IMPORTANT

- **The following instructions apply to SBIR topics only:**
 - N213-140 through N213-142
- **The information provided in the DON Proposal Submission Instructions document takes precedence over the DoD Instructions posted for this Broad Agency Announcement (BAA).**
- **DON Phase I Technical Volume (Volume 2) page limit is not to exceed 10 pages.**
- **Proposers 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 proposers are detailed in the section titled ADDITIONAL SUBMISSION CONSIDERATIONS.**
- Phase I Technical Volume (Volume 2) and Supporting Documents (Volume 5) templates, specific to DON topics, are available at https://www.navysbir.com/links_forms.htm.
- The DON provides notice that Basic Ordering Agreements (BOAs) may be used for Phase I awards, and BOAs or Other Transaction Agreements (OTAs) may be used for Phase II awards.

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.navysbir.com. Additional information on DON's mission can be found on the DON website at www.navy.mil.

The Director of the DON SBIR/STTR Programs is Mr. Robert Smith. 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	Program Managers list in Table 2 (below)
Topic-specific technical questions	BAA Pre-release	Technical Point of Contact (TPOC) listed in each topic. Refer to the Proposal Fundamentals section of the DoD SBIR/STTR Program BAA for details.
	BAA Open	DoD SBIR/STTR Topic Q&A platform (https://www.dodsbirsttr.mil/submissions)

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		Refer to the Proposal Fundamentals section of the DoD SBIR/STTR Program BAA for details.
Electronic submission to the DoD SBIR/STTR Innovation Portal (DSIP)	Always	DoD Help Desk via email at dodsbirsupport@reisystems.com
Navy-specific BAA instructions and forms	Always	Navy-sbir-sttr.fct@navy.mil

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

<u>Topic Numbers</u>	<u>Point of Contact</u>	<u>SYSCOM</u>	<u>Email</u>
N213-140	Mr. Timothy Petro	Naval Facilities Engineering Center (NAVFAC)	timothy.petro@navy.mil
N213-141 and N213-142	Mr. Shadi Azoum	Naval Information Warfare Systems Command (NAVWAR)	shadi.azoum@navy.mil

PHASE I SUBMISSION INSTRUCTIONS

The following section details what is required for a Phase I proposal submission to the DoD SBIR/STTR Programs.

(NOTE: Proposers 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.)

DoD SBIR/STTR Innovation Portal (DSIP). Proposers are required to submit proposals via the DoD SBIR/STTR Innovation Portal (DSIP); follow proposal submission instructions in the DoD SBIR/STTR Program BAA on the DSIP at <https://www.dodsbirsttr.mil/submissions>. Proposals submitted by any other means will be disregarded. Proposers submitting through DSIP for the first time will be asked to register. It is recommended that firms 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. Please refer to the DoD SBIR/STTR Program BAA for further information.

Proposal Volumes. The following six volumes are required.

- **Proposal Cover Sheet (Volume 1).** As specified in DoD SBIR/STTR Program BAA.
- **Technical Proposal (Volume 2)**
 - Technical Proposal (Volume 2) must meet the following requirements or it will be REJECTED:
 - Not to exceed 10 pages, regardless of page content
 - 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.

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- No font size smaller than 10-point
- Include, within the 10-page limit of Volume 2, an Option that furthers the effort in preparation for Phase II and will bridge the funding gap between the end of Phase I and the start of Phase II. Tasks for both the Phase I Base and the Phase I Option must be clearly identified. Phase I Options are exercised upon selection for Phase II.
- Phase I Base Period of Performance must be exactly six (6) months.
- Phase I Option Period of Performance must be exactly six (6) months.
- Additional information:
 - It is highly recommended that proposers use the Phase I proposal template, specific to DON topics, at https://navysbir.com/links_forms.htm to meet Phase I Technical Volume (Volume 2) requirements.
 - A font size smaller than 10-point is allowable for headers, footers, imbedded tables, figures, images, or graphics that include text. However, proposers are cautioned that if the text is too small to be legible it will not be evaluated.
- **Cost Volume (Volume 3).**
 - Cost Volume (Volume 3) must meet the following requirements or it will be REJECTED:
 - The Phase I Base amount must not exceed \$140,000.
 - Phase I Option amount must not exceed \$100,000.
 - Costs for the Base and Option must be separated and clearly identified on the Proposal Cover Sheet (Volume 1) and in Volume 3.
 - Additional information:
 - 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. When a proposal is selected for award, be prepared to submit further documentation to the SYSCOM Contracting Officer to substantiate costs (e.g., an explanation of cost estimates for equipment, materials, and consultants or subcontractors).
- **Company Commercialization Report (Volume 4).** DoD collects and uses Volume 4 and DSIP requires Volume 4 for proposal submission. Please refer to the Phase I Proposal section of the DoD 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 proposers must review and submit the following items, as applicable:
 - **Telecommunications Equipment Certification.** Required for all proposers. The DoD must comply with Section 889(a)(1)(B) of the FY2019 National Defense Authorization Act (NDAA) and is working to reduce or eliminate contracts, or extending or renewing a contract with an entity that uses 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. As such, all proposers must include as a part of their submission a written certification in response to the clauses (DFAR clauses 252.204-7016, 252.204-7018, and subpart 204.21). The written certification can

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be found in Attachment 1 of the DoD SBIR/STTR Program BAA. This certification must be signed by the authorized company representative and is to be uploaded as a separate PDF file in Volume 5. Failure to submit the required certification as a part of the proposal submission process will be cause for rejection of the proposal submission without evaluation. Please refer to the instructions provided in the Phase I Proposal section of the DoD SBIR/STTR Program BAA.

- **Disclosure of Offeror’s Ownership or Control by a Foreign Government.** All proposers must review to determine applicability. In accordance with DFARS provision 252.209-7002, a proposer is required to disclose any interest a foreign government has in the proposer when that interest constitutes control by foreign government. All proposers must review the Foreign Ownership or Control Disclosure information to determine applicability. If applicable, an authorized firm representative must complete the Disclosure of Offeror’s Ownership or Control by a Foreign Government (found in Attachment 2 of the DoD SBIR/STTR Program BAA) and upload as a separate PDF file in Volume 5. Please refer to instructions provided in the Phase I Proposal section of the DoD SBIR/STTR Program BAA.
- **Majority Ownership in Part.** Proposers 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 certification as detailed under ADDITIONAL SUBMISSION CONSIDERATIONS.
- Additional information:
 - Proposers 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 proposer 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
 - Allocation of Rights between Prime and Subcontractor
 - Disclosure of Information (DFARS 252.204-7000)
 - Prior, Current, or Pending Support of Similar Proposals or Awards
 - Foreign Citizens
 - 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, proposers are cautioned that the text may be unreadable.
- **Fraud, Waste and Abuse Training Certification (Volume 6).** DoD requires Volume 6 for submission. Please refer to the Phase I Proposal section of the DoD SBIR/STTR Program BAA for details.

PHASE I EVALUATION AND SELECTION

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

Proposals meeting DoD SBIR/STTR submission requirements will be forwarded to the DON SBIR/STTR Programs. Upon receipt, all proposals will undergo a compliance review to verify compliance with DoD

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and DON SBIR/STTR submission requirements. Proposals not meeting submission requirements will be REJECTED and not evaluated.

- **Proposal Cover Sheet (Volume 1).** Not evaluated. The Cover Sheet (Volume 1) will undergo a compliance review to verify the proposer has met eligibility requirements.
- **Technical Volume (Volume 2).** The DON will evaluate and select Phase I proposals using the evaluation criteria specified in the Phase I Proposal Evaluation Criteria section of the DoD SBIR/STTR Program BAA, with technical merit being most important, followed by qualifications of key personnel and commercialization potential of equal importance. “Best value” is defined as approaches containing innovative technology solutions to the Navy’s technical challenges for meeting its mission needs as reflected in the SBIR/STTR topics. This is not a FAR Part 15 evaluation and proposals will not be compared to one another. Cost is not an evaluation criteria and will not be considered during the evaluation process. 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 to verify the proposer has met the following requirements or it will be REJECTED:

- Not to exceed 10 pages, regardless of page content
 - 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.
 - Include, within the 10-page limit of Volume 2, an Option that furthers the effort in preparation for Phase II and will bridge the funding gap between the end of Phase I and the start of Phase II. Tasks for both the Phase I Base and the Phase I Option must be clearly identified.
 - Phase I Base Period of Performance must be exactly six (6) months.
 - Phase I Option Period of Performance must be exactly six (6) months.
- **Cost Volume (Volume 3).** Not evaluated. The Cost Volume (Volume 3) will undergo a compliance review to verify the proposer has complied with not to exceed values for the Base (\$140,000) and Option (\$100,000). Proposals exceeding either the Base or Option not to exceed values will be REJECTED without further consideration.
 - **Company Commercialization Report (Volume 4).** Not evaluated.
 - **Supporting Documents (Volume 5).** Not evaluated. Supporting Documents (Volume 5) will undergo a compliance review to ensure the proposer has included items in accordance with the PHASE I SUBMISSION INSTRUCTIONS section above.
 - **Fraud, Waste, and Abuse Training Certificate (Volume 6).** Not evaluated.

ADDITIONAL SUBMISSION CONSIDERATIONS

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

Discretionary Technical and Business Assistance (TABAs). The SBIR and STTR Policy Directive section 9(b) allows the DON to provide TABAs (formerly referred to as DTAs) to its awardees. The purpose

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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. Firms may request, in their Phase I Cost Volume (Volume 3) and Phase II Cost Volume, to contract these services themselves through one or more TABA providers in an amount not to exceed the values specified below. The Phase I TABA amount is up to \$6,500 and is in addition to the award amount. The Phase II TABA amount is up to \$25,000 per award. The TABA amount, of up to \$25,000, 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 \$1,700,000 or lower limit specified by the SYSCOM). As with Phase I, the amount proposed for TABA cannot include any profit/fee by the proposer and must be inclusive of all applicable indirect costs. 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 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
- Total TABA provider(s) cost, number of hours, and labor rates (average/blended rate is acceptable)

TABA must NOT:

- Be subject to any profit or fee by the SBIR proposer
- Propose a TABA provider that is the SBIR proposer
- Propose a TABA provider that is an affiliate of the SBIR proposer
- Propose a TABA provider that is an investor of the SBIR proposer
- Propose a TABA provider that is a subcontractor or consultant of the requesting firm 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 I:
 - Online DoD Cost Volume (Volume 3) – the value of the TABA request.
 - Supporting Documents Volume (Volume 5) – a detailed request for TABA (as specified above) specifically identified as “Discretionary Technical and Business Assistance” in the section titled Additional Cost Information.
- 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 “Discretionary Technical and Business Assistance” in the section titled Additional Cost Information.

Proposed values for TABA must NOT exceed:

- Phase I: A total of \$6,500
- Phase II: A total of \$25,000 per award, not to exceed \$50,000 per Phase II project

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If a proposer requests and is awarded TABA in a Phase II contract, the proposer will be eliminated from participating in the DON SBIR/STTR Transition Program (STP), the DON Forum for SBIR/STTR Transition (FST), and any other Phase II assistance the DON provides directly to awardees.

All Phase II awardees not receiving funds for TABA in their awards must attend a one-day DON STP meeting during the first or second year of the Phase II contract. This meeting is typically held in the spring/summer in the Washington, D.C. area. STP information can be obtained at: <https://navystp.com>. Phase II awardees will be contacted separately regarding this program. It is recommended that Phase II cost estimates include travel to Washington, D.C. for this event.

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 proposer 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). A firm 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 it to the Supporting Documents (Volume 5) 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. Proposers 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 proposers 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, firms must register with the SBA Company Registry Database.
- b. The proposer 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 proposer become a member of this ownership class after submitting its proposal and prior to any receipt of a funding agreement, the proposer 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 proposers 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, proposers should confirm that they are registered to receive contracts (not just grants) and the address in SAM matches the address on the proposal.

Notice of NIST SP 800-171 Assessment Database Requirement. The purpose of the National Institute of

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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 252.204-7019, in order to be considered for award, a firm 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. Due to the short timeframe associated with Phase I of the SBIR/STTR process, the DON does not recommend the submission of Phase I proposals that require the use of Human Subjects, Animal Testing, or Recombinant DNA. For example, the ability to obtain Institutional Review Board (IRB) approval for proposals that involve human subjects can take 6-12 months, and that lengthy process can be at odds with the Phase I goal for time-to-award. Before the DON makes any award that involves an IRB or similar approval requirement, the proposer must demonstrate compliance with relevant regulatory approval requirements that pertain to proposals involving human, animal, or recombinant DNA protocols. It will not impact the DON's evaluation, but requiring IRB approval may delay the start time of the Phase I award and if approvals are not obtained within two months of notification of selection, the decision to award may be terminated. If the use of human, animal, and recombinant DNA is included under a Phase I or Phase II proposal, please carefully review the requirements at: <https://www.onr.navy.mil/work-with-us/how-to-apply/compliance-protections/Research-Protections/Human-Subject-Research.aspx>. This webpage provides guidance and lists approvals that may be required before contract/work can begin.

Government Furnished Equipment (GFE). Due to the typical lengthy time for approval to obtain GFE, it is recommended that GFE is not proposed as part of the Phase I proposal. If GFE is proposed, and it is determined during the proposal evaluation process to be unavailable, proposed GFE may be considered a weakness in the technical merit of the proposal.

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 firm proposal within 60 days of receipt of the request. Requests for oral debriefs may not be accommodated. If contact information for the Corporate

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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. Protests of Phase I and II selections and awards must be directed to the cognizant Contracting Officer for the DON Topic Number, or filed with the Government Accountability Office (GAO). Contact information for Contracting Officers may be obtained from the DON SYSCOM Program Managers listed in Table 2. If the protest is to be filed with the GAO, please refer to instructions provided in the Proposal Fundamentals section of the DoD SBIR/STTR Program BAA.

Protests to this BAA and proposal submission must be directed to the DoD SBIR/STTR Program BAA Contracting Officer, or filed with the GAO. Contact information for the DoD SBIR/STTR Program BAA Contracting Officer can be found in the Proposal Fundamentals section of the DoD SBIR/STTR Program BAA.

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 proposer, and to take other relevant steps necessary prior to making an award.

Contract Types. The DON typically awards a Firm Fixed Price (FFP) contract or a small purchase agreement for Phase I. In addition to the negotiated contract award types listed in the section of the DoD SBIR/STTR Program BAA titled Proposal Fundamentals, for Phase II awards the DON may (under appropriate circumstances) propose the use of an Other Transaction Agreement (OTA) as specified in 10 U.S.C. 2371/10 U.S.C. 2371b and related implementing policies and regulations. The DON may choose to use a Basic Ordering Agreement (BOA) for Phase I and Phase II awards.

Funding Limitations. In accordance with the SBIR and STTR Policy Directive section 4(b)(5), there is a limit of one sequential Phase II award per firm per topic. Additionally, to adjust for inflation DON has raised Phase I and Phase II award amounts. The maximum Phase I proposal/award amount including all options (less TABA) is \$240,000. The Phase I Base amount must not exceed \$140,000 and the Phase I Option amount must not exceed \$100,000. The maximum Phase II proposal/award amount including all options (including TABA) is \$1,700,000 (unless non-SBIR/STTR funding is being added). Individual SYSCOMs may award amounts, including Base and all Options, of less than \$1,700,000 based on available funding. The structure of the Phase II proposal/award, including maximum amounts as well as breakdown between Base and Option amounts will be provided to all Phase I awardees either in their Phase I award or a minimum of 30 days prior to the due date for submission of their Initial Phase II proposal.

Contract Deliverables. Contract deliverables for Phase I are typically a kick-off brief, progress reports, and a final report. Required contract deliverables (as stated in the contract) must be uploaded to <https://www.navysbirprogram.com/navydeliverables/>.

Payments. The DON makes three payments from the start of the Phase I Base period, and from the start of the Phase I Option period, if exercised. Payment amounts represent a set percentage of the Base or Option value as follows:

Days From Start of Base Award or Option	Payment Amount
15 Days	50% of Total Base or Option
90 Days	35% of Total Base or Option
180 Days	15% of Total Base or Option

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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.

PHASE II GUIDELINES

Evaluation and Selection. All Phase I awardees may submit an **Initial** Phase II proposal for evaluation and selection. The evaluation criteria for Phase II is the same as Phase I. The Phase I Final Report, Initial Phase II Proposal, and Transition Outbrief (as applicable) will be used to evaluate the proposer's potential to progress to a workable prototype in Phase II and transition technology to Phase III. Details on the due date, content, and submission requirements of the Initial Phase II Proposal will be provided by the awarding SYSCOM either in the Phase I contract or by subsequent notification.

NOTE: All SBIR/STTR Phase II awards made on topics from BAAs prior to FY13 will be conducted in accordance with the procedures specified in those BAAs (for all DON topics, this means by invitation only).

Awards. The DON typically awards a Cost Plus Fixed Fee contract for Phase II; but, may consider other types of agreement vehicles. Phase II awards can be structured in a way that allows for increased funding levels based on the project's transition potential. To accelerate the transition of SBIR/STTR-funded technologies to Phase III, especially those that lead to Programs of Record and fielded systems, the Commercialization Readiness Program was authorized and created as part of section 5122 of the National Defense Authorization Act of Fiscal Year 2012. The statute set-aside is 1% of the available SBIR/STTR funding to be used for administrative support to accelerate transition of SBIR/STTR-developed technologies and provide non-financial resources for the firms (e.g., the DON STP).

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.

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NAVY SBIR 21.3 Phase I Topic Index

N213-140	Automated Pier Battle Damage Assessment from 3D Scanned Data
N213-141	Positioning Using Magnetic Anomalies Correlation of Earth (PUMACE)
N213-142	Automated High Frequency Communications Planner

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N213-140 TITLE: Automated Pier Battle Damage Assessment from 3D Scanned Data

OUSD (R&E) MODERNIZATION PRIORITY: Artificial Intelligence (AI)/Machine Learning (ML); Autonomy

TECHNOLOGY AREA(S): Information Systems; Materials / Processes; Sensors

OBJECTIVE: Enable an automated pier repair planning tool with the inputs from remote sensing-captured infrastructure data such as three-dimensional (3D) point-cloud, Simultaneous Localization and Mapping (SLAM) technologies, photogrammetry, and Structure from Motion (SfM), and the outputs being Battle Damage Assessment (BDA) Rough Order of Magnitude (ROM) for repair type, enabling material quantities, and estimated repair times.

DESCRIPTION: Currently, when Port Damage Repair (PDR) efforts are conducted for piers or wharves, geo-referenced 3D point-cloud data for a structure is gathered via LiDAR (for the above water structure) and multi-beam sonar (for the underwater structure). However, presently, all key details of the scanned data are manually entered into a spreadsheet-based tool, known as the Pier Reconnaissance Assessment Tool (PRAT), for facility repair planning and detailed repair instructions. This manual data entry is a laborious human-in-the-loop bottleneck and is an opportunity for significant PDR improvement. Therefore, automating the conversion of structural 3D scan data into actionable tabular gross-defects and BDA are the key focus of this SBIR topic. The methods employed to achieve this end are believed to have commercial value.

This SBIR topic seeks to prototype the automation of gross-defect and battle damage detection (from structure scan 3D point-clouds, SLAM technologies, photogrammetry, and SfM data types), defect identification, defect volume approximation, defect location, and defect tabular summation. This SBIR topic must enable future tabulation of ROM for repair material quantities, and ROM for approximated repair times. All ROM estimates may be nominally approximated from conventional construction, as some military-specific solutions are still in development and such military-specific information is considered out of scope for proposers to this SBIR topic. Common pier construction types to be considered include cast reinforced concrete, pre-stressed concrete, steel, and timber construction (listed in the order of importance, with emphasis on cast reinforced concrete construction). In addition to the concrete, steel, or timber sub-structure or base-structure concerns, the facilities' fender (bumper) system and mooring hardware (cleats and bollards) shall also be addressed.

This SBIR topic does not address generation of repair instruction, plans, specifications, etc., as the actual repair methods may or may not be of a conventional construction method. Current methods for converting 3D point-cloud data into Building Information Modeling (BIM), or for inventorying of scanned city streets, as applied to waterfront structures fall short since they rely on libraries of standardized pre-modelled mechanical components. However, with the construction of piers and wharves, while there are common construction techniques and configurations per material type, there is notable variability within even a single structure, i.e., piers are not built with uniformity, precision, or accuracy (particularly in regard to pile placement and angle, pile-cap dimensions, cast deck features, etc.). Therefore, innovation is needed to post-process 3D scan data, delivering volumetric construction details and patterns on the existing and missing component(s), while allowing for original structural variability (i.e., variability is not a gross defect or battle damage).

Also, current methods for defect detection/location rely on change-detection between two vintages of data. However, in the subject case, the user is assumed to not have access to pre-event scan data. Therefore, gross-defect and BDA will need to rely on things such as in-situ pattern recognition/missing-pattern detection within a +/- 12 inch grid precision, and +/- 6 inch feature/component (e.g., pile, pile cap,

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etc.) dimensional precision (statistical pattern configuration [i.e., change-detection strategy] from undamaged portions of structure), innovations in artificial intelligence (AI)/machine learning (ML), a convenient user interface for identification, or other diverse BDA techniques. Increases in the level of required human interaction for this step will proportionally lower the overall satisfaction in the resulting solutions(s).

It is desired to reduce the time (or labor equivalent) required between obtaining of scan data to the completion of the BDA tabular data entry by a factor of between half (satisfactory) and three quarters (excellent) reduction.

This SBIR topic seeks solutions that will work equally well for structure scan data sets from either (listed in order of preference): 1.) 3D point-clouds, 2.) SLAM technologies, 3.) Photogrammetry, and 4.) SfM technologies. Proposed solutions that do not address all these listed technologies will receive proportionally less consideration. Emphasis for this SBIR topic is currently placed on, however not limited to, 3D point-cloud data.

This SBIR topic seeks solutions which can be executed in the field, without reliable Wi-Fi connectivity; therefore, are not cloud-based or require high computing capability. This topic also seeks solutions that utilize open standard data interfaces and enables interoperability between IT systems.

Once the gross defects and BDA are tabulated, with ROM repair volumes and times summarized, the requirements of this topic will be satisfied.

PHASE I: Determine the technical feasibility of automating the conversion of structural 3D scan data into actionable tabular-based gross-defects and BDA. Within this requirement, separately determine the technical feasibility of:

- a) Post-processing 3D scan data, delivering volumetric detail and construction patterns on the existing and potentially missing component(s), while allowing for constructed variability.
- b) Determining BDA from in-situ pattern recognition, missing pattern detection (i.e., 3D statistically-based pattern-detection/change-detection based on undamaged portions of a variably-constructed structure), innovations in AI/ML, a field user interface for identification, or other diverse BDA techniques.
- c) Reducing by half or three quarters the time (or labor equivalent) between obtaining scan data through to the completion of the BDA tabular data entry. For proposal purposes, assume a concrete-constructed pier approximately 100 ft. wide x 1,000 ft. long x 5 ft. of average under-deck clearance, with 100 bents and 20 piles per bent (i.e., 20 rows of piles); assume that a three person BDA assessment team will require two days (equivalent to 48 labor hours) to assess.
- d) The solution's likelihood to work with 3D point-clouds, SLAM technologies, photogrammetry, and SfM data types, in a communications degraded or communications denied environment (i.e., local connectivity possible, global/networked connectivity not).

Note: Beginning with commercial off-the-shelf (COTS) options is acceptable in Phase I. Limited proof of concept for custom integration is also acceptable in Phase I, but is not required.

PHASE II: Develop a prototype of custom solutions or integration that enables post-processing of 3D scan data of an idealized structure(s) and idealized damage scenario(s). Deliver a tabular summary of volumetric detail, location, and affected structural components (down to NAVFAC Design-Build RFP Structure [UNIFORMAT-II] component level) for gross-defects and for BDA.

While not required at this point, possible steps for the above might include:

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- Determining or establishing situ/constructed pattern recognition (while allowing for constructed variability), either via pattern recognition methods, AI/ML, field user interface for identification, or other diverse defect identification techniques
- Providing volumetric detail of the structure, down to UNIFORMAT-II component level (see references), i.e., delineate the volume of each pile, pile-cap, beam, deck span, etc.
- Determining or establishing construction pattern for the missing component(s), while allowing for constructed variability.
- Providing volumetric detail of the missing structure component(s), down to UNIFORMAT-II component level, i.e., enabling future ROM repairs and times likely driven by the combination of volume and component location.
- Providing tabular output of volumetric detail, location, and affected structural component for gross-defects and for BDA.

Provide the idealized data(s) for structure(s) and damage scenario(s) of typical port/harbor pier(s) and wharf construction types, and include rubble, debris, and other simulated realistic scenario for the solution to overcome. (Note: Single construction type for reinforced concrete is acceptable for Phase II.)

Provide validation of the following:

- Volumes of constructed element(s)
- Constructed structural pattern (i.e., bent/row grid, or similar)
- Volumes of missing/damaged element(s)
- Identification of missing element(s) from pattern or convenient graphical user interface
- Reductions by half to three quarters for the time (or labor equivalent) between obtaining scan data through to the completion of the BDA tabular data generation
- The solution's likelihood to work with 3D point-clouds, SLAM technologies, photogrammetry, and SfM data types
- Capability to operate in a communications degraded or communications denied environment (i.e., local connectivity possible, global/networked connectivity not)

PHASE III DUAL USE APPLICATIONS: Transition the product within the Government to include field demonstration of the Phase III solution for two actual concrete-constructed piers, where actual gross defects may or may not exist, and where the actual data is edited to simulate battle damage with simulated debris, rubble, and other realistic anomalies.

Revise the tabular formatting of the Phase II solution to fully satisfy employment by the Pier Reconnaissance Assessment Tool (PRAT) process.

Potential dual-use applications include:

- 1) Government off-the-shelf (GOTS) to U.S. Army Corps of Engineers (USACE), Engineer Research and Development Center (ERDC) for use with the PRAT; whereby Navy Expeditionary Combat Command (NECC) and the Underwater Construction Team (UCT) will employ the solution from within the PRAT.
- 2) A non-military tool for licensing or selling to major vendor(s) of related computer aided design and modelling tools and software.

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https://www.goodreads.com/author/show/17316991.United_States_Government_US_Navy

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2. Unified Facilities Criteria (UFC); UFC 4-150-07; MAINTENANCE AND OPERATION: MAINTENANCE OF WATERFRONT FACILITIES.

https://www.cioimpact.com/www/FFC/DOD/UFC/ufc_4_150_07_2001_c1.pdf

3. UFC 4-150-08; INSPECTION OF MOORING HARDWARE.

<https://standards.globalspec.com/std/565254/ufc-4-150-08>

4. NAVFAC Design-Build RFP Unifomat Structure; UNIFORMAT II / WORK BREAKDOWN STRUCTURE; Section H – Waterfront; see all H1010 through H1040 codes.

<https://www.wbdg.org/ffc/navy-navfac/design-build-request-proposal/uniformat-structure>

5. ASCE Manuals and Reports on Engineering Practice No. 130; Waterfront Facilities Inspection and Assessment.

<https://sp360.asce.org/PersonifyEbusiness/Merchandise/Product-Details/productId/233127082>

KEYWORDS: Battle Damage Assessment; BDA; Engineering Survey; Expeditionary Pier Repair; Repair Planning Tool; 3D; Point Cloud Data; Point Cloud Conversion; Simultaneous Localization and Mapping; (SLAM); Photogrammetry; Structure From Motion; Building Information Modeling; BIM

VERSION 2

N213-141 TITLE: Positioning Using Magnetic Anomalies Correlation of Earth (PUMACE)

OUSD (R&E) MODERNIZATION PRIORITY: Networked C3

TECHNOLOGY AREA(S): Sensors

OBJECTIVE: Develop Global Positioning System (GPS)-independent positioning sensors for accurate surface and subsurface vessel positioning that utilizes Earth's magnetic anomalies with an accuracy threshold of at least 30 meters and 15 meters (Objective) and has a Size, Weight and Power (SWaP) of 500 cm³ for the target volume, <5W for power and weight of <15 lbs.

DESCRIPTION: GPS is a highly accurate all-weather source of positioning, velocity, and timing and is invaluable in bounding a ship's inertial navigation system's (INS) error. However, GPS utilizes weak radio frequency (RF) signals from distant satellites and are subjected to intentional and unintentional interference. Navigation based on the Earth's magnetic field promises a more robust all-weather passive navigation with no dependence on new infrastructure.

Magnetic anomaly navigation has been extensively explored and researched, most notably by the Air Force Institute of Technology; however, challenges remain in the availability of precise maps of the Earth's crustal magnetic field. The presence of larger core fields, as well as temporal variations, can further limit the precision of position accuracy. Additionally, locally induced magnetic fields of the ship itself must also be considered in the determination of position. Furthermore, there are limitations to current Geomagnetic Mapping that requires advanced modeling techniques. For example, the International Geomagnetic Reference Field (IGRF) model only accounts for the core field. Crustal field variation sensing could result in accurate positioning; however, because the crustal field is so weak in comparison to core fields, it also requires advanced vector sensors. Current-generation sensors are limited because they are scalar sensors and, therefore, not capable of sensing minute variations of the Earth's crustal field.

Advanced magnetic anomaly sensors can provide reliable and accurate INS aiding. These sensors can also work effectively to bound inertial error by providing re-sets to the INS. Additionally, they can provide a precise, all-weather robust vertical reference to bound INS errors over time. This family of sensors can promise robust positioning using integrated systems that are capable of blending alternate positioning sensor data as a re-set of the INS for continued accurate platform navigation holdover without GPS dependency. In addition to INS aiding, the data can be used as another sensor source for integrity evaluation within the Position, Navigation, and Timing (PNT) suite.

PHASE I: Determine the technical feasibility of using measurements of anomalies in the Earth's magnetic field for accurate Geomagnetic Mapping, as well as the identification of sensors necessary to detect magnetic field anomalies for accurate positioning.

Describe the technical solution based on the investigation and technical trade-offs performed earlier in this phase. Identify the means to incorporate the technical solution into the PNT suite, such as the GPS-based Positioning Navigation and Timing Service (GPNTS).

For the identified solution, develop the SBIR Phase II Project Plan to include a detailed schedule (in Gantt format), spend plan, performance objectives, and transition plan for the identified Program of Records (PoRs).

PHASE II: Develop a set of performance specifications for the Positioning Using Magnetic Anomalies Correlation of Earth (PUMACE) sensor with positioning solution system for GPNTS and conduct a System Requirements Review (SRR).

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Engage with the Program Office in its introduction and collaboration with Naval Information Warfare Center (NIWC) Pacific engineers. Establish a working relationship with PMW/A 170 and NIWC Pacific engineers to perform integration studies to include the identification of any necessary engineering changes to the GPNTS system. Additionally, establish a working relationship with the engineering team(s) of other potential transition PNT suite target(s).

Develop the prototype PUMACE sensor with positioning solution system for GPNTS for demonstration and validation in the GPNTS or equivalent development environment. Conduct a Preliminary Design Review (PDR) and commence development of an Engineering Development Model (EDM) system. Conduct a Critical Design Review (CDR) prior to building the EDM.

Develop the life-cycle support strategies and concepts for the system.

Develop a SBIR Phase III Project Plan to include a detailed schedule (in Gantt format) and spend plan, performance requirements, and revised transition plan for the GPNTS and other potential transition PNT suite target(s).

PHASE III DUAL USE APPLICATIONS: Refine and fully develop the Phase II EDM to produce a Production Representative Article (PRA) of the PUMACE sensor.

Perform Formal Qualification Tests (FQT) (e.g., field testing, operational assessments) of the PRA PUMACE sensor with the GPNTS system and other potential transition PNT suite target(s). Provide life-cycle support strategies and concepts for the PUMACE sensor with the GPNTS and other potential transition PNT suite contractor(s) by developing a Life-Cycle Sustainment Plan (LCSP).

Investigate the dual use of the developed technologies for commercial applications, including but not limited to, commercial and privately owned vessels and aircrafts. These sensors can provide an additional method of positioning that is independent of GPS and is available at all times, world-wide.

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3. Mount, Lauren A. "Navigation using Vector and Tensor Measurements of the Earth's Magnetic Anomaly Field." (2018). AFIT Scholar Theses and Dissertations. 1817. <https://scholar.afit.edu/etd/1817>
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KEYWORDS: Earth's Magnetic Fields; Magnetic Sensors; Magnetic Anomalies; GPS-based Positioning, Navigation, and Timing Service; GPNTS; Position, Navigation, and Timing; PNT; Assured Position, Navigation, and Timing; APNT; Positioning; Navigation; Global Positioning System; GPS; Positioning Using Magnetic Anomalies Correlation of Earth; PUMACE

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N213-142 TITLE: Automated High Frequency Communications Planner

OUSD (R&E) MODERNIZATION PRIORITY: Autonomy; Networked C3

TECHNOLOGY AREA(S): Human Systems; Information Systems

OBJECTIVE: Develop a fully automated communications planning tool that will cover the military High Frequency (HF) operational frequencies (2 MHz to 30 MHz) and will support, at a minimum, HF sounding information (e.g., ionospheric analysis and modeling, real-time and forecast ionospheric and propagation conditions) to create frequency plans; monitor and control local and distant radio assets; and utilize open standards for management and control planes.

DESCRIPTION: As various threats to the communications world continue to grow, the Navy must remain vigilant and properly equipped to respond to changes to the threat environment. While Satellite Communications (SATCOM) is the preferred method of communications, if degraded or denied, High Frequency (HF) communications provide a means for the continuity of communications. HF communications via ionospheric reflection is a commonly used technique; unfortunately, HF communications are complex due to the constantly changing ionosphere. Ionospheric sounding is a technique used to provide real-time ionospheric data that is vital for HF communications. With the addition of forecasted data, it can effectively predict the optimal channels for communications.

The solution, expected to be fully automated, will ingest ionospheric and propagation information to actively and dynamically provide frequency plans; and will provide resilient and reliable communications in the tactical environment, which is key to the successful completion of missions of the U.S. Navy, Joint, and Coalition forces.

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 DoD 5220.22-M, National Industrial Security Program Operating Manual, unless acceptable mitigating procedures can and have been implemented and approved by the Defense Counterintelligence Security Agency (DCSA). The selected contractor must be able to acquire and maintain a secret level facility and Personnel Security Clearances, in order to perform on advanced phases of this project as set forth by DCSA and NAVWAR 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 IAW DoD 5220.22-M during the advanced phases of this contract.

PHASE I: Define the automated HF communications planning tool architecture that will optimize HF channel selection based on real-time ionospheric and propagation information, as well as prediction data; and enable monitoring and control of local and distant radios. Determine the feasibility of the tool architecture.

Develop the SBIR Phase II Project Plan to include a detailed schedule (in Gantt format), spend plan, performance objectives, and transition plan for Battle Force Tactical Network (BFTN) Resilient Command and Control (RC2) System Enhancement (BRSE).

PHASE II: Develop a set of performance specifications for the system and conduct a System Requirements Review (SRR).

Engage with the Program Office in its introduction and collaboration with Naval Information Warfare Center (NIWC) Pacific and Office of Naval Research (ONR) Engineers. Establish a working relationship

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with PMW/A 170 and NIWC Pacific engineers to perform initial integration activities and identification/development of any necessary engineering changes to BRSE.

Develop the prototype system for demonstration and validation in BRSE or an equivalent development environment. Conduct a Preliminary Design Review (PDR). Conduct a Critical Design Review (CDR) prior to building the EDM. Commence development of an Engineering Development Model (EDM) system.

Develop the life-cycle support strategies and concepts for the system.

Develop a SBIR Phase III Project Plan to include a detailed schedule (in Gantt format) and spend plan, performance requirements, and revised transition plan for BRSE.

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: Refine and fully develop the Phase II EMD to produce a Production Representative Article (PRA) of the system.

Perform Formal Qualification Tests (FQT) (e.g., field testing, operational assessments) of the PRA with BRSE.

Provide life-cycle support strategies and concepts for the system by developing a Life-Cycle Sustainment Plan (LCSP).

Investigate the dual use of the developed technologies for commercial applications such as Global Maritime Distress and Safety System (GMDSS) communications or other users that employ maritime sea-to-shore and ship-to-ship services.

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3. Hervás, Marcos, et al. "Ionospheric Narrowband and Wideband HF Soundings for Communications Purposes: A Review." PubMed Central (PMC), 28 Apr. 2020. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7273218>

KEYWORDS: Battle Force Tactical Network; BFTN; Resilient Command and Control; RC2, BFTN RC2 System Enhancements; BRSE,; High Frequency: HF; Ionosphere; Propagation; Automation