

**AIR FORCE (AF)**  
**16.3 Small Business Innovation Research (SBIR)**  
**Direct to Phase II Proposal Instructions**

The AF 16.3 Direct to Phase II proposal submission instructions are intended to clarify the Department of Defense (DoD) instructions as they apply to AF requirements. This Announcement is for Direct to Phase II proposals only. All Phase II proposals must be prepared and submitted through the DoD SBIR/STTR electronic submission site: <https://sbir.defensebusiness.org>. The offeror is responsible for ensuring that their proposal complies with the requirements in the most current version of this instruction. Prior to submitting your proposal, please review the latest version of these instructions as they are subject to change before the submission deadline.

**Please note that changes have been made to these instructions. Firms must ensure their proposal meets all requirements of the Announcement currently posted on the DoD website at the time the Announcement closes. Incomplete proposals will be rejected.**

**I. DIRECT TO PHASE II**

15 U.S.C. §638 (cc), as amended by NDAA FY2012, Sec. 5106, PILOT TO ALLOW PHASE FLEXIBILITY, allows the Department of Defense to make an award to a small business concern under Phase II of the SBIR program with respect to a project, without regard to whether the small business concern was provided an award under Phase I of an SBIR program with respect to such project. Air Force is conducting a "Direct to Phase II" implementation of this authority for this 16.3 SBIR Announcement and does not guarantee Direct to Phase II opportunities will be offered in future Announcements. Each eligible topic requires documentation to determine that Phase I feasibility described in the Phase I section of the topic has been met.

The Air Force Direct to Phase II Proposals are different than traditional Air Force Phase I SBIR/STTR proposals. The chart below explains some of these differences.

	<b>STANDARD AIR FORCE SBIR/STTR PROCESS</b>	<b>AIR FORCE D2P2 PROCESS</b>
<b>PHASE 1 TYPICAL FUNDING LEVEL</b>	~\$150k	None
<b>PHASE 1 TECHNICAL *POP DURATION</b>	9 months	None
<b>PHASE I TECHNICAL REPORT</b>	3 months	None
<b>PHASE 2 TYPICAL FUNDING LEVEL</b>	~\$750k	\$1.5M
<b>PHASE 2 TECHNICAL *POP DURATION</b>	24 months	12 months
<b>PHASE 2 TECHNICAL REPORT</b>	3 months	3 months

\*POP= Period of Performance

**II. INTRODUCTION**

Direct to Phase II proposals must follow the steps outlined below:

STEP 1:

1. Offerors must create a Cover Sheet using the DoD Proposal submission system (follow the DoD Instructions for the Cover Sheet located in section 5.4.a. Offerors must provide documentation that satisfies the Phase I feasibility requirement\* that will be included as an Appendix to the Phase II proposal. Offerors must demonstrate that they have completed research and development through means other than the SBIR/STTR program to establish the feasibility of the proposed Phase II effort based on the criteria outlined in the topic description.

STEP 2:

2. Offerors must submit a Phase II proposal using the AF Phase II proposal instructions below.

\* NOTE: Offerors are required to provide information demonstrating that the scientific and technical merit and feasibility has been established. The Air Force will not evaluate the offeror's related Phase II proposal if it determines that the offeror has failed to demonstrate that technical merit and feasibility has been established or the offeror has failed to demonstrate that work submitted in the feasibility documentation was substantially performed by the offeror and/or the principal investigator (PI). Refer to the Phase I description (within the topic) to review the minimum requirements that need to be demonstrated in the feasibility documentation. **Feasibility documentation MUST NOT be solely based on work performed under prior or ongoing federally funded SBIR or STTR work.**

### **III. PROPOSAL SUBMISSION**

The complete proposal, i.e., DoD Cover Sheet, technical proposal, cost proposal, and Company Commercialization Report, must be submitted electronically at <https://sbir.defensebusiness.org/>. Only one Phase II proposal file can be uploaded to the DoD Submission Site. Ensure your complete technical volume and additional cost volume information is included in this sole submission. The preferred submission format is Portable Document Format (.pdf). Graphics must be distinguishable in black and white. **VIRUS-CHECK ALL SUBMISSIONS.**

**Complete proposals must include all of the following:**

- a. Cover Sheet
- b. Technical Volume
- c. A signed Non-Disclosure Agreement inserted at the end of the Technical Volume
- d. A signed Certificate of Training inserted at the end of the Technical Volume
- e. Cost Volume
- f. DD2345 if applicable
- g. Commercialization Report
- h. SBIR/STTR Environment, Safety and Occupational Health (ESOH) Questionnaire

Phase II proposals require a comprehensive, detailed submission of the proposed effort. AF Direct to Phase II efforts are 15 months; 12 months for technical performance and three (3) months for completion of the final report. AF Direct to Phase II efforts are awarded up to a maximum value of \$1.5M per contract award. Please refer to individual topic write-ups for specific award funding limits. Commercial and military potential of the technology under development is extremely important. Proposals emphasizing dual-use applications and commercial exploitation of resulting technologies are sought.

All Phase II Research or Research and Development (R/R&D) must be performed by the small business and its team members in the United States, as defined in the DoD 16.2 Announcement Instructions. The primary employment of the Phase II principal investigator must be with the small business concern at the time of award and during conduct of the entire proposed effort. Primary employment is defined as more than one-half of the principal investigator's time being spent working for the small business. This

precludes full-time employment with another organization.

Knowingly and willfully making false, fictitious, or fraudulent statements or representations may be a felony under the Federal Criminal Statement Act, 18 U.S.C. Section 1001, punishable by a fine up to \$10,000, up to five years in prison, or both.

#### **IV. PHASE II PROPOSAL PREPARATION INSTRUCTIONS AND PROPOSAL REQUIREMENTS**

The technical proposal is limited to 50 pages. The commercialization report, advocacy letters (if any), "SBIR/ STTR Environment, Safety and Occupational Health (ESOH) Questionnaire", (Attachment 1) and the additional cost proposal itemized listing (17a through 17i) should be included as the last pages of the uploaded technical volume. This documentation and the Cover Sheet will not count toward the 50-page limitation.

**The Air Force SBIR/STTR Program Office has instituted new requirements in an initiative to combat fraud in the SBIR/STTR program. As a result, each Small Business is required to visit the AF SBIR Program website: [www.wpafb.af.mil/AFSBIRSTTR](http://www.wpafb.af.mil/AFSBIRSTTR) and read through the "Compliance with Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Program Rules" training. The Certificate of Training Completion at the end of the training presentation and/or as pg. AF-16 of this document, MUST be signed by an official of your company, AND ATTACHED to your proposal. Failure to do this will result in your proposal being removed from consideration. This will not count toward the 50-page limitation.**

A. **Proposal Requirements.** A Phase II proposal should provide sufficient information to persuade the AF the proposed advancement of the technology represents an innovative solution to the scientific or engineering problem and is worthy of support under the stated criteria. All sections below count toward the page limitation, unless otherwise specified.

B. **Proprietary Information.** Information constituting a trade secret, commercial or financial information, confidential personal information, or data affecting national security must be clearly marked. It shall be treated in confidence to the extent permitted by law. Be advised, in the event of proposal selection it is likely the Work Plan or Statement of Work (SOW) will be incorporated into the resulting contract, in whole or part, by reference or as an attachment. Therefore, segregate any information to be excluded from public release pursuant to the Freedom of Information Act (FOIA). See Section 5.3 of the DoD Announcement regarding marking of proprietary information.

C. **General Content.** Proposals should be direct, concise, and informative. Type shall be no smaller than 11-point on standard 8 ½ X 11 paper, with one-inch margins and pages consecutively numbered. Offerors are discouraged from including promotional and non-programmatic items.

D. **Proposal Format.** The technical proposal includes all items listed below in the order provided.

- (1) **Proposal Cover Sheet:** Complete and submit the SBIR Proposal Cover Sheet in accordance with the instructions provided at <https://sbir.defensebusiness.org/>. The technical abstract should include a brief description of the program objective(s), a description of the effort, anticipated benefits and commercial applications of the proposed research, and a list of key words/terms. The technical abstract of each successful proposal will be submitted to the Office of the Secretary of Defense (OSD) for publication and, therefore, must not contain

proprietary or classified information. The term “Component” on the Cover Sheet refers to the AF organization requesting the Phase II proposal.

- (2) **Table of Contents**: A table of contents should be located immediately after the Cover Sheet.
- (3) **Glossary**: Include a glossary of acronyms and abbreviations used in the proposal.
- (4) **Milestone Identification**: Include a program schedule with all key milestones identified. If options are proposed, the schedule should provide notional option start date and period of performance.
- (5) **Identification and Significance of the Problem or Opportunity**: Briefly reference the specific technical problem/opportunity that will be pursued under this effort.
- (6) **Phase II Technical Objectives**: **Detail the specific objectives of the Phase II work, and describe the technical approach and methods to be used in meeting these objects.** The proposal should also include an assessment of the potential commercial application for each objective.
- (7) **Proposer-Prepared Statement of Work (SOW)**: The SOW shall be a separate and distinct part of the proposal package, using a page break to divide it from the technical proposal. The proposed SOW must contain a summary description of the technical methodology and task description in broad enough detail to provide contractual flexibility. The following is the recommended format for the SOW; begin this section on a new page. **DO NOT include proprietary information in the SOW.**
  - a) 1.0 – Objective: This section is intended to provide a brief overview of the specialty area. It should explain why it is being pursued and the expected outcome.
  - b) 2.0 – Scope: This section should provide a concise description of the work to be accomplished, including the technology area to be investigated, goals, and major milestones. However, the key elements of this section are task development and deliverables, i.e., the anticipated end result and/or product of the effort. This section must also be consistent with the information in 4.0 (below).
  - c) 3.0 – Background: The proposer shall identify appropriate specifications, standards, and other documents applicable to the effort. This section includes any information, explanation, or constraints to understanding the requirements. It may include relationships to previous, current, and/or future operations. It may also include techniques previously found to be ineffective.
  - d) 4.0 – Task/Technical Requirements: The detailed description of the individual tasks to accomplish the work to be performed is considered to be legally binding on the proposer. Therefore, it must be developed in an orderly progression with sufficient detail to establish overall program requirements and goals. The work effort must be segregated into major tasks and identified in separately numbered paragraphs.

Each numbered major task should delineate by subtask the work to be performed. The SOW MUST contain every task to be accomplished; they must be definite, realistic, and clearly stated. Use “shall” whenever the SOW expresses a binding provision. Use “should” or “may” to express a declaration or purpose. Use “will” when no contractor requirement is involved, i.e., “. . . power will be supplied by the Government.”

- (8) **Deliverables:** Include a section clearly describing the specific sample/prototype hardware/software to be delivered, as well as data deliverables, schedules, and quantities. Be aware of the possible requirement for unique item identification IAW DFARS 252.211-7003, Item Identification and Valuation, for hardware. If hardware/software will be developed but not delivered, provide an explanation. At a minimum, the following reports will be required under ALL Phase II contracts.
- a) **Scientific and Technical Reports:** Rights in technical data, including software, developed under the terms of any contract resulting from a SBIR Announcement generally remain with the contractor. The Government obtains a royalty-free license to use such technical data for Government purposes during the period commencing with contract award and ending five (5) years after submission of the last contract deliverable. Upon expiration of the five year restrictive license, the Government has unlimited rights to the SBIR data, unless the firm receives another contract under which the SBIR data rights may be asserted.
    - i. **Final Report:** The draft is due 30 days after completion of the Phase II technical effort. The first page of the final report will be a single-page project summary, identifying the purpose of the work, providing a brief description of the effort accomplished, and listing potential applications of the results. The summary may be published by DoD; therefore, it must not contain any proprietary or classified information. The remainder of the report should contain details of the project objectives met, work completed, results obtained, and estimates of technical feasibility.
    - ii. **Status Reports:** Status reports are due quarterly at a minimum.
    - iii. **Phase II Summary Report:** The Phase II summary report is due at the end of the technical effort and must be submitted via electronic form to your cognizant Contracting Officer. Each report should not exceed 700 words and should include a description of the technology and anticipated applications/benefits for Government and/or private sector use.
    - iv. **Small Business Online Success Stories:** Success Story submissions are due at the end of the technical effort via the <http://launchstories.org/> website. Refer to the Contract Data Requirements List (CDRL) in your contract for submission instructions.
  - b) **Cost Reports:** Required if a cost-type contract is awarded.
  - c) **Additional Reporting:** AF may require additional reporting or documentation including:
    - i. Software documentation and users' manuals;
    - ii. Engineering drawings;
    - iii. Operation and maintenance documentation;
    - iv. Safety hazard analysis when the project will result in partial or total development and delivery of hardware; and
    - v. Updates to the commercialization results.
- (9) **Related Work:** Describe significant activities directly related to the proposed effort, including any previous programs conducted by the principal investigator, proposing firm, consultants, or others, and their application to the proposed project. Also list any reviewers providing comments regarding the offeror's knowledge of the state-of-the-art in the specific

approach proposed.

(10) **Commercialization Potential:**

- a) The DoD requires a commercialization plan be submitted with the Phase II proposal, specifically addressing the following questions:
  - i. What is the first planned product to incorporate the proposed technology?
  - ii. Who are the probable customers, and what is the estimated market size?
  - iii. How much money is needed to bring this technology to market and how will it be raised?
  - iv. Does your firm have the necessary marketing expertise and, if not, how will your firm compensate?
  - v. Who are the probable competitors, and what price/quality advantage is anticipated by your firm?
- b) The commercialization strategy plan should briefly describe the commercialization potential for the anticipated results of the proposed project, as well as plans to exploit it. Commercial potential is evidenced by:
  - i. The small business' record of commercializing SBIR/STTR or other research, particularly as reflected in its Company Commercialization Report. The Company Commercialization Report of prior SBIR/STTR awards may be included to satisfy this requirement.
  - ii. The existence of private sector or non-SBIR/STTR funding sources demonstrating commitment to Phase II efforts/results.
  - iii. The existence of Phase III follow-on commitments for the research subject.
  - iv. The presence of other indicators of commercial technology potential, including the firm's commercialization strategy.
- c) If awarded a Phase II contract, the contractor is required to periodically update the commercialization results of the Phase II project at <https://sbir.defensebusiness.org/>. These updates will be required, at completion of the Phase II effort, and subsequently when the contractor submits a new SBIR/STTR proposal to DoD. Firms not submitting a new proposal to DoD will be requested to provide updates annually after completion of the Phase II.

(11) **Military Applications:** Briefly describe the existing/potential military requirement and the military potential of the SBIR/STTR Phase II results. Identify the DoD agency/organization most likely to benefit from the project. State if any DoD agency has expressed interest in, or commitment to, a non-SBIR, Federally-funded Phase III effort. This section should involve not more than one to two (1-2) paragraphs. Include agency point of contact names and telephone numbers.

(12) **Relationship with Future Research or Research and Development (R/R&D) Efforts:**

- a) State the anticipated results of the proposed approach, specifically addressing plans for Phase III, if any.
- b) Discuss the significance of the Phase II effort in providing a basis for the Phase III R/R&D effort, if planned.

- (13) **Key Personnel:** In the technical volume, identify all key personnel involved in the project. Include information directly related to education, experience, and citizenship. A technical resume for the principal investigator, including publications, if any, must also be included. Concise technical resumes for subcontractors and consultants, if any, are also useful. You must identify all non-U.S. citizens expected to be involved in the project as direct employees, subcontractors, or consultants. For these individuals, in addition to technical resumes, please provide countries of origin, type of visas or work permits under which they are performing, and explanation of their anticipated level of involvement in the project.

Foreign Nationals (also known as Foreign Persons) means any person who is NOT:

- a. a citizen or national of the United States; or
- b. a lawful permanent resident; or
- c. a protected individual as defined by 8 U.S.C. § 1324b

ALL offerors proposing to use foreign nationals MUST follow Section 5.4. c. (8) of the DoD Program Announcement and disclose this information regardless of whether the topic is subject to ITAR restrictions.

When the topic area is subject to export control, these individuals, if permitted to participate, are limited to work in the public domain. Further, tasks assigned must not be capable of assimilation into an understanding of the project's overall objectives. This prevents foreign citizens from acting in key positions, such as Principal Investigator, Senior Engineer, etc. Additional information may be requested during negotiations in order to verify foreign citizens' eligibility to perform on a contract awarded under this Announcement.

The following will apply to all projects with military or dual-use applications that develop beyond fundamental research (basic and applied research ordinarily published and shared broadly within the scientific community):

- (1) The Contractor shall comply with all U. S. export control laws and regulations, including the International Traffic in Arms Regulations (ITAR), 22 CFR Parts 120 through 130, and the Export Administration Regulations (EAR), 15 CFR Parts 730 through 799, in the performance of this contract. In the absence of available license exemptions/exceptions, the Contractor shall be responsible for obtaining the appropriate licenses or other approvals, if required, for exports of (including deemed exports) hardware, technical data, and software, or for the provision of technical assistance.
  - (2) The Contractor shall be responsible for obtaining export licenses, if required, before utilizing foreign persons in the performance of this contract, including instances where the work is to be performed on-site at any Government installation (whether in or outside the United States), where the foreign person will have access to export-controlled technologies, including technical data or software.
  - (3) The Contractor shall be responsible for all regulatory record keeping requirements associated with the use of licenses and license exemptions/exceptions.
  - (4) The Contractor shall be responsible for ensuring that these provisions apply to its subcontractors.
- (14) **Facilities/Equipment:** Describe instrumentation and physical facilities necessary and available to carry out the Phase II effort. Justify equipment to be purchased (detail in cost proposal). State whether proposed performance locations meet environmental

laws and regulations of Federal, state, and local Governments for, but not limited to, airborne emissions, waterborne effluents, external radiation levels, outdoor noise, solid and bulk waste disposal practices, and handling and storage of toxic and hazardous materials.

- (15) **Consultants/Subcontractors:** Private companies, consultants, or universities may be involved in the project. All should be described in detail and included in the cost proposal. **In accordance with the Small Business Administration (SBA) SBIR Policy Directive, a minimum of 50% of the R/R&D must be performed by the proposing firm, unless otherwise approved in writing by the Contracting Officer.** Signed copies of all consultant or subcontractor letters of intent must be attached to the proposal. These letters should briefly state the contribution or expertise being provided. Include a SOW and detailed cost proposal. Include information regarding consultant or subcontractor unique qualifications. Subcontract copies and supporting documents do not count against the Phase II page limit. Identify any subcontract/consultant foreign citizens per (13) above.

- (16) **Prior, Current, or Pending Support of Similar Proposals or Awards:** WARNING: While it is permissible, with proper notification, to submit identical proposals or proposals containing a significant amount of essentially equivalent work for consideration under numerous Federal program Announcements, it is unlawful to enter into contracts or grants requiring essentially equivalent effort. Any potential for this situation must be disclosed to the Announcement agency(ies) before award. If a proposal submitted in response to this Announcement is substantially the same as another proposal previously, currently, or in process of being funded by another Federal agency/DoD Component or the same DoD Component, the company must so indicate on the Cover Sheet and provide the following:

- a) The name and address of the Federal agency(ies) or DoD Component(s) to which proposals were or will be submitted, or from which an awarded is expected or has been received;
- b) The date of proposal submission or date of award;
- c) The title of the proposal;
- d) Name and title of the principal investigator for each proposal submitted or award received; and
- e) Title, number, and date of Announcement(s) under which the proposal was or will be submitted, or under which an award is expected or has been received.
- f) If award was received, provide the contract number.
- g) Specify the applicable topics for each SBIR proposal submitted or award received.

NOTE: If this section does not apply, state in the proposal, "No prior, current, or pending support for proposed work."

- (17) **Cost Proposal:** A detailed cost proposal must be submitted. Cost proposal information will be treated as proprietary. Proposed costs must be provided by both individual cost element and contractor fiscal year (FY) in sufficient detail to determine the basis for estimates, as well as the purpose, necessity, and reasonableness of each. This information will expedite award of the resulting contract if the proposal is selected for award. Generally, cost plus fixed fee (CPFF) contracts are appropriate for Phase II awards. Phase II contracts may include profit (Firm Fixed price) or fee (cost type).

Cost proposal attachments do not count toward Phase II proposal page limitations. The cost proposal

includes:

- a) Direct Labor: Identify key personnel by labor category. Number of hours, actual hourly rates, labor overhead, and/or fringe benefits per contractor FY is also required.
- b) Direct Materials: Costs for materials, parts, and supplies must be justified and supported. Provide an itemized list of types, quantities, prices, and, where appropriate, purpose. If computer or software purchases are planned, detailed information such as manufacturer, price quotes, proposed use, and support for the need will be required.
- c) Other Direct Costs: This includes specialized services such as machining or milling, special test/analysis, and costs for temporary use/lease of specialized facilities/equipment. Provide usage (hours) expected, rates, and sources, as well as brief discussion concerning the purpose and justification. Proposals including leased hardware must include an adequate lease versus purchase rationale. Special tooling/test equipment/material costs are acceptable but will be carefully reviewed to determine the need/appropriateness of the work proposed. The Contracting Officer must decide whether these purchases are advantageous to the Government and are directly related to the proposed effort. Title to property furnished by the Government will be vested with the AF unless determined to be more cost-effective for transfer to the contractor. The Government's intention is not to directly fund purchase of general purpose equipment.
- d) Subcontracts: Subcontract costs must be supported with copies of the subcontract agreements. Agreement documents must adequately describe the work to be performed and basis for cost. The agreement document should include a SOW, assigned personnel, hours and rates, materials (if any), and proposed travel (if any). A letter from the subcontractor agreeing to perform a task or tasks at a fixed price is not considered sufficient. The proposed total of all consultant fees, facility leases or usage fees, and other subcontract or purchase agreements may not exceed one-half of the total contract price or cost, unless otherwise approved in writing by the Contracting Officer.

IAW FAR 15.404-1, price analysis, including reasonableness, realism, and completeness, of the proposed subcontractor costs by the prime is required. If based on comparison with prior efforts, identify the basis upon which the prior prices were determined to be reasonable. If price analysis techniques are inadequate or the FAR requires submission of subcontractor cost or pricing data, provide a cost analysis IAW FAR 15.404-1(c). Cost analysis includes, but is not limited to, consideration of materials, labor, travel, other direct costs, and proposed profit rates.

- e) Consultants: For each consultant, provide a separate agreement letter briefly stating the service to be provided, hours required, and hourly rate and include a short, concise resume.
- f) Travel: Each Phase II effort, at a minimum, should include a kickoff or interim meeting. Travel costs must be justified as related to the needs of the effort. Include destinations, the number of trips, number of travelers per trip, airfare, per diem, lodging, ground transportation, etc. Information regarding per diem and lodging rates may be found in the Joint Travel Regulation (JTR), Volume 2, [www.defensetravel.dod.mil](http://www.defensetravel.dod.mil).
- g) Indirect Costs: Indicate the basis of the proposed rates, e.g., budgeted/actual rates per FY, etc. The proposal should identify the specific rates used and allocation bases to which they are applied. Do not propose composite rates; proposed rates and

applications per FY throughout the anticipated performance period should be provided.

- h) **Cost Share:** Cost sharing is permitted. However, cost sharing is not required nor will it be an evaluation factor in the consideration of a proposal. Please note that cost share contracts do not allow fees.
- i) **DD Form 2345:** For proposals submitted under export-controlled topics (either International Traffic in Arms (ITAR) and Export Administration Regulations (EAR)), a copy of the certified DD Form 2345, Militarily Critical Technical Data Agreement, or evidence of application submission must be included. The form, instructions, and FAQs may be found at the United States/Canada Joint Certification Program website, <http://www.dlis.dla.mil/jcp/>. Approval of the DD Form 2345 will be verified if proposal is chosen for award.

#### **18. Feasibility Documentation**

- a. Maximum page length for feasibility documentation is 25 pages. If you have references, include a reference list or works cited list as the last page of the feasibility documentation. This will count towards the page limit.
- b. Work submitted within the feasibility documentation must have been substantially performed by the offeror and/or the principal investigator (PI). If technology in the feasibility documentation is subject to intellectual property (IP), the offeror must provide IP rights assertions. Provide a good faith representation that you either own or possess appropriate licensing rights to all other IP that will be utilized under your proposal. Additionally, proposers shall provide a short summary for each item asserted with less than unlimited rights that describes the nature of the restriction and the intended use of the intellectual property in the conduct of the proposed research. Please see section 11.5 of the DoD instructions for information regarding technical data rights.
- c. DO NOT INCLUDE marketing material. Marketing material will NOT be evaluated and WILL be redacted.

E. **Company Commercialization Report:** All Phase II proposals must contain a “Commercialization Report of Prior SBIR Awards”. This report should be submitted as an attachment or enclosure and will not be counted against the 50-page limitation. The online Company Commercialization Report may be used to fulfill this requirement. As instructed in paragraph 11.2 of the DoD Announcement, prepare the report using the password-protected DoD SBIR electronic submission site, <https://sbir.defensebusiness.org/>.

#### **V. METHOD OF SELECTION AND EVALUATION CRITERIA**

A. **Introduction:** Phase II proposals are evaluated on a competitive basis by subject matter expert (SME) scientists, engineers, or other technical personnel. Throughout evaluation, selection, and award, confidential proposal and evaluation information will be protected to the greatest extent possible. Phase II proposals will be disqualified and will not be evaluated if the Phase I equivalency documentation does not establish feasibility and technical merit of the proposed technical approach.

B. **Evaluation Criteria:** Phase II proposals will be reviewed for overall merit based on following criteria published in the DoD SBIR Announcement in descending order of importance:

- (1) Technical Merit – The soundness, technical merit, and innovation of the proposed approach and its incremental progress toward topic or subtopic solution.

- (2) Potential for Commercial Application – The potential for commercial (Government or private sector) application and the benefits expected to accrue from it.
- (3) Qualifications of the Principal Investigator (and Team) – Qualifications of the proposed principal/key investigators, supporting staff, and consultants. Qualifications include not only the ability to perform the R/R&D but also to commercialize the results.

Other factors considered during the selection process include appropriate demonstration of feasibility of the technology, equivalent to that resulting from Phase I type efforts; commitment for Phase III funding; possible duplication with other R/R&D; program balance; budget limitations; and potential, if successful, of leading to a product of continuing interest to DoD. Where technical evaluations are essentially equal in merit, and as cost and/or price is a substantial factor, cost to the Government will be considered in determining the successful offeror. AF anticipates pricing will be based on adequate price competition. The next tie-breaker on essentially equivalent proposals is the inclusion of manufacturing considerations. Phase II evaluations may include on-site assessment of the offeror's research results to date, or of the Contractor's facility, by Government personnel. The reasonableness of proposed costs for the Phase II effort will be examined to determine proposals offering the best value to the Government.

**NOTE: Only Government employees and technical personnel from Federally Funded Research and Development Centers (FFRDCs), MITRE and Aerospace Corporations, working under contract to provide technical support to Department of Defense and the AF Space and Missile Systems Center respectively, may evaluate proposals. All FFRDC employees have executed non-disclosure agreement (NDAs) as a requirement of their contracts. Additionally, AF support contractors may be used to administratively or technically support the Government's SBIR Program execution. DFARS 252.227-7025, Limitations on the Use or Disclosure of Government-Furnished Information Marked with Restrictive Legends (Mar 2011), allows Government support contractors to do so without company-to-company NDAs only AFTER the support contractor notifies the SBIR firm of its access to the SBIR data AND the SBIR firm agrees in writing no NDA is necessary. If the SBIR firm does not agree, a company-to-company NDA is required. The attached "NDA Requirements form" (Attachment 2) must be completed, signed, and included in Phase II proposal, indicating your firm's determination regarding company-to-company NDAs for administrative access to SBIR data by AF support contractors or your proposal will be considered incomplete and will not be evaluated. This form will not count against the 50-page limitation.**

## **VI. CERTIFICATIONS**

In addition to the standard Federal and DoD procurement certifications, the SBA SBIR/STTR Policy Directives require the collection of certain information from firms at the time of award and during the award life cycle. Each firm must provide this additional information at the time of the Phase II award, prior to receiving 50% of the total award amount for a Phase II award, and prior to final payment on the Phase II award.

**SBIR/STTR Environment, Safety and Occupational Health (ESOH) Questionnaire**

**Company Name:**

**Title:**

- a. Will hazardous materials (as defined by Federal Standard 313D, Material Safety Data, Transportation Data and Disposal Data for Hazardous Material Furnished to Government Activities and 40 CFR Part 260 – 279) be used in the contract?

Yes                       No

If the answer is "yes," list materials:

\_\_\_\_\_

- b. Will explosives or ammunition be used in research? (See definitions listed below before answering.)

Yes                       No

Explosives and ammunition mean:

(a.) Liquid and solid propellants and explosives, pyrotechnics, incendiaries and smokes in the following:

1. Bulk;
2. Ammunition;
3. Rockets;
4. Missiles;
5. Warheads;
6. Devices; and
7. Components of (1) through (6), except for wholly inert items.

(b.) This definition does not include the following, unless the contractor is using or incorporating these materials for initiation, propulsion, or detonation as an integral or component part of an explosive, an ammunition or explosive end item, or of a weapon system.

1. Inert components containing no explosives, propellants, or pyrotechnics;
2. Flammable liquids;
3. Acids;
4. Oxidizers;
5. Powdered metals; or
6. Other materials having fire or explosive

characteristics.

If the answer is "yes," list items:

\_\_\_\_\_

c. Will any hazardous processes be performed under the contract? Examples include operation of heavy equipment or power tools, operation of lasers or radio frequency radiation emitters, use of high voltage (greater than 600 volts) equipment, or use of equipment operating at high pressure (greater than 60 psig) or high temperature (greater than 50°C).

Yes  No

If the answer is "yes," list processes:

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Will this research be completed on a U.S. Air Force installation?

Yes  No

If the answer is "yes," list facilities:

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d. Will the contract require the purchase, storage use or delivery of any chemicals or hazardous material to USAF facilities?

Yes  No

If the answer is "yes," list chemicals or hazardous materials:

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e. Will any hazardous chemical or waste be generated during the course of this research?

Yes  No

If the answer is "yes," specify the hazardous chemical or waste to be generated:

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f. Will any Class I ozone depleting substances (ODSs) be required in this research?

A list of Class I ODSs is located at the following website: <http://www.epa.gov/ozone/ods.html>

Yes  No

If the answer is "yes," list substances:

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g. Does this effort involve the purchase or use of any radioactive materials?

Yes  No

If the answer is "yes," specify the radioactive materials:

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h. Will this effort involve any asbestos, radiation, or chemical generating/using components that will be delivered to USAF facilities?

Yes                       No

If the answer is "yes," specify the components:

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10. Are there any special atmospheric or water resource requirements?

Yes                       No

If "yes" specify the requirements:

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Revised: 10 July 2015

**AIR FORCE**  
**16.3 Small Business Innovation Research (SBIR)**  
**Non-Disclosure Agreement (NDA) Requirements**

DFARS 252.227-7018(b)(8), Rights in Noncommercial Technical Data and Computer Software – Small Business Innovation Research (SBIR) Program (May 2013), allows Government support contractors access to SBIR data without company-to-company NDAs only AFTER the support contractor notifies the SBIR firm of its access to the SBIR data AND the SBIR firm agrees in writing no NDA is necessary. If the SBIR firm does not agree, a company-to-company NDA is required.

“Covered Government support contractor” is defined in 252.227-7018(a)(6) as “a contractor under a contract, the primary purpose of which is *to furnish independent and impartial advice or technical assistance directly to the Government in support of the Government’s management and oversight of a program or effort* (rather than to directly furnish an end item or service to accomplish a program or effort), provided that the contractor—

(i) Is not affiliated with the prime contractor or a first-tier subcontractor on the program or effort, or with any direct competitor of such prime contractor or any such first-tier subcontractor in furnishing end items or services of the type developed or produced on the program or effort; and

(ii) Receives access to the technical data or computer software for performance of a Government contract that contains the clause at 252.227-7025, Limitations on the Use or Disclosure of Government-Furnished Information Marked with Restrictive Legends.”

**USE OF SUPPORT CONTRACTORS:**

Support contractors may be used to administratively process SBIR documentation or provide technical support related to SBIR contractual efforts to Government Program Offices.

Below, please provide your firm’s determination regarding the requirement for company-to-company NDAs to enable access to SBIR documentation by Air Force support contractors. This agreement must be signed and included in your Phase I/II proposal package

YES       NO      Non-Disclosure Agreement Required  
(If Yes, include your firm’s NDA requirements in your proposal)

Company: \_\_\_\_\_ Proposal Number: \_\_\_\_\_

Address: \_\_\_\_\_ City/State/Zip: \_\_\_\_\_

Proposal Title: \_\_\_\_\_

Name \_\_\_\_\_ Date: \_\_\_\_\_

Title/Position \_\_\_\_\_

Revised: 10 July, 2015

**AIR FORCE SMALL BUSINESS INNOVATION RESEARCH (SBIR)/  
SMALL BUSINESS TECHNOLOGY TRANSFER (STTR) PROGRAMS  
“COMPLIANCE WITH SBIR/STTR PROGRAM RULES”**

The undersigned has fully and completely reviewed this training on behalf of the proposer/awardee, understands the information presented, and has the authority to make this certification on behalf of the proposer/awardee. The undersigned understands providing false or misleading information during any part of the proposal, award, or performance phase of a SBIR or STTR contract or grant may result in criminal, civil or administrative sanctions, including but not limited to: fines, restitution, and/or imprisonment under 18 USC 1001; treble damages and civil penalties under the False Claims Act, 31 USC 3729 et seq.; double damages and civil penalties under the Program Fraud Civil Remedies Act, 31 USC 3801 et seq.; civil recovery of award funds; suspension and/or debarment from all federal procurement and non-procurement transactions, FAR Part 9.4 or 2 CFR Part 180; and other administrative remedies including termination of active SBIR/STTR awards.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Name

\_\_\_\_\_  
Firm Name and Position Title

\_\_\_\_\_  
Proposal Number

## **AIR FORCE SBIR 16.3 Direct to Phase II Topic Index**

AF163-D001      Small Satellite System for Space Surveillance

## AIR FORCE SBIR 16.3 Direct to Phase II Topic Descriptions

AF163-D001      TITLE: Small Satellite System for Space Surveillance

TECHNOLOGY AREA(S): Battlespace, Information Systems

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 section 5.4.c.(8) of the solicitation and within the AF Component-specific instructions. Offerors are advised foreign nationals proposed to perform on this topic may be restricted due to the technical data under US Export Control Laws. Please direct questions to the AF SBIR/STTR Contracting Officer, Ms. Gail Nyikon, [gail.nyikon@us.af.mil](mailto:gail.nyikon@us.af.mil).

**OBJECTIVE:** Develop a low earth orbit small satellite system suitable for detecting and locating near-GEO (geosynchronous orbit) space objects of apparent visible magnitude 16 Mv or brighter. The project shall serve as a pathfinder in assessing the feasibility and affordability of developing a low cost constellation for routine and frequent updates to the GEO catalog.

**DESCRIPTION:** Multiple factors are causing rapid advances in space-related capabilities beyond the traditional domain of governments and commercial geostationary satellites services. A primary driver of these advancements is that leading innovators, entrepreneurs and technology companies are turning their attention and resources to developing satellite-based services and supporting satellite and launch systems. Commoditization of satellite components and major subsystems, through modularization and standardization, use of commercial/automotive electronics and hardware, rapid manufacturing, 3D printing, automated design tools, and advanced software capabilities are yielding cubesats, smallsats, and microsats that can be built in months and that cost a fraction of that of traditional satellites. The standardization of cubesats based on 3U, 6U and 12U sizes and associated containerized launch and release systems, and standardization of smallsat sizes and interfaces including ESPA (EELV Secondary Payload Adapter) class, offer more options for low-cost space access through rideshare. Emerging dedicated smallsat launchers are using novel production methods, new rocket technology, reusability, large launch rates, and modern range and operational approaches. Furthermore, the availability of global networks for commercial ground stations and communications services allow for significant reduction in the cost of operations for these systems. It is envisioned that the revolution in business models, data analytics, payloads, satellites, launch and ground systems, sometimes collectively called New Space, can provide benefits to the Air Force in certain mission areas, and in particular for this Phase II topic area, for space surveillance. The current Air Force Space Surveillance Network (SSN) includes a range of ground-based sensors and space-based sensors to maintain a catalog of over 1500 objects in near-GEO, and it is known that there are many smaller objects that are difficult to detect or cannot be tracked with current systems. For the purposes of this solicitation, near-GEO is defined to include orbits having a mean period of approximately 24 hours, or an apogee near 35,768km, and having any values of inclination angle and orbital eccentricity. It is projected that the New Space paradigm can replicate the capabilities of these LEO systems within the scope of this Phase II, i.e., deliver a satellite and/or payload for this mission area within the funding and schedule of the awarded contract(s). There are several options for award, including a single award for satellite bus and payload, or separate awards to two vendors, one for the bus and one for the payload. In the latter case, vendors will be required to collaborate to define appropriate interfaces between these two system elements. The Air Force may elect to subsequently partner with awardees to support the integration, launch and operations of the delivered systems.

PHASE I: Proposal must show

- A) Demonstrated understanding of space surveillance technology and data products used for space catalog maintenance.
- B) Demonstrated capability to produce small satellites and/or optical payloads that have relevance to this

space surveillance mission area.

C) Demonstrated understanding of opportunities, processes and constraints for ground communications links, satellite operations and low cost launch, primarily through ridesharing.

**FEASIBILITY DOCUMENTATION:** Offerors interested in submitting a Direct to Phase II proposal in response to this topic must provide documentation to substantiate that the scientific and technical merit and feasibility described above has been met and to identify the potential commercial applications. The documentation provided must substantiate that the proposer has developed a preliminary understanding of the technology to be applied in their Phase II proposal to meet the objectives of this topic. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Read and follow all of the feasibility documentation portions of the Air Force 16.3 Instructions. The Air Force will not evaluate the offeror's related Direct to Phase II proposal where it determines that the offeror has failed to demonstrate the scientific and technical merit and feasibility of the Phase I project.

**PHASE II:** The contractor shall perform the following tasks:

1. Develop an overall low-cost LEO-based small satellite mission design concept that provides for detection and location of near-GEO objects, on a prescheduled / routine basis (sweep mode or fence mode), or with options for scheduled tasking.
  - a. Space segment design to include satellite bus and payload, and interfaces / requirements for operations, including ground communications links
  - b. Define the performance capabilities in terms of at least:
    - i. Detectability of near-GEO objects (goal of apparent visual magnitude of 16 and brighter and clear analysis of technical limitations for detecting magnitude 16 or possibly dimmer objects)
    - ii. Tracking limitations including
    - iii. Number of observations / day (goal of 2000 or more)
    - iv. Latency of reporting observations (goal less than 2 hours)
    - v. Tracking accuracy (goal of better than 10 arc seconds)
    - vi. Mission life (goal of 1 year or more)
  - c. Assessment of available launch option(s) utilizing rideshare or dedicated smallsat launchers
  - d. Plan for ground segment communications option(s) utilizing commercial ground station opportunities
2. Develop and deliver a space qualifiable small satellite bus and/or sensor payload that provides detection and location of near-GEO objects consistent with this mission design:
  - a. Utilize standard or prescribed interfaces to proposed launch vehicles and ground segment.
  - b. Define and utilize commonly available industry standard electrical, data and mechanical interfaces between payload and bus, if opting to deliver only one or the other, for example using RS-422, Ethernet, etc. Details of these interfaces may be modified during the course of the effort to accommodate other awardees developments.

**PHASE III DUAL USE APPLICATIONS:** The Government has an interest in transition of the demonstrated concept to an operational capability in support of routine space situational awareness operations. Additionally, applications of the technology to support commercial satellite operators are envisioned for collision avoidance and anomaly resolution. Furthermore, technologies for low cost satellites and sensors have other commercial mission applications.

**REFERENCES:**

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2. Maskell, P., & Oram, L. (2008, September). Sapphire: Canada's answer to space-based surveillance of orbital objects. In *Advanced Maui Optical and Space Surveillance Conference*.
3. Ackermann, M. R., Kiziah, C. R. R., Zimmer, P. C., McGraw, J. T., & Cox, D. D. A systematic examination of ground-based and space-based approaches to optical detection and tracking of satellites. 31st Space Symposium, Technical Track, Colorado Springs, Colorado, Presented on April 14, 2015
4. USSTRATCOM Space Control and Space Surveillance,

[https://www.stratcom.mil/factsheets/11/Space\\_Control\\_and\\_Space\\_Surveillance/](https://www.stratcom.mil/factsheets/11/Space_Control_and_Space_Surveillance/)

**KEYWORDS:** space situational awareness, space surveillance, space catalog, orbit tracking, deep-space, geosynchronous orbit, image processing, small space-based telescope, cubesat, micro-satellite, space catalog maintenance