# The Department of Defense

# Small Business Technology Transfer (STTR)

# FY 1995

## PROGRAM SOLICITATION
## Closing Date: 7 APRIL 1995

**DoD Departments/Agencies:**

Department of the Army

Department of the Navy

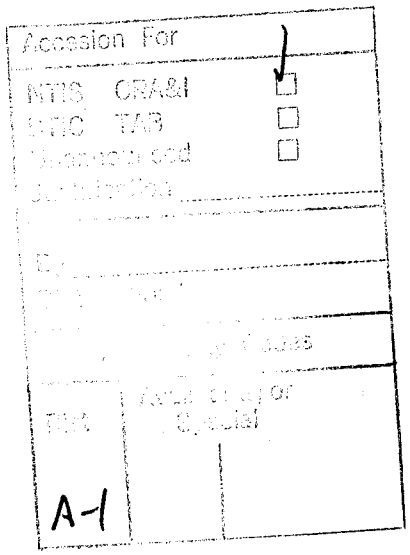
Department of the Air Force

BMDO Ballistic Missile Defense Organization

# PROGRAM SOLICITATION

## Number 95

## Small Business Technology Transfer (STTR) Program




**IMPORTANT**

The DoD is updating its SBIR/STTR Mailing list. To remain on the mailing list or to be added to the list, send in the Mailing List form (Reference E), found at the back of this solicitation, to DTIC.

U.S. Department of Defense
STTR Program Office
Washington, DC 20301

Closing Date: APRIL 7, 1995

Deadline for receipt of proposals at the DoD Component is 2:00 p.m. local time.

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# DOD PROGRAM SOLICITATION FOR SMALL BUSINESS TECHNOLOGY TRANSFER

## 1.0 PROGRAM DESCRIPTION

### 1.1 Introduction

The Army, Navy, Air Force, and Ballistic Missile Defense Organization hereafter referred to as DoD Components, invite small business firms and research institutions to jointly submit proposals under this program solicitation entitled Small Business Technology Transfer (STTR). The STTR Program is a pilot program under which awards are made to small business concerns for cooperative research and development, conducted jointly by a small business and a research institution, through a uniform process having three phases. STTR, although modelled substantially on the SBIR Program, is a separate program and is separately financed. Subject to availability of funds, DoD Components will support high quality cooperative research and development proposals of innovative concepts to solve the listed defense-related scientific or engineering problems, especially those concepts that also have high potential for commercialization in the private sector.

The STTR Program is designed to provide a strong incentive for small companies and researchers at research institutions, i.e., non-profit institutes, contractor-operated federally funded research and development centers (FFRDC), and universities, to work together as a team to move ideas from the laboratory to the marketplace, to foster high-tech economic development, and to advance U.S. economic competitiveness. (See Appendix F)

To foster increased minority participation in DoD Research and Development programs, selecting a Historically Black College or University (HBCU) or Minority Institution (MI) as a second partner is encouraged, although no preference will be given to these proposals. This effort is to facilitate building a research and development infrastructure at the HBCUs and MIs.

The Federal STTR Program is mandated by Public Law 102-564. The basic design of the DoD STTR Program is in accordance with the Small Business Administration (SBA) STTR Policy Directive of 1993. The DoD Program presented in this solicitation strives to encourage scientific and technical innovation in areas specifically identified by DoD Components. The guidelines presented in this solicitation incorporate and exploit the flexibility of the SBA Policy Directive to encourage proposals based on scientific and technical approaches most likely to yield results important to DoD and the private sector.

### 1.2 Three Phase Program

This program solicitation is issued pursuant to the Small Business Research and Development Enhancement Act of 1992, PL 102-564. Phase I is to determine the scientific, technical and commercial merit and feasibility of the proposed cooperative effort and the quality of performance of the small business concern with a relatively small investment before consideration of future DoD support in Phase II. Several different proposed solutions to a given topic may be funded. Proposals will be evaluated on a competitive basis giving primary consideration to the scientific and technical merit of the proposal along with its potential for commercialization. Phase I will typically be one half-person year effort over a period not to exceed one year.

Subsequent Phase II awards will be made to firms on the basis of results from the Phase I effort and the scientific, technical merit and commercial potential of the Phase II proposal. Phase II awards will typically cover 2 to 5 person-years of effort over a period generally not to exceed 24 months (subject to negotiation). Phase II is the principal research or research and development effort and is expected to produce a well-defined deliverable product or process.

Under Phase III, the small business is expected to use non-federal capital to pursue private sector applications of the research or development. Also, under Phase III, federal agencies may award non-STTR funded follow-on contracts for products or processes which meet the mission needs of those agencies.

DoD is not obligated to make any awards under either Phase I, II, or III. DoD is not responsible for any monies expended by the proposer before award of any contract.

### 1.3 Follow-On Funding

In addition to supporting scientific and engineering research and development, another important goal of the program is conversion of DoD-supported research or research and development into commercial products. Proposers are encouraged to obtain a contingent commitment for private or non-STTR follow-on funding prior to Phase II. This commitment may be contingent upon the DoD supported research or development meeting some specific technical objectives in Phase II which if met, would justify non-federal funding to pursue further development for commercial purposes in Phase III. *Note*

*that when several Phase II proposals receive evaluations being of approximately equal merit, proposals that demonstrate such a commitment for follow-on funding will receive extra consideration during the evaluation process.*

The recipient will be permitted to obtain commercial rights to any invention made in either Phase I or Phase II, subject to the patent policies as stated in Section 5.7.

### 1.4 Eligibility and Limitation

Each proposer must qualify as a small business for research or research and development purposes as defined in Section 2.3 and certify to this on the Cover Sheet (Appendix A) of the proposal. In addition, a minimum of 40 percent of each STTR project must be carried out by the small business concern and a minimum of 30 percent of the effort performed by the research institution, as defined in Section 2.4.

A small business concern must negotiate a written agreement between the small business and the research institution allocating intellectual property rights and rights to carry out follow-on research, development, or commercialization (see Reference A).

For both Phase I and Phase II, the research or research and development work must be performed by the small business concern and research institution in the United States. "United States" means the fifty states, the Territories and possessions of the United States, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, the Trust Territory of the Pacific Islands, and the District of Columbia.

Joint ventures and limited partnerships are permitted for the small business portion, provided that the entity created qualifies as a small business in accordance with the Small Business Act, 15 USC 631, and the definition included in Section 2.3.

### 1.5 Conflicts of Interest

Awards made to firms owned by or employing current or previous Federal Government employees could create conflicts of interest for those employees in violation of 18 USC and 10 USC 2397. Such proposers should contact the cognizant Ethics Counsellor of the DoD Component for further guidance.

### 1.6 Contact with DoD

**a. General Information.** General information questions pertaining to proposal instructions contained in this solicitation should be directed to:

Mr. Bob Wrenn, STTR Coordinator
OUSD(ANT)/SADBU
The Pentagon - Room 2A340
Washington, DC 20301-3061
(703) 697-1481

Other non-technical questions pertaining to a specific DoD Component should be directed in accordance with instructions given at the beginning of that DoD Component's topics in Section 8.0 of this solicitation. Oral communications with DoD Components regarding the technical content of this solicitation during the Phase I proposal preparation periods are prohibited for reasons of competitive fairness.

**b. Requests for Copies of DoD STTR Solicitation.** *To remain on the DoD SBIR/STTR Mailing list, send in the Mailing List form (Reference E) to DTIC.* Additional copies of this solicitation may be ordered from:

Defense Technical Information Center
Attn: DTIC/STTR
Building 5, Cameron Station
Alexandria, Virginia 22304-6415
(800) 363-7247 (800 DOD-SBIR)
(703) 274-6903 commercial

This solicitation is also available on floppy diskette (in Word Perfect) from DTIC for a nominal processing fee. Internet access to this solicitation is also provided by DTIC. The file may be accessed via gopher at Internet address: **gopher.dtic.dla.mil** on port 70, or through file transfer at Internet address: **asc.dtic.dla.mil** (login is "anonymous", password is: your E-Mail address), under the /pub/sbir directory.

The DoD STTR solicitation can be obtained electronically using Business Gold, the National Technology Transfer Center's bulletin board system. Connect via Internet by telneting to **iron.nttc.edu**, or by dialing (304) 243-2560 for high speed modems (9600+) or (304) 243-2561 for 1200-2400 baud modems and logging in as guest. For more information on the NTTC electronic bulletin board system contact:

National Technology Transfer Center
Wheeling Jesuit College
316 Washington Ave.
Wheeling, WV 26003
(800) 678-6882

**c. Outreach Program.** The DoD holds three National SBIR/STTR Conferences a year and participates in many state-organized conferences for small business. We have a special outreach effort to socially and economically disadvantaged firms and to small companies that are negatively affected by the Defense down-sizing.

## 2.0 DEFINITIONS

The following definitions apply for the purposes of this solicitation:

**2.1 Research or Research and Development.** Systematic study and experimentation directed toward greater knowledge or understanding of the subject studied or toward applying new knowledge to meet a recognized need.

**2.2 Cooperative Research and Development.** For the purposes of the STTR Program this means research and development conducted jointly by a small business concern and a research institution in which not less than 40 percent of the work is performed by the small business concern, and not less than 30 percent of the work is performed by the research institution.

**2.3 Small Business Concern.** A small business concern is one that, at the time of award of a Phase I or Phase II contract:

**a.** Is independently owned and operated and organized for profit, is not dominant in the field of operation in which it is proposing, and has its principal place of business located in the United States;

**b.** Is at least 51% owned, or in the case of a publicly owned business, at least 51% of its voting stock is owned by United States citizens or lawfully admitted permanent resident aliens;

**c.** Has, including its affiliates, a number of employees not exceeding 500, and meets the other regulatory requirements found in 13 CFR 121. Business concerns, other than investment companies licensed, or state development companies qualifying under the Small Business Investment Act of 1958, 15 USC 661, et seq., are affiliates of one another when either directly or indirectly (1) one concern controls or has the power to control the other; or (2) a third party or parties controls or has the power to control both. Control can be exercised through common ownership, common management, and contractual relationships. The term "affiliates" is defined in greater detail in 13 CFR 121.3-2(a). The term "number of employees" is defined in 13 CFR 121.3-2(t). Business concerns include, but are not limited to, any individual, partnership, corporation, joint venture, association or cooperative.

**2.4 Research Institution.** Any organization that is:

**a.** A university.

**b.** A nonprofit institution as defined in section 4(5) of the Stevenson-Wydler Technology Innovation Act of 1980.

**c.** A contractor-operated federally funded research and development center, as identified by the National Science Foundation in accordance with the government-wide Federal Acquisition Regulation issued in accordance with section 35(c)(1) of the Office of Federal Procurement Policy Act. (See Appendix F for a list of eligible FFRDCs.)

**2.5 Socially and Economically Disadvantaged Small Business.** A small business that is at the time of award of a Phase I or Phase II contract:

**a.** At least 51% owned by an Indian tribe or a native Hawaiian organization, or one or more socially and economically disadvantaged individuals, and

**b.** Whose management and daily business operations are controlled by one or more socially and economically disadvantaged individuals.

A socially and economically disadvantaged individual is defined as a member of any of the following groups: Black Americans, Hispanic Americans, Native Americans, Asian-Pacific Americans, Subcontinent-Asian Americans, or other groups designated by SBA to be socially disadvantaged.

**2.6 Women-Owned Small Business.** A small business concern that is at least 51% owned by a woman or women who also control and operate it. "Control" in this context means exercising the power to make policy decisions. "Operate" in this context means being actively involved in the day-to-day management.

**2.7 Funding Agreement.** Any contract, grant, or cooperative agreement entered into between any federal agency and any small business concern for the performance of experimental, developmental, or research work funded in whole or in part by the federal government. *Only the contract method will be used by DoD components for all STTR awards.*

**2.8 Subcontract.** A subcontract is any agreement, other than one involving an employer-employee relationship, entered into by a Federal Government contract awardee calling for supplies or services required solely for the performance of the original contract. This includes consultants.

**2.9 Commercialization.** The process of developing markets and producing and delivering products for sale (whether by the originating party or by others); as used here, commercialization includes both government and private sector markets.

**2.10 HBCU/MI.** A list of the Historically Black Colleges and Universities (HBCU) and Minority Institutions (MI) is available through DTIC (see section 1.6.b).

# 3.0 PROPOSAL PREPARATION INSTRUCTIONS AND REQUIREMENTS

## 3.1 Proposal Requirements

A proposal to any DoD Component under the STTR Program is to provide sufficient information to persuade the DoD Component that the proposed work represents an innovative approach to the investigation of an important scientific or engineering problem and is worthy of support under the stated criteria.

The quality of the scientific, technical or commercial content of the proposal will be the principal basis upon which proposals will be evaluated. The proposed research or research and development must be responsive to the chosen topic. Any small business contemplating a bid for work on any specific topic should determine that (a) the technical approach has a reasonable chance of meeting the topic objective, (b) this approach is innovative, not routine, and (c) the firm and research institution team have the capability to implement the technical approach, i.e. have or can obtain people and equipment suitable to the task.

It should be recognized that while the STTR Program requires a small business and a research institution to undertake a project cooperatively, the Federal contract is with the small business. The small business, and not the research institution, is to provide satisfactory evidence that it will exercise management direction and control of the performance of the STTR funding agreement. Regardless of the proportion of the work or funding of each of the performers under the contract, the small business is to be primary contractor with overall responsibility for its performance.

Those responding to this solicitation should note the proposal preparation tips listed below:

- Read and follow all instructions contained in this solicitation.
- Use the technical information services from DTIC and other information assistance organizations (Section 7.1 - 7.4).
- Mark proprietary information as instructed in Section 5.5.
- Limit your proposal to 25 pages (excluding company commercialization report).
- Have an agreement between the small business and research institution in place prior to proposal submission (see Section 3.4.o and Reference A).
- Use a type size no smaller than 12 pitch or 11 point.
- Don't include proprietary or classified information in the project summary (Appendix B).
- Include a Red Copy of Appendix A and Appendix B as part of the Original of each proposal.
- Do not use a proportionally spaced font on Appendix A and Appendix B.

## 3.2 Proprietary Information

If information is provided which constitutes a trade secret, proprietary, commercial or financial information, confidential personal information, or data affecting the national security, it will be treated in confidence to the extent permitted by law, provided it is clearly marked in accordance with Section 5.5.

## 3.3 Limitations on Length of Proposal

This solicitation is designed to reduce the investment of time and cost to small firms in preparing a formal proposal. Those who wish to respond must submit a direct, concise, and informative research or research and development proposal of no more than 25 pages, excluding commercialization record summary, (no type smaller than 11 point or 12 pitch on standard 8½" X 11" paper with one (1) inch margins, 6 lines per inch), *including Proposal Cover Sheet (Appendix A), Project Summary (Appendix B), Cost Proposal (Appendix C), and any enclosures or attachments.* Promotional and non-project related discussion is discouraged. Cover all items listed below in Section 3.4 in the order given. The space allocated to each will depend on the problem chosen and the principal investigator's approach. In the interest of equity, proposals in excess of the 25-page limitation (including attachments, appendices, or references, but excluding commercialization record summary) will not be considered for review or award.

## 3.4 Phase I Proposal Format

All pages shall be consecutively numbered and the ORIGINAL of each proposal must contain a completed red copy of Appendix A and Appendix B. Through the signature of the Corporate Official of the small business concern and the signature of the appropriate official of the research institution on Appendix A, the small business concern AND the research institution certify jointly that:

(1) The proposing firm meets the definition of small business concern found in section 2.3, the proposing institution meets the definition of research institution found in section 2.4, and the proposed STTR project meets the definition of cooperative research and development as defined in section 2.2, and

(2) Regardless of the proportion of the proposed project to be performed by each party, the small business concern will be the primary party that will exercise management direction and control of the performance of the STTR award.

(3) An agreement has been signed by both the small business and research institution. (see section 3.4.o)

If the research institution is a contractor-operated Federally funded research and development center, the appropriate official signing for the contractor-operated Federally funded research and development center certifies additionally that it:

(4) Is free from organizational conflicts of interests relative to the STTR program;
(5) Did not use privileged information gained through work performed for an STTR agency or private access to STTR agency personnel in the development of this STTR proposal; and
(6) Used outside peer review as appropriate, to evaluate the proposed project and its performance therein.

**a. Cover Sheet.** Complete RED COPY of Appendix A, photocopy the completed form, and use a copy as Page 1 of each additional copy of your proposal.

**b. Project Summary.** Complete RED COPY of Appendix B, photocopy the completed form, and use a copy as Page 2 of each additional copy of your proposal. The technical abstract should include a brief description of the project objectives and description of the effort. Anticipated benefits and commercial applications of the proposed research or research and development should also be summarized in the space provided. The Project Summary of successful proposals will be submitted for publication with unlimited distribution and, therefore, will not contain proprietary or classified information.

**c. Identification and Significance of the Problem or Opportunity.** Define the specific technical problem or opportunity addressed and its importance. (Begin on Page 3 of your proposal.)

**d. Phase I Technical Objectives.** Enumerate the specific objectives of the Phase I work, including the questions it will try to answer to determine the feasibility of the proposed approach.

**e. Phase I Work Plan.** Provide an explicit, detailed description of the Phase I approach. The plan should indicate what is planned, how and where the work will be carried out, a schedule of major events, and the final product to be delivered. Phase I effort should attempt to determine the technical feasibility of the proposed concept. The methods planned to achieve each objective or task should be discussed explicitly and in detail. This section should be a substantial portion of the total proposal.

**f. Related Work.** Describe significant activities directly related to the proposed effort, including any conducted by the principal investigator, the proposing firm, consultants, or others. Describe how these activities interface with the proposed project and discuss any planned coordination with outside sources. The proposal must persuade reviewers of the proposer's awareness of the state-of-the-art in the specific topic.

Describe previous work not directly related to the proposed effort but similar. Provide the following: (1) short description, (2) client for which work was performed (including individual to be contacted and phone number), and (3) date of completion.

**g. Relationship with Future Research or Research and Development.**
(1) State the anticipated results of the proposed approach if the project is successful.
(2) Discuss the significance of the Phase I effort in providing a foundation for Phase II research or research and development effort.

**h. Potential Post Applications.** Describe:
(1) Whether and by what means the proposed project appears to have potential use by the Federal Government.
(2) Whether and by what means the proposed project appears to have potential private sector application.

**i. Key Personnel.** Identify key personnel who will be involved in the Phase I effort including information on directly related education and experience. A concise resume of the principal investigator, including a list of relevant publications (if any), must be included.

**j. Facilities/Equipment.** Describe available instrumentation and physical facilities necessary to carry out the Phase I effort. Items of equipment to be purchased (as detailed in Appendix C) shall be justified under this section. Also state whether or not the facilities where the proposed work will be performed meet environmental laws and regulations of federal, state (name) and local governments for, but not limited to, the following groupings: airborne emissions, waterborne effluents, external radiation levels, outdoor noise, solid and bulk waste disposal practices, and handling and storage of toxic and hazardous materials.

**k. Subcontractors/Consultants.** All subcontractors, including the research institution partner, must be identified and described according to the guidelines in Appendix C. The STTR program may only make awards to small businesses therefore the research institution must have a subcontracting arrangement with the small business. More than one subcontractor is allowed; however, the small business must perform at least 40% of the effort and the research institution listed on the Appendix A must perform

at least 30% of the work. Subcontractor costs must be detailed at the same level as prime contractor costs in accordance with Appendix C (in regards to labor, travel, equipment, etc.). If consultants are involved, it should be described in detail and identified in Appendix C.

**l. Prior, Current, or Pending Support.** If a proposal submitted in response to this solicitation is substantially the same as another proposal that has been funded, is now being funded, or is pending with another federal agency or DoD Component or the same DoD Component, the proposer must indicate action on Appendix A and provide the following information:

(1) Name and address of the federal agency(s) or DoD Component to which a proposal was submitted, will be submitted, or from which an award is expected or has been received.
(2) Date of proposal submission or date of award.
(3) Title of proposal.
(4) Name and title of principal investigator for each proposal submitted or award received.
(5) Title, number, and date of solicitation(s) under which the proposal was submitted, will be submitted, or under which award is expected or has been received.
(6) If award was received, state contract number.
(7) Specify the applicable topics for each STTR proposal submitted or award received.

*Note: If Section 3.4.l does not apply, state in the proposal "No prior, current, or pending support for proposed work."*

**m. Cost Proposal.** Complete the cost proposal in the form of Appendix C for the Phase I effort only. Some items of Appendix C may not apply to the proposed project. If such is the case, there is no need to provide information on each and every item. What matters is that enough information be provided to allow the DoD Component to understand how the proposer plans to use the requested funds if the contract is awarded.

(1) List all key personnel by name as well as by number of hours dedicated to the project as direct labor.
(2) Special tooling and test equipment and material cost may be included under Phases I and II. The inclusion of equipment and material will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Contracting Officer, be advantageous to the government and should be related directly to the specific topic. These may include such items as innovative instrumentation and/or automatic test equipment. Title to property furnished by the government or acquired with government funds will be vested with the DoD Component, unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DoD Component.
(3) Cost for travel funds must be justified and related to the needs of the project.
(4) Cost sharing is permitted for proposals under this solicitation; however, cost sharing is not required nor will it be an evaluation factor in the consideration of a proposal.

**n. Company Commercialization Report.** Describe the commercialization efforts and successes of the small business. List projects or technology areas in which commercial products or services have been sold to the private sector or government.

**o. Agreement between the Small Business and Research Institution.** The small business, before submitting an STTR proposal, must negotiate a written agreement between the small business and the research institution allocating intellectual property rights and rights, if any, to carry out follow-on research, development, or commercialization. The small business must submit this agreement to the awarding agency on request and certify in all proposals that the agreement is satisfactory to the small business. The agreement should, as a minimum, state:

(1) specifically the degree of responsibility and ownership of any product, process, or other invention or innovation resulting from the cooperative research. The degree of responsibility shall include responsibility for expenses and liability, and the degree of ownership shall also include the specific rights to revenues and profits.
(2) which party may obtain U.S. or foreign patents or otherwise protect any inventions resulting from the cooperative research.
(3) which party has the right to any continuation of research including non-STTR follow-on awards.

See Reference A for a guideline or model for such an agreement.

The Federal government will not normally be party to any agreement between the small business concern and the research institution. Nothing in the agreement is to conflict with any provisions setting forth the respective rights of the United States and the small business with respect to intellectual property rights and with respect to any right to carry out follow-on research. All agreements between the small business and the research institution cooperating in the STTR projects, or any business plans reflecting agreements and responsibilities between the parties during the performance of Phase I or II, or for the commercialization of the resulting technology, shall reflect the controlling position of the small business.

### 3.5 Bindings

Do not use special bindings or cover. Staple the pages in the upper left hand corner of each proposal.

### 3.6 Phase II Proposal

This solicitation is for Phase I only. A Phase II proposal can be submitted only by a Phase I awardee and only in response to a request from the agency; that is, Phase II is not initiated by a solicitation. Each proposal must contain a Red Cover Sheet (Appendix A) and a Red Project Summary Sheet (Appendix B). Copies of Appendices along with instructions regarding Phase II proposal preparation and submission will be provided by the DoD Components to all Phase I winners at time of Phase I contract award.

## 4.0 METHOD OF SELECTION AND EVALUATION CRITERIA

### 4.1 Introduction

Phase I proposals will be evaluated on a competitive basis and will be considered to be binding for six (6) months from the date of closing of this solicitation unless offeror states otherwise. If selection has not been made prior to the proposal's expiration date, offerors will be requested as to whether or not they want to extend their proposal for an additional period of time. Proposals meeting stated solicitation requirements will be evaluated by scientists or engineers knowledgeable in the topic area. Proposals will be evaluated first on their relevance to the chosen topic. Those found to be relevant will then be evaluated using the criteria listed in Section 4.2. Final decisions will be made by the DoD Component based upon these criteria and consideration of other factors including possible duplication of other work, and program balance. A DoD Component may elect to fund several or none of the proposed approaches to the same topic. In the evaluation and handling of proposals, every effort will be made to protect the confidentiality of the proposal and any evaluations. There is no commitment by the DoD Components to make any awards on any topic, to make a specific number of awards or to be responsible for any monies expended by the proposer before award of a contract.

For proposals that have been selected for contract award, a Government Contracting Officer will draw up an appropriate contract to be signed by both parties before work begins. Any negotiations that may be necessary will be conducted between the offeror and the Government Contracting Officer. It should be noted that only a duly appointed contracting officer has the authority to enter into a contract on behalf of the U.S. Government.

Phase II proposals will be subject to a technical review process similar to Phase I. Final decisions will be made by DoD Components based upon the scientific and technical evaluations and other factors, including a commitment for Phase III follow-on funding, the possible duplication with other research or research and development, program balance, budget limitations, and the potential of a successful Phase II effort leading to a product of continuing interest to DoD and with high private sector commercial potential.

Upon written request and after final award decisions have been announced, a debriefing will be provided to unsuccessful offerors on their proposals.

### 4.2 Evaluation Criteria - Phase I

The DoD Components plan to select for award those proposals offering the best value to the government and the nation considering the following factors.

**a.** The soundness and technical merit of the proposed approach and its incremental progress toward topic or subtopic solution

**b.** The potential for commercial (government or private sector) application and the benefits expected to accrue from this commercialization

**c.** The adequacy of the proposed effort for the fulfillment of requirements of the research topic

**d.** The qualifications of the proposed principal/key investigator, supporting staff and researchers from the research institution. Qualifications include not only the ability to perform the research and development but also the ability to commercialize the results.

Where evaluations are essentially equal in merit, cost to the government will be considered in determining the successful offeror.

Reviewers will base their conclusions only on information contained in the proposal. It cannot be assumed that reviewers are acquainted with the firm or key individuals or any referenced experiments. Relevant supporting data such as journal articles, literature, including government publications, etc., should be contained or referenced in the proposal.

### 4.3 Evaluation Criteria - Phase II

The Phase II proposal will be reviewed for overall merit based upon the criteria below.

**a.** The soundness and technical merit of the proposed

approach and its incremental progress toward topic or subtopic solution

**b.** The potential for commercial (government or private sector) application and the benefits expected to accrue from this commercialization

**c.** The adequacy of the proposed effort for the fulfillment of requirements of the research topic

**d.** The qualifications of the proposed principal/key investigator, supporting staff and researchers from the research institution. Qualifications include not only the ability to perform the research and development but also the ability to commercialize the results.

A proposal's commercial potential can be evidenced by:

(1) the small business concern's record of commercializing STTR or other research,

(2) the existence of second phase funding commitments from private sector or non-STTR government funding sources,

(3) the existence of third phase follow-on commitments for the subject of the research, or

(4) the presence of other indicators of commercial potential of the idea.

The reasonableness of the proposed costs of the effort to be performed will be examined to determine those proposals that offer the best value to the government. Where technical evaluations are essentially equal in merit, cost to the government will be considered in determining the successful offeror.

The follow-on funding commitment must provide that a specific amount of Phase III funds will be made available to or by the small business and indicate the dates the funds will be made available. It must also contain specific technical objectives which, if achieved in Phase II, will make the commitment exercisable by the small business. The terms cannot be contingent upon the obtaining of a patent due to the length of time this process requires. The funding commitment shall be submitted with the Phase II proposal.

Phase II proposal evaluation may include on-site evaluations of the Phase I effort by government personnel.

## 5.0 CONTRACTUAL CONSIDERATIONS

Note: Eligibility and Limitation Requirements (Section 1.4) Will Be Enforced

### 5.1 Awards (Phase I)

**a. Number of Phase I Awards.** The number of Phase I awards will be consistent with the agency's RDT&E budget, the number of anticipated awards for interim Phase I modifications, and the number of anticipated Phase II contracts. No Phase I contracts will be awarded until all qualified proposals (received in accordance with Section 6.2) on a specific topic have been evaluated. All proposers will be notified of selection/non-selection status for a Phase I award no later than October 1, 1995. The name of those firms selected for awards will be announced. *The DoD Components anticipate making 70 Phase I awards from this solicitation.*

**b. Type of Funding Agreement.** All winning proposals will be funded under negotiated contracts and may include a fee or profit. The firm fixed price or cost plus fixed fee type contract will be used for all Phase I projects (see Section 5.4). *Note: The firm fixed price contract is the preferred type for Phase I.*

**c. Average Dollar Value of Awards.** DoD Components will make Phase I awards to small businesses typically on a one-half person-year effort over a period generally not to exceed one year (subject to negotiation). PL 102-564 allows agencies to award Phase I contracts up to $100,000 without justification. Where applicable, specific funding instructions are contained in Section 8 for each DoD Component.

### 5.2 Awards (Phase II)

**a. Number of Phase II Awards.** The number of Phase II awards will depend upon the results of the Phase I efforts and the availability of funds. *The DoD anticipates that approximately 40 percent of its Phase I awards will result in Phase II projects.*

**b. Type of Funding Agreement.** Each Phase II proposal selected for award will be funded under a negotiated contract and may include a fee or profit.

**c. Project Continuity.** Phase II proposers who wish to maintain project continuity must submit proposals no later than 30 days prior to the expiration date of the Phase I contract and must identify in their proposal the work to be performed for the first four months of the Phase II effort and the costs associated therewith. *These Phase II proposers may be issued a modification to the Phase I contract, at the discretion of the government*, covering an interim period not to exceed four months for preliminary Phase II work while the total Phase II proposal is being evaluated and a contract is negotiated. This modification would normally become effective at the completion of Phase I or as soon thereafter as possible. Funding, scope

of work, and length of performance for this interim period will be subject to negotiations. Issuance of a contract modification for the interim period does not commit the government to award a Phase II contract. See special instructions for each DoD Component in Section 8.

**d. Average Dollar Value of Awards.** Phase II awards will be made to small businesses based on results of the Phase I efforts and the scientific, technical, and commercial merit of the Phase II proposal. Average Phase II awards will typically cover 2 to 5 person-years of effort over a period generally not to exceed 24 months (subject to negotiation). PL 102-564 states that the Phase II awards may be up to $500,000 each without justification. Specific instructions are provided by each DoD Component in Section 8.

### 5.3 Reports

**a. Content.** A final report is required for each Phase I project. The report must contain in detail the project objectives, work performed, results obtained, and estimates of technical feasibility. A completed SF 298, "Report Documentation Page", will be used as the first page of the report. In addition, Monthly status and progress reports may be required by the DoD Component. (A Sample SF 298 is provided in Reference D.)

**b. Preparation.**

(1) To avoid duplication of effort, language used to report Phase I progress in a Phase II proposal, if submitted, may be used verbatim in the final report with changes to accommodate results after Phase II proposal submission and modifications required to integrate the final report into a self-contained comprehensive and logically structured document.

(2) Block 12a (Distribution/Availability Statement) of the SF298, "Report Documentation Page" in each unclassified final report must contain one of the following statements:

  (a) Distribution authorized to U.S. Government Agencies only; report contains proprietary data produced under STTR contract. Other requests shall be referred to the performing organization in Block 7 of this form.

  (b) Approved for public release; STTR report, distribution unlimited.

(3) The report abstract (Block 13 of the SF 298, "Report Documentation Page") must identify the purpose of the work and briefly describe the work carried out, the finding or results and the potential applications of the effort. The abstract may be published by the DoD.

**c. Submission.** SIX COPIES of the final report on each Phase I project shall be submitted within the DoD in accordance with the negotiated delivery schedule contained in the contract. Delivery will normally be within thirty days after completion of the Phase I technical effort. The contract delivery schedule should specify that one copy of each unclassified report shall be delivered directly to the DTIC, ATTN: Document Acquisition, Cameron Station, Alexandria, VA 22304-6145.

### 5.4 Payment Schedule

The specific payment schedule (including payment amounts) for each contract will be incorporated into the contract upon completion of negotiations between the DoD and the successful Phase I or Phase II offeror. Successful offerors may be paid periodically as work progresses in accordance with the negotiated price and payment schedule. Phase I contracts are primarily fixed price contracts, under which monthly progress payments may be made up to 90% for small businesses and up to 95% for small disadvantaged businesses of the contract price excluding fee or profit. The contract may include a separate provision for payment of a fee or profit. Final payment will follow completion of contract performance and acceptance of all work required under the contract. Other types of financial assistance may be available under the contract.

### 5.5 Markings of Proprietary or Classified Proposal Information

The proposal submitted in response to this solicitation may contain technical and other data which the proposer does not want disclosed to the public or used by the government for any purpose other than proposal evaluation.

Information contained in unsuccessful proposals will remain the property of the proposer except for Appendices A and B. The government may, however, retain copies of all proposals. Public release of information in any proposal submitted will be subject to existing statutory and regulatory requirements.

If proprietary information is provided by a proposer in a proposal which constitutes a trade secret, proprietary commercial or financial information, confidential personal information or data affecting the national security, it will be treated in confidence, to the extent permitted by law, provided this information is clearly marked by the proposer with the term "confidential proprietary information" and provided that the following legend which appears on the title page (Appendix A) of the proposal is completed:

> "For any purpose other than to evaluate the proposal, this data except Appendix A and B shall not be disclosed outside the government and shall not be duplicated, used, or disclosed in whole or in part, provided that if a contract is awarded to the proposer as a result of or in connection with the submission of this data, the government shall have

the right to duplicate, use or disclose the data to the extent provided in the funding agreement. This restriction does not limit the government's right to use information contained in the data if it is obtained from another source without restriction."

Any other legend may be unacceptable to the government and may constitute grounds for removing the proposal from further consideration and without assuming any liability for inadvertent disclosure. The government will limit dissemination of properly marked information to within official channels.

In addition, each page of the proposal containing proprietary data which the proposer wishes to restrict must be marked with the following legend:

"Use or disclosure of the proposal data on lines specifically identified by asterisk (*) are subject to the restriction on the cover page of this proposal."

The government assumes no liability for disclosure or use of unmarked data and may use or disclose such data for any purpose.

In the event properly marked data contained in a proposal in response to this solicitation is requested pursuant to the Freedom of Information Act, 5 USC 552, the proposer will be advised of such request and prior to such release of information will be requested to expeditiously submit to the DoD Component a detailed listing of all information in the proposal which the proposer believes to be exempt from disclosure under the Act. Such action and cooperation on the part of the proposer will ensure that any information released by the DoD Component pursuant to the Act is properly determined.

Those proposers that have a classified facility clearance may submit classified material with their proposal. Any classified material shall be marked and handled in accordance with applicable regulations. Arbitrary and unwarranted use of this restriction is discouraged. Offerors must follow the Industrial Security Manual for Safeguarding Classified Information (DoD 5220.22M) procedures for marking and handling classified material.

**5.6 Copyrights**

To the extent permitted by statute, the awardee may copyright (consistent with appropriate national security considerations, if any) material developed with DoD support. DoD receives a royalty-free license for the Federal Government and requires that each publication contain an appropriate acknowledgement and disclaimer statement.

**5.7 Patents**

Small business firms normally may retain the principal worldwide patent rights to any invention developed with government support. The government receives a royalty-free license for its use, reserves the right to require the patent holder to license others in certain limited circumstances, and requires that anyone exclusively licensed to sell the invention in the United States must normally manufacture it domestically. To the extent authorized by 35 USC 205, the government will not make public any information disclosing a government-supported invention for a period of four years to allow the awardee to pursue a patent.

**5.8 Technical Data Rights**

Rights in technical data, including software, developed under the terms of any contract resulting from proposals submitted in response to this solicitation shall remain with the contractor, except that the government shall have the limited right to use such data for government purposes and shall not release such data outside the government without permission of the contractor for a period of four years from completion of the project from which the data was generated unless the data has already been released to the general public. However, effective at the conclusion of the four-year period, the government shall retain a royalty-free license for government use of any technical data delivered under an STTR contract whether patented or not.

**5.9 Cost Sharing**

Cost sharing is permitted for proposals under this solicitation; however, cost sharing is not required nor will it be an evaluation factor in the consideration of any Phase I proposal.

**5.10 Joint Ventures or Limited Partnerships**

Joint ventures and limited partnerships are eligible provided the entity created qualifies as a small business as defined in Section 2.2 of this solicitation.

**5.11 Research and Analytical Work**

For Phase I and II, a minimum of 40 percent of the research and/or analytical effort must be performed by the proposing firm and a minimum of 30 percent performed by the research institution unless otherwise approved in writing by the contracting officer.

**5.12 Contractor Commitments**

Upon award of a contract, the contractor will be required to make certain legal commitments through

acceptance of government contract clauses in the Phase I contract. The outline that follows is illustrative of the types of provisions required by the Federal Acquisition Regulations that will be included in the Phase I contract. This is not a complete list of provisions to be included in Phase I contracts, nor does it contain specific wording of these clauses. Copies of complete general provisions will be made available prior to award.

**a. Standards of Work.** Work performed under the contract must conform to high professional standards.

**b. Inspection.** Work performed under the contract is subject to government inspection and evaluation at all reasonable times.

**c. Examination of Records.** The Comptroller General (or a fully authorized representative) shall have the right to examine any directly pertinent records of the contractor involving transactions related to this contract.

**d. Default.** The government may terminate the contract if the contractor fails to perform the work contracted.

**e. Termination for Convenience.** The contract may be terminated at any time by the government if it deems termination to be in its best interest, in which case the contractor will be compensated for work performed and for reasonable termination costs.

**f. Disputes.** Any dispute concerning the contract which cannot be resolved by agreement shall be decided by the contracting officer with right of appeal.

**g. Contract Work Hours.** The contractor may not require an employee to work more than eight hours a day or forty hours a week unless the employee is compensated accordingly (that is, receives overtime pay).

**h. Equal Opportunity.** The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin.

**i. Affirmative Action for Veterans.** The contractor will not discriminate against any employee or applicant for employment because he or she is a disabled veteran or veteran of the Vietnam era.

**j. Affirmative Action for Handicapped.** The contractor will not discriminate against any employee or applicant for employment because he or she is physically or mentally handicapped.

**k. Officials Not to Benefit.** No member of or delegate to Congress shall benefit from the contract.

**l. Covenant Against Contingent Fees.** No person or agency has been employed to solicit or secure the contract upon an understanding for compensation except bona fide employees or commercial agencies maintained by the contractor for the purpose of securing business.

**m. Gratuities.** The contract may be terminated by the government if any gratuities have been offered to any representative of the government to secure the contract.

**n. Patent Infringement.** The contractor shall report each notice or claim of patent infringement based on the performance of the contract.

**o. Military Security Requirements.** The contractor shall safeguard any classified information associated with the contracted work in accordance with applicable regulations.

**p. American Made Equipment and Products.** When purchasing equipment or a product under the STTR funding agreement, purchase only American-made items whenever possible.

### 5.13 Additional Information

**a. General.** This Program Solicitation is intended for information purposes and reflects current planning. If there is any inconsistency between the information contained herein and the terms of any resulting STTR contract, the terms of the contract are controlling.

**b. Small Business Data.** Before award of an STTR contract, the government may request the proposer to submit certain organizational, management, personnel, and financial information to confirm responsibility of the proposer.

**c. Proposal Preparation Costs.** The government is not responsible for any monies expended by the proposer before award of any contract.

**d. Government Obligations.** This Program Solicitation is not an offer by the government and does not obligate the government to make any specific number of awards. Also, awards under this program are contingent upon the availability of funds.

**e. Unsolicited Proposals.** The STTR Program is not a substitute for existing unsolicited proposal mechanisms. Unsolicited proposals will not be accepted under the STTR Program in either Phase I or Phase II.

**f. Duplication of Work.** If an award is made

pursuant to a proposal submitted under this Program Solicitation, the contractor will be required to certify that he or she has not previously been, nor is currently being, paid for essentially equivalent work by an agency of the Federal Government.

**g. Classified Proposals.** If classified work is proposed or classified information is involved, the offeror to the solicitation must have, or obtain, security clearance in accordance with the Industrial Security Manual for Safeguarding Classified Information (DoD 5220.22M).

## 6.0 SUBMISSION OF PROPOSALS

An original plus (4) copies of each proposal or modification will be submitted, in a single package, as described below, unless otherwise stated by specific instructions in Section 8.0.

*NOTE: THE ORIGINAL OF EACH PROPOSAL MUST CONTAIN A COMPLETED RED COPY OF APPENDIX A (COVER SHEET) AND APPENDIX B (PROJECT SUMMARY), AND A COMPANY COMMERCIALIZATION REPORT (see Section 3.4.n).*

### 6.1 Address

Each proposal or modification package must be addressed to that DoD Component address which is identified for the specific topic in that Component's subsection of Section 8.0 to this solicitation.

The name and address of the offeror, the solicitation number and the topic number for the proposal must be clearly marked on the face of the envelope or wrapper.

Mailed or handcarried proposals must be delivered to the address indicated for each topic. Secured packaging is mandatory. The DoD Component cannot be responsible for the processing of proposals damaged in transit.

All copies of a proposal must be sent in the same package. Do not send separate information copies or several packages containing parts of the single proposal.

### 6.2 Deadline of Proposals

Deadline for receipt of proposals at the DoD Component is 2:00 p.m. local time, April 7, 1995. Any proposal received at the office designated in the solicitation after the exact time specified for receipt will not be considered unless it is received before an award is made, and: (a) it was sent by registered or certified mail not later than March 29, 1995 or (b) it was sent by mail and it is determined by the government that the late receipt was due solely to mishandling by the government after receipt at the government installation.

Note: There are no other provisions for late receipt of proposals under this solicitation.

The only acceptable evidence to establish (a) the date of mailing of a late-received proposal sent either by registered mail or certified mail is the U. S. Postal Service postmark on the wrapper or on the original receipt from the U. S. Postal Service. If neither postmark shows a legible date, the proposal shall be deemed to have been mailed late. The term postmark means a printed, stamped, or otherwise placed impression (exclusive of a postage meter machine impression) that is readily identifiable without further action as having been supplied and affixed on the date of mailing by employees of the U. S. Postal Service. Therefore, offerors should request the postal clerk to place a hand cancellation bull's-eye postmark on both the receipt and the envelope or wrapper; (b) the time of receipt at the government installation is the time-date stamp of such installation on the proposal wrapper or other documentary evidence of receipt maintained by the installation.

Proposals may be withdrawn by written notice or a telegram received at any time prior to award. Proposals may also be withdrawn in person by an offeror or his authorized representative, provided his identity is made known and he signs a receipt for the proposal. (NOTE: the term telegram includes mailgrams.)

Any modification or withdrawal of a proposal is subject to the same conditions outlined above. Any modification may not make the proposal longer than 25 pages (excluding company commercialization record). Notwithstanding the above, a late modification of an otherwise successful proposal which makes its terms more favorable to the government will be considered at any time it is received and may be accepted.

### 6.3 Notification of Proposal Receipt

Proposers desiring notification of receipt of their proposal must complete and include a self-addressed stamped envelope and a copy of the notification form (Reference B) in the back of this brochure. If multiple proposals are submitted, a separate form and envelope is required for each. Notification of receipt of a proposal by the government does not by itself constitute a determination that the proposal was received on time or not. The determination of timeliness is solely governed by the criteria set forth in Section 6.2.

### 6.4 Information on Proposal Status

Evaluation of proposals and award of contracts will be expedited, but no information on proposal status will be available until the final selection is made. However,

contracting officers may contact any and all qualified proposers prior to contract award.

### 6.5 Debriefing of Unsuccessful Offerors

Upon written request and after final award decisions have been announced, a debriefing will be provided to unsuccessful offerors for their proposals.

### 6.6 Correspondence Relating to Proposals

All correspondence relating to proposals should cite the STTR solicitation number and specific topic number and should be addressed to the DoD Component whose address is associated with the specific topic number.

## 7.0 SCIENTIFIC AND TECHNICAL INFORMATION ASSISTANCE

### 7.1 DoD Technical Information Services Available

The Defense Technical Information Center (DTIC), the central source of scientific and technical information resulting from and describing research and development projects funded by DoD, is a major component of the DoD Scientific and Technical Information Program. DTIC provides access to and transfer of scientific and technical information for DoD personnel, DoD contractors, and other U.S. Government agencies and their contractors.

It is anticipated that participants in the STTR program will have direct access to DTIC as current Federal contractors, protential defense contractors, or access through partnership with an institution eligible to receive DTIC services.

The scientific and technical information assistance provided by DTIC enables organizations preparing R&D proposals to DoD to make better informed bid decisions and to make technically stronger submittals. Respondents to this solicitation are encouraged to ascertain their organization's authorization to use DTIC and, if eligible, to request bibliographies of technical reports that have resulted from DoD-funded R&D in their proposal topic areas and copies of the technical reports cited in the bibliographies. Information should also be requested about topic related DoD-sponsored work in progress.

Call, or visit (by pre-arrangement), DTIC at the location most convenient to you:

Defense Technical Information Center
ATTN: DTIC-User Services
Building 5, Cameron Station
Alexandria, VA 22304-6145
(800) 363-7247 (800 DOD-SBIR)
(703) 274-9274 (FAX)

DTIC Boston Regional Office
Building 1103, 5 Wright Street
Hanscom AFB
Bedford, MA 01731-5000
(617) 377-2413

DTIC Albuquerque Regional Office
PL/SUL
3550 Aberdeen Ave, SE
Kirtland AFB, NM 87117-6008
(505) 846-6797

DTIC Dayton Regional Office
2690 C Street, Suite 4
Wright Patterson AFB, OH 45433-7411
(513) 255-7905

DTIC Los Angeles Regional Office
222 N. Sepulveda Blvd., Suite 906
El Segundo, CA 90245-4320
(310) 335-4170

For information services in the areas of manpower, personnel, training and simulation devices, human factors and safety, contact the DTIC Manpower and Training Research Information System:

DTIC MATRIS Office
San Diego, CA 92152-6800
(619) 553-7008

DTIC also provides access to DoD-sponsored Centers for Analysis of Scientific and Technical Information (IACs), offering DTIC users specialized reference services and subject matter expertise. IACs are concerned with the Scientific and Technical Information content of worldwide engineering, technical and scientific documents and databases. They receive technical management and direction from the DoD organizations with leading competence in the science and technology area within which each IAC functions. DTIC-managed IACs and their subject areas are as follows:

Chemical Propulsion Information Agency, CPIA

Data and Analysis Center for Software, DACS

Guidance and Control IAC, GACIAC

Infrared Information Analysis Center, IRIA

Metals Information Analysis Center, MIAC

Ceramics Information Analysis Center, CIAC

Metal Matrix Composites IAC, MMCIAC

Nondestructive Testing IAC, NTIAC

Reliability Analysis Center, RAC

High Temperature Materials IAC, HTMIAC

Manufacturing Technology IAC, MTIAC

Survivability/Vulnerability IAC, SURVIAC

Chemical Warfare/Chemical Biological Defense IAC, CBIAC

Crew System Ergonomics IAC, CSERIAC

Tactical Warfare Simulation & Technology IAC, TWSTIAC

For more information about the DTIC IAC program and other DoD IACs contact:

Defense Technical Information Center
DTIC-IAC Program Manager
Alexandria, VA 22304-6145
(703) 274-6260
(703) 274-0980 (FAX)

**7.2 Other Technical Information Assistance Sources**

Other sources provide technology search and/or document services and can be contacted directly for service and cost information. These include:

National Technical Information Services
5285 Port Royal Road
Springfield, VA 22161
(703) 487-4600
(703) 321-8547 (FAX)

National Technology Transfer Center
Wheeling Jesuit College
316 Washington Ave
Wheeling, WV 26003
(800) 678-6882 (all services at no cost)

**7.3 DoD Counseling Assistance Available**

Small business firms interested in participating in the STTR Program may seek general administrative guidance from small and disadvantaged business utilization specialists located in various Defense Contract Management activities throughout the continental United States. These specialists are available to discuss general administrative requirements to facilitate the submission of proposals and ease the entry of the small high technology business into the Department of Defense marketplace. The small and disadvantaged business utilization specialists are expressly prohibited from taking any action which would give an offeror an unfair advantage over others, such as discussing or explaining the technical requirements of the solicitation, writing or discussing technical or cost proposals, estimating cost or any other actions which are the offerors responsibility as outlined in this solicitation. (See Reference C at the end of this solicitation for a complete listing, with telephone numbers, of Small and Disadvantaged Business Utilization Specialists assigned to these activities.)

**7.4 State Assistance Available**

Many states have established programs to provide services to those small firms and individuals wishing to participate in the Federal STTR Program. These services vary from state to state, but may include:

- Information and technical assistance;
- Matching funds to STTR recipients;
- Assistance in obtaining Phase III funding.

Contact your State Government Office of Economic Development for further information.

## 8.0 TECHNICAL TOPICS

Section 8 contains detailed topic descriptions outlining the technical problems for which DoD Components requests proposals for innovative R&D solutions from small businesses. Topics for each participating DoD Component are listed and numbered separately. Each DoD Component Topic Section contains topic descriptions, addresses of organizations to which proposals are to be submitted, and special instructions for preparing and submitting proposals to organizations within the component. Read and follow these instructions carefully to help avoid administrative rejection of your proposal.

## ARMY

### Submission of Proposals

The responsibility for the implementation, administration, and management of the U.S. Army STTR Program rests with the Army SBIR/STTR Program Management Office. The Army STTR Program Manager is Dr. Kenneth A. Gabriel. You are invited to send your proposals directly to the following address:

U.S. Army Research Office--Washington
ATTN: AMXRO-W
Room 8N23
5001 Eisenhower Avenue
Alexandria, VA 22333
(919) 549-4336

The Army has identified four technical topics, numbered ARMY 95T001 through ARMY 95T004, to which small businesses and their partner research institutes may respond. Please note that these are the only topics for which proposals will be accepted at this time. Unless otherwise stated in the topic, Phase I will show the concept feasibility and the merit and Phase II will produce a prototype or at least show a proof-of-principle.

The four Army STTR topics presented on the following pages were generated by the U.S. Army Research Office. Selection of Phase I proposals for funding is based upon technical merit and the evaluation criteria contained in this solicitation document. Due to limited funding, the Army will only fund those proposals which are of superior technical quality and which present excellent opportunities for dual use and commercialization beyond STTR-funded projects.

Please note that the Army will be limiting Phase I awards to $100,000. Any Phase II contracts resulting from these Phase I efforts will be limited to $500,000.

ARMY 95T001 TITLE: Robust Biomolecular Catalysts

DESCRIPTION: In the form of enzymes, nature provides a wide variety of efficient catalysts for both synthetic and degradative chemical reactions of commercial importance. Capable of accelerating the rate of reaction by many, many orders of magnitude over the rate of an uncatalyzed reaction, while at the same time exhibiting a remarkably high degree of substrate specificity and exacting structural selectivity, enzymes offer a means to effect a number of chemical transformations of interest to the Army as well. To further enhance the range of practical application, say, for activity in solvents other than water, or in an immobilized or suspended state, biocatalytic technology needs to be advanced to a stage where enzymes or other enzyme-like protein molecules, or the environment in which they operate, might be engineered to create catalysts of desired specificity and rugged stability. This engineering might take the form of (1) existing enzyme protein modification by recombinant DNA methods, (2) combinatorially evolved and selected biocatalysts derived from an antibody repertoire, (3) chemical semi-synthetic modification of relevant protein derivatives or wholly synthetic biomimetic peptide-based catalysts, or (4) manipulation of solvent conditions to favor desired reaction thermodynamics, kinetics and stability.

Very recent work in the area of stabilization of enzyme crystals, by chemical crosslinking, serves as an example of the type of technology direction sought by the Army. With crosslinking, the crystalline lattice and constituent enzyme molecules are stabilized in a highly concentrated form able to withstand lyophilization and long term storage at room temperature. Just as importantly, these crosslinked enzyme crystals retain their catalytic activity in environmental extremes.

Areas of interest would include, but not be limited to, (1) catalytic breakdown of energetic materials, chemical agents and various environmental pollutants, (2) synthetic reactions of broad applicability to polymers and other chemicals.

REFERENCE: M.A. Navia and N.L. St. Clair, "Crosslinked enzyme crystals as robust biocatalysts," Proceedings of the Materials Research Society 1993 Symposium, Biomolecular Materials by Design.

ARMY 95T002 TITLE: Optical Sensors for the Cone Penetrometer

DESCRIPTION: Subsurface characterization is a prime requirement for environmental site assessment. This project will involve technical research and development leading to a new suite of optical sensors and sensor systems that can utilize the cone penetrometer as a fielding platform.

The cone penetrometer has been selected by the DOD as its primary tool for site characterization and assessment. This is being implemented under the Site Characterization and Analysis Penetrometer (SCAPS) program. A significant requirement for the SCAPS system is the development of diagnostic methods and technologies that can be accommodated by the 2.5 cm interior diameter of the cone penetrometer shaft. Recent advances in laser fiber optics and optical waveguide technology has provided the capability for novel optical interferometry/spectrometry systems and created an opportunity for improvements in integrated optic sensor technology.

What is sought are innovative opto-electronic chemical sensor systems, based upon the interaction of a guided optical beam with a surrounding medium, that will operate in the interferometer or spectrometer modes. Sensors must be compact and capable of being mounted on the standard geo-environmental cone penetrometer for the rapid, in-situ identification of hazardous substances. The sensor should have the capability of making quantitative assessments of specific or multiple chemical species in both gaseous and liquid media in soil down to the part-per-billion concentration range, exhibit a rapid response and be fully reversible so as to permit real-time analysis, neither generate nor be susceptible to environmental interferences, be of robust character, and have a low cost.

ARMY 95T003 TITLE: Mesoscale Smart Materials

DESCRIPTION: Integrated mesoscale functional materials are sought that have sensor and transducer capabilities. In an Army context, such materials are needed for improved active and passive signal control and suppression; damage evaluation, control, and self-repair; chemical/biological agent detection; automatic destruction/disposal; system failure mitigation, and integrated manufacturing process controls and response capabilities. In this context, rapid response and high capacity/light weight transducer capability are an important priority.

The work should in Phase I successfully complete proof of concept experiments for the new technology and scope out how its integration into an Army or civilian system could be accomplished. A commercialization plan should be outlined with prospective users and their interests identified.

In Phase II, the materials concept should be designed and built into a prototype system or component. Major cost and applicability issues involving Army and civilian commercialization should be explored and documented.

ARMY 95T004 TITLE: Small, Efficient Thermophotovoltaic Power Supply

DESCRIPTION: There is a critical need for compact, lightweight, quiet, and efficient power systems in the 100 to 500 watt range. In an Army context, these would be needed for a number of Soldier System requirements. Currently available power systems are either too large and heavy, or too noisy.

Thermophotovoltaic power systems offer a promising alternative. They are quiet and clean, relying on the combustion of fuels such as natural gas or hydrogen to produce thermal radiation which is then converted into electric power by photovoltaic cells. Thermophotovoltaic power systems have been very inefficient because standard thermal emitters are broadband continuum sources which cover a large region of the spectrum, so that only a fraction of the radiation is matched into the photovoltaic cell and the rest of the energy is wasted as unwanted heat.

Recent advances in composite emitters will significantly overcome this shortcoming and greatly enhance the overall efficiency of thermophotovoltaic systems. Composite emitters constructed from rare earth oxides selectively emit radiation in a narrow frequency band which can be matched to the photovoltaic cells. Research and development are required to further improve the mechanical integrity of the composite emitters, to match the emission spectrum onto appropriate photovoltaic cells, and engineer a system which produces power in the needed 100 to 500 watt range.

## NAVY

### Proposal Submission

The responsibility for the implementation, administration and management of the Navy STTR program is with the Office of Naval Research. The Navy STTR Program Manager is Mr. Vincent D. Schaper. Inquiries of a general nature may be brought to the Navy STTR Program Manager's attention and should be addressed to:

Office of Naval Research
ATTN: Mr. Vincent D. Schaper
ONR 412 E
800 North Quincy Street
Arlington, VA 22217-5660
(703) 696-4286

All STTR proposals submitted in response to a Navy STTR topic should be sent to the above address.

This solicitation contains eight technical topics that meet the mission requirements of the Navy to which small R&D businesses together with a research institution may respond. As in SBIR solicitations the Navy will provide potential awardees the opportunity to reduce the gap between Phases I & II by providing a $70,000 Phase I proposal award and a $30,000 Phase I option award or may elect to just submit a Phase I proposal for $100,000. If a potential awardee chooses the former, the option effort should form the initial part of the Phase II work. If a potential awardee chooses the latter the ability to reduce the gap may be lost and there is a risk of loosing in competition when tied with a lower priced proposal (see paragraph 4.2 and paragraph 4.3 - Evaluation Criteria). Only an awardee whose Phase II proposal has been recommended and selected for award will be funded for the Phase I Option. Therefore, those who have finished or almost finished their Phase I should submit their Phase II proposal. The Phase II proposal should contain three elements: 1) a plan of how the proposer will commercialize the technology to the government and the private sector; 2) a Phase II work plan; and 3) a Phase II Option. At the end of the Phase II portion, a determination will be made by the Navy as to whether the proposer has satisfied the commercialization plan sufficiently for the government to fund the "Phase II Option" portion of the proposal. The Phase II option should address the further R&D or test and evaluation aspects of the proposal. The total Phase II funding should not exceed $500,000 with 80% going to the Phase II and 20% for the "option Phase II".

Selection of Phase I proposals is based upon technical merit and evaluation criteria contained in this solicitation document. Due to limited funding, the Navy reserves the right to limit awards under any topic and only those proposals considered to be of superior quality will be funded. For the following topics, Phase I will show the concept feasibility and the merit and Phase II will produce a prototype or at least show a proof-of-principle.

## Department of the Navy FY 1995 STTR Topics

| | |
|---|---|
| NAVY 95T001 | General Structural Materials |
| NAVY 95T002 | General Functional Materials |
| NAVY 95T003 | General Nondestructive Evaluation Techniques |
| NAVY 95T004 | Specific Structural Materials Processing |
| NAVY 95T005 | Specific Structural materials in Electronic |
| NAVY 95T006 | Specific Nondestructive Evaluation Techniques |
| NAVY 95T007 | Environmentally Acceptable Processes |
| NAVY 95T008 | Specific Functional Materials |

**Department of the Navy Topic Descriptions**

The following Navy STTR topics encompass ADVANCED MATERIALS & PROCESSES. Concepts for new and innovative materials, processing and characterization methodologies, for structural and functional materials are encouraged.

NAVY 95T001 TITLE: General Structural Materials

DESCRIPTION: Development of innovative processing techniques and equipment for high temperature materials including composites and metal-ceramic hybrids, advanced metallics and intermetallics, and their protection against high temperature oxidation are sought.

NAVY 95T002 TITLE: General Functional Materials

DESCRIPTION: Development of innovative synthesis, equipment and processing techniques for materials with electrical, optical, magnetic or acoustic functionality including metals, ceramics, optics but not semiconductors are sought.

NAVY 95T003 TITLE: General Nondestructive Evaluation Techniques

DESCRIPTION: Development of novel techniques and equipment for the characterization of material integrity, properties, or microstructure through non-destructive and (if possible) non-contact methods are sought.

NAVY 95T004 TITLE: Specific Structural Materials Processing

DESCRIPTION: Development of processing techniques and equipment are required which can be integrated with CAD/CAM in order to produce complex-shaped structures in a cost-effective manner, as well as techniques which result in lowered sintering temperatures, superplastic forming capability, and/or improved mechanical properties.

NAVY 95T005 TITLE: Specific Structural Materials in Electronic Devices

DESCRIPTION: The integration and demonstration of high thermal conductivity materials and composites in electronic devices as part of packaging or heat sinks is desired. The development should also demonstrate the cost effectiveness of processing.

NAVY 95T006 TITLE: Specific Nondestructive Evaluation Techniques

DESCRIPTION: Development of equipment and techniques for the detection and measurement of surface residual stresses in non-ferrous metals by means (portable if possible) of other than x-ray, ionizing radiation or other hazardous techniques are sought.

NAVY 95T007 TITLE: Environmentally Acceptable Processes

DESCRIPTION: Development of processing techniques and equipment are sought which comply with anti-pollution legislation, such as application of zero volatile organic compound paints by the use of affordable supercritical fluids.

NAVY 95T008 TITLE: Specific Functional Materials

DESCRIPTION: Development of equipment and techniques for the processing and synthesis of the following materials are sought:

a. Electromechanical transduction materials-magnetostrictors, piezoelectrics and electrostrictors for structures vibrational control and sonar applications.

b. High temperature superconductors and magnetic ferrites for radar components and magnetic gradiometers.

c. Ferroelectric thin films and integrated ferroelectric/semiconductor structures for electro-optic, high density memory, and non-volatile memory applications.

## AIR FORCE

The responsibility for the implementation and management of the Air Force STTR Program is with the Air Force Materiel Command Deputy Chief of Staff for Science & Technology. The Air Force STTR Program Executive is R. Jill Dickman. Do NOT submit STTR proposals to the AF STTR Program Executive. Inquiries of a general nature or problems that require the attention of the Air Force Program Executive should be directed to her at this address:

Department of The Air Force
HQ/AFMC/STXB (R. Jill Dickman)
4375 Chidlaw Rd
Suite 6
Wright-Patterson AFB OH 45433-5006

For each Phase I proposal, send one original (with red appendices A and B) and three (3) copies to the office designated below. Also, send an additional set of red appendices A and B, which are not stapled or mutilated in any way. Be advised that any overnight delivery may not reach the appropriate desk within one day.

Unless otherwise stated in the topic, Phase I will show the concept feasibility and the merit and Phase II will produce a prototype or at least show a proof-of-principle.

| Topic Number | Activity/Mailing Address<br>(Name and number for mailing proposals and for administrative questions) | Contracting Authority<br>(For contractual questions only) |
|---|---|---|
| AF 95T001 - AF 95T003 | Air Force Office of Scientific Research<br>AFOSR/XPP (John Colon)<br>110 Duncan Avenue, Suite B115<br>Bolling AFB, DC 20332-0001<br>(John Colon, (202) 767-5015) | Harry Haraldsen<br>(202) 767-4990 |
| AF 95T004 - AF 95T005 | Armstrong Laboratory<br>AL/XPTT<br>2509 Kennedy Circle<br>Brooks AFB, TX 78235-5000<br>(Belva Williams, (210) 536-2103) | Sharon Shen<br>(512) 536-6393 |
| AF 95T006 | Rome Laboratory<br>RL/XPX<br>26 Electronic Parkway<br>Griffis AFB, NY 13441-4514<br>(Robert Falk, (315) 330-2912) | Mary Lovett<br>(315) 330-2804 |
| AF 95T007 - AF 95T008 | Phillips Laboratory - Space & Missile Technology Directorate<br>PL/XPI (Attn: Bob Hancock)<br>Bldg 497 Room 239<br>3650 Aberdeen Ave S.E.<br>Kirtland AFB, NM 87117-5776<br>(Robert Hancock, (505) 846-4418) | Mr. Roger Shinnick<br>(505) 846-2664 |
| AF 95T009 | Wright Laboratory<br>Flight Dynamics Directorate<br>WL/FIOP BLDG 45<br>2130 Eighth St, Ste 1<br>Wright-Patterson AFB, OH 45433-7542<br>(Madie Tillman, (513) 255-5066) | Terry Rogers or<br>Bruce Miller<br>(513) 255-5830 |
| AF 95T010 | WL/MTX BLDG 653<br>2977 P St, Ste 6<br>Wright-Patterson AFB, OH 45433-7739<br>(Marvin Gale, (513) 255-4623) | Terry Rogers or<br>Bruce Miller<br>(513) 255-5830 |
| AF 95T011 | WL/POMX Bldg 18<br>1950 Fifth St, Room 105A<br>Wright-Patterson AFB, OH 45433-7251<br>(Betty Siferd, (513) 255-2131) | Terry Rogers or<br>Bruce Miller<br>(513) 255-5830 |

AF 95T001 TITLE: Human Performance and Weapons System Enhancements via Polarization Technology

DESCRIPTION: The present breakthrough in polarization technology (PT) is a force multiplier. The PT will assist special operations aviators in more rapidly accomplishing their search and rescue (SAR) missions. This major enhancement to the special forces mission is made possible by a modular polarized three-line scanning lens (powered by a 9 volt camera battery) that is easily attached to a hand-held camera instead of the existing lens. The polarized scanning lens technology uses proprietary hardware modifications to an existing chip. The PT can be optimized (between 2 and 100 microns) to detect the presence of a small quantity of polarized plastic that is about the size of a credit card or floppy disc. The camera "sees" more than "unaided normal" human vision and easily displays the polarized target as a glowing red-violet color. Consequently, the PT technology allows for rapid identification and location of friendly assets (e.g., troops or equipment) that are concealed out of necessity amongst the background cover. This provides for more expeditious pick up of assets and a decreased probability of fratricide to airborne, ground- or sea-based assets. Additional research is required to benefit from the enhanced speed that would be realized from a totally self-contained chip with software optimized for performance. This additional research would also enhance the signal and reduce the noise resulting in an even clear picture and longer detection ranges. In addition, to the reduction of fratricide and SAR times, the PT technology could be used to mark a landing/drop zone. Other pertinent information would include passive identification of where on the surface ordnance should hit to destroy a concealed (no show) target such as a bunker or underground tunnel without divulging this information to the adversary.

Additional technical information packets may be obtained by calling John Colon, (202) 767-5015.

AF 95T002 TITLE: Stress/Failure Analysis Software for Multi-Material Interfaces

DESCRIPTION: The Air Force utilizes a variety of advanced composite materials in airframe structures and on-board electronic devices, including integrated circuits and multichip modules. Prediction of the expected life, durability and damage tolerance characteristics of structural and electronic components is important in designing and maintaining military equipment. In particular, Multichip Modules (MCM) are currently being developed for Air Force applications by several manufacturers. These modules are the next generation packaging technology. As such they will be present in nearly every piece of equipment used by the Air Force warfighter. They will be subjected to harsh environments (e.g., thermal, electromagnetic, structural). It is imperative that the Air Force have adequate modeling and simulation tools to assure that environmental hardness is built in during the original design. In order to assess the possibility of failure caused by strain and stress of MCM components, it is necessary to accurately calculate such values at multi-material boundaries where many failures are initiated. To date, the accuracy of this assessment has been poor due to singularity issues. Development of computational algorithms and software for the accurate calculation of strains and stresses near singularities remains an undeveloped, but vitally needed, component of complete MCM reliability assessment capability. Accurate and efficient algorithms and software are now being sought for the computation of the generalized stress intensity factors which characterize the temperature and stress fields at multi-material interfaces where stress mismatch drives damage nucleation. The formulation of failure criteria for multi-material interfaces subjected to thermal and mechanical loading involves functionals, the exact values of which are finite and in sensitive to minor variations in topology. Conventional prediction of thermaomechanical responses suffer from a variety of sources of numerical error. Since these functionals incorporate details of the stress and field the software must include a provable sound capability for a posterior error assessment.

Additional technical information packets may be obtained by calling John Colon, (202) 767-5015.

AF 95T003 TITLE: Fusion of Sensors that Interact Dynamically for Exploratory Development for Robust, Fast Object Detection and Recognition

DESCRIPTION: Sensing technology and algorithm design have advanced to a degree that it might be feasible now to reduce to practice the dynamic integration of low-resolution, wide angle sensors with high resolution, narrow angle sensors, in a single, efficient object detection recognition system.

The desirability of integration of inputs from more than a single sensor in order to interpret and analyze scenes has been apparent to researchers for a long time. It has been the object of intense research for the past two decades. To date however, there are only a few examples of successful sensor fusion system in actual application. The intensity of computation, and the state of computation and sensor technology themselves prevented meaningful realization of such integration.

Low resolution sensors can detect the states of sparse pixels in a scene. Such detection is fast and efficient but not sufficient to provide information for object recognition. However, it is sufficient to detect the existence of an object. High resolution sensors can detect the state of pixels close to one another. They can therefore be efficient in extracting object features in a relatively small neighborhood.

The idea behind the dynamic integration of low and high resolution sensors is that upon detection of the existence of an object, the low resolution sensor transfers this information to the high resolution sensor for further intense investigation. The high resolution sensor in turn, upon identifying an object of interest, could "abstract" its features and signal the low resolution sensor to re-investigate other parts of the scene for possible additional such abstractions.

Additional technical information packets may be obtained by calling John Colon, (202) 767-5015.

AF 95T004 TITLE: Treatment of AFFF-contaminated Soils

DESCRIPTION: Information is required about the impact of Aqueous Film Forming Foam (AFFF) fluorocarbon-surfactant contamination on aerobic bioremediation technologies. These compounds are known to be recalcitrant to biodegradation. All other components of AFFF, such as glycol ether and hydrocarbon surfactants, are readily biodegradable by native soil bacteria. The goal of Phase I and Phase II proposed research is to (1) predict impact of AFFF fluorocarbon surfactants on in situ biodegradation processes; (2) recommend methods to prevent negative impacts on biodegradation processes; and (3) recommend modifications to biodegradation processes to prevent the negative impacts of the fluorocarbon surfactants. The research must establish the effect of soil type on the sorption of fluorocarbon surfactants on unsaturated soils, and the influence of soil contaminants (e.g., petroleum hydrocarbons) on the fluorocarbon surfactants. It must address the sorbed and unsorbed portions of the surfactants, quantify these amounts, and determine how these different surfactant phases and soil types affect bubble formation during aeration. Research should provide information on the influence of the fluorocarbon surfactants in unsaturated soils on the transport of contaminants in those soils, in addition to addressing the movement of the fluorocarbon surfactants through the soil. These questions could be answered in the first phase. This is necessary to develop methods used to prevent or control fluorocarbon surfactants from creating potential problems from bubble formation with remediation technologies such as in situ aerobic bioremediation. Knowledge gained through this research can be incorporated into a treatment process plan for fluorocarbon surfactant-contaminated sites. Knowledge gained from the first effort would be refined in the second phase where methods to reduce the negative impact of AFFF on biodegradation technologies will be applied to sites with surfactant-contaminated vadose soils (e.g., fire training facilities with petroleum hydrocarbon contamination). A model is expected which can be applied to remediation technologies. It may either be a prototype applicable to various sites, or a computer-generated model available for use at both military and civilian fluorocarbon surfactant-contaminated sites (e.g. predict the affect of fluorocarbon surfactants on remediation applications). The knowledge gained from this investment can be utilized in various aerobic bioremediation applications ranging from bioventing and oxygen microbubble treatments to soil vapor extraction and air sparging.

Additional technical information packets may be obtained by calling Belva Williams (210) 536-2103.

AF 95T005 TITLE: Human Systems/Subsystems Research

DESCRIPTION: Ideas are sought to enhance human performance as an integral part of Air Force systems and operations. Environmental research is conducted in the Environics Directorate and the Occupational and Environmental Health Directorate.

a. Innovative research is needed to develop a technique to image underground waste and other objects using electromagnetic and acoustic emitters to probe the earth's surface. Development of mathematical algorithms and a radiating and receiver system that will characterize underground deposits as to position and chemical nature is desired. The final product should be a small above-ground device that could be employed from a small truck or an airborne platform such as a helicopter. This technology will make it possible to search for underground waste using a rapid acting system for environmental surveillance and waste detection.

b. Innovative ideas/concepts are sought for sensors, sensor integration, and data analysis for site characterization and monitoring of sites contaminated with fuels and solvents including Dense Non-Aqueous Phase Liquids, for monitoring for Air Toxic compliance, and for on-line monitoring of industrial waste streams containing metals and other hazardous materials.

Additional technical information packets may be obtained by calling Belva Williams (210) 536-2103.

AF 95T006 TITLE: Innovative C3I Technologies

DESCRIPTION: C3I Technology pursued within Rome Laboratory addresses four mission thrusts: Command, Control & Communications; Electromagnetics & Reliability; Intelligence & Reconnaissance and Surveillance & Photonics. Proposals may address any aspect of C3I technology. Areas of interest may include but are not limited to the following:

a) C3 concepts for fixed, mobile or distributed command centers; mission-support system-planning tools; innovative methods for employing commercial off-the-shelf communications technology; innovative concepts and technologies in computer science (including software engineering, software quality, distributed-computer-systems technology, artificial intelligence and distributed data bases); innovative concepts in information portrayal; and survivable protocols.

b) Science and engineering research that encompasses all aspects of the system life cycle from "cradle to grave," including development and use of tools and techniques such as the following: 1) modeling and simulation; 2) materials and process characterization; 3) operational assessments; 4) assessment and correction of failure modes and effects; 5) development of diagnostic techniques for implementation of cost-effective, logistic support capability.

c) Electromagnetic technology, including the following: 1) adaptive pattern control for high-performance phased-array antennas; 2) innovative target and clutter scattering models for improved radar detection; 3) improved modeling of high frequency propagation for enhanced communications and small target detection; 4) monolithic millimeter wave components; 5) materials for thin, lightweight, conformal, phased arrays; 6) superconducting electronics for improved phased arrays, signal detection, and signal processing; and 7) computational electromagnetics for assessing susceptibility in RF environments.

d) A wide variety of surveillance technologies; including signal processing; airborne radars (bistatic radars and multispectral surveillance radars); advanced algorithm development and testing for airborne surveillance systems; and the application of digital and analog photonics to existing and planned Air Force systems.

Additional technical information packets may be obtained by calling Bob Falk (315) 330-2912.

AF 95T007 TITLE: Innovative Applications Advanced Photonics

DESCRIPTION: The Phillips Laboratory (PL) has corporate responsibility in the Air Force for the development of advanced weapons technologies. This activity includes the development of semiconductor diode lasers, diode-pumped solid-state lasers, mid- infrared lasers, chemical oxygen/iodine lasers, and photolytic iodine lasers. These high-power lasers; as well as related advancements in the development of nonlinear optics, nonlinear coupling of lasers, spatial light modulators, and imaging (active, passive and compensated); offer a wide range of opportunities for innovative, dual-use applications. It should be noted that while PL is not specifically interested in developing fiber-optic network technology, offerers should not be discouraged from submitting proposals which involve the use of fiber-optics or fiber-optic couplings. New and innovative concepts for the development of technologies and or applications in the following fields are sought.

a) Industrial Applications: PL is seeking novel proposals for innovative applications of high power lasers at wavelengths suitable for materials processing. Such applications may include precision measurement, cutting, boring, drilling, and welding as well as computer aided fabrication and assembly. Proposals to develop similar novel applications using emerging imaging technologies may also be appropriate.

b) Medical Applications: PL is also seeking proposals to develop novel diagnostic and surgical products using emerging laser and imaging technologies. Applications are being sought for new high power lasers at wavelengths useful for non-invasive surgical and diagnostic requirements. Proposals to develop medical diagnostic applications based on emerging compensated imaging and hyperspectral sensing techniques or technologies are also sought.

Additional technical information packets may be obtained by calling Robert Hancock (505) 846-4418.

AF 95T008 TITLE: Innovative Applications Of Advanced Spacecraft And Launch Vehicle Technologies

DESCRIPTION: The Phillips Laboratory (PL) has corporate responsibility in the Air Force for the development of advanced spacecraft and launch vehicle technologies. This activity includes the development of advanced space structures concepts; design, analysis and test methodologies of spacecraft and launch vehicle structures; vibration isolation; vibration damping; active and passive structural control; stabilization and precision pointing; smart mechanism and device concepts; sensors and actuators; health monitoring systems, and micro-electronics. New and innovative concepts for the development of technologies and/or applications in the following fields are sought.

a) Industrial Applications: PL is seeking novel proposals for innovative applications of vibration isolation, vibration damping, stabilization, precision control, and smart mechanisms/devices applicable to launch vehicles and spacecraft precision pointing missions. In addition, innovative proposals addressing health monitoring of dynamic systems using expert systems or neural network architectures are sought. Proposals to develop industrial applications of these technologies in the areas of precision machining and manufacturing, precision measurement equipment, semi-conductor fabrication, and health monitoring may also be appropriate.

b) Space Electronics/Packaging: New approaches and concepts for the development of dual-use paradigms in radiation-tolerant and/or radiation-hardened processes. The possibilities of novel exploitation of architectural and shielding features may be worth consideration. Flexibility and longevity are key, due to the dwindling demand base for these types of electronics. Innovation in advanced packaging approaches are also sought, not only for the purposes of miniaturization, but for performance enhancement. Another crucial area of exploration is in cost reduction/yield enhancement. One particular interest area is in finding qualified non-hermetic technologies, as it is felt that these will become synergistic with commercial sector applications that cannot tolerate the expense of hermetic enclosures.

Additional technical information packets may be obtained by calling Robert Hancock (505) 846-4418.

AF 95T009 TITLE: Air Vehicle Technology

DESCRIPTION: Air Vehicle Integration and Flight Dynamics Technology pursued within the Flight Dynamics Directorate of Wright Laboratory reflect the mission of four Divisions: Structures, Flight Control, Aeromechanics and Vehicle Subsystems.

STRUCTURES: Airframe Design Optimization requires the integration of the following engineering disciplines: structures, aerodynamics, controls, and vehicle subsystems; mathematical disciplines; and computer science related disciplines. The Flight Dynamics Directorate has developed a prototype system called "ASTROS" (Automated Structural Optimization System), which runs on most modern work stations and mainframes. ASTRO' comprehensive self-contained system allows easy enhancement and additions of new engineering modules. Any expansion related to airframe and other aircraft subsystems optimization qualifies as a potential topic for this solicitation. In the development of aging aircraft technology the goal is to generate methodologies for determining, assessing, and predicting the effects of various forms of aircraft service damage.

FLIGHT CONTROL: Simulation has proved to be an invaluable tool for aircraft and flight control design. This tool can be used earlier in the design cycle by having near-real-time simulations hosted on personal computers. The critical problem is inputting, in minimum time, aerodynamic data generated from analysis and from multiple wind tunnel tests including rotary balance testing. Generic control law structures, actuator and sensor models should be utilized, and interfaces with standardized control techniques law design software provided. Ideas for improvements to technologies, techniques, or subsystems used in single-site or networked flight simulators are solicited. Hardware or software, which improves performance and fidelity or lowers the cost of simulating an aircraft subsystem, are of particular interest, as are novel uses of commercially available video and display technology. Ideas are solicited for human factors investigations of effects of network delays on long haul simulations. Areas of special interest include the identification of types of tasks which can be meaningfully simulated as with various amounts of network delays.

AEROMECHANICS: Sol-gel materials because of their unique nonlinear optical properties, can be engineered to optimize applications of interests to the Air Force. These applications include real-time holographic interferometry; high-speed spatial-light modulators; new sensors covering ultraviolet, visible, and infrared wavelengths; and large storage media for use in flow field diagnosis. Advanced sensor concepts for time-resolved pressure measurements in high-speed wind tunnels are sought. Convective scale fluid dynamic phenomena are difficult to access computational. Therefore, they are a fruitful area for

experimental research. Current research is hampered by the lack of pressure sensors which respond at frequencies of interest (typically 200kz to 1 MHz) and which will survive the temperatures typical of high spec wind tunnels.

VEHICLE SUBSYSTEMS: Applicator nozzles of cryogenic, CO2 pellet-jet-blast cleaning and surface preparation equipment are of interest to the Air Force and proposals are solicited for their design and development. Current aircraft maintenance surface cleaning methods typically involve environmentally nonhazardous materials such as CO2 pellets, but may not be as efficient or as cost effective as desired. Applicator nozzle optimization should reduce operative costs and improve cleaning efficiency and abate noise of the equipment while ensuring an environmentally safe system. Design should be based on comprehensive understanding of the associated fluid and particle dynamics phenomena achieved through computational flowfield analysis and modern experimental techniques.

a. Infrared detector technologies have been developed that utilize sampling of air for the presence of flammables, by passing it through a short gap of about 1 centimeter. The purpose is to find methods to detect the presence of flammable gases prior to ignition so that preemptive actions can be taken. An improved approach would use an open channel or long optical path to provide direct monitoring of the protected space rather than involving long time delays associated with short gap monitoring.

b. The cooling techniques and heat transport system must be environmentally friendly, interface compatible with lightweight aircraft structures and avionics equipment, be lightweight themselves, affordable, producible, thrifty in terms of fluid flow pressure losses incurred and blower power consumption, with a goal to double the capacity of currently used systems, without sacrifice in thermal control quality. The expanded performance capabilities of modern and retrofitted military aircraft require the transfer of large quantities of waste heat from closely packed internal equipment. Methods need to be developed to greatly increase the heat transfer intensity and capacity of circulating gas systems suitable for cooling aircraft equipment and subsystems.

Technical information packets for the topic may be obtained by calling Madie Tillman at 513-255-5066

AF 95T010 TITLE: Manufacturing Integration/Infrastructure Technologies

DESCRIPTION: Manufacturing technology seeks quality research that will provide solutions to manufacturing integration issues in the supporting infrastructure of engineering and manufacturing application systems. Manufacturing is a team activity and the key success factor to that activity is communication among people and machines. The team can become cohesive and integrated once information is exchanged effectively and efficiently. The following topics are intended to provide general categories and areas of concentration for creative response.

a) Helioimaging Durable Product Generator (HDPG): Develop and demonstrate the manufacture of durable "one of a kind" products to design engineering specifications for function, useful, life, and mean time between failure requirements, etc. This technology represents an uninterrupted life cycle process and continuous electronic information flow from design through yielded product; where the design activity has accounted for product disposal. Media from which the materials for the product are derived require research into micron size materials, production processes, media for suspension, and encapsulation of materials for deposition. The product definition and processes should be based on the International Standards Organization Standard for the Exchange of Product Model Data (ISO STEP) standard with enhancements for demonstration of mechanical and electronic product life cycles.

b) Personal Translator Assistant (PTA): The world is quickly getting smaller with enterprises distributed across the globe. Multiple language translation and explicit understanding is a major barrier in the performance of jobs. A solution is required to this communications problem through research, development, and demonstrated as a pin-on personal translation capability containing power and communications. This micro/nano sized electronics packaged technology will be state of the art in natural language processing and global information systems communications technology with an evolutionary strategy built into the design.

c) Enterprise Federation Models for Virtual Manufacturing (VM-EFM): Manufacturing is practiced via complex organizational network structures and supported by more complex information systems. Competitive pressures have increased the emphasis on the virtual capability to produce many products in small economic batches. Contained in the definition of virtual manufacturing is an integrated synthetic environment which can be exercised to enhance all levels of decision and control. VM-EFM is an enabler necessary to "perform realizable manufacturing in the computer." Federated models hold the promise of

decision support and meaningful communication among disparate enterprises.

d) Virtual Enterprise Distributed Object Management Environment (VEDOME): The open nonintrusive architecture of VEDOME will be open and solve operational issues in the object management manager and object broker standards. This effort will demonstrate distributed management of assured transactions in real time for activities, programs, networks, and multiple data structures in a heterogeneous computing environment. A tailored VEDOME will support different manufacturing applications and end-users in industry and government enterprises. Systems administrators and end-users will automatically be provided their preferred intelligent user interface.

e) Near-netshape Casting Producing Machine (NCPM): The response time for delivery of product to customer's specifications in the global manufacturing market is the competitive edge. The NCPM demonstration will dynamically create precise and predictable near-netshape castings for end-products; derived from the digital product definition data of end products and their features. Resulting die sets can be precision coated (via sensor based plasma spray, etc.) and treated (thermally, etc.) for final tolerance. Design data for NCPM use will support the control of material properties and characteristics during material forming and transformation as design specified directly. Statistical data will be gathered, organized, analyzed, and modeled in categories of quality, cost, and performance and reported against traditional approaches.

Technical information can be obtained by calling Marvin Gale, WL/MTX, (513) 255-7371.

AF 95T011 TITLE: Electro Devices For Propulsion & Power Research

DESCRIPTION: Wright Laboratory's Aero Propulsion & Power Directorate conducts research in airbreathing propulsion, fuels and lubrication, and aerospace power technology. We are soliciting ideas for the following two areas:

a) Ideas for acquiring data optically from large arrays of microsensors measuring pressure, temperature, and wall shear stress are sought. An array of 1000 x 1000 sensors or greater could be of interest. Spatial and temporal resolution of scales which are characteristic of turbine blades and vanes is desired in low temperature (200-500F) research facilities. This capability would likewise be useful for a number of external aerothermal flows on aircraft and missiles. We would like to be able to resolve film cooling flows, film cooling effectiveness, heat transfer, pressure distribution, secondary flows, shocks, shock motion, separation, transition, and reattachment simultaneously with 10 to 30 realizations per blade passage. Temporal resolution capable of at least capturing and freezing the large scale motion in these flows would include scales at least as small as the region of high shear in the boundary layer. A spatial resolution as high as 10 sensors/mm might be desired in some situations. Currently, a number of silicon microsensors are being developed to accomplish many of the above tasks but simultaneous acquisition of a large dense array which depends upon a conventional A to D approach involves the very difficult or impossible task of wiring many individual sensors. An equally difficult task is recording the many channels of information, as is the formidable task of reduction and processing the data from large arrays. The goal of this effort would be to provide data realizations with both spatial and temporal resolutions comparable to the best computations with would be capable of being processed optically.

b) Interdisciplinary proposals for novel energy and power materials and devices with high payoffs in performance, reliability, and cost benefits for nonpropulsive aerospace power applications (e.g. The more Electric Airplane Initiative) and energy storage applications are being sought . Topics of interest include the following:

(1) Conventional and high temperature (>200C) semiconductor power device materials and large area electronic structures (gates, contacts, dopants) and processing methods.

(2) Dielectric coatings for semiconductors and conductors (e.g. conducting polymer wire coating).

(3) Novel soft and hard high temperature, low loss, high strength magnetic materials for aerospace generators, motors, and MHz inductive resonant switching devices.

(4) Lithiated and other conducting polymers for novel battery electrolytes.

(5) EMI suppressing/attenuating coatings and/or composite packaging structures.

(6) Novel high heat flux (100 $W/cm^2$) thermally stable coolants and high conductive interfaces for high temperature electronic cooling.

(7) Conducting polymers and contacts for power transmission (e.g. lightweight wire) and novel capacitor materials and devices.

Proposals should delineate the benefits envisioned in a quantitative fashion. Proposals addressing both the material development and device embodiment are encouraged.

Technical information packets for each subtopic may be obtained by calling Betty Siferd, 513-255-2131.

# BALLISTIC MISSILE DEFENSE ORGANIZATION (BMDO)
## SMALL BUSINESS TECHNOLOGY TRANSFER PROGRAM
## Submitting Proposals

Send **five** copies of Phase I proposals to:
(Appendix A and B need not be red)
For administrative help **ONLY**:
call **800-937-3150**

Ballistic Missile Defense Organization
7100 Defense Pentagon
ATTN: DTI/STTR
Washington, DC 20301-7100

Proposals delivered by means other than US Mail must be delivered to Room 1D110, The Pentagon, Washington, DC. **WARNING: Only persons with access to the interior of the Pentagon building can reach Room 1D110. Delivery to a Pentagon entrance is not sufficient.** BMDO will acknowledge receipt if the proposal includes a self-addressed stamped envelope.

BMDO seeks the most innovative technology to find and disable a missile in flight -lighter, faster, smarter, more reliable components. Proposers need not know details of possible BMDO systems.

**BMDO seeks to invest seed-capital, to supplement private capital, in a product with a future market potential (preferably private sector) and a measurable BMDO benefit.** BMDO will not compete with private or government markets in that it will not further develop concepts already mature enough to compete for private capital or government development funds. BMDO prefers projects which move technology from the non-profit institution into the private sector market through a market-oriented small firm. BMDO expects to fund about 20 projects.

Phase I should be only an examination of the feasibility and competitive merit of the concept with an average cost about $60,000. Although proposed cost will not affect selection for negotiation, contracting may be delayed if BMDO reduces the cost ceiling. Phase I competition will give approximately equal weight to degree of innovation and market potential. Phase II competition will give more weight to future market potential. BMDO expects keen competition for both Phases.

Because BMDO seeks the best nation-wide experts in innovative technology, proposers may suggest both technical reviewers and contract technical monitors by enclosing a cover letter with the name, organization, address and phone number (if known), and a rationale for each suggestion. Each must be a government employee. BMDO promises only to consider the suggestion.

BMDO 95T001 TITLE: Sensors

DESCRIPTION: Sensors provide warning of attack, target identification, target discrimination from non-target objects, and determination of kill. New and innovative approaches are sought for sensors in the infrared, visible, and ultraviolet wavelengths for passive, active, and interactive sensors. Examples are: cryogenic cooling, superconducting focal plane elements, low power optical beam steering, passive focal plane imaging, interferometry for imaging, optics, diode pumped lasers, and optical materials.

BMDO 95T002 TITLE: Electronics and Photonics

DESCRIPTION: BMDO needs advances in processing capacity made possible by advances in electronics and opto- electronics. BMDO wants to advance integrated circuits, detectors, sensors, large scale integration, and radiation hardness. Advances are sought in band gap engineering, single crystal diamond, solid state lasers, optical detectors, electronics packaging, and any other related breakthrough technology.

BMDO 95T003 TITLE: Surprises and Opportunities

DESCRIPTION: BMDO recognizes that, at the leading edge of technology, surprises and opportunities may arise from creative minds and entrepreneurs. BMDO will consider proposals in other technologies that present an extraordinary opportunity for BMDO. But proposals will receive a preliminary screening that may reject them without full technical review as not offering enough of an extraordinary opportunity. This open call is for breakthrough technology with great market potential beyond the standards for the topics listed above.

# 9.0 SUBMISSION FORMS AND CERTIFICATIONS

Section 9.0 contains:

**Appendix A:** **Proposal Cover Sheet**
An original red-printed Appendix A must be included with each proposal submitted.

**Appendix B:** **Project Summary Form**
An original red-printed Appendix B must be included with each proposal submitted. Don't include proprietary or classified information in the project summary form.

**Appendix C:** **Cost Proposal Outline**
A cost proposal following the format in Appendix C must be included with each proposal submitted.

**Reference A:** **Model Agreement for the Allocation of Intellectual Property and Follow-on Rights**
*This is only a model* provided as a guideline for the small business in the development of an agreement that allocates intellectual property rights and rights to follow-on research, development, or commercialization between the small business and the research institution (see Section 3.4.o for more details). The small business is not required to use this model agreement, in whole or part, for its agreement with the research institution. A written agreement between the small business and research institution need not be submitted with the proposal, but must be available upon request.

**Reference B:** **Proposal Receipt Notification Form**

**Reference C:** **Directory of Small Business Specialists**

**Reference D:** **SF 298 Report Documentation Page**

**Reference E:** **DoD SBIR/STTR Mailing List Form**

**Reference F:** **List of Eligible FFRDCs**

APPENDIX A

# *U.S. DEPARTMENT OF DEFENSE*

## SMALL BUSINESS TECHNOLOGY TRANSFER (STTR) PROGRAM

## PROPOSAL COVER SHEET

Failure to use a RED Copy as the orginial for each proposal and to fill in all appropriate spaces may cause your proposal to be disqualified

| TOPIC NUMBER: | PROPOSAL TITLE: | |
|---|---|---|
| PRINCIPAL INVESTIGATOR: | | PI TELEPHONE: |
| PROPOSED COST: | PHASE I OR II: | PROPOSED DURATION IN MONTHS: |

| FIRM | RESEARCH INSTITUTION |
|---|---|
| NAME: | NAME: |
| STREET: | STREET: |
| CITY: STATE: ZIP: | CITY: STATE: ZIP: |
| CORPORATE OFFICIAL NAME: | INSTITUTE OFFICIAL NAME: |
| TITLE: | TITLE: |
| TELEPHONE: | TELEPHONE: |
| PERCENTAGE OF WORK: (minimum of 40%) | PERCENTAGE OF WORK: (minimum of 30%) |

| CERTIFICATION: | YES | NO |
|---|---|---|
| Is the FIRM a small business as described in section 2.3? | ☐ | ☐ |
| Is the INSTITUTION a research institution as defined in section 2.4? | ☐ | ☐ |
| Is the FIRM a socially and economically disadvantaged business as defined in section 2.5? (Collected for statistical purposes only) | ☐ | ☐ |
| Is the FIRM a woman-owned small business as described in section 2.6? (Collected for statistical purposes only) | ☐ | ☐ |
| Number of employess in the FIRM including all affiliates: | ---------- | |
| Has this proposal has been submitted to other government agencies or DoD components? If yes, list the names of the agency or component and topic number below: | ☐ | ☐ |

For any purpose other than to evaluate the proposal, this data except Appendix A and B shall not be disclosed outside the Government and shall not be duplicated, used or disclosed in whole or in part, provided that if a contract is awarded to this proposer as a result of or in connection with the submission of this data, the Government shall have the right to duplicate, use or disclose the data to the extent provided in the funding agreement. This restriction does not limit the Government's right to use information contained in the data if it is obtained from another source without restriction.

| SIGNATURE OF PRINCIPAL INVESTIGATOR DATE | SIGNATURE OF CORPORATE OFFICIAL DATE | SIGNATURE OF INSTITUTION OFFICIAL DATE |
|---|---|---|
| | | |

Nothing on this page is classified or proprietary information/data

# INSTRUCTIONS FOR COMPLETING APPENDIX A

# AND APPENDIX B

General:

DOD Components employ automated optical devices to record STTR proposal information. Therefore the proposal cover sheet (Appendix A) and the project summary (Appendix B) should be TYPED without proportional spacing using one of the following typestyles:

Courier 12,10 or 12 pitch
Courier 71 10 pitch
Elite 71
Letter Gothic 10 or 12 pitch
OCR-B 10 or 12 pitch
Pica 72 10 pitch
Prestige Elite 10 or 12 pitch
Prestige Pica 10 Pitch

Whenever a numerical value is requested type the numerical character (i.e. in "Proposed Duration" type 6 NOT six).

When typing address information use the two alphabet characters used by the Post Office for the state, DO NOT SPELL OUT THE FULL STATE NAME (i.e. type NY not New York or N.Y.).

Complete and SUBMIT THE ORIGINAL RED FORMS bound in this solicitation (not photocopies) as page 1 and 2 of the original copy of each proposal. The completed forms can then be copied for use as pages 1 and 2 of the photocopies of the proposal. The original proposal (with red forms) plus (4) complete copies must be submitted (see Section 6).

Carefully align the forms in the typewriter using the underlines as a guide. The forms are printed to accommodate standard typewriter spacing.

Additional red forms may be obtained from your State SBIR Organization (Reference C) or:

Defense Technical Information Center
ATTN: DTIC-User Services
Building 5, Cameron Station
Alexandria, VA 22304-6145
(800) 363-7247 (800 DOD-SBIR)

# *U.S. DEPARTMENT OF DEFENSE*

## SMALL BUSINESS TECHNOLOGY TRANSFER (STTR) PROGRAM

## PROPOSAL COVER SHEET

Failure to use a RED Copy as the orginial for each proposal and to fill in all appropriate spaces may cause your proposal to be disqualified

| TOPIC NUMBER: | PROPOSAL TITLE: | |
|---|---|---|
| PHASE I OR II PROPOSAL: | FIRM NAME: | PRINCIPAL INVESTIGATOR: |

TECHNICAL ABSTRACT (Limit your abstract to 200 words with no classified or proprietary information/data)

ANTICIPATED BENEFITS/POTENTIAL COMMERCIAL APPLICATIONS OF THE RESEARCH OR DEVELOPMENT

KEYWORDS (List a maximum of 8 Keywords that describe the project)

Nothing on this page is classified or proprietary information/data

# INSTRUCTIONS FOR COMPLETING APPENDIX A

# AND APPENDIX B

General:

DOD Components employ automated optical devices to record STTR proposal information. Therefore the proposal cover sheet (Appendix A) and the project summary (Appendix B) should be TYPED without proportional spacing using one of the following typestyles:

Courier 12,10 or 12 pitch
Courier 71 10 pitch
Elite 71
Letter Gothic 10 or 12 pitch
OCR-B 10 or 12 pitch
Pica 72 10 pitch
Prestige Elite 10 or 12 pitch
Prestige Pica 10 Pitch

Whenever a numerical value is requested type the numerical character (i.e. in "Proposed Duration" type 6 NOT six).

When typing address information use the two alphabet characters used by the Post Office for the state, DO NOT SPELL OUT THE FULL STATE NAME (i.e. type NY not New York or N.Y.).

Complete and SUBMIT THE ORIGINAL RED FORMS bound in this solicitation (not photocopies) as page 1 and 2 of the original copy of each proposal. The completed forms can then be copied for use as pages 1 and 2 of the photocopies of the proposal. The original proposal (with red forms) plus (4) complete copies must be submitted (see Section 6).

Carefully align the forms in the typewriter using the underlines as a guide. The forms are printed to accommodate standard typewriter spacing.

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Defense Technical Information Center
ATTN: DTIC-User Services
Building 5, Cameron Station
Alexandria, VA 22304-6145
(800) 363-7247 (800 DOD-SBIR)

U.S. DEPARTMENT OF DEFENSE

## SMALL BUSINESS TECHNOLOGY TRANSFER (STTR) PROGRAM
## COST PROPOSAL

**Background:**

The following items, as appropriate, should be included in proposals responsive to the DoD Solicitation Brochure.

**Cost Breakdown Items** (in this order, as appropriate):

1. Name of offeror
2. Home office address
3. Location where work will be performed
4. Title of proposed effort
5. Topic number and topic title from DoD Solicitation Brochure
6. Total dollar amount of the proposal
7. Direct material costs
   a. Purchased parts (dollars)
   b. Subcontracted items (dollars)
   c. Other
      (1) Raw material (dollars)
      (2) Your standard commercial items (dollars)
      (3) Interdivisional transfers (at other than cost dollars)
   d. Total direct material (dollars)
8. Material overhead (rate_____%) x total direct material = dollars
9. Direct labor (specify)
   a. Type of labor, estimated hours, rate per hour and dollar cost for each type
   b. Total estimated direct labor (dollars)
10. Labor overhead
    a. Identify overhead rate, the hour base and dollar cost
    b. Total estimated labor overhead (dollars)
11. Special testing (include field work at government installations)
    a. Provide dollar cost for each item of special testing
    b. Estimated total special testing (dollars)
12. Special equipment
    a. If direct charge, specify each item and cost of each
    b. Estimated total special equipment (dollars)
13. Travel (if direct charge)
    a. Transportation (detailed breakdown and dollars)
    b. Per diem or subsistence (details and dollars)
    c. Estimated total travel (dollars)
14. Consultants
    a. Identify each, with purpose, and dollar rates
    b. Total estimated consultants costs (dollars)
15. Other direct costs (specify)
    a. Total estimated direct cost and overhead (dollars)
16. General and administrative expense
    a. Percentage rate applied
    b. Total estimated cost of G&A expense (dollars)
17. Royalties (specify)
    a. Estimated cost (dollars)
18. Fee or profit (dollars
19. Total estimate cost and fee or profit (dollars)
20. The cost breakdown portion of a proposal must be signed by a responsible official, and the person signing must have typed name and title and date of signature must be indicated.
21. On the following items offeror must provide a yes or no answer to each question.
    a. Has any executive agency of the United State Government performed any review of your accounts or records in connection with any other government prime contract or subcontract within the past twelve months? If yes, provide the name and address of the reviewing office, name of the individual and telephone extension.
    b. Will you require the use of any government property in the performance of this proposal? If yes, identify.
    c. Do you require government contract financing to perform this proposed contract? If yes, then specify type as advanced payments or progress payments.
22. Type of contract proposed, either cost-plus-fixed-fee or firm-fixed price.

**SMALL BUSINESS TECHNOLOGY TRANSFER (STTR) PROGRAM**

**ALLOCATION OF RIGHTS IN INTELLECTUAL PROPERTY AND RIGHTS TO CARRY OUT FOLLOW-ON RESEARCH, DEVELOPMENT, OR COMMERCIALIZATION**

**(This is only a model)**

This Agreement between _____, a small business concern organized as a _____ under the laws of _____ and having a principal place of business at _____, ("SBC") and _____, a research institution having a principal place of business at _____, ("RI") is entered into for the purpose of allocating between the parties certain rights relating to an STTR project to be carried out by SBC and RI (hereinafter referred to as the "PARTIES") under an STTR funding agreement that may be awarded by _____ ("AGENCY") to SBC to fund a proposal entitled "_____" submitted, or to be submitted, to AGENCY by SBC on or about _____, 199_.

**1. Applicability of this Agreement.**

**(a)** This Agreement shall be applicable only to matters relating to the STTR project referred to in the preamble above.

**(b)** If a funding agreement for an STTR project is awarded to SBC based upon the STTR proposal referred to in the preamble above, SBC will promptly provide a copy of such funding agreement to RI, and SBC will make a subaward to RI in accordance with the funding agreement, the proposal, and this Agreement. If the terms of such funding agreement appear to be inconsistent with the provisions of this Agreement, the PARTIES will attempt in good faith to resolve any such inconsistencies. However, if such resolution is not achieved within a reasonable period, SBC shall not be obligated to award nor RI to accept the subaward. If a subaward is made by SBC and accepted by RI, this Agreement shall not be applicable to contradict the terms of such subaward or of the funding agreement awarded by AGENCY to SBC except on the grounds of fraud, misrepresentation, or mistake, but shall be considered to resolve ambiguities in the terms of the subaward.

**(c)** The provisions of this Agreement shall apply to any and all consultants, subcontractors, independent contractors, or other individuals employed by SBC or RI for the purposes of this STTR project.

**2. Background Intellectual Property.**

**(a)** "Background Intellectual Property" means property and the legal right therein of either or both parties developed before or independent of this Agreement including inventions, patent applications, patents, copyrights, trademarks, mask works, trade secrets and any information embodying proprietary data such as technical data and computer software.

**(b)** This Agreement shall not be construed as implying that either party hereto shall have the right to use Background Intellectual Property of the other in connection with this STTR project except as otherwise provided hereunder.

**(1)** The following Background Intellectual Property of SBC may be used nonexclusively and, except as noted, without compensation by RI in connection with research or development activities for this STTR project (if "none" so state): ___ _____;

**(2)** The following Background Intellectual Property of RI may be used nonexclusively and, except as noted, without compensation by SBC in connection with research or development activities for this STTR project (if "none" so state): _ _____;

**(3)** The following Background Intellectual Property of RI may be used by SBC nonexclusively in connection with commercialization of the results of this STTR project, to the extent that such use is reasonably necessary for practical, efficient and competitive commercialization of such results but not for commercialization independent of the commercialization of such results, subject to any rights of the Government therein and upon the condition that SBC pay to

RI, in addition to any other royalty including any royalty specified in the following list, a royalty of ___% of net sales or leases made by or under the authority of SBC of any product or service that embodies, or the manufacture or normal use of which entails the use of, all or any part of such Background Intellectual Property (if "none" so state): _____
_____.

**3. Project Intellectual Property.**

**(a)** "Project Intellectual Property" means the legal rights relating to inventions (including Subject Inventions as defined in 37 CFR § 401), patent applications, patents, copyrights, trademarks, mask works, trade secrets and any other legally protectable information, including computer software, first made or generated during the performance of this STTR Agreement.

**(b)** Except as otherwise provided herein, ownership of Project Intellectual Property shall vest in the party whose personnel conceived the subject matter or first actually reduced the subject matter to practice, and such party may perfect legal protection therein in its own name and at its own expense. Jointly made or generated Project Intellectual Property shall be jointly owned by the PARTIES unless otherwise agreed in writing. The SBC shall have the first option to perfect the rights in jointly made or generated Project Intellectual Property unless otherwise agreed in writing.

**(1)** The ownership, including rights to any revenues and profits, resulting from any product, process, or other innovation or invention based on the cooperative shall be allocated between the SBC and the RI as follows:
SBC Percent: _____ RI Percent: _____

**(2)** Expenses and other liabilities associated with the development and marketing of any product, process, or other innovation or invention shall be allocated as follows:
SBC Percent: _____ RI Percent: _____

**(c)** The PARTIES agree to disclose to each other, in writing, each and every Subject Invention, which may be patentable or otherwise protectable under the United States patent laws in Title 35, United States Code. The PARTIES acknowledge that they will disclose Subject Inventions to each other and the awarding agency within ___ months after their respective inventor(s) first disclose the invention in writing to the person(s) responsible for patent matters of the disclosing Party. All written disclosures of such inventions shall contain sufficient detail of the invention, identification of any statutory bars, and shall be marked confidential, in accordance with 35 U.S.C. § 205.

**(d)** Each party hereto may use Project Intellectual Property of the other nonexclusively and without compensation in connection with research or development activities for this STTR project, including inclusion in STTR project reports to the AGENCY and proposals to the AGENCY for continued funding of this STTR project through additional phases.

**(e)** In addition to the Government's rights under the Patent Rights clause of 37 CFR § 401.14, the PARTIES agree that the Government shall have an irrevocable, royalty free, nonexclusive license for any governmental purpose in any Project Intellectual Property.

**(f)** SBC will have an option to commercialize the Project Intellectual Property of RI, subject to any rights of the Government therein, as follows--

**(1)** Where Project Intellectual Property of RI is a potentially patentable invention, SBC will have an exclusive option for a license to such invention, for an initial option period of ____ months after such invention has been reported to SBC. SBC may, at its election and subject to the patent expense reimbursement provisions of this section, extend such option for an additional ____ months by giving written notice of such election to RI prior to the expiration of the initial option period. During the period of such option following notice by SBC of election to extend, RI will pursue and maintain any patent protection for the invention requested in writing by SBC and, except with the written consent of SBC or upon the failure of SBC to reimburse patenting expenses as required under this section, will not voluntarily discontinue the pursuit and maintenance of any United States patent protection for the invention initiated by RI or of any patent protection requested by SBC. For any invention for which SBC gives notice of its election to extend the option, SBC will, within ___ days after invoice, reimburse RI for the expenses incurred by RI prior to expiration or termination of the option period in pursuing and maintaining (i) any United States patent protection initiated by RI and (ii) any patent protection requested by SBC. SBC may terminate such option at will by giving written notice to RI, in which case further accrual of reimbursable patenting expenses hereunder, other than prior commitments not practically revocable, will cease upon RI's receipt of such notice.

At any time prior to the expiration or termination of an option, SBC may exercise such option by giving written notice to RI, whereupon the parties will promptly and in good faith enter into negotiations for a license under RI's patent rights in the invention for SBC to make, use and/or sell products and/or services that embody, or the development, manufacture and/or use of which involves employment of, the invention. The terms of such license will include: (i) payment of reasonable royalties to RI on sales of products or services which embody, or the development, manufacture or use of which involves employment of, the invention; (ii) reimbursement by SBC of expenses incurred by RI in seeking and maintaining patent protection for the invention in countries covered by the license (which reimbursement, as well as any such patent expenses incurred directly by SBC with RI's authorization, insofar as deriving from RI's interest in such invention, may be offset in full against up to _____ of accrued royalties in excess of any minimum royalties due RI); and, in the case of an exclusive license, (iii) reasonable commercialization milestones and/or minimum royalties.

(2) Where Project Intellectual Property of RI is other than a potentially patentable invention, SBC will have an exclusive option for a license, for an option period extending until ____ months following completion of RI's performance of that phase of this STTR project in which such Project Intellectual Property of RI was developed by RI. SBC may exercise such option by giving written notice to RI, whereupon the parties will promptly and in good faith enter into negotiations for a license under RI's interest in the subject matter for SBC to make, use and/or sell products or services which embody, or the development, manufacture and/or use of which involve employment of, such Project Intellectual Property of RI. The terms of such license will include: (i) payment of reasonable royalties to RI on sales of products or services that embody, or the development, manufacture or use of which involves employment of, the Project Intellectual Property of RI and, in the case of an exclusive license, (ii) reasonable commercialization milestones and/or minimum royalties.

(3) Where more than one royalty might otherwise be due in respect of any unit of product or service under a license pursuant to this Agreement, the parties shall in good faith negotiate to ameliorate any effect thereof that would threaten the commercial viability of the affected products or services by providing in such license(s) for a reasonable discount or cap on total royalties due in respect of any such unit.

**4. Follow-on Research or Development.**

All follow-on work, including any licenses, contracts, subcontracts, sublicenses or arrangements of any type, shall contain appropriate provisions to implement the Project Intellectual Property rights provisions of this agreement and insure that the PARTIES and the Government obtain and retain such rights granted herein in all future resulting research, development, or commercialization work.

**5. Confidentiality/Publication.**

(a) Background Intellectual Property and Project Intellectual Property of a party, as well as other proprietary or confidential information of a party, disclosed by that party to the other in connection with this STTR project shall be received and held in confidence by the receiving party and, except with the consent of the disclosing party or as permitted under this Agreement, neither used by the receiving party nor disclosed by the receiving party to others, provided that the receiving party has notice that such information is regarded by the disclosing party as proprietary or confidential. However, these confidentiality obligations shall not apply to use or disclosure by the receiving party after such information is or becomes known to the public without breach of this provision or is or becomes known to the receiving party from a source reasonably believed to be independent of the disclosing party or is developed by or for the receiving party independently of its disclosure by the disclosing party.

(b) Subject to the terms of paragraph (a) above, either party may publish its results from this STTR project. However, the publishing party will give a right of refusal to the other party with respect to a proposed publication, as well as a ___ day period in which to review proposed publications and submit comments, which will be given full consideration before publication. Furthermore, upon request of the reviewing party, publication will be deferred for up to ____ additional days for preparation and filing of a patent application which the reviewing party has the right to file or to have filed at its request by the publishing party.

**6. Liability.**

(a) Each party disclaims all warranties running to the other or through the other to third parties, whether express or implied, including without limitation warranties of merchantability, fitness for a particular purpose, and freedom from infringement, as

to any information, result, design, prototype, product or process deriving directly or indirectly and in whole or part from such party in connection with this STTR project.

(b) SBC will indemnify and hold harmless RI with regard to any claims arising in connection with commercialization of the results of this STTR project by or under the authority of SBC. The PARTIES will indemnify and hold harmless the Government with regard to any claims arising in connection with commercialization of the results of this STTR project.

**7. Termination.**

(a) This agreement may be terminated by either Party upon __ days written notice to the other Party. This agreement may also be terminated by either Party in the event of the failure of the other Party to comply with the terms of this agreement.

(b) In the event of termination by either Party, each Party shall be responsible for its share of the costs incurred through the effective date of termination, as well as its share of the costs incurred after the effective date of termination, and which are related to the termination. The confidentiality, use, and/or non-disclosure obligations of this agreement shall survive any termination of this agreement.

**AGREED TO AND ACCEPTED--**

**Small Business Concern**

By:_____ Date:_____

Print name:_____

Title:_____

**Research Institution**

By:_____ Date:_____

Print name:_____

Title:_____

RECEIPT NOTIFICATION

TO: _____
(Fill in firm name)

_____
(street)

_____
(city, state ZIP)

SUBJECT: STTR Solicitation No. 95
Topic No. _____
(Fill in Topic No.)

This is to notify you that your proposal in response to the subject solicitation and topic number has been received by

_____
(Fill in name of organization to which you will send your proposal)

_____ _____
Signature by receiving organization Date

DIRECTORY OF SMALL BUSINESS SPECIALISTS

Associate Directors of Small Business assigned at Defense Contract Management Districts (DCMD) and Defense Contract Management Area Operations (DCMAO):

**DCMD WEST**
**ATTN: Renee Deavens**
**222 N. Sepulveda Blvd., Suite 1107**
**El Segundo, CA 90245-4394**
**(800) 233-6521 (Toll Free CA Only)**
**(800) 624-7372 (Toll Free-AK,HI,ID,MT,NV,OR,WA)**
**(310) 335-3260**
**(310) 335-4443 (FAX)**

DCMAO San Francisco
ATTN: Robert Lane
1265 Borregas Ave.
Sunnyvale, CA 94089
(408) 541-7041/7042

DCMAO San Diego
ATTN: Marvie Bowlin
7675 Dagget Street, Suite 200
San Diego, CA 92111-2241
(619) 637-4922

DCMAO El Segundo
ATTN: Debbie Tatum
222 N. Sepulveda Boulevard, Suite 404
El Segundo, CA 90245-4320
(310) 335-3511/3495

DCMAO Seattle
ATTN: Alice Toms
3009 112th Ave., NE, Suite 200
Bellvue, WA 98004-8019
(206) 889-7317/7318

DCMAO Santa Ana
ATTN: Laura Robello
34 Civic Center Plaza, PO Box C-12700
Santa Ana, CA 92172-2700
(714) 836-2913 (ext. 659 or 661)

DCMAO Van Nuys
ATTN: Diane Thompson
6230 Van Nuys Boulevard
Van Nuys, CA 91401-2713
(818) 904-6158

DCMAO St. Louis
ATTN: William Wilkins
1222 Spruce Street
St. Louis, MO 63103-2811
(314) 331-5392 (ext. 231 or 229)

DCMAO Phoenix
ATTN: Clarence Fouse
The Monroe School Building
215 N. 7th Street
Phoenix, AZ 85034-1012
(602) 379-6177

DCMAO Chicago
ATTN: James Kleckner
O'Hare International Airport
10601 W. Higgins Road, PO Box 66911
Chicago, IL 60666-0911
(312) 825-6021

DCMAO Denver
ATTN: Robert Sever
Orchard Place 2, Suite 200
5975 Greenwood Plaza Blvd.
Englewood, CO 80110-4715
(303) 843-4381

DCMAO Milwaukee
ATTN: Paul Roppuld
Henry S. Ruess Federal Plaza
310 West Wisconsin Avenue
Milwaukee, WI 53203-2216
(414) 297-4328

DCMAO Twin Cities
ATTN: Otto Murry
3001 Metro Drive, Suite 200
Bloominton, MN 55425-1573
(612) 335-2003

DCMAO Wichita
ATTN: George Luckman
U.S. Courthouse Suite D-34
401 N. Market Street
Wichita, KS 67202-2095
(316) 269-7137

**DCMD NORTHEAST**
**ATTN: John McDonough**
**495 Summer Street, 8th Floor**
**Boston, MA 02210-2184**
**(800) 348-1011 (Toll Free MA Only)**
**(800) 321-1861 (Toll Free Outside MA)**
**(617) 451-4317/4318**
**(617) 451-3174 (FAX)**

DCMAO Boston
ATTN: Ann Howell
495 Summer Street
Boston, MA 02210-2184
(617) 451-4108/4109/4110

DCMAO Cleveland
ATTN: Herman Peaks
1240 East 9th Street
Cleveland, OH 44199-2064
(216) 522-5446

DCMAO Dayton
ATTN: Betty Adams
c/o Defense Electronics Supply Center
Building 1, 1507 Wilmington Pike
Dayton, OH 45444-5300
(513) 296-5150

DCMAO Detroit
ATTN: David Boyd
905 McNamara Federal Bldg, 477 Michigan Ave.
Detroit, MI 48226-2506
(313) 226-5180

DCMAO Garden City
ATTN: Eileen Kelly
605 Stewart Avenue
Garden City, NY 11530-4761
(516) 228-5724

DCMAO Grand Rapids
ATTN: Kay Hamilton
678 Front Street, NW
Grand Rapids, MI 49504-5352
(616) 456-2620

DCMAO Hartford
ATTN: Frank Prater
130 Darlin Street
E. Hartford, CT 06108-3234
(203) 291-7706/7705

DCMAO Indianapolis
ATTN: Robert Staton
Building 1
Fort Benjamin Harrison, IN 46249-5701
(317) 542-2015

DCMAO New York
ATTN: John Castellane
201 Varick Street, Room 1061
New York, NY 10014-4811
(212) 337-0326

DCMAO Philadelphia
ATTN: Julia Graciano
2800 S. 20th Street, PO Box 7699
Philadelphia, PA 19101-7478
(215) 737-5818

DCMAO Pittsburg
ATTN: Rich Spanard
1000 Liberty Avenue
Pittsburgh, PA 15222-4190
(412) 644-5926

DCMAO Reading
ATTN: Thomas Knudsen
45 South Front Street
Reading, PA 19602-1094
(215) 320-5012

DCMAO Springfield
ATTN: Sylvia Liggins
955 South Springfield Ave.
Springfield, NJ 07081-3170
(201) 564-8204

DCMAO Stratford
ATTN: Otis Wade
550 Main Street
Stratford, CT 06497-7574
(203) 385-4413

DCMAO Syracuse
ATTN: Ralph Vinciguerra
615 Erie Boulevard, West
Syracuse, NY 13204-2408
(315) 423-5664

**DCMD SOUTH**
**ATTN: Howard Head, Jr.**
**805 Walker Street**
**Marietta, GA 30060-2789**
**(800) 551-7801 (Toll Free-GA)**
**(800) 331-6415 (Nationwide)**
**(404) 590-6196**
**(404) 590-2612 (FAX)**

DCMAO Atlanta
ATTN: Sandra Scanlon
805 Walker Street
Marietta, GA 30060-2789
(404) 590-6197
(404) 590-2110 (FAX)

DCMAO Baltimore
ATTN: Gregory W. Prouty
200 Towsontown Blvd.
Towson, MD 21204-5299
(410) 339-4809
(410) 339-4990 (FAX)

DCMAO Birmingham
ATTN: Lola Alexander
2121 Eight Avenue, N., Suite 104
Birmingham, AL 35203-2376
(205) 226-4304
(205) 251-5325 (FAX)

DCMAO Dallas
ATTN: Jerome Anderson
1200 Main Street, Room 640
PO Box 50500
Dallas, TX 75202-4399
(214) 670-9205
(214) 573-2182 (FAX)

DCMAO Orlando
ATTN: Victor Irizarry
3555 Maguire Boulevard
Orlando, FL 32803-3726
(407) 228-5113/5260
(407) 228-5312 (FAX)

DCMAO San Antonio
ATTN: Thomas Bauml
615 E. Houston Street, PO Box 1040
San Antonio, TX 78294-1040
(210) 229-4650
(210) 229-6092 (FAX)

**DCDM INTERNATIONAL**
**DCMAO Puerto Rico**
**ATTN: Orlando Coriano**
**209 Chapel Drive**
**Navy Security Group Activity**
**Sabana Seca, PR 00952**
**(809) 795-3202**
**(809) 784-2011 (FAX)**

# REPORT DOCUMENTATION PAGE

*Form Approved*
*OMB No. 0704-0188*



| 1. AGENCY USE ONLY (*Leave Blank*) | 2. REPORT DATE | 3. REPORT TYPE AND DATES COVERED |
|---|---|---|
| | | |

| 4. TITLE AND SUBTITLE | 5. FUNDING NUMBERS |
|---|---|
| 6. AUTHOR(S) | |
| 7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) | 8. PERFORMING ORGANIZATION REPORT NUMBER |
| 9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) | 10. SPONSORING/MONITORING AGENCY REPORT NUMBER |
| 11. SUPPLEMENTARY NOTES | |
| 12a. DISTRIBUTION/AVAILABILITY STATEMENT | 12b. DISTRIBUTION CODE |
| 13. ABSTRACT (*Maximum 200 words*) | |
| 14. SUBJECT TERMS | 15. NUMBER OF PAGES |
| | 16. PRICE CODE |

| 17. SECURITY CLASSIFICATION OF REPORT | 18. SECURITY CLASSIFICATION OF THIS PAGE | 19. SECURITY CLASSIFICATION OF ABSTRACT | 20. LIMITATION OF ABSTRACT |
|---|---|---|---|
| | | | |

## GENERAL INSTRUCTIONS FOR COMPLETING SF 298

The Report Documentation Page (RDP) is used in announcing and cataloging reports. It is important that this information be consistent with the rest of the report, particularly the cover and title page. Instructions for filling in each block of the form follow. It is important to stay within the lines to meet optical scanning requirements.

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