

National Aeronautics and Space Administration

STTR:
Small Business Technology Transfer
1999 Program Solicitation

*A searchable version of this document
is found through this URL:
<http://sbir.nasa.gov>*

Opening Date: March 2, 1999
Closing Date: May 14, 1999

TABLE OF CONTENTS

1. STTR PROGRAM DESCRIPTION.....	1
1.1 Introduction.....	1
1.2 NASA STTR Program	1
1.3 Features of the Three-Phase STTR Program.....	1
1.4 Program Eligibility	2
1.5 Access to NASA STTR Program Information	2
2. DEFINITIONS	3
2.1 Cooperative Research and Development.....	3
2.2 Research Institution.....	3
2.3 Small Business Concern.....	3
2.4 Socially and Economically Disadvantaged SBC	3
2.5 Socially and Economically Disadvantaged Individual	4
2.6 Women-Owned SBC.....	4
2.7 United States	4
2.8 Commercialization	4
2.9 Subcontract	4
3. PROPOSAL PREPARATION INSTRUCTIONS AND REQUIREMENTS.....	4
3.1 Proposal Content.....	4
3.2 General Requirements	5
3.3 Proposal Cover Sheet and Project Summary.....	5
3.4 Technical Proposal.....	5
3.5 Proposed Budget.....	7
3.6 Cooperative Agreement.....	8
4. METHOD OF SELECTION AND EVALUATION CRITERIA.....	8
4.1 Phase-I.....	8
4.2 Phase-II	9
4.3 Debriefing of Unsuccessful Offerors.....	12
5. CONSIDERATIONS	12
5.1 Award.....	12
5.2 Phase-I Reporting.....	12
5.3 Payment Schedule	13
5.4 Treatment and Protection of Proposal Information	13
5.5 Government Rights to Data Developed Under STTR Contracts	14
5.6 Copyrights	14
5.7 Patents	14
5.8 Cost Sharing	14
5.9 Profit or Fee	14
5.10 Joint Ventures and Limited Partnerships.....	15
5.11 Similar Proposals and Prior Work.....	15
5.12 Contractor Commitments	15
5.13 Additional Information.....	16
5.14 Property.....	16
6. SUBMISSION OF PROPOSALS	17
6.1 The Submission Process.....	17
6.2 Internet Submission	17
6.3 Postal Submission	18
6.4 Acknowledgment of Proposal Receipt	18

6.5 Withdrawal of Proposals	18
7. SCIENTIFIC AND TECHNICAL INFORMATION SOURCES	19
7.1 NASA SBIR and STTR Homepage.....	19
7.2 NASA Commercial Technology Network	19
7.3 United States Small Business Administration.....	19
7.4 Federal Research in Progress (FEDRIP) Database.....	19
7.5 NASA Technology Utilization Services	19
7.6 National Technical Information Service.....	20
8. RESEARCH TOPICS	21
Topic 1: Human Operations in Space	21
Topic 2: Launch and Payload Processing Systems	22
Topic 3: Structures & Materials	26
Topic 4: Turbomachinery	26
9. SUBMISSION FORMS AND CERTIFICATIONS (APPENDICES).....	28
Form 9A - PROPOSAL COVER.....	29
Form 9B - PROJECT SUMMARY	32
Form 9C - SUMMARY BUDGET	34
MODEL COOPERATIVE AGREEMENT	36
MODEL ALLOCATION OF RIGHTS AGREEMENT.....	37
CHECK LIST	41

1. STTR Program Description

1.1 Introduction

The National Aeronautics and Space Administration (NASA) invites Small Business Concerns (SBC), as defined in section 2.3, in collaboration with a Research Institution (RI), as defined in section 2.2, to submit Phase-I proposals for cooperative research under this 1999 Solicitation for the Small Business Technology Transfer (STTR) Program. The NASA STTR Program is designed as a vehicle for converting the nation's investment in research carried out by RIs into new commercial technologies for advancing U.S. economic competitiveness and high-tech development.

Subject to the availability of funds, NASA plans to select 20-25 proposals in August 1999 for negotiation of Phase-I fixed-price contracts. NASA anticipates that about 35 percent of these Phase-I projects will be selected for Phase-II development.

Proposals submitted in response to this Solicitation must be jointly developed by the SBC and the RI, and must include all relevant documentation as required in Section 3. At least **40 percent** of the work (amount requested including cost sharing, less fee, if any) is to be performed by the SBC as the prime contractor, and at least **30 percent** of the work is to be performed by the RI.

1.2 NASA STTR Program

The NASA STTR Program is a three-phase program utilizing the entrepreneurial talents of the SBC to convert technology resident at the RI for meeting the needs of both NASA and the commercial marketplace. Proposals submitted in response to this Solicitation must present an innovative technology concept, which is applicable to the following Research Topics and NASA Centers of Excellence.

1. Research Topic: Human Operations in Space
NASA Center: Johnson Space Center
2. Research Topic: Launch and Payload Processing Systems
NASA Center: Kennedy Space Center
3. Research Topic: Structures and Materials
NASA Center: Langley Research Center
4. Research Topic: Turbomachinery
NASA Center: Glenn Research Center

Research Topics from the other NASA Centers of Excellence will be included in future Solicitations.

1.3 Features of the Three-Phase STTR Program

1.3.1 Legislative Basis. The legislative basis for this Solicitation is the Small Business Research and Development Enhancement Act of 1992 (P.L. 102-564, October 28, 1992). It amends Section 9 of the Small Business Act (15 U.S.C. 638). On August 10, 1993, the Small Business Administration (SBA) issued a Policy Directive for the general conduct of STTR Programs within the Federal Government.

1.3.2 Program Funding. The current law authorizes agencies participating in the STTR Program to expend with small business concerns not less than 0.15 percent of their extramural Research/Research and Development (R/R&D) budgets in FY 1999. The FY 1999 NASA STTR Program budget is approximately \$5.6M.

1.3.3 STTR Program Phases. The NASA STTR Program consists of the following three phases:

Phase-I. The purpose of Phase-I is to determine the scientific, technical, and commercial merit and feasibility of the proposed cooperative R/R&D effort, and the quality of the SBC's performance with a relatively small NASA investment before consideration of further Federal support in Phase-II. NASA funding for each Phase-I contract is limited to \$100,000. Contractors have up to 12 months to submit their final report. Successful completion of Phase-I objectives is a prerequisite to Phase-II consideration.

Phase-II. The objective of Phase-II is to continue the R/R&D effort from Phase-I. Only SBCs awarded Phase-I contracts are eligible for Phase-II STTR funding agreements, and only at the Federal agency which awarded the Phase-I project. Awards will be based on the scientific, technical, and commercial merit and feasibility of the idea, as evidenced by the first phase, and by other relevant information. Funding for each Phase-II contract will be limited to \$500,000. Contractors have up to 24 months to complete the effort and submit their final report.

Phase-III. NASA may award *Phase-III contracts for products or services, with non-STTR funds.* Phase-I and Phase-II awards satisfy the requirements of the Competition in Contracting Act for subsequent NASA Phase-III contracting. The small business is also expected to use non-Federal capital to pursue private sector applications of the R/R&D effort.

1.4 Program Eligibility

Each offeror submitting a proposal must qualify as the SBC for R/R&D purposes at the time of award. The SBC will submit a proposal for cooperative research and development as defined in Section 2 of this Solicitation. For both Phase-I and Phase-II, all R/R&D work must be performed in the United States.

1.5 Access to NASA STTR Program Information

1.5.1 Questions About This Solicitation. To ensure fairness, questions relating to the intent and/or content of research topics in this Solicitation cannot be answered during the Phase-I Solicitation period beginning March 2, 1999 and ending May 14, 1999. Only questions requesting clarification of Solicitation instructions and administrative matters will be answered.

1.5.2 Questions Regarding Proposal Status. Evaluation and selection of proposals will require about three months after the closing date of May 14, 1999. Information about proposal status will not be available until final selections are announced. However, an acknowledgment of proposal receipt will be e-mailed within 14 days of the closing date (Section 6.4).

1.5.3 Other Means of Contacting NASA STTR. Each of the field centers has its own homepage including strategic planning and Small Business Innovation Research (SBIR) and STTR information. Please consult these homepages for more details on the technology requirements within the topic areas.

1) **Help Line.** For all inquiries, requests, and help-related questions, contact via:

telephone (301)-937-0888 between 8:00am-5:00pm (Mon.-Fri., EST), or
facsimile (301)-937-0204, or
e-mail sttr@reisis.com

Regardless of the Help Line method used, the requestor must provide the name and telephone number of the person to contact, the organization name and address, and the specific questions or requests.

- 2) **NASA STTR Program Manager.** Specific information requests that could not be answered by the Help Line should be mailed to:

Paul Mexcur, Program Manager
NASA SBIR/STTR Program Management Office
Building 3, Room 108, Code 710
Goddard Space Flight Center
Greenbelt, MD 20771-0001

2. Definitions

2.1 Cooperative Research and Development

For purposes of the NASA STTR Program, cooperative research and development is that which is to be conducted jointly by the SBC and the RI in which at least 40 percent of the work (amount requested, including cost sharing if any, less fee if any) is performed by the SBC and at least 30 percent of the work is performed by the RI.

2.2 Research Institution

A U.S. research institution is one that is: (1) 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 section 35(c)(1) of the Office of Federal Procurement Policy Act (or any successor legislation thereto), or (2) a non-profit research institution as defined in section 4(5) of the Stevenson-Wydler Technology Innovation Act of 1980, or (3) a non-profit college or university.

2.3 Small Business Concern

The SBC is one that, at the time of award of Phase-I and Phase-II contract, meets the following criteria:

- (1) Is independently owned and operated, is not dominant in the field of operation in which it is proposing, has its principal place of business located in the United States, and is organized for profit; and
- (2) Is at least 51 percent owned by, or, in the case of a publicly owned business, at least 51 percent of its voting stock is owned by United States citizens or lawfully admitted permanent resident aliens; and
- (3) Has, including its affiliates, a number of employees not exceeding 500, and meets the other regulatory requirements found in 13 CFR Part 121. Business concerns, other than investment companies licensed, or state development companies qualifying under the Small Business Investment Act of 1958, 15 U.S.C. 661, et seq., are affiliates of one another when, either directly or indirectly, (a) one concern controls or has the power to control the other; or (b) a third party controls or has the power to control both. Control can be exercised through common ownership, common management, and contractual relationships. The terms "affiliates" and "number of employees" are defined in greater detail in 13 CFR 121. Business concerns include, but are not limited to, any individual, partnership, corporation, joint venture, association, or cooperative.

2.4 Socially and Economically Disadvantaged SBC

A socially and economically disadvantaged SBC is: (1) one that is at least 51 percent owned by (i) an Indian tribe or a native Hawaiian organization, or (ii) one or more individuals who are socially and economically disadvantaged, and (2) whose management and daily business operations are controlled by one or more socially and economically disadvantaged individuals.

2.5 Socially and Economically Disadvantaged Individual

A member of any of the following groups:

- (1) Black Americans
- (2) Hispanic Americans
- (3) Native Americans
- (4) Asian-Pacific Americans
- (5) Subcontinent Asian Americans
- (6) Other groups designated from time to time by SBA to be socially disadvantaged; or
- (7) Any other individual found to be socially and economically disadvantaged by SBA pursuant to Section 8(a) of the Small Business Act, 15 U.S.C. 637(a).

2.6 Women-Owned SBC

The SBC that is at least 51 percent 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 United States

Means the 50 states, the territories and possessions of the United States, the Commonwealth of Puerto Rico, the Trust Territory of the Pacific Islands, and the District of Columbia.

2.8 Commercialization

The process of developing markets and producing and delivering products or services for sale (whether by the originating party or by others). As used here, commercialization includes both government and non-government markets.

2.9 Subcontract

Any agreement, other than one involving an employer-employee relationship, entered into by a Federal Government contractor calling for supplies or services required solely for the performance of the original contract. (Section 3.4.1, Part 10.)

3. Proposal Preparation Instructions and Requirements

3.1 Proposal Content

Each proposal submitted to the STTR Program must contain the following items in this order of presentation: (1) Proposal Cover Sheet (Form 9A); (2) Project Summary Sheet (Form 9B); (3) Technical Proposal; (4) Summary Budget Sheet (Form 9C); and (5) Cooperative Agreement.

The STTR Phase-I proposal must provide sufficient information to convince NASA that the proposed SBC/RI cooperative effort represents a sound approach for converting technical information resident at the RI into a product or service that meets a need described in a Solicitation research topic. It must also identify the eventual commercial application potential of the product or service and discuss how the SBC would bring it to market. **A proposal directed toward systems studies, market research, and routine engineering design is non-responsive to this Solicitation.**

3.2 General Requirements

3.2.1 Page Limitation. Offerors are required to submit Phase-I proposals in both paper and electronic formats. The paper copy of the proposal submitted by the offeror shall not exceed a total of **25 standard 8.5 x 11 inch pages**. All five proposal items required in Section 3.1 will be included within this total. Pages may be single or double spaced. Each page shall be numbered consecutively at the bottom. Samples, videotapes, slides, or other ancillary items are not required and will not be accepted. **If the paper copy of the proposal exceeds the 25-page limitation, then the entire proposal will be rejected as part of the administrative screening conducted prior to technical evaluation.**

3.2.2 Type Size. A font size of 10 point or larger is to be used for text and tables, except as legends on reduced drawings. **Proposals prepared in a font smaller than 10 point will be rejected.**

3.2.3 Brevity and Organization. The proposal should be direct, concise, and logically organized with all required paragraphs *numbered* and in the requested order. Offerors are requested not to use the entire 25-page allowance unless necessary.

3.3 Proposal Cover Sheet and Project Summary

3.3.1 Page 1: Proposal Cover Sheet (Form 9A). The Proposal Cover Sheet is provided in Section 9. Each offeror shall provide complete information for each item and submit the form as required in Section 6. The proposal title shall be concise and descriptive of the proposed product. The title should not use acronyms or words like "Development of" or "Study of." The NASA research topic title must not be used as the proposal title.

3.3.2 Page 2: Project Summary (Form 9B). The Project Summary Sheet is provided in Section 9. Each offeror shall provide complete information for each item and submit form 9B as required in Section 6. **Without revealing proprietary information and limited to 200 words**, the technical abstract section shall summarize the anticipated results and implications of the approach (both Phases I and II). Potential commercial applications of the technology should also be presented.

Note: The Proposal Cover Sheet and the Project Summary are public information, and the Government may disclose them. Do not include proprietary information on these forms.

3.4 Technical Proposal

3.4.1 The Technical Proposal shall not contain any budget data and **must consist of all eleven parts in the following order.** (Note: Parts that are not applicable must be included and marked "Not Applicable.")

Part 1: Table of Contents. Page 3 of the proposal shall begin with a brief table of contents indicating the page numbers of each of the sections of the proposal.

Part 2: Identification and Significance of the Technology or Intellectual Property. The first paragraph of Part 2 shall contain (1) **a clear and succinct statement of the specific technology or intellectual property resident at the RI** that is the basis for the proposed cooperative effort, and (2) a brief explanation of how this effort is relevant to meeting the need described in the applicable Research Topic contained in this Solicitation. Additional paragraphs in Part 2 should provide appropriate background explanation why the proposed cooperative effort should be supported.

Part 3: Phase-I Technical Objectives. The offeror shall state the specific objectives of the Phase-I effort and the technical questions that must be answered during Phase-I to determine the feasibility of further research and development to convert the intellectual property resident at the RI into products or services that benefit the specified research topic and have potential commercial application.

Part 4: Phase-I Work Plan. The Phase-I Work Plan must be complete and self-contained and shall describe the Phase-I R/R&D required to answer the feasibility questions stated in Part 3. The work plan shall indicate, in detail, what will be done and where the work will be carried out. The methods planned to achieve each objective or task should be discussed in detail. Schedules (Gantt charts, or other suitable scheduled task displays), task descriptions and assignments, resource allocations, and planned accomplishments, including project milestones, shall be included. The work plan will specifically address the percentage and type of work to be performed by the SBC and the RI. The plan will provide evidence that the SBC will exercise management direction and control of the performance of the STTR effort, including situations in which the Principal Investigator may be an employee of the RI.

Part 5: Related R/R&D and Bibliography of Related Work. The section should include a clear statement of the offerors awareness of key recent developments by others in the specific subject area. It should include significant R&D activities, which are directly related to the proposal, that have been conducted by the SBC, the RI and the Principal Investigator or Project Manager (PI/PM). Any other planned R&D related to the proposed project should also be described. At the offeror's option, this section may include concise bibliographic references in support of the proposal if they are confined to activities directly related to the proposed work.

Part 6: Relationship with Phase-II. The offeror shall (1) state the anticipated results of the proposed R&D effort if the project is successful (Phases-I and Phase-II), and (2) discuss the significance of the Phase-I effort in providing a foundation for the Phase-II R&D effort.

Part 7: Commercial Applications Potential. The offeror shall describe whether and by what means the proposed project appears to have potential (1) commercial application, and (2) use by the Federal government.

Part 8: Company Information and Facilities. This section shall provide adequate information to allow the evaluators to assess the ability of the SBC/RI team to carry out the proposed Phase-I and projected Phase-II and Phase-III activities. The offeror should describe the relevant facilities and equipment currently available, and those to be purchased, in order to adequately support the team's proposed activities. NASA will not fund the acquisition of equipment, instrumentation, or facilities under STTR Phase-I contracts as a direct cost (Section 5.14). The capability of the offeror to perform the proposed activities and bring a resulting product or service to market must be indicated. Qualifications of the offeror and its principals in marketing related products or services or in raising capital should be presented. If an offeror proposes the use of unique or one-of-a-kind Government facilities, a statement, describing the uniqueness of the facility and its availability to the offeror at specified times, signed by the appropriate Government Official must be included with the proposal. Proposals lacking this signed statement may be rejected without evaluation.

If the proposer does not require the use of Government Facilities or Equipment, the proposer shall so state in this part of the proposal.

Part 9: Key Personnel and Other Staff. The offeror shall identify the key employees to be committed to Phase-I activities. Key personnel are the Principal Investigator or Project Manager (PI/PM) and other individuals whose expertise is essential to the success of the project. Substitution of the PI/PM or other personnel designated as "key" at any time may be made only with the written consent of the NASA contracting officer. Substitution of a "key" person will be judged against the education and experience of the key person approved at contract award.

The PI/PM is presumed to be essential to the success of an STTR project. The PI/PM must have the technical competence and authority to plan and guide the proposed R/R&D effort. Co-PI's or Co-PM's are not acceptable. NASA assumes that the PI will be employed either by the SBC or the RI, and will make a substantial commitment to the project. If the PI is not an employee of the SBC, the offeror must describe the management process to ensure SBC control of the project.

The proposal must state the time and effort planned for the key personnel and their organizational affiliation (SBC, RI, or other). Information on the education, experience, and directly related publications of key personnel is required. Offerors are requested to avoid extensive vitae and publication lists not pertinent to the proposed R/R&D. This section shall indicate the extent to which other proposals recently submitted or planned for submission in 1999 and existing projects, commit key persons' time concurrently with this proposed activity. The qualifications of other staff members who will make significant contributions to the project, and not considered key personnel, should also be described.

Part 10: Subcontracts and Consultants. The SBC/RI team may establish business arrangements with other entities or individuals provided such arrangements do not exceed 30 percent of the work (amount requested including cost sharing if any, less fee, if any) in both Phases-I and Phase-II. The offeror must describe all subcontracting or other business arrangements, and identify the relevant organizations and/or individuals with whom arrangements are planned.

The expertise to be provided by entities other than the SBC and RI must be described in detail, as well as the functions, services, number of hours and labor rates, and their extent of the effort. The proposal must include certifications by each participating organization and individual consultant that they will be available at the times required for the purposes and extent of effort described in the proposal. **Failure to provide subcontractor/consultant certifications may result in rejection of the entire proposal.**

Part 11: Similar Proposals or Awards. A firm may elect to submit proposals for essentially equivalent work under other Federal program solicitations or may have received or expect to receive other Federal awards for essentially equivalent work. In such cases, the offeror will inform NASA of related proposals and awards and must first certify on the Proposal Cover whether the offeror (a) has received Federal government awards for related work, or (b) has submitted currently active proposals for similar work under other Federal government program solicitations or intends to submit proposals for such work to other agencies during 1999. For all such cases, the following information is required:

1. The name and address of the agencies to which proposals have been or will be submitted, or from which awards have been received;
2. Dates of such proposal submissions or awards;
3. Title, number, and date of solicitations under which proposals have been or will be submitted or awards received;
4. The specific applicable research topic for each such proposal submitted or award received;
5. Titles of research projects;
6. Name and title of the principal investigator/project manager for each proposal that has been or will be submitted or award received.

Note: Lack of the required certification on the cover page or failure to declare the existence of related, similar or duplicate awards or proposals will result in rejection of the offer or loss of an award. If no such awards have been received or no such proposals have been submitted or are intended, the offeror shall so state in this part of the proposal.

3.5 Proposed Budget

3.5.1 Summary Budget (Form 9C). A copy of the Summary Budget Sheet is provided in Section 9. Each offeror shall provide complete information for each item and submit the form as required in Section 6. Sufficient information shall be submitted to show how the offeror plans to use the requested funds, and enable NASA to determine whether the proposed budget is realistic and reasonable. Items on the form that do not apply to the proposed project may be omitted.

3.5.2 Property. NASA will not fund the purchase of instrumentation, equipment, or facility acquisition as a direct cost under Phase-I (Section 5.14). However, any purchases of products required for R/R&D under an STTR contract using NASA funds should be American-made.

3.5.3 Travel. Use of STTR funds for travel must be reasonable and essential for the purposes of Phase-I.

3.5.4 Profit. Unless prohibited by statute, a reasonable profit or fee should be included in the proposed budget (Section 5.9).

3.5.5 Cost Sharing. Cost sharing is permitted for proposals under this Solicitation (See Section 5.8).

3.6 Cooperative Agreement

The Cooperative Agreement (not to be confused with the Allocation of Rights Agreement) shall be a single page document (see example Model Cooperative Agreement in Section 9) which contains a statement to NASA that the SBC, the RI, and any applicable subcontractors and/or consultants have agreed to cooperate on the proposed project, if and when the project is selected for funding.

4. Method of Selection and Evaluation Criteria

4.1 Phase-I

4.1.1 Phase-I Evaluation Process. Proposals compliant with the administrative requirements of the Solicitation and responsive to the topic chosen by the offeror will be evaluated on a competitive basis using the criteria specified in Section 4.1.2. The prime objective of the evaluation process is to ensure that only innovative and promising proposals are selected for contract negotiations.

Evaluators rely only on information contained in the technical proposals. Offerors should not assume that evaluators are acquainted with the firm, the research institution, key individuals, or with any experiments/data regarding the proposed research. Any pertinent references or publications should be provided in Part 5 of the technical proposal.

4.1.2 Phase-I Evaluation Criteria. Each Proposal will be evaluated and scored on its own merits using the following factors:

Factor 1. Scientific/technical merit and feasibility

The proposed cooperative R/R&D effort will be evaluated on whether it offers a clearly innovative and feasible technical approach to a problem area posed in the topic. Specific objectives, approaches and plans for developing and verifying the innovation must demonstrate a clear understanding of the problem and the current state-of-the-art. The degree of understanding and significance of the risks involved in the proposed innovation should be presented.

Factor 2. Experience, qualifications and facilities

The technical capabilities and experience of the principal investigator or project manager, key personnel, staff, consultants and subcontractors, if any, are evaluated for consistency with the research effort and their degree of commitment/availability. The necessary instrumentation or facilities required by the SBC and RI must be shown to be adequate and any reliance on external sources, such as Government Furnished Equipment or Facilities addressed (see 5.14).

Factor 3. Effectiveness of the proposed organization

The clear delineation of the responsibilities of the SBC and RI for the success of the proposed cooperative R/R&D effort will be evaluated. The joint work plan will be reviewed for its comprehensiveness, effective use of available resources, cost management and proposed schedule for meeting the Phase-I objectives. The offeror must demonstrate the ability to organize for effective conversion of intellectual property provided by the RI into products or services of value to NASA and the commercial marketplace.

Factor 4. Commercial merit and feasibility

The proposal will be evaluated for any potential commercial applications in the private sector or for use by the Federal Government.

Scoring of Factors and Weighting: The sum of the scores for factors 1, 2 and 3 constitutes the numerical value for the **Technical Merit** of a proposal. Factor 1 is about twice the weight of factors 2 and 3. The score for **Commercial Merit** will be in the form of an adjectival rating (Excellent, Very Good, Average, Below Average, Poor, Insufficient Data). Technical Merit is more significant for Phase-I. In proposals of equal Technical Merit, Commercial Merit can be a deciding factor. Commercial Merit rises in significance for Phase-II consideration.

4.1.3 Selection. After a proposal is evaluated, it will be ranked relative to all others evaluated under the same topic. Those determined suitable for selection will be recommended for further consideration by the NASA Center STTR Committee. The committee will prepare final recommendations for selection based on proposal merit, program priorities, and mission needs. These recommendations will then be forwarded to the Source Selection Official at NASA Headquarters. Selection decisions will consider the recommendations from all Centers, overall NASA priorities, and program balance.

Firms selected for negotiations that may lead to an award will be notified by e-mail. An announcement of all awards will be posted on the SBIR/STTR web site (<http://sbir.nasa.gov>). The list of selections will also be available electronically via the Internet and by public announcement. The notification letters will identify the Contracting Officer at the NASA Center responsible for negotiating a Phase-I contract.

4.1.4 Contracting. Fixed-price contracts will be issued for Phase-I. Simplified contract documentation is employed. SBCs selected for negotiation of contract awards can reduce processing time by examining the procurement documents, furnishing the contracting officer with signed representations and certifications, and indicating any contract terms to be negotiated or agreement with the contract terms. NASA will make the Phase-I model contract and other documents available to the public on the NASA SBIR/STTR homepage (<http://sbir.nasa.gov>) at the time of selection announcement. **From the time of proposal selection until the award of a contract, only the Contracting Officer is authorized to commit the Government, and all communications must be through the Contracting Officer.**

4.1.5 Allocation of Rights Agreement. After being selected for Phase-I contract negotiations, but before the contract starts, the offeror shall, if requested, provide to the Contracting Officer at the managing NASA Center, a completed **Allocation of Rights Agreement (ARA)**, which has been signed by authorized representatives of the SBC, RI and subcontractors and consultants, as applicable. The ARA shall state the allocation of intellectual property rights with respect to the proposed STTR activity and planned follow-on research, development and/or commercialization.

4.2 Phase-II

Selection of Phase-II proposals will be based on evaluation factors listed in Section 4.2.3 and other considerations as discussed in Section 4.2.4.

4.2.1 Phase-II Proposals. The STTR Phase-I contract will serve as the Request for Proposal (RFP) for the STTR Phase-II follow-on contract except (1) when NASA notifies the contractor that the area or topic of R/R&D no longer has high priority in the agency, or (2) when NASA notifies the contractor that the Phase-I R/R&D results are not worthy of continuation. Submission of a Phase-II proposal is strictly voluntary, and NASA assumes no responsibility for proposal preparation cost. NASA is not obligated to fund any specific Phase-II proposals.

Phase-II proposals are more comprehensive than those required for Phase-I. They shall be submitted no later than the end of the Phase-I contract performance term; however, contractors are encouraged to submit their proposals and the Phase-I final reports as early as possible. Final selections will be based upon the evaluation of the Phase-I final report and the Phase-II proposal.

4.2.2 Phase-II Proposal Contents. Phase-II proposals shall be addressed in the following "Part" order listed. Failure to include any requested information in the proposal may make it non-responsive to the RFP.

Part 1: Cover Page. (Form provided by NASA)

Part 2: Project Summary. (Form provided by NASA)

Part 3: Table of Contents.

Part 4: Results of the Phase-I Project. Briefly describe how Phase-I has: proven the feasibility of the innovation; provided a rationale for both NASA and commercial applications; and demonstrated the ability of the offeror to conduct the R/R&D.

Part 5: Phase-II Technical Objectives, Approach, and Work Plan. Define the specific objectives of the Phase-II research and technical approach to meet these objectives; and provide a work plan defining specific tasks, performance schedules, milestones, and deliverables.

Part 6: Company Information. Describe the capability of the firm to carry out Phase-II and Phase-III activities including its organization, operations, number of employees, R/R&D capabilities, and experience relevant to the work proposed.

Part 7: Facilities and Equipment. This section shall provide adequate information to allow the evaluators to assess the ability of the SBC/RI team to carry out the proposed Phase-II activities. The offeror should describe the relevant facilities and equipment currently available, and those to be purchased, in order to adequately support the team's proposed research efforts. NASA will not fund the acquisition of equipment, instrumentation, or facilities under STTR Phase-II contracts as a direct cost (Section 5.14). The capability of the offeror to perform the proposed activities and bring a resulting product or service to market must be indicated. Qualifications of the offeror and its principals in marketing related products or services or in raising capital should be presented.

If an offeror proposes the use of unique or one-of-a-kind Government facilities, a statement, describing the uniqueness of the facility and its availability to the offeror at specified times, signed by the appropriate Government Official must be included with the proposal. Proposals lacking this signed statement may be rejected without evaluation.

If the proposer does not require the use of Government Facilities or Equipment, the proposer shall so state in this part of the proposal.

Part 8: Key Personnel. Identify the key personnel for the project, confirm their specific availability for Phase-II, and discuss their qualifications in terms of education, work experience, and accomplishments that are relevant to the project.

Part 9: Subcontracts and Consultants. Describe in detail any subcontract, consultant, or other business arrangements and provide written evidence of their availability for the project. For Phase-II, a minimum of 40 percent of the work must be performed by the proposing SBC and 30 percent by the RI unless approved in writing by the Contracting Officer. The proposal must include a commitment from each subcontractor and/or consultant that they will be available at the times required for the purposes and extent of effort described in the proposal.

Part 10: Commercialization and Phase-III Plans. Describe plans for commercialization (Phase-III) in terms of each of the following areas:

- (1) Product or Service Commercial Feasibility
- (2) Market Feasibility and Competition
- (3) Strategic Relevance to the Offeror

- (4) Current and Proposed Personnel and Organizational Structure relevant to bringing innovative technology to commercial application.
- (5) Production and Operations, Plans and Dates, and
- (6) Financial Resources and Planning

Part 11: Capital Commitments Supporting Phases II and III. Describe and document capital commitments from non-STTR sources or from internal funds for pursuit of Phase-II and Phase-III. Potential Phase-II contractors are strongly urged to obtain valid non-STTR funding support commitments for (1) follow-on Phase-III activities, and (2) additional support of Phase-II from parties other than the proposing firm. Valid funding support commitments must provide that a specific, substantial amount will be made available to the firm to pursue the stated Phase-II and/or Phase-III objectives. They must indicate the source, date, and conditions or contingencies under which the funds will be made available. Alternatively, self-commitments of the same type and magnitude that are required from outside sources can be considered. If Phase-III will be funded internally, offerors should describe their financial position.

Evidence of funding support commitments from outside parties must be provided in writing to the proposing entity, and should accompany the Phase-II proposal. Letters of commitment should specify funding commitments, availability, other resources to be provided, and any contingent conditions. Expressions of technical interest by such parties in the Phase-II research or of potential future financial support are insufficient and will not be accepted as support commitments by NASA.

Part 12: Related R/R&D. Describe R/R&D related to the proposed work and affirm that the proposed objectives have not already been achieved and that the same development is not presently being pursued elsewhere under contract to the government.

Part 13: Proposal Pricing. Special instructions for pricing the Phase-II proposal will be provided in the Phase-I contract and may be provided in writing by the Contracting Officer.

4.2.3 Phase-II Evaluation Factors. The evaluation of Phase-II proposals that may result from Phase-I contracts awarded under this Solicitation will apply the following factors:

Factor 1. Scientific/technical merit and feasibility

The proposed cooperative R/R&D effort will be evaluated on its innovativeness, originality, and technical payoff potential if successful, including the degree to which Phase-I objectives were met, the feasibility of the innovation, and whether the Phase-I results indicate a Phase-II project is appropriate.

Factor 2. Future importance and eventual value to NASA

The eventual value of the product, process, or technology results to the NASA mission will be assessed.

Factor 3. Capability of the Small Business Concern

NASA will assess the capability of the concern to conduct Phase-II based on (a) the validity of the project plans for achieving the stated goals, (b) the qualifications and ability of the project team (Principal Investigator/Project Manager, company staff, consultants and subcontractors) relative to the proposed research, and (c) the availability of any required equipment and facilities.

Factor 4. Commercial Potential

Consideration will be given to the commercial potential of the technology; demonstrated commercial intent of the offeror; and capability of the offeror to bring successfully developed technology to commercial application.

In applying these commercial criteria, NASA will assess proposal information in terms of credibility, objectivity, reasonableness of key assumptions, independent corroborating evidence, internal consistency, demonstrated awareness of key risk areas and other indicators of sound business analysis and judgment.

4.2.4 Evaluation and Selection. At least two NASA engineers or scientists will evaluate factors 1, 2, and 3 for each proposal. Clarity and comprehensiveness in addressing all three of these factors is critical to award consideration. Proposals satisfying the first three factors will be evaluated and rated for their commercial potential using the criteria listed in factor 4 and by applying the same adjectival ratings as set forth for Phase-I proposals (Section 4.1.2). A peer review panel that may include reviewers from government, academia, and private industry does commercial evaluation.

The Center's STTR Committee will recommend proposals for award to the STTR Source Selection Official. Final selections by the STTR Source Selection Official will be based on recommendations from all Centers; NASA Headquarters Program Offices' assessments of project value to NASA programs and plans; and any other evaluations or assessments (particularly of commercial potential) that may become available to the Source Selection Official. Past performance evaluations under prior contracts with NASA may be reviewed by the Source Selection Official and considered in making final selection decision.

4.3 Debriefing of Unsuccessful Offerors

After Phase-I and Phase-II selection decisions have been announced, a proposal critique (debriefing) for an unsuccessful offeror will be available to the offeror's corporate official or designee via e-mail. Telephone requests for debriefings will not be accepted. Debriefings are not opportunities to reopen selection decisions. They are intended to acquaint the offeror with perceived strengths and weaknesses of the proposal and perhaps identify constructive future action by the offeror.

Debriefings will not disclose the identity of the proposal evaluators nor provide proposal scores, proposal rankings in the competition, or the content of, and comparisons with other proposals with which they were in competition.

4.3.1 Phase-I Debriefings. For Phase-I proposals, any request for a debriefing must be made via e-mail to sttr@reisy.com, within 60 days after the selection announcement. Late requests will not be honored.

4.3.2 Phase-II Debriefings. To request debriefings on Phase-II proposals, offerors must request via e-mail to the Contracting Officer at the appropriate NASA Center (not the STTR Program Manager) within 60 days after notification sent to the offeror that their proposal was not selected. Late requests will not be honored.

5. Considerations

5.1 Award

Both Phase-I and Phase-II awards are subject to availability of funds. NASA has no obligation to make any specific number of Phase-I or Phase-II awards based on this Solicitation, and may elect to make several or no awards in any specific technical topic. In 1999, NASA expects to announce the selection of approximately 20-25 proposals for negotiation of fixed-price Phase-I contracts with values not exceeding \$100,000. Following contract negotiations and awards, contractors will have 12 months to complete their proposed Phase-I program and to submit their final report.

About 35 percent of the successfully completed Phase-I projects resulting from this Solicitation may be selected for Phase-II continuations based on the results of Phase-I activities and competitive evaluations of Phase-II proposals. Phase-II agreements will be fixed-price contracts with performance periods not exceeding 24 months and funding not exceeding \$500,000.

5.2 Phase-I Reporting

An interim progress report is required when the invoice is submitted at project mid-point in accordance with the payment schedule (Section 5.3). This report shall document progress made on the project and activities required for completion to provide NASA the basis for determining whether the payment is warranted.

A final report must be submitted to NASA upon completion of the Phase-I R/R&D effort in accordance with contract provisions. It shall elaborate the project objectives, work carried out, results obtained, and assessments of technical merit and feasibility. The final report shall include a single page project summary as the first page, in a format provided in the Phase-I contract, identifying the purpose of the R/R&D effort and describing the findings and results, including the degree to which the Phase-I objectives were achieved, and whether the results justify Phase-II continuation. The potential applications of the project results in Phase-III either for NASA or commercial purposes shall also be described. The project summary is to be submitted without restriction for NASA publication. Language used in the Phase-I report may be used verbatim in the Phase-II proposal.

5.3 Payment Schedule

Payments in Phase-I can be authorized as follows: one-third at the time of award, one-third at project mid-point, and the remainder upon acceptance of the final report by NASA. The first two payments will be made 30 days after receipt of valid invoices. The final payment will be made 30 days after acceptance of the final report and other deliverables as required by the contract. Electronic funds transfer will be employed and offerors will be required to submit account data if selected for contract negotiations.

5.4 Treatment and Protection of Proposal Information

In the evaluation and handling of proposals, NASA will make every effort to protect the proposals and their evaluations from unauthorized disclosure. **NASA does not accept STTR proposals that contain classified information.**

5.4.1 Proprietary Information. It is NASA's policy to use information (data) included in proposals for evaluation purposes only. Public release of information in any proposal submitted will be subject to existing statutory and regulatory requirements. If proprietary information consisting of a trade secret, proprietary commercial or financial information, or private personal information is provided in an STTR proposal, NASA will treat it in confidence proprietary information provided the following legend appears on the title page of the proposal:

For any purpose other than to evaluate the proposal, this data shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed in whole or in part, provided that if a funding agreement is awarded to the offeror 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. The data subject to this restriction are contained on pages _____ of this proposal.

NASA recommends that offerors do not include proprietary information in their proposals. **Do not label the entire proposal proprietary.** Form 9B, Project Summary, should not contain proprietary information.

5.4.2 Non-NASA Reviewers. In addition to Government personnel, NASA, at its discretion and in accordance with 18 15.413-2 of the NASA FAR Supplement, may utilize reviewers from outside the Government in the proposal review process. Any decision to obtain outside evaluation shall take into consideration requirements for the avoidance of organizational or personal conflicts of interest and the competitive relationship, if any, between the prospective contractor and associated business entities and the prospective outside evaluator. Any such evaluation will be under an agreement with the evaluator that the information contained in the proposal will be used only for evaluation purposes and will not be further disclosed.

5.4.3 Release of Proposal Information. By submission of a proposal, the offeror agrees to permit the Government to publicly disclose the information contained in the Cover Sheet and Project Summary. Other proposal information is considered to be the property of the offeror, and NASA will protect it from public disclosure to the extent permitted by law.

5.4.4 Final Disposition of Proposals. The Government retains ownership of proposals accepted for evaluation, and they will not be returned to the offeror. Copies of all evaluated Phase-I proposals will be retained for one year after the Phase-I selections have been made, after which time unsuccessful proposals may be destroyed.

5.5 Government Rights to Data Developed Under STTR Contracts

5.5.1. Non-Proprietary Data. Some data of a general nature are to be furnished to NASA without restriction (i.e., with unlimited rights) and may be published by NASA. These data will normally be limited to the project summaries accompanying any periodic progress reports and the final reports required to be submitted (see Section 5.2). The requirement will be specifically set forth in any contract resulting from this Solicitation.

5.5.2 Proprietary Data. When data that is required to be delivered under an STTR contract qualifies as "proprietary," *i.e.*, either data developed at private expense that embody trade secrets or are commercial or financial and confidential or privileged, or computer software developed at private expense that is a trade secret, the Contractor, if the contractor desires to continue protection of such proprietary data, shall not deliver such data to the Government, but instead shall deliver form, fit, and function data.

5.5.3 Non-Disclosure Period. The Government, for a period of 4 years from acceptance of all items to be delivered under an STTR contract, shall use STTR data, *i.e.*, data first produced by the Contractor in performance of the contract where such data are not generally known, and which data without obligation as to its confidentiality have not been made available to others by the Contractor or are not already available to the Government, agrees to use these data for Government purposes, and shall not be disclosed outside the Government (including disclosure for procurement purposes) during the 4 -year period without permission of the Contractor, except that such data may be disclosed for use by support Contractors under an obligation of confidentiality. After the 4-year period the Government has a royalty-free license to use, and to authorize others to use on its behalf, these data for Government purposes, but the Government is relieved of all disclosure prohibitions and assumes no liability for unauthorized use by third parties.

5.6 Copyrights

Subject to certain licenses granted by the Contractor to the Government, the Contractor receives copyright to any data first produced by the Contractor in the performance of an STTR contract.

5.7 Patents

The Contractor may normally elect title to any inventions made in the performance of an STTR contract. The Government receives a nonexclusive license to practice or have practiced for or on behalf of the Government each such invention throughout the world. To the extent authorized by 35 U.S.C. 205, the Government will not make public any information disclosing such inventions for a reasonable time to allow the Contractor to file a patent application.

5.8 Cost Sharing

Cost sharing is permitted, but not required for proposals under this Solicitation. Cost sharing, if included, should be shown in the summary budget but not in items labeled "AMOUNT REQUESTED." **If cost sharing is proposed, then these added funds shall be included in the 40/30 work percentage distribution and reflected in the Summary Budget (Form 9C).**

5.9 Profit or Fee

Both Phase-I and Phase-II STTR contracts shall include a reasonable profit except where cost sharing is proposed. No profit will be paid under cost-sharing contracts. The reasonableness of a proposed profit is examined by the Contracting Officer during contract negotiations.

5.10 Joint Ventures and Limited Partnerships

Proposals may be submitted in the name of a joint venture or a limited partnership provided the entity qualifies as a small business concern in accordance with the definition in Section 2.3.

5.11 Similar Proposals and Prior Work

If an award is made pursuant to a proposal submitted under this Program Solicitation, the firm will be required to certify that it has not previously been paid nor is currently being paid for essentially equivalent work by any agency of the Federal Government. Failure to acknowledge or report similar or duplicate efforts can lead to the termination of contracts or other actions.

5.12 Contractor Commitments

Upon award of a contract, the contractor will be required to make certain legal commitments through acceptance of numerous clauses in the Phase-I contract. The following illustrates the types of clauses that will be included in the Phase-I contract. This is not a complete list of clauses to be included in Phase-I contracts, nor does it contain specific wording of these clauses. Copies of complete provisions will be made available prior to contract negotiations.

5.12.1 Standards of Work. Work performed under the contract must conform to high professional standards. Analyses, equipment, and components for use by NASA will require special consideration to satisfy the stringent safety and reliability requirements imposed in aerospace applications.

5.12.2 Inspection. Work performed under the contract is subject to Government inspection and evaluation at all reasonable times.

5.12.3 Examination of Records. The Comptroller General (or a duly authorized representative) shall have the right to examine any pertinent records of the Contractor involving transactions related to the contract.

5.12.4 Default. The Government may terminate the contract if the contractor fails to perform the contracted work.

5.12.5 Termination for Convenience. The contract may be terminated by the Government at any time 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.

5.12.6 Disputes. Any dispute concerning the contract that cannot be resolved by mutual agreement shall be decided by the Contracting Officer with right of appeal.

5.12.7 Contract Work Hours. The Contractor may not require a non-exempt employee to work more than 40 hours in a work week unless the employee is paid for overtime.

5.12.8 Equal Opportunity. The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, age, sex, or national origin.

5.12.9 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.

5.12.10 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.

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

5.12.12 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.

5.12.13 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.

5.12.14 Patent Infringement. The Contractor shall report to NASA each notice or claim of patent infringement based on the performance of the contract.

5.12.15 American-Made Equipment and Products. Equipment or products purchased under an STTR contract must be American-made whenever possible.

5.13 Additional Information

5.13.1 Precedence of Contract over Solicitation. This Solicitation 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.

5.13.2 Evidence of Contractor Responsibility. Before award of an STTR contract, the Government may request the offeror to submit certain organizational, management, personnel, and financial information to establish responsibility of the offeror.

5.13.3 Limitations on Awards. This Solicitation is not an offer by the Government to make any specific number of awards under either Phase-I or Phase-II. NASA is not responsible for any monies expended by the offeror before award of any contract resulting from this Solicitation. Awards under this Program Solicitation are contingent upon the availability of funds.

5.13.4 Classified Proposals. NASA will not accept proposals containing information marked “classified”, “confidential” or “sensitive”.

5.13.5 Unsolicited Proposals. Unsolicited proposals will not be accepted under the STTR program in either Phase-I or Phase-II.

5.14 Property

In accordance with the Federal Acquisition Regulations (FAR) Part 45, it is NASA's policy not to provide facilities (capital equipment, tooling, test and computer facilities, etc.) for the performance of work under contract. The presumption is that an offeror will furnish their own facilities to perform the proposed work as an indirect cost to the contract. Special tooling required for a project may be allowed as a direct cost.

When an offeror cannot furnish their own facilities to perform required tasks, an offeror may propose to acquire the use of commercially available facilities. Rental or lease costs may be considered as direct costs as part of the total funding for the project.

If unique requirements force an offeror to acquire facilities under a NASA contract, they will be purchased as Government Furnished Equipment (GFE) and titled to the Government.

An offeror may propose the use of unique or one-of-a-kind NASA facilities if essential for the research. Their availability, however, cannot always be guaranteed, and non-availability may lead to non-selection. Offerors requiring a NASA facility must clearly describe why use of such facilities will accelerate Phase-III commercialization. Should an offeror propose the use of unique or one-of-a-kind NASA facilities, an agreement with the responsible installation is required and costs for their use will be determined by the installation. These costs may be chargeable in accordance with the Government property clause of the contract.

6. Submission of Proposals

6.1 The Submission Process

6.1.1 Submission Requirements. NASA utilizes an electronic process for management of the STTR and SBIR programs. This management approach requires that a proposing firm have Internet access via the World Wide Web, and an email address.

6.1.2 What Needs to Be Submitted. A proposal submission is comprised of two parts:

1. **Internet Submission.** The entire proposal including all forms must be submitted via the Internet. (<http://sbir.nasa.gov>)
2. **Postal Submission** of the original signed proposal plus three copies.

Firms not able to obtain Internet access must request an exemption by calling (301)-286-5661 or (301)-937-0888 by Friday, April 30, 1999.

6.2 Internet Submission

6.2.1 Electronic Technical Proposal Preparation. Technical proposal, means the part of the submission as described in section 3.4.

Word Processor. NASA converts all technical proposal files to PDF format for evaluation purposes. Therefore, NASA requests that technical proposals be submitted in PDF format, and encourages companies to do so. Other acceptable formats for PC are AmiPro, ClarisWorks for Windows, MS Works, Text, MS Word, WordPerfect, Postscript, and Adobe Acrobat. For Macintosh, other acceptable formats are ClarisWorks, MS Works, MacWrite Pro, Text, MS Word, WordPerfect, Postscript, and Adobe Acrobat. Unix and TeX users please note that due to PDF difficulties with non-standard fonts, please output technical proposal files in DVI format.

Graphics. The offeror is encouraged for reasons of space conservation and simplicity, but not required, to embed graphics within the word processed document. For graphics submitted as separate files, the acceptable file formats (and their respective extensions) are: Bit-Mapped (.bmp), Graphics Interchange Format (.gif), JPEG (.jpg), PC Paintbrush (.pcx), WordPerfect Graphic (.wpg), and Tagged-Image Format (.tif).

Limitations. While only the paper copy will be screened for administrative compliance, the various files comprising the electronic version are required to exactly reflect the paper version.

Virus Check. The offeror is responsible for performing a virus check on each submitted technical proposal. As a standard part of entering the proposal into the processing system, NASA will scan each submitted electronic technical proposal for viruses. **The detection, by NASA, of a virus on any submitted electronic technical proposal, may cause rejection of the proposal.**

6.2.2 Electronic Handbook. An Electronic Handbook for submitting proposals via the World Wide Web is available on the NASA SBIR/STTR Homepage (<http://sbir.nasa.gov>). The handbook will electronically guide the submitting firm through the various steps for submitting STTR proposals, and issue secure user identification and passwords for each submission. The electronic handbook also includes: SBIR/STTR overview, schedules, previous awards history, sample proposals, other Federal SBIR/STTR Internet sites, and the 1999 STTR Solicitation. In addition, the electronic handbook supports secure electronic submission of Forms 9A, 9B and 9C, the technical proposal, award announcements, and debriefings. Communication between NASA and the firm will be via a combination of e-mail and electronic handbooks.

Important: After the offeror has submitted Forms 9A, 9B, and 9C via the Internet, the offeror may use the handbook for printing out the three forms on your own printer. These forms should be used as part of the postal submission.

6.3 Postal Submission

Postal Submissions are comprised of:

1. One original signed paper copy of the proposal, including paper copies of the signed Cooperative Agreement and all original forms (printed from Section 6.2 above)
2. Three additional paper copies of the entire proposal. Each proposal copy is to be stapled separately.

6.3.1 Physical Packaging Requirements

Paper Copies of Proposal. Do not use bindings or special covers. Staple the pages of each copy of the proposal in the upper left-hand corner only. Secure packaging is mandatory. NASA cannot process proposals damaged in transit. All items for any proposal must be sent in the same envelope. If more than one proposal is being submitted, each proposal must be in its own envelope, but all proposals may be sent in the same package. Do not send duplicate packages of any proposal as "insurance" that at least one will be received.

6.3.2 Where to Send Proposals

All proposals that are mailed through the U.S. Postal Service first class, registered, or certified mail; proposals sent by express mail or commercial delivery services; or hand-carried proposals **must be** delivered to the following address between 8:00 a.m. and 5:00 p.m. EDT:

NASA STTR Support Office
REI Systems, Inc
4041 Powder Mill Road
Suite 311
Calverton, MD 20705-3106

The following telephone number may be used when required for reference by delivery services: 301-937-0888.

6.3.3 Deadline for Proposal Receipt

Deadline for receipt of Phase-I proposals is 5:00 p.m. EDT on Friday, May 14, 1999. Any proposal received after that date and time shall be considered late. Since the postmark (or other carrier's date mark) will be the evidence on which the decision is made, offerors must assure themselves that the postmark (or other carrier's date mark) is clear and easily legible; hand cancellation is suggested. Postage meter date stamps are not acceptable. It is not sufficient for an electronically submitted proposal to be on time, the signed original paper version must be received at NASA by the date and time stated above. Proposals may not be submitted by facsimile. Late proposals will not be eligible for award and will be rejected without review.

6.4 Acknowledgment of Proposal Receipt

NASA will acknowledge receipt of proposals by e-mail to the address on the proposal cover sheet. If a proposal acknowledgment is not received within 14 days following the closing date of this Solicitation, the offeror should call 301-937-0888. NASA will not respond to such inquiries made prior to May 28, 1999.

6.5 Withdrawal of Proposals

Proposals may be withdrawn by written notice, fax, or telegram (including Mailgram) received at any time before award.

7. Scientific and Technical Information Sources

7.1 NASA SBIR and STTR Homepage

Detailed information on NASA's SBIR and STTR Programs are available on the Internet at: <http://sbir.nasa.gov>.

7.2 NASA Commercial Technology Network

The NASA Commercial Technology Network (NCTN) contains a significant amount of on-line information about the NASA Commercial Technology Program. The address for the NCTN Homepage is: <http://nctn.hq.nasa.gov/>

7.3 United States Small Business Administration

The Policy Directives for the SBIR/STTR Programs, which also state the SBA policy for this Solicitation, may be obtained from the following source.

Office of Innovation, Research and Technology
U.S. Small Business Administration
409 Third Street, S.W.
Washington, D.C. 20416
(202) 205-7701

SBA information can also be obtained via Internet at the following address: <http://www.sbaonline.sba.gov/>.

7.4 Federal Research in Progress (FEDRIP) Database

On-line access to abstracts of research from all agencies is available through this database. FEDRIP is accessible through DIALOG, a private information service. For a free copy of the FEDRIP Search Guide, call (703)-605-6000 and ask for order number PB96-153606.

7.5 NASA Technology Utilization Services

The **National Technology Transfer Center (NTTC)**, sponsored by NASA in cooperation with other Federal agencies, serves as a national resource for technology transfer and commercialization. NTTC has a primary role to get Government research into the hands of U.S. businesses. Its gateway services make it easy to access databases and to contact experts in your area of research and development. For further information, call (800) 678-6882.

NASA's network of **Regional Technology Transfer Centers (RTTCs)**, listed below, provides a variety of business planning and development services to NASA STTR offerors. However, NASA does not accept responsibility for any services these centers may offer in the preparation of proposals. RTTCs should be contacted directly to determine what services are available and to discuss fees charged. To contact any RTTC, call (800) 472-6785.

Northeast:

Center for Technology Commercialization
 Massachusetts Technology Park
 1400 Computer Drive
 Westboro, MA 01581-5054
 Phone: 508-870-0042
 URL: <http://www.ctc.org>

Southeast:

Southern Technology Applications Center
 University of Florida, College of Engineering
 1900 SW 34th Street, Suite 206
 Gainesville, FL 32608-1260
 Phone: 352-294-7822
 URL: <http://www.state.fl.us/stac>

Mid-Continent:

Mid-Continent Technology Transfer Center
 Texas Engineering Extension Service
 Technology & Economic Development Division
 College Station, TX 77843-8000
 Phone: 409-854-2913
 URL: <http://www.tedd.org/MCTTC>

Mid-Atlantic:

Mid-Atlantic Technology Applications Center
 University of Pittsburgh
 3400 Forbes Avenue, 5th Floor
 Pittsburgh, PA 15260
 Phone: 412-383-2500
 URL: <http://oracle.mtac.pitt.edu/WWW/MTAC.html>

Mid-West:

Great Lakes Industrial Technology Center
 Battelle Memorial Institute
 25000 Great Northern Corporate Center, Suite 450
 Cleveland, OH 44070-5310
 Phone: 440-734-0094
 URL: <http://www.battelle.org/glitec>

Far-West:

Far-West Regional Technology Transfer Center
 University of Southern California
 3716 South Hope Street, Suite 200
 Los Angeles, CA 90007-4344
 Phone: 800-642-2872
 URL: <http://www.usc.edu/dept/engineering/TTC/NASA>

7.6 National Technical Information Service

The **National Technical Information Service**, an agency of the Department of Commerce, is the Federal government's central clearinghouse for publicly funded scientific and technical information. For information about their various services and fees, call or write:

National Technical Information Service
 5285 Port Royal Road
 Springfield, VA 22161
 Tel: (800) 553-6847
 Fax: (703) 321-8647

8. Research Topics

To reduce overlap and streamline administrative and programmatic functions, NASA's senior management has established areas of excellence and specific missions for each of the NASA field installations. These are termed Centers of Excellence (CE). Each CE represents a focused, Agency-wide leadership responsibility in a specific area of technology or knowledge. CE's are chartered with a clear definition of their capabilities and boundaries. They are charged to be preeminent within the Agency, if not worldwide, with respect to the human resources, facilities, and other critical capabilities associated with the particular area of excellence. Each CE must maintain or increase the Agency's preeminent position in their assigned area in line with the program requirements of the Strategic Enterprises and the long-term interests of the Agency. More information can be found in the NASA Strategic Plan (<http://www.hq.nasa.gov/office/codez/plans.html>)

The NASA STTR Program is aligned with the CE's. This year four CE's are participating. The research topics will be focused on specific product areas or challenges faced by the CE. Research topics will rotate each year between different CE's.

Topic 1: Human Operations in Space NASA Installation: Johnson Space Center (JSC)

The Center of Excellence for Human Operations in Space seeks to expand the human experience into the far reaches of space through exploring, using and enabling the development of space. Human presence in space requires research and technology to establish and maintain the state-of-the-art of applications and manufacturing techniques related to human spacecraft and habitat.

Technology challenges to support this Center of Excellence for this Solicitation include:

Nanotechnology

Applications of nanotechnology should focus on long duration space missions and habitats for beyond Earth orbit. Revolutionary designs and concepts are sought using the extraordinary properties of single wall carbon nanotubes in areas such as high strength materials and composites, energy and fuel storage, nanoelectronics, and advanced thermal protection, among others. Nanotube composites (polymer or metal matrix) are of particular interest because of the great possibilities of using these materials with their ultra-high strength combined with good toughness. Products should be real world applications, which have the capability to revolutionize a system or capability for far space missions.

This focus of nanotechnology should include the use of carbon or other nanotubes, and may include the following ideas. However, other ideas for applications using nanotubes for space applications will be thoroughly considered.

Of particular interest is a dramatic improvement in strength to weight properties of composites (polymer or metal matrix) that is possible by the application of Nanotubes to these materials. These properties offers the opportunity to significantly reduce the total structural mass of future spacecraft. Products which have practical applications and which have the ability to revolutionize spacecraft system design, compared to current state-of-the-art, will have higher value.

- **Advanced Materials.** Nanocomposites may provide extremely high strength to weight ratios, compared to today's state of the art materials. They may also incorporate multiple functionality or hierarchical structured materials. For example, a material may serve many purposes such as external environment and radiation shielding, thermal control, power distribution, etc. Composites including nanotubes are thought to be able to greatly add to the strength of today's best materials.

Rapid prototyping of materials may also be greatly enhanced by using nanotubes as reinforcement. New ideas are desired in this area so that increasing the strength of rapidly prototyped parts through the use of nanotube reinforcement may develop useable parts.

- **Fuel and Energy Storage.** The high surface area of nanotubes, inside and out, may allow for storage of extremely high amounts of energy or fuel. Advanced concepts are desired using nanotubes to surpass any of today's devices.
- **Nanoelectronics and Other Applications.** Many applications are coming closer to reality through the use of nanotubes. These include field emission through very tiny tips of nanotubes for flat panel displays and scanning probe microscope tips. New technologies some years from now will certainly include nanoelectronics. These may include carbon nanotubes used as nanowires.

Topic 2: Launch and Payload Processing Systems

NASA Installation: Kennedy Space Center: (KSC)

In support of the strategic development of NASA's Technology Plan, the Center of Excellence for Launch and Payload Processing Systems is continually advancing the state of the art in launch and payload processing hardware, software, and support activities. Development of innovative technologies needed to improve operational safety and reliability, reduce costs and shorten flight hardware processing turnaround times is critical to NASA's continued excellence in launch and payload processing. NASA's goals to achieve affordable access to space require greater efficiencies in ground operations for current and future space flight vehicles and payloads. The four primary goals of the Center of Excellence are to 1) assure that sound, safe, and efficient practices and processes are in place for privatized/commercialized launch site operations; 2) increase the use of KSC's operations expertise to contribute to the design and development of new payloads and launch vehicles; 3) utilize KSC's operations expertise in partnership with other entities (government, industry, academia) to develop new technologies for future space initiatives; and 4) continually enhance core capabilities (people, facilities, equipment, and systems) to meet agency objectives and customer needs for faster, better, and cheaper development and operations of space systems.

Core technology challenges to support this Center of Excellence for this Solicitation include:

Spaceport Architecture Technologies

Advancement in spaceport architecture technologies is sought to assist existing and emerging spaceports in understanding and revolutionizing spaceport infrastructure with flight system requirements. These technologies will help identify strategic space launch/spaceport investments.

- **Propellant Acquisition, Storage, Distribution and Space Vehicle Propellant Loading Technologies:** Producing and handling large propellant quantities, on the order of 1/3 to 1 kiloton per day use, to maintain the high flight rates (one or more per day) required for highly productive and affordable launch operations is a key spaceport technology challenge. Demonstrations in key areas are needed to identify promising concepts and technologies utilizing such capabilities as co-generation or polygeneration of propellant production technologies and consumables (e.g., LH₂, LO₂, LN₂, power, water, etc.). Reclamation of high value propellants and gasses (GH₂, GHe) used in the launch operations, and cryogen distribution/transport to the launch site can also provide high leverage if this critical technology challenge can be overcome. For efficient and effective use of spaceport resources, reclamation technologies need to address alternative functional use in addition to re-use and disposal. These key technology challenges have application to terrestrial spaceport architectures as well as enabling futuristic planetary in-situ consumable production, storage, and distribution (moon, Mars, etc.).
- **Ground Launch Assist Systems & Technologies:** Recent NASA studies into highly reusable space transportation and launch requirements for advanced in-space architectures (space solar power, for example), have suggested a cost advantage for ground launch assist methods. These concepts involve imparting an initial velocity (hundreds of feet per second) to the launch vehicle via ground-based spaceport technologies. Some

recently examined concepts include, mag-lev rails, rocket-propelled sled devices, and pneumatic catapults. Coordinated research leading to proof-of-concept demonstrations is needed to overcome the technical challenges of ground launch assist concepts such that a greater research database is available to assess operational benefits and risks.

- **Space-Based Range System:** Tracking and telemetry data acquisition and distribution for space vehicle launch involves a geographically diverse set of assets which allow vehicle position determination from launch to orbit and return. The use of the assets requires advanced scheduling, can be very expensive and is only available in certain locations and for certain trajectories. Develop a proof-of-concept demonstration for key technologies that enable space based tracking and telemetry acquisition and distribution systems. These may include advanced global locating systems, laser/optical tracking and flight safety management, etc. Technologies should demonstrate accomplishment of space launch range functions more inexpensively with greater flexibility than current systems.

Regenerative Environmental Systems Technologies

Proposals are solicited for innovative and commercially viable technologies in environmental and ecological monitoring and management. Of particular emphasis are the development of systems and sensors to monitor ecological communities, biological organisms and environmental conditions remotely, over long periods of time, under field and controlled chamber conditions. Specific areas of emphasis are:

- **Microbial Functionality Monitoring for Remediation and Bioregenerative Life Support:** Alternative technologies for monitoring microbial populations in groundwater remediation systems and prototype bioregenerative life support subsystems under development at Kennedy Space Center are needed. Innovative application of existing technologies or emerging technologies are needed to allow for a better understanding of the functionality of microbial communities and risks associated with biological groundwater remediation and bioregenerative life support systems. Bioregenerative life support system technologies should identify growth of human and/or plant pathogens, and have the ability to assess the stability of hydroponic and bioreactor systems for long duration missions – lunar or Mars. Biological remediation systems should address natural attenuation and/or active bioremediation monitoring and augmentation as they would apply towards Florida groundwater site cleanup goals.
- **Lighting Technologies for Bioregenerative Life Support Systems:** New lighting technologies must be developed and existing technologies must be improved to meet the requirements of the bioregenerative life support systems for future space missions. The development of new, innovative light sources which have higher electrical conversion efficiencies and high photosynthetic spectral efficiencies are required. The application of existing technologies in lighting applied to crop production include: improved lamp design for better electrical conversion, improved spectral quality for photosynthesis (400-700nm) and photomorphogenesis (360-400nm and 700-750nm), improved laminaire design for more efficient delivery of the radiation to the crop canopy, reduced thermal output from the lamps, and luminaire designs and materials that reduce or remove the thermal radiation from the lamp/luminaire. In addition, applications of solar energy through indirect delivery including: high efficiency collectors, transportation and delivery of the solar spectrum from 360 to 750nm with high efficiency, and removal of all wavelengths shorter than 360nm and greater than 750nm with alternative uses of the thermal energy. In addition to the high efficiency requirements, component and system mass must be minimized relative to existing technologies. Proposals addressing these issues are sought for developing NASA Bioregenerative Life Support Systems.
- **DNAPL Location and Removal Technologies for Contaminated Groundwater:** During NASA's early space exploration activities, groundwater and soil contamination occurred. Mandated by the Resource Conservation and Recovery Act, NASA is investigating sites where chemicals such as trichloroethylene and other halogenated hydrocarbons were released. Currently available technologies for locating subsurface DNAPLs (Dense Non-Aqueous Phase Liquids) involve monitoring well placement or direct push technologies with analytical sampling and subsequent groundwater modeling. The focus of remediation technologies has historically been on plume treatment, which involves the dissolved fraction of the DNAPL. This approach to remediation addressed the

symptom of the problem, the plume and not the source of the problem, DNAPL free product. Therefore, innovative and cost efficient source location and removal techniques are sought for DNAPLs. Innovative source location technologies should indicate mass of contaminant present and its exact location. Non-invasive removal techniques are preferred for locating DNAPL source under existing facilities. Innovative removal techniques should consider application under existing, occupied facilities.

Integrated Intelligent Test and Simulation Technologies

Integrated Intelligent Test and Simulation technological advancements, concept definition, and proof of concept demonstrations are being sought in three focused technology growth areas. These technology growth areas offer tremendous potential in establishing safer, more efficient, and more effective Launch and Payload Processing activities.

- **Process/Industrial Engineering:** Kennedy Space Center operations have many unique aspects that require development of innovative process or Industrial Engineering (IE) technologies. All major current and potential future human space flight programs (the Space Shuttle, International Space Station, X-vehicles, and Mars missions) have lengthy operational phases. Payload processing activities are also emphasizing repeatable processes and improved customer satisfaction. The strategic importance of IE technologies to NASA is rapidly increasing. Proposals are being sought to research and advance technologies in areas promising significant improvements or efficiencies in Process/Industrial Engineering methods, tools, and techniques. Proposals should address the generic challenges of “doing more with less” and delivering safer, better, faster, and cheaper products/services. Core process/industrial engineering technology challenges include, but are not limited to, the following areas:
 - Advanced operations process modeling, simulation, verification and validation technologies for cost-effective evaluation of the impacts of proposed changes to operational processes & procedures. Tools for rapidly assessing cost, schedule, and technical risks of proposed Shuttle hardware/software upgrades and process changes.
 - Automated, advanced statistical quality control techniques which can be applied to data generated by space vehicle health monitoring systems. Non-intrusive automated health monitoring and exception reporting of ground systems. Automated resource and process scheduling and acquisition in response to systems health monitoring exception reporting.
 - Intelligent scheduling and model-based reasoning systems to quickly adapt, verify and validate spacecraft maintenance plans by incorporating appropriate in-flight data sets. Technologies supporting integrated flight and ground processing management systems.
 - Tools for seamless integration of knowledge capture, intelligent computer-based training technologies and knowledge based systems for launch and Payload processing.
 - Advanced task/methods analysis and procedure design techniques for maximizing work place safety and efficiency.
 - Advanced decision analysis, human factors engineering, and operations research tools for optimizing utilization of scarce resources and minimizing the potential for human error during aircraft/reusable spacecraft (Shuttle and X-vehicle) maintenance activities and human missions to Mars.
 - Virtual modeling and immersive environment technologies for multi users and network applications.

Cryogenics

Kennedy Space Center utilizes large quantities of Cryogenics in support of flight vehicle operations. These operations are complex, often hazardous yet essential and critical to KSC’s responsibility of safely launching Space Vehicles. Technology advances focused in cryogenic operations, servicing, supply, delivery and storage systems/components are sought that offer safer, more reliable and more efficient means of processing and handling cryogenics. Research areas where advances in technology are of particular interest to KSC include:

- Leak-Proof Compliant Cryogenic Connector Development that offer mate/remate capabilities with up to 30 degrees of misalignment; allow for mate operations with the connectors prechilled to cryogenic temperatures;

permit leak-free disconnect (for oxygen or toxic service); provide reliable, verifiable connections for remote operations. Connector sizes of interest: ½-inch to 6 inches. Service fluids (cryogenic) of interest: nitrogen, oxygen, hydrogen, helium, carbon dioxide.

- Cryogenic Insulation Systems for Propellant Transfer and Control Systems which: operate at a soft vacuum level; offer minimal maintenance while providing simple installation; provide minimal commodity loss upon vacuum breach.
- Cryogenic Propellant Densification Flight/Ground Systems Integration which: provides “real-world” end-to-end systems operations development; allows development of alternative densification methodologies appropriate for various applications; offers operational systems for extensive, long-term development and optimization of system hardware such as pumps, valves, and controls.
- Future Launch Vehicle Umbilical System Development and Testing that provides integrated alignment and connection methods; develops alternative latching technologies, including shape-memory alloy applications; allows for maximum preload with minimum application loading; includes alternative mechanisms for both T-0 and prelaunch umbilical release; allows for repeatable, reliable mate/demate/remate for remote, automated operations.
- Autonomous Launch Systems Operations which will develop new technologies/systems for automated propellant storage vessel replenishment that tie propellant level indications directly to supplier distribution system for transparent replenish operations. Replenish operations options include off-site, automated delivery systems or on-site production, storage, and distribution via long transfer lines from a centralized storage facility.

Instrumentation

Advanced instrumentation technology is necessary to provide significant improvements in control and monitoring, detection, inspection, nondestructive evaluation, and advanced sensor technologies in support of intelligent systems applications. Technology advancements in instrumentation miniaturization, ruggedizing, reliability, solid state applications, electro-optic sensors, optical and infrared technologies are continually being sought for employment within the launch systems of our Space Programs. Of special interest are those instrumentation technology advances that support autonomous and intelligent systems. Instrumentation technology advancement areas include, but are not limited to:

- Smart, ultra-high-reliability sensors with built in fault correction plus power and data management for long duration applications
- Self contained wireless monitoring capability.
- Transducers with built in health monitoring, fault tolerance and low maintenance and calibration requirements.
- Remote sensing of atmospheric electric fields along spacecraft ascent and re-entry trajectories from the surface to the tropopause.
- Advanced methods of performing in-situ inspection and testing of flight hardware.
- Remote detection and measurement of ice buildup on flight hardware.
- Intelligent systems to perform continuous vehicle and Payload health monitoring and automated servicing.

Topic 3: Structures & Materials

NASA Installation: Langley Research Center (LaRC)

The Center of Excellence for Structures and Materials targets innovations in membrane reflectors with integral actuation concepts that may lead to optical systems with reduced manufacturing costs, reduced manufacturing time, and weight. These innovations should be implemented using advanced structural concepts and advanced materials including smart materials and superconductors.

Innovations are needed to reduce the cost, weight, and time to flight of future large aperture space telescopes. The use of thinner membranes will likely require the use of more actuators to maintain the desired optical figure. An understanding of the trade-offs between membrane thickness, actuator control authority, locations, and system weight is expected to lead to more optimal designs.

Technology challenges to support this Center of Excellence and proposals for this solicitation should include each of the following elements.

Adaptive Optical Segment

An adaptive optical segment consists of a reflector surface material that is integrated with an actuation system to enable adaptive figure control to achieve a desired optical performance. Concepts for an adaptive optical system could be for the entire aperture of a telescope or for a segment of the entire aperture. The Center of Excellence seeks innovations in adaptive optical segments that couple membrane reflector materials with actuation concepts.

Membrane Reflectors

Innovations in membrane reflectors including polymers and metals that incorporate reduced cost manufacturing techniques are sought. Reflectors used in optical telescope missions require stringent surface finish and figure control.

Actuators

Actuation concepts consistent with the membrane reflector material properties are sought. These actuators should be capable of correcting the shape of the reflector surface and should be able to hold the reflector shape with minimal power dissipation.

Integrated Analysis

Analyses that couple membrane mechanics, actuator performance, and optical figures of merit are sought. These analyses should address the membrane thickness, actuator spacing, and actuator authority and how these relate to optical performance.

Topic 4: Turbomachinery

NASA Field Installation: Glenn Research Center (GRC)

In the Center of Excellence context, turbomachinery refers to turbine driven systems for propulsion, power generation, and energy conversion. These systems include rotating and related components, and associated enabling technologies. Turbomachinery technology is central to propulsion, power, and energy conversion systems for aeronautics, space, and terrestrial applications. The components and technologies associated with the Turbomachinery are broad in scope. For rotating components, it includes fans, compressors, turbines and pumps. Related components are inlets, ducts, combustors, mixers, nozzles, nacelles, actuators, sensors, bearings, gears and seals. The associated enabling technologies are acoustics, combustion, cryogenics, icing, dynamics, tribology, mechanical systems, controls, heat transfer, instruments, materials and structures, simulation systems/models, fluid mechanics, turbulence and transition.

Core technology challenges to support the Center of Excellence for this Solicitation includes the development of computational and experimental tools as follows:

Engine Systems

Innovative aeropropulsion concepts such as pre-cooled turbomachinery systems, exo-skeletal (reduced structural loadings) engine and combined cycle systems.

Aeroacoustics

Active Noise Control: Development of durable, high-power actuators, advanced control and sensor systems for broadband and/or tone noise reduction, and novel methods for reducing engine noise.

Computational Aeroacoustics: Development and application of computational methods capable of efficiently modeling acoustic sources for turbofan engines.

Fan/Jet Flow Management: Methods for modifying fan or jet flows to reduce noise and analyses needed to develop flow management methods.

Bearing Systems

The development of flight weight, low power, magnetic bearing systems for flexible high-speed shafts for reliable long-life maintenance free application.

Materials

Advanced long-life high temperature structural materials for turbomachinery components that reduce manufacturing costs.

Turbomachinery Geometry

Software for rapid generation of detailed turbomachinery geometry to reduce engine design time and cost.

9. Submission Forms and Certifications (Appendices)

Appendix A Form 9A - Proposal Cover Sheet (to be submitted via Internet)

Appendix B Form 9B - Project Summary (to be submitted via Internet)

Appendix C Form 9C - Summary Budget (to be submitted via Internet)

Appendix D Model Cooperative Agreement Letter

Appendix E Model Allocation of Rights Agreement

Form 9A - PROPOSAL COVER
1999 NASA STTR Phase-I Proposal

1. NASA Research Topic:

2. Project Title:

3. Small Business Concern (SBC):

Name:

Address (include 9-digit ZIP):

Telephone No:

Electronic Mail ID:

EIN:

SBC

Research Institution (RI):

Name:

Address (include 9-digit ZIP):

Facsimile No:

RI

4. Phase-I: Amount Requested: \$ _____ Duration: _____ months

5. Certifications: The above SBC and RI certify that, as defined in Section 2 of the Solicitation, they qualify as a:

(a) SBC	Yes	No	Number of Employees:
RI	Yes	No	
(b) Socially and economically disadvantaged SBC	Yes	No	
(c) Woman-owned SBC	Yes	No	

The requirements described in Section 3 are met:

(d) Limits on subcontracting and consultants	Yes	No
(e) Eligibility of the Principal Investigator	Yes	No
(f) Subcontracts and agreements	Yes	No
(g) Government furnished equipment	Yes	No
(h) The SBC and/or RI has submitted proposals containing a significant amount of essentially equivalent work under other federal program solicitations, or has received other federal awards containing a significant amount of essentially equivalent work. (If yes, identify proposals and/or contracts in Part 11 of the proposal as specified in Section 3.4.1).	Yes	No

The above SBC certifies that a satisfactory Cooperative Agreement has been signed by the SBC and its RI.

Yes No

6. The SBC will perform ___% of the work and the RI will perform ___% of the work of this project.

7. Endorsements:

SBC Official:

Name:

Title:

Phone:

Signature:

Date:

PI/PM:

Name:

Employer:

Phone:

Signature:

Date:

RI Official:

Name:

Title:

Phone:

Signature:

Date:

NOTICE: For any purpose other than to evaluate the proposal, this data shall not be disclosed outside the government and shall not be duplicated, used, or disclosed in whole or in part, provided that, if a funding agreement is awarded to this proposer as a result of or in connection with the submission of these 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. The data subject to this restriction are contained in pages _____ of this proposal.

Guidelines for Completing Proposal Cover Sheet

1999 NASA STTR Phase-I Proposal

General: Complete Form 9A electronically by following the instructions provided in the electronic handbook. Print one copy of Form 9A and sign it manually. This will be the signed cover sheet for the paper copy of the proposal to be submitted to NASA along with the internet submission. (See Sections 3.2, 3.3, 3.4 and 6.2 for further instructions.)

- 1 Research Topic: Enter NASA research topic number and title (Section 8).
2. Project Title: Enter a brief, descriptive title, avoid words like "development of" and "study of" and do not use acronyms or trade names.
3. Small Business Concern: Enter the full name and address of the company submitting the proposal. If a joint venture, list the company chosen to negotiate and receive contracts. If the name exceeds 40 keystrokes, please abbreviate.

Research Institution: Enter the full name and address of the research institute.

Address: Enter address where mail is received.
State: Enter 2-letter designation (example Maine, ME)
ZIP Code: Enter 9-digit code (the 9-digit ZIP Code is required)
Telephone: Enter phone number of the SBC and RI including area code.
Facsimile: Same as telephone.
E-mail ID: Enter Internet address of primary SBC and RI contact.
EIN: Enter EIN (tax number) for the SBC and RI

4. Phase-I - Amount Requested: Enter proposal amount from Budget Summary. The amount requested should not exceed \$100,000; round to nearest dollar. Do not enter cents.

Duration: Enter the proposed duration in months. If the proposed duration is other than 12 months, be sure to discuss the reason in the text of the proposal.

5. Certifications: Indicate Yes or No by placing an "X" after the appropriate answer. The Cooperative Agreement shall be in compliance with the Solicitation.

5(a), (b), (c) See definitions in Section 2 of this solicitation

5(d) Limits on subcontracting and consultants. By answering yes, the SBC/RI certifies that business arrangements with other entities or individuals provided such arrangements do not exceed 30 percent of the work (amount requested including cost sharing if any, less fee, if any) and is in compliance with Section 3.4.1, Part 10.

5(e) Eligibility of the Principal Investigator. By answering yes, the SBC/RI certifies that all the requirements for the proposed Principal Investigator as described in Section 3.4.1, Part 9 are met.

5(f) Subcontracts and Agreements. By answering yes, the SBC/RI certifies that a copy of any subcontracting or consulting agreements described in Section 3.4.1 Part 10 is included as required. If such agreements are lengthy, the signature page should be included. These copies may be submitted in a reduced size.

- 5(g) Government Furnished Equipment. By answering yes, the SBC/RI certifies that unique, one-of-a-kind Government Furnished Facilities or Government Furnished Equipment are required to perform the proposed activities (see Section 3.4.1 Part 8, Section 4.2.2 Part 7, and Section 5.14). By answering no, the SBC/RI certifies that no Government Furnished Facilities or Government Furnished Equipment are required to perform the proposed activities.
- 5(h) Similar Proposals submitted to other Government Agencies or Prior Federal Funding. By answering yes, the SBC/RI certifies that the SBC or the RI has submitted proposals for essentially equivalent work under other federal program solicitations or has received other federal awards containing a significant amount of essentially equivalent work (see Section 3.4.1 Part 11).
- 6. Provide percentage distributions of the work (amount requested including cost sharing, less fee, if any).
- 7. Endorsements: The proposal should be signed by an official of the firm qualified to make a contractual commitment on behalf of the firm and by the proposed Principal Investigator/Project Manager.

The cover sheet is submitted with original signatures in paper form to NASA with the proposal.

Guidelines for Completing Project Summary

1999 NASA STTR Phase-I Proposal

Complete Form 9B electronically and print a copy for second page of the proposal.

1. Topic No. and Title: Enter research topic number and title chosen by offeror.
2. Project Title: Enter the same project title as shown on your proposal Cover Sheet.
3. Firm name and address: Enter as shown on the Proposal Cover sheet.
4. Principal Investigator/Project Manager: Enter name as shown on the Proposal Cover sheet.
5. Research institution name and address: Enter name and address as shown on the Proposal Cover sheet.
6. Technical Abstract: Provide a summary of 200 words or less of the offeror's proposed project. The abstract must not contain proprietary information and must describe the NASA need addressed by the proposed R/R&D effort.
7. Potential Commercial Application(s): Summarize the direct or indirect commercial potential of the project, assuming the goals of the proposed R/R&D are achieved.

Form 9C - SUMMARY BUDGET

1999 NASA STTR Phase-I Proposal

1. Small Business Concern:

2. Project Manager:

3. DIRECT LABOR:

Category	Hours	Rate	Cost
----------	-------	------	------

(a) TOTAL DIRECT LABOR:\$

4. OVERHEAD RATE:

____% of Total Direct Labor

(b) OVERHEAD COST: \$

5. OTHER DIRECT COSTS (ODC)

Category	Cost \$
----------	---------

(c) TOTAL ODC: \$

6. <(a)+(b)+(c)=(d)>

(d) SUBTOTAL: \$

7. G&A RATE ____% of Subtotal

(e) G&A COSTS: \$

8. <(d)+(e)=(f)>

(f) TOTAL COSTS: \$

9. Add FEE or Subtract COST SHARING (as applicable)

(g) FEE/SHARING: \$

10. <(f)+(g)=(h)>

(h) AMOUNT REQUESTED: \$

THIS PROPOSAL IS SUBMITTED IN RESPONSE TO 1999 NASA STTR PROGRAM SOLICITATION AND REFLECTS OUR BEST ESTIMATES AS OF THIS DATE:

11. TYPED NAME AND TITLE:

12. SIGNATURE: _____

13. DATE: _____

Guidelines for Preparing Summary Budget Form 1999 NASA STTR Phase-I Proposal

By using this form, the offeror submits to the Government a pricing proposal of estimated costs with detailed information for each cost element, consistent with the offeror's cost accounting system. Prepare electronically, print and sign a paper copy for submission to NASA with the proposal.

This summary does not eliminate the need to fully document and justify the amounts requested in each category. Such documentation should be contained, as appropriate, on a budget explanation page immediately following the budget in the proposal.

1. Small Business Concern - Enter name of Small Business Concern in the same form as on the proposal cover sheet.
2. Project Manager - Enter the Small Business Concern's Project Manager.
3. Direct Labor - Enter labor categories (e.g., principal investigator/project manager, laboratory assistant, administrative staff), rates of pay and the hours for each labor category.
4. Overhead - Specify current rate(s) and base(s). Use current rate(s) negotiated with the cognizant federal negotiating agency, if available. If no rate(s) has(have) been negotiated, a reasonable indirect cost (overhead) rate(s) may be requested for Phase-I that will be subject to approval by NASA. If a current negotiated rate(s) is(are) not available, NASA will negotiate an approved rate(s) with the offeror. The offeror may use whatever number and types of overhead rates that are in accordance with the firm's accounting system and approved by the cognizant federal negotiating agency, if available. Multiply Direct Labor Cost by the Overhead Rate to determine the Overhead Cost.
5. Other Direct Costs (ODC). (Include budget for the Research Institution as a Direct Cost.)
 - Materials and Supplies: Indicate types required and estimate costs.
 - Documentation Costs or Page Charges: Estimate cost of preparing and publishing project results.
 - Subcontracts: Include a completed budget—including hours and rates and justify details. (Section 3.4, Part 10.)
 - Consultant Services: Indicate name, daily compensation, and estimated days of service.
 - Computer Services: Computer equipment leasing is included here.
 - Equipment: List each item of permanent equipment to be purchased, its price, and explain its relation to the project.List all other direct costs that are not otherwise included in the categories described above.
6. Subtotal - Sum of (a) Total Direct Labor, (b) Overhead and (c) ODCs.
7. General and Administrative (G&A)--Specify current rate and base. Use current rate negotiated with the cognizant federal negotiating agency, if available. If no rate has been negotiated, a reasonable indirect cost (G&A) rate may be requested for Phase-I that will be subject to approval by NASA. If a current negotiated rate is not available, NASA will negotiate an approved rate with the offeror. Multiply (d) Total Direct Cost by the G&A Rate to determine G&A Cost.
8. Total Costs - Sum of Items (d) and (e). Note that this value will be used in verifying the minimum required work percentage for the SBC and RI.
9. Fee/Cost Sharing - See Sections 5.8 and 5.9. Fee to be added to total budget, shared costs to be subtracted from total budget, as applicable.
10. Amount Requested (h) - Sum of Items (f) and (g), not to exceed \$100,000.
- 11/12. Name/Signature and Title of SBC Contracting Official.

MODEL COOPERATIVE AGREEMENT

By virtue of the signatures of our authorized representatives, _____ (Small Business Concern), _____ and _____ (Research Institution) _____ have agreed to cooperate on the _____ (Proposal Title) _____ Project, in accordance with the proposal being submitted with this agreement.

This agreement shall be binding until the completion of all Phase-I activities, at a minimum. If the _____ (Proposal Title) _____ Project is selected to continue into Phase-II, the agreement may also be binding in Phase-II activities that are funded by NASA, then this agreement shall be binding until those activities are completed. The agreement may also be binding in Phase-III activities that are funded by NASA.

After notification of Phase-I selection and prior to contract release, we shall prepare and submit, if requested by NASA, an **Allocation of Rights Agreement**, which shall state our rights to the intellectual property and technology to be developed and commercialized by the _____ (Proposal Title) _____ Project. We understand that our contract cannot be approved and project activities may not commence until the **Allocation of Rights Agreement** has been signed and certified to NASA.

Please direct all questions and comments to _____ (Small Business Concern representative) at _____ (Phone Number) _____.

signature

name/title

Small Business Concern

signature

name/title

Research Institution

**SMALL BUSINESS TECHNOLOGY TRANSFER (STTR) PROGRAM
MODEL ALLOCATION OF RIGHTS AGREEMENT**

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 NASA _____ to SBC to fund a proposal entitled " _____ " submitted, or to be submitted, to 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 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 sub-award 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 sub-award. If a sub-award is made by SBC and accepted by RI, this Agreement shall not be applicable to contradict the terms of such sub-award or of the funding agreement awarded by NASA to SBC except on the grounds of fraud, misrepresentation, or mistake, but shall be considered to resolve ambiguities in the terms of the sub-award.

(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, and such party may perfect legal protection 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 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: the SBC will be responsible for _____ percent and the RI will be responsible for _____ 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 Agency within two 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, sub-licenses 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: _____

For assistance in completing your proposal, use this checklist to ensure your submission is complete.

CHECK LIST

1. General

- 1.1 The offeror has read all instructions in this Solicitation and understands that proposals not meeting all requirements may be non-responsive and may not be evaluated.
- 1.2 The offeror understands that proposals must be received by NASA no later than by 5:00 p.m. EDT on May 14, 1999. (Section 6.3.3).
- 1.3 Postal Submission includes the original signed proposal plus three copies. (Section 6.3).
- 1.4 The entire proposal (including any supplemental material) shall not exceed a total of 25 8.5 x 11 inch pages, including Cooperative Agreement(s). (Sections 3.1, 3.2).
- 1.5 The entire proposal must be submitted in the order outlined in Section 3.1.

2. Cover Form 9A

- 2.1 The proposal and innovation is submitted for one topic only. (Section 3.3).
- 2.2 Certifications in Form 9A are completed.
- 2.3 The period of technical performance does not exceed 12 months and the funding request does not exceed \$100,000. (Section 1.3.3).
- 2.4 Form 9A submitted via Internet (Section 6.1).
- 2.5 Printed version of Form 9A is signed (Section 6.2.2) and included in Postal Submission.

3. Summary Form 9B

- 3.1 Form 9B submitted via Internet (Section 6.1).
- 3.2 Printed version of Form 9B (Section 6.2.2) is included in Postal Submission.

4. Technical Proposal

- 4.1 The proposed innovation is described in the first paragraph of the Technical Proposal (Section 3.4).
- 4.2 The technical proposal contains all eleven parts in order (Section 3.4).
- 4.3 Phase-II objectives are discussed (Section 3.4).
- 4.4 Commercial applications potential is discussed (Section 3.4).
- 4.5 Any pages containing proprietary information are labeled " Proprietary Material" and kept to the minimum essential for the proposal (Section 5.4.1).
- 4.6 The Electronic Technical Proposal was:
 - 4.6.1 submitted over the Internet, (Sections 6.1 and 6.2) and
 - 4.6.2 included with the Postal Submission Package (Section 6.3).

5. Budget Form 9C

- 5.1 Form 9C submitted via Internet (Sections 6.1 and 6.2).
- 5.2 Printed version of Form 9C is signed (Section 6.2.2) and included in Postal Submission.

6. Cooperative Agreement Letter

- Cooperative Agreement is signed and included in postal submission.